HOW TO USE THIS MANUAL

IN00U-90

GENERAL INFORMATION

1. INDEX

An INDEX is provided on the first page of each section to guide you to the item to be repaired. To assist you in finding your way through the manual, the Section Title and major heading are given at the top of every page.

2. GENERAL DESCRIPTION

At the beginning of each section, a General Description is given that pertains to all repair operations contained in that section.

Read these precautions before starting any repair task.

3. TROUBLESHOOTING

TROUBLESHOOTING tables are included for each system to help you diagnose the problem and find the cause. The fundamentals of how to proceed with troubleshooting are described on page IN-22 .

Be sure to read this before performing troubleshooting.

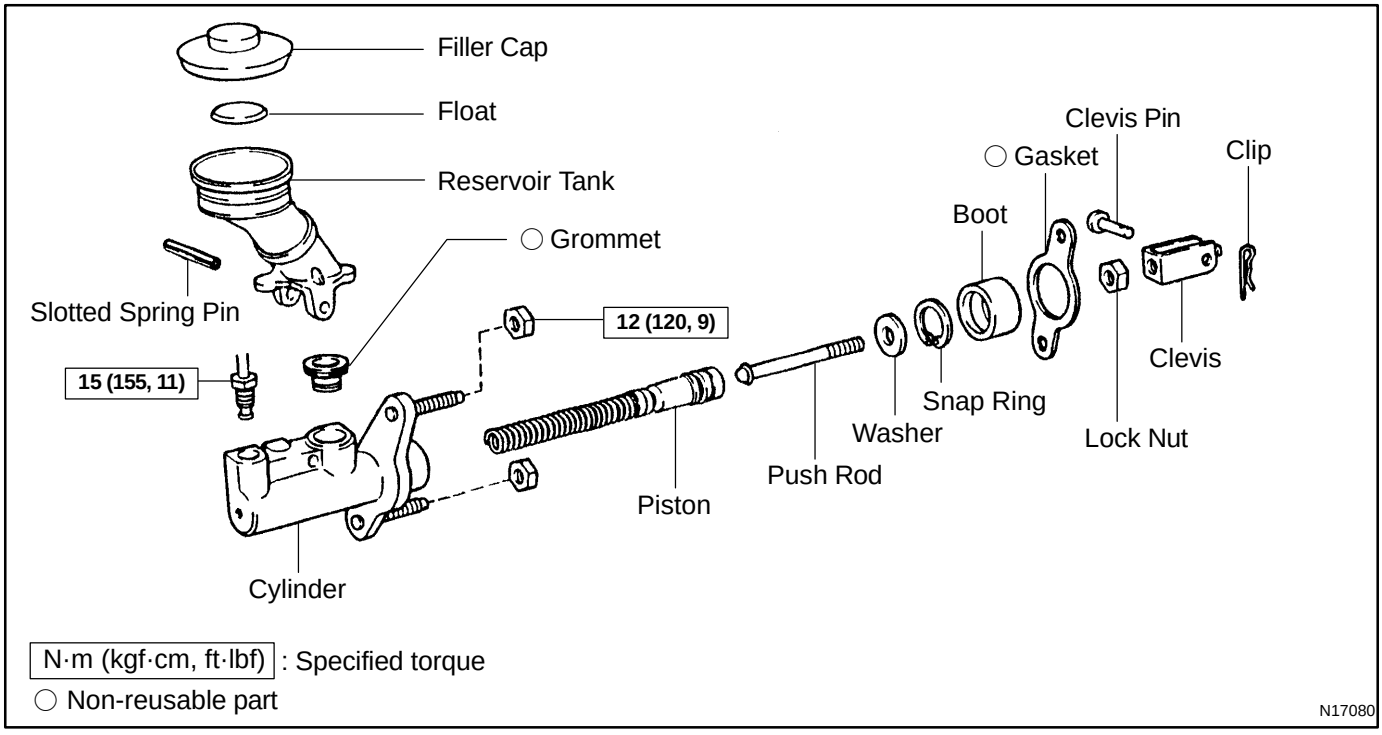
4. PREPARATION

Preparation lists the SST (Special Service Tools), recommended tools, equipment, lubricant and SSM (Special Service Materials) which should be prepared before beginning the operation and explains the purpose of each one.

5. REPAIR PROCEDURES

Most repair operations begin with an overview illustration. It identifies the components and shows how the parts fit together.

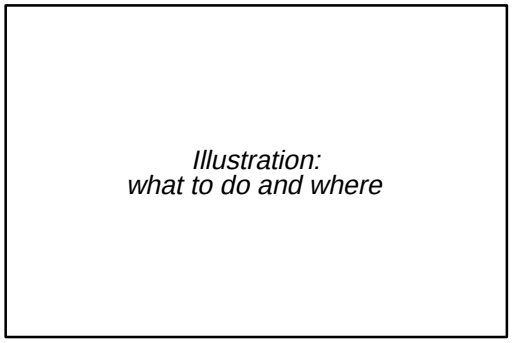
Example:



The procedures are presented in a step-by-step format:

- The illustration shows what to do and where to do it.
- The task heading tells what to do.
- The detailed text tells how to perform the task and gives other information such as specifications and warnings.

Example:



Task heading : what to do

21. CHECK PISTON STROKE OF OVERDRIVE BRAKE

(a) Place SST and a dial indicator onto the overdrive brake piston as shown in the illustration.

SST 09350-30020 (09350-06120)

Set part No. *Component part No.*

Detailed text : how to do task

(b) Measure the stroke applying and releasing the compressed air (392 — 785 kPa, 4 — 8 kgf/cm^2 or 57 — 114 psi) as shown in the illustration.

Piston stroke: 1.40 — 1.70 mm (0.0551 — 0.0669 in.)

Specification

This format provides the experienced technician with a FAST TRACK to the information needed. The upper case task heading can be read at a glance when necessary, and the text below it provides detailed information. Important specifications and warnings always stand out in bold type.

6. REFERENCES

References have been kept to a minimum. However, when they are required you are given the page to refer to.

7. SPECIFICATIONS

Specifications are presented in bold type throughout the text where needed. You never have to leave the procedure to look up your specifications. They are also found in Service Specifications section for quick reference.

8. CAUTIONS, NOTICES, HINTS:

- CAUTIONS are presented presented in bold type, and indicate there is a possibility of injury to you or other people.
- NOTICES are also presented in bold type, and indicate the possibility of damage to the components being repaired.
- HINTS are separated from the text but do not appear in bold. They provide additional information to help you perform the repair efficiently.

9. SI UNIT

The UNITS given in this manual are primarily expressed according to the SI UNIT (International System of Unit), and alternately expressed in the metric system and in the English System.

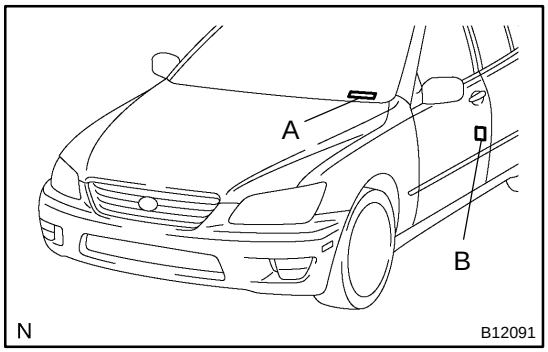
Example:

Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

IDENTIFICATION INFORMATION

IN04P-27

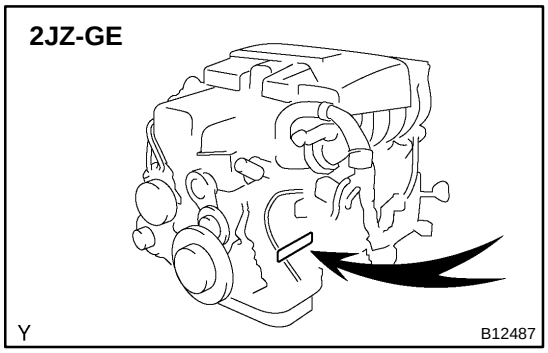
VEHICLE IDENTIFICATION AND ENGINE SERIAL NUMBER



1. VEHICLE IDENTIFICATION NUMBER

The vehicle identification number is stamped on the vehicle identification number plate and the certification label, as shown in the illustration.

A: Vehicle Identification Number Plate
B: Certification Label



2. ENGINE SERIAL NUMBER

The engine serial number is stamped on the engine block, as shown in the illustration.

REPAIR INSTRUCTIONS

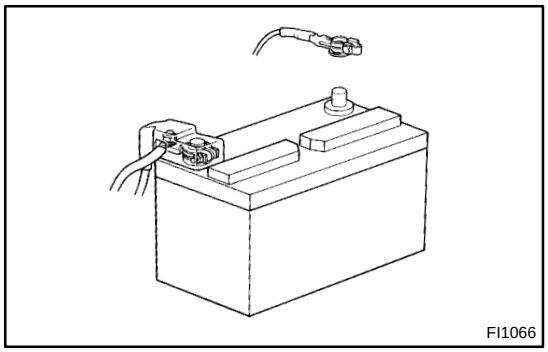
IN0DC-15

GENERAL INFORMATION

BASIC REPAIR HINT

(a) Prevent damage and maintain vehicle cleanliness by protective covering on the fender, seat and floor.

(b) During disassembly, line up parts in the order they were removed to facilitate reassembly.


FI1066

(c) Installation and removal of battery terminal:

(1) Before performing electrical work, disconnect the negative (-) terminal cable from the battery.

(2) If it is necessary to disconnect the battery for inspection or repair, first disconnect the negative (-) terminal cable.

(3) To prevent damage to the battery terminal when disconnecting the terminal cable, loosen the cable nut and raise the cable straight up. Do not twist or pry the cable off.

(4) Clean the battery terminals and cable ends with a clean shop rag. Do not scrape them with a file or other abrasive objects.

(5) Install the cable ends to the battery terminals after loosening the nut, and tighten the nut after installation. Do not use a hammer to tap the cable ends onto the terminals.

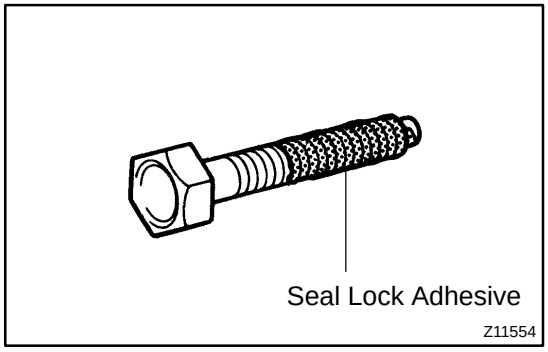
(6) Be sure the cover for the positive (+) terminal is properly in place.

(d) Check hose and wiring connectors to make sure that they are connected securely and correctly.

(e) Non-reusable parts:

(1) Always replace cotter pins, gaskets, O-rings, oil seals, etc. with new ones.

(2) Non-reusable parts are indicated in component illustrations by the " " symbols.



Z11554

(f) Precoated parts

Precoated parts are bolts, nuts, etc. that are coated with a seal lock adhesive at the factory.

(1) If a precoated part is retightened, loosened or move caused to in any way, it must be recoated with the specified adhesive.

(2) When reusing precoated parts, clean off the old adhesive and dry with compressed air. Then apply new seal lock adhesive to the bolt, nut or threads.

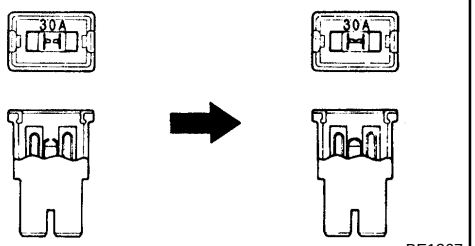
(3) Precoated parts are indicated in component illustrations by the "●" symbols.

(g) When necessary, use a sealer on gaskets to prevent leaks.

(h) Carefully observe all specifications for bolt tightening torques. Always use a torque wrench.

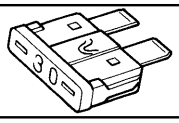
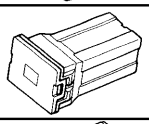
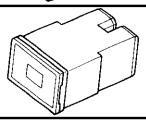
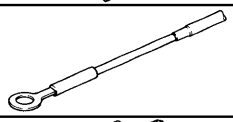
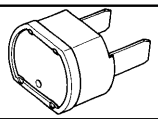
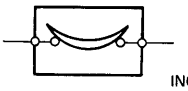
(i) Use of special service tools (SST) and special service materials (SSM) may be required, depending on the nature of the repair. Be sure to use SST and SSM where specified and follow the proper work procedure. A list of SST and SSM can be found in the Preparation section in this manual.

Medium Current Fuse and High Current Fuse Equal Amperage Rating



BE1367

(j) When replacing fuses, be sure the new fuse has the correct amperage rating. DO NOT exceed the rating or use one with a lower rating.

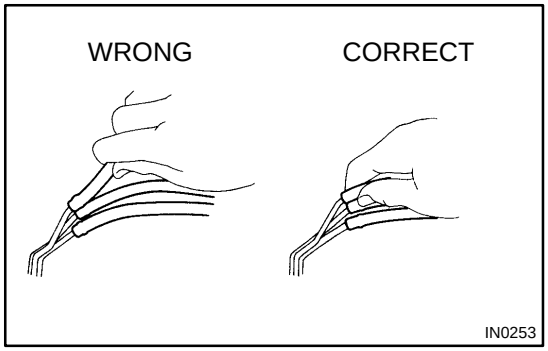
Illustration	Symbol	Part Name	Abbreviation
 BE5594	 IN0365	FUSE	FUSE
 BE5595	 IN0366	MEDIUM CURRENT FUSE	M-FUSE
 BE5596	 IN0367	HIGH CURRENT FUSE	H-FUSE
 BE5597	 IN0367	FUSIBLE LINK	FL
 BE5598	 IN0368	CIRCUIT BREAKER	CB

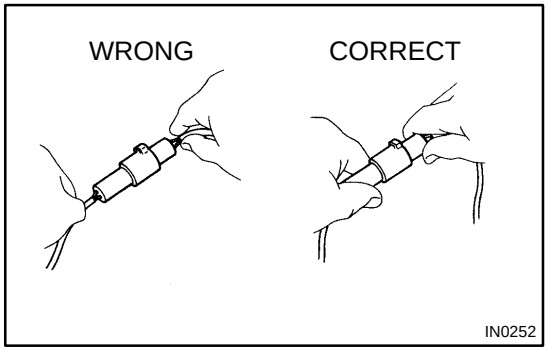
V00076

(k) Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations (see page IN-8).
- ○ Release the parking brake on a level surface and shift to in Neutral or N range.
- ○ When jacking up the front wheels of the vehicle, at first place chocks behind the rear wheels.
- ○ When jacking up the rear wheels of the vehicle, place chocks in front of the front wheels.
- ○ When jacking up only the front or rear wheels, set rigid racks and place chocks on front and behind the wheels in contact with the ground.
- ○ After the vehicle is jacked up, be sure to support it on rigid racks. It is extremely dangerous to do any work on a vehicle raised on a jack alone, even for a small job that can be finished quickly.

(l) Observe the following precautions to avoid damage to the following parts:

(1) Do not open the cover or case of the ECU unless absolutely necessary. (Static electricity transmitted through human touch may destroy the IC.)





(2) To disconnect vacuum hoses, pull off the end of the hose, not the middle.

(3) To pull apart electrical connectors, pull on the connector itself, not the wires.

(4) Be careful not to drop electrical components, such as sensors or relays. If they are dropped on a hard floor, they should be replaced and not reused.

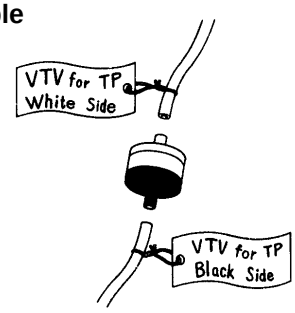
(5) When steam cleaning an engine, protect the electronic components, air filter and emission-related components from water.

(6) Never use an impact wrench to remove or install temperature switches or temperature sensors.

(7) When checking continuity at the wire connector, insert the tester probe carefully to prevent terminals from bending.

(8) When using a vacuum gauge, never force the hose onto a connector that is too large. Use a step-down adapter for adjustment. Once the hose has been stretched, it may leak air.

Example



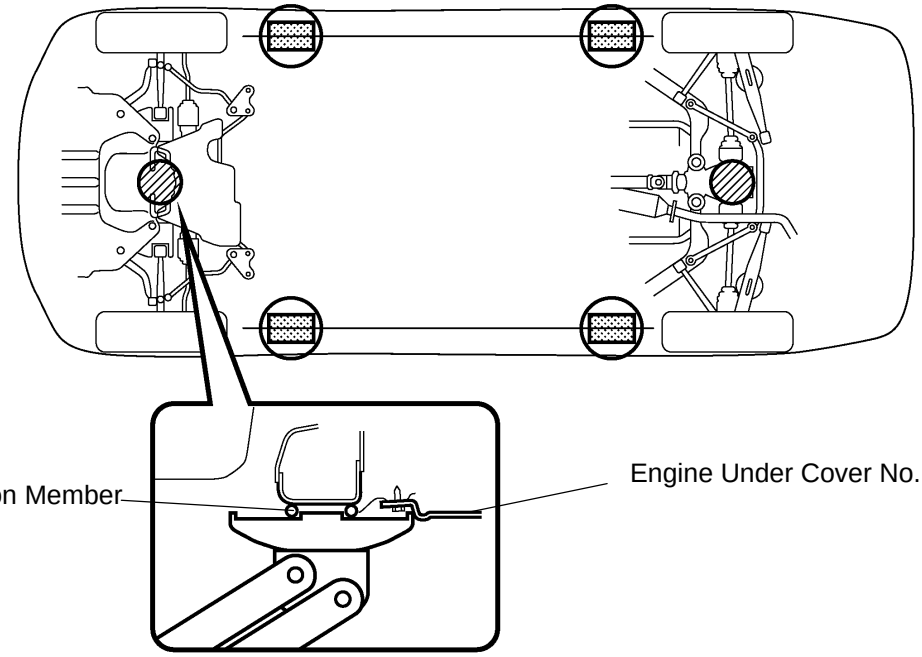
IN0002

(m) Installation and removal of vacuum hose:
  (1) When disconnecting vacuum hoses, use tags to identify where they should be reconnected to.
  (2) After completing a job, double check that the vacuum hoses are properly connected. A label under the hood shows the proper layout.

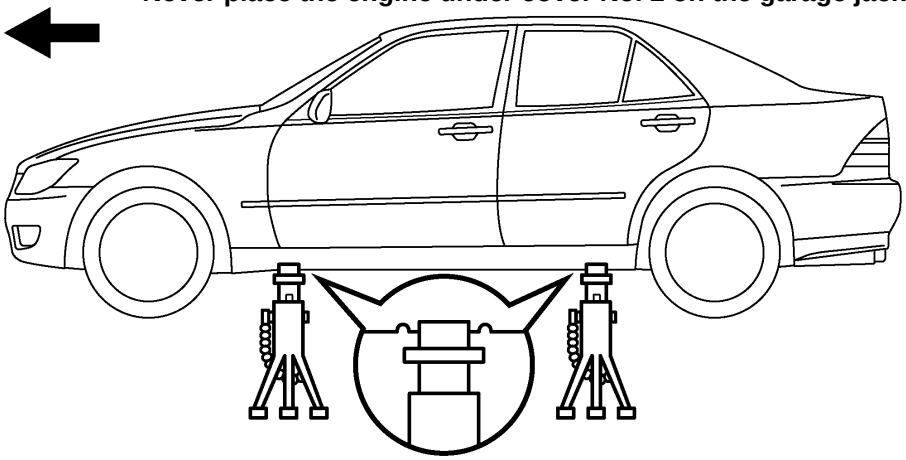
(n) Unless otherwise stated, all resistance should be measured at an ambient temperature of 20˚C (68˚F). Measurement should be made after the engine has cooled down. If measured at high temperatures immediately after the vehicle has been running, resistance may be outside specifications.

IN04O-16

VEHICLE LIFT AND SUPPORT LOCATIONS



NOTICE:
Never place the engine under cover No. 2 on the garage jack.



JACK POSITION

Front - - - - - - - - - - Front suspension member
Rear - - - - - - - - - - Differential carrier

CAUTION : **When jacking-up the front and rear, make sure the vehicle is not carrying any extra weight.**

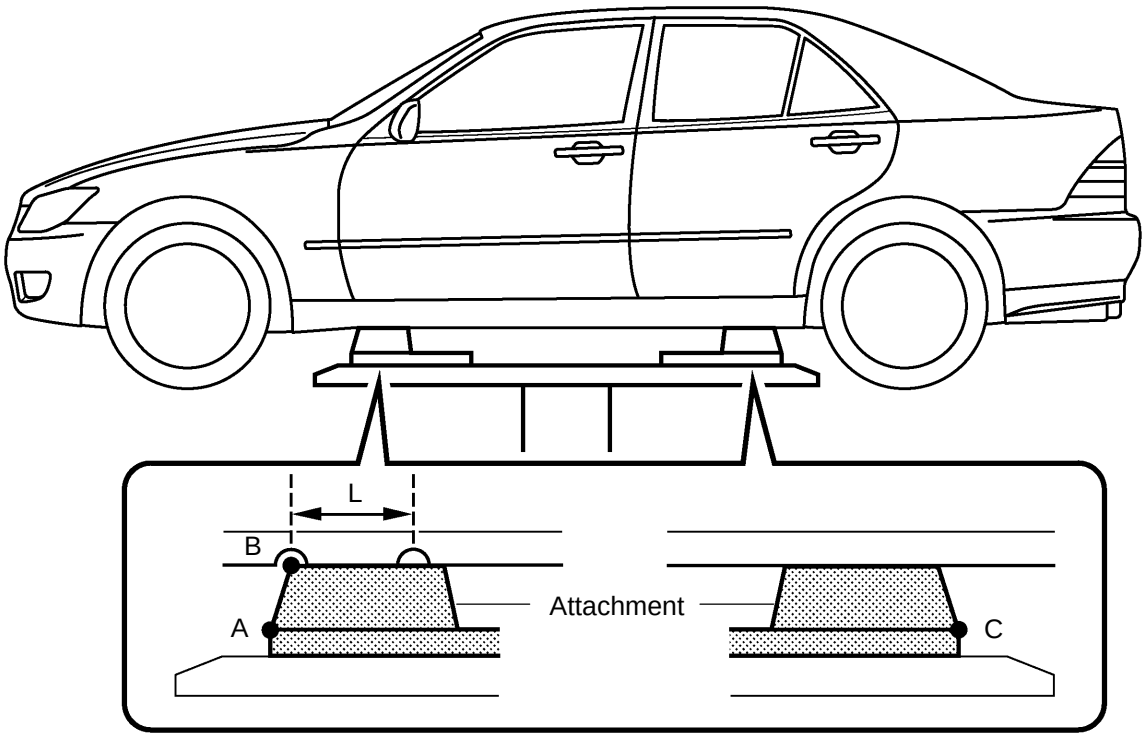
PANTOGRAPH JACK POSITION

SUPPORT POSITION

Safety stand and swing arm type lift -

I19098

Plate type lift



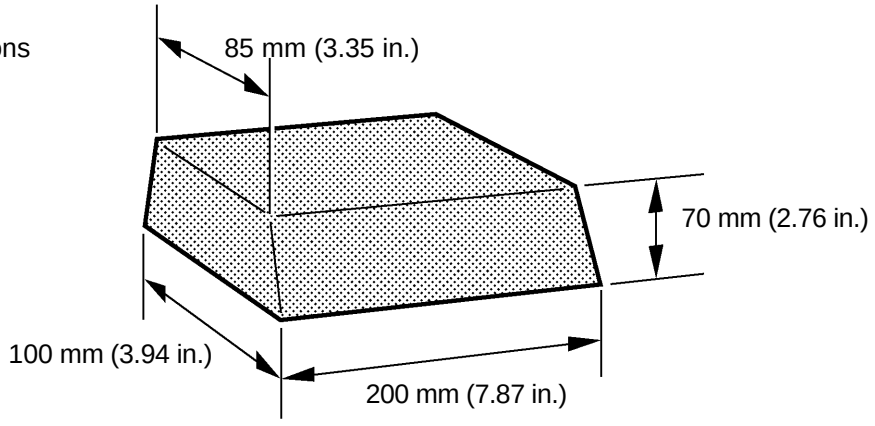
HINT :

Right and left set position	Place the vehicle over the center of the lift.
Front and rear set position	●When using attachments, place the one for front side vertically and the one for rear side horizontally to the vehicle. ●Align the cushion gum ends of the plate with the attachment lower ends (A, C). ●Align the attachment upper end (B) with the rocker flange front side notch.

NOTICE :

Check the interference of the attachment with the front floor cover when placing the attachment on the plate.

Attachment dimensions



I19099

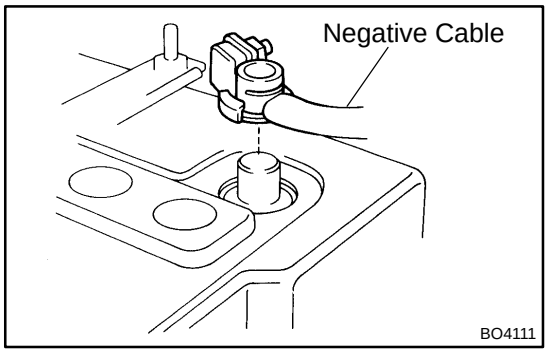
FOR ALL OF VEHICLES

IN0KE-01

PRECAUTION

1. FOR VEHICLES EQUIPPED WITH SRS AIRBAG AND SEAT BELT PRETENSIONER

(a) The LEXUS IS300 is equipped with an Supplemental Restraint System (SRS), such as the driver airbag, front passenger airbag assembly, side airbag assembly, curtain shield airbag assembly and seat belt pretensioners.
Failure to carry out service operations in the correct sequence could cause the supplemental restraint system to unexpectedly deploy during servicing, possibly leading to a serious accident.
Further, if a mistake is made in servicing the supplemental restraint system, it is possible the SRS may fail to operate when required. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the following items carefully, then follow the correct procedure described in this manual.



(b) GENERAL NOTICE

(1) Malfunction symptoms of the SRS are difficult to confirm, so the diagnostic trouble codes become the most important source of information when troubleshooting. When troubleshooting the supplemental restraint system, always check the diagnostic trouble codes before disconnecting the battery (see page DI-607).

(2) Work must be started after 90 seconds from the time the ignition switch is turned to the LOCK position and the negative (-) terminal cable is disconnected from the battery.
(The supplemental restraint system is equipped with a back-up power source so that if work is started within 90 seconds of disconnecting the negative (-) terminal cable from the battery, the SRS may deploy.)
When the negative (-) terminal cable is disconnected from the battery, memory of the clock and audio systems will be cancelled. So before starting work, make a record of the contents memorized by the each memory system. Then when work is finished, reset the clock and audio systems as before.
To avoid erasing the memory of each memory system, never use a back-up power supply from another battery.

(3) Even in cases of a minor collision where the SRS does not deploy, the steering wheel pad (see page RS- 17), front passenger airbag assembly (see page RS- 31), side airbag assembly (see page RS-44), curtain shield airbag assembly (see page RS-58), front airbag sensor (see page RS-74), side and curtain shield airbag sensor assembly (see page RS-79) and seat belt pretensioner (see page BO-220) should be inspected.

(4) Never use SRS parts from another vehicle. When replacing parts, replace them with new parts.

(5) Before repairs, remove the airbag sensor if shocks are likely to be applied to the sensor during repairs.

(6) Never disassemble and repair the steering wheel pad, front passenger airbag assembly, side airbag assembly, curtain shield airbag assembly, front air-bag sensor, side and curtain shied airbag sensor assembly or seat belt pretensioner.

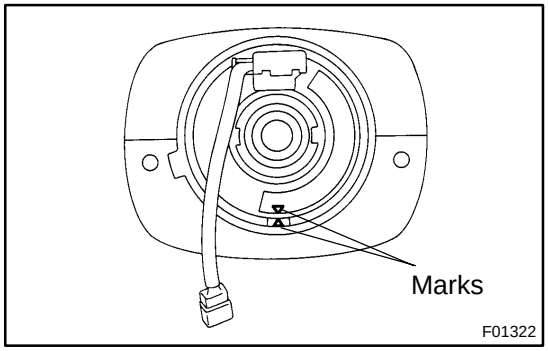
(7) Replace if the airbag sensor, steering wheel pad, front passenger airbag assembly, side airbag assembly, curtain shield airbag assembly, front airbag sensor assembly or seat belt pretensioner if it has been dropped, or if there are cracks, dents or other defects in its case, bracket or connector.

(8) Do not directly expose the steering wheel pad, front passenger airbag assembly, side airbag assembly, curtain shield airbag assembly, front airbag sensor, side and curtain shied airbag sensor assembly or seat belt pretensioner to hot air or flames.

(9) Use a voltmeter/ohmmeter with high impedance (10 kΩ/V minimum) for troubleshooting of the electrical circuit.

(10) Information labels are attached to the periphery of the SRS components. Follow the instructions on the labels.

(11) After work on the SRS is completed, check the SRS warning light (see page DI-607).



(c) SPIRAL CABLE (in Combination Switch)
The steering wheel must be fitted correctly to the steering column with the spiral cable at the neutral position, otherwise cable disconnection and other troubles may result. Refer to SR-25 of this manual concerning correct steering wheel installation.

(d) STEERING WHEEL PAD (with Airbag)

(1) When removing the steering wheel pad or handling a new steering wheel pad, it should be placed with the pad top surface facing up see illustration below. Storing the pad with its metallic surface facing upward may lead to a serious accident if the airbag inflates. In addition, do not store a steering wheel pad on top of one another.

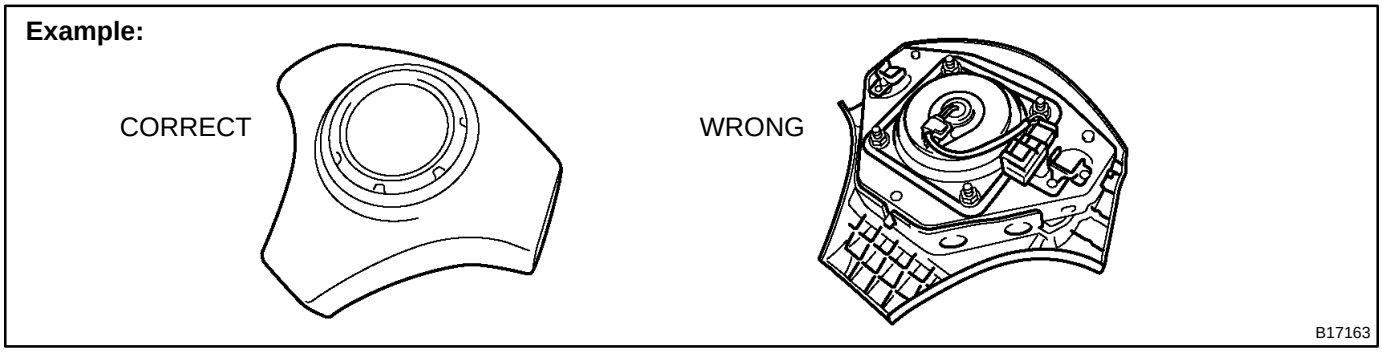
(2) Never measure the resistance of the airbag squib. This may cause the airbag to deploy, which is could cause serious injury.

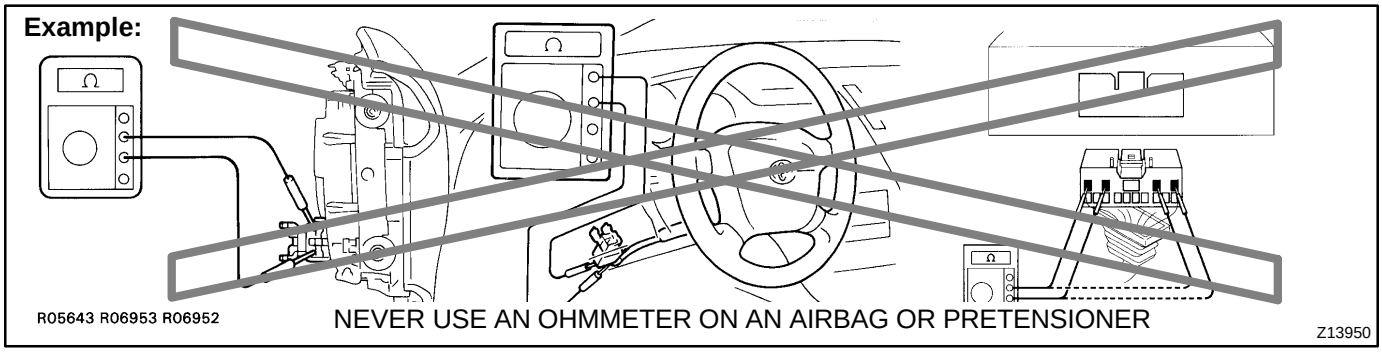
(3) Grease or detergents of any kind should not be applied to the steering wheel pad.

(4) Store the steering wheel pad where the ambient temperature remains below 93˚C (200˚F), has low humidity and is away from electrical noise.

(5) Before using an electric welder, first disconnect the airbag connector (the connector is yellow and has 4 pins) under the steering column near the combination switch connector.

(6) As a safety measure, always deploy airbags using an SST before disposal (see page RS-17). Deploy airbags in a safe place away from electrical noise.





(e) FRONT PASSENGER AIRBAG ASSEMBLY

(1) Always store a removed or new front passenger airbag assembly with the airbag deployment direction facing up.
Storing the airbag assembly with the airbag deployment direction facing down could cause a serious accident if the airbag inflate.

(2) Never measure the resistance of the airbag squib. This may cause the airbag to deploy, which is could cause serious injury.

(3) Grease or detergents of any kind should not be applied to the steering wheel pad.

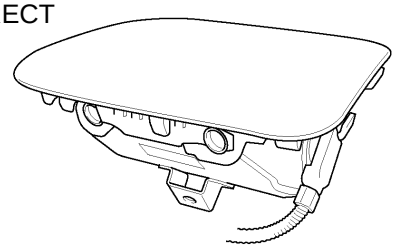
(4) Store the steering wheel pad where the ambient temperature remains below 93˚C (200˚F), has low humidity and is away from electrical noise.

(5) Before using an electric welder, first disconnect the airbag connector (the connector is yellow and has 4 pins) under the steering column near the combination switch connector.

(6) As a safety measure, always deploy airbags using an SST before disposal (see page RS-31).
Deploy airbags in a safe place away from electrical noise.

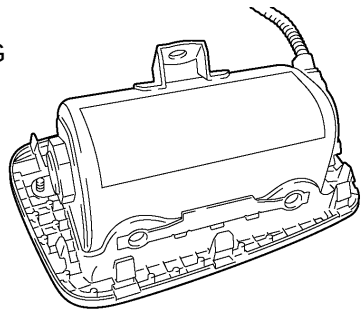
Example:

CORRECT



H15183 B11669

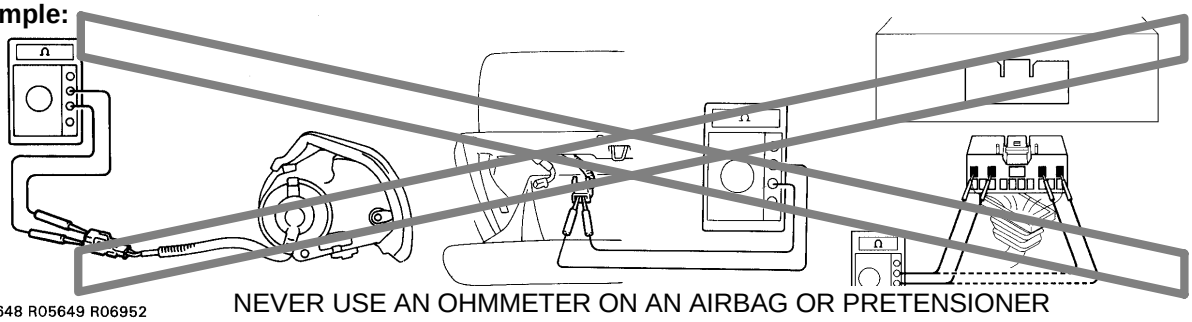
WRONG



Y

B17162

Example:



R05648 R05649 R06952

NEVER USE AN OHMMETER ON AN AIRBAG OR PRETENSIONER

Z13951

(f) SIDE AIRBAG ASSEMBLY

(1) Always store a removed or new side airbag assembly with the airbag deployment direction facing up. Storing the airbag assembly with the airbag deployment direction facing down could cause a serious accident if the airbag inflates.

(2) Never measure the resistance of the airbag squib. This may cause the airbag to deploy, which could cause serious injury.

(3) Grease or detergents of any kind should not be applied to the steering wheel pad.

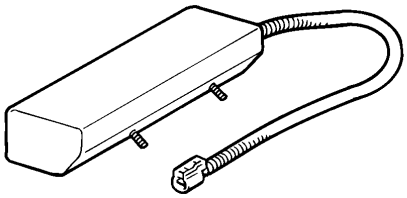
(4) Store the steering wheel pad where the ambient temperature remains below 93˚C (200˚F), has low humidity and is away from electrical noise.

(5) Before using an electric welder, first disconnect the airbag connector (the connector is yellow and has 2 pins) under the steering column near the combination switch connector.

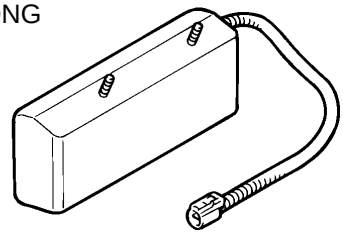
(6) As a safety measure, always deploy airbags using an SST before disposal (see page RS-44). Deploy airbags in safe place away from electrical noise.

Example:

CORRECT

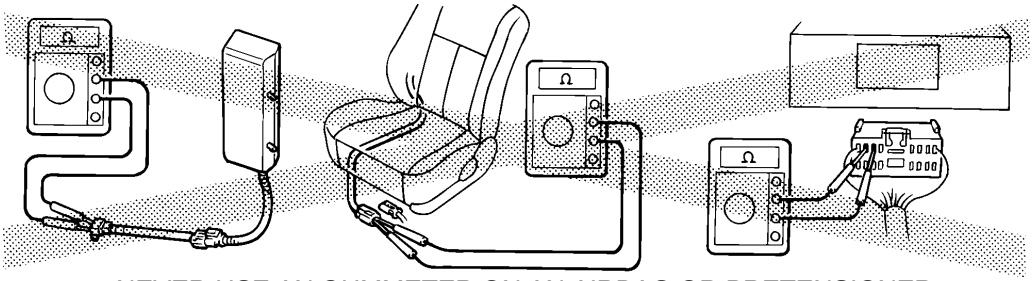


WRONG



B17197

Example:



NEVER USE AN OHMMETER ON AN AIRBAG OR PRETENSIONER

B01546

(g) CURTAIN SHIELD AIRBAG ASSEMBLY

(1) Always store a removed or new side airbag assembly with the airbag deployment direction facing up. Storing the airbag assembly with the airbag deployment direction facing down could cause a serious accident if the airbag inflates.

NOTICE:

Plastic bag is not re-useable.

CAUTION:

Never disassemble the curtain shield airbag assembly.

(2) Never measure the resistance of the airbag squib. This may cause the airbag to deploy, which could cause serious injury.

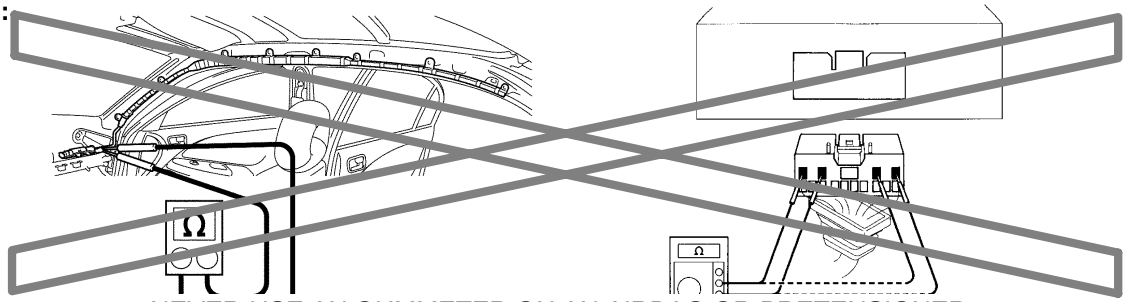
(3) Grease or detergents of any kind should not be applied to the curtain shield airbag assembly.

(4) Store the steering wheel pad where the ambient temperature remains below 93˚C (200˚F), has low humidity and is away from electrical noise.

(5) Before using an electric welder, first disconnect the airbag connector (the connector is yellow and has 2 pins) under the steering column near the combination switch connector.

(6) As a safety measure, always deploy airbags using an SST before disposal (see page RS-59). Deploy airbags in a safe place away from electrical noise.

Example:



H12059R06952 P NEVER USE AN OHMMETER ON AN AIRBAG OR PRETENSIONER B08605

(h) SEAT BELT PRETENSIONER

(1) Never measure the resistance of the seat belt pretensioner. This may cause the seat belt pretensioner to activate, which could cause serious injury.

(2) Never disassemble the seat belt pretensioner.

(3) Never install the seat belt pretensioner in another vehicle.

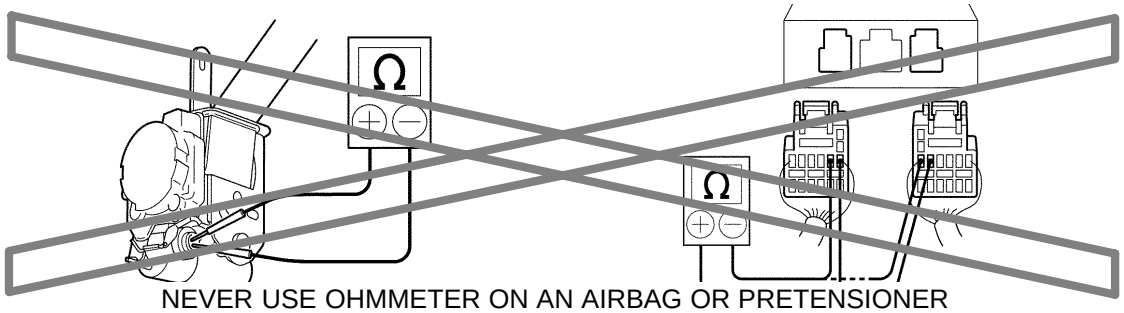
(4) Store the seat belt pretensioner where the ambient temperature remains below 80˚C (176˚F), has low humidity and is away from electrical noise.

(5) Before using an electric welder, first disconnect the connector (the connector is yellow and has 2 pins).

(6) As a safety measure, always activate the seat belt pretensioner before disposal (see page BO-220). Activate the pretensioner in safe place away from electrical noise.

(7) The seat belt pretensioner becomes hot after activation. Allow it to cool before disposing. Never use water to cool seat belt pretensioner.

Example:



NEVER USE OHMMETER ON AN AIRBAG OR PRETENSIONER

B02121

(i) AIRBAG SENSOR ASSEMBLY

(1) If an airbag sensor assembly has been involved in a collision where its SRS has deployed, do not re-use it.

(2) The connectors to the airbag sensor assembly should be connected or disconnected with the sensor mounted on the floor. Failure to do so could cause undesired deployment of the SRS.

(3) To avoid serious injury, servicing the SRS must be started 90 seconds after:

- The ignition switch is turned to the LOCK position.
- The negative (-) terminal cable is disconnected from the battery.

Even if only loosening the set bolts of the airbag sensor assembly, you must follow the above guidelines.

(j) WIRE HARNESS AND CONNECTOR

The SRS wire harness is integrated with the instrument panel wire harness assembly. All the connectors in the system are a standard yellow color. If the SRS wire harness becomes disconnected or the connector becomes broken, etc., repair or replace it as shown on page RS-82 .

2. FOR VEHICLES EQUIPPED WITH A CATALYTIC CONVERTER

CAUTION:

If large amount of unburned gasoline flows into the converter, it may overheat and create a fire hazard. To prevent this, observe the following precautions and explain them to your customer.

(a) Use only unleaded gasoline.

(b) Avoid prolonged idling.
Avoid running the engine at idle speed for more than 20 minutes.

(c) Avoid spark jump test.
(1) Perform spark jump test only when absolutely necessary. Perform this test as rapidly as possible.
(2) While testing, never race the engine.

(d) Avoid prolonged engine compression measurement.
Engine compression tests must be done as rapidly as possible.

(e) Do not run engine when fuel tank is nearly empty.
This may cause the engine to misfire and create an extra load on the converter.

(f) Avoid coasting with ignition turned off.

(g) Do not dispose of used catalyst along with parts contaminated with gasoline or oil.

3. IF VEHICLE IS EQUIPPED WITH MOBILE COMMUNICATION SYSTEM

For vehicles with mobile communication systems such as two-way radios and cellular telephones, observe the following precautions.

(1) Install the antenna as far as possible away from the ECU and sensors of the vehicle's electronic system.

(2) Install the antenna feeder at least 20 cm (7.87 in.) away from the ECU and sensors of the vehicle's electronic systems. For details about ECU and sensors locations, refer to the section on the applicable component.

(3) Avoid winding the antenna feeder together with other wiring as much as possible, and also avoid running the antenna feeder parallel with other wire harnesses.

(4) Check that the antenna and feeder are correctly adjusted.

(5) Do not install powerful mobile communications system.

4. FOR USING OBD II SCAN TOOL OR HAND-HELD TESTER

CAUTION:

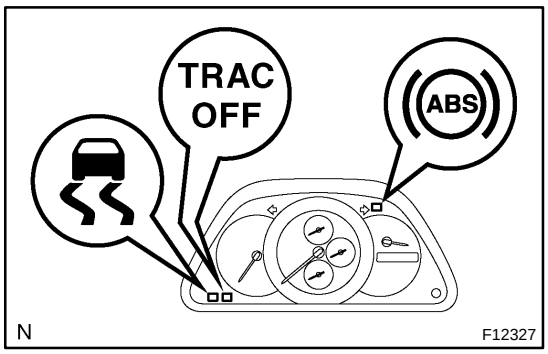
Observe the following items for safety reasons:

- **Before using the OBD II scan tool or hand-held tester, the OBD II scan tool's instruction book or hand-held tester's operator manual should be read thoroughly.**
- **Be sure to route all cables securely when driving with the OBD II scan tool or hand-held tester connected to the vehicle. (i.e. Keep cables away from feet, pedals, steering wheel and shift lever.)**
- **Two persons are required when test driving with the OBD II scan tool or hand-held tester, one person to drive the vehicle and the other person to operate the OBD II scan tool or hand-held tester.**

5. FOR VEHICLES EQUIPPED WITH TRACTION CONTROL (TRAC) SYSTEM

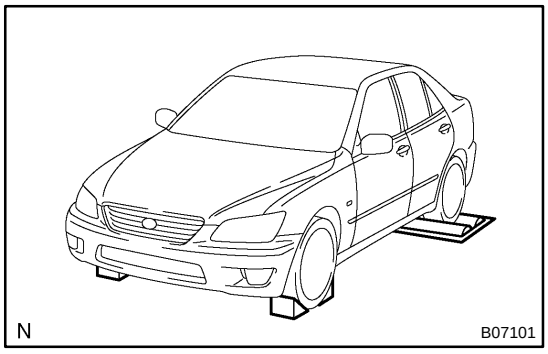
NOTICE:

When using a 2-wheel drum tester such as a speedometer tester or chassis dynamometer, etc., or jacking up the rear wheels and driving the wheels, always push in the TRAC cut switch and turn the TRAC system OFF.



(a) Press the TRAC cut switch.
(b) Check that the TRAC system is turned OFF by the TRAC cut switch.

HINT:
The SLIP indicator light should be always ON immediately after the engine is restarted.

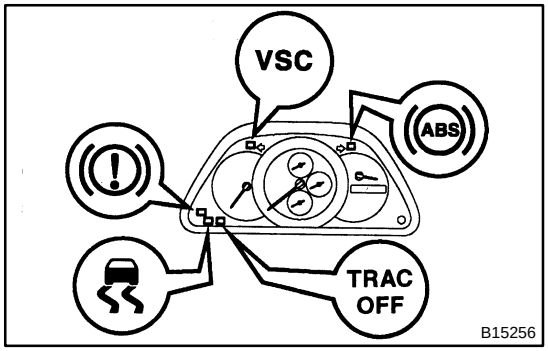


(c) Begin measurements.
(d) Press the TRAC cut switch to turn the TRAC to the operative mode and check that the TRAC OFF indicator light goes off.

HINT:
The SLIP indicator light blinks when the TRAC system is operational.

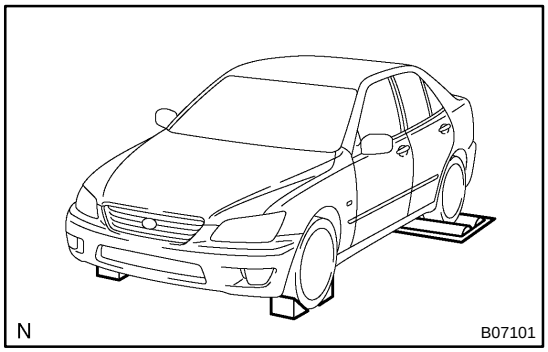
6. FOR VEHICLES EQUIPPED WITH VEHICLE SKID CONTROL (VSC) SYSTEM

NOTICE:
When using 2-wheel drum tester such as a speedometer tester or chassis dynamometer, etc., or jacking up the front wheels and driving the wheels, always push in the VSC OFF switch to turn the VSC system OFF.



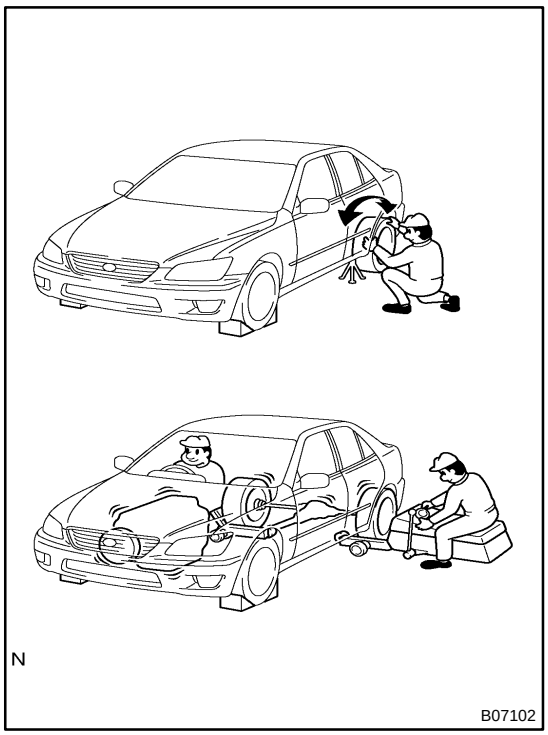
(a) Press the VSC OFF switch.
(b) Check that the VSC OFF indicator light comes ON.

HINT:
The VSC OFF indicator light should be always OFF when the engine is restarted.



(c) Begin measurements.
(d) Press the VSC OFF switch again to change the VSC system to operational condition and check that the VSC OFF indicator light goes off.

HINT:
The SLIP indicator light blinks and the VSC buzzer sounds when the VSC system is operational.



7. FOR VEHICLES EQUIPPED WITH LIMITED SLIP DIFFERENTIAL

(a) Never apply driving force when RH or LH rear wheel only is touching the ground.

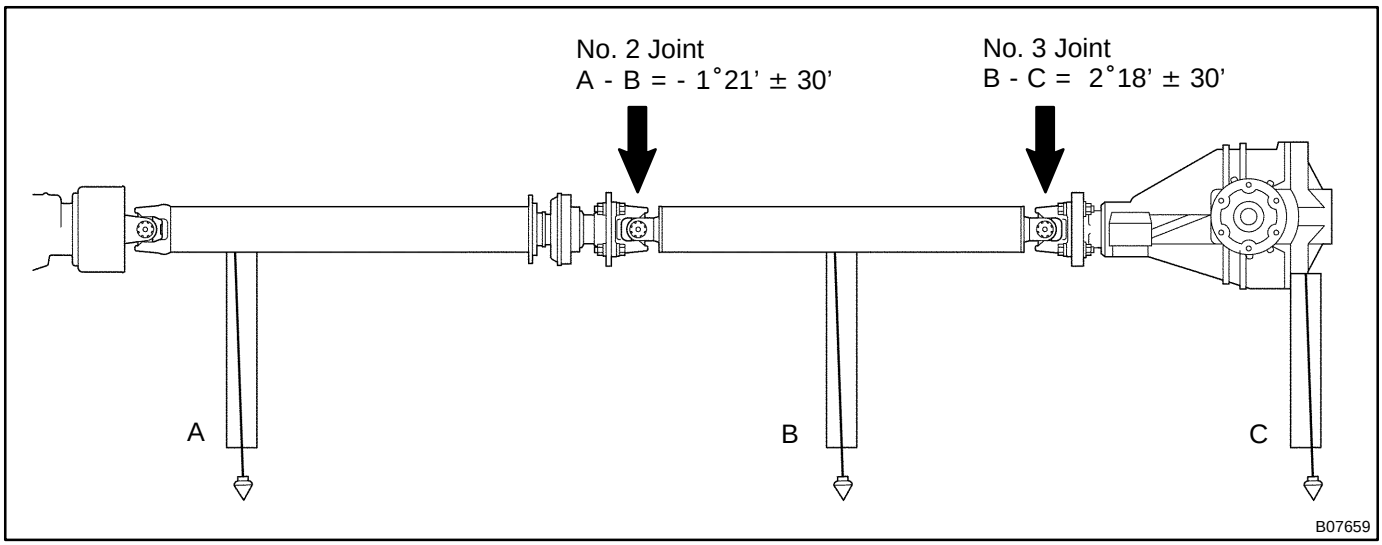
(b) During service/rectification work never spin (race) the RH or LH rear wheel only such as with ON-The-Car type wheel balancer, both rear wheels must be off the ground.

HINT:

- In case of the above, due to the construction of the LSD the driving force is transmitted to the opposite wheel and therefore it is possible for the vehicle to start suddenly if only one rear wheel is off the ground. Furthermore it could result in component damage to the LSD due to the loads acting on it.
- Always raise both rear wheels off the ground and support the vehicle on suitable safety stand.

8. INSPECTION AND ADJUSTMENT OF JOINT ANGLE DURING REMOVAL AND INSTALLATION OF PROPELLER SHAFT

When performing operations which involve the removal and installation of the propeller shaft, always check the joint angle. Make adjustments if necessary (see page PR-1 1).



HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

IN04S-45

GENERAL INFORMATION

A large number of ECU controlled systems are used in the LEXUS IS300. In general, ECU controlled systems are considered to be a very intricate, requiring a high level of technical knowledge to troubleshoot. However, following the problem checking procedures of the ECU controlled system's circuits carefully is not complex. If you have an adequate understanding of the system and a basic knowledge of electricity, accurate diagnosis and necessary repair can be performed.

This manual emphasizes the above standpoint to help service technicians perform accurate and effective troubleshooting. Detailed information on major ECU controlled systems in this vehicle are outlined below:

System	Page
1. Engine	DI-1
2. Automatic Transmission	DI-335
3. ABS with EBD & BA & TRAC System	DI-435
4. ABS with EBD & BA & TRAC & VSC System	DI-505
5. Supplemental Restraint System	DI-605
6. Theft Deterrent System	DI-776
7. Cruise Control System	DI-818
8. Engine Immobiliser System	DI-849
9. Combination Meter System	DI-870
10.Body Control System	DI-893
11.Multiplex Communication System	DI-949
12.LEXUS Navigation System	DI-979
13.Air Conditioning System	DI-1009

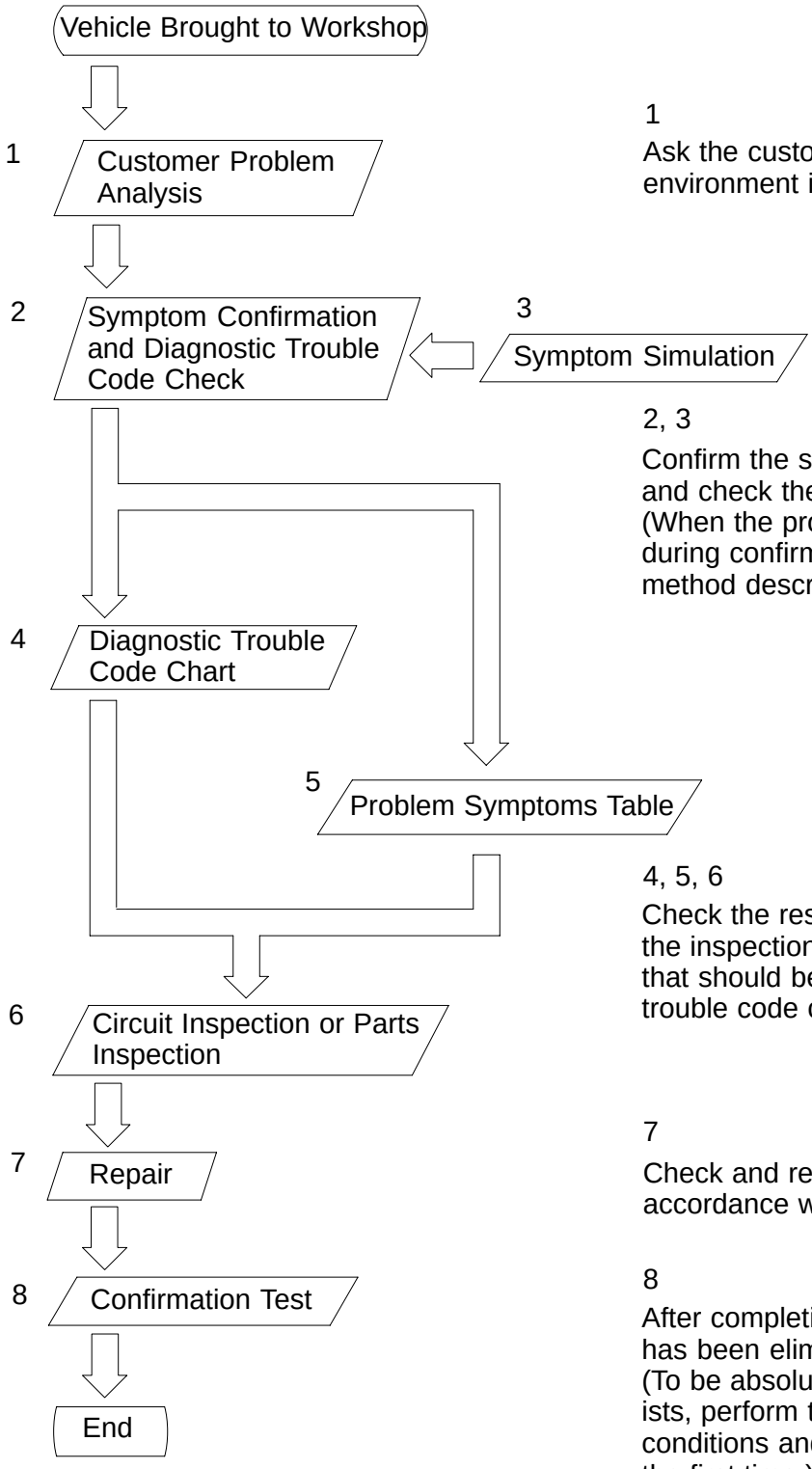
FOR USING OBDII SCAN TOOL OR HAND-HELD TESTER

- Before using the scan tool or tester, the scan tool's instruction book or tester's operator manual should be read thoroughly.
- If the scan tool or tester cannot communicate with ECU controlled systems when you have connected the cable of the scan tool or tester to DLC3, turned the ignition switch ON and operated the scan tool, there is a problem on the vehicle side or tool side.
  (1) If communication is normal when the tool is connected to another vehicle, inspect the diagnosis data link line (Bus⊕line) or ECU power circuit of the vehicle.
  (2) If communication is still not possible when the tool is connected to another vehicle, the problem is probably in the tool itself, so perform the Self Test procedures outlined in the Tester Operator's Manual.

IN04T-22

HOW TO PROCEED WITH TROUBLESHOOTING

Carry out troubleshooting in accordance with the procedure below. Only a basic procedure is shown. Details in the Diagnostics section show the most effective methods for each circuit. Confirm troubleshooting procedures first for the relevant circuit before beginning troubleshooting of that circuit.



1

Ask the customer about the conditions and the environment in which the problem occurred.

2, 3

Confirm the symptoms and the problem conditions, and check the diagnostic trouble codes.
(When the problem symptoms do not appear during confirmation, use the symptom simulation method described later on.)

4, 5, 6

Check the results obtained in Step 2. Confirm the inspection procedure for the system or the part that should be checked using the diagnostic trouble code chart or the problem symptoms table.

7

Check and repair the affected system or part in accordance with the instructions in Step 6.

8

After completing repairs, confirm that the problem has been eliminated.
(To be absolutely sure the problem no longer exists, perform the confirmation test under the same conditions and environment as when it occurred the first time.)

1. CUSTOMER PROBLEM ANALYSIS

○ The 5 items in the table below are important points in the problem analysis:

○ In troubleshooting, the problem symptoms must be confirmed accurately. Preconceptions should be discarded in order to give an accurate judgement. To ascertain what the problem symptoms are, it is extremely important to ask the customer about the problem and the conditions at the time it occurred.

Important Points in the Customer Problem Analysis

- What ----- Vehicle model, system name
- When ----- Date, time, occurrence frequency
- Where ----- Road conditions
- Under what conditions? ----- Running conditions, driving conditions, weather conditions
- How did it happen? ----- Problem symptoms

(Sample) Supplemental restraint system check sheet.

CUSTOMER PROBLEM ANALYSIS CHECK

SUPPLEMENTAL RESTRAINT SYSTEM Check Sheet Inspector's Name

Customer's Name		VIN	
		Production Date	/ /
		Licence No.	
Date Vehicle Brought In	/ /	Odometer Reading	km miles

Date Problem First Occurred	/ /
Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Other
Temperature	Approx.

Vehicle Operation	☐ Starting ☐ Idling ☐ Driving [☐ Constant speed ☐ Acceleration ☐ Deceleration ☐ Other]

2. SYMPTOM CONFIRMATION AND DIAGNOSTIC TROUBLE CODE CHECK

The diagnostic system in the LEXUS IS300 fulfills various functions.

- ○ The first function is the Diagnostic Trouble Code (DTC) Check. In a DTC Check,a previous malfunction's DTC can be checked by a technician during troubleshooting. (A DTC is a code stored in the ECU memory whenever a malfunction in the signal circuits to the ECU occurs.)
- ○ Another function is the Input Signal Check, which checks if the signals from various switches are sent to the ECU correctly. By using these check functions, the problem areas can be narrowed down and troubleshooting is more effective. Diagnostic functions are incorporated in the following systems in the LEXUS IS300.

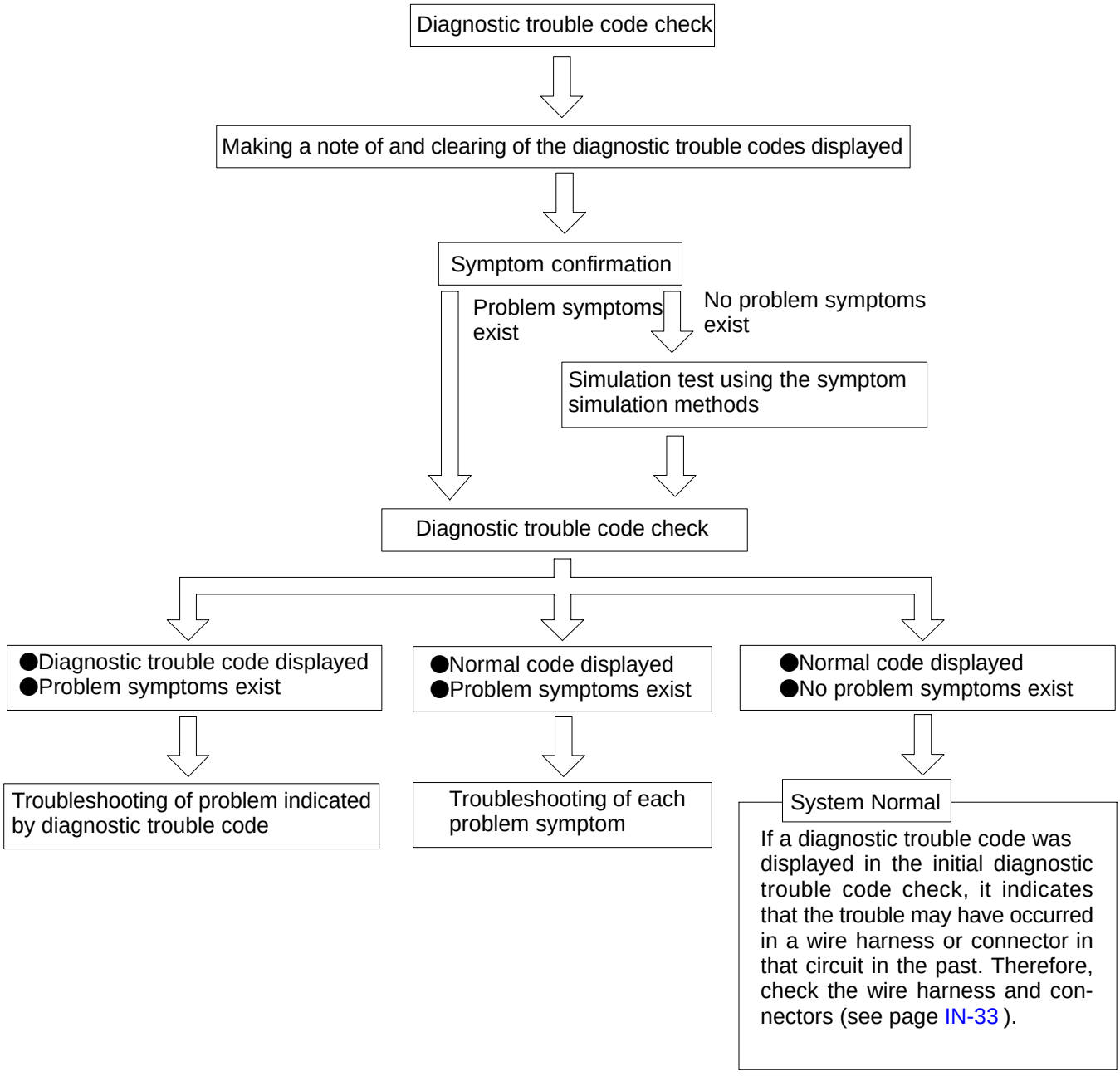
System	Diagnostic Trouble Code Check	Input Signal Check (Sensor Check)	Diagnostic Test Mode (Active Test)
Engine	○ (with Check Mode)	○	○
Automatic Transmission	○ (with Check Mode)	○	
ABS with EBD & BA & TRAC System	○	○	○
ABS with EBD & BA & TRAC & VSC System	○	○	○
Supplemental Restraint System	○		
Theft Deterent System			○
Cruise Control System	○	○	
Engine Immobiliser System	○		
Combination Meter System			○
Body Control System			○
Multiplex Communication System	○		○
LEXUS Navigation System			○
Air Conditioning System	○		○

In diagnostic trouble code check, it is very important to determine whether the problem indicated by the diagnostic trouble code is still occurring or occurred in the past but returned to normal at present. In addition, it must be checked in the problem symptom check whether the malfunction indicated by the diagnostic trouble code is directly related to the problem symptom or not. For this reason, the diagnostic trouble codes should be checked before and after the symptom confirmation to determine the current conditions, as shown in the table below. If this is not done, it may, depending on the case, result in unnecessary troubleshooting for normally operating systems, thus making it more difficult to locate the problem, or in repairs not pertinent to the problem. Therefore, always follow the procedure in correct order and perform the diagnostic trouble code check.

DIAGNOSTIC TROUBLE CODE CHECK PROCEDURE

Diagnostic Trouble Code Check (Make a note of and then clear)	Confirmation of Symptoms	Diagnostic Trouble Code Check	Problem Condition
Diagnostic Trouble Code Display	Problem symptoms exist	Same diagnostic trouble code is displayed	Problem is still occurring in the diagnostic circuit
		Normal code is displayed	The problem is still occurring in a place other than in the diagnostic circuit (The diagnostic trouble code displayed first is either for a past problem or it is a secondary problem)
	No problem symptoms exist		The problem occurred in the diagnostic circuit in the past
Normal Code Display	Problem symptoms exist	Normal code is displayed	The problem is still occurring in a place other than in the diagnostic circuit
	No problem symptoms exist	Normal code is displayed	The problem occurred in a place other than in the diagnostic circuit in the past

Taking into account the points on the previous page, a flow chart showing how to proceed with troubleshooting using the diagnostic trouble code check is shown below. This flow chart shows how to utilize the diagnostic trouble code check effectively, then by carefully checking the results, indicates how to proceed either to diagnostic trouble code troubleshooting or to troubleshooting of problem symptoms table.



3. SYMPTOM SIMULATION

The most difficult case in troubleshooting is when no problem symptoms occurring. In such cases, a thorough customer problem analysis must be carried out. Then simulate a simulation of the same or similar conditions and environment in which the problem occurred in the customer's vehicle should be carried out. No matter how much skill or experience a technician has, troubleshooting without confirming the problem symptoms will lead to something important in the repair operation being overlooked and lead to mistakes or delays in repairs.

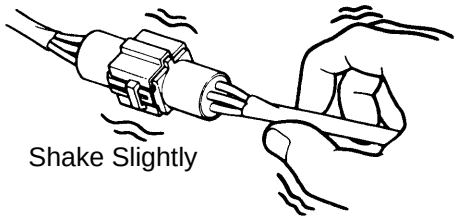
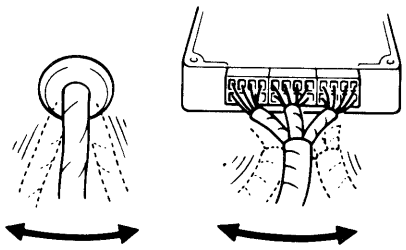
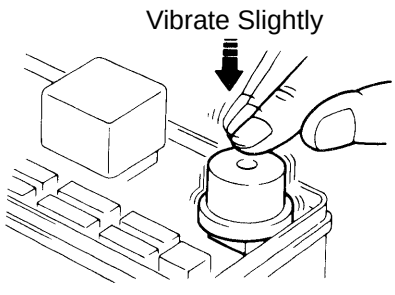
For example:

With a problem that only occurs when the engine is cold, or occurs as result of vibration caused by road during driving, the problem can never be determined as long as the symptoms are being checked on stationary vehicle or a vehicle with a warmed-up engine.

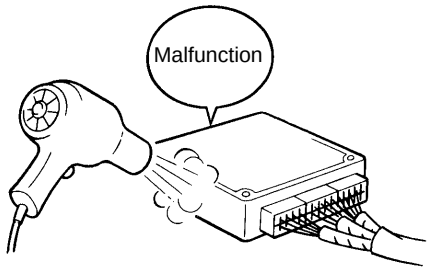
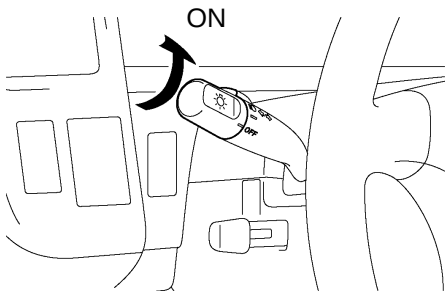
Vibration, heat or water penetration (moisture) is difficult to reproduce. The symptom simulation tests below are effected substitutes for the conditions and can be applied on a stationary vehicle.

Important Points in the Symptom Simulation Test:

In the symptom simulation test, the problem symptoms as well as problem area or parts must be confirmed. First, narrow down the possible problem circuits according to the symptoms. Then, connect the tester and carry out the symptom simulation test, judging whether the circuit being tested is defective or normal, and also confirming the problem symptoms at the same time. Refer to the problem symptoms table for each system to narrow down the possible causes of the symptom.

1	**VIBRATION METHOD: When vibration seems to be the major cause.**
CONNECTORS Slightly shake the connector vertically and horizontally. **WIRE HARNESS** Slightly shake the wire harness vertically and horizontally. The connector joint, fulcrum of the vibration, and body through portion are the major areas that should be checked thoroughly.	  FI2331 FI2332
PARTS AND SENSOR Apply slight vibration with a finger to the part of the sensor considered to be the cause of the problem and check whether or not the malfunction occurs. HINT: Applying strong vibration to relays may result in open relays.	 FI2330

V07268

2	**HEAT METHOD: When the problem seems to occur when the suspect area is heated.**
Heat the component that is the likely cause of the malfunction with a hair dryer or similar device. Check whether or not if the malfunction occurs. **NOTICE:** **(1) Do not heat to more than 60˚C (140˚F). (Exceeding this temperature may damage components.)** **(2) Do not apply heat directly to parts in the ECU.**	 FI2334
3	**WATER SPRINKLING METHOD: When the malfunction seems to occur on a rainy day or in a high-humidity condition.**
Sprinkle water onto the vehicle and check whether or not if the malfunction occurs. **NOTICE:** **(1) Never sprinkle water directly into the engine compartment. Indirectly change the temperature and humidity by applying water spray onto the front of the radiator.** **(2) Never apply water directly onto electronic components.** HINT: If a vehicle is subject to water leakage, the leaked water may damage the ECU. When testing a vehicle with a water leakage problem, special caution must be taken.	 FI6649
4	**OTHER: When a malfunction seems to occur when electrical load is excessive.**
Turn on all electrical loads including the heater blower, head lights, rear window defogger, etc. and check to see if the malfunction occurs.	 B02389

B02390

4. DIAGNOSTIC TROUBLE CODE CHART

Use Diagnostic Trouble Codes (DTCs) (from the DTC checks) in the table below to determine the trouble area and proper inspection procedure. The engine diagnostic trouble code chart is shown below as an example.

●DTC No.
Indicates the diagnostic trouble code.
●Page or Instructions
Indicates the page where the inspection procedure for each circuit is to be found, or gives instructions for checking and repairs.

●Trouble Area
Indicates the suspect area of the problem.

●Detection Item
Indicates the system of the problem or contents of the problem.

DTC CHART (SAE Controlled)

HINT:
Parameters listed in the chart may not be exactly the same as your reading due to the type of instrument or other factors.

If a malfunction code is displayed during the DTC check mode, check the circuit for that code listed in the table below. For details of each code, refer to the ”See page” under the ”DTC No.” in the DTC chart.

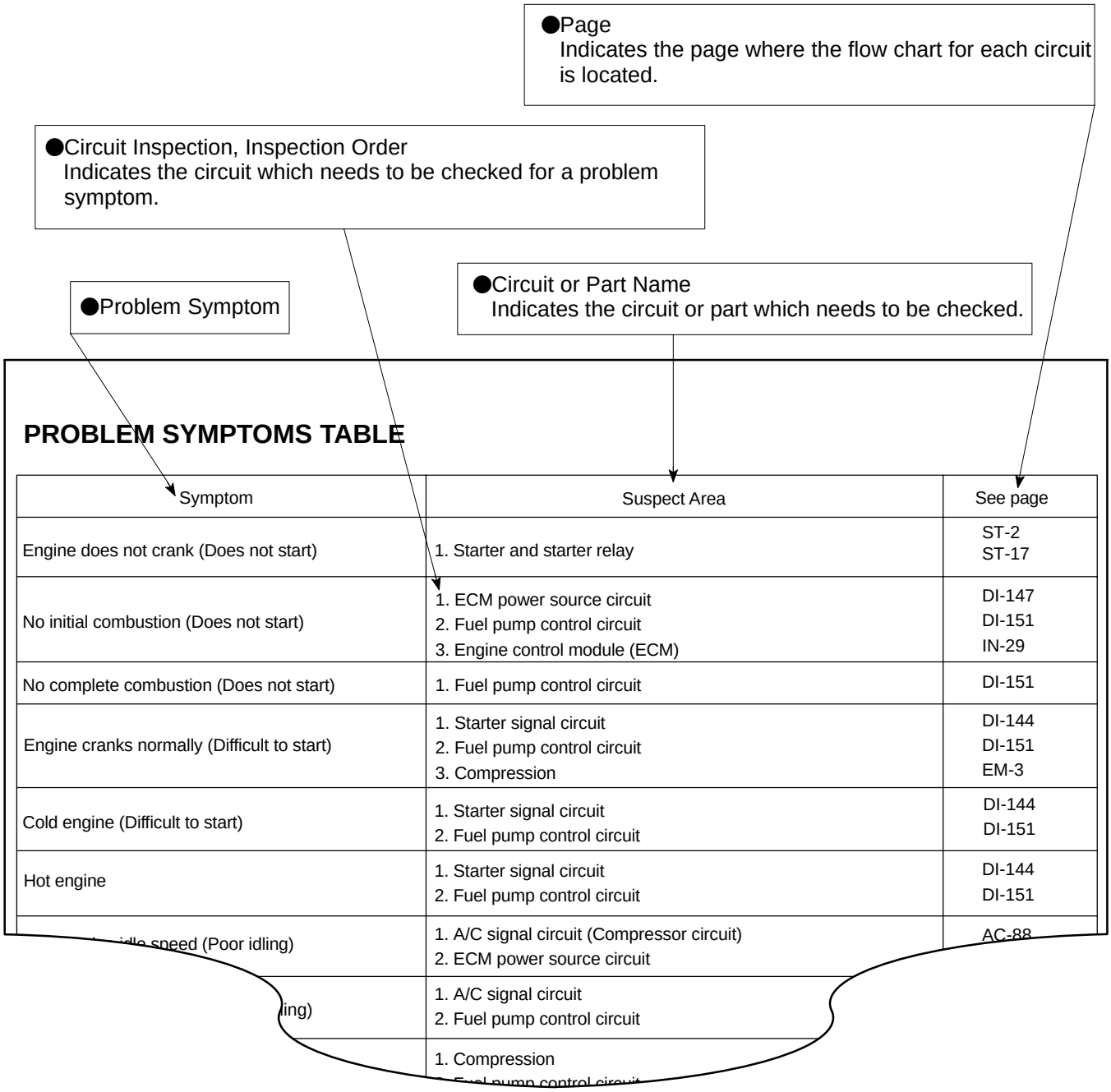
DTC No. (See page)	Detection Item	Trouble Area	MIL*	Memory
P0100 (DI-24)	Mass Air Flow Circuit Malfunction	●Open or short in mass air flow meter circuit ●Mass air flow meter ●ECM	○	○
P0101 (DI-28)	Mass Air Flow Circuit Range/ Performance Problem	●Mass air flow meter	○	○
P0110 (DI-29)	Intake Air Temp. Circuit Malfunction	●Open or short in intake air temp. sensor circuit ●Intake air temp. sensor ●ECM	○	○
P0115 (DI-33)	Engine Coolant Temp. Circuit Malfunction	●Open or short in engine coolant temp. sensor circuit ●Engine coolant temp. sensor ●ECM	○	○
P0116 (DI-37)	Engine Coolant Temp. Circuit Range/ Performance Problem	●Engine coolant temp. sensor ●Cooling system	○	○
	/ Pedal Position Sensor/Switch nction	●Open or short in throttle position sensor circuit ●Throttle position sensor ●ECM		
	osition Sensor/ Switch rformance Prob-	●Throttle position sensor		

5. PROBLEM SYMPTOMS TABLE

The suspected circuits or parts for each problem symptom are shown in the table below. Use this table to troubleshoot when, during a DTC check, a ”Normal” code is displayed in the diagnostic trouble code check but the problem is still occurring. Numbers in the table show the inspection order in which the circuits or parts should be checked.

HINT:

In some cases, a problem is not detected by the diagnostic system even though a problem symptom is present. It is possible that the problem is occurring outside the detection range of the diagnostic system, or that the problem is occurring in a completely different system.



PROBLEM SYMPTOMS TABLE

Symptom	Suspect Area	See page
Engine does not crank (Does not start)	1. Starter and starter relay	ST-2 ST-17
No initial combustion (Does not start)	1. ECM power source circuit 2. Fuel pump control circuit 3. Engine control module (ECM)	DI-147 DI-151 IN-29
No complete combustion (Does not start)	1. Fuel pump control circuit	DI-151
Engine cranks normally (Difficult to start)	1. Starter signal circuit 2. Fuel pump control circuit 3. Compression	DI-144 DI-151 EM-3
Cold engine (Difficult to start)	1. Starter signal circuit 2. Fuel pump control circuit	DI-144 DI-151
Hot engine	1. Starter signal circuit 2. Fuel pump control circuit	DI-144 DI-151
idle speed (Poor idling)	1. A/C signal circuit (Compressor circuit) 2. ECM power source circuit	AC-88
ling)	1. A/C signal circuit 2. Fuel pump control circuit	
	1. Compression 2. Fuel pump control circuit	

6. CIRCUIT INSPECTION

How to read and use each page is shown below.

●Diagnostic Trouble Code No. and Detection Item

●Circuit Description
The major role and operation of the circuit and its component parts are explained.

DTC	P0325	Knock Sensor 1 Circuit Malfunction

CIRCUIT DESCRIPTION

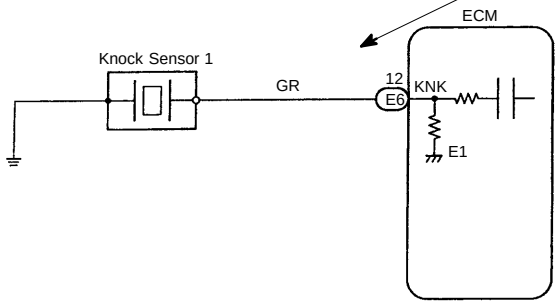
Knock sensor is fitted to the cylinder block to detect engine knocking. This sensor contains a piezoelectric element which generates a voltage when it becomes deformed, which occurs when the cylinder block vibrates due to knocking. If engine knocking occurs, ignition timing is retarded to suppress it.

DTC No.	DTC Detecting Condition	Trouble Area
P0325	No knock sensor 1 signal to ECM with engine speed, 1,200 rpm or more.	●Open or short in knock sensor1 circuit ●Knock sensor 1 (looseness) ●ECM

If the ECM detects the above diagnosis conditions, it operates the fail safe function in which the corrective retard angle value is set to the maximum value.

●Indicates the diagnostic trouble code (DTC), (DTC) set parameter and suspect area of the problem.

WIRING DIAGRAM



●Wiring Diagram
This is a wiring diagram of the circuit.
Use this diagram together with an ELECTRICAL WIRING DIAGRAM to thoroughly understand the circuit.
Wire colors are indicated by an alphabetical code:
B = Black; L = Blue; R = Red; BR = Brown;
LG = Light Green; V = Violet; G = Green;
O = Orange; W = White; GR = Gray; P = Pink;
Y = Yellow; SB = Sky Blue.
The first letter indicates the basic wire color and the second letter indicates the color of the stripe.

V08423

●Indicates the position of the ignition switch during the check.

LOCK
Ignition Switch LOCK (OFF)

ON
Ignition Switch ON

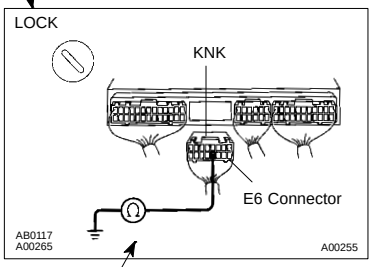
START
Ignition Switch START

ACC
Ignition Switch ACC

●Inspection Procedure
Use the inspection procedure to determine if the circuit is normal or abnormal. If it is abnormal, use it to determine whether the problem is located in the sensors, actuators, wire harness or ECU.

INSPECTION PROCEDURE

1	**Check continuity between terminal KNK of ECM connector and body ground.**



PREPARATION:
(a) Remove the glove compartment (See page SF-68).
(b) Disconnect the E6 connector of ECM.

CHECK:
Measure resistance between terminal KNK of ECM connector and body ground.

OK:
Resistance: 1 MΩ or higher

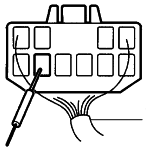
OK	**Go to step 3.**

NG

2	**Check knock sensor (See page SF-61).**

OK	**Replace knock sensor.**

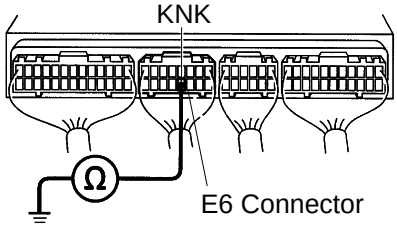
●Indicates the place to check the voltage or resistance.
●Indicates the connector position to checked (from the front or back side).



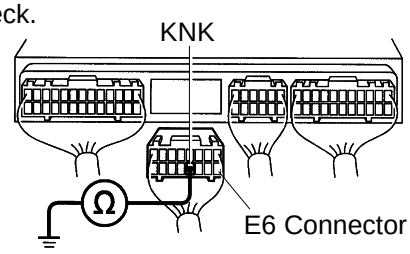
Check from the connector back side (with harness).

Check from the connector front side (without harness). In this case, care must be taken not to bend the terminals.

●Indicates the condition of the connector of ECU during the check.



Connector being checked is connected.



Connector being checked is disconnected.

V08425

HOW TO USE THIS MANUAL

IN00U-90

GENERAL INFORMATION

1. INDEX

An INDEX is provided on the first page of each section to guide you to the item to be repaired. To assist you in finding your way through the manual, the Section Title and major heading are given at the top of every page.

2. GENERAL DESCRIPTION

At the beginning of each section, a General Description is given that pertains to all repair operations contained in that section.

Read these precautions before starting any repair task.

3. TROUBLESHOOTING

TROUBLESHOOTING tables are included for each system to help you diagnose the problem and find the cause. The fundamentals of how to proceed with troubleshooting are described on page IN-22 .

Be sure to read this before performing troubleshooting.

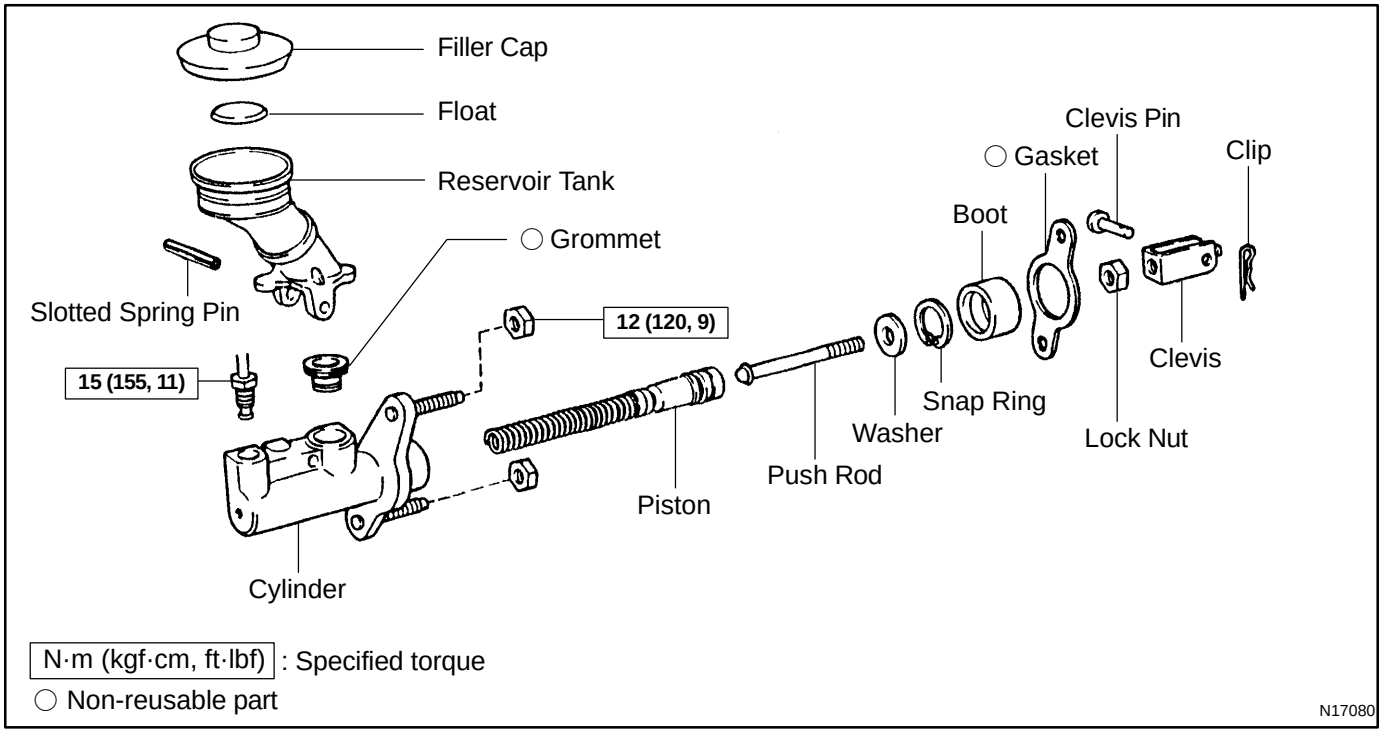
4. PREPARATION

Preparation lists the SST (Special Service Tools), recommended tools, equipment, lubricant and SSM (Special Service Materials) which should be prepared before beginning the operation and explains the purpose of each one.

5. REPAIR PROCEDURES

Most repair operations begin with an overview illustration. It identifies the components and shows how the parts fit together.

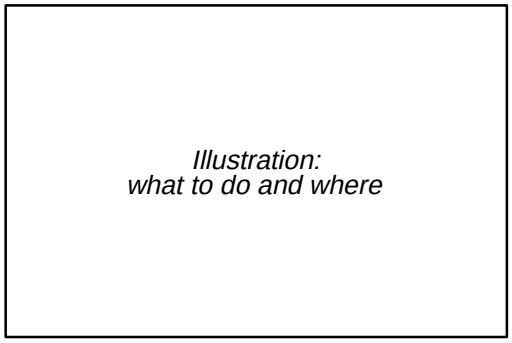
Example:



The procedures are presented in a step-by-step format:

- The illustration shows what to do and where to do it.
- The task heading tells what to do.
- The detailed text tells how to perform the task and gives other information such as specifications and warnings.

Example:



Task heading : what to do

21. CHECK PISTON STROKE OF OVERDRIVE BRAKE

(a) Place SST and a dial indicator onto the overdrive brake piston as shown in the illustration.

SST 09350-30020 (09350-06120)

Set part No. *Component part No.*

Detailed text : how to do task

(b) Measure the stroke applying and releasing the compressed air (392 — 785 kPa, 4 — 8 kgf/cm^2 or 57 — 114 psi) as shown in the illustration.

Piston stroke: 1.40 — 1.70 mm (0.0551 — 0.0669 in.)

Specification

This format provides the experienced technician with a FAST TRACK to the information needed. The upper case task heading can be read at a glance when necessary, and the text below it provides detailed information. Important specifications and warnings always stand out in bold type.

6. REFERENCES

References have been kept to a minimum. However, when they are required you are given the page to refer to.

7. SPECIFICATIONS

Specifications are presented in bold type throughout the text where needed. You never have to leave the procedure to look up your specifications. They are also found in Service Specifications section for quick reference.

8. CAUTIONS, NOTICES, HINTS:

- CAUTIONS are presented presented in bold type, and indicate there is a possibility of injury to you or other people.
- NOTICES are also presented in bold type, and indicate the possibility of damage to the components being repaired.
- HINTS are separated from the text but do not appear in bold. They provide additional information to help you perform the repair efficiently.

9. SI UNIT

The UNITS given in this manual are primarily expressed according to the SI UNIT (International System of Unit), and alternately expressed in the metric system and in the English System.

Example:

Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

TERMS

ABBREVIATIONS USED IN THIS MANUAL

IN04Q-24

Abbreviations	Meaning
ABS	Anti-Lock Brake System
AC	Alternating Current
ACC	Accessory
ACIS	Acoustic Control Induction System
ACSD	Automatic Cold Start Device
A.D.D.	Automatic Disconnecting Differential
A/F	Air-Fuel Ratio
AHC	Active Height Control Suspension
ALR	Automatic Locking Retractor
ALT	Alternator
AMP	Amplifier
ANT	Antenna
APPROX.	Approximately
A/T	Automatic Transmission (Transaxle)
ATDC	After Top Dead Center
ATF	Automatic Transmission Fluid
AUTO	Automatic
AUX	Auxiliary
AVG	Average
AVS	Adaptive Variable Suspension
BA	Brake Assist
BACS	Boost Altitude Compensation System
BAT	Battery
BDC	Bottom Dead Center
B/L	Bi-Level
B/S	Bore-Stroke Ratio
BTDC	Before Top Dead Center
BVSV	Bimetallic Vacuum Switching Valve
Calif.	California
CB	Circuit Breaker
CCo	Catalytic Converter For Oxidation
CD	Compact Disc
CF	Cornering Force
CG	Center Of Gravity
CH	Channel
COMB.	Combination
CPE	Coupe
CPS	Combustion Pressure Sensor
CPU	Central Processing Unit
CRS	Child Restraint System
CTR	Center
C/V	Check Valve

CV	Control Valve
CW	Curb Weight
DC	Direct Current
DEF	Defogger
DFL	Deflector
DIFF.	Differential
DIFF. LOCK	Differential Lock
D/INJ	Direct Injection
DLI	Distributorless Ignition
DOHC	Double Overhead Camshaft
DP	Dash Pot
DS	Dead Soak
DSP	Digital Signal Processor
ECAM	Engine Control And Measurement System
ECD	Electronic Controlled Diesel
ECDY	Eddy Current Dynamometer
ECU	Electronic Control Unit
ED	Electro-Deposited Coating
EDU	Electronic Driving Unit
EDIC	Electric Diesel Injection Control
EFI	Electronic Fuel Injection
E/G	Engine
EGR-VM	EGR-V acuum Modulator
ELR	Emergency Locking Retractor
ENG	Engine
ESA	Electronic Spark Advance
ETCS	Electronic Throttle Control System
EVAP	Evaporator
E-VR V	Electric Vacuum Regulating Valve
EXH	Exhaust
FE	Fuel Economy
FF	Front-Engine Front-Wheel-Drive
F/G	Fuel Gauge
FIPG	Formed In Place Gasket
FL	Fusible Link
F/P	Fuel Pump
FPU	Fuel Pressure Up
Fr	Front
FR	Front-Engine Rear-Wheel-Drive
F/W	Flywheel
FW/D	Flywheel Damper
FWD	Front-Wheel-Drive
GAS	Gasoline
GND	Ground
HAC	High Altitude Compensator
H/B	Hatchback

H-FUSE	High Current Fuse
HI	High
HID	High Intensity Discharge (Head Lamp)
HSG	Housing
HT	Hard Top
HWS	Heated Windshield System
IAC	Idle Air Control
IC	Integrated circuit
IDI	Indirect Diesel Injection
IFS	Independent Front Suspension
IG	Ignition
IIA	Integrated Ignition Assembly
IN	Intake (Manifold, Valve)
INT	Intermittent
I/P	Instrument Panel
IRS	Independent Rear Suspension
J/B	Junction Block
J/C	Junction Connector
KD	Kick-Down
LAN	Local Area Network
LB	Liftback
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LH	Left-Hand
LHD	Left-Hand Drive
L/H/W	Length, Height, Width
LLC	Long-Life Coolant
LNG	Liquified Natural Gas
LO	Low
LPG	Liquified Petroleum Gas
LSD	Limited Slip Differential
LSP & PV	Load Sensing Proportioning And Bypass Valve
LSPV	Load Sensing Proportioning Valve
MAX.	Maximum
MIC	Microphone
MIL	Malfunction Indicator Lamp
MIN.	Minimum
MP	Multipurpose
MPX	Multiplex Communication System
M/T	Manual Transmission (Transaxle)
MT	Mount
MTG	Mounting
N	Neutral
NA	Natural Aspiration
No.	Number
O/D	Overdrive

OEM	Original Equipment Manufacturing
OHC	Overhead Camshaft
OHV	Overhead Valve
OPT	Option
O/S	Oversize
P & BV	Proportioning And Bypass Valve
PCS	Power Control System
PCV	Positive Crankcase Ventilation
PKB	Parking Brake
PPS	Progressive Power Steering
PS	Power Steering
PTO	Power Take-Off
R & P	Rack And Pinion
R/B	Relay Block
RBS	Recirculating Ball Type Steering
R/F	Reinforcement
RFS	Rigid Front Suspension
RRS	Rigid Rear Suspension
RH	Right-Hand
RHD	Right-Hand Drive
RLY	Relay
ROM	Read Only Memory
Rr	Rear
RR	Rear-Engine Rear-Wheel Drive
RWD	Rear-Wheel Drive
SDN	Sedan
SEN	Sensor
SICS	Starting Injection Control System
SOC	State Of Charge
SOHC	Single Overhead Camshaft
SPEC	Specification
SPI	Single Point Injection
SRS	Supplemental Restraint System
SSM	Special Service Materials
SST	Special Service Tools
STD	Standard
STJ	Cold-Start Fuel Injection
SW	Switch
SYS	System
T/A	Transaxle
TACH	Tachometer
TBI	Throttle Body Electronic Fuel Injection
TC	Turbocharger
TCCS	TOYOTA Computer-Controlled System
TCV	Timing Control Valve
TDC	Top Dead Center

TEMP.	Temperature
TEMS	TOYOTA Electronic Modulated Suspension
TIS	Total Information System For Vehicle Development
T/M	Transmission
TMC	TOYOTA Motor Corporation
TMMK	TOYOTA Motor Manufacturing Kentucky, Inc.
TRAC	Traction Control System
TURBO	Turbocharger
U/D	Underdrive
U/S	Undersize
VCV	Vacuum Control Valve
VENT	Ventilator
VIN	Vehicle Identification Number
VPS	Variable Power Steering
VSC	Vehicle Skid Control
VSV	Vacuum Switching Valve
VTV	Vacuum Transmitting Valve
w/	With
WGN	Wagon
W/H	Wire Harness
w/o	Without
1st	First
2nd	Second
2WD	Two Wheel Drive Vehicle (4x2)
4WD	Four Wheel Drive Vehicle (4x4)

IN03Q-04

GLOSSARY OF SAE AND LEXUS TERMS

This glossary lists all SAE-J1930 terms and abbreviations used in this manual in compliance with SAE recommendations, as well as their LEXUS equivalents.

SAE ABBREVIATIONS	SAE TERMS	LEXUS TERMS ( )--ABBREVIATIONS
A/C	Air Conditioning	Air Conditioner
ACL	Air Cleaner	Air Cleaner, A/CL
AIR	Secondary Air Injection	Air Injection (AI)
AP	Accelerator Pedal	-
B+	Battery Positive Voltage	+B, Battery Voltage
BARO	Barometric Pressure	HAC
CAC	Charge Air Cooler	Intercooler
CARB	Carburetor	Carburetor
CFI	Continuous Fuel Injection	-
CKP	Crankshaft Position	Crank Angle
CL	Closed Loop	Closed Loop
CMP	Camshaft Position	Cam Angle
CPP	Clutch Pedal Position	-
CTOX	Continuous Trap Oxidizer	-
CTP	Closed Throttle Position	LL ON, Idle ON
DFI	Direct Fuel Injection	Direct Injection (DI)
DI	Distributor Ignition	-
DLC1 DLC2 DLC3	Data Link Connector 1 Data Link Connector 2 Data Link Connector 3	1: Check Connector 2: Total Diagnosis Comunication Link (TDCL) 3: OBD II Diagnostic Connector
DTC	Diagnostic Trouble Code	Diagnostic Code
DTM	Diagnostic Test Mode	-
ECL	Engine Coolant Level	-
ECM	Engine Control Module	Engine ECU (Electronic Control Unit)
ECT	Engine Coolant Temperature	Coolant Temperature, Water Temperature (THW)
EEPROM	Electrically Erasable Programmable Read Only Memory	Electrically Erasable Programmable Read Only Memory (EEPROM), Erasable Programmable Read Only Memory (EPROM)
EFE	Early Fuel Evaporation	Cold Mixture Heater (CMH), Heat Control Valve (HCV)
EGR	Exhaust Gas Recirculation	Exhaust Gas Recirculation (EGR)
EI	Electronic Ignition	TOYOTA Distributor-less Ignition (TDI)
EM	Engine Modification	Engine Modification (EM)
EPROM	Erasable Programmable Read Only Memory	Programmable Read Only Memory (PROM)
EVAP	Evaporative Emission	Evaporative Emission Control (EVAP)
FC	Fan Control	-
FEEPROM	Flash Electrically Erasable Programmable Read Only Memory	-
FEPROM	Flash Erasable Programmable Read Only Memory	-
FF	Flexible Fuel	-
FP	Fuel Pump	Fuel Pump
GEN	Generator	Alternator
GND	Ground	Ground (GND)

HO2S	Heated Oxygen Sensor	Heated Oxygen Sensor (HO_2S)
IAC	Idle Air Control	Idle Speed Control (ISC)
IAT	Intake Air Temperature	Intake or Inlet Air Temperature
ICM	Ignition Control Module	-
IFI	Indirect Fuel Injection	Indirect Injection (IDL)
IFS	Inertia Fuel-Shutoff	-
ISC	Idle Speed Control	-
KS	Knock Sensor	Knock Sensor
MAF	Mass Airflow	Air Flow Meter
MAP	Manifold Absolute Pressure	Manifold Pressure Intake Vacuum
MC	Mixture Control	Electric Bleed Air Control Valve (EBCV) Mixture Control Valve (MCV) Electric Air Control Valve (EACV)
MDP	Manifold Differential Pressure	-
MFI	Multiport Fuel Injection	Electronic Fuel Injection (EFI)
MIL	Malfunction Indicator Lamp	Check Engine Lamp
MST	Manifold Surface Temperature	-
MVZ	Manifold Vacuum Zone	-
NVRAM	Non-Volatile Random Access Memory	-
O2S	Oxygen Sensor	Oxygen Sensor, O_2 Sensor (O_2S)
OBD	On-Board Diagnostic	On-Board Diagnostic System (OBD)
OC	Oxidation Catalytic Converter	Oxidation Catalyst Convert (OC), CCo
OL	Open Loop	Open Loop
PAIR	Pulsed Secondary Air Injection	Air Suction (AS)
PCM	Powertrain Control Module	-
PNP	Park/Neutral Position	-
PROM	Programmable Read Only Memory	-
PSP	Power Steering Pressure	-
PTOX	Periodic Trap Oxidizer	Diesel Particulate Filter (DPF) Diesel Particulate Trap (DPT)
RAM	Random Access Memory	Random Access Memory (RAM)
RM	Relay Module	-
ROM	Read Only Memory	Read Only Memory (ROM)
RPM	Engine Speed	Engine Speed
SC	Supercharger	Supercharger
SCB	Supercharger Bypass	E-ABV
SFI	Sequential Multiport Fuel Injection	Electronic Fuel Injection (EFI), Sequential Injection
SPL	Smoke Puff Limiter	-
SRI	Service Reminder Indicator	-
SRT	System Readiness Test	-
ST	Scan Tool	-
TB	Throttle Body	Throttle Body
TBI	Throttle Body Fuel Injection	Single Point Injection Central Fuel Injection (Ci)
TC	Turbocharger	Turbocharger
TCC	Torque Converter Clutch	Torque Converter

TCM	Transmission Control Module	Transmission ECU, ECT ECU
TP	Throttle Position	Throttle Position
TR	Transmission Range	-
TVV	Thermal Vacuum Valve	Bimetallic Vacuum Switching Valve (BVSV) Thermostatic Vacuum Switching Valve (TVSV)
TWC	Three-Way Catalytic Converter	Three-Way Catalytic (TWC) Manifold Converter CC_{RO}
TWC+OC	Three-Way + Oxidation Catalytic Converter	CC_R + CCo
VAF	Volume Airflow	Air Flow Meter
VR	Voltage Regulator	Voltage Regulator
VSS	Vehicle Speed Sensor	Vehicle Speed Sensor
WOT	Wide Open Throttle	Full Throttle
WU-OC	Warm Up Oxidation Catalytic Converter	-
WU-TWC	Warm Up Three-Way Catalytic Converter	-
3GR	Third Gear	-
4GR	Fourth Gear	-

OUTSIDE VEHICLE

MA001-43

GENERAL MAINTENANCE

Performing these maintenance checks on the vehicle in the owner's responsibility. The owner may perform the maintenance or take the vehicle to a service center.
Check the parts of the vehicle described below on a daily basis. In most cases, special tool are not required. It i recommended that the owner perform these check.
The procedures for general maintenance are as follows.

1. GENERAL NOTES

- Maintenance requirements vary depending on the country.
- Check the maintenance schedule in the owner's manual supplement.
- Following the maintenance schedule is mandatory.
- Determine the appropriate time to service the vehicle using either miles driven or time (month) elapsed, whichever reaches the specification first.
- Maintain similar intervals between periodic maintenance unless noted.
- Failing to check each vehicle part could lead to poor engine performance and increase exhaust emissions.

2. TIRES

(a) Check the tire pressure with a gauge. Make adjustment if necessary.
(b) Check the surfaces of tires for cuts, damage or excessive wear.

3. WHEEL NUTS

Check for nuts that are loose or missing. Tighten them if necessary.

4. TIRE ROTATION

Check the maintenance schedule in the owner's manual supplement.

5. WINDSHIELD WIPER BLADES

Check the blades for wear or cracks whenever they are unable to wipe the windshield clean. Replace them if necessary.

6. FLUID LEAKS

(a) Check under the vehicle for leaking fuel, oil, water and other fluid.
(b) If you smell gasoline fumes or notice any leak, locate the cause found and correct it.

7. DOORS AND ENGINE HOOD

(a) Check that all of the doors and the trunk lid operate smoothly, and that all the latches lock securely.
(b) When the primary latch is released, check that the engine hood secondary latch prevents the hood from opening.

INSIDE VEHICLE

MA002-51

GENERAL MAINTENANCE

Performing these maintenance checks on the vehicle in the owner's responsibility. The owner may perform the maintenance or take the vehicle to a service center.
Check the parts of the vehicle described below on a daily basis. In most cases, special tool are not required. It i recommended that the owner perform these check.
The procedures for general maintenance are as follows.

1. GENERAL NOTES

- Maintenance requirements vary depending on the country.
- Check the maintenance schedule in the owner's manual supplement.
- Following the maintenance schedule is mandatory.
- Determine the appropriate time to service the vehicle using either miles driven or time (month) elapsed, whichever reaches the specification first.
- Maintain similar intervals between periodic maintenance unless noted.
- Failing to check each vehicle part could lead to poor engine performance and increase exhaust emissions.

2. LIGHTS

(a) Check that the headlights, stop lights, taillights, turn signal lights, and other lights are all working.
(b) Check that the headlights are aimed properly.

3. WARNING LIGHTS AND BUZZERS

Check that all the warning lights and buzzers are working.

4. HORN

Check that the horn is working.

5. WINDSHIELD GLASS

Check for scratches, pits or abrasions.

6. WINDSHIELD WIPER AND WASHER

(a) Check if the wind washers are aimed properly. Also, check if the washer fluid hits the center of the operating range of each wiper on the windshield.
(b) Check that the wipers do not streak.

7. WINDSHIELD DEFROSTER

When the heater or air conditioner is on the defroster setting, check that air comes out of the defroster outlet.

8. REAR VIEW MIRROR

Check that the rear view mirror is securely mounted.

9. SUN VISORS

Check that the sun visors move freely and are securely mounted.

10. STEERING WHEEL

Check that the steering wheel has the proper freeplay. Also check for steering difficulty, freeplay in the steering wheel and unusual noises.

11. SEATS

(a) Check that the seat adjusters operate smoothly.
(b) Check that all the latches lock securely in all positions.
(c) Check that the head restraints move up and down smoothly and that the locks hold securely in all latched positions.
(d) When the rear seatbacks are folded down, check if the latches lock securely.

12. SEAT BELTS

(a) Check that the seat belt system such as the buckles, retractors and anchors operate properly and smoothly.
(b) Check that the belt webbing is not cut, frayed, worn or damaged.

13. ACCELERATOR PEDAL

Check the pedal for smooth operation and uneven pedal effort and catching.

14. BRAKE PEDAL (See page BR-6)

(a) Check the pedal for smooth operation.

(b) Check that the pedal has the proper reserve distance and freeplay.

(c) Check the brake booster function.

15. BRAKES

In a safe place, check that the vehicle remains straight when applying the brakes.

16. PARKING BRAKE (See page BR-9)

(a) Check that the parking brake pedal has the proper range of motion.

(b) On a low incline, check that the parking brake alone can stabilize the vehicle.

17. AUTOMATIC TRANSMISSION ”PARK” MECHANISM

(a) Check the lock release mechanism of the selector lever for proper and smooth operation.

(b) When the selector lever is in the ”P” position and all brakes are released on a low incline, check that the vehicle is stabilized.

UNDER HOOD

MA003-51

GENERAL MAINTENANCE

1. GENERAL NOTES

- Maintenance requirements vary depending on the country.
- Check the maintenance schedule in the owner's manual supplement.
- Following the maintenance schedule is mandatory.
- Determine the appropriate time to service the vehicle using either miles driven or time (month) elapsed, whichever reaches the specification first.
- Maintain similar intervals between periodic maintenance unless noted.
- Failing to check each vehicle part could lead to poor engine performance and increase exhaust emissions.

2. WINDSHIELD WASHER FLUID

Check that there is sufficient fluid in the tank.

3. ENGINE COOLANT LEVEL

Check that the coolant level is between the "FULL" and "LOW" lines on the see-through reservoir.

4. RADIATOR AND HOSES

(a) Check that the front of the radiator is clean and free of leaves, dirt and bugs.
(see page CO-15)

(b) Check the hoses for cracks, kinks, rotting and loose connections.

5. BATTERY ELECTROLYTE LEVEL

Check that the electrolyte level of all the battery cells is between the upper and lower lines on the case.

6. BRAKE FLUID LEVEL

Check that the brake fluid levels are near the upper level line on the see-through reservoirs.

7. ENGINE DRIVE BELT

Check the drive belt for fraying, cracks, wear or oiliness.

8. ENGINE OIL LEVEL

Check if the level of engine oil is between "F" and "L" on the dipstick with the engine turned off.

9. POWER STEERING FLUID LEVEL

- Check the level on the dipstick.
- The level should be in the "HOT" or "COLD"range depending on the fluid temperature.

10. AUTOMATIC TRANSMISSION FLUID LEVEL

(a) Park the vehicle on a level surface.

(b) With the engine idling and the parking brake applied, shift the selector into all the positions from "P" to "L". Then shift the "P" position.

(c) Pull out the dipstick and wipe off the fluid with a clean shop rag. Re-insert the dipstick and check that the fluid level is in the "HOT" range.

(d) Perform this check with the fluid at the normal driving temperature: 70 to 80˚C (158 to 176˚F).

HINT:

After extended driving under harsh conditions (high speeds, hot weather, heavy traffic or pulling a trailer), let the engine cool own for approximately 30 minutes before checking the fluid level.

11. EXHAUST SYSTEM

Check for unusual exhaust sounds or abnormal exhaust fumes. Locate the cause and correct it.

ENGINE

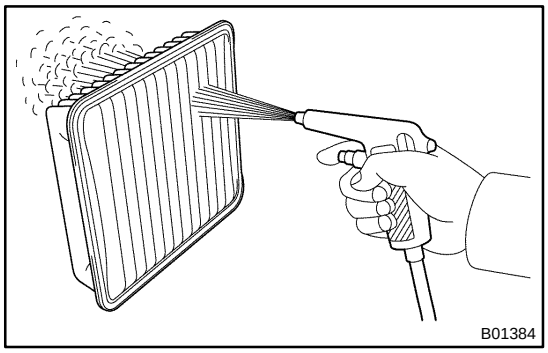
INSPECTION

MA004-19

HINT:

Inspect these items on a cooled down engine.

1. **REPLACE TIMING BELT**
   (See page EM-17)
2. **INSPECT DRIVE BELT**
   (See page CH-1)
3. **REPLACE SPARK PLUGS**
   (See page IG-1)



4. **INSPECT AIR FILTER**

(a) Remove the air filter.

(b) Visually check that the air filter is not excessively damaged or oily.

If necessary, replace the air filter.

(c) Clean the filter with compressed air.
First blow from the inside of the filter thoroughly then repeat from the outside.

(d) Reinstall the air filter.

5. **REPLACE AIR FILTER**

Replace the air filter with a new one.

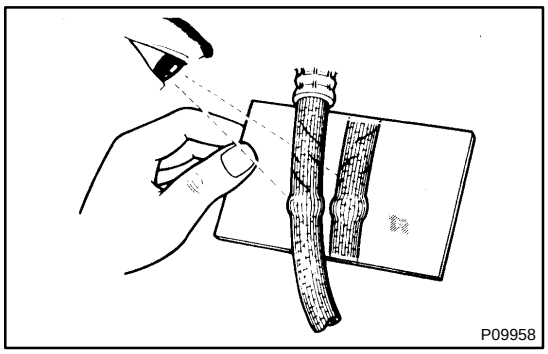
6. **REPLACE ENGINE OIL AND OIL FILTER**
   (See page LU-2)
7. **REPLACE ENGINE COOLANT**
   (See page CO-2)
8. **INSPECT GASKET IN FUEL TANK CAP**
   (See page EC-7)
9. **INSPECT FUEL LINES AND CONNECTIONS, FUEL TANK VAPOR VENT SYSTEM HOSES AND FUEL TANK BAND**

Visually check the fuel lines for cracks, leakage, loose connections, deformation or tank band looseness.

10. **INSPECT EXHAUST PIPES AND MOUNTINGS**

Visually check the pipes, hangers and connections for severe corrosion, leaks or damage.

11. **INSPECT VALVE CLEARANCE**
    (See page EM-5)



BRAKE

MA01R-13

INSPECTION

1. INSPECT BRAKE LINE PIPES AND HOSES

HINT:

Work in a well-lighted area. Check the entire circumference and length of the brake hoses using a mirror if neccessary. Turn the front wheels fully to the right or left before beginning.

(a) Check all brake lines and hoses for.

- Damage
- Wear
- Deformation
- Cracks
- Corrosion
- Leaks
- Bends
- Twists

(b) Check all the clamps for tightness and connections for leakage.

(c) Check that the hoses and lines are not near sharp edges, moving parts and the exhaust system.

(d) Check that the lines are installed pass through the center of the grommets.

2. INSPECT FRONT AND REAR BRAKE PADS AND DISCS

(FRONT PADS: See page BR-24)

(REAR PADS: See page BR-33)

(FRONT DISCS: See page BR-29)

(REAR DISCS: See page BR-38)

3. INSPECT OR CHANGE BRAKE FLUID

(See page BR-4)

Fluid: SAE J1703 or FMVSS No.116 DOT3

CHASSIS

MA01S-07

INSPECTION

1. INSPECT STEERING LINKAGE

(a) Check the steering wheel freeplay.
(see page SR-8)

(b) Check the steering linkage for looseness or damage.
Check that:

- Check that the tie rod ends do not have excessive play.
- Check that the dust seals and boots are not damaged.
- Check that the boot clamps are not loose.

2. INSPECT STEERING GEAR HOUSING OIL

Check the steering gear housing for oil leakage.

3. INSPECT DRIVE SHAFT BOOTS

Check the drive shaft boots for loose clamps, leakage or damage.

4. INSPECT LOWER BALL JOINTS AND DUST COVERS

(a) Jack up the front of the vehicle and support it with stands.

(b) Make sure the front wheels are in a straight-ahead position, and depress the brake pedal.

(c) Jack up the lower suspension arm until there is about half a load on the front coil spring.

(d) Inspect the dust cover for damage.

5. CHECK AUTOMATIC TRANSMISSION AND DIFFERENTIAL

Visually check the automatic transmission and differential for oil leakage.

6. CHECK MANUAL TRANSMISSION AND DIFFERENTIAL

Visually check the manual transmission and differential for oil leakage.

If leakage is found, check for the cause and repair it.

7. LSD torque sensing type:
REPLACE DIFFERENTIAL OIL (See page SA-73)

8. Except wagon model:
ROTATE TIRES (See page SA-3)

BODY

MA01T-07

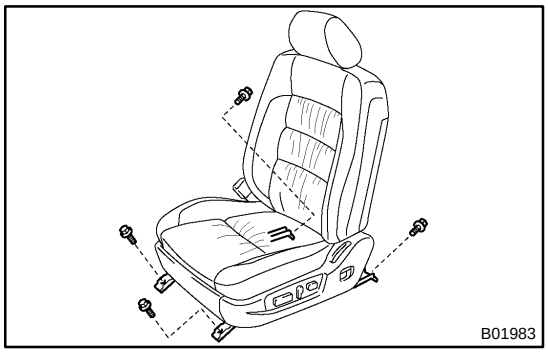
INSPECTION

1. CANADA:

TIGHTEN BOLTS AND NUTS ON CHASSIS AND BODY

(a) Where necessary, tighten all parts of the chassis.

- Front axle and suspension
- Rear axle and suspension
- Drive train
- Brake system
- Engine mounting, etc.

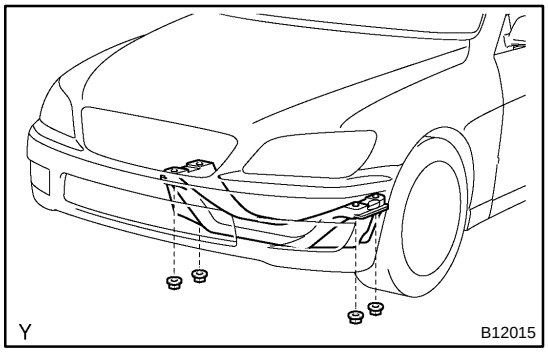


(b) Where necessary, tighten all parts of the body.

- Front seat mount bolts

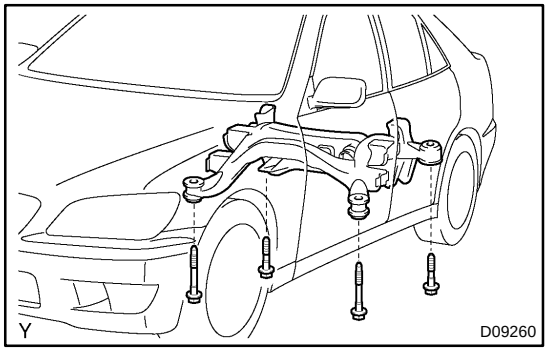
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)

- Seat belt system
- Doors and hood
- Body mountings
- Fuel tank
- Exhaust pipe system, etc.



- Front suspension member-to-body mounting bolts

Torque: 98 N·m (1,000 kgf·cm, 72 ft·lbf)



- Rear axle beam assembly-to-body mounting nuts

Torque: 127 N·m (1,300 kgf·cm, 94 ft·lbf)

2. REPLACE AIR REFINER FILTER (See page AC-93)

3. BODY INSPECTION

(a) Check the body exterior for dents, scratches and rust.

(b) Check the underbody for rust and damage.

If necessary, replace or repair.

4. ROAD TEST

(a) Check the engine and chassis for abnormal noises.

(b) Check that the vehicle does not wander or pull to one side.

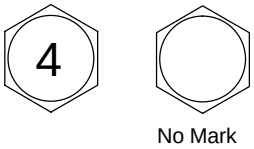
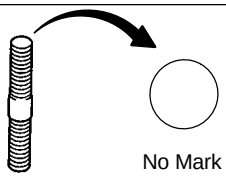
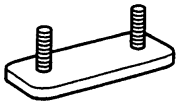
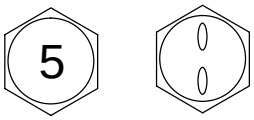
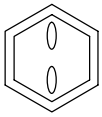
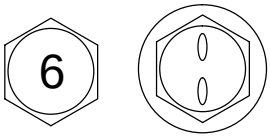
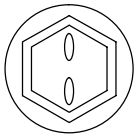
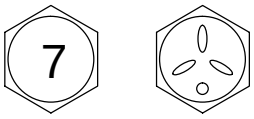
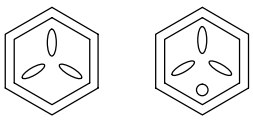
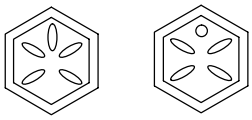
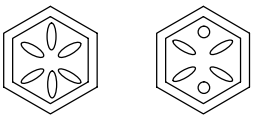
(c) Check that the brakes work properly and do not drag.

(d) Do setting of the parking brake shoes and drum.

STANDARD BOLT

HOW TO DETERMINE BOLT STRENGTH

SS0ZS-01

Bolt Type				Class
Hexagon Head Bolt		Stud Bolt	Weld Bolt	
Normal Recess Bolt	Deep Recess Bolt			
 No Mark	 No Mark	 No Mark		4T
				5T
 w/ Washer	 w/ Washer			6T
				7T
				8T
				9T
				10T
				11T

B06431

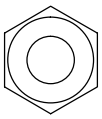
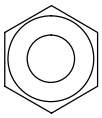
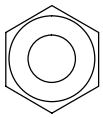
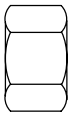
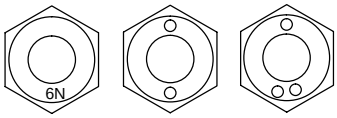
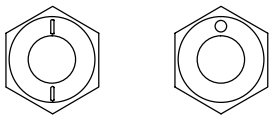
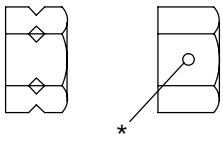
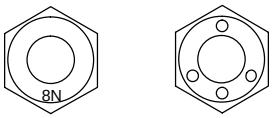
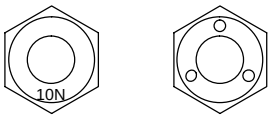
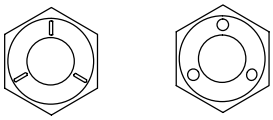
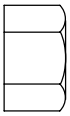
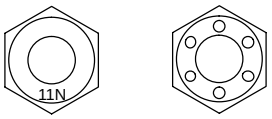
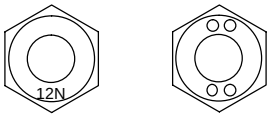
SS0ZT-01

SPECIFIED TORQUE FOR STANDARD BOLTS

Class	Diameter mm	Pitch mm	Specified torque					
			Hexagon head bolt			Hexagon flange bolt		
			N·m	kgf·cm	ft·lbf	N·m	kgf·cm	ft·lbf
4T	6	1	5	55	48 in.·lbf	6	60	52 in.·lbf
	8	1.25	12.5	130	9	14	145	10
	10	1.25	26	260	19	29	290	21
	12	1.25	47	480	35	53	540	39
	14	1.5	74	760	55	84	850	61
	16	1.5	115	1,150	83	-	-	-
5T	6	1	6.5	65	56 in.·lbf	7.5	75	65 in.·lbf
	8	1.25	15.5	160	12	17.5	175	13
	10	1.25	32	330	24	36	360	26
	12	1.25	59	600	43	65	670	48
	14	1.5	91	930	67	100	1,050	76
	16	1.5	140	1,400	101	-	-	-
6T	6	1	8	80	69 in.·lbf	9	90	78 in.·lbf
	8	1.25	19	195	14	21	210	15
	10	1.25	39	400	29	44	440	32
	12	1.25	71	730	53	80	810	59
	14	1.5	110	1,100	80	125	1,250	90
	16	1.5	170	1,750	127	-	-	-
7T	6	1	10.5	110	8	12	120	9
	8	1.25	25	260	19	28	290	21
	10	1.25	52	530	38	58	590	43
	12	1.25	95	970	70	105	1,050	76
	14	1.5	145	1,500	108	165	1,700	123
	16	1.5	230	2,300	166	-	-	-
8T	8	1.25	29	300	22	33	330	24
	10	1.25	61	620	45	68	690	50
	12	1.25	110	1,100	80	120	1,250	90
9T	8	1.25	34	340	25	37	380	27
	10	1.25	70	710	51	78	790	57
	12	1.25	125	1,300	94	140	1,450	105
10T	8	1.25	38	390	28	42	430	31
	10	1.25	78	800	58	88	890	64
	12	1.25	140	1,450	105	155	1,600	116
11T	8	1.25	42	430	31	47	480	35
	10	1.25	87	890	64	97	990	72
	12	1.25	155	1,600	116	175	1,800	130

SS0ZU-01

HOW TO DETERMINE NUT STRENGTH

Nut Type			Class
Present Standard Hexagon Nut	Old Standard Hexagon Nut		
	Cold Forging Nut	Cutting Processed Nut	
 No Mark			4N
 No Mark (w/ Washer)	 No Mark (w/ Washer)	 No Mark	5N (4T)
 6N			6N
		 *	7N (5T)
 8N			8N
 10N		 No Mark	10N (7T)
 11N			11N
 12N			12N

*: Nut with 1 or more marks on one side surface of the nut.

B06432

HINT:

Use the nut with the same number of the nut strength classification or the greater than the bolt strength classification number when tightening parts with a bolt and nut.

Example: Bolt = 4T

Nut = 4N or more

MAINTENANCE

TORQUE SPECIFICATION

SS1JW-02

Part tightened	N·m	kgf·cm	ft·lbf
Front seat mount bolts	37	375	27
Front suspension member x Body	98	1,000	72
Rear suspension member x Body	127	1,300	94

ENGINE MECHANICAL

SS0FH-11

SERVICE DATA

Compression pressure		at 250 rpm STD	1,324 kPa (13.5 kgf/cm^2, 192 psi) or more
		Minimum	1,079 kPa (11.0 kgf/cm^2, 156 psi)
		Difference of pressure between each cylinder	98 kPa (1.0 kgf/cm^2, 14 psi) or less
Valve clearance		at cold Intake	0.15 - 0.25 mm (0.006 - 0.010 in.)
		Exhaust	0.25 - 0.35 mm (0.010 - 0.014 in.)
	Adjusting shim (for repair part)	Mark 2.500	2.500 mm (0.0984 in.)
		2.550	2.550 mm (0.1004 in.)
		2.600	2.600 mm (0.1024 in.)
		2.650	2.650 mm (0.1043 in.)
		2.700	2.700 mm (0.1063 in.)
		2.750	2.750 mm (0.1083 in.)
		2.800	2.800 mm (0.1102 in.)
		2.850	2.850 mm (0.1122 in.)
		2.900	2.900 mm (0.1142 in.)
		2.950	2.950 mm (0.1161 in.)
		3.000	3.000 mm (0.1181 in.)
		3.050	3.050 mm (0.1201 in.)
		3.100	3.100 mm (0.1220 in.)
		3.150	3.150 mm (0.1240 in.)
		3.200	3.200 mm (0.1260 in.)
		3.250	3.250 mm (0.1280 in.)
		3.300	3.300 mm (0.1299 in.)
Ignition timing	w/ Terminals TE and E1 connected of DLC1		10˚ ± 2˚ BTDC @ idle
Idle speed	-		700 ± 50 rpm
Timing belt tensioner	Protrusion (from housing side)		8.0 - 8.8 mm (0.315 - 0.346 in.)
Cylinder head	Warpage		
	Cylinder block side	Maximum	0.10 mm (0.0039 in.)
	Intake manifold side	Maximum	0.10 mm (0.0039 in.)
	Exhaust manifold side	Maximum	0.10 mm (0.0039 in.)
	Valve guide bore diameter	STD	10.985 - 11.006 mm (0.4325 - 0.4333 in.)
		O/S 0.05	11.035 - 11.056 mm (0.4344 - 0.4353 in.)
	Valve seat		
	Refacing angle		15˚, 45˚, 75˚
	Contacting angle		45˚
	Contacting width	Intake	1.0 - 1.4 mm (0.039 - 0.055 in.)
		Exhaust	1.2 - 1.6 mm (0.047 - 0.063 in.)
	Cylinder head bolt diameter	STD	10.8 - 11.0 mm (0.425 - 0.433 in.)
		Minimum	10.7 mm (0.421 in.)
Valve guide bushing	Inside diameter		6.010 - 6.030 mm (0.2366 - 0.2374 in.)
	Outside diameter (for repair part)	STD	11.033 - 11.044 mm (0.4344 - 0.4348 in.)
		O/S 0.05	11.083 - 11.094 mm (0.4363 - 0.4368 in.)
Valve	Valve overall length	STD Intake	98.29 - 98.79 mm (3.8697 - 3.8894 in.)
		Exhaust	98.84 - 99.34 mm (3.8913 - 3.9110 in.)
		Minimum Intake	98.19 mm (3.8657 in.)
		Exhaust	98.74 mm (3.8874 in.)
	Valve face angle		44.5˚
	Stem diameter	Intake	5.970 - 5.985 mm (0.2350 - 0.2356 in.)
		Exhaust	5.965 - 5.980 mm (0.2348 - 0.2354 in.)

Valve (cont'd)	Stem oil clearance	STD Intake	0.025 - 0.060 mm (0.0010 - 0.0024 in.)
		Exhaust	0.030 - 0.065 mm (0.0012 - 0.0026 in.)
		Maximum Intake	0.08 mm (0.0031 in.)
		Exhaust	0.10 mm (0.0039 in.)
	Margin thickness	STD	0.8 - 1.2 mm (0.031 - 0.047 in.)
		Minimum	0.5 mm (0.020 in.)
Valve spring	Deviation	Maximum	2.0 mm (0.079 in.)
	Free length	Pink painted mark	43.71 mm (1.7209 in.)
		Yellow painted mark	44.10 mm (1.7362 in.)
	Installed tension at 34.5 mm (1.358 in.)		186.2 - 205.8 N (19.0 - 21.0 kgf, 41.9 - 46.3 lbf)
Valve lifter	Lifter diameter		30.966 - 30.976 mm (1.2191 - 1.2195 in.)
	Lifter bore diameter		31.000 - 31.016 mm (1.2205 - 1.2211 in.)
	Oil clearance	STD	0.024 - 0.050 mm (0.0009 - 0.0020 in.)
		Maximum	0.07 mm (0.0028 in.)
Camshaft	Thrust clearance	STD	0.080 - 0.190 mm (0.0031 - 0.0075 in.)
		Maximum	0.30 mm (0.0118 in.)
	Cam lobe height	STD Intake	44.310 - 44.360 mm (1.7445 - 1.7465 in.)
		Exhaust	44.250 - 44.350 mm (1.7421 - 1.7461 in.)
		Maximum Intake	44.16 mm (1.7386 in.)
		Exhaust	44.10 mm (1.7362 in.)
	Journal diameter		28.949 - 28.965 mm (1.1397 - 1.1404 in.)
	Journal oil clearance	STD	0.035 - 0.072 mm (0.0014 - 0.0028 in.)
		Maximum	0.10 mm (0.0039 in.)
	Circle runout	Maximum	0.08 mm (0.0031 in.)
Air intake chamber	Warpage	Maximum	0.15 mm (0.0059 in.)
Manifold	Warpage	Maximum Intake	0.15 mm (0.0059 in.)
		Exhaust	0.50 mm (0.0196 in.)
Cylinder block	Cylinder head surface warpage	Maximum	0.07 mm (0.0028 in.)
	Cylinder bore diameter	STD	86.000 - 86.013 mm (3.3858 - 3.3863 in.)
		Maximum	86.02 mm (3.3866 in.)
	Main bearing bolt diameter	STD	9.96 - 9.97 mm (0.3921 - 0.3925 in.)
		Minimum	9.7 mm (0.382 in.)
Connecting rod	Thrust clearance	STD	0.250 - 0.402 mm (0.0098 - 0.0158 in.)
		Maximum	0.50 mm (0.0197 in.)
	Connecting bolt diameter	STD	8.1 - 8.3 mm (0.319 - 0.327 in.)
		Minimum	8.0 mm (0.315 in.)
	Connecting rod oil clearance	STD STD	0.023 - 0.041 mm (0.0009 - 0.0016 in.)
		U/S 0.25	0.028 - 0.066 mm (0.0011 - 0.0026 in.)
		Maximum STD	0.07 mm (0.0027 in.)
		U/S 0.25	0.08 mm (0.0031 in.)
	Connecting rod bearing center wall thickness (Reference)		
		STD Mark 1	1.498 - 1.501 mm (0.0590 - 0.0591 in.)
		2	1.501 - 1.504 mm (0.0591 - 0.0592 in.)
		3	1.504 - 1.507 mm (0.0592 - 0.0593 in.)
		4	1.507 - 1.510 mm (0.0593 - 0.0594 in.)
		5	1.510 - 1.513 mm (0.0594 - 0.0596 in.)
	Bushing inside diameter		22.005 - 22.014 mm (0.8663 - 0.8667 in.)
	Piston pin diameter		21.997 - 22.006 mm (0.8660 - 0.8664 in.)
	Piston pin oil clearance	STD	0.005 - 0.011 mm (0.0002 - 0.0004 in.)
		Maximum	0.05 mm (0.0020 in.)
	Rod out-of alignment	Maximum per 100 mm (3.94 in.)	0.05 mm (0.0020 in.)
	Rod twist	Maximum per 100 mm (3.94 in.)	0.15 mm (0.0059 in.)

Piston and Piston ring	Piston diameter		85.935 - 85.945 mm (3.3833 - 3.3837 in.)
	Piston oil clearance	STD	0.055 - 0.078 mm (0.0022 - 0.0031 in.)
		Maximum	0.10 mm (0.0039 in.)
	Piston ring groove clearance	No. 1	0.011 - 0.070 mm (0.0004 - 0.0028 in.)
		No. 2	0.030 - 0.070 mm (0.0012 - 0.0028 in.)
	Piston ring end gap	STD No. 1	0.300 - 0.470 mm (0.0118 - 0.0185 in.)
		No. 2	0.350 - 0.520 mm (0.0138 - 0.0205 in.)
		Oil	0.130 - 0.450 mm (0.0051 - 0.0177 in.)
		Maximum No. 1	1.07 mm (0.0421 in.)
		No. 2	1.12 mm (0.0441 in.)
		Oil	1.05 mm (0.0413 in.)
Crankshaft	Thrust clearance	STD	0.020 - 0.220 mm (0.0008 - 0.0087 in.)
		Maximum	0.30 mm (0.0118 in.)
	Thrust washer thickness	STD	1.940 - 1.990 mm (0.0764 - 0.0783 in.)
	Main journal oil clearance	STD STD	0.026 - 0.040 mm (0.0010 - 0.0016 in.)
		U/S 0.25	0.025 - 0.061 mm (0.0010 - 0.0024 in.)
		Maximum STD	0.06 mm (0.0024 in.)
		U/S 0.25	0.08 mm (0.0031 in.)
	Main journal diameter	STD	61.984 - 62.000 mm (2.4403 - 2.4409 in.)
		U/S 0.25	61.745 - 61.755 mm (2.4309 - 2.4313 in.)
	Main bearing center wall thickness (Reference)	Mark 1	1.994 - 1.997 mm (0.0785 - 0.0786 in.)
		2	1.997 - 2.000 mm (0.0786 - 0.0787 in.)
		3	2.000 - 2.003 mm (0.0787 - 0.0789 in.)
		4	2.003 - 2.006 mm (0.0789 - 0.0790 in.)
		5	2.006 - 2.009 mm (0.0790 - 0.0791 in.)
	Crank pin diameter	STD	51.982 - 52.000 mm (2.0465 - 2.0472 in.)
		U/S 0.25	51.745 - 51.755 mm (2.0372 - 2.0376 in.)
	Circle runout	Maximum	0.06 mm (0.0024 in.)
	Main journal taper and out-of-round	Maximum	0.02 mm (0.0008 in.)
	Crank pin taper and out-of-round	Maximum	0.02 mm (0.0008 in.)

SS0FI-11

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Timing belt plate x Oil pump		8.0	80	71 in.·lbf
Idler pulley x Oil pump		35	350	26
No. 1 timing belt cover x Oil pump		8.0	80	71 in.·lbf
Camshaft timing pulley x Camshaft		81	810	60
Straight screw plug x Camshaft timing pulley		15	150	11
No. 1 oil pipe x No. 3 camshaft bearing cap		55	550	41
Cylinder head cover x Cylinder head		8.5	85	75 in.·lbf
High-tension cord x Cylinder head cover		8.0	80	71 in.·lbf
Timing belt tensioner x Oil pump		27	270	20
Crankshaft pulley x Crankshaft		330	3,300	243
Drive belt tensioner x Cylinder head		21	210	15
No. 2 timing belt cover x Cylinder head		8.0	80	71 in.·lbf
No. 3 timing belt cover x Cylinder head		8.0	80	71 in.·lbf
PS pump front bracket x PS vane pump		58	590	43
PS pump front bracket x Cylinder block		52	530	38
Drive belt tensioner absorber x Drive belt tensioner arm		20	200	14
Drive belt tensioner absorber x Drive belt tensioner bracket		20	200	14
Drive belt tensioner Arm x Drive belt tensioner		21	210	15
Drive belt tensioner bracket x Oil pump		28	280	21
ECT sensor x Cylinder head		19.6	200	14
Engine hanger x Cylinder head		40	400	30
Water outlet x Cylinder head		28	280	21
Cylinder head x Cylinder head	1st 2nd 3rd	35 Turn 90° Turn 90°	350 Turn 90° Turn 90°	26 Turn 90° Turn 90°
Camshaft bearing cap x Cylinder head		20	200	14
No. 3 camshaft bearing cap x Cylinder head	Hexagon bolt	5.0	50	44 in.·lbf
No. 4 timing belt cover x Cylinder head		8.0	80	71 in.·lbf
Intake manifold x Cylinder head		28	280	21
Manifold stay x Intake manifold		40	400	30
Manifold stay x Cylinder block		40	400	30
Vacuum control valve set x Intake manifold		21	210	15
Exhaust manifold x Cylinder head		40	410	30
Front exhaust pipe x Exhaust manifold		43	438	32
PS vane pump x Cylinder block		58	590	43
PS vane pump x A/C compressor		58	590	43
PS pump rear stay x PS pump bracket		39.2	400	29
PS pump rear stay x Manifold stay		39.2	400	29
Drive plate x Torque converter clutch		48	490	35
Engine hanger x Cylinder head		40	400	30
Rear support member x Body		25.5	260	19
Drive plate x Crankshaft		83	850	61
Transmission x Cylinder block		72	730	53
Starter x Transmission		37	380	27

No. 1 oil pan x Transmission		37	380	27
Torque converter clutch x Drive plate		48	490	35
Suspension member x Body		70	714	52
Engine rear mounting member x Transmission		13.5	135	10
Engine rear mounting member x Body		25.5	260	19
Lower arm x Steering knuckle		245	2,500	181
Shock absorber x Steering knuckle		64	650	47
Stabilizer bar x Body	Bolt	18	180	13
	Nut	49	500	30
Sliding yoke x Steering intermediate shaft		35	360	26
Transmission control rod x Shift lever		13	130	9
Transmission control rod x Transmission		13	130	9
A/C compressor x Cylinder block	Stud bolt	26	265	19
	Bolt and nut	52	530	38
Fuel inlet hose x Fuel pipe support		29	300	22
Front suspension member brace x Front suspension member		119	1,120	88
Front suspension member brace x Body		58	590	43
Main bearing cap x Cylinder block	1st	45	450	33
	2nd	Turn 90°	Turn 90°	Turn 90°
Connecting rod cap x Connecting rod	1st	30	300	22
	2nd	Turn 90°	Turn 90°	Turn 90°
Rear oil seal retainer x Cylinder block		6.0	60	53
Engine mounting bracket x Cylinder block		59	590	44
Fuel inlet pipe x Cylinder block		29	290	21
No. 1 oil pipe x Cylinder block		55	550	41
Oil filter bracket x Cylinder block		90	900	66
No. 2 water bypass pipe x Water pump		21	210	15
No. 2 water bypass pipe x Cylinder block		21	210	15
Generator x Water pump		40	400	30
Generator x Cylinder block		40	400	30
Front exhaust pipe x Exhaust manifold		43	438	32
Front exhaust pipe x Center exhaust pipe		43	438	32
Center exhaust pipe x Tailpipe		43	438	32
Tailpipe bracket x Body		13	133	10

EMISSION CONTROL

TORQUE SPECIFICATION

SS0FJ-12

Part tightened	N·m	kgf·cm	ft·lbf
Protector for charcoal canister x Body	5.5	56	49 in.·lbf
Charcoal canister x Protector	5.0	51	44 in.·lbf
RH rear drive shaft x Differential	83	850	61
Heated oxygen sensor x Exhaust manifold	45	450	33
Exhaust manifold x Cylinder head	40	408	30
Front exhaust pipe (with rear TWC) x Exhaust manifold	44	440	32
Front exhaust pipe (with rear TWC) x Center exhaust pipe	44	440	32
Pipe support bracket x Transmission	44	440	32

SFI

SERVICE DATA

SS0FK-15

Fuel pump	Resistance	at 20˚C (68˚F)	0.2 - 3.0 Ω
Fuel pressure regulator	Fuel pressure		304 - 343 kPa (3.1 - 3.5 kgf/cm^2, 44 - 50 psi)
Injector	Resistance Injection volume Difference between each cylinder Fuel leakage	at 20˚C (68˚F)	13.4 - 14.2 Ω 60 - 73 cm^3 (3.7 - 4.5 cu in.) per 15 sec. 13 cm^3 (0.8 cu in.) or less 1 drop or less per 12 min.
MAF meter	Resistance (THA - E2)	at -20˚C (-4˚F) at 20˚C (68˚F) at 60˚C (140˚F)	13.6 - 18.4kΩ 2.21 - 2.69 kΩ 0.493 - 0.667 kΩ
Throttle body	Throttle body fully closed angle		3.5˚
Throttle control motor	Motor (M+ - M-) Clutch (CL+ - CL-)	at 20˚C (68˚F) at 20˚C (68˚F)	0.3 - 100 Ω 4.2 - 5.2 Ω
Throttle position sensor	Resistance (VC - E2) Throttle valve opening percentage	at 20˚C (68˚F) STD	1.2 - 3.2 kΩ 14.8 ± 0.8 %
Accelerator pedal position sensor	Resistance (VC - E2) Accelerator pedal position voltage	at 20˚C (68˚F) STD	1.2 - 3.2 kΩ 0.3 - 0.9 V
Camshaft timing oil control valve	Resistance	at 20˚C (68˚F)	5.5 - 12 Ω
Fuel pump resister	Resistance	at 20˚C (68˚F)	0.30 - 0.35 Ω
VSV for EVAP	Resistance	at 20˚C (68˚F)	27 - 33 Ω
VSV for ACIS	Resistance	at 20˚C (68˚F)	38.5 - 44.5 Ω
VSV for CCV	Resistance	at 20˚C (68˚F)	24 - 30 Ω
VSV for pressure switching valve	Resistance	at 20˚C (68˚F) at 120˚C (248˚F)	37 - 44 Ω 51 - 62 Ω
ECT sensor	Resistance	at -20˚C (-4˚F) 0˚C (32˚F) 20˚C (68˚F) 40˚C (104˚F) 60˚C (140˚F) 80˚C (176˚F)	10 - 20 kΩ 4 - 7 kΩ 2 - 3 kΩ 0.9 - 1.3 kΩ 0.4 - 0.7 kΩ 0.2 - 0.4 kΩ
Vapor pressure sensor	Power sorce voltage		4.5 - 5.5 V
Heated oxygen sensor	Heater coil resistance	at 20˚C (68˚F) at 800˚C (1,472˚F)	11 - 16 Ω 23 - 32 Ω
Fuel cut rpm		Fuel return rpm	1,000 rpm
EFI main relay	Resistance 3 - 5 (Apply battery voltage to terminal 1 and 2)	3 - 5	10 kΩ or higher Below 1 Ω
Circuit opening relay	Resistance 3 - 5 (Apply battery voltage to terminal 1 and 2)	3 - 5	10 kΩ or higher Below 1 Ω

SS0FL-12

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Fuel line Union bolt	29	300	22
Flare nut for use with SST	30	310	22
for use without SST	38	387	28
Fuel tank vent tube set plate x Fuel tank	3.5	36	31 in.·lbf
Fuel inlet hose x Body	9.0	90	80 in.·lbf
Delivery pipe x Intake manifold	21	210	15
Fuel pressure pulsation damper x Fuel pipe support	32.5	325	24
Fuel inlet pipe x Intake manifold	9.0	90	80 in.·lbf
No. 2 vacuum pipe x Intake manifold	21	210	15
Fuel sender gauge x Fuel tank	1.5	15	13 in.·lbf
Fuel tank band x Body	39	400	29
MAF meter x Air cleaner	10.7	109	8
Throttle body bracket x Throttle body	21	210	15
Throttle body bracket x Cylinder head	21	210	15
Throttle position sensor x Throttle body	1.7	17.5	15 in.·lbf
Throttle control motor x Throttle body	3.7	37.5	33 in.·lbf
Throttle control motor cover x Throttle body	1.7	17.5	15 in.·lbf
Accelerator pedal position sensor x Throttle body	3.7	37.5	33 in.·lbf
Camshaft timing oil control valve x No. 3 camshaft bearing cap	8.0	80	71 in.·lbf
No. 3 timing belt cover x Cylinder head cover	8.0	80	71 in.·lbf
Intake air connector x Air intake chamber	28	280	21
Air intake chamber x Intake manifold	28	280	21
Vacuum control valve set x Intake manifold	21	210	15
ECT sensor x Cylinder head	19.6	200	14
Knock sensor x Cylinder block	44	450	33
PS pump rear stay x Manifold stay	39.2	400	29
PS pump rear stay x PS pump bracket	39.2	400	29
Heated oxygen sensor x Exhaust manifold	45	450	33
Heated oxygen sensor x Front exhaust pipe	45	450	33

COOLING

SERVICE DATA

SS0SD-04

Thermostat	Valve opening temperature Valve lift at 95˚C (203˚F)	80 - 84˚C (176 - 183˚F) 8.5 mm (0.335 in.) or more
Radiator cap	Relief valve opening pressure STD Minimum	93 - 123 kPa (0.95 - 1.25 kgf/cm^2, 13.5 - 17.8 psi) 78 kPa (0.8 kgf/cm^2, 11.4 psi)
Electric cooling fan	Rotating amperage at 20˚C (68˚F)	8.5 - 11.5 A
Cooling No. 1 fan relay	Resistance 3 - 5 3 - 5 (Apply battery voltage to terminal 1 and 2)	10 kΩ or higher Below 1 Ω
Cooling No. 2 fan relay	Resistance 3 - 4 3 - 4 (Apply battery voltage to terminal 1 and 2) 3 - 5 3 - 5 (Apply battery voltage to terminal 1 and 2)	Below 1 Ω 10 kΩ or higher 10 kΩ or higher Below 1 Ω
Cooling No. 3 fan relay	Resistance 3 - 5 3 - 5 (Apply battery voltage to terminal 1 and 2)	10 kΩ or higher Below 1 Ω

SS0SE-04

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Engine drain plug x Cylinder block	30	300	22
Water pump x Cylinder block	21	210	15
Water pump x No. 2 water bypass pipe	21	210	15
Generator x Water pump	40	400	30
Generator x Cylinder block	40	400	30
Water bypass outlet x Cylinder head	9.0	90	80 in.·lbf
Water pump pulley x Water pump	14	140	10
Drive belt tensioner absorber x Drive belt tensioner arm	20	200	14
Drive belt tensioner absorber x Drive belt tensioner bracket	20	200	14
Water inlet x Water pump	9.0	90	80 in.·lbf
Oil cooler x Radiator lower tank	8.3	85	74 in.·lbf
Oil cooler x Oil cooler pipe	14.7	150	11
Electric cooling fan x Radiator	5.0	50	44 in.·lbf
Upper radiator support x Body	13.5	135	10

LUBRICATION

SS0SF-03

SERVICE DATA

Oil pressure		at idle speed	49 kPa (0.5 kgf/cm^2, 7.3 psi) or more
		at 3,000 rpm	324 kPa (3.3 kgf/cm^2, 47 psi) or more
Oil pump	Tip clearance	STD	0.060 - 0.240 mm (0.0024 - 0.0094 in.)
		Maximum	0.30 mm (0.0118 in.)
	Body clearance	STD	0.100 - 0.175 mm (0.0039 - 0.0069 in.)
		Maximum	0.20 mm (0.0079 in.)
	Side clearance	STD	0.030 - 0.090 mm (0.0012 - 0.0035 in.)
		Maximum	0.12 mm (0.0047 in.)

SS0SG-03

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Union bolt x Cylinder block		90	900	66
Oil pressure switch x Union bolt		15	150	11
Oil drain plug x No. 2 oil pan		38	380	28
Oil pump body cover x Oil pump body		10	105	8
Plug x Oil pump body		49	500	36
Oil pump x Cylinder block		21	210	15
No. 1 oil pan x Cylinder block	12 mm head 14 mm head	21 40	210 400	15 30
Oil pan baffle plate x No. 1 oil pan		9.0	90	80 in.·lbf
Oil strainer x No. 1 oil pan		9.0	90	80 in.·lbf
No. 2 oil pan x No. 1 oil pan		9.0	90	80 in.·lbf
Oil level sensor x No. 1 oil pan		5.4	55	48 in.·lbf
Crankshaft position sensor x Oil pump		9.0	90	80 in.·lbf

IGNITION

SS0IM-03

SERVICE DATA

High-tension cord	Resistance	Maximum	25 kΩ per cord
Spark plug	Recommended spark plug	DENSO made	SK16R-P11
	Correct electrode gap for new plug		1.1 mm (0.043 in.)
	Maximum electrode gap for used plug		1.2 mm (0.047 in.)
Ignition coil	Primary coil resistance	at cold	0.33 - 0.52 Ω
		at hot	0.42 - 0.61 Ω
	Secondary coil resistance	at cold	8.5 - 14.7 kΩ
		at hot	10.8 - 17.2 kΩ
Camshaft position sensor	Resistance	at cold	835 - 1,400 Ω
		at hot	1,060 - 1,645 Ω
Crankshaft position sensor	Resistance	at cold	1,630 - 2,740 Ω
		at hot	2,065 - 3,225 Ω

SS0IN-03

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Spark plug x Cylinder head	18	180	13
Throttle body x Intake air connector	21	210	15
Throttle body bracket x Cylinder head	21	210	15
Throttle body bracket x Throttle body	21	210	15
Throttle body gasket x Intake air connector	21	210	15
Ignition coils and high-tension cord set assembly x Cylinder head	8.0	80	71 in.·lbf
PS pump rear stay x Manifold stay	39.2	400	29
PS pump rear stay x PS pump bracket	39.2	400	29
Camshaft position sensor x Cylinder head	9.0	90	80 in.·lbf
Crankshaft position sensor x Oil pump	9.0	90	80 in.·lbf

STARTING

SERVICE DATA

SS0FQ-12

Starter	Rated voltage and output power		12 V 1.4 kW
	No-load characteristics	Current	90 A or less at 11.5 V
		rpm	3,000 rpm or more
	Brush length	STD	15.5 mm (0.610 in.)
		Minimum	10.0 mm (0.394 in.)
	Spring installed load	STD	17.6 - 23.5 N (1.8 - 2.4 kgf, 3.9 - 5.3 lbf)
		Minimum	11.8 N (1.2 kgf, 2.6 lbf)
	Commutator		
	Diameter	STD	30.0 mm (1.181 in.)
		Minimum	29.0 mm (1.412 in.)
	Undercut depth	STD	0.6 mm (0.024 in.)
		Minimum	0.2 mm (0.008 in.)
	Circle runout	Maximum	0.05 mm (0.0020 in.)
	Magnetic switch		
	Contact plate for wear	Maximum	0.9 mm (0.035 in.)
Starter relay	Resistance	3 - 5	10 kΩ or higher
	3 - 5 (Apply battery voltage to terminal 1 and 2)		Below 1 Ω

SS0FR-11

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Starter x Transmission	37	380	27
Lead wire x Terminal C of starter	5.9	60	52 in.·lbf
Field frame x Armature assembly	5.9	60	52 in.·lbf
Starter housing x Magnetic switch	5.9	60	52 in.·lbf
End cover x Field frame	1.5	15	13 in.·lbf
Terminal nut x Terminal 30 of starter	17	173	13
Terminal nut x Terminal C of starter	17	173	13
Magnetic switch end cover x Magnetic switch	2.5	26	22 in.·lbf

CHARGING

SS0E6-10

SERVICE DATA

Battery	Voltage (Maintenance-free battery)	at 20˚C (68˚F)	12.5 - 12.9 V
	Specific gravity (Except maintenance-free battery)	at 20˚C (68˚F)	1.25 - 1.29
Alternator	Rated output		12 V 80 A
	Rotor coil resistance	at 20˚C (68˚C)	2.1 - 2.5 Ω
	Slip ring diameter	STD	14.2 - 14.4 mm (0.559 - 0.567 in.)
		Minimum	12.8 mm (0.504 in.)
	Brush exposed length	STD	9.5 -11.5 mm (0.374 -0.453 in.)
		Minimum	1.5 mm (0.059 in.)
Voltage regulator	Regulating voltage		13.2 - 14.8 V

SS0E7-14

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Drive belt tensioner absorber x Drive belt tensioner arm		20	200	14
Drive belt tensioner absorber x Drive belt tensioner bracket		20	200	14
Generator x Water pump		40	400	30
Generator x Cylinder block		40	400	30
Bearing retainer x Drive end frame		3.0	31	27 in.·lbf
Rectifier end frame x Drive end frame		4.5	46	40 in.·lbf
Rectifier end frame with wire clip x Rectifier end frame		5.4	55	48 in.·lbf
Generator pully x Rotor		110.5	1,125	81
Rectifier holder x Coil lesd on rectifier end frame		2.9	30	26 in.·lbf
Voltage regulator x Rectifier end frame		2.0	20	18 in.·lbf
Voltage regulator x Rectifier holder		2.0	20	18 in.·lbf
Brush holder x Rectifier holder		2.0	20	18 in.·lbf
Brush holder x Voltage regulator		2.0	20	18 in.·lbf
Rear end cover x Rectifier holder		4.4	45	39 in.·lbf
Plate terminal x Rectifier holder	Nut	4.4	45	39 in.·lbf
	Bolt	3.9	40	35 in.·lbf
Terminal insulator x Rectifier holder		6.5	67	58 in.·lbf

CLUTCH

SERVICE DATA

SS1JS-01

Pedal height from asphalt sheet		162 - 172 mm (6.38 - 6.77 in.)
Pedal free play		5.0 - 15.0 mm (0.197 - 0.591 in.)
Push rod play at pedal top		1.0 - 5.0 mm (0.039 - 0.197 in.)
Full pedal stroke		142.0 - 147.5 mm (5.591 - 5.807 in.) or more
Clutch release point from pedal full stroke end position		25 mm (0.98 in.) or more
Clutch start switch ON-OFF Stroke		8.0 ± 0.5 mm (0.315 ± 0.020 in.)
Slotted spring pin protrusion		1.5 - 3.5 mm (0.059 - 0.138 in.)
Disc rivet head depth	Minimum	0.3 mm (0.012 in.)
Disc runout	Maximum	0.8 mm (0.031 in.)
Flywheel runout	Maximum	0.1 mm (0.004 in.)
Diaphragm spring finger wear	Maximum depth	0.6 mm (0.024 in.)
Diaphragm spring finger wear	Maximum width	5.0 mm (0.197 in.)
Diaphragm spring tip non-alignment	Maximum	0.5 mm (0.020 in.)

SS1JT-01

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Pedal hight lock nut	15.7	160	12
Push rod lock nut	12	120	9
Clutch line union	15.2	155	11
Master cylinder installation nut	12	120	9
Release cylinder installation bolt	12	120	9
Bleeder plug	10.7	109	8
Clutch cover x Flywheel	19.1	195	14
Release fork suppor	39.2	400	29

MANUAL TRANSMISSION

SS1JU-01

SERVICE DATA

Output shaft 2nd gear journal diameter	Minimum	42.975 mm (1.6919 in.)
Output shaft 3rd gear journal diameter	Minimum	31.969 mm (1.2586 in.)
Output shaft flange thickness	Minimum	5.70 mm (0.2244 in.)
Output shaft runout	Maximum	0.03 mm (0.0012 in.)
1st gear inner race flange thickness	Minimum	4.78 mm (0.1881 in.)
1st gear inner race outer diameter	Minimum	42.975 mm (1.6919 in.)
Counter gear bearing journal diameter	Minimum	29.950 mm (1.1791 in.)
Counter 5th gear journal diameter	Minimum	26.975 mm (1.0620 in.)
1st, 2nd and 3rd gear thrust clearance	Standard	0.10 - 0.25 mm (0.0039 - 0.0098 in.)
	Maximum	0.25 mm (0.0098 in.)
Counter 5th gear thrust clearance	Standard	0.10 - 0.41 mm (0.0039 - 0.0161 in.)
	Maximum	0.41 mm (0.0161 in.)
1st, 2nd and counter 5th gear radial clearance	Standard	0.009 - 0.060 mm (0.0004 - 0.0024 in.)
	Maximum	0.060 mm (0.0024 in.)
3rd gear radial clearance	Standard	0.015 - 0.066 mm (0.0006 - 0.0026 in.)
	Maximum	0.066 mm (0.0026 in.)
Reverse idler gear radial clearance	Standard	0.041 - 0.074 mm (0.0016 - 0.0029 in.)
	Maximum	0.074 mm (0.0029 in.)
No. 1 and No. 2 shift fork to hub sleeve clearance	Maximum	0.5 mm (0.020 in.)
No. 3 shift fork to hub sleeve clearance	Maximum	0.84 mm (0.0331 in.)
Synchronizer ring to 1st, 3rd and 4th gear clearance	Minimum	0.70 mm (0.0276 in.)
Synchronizer ring to 2nd and 3rd gear clearance	Minimum	0.74 mm (0.0291 in.)
Input shaft snap ring thickness		
	Mark 1	2.05 - 2.10 mm (0.0807 - 0.0827 in.)
	Mark 2	2.10 - 2.15 mm (0.0827 - 0.0846 in.)
	Mark 3	2.15 - 2.20 mm (0.0846 - 0.0866 in.)
	Mark 4	2.20 - 2.25 mm (0.0866 - 0.0886 in.)
	Mark 5	2.25 - 2.30 mm (0.0886 - 0.0906 in.)
	Mark 11	2.30 - 2.35 mm (0.0906 - 0.0925 in.)
	Mark 12	2.35 - 2.40 mm (0.0925 - 0.0945 in.)
Output shaft snap ring thickness		
No.2 clutch hub	Mark C-1	1.75 - 1.80 mm (0.0689 - 0.0709 in.)
	Mark D	1.80 - 1.85 mm (0.0709 - 0.0728 in.)
	Mark 11	1.86 - 1.91 mm (0.0732 - 0.0752 in.)
	Mark 12	1.92 - 1.97 mm (0.0756 - 0.0776 in.)
	Mark 13	1.98 - 2.03 mm (0.0780 - 0.0799 in.)
	Mark 14	2.04 - 2.09 mm (0.0803 - 0.0823 in.)
	Mark 15	2.10 - 2.15 mm (0.0827 - 0.0846 in.)
Output shaft snap ring thickness		
Rear bearing	Mark 8	2.31 - 2.36 mm (0.0909 - 0.0929 in.)
	Mark 9	2.37 - 2.42 mm (0.0933 - 0.0953 in.)
	Mark 10	2.43 - 2.48 mm (0.0957 - 0.0976 in.)
	Mark 11	2.49 - 2.54 mm (0.0980 - 0.1000 in.)
	Mark 12	2.55 - 2.60 mm (0.1004 - 0.1024 in.)
	Mark 13	2.61 - 2.66 mm (0.1028 - 0.1047 in.)
	Mark 14	2.68 - 2.73 mm (0.1055 - 0.1075 in.)
	Mark 15	2.74 - 2.79 mm (0.1079 - 0.1098 in.)

Output shaft snap ring thickness		
Reverse gear	Mark 5	2.25 - 2.30 mm (0.0886 - 0.0906 in.)
	Mark 11	2.30 - 2.35 mm (0.0906 - 0.0925 in.)
	Mark 12	2.35 - 2.40 mm (0.0925 - 0.0945 in.)
	Mark 13	2.40 - 2.45 mm (0.0945 - 0.0965 in.)
	Mark 14	2.45 - 2.50 mm (0.0965 - 0.0984 in.)
	Mark 15	2.50 - 2.55 mm (0.0984 - 0.1004 in.)
	Mark 16	2.55 - 2.60 mm (0.1004 - 0.1024 in.)
	Mark 17	2.61 - 2.66 mm (0.1028 - 0.1047 in.)
	Mark 18	2.67 - 2.72 mm (0.1051 - 0.1071 in.)
	Mark 19	2.73 - 2.78 mm (0.1075 - 0.1094 in.)
	Mark 20	2.79 - 2.84 mm (0.1098 - 0.1118 in.)
	Mark 21	2.85 - 2.90 mm (0.1122 - 0.1142 in.)
	Mark 22	2.91 - 2.96 mm (0.1146 - 0.1165 in.)
	Mark 23	2.97 - 3.02 mm (0.1169 - 0.1189 in.)
Coutner gear snap ring thickness		
Front bearing	Mark A	2.05 - 2.10 mm (0.0807 - 0.0827 in.)
	Mark B	2.10 - 2.15 mm (0.0827 - 0.0846 in.)
	Mark C	2.15 - 2.20 mm (0.0846 - 0.0866 in.)
	Mark D	2.20 - 2.25 mm (0.0866 - 0.0886 in.)
	Mark E	2.25 - 2.30 mm (0.0886 - 0.0906 in.)
	Mark F	2.30 - 2.35 mm (0.0906 - 0.0925 in.)
Counter gear snap ring thickness		
No.3 clutch hub	Mark 2	2.06 - 2.11 mm (0.0811 - 0.0831 in.)
	Mark 3	2.12 - 2.17 mm (0.0835 - 0.0854 in.)
	Mark 4	2.18 - 2.23 mm (0.0858 - 0.0878 in.)
	Mark 5	2.24 - 2.29 mm (0.0882 - 0.0902 in.)
Counter gear snap ring thickness		
Rear bearing	Mark 1	1.90 - 1.95 mm (0.0748 - 0.0768 in.)
	Mark 2	1.96 - 2.01 mm (0.0772 - 0.0791 in.)
	Mark 3	2.02 - 2.07 mm (0.0795 - 0.0815 in.)
	Mark 4	2.08 - 2.13 mm (0.0819 - 0.0839 in.)
	Mark 5	2.14 - 2.19 mm (0.0843 - 0.0862 in.)
	Mark 6	2.20 - 2.25 mm (0.0866 - 0.0886 in.)
	Mark 7	2.26 - 2.31 mm (0.0890 - 0.0909 in.)
Oil seal drive in depth		
Front bearing retainer (from retainer end)		12.2 ± 0.5 mm (0.480 ± 0.020 in.)
Extension housing		0 ± 0.5 mm (0 ± 0.020 in.)
Reverse restrict pin drive in depth		16 - 17 mm (0.63 - 0.67 in.)

SS1JV-02

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Transmission x Engine	12 mm bolt	71.6	730	53
	10 mm bolt	37.3	380	27
Engine rear mounting x Transmission		25.5	260	19
Rear engine mounting member	Nut	13.5	138	10
	Bolt	25	255	18
Transmission x Starter		37.3	380	28
Starter wire set nut		9.8	10	7
Clutch release cylinder set bolt		11.7	119	9
Propeller shaft x Differential		74	750	54
Propeller shaft center bearing		49	500	36
Exhaust manifold x Front exhaust pipe		62	630	46
Front exhaust pipe x Pipe support bracket		43	438	32
Center exhaust pipe x Tailpipe		43	438	32
Drain and filler plugs		38	387	28
Exhaust manifold x Engine		40	408	29
Engine cover No. 1 set nut		5.0	51	44 in.·lbf
Shift lever x Control shift lever arm		8.0	82	71 in.·lbf
Back-up light switch clamp set bolt		5.8	59	51 in.·lbf
Back-up light switch		41	410	30
Vehicle speed sensor drain gear set bolt		13	130	9
Clutch housing x Transmission case		38	387	28
Control shift lever retainer x Extension housing		18.5	189	14
Straight screw plug x Control shift lever retainer		24.5	250	18
Restrict pin		41	418	30
Inner lever x Shift and select lever		33	337	24
Extension housing x Intermediate plate		38	387	28
Front bearing retainer x Transmission case		25	255	18
Oil separator x Intermediate plate		18.5	189	14
Straight screw plug x Intermediate plate		25	255	18
No. 1 and No. 2 shift fork set bolt		20	203	15
Reverse idler gear shaft stopper set bolt		25	255	18
Straight screw plug x Reverse shift head		25	255	18
Rear bearing retainer x Intermediate plate		18.5	189	14
Straight screw plug x Extension housing		25	25.5	18

AUTOMATIC TRANSMISSION

SS0C5-13

SERVICE DATA

Line pressure (Wheel locked)		
	Idling	
	D position	390 - 460 kPa (4.0 - 4.7 kgf·cm^2, 57 - 67 psi)
	R position	0
	Stall	
	D position	1,200 - 1,360 kPa (12.2 - 13.8 kgf·cm^2, 174 - 196 psi)
	R position	1,640 - 1,960 kPa (16.7 - 19.8 kgf·cm^2, 238 - 282 psi)
Engine stall revolution (D position)		2,700 ± 150 rpm
Time lag	N → D position	Less than 1.2 seconds
	N → R position	Less than 1.5 seconds
Engine idle speed (N position and A/C OFF)		700 ± 50 rpm
Drive plate runout	Max.	0.20 mm (0.0079 in.)
Torque converter clutch sleeve runout	Max.	0.30 mm (0.0118 in.)
Torque converter clutch installation (Correct distance)		More than 0.1 mm (0.004 in.)
Shift schedule (NORM and PWR mode)		
Differential gear ratio 3.909		
D, 4 position		
(Throttle valve fully opened)	1 → 2	47 - 59 km/h (29 - 37 mph)
	2 → 3	77 - 88 km/h (48 - 55 mph)
	3 → 4	118 - 133 km/h (73 - 83 mph)
	4 → 5	168 - 185 km/h (104 - 115 mph)
	5 → 4	163 - 176 km/h (101 - 109 mph)
	4 → 3	107 - 118 km/h (66 - 73 mph)
	3 → 2	60 - 66 km/h (37 - 41 mph)
	2 → 1	32 - 38 km/h (20 - 24 mph)
(Throttle valve fully closed)	4 → 5	37 - 43 km/h (23 - 27 mph)
	5 → 4	21 - 26 km/h (13 - 16 mph)
3 position		
(Throttle valve fully opened)	1 → 2	47 - 59 km/h (29 - 37 mph)
	2 → 3	77 - 87 km/h (48 - 54 mph)
	4 → 3	123 - 134 km/h (76 - 83 mph)
	3 → 2	60 - 66 km/h (37 - 41 mph)
	2 → 1	32 - 38 km/h (20 - 24 mph)
2 position		
(Throttle valve fully opened)	1 → 2	47 - 59 km/h (29 - 37 mph)
	3 → 2	82 - 90 km/h (51 - 56 mph)
	2 → 1	32 - 38 km/h (20 - 24 mph)
L position		
(Throttle valve fully opened)	2 → 1	17 - 22 km/h (11 - 14 mph)

Shift schedule (SNOW mode)		
Differential gear ratio 3.916		
D, 4 position		
(Throttle valve fully opened)	1 → 2	35 - 49 km/h (22 - 30 mph)
	2 → 3	55 - 73 km/h (34 - 45 mph)
	3 → 4	84 - 109 km/h (52 - 68 mph)
	4 → 5	121 - 151 km/h (75 - 94 mph)
	5 → 4	64 - 88 km/h (40 - 55 mph)
	4 → 3	38 - 54 km/h (24 - 34 mph)
	3 → 2	17 - 31 km/h (11- 19 mph)
(Throttle valve fully closed)	4 → 5	37 - 43 km/h (23 - 27 mph)
	5 → 4	21 - 26 km/h (13 - 16 mph)
3 position		
(Throttle valve fully opened)	1 → 2	35 - 49 km/h (22 - 30 mph)
	2 → 3	55 - 73 km/h (34 - 45 mph)
	4 → 3	123 - 134 km/h (76 - 83 mph)
	3 → 2	17 - 31 km/h (11 - 19 mph)
2 position		
(Throttle valve fully opened)	1 → 2	47 - 59 km/h (29 - 37 mph)
	3 → 2	82 - 90 km/h (51 - 56 mph)
L position		
(Throttle valve fully opened)	2 → 1	17 - 22 km/h (11 - 14 mph)
Lock-up point	(Throttle valve opening 5 %)	
5th gear (D position)	Lock-up ON	53 - 59 km/h (33 - 37 mph)
	Lock-up OFF	52 - 58 km/h (32 - 36 mph)
4th gear (4 position)	Lock-up ON	53 - 59 km/h (33 - 37 mph)
	Lock-up OFF	52 - 58 km/h (32 - 36 mph)
Flex lock-up point		
(Throttle valve opening 3 %)		
D position (When accelerating)		
5th gear	Lock-up ON	37 - 43 km/h (23 - 27 mph)
	Lock-up OFF	36 - 41 km/h (22 - 25 mph)
4th gear	Lock-up ON	28 - 33 km/h (17 - 32 mph)
	Lock-up OFF	27 - 32 km/h (18 - 20 mph)

SS139-04

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Extension housing x Transmission case		34	345	25
Transmission mounting bracket x Extension housing		12	120	9
Engine rear support member x Frame		25	260	19
Engine rear support member x Transmission mounting bracket		12	120	9
Vehicle speed sensor set bolt		5.4	55	48 in.·lbf
O/D direct clutch speed sensor set bolt		5.4	55	48 in.·lbf
AFT temperature sensor connector set bolt		5.4	55	48 in.·lbf
Drain plug		20	205	15
Shift solenoid valve SLU and SLT set bolt		6.4	65	56 in.·lbf
Shift solenoid valve SLN and No. 4 set bolt		10	100	7
Shift solenoid valve clamp set bolt		6.4	65	56 in.·lbf
Shift solenoid valve No. 1 and No. 3		6.4	65	56
Shift solenoid valve No. 2		10	100	7
Shift control rod set nut		13	130	9
Valve body x Transmission case		10	100	7
Oil pan x Transmission case		7.4	75	65 in.·lbf
Oil strainer x Valve body		10	100	7
Parking lock pawl bracket x Transmission case		7.4	75	65 in.·lbf
Control shaft lever set nut		13	130	9
Shift lever guide housing assembly x Shift lever plate		4.9	50	43 in.·lbf
Floor shift lever assembly set bolt		8.3	85	73 in.·lbf
Oil cooler pipe clamp bolt		5.4	55	48 in.·lbf
Oil cooler pipe union nut		44	450	33
Transmission x Engine	14 mm head	37	380	27
	17 mm head	72	730	53
Starter x Transmission		37	380	27
Exhaust pipe assembly x Exhaust manifold		62	632	46
Exhaust manifold with TWC x Engine		39	400	29
Pipe support bracket x Transmission		43	438	32
Torque converter clutch x Drive plate		48	490	35
Propeller shaft x Differential		74	750	54
Propeller shaft x Body		49	500	36
Drive plate x Crankshaft		83	850	61

PROPELLER SHAFT

SS132-01

SERVICE DATA

Shaft runout Max.	0.8 mm (0.031 in.)
Joint angle (No. 2 joint)	- 1° 21' ± 30'
Joint angle (No. 3 joint)	2° 18' ± 30'
Center support bearing adjusting washer thickness	2.0 mm (0.079 in.) 4.5 mm (0.177 in.) 6.5 mm (0.256 in.) 9.0 mm (0.354 in.) 11.0 mm (0.433 in.) 13.5 mm (0.531 in.)

SS133-03

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Propeller shaft x Differential		74	750	54
Propeller shaft x Intermediate shaft		74	750	54
Intermediate shaft x Center support bearing x Universal joint flange	1st	181	1,850	134
	2nd	Loosen nut		
	3rd	69	700	51
Center support bearing x Body		49	500	36
Exhaust pipe assembly x Exhaust manifold		62	632	46
Heated oxygen sensor x Exhaust pipe assembly		44	450	33
Pipe support bracket x Transmission		43	438	32

SUSPENSION AND AXLE

SS0FD-11

SERVICE DATA

Cold tire inflation pressure (SEDAN)	Tire size: 215/45ZR17 or P205/55R16 89V	
	Front*1	230 kPa (2.3 kgf/cm^2, 33 psi)
	Rear*1	230 kPa (2.3 kgf/cm^2, 33 psi)
	Front*2	300 kPa (3.0 kgf/cm^2, 44 psi)
	Rear*2	300 kPa (3.0 kgf/cm^2, 44 psi)
Cold tire inflation pressure (WAGON)	Tire size: 215/45ZR17	
	Front*1	230 kPa (2.3 kgf/cm^2, 33 psi)
	Front*2	300 kPa (3.0 kgf/cm^2, 44 psi)
	Tire size: 225/45ZR17	
	Rear*1	240 kPa (2.4 kgf/cm^2, 35 psi)
	Rear*2	310 kPa (3.1 kgf/cm^2, 45 psi)
	Tire size: P205/55R16 89V	
	Front*1	230 kPa (2.3 kgf/cm^2, 33 psi)
	Rear*1	230 kPa (2.3 kgf/cm^2, 33 psi)
	Front*2	300 kPa (3.0 kgf/cm^2, 44 psi)
	Rear*2	320 kPa (3.2 kgf/cm^2, 46 psi)
Front wheel alignment (SEDAN, Canada)	Vehicle height: Front: B*4 - A*3	66 mm (2.60 in.)
	Rear: C*5 - D*6	66 mm (2.60 in.)
	Camber	-0°21' ± 30' (-0.35° ± 0.5°)
	Right-left error	30' (0.5°) or less
	Caster	5°46' ± 30' (5.77° ± 0.5°)
	Right-left error	30' (0.5°) or less
	Steering axis inclination	9°16' ± 30' (9.27° ± 0.5°)
	Right-left error	30' (0.5°) or less
	Toe-in (total)	0°06' ± 12' (0.1° ± 0.2°, 1 ± 2 mm, 0.04 ± 0.08 in.)
	Rack end length difference	1.5 mm (0.059 in.) or less
	Wheel angle: Inside wheel	41°02' (39°02' – 42°02')
		41.03° (39.03° – 42.03°)
	Outside wheel: Reference	33°30'
		33.5°
Front wheel alignment (SEDAN, Except Canada)	Vehicle height: Front: B*4 - A*3	72 mm (2.83 in.)
	Rear: C*5 - D*6	85 mm (3.35 in.)
	Camber	-0°30' ± 30' (-0.5° ± 0.5°)
	Right-left error	30' (0.5°) or less
	Caster	6°07' ± 30' (6.12° ± 0.5°)
	Right-left error	30' (0.5°) or less
	Steering axis inclination	9°25' ± 30' (9.42° ± 0.5°)
	Right-left error	30' (0.5°) or less
	Toe-in (total)	0°06' ± 12' (0.1° ± 0.2°, 1 ± 2 mm, 0.04 ± 0.08 in.)
	Rack end length difference	1.5 mm (0.059 in.) or less
	Wheel angle: Inside wheel	41°01' (39°01' – 42°01')
		41.02° (39.02° – 42.02°)
	Outside wheel: Reference	33°23'
		33.38°

Front wheel alignment (WAGON, Canada)	Vehicle height Front: B*4 - A*3 Rear: C*5 - D*6	56 mm (2.20 in.) 58 mm (2.28 in.)
	Camber Right-left error	-0°05' ± 30' (-0.08° ± 0.5°) 30' (0.5°) or less
	Caster Right-left error	5°31' ± 30' (5.52° ± 0.5°) 30' (0.5°) or less
	Steering axis inclination Right-left error	8°59' ± 30' (8.98° ± 0.5°) 30' (0.5°) or less
	Toe-in (total) Rack end length difference	0°06' ± 12' (0.1° ± 0.2°, 1 ± 2 mm, 0.04 ± 0.08 in.) 1.5 mm (0.059 in.) or less
	Wheel angle Inside wheel Outside wheel: Reference	41°03' (39°03' – 42°03') 41.05° (39.05° – 42.05°) 33°40' 33.6°
Front wheel alignment (WAGON, Except Canada)	Vehicle height Front: B*4 - A*3 Rear: C*5 - D*6	66 mm (2.60 in.) 66 mm (2.60 in.)
	Camber Right-left error	-0°21' ± 30' (-0.35° ± 0.5°) 30' (0.5°) or less
	Caster Right-left error	5°46' ± 30' (5.77° ± 0.5°) 30' (0.5°) or less
	Steering axis inclination Right-left error	9°16' ± 30' (9.27° ± 0.5°) 30' (0.5°) or less
	Toe-in (total) Rack end length difference	0°06' ± 12' (0.1° ± 0.2°, 1 ± 2 mm, 0.04 ± 0.08 in.) 1.5 mm (0.059 in.) or less
	Wheel angle Inside wheel Outside wheel: Reference	41°02' (39°02' – 42°02') 41.03° (39.03° – 42.03°) 33°30' 33.5°
Rear wheel alignment (SEDAN, Canada)	Camber Right-left error	-0°23' ± 30' (-0.38° ± 0.5°) 30' (0.5°) or less
	Toe-in (total) Right and left length difference	0°12' ± 12' (0.2° ± 0.2°, 2 ± 2 mm, 0.08 ± 0.08 in.) 4.0 mm (0.157 in.) or less
Rear wheel alignment (SEDAN, Except Canada)	Camber Right-left error	-0°55' ± 30' (-0.92° ± 0.5°) 30' (0.5°) or less
	Toe-in (total) Right and left length difference	0°12' ± 12' (0.2° ± 0.2°, 2 ± 2 mm, 0.08 ± 0.08 in.) 4.0 mm (0.157 in.) or less
Rear wheel alignment (WAGON, Canada)	Camber Right-left error	-0°04' ± 30' (-0.07° ± 0.5°) 30' (0.5°) or less
	Toe-in (total) Right and left length difference	0°12' ± 12' (0.2° ± 0.2°, 2 ± 2 mm, 0.08 ± 0.08 in.) 4.0 mm (0.157 in.) or less
Rear wheel alignment (WAGON, Except Canada)	Camber Right-left error	-0°23' ± 30' (-0.38° ± 0.5°) 30' (0.5°) or less
	Toe-in (total) Right and left length difference	0°12' ± 12' (0.2° ± 0.2°, 2 ± 2 mm, 0.08 ± 0.08 in.) 4.0 mm (0.157 in.) or less

*1: For driving under 160 km/h (100 mph)
*2: For driving at 160 km/h (100 mph) or over
*3: Ground clearance of the front No .1 lower suspension arm mounting bolt center.
*4: Ground clearance of the front wheel center.
*5: Ground clearance of the rear wheel center.
*6: Ground clearance of the No. 2 lower suspension arm mounting bolt (Suspension member side) tail center.

Front axle	Wheel bearing backlash	Maximum	0.05 mm (0.0020 in.)
	Axle hub deviation	Maximum	0.05 mm (0.0020 in.)
Front suspension	Upper ball joint turning torque		1.0 - 3.4 N·m (10 - 35 kgf·cm, 9 - 30 in.·lbf)
	Lower ball joint excessive play	Maximum	0.9 mm (0.035 in.)
	Lower ball joint turning torque		0.5 - 3.0 N·m (5 - 30 kgf·cm, 0.4 - 26 in.·lbf)
	Stabilizer bar link ball joint turning torque		0.05 - 1.9 N·m (0.5 - 20 kgf·cm, 0.4 - 16 in.·lbf)
Rear axle	Wheel bearing backlash	Maximum	0.05 mm (0.0020 in.)
	Axle hub deviation	Maximum	0.07 mm (0.0028 in.)
Rear drive shaft	Drive shaft standard length		RH: 585.4 ± 5.0 mm (23.047 ± 0.197 in.) LH: 539.8 ± 5.0 mm (21.252 ± 0.197 in.)
Rear suspension	Upper ball joint turning torque		1.0 - 2.9 N·m (10 - 30 kgf·cm, 9 - 26 in.·lbf)
	Toe control link ball joint turning torque		1.0 - 2.5 N·m (10 - 25 kgf·cm, 9 - 22 in.·lbf)
	Stabilizer bar link ball joint turning torque		0.05 - 1.0 N·m (0.5 - 10 kgf·cm, 0.4 - 9.0 in.·lbf)
Rear differential	Companion flange vertical runout	Maximum	0.09 mm (0.0035 in.)
	Companion flange lateral runout	Maximum	0.09 mm (0.0035 in.)
	Ring gear runout	Maximum	0.07 mm (0.0028 in.)
	Ring gear backlash	Maximum	0.13 - 0.18 mm (0.0051 - 0.0071 in.)
	Drive pinion bearing (at starting)	New bearing Reused bearing	0.98 - 1.57 N·m (10 - 16 kgf·cm, 8.7 - 13.9 in.·lbf) 0.49 - 0.78 N·m (5 - 8 kgf·cm, 4.3 - 6.9 in.·lbf)
	Total preload (at starting)		Drive pinion preload plus 0.39 - 0.59 N·m (4 - 6 kgf·cm, 3.5 - 5.2 in.·lbf)
	Side gear backlash (2 pinion differential)		0.05 - 0.20 mm (0.0020 - 0.0079 in.)
	Differential case runout	Maximum	0.07 mm (0.0028 in.)
	Side gear shaft oil seal drive in depth		0 ± 0.50 mm (0 ± 0.0197 in.)
	Front oil seal drive in depth		2.00 ± 0.45 mm (0.0787 ± 0.0177 in.)
	Right and left side gear shafts standard distance		279.7 mm (11.012 in.) or less
	Pinion gear backlash adjusting thrust washer		1.6 mm (0.062 in.) 1.7 mm (0.067 in.) 1.8 mm (0.071 in.)
Rear differential	Drive pinion bearing adjusting washer thickness		1.70 mm (0.0669 in.) 1.73 mm (0.0681 in.) 1.76 mm (0.0693 in.) 1.79 mm (0.0704 in.) 1.82 mm (0.0717 in.) 1.85 mm (0.0729 in.) 1.88 mm (0.0740 in.) 1.91 mm (0.0752 in.) 1.94 mm (0.0764 in.) 1.97 mm (0.0776 in.) 2.00 mm (0.0787 in.) 2.03 mm (0.0799 in.) 2.06 mm (0.0811 in.) 2.09 mm (0.0822 in.) 2.12 mm (0.0835 in.) 2.15 mm (0.0847 in.) 2.18 mm (0.0858 in.) 2.21 mm (0.0870 in.) 2.24 mm (0.0882 in.) 2.27 mm (0.0894 in.) 2.30 mm (0.0906 in.) 2.33 mm (0.0918 in.)

Rear differential	Side bearing adjusting washer thickness	2.58 mm (0.1016 in.) 2.60 mm (0.1024 in.) 2.62 mm (0.1031 in.) 2.64 mm (0.1039 in.) 2.66 mm (0.1047 in.) 2.68 mm (0.1055 in.) 2.70 mm (0.1063 in.) 2.72 mm (0.1071 in.) 2.74 mm (0.1079 in.) 2.76 mm (0.1087 in.) 2.78 mm (0.1094 in.) 2.80 mm (0.1102 in.) 2.82 mm (0.1110 in.) 2.84 mm (0.1118 in.) 2.86 mm (0.1126 in.) 2.88 mm (0.1134 in.) 2.90 mm (0.1142 in.) 2.92 mm (0.1150 in.) 2.94 mm (0.1157 in.) 2.96 mm (0.1165 in.) 2.98 mm (0.1173 in.) 3.00 mm (0.1181 in.) 3.02 mm (0.1189 in.) 3.04 mm (0.1197 in.) 3.06 mm (0.1205 in.) 3.08 mm (0.1213 in.) 3.10 mm (0.1220 in.) 3.12 mm (0.1228 in.) 3.14 mm (0.1236 in.) 3.16 mm (0.1244 in.) 3.18 mm (0.1252 in.) 3.20 mm (0.1260 in.) 3.22 mm (0.1268 in.) 3.24 mm (0.1276 in.) 3.26 mm (0.1283 in.) 3.28 mm (0.1291 in.) 3.30 mm (0.1299 in.) 3.32 mm (0.1307 in.) 3.34 mm (0.1315 in.) 3.36 mm (0.1323 in.) 3.38 mm (0.1331 in.) 3.40 mm (0.1339 in.) 3.42 mm (0.1346 in.) 3.44 mm (0.1354 in.) 3.46 mm (0.1362 in.) 3.48 mm (0.1370 in.)

SS0FE-12

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
FRONT AXLE			
Hub nut	103	1,050	76
Brake caliper x Steering knuckle	118	1,200	87
ABS speed sensor x Steering knuckle	8.0	82	71 in.·lbf
Steering knuckle x Upper suspension arm	65	660	50
Steering knuckle x Lower ball joint	113	1,150	83
Brake dust cover x Steering knuckle	8.3	85	74 in.·lbf
Tie rod end lock nut	56	570	41
Axle hub lock nut	147	1,500	108
FRONT SUSPENSION			
Height control sensor link x Lower arm bracket	5.4	55	48 in.·lbf
ABS speed sensor wire harness x Shock absorber	5.0	51	44 in.·lbf
Stabilizer bar x Stabilizer bar link	74	755	55
Shock absorber x Shock absorber bracket	64	650	47
Piston rod x Suspension support	34	350	25
Suspension support x Body	35	360	26
Upper suspension arm x Body	59	600	44
No. 1 lower suspension arm x Front suspension member	184	1,880	136
Steering gear housing bracket x Front suspension member	74	755	55
Front suspension member brace x No. 2 lower suspension arm x Body	119	1,210	88
Front suspension member brace x Body	58	590	43
Front suspension member brace x Front suspension member	58	590	43
Stabilizer bar link x Shock absorber bracket	95	970	70
No. 1 lower suspension arm x No. 2 lower suspension arm	245	2,500	180
No. 1 lower suspension arm x Lower ball joint	123	1,250	91
Shock absorber bracket x No. 1 lower suspension arm	25	250	18
Tie rod end x Lower ball joint	54	550	40
Stabilizer bar bracket x Body	23	235	17
REAR AXLE			
Hub nut	103	1,050	76
Brake caliper x Axle carrier	104	1,065	77
Axle carrier x Upper suspension arm	108	1,100	80
Backing plate x Axle carrier	59	600	43
No.2 lower suspension arm x Axle carrier	110	1,120	81
No.1 lower suspension arm x Axle carrier	75	765	55
Toe control link x Axle carrier	49	500	36
ABS speed sensor x Axle carrier	8.0	82	71 in.·lbf
Parking brake cable x Backing plate	7.8	80	69 in.·lbf
REAR DRIVE SHAFT			
Drive shaft x Axle hub	289	2,950	213
Drive shaft x Differential side gear shaft	68	695	50
REAR DIFFERENTIAL			
Differential drain plug	49	500	36

Differential filler plug		49	500	36
Differential mounting bolt	Front	95	970	71
	Rear	142	1,450	105
Ring gear set bolt		97	985	71
Companion flange lock nut		See page SA-88		
Differential carrier cover set bolt		47	475	34
Breather plug		21	210	15
Rear suspension member brace set bolt		50	510	37
Center exhaust pipe x Tailpipe		43	440	32
Front exhaust pipe x Exhaust pipe assembly		62	632	46
Heated oxygen sensor		44	450	33
Propeller shaft center support bearing set bolt		49	500	36
Propeller shaft assembly x Rear differential		74	750	54
Differential carrier x Bearing cap		85	870	63
Oil deflector x Differential carrier cover		8.0	82	71 in.·lbf
Rear suspension member x Body		127	1,300	94
Rear suspension member stopper x Body		19	195	14
Rear suspension member lower brace x Body		19	195	14
Parking brake cable x Body		7.8	80	69 in.·lbf
REAR SUSPENSION				
Height control sensor link x Lower arm bracket		5.4	55	48 in.·lbf
Rear seat belt assembly outer x Body		42	430	31
Rear seatback assembly x Body		18	185	13
Suspension support x Body	Upper side	64	650	47
	Lower side	18	185	13
Piston rod x Suspension support		18	185	13
Upper suspension arm x Body	Front side	88	900	65
	Rear side	74	755	55
No. 1 lower suspension arm x Body		75	765	55
No. 2 lower suspension arm x Stabilizer bar link		30	305	22
No. 2 lower suspension arm x Shock absorber		110	1,120	81
No. 2 lower suspension arm x Rear suspension member		110	1,120	81
ABS speed sensor wire harness x Toe control link		5.0	51	44 in.·lbf
Toe control link x Rear suspension member		49	500	36
Stabilizer bar x Stabilizer bar link		65	663	48
Stabilizer bar bracket x Suspension member		18	185	13

BRAKE

SS062-22

SERVICE DATA

Brake pedal height (from asphalt sheet)		154.0 - 164.0 mm (6.063 - 6.457 in.)
Brake pedal freeplay		1.0 - 6.0 mm (0.04 - 0.24 in.)
Stop light switch crearance		1.5 - 2.5 mm (0.059 - 0.098 in.)
Brake pedal reserve distance at 490 N (50 kgf, 110.2 lbf)		More than 99 mm (3.90 in.)
Brake booster push rod to piston clearance (w/ SST)		0 mm (0 in.)
Front brake pad thickness	STD	11.0 mm (0.433 in.)
Front brake pad thickness	Minimum	1.0 mm (0.039 in.)
Front brake disc thickness	STD	32.0 mm (1.260 in.)
Front brake disc thickness	Minimum	30.0 mm (1.181 in.)
Front brake disc runout	Maximum	0.05 mm (0.0020 in.)
Rear brake pad thickness	STD	10.5 mm (0.413 in.)
Rear brake pad thickness	Minimum	1.0 mm (0.039 in.)
Rear brake disc thickness	STD	12.0 mm (0.472 in.)
Rear brake disc thickness	Minimum	10.5 mm (0.413 in.)
Rear brake disc runout	Maximum	0.05 mm (0.0020 in.)
Rear brake disc inside diameter	STD	190 mm (7.48 in.)
Rear brake disc inside diameter	Maximum	191 mm (7.52 in.)
Parking brake shoe lining thickness for rear disc brake	STD	2.5 mm (0.098 in.)
Parking brake shoe lining thickness for rear disc brake	Minimum	1.0 mm (0.039 in.)
Parking brake pedal lever at 196 N (20 kgf, 44.1 lbf)		5 - 8 clicks
Parking brake clearance between rear shoe and lever		Less than 0.35 mm (0.0138 in.)
Parking brake adjusting shim thickness for rear disc brake		0.3 mm (0.012 in.) 0.6 mm (0.024 in.) 0.9 mm (0.035 in.)

SS063-24

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Master cylinder x Brake booster	13	130	9
Master cylinder x Piston stopper bolt	10	102	7
Brake line union nut	15	155	11
Brake booster clevis lock nut	25	260	19
Brake booster x Pedal bracket	13	130	9
Bleeder plug (Brake caliper)	11	110	8
Bleeder plug (ABS & TRAC / VSC actuator)	8.3	85	74 in.·lbf
Brake pedal x pedal bracket	37	377	27
Reservoir set screw	1.8	18	16 in.·lbf
Front brake caliper installation bolt	34	350	25
Front disc brake caliper x Flexible hose	30	310	22
Front disc brake torque plate x Steering knuckle	118	1,200	87
Rear disc brake caliper x Flexible hose	30	310	22
Rear disc brake caliper x Rear axle carrier	104	1,065	77
ABS & TRC Actuator x Actuator Bracket	5.4	55	48 in.·lbf
ABS & TRC Actuator Assembly x Body	19	195	14
Front speed sensor installation bolt	8.0	82	71 in.·lbf
Front speed sensor harness clamp bolt	5.0	51	44 in.·lbf
Rear speed sensor installation bolt	8.0	82	71 in.·lbf
Rear speed sensor harness x Body	5.0	51	44 in.·lbf
Rear speed sensor harness x Toe control link	5.0	51	44 in.·lbf

STEERING

SERVICE DATA

SS0MY-18

POWER STEERING FLUID		
Fluid level rise	Maximum	5 mm (0.20 in.)
Fluid pressure at idle speed with valve closed	Minimum	6,900 kPa (70 kgf/cm^2, 996 psi)
STEERING WHEEL		
Steering wheel freeplay	Maximum	30 mm (1.18 in.)
Steering effort at idle speed		4.2 - 5.4 N·m (43 - 55 kgf·cm, 37 - 48 in.lbf)
POWER STEERING VANE PUMP		
Vane pump rotating torque		0.25 N·m (2.5 kgf·cm, 2.2 in.·lbf) or less
Vane pump shaft and front housing bushing oil clearance	STD Maximum	0.03 - 0.05 mm (0.0012 - 0.0020 in.) 0.07 mm (0.0028 in.)
Vane plate height	Minimum	8.6 mm (0.339 in.)
Vane plate thickness	Minimum	1.40 mm (0.0551 in.)
Vane plate length	Minimum	14.99 mm (0.5902 in.)
Vane plate and vane pump rotor groove clearance	Maximum	0.033 mm (0.0013 in.)
Vane plate length	Pump rotor and cam ring mark	
	None	14.999 - 15.001 mm (0.59051 - 0.59059 in.)
	1	14.997 - 14.999 mm (0.59043 - 0.59051 in.)
	2	14.995 - 14.997 mm (0.59035 - 0.59043 in.)
	3	14.993 - 14.995 mm (0.59027 - 0.59035 in.)
	4	14.991 - 14.993 mm (0.59020 - 0.59027 in.)
Spring free length	Minimum	33.2 mm (1.307 in.)
POWER STEERING GEAR		
Steering rack runout	Maximum	0.15 mm (0.0059 in.)
Total preload	Turning	1.2 - 1.7 N·m (12.2 - 17.3 kgf·cm, 10.6 - 15.0 in.·lbf)

SS136-04

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
TILT STEERING COLUMN				
Tilt steering shaft		20	210	15
Turn signal bracket set bolt		2.9	30	26 in.·lbf
Column protector set bolt		6.1	60	52 in.·lbf
Column tube support x Column tube		15	150	11
No. 2 intermediate shaft assembly x Main shaft assembly		35	360	26
Steering column assembly set nut		26	270	19
Sliding yoke x No. 2 intermediate shaft assembly		35	360	26
Sliding yoke x Control valve shaft		35	360	26
Steering wheel set nut		50	510	37
Steering wheel pad set screw (Torx screw)		8.8	90	78 in.·lbf
POWER STEERING VANE PUMP				
Rear housing		24	240	17
Pressure port union		83	850	61
Oil reservoir	Front side	13	130	9
	Rear side	24	240	17
Vane pump pulley set nut		44	450	33
Vane pump assembly set bolt		58	590	43
Pressure feed tube x PS vane pump assembly		49	500	36
POWER STEERING GEAR				
Cylinder end stopper		59	600	44
Bearing guide nut		25	250	18
Control valve housing x Rack housing		18	180	13
Rack guide spring cap lock nut		50 (69)	510 (700)	37 (51)
Rack x Rack end		76 (103)	780 (1,050)	56 (76)
Tie rod end lock nut		56	570	41
Turn pressure tube union nut		22 (25)	220 (250)	16 (18)
PS gear assembly set bolt		74	750	54
Return tube x PS gear assembly		40 (44)	410 (450)	30 (33)
Pressure feed tube x PS gear assembly		42	430	31
Front suspension member brace	Bolt A	119	1,210	88
	Bolt B	58	590	43
Sliding yoke x Control valve shaft		35	360	26
Tie rod end x Steering knuckle		54	550	40
Front brake caliper x Steering knuckle		118	1,200	87
Steering wheel set nut		50	510	37

( ): For use without SST

SUPPLEMENTAL RESTRAINT SYSTEM

SS061-63

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Steering wheel	50	510	37
Steering wheel pad	8.8	90	78 in.·lbf
Front passenger airbag assembly x Instrument panel	5.4	55	48 in.·lbf
Front passenger airbag assembly x Instrument panel reinforcement	20	205	15
Front seat installation bolt	37	375	27
Seatback assembly x Seat cushion assembly	43	440	32
Front seat airbag door x Seat back assembly	4.7	48	42 in.·lbf
Airbag sensor assembly	20	205	15
Front airbag sensor	8.5	86.7	75 in.·lbf
Side and curtain shield airbag sensor assembly	20	205	15
Curtain shield airbag assembly x Body	9.8	100	86 in.·lbf

BODY ELECTRICAL

SS0CN-27

SERVICE DATA

AUTOMATIC LIGHT CONTROL SENSOR	
1 - Ground (Ignition switch LOCK or ACC)	No voltage
1 - Ground (Ignition switch ON)	9.5 V or more
SPEEDOMETER (ON-VEHICLE)	
Standard indication (mph) USA Models	Allowable range (mph)
20	18.5 - 21.5
40	38 - 41.5
60	58 - 62
80	77.5 - 82
100	97 - 102
120	116.5 - 122
140	136 - 142
Standard indication (km/h) CANADA Models	Allowable range (km/h)
20	18 - 23
40	40 - 44
60	60 - 64.5
80	80 - 85
100	100 - 105
120	120 - 125.5
140	140 - 146
160	160 - 169
180	180 - 188
200	200 - 209
220	220 - 230
240	240 - 251
Speedometer	Resistance (Ω)
A - B	160 Ω
C - D	160 Ω
TACHOMETER (ON-VEHICLE)/ DC 13.5 V 25 ˚C at (77 ˚F)	
Standard indication	Allowable range
700	630 - 770
1,000	900 - 1,100
2,000	1,850 - 2,150
3,000	2,800 - 3,200
4,000	3,800 - 4,200
5,000	4,800 - 5,200
6,000	5,750 - 6,250
7,000	6,700 - 7,300
8,000	7,700 - 8,300
Tachometer	Resistance (Ω)
A - B	160 Ω
C - D	160 Ω

FUEL RECEIVER GAUGE	Resistance (Ω)
A - B	160 Ω
C - D	160 Ω
FUEL MAIN SENDER GAUGE	
Float position mm (in.)	Resistance (Ω)
F: Approx. 22.9 (0.90) ± 3 (0.12)	Approx. 2.0 ± 1.0
1/2: Approx. 58.3 (2.30) ± 3 (0.12)	Approx. 30.3 ± 3.0
E: Approx. 133.6 (5.26) ± 3 (0.12)	Approx. 55.0 ± 1.0
FUEL SUB SENDER GAUGE	
Float position mm (in.)	Resistance (Ω)
F: Approx. 29.1 (1.15) ± 3 (0.12)	Approx. 2.0 ± 1.0
1/2: Approx. 65.8 (2.59) ± 3 (0.12)	Approx. 29.7 ± 3.0
E: Approx. 169.5 (6.67) ± 3 (0.12)	Approx. 55 ± 1.0
ENGINE COOLANT TEMPERATURE RECEIVER GAUGE (Resistance)	Resistance (Ω)
A - B	160 Ω
C - D	160 Ω
VOLTAGE GAUGE (Resistance)	Resistance (Ω)
A - B	160
C - D	160
SPECIFIC FUEL CONSUMPTION GAUGE (Resistance)	Resistance (Ω)
A - B	160
C - D	160

BODY

TORQUE SPECIFICATION

SS137-07

Part tightened	N·m	kgf·cm	ft·lbf
FRONT BUMPER			
Front bumper cover x Front fender panel	5.4	55	48 in.·lbf
REAR BUMPER (Sedan)			
Rear bumper cover x Side mounting bracket	5.4	55	48 in.·lbf
Rear bumper cover x Rear fender panel	5.4	55	48 in.·lbf
Rear bumper cover x Body Nut	8.3	85	74 in.·lbf
Rear bumper reinforcement x Body	6.0	61	53 in.·lbf
HOOD			
Hood x Hood hinge	13	133	10
Hood lock x Body	8.0	82	71 in.·lbf
FRONT DOOR			
Outside handle x Key cylinder	5.5	56	49 in.·lbf
Outside handle x Door panel	5.5	56	49 in.·lbf
Door lock x Door panel	5.5	56	49 in.·lbf
Window regulator x Door panel	8.0	82	71 in.·lbf
Door glass x Window regulator	5.5	56	49 in.·lbf
Outside rear view mirror x Door panel	8.0	82	71 in.·lbf
Front No.2 speaker x Body	8.0	82	71 in.·lbf
Door hinge x Body	30	306	22
Door hinge x Door panel	30	306	22
Door check x Door panel	5.5	56	49 in.·lbf
Door lock striker x Body	23	235	17
REAR DOOR			
Outside handle x Door panel	5.5	56	49 in.·lbf
Door lock x Door panel	5.5	56	49 in.·lbf
Window regulator x Door panel	8.0	82	71 in.·lbf
Door hinge x Body	21	214	15
Door hinge x Door panel	30	306	22
Door check x Door panel	5.5	56	49 in.·lbf
Door lock striker x Body	23	235	17
BACK DOOR			
Back door lock x Body	12.5	128	9
Door hinge x Door panel	8.0	82	71 in.·lbf
Door hinge x Body	11.5	117	8
Door lock striker x Body	23	235	17
Back door outside handle x Back door outside garnish	4.0	40	35 in.·lbf
BACK DOOR STAY			
Back door stay x Door panel	22	224	16
Back door stay x Body	19.5	199	14
LUGGAGE COMPARTMENT DOOR AND HINGE			
Door lock striker x Body	5.5	56	49 in.·lbf
Luggage compartment door x Hinge	8.0	82	71 in.·lbf

Luggage compartment door lock x Body	5.5	56	49 in.·lbf
Luggage compartment door hinge x Body	5.5	56	49 in.·lbf
FRONT WIPER AND WASHER			
Wiper motor x Wiper link	5.4	55	48 in.·lbf
Wiper link assembly x Body	5.5	56	49 in.·lbf
Wiper arm x Wiper link assembly	26	265	19
REAR WIPER AND WASHER (Wagon)			
Wiper arm x Rear wiper motor	5.5	56	49 in.·lbf
Nut x Rear wiper motor	12	122	9
Rear wiper motor x Rear wiper motor	5.5	56	49 in.·lbf
SLIDING ROOF			
Sliding roof housing x Body	5.5	56	49 in.·lbf
Sliding roof bracket x Body	8.0	82	71 in.·lbf
Sliding roof bracket x Sliding roof housing	5.5	56	49 in.·lbf
INSTRUMENT PANEL			
Front passenger airbag assembly x Reinforcement	20	205	15
Front passenger airbag assembly x Instrument panel	5.5	56	49 in.·lbf
ROOF HEADLINING			
Inner rear view mirror x Body	5.5	56	49 in.·lbf
FRONT SEAT			
Seatback assembly x Seat track	43	440	32
Seat cushion assembly x Seat track	21	210	15
Seat track x Body	38	387	28
REAR SEAT (Sedan)			
Seatback assembly x Body	7.8	80	69 in.·lbf
REAR SEAT (Wagon)			
Seatback x Body	21	214	15
SEAT BELT			
Front seat outer belt:			
Shoulder anchor x Adjuster anchor	41	420	30
Floor anchor x Body	41	420	30
Retractor x Body Upper bolt	7.8	80	69 in.·lbf
Adjustable anchor x Body	41	420	30
Inner belt x Seat track	41	420	30
Rear seat belt (Sedan):			
Shoulder anchor x Body	41	420	30
Floor anchor x Body	41	420	30
Inner belt x Body	41	420	30
Shoulder anchor x Body	41	420	30
Floor anchor x Body	41	420	30
CRS anchor set bolt	21	210	15
Rear Seat Belt (Wagon):			
Floor anchor x Body	42	428	31
Inner belt x Body	42	428	31

Retractor x Body	Floor side: Roof Side:	42	428	31
CRS anchor set bolt		13.2	135	10

AIR CONDITIONING

SERVICE DATA

SS0F5-05

Refrigerant volume		600 ± 50 g (21.16 ± 1.76 oz.)
Idle Speed	Magnetic clutch not engaged	600 ± 50 rpm
	Magnetic clutch engaged	650 ± 50 rpm
Magnetic clutch clearance		0.5 ± 0.15 mm (0.020 ± 0.0059 in.)

SS0F6-04

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
REFRIGERANT LINE			
Condenser x Discharge hose	10	100	7
Condenser x Liquid tube	10	100	7
Compressor x Discharge hose	10	100	7
Compressor x Suction hose	10	100	7
Suction line (Block joint)	10	100	7
A/C unit x Liquid and suction tubes	10	100	7
AIR CONDITIONER UNIT			
Tube connector x Expansion valve x Tube and accessory	4.1	42	36 in.·lbf
Tube and accessory x Evaporator	4.1	42	36 in.·lbf
COMPRESSOR AND MAGNETIC CLUTCH			
Compressor x Engine (Bolt)	52	530	38
Compressor x Engine (Nut)	52	530	38
Compressor x Engine (Stud bolt)	26	265	19
PS pump bracket x Compressor x Engine	52	530	38
PS pump bracket x Compressor bracket Engine	58	590	43
Compressor bracket x Engine	39	400	29
Pump stay x Compressor bracket	39	400	29
Compressor bracket x Compressor	58	590	43
Pressure plate x Compressor	13.2	135	9
CONDENSER			
Cap x Condenser	12.3	125	9
CONDENSER FAN			
Radiator x Cooling fan assembly	5	50	44 in.·lbf
PRESSURE SWITCH			
Pressure switch x Liquid tube	10	100	7
ENGINE COOLANT TEMPERATURE (ECT) SWITCH			
Engine coolant temperature (ECT) switch x Radiator	7.4	75	65 in.·lbf

CO/HC

INSPECTION

EM0D0-09

HINT:

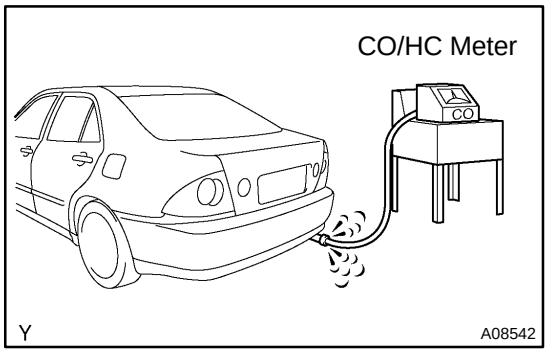
This check is used only to determine whether or not the idle CO/HC complies with regulations.

1. INITIAL CONDITIONS

(a) Engine at normal operating temperature
(b) Air cleaner installed
(c) All pipes and hoses of air induction system connected
(d) All accessories switched OFF
(e) All vacuum lines properly connected
(f) SFI system wiring connectors fully plugged
(g) Ignition timing checked correctly
(h) Transmission in neutral position
(i) Tachometer and CO/HC meter calibrated by hand

2. START ENGINE

3. RACE ENGINE AT 2,500 RPM FOR APPROX. 180 SECONDS



4. INSERT CO/HC METER TESTING PROBE AT LEAST 40 cm (1.3 ft) INTO TAILPIPE DURING IDLING

5. IMMEDIATELY CHECK CO/HC CONCENTRATION AT IDLE AND/OR 2,500 RPM

HINT:

When doing the 2 mode (2,500 rpm and idle) test, follow the measurement order prescribed by the applicable local regulations.

If the CO/HC concentration does not comply with regulations, troubleshoot in the order given below.

(a) Check heated oxygen sensors operation (See page SF-73).

(b) See the table below for possible causes, and then inspect and correct the applicable causes if necessary.

HC	CO	Phenomenon	Causes
High	Normal	Rough idle	4. Faulty ignitions: ●Incorrect timing ●Fouled, shorted or improperly gapped plugs ●Open or crossed high-tension cords 5. Incorrect valve clearance 6. Leaky intake and exhaust valves 7. Leaky cylinder
High	Low	Rough idle (Fluctuating HC reading)	1. Vacuum leaks: ●PCV hose ●Intake manifold ●Throttle body ●Cylinder head gasket 2. Lean mixture causing misfire
High	High	Rough idle (Black smoke from exhaust)	1. Restricted air filter 2. Plugged PCV valve 3. Faulty SFI system: ●Faulty fuel pressure regulator ●Faulty ECM ●Faulty injector ●Faulty throttle position sensor ●Faulty MAF meter

COMPRESSION

EM0D1-09

INSPECTION

HINT:

If there is lack of power, excessive oil consumption or poor fuel economy, measure the compression pressure.

1. WARM UP AND STOP ENGINE

Allow the engine to warm up to normal operating temperature.

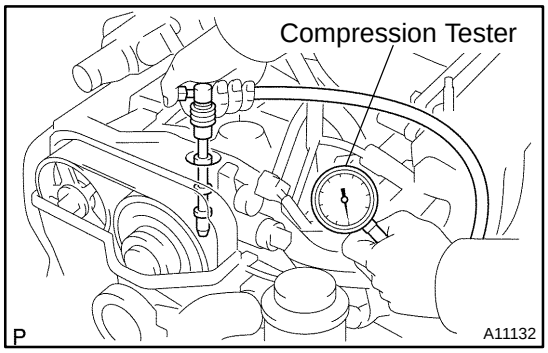
2. REMOVE ENGINE COVER

Remove the 4 nuts and engine cover.

3. DISCONNECT IGNITION COILS AND HIGH-TENSION CORD SET ASSEMBLY (See page IG-7)

4. REMOVE SPARK PLUGS

5. DISCONNECT INJECTOR CONNECTORS



6. CHECK CYLINDER COMPRESSION

(a) Insert a compression tester into the spark plug hole.

(b) While cranking the engine, measure the compression pressure.

HINT:

Always use a fully charged battery to obtain engine revolutions of 250 rpm or more.

(c) Repeat steps (a) through (b) for each cylinder.

NOTICE:

This measurement must be done in as short a time as possible.

Compression:
1,324 kPa (13.5 kgf/cm^2, 192 psi) or more
Minimum pressure: 1,079 kPa (11.0 kgf/cm^2, 156 psi)
Difference between each cylinder:
98 kPa (1.0 kgf/cm^2, 14 psi) or less

(d) If the cylinder compression in 1 or more cylinders is low, pour a small amount of engine oil into the cylinder through the spark plug hole and repeat steps (a) through (b) for the cylinder with low compression.

- If adding oil helps the compression, it is likely that the piston rings and/or cylinder bore are probably worn or damaged.
- If pressure stays low, a valve may be sticking or seating improper, or there may be leakage past the gasket.

7. RECONNECT INJECTOR CONNECTORS

HINT:

The Nos. 1, 3, 5 injector connectors and dark gray, and the Nos. 2, 4, 6 injector connectors are brown.

8. REINSTALL SPARK PLUGS

9. RECONNECT IGNITION COILS AND HIGH-TENSION CORD SET ASSEMBLY (See page IG-9)

10. INSTALL ENGINE COVER

Install the engine cover with the 4 nuts.

VALVE CLEARANCE

ADJUSTMENT

EM0D2-07

HINT:

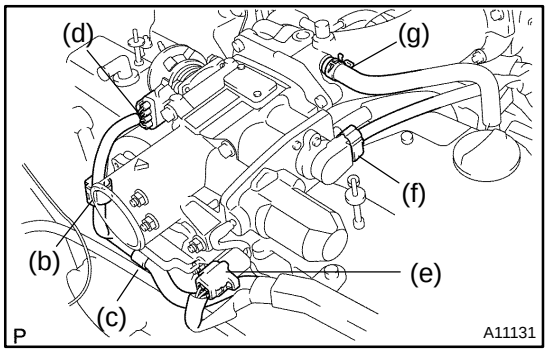
Inspect and adjust the valve clearance when the engine is cold.

1. REMOVE ENGINE COVER

Remove the 4 nuts and engine cover.

2. DRAIN ENGINE COOLANT

3. REMOVE INTAKE AIR RESONATOR



4. REMOVE THROTTLE BODY AND INTAKE AIR CONNECTOR ASSEMBLY

(a) Disconnect the accelerator cable from the throttle body.

(b) Disconnect the engine wire clamp from the clamp bracket of the throttle body.

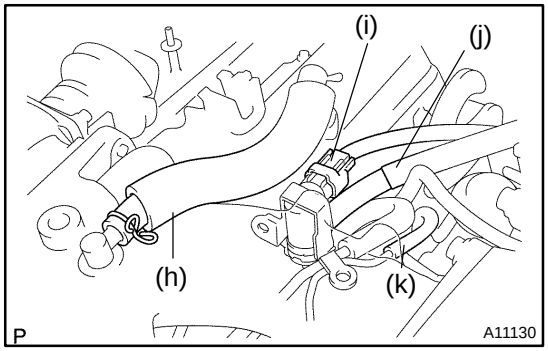
(c) Disconnect the engine wire from the clamp on the throttle body bracket.

(d) Disconnect the accelerator pedal position sensor connector.

(e) Disconnect the throttle control motor connector.

(f) Disconnect the throttle position sensor connector.

(g) Disconnect the air assist hose from the intake air connector.

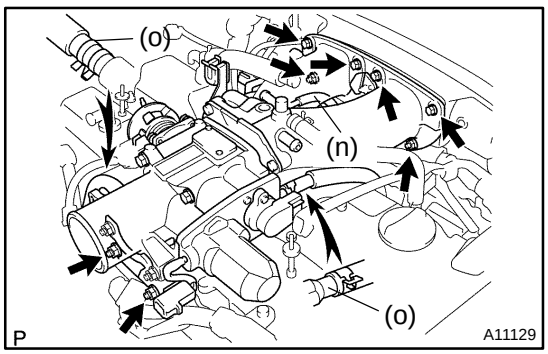


(h) Disconnect the PCV hose from the intake air connector.

(i) Disconnect the VSV connector for EVAP.

(j) Disconnect the EVAP hose (from charcoal canister) from the VSV for EVAP.

(k) Disconnect the vacuum hose (from No. 2 vacuum pipe) from the No. 1 vacuum pipe.



(l) Remove the 2 nuts holding the throttle body bracket to the cylinder head.

(m) Remove the 4 bolts and 2 nuts holding the intake air connector to the air intake chamber.

(n) Disconnect the vacuum hose (from actuator for ACIS) from the No. 1 vacuum pipe.

(o) Disconnect the 2 water bypass hoses from the throttle body, and remove the throttle body together with the intake air connector and gasket.

5. REMOVE NO. 3 TIMING BELT COVER

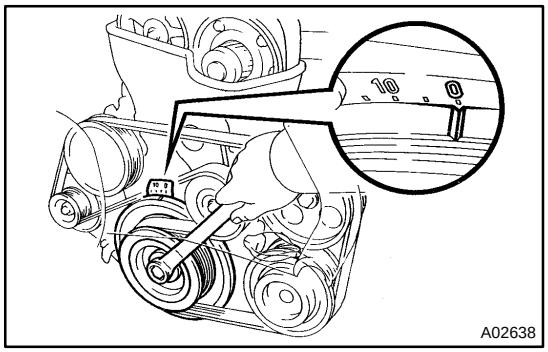
Using a 5 mm hexagon wrench, remove the 4 bolts, oil filler cap, timing belt cover and gasket.

6. REMOVE IGNITION COILS AND HIGH- TENSION CORD SET ASSEMBLY (See page IG-7)

7. REMOVE SPARK PLUGS

8. DISCONNECT ENGINE WIRE FROM CYLINDER HEAD COVERS

9. REMOVE CYLINDER HEAD COVERS (See page EM-34)

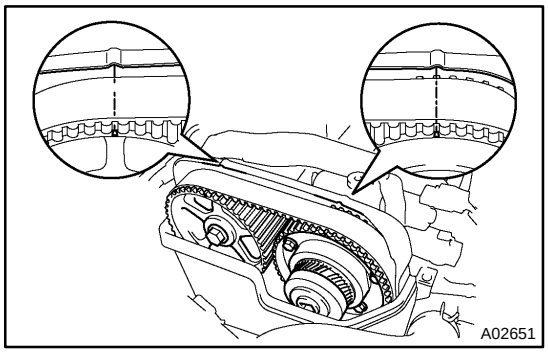


10. SET NO.1 CYLINDER TO TDC/COMPRESSION

(a) Turn the crankshaft pulley and align its groove with the timing mark ”0” of the No. 1 timing belt cover.

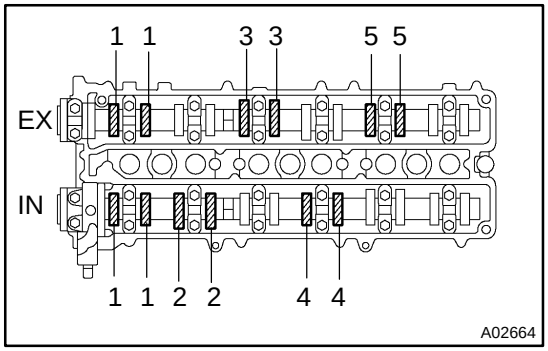
NOTICE:

Always turn the crankshaft clockwise.



(b) Check that the timing marks of the camshaft timing pulleys are aligned with the timing marks of the No. 4 timing belt cover.

If not, turn the crankshaft 1 revolution (360˚).



11. INSPECT VALVE CLEARANCE

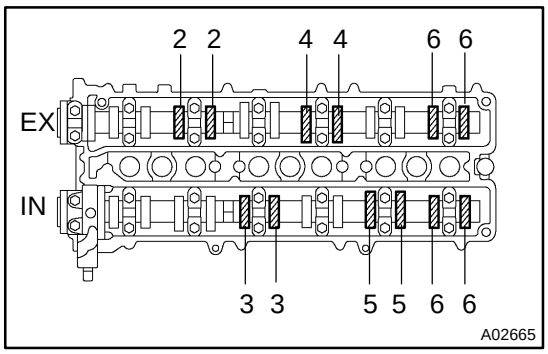
(a) Check only those valves indicated in the illustration.

- Using a feeler gauge, measure the clearance between the valve lifter and camshaft.
- Record the valve clearance measurements of those that are out of specification. They will be used later to determine the required replacement adjusting shim.

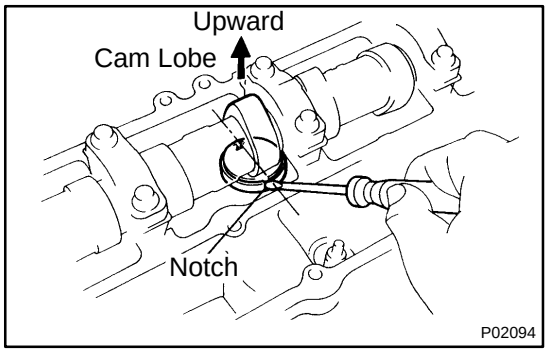
Valve clearance (Cold):

Intake	0.15 - 0.25 mm(0.006 - 0.010 in.)
Exhaust	0.25 - 0.35 mm (0.010 - 0.014 in.)

(b) Turn the crankshaft pulley 1 revolution (360˚), and align the groove with the timing mark ”0” of the No. 1 timing belt cover.



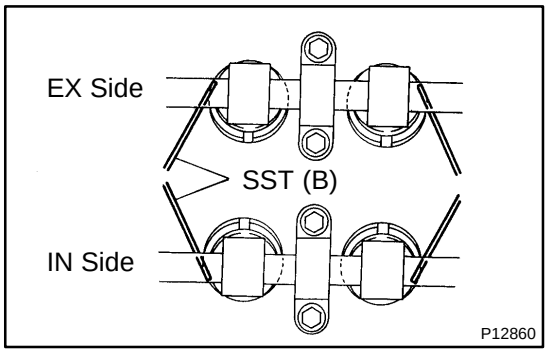
(c) Check only the valves indicated as shown. Measure the valve clearance. (See procedure in step (a))



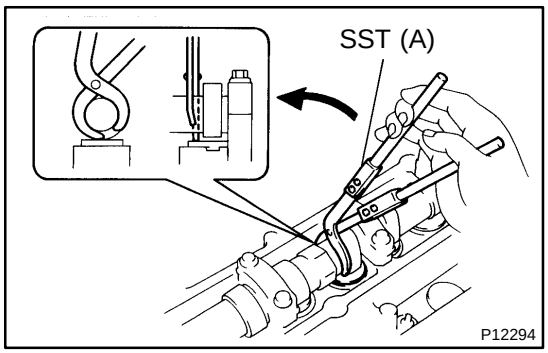
12. ADJUST VALVE CLEARANCE

(a) Remove the adjusting shim.

- Turn the camshaft so that the cam lobe for the valve to be adjusted faces up.
- Turn the valve lifter with a screwdriver so that the notches are perpendicular to the camshaft.

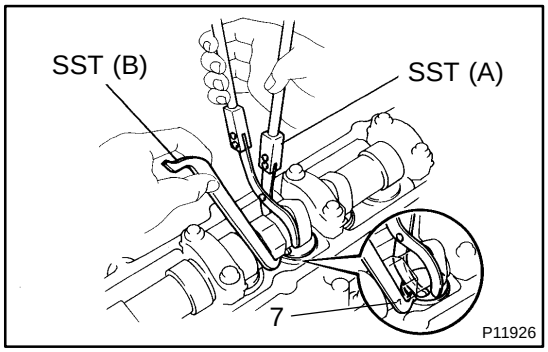


- Insert SST (B) gently from the inside as shown in the illustration.



- Using SST (A), hold the camshaft as shown in the illustration.

SST 09248-55040 (09248-05410)

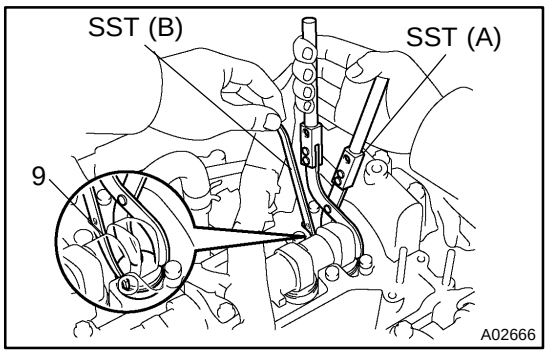


- Using SST (A), press down the valve lifter and place SST (B) between the camshaft and valve lifter. Remove SST (A).

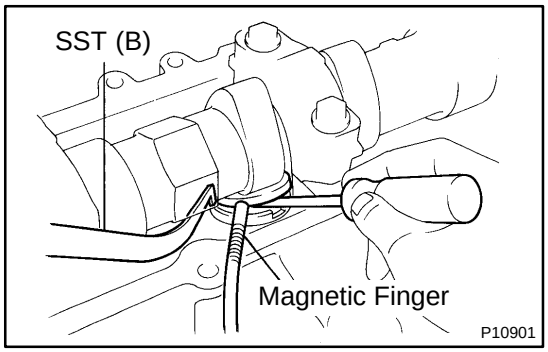
SST 09248-55040 (09248-05410, 09248-05420)

HINT:

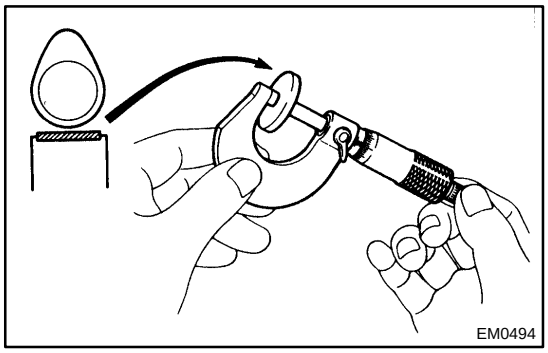
- Apply SST (B) at slight angle on the side marked with ”7” or ”9”, at the position shown in the illustration.



- When the adjusting shim of the No. 1 intake side replace, remove the No. 2 or No. 3 camshaft bearing cap, and insert SST as shown in the illustration.



- Using a small screwdriver and a magnetic finger, remove the adjusting shim.



(b) Determine the replacement adjusting shim size according to the following Formula or Charts:

- Using a micrometer, measure the thickness of the removed shim.
- Calculate the thickness of a new shim so the valve clearance comes within specified value.

  T ..... Thickness of used shim
  A ..... Measured valve clearance
  N ..... Thickness of new shim

Intake: N = T + (A - 0.20 mm (0.008 in.))

Exhaust: N = T + (A - 0.30 mm (0.012 in.))

- Select a new shim with a thickness as close as possible to the calculated values.

HINT:

Shims are available in 17 sizes in increments of 0.050 mm (0.0020 in.), from 2.500 mm (0.0984 in.) to 3.300 mm (0.1299 in.).

Adjusting Shim Selection Chart (Intake)

Measured Clearance mm (in.) \ Installed Shim Thickness mm (in.)	2.500 (0.0984)	2.520 (0.0992)	2.540 (0.1000)	2.550 (0.1004)	2.560 (0.1008)	2.580 (0.1016)	2.600 (0.1024)	2.620 (0.1031)	2.640 (0.1039)	2.650 (0.1043)	2.660 (0.1047)	2.670 (0.1051)	2.680 (0.1055)	2.690 (0.1059)	2.700 (0.1063)	2.710 (0.1067)	2.720 (0.1071)	2.730 (0.1075)	2.740 (0.1079)	2.750 (0.1083)	2.760 (0.1087)	2.770 (0.1091)	2.780 (0.1094)	2.790 (0.1098)	2.800 (0.1102)	2.810 (0.1106)	2.820 (0.1110)	2.830 (0.1114)	2.840 (0.1118)	2.850 (0.1122)	2.860 (0.1126)	2.870 (0.1130)	2.880 (0.1134)
0.000 – 0.020 (0.0000 – 0.0008)									1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5
0.021 – 0.040 (0.0008 – 0.0016)								1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5
0.041 – 0.060 (0.0016 – 0.0024)							1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6
0.061 – 0.080 (0.0024 – 0.0031)						1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6
0.081 – 0.100 (0.0032 – 0.0039)				1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6
0.101 – 0.120 (0.0040 – 0.0047)			1	1	1	1	1	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7
0.121 – 0.140 (0.0048 – 0.0055)		1	1	1	1	1	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7
0.141 – 0.149 (0.0056 – 0.0059)		1	1	1	1	2	2	2	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8
0.150 – 0.250 (0.0059 – 0.0098)																																	
0.251 – 0.260 (0.0099 – 0.0102)	2	3	3	3	3	4	4	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10
0.261 – 0.280 (0.0103 – 0.0110)	2	3	3	3	4	4	4	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10
0.281 – 0.300 (0.0111 – 0.0118)	3	3	4	4	4	4	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10
0.301 – 0.320 (0.0119 – 0.0126)	3	4	4	4	4	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11
0.321 – 0.340 (0.0126 – 0.0134)	4	4	4	5	5	5	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11
0.341 – 0.360 (0.0134 – 0.0142)	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12
0.361 – 0.380 (0.0142 – 0.0150)	4	5	5	5	6	6	6	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12
0.381 – 0.400 (0.0150 – 0.0157)	5	5	6	6	6	6	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12
0.401 – 0.420 (0.0158 – 0.0165)	5	6	6	6	6	7	7	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13
0.421 – 0.440 (0.0166 – 0.0173)	6	6	6	7	7	7	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13
0.441 – 0.460 (0.0174 – 0.0181)	6	6	7	7	7	8	8	8	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14
0.461 – 0.480 (0.0181 – 0.0189)	6	7	7	7	8	8	8	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14
0.481 – 0.500 (0.0189 – 0.0197)	7	7	8	8	8	8	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14
0.501 – 0.520 (0.0197 – 0.0205)	7	8	8	8	8	9	9	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15
0.521 – 0.540 (0.0205 – 0.0213)	8	8	8	9	9	9	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15
0.541 – 0.560 (0.0213 – 0.0220)	8	8	9	9	9	10	10	10	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16
0.561 – 0.580 (0.0221 – 0.0228)	8	9	9	9	10	10	10	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16
0.581 – 0.600 (0.0229 – 0.0236)	9	9	10	10	10	10	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16
0.601 – 0.620 (0.0237 – 0.0244)	9	10	10	10	10	11	11	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17
0.621 – 0.640 (0.0244 – 0.0252)	10	10	10	11	11	11	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17
0.641 – 0.660 (0.0252 – 0.0260)	10	10	11	11	11	12	12	12	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17
0.661 – 0.680 (0.0260 – 0.0268)	10	11	11	11	12	12	12	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17
0.681 – 0.700 (0.0268 – 0.0276)	11	11	12	12	12	12	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17		
0.701 – 0.720 (0.0276 – 0.0283)	11	12	12	12	12	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17				
0.721 – 0.740 (0.0284 – 0.0291)	12	12	12	13	13	13	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17						
0.741 – 0.760 (0.0292 – 0.0299)	12	12	13	13	13	14	14	14	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17								
0.761 – 0.780 (0.0300 – 0.0307)	12	13	13	13	14	14	14	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17										
0.781 – 0.800 (0.0307 – 0.0315)	13	13	14	14	14	14	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17												
0.801 – 0.820 (0.0315 – 0.0323)	13	14	14	14	14	15	15	16	16	16	16	17	17	17	17	17	17	17	17														
0.821 – 0.840 (0.0323 – 0.0331)	14	14	14	15	15	15	16	16	16	17	17	17	17	17	17	17	17																
0.841 – 0.860 (0.0331 – 0.0339)	14	14	15	15	15	16	16	16	17	17	17	17	17	17	17																		
0.861 – 0.880 (0.0339 – 0.0346)	14	15	15	15	16	16	16	17	17	17	17	17	17																				
0.881 – 0.900 (0.0347 – 0.0354)	15	15	16	16	16	16	17	17	17	17	17																						
0.901 – 0.920 (0.0355 – 0.0362)	15	16	16	16	16	17	17	17	17																								
0.921 – 0.940 (0.0363 – 0.0370)	16	16	16	17	17	17	17	17																									
0.941 – 0.960 (0.0370 – 0.0378)	16	16	17	17	17	17	17																										
0.961 – 0.980 (0.0378 – 0.0386)	16	17	17	17	17	17																											
0.981 – 1.000 (0.0386 – 0.0394)	17	17	17	17	17																												
1.001 – 1.020 (0.0394 – 0.0402)	17	17	17																														
1.021 – 1.040 (0.0402 – 0.0409)	17	17																															
1.041 – 1.050 (0.0410 – 0.0413)	17																																

Measured Clearance mm (in.) \ Installed Shim Thickness mm (in.)	2.890 (0.1138)	2.900 (0.1142)	2.910 (0.1146)	2.920 (0.1150)	2.930 (0.1154)	2.940 (0.1157)	2.950 (0.1161)	2.960 (0.1165)	2.970 (0.1169)	2.980 (0.1173)	2.990 (0.1177)	3.000 (0.1181)	3.010 (0.1185)	3.020 (0.1189)	3.030 (0.1193)	3.040 (0.1197)	3.050 (0.1201)	3.060 (0.1205)	3.080 (0.1213)	3.100 (0.1220)	3.120 (0.1228)	3.140 (0.1236)	3.150 (0.1240)	3.160 (0.1244)	3.180 (0.1252)	3.200 (0.1260)	3.220 (0.1268)	3.240 (0.1276)	3.250 (0.1280)	3.260 (0.1283)	3.280 (0.1291)	3.300 (0.1299)
0.000 – 0.020 (0.0000 – 0.0008)	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	10	10	10	10	11	11	12	12	12	12	13	13
0.021 – 0.040 (0.0008 – 0.0016)	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14
0.041 – 0.060 (0.0016 – 0.0024)	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14	14
0.061 – 0.080 (0.0024 – 0.0031)	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14	14	14
0.081 – 0.100 (0.0032 – 0.0039)	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	11	11	12	12	12	12	13	13	14	14	14	14	15
0.101 – 0.120 (0.0040 – 0.0047)	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	12	12	12	12	13	13	14	14	14	14	15	15
0.121 – 0.140 (0.0048 – 0.0055)	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	12	12	12	13	13	13	14	14	14	15	15	15	16
0.141 – 0.149 (0.0056 – 0.0059)	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	12	12	12	13	13	13	14	14	14	15	15	15	16	16
0.150 – 0.250 (0.0059 – 0.0098)																																
0.251 – 0.260 (0.0099 – 0.0102)	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	15	15	15	15	16	16	17	17	17	17	17	
0.261 – 0.280 (0.0103 – 0.0110)	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	15	15	15	16	16	16	17	17	17	17	17	
0.281 – 0.300 (0.0111 – 0.0118)	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	15	15	16	16	16	16	17	17	17	17	17		
0.301 – 0.320 (0.0119 – 0.0126)	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	16	16	16	16	17	17	17	17				
0.321 – 0.340 (0.0126 – 0.0134)	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	16	16	16	17	17	17	17	17					
0.341 – 0.360 (0.0134 – 0.0142)	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	16	16	16	17	17	17	17	17						
0.361 – 0.380 (0.0142 – 0.0150)	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	17	17	17	17	17							
0.381 – 0.400 (0.0150 – 0.0157)	13	13	13	13	13	14	14	14	14	14	15	15	15	15	16	16	16	16	16	17	17	17	17	17								
0.401 – 0.420 (0.0158 – 0.0165)	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17										
0.421 – 0.440 (0.0166 – 0.0173)	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17											
0.441 – 0.460 (0.0174 – 0.0181)	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17												
0.461 – 0.480 (0.0181 – 0.0189)	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17													
0.481 – 0.500 (0.0189 – 0.0197)	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17														
0.501 – 0.520 (0.0197 – 0.0205)	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																
0.521 – 0.540 (0.0205 – 0.0213)	15	16	16	16	16	16	17	17	17	17	17	17	17	17																		
0.541 – 0.560 (0.0213 – 0.0220)	16	16	16	16	17	17	17	17	17	17	17	17																				
0.561 – 0.580 (0.0221 – 0.0228)	16	16	17	17	17	17	17	17	17	17																						
0.581 – 0.600 (0.0229 – 0.0236)	17	17	17	17	17	17	17	17																								
0.601 – 0.620 (0.0237 – 0.0244)	17	17	17	17	17	17																										
0.621 – 0.640 (0.0244 – 0.0252)	17	17	17	17																												
0.641 – 0.660 (0.0252 – 0.0260)	17	17																														

New shim thickness mm (in.)

Shim No.	Thickness	Shim No.	Thickness
1	2.500 (0.0984)	10	2.950 (0.1161)
2	2.550 (0.1004)	11	3.000 (0.1181)
3	2.600 (0.1024)	12	3.050 (0.1201)
4	2.650 (0.1043)	13	3.100 (0.1220)
5	2.700 (0.1063)	14	3.150 (0.1240)
6	2.750 (0.1083)	15	3.200 (0.1260)
7	2.800 (0.1102)	16	3.250 (0.1280)
8	2.850 (0.1122)	17	3.300 (0.1299)
9	2.900 (0.1142)		

Intake valve clearance (Cold):
0.15 - 0.25 mm (0.006 - 0.010 in.)

EXAMPLE:
The 2.800 mm (0.1102 in.) shim is installed, and the measured clearance is 0.450 mm (0.0177 in.). Replace the 2.800 mm (0.1102 in.) shim with a new No. 12 shim.

HINT:
New shims have the thickness in millimeters imprinted on the face.

V00719

Adjusting Shim Selection Chart (Exhaust)

Measured Clearance mm (in.) \ Installed Shim Thickness mm (in.)	2.500 (0.0984)	2.520 (0.0992)	2.540 (0.1000)	2.550 (0.1004)	2.560 (0.1008)	2.580 (0.1016)	2.600 (0.1024)	2.620 (0.1031)	2.640 (0.1039)	2.650 (0.1043)	2.660 (0.1047)	2.670 (0.1051)	2.680 (0.1055)	2.690 (0.1059)	2.700 (0.1063)	2.710 (0.1067)	2.720 (0.1071)	2.730 (0.1075)	2.740 (0.1079)	2.750 (0.1083)	2.760 (0.1087)	2.770 (0.1091)	2.780 (0.1094)	2.790 (0.1098)	2.800 (0.1102)	2.810 (0.1106)	2.820 (0.1110)	2.830 (0.1114)	2.840 (0.1118)	2.850 (0.1122)	2.860 (0.1126)	2.870 (0.1130)	2.880 (0.1134)	2.890 (0.1138)	2.900 (0.1142)	2.910 (0.1146)	2.920 (0.1150)	2.930 (0.1154)	2.940 (0.1157)	2.950 (0.1161)	2.960 (0.1165)	2.970 (0.1169)	2.980 (0.1173)	2.990 (0.1177)	3.000 (0.1181)	3.010 (0.1185)	3.020 (0.1189)	3.030 (0.1193)	3.040 (0.1197)	3.050 (0.1201)	3.060 (0.1205)	3.080 (0.1213)	3.100 (0.1220)	3.120 (0.1228)	3.140 (0.1236)	3.150 (0.1240)	3.160 (0.1244)	3.180 (0.1252)	3.200 (0.1260)	3.220 (0.1268)	3.240 (0.1276)	3.250 (0.1280)	3.260 (0.1283)	3.280 (0.1291)	3.300 (0.1299)
0.000 – 0.020 (0.0000 – 0.0008)																		1	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	8	8	8	8	9	9	10	10	10	10	11	11
0.021 – 0.040 (0.0008 – 0.0016)																1	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	8	8	8	9	9	9	10	10	10	11	11	11	12
0.041 – 0.060 (0.0016 – 0.0024)														1	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	8	8	8	9	9	9	10	10	10	11	11	11	12	12
0.061 – 0.080 (0.0024 – 0.0031)												1	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12
0.081 – 0.100 (0.0032 – 0.0039)										1	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	9	9	10	10	10	10	11	11	12	12	12	12	13
0.101 – 0.120 (0.0040 – 0.0047)									1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	10	10	10	10	11	11	12	12	12	12	13	13
0.121 – 0.140 (0.0048 – 0.0055)								1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14
0.141 – 0.160 (0.0056 – 0.0063)							1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14	14
0.161 – 0.180 (0.0063 – 0.0071)						1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	11	11	11	12	12	12	13	13	13	14	14	14
0.181 – 0.200 (0.0071 – 0.0079)				1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	11	11	12	12	12	12	13	13	14	14	14	14	15
0.201 – 0.220 (0.0079 – 0.0087)			1	1	1	1	1	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	12	12	12	12	13	13	14	14	14	14	15	15
0.221 – 0.240 (0.0087 – 0.0094)		1	1	1	1	1	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	12	12	12	13	13	13	14	14	14	15	15	15	16
0.241 – 0.249 (0.0095 – 0.0098)		1	1	1	1	2	2	2	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	12	12	12	13	13	13	14	14	14	15	15	15	16	16
0.250 – 0.350 (0.0098 – 0.0138)																																																																	
0.351 – 0.360 (0.0138 – 0.0142)	2	3	3	3	3	4	4	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	15	15	15	15	16	16	17	17	17	17	17	
0.361 – 0.380 (0.0142 – 0.0150)	2	3	3	3	4	4	4	5	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	15	15	15	16	16	16	17	17	17	17	17	
0.381 – 0.400 (0.0150 – 0.0157)	3	3	4	4	4	4	5	5	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	15	15	16	16	16	16	17	17	17	17	17		
0.401 – 0.420 (0.0158 – 0.0165)	3	4	4	4	4	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	16	16	16	16	17	17	17	17				
0.421 – 0.440 (0.0166 – 0.0173)	4	4	4	5	5	5	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	16	16	16	17	17	17	17	17					
0.441 – 0.460 (0.0174 – 0.0181)	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	16	16	16	17	17	17	17	17						
0.461 – 0.480 (0.0181 – 0.0189)	4	5	5	5	6	6	6	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	17	17	17	17	17							
0.481 – 0.500 (0.0189 – 0.0197)	5	5	6	6	6	6	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17	17	17	17								
0.501 – 0.520 (0.0197 – 0.0205)	5	6	6	6	6	7	7	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17										
0.521 – 0.540 (0.0205 – 0.0213)	6	6	6	7	7	7	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17											
0.541 – 0.560 (0.0213 – 0.0220)	6	6	7	7	7	8	8	8	9	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17												
0.561 – 0.580 (0.0221 – 0.0228)	6	7	7	7	8	8	8	9	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17													
0.581 – 0.600 (0.0229 – 0.0236)	7	7	8	8	8	8	9	9	10	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17														
0.601 – 0.620 (0.0237 – 0.0244)	7	8	8	8	8	9	9	10	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																
0.621 – 0.640 (0.0244 – 0.0252)	8	8	8	9	9	9	10	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																		
0.641 – 0.660 (0.0252 – 0.0260)	8	8	9	9	9	10	10	10	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																				
0.661 – 0.680 (0.0260 – 0.0268)	8	9	9	9	10	10	10	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																						
0.681 – 0.700 (0.0268 – 0.0276)	9	9	10	10	10	10	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																								
0.701 – 0.720 (0.0276 – 0.0283)	9	10	10	10	10	11	11	12	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																										
0.721 – 0.740 (0.0284 – 0.0291)	10	10	10	11	11	11	12	12	12	13	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																												
0.741 – 0.760 (0.0292 – 0.0299)	10	10	11	11	11	12	12	12	13	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																														
0.761 – 0.780 (0.0300 – 0.0307)	10	11	11	11	12	12	12	13	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																																
0.781 – 0.800 (0.0307 – 0.0315)	11	11	12	12	12	12	13	13	14	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																																		
0.801 – 0.820 (0.0315 – 0.0323)	11	12	12	12	12	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																																				
0.821 – 0.840 (0.0323 – 0.0331)	12	12	12	13	13	13	14	14	14	15	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																																						
0.841 – 0.860 (0.0331 – 0.0339)	12	12	13	13	13	14	14	14	15	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																																								
0.861 – 0.880 (0.0339 – 0.0346)	12	13	13	13	14	14	14	15	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																																										
0.881 – 0.900 (0.0347 – 0.0354)	13	13	14	14	14	14	15	15	16	16	16	16	16	17	17	17	17	17	17	17	17																																												
0.901 – 0.920 (0.0355 – 0.0362)	13	14	14	14	14	15	15	16	16	16	16	17	17	17	17	17	17	17	17																																														
0.921 – 0.940 (0.0363 – 0.0370)	14	14	14	15	15	15	16	16	16	17	17	17	17	17	17	17	17																																																
0.941 – 0.960 (0.0370 – 0.0378)	14	14	15	15	15	16	16	16	17	17	17	17	17	17	17																																																		
0.961 – 0.980 (0.0378 – 0.0386)	14	15	15	15	16	16	16	17	17	17	17	17	17																																																				
0.981 – 1.000 (0.0386 – 0.0394)	15	15	16	16	16	16	17	17	17	17	17																																																						
1.001 – 1.020 (0.0394 – 0.0402)	15	16	16	16	16	17	17	17	17																																																								
1.021 – 1.040 (0.0402 – 0.0409)	16	16	16	17	17	17	17	17																																																										
1.041 – 1.060 (0.0410 – 0.0417)	16	16	17	17	17	17	17																																																											
1.061 – 1.080 (0.0418 – 0.0425)	16	17	17	17	17	17																																																												
1.081 – 1.100 (0.0426 – 0.0433)	17	17	17	17	17																																																													
1.101 – 1.120 (0.0433 – 0.0441)	17	17	17																																																															
1.121 – 1.140 (0.0441 – 0.0449)	17	17																																																																
1.141 – 1.150 (0.0449 – 0.0453)	17																																																																	

New shim thickness mm (in.)

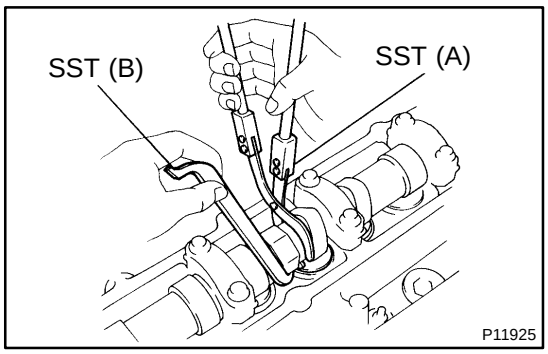
Shim No.	Thickness	Shim No.	Thickness
1	2.500 (0.0984)	10	2.950 (0.1161)
2	2.550 (0.1004)	11	3.000 (0.1181)
3	2.600 (0.1024)	12	3.050 (0.1201)
4	2.650 (0.1043)	13	3.100 (0.1220)
5	2.700 (0.1063)	14	3.150 (0.1240)
6	2.750 (0.1083)	15	3.200 (0.1260)
7	2.800 (0.1102)	16	3.250 (0.1280)
8	2.850 (0.1122)	17	3.300 (0.1299)
9	2.900 (0.1142)		

HINT:
New shims have the thickness in millimeters imprinted on the face.

Exhaust valve clearance (Cold):
0.25 - 0.35 mm (0.010 - 0.014 in.)

EXAMPLE:
The 2.800 mm (0.1102 in.) shim is installed, and the measured clearance is 0.450 mm (0.0177 in.). Replace the 2.800 mm (0.1102 in.) shim with a new No. 10 shim.

V00720



(c) Install a new adjusting shim.
- Place a new adjusting shim on the valve lifter, with imprinted numbers facing down.
- Press down the valve lifter with SST (A), and remove SST (B).

SST 09248-55040

(d) Recheck the valve clearance.

13. REINSTALL CYLINDER HEAD COVERS (See page EM-53)

14. RECONNECT ENGINE WIRE TO CYLINDER HEAD COVERS

15. REINSTALL SPARK PLUGS

16. REINSTALL IGNITION COILS AND HIGH-TENSION CORD SET ASSEMBLY (See page IG-9)

17. REINSTALL NO. 3 TIMING BELT COVER

(a) Install the gasket to the timing belt cover.

(b) Using a 5 mm hexagon wrench, install the timing belt cover with the 4 bolts.

Torque: 8.0 N·m (80 kgf·cm, 71 in.·lbf)

(c) Install the oil filler cap.

18. REINSTALL THROTTLE BODY AND INTAKE AIR CONNECTOR ASSEMBLY

(a) Install a new gasket to the air intake chamber.

(b) Place the throttle body together with the intake air connector on the cylinder head.

(c) Connect the vacuum hose (from actuator for ACIS) to the No. 1 vacuum pipe.

(d) Connect the 2 water bypass hoses to the throttle body.

(e) Install the 4 bolts and 2 nuts holding the intake air connector to the air intake chamber.

Torque: 28 N·m (280 kgf·cm, 21 ft·lbf)

(f) Install the 2 nuts holding the throttle body bracket to the cylinder head.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

(g) Connect the air assist hose to the intake air connector.

(h) Install the PCV hose to the intake air connector.

(i) Install the EVAP hose (from charcoal canister) to the VSV for EVAP.

(j) Install the vacuum hose (from No. 2 vacuum pipe) to the No. 1 vacuum pipe.

(k) Install the throttle position sensor connector.

(l) Install the accelerator pedal position sensor connector.

(m) Install the throttle control motor connector.

(n) Install the VSV connector for EVAP.

(o) Secure the engine wire with the clamp on the throttle body bracket.

(p) Install the engine wire clamp with the clamp bracket of the throttle body.

(q) Connect the accelerator cable to the throttle body.

19. REINSTALL INTAKE AIR RESONATOR

20. REINSTALL ENGINE COVER

Install the engine cover with the 4 nuts.

21. REFILL WITH ENGINE COOLANT

22. START ENGINE AND CHECK FOR LEAKS

IGNITION TIMING

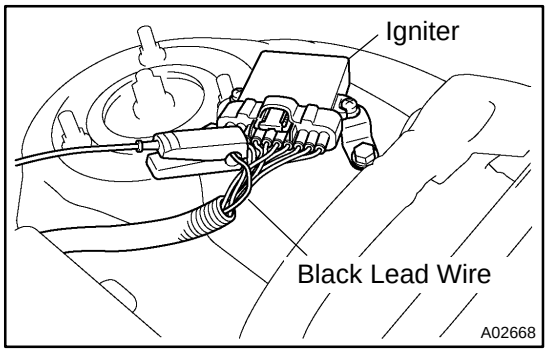
EM1SC-02

INSPECTION

1. WARM UP ENGINE

Allow the engine to warm up to normal operating temperature.

2. CHECK IDLE SPEED (See page EM-14)

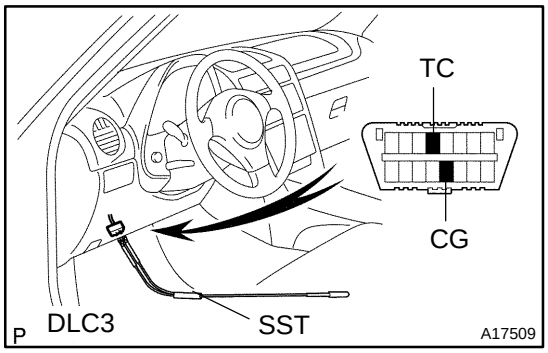


3. CONNECT TIMING LIGHT TO ENGINE

Connect the timing light clip to the black lead wire.

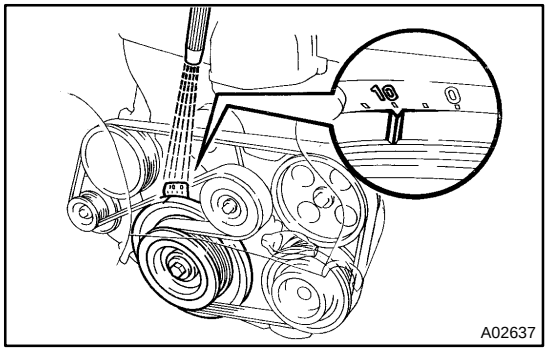
NOTICE:

Use a timing light that can detect the primary signal.



4. INSPECT IGNITION TIMING

(a) Using SST, connect terminals TC and CG of the DLC3.
SST 09843-18040



(b) Using a timing light, check the ignition timing.
Ignition timing:
10 ± 2˚ BTDC @ idle
(Transmission in neutral position)

(c) Remove the SST from the DLC1.

5. FURTHER CHECK IGNITION TIMING
Ignition timing: 6 - 16˚ BTDC @ idle
(Transmission in neutral position)

HINT:

The timing mark moves in a range between 6˚ and 16˚.

6. DISCONNECT TIMING LIGHT FROM ENGINE

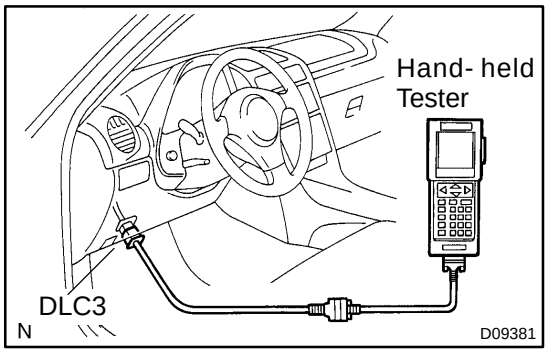
IDLE SPEED

EM1S9-02

INSPECTION

1. INITIAL CONDITIONS

(a) Engine at normal operating temperature
(b) Air cleaner installed
(c) All pipes and hoses of air induction system connected
(d) All accessories switched OFF
(e) All vacuum lines properly connected
(f) SFI system wiring connectors fully plugged
(g) Ignition timing checked correctly
(h) Transmission in neutral position



2. CONNECT HAND-HELD TESTER OR OBD II SCAN TOOL

(a) Connect the hand-held tester or OBD II scan tool to the DLC3.
(b) Please refer to the hand-held tester or OBD II scan tool operator's manual for further details.

3. INSPECT IDLE SPEED

(a) Race the engine speed at 2,500 rpm for approx. 90 seconds.
(b) Check the idle speed.

Idle speed: 700 ± 50 rpm

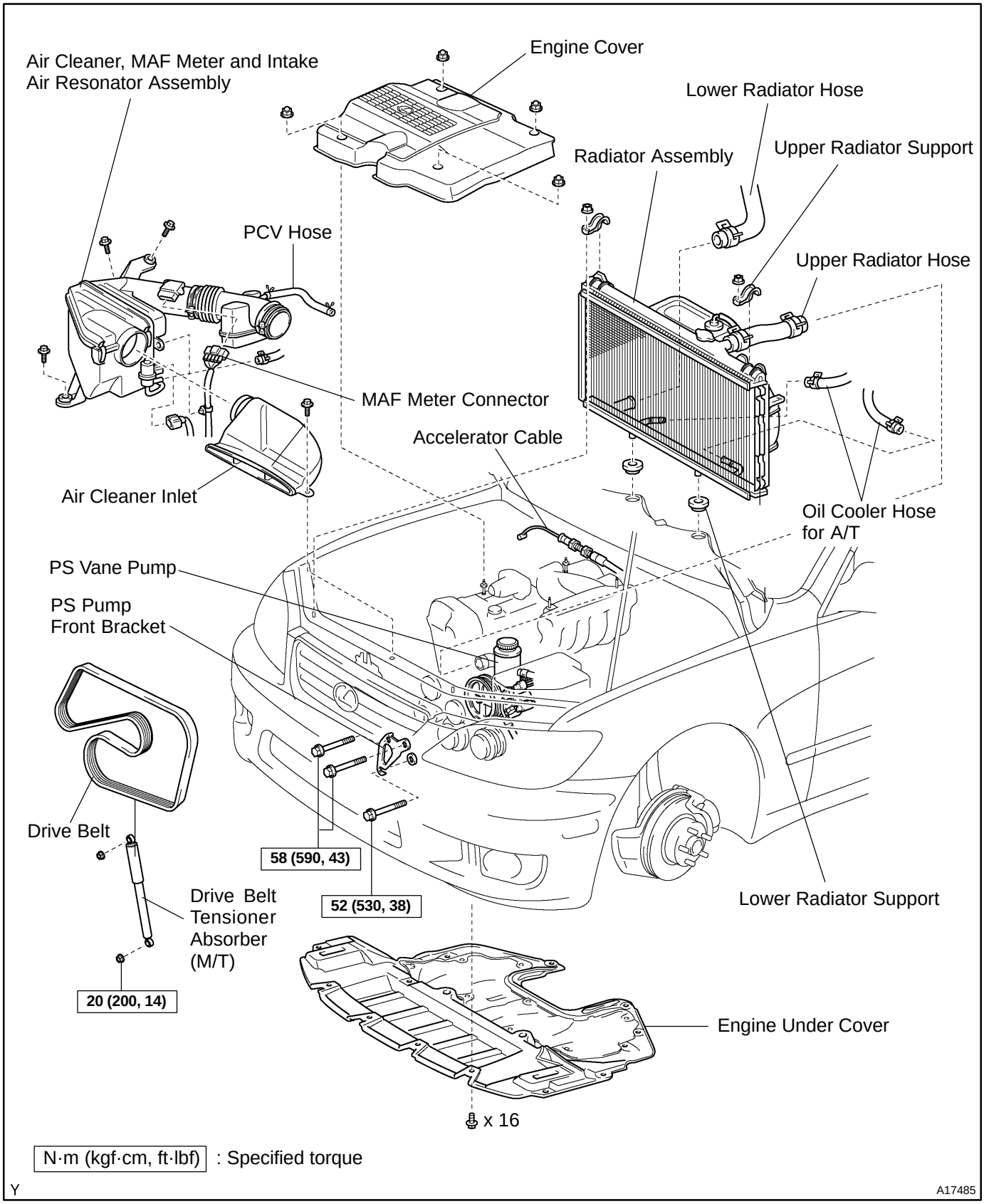
If the idle speed is not as specified, check the throttle body.

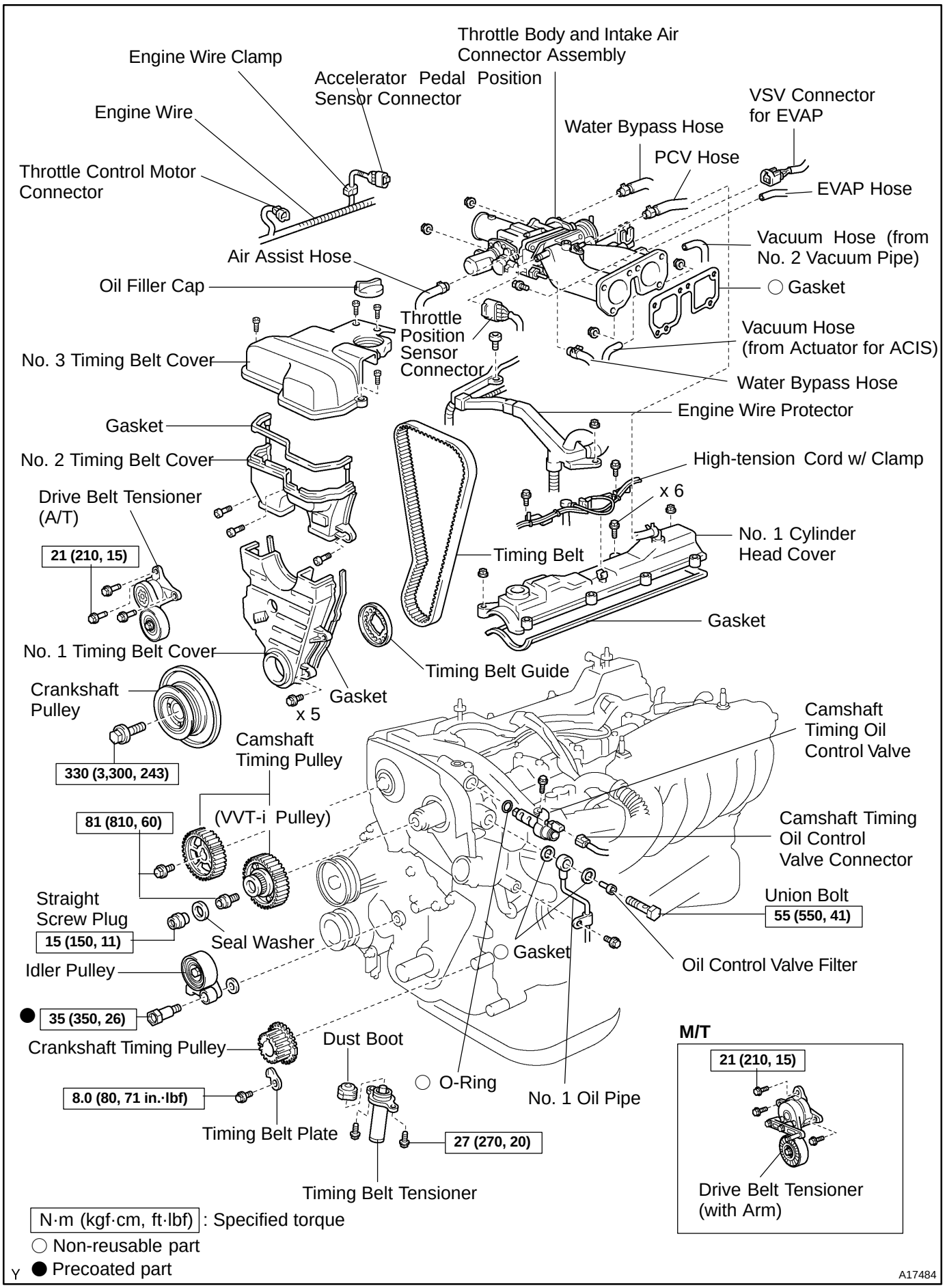
4. DISCONNECT HAND-HELD TESTER OR OBD II SCAN TOOL

TIMING BELT

COMPONENTS

EM0D5-09




Throttle Body and Intake Air Connector Assembly
Engine Wire Clamp
Accelerator Pedal Position Sensor Connector
VSV Connector for EVAP
Engine Wire
Water Bypass Hose
PCV Hose
Throttle Control Motor Connector
EVAP Hose
Vacuum Hose (from No. 2 Vacuum Pipe)
Air Assist Hose
Oil Filler Cap
○ Gasket
Throttle Position Sensor Connector
Vacuum Hose (from Actuator for ACIS)
No. 3 Timing Belt Cover
Water Bypass Hose
Engine Wire Protector
Gasket
No. 2 Timing Belt Cover
High-tension Cord w/ Clamp
x 6
Drive Belt Tensioner (A/T)
No. 1 Cylinder Head Cover
21 (210, 15)
Timing Belt
Gasket
No. 1 Timing Belt Cover
Timing Belt Guide
Crankshaft Pulley
Gasket
x 5
Camshaft Timing Oil Control Valve
330 (3,300, 243)
Camshaft Timing Pulley
(VVT-i Pulley)
81 (810, 60)
Camshaft Timing Oil Control Valve Connector
Straight Screw Plug
Union Bolt
55 (550, 41)
15 (150, 11)
Seal Washer
Gasket
Oil Control Valve Filter
Idler Pulley
● 35 (350, 26)
Crankshaft Timing Pulley
Dust Boot
8.0 (80, 71 in.·lbf)
○ O-Ring
No. 1 Oil Pipe
Timing Belt Plate
27 (270, 20)
Timing Belt Tensioner
M/T
21 (210, 15)
Drive Belt Tensioner (with Arm)
N·m (kgf·cm, ft·lbf) : Specified torque
○ Non-reusable part
● Precoated part
A17484

EM1J7-03

REMOVAL

1. REMOVE ENGINE UNDER COVER

2. DRAIN ENGINE COOLANT

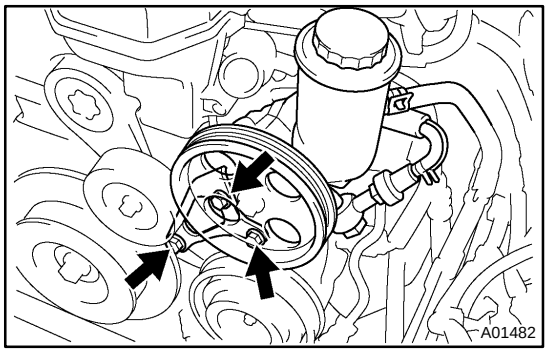
3. REMOVE RADIATOR ASSEMBLY (See page CO-19)

4. M/T:

REMOVE DRIVE BELT TENSIONER ABSORBER

Remove the 2 nuts and absorber.

5. REMOVE DRIVE BELT (See page CH-1)



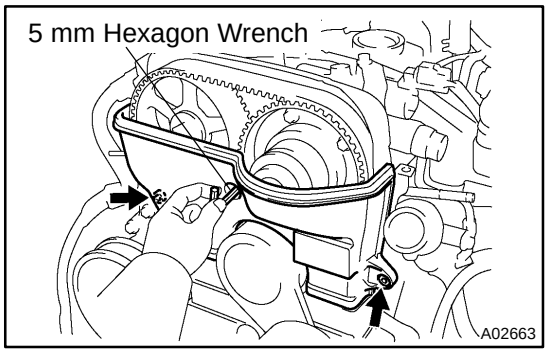
6. REMOVE PS PUMP AND FRONT BRACKET

(a) Remove the 3 bolts, plate washer and pump front bracket.

(b) Disconnect the vane pump from the bracket.

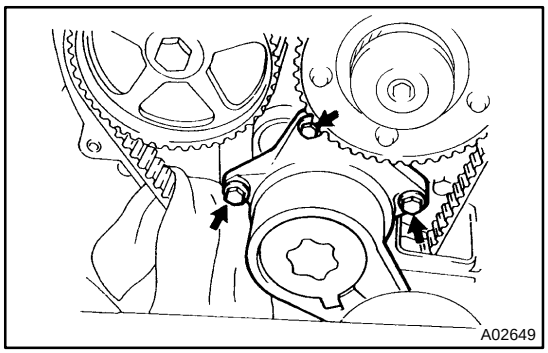
7. REMOVE NO. 3 TIMING BELT COVER

Using a 5 mm hexagon wrench, remove the 4 bolts, oil filler cap, timing belt cover and gasket.



8. REMOVE NO. 2 TIMING BELT COVER

Using a 5 mm hexagon wrench, remove the 3 bolts, timing belt cover and gasket.

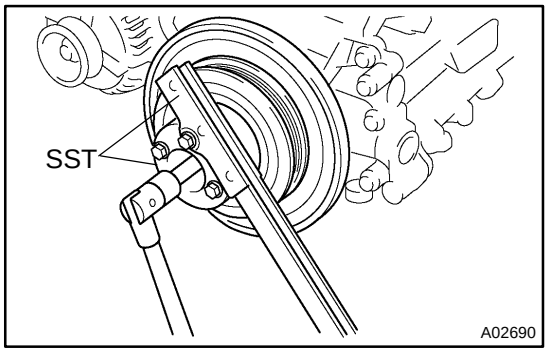


9. REMOVE DRIVE BELT TENSIONER

Remove the 3 bolts and tensioner.

NOTICE:

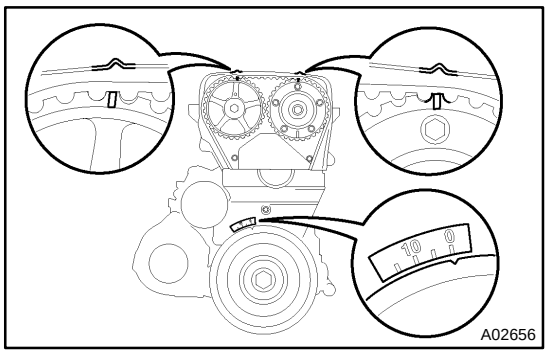
Be careful not to drop the bolts inside the timing belt cover.



10. LOOSEN CRANKSHAFT PULLEY BOLT

Using SST, loosen the pulley bolt.

SST 09213-7001 1, 09330-00021



11. SET NO. 1 CYLINDER TO APPROX. 60˚/ BTDC COMPRESSION

(a) Turn the crankshaft pulley, and align its groove with timing mark ”0” of the No. 1 timing belt cover.

NOTICE:

Always turn the crankshaft clockwise.

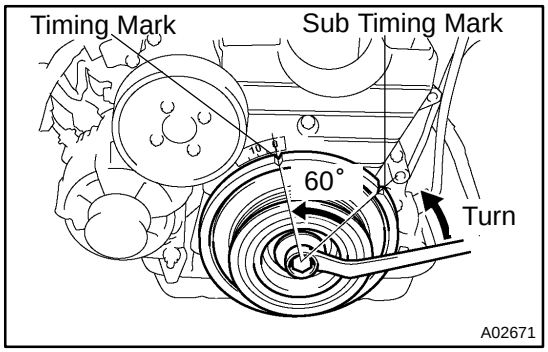
(b) Check that the timing marks (TDC mark) of the camshaft timing pulleys are aligned with the timing marks of the No. 4 timing belt cover.

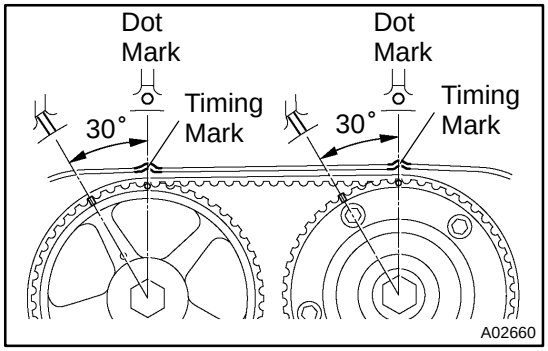
If not, turn the crankshaft 1 revolution (360˚).

(c) Turn the crankshaft pulley 60˚ counterclockwise to place the sub timing mark (60˚ mark BTDC) on the crankshaft pulley at the timing mark ”0” position of the No. 1 timing belt cover.

NOTICE:

If the timing belt is disengaged, having the crankshaft pulley at the wrong angle can cause the piston head and valve head to come into contact with each other when you remove the camshaft timing pulleys (steps 13 and 19), thus resulting damage. So, always set the crankshaft pulley at the correct angle.



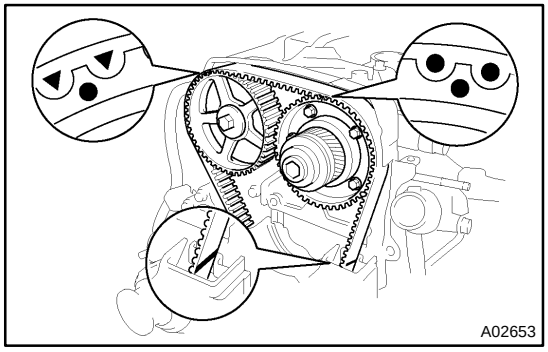


(d) Check that the dot marks (60˚ mark BTDC) of the camshaft timing pulleys are aligned with the timing marks of the No. 4 timing belt cover.

(e) Remove the crankshaft pulley bolt.

NOTICE:

Do not turn the crankshaft pulley.

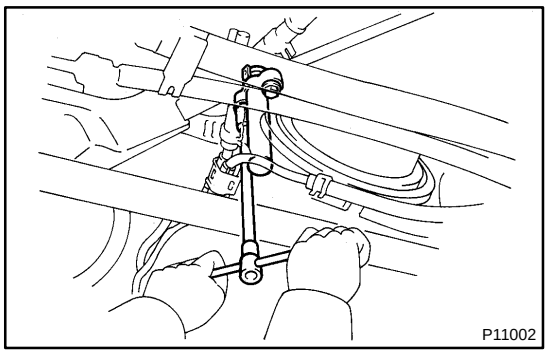


12. REMOVE TIMING BELT FROM CAMSHAFT TIMING PULLEYS

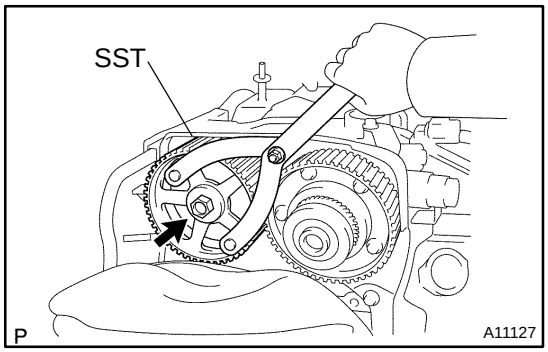
HINT:

Re-using timing belt:

Place matchmarks on the timing belt and camshaft timing pulleys as shown in the illustration.



(a) Alternately loosen the 2 bolts, and remove them, the tensioner and dust boot.
(b) Disconnect the timing belt from the camshaft timing pulleys.



13. REMOVE EXHAUST CAMSHAFT TIMING PULLEY

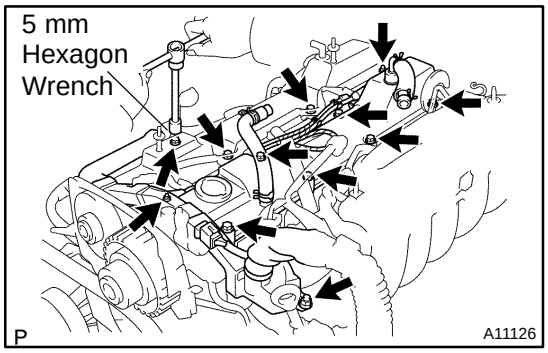
Using SST, remove the bolt and timing pulley.

SST 09960-10010 (09962-01000, 09963-01000)

14. REMOVE ENGINE COVER

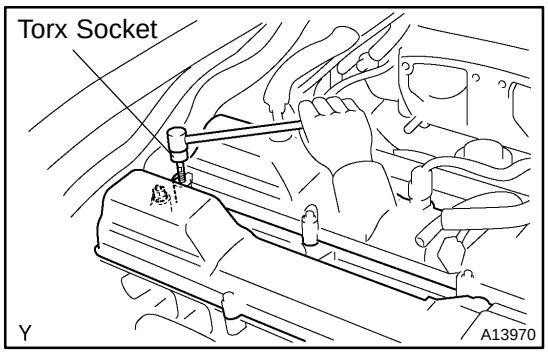
Remove the 4 nuts and engine cover.

15. REMOVE THROTTLE BODY AND INTAKE AIR CONNECTOR ASSEMBLY (See page EM-5)



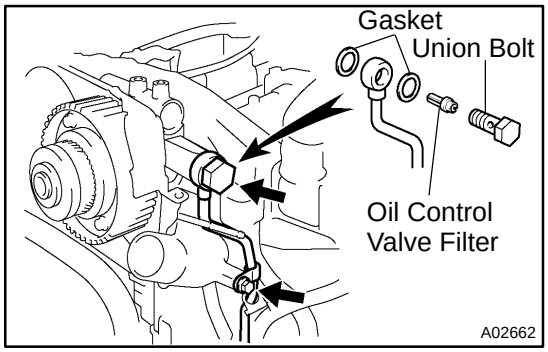
16. REMOVE NO. 1 CYLINDER HEAD COVER

(a) Using a 5 mm hexagon wrench, remove the bolts, and disconnect the engine wire protector from the No. 2 cylinder head cover.
(b) Remove the nut, and disconnect the engine wire protector from the intake manifold.
(c) Remove the 2 bolts, and disconnect the high-tension cords with the clamp from the No. 2 cylinder head.



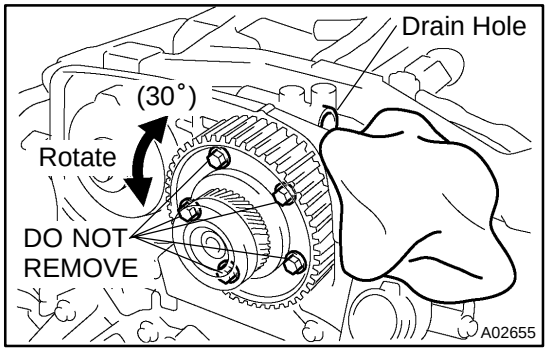
(d) Remove the 2 nuts from the No. 1 cylinder head cover.
(e) Using a torx socket (E5), remove the 2 stud bolts.
(f) Remove the 6 bolts, No. 1 cylinder head cover and gasket.

17. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE (See page SF-43)



18. DISCONNECT NO. 1 OIL PIPE

Remove the bolt, union bolt, oil control valve filter and 2 gaskets, and disconnect the No. 1 oil pipe from the No. 3 camshaft bearing cap.



19. REMOVE VVT-i (INTAKE CAMSHAFT TIMING) PULLEY

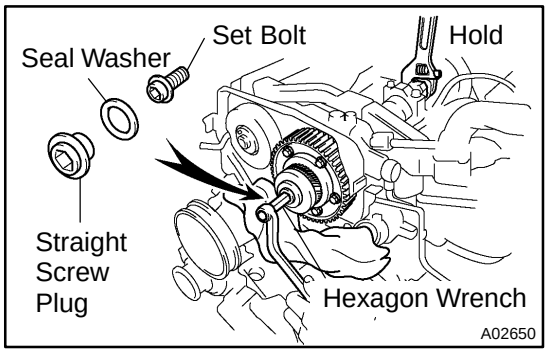
NOTICE:

- **The 5 bolts shown in the illustration determine the backlash of the gear in the timing pulley, so do not remove them.**
  If any of the 5 bolts are removed, install a new camshaft timing pulley assembly.
- **When removing the straight screw plug, follow the prescribed procedure in order to avoid spilling oil on the timing system parts.**

(a) Rotate the VVT-i pulley from left to right 2 to 3 times within its range of movement (30˚) and use a waste cloth to collect the oil from the camshaft timing oil control valve installation hole.

NOTICE:

Approximately 20 cc (1.2 cu in.) of oil will be ejected, so take care not to spill it.



(b) Holding the hexagon portion of camshaft with a wrench.

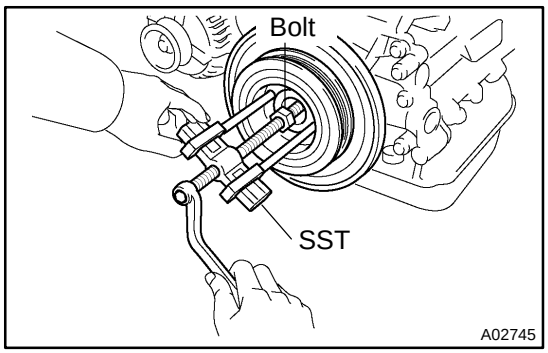
(c) Using a 14 mm hexagon wrench, remove the straight screw plug and seal washer.

NOTICE:

Some oil may spill, so put a waster cloth below the plug white doing the operation.

(d) Using a 10 mm hexagon wrench, and remove the set bolt and VVT-i pulley.

(e) Remove the wrench.



20. REMOVE CRANKSHAFT PULLEY

Using SST and bolt (diameter: 8 mm, pitch: 1.5 mm), remove the crankshaft pulley.

SST 09950-50013 (09951-05010, 09552-05010, 09553-05020, 09554-05031)

Bolt: Part No. 90119-18001

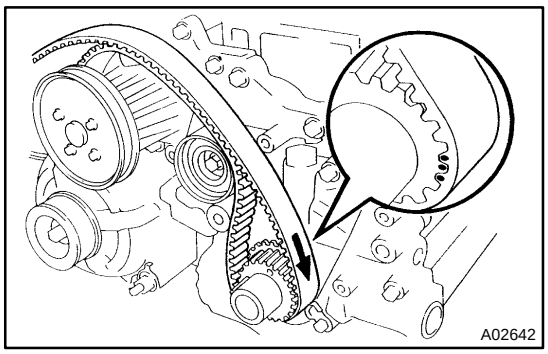
NOTICE:

Do not turn the crankshaft pulley.

21. REMOVE NO. 1 TIMING BELT COVER

Remove the 5 bolts, timing belt cover and gasket.

22. REMOVE TIMING BELT GUIDE

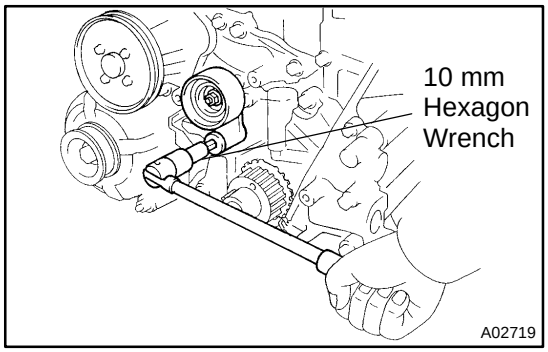


23. REMOVE TIMING BELT

HINT:

When re-using timing belt:

Draw an arrow on the timing belt in the direction of engine revolution, and place matchmarks on the timing belt and crankshaft timing pulley.

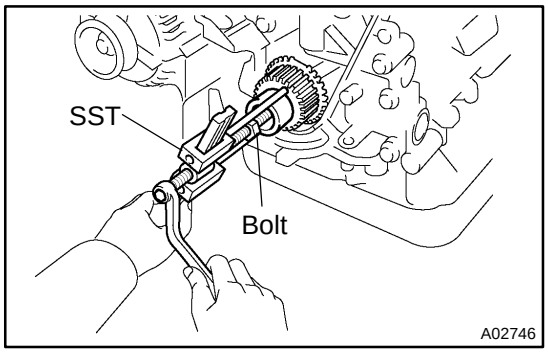


24. REMOVE IDLER PULLEY

Using a 10 mm hexagon wrench, remove the pivot bolt, plate washer and idler pulley.

25. REMOVE CRANKSHAFT TIMING PULLEY

(a) Remove the bolt and timing belt plate.



(b) Remove the crankshaft timing pulley.

If the pulley cannot be removed by hand, use SST and bolt (diameter: 8 mm, pitch: 1.5 mm) to remove the crankshaft timing pulley.

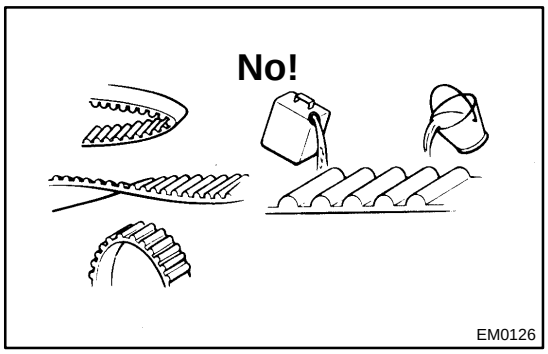
SST 09950- 50013 (09951- 05010, 09952- 05010, 09953-05020, 09954-05011)

Bolt: Part No. 90119-18001

NOTICE:

- **Do not scratch the sensor part the crankshaft timing pulley.**
- **Do not turn the timing pulley.**

EM1SB-02



INSPECTION

1. INSPECT TIMING BELT

NOTICE:

- **Do not bend, twist or turn the timing belt inside out. Do not allow the timing belt to come into contact with oil, water or steam.**
- **Do not utilize timing belt tension when installing or removing the mount bolt of the camshaft timing pulley.**

If there are any defects, as shown in the illustrations, check the following points.

(a) Premature parting
- Check for proper installation.
- Check the timing cover gasket for damage and proper installation.

(b) If the belt teeth are cracked or damaged, check to see if either camshaft is locked.

(c) If there is noticeable wear or cracks on the belt face, check to see if there are nicks on the side of the idler pulley lock.

(d) If there is wear or damage on only one side of the belt, check the belt guide and the alignment of each pulley.

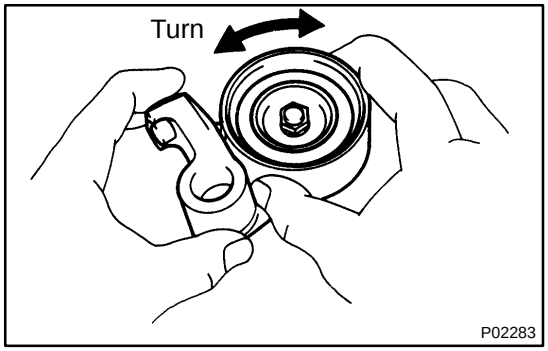
(e) If there is noticeable wear on the belt teeth, check timing cover for damage and check gasket has been installed correctly and for foreign material on the pulley teeth.

If necessary, replace the timing belt.

2. INSPECT DRIVE BELT TENSIONER

Check the turning smoothness of the tensioner.

If necessary, replace the tensioner.



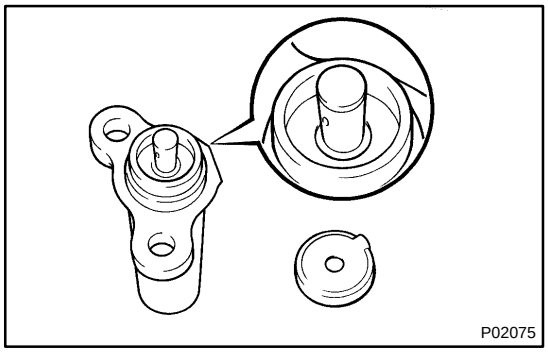
3. INSPECT IDLER PULLEY

(a) Visually check the seal portion of the idler pulley for oil leakage.

If leakage is found, replace the idler pulley.

(b) Check the turning smoothness of the idler pulley.

If necessary, replace the idler pulley.



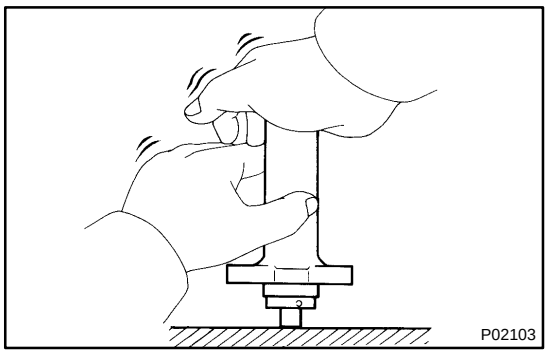
4. INSPECT TIMING BELT TENSIONER

(a) Visually check tensioner for oil leakage.

HINT:

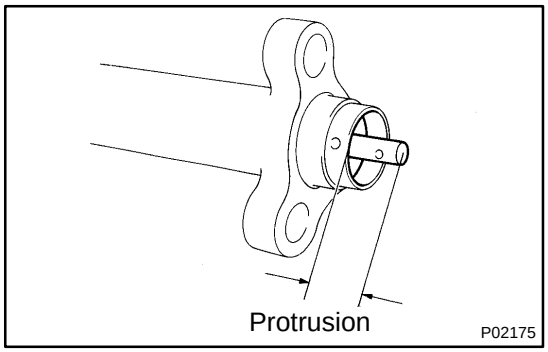
If there is only the faintest trace of oil on the seal on the push rod side, the tensioner is all right.

If leakage is found, replace tensioner.



(b) Hold the tensioner with both hands and push the push rod strongly against the floor or wall to check that it doesn't move.

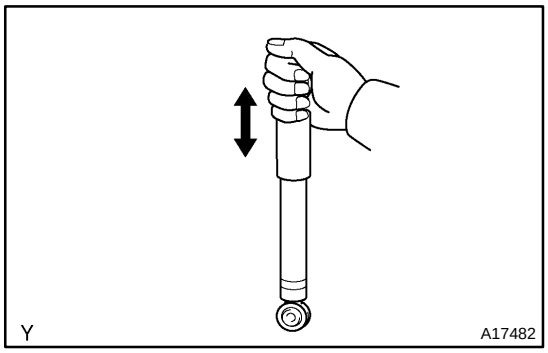
If the push rod moves, replace the tensioner.



(c) Measure the protrusion of the push rod from the housing end.

Protrusion: 8.0 - 8.8 mm (0.315 - 0.346 in.)

If the protrusion is not as specified, replace the tensioner.

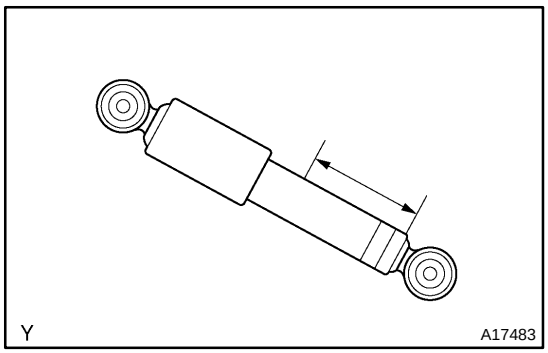


5. M/T:

INSPECT DRIVE BELT TENSIONER ABSORBER

Compress and extend the absorber rod and check that there is no abnormal resistance or unusual operation sounds.

If there is any abnormality, replace the absorber.



NOTICE:

When discarding the absorber, use the these procedure.

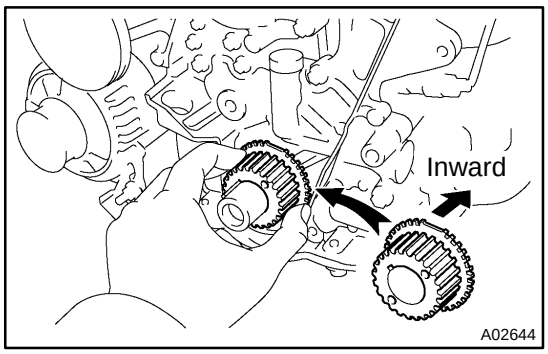
- **Fully extend the absorber rod.**
- **Using a drill, make a hole in the cylinder as shown to release the gas inside.**

CAUTION:

The gas coming out is harmless, but the careful of the chips which may fly up when drilling.

EM1J8-03

INSTALLATION



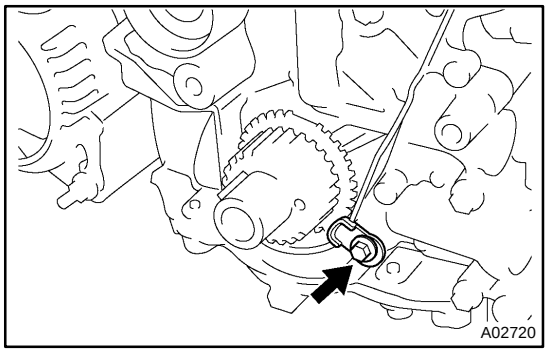
1. INSTALL CRANKSHAFT TIMING PULLEY

(a) Align the pulley set key with the key groove of the pulley.

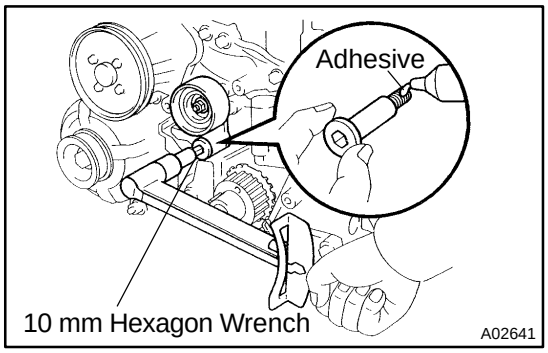
(b) Slide on the timing pulley facing the flange side inward.

NOTICE:

Do not scratch the sensor part of the crankshaft timing pulley.



(c) Install the timing belt plate with the bolt.
Torque: 8.0 N·m (80 kgf·cm, 71 in.·lbf)

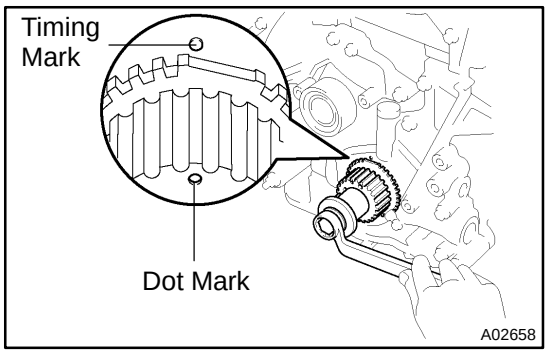


2. INSTALL IDLER PULLEY

(a) Apply adhesive to 2 or 3 threads of the pivot bolt.
Adhesive:
Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(b) Using a 10 mm hexagon wrench, install the plate washer and pulley with the pivot bolt.
Torque: 35 N·m (350 kgf·cm, 26 ft·lbf)

(c) Check that the pulley bracket moves smoothly.



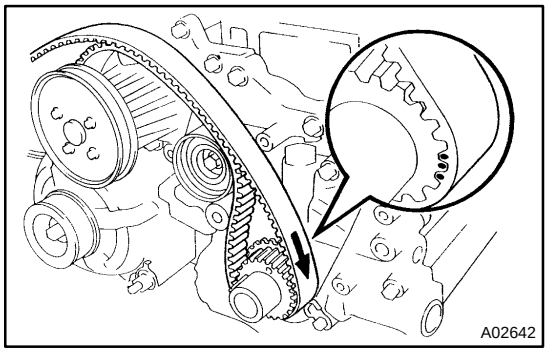
3. TEMPORARILY INSTALL TIMING BELT

NOTICE:

The engine should be cold.

(a) Use the crankshaft pulley bolt to turn the crankshaft, and align the dot mark on the crankshaft timing pulley and the timing mark on the oil pump body.

(b) Remove any oil or water on the crankshaft timing pulley and idler pulley, and keep them clean.

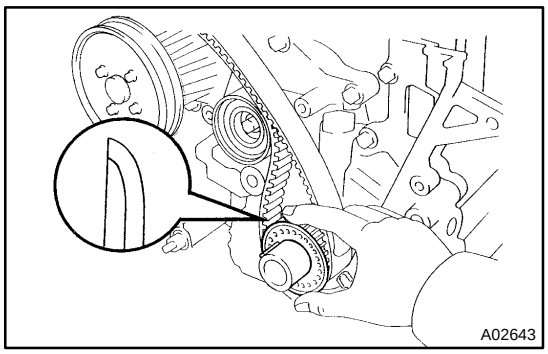


(c) Install the timing belt on the crankshaft timing pulley and idler pulley.

HINT:

When re-using timing belt:

Align the matchmarks of the crankshaft timing pulley and timing belt, and install the belt with the arrow pointing in the direction of engine revolution.



4. INSTALL TIMING BELT GUIDE

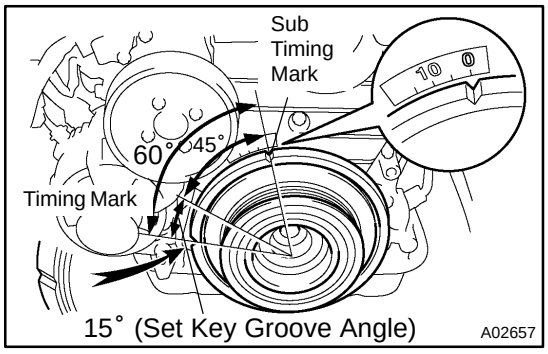
Install the guide, facing the cup side outward.

5. INSTALL NO. 1 TIMING BELT COVER

(a) Install the gasket to the timing belt cover.

(b) Install the timing belt cover with the 5 bolts.

Torque: 8.0 N·m (80 kgf·cm, 71 in.·lbf)



6. INSTALL CRANKSHAFT PULLEY

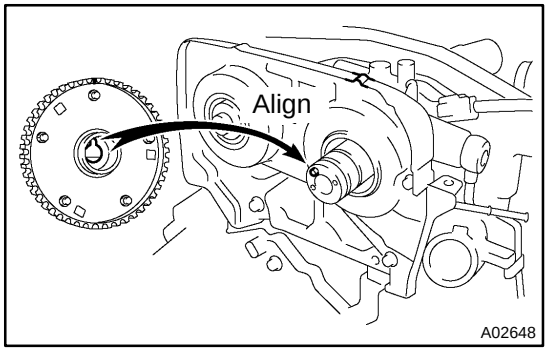
(a) Align the pulley set key with the key groove of the pulley, and slide on the pulley.

(b) Check that the sub timing mark (60° mark BTDC) of the crankshaft pulley is aligned with the timing mark "0" of the No.1 timing belt cover.

HINT:

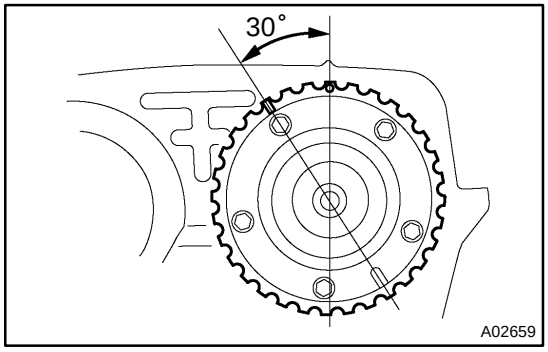
At this time, the crankshaft pulley set key groove and the timing mark (TDC mark) of the crankshaft pulley are as shown the illustration.

(c) Temporarily install the pulley bolt.

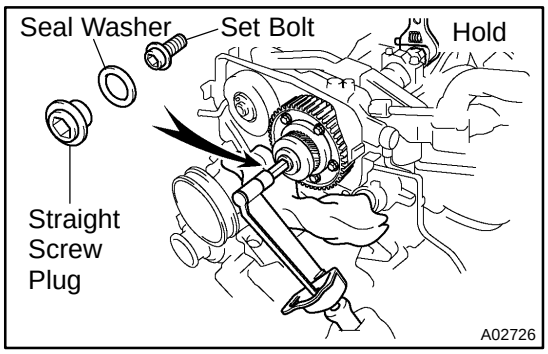


7. INSTALL VVT-i (INTAKE CAMSHAFT TIMING) PULLEY

(a) Align the camshaft knock pin with the VVT-i pulley, and push the VVT-i pulley by hand until you feel it touch the bottom.



(b) Check that the outer circumference of the VVT-i pulley easily rotates through 30°.

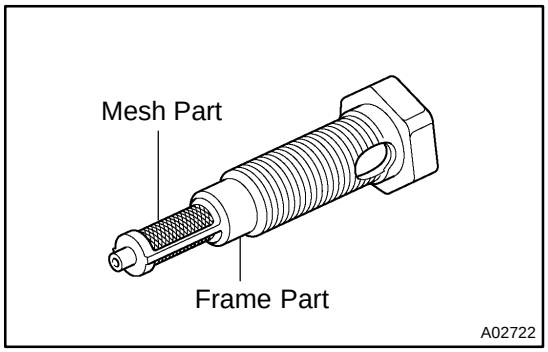


(c) Holding the hexagon portion of the camshaft with a wrench.
(d) Using a 10 mm hexagon wrench, and the set bolt.
Torque: 81 N·m (810 kgf·cm, 60 ft·lbf)
(e) Using a 14 mm hexagon wrench, install the straight screw plug with the seal washer to the set bolt.
Torque: 15 N·m (150 kgf·cm, 11 ft·lbf)
(f) Align the dot mark on the camshaft timing pulley with the timing mark of the No. 4 timing belt cover.
(g) Remove the wrench.

8. CONNECT NO. 1 OIL PIPE

(a) Install the union bolt to the oil control valve filter.

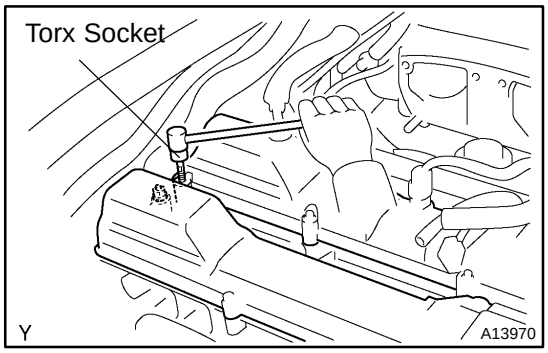
NOTICE:
In case of touching the filter, avoid holding the mesh part and holding the frame part.



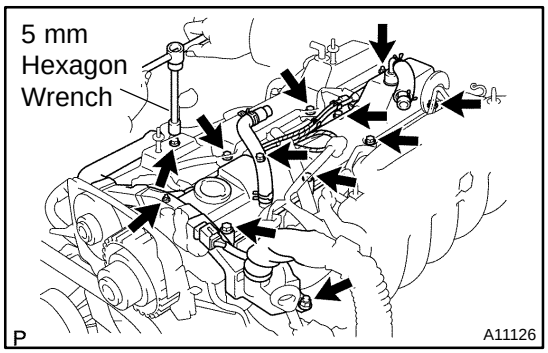
(b) Install the oil pipe with 2 new gasket and the union bolt to the No.3 camshaft bearing cap.
Torque: 55 N·m (550 kgf·cm, 41 ft·lbf)

9. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE (See page SF-43)

10. INSTALL NO. 1 CYLINDER HEAD COVER



(a) Install the cylinder head and gasket with the 6 bolts.
Torque: 8.5 N·m (85 kgf·cm, 75 in.·lbf)
(b) Using a torx socket (E5), install the 2 stud bolts.
Torque: 8.5 N·m (85 kgf·cm, 75 in.·lbf)
(c) Install the 2 nuts to the 2 stud bolts.
Torque: 8.5 N·m (85 kgf·cm, 75 in.·lbf)
(d) Install the high-tension cords and clamps with the 2 bolts.
Torque: 8.0 N·m (80 kgf·cm, 71 in.·lbf)

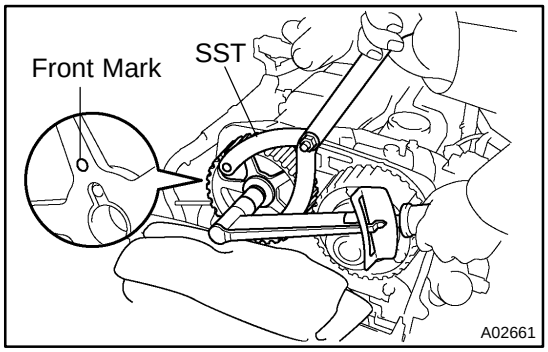


(e) Using a 5 mm hexagon wrench, install the engine wire protector with the bolt and nut.

11. INSTALL THROTTLE BODY AND INTAKE AIR CONNECTOR ASSEMBLY (See page EM-5)

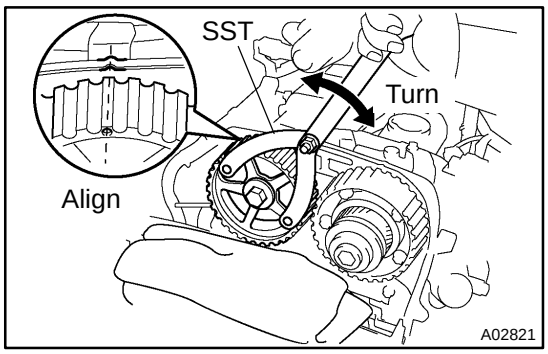
12. INSTALL ENGINE COVER

Install the engine cover with the 4 nuts.

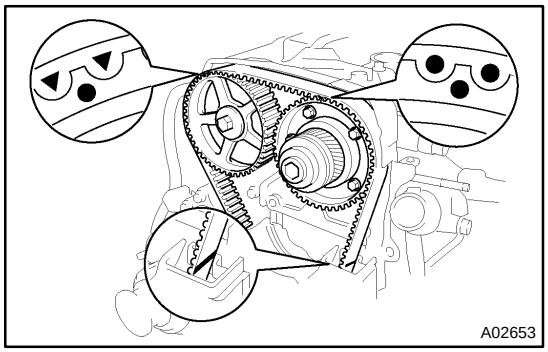


13. INSTALL EXHAUST CAMSHAFT TIMING PULLEY

(a) Align the camshaft knock pin with the groove on the pulley, and slide on the timing pulley.
(b) Slide the timing pulley on the camshaft, facing the front mark forward.
(c) Using SST, install the pulley bolt.
SST 09960-10010 (09962-01000, 09963-01000)
Torque: 81 N·m (810 kgf·cm, 60 ft·lbf)



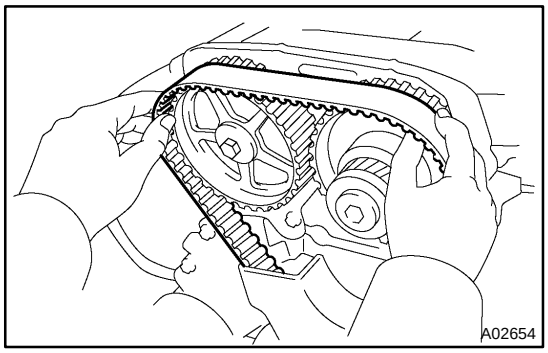
(d) Using SST, align the dot mark on the camshaft timing timing pulley with the timing mark of the No. 4 timing belt cover.
SST 09960-10010 (09962-01000, 09963-01000)



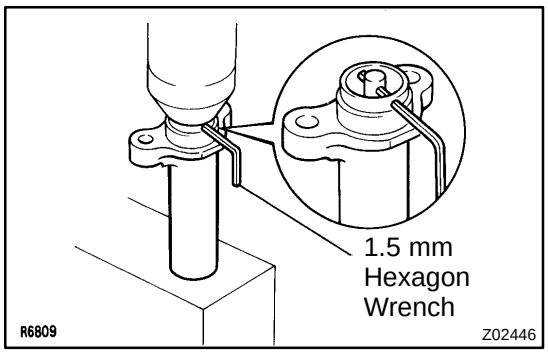
14. CONNECT TIMING BELT TO CAMSHAFT TIMING PULLEYS

HINT:
When re-using timing belt:

- Check that the matchmark on the timing belt matches the end of the No. 1 timing belt cover.
  If the matchmark does not align, shift the meshing of the timing belt and crankshaft timing pulley until they align.
- Align the matchmarks of the timing belt and camshaft timing pulleys.

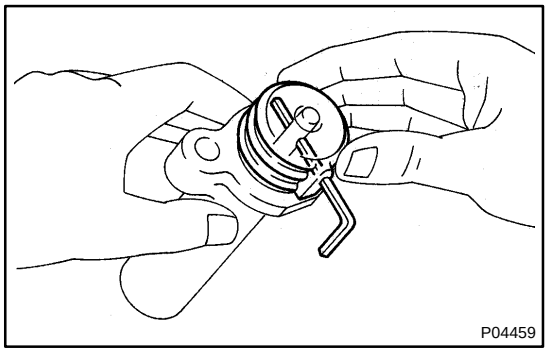


(a) Remove any oil or water on the camshaft timing pulley, and keep it clean.
(b) Install the timing belt, checking the tension between the crankshaft timing pulley and intake camshaft timing pulley.

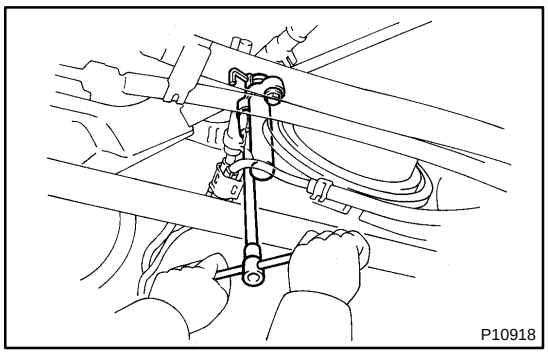


15. SET TIMING BELT TENSIONER

(a) Using a press, slowly press in the push rod using 981 - 9,807 N (100 - 1,000 kgf, 220 - 2,205 lbf) of force.
(b) Align the holes of the push rod and housing, pass a 1.5 mm hexagon wrench through the holes to keep the push rod retracted.
(c) Release the press.



(d) Install the dust boot onto the tensioner.

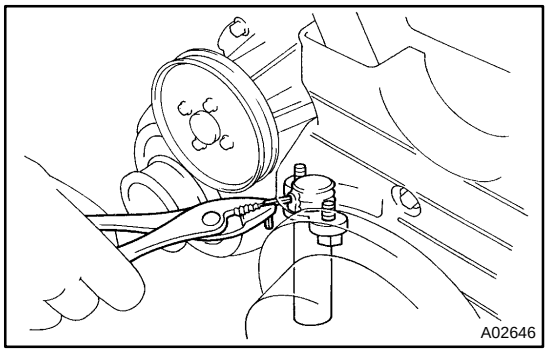


16. INSTALL TIMING BELT TENSIONER

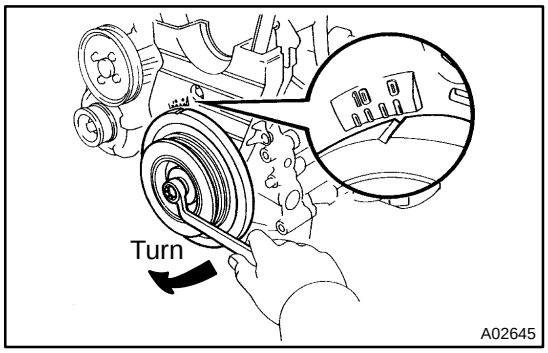
(a) Temporarily install the tensioner with the 2 bolts.

(b) Alternately tighten the 2 bolts.

Torque: 27 N·m (270 kgf·cm, 20 ft·lbf)



(c) Remove the 1.5 mm hexagon wrench from the tensioner with pliers.

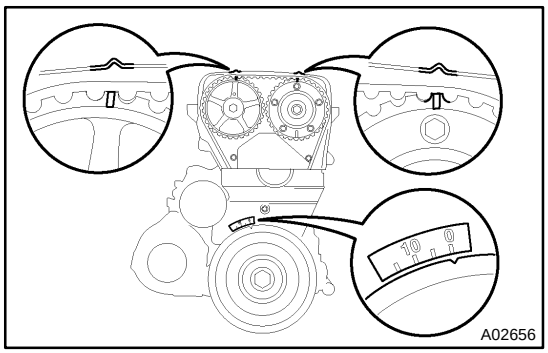


17. CHECK VALVE TIMING

(a) Slowly turn the crankshaft pulley 2 revolutions from TDC to TDC.

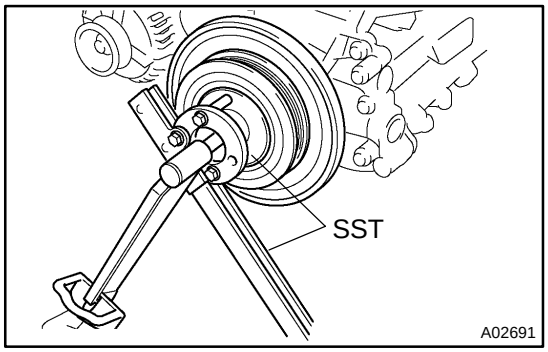
NOTICE:

Always turn the crankshaft clockwise.



(b) Check that each pulley aligns with the timing marks as shown in the illustration.

If the marks do not align, remove the timing belt and reinstall it.



18. TIGHTEN CRANKSHAFT PULLEY BOLT

Using SST, install the pulley bolt.

SST 09213-7001 1, 09330-00021

Torque: 330 N·m (3,300 kgf·cm, 243 ft·lbf)

19. INSTALL DRIVE BELT TENSIONER

Install the tensioner with the 3 bolts.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

NOTICE:

Be careful not to drop the bolts inside the timing belt cover.

20. INSTALL NO. 2 TIMING BELT COVER

(a) Install the gasket on the timing belt cover.

(b) Using a 5 mm hexagon wrench, install the timing belt cover with the 3 bolts.

Torque: 8.0 N·m (80 kgf·cm, 71 in.·lbf)

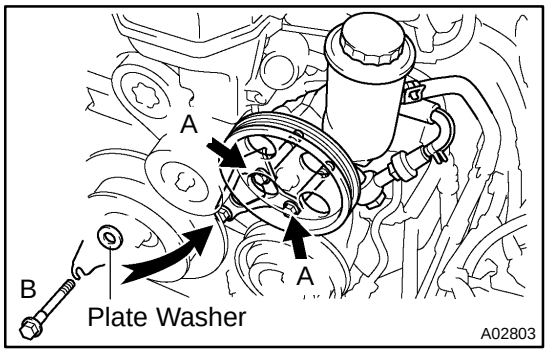
21. INSTALL NO. 3 TIMING BELT COVER

(a) Install the gasket on the timing belt cover.

(b) Using a 5 mm hexagon wrench, install the timing belt cover with the 4 bolts.

Torque: 8.0 N·m (80 kgf·cm, 71 in.·lbf)

(c) Install the oil filler cap.



22. INSTALL PS PUMP AND FRONT BRACKET

(a) Temporarily install the vane pump to the bracket.

(b) Install the plate washer and front bracket with the 3 bolts.

Torque:
58 N·m (590 kgf·cm, 43 ft·lbf) for bolt A
52 N·m (530 kgf·cm, 38 ft·lbf) for bolt B

23. INSTALL DRIVE BELT (See page CH-1)

24. M/T:

INSTALL DRIVE BELT TENSIONER ABSORBER

Install the absorber with the 2 nuts.

Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

25. INSTALL RADIATOR ASSEMBLY (See page CO-24)

26. FILL ENGINE WITH COOLANT

27. START ENGINE CHECK FOR LEAKS

28. INSTALL ENGINE UNDER COVER

29. ROAD TEST

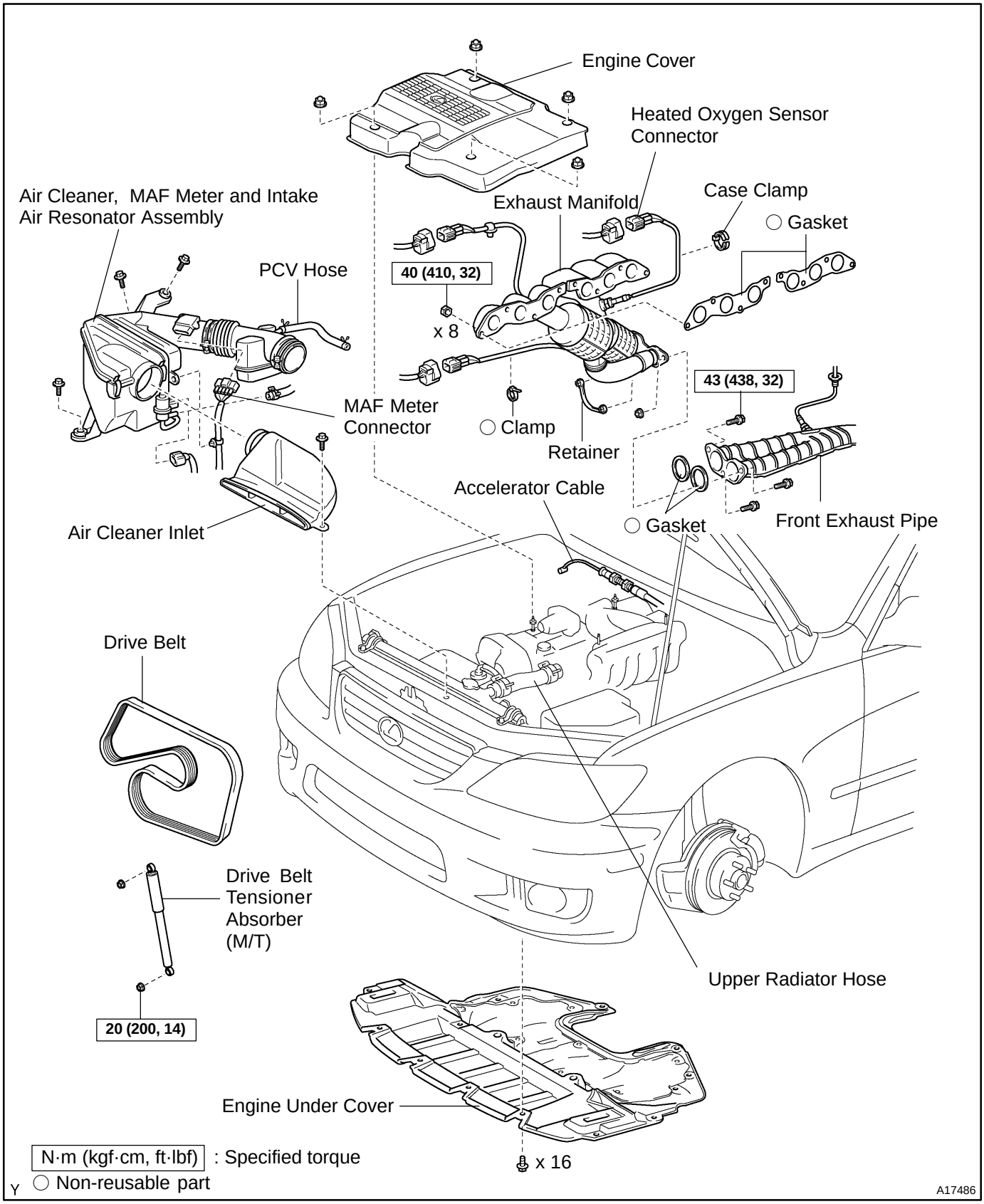
Check for abnormal noise, shock, slippage, correct shift points and smooth operation.

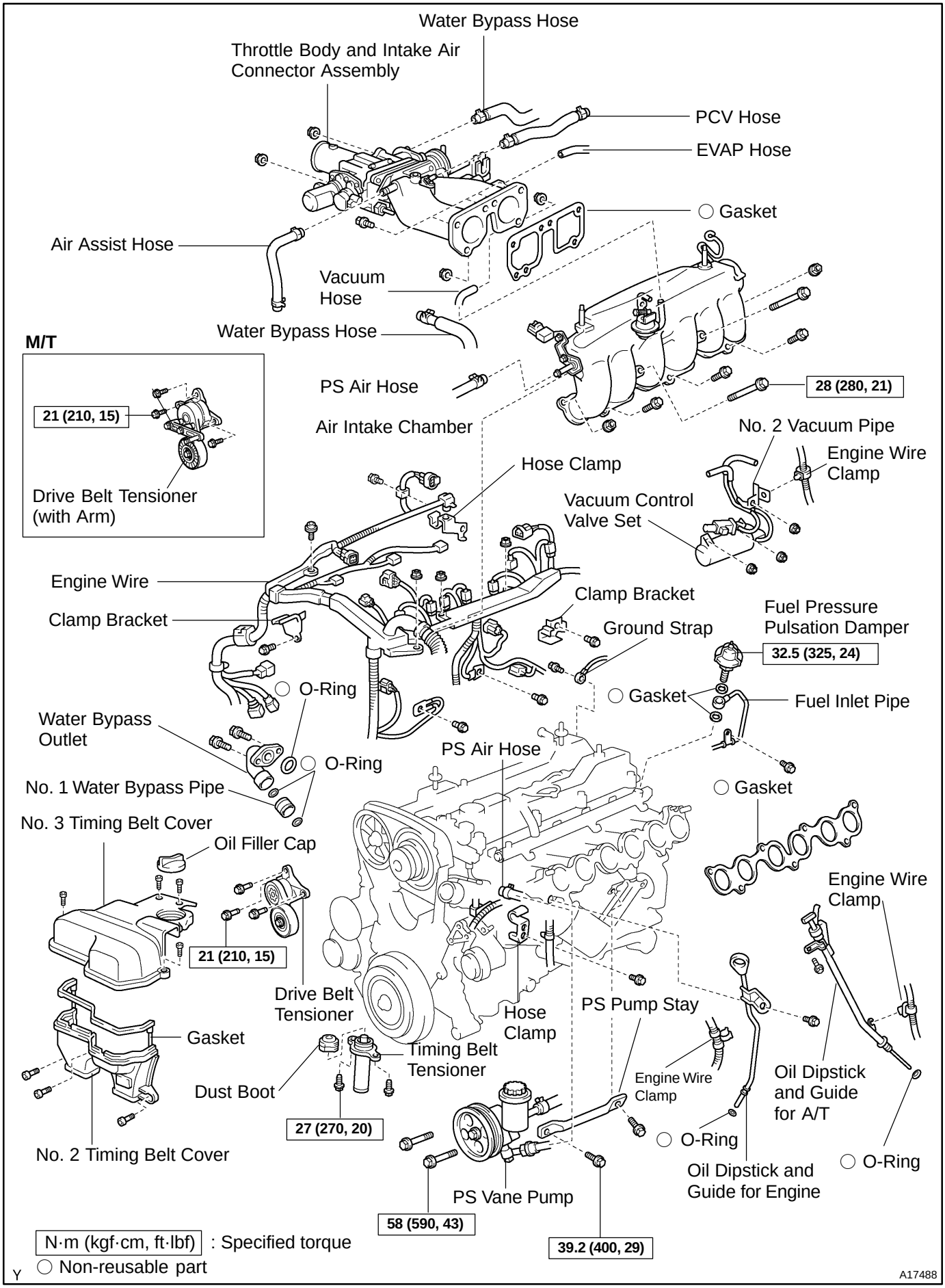
30. RECHECK ENGINE COOLANT LEVEL

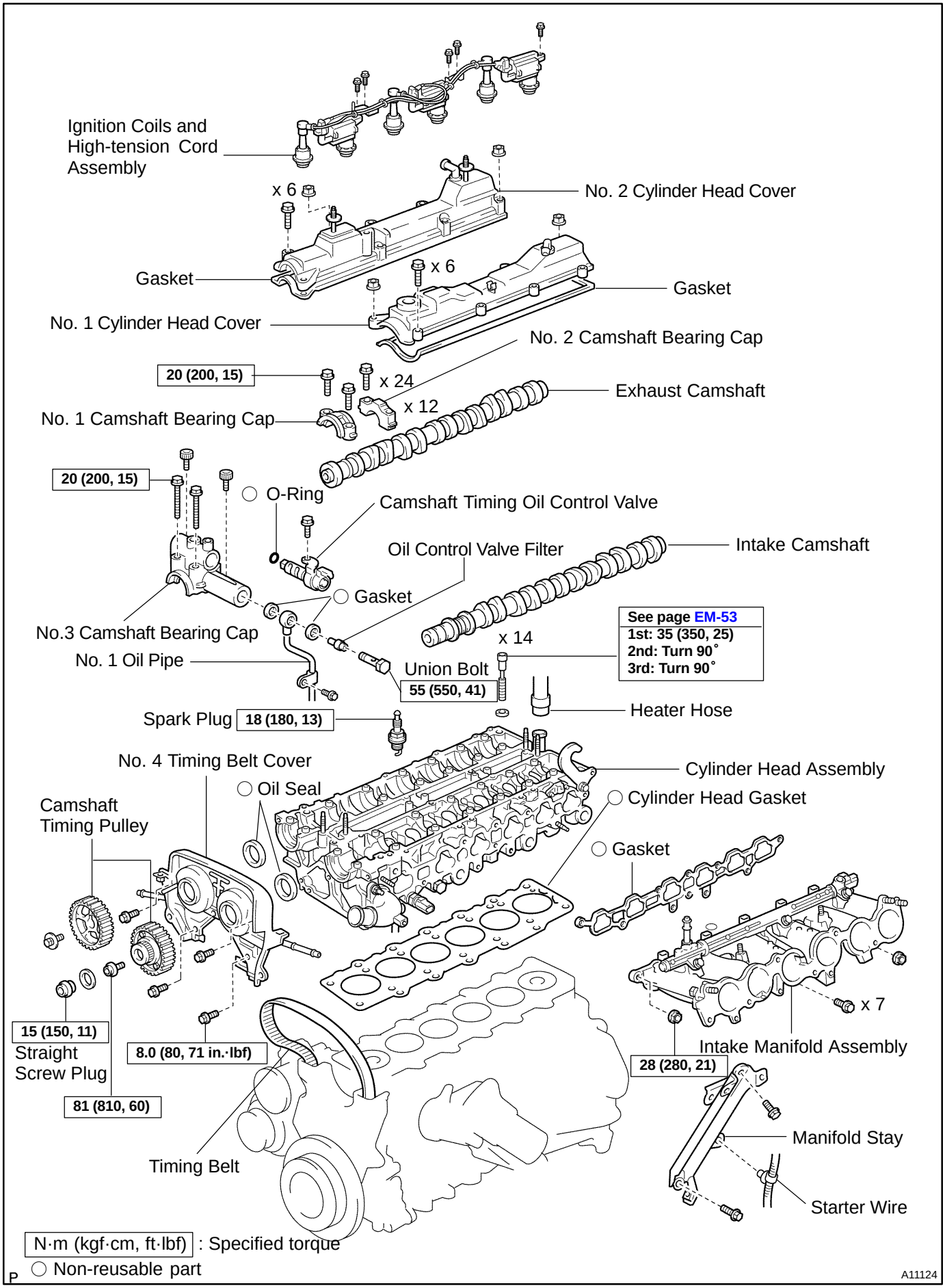
CYLINDER HEAD

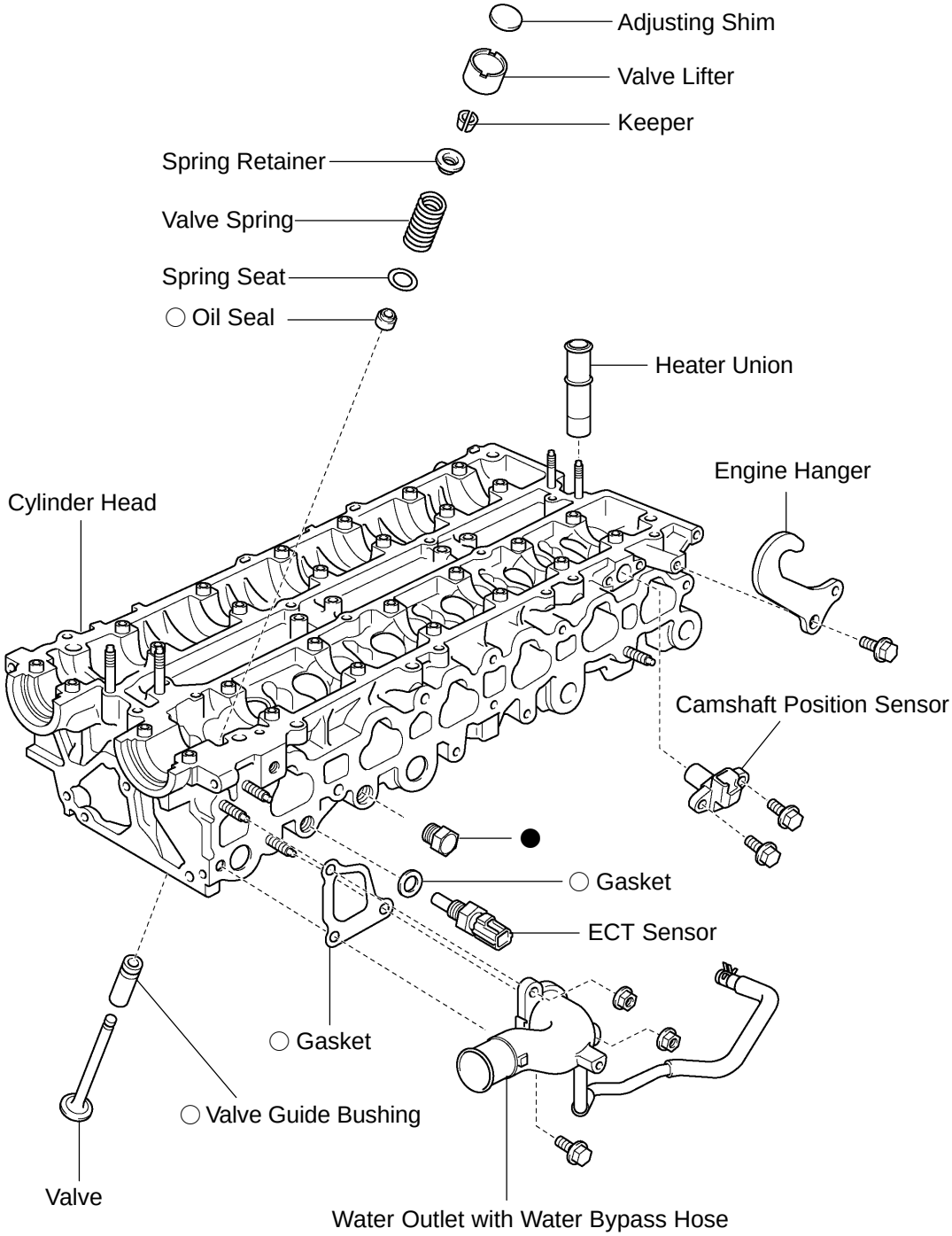
COMPONENTS

EM0D9-09




Water Bypass Hose
Throttle Body and Intake Air Connector Assembly
PCV Hose
EVAP Hose
○ Gasket
Air Assist Hose
Vacuum Hose
Water Bypass Hose
M/T
21 (210, 15)
Drive Belt Tensioner (with Arm)
PS Air Hose
28 (280, 21)
Air Intake Chamber
No. 2 Vacuum Pipe
Engine Wire Clamp
Hose Clamp
Vacuum Control Valve Set
Engine Wire
Clamp Bracket
Clamp Bracket
Ground Strap
Fuel Pressure Pulsation Damper
32.5 (325, 24)
○ O-Ring
○ Gasket
Fuel Inlet Pipe
Water Bypass Outlet
PS Air Hose
○ O-Ring
No. 1 Water Bypass Pipe
○ Gasket
No. 3 Timing Belt Cover
Oil Filler Cap
Engine Wire Clamp
21 (210, 15)
Drive Belt Tensioner
Hose Clamp
PS Pump Stay
Gasket
Timing Belt Tensioner
Engine Wire Clamp
Oil Dipstick and Guide for A/T
Dust Boot
27 (270, 20)
○ O-Ring
○ O-Ring
No. 2 Timing Belt Cover
Oil Dipstick and Guide for Engine
PS Vane Pump
58 (590, 43)
39.2 (400, 29)
N·m (kgf·cm, ft·lbf) : Specified torque
○ Non-reusable part
Y
A17488


Ignition Coils and High-tension Cord Assembly
x 6
No. 2 Cylinder Head Cover
Gasket
x 6
Gasket
No. 1 Cylinder Head Cover
No. 2 Camshaft Bearing Cap
20 (200, 15)
x 24
x 12
Exhaust Camshaft
No. 1 Camshaft Bearing Cap
20 (200, 15)
O-Ring
Camshaft Timing Oil Control Valve
Oil Control Valve Filter
Intake Camshaft
Gasket
No.3 Camshaft Bearing Cap
See page EM-53
1st: 35 (350, 25)
2nd: Turn 90°
3rd: Turn 90°
x 14
No. 1 Oil Pipe
Union Bolt
55 (550, 41)
Heater Hose
Spark Plug
18 (180, 13)
No. 4 Timing Belt Cover
Cylinder Head Assembly
Oil Seal
Cylinder Head Gasket
Camshaft Timing Pulley
Gasket
x 7
15 (150, 11)
Straight Screw Plug
8.0 (80, 71 in.·lbf)
Intake Manifold Assembly
28 (280, 21)
81 (810, 60)
Manifold Stay
Timing Belt
Starter Wire
N·m (kgf·cm, ft·lbf) : Specified torque
Non-reusable part
A11124



○ Non-reusable part
Y ● Precoated part

A14344

EM1J9-03

REMOVAL

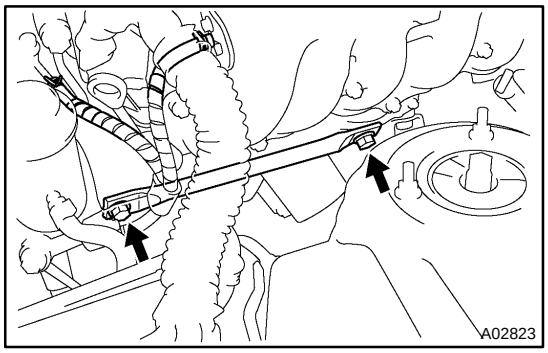
1. **REMOVE ENGINE UNDER COVER**
2. **DRAIN ENGINE COOLANT**
3. **DISCONNECT UPPER RADIATOR HOSE FROM WATER OUTLET**
4. **REMOVE ENGINE COVER**

Remove the 4 nuts and engine cover.

5. **REMOVE AIR CLEANER INLET**
6. **REMOVE AIR CLEANER, MAF METER AND INTAKE AIR RESONATOR ASSEMBLY (See page EM-65)**
7. **M/T:**
   REMOVE DRIVE BELT TENSIONER ABSORBER

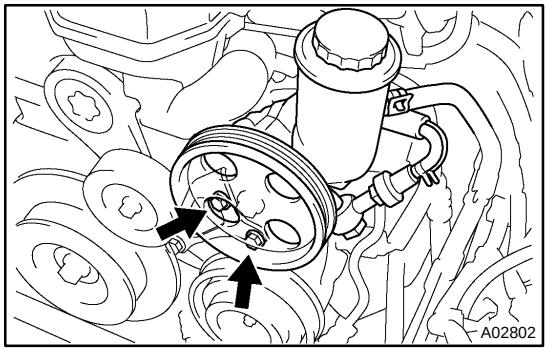
Remove the 2 nuts and absorber.

8. **REMOVE DRIVE BELT (See page CH-1)**



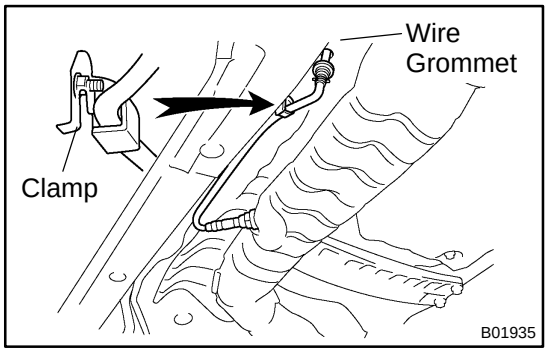
9. **DISCONNECT PS PUMP WITHOUT DISCONNECTING HOSES**

(a) Disconnect the PS air hose from the No. 4 timing belt cover.
(b) Disconnect the PS air hose from the air intake chamber.
(c) Remove the 2 bolts and pump rear stay.



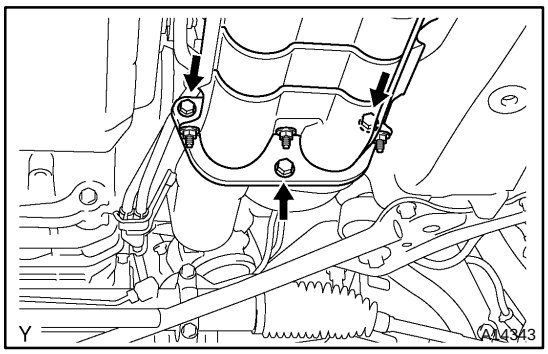
(d) Remove the 2 bolts, and disconnect the vane pump from the pump bracket.

HINT:
Put aside the vane pump, and suspend it.

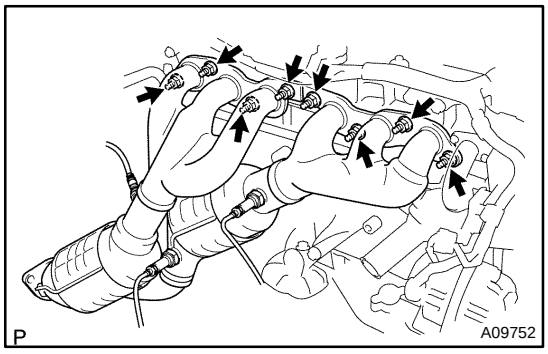


10. **DISCONNECT FRONT EXHAUST PIPE FROM EXHAUST MANIFOLD**

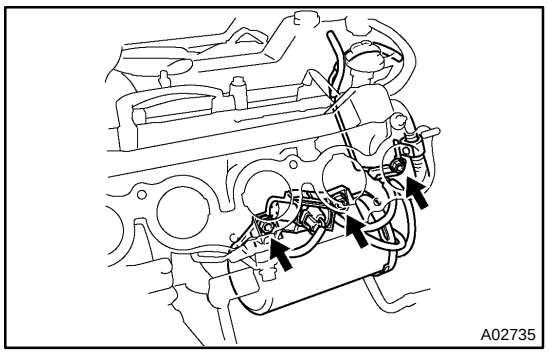
(a) Disconnect the wire grommet and sensor wire of the heated oxygen sensor (bank 2 sensor 2) from the hole and clamp on the floor.



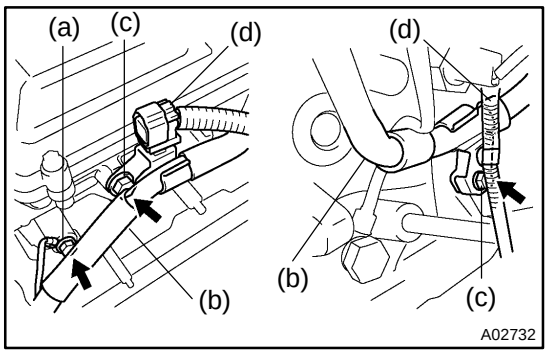
(b) Remove the 3 bolts, nuts and retainer holding the front exhaust pipe to the exhaust manifold.
(c) Disconnect the front exhaust pipe from the exhaust manifold, and remove the 2 gaskets.



11. REMOVE EXHAUST MANIFOLD
(a) Disconnect the 3 heated oxygen sensor connectors and clamp.
(b) Remove the clamp and case clamp.
(c) Using a 14 mm deep socket wrench, remove the 8 nuts, exhaust manifold and 2 gaskets.
12. REMOVE WATER BYPASS OUTLET AND NO. 1 WATER BYPASS PIPE (See page CO-12)
13. REMOVE THROTTLE BODY AND INTAKE AIR CONNECTOR ASSEMBLY (See page EM-5)
14. REMOVE OIL DIPSTICK AND GUIDE FOR ENGINE (See page LU-6)
15. REMOVE OIL DIPSTICK AND GUIDE FOR A/T (See page EM-65)
16. REMOVE AIR INTAKE CHAMBER (See page SF-46)

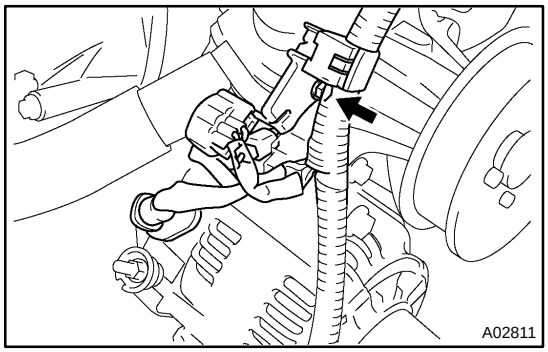


17. REMOVE VACUUM CONTROL VALVE SET AND NO. 2 VACUUM PIPE
(a) Disconnect the VSV connector for the ACIS.
(b) Remove the 3 nuts, vacuum control valve set and No. 2 vacuum pipe.
(c) Disconnect the engine wire clamp from the clamp bracket of the No. 2 vacuum pipe.
18. REMOVE NO. 3 TIMING BELT COVER
19. REMOVE IGNITION COILS AND HIGH- TENSION CORD SET ASSEMBLY (See page IG-7)
20. REMOVE SPARK PLUGS

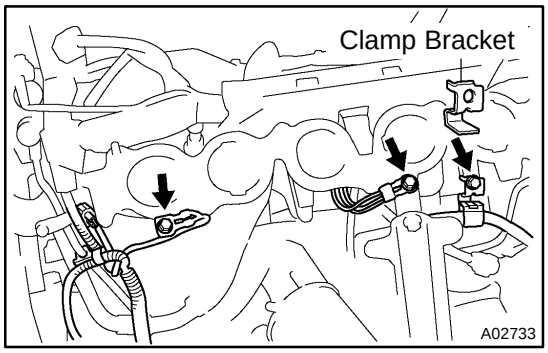


21. DISCONNECT ENGINE WIRE FROM CYLINDER HEAD

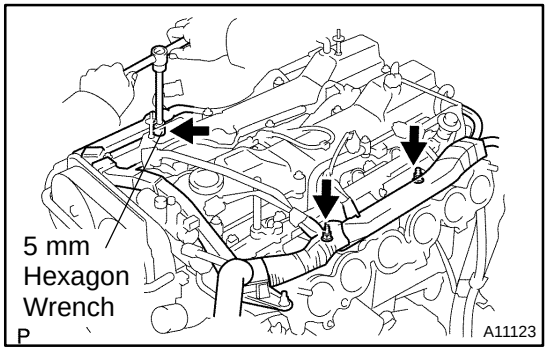
(a) Disconnect the ground strap from the cylinder head.
(b) Disconnect the 2 water bypass hoses from the hose clamps on the cylinder head and oil filter bracket.
(c) Remove the 2 bolts and hose clamps.
(d) Disconnect the heated oxygen sensor (bank 2 sensor 1) connector and engine wire clamp from the hose clamps.



(e) Disconnect the heated oxygen sensor (bank 1 sensor 1) connector.
(f) Disconnect the crankshaft position sensor connector.
(g) Disconnect the generator connector.
(h) Remove the bolt and clamp bracket, and disconnect the engine wire from the water pump.

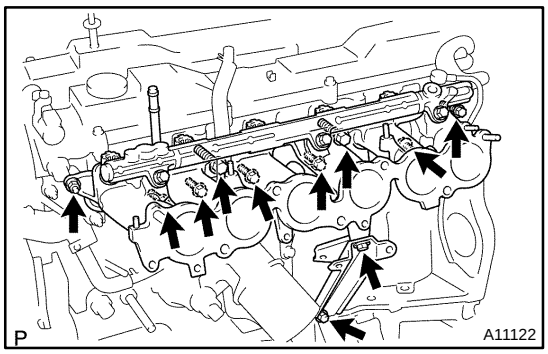


(i) Disconnect the 2 ground terminals from the intake manifold.
(j) Disconnect the 2 engine wire clamps from the No. 1 oil pipe and clamp bracket on the intake manifold.
(k) Remove the bolt and clamp bracket.
(l) Disconnect the ECT sensor connector.
(m) Remove the 2 knock sensor connectors.
(n) Remove the oil pressure switch connector.
(o) Remove the oil level sensor connector.
(p) Remove the starter connector.
(q) Remove the 6 injector connectors.
(r) Remove the camshaft timing oil control valve connector.
(s) Remove the camshaft position sensor connector.



(t) Using a 5 mm hexagon wrench, remove the bolt holding the engine wire protector to the No. 2 cylinder head cover.
(u) Remove the 3 nuts, and disconnect the engine wire protector from the intake manifold.

22. REMOVE FUEL PRESSURE PULSATION DAMPER (See page SF-26)

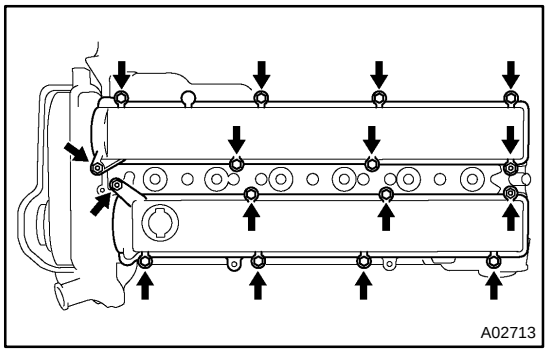


23. REMOVE INTAKE MANIFOLD ASSEMBLY

(a) Disconnect the starter wire from the manifold stay.

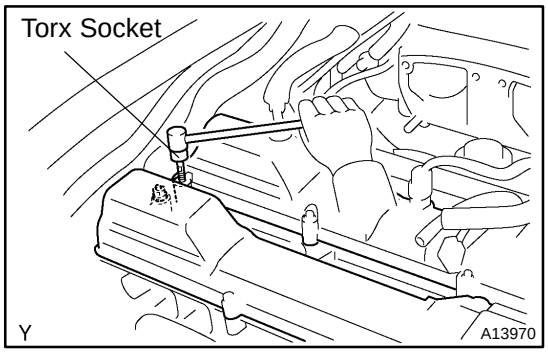
(b) Remove the 2 bolts and manifold stay.

(c) Remove the 7 bolts, 2 nuts, the intake manifold and delivery pipe assembly and gasket.



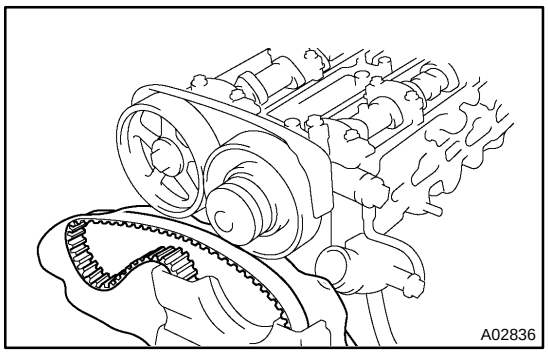
24. REMOVE NO. 1 AND NO. 2 CYLINDER HEAD COVERS

(a) Remove the 12 bolts and 4 nuts.



(b) Using a torx socket (E5), remove the 4 stud bolts.

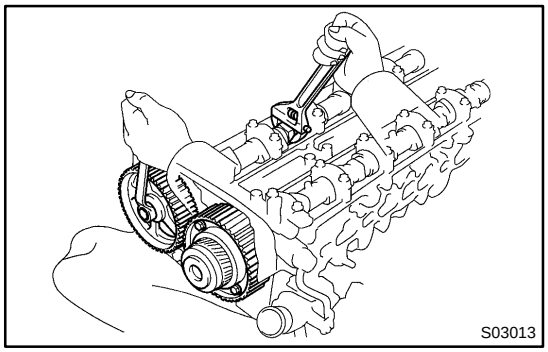
(c) Remove the cylinder head covers and gaskets.



25. DISCONNECT TIMING BELT FROM CAMSHAFT TIMING PULLEYS (See page EM-17)

NOTICE:

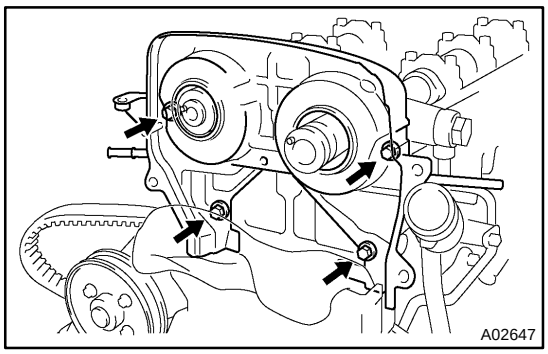
- **Support the timing belt, so that the measuring of the crankshaft timing pulley and timing belt does not shift.**
- **Be careful not to drop anything inside the timing belt cover.**
- **Do not allow the timing belt to come into contact with oil, water or dust.**



26. REMOVE CAMSHAFT TIMING PULLEYS

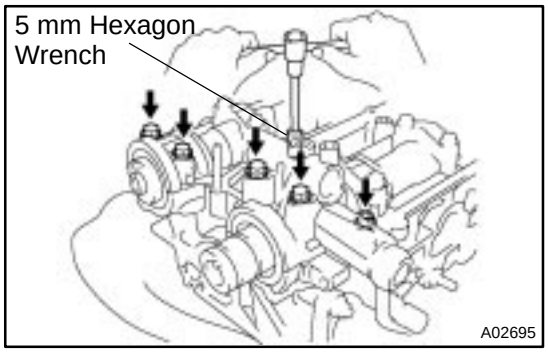
(a) Remove the exhaust camshaft timing pulley.
Hold the hexagon portion of the camshaft with a wrench, and remove the pulley bolt and camshaft pulley.

(b) Remove the VVT-i (intake camshaft timing) pulley (See page EM-17).



27. REMOVE NO. 4 TIMING BELT COVER

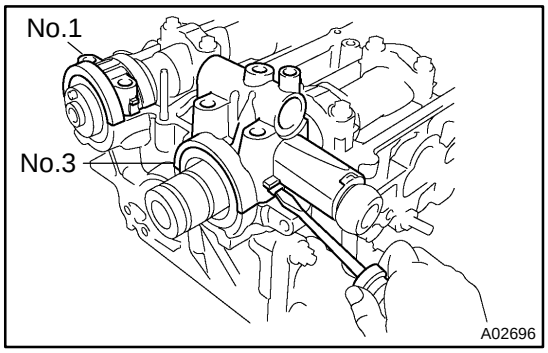
Remove the 4 bolts and timing belt cover.



28. REMOVE CAMSHAFTS

(a) Using a 5 mm hexagon wrench, the 2 No. 3 camshaft bearing cap bolts.

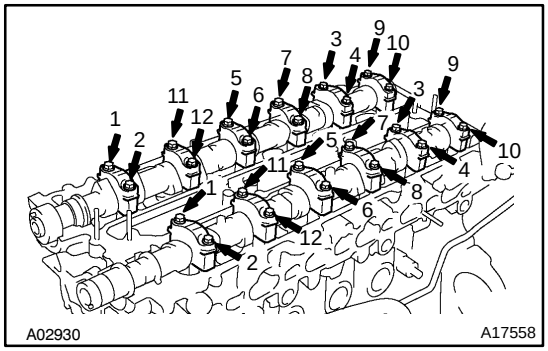
(b) Uniformly loosen and remove the 4 camshaft bearing cap bolts.



(c) Using a screwdriver, pry out the Nos. 1, 3 camshaft bearing caps and oil seals.

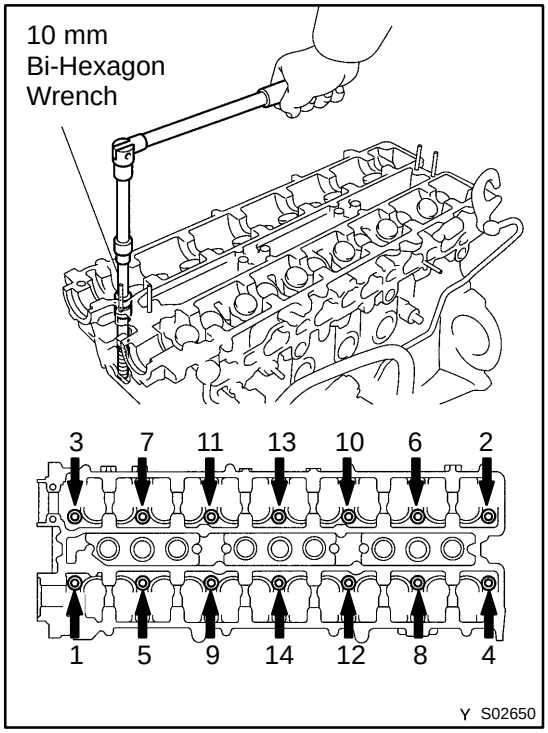
NOTICE:

Be careful not to damage the cap. Tape the screwdriver tip.



(d) Uniformly loosen and remove the 12 camshaft bearing cap bolts, in several passes, in the sequence shown.

(e) Remove the 6 No. 2 camshaft bearing caps and camshaft. Remove the intake and exhaust camshafts.



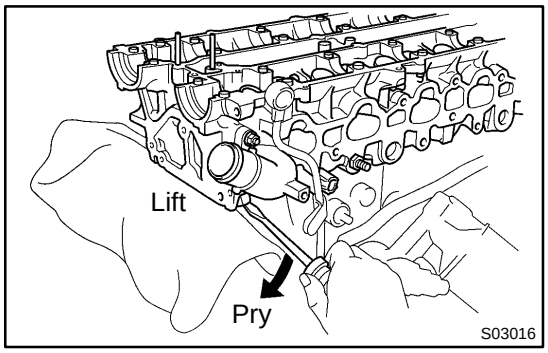
29. REMOVE CYLINDER HEAD ASSEMBLY

(a) Using a 10 mm bi-hexagon wrench, uniformly loosen and remove the 14 cylinder head bolts, in several passes, in the sequence shown.

NOTICE:

Cylinder head warpage or cranking could result from removing in incorrect order.

(b) Remove the 14 plate washers.



(c) Lift the cylinder head from the dowels on the cylinder block.

(d) Disconnect the heater hose from the heater union.

(e) Place the head on wooden blocks on a bench.

If the cylinder head is difficult to lift off, pry with a screwdriver between the cylinder head and block projection.

NOTICE:

Be careful not to damage the contact surfaces of the cylinder head and cylinder block.

EM0DB-05

DISASSEMBLY

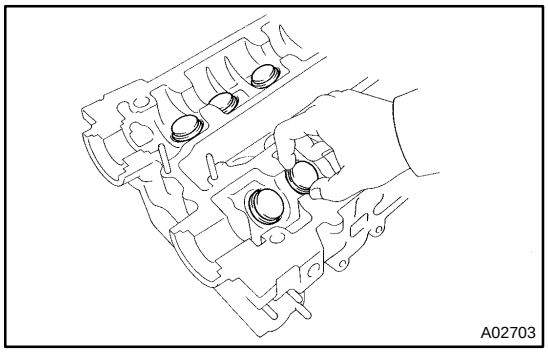
1. REMOVE WATER OUTLET WITH WATER BYPASS HOSE

Remove the 2 nuts, bolt, water outlet and gasket.

2. REMOVE ENGINE HANGER

3. REMOVE CAMSHAFT POSITION SENSOR

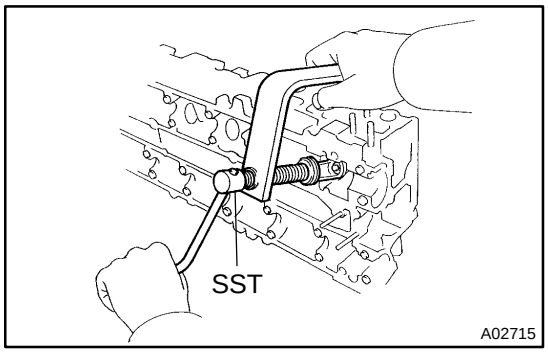
4. REMOVE ECT SENSOR



5. REMOVE VALVE LIFTERS AND SHIMS

HINT:

Store the valve lifters and shims in correct order.



6. REMOVE VALVES

(a) Using SST, compress the valve spring and remove the 2 keepers.

SST 09202-70020 (09202-00010)

(b) Remove the spring retainer, valve spring, valve and spring seat.

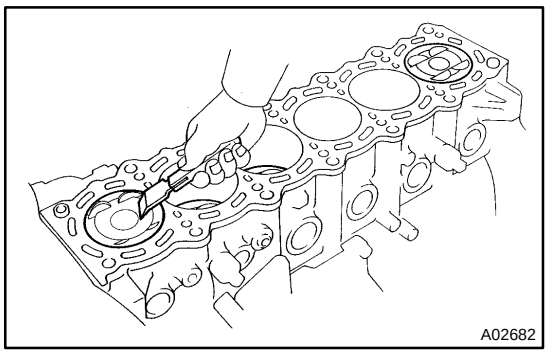
HINT:

Store the valves, valve springs, spring seats and spring retainers in correct order.

(c) Using needle-nose pliers, remove the oil seal.

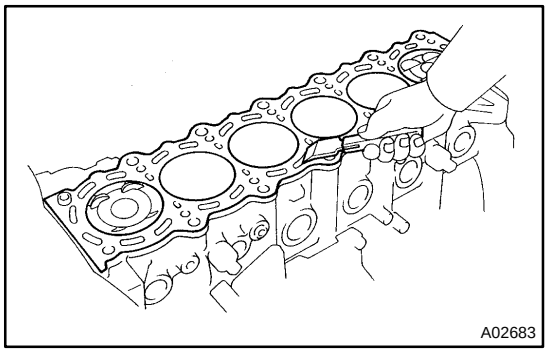
EM0DC-06

INSPECTION



1. CLEAN TOP SURFACES OF PISTONS AND CYLINDER BLOCK

(a) Turn the crankshaft, and bring each piston to top dead center (TDC). Using a gasket scraper, remove all the carbon from the piston top surface.



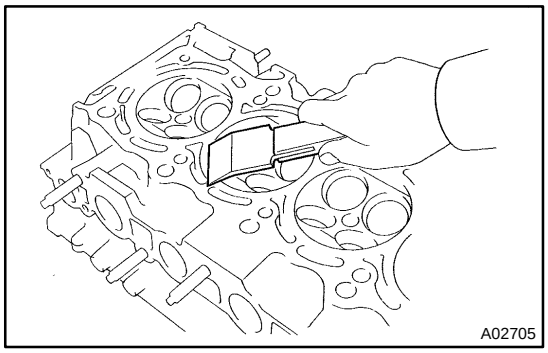
(b) Using a gasket scraper, remove all the gasket material from the top surface of the cylinder block.

(c) Using compressed air, blow carbon and oil from the bolt holes.

CAUTION:

Protect your eyes when using high - pressure compressed air.

2. INSPECT CYLINDER BLOCK FOR FLATNESS (See page EM-87)



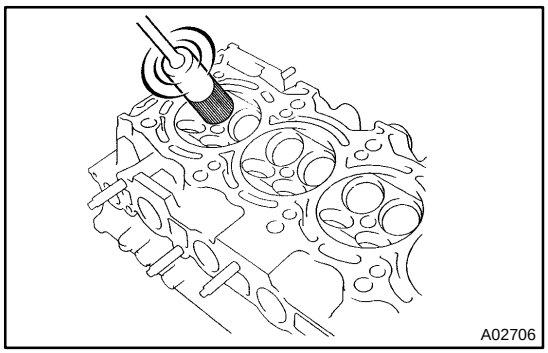
3. CLEAN CYLINDER HEAD

(a) Remove the gasket material.

Using a gasket scraper, remove all the gasket material from the cylinder block surface.

NOTICE:

Be careful not to scratch the cylinder block contact surface.

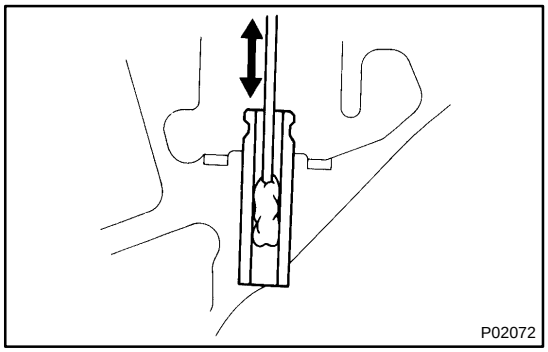


(b) Clean the combustion chambers.

Using a wire brush, remove all the carbon from the combustion chambers.

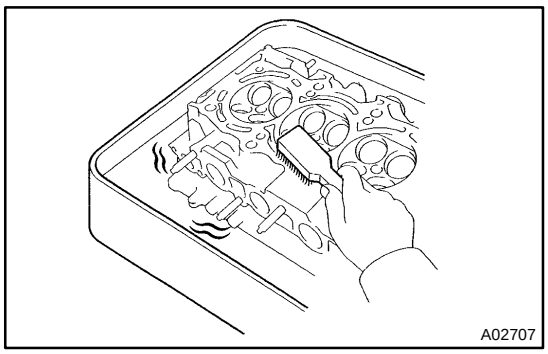
NOTICE:

Be careful not to scratch the cylinder block contact surface.

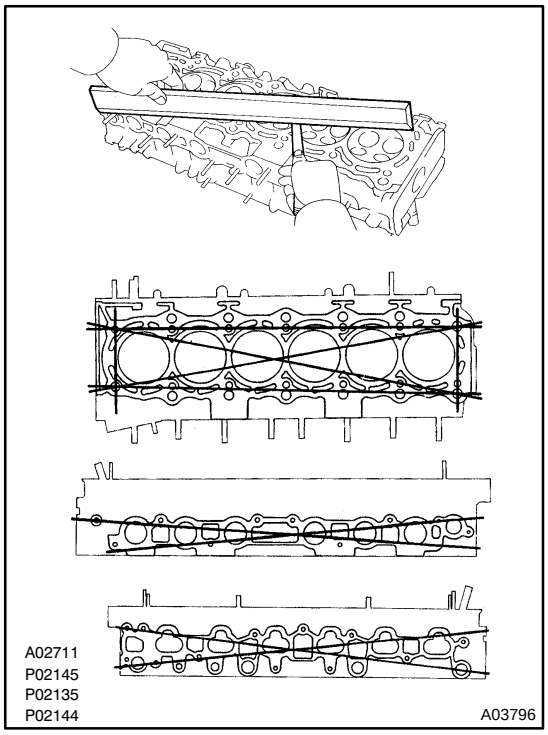


(c) Clean the valve guide bushings.

Using a valve guide bushing brush and solvent, clean all the guide bushings.



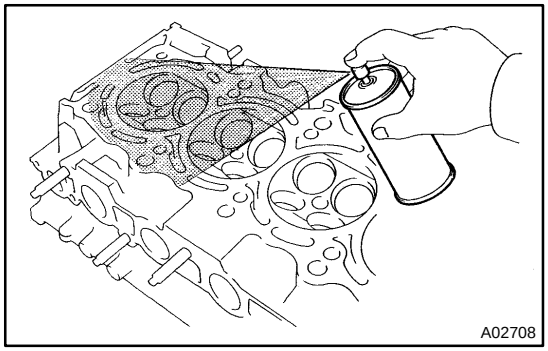
(d) Clean the cylinder head.
Using a soft brush and solvent, thoroughly clean the cylinder head.



4. INSPECT CYLINDER HEAD

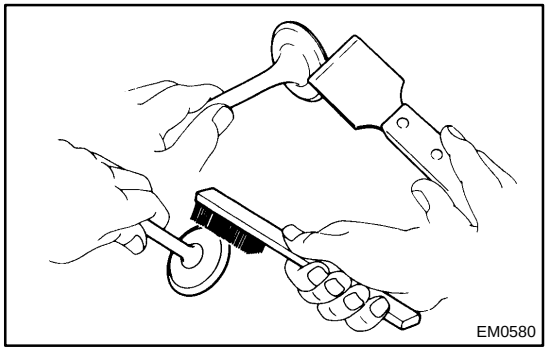
(a) Inspect for the flatness.
Using precision straight edge and feeler gauge, measure the surfaces contacting the cylinder block, intake and exhaust manifolds for warpage.
Maximum warpage: 0.10 mm (0.0039 in.)

If warpage is greater than maximum, replace the cylinder head.



(b) Inspect for the cranks.
Using a dye penetrant, check the combustion chamber, intake ports, exhaust ports and cylinder block surface for cracks.

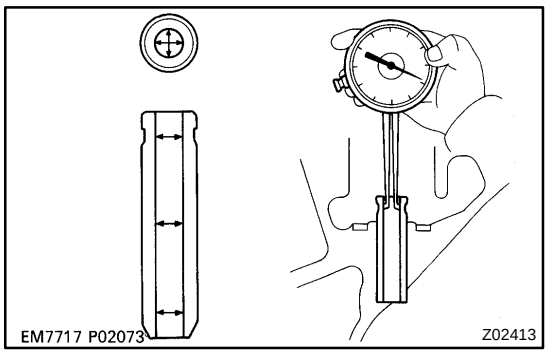
If cracked, replace the cylinder head.



5. CLEAN VALVES

(a) Using a gasket scraper, chip off any carbon from the valve head.

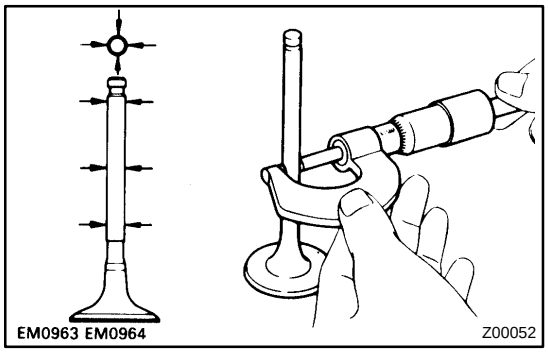
(b) Using a wire brush, thoroughly clean the valve.



6. INSPECT VALVE STEMS AND GUIDE BUSHINGS

(a) Using a caliper gauge, measure the inside diameter of the guide bushing.

Bushing inside diameter:
6.010 - 6.030 mm (0.2366 - 0.2374 in.)



(b) Using a micrometer, measure the diameter of the valve stem.

Valve stem diameter:

Intake	5.970 - 5.985 mm (0.2350 - 0.2356 in.)
Exhaust	5.965 - 5.980 mm (0.2348 - 0.2354 in.)

(c) Subtract the valve stem diameter measurement from the guide bushing inside diameter measurement.

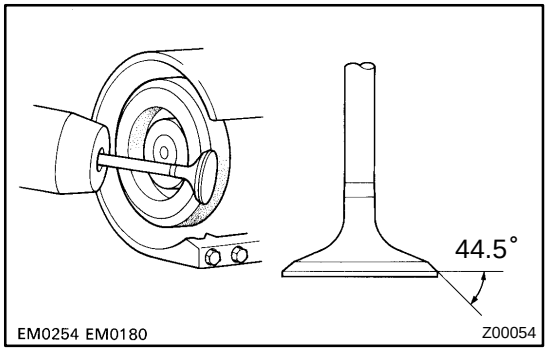
Standard oil clearance:

Intake	0.025 - 0.060 mm (0.0010 - 0.0024 in.)
Exhaust	0.030 - 0.065 mm (0.0012 - 0.0026 in.)

Maximum oil clearance:

Intake	0.08 mm (0.0031 in.)
Exhaust	0.10 mm (0.0039 in.)

If the clearance is greater than maximum, replace the valve and guide bushing (See page EM-49).

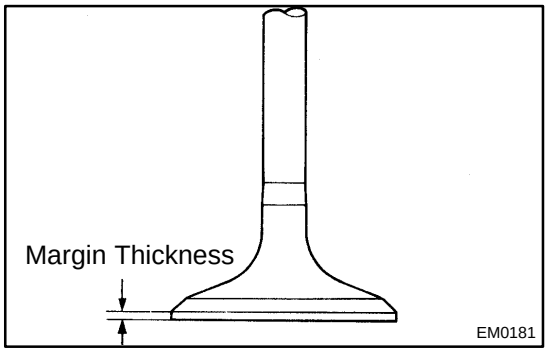


7. INSPECT AND GRIND VALVES

(a) Grind the valve enough to remove pits and carbon.

(b) Check that the valve is ground to the correct valve face angle.

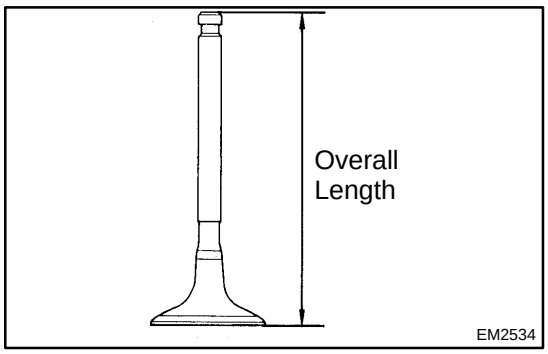
Valve face angle: 44.5°



(c) Check the valve head margin thickness.

Standard margin thickness:
0.8 - 1.2 mm (0.031 - 0.047 in.)
Minimum margin thickness: 0.5 mm (0.020 in.)

If the margin thickness is less than minimum, replace the valve.



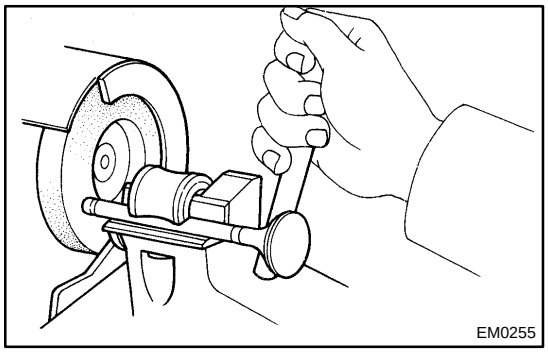
(d) Check the valve overall length.

Standard overall length:

Intake	98.29 - 98.79 mm (3.8697 - 3.8894 in.)
Exhaust	98.84 - 99.34 mm (3.8913 - 3.9110 in.)

Minimum overall length:

Intake	98.19 mm (3.8657 in.)
Exhaust	98.74 mm (3.8874 in.)



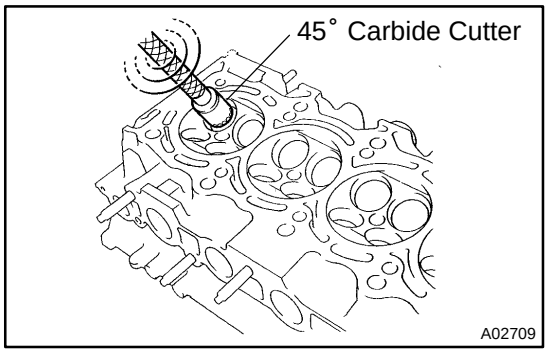
If the overall length is less than minimum, replace the valve.

(e) Check the surface of the valve stem tip for wear.

If the valve stem tip is worn, resurface the tip with a grinder or replace the valve.

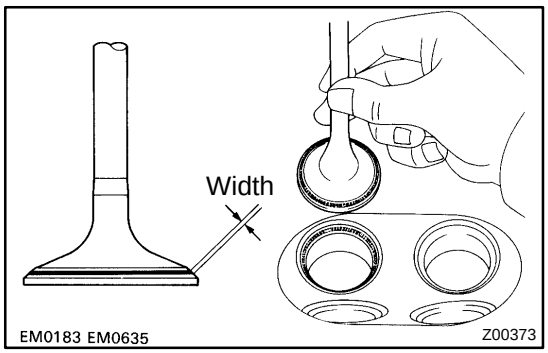
NOTICE:

Do not grind off more than the minimum overall length.



8. INSPECT AND CLEAN VALVE SEATS

(a) Using a 45˚ carbide cutter, resurface the valve seats. Remove only enough metal to clean the seats.



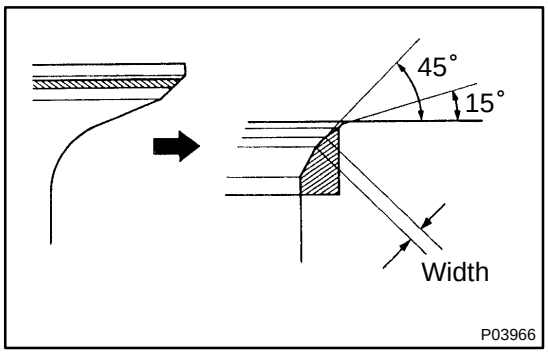
(b) Check the valve seating position.

Apply a thin coat of Prussian blue (or white lead) to the valve face. Lightly press the valve against the seat. Do not rotate the valve.

(c) Check the valve face and seat for the following:

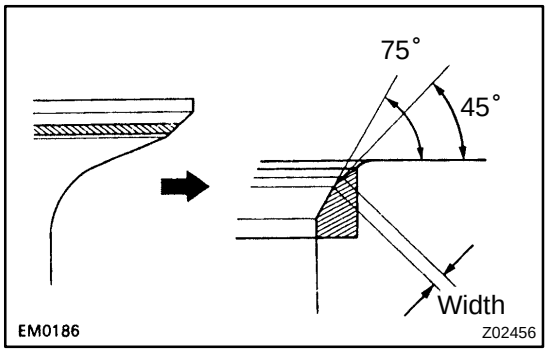
- If blue appears 360˚ around the face, the valve is concentric. If not, replace the valve.
- If blue appears 360˚ around the valve seat, the guide and face are concentric. If not, resurface the seat.
- Check that the seat contact is in the middle of the valve face with the following width:

Intake	1.0 - 1.4 mm (0.039 - 0.055 in.)
Exhaust	1.2 - 1.6 mm (0.047 - 0.063 in.)

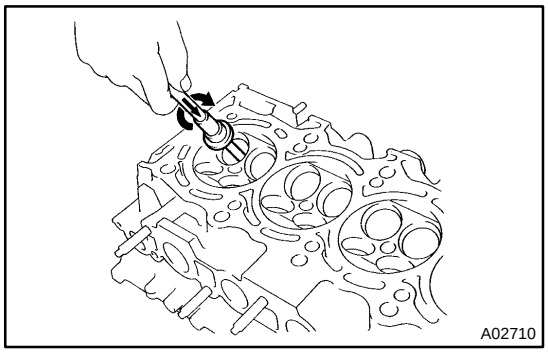


If not, correct the valve seats as follows:

(1) If the seating is too high on the valve face, use 15˚ and 45˚ cutters to correct the seat.

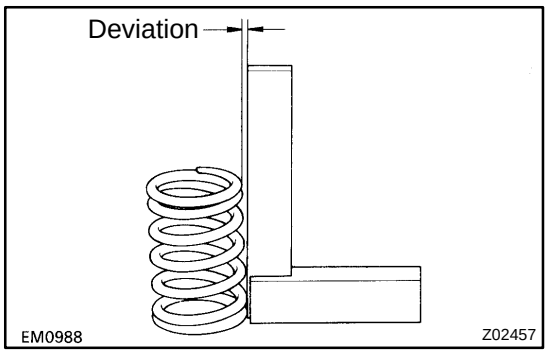


(2) If the seating is too low on the valve face, use 75˚ and 45˚ cutters to correct the seat.



(d) Hand-lap the valve and valve seat with an abrasive compound.

(e) After hand-lapping, clean the valve and valve seat.

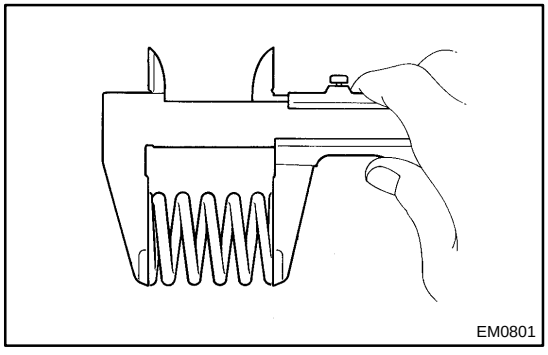


9. INSPECT VALVE SPRINGS

(a) Using a steel square, measure the deviation of the valve spring.

Maximum deviation: 2.0 mm (0.079 in.)

If deviation is greater than maximum, replace the valve spring.

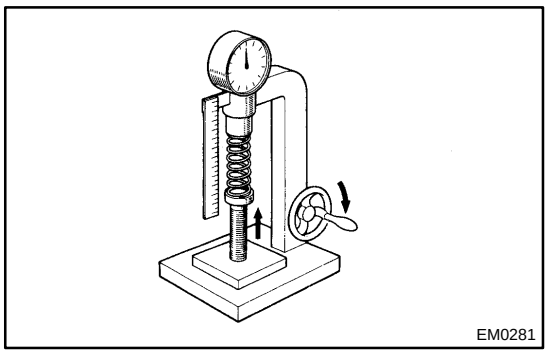


(b) Using vernier calipers, measure the free length of the valve spring.

Free length:

Pink painted mark	43.71 mm (1.7209 in.)
Yellow painted mark	44.10 mm (1.7362 in.)

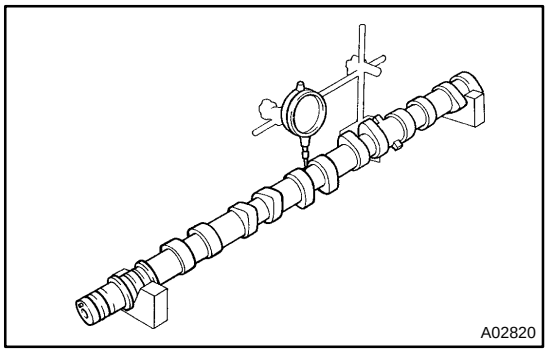
If the free length is not as specified, replace the valve spring.


EM0281

(c) Using a spring tester, measure the tension of the valve spring at the specified installed length.

Installed tension:
186.2 - 205.8 N (19.0 - 21.0 kgf, 41.9 - 46.3 lbf)
at 34.5 mm (1.358 in.)

If the installed tension is not as specified, replace the valve spring.


A02820

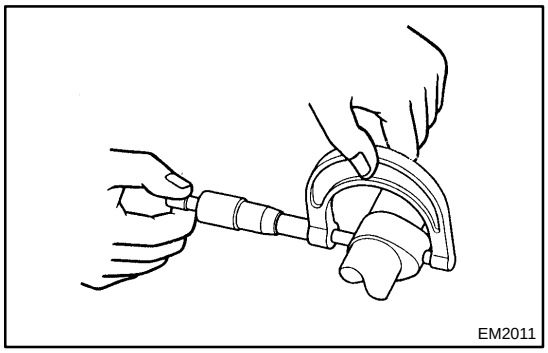
10. INSPECT CAMSHAFTS FOR RUNOUT

(a) Place the camshaft on V-blocks.

(b) Using a dial indicator, measure the circle runout at the center journal.

Maximum circle runout: 0.08 mm (0.0031 in.)

If the circle runout is greater than maximum, replace the camshaft.


EM2011

11. INSPECT CAM LOBES

Using a micrometer, measure the cam lobe height.

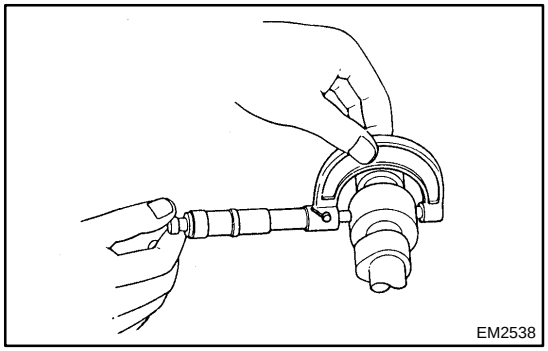
Standard cam lobe height:

Intake	44.310 - 44.360 mm (1.7445 - 1.7465 in.)
Exhaust	44.250 - 44.350 mm (1.7421 - 1.7461 in.)

Minimum cam lobe height:

Intake	44.16 mm (1.7386 in.)
Exhaust	44.10 mm (1.7362 in.)

If the lobe height is less than minimum, replace the camshaft.


EM2538

12. INSPECT CAMSHAFT JOURNALS

Using a micrometer, measure the journal diameter.

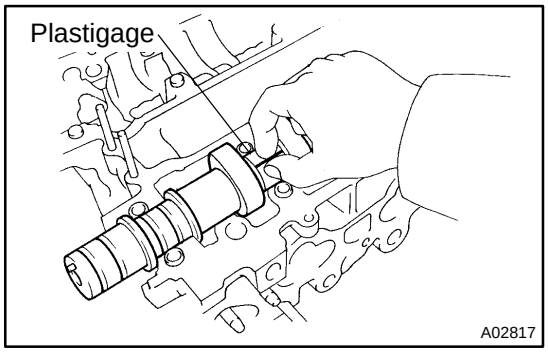
Journal diameter:
28.949 - 28.965 mm (1.1397 - 1.1404 in.)

If the journal diameter is not as specified, check the oil clearance.

13. INSPECT CAMSHAFT BEARING

Check the bearings for flaking and scoring.

If the bearings are damaged, replace the bearing caps and cylinder head as a set.



A02817

14. INSPECT CAMSHAFT JOURNAL OIL CLEARANCE

(a) Clean the bearing caps and camshaft journals.

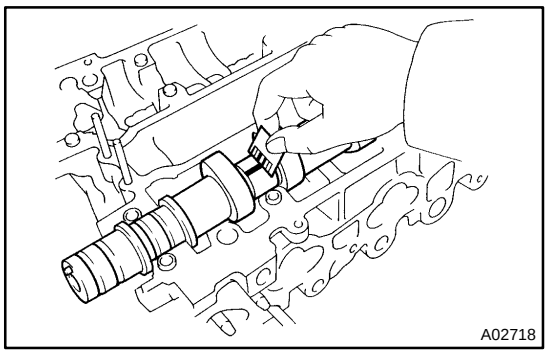
(b) Place the camshafts on the cylinder head.

(c) Lay a strip of Plastigage across each of the camshaft journals.

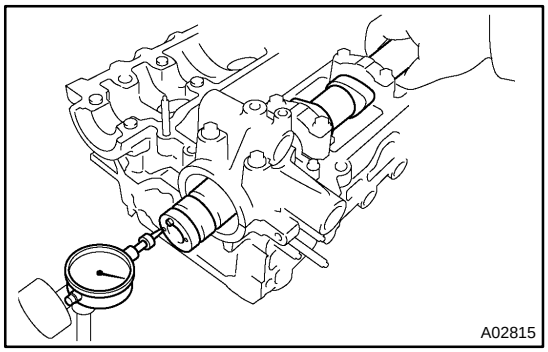
(d) Install the bearing caps (See page EM-53).

NOTICE:
Do not turn the camshaft.

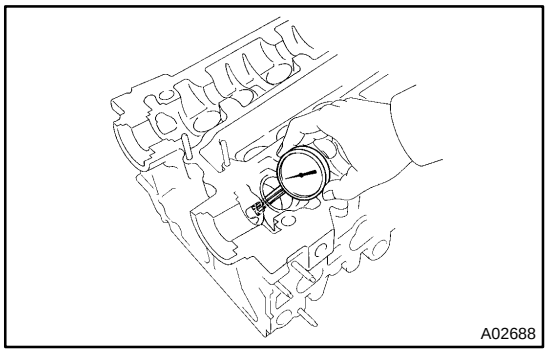
(e) Remove the bearing caps.


A02718

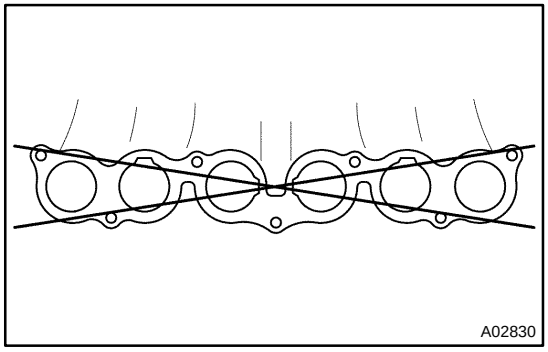
(f) Measure the Plastigage at its widest point.
Standard oil clearance:
0.035 - 0.072 mm (0.0014 - 0.0028 in.)
Maximum oil clearance: 0.10 mm (0.0039 in.)
If the oil clearance is greater than maximum, replace the camshaft. If necessary, replace the bearing caps and cylinder head as a set.
(g) Completely remove the Plastigage.


A02815

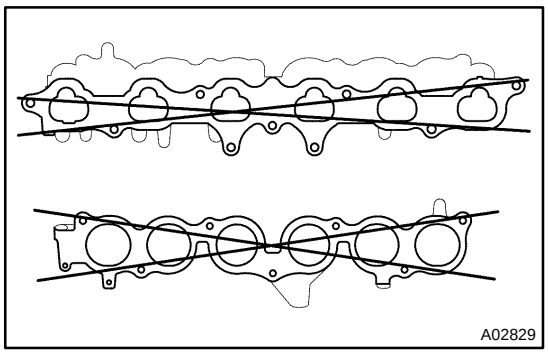
15. INSPECT CAMSHAFT THRUST CLEARANCE
(a) Install the camshafts (See page EM-53).
(b) Using a dial indicator, measure the thrust clearance while moving the camshaft back and forth.
Standard thrust clearance:
0.080 - 0.190 mm (0.0031 - 0.0075 in.)
Maximum thrust clearance: 0.30 mm (0.0118 in.)
If the thrust clearance is greater than maximum, replace the camshaft. If necessary, replace the bearing caps and cylinder head as a set.


A02688

16. INSPECT VALVE LIFTERS AND LIFTER BORES
(a) Using a caliper gauge, measure the lifter bore diameter of the cylinder head.
Lifter bore diameter:
31.000 - 31.016 mm (1.2205 - 1.2211 in.)
(b) Using a micrometer, measure the lifter diameter.
Lifter diameter:
30.966 - 30.976 mm (1.2191 - 1.2195 in.)
(c) Subtract the lifter diameter measurement from the lifter bore diameter measurement.
Standard oil clearance:
0.024 - 0.050 mm (0.0009 - 0.0020 in.)
Maximum oil clearance: 0.07 mm (0.0028 in.)
If the oil clearance is greater than maximum, replace the lifter. If necessary, replace the cylinder head.


A02830

17. INSPECT AIR INTAKE CHAMBER
Using a precision straight edge and feeler gauge, measure the surfaces contacting the intake manifold for warpage.
Maximum warpage: 0.15 mm (0.0059 in.)
If warpage is greater than maximum, replace the chamber.

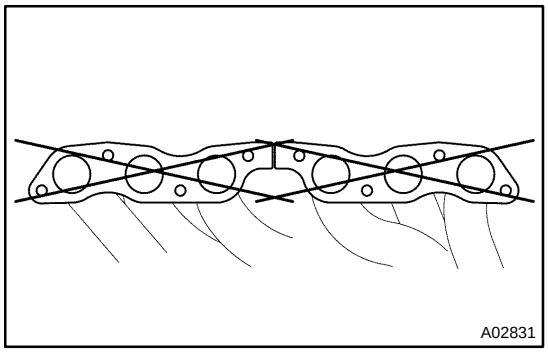


18. INSPECT INTAKE MANIFOLD

Using a precision straight edge and feeler gauge, measure the surfaces contacting the cylinder head and air intake chamber for warpage.

Maximum warpage: 0.15 mm (0.0059 in.)

If warpage is greater than maximum, replace the manifold.

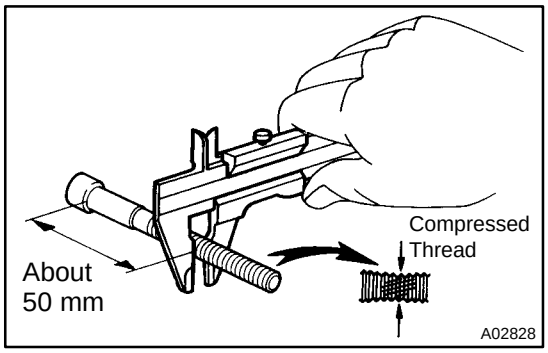


19. INSPECT EXHAUST MANIFOLD

Using a precision straight edge and feeler gauge, measure the surfaces contacting the cylinder head for warpage.

Maximum warpage: 0.50 mm (0.0196 in.)

If warpage is greater than maximum, replace the manifold.



20. INSPECT CYLINDER HEAD BOLTS

Using a vernier caliper, measure the thread outside diameter of the bolt.

Standard outside diameter:

10.8 - 11.0 mm (0.425 - 0.433 in.)

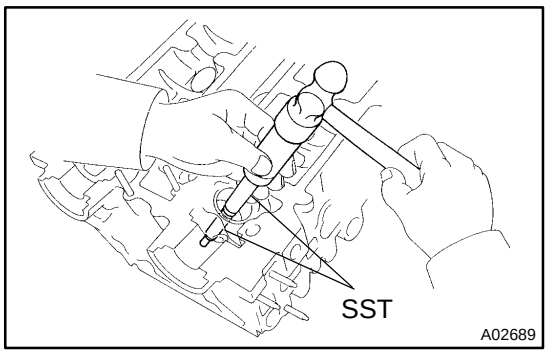
Minimum outside diameter: 10.7 mm (0.421 in.)

If the diameter is less than minimum, replace the bolt.

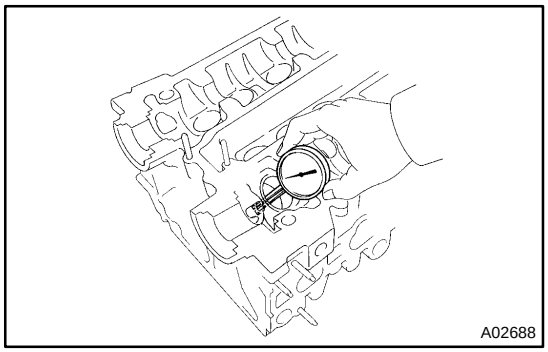
EM0DD-06

REPLACEMENT

REPLACE VALVE GUIDE BUSHINGS



(a) Using SST and a hammer, tap out the guide bushing.
SST 09201- 10000 (09201- 01060), 09950- 70010 (09951-07100)



(b) Using a caliper gauge, measure the bushing bore diameter of the cylinder head.

Both intake and exhaust

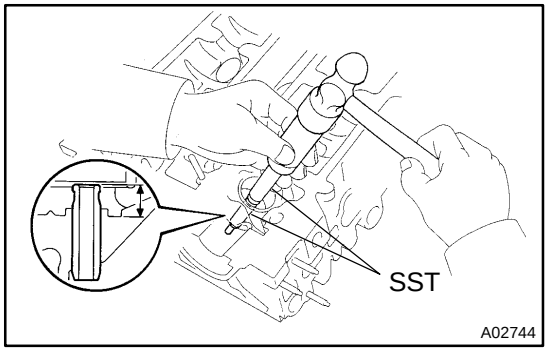
Bushing bore diameter mm (in.)	Bushing size
10.985 - 11.006 mm (0.4325 - 0.4333 in.)	Use STD
11.035 - 11.056 mm (0.4344 - 0.4353 in.)	Use O/S 0.05

(c) Select a new guide bushing (STD or O/S 0.05).

If the bushing bore diameter of the cylinder head is greater than 11.006 mm (0.4333 in.), machine the bushing bore to the following dimension:

11.035 - 11.056 mm (0.4344 - 0.4353 in.)

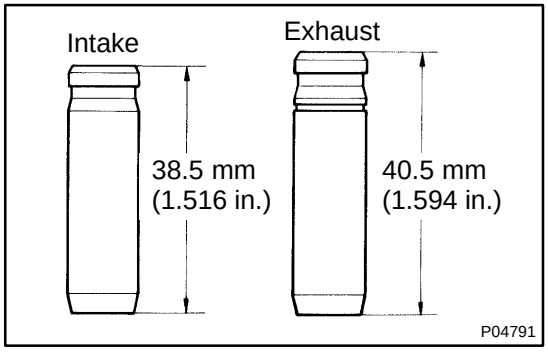
If the bushing bore diameter of the cylinder head is greater than 11.056 mm (0.4353 in.), replace the cylinder head.



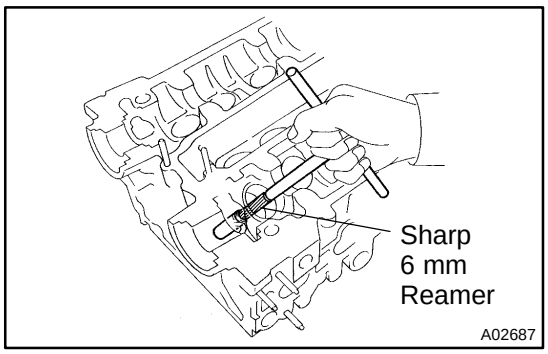
(d) Using SST and a hammer, tap in a new guide bushing to the specified protrusion height.
SST 09201- 10000 (09201- 01060), 09950- 70010 (09951-07100)

Protrusion height:

Intake	12.3 - 12.7 mm (0.484 - 0.500 in.)
Exhaust	11.4 - 11.8 mm (0.449 - 0.465 in.)



HINT:
Different bushings are used for the intake and exhaust.



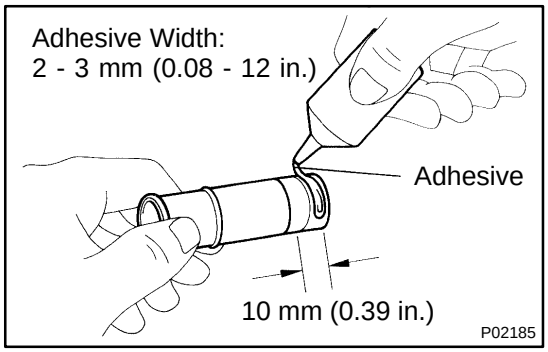
(e) Using a sharp 6 mm reamer, ream the guide bushing to obtain the standard specified clearance (See page EM-41) between the guide bushing and valve stem.

EM0DE-06

REASSEMBLY

HINT:

- Thoroughly clean all parts to be assembled.
- Before installing the parts, apply fresh engine oil to all sliding and rotating surfaces.
- Replace all gaskets and oil seals with new ones.



1. INSTALL HEATER UNION

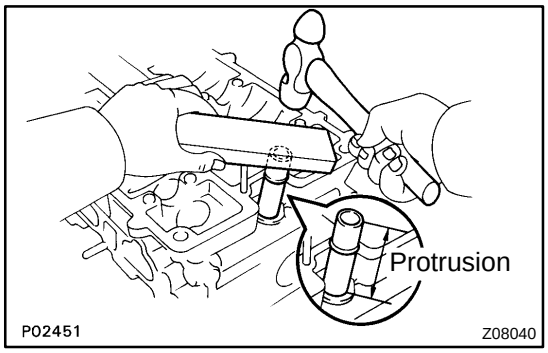
HINT:

When using a new cylinder head, a new heater union must be installed.

(a) Apply adhesive to the end of the heater union as shown in the illustration.

Adhesive:

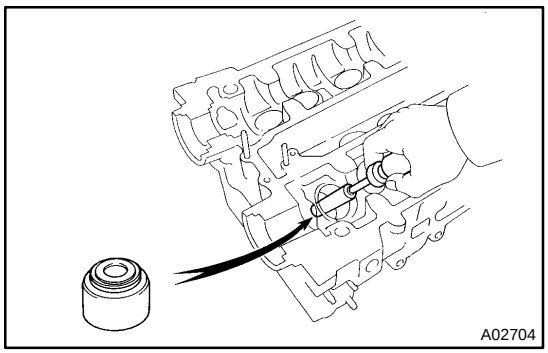
Part No.08833-00070, THREE BOND 1324 or equivalent



(b) Using a wooden block and hammer, tap in a new heater union, leaving 48 mm (1.89 in.) protruding from the cylinder head.

NOTICE:

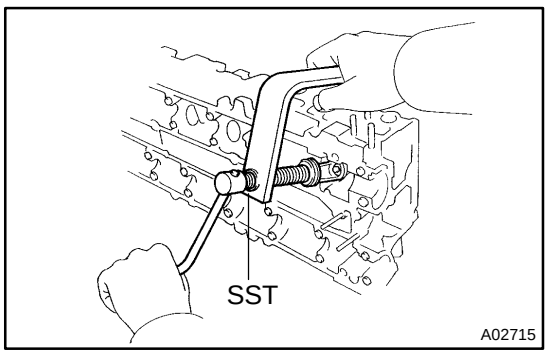
Do not tap it in too far.



2. INSTALL VALVES

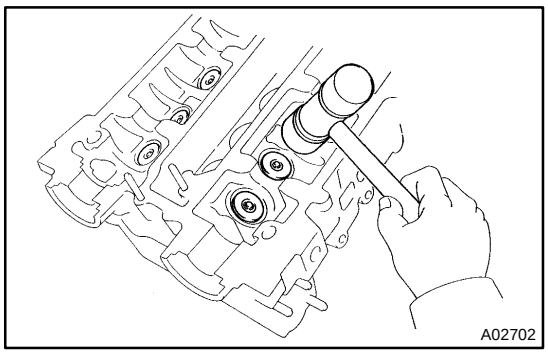
(a) Install a new oil seal on the valve guide bushing.

(b) Install the valve, spring seat, valve spring and spring retainer.



(c) Using SST, compress the valve spring and place the 2 keepers around the valve stem.

SST 09202-70020 (09202-00010)



(d) Using a plastic-faced hammer, lightly tap the valve stem tip to assure proper fit.

3. INSTALL VALVE LIFTERS AND SHIMS

(a) Install the valve lifter and shim.

(b) Check that the valve lifter rotates smoothly by hand.

4. INSTALL ECT SENSOR

Torque: 19.6 N·m (200 kgf·cm, 14 ft·lbf)

5. INSTALL CAMSHAFT POSITION SENSOR

6. INSTALL ENGINE HANGER

Torque: 40 N·m (400 kgf·cm, 30 ft·lbf)

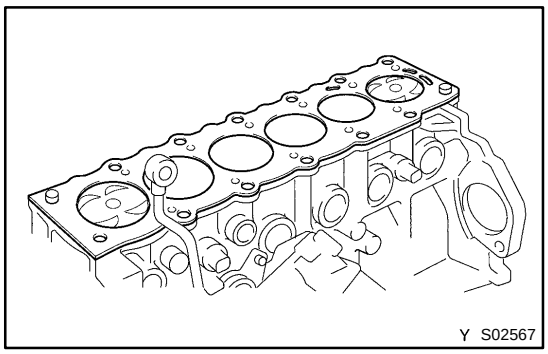
7. INSTALL WATER OUTLET WITH WATER BYPASS HOSE

Install a new gasket and the water outlet with the bolt and 2 nuts.

Torque: 28 N·m (280 kgf·cm, 21 ft·lbf)

EM1JA-03

INSTALLATION



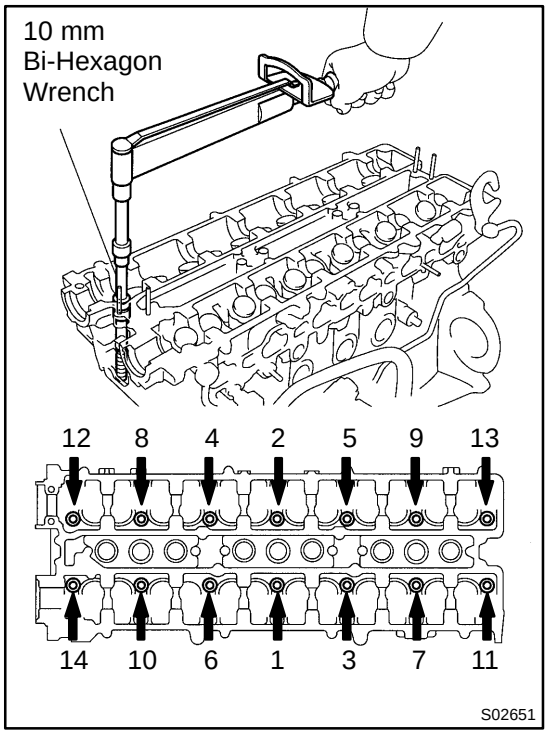
1. PLACE CYLINDER HEAD ON CYLINDER BLOCK

(a) Place a new cylinder head gasket in position on the cylinder block.

NOTICE:

Be sure to install it correctly.

(b) Place the cylinder head in position on the cylinder head gasket.



2. INSTALL CYLINDER HEAD BOLTS

HINT:

- The cylinder head bolts are tightened in 2 progressive steps (steps (c) and (f)).
- If any of bolts break or deform, replace them.

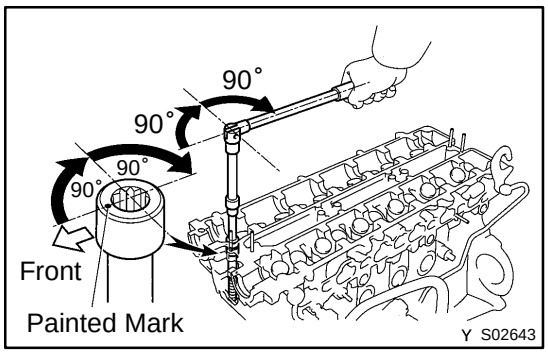
(a) Apply a light coat of engine oil on the threads and under the heads of the cylinder head bolts.

(b) Install the 14 plate washers to each cylinder head bolt.

(c) Using a 10 mm bi-hexagon wrench, uniformly tighten the cylinder head bolts, in several passes, in the sequence shown.

Torque: 35 N·m (350 kgf·cm, 26 ft·lbf)

If any of the bolts do not meet the torque specification, replace the bolt.

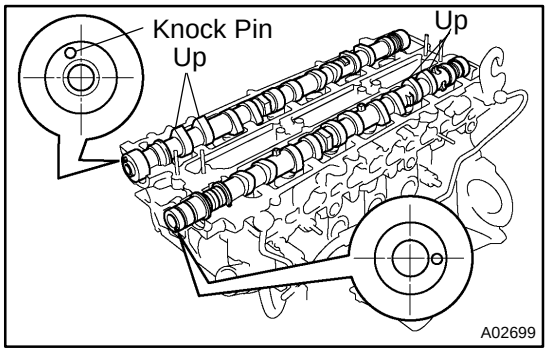


(d) Mark the front of the cylinder head bolt head with paint.

(e) Retighten the cylinder head bolts 90° in the numerical order shown.

(f) Retighten cylinder head bolts by an additional 90° shown.

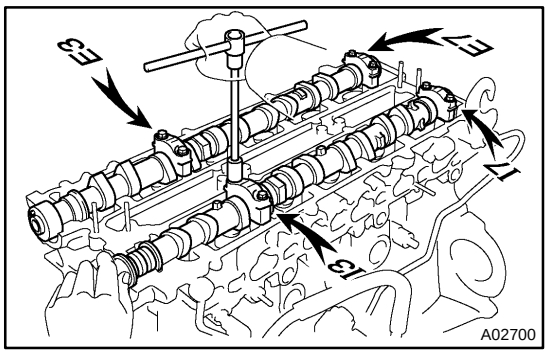
(g) Check that the painted mark is now turned to the rear.



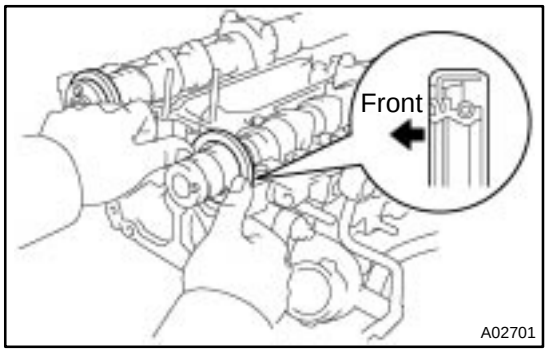
3. INSTALL CAMSHAFTS

(a) Apply engine oil to the thrust portion of the camshaft.

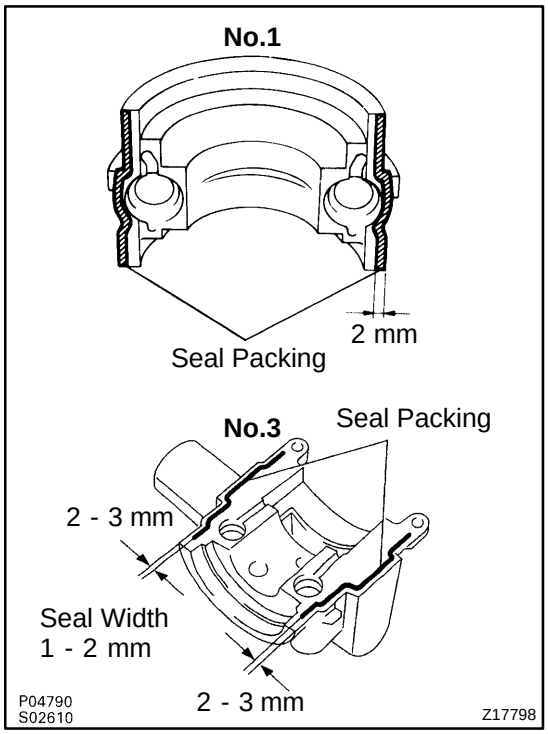
(b) Place the camshaft on the cylinder head with the cam lobe facing up as shown.



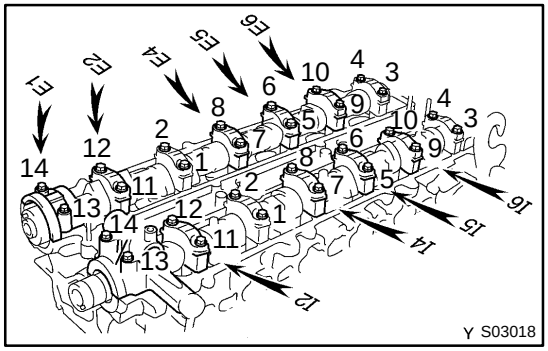
(c) Place the (Nos. 3, 7 journal) camshaft bearing caps in their proper location.
(d) Apply a light coat of engine oil on the threads and under the heads of the bearing cap bolts.
(e) Temporarily tighten these bearing cap bolts uniformly and alternately, in several passes, until the bearing caps are snug with the cylinder head.



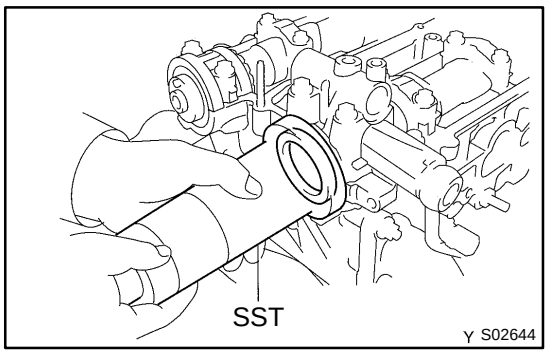
(f) Apply MP grease to a new camshaft oil seal lip.
(g) Install the 2 oil seals to the camshafts.



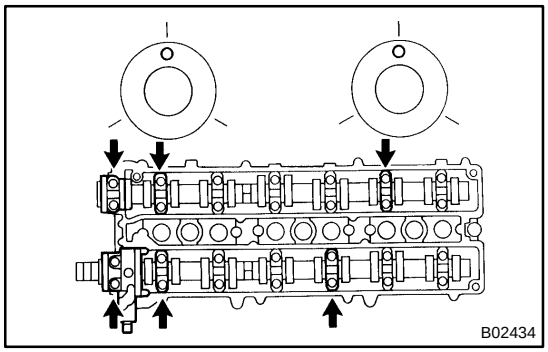
(h) Clean the installed surfaces of the Nos. 1, 3 camshaft bearing cap and cylinder head with cleaner.
(i) Apply seal packing to the bearing caps as shown.
Seal packing: Part No. 08826-00080 or equivalent



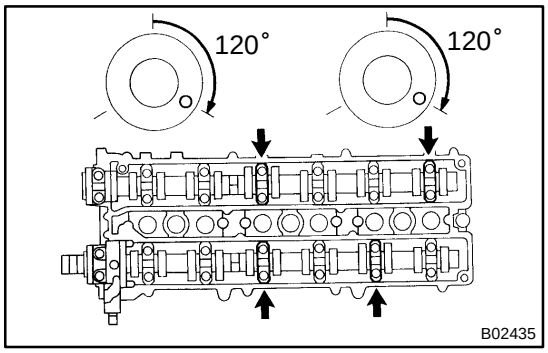
(j) Install the other bearing caps in their proper locations.
(k) Apply a light coat of engine oil on the threads and under the heads of the bearing cap bolts.
(l) Install and uniformly tighten the 14 bearing cap bolts on one side, in several passes, in the sequence shown.
Torque: 20 N·m (200 kgf·cm, 15 ft·lbf)
(m) Using a 5 mm hexagon wrench, the 2 No. 3 camshaft bearing cap bolts.
Torque: 5.0 N·m (50 kgf·cm, 44 in.·lbf)



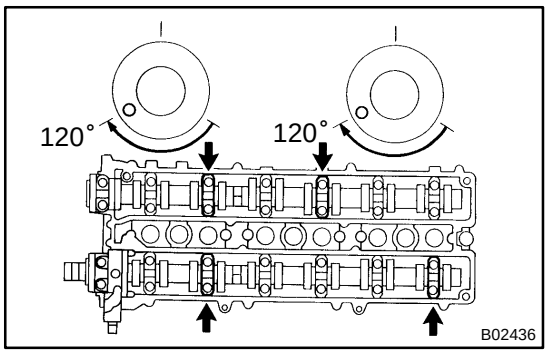
(n) Using SST, push the 2 oil seals in as far as they can go.
SST 09316-6001 1 (09316-00011, 09316-00051)



(o) Rotate the camshaft with a wrench at the hexagon position, bring the forward straight pin up.
(p) Loosen the 12 bearing cap bolts as shown, until they can be turned by hand; retighten in several passes.
Torque: 20 N·m (200 kgf·cm, 15 ft·lbf)



(q) Turn the camshaft 1/3 of a revolution.
(r) Loosen the 8 bearing cap bolts as shown, until they can be turned by hand; retighten in several passes.
Torque: 20 N·m (200 kgf·cm, 15 ft·lbf)

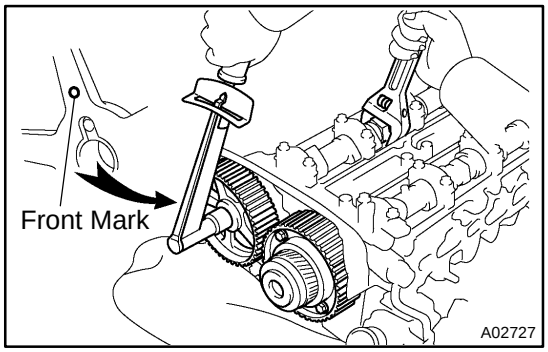


(s) Turn the camshaft a further 1/3 of a revolution.
(t) Loosen the 8 bearing cap bolts as shown, until they can be turned by hand; retighten in several passes.
Torque: 20 N·m (200 kgf·cm, 15 ft·lbf)

4. CHECK AND ADJUST VALVE CLEARANCE (See page EM-5)

5. INSTALL NO. 4 TIMING BELT COVER

Install the timing belt cover with 4 bolts.
Torque: 8.0 N·m (80 kgf·cm, 71 in.·lbf)

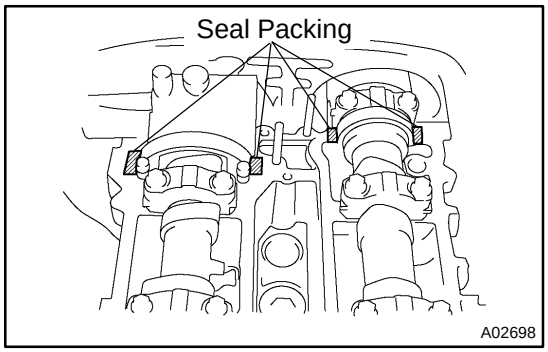


6. INSTALL CAMSHAFT TIMING PULLEYS

(a) Install the exhaust camshaft timing pulley.
(1) Align the camshaft knock pin with the groove in the pulley, and slide on the pulley.
(2) Slide the timing pulley on the camshaft, facing the front mark forward.
(3) Hold the hexagon portion of the camshaft with a wrench, and tighten the timing pulley bolt.
Torque: 81 N·m (810 kgf·cm, 60 ft·lbf)

(b) Install the VV-i (intake camshaft timing) pulley (See page EM-24).

7. CONNECT TIMING BELT TO CAMSHAFT TIMING PULLEYS (See page EM-24)



8. INSTALL NO. 1 AND NO. 2 CYLINDER HEAD COVERS

(a) Remove the any old packing (FIPG) material.

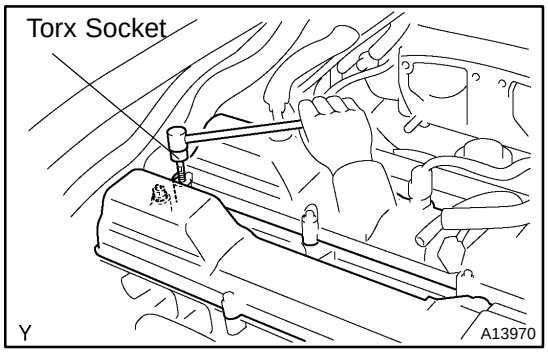
(b) Apply seal packing to the cylinder head as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

(c) Install the gaskets to the cylinder head covers.

(d) Install the cylinder head covers with the 12 bolts.

Torque: 8.5 N·m (85 kgf·cm, 75 in.·lbf)

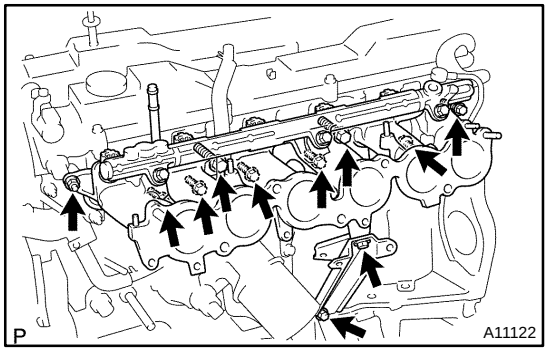


(e) Using a torx socket (E5), install the 4 stud bolts.

Torque: 8.5 N·m (85 kgf·cm, 75 in.·lbf)

(f) Install the 4 nuts to the stud bolts.

Torque: 8.5 N·m (85 kgf·cm, 75 in.·lbf)



9. INSTALL INTAKE MANIFOLD ASSEMBLY

(a) Install a new gasket and the intake manifold and delivery pipe assembly with the 7 bolts and 2 nuts.

Torque: 28 N·m (280 kgf·cm, 21 ft·lbf)

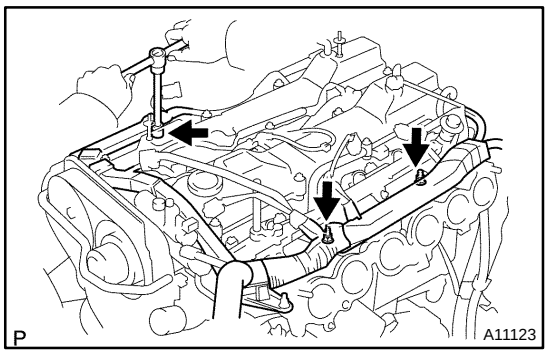
(b) Pass the water bypass hose between the No. 2, No. 3 intake ports of the manifold and delivery pipe.

(c) Install the manifold stay with the 2 bolts.

Torque: 40 N·m (400 kgf·cm, 30 ft·lbf)

(d) Install the starter wire to the manifold stay.

10. INSTALL FUEL PRESSURE PULSATION DAMPER (See page SF-27)



11. CONNECT ENGINE WIRE TO CYLINDER HEAD

(a) Install the engine wire protector with the 3 nuts.

(b) Using a 5 mm hexagon wrench, install the bolt holding the engine wire protector to the No. 2 cylinder head cover.

(c) Connect the 6 injector connectors.

HINT:

The Nos. 1, 3, 5 injector connectors and dark gray, and the Nos. 2, 4, 6 injector connectors are brown.

(d) Connect the camshaft timing oil control valve connector.

(e) Connect the camshaft position sensor connector.

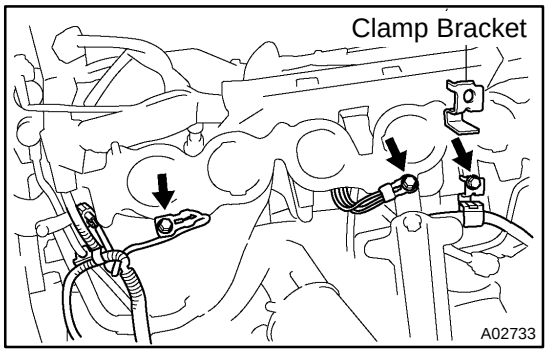
(f) Connect the ECT sensor connector.

(g) Connect the 2 knock sensor connector.

(h) Connect the starter connector.

(i) Connect the oil pressure switch connector.

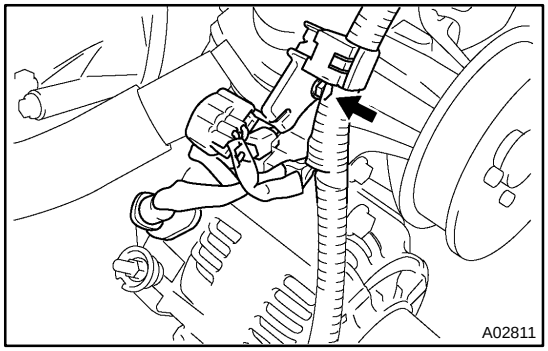
(j) Connect the oil level sensor connector.



(k) Install the clamp bracket to the intake manifold.

(l) Connect the 2 wire clamps to the No. 1 oil pipe and clamp bracket on the intake manifold.

(m) Install the 2 ground terminals to the intake manifold. Tighten so that each calking part should face inside.



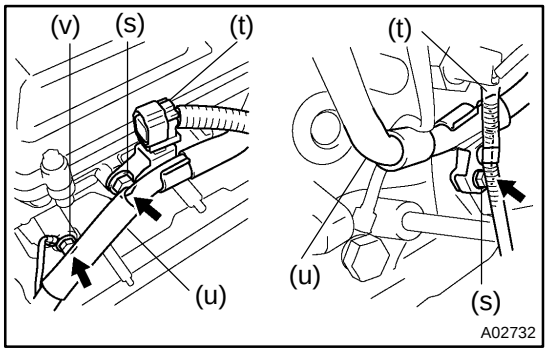
(n) Install the clamp bracket to the water pump.

(o) Connect the generator connector.

(p) Connect the crankshaft position sensor connector.

(q) Connect the heated oxygen sensor (bank 1 sensor 1) connector.

(r) Secure the engine wire with the clamp.



(s) Install the 2 hose clamps to the cylinder head and oil filter bracket.

(t) Install the heated oxygen sensor (bank 2 sensor 1) connector and engine wire clamp to the hose clamps.

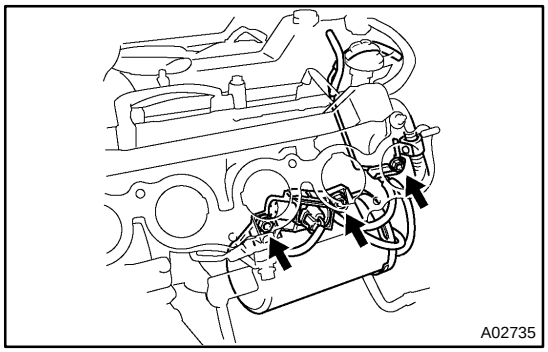
(u) Install the 2 water bypass hoses to the hose clamps on the cylinder head and oil filter bracket.

(v) Install the ground strap to the cylinder head.

12. INSTALL SPARK PLUGS

13. INSTALL IGNITION COILS AND HIGH-TENSION CORD SET ASSEMBLY (See page IG-9)

14. INSTALL NO. 3 TIMING BELT COVER
Torque: 8.0 N·m (80 kgf·cm, 71 in.·lbf)



15. INSTALL VACUUM CONTROL VALVE SET AND NO. 2 VACUUM PIPE

(a) Install the vacuum control valve set and No. 2 vacuum pipe with the 3 nuts.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

(b) Install the engine wire clamp to the clamp bracket of the No. 2 vacuum pipe.

(c) Connect the VSV connector for the ACIS.

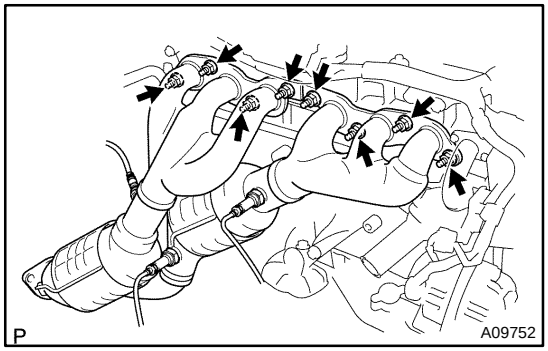
16. INSTALL AIR INTAKE CHAMBER (See page SF-49)

17. INSTALL OIL DIPSTICK AND GUIDE FOR A/T (See page EM-71)

18. INSTALL OIL DIPSTICK AND GUIDE FOR ENGINE (See page LU-12)

19. INSTALL THROTTLE BODY AND INTAKE AIR CONNECTOR ASSEMBLY (See page EM-5)

20. INSTALL WATER BYPASS OUTLET AND NO. 1 WATER BYPASS PIPE (See page CO-14)

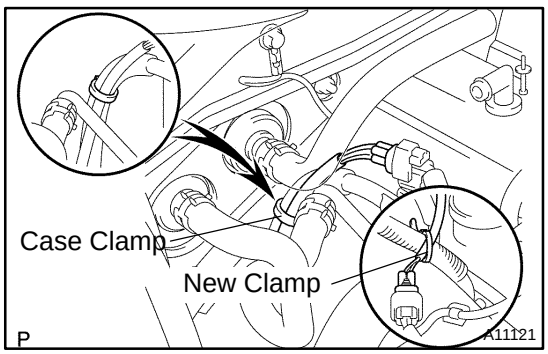


21. INSTALL EXHAUST MANIFOLD

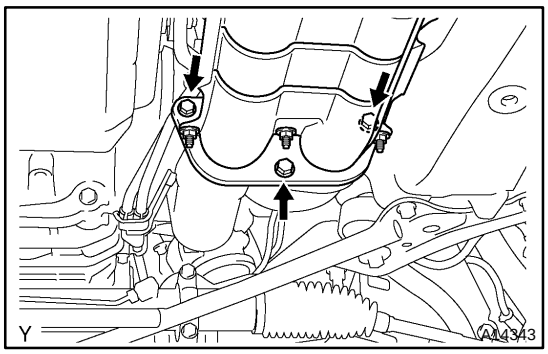
(a) Install 2 new gaskets to the cylinder head.

(b) Using a 14 mm deep socket wrench, install the exhaust manifold with the 8 nuts. Uniformly tighten the nuts in several passes.
Torque: 40 N·m (410 kgf·cm, 30 ft·lbf)

(c) Connect the 3 heated oxygen sensor connectors and clamp.



(d) Install a new clamp and the case clamp as shown in the illustration.

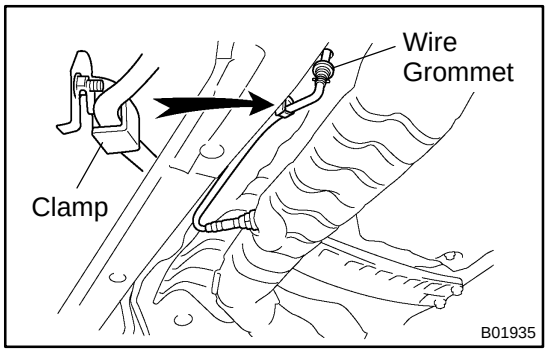


22. CONNECT FRONT EXHAUST PIPE TO EXHAUST MANIFOLD

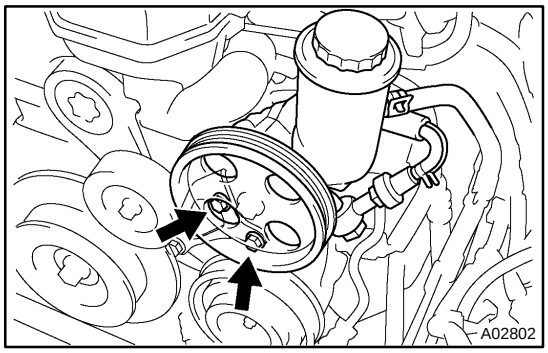
(a) Temporarily install the pipe support bracket to the transmission with the 2 bolts.

(b) Install 2 new gaskets to front end of the front exhaust pipe, and connect the front exhaust pipe to the exhaust manifold with the 3 bolts nuts and retainer.

Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)



(c) Connect the wire grommet and sensor wire of the the heated oxygen sensor (bank 2 sensor 2) to the hole and clamp on the floor.



23. INSTALL PS PUMP

(a) Install the vane pump with the 2 bolts.

Torque: 58 N·m (590 kgf·cm, 43 ft·lbf)

(b) Install the pump rear stay with the 2 bolts.

Torque: 39.2 N·m (400 kgf·cm, 29 ft·lbf)

(c) Connect the PS air hose to the No.4 timing belt cover.

(d) Connect the PS air hose to the air intake chamber.

24. INSTALL DRIVE BELT (See page CH-1)

25. M/T:

INSTALL DRIVE BELT TENSIONER ABSORBER

Install the absorber with the 2 nuts.

Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

26. INSTALL AIR CLEANER, MAF METER AND INTAKE AIR RESONATOR ASSEMBLY (See page EM-71)

27. INSTALL AIR CLEANER INLET

28. CONNECT UPPER RADIATOR HOSE TO WATER OUTLET

29. INSTALL ENGINE COVER

Install the engine cover with the 4 nuts.

30. FILL WITH ENGINE COOLANT

31. START ENGINE AND CHECK FOR LEAKS

32. INSTALL ENGINE UNDER COVER

33. ROAD TEST

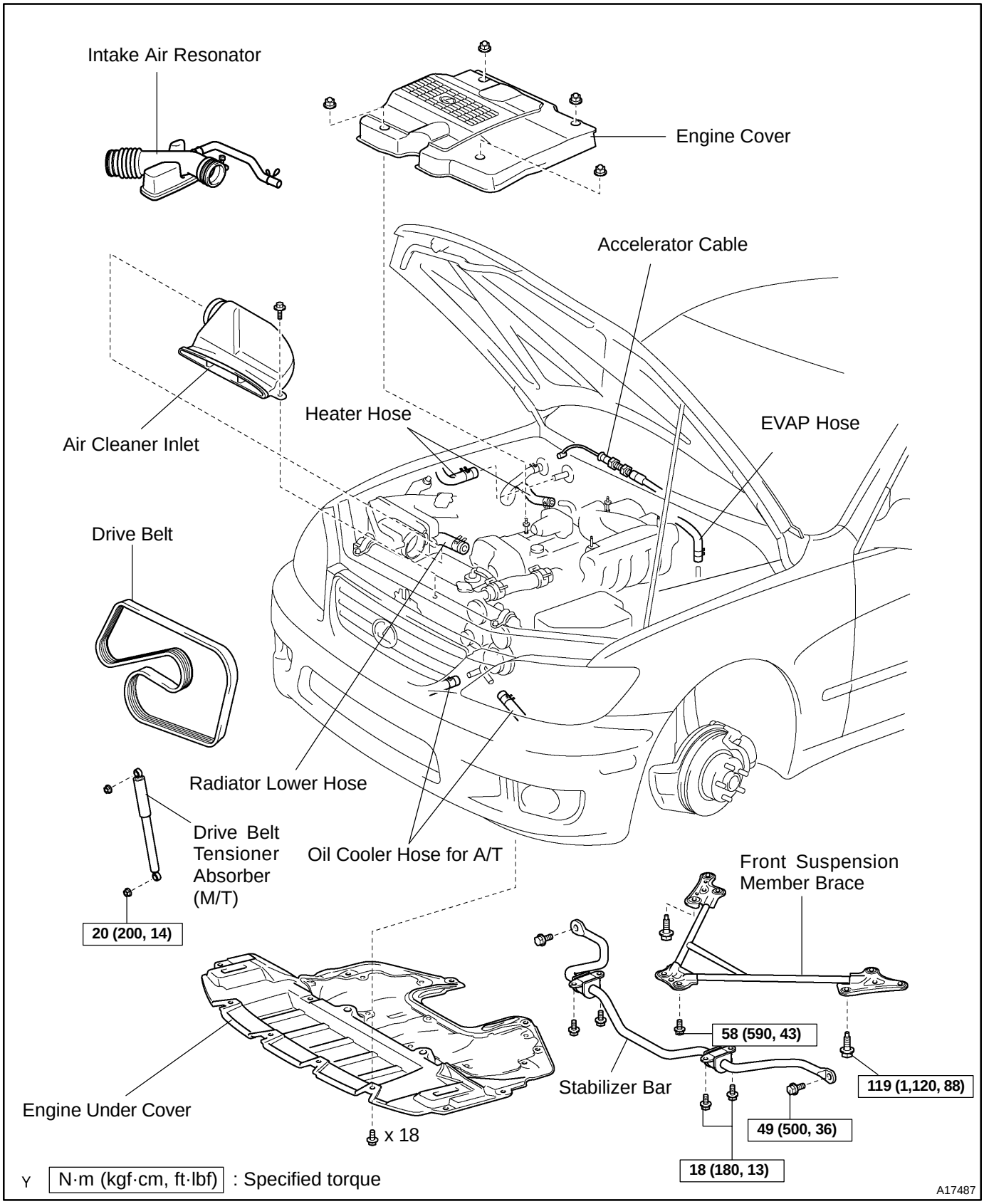
Check for abnormal noise, shock, slippage, correct shift points and smooth operation.

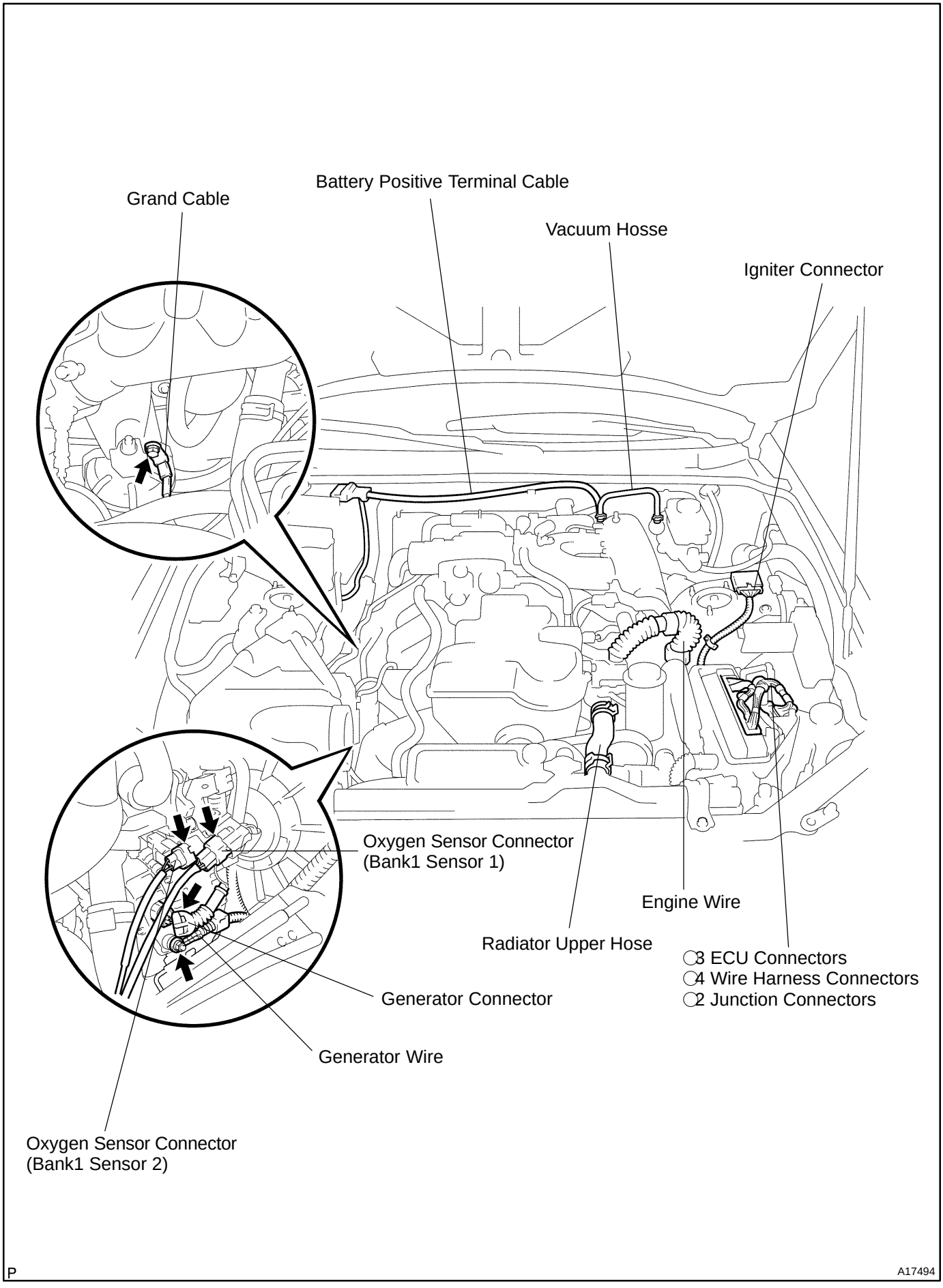
34. RECHECK ENGINE COOLANT LEVEL

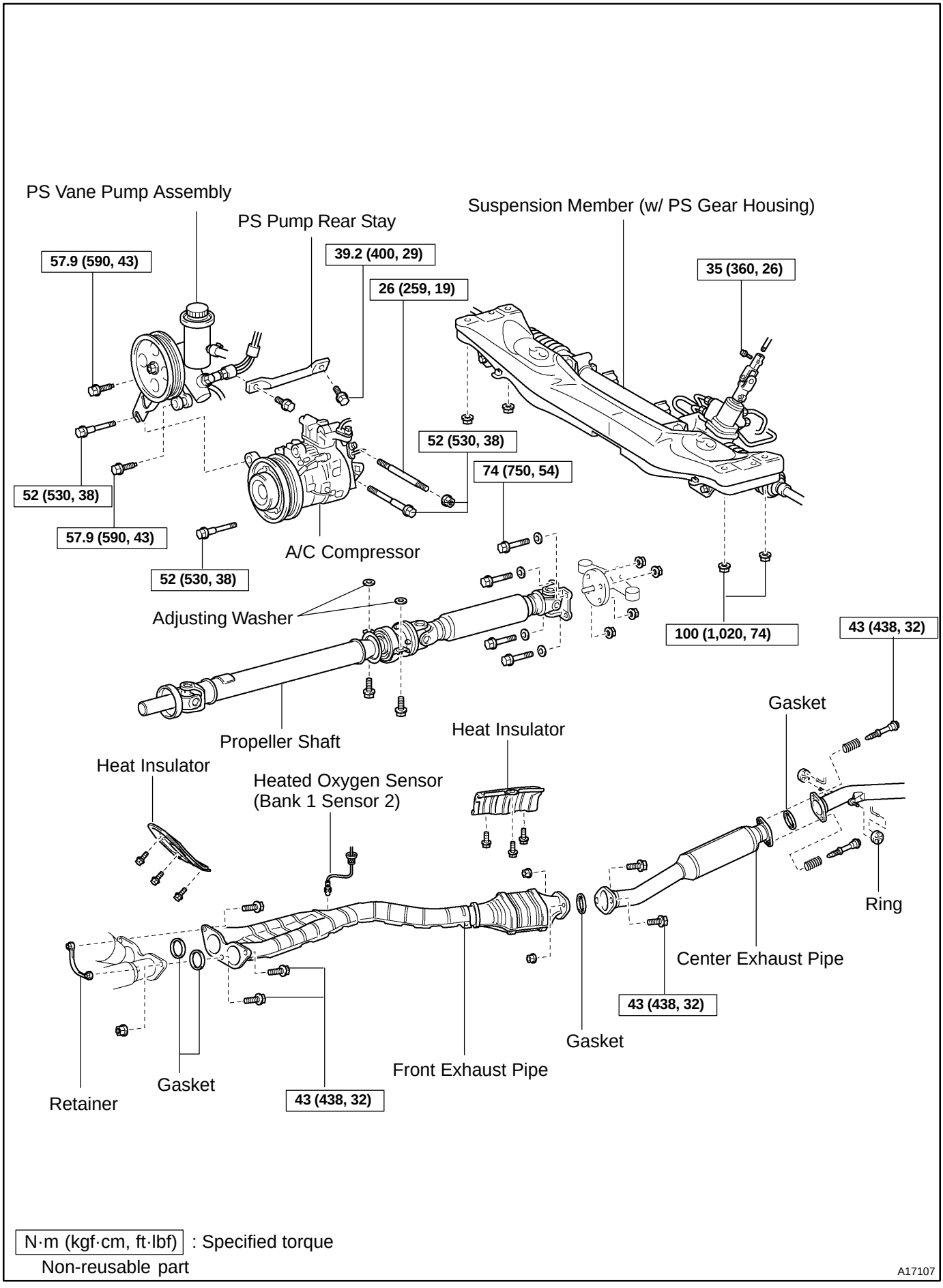
ENGINE UNIT

COMPONENTS

EM1SA-02



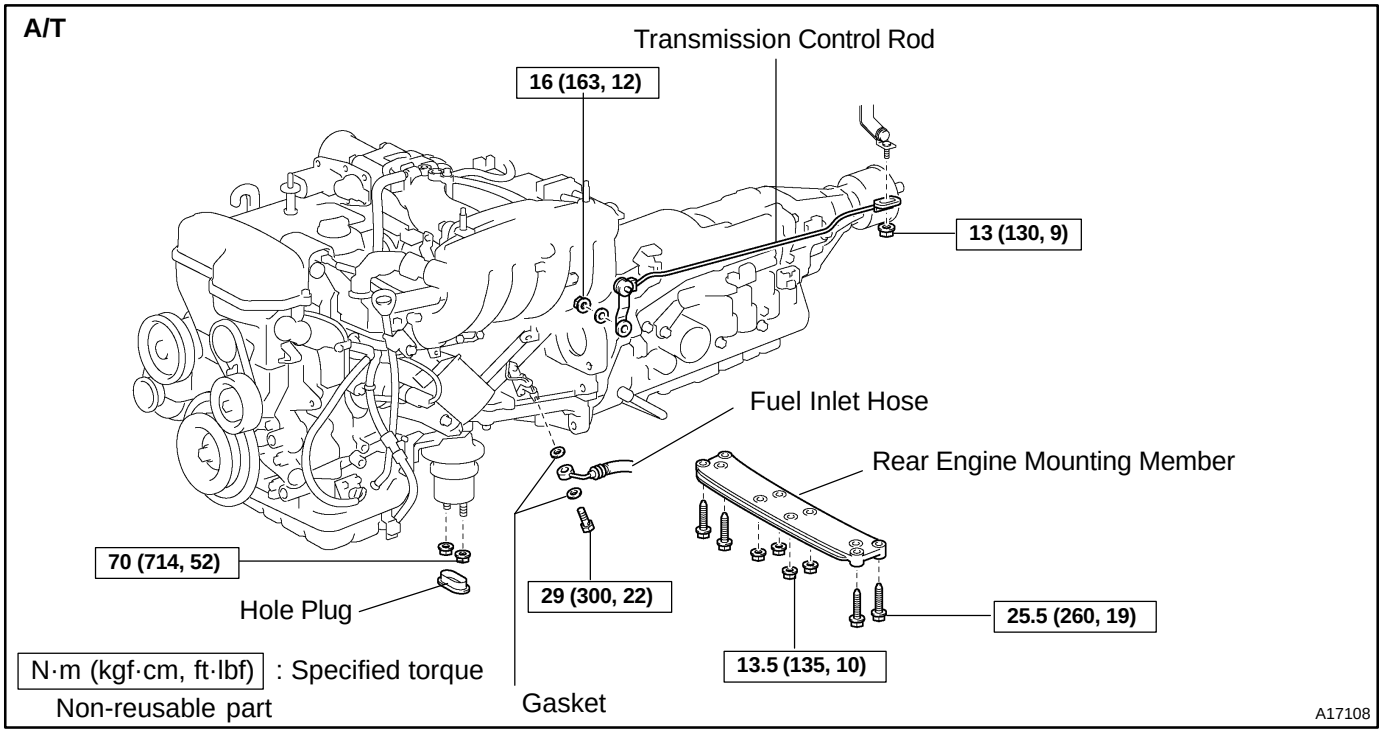

Grand Cable
Battery Positive Terminal Cable
Vacuum Hosse
Igniter Connector
Oxygen Sensor Connector
(Bank1 Sensor 1)
Engine Wire
Radiator Upper Hose
3 ECU Connectors
4 Wire Harness Connectors
2 Junction Connectors
Generator Connector
Generator Wire
Oxygen Sensor Connector
(Bank1 Sensor 2)
P
A17494

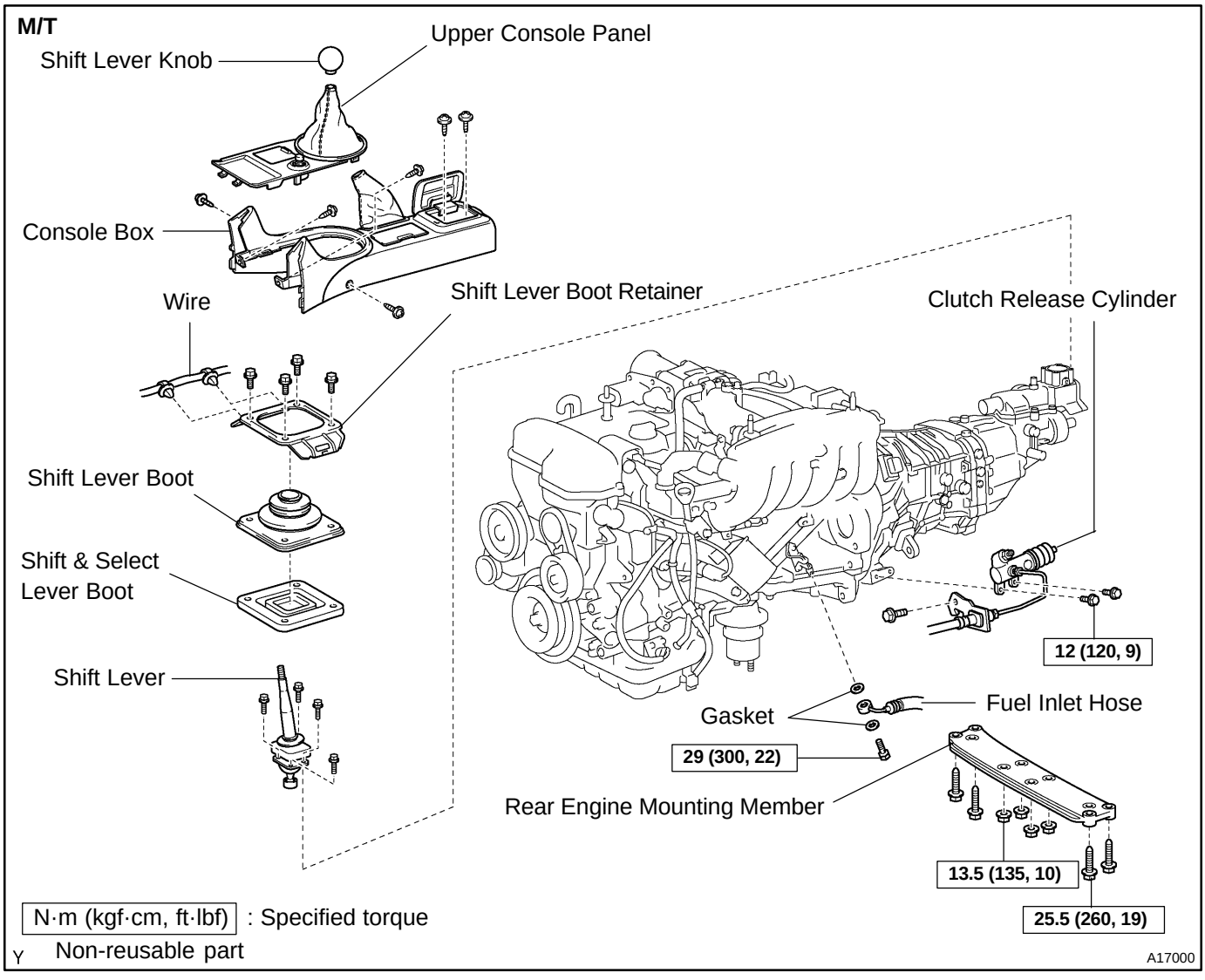


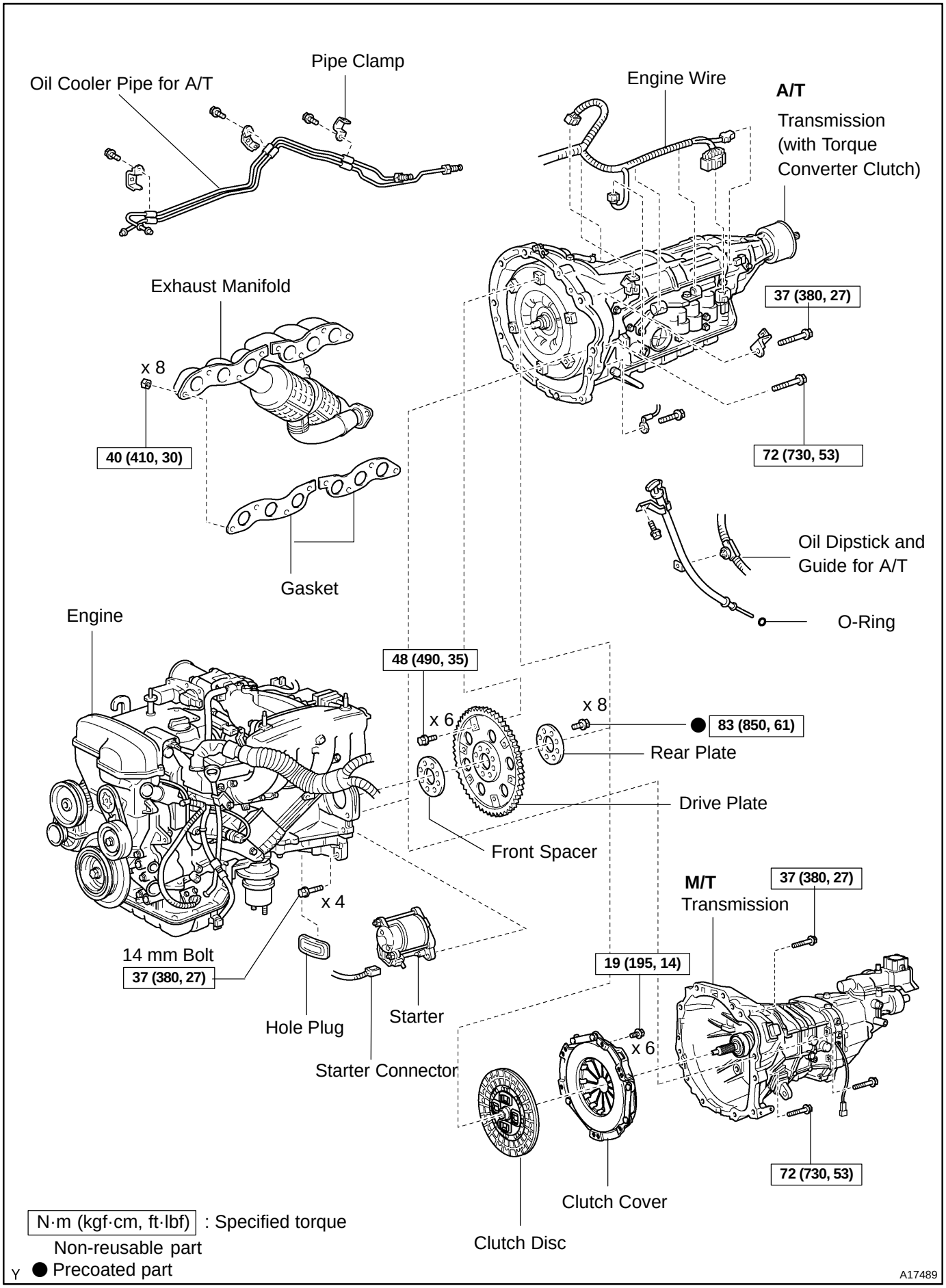
N·m (kgf·cm, ft·lbf) : Specified torque

Non-reusable part

A17107


A/T
Transmission Control Rod
16 (163, 12)
13 (130, 9)
Fuel Inlet Hose
Rear Engine Mounting Member
70 (714, 52)
29 (300, 22)
25.5 (260, 19)
Hole Plug
13.5 (135, 10)
N·m (kgf·cm, ft·lbf) : Specified torque
Non-reusable part
Gasket
A17108


M/T
Upper Console Panel
Shift Lever Knob
Console Box
Wire
Shift Lever Boot Retainer
Clutch Release Cylinder
Shift Lever Boot
Shift & Select
Lever Boot
12 (120, 9)
Shift Lever
Gasket
Fuel Inlet Hose
29 (300, 22)
Rear Engine Mounting Member
13.5 (135, 10)
25.5 (260, 19)
N·m (kgf·cm, ft·lbf) : Specified torque
Y Non-reusable part
A17000


Pipe Clamp
Oil Cooler Pipe for A/T
Engine Wire
A/T
Transmission
(with Torque
Converter Clutch)
Exhaust Manifold
x 8
37 (380, 27)
40 (410, 30)
72 (730, 53)
Gasket
Oil Dipstick and
Guide for A/T
O-Ring
Engine
48 (490, 35)
x 6
x 8
83 (850, 61)
Rear Plate
Drive Plate
Front Spacer
M/T
Transmission
37 (380, 27)
x 4
14 mm Bolt
37 (380, 27)
19 (195, 14)
Hole Plug
Starter
Starter Connector
x 6
72 (730, 53)
Clutch Cover
Clutch Disc
N·m (kgf·cm, ft·lbf) : Specified torque
Non-reusable part
Precoated part
A17489

EM1JB-03

REMOVAL

1. REMOVE ENGINE UNDER COVER

2. DRAIN ENGINE COOLANT

3. DRAIN ENGINE OIL

4. REMOVE ENGINE COVER

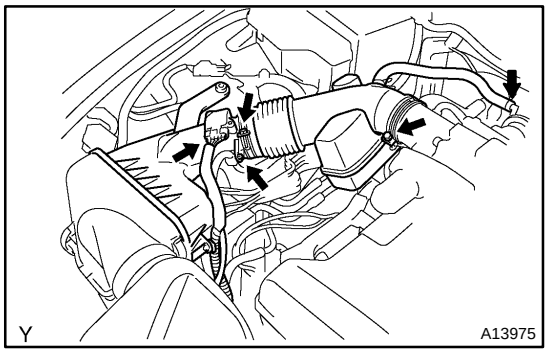
Remove the 4 nuts and engine cover.

5. REMOVE AIR CLEANER INLET

6. DISCONNECT BRAKE BOOSTER VACUUM HOSE

7. DISCONNECT RADIATOR UPPER AND LOWER HOSES FROM ENGINE

8. DISCONNECT ACCELERATOR CABLE FROM ENGINE



9. REMOVE INTAKE AIR RESONATOR

(a) Disconnect the MAF meter connector.

(b) Disconnect the engine wire clamp from the air cleaner case.

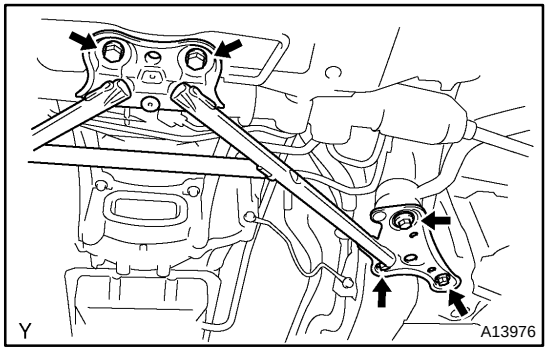
(c) Disconnect the PCV hose from the No. 2 cylinder head cover.

(d) Loosen the 2 hose clamp bolts, remove the intake air resonator from the throttle body.

10. M/T:
REMOVE DRIVE BELT TENSIONER ABSORBER

Remove the 2 nuts and absorber.

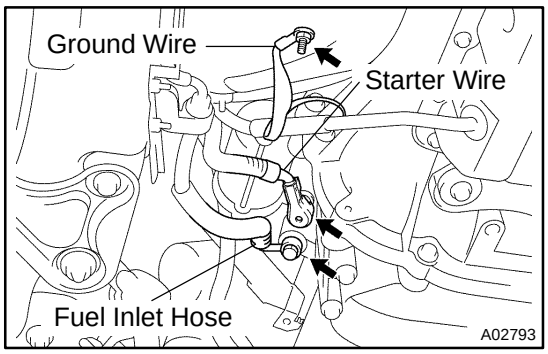
11. REMOVE DRIVE BELT (See page CH-1)



12. REMOVE FRONT SUSPENSION MEMBER BRACE

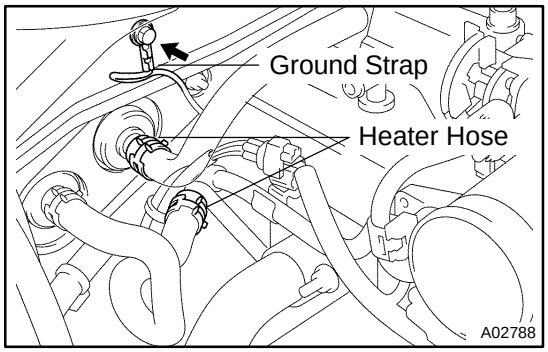
Remove the 8 bolts and brace.

13. M/T:
REMOVE TRANSMISSION SHIFT LEVER

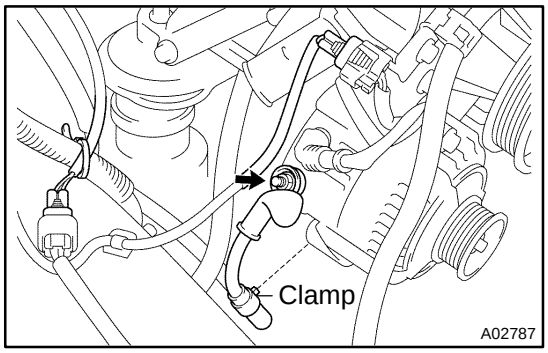


14. DISCONNECT WIRES, CABLE, STRAP, CONNECTORS, HOSES AND CLAMPS

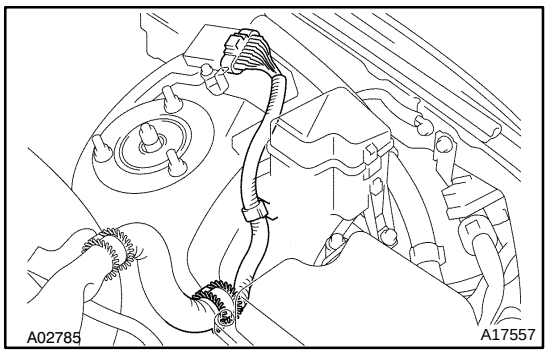
(a) Disconnect the ground wire from the floor.
(b) Disconnect the starter wire from the terminal and manifold stay.
(c) Disconnect the fuel inlet hose from the fuel pipe support.



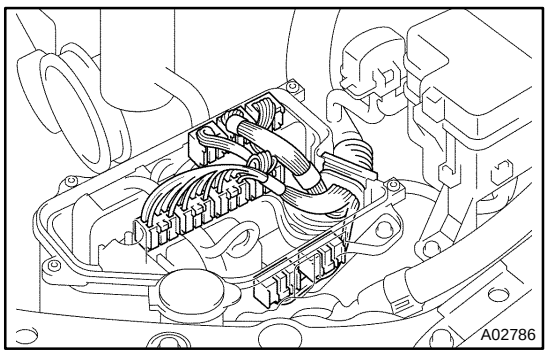
(d) Disconnect the ground strap from the dash panel.
(e) Disconnect the heater hose from the heater pipe.
(f) Disconnect the heater hose from the water bypass pipe.
(g) Disconnect the EVAP hose from the pipe (from charcoal canister).



(h) Disconnect the heater oxygen sensor (bank 1 sensor 1) connector.
(i) Disconnect the heater oxygen sensor (bank 1 sensor 2) connector.
(j) Disconnect the generator wire.
(k) Disconnect the engine wire clamp from the wire clip of generator.
(l) Disconnect the ground cable from the bracket on the cylinder block.

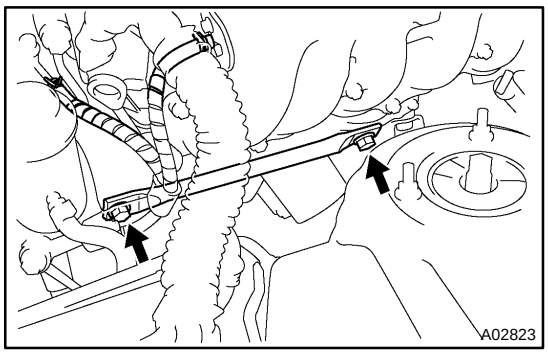


(m) Disconnect the igniter connector.
(n) Disconnect the 2 engine wire clamps from the clamp brackets.



15. DISCONNECT ENGINE WIRE FROM ECM BOX

(a) Remove the ECM hood and ECM cover.
(b) Disconnect the 3 ECM connectors.
(c) Disconnect the 4 wire harness connectors.
(d) Disconnect the 2 junction connectors.
(e) Disconnect the grommet and engine wire from the ECM box.

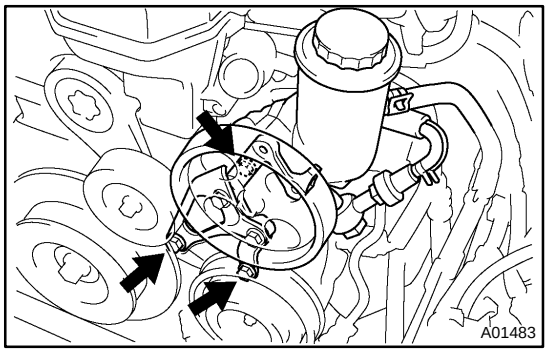


16. DISCONNECT PS PUMP AND A/C COMPRESSOR WITHOUT DISCONNECTING HOSES

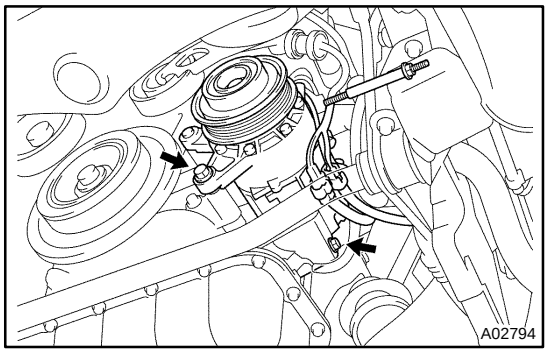
(a) Disconnect the PS air hose from the No. 4 timing belt cover.

(b) Disconnect the PS air hose from the air intake chamber

(c) Remove the 2 bolts and pump rear stay.



(d) Remove the 3 bolts and plate washer, and disconnect the vane pump assembly from the engine.



(e) Loosen the nut.

(f) Using a torx socket (E10), remove the stud bolt and nut.

(g) Disconnect the PPS solenoid valve connector.

(h) Disconnect the A/C compressor connector.

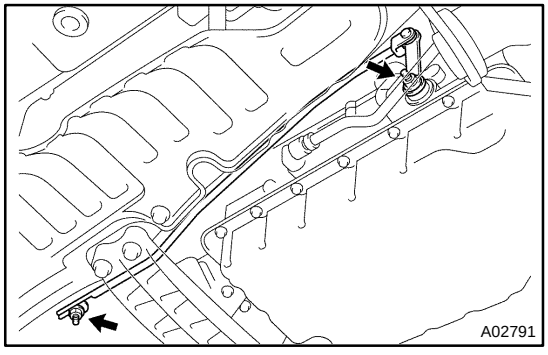
(i) Remove the 2 bolts, and disconnect the compressor from the engine.

HINT:

Put aside the vane pump and compressor, and suspend it securely.

17. M/T:
DISCONNECT CLUTCH RELEASE CYLINDER FROM TRANSMISSION

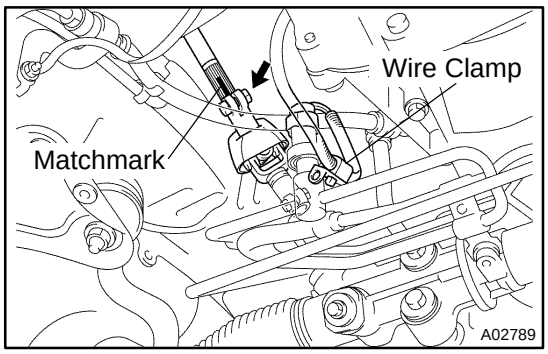
18. REMOVE PROPELLER SHAFT (See page PR-4)



19. A/T:
REMOVE TRANSMISSION CONTROL ROD

Remove the 2 nuts and control rod.

20. REMOVE FRONT AND CENTER EXHAUST PIPES

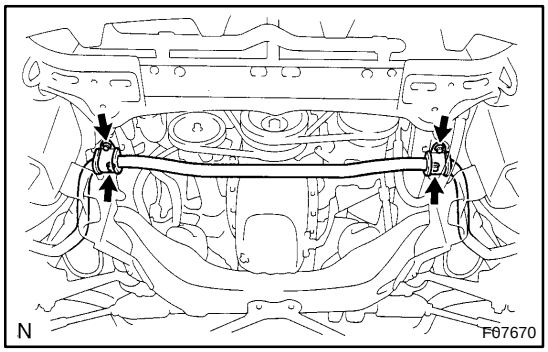


21. DISCONNECT SLIDING YOKE

(a) Check the steering wheel at the straight-ahead position, and place matchmarks on the sliding yoke and intermediate shaft.

(b) Remove the bolt, and disconnect the sliding yoke from the steering intermediate shaft.

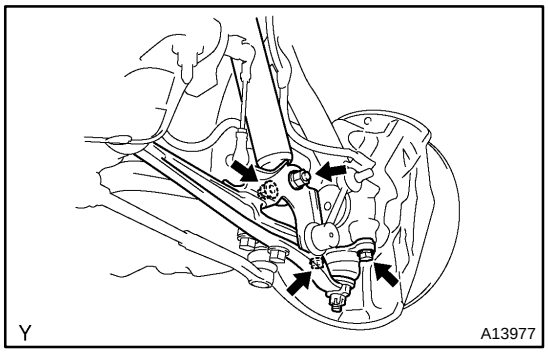
(c) Disconnect the PS pressure switch connector and wire clamp.



22. REMOVE STABILIZER BAR

(a) Remove the 2 nuts from the stabilizer bar links.

(b) Remove the 4 bolts, 2 stabilizer bar brackets and 2 bushings.



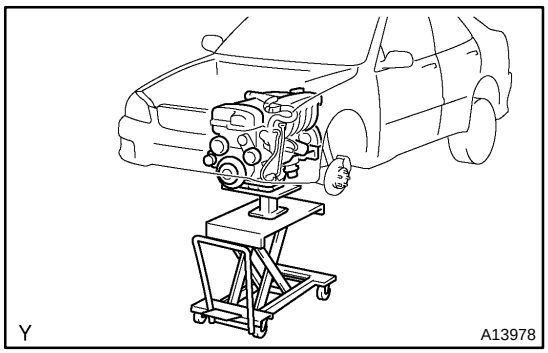
23. DISCONNECT SHOCK ABSORBER

Remove the bolt and nut, and disconnect the shock absorber from the shock absorber bracket.

24. DISCONNECT LOWER ARM

(a) Remove the nut, and disconnect the height level sensor from the lower arm.

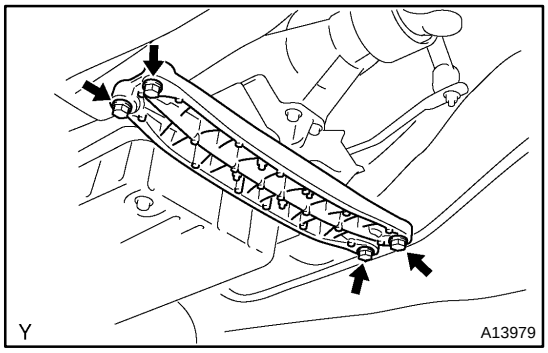
(b) Remove the 2 bolts, and disconnect the lower arm from the steering knuckle.



25. SET ENGINE JACK

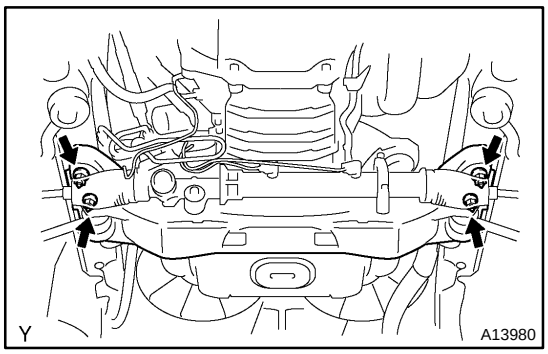
NOTICE:

Using chain, hold the engine tightly.



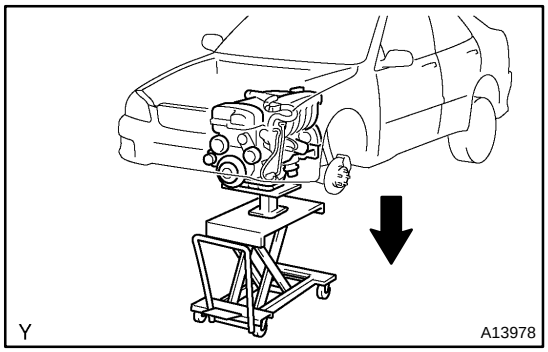
26. DISCONNECT REAR ENGINE MOUNTING MEMBER

Remove the 4 bolts and rear engine mounting member.



27. DISCONNECT SUSPENSION MEMBER

Remove the 4 bolts, and disconnect the suspension member from the body.



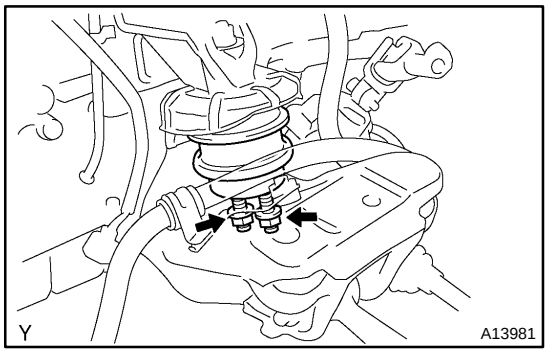
28. REMOVE ENGINE AND TRANSMISSION ASSEMBLY

(a) Remove the engine out of vehicle slowly and carefully.

NOTICE:

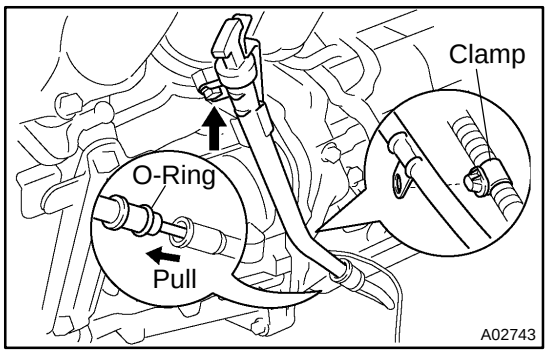
Make sure the engine is clear of all wiring, hoses and cables.

(b) Using a engine sliding device, and place the engine and transaxle assembly onto the stand.



29. REMOVE SUSPENSION MEMBER FROM ENGINE

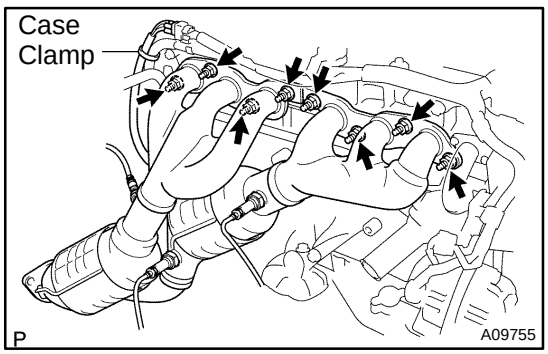
Remove the 4 nuts and suspension member with the steering gear housing from the engine.



30. A/T:

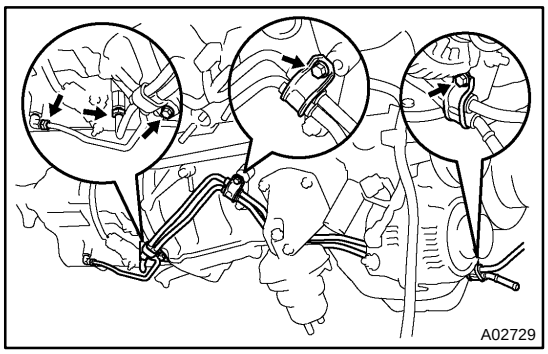
REMOVE OIL DIPSTICK AND GUIDE

(a) Disconnect the engine wire clamp from the dipstick guide.
(b) Remove the bolt.
(c) Pull out the dipstick guide and dipstick from the dipstick tube.
(d) Remove the O-ring from the dipstick guide.



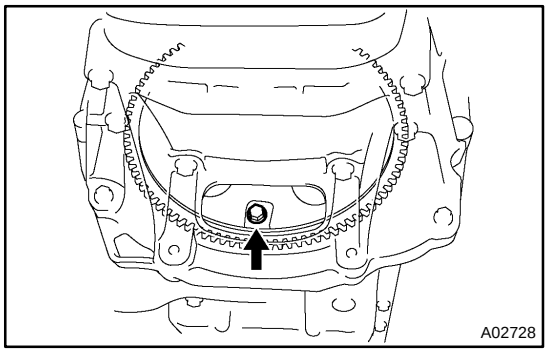
31. REMOVE EXHAUST MANIFOLD

(a) Remove the case clamp.
(b) Disconnect the heated oxygen sensor (bank 2 sensor 1) connector.
(c) Remove the 8 nuts, exhaust manifold and 2 gaskets.



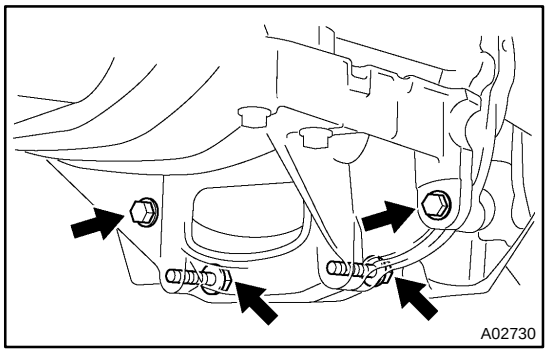
32. A/T:
REMOVE OIL COOLER PIPES

(a) Remove the 3 bolts and pipe clamps.
(b) Loosen the 2 union nuts, and remove the 2 oil cooler pipes.



33. A/T:
REMOVE TORQUE CONVERTER CLUTCH BOLTS

(a) Remove the hole plug.
(b) Turn the crankshaft pulley bolt to gain access to each bolt.
(c) Hold the crankshaft pulley bolt with a wrench, and remove the 6 bolts.



34. REMOVE 4 BOLTS HOLDING NO. 1 OIL PAN TO TRANSMISSION

35. REMOVE STARTER

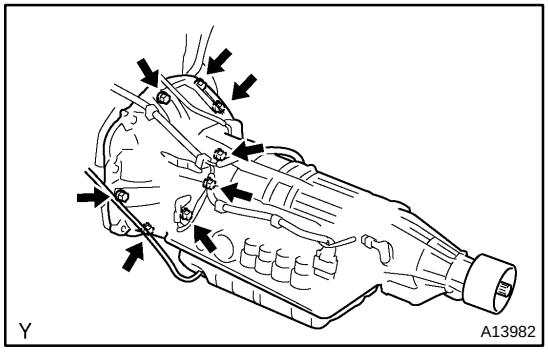
(a) Disconnect the starter connector.
(b) Remove the 2 bolts, clamp bracket and starter.

36. DISCONNECT ENGINE WIRE FROM TRANSMISSION

(a) Disconnect the VSS connector.
(b) Disconnect the PNP switch connector.
(c) Disconnect the solenoid connector.
(d) Disconnect the direct clutch speed sensor connector.
(e) Disconnect the engine wire from the 3 wire clamps.

37. M/T:
DISCONNECT ENGINE WIRE FROM TRANSMISSION

(a) Disconnect the VSS connector.
(b) Disconnect the back-up light switch connector.



38. REMOVE TRANSMISSION FROM ENGINE

(a) Remove the 5 bolts and ground wire.
(b) Remove the transmission together with the torque converter clutch from the engine.

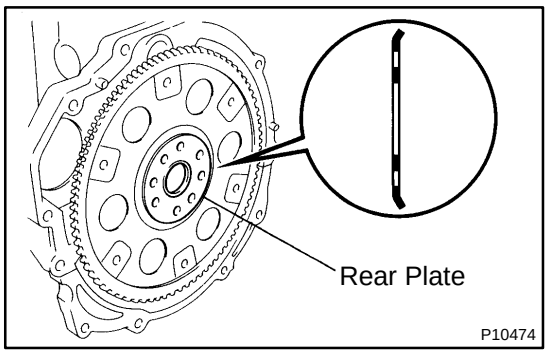
39. A/T:
REMOVE DRIVE PLATE

Remove the 8 bolts, rear plate, drive plate and front spacer.

40. M/T:
REMOVE CLUTCH COVER AND DISC

EM1JC-03

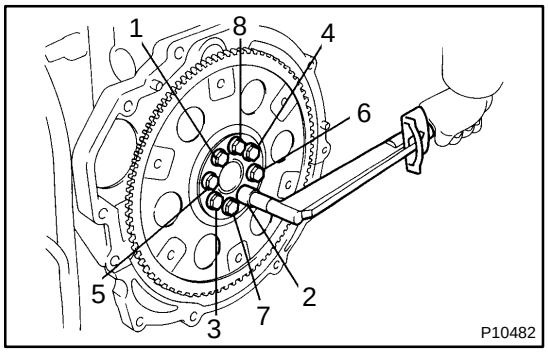
INSTALLATION



1. A/T:

INSTALL DRIVE PLATE

(a) Install the front spacer, drive plate and rear plate on the crankshaft.



(b) Apply adhesive to 2 or 3 threads of the mounting bolt end.

Adhesive:

Part No. 08833-00070, THREE BOND 1324 or equivalent

(c) Install the uniformly tighten the 8 mounting bolts in several passes, in the sequence shown.

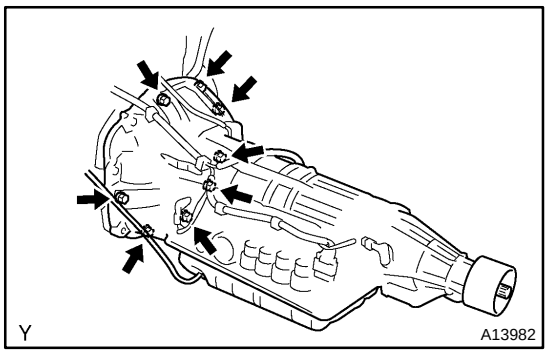
Torque: 83 N·m (850 kgf·cm, 61 ft·lbf)

2. M/T:

INSTALL CLUTCH DISC AND COVER (See page CL-18)

3. A/T:

INSTALL TORQUE CONVERTER CLUTCH INSTALLATION (See page AT-35)



4. INSTALL TRANSMISSION TO ENGINE

(a) Attach the transmission to the engine.

(b) Install the ground wire and 5 bolts.

Torque: 72 N·m (730 kgf·cm, 53 ft·lbf)

5. A/T:

CONNECT ENGINE WIRE TO TRANSMISSION

(a) Connect the VSS connector.

(b) Connect the PNP switch connector.

(c) Connect the solenoid connector.

(d) Connect the direct clutch speed sensor connector.

(e) Connect the engine wire to the 3 wire clamps.

6. M/T:

CONNECT ENGINE WIRE TO TRANSMISSION

(a) Connect the VSS connector.

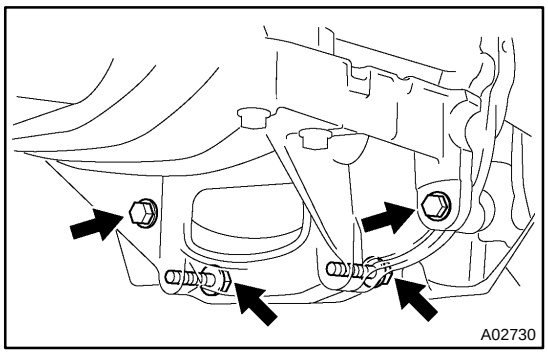
(b) Connect the back-up light switch connector.

7. INSTALL STARTER

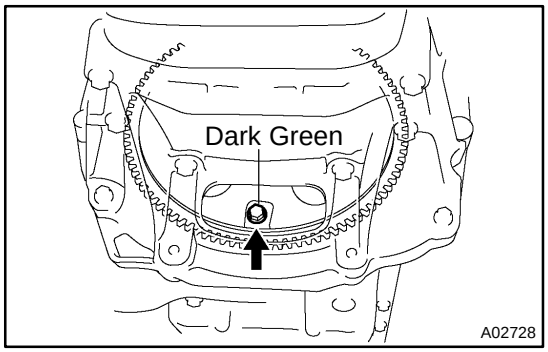
(a) Install the starter and clamp bracket with the 2 bolts.

Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)

(b) Connect the starter connector.

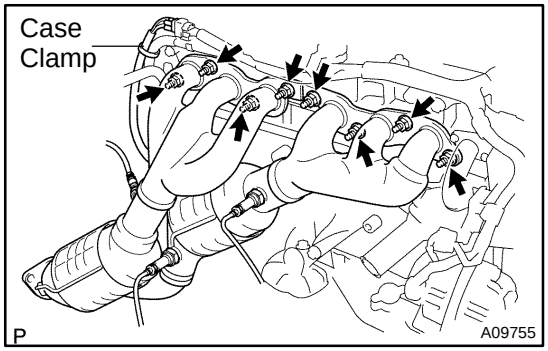


8. INSTALL 4 BOLTS HOLDING NO. 1 OIL PAN TO TRANSMISSION
Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)

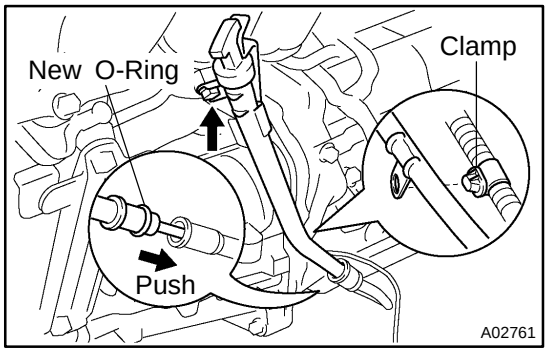


9. A/T:
INSTALL TORQUE CONVERTER CLUTCH BOLTS
(a) Apply adhesive to 2 or 3 threads of the bolt end.
Adhesive:
Part No. 08833-00070, THREE BOND 1324 or equivalent
(b) Hold the crankshaft pulley bolt with a wrench, and install the 6 bolts evenly.
Torque: 48 N·m (490 kgf·cm, 35 ft·lbf)
HINT:
First install the dark green colored bolt, install the other bolts.
(c) Install the hole plug.

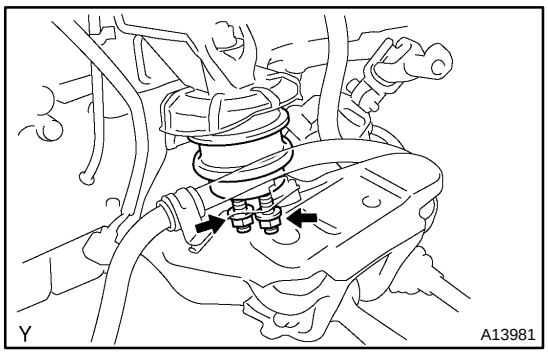
10. A/T:
INSTALL OIL COOLER PIPE



11. INSTALL EXHAUST MANIFOLD
(a) Install 2 new gaskets to the cylinder head.
(b) Using a 14 mm deep socket wrench, install the exhaust manifold with the 8 nuts. Uniformly tighten the nuts in several passes.
Torque: 40 N·m (408 kgf·cm, 30 ft·lbf)
(c) Connect the heated oxygen sensor (bank 2 sensor 1) connector.
(d) Install the case clamp.



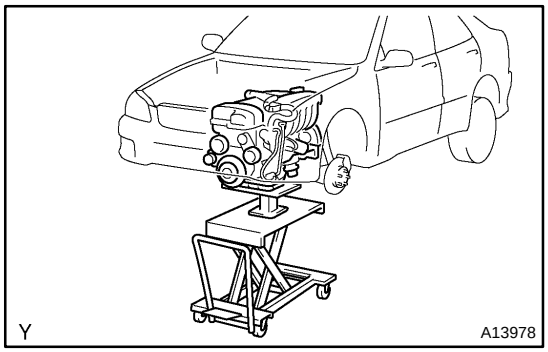
12. A/T:
INSTALL OIL DIPSTICK GUIDE AND DIPSTICK
(a) Install a new O-ring to the dipstick guide.
(b) Push in the dipstick guide end to the dipstick tube of the oil pan.
(c) Install the dipstick guide with the bolt.
(d) Connect the engine wire clamp to the dipstick guide.
(e) Install the dipstick.



13. INSTALL SUSPENSION MEMBER TO ENGINE

Install the suspension member and to the engine with the 4 nuts.

Torque: 70 N·m (714 kgf·cm, 52 ft·lbf)



14. SET ENGINE JACK

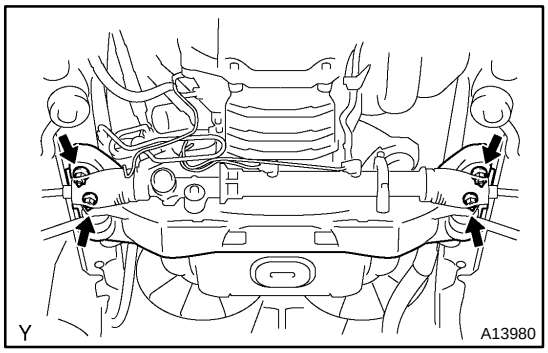
NOTICE:

Using a chain, hold the engine tightly.

15. INSTALL ENGINE AND TRANSMISSION ASSEMBLY IN VEHICLE

(a) Raise the engine into the engine compartment.

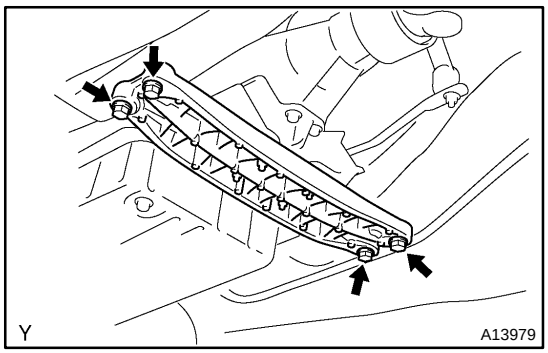
(b) Keep the engine level, and align RH and LH mountings with the insulator.



16. CONNECT SUSPENSION MEMBER

Connect the suspension member with the 4 bolts to the body.

Torque: 70 N·m (714 kgf·cm, 52 ft·lbf)



17. CONNECT REAR ENGINE MOUNTING MEMBER

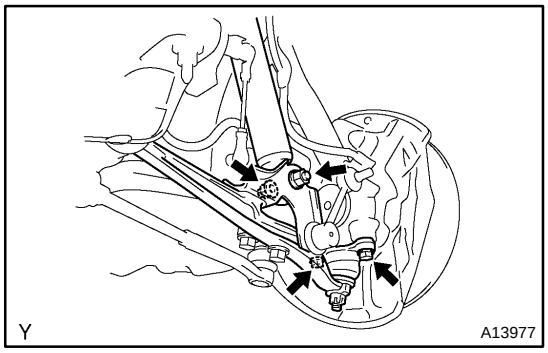
Install the rear engine mounting member with the 4 bolts.

Torque:

25.5 N·m (260 kgf·cm, 19 ft·lbf) for bolt

13.5 N·m (135 kgf·cm 10 ft·lbf) for nut

18. REMOVE ENGINE JACK



19. CONNECT LOWER ARM

(a) Connect the lower arm with the 2 bolts to the steering knuckle.

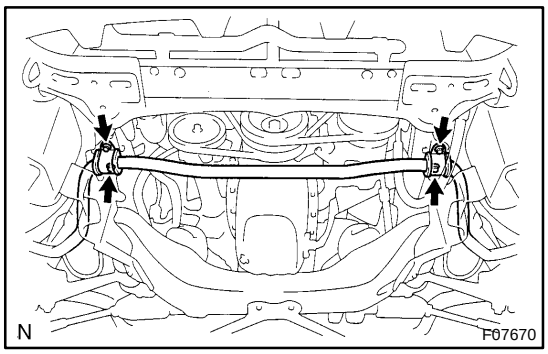
Torque: 245 N·m (2,500 kgf·cm, 181 ft·lbf)

(b) Connect the height level sensor to the lower arm.

20. CONNECT SHOCK ABSORBER

Connect the shock absorber with the bolt and nut.

Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

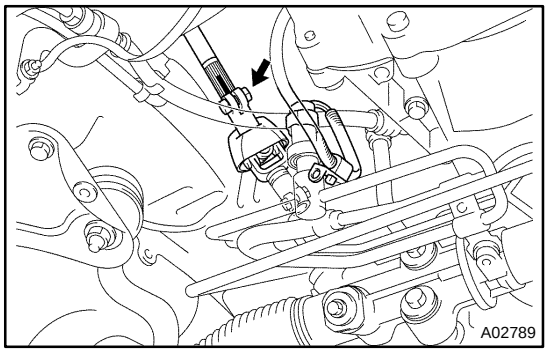


21. INSTALL STABILIZER BAR

(a) Install the 2 bushings and 2 stabilizer bar brackets to the stabilizer bar.

(b) Install the stabilizer bar with the 4 bolts and 2 nuts.

Torque:
18 N·m (180 kgf·cm, 13 ft·lbf) for bolt
49 N·m (500 kgf·cm, 36 ft·lbf) for nut



22. CONNECT SLIDING YOKE

(a) Align the matchmarks and connect the sliding yoke to the steering intermediate shaft.

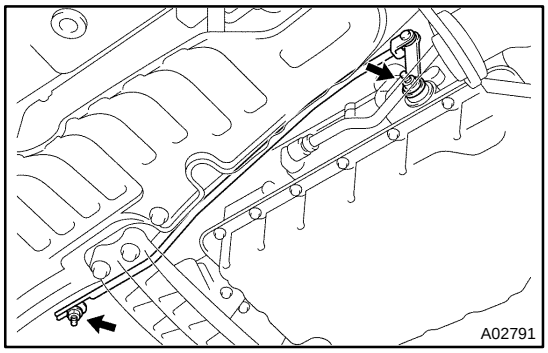
(b) Install the bolt holding the sliding yoke to the steering intermediate shaft.

Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

(c) Connect the PS pressure switch and wire clamp.

23. INSTALL FRONT AND CENTER EXHAUST PIPE

Torque: 43 N·m (438 kgf·cm, 32 ft·lbf)

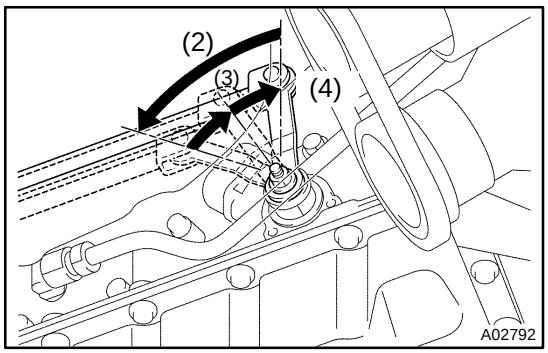


24. A/T:

INSTALL TRANSMISSION CONTROL ROD

Install the control rod with the 2 nuts.

Torque: 16 N·m (163 kgf·cm, 12 ft·lbf)



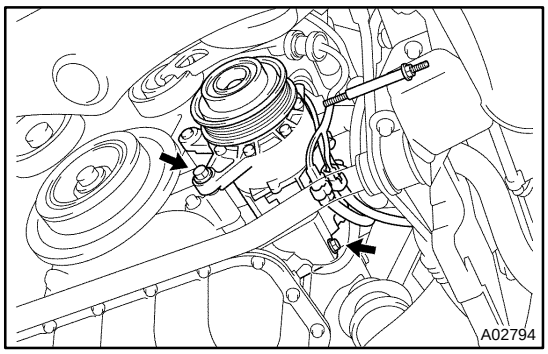
If the indicator is not aligned with the correct position, carry out the following adjustment procedures.

(1) Loosen the nut on the shift lever.
(2) Push the control shaft lever fully rearward.
(3) Return the control shaft lever 2 notches to the N position.
(4) Set the shift lever to the N position.
(5) While holding the shift lever lightly toward the R position side, tighten the nut.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

25. M/T:

INSTALL CLUTCH RELEASE CYLINDER TO TRANSMISSION



26. INSTALL A/C COMPRESSOR AND PS PUMP

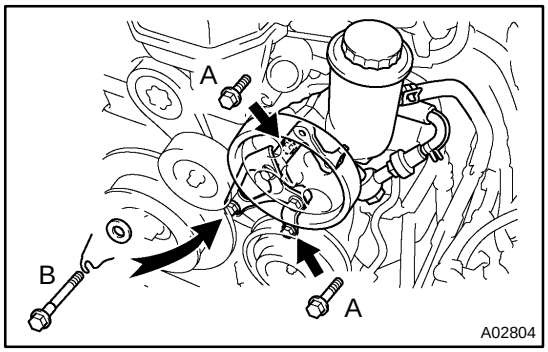
(a) Temporarily install the compressor with the 2 bolts.

(b) Using a torx socket (E10), install the stud bolt.
Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)

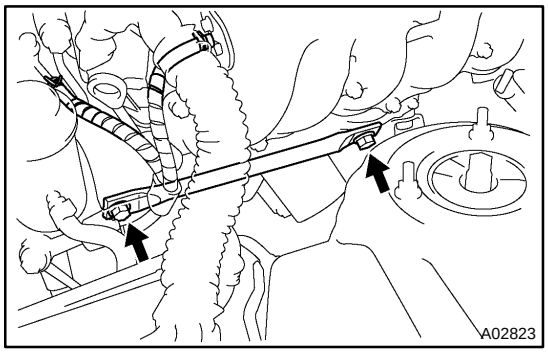
(c) Tighten the nut and 2 bolts.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

(d) Connect the compressor connector.

(e) Connect the PPS solenoid valve connector.



(f) Install the vane pump assembly with the 3 bolts and plate washer.
Torque:
58 N·m (590 kgf·cm, 43 ft·lbf) for bolt A
52 N·m (530 kgf·cm, 38 ft·lbf) for bolt B



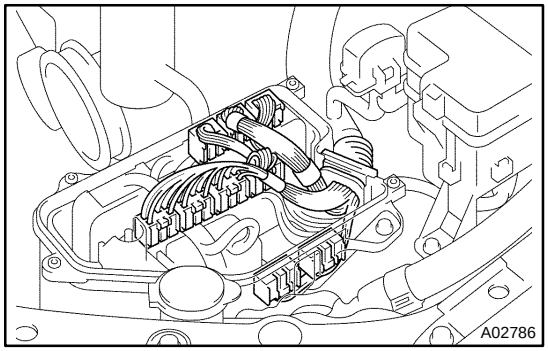
(g) Install the pump rear stay with the 2 bolts.
Torque: 39.2 N·m (400 kgf·cm, 29 ft·lbf)

(h) Connect the PS air hose to the No. 4 timing belt cover.

(i) Connect the PS air hose to the air intake chamber.

27. M/T:
INSTALL TRANSMISSION SHIFT LEVER

(a) Install the shift lever with the 4 bolts.
Torque: 8 N·m (82 kgf·cm, 71 in.·lbf)



28. CONNECT ENGINE WIRE TO ECM BOX

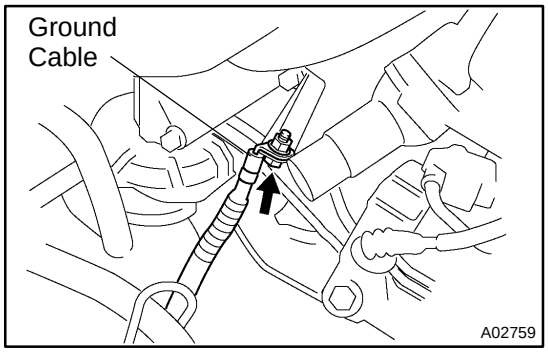
(a) Install the engine wire grommet to the ECM box.

(b) Connect the 3 ECM connectors.

(c) Connect the 4 wire harness connectors.

(d) Connect the 2 junction connectors.

(e) Install the ECM cover and hood.



29. CONNECT CLAMPS, WIRES, CONNECTORS, HOSES, CABLE AND STRAP

(a) Connect the 2 engine wire clamps to the clamp brackets.

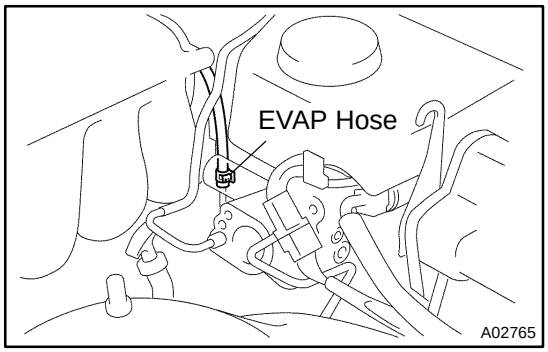
(b) Connect the igniter connector.

(c) Connect the ground cable to the bracket on the cylinder block.

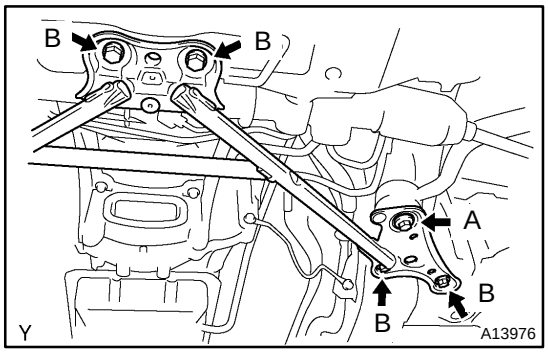
(d) Connect the engine wire clamp to the wire clip of the generator.

(e) Connect the generator wire.

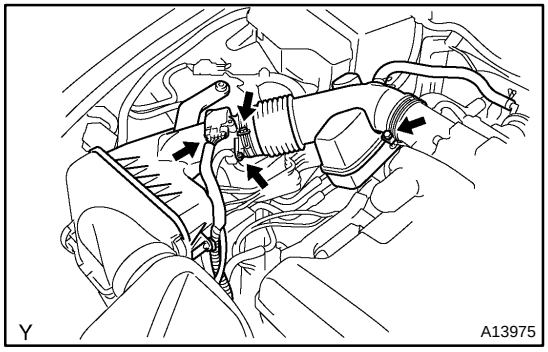
(f) Connect the heated oxygen sensor (bank 1 sensor 1) connector.
(g) Connect the heated oxygen sensor (bank 1 sensor 2) connector.



(h) Connect the EVAP hose to the pipe (from charcoal canister).
(i) Connect the heater hose to the heater pipe.
(j) Connect the heater hose to the water bypass pipe.
(k) Connect the ground strap to the dash panel.
(l) Connect the fuel inlet hose to the fuel pipe support.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)
(m) Connect the starter wire to the terminal and manifold stay.
(n) Connect the ground wire to the floor.



30. INSTALL FRONT SUSPENSION MEMBER BRACE
Install the brace with the 8 bolts.
Torque:
Bolt A: 119 N·m (1,210 kgf·cm, 88 ft·lbf)
Bolt B: 58 N·m (590 kgf·cm, 43 ft·lbf)
31. INSTALL DRIVE BELT (See page CH-1)
32. M/T:
INSTALL DRIVE BELT TENSIONER ABSORBER
Install the absorber with the 2 nuts.
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)
33. CONNECT ACCELERATOR CABLE TO ENGINE



34. INSTALL INTAKE AIR RESONATOR
(a) Connect the intake air resonator to the throttle body.
(b) Tighten the hose clamp bolt holding the intake air resonator to the throttle body.
(c) Connect the MAF meter connector.
(d) Connect the engine wire clamp to the air cleaner case.
(e) Connect the PCV hose to the No.2 cylinder head cover.
35. CONNECT RADIATOR UPPER AND LOWER HOSES
36. CONNECT BRAKE BOOSTER VACUUM HOSE
37. INSTALL AIR CLEANER INLET

38. INSTALL ENGINE COVER

Install the engine cover with the 4 nuts.

39. FILL WITH ENGINE COOLANT

40. FILL WITH ENGINE OIL

41. START ENGINE AND CHECK FOR LEAKS

42. INSTALL ENGINE UNDER COVER

NOTICE:

Be careful not to damage the body or glass with the hood end.

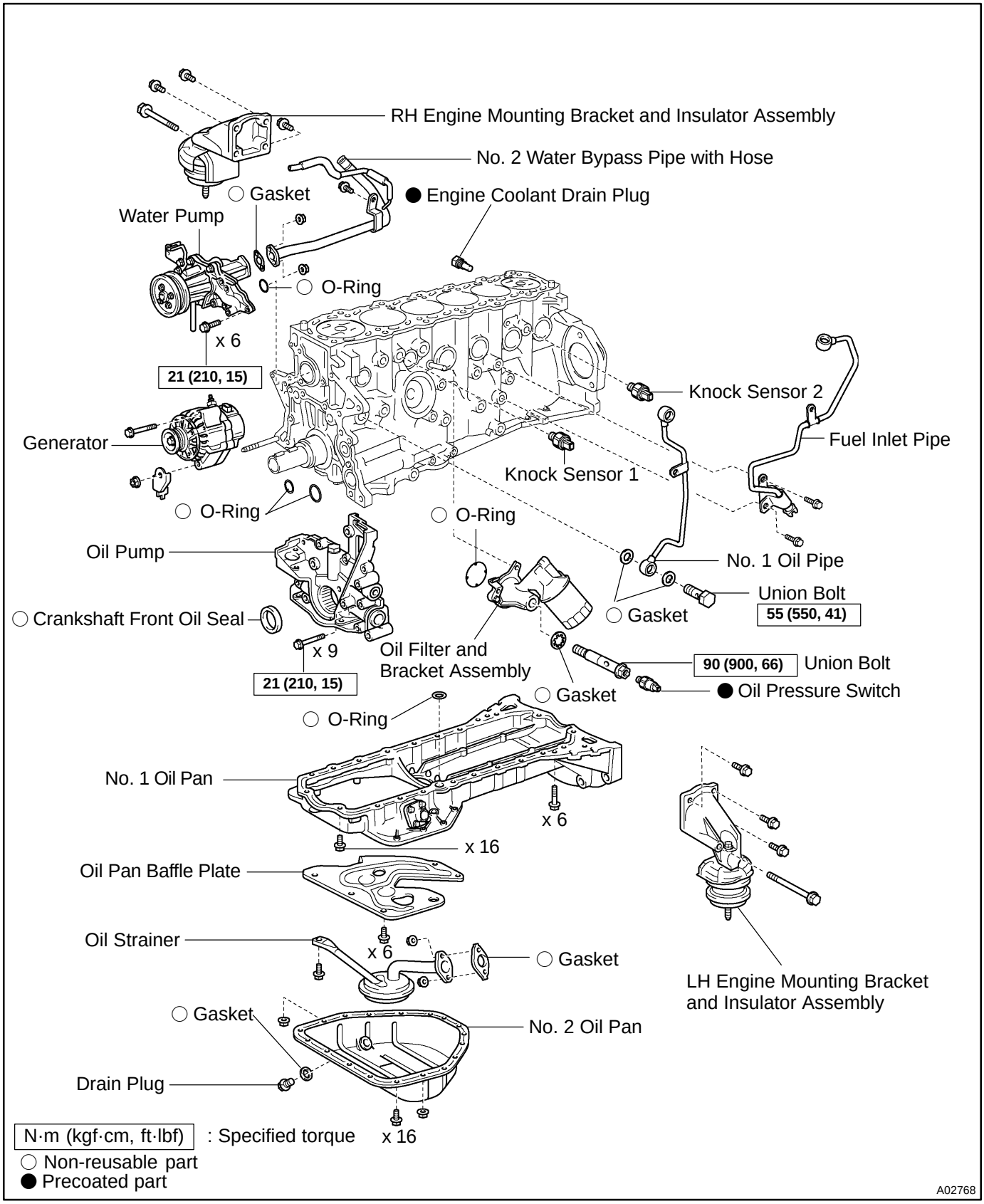
43. PERFORM ROAD TEST

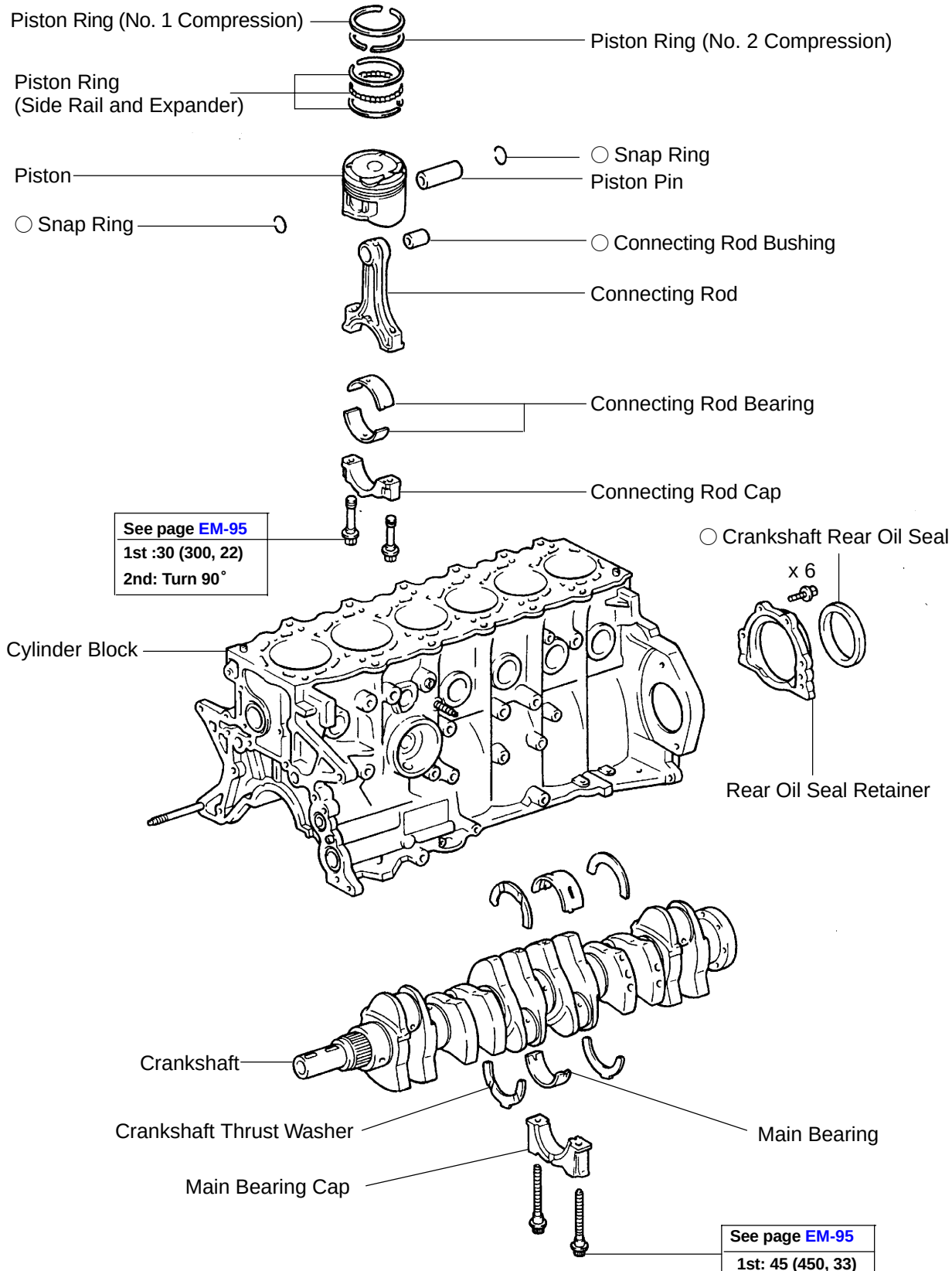
Check for abnormal noise, shock, slippage, correct shift points and smooth operation.

44. RECHECK ENGINE COOLANT AND OIL LEVELS

CYLINDER BLOCK COMPONENTS

EM0DJ-06




Piston Ring (No. 1 Compression)
Piston Ring (No. 2 Compression)
Piston Ring
(Side Rail and Expander)
Piston
○ Snap Ring
Piston Pin
○ Snap Ring
○ Connecting Rod Bushing
Connecting Rod
Connecting Rod Bearing
Connecting Rod Cap
See page EM-95
1st :30 (300, 22)
2nd: Turn 90°
○ Crankshaft Rear Oil Seal
x 6
Cylinder Block
Rear Oil Seal Retainer
Crankshaft
Crankshaft Thrust Washer
Main Bearing
Main Bearing Cap
See page EM-95
1st: 45 (450, 33)
2nd: Turn 90°
N·m (kgf·cm, ft·lbf) : Specified torque
○ Non-reusable part
A02806

EM0DK-06

DISASSEMBLY

1. INSTALL ENGINE TO ENGINE STAND FOR DISASSEMBLY

2. REMOVE GENERATOR

Remove the bolt, nut, pipe bracket and generator.

3. REMOVE TIMING BELT AND PULLEYS (See page EM-17)

4. REMOVE NO. 2 WATER BYPASS PIPE WITH HOSE

Remove the bolt, 2 nuts, water bypass pipe and gasket.

5. REMOVE WATER PUMP

Remove the 6 bolts, water pump and O-ring.

6. REMOVE CYLINDER HEAD (See page EM-34)

7. REMOVE OIL PRESSURE SWITCH (See page LU-1) AND KNOCK SENSORS (See page SF-69)

8. REMOVE OIL FILTER AND BRACKET ASSEMBLY

(a) Remove the union bolt and oil filter bracket.

(b) Remove the gasket from the union bolt.

(c) Remove the O-ring from the oil filter bracket.

9. REMOVE NO. 1 OIL PIPE

Remove the union bolt, oil pipe and 2 gaskets.

10. REMOVE FUEL INLET PIPE

Remove the 2 bolts and fuel inlet pipe.

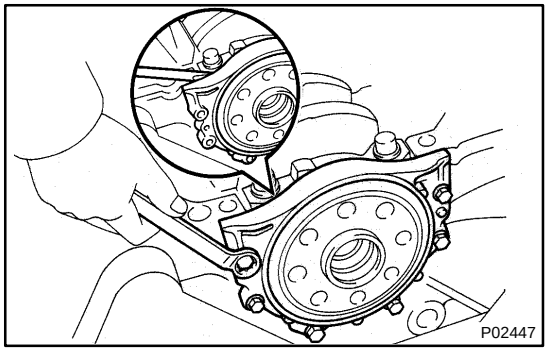
11. REMOVE LH ENGINE MOUNTING BRACKET AND INSULATOR ASSEMBLY

Remove the 4 bolts and mounting bracket.

12. REMOVE RH ENGINE MOUNTING BRACKET AND INSULATOR ASSEMBLY

Remove the 4 bolts and mounting bracket.

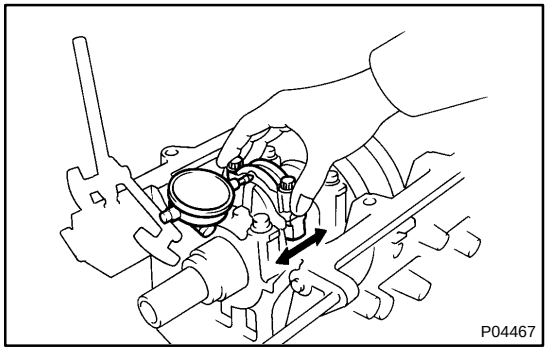
13. REMOVE OIL PUMP (See page LU-6)



14. REMOVE REAR OIL SEAL RETAINER

(a) Remove the 6 bolts of the retainer.

(b) Remove the oil seal retainer by prying the area between the oil seal retainer and main bearing cap with a screwdriver.



15. CHECK CONNECTING ROD THRUST CLEARANCE

Using a dial indicator, measure the thrust clearance while moving the connecting rods back and forth.

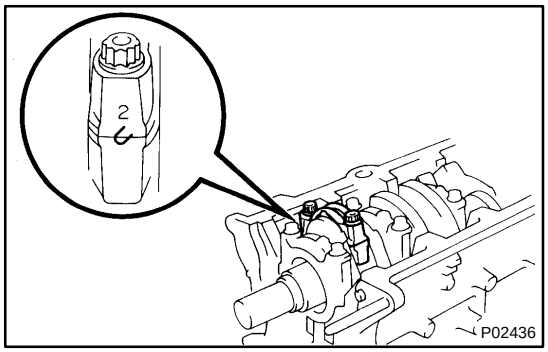
Standard thrust clearance:

0.250 - 0.402 mm (0.0098 - 0.0158 in.)

Maximum thrust clearance: 0.50 mm (0.0197 in.)

If the thrust clearance is greater than maximum, replace the connecting rod assembly(s). If necessary, replace the crankshaft.

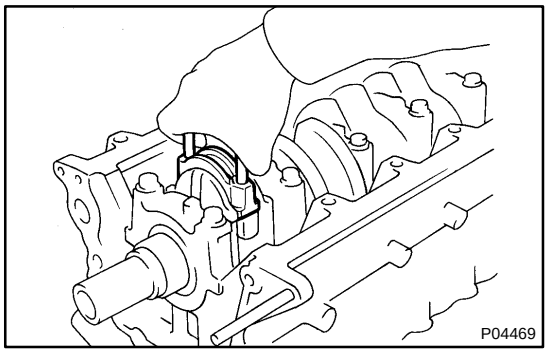
Connecting rod thickness:
25.898 - 25.950 mm (1.0196 - 1.0217 in.)



16. REMOVE CONNECTING ROD CAPS AND CHECK OIL CLEARANCE

(a) Check the matchmarks on the connecting rod and cap to ensure correct reassembly.

(b) Remove the connecting rod cap bolts.

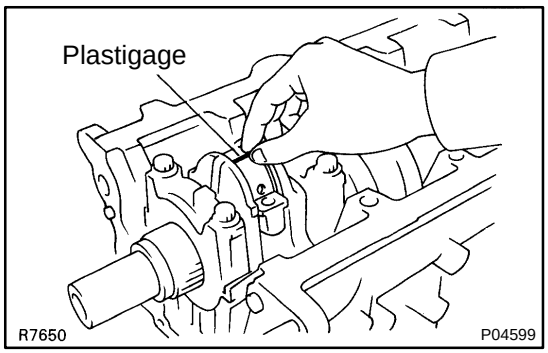


(c) Using the 2 removed connecting rod bolts, remove the connecting rod cap and lower bearing by wiggling the connecting rod cap right and left.

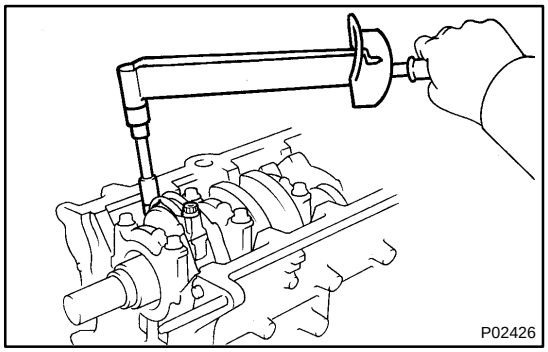
HINT:
Keep the lower bearing inserted with the connecting rod cap.

(d) Clean the crank pin and bearings.

(e) Check the crank pin and bearing for pitting and scratches.
If the crank pin or bearing is damaged, replace the bearings. If necessary, replace the crankshaft.



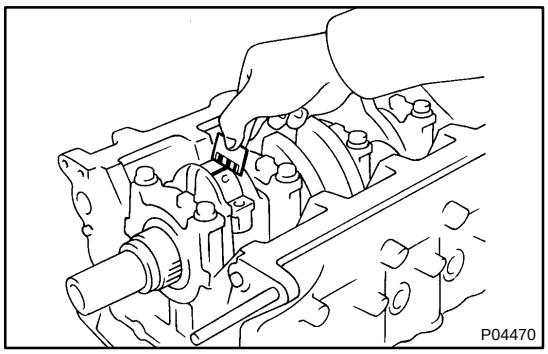
(f) Lay a strip of Plastigage across the crank pin.

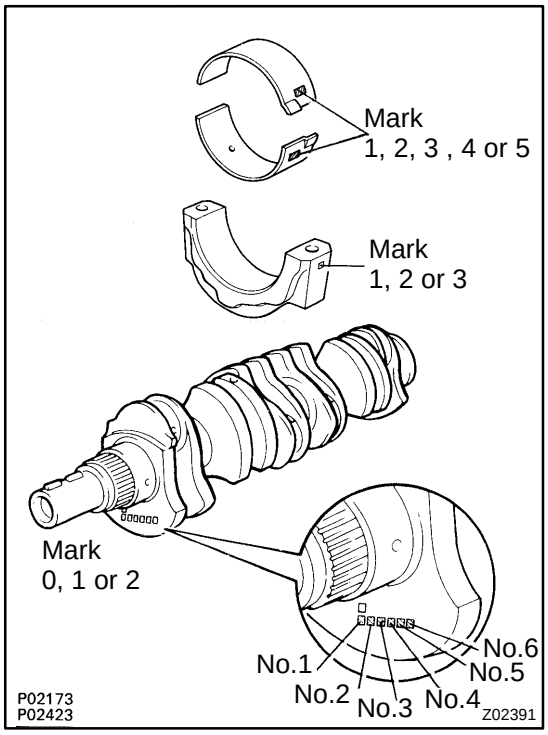


(g) Install the connecting rod cap with the 2 bolts (See page EM-95).

NOTICE:
Do not turn the crankshaft.

(h) Remove the 2 bolts, connecting rod cap and lower bearing (See procedure (b) and (c) above).





(i) Measure the Plastigage at its widest point.

Standard oil clearance:

STD	0.023 - 0.041 mm (0.0009 - 0.0016 in.)
U/S 0.25	0.028 - 0.066 mm (0.0011 - 0.0026 in.)

Maximum oil clearance:

STD	0.07 mm (0.0027 in.)
U/S 0.25	0.08 mm (0.0031 in.)

If the oil clearance is greater than maximum, replace the bearings. If necessary, grind or replace the crankshaft.

HINT:

If using a standard bearing, replace with one having the same number. If the number of the bearing cannot be determined, select the correct bearing by adding together the numbers imprinted on the connecting rod cap and crankshaft, then selecting the bearing with the same number as the total. There are 5 sizes of standard bearings, marked ”1”, ”2”, ”3”, ”4” and ”5” accordingly.

	Number mark								
Connecting rod cap	1			2			3		
Crankshaft	0	1	2	0	1	2	0	1	2
Use bearing	1	2	3	2	3	4	3	4	5

EXAMPLE:
Connecting rod cap ”3” + Crankshaft ”1”
= Total number 4 (Use bearing ”4”)

Reference

Connecting rod big end inside diameter:

Mark ”1”	55.025 - 55.031 mm (2.1663 - 2.1666 in.)
Mark ”2”	55.031 - 55.037 mm (2.1666 - 2.1668 in.)
Mark ”3”	55.037 - 55.043 mm (2.1668 - 2.1670 in.)

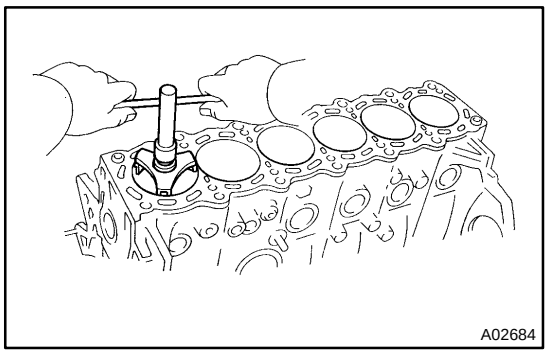
Crankshaft crank pin diameter:

Mark ”0”	51.994 - 52.000 mm (2.0470 - 2.0472 in.)
Mark ”1”	51.988 - 51.994 mm (2.0468 - 2.0470 in.)
Mark ”2”	51.982 - 51.988 mm (2.0465 - 2.0468 in.)

Standard sized bearing center wall thickness:

Mark ”1”	1.498 - 1.501 mm (0.0590 - 0.0591 in.)
Mark ”2”	1.501 - 1.504 mm (0.0591 - 0.0592 in.)
Mark ”3”	1.504 - 1.507 mm (0.0592 - 0.0593 in.)
Mark ”4”	1.507 - 1.510 mm (0.0593 - 0.0594 in.)
Mark ”5”	1.510 - 1.513 mm (0.0594 - 0.0596 in.)

(j) Completely remove the Plastigage.

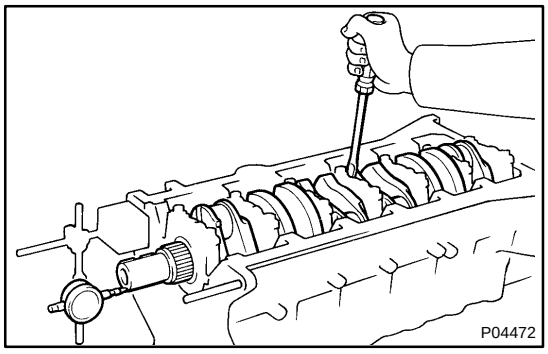


17. REMOVE PISTON AND CONNECTING ROD ASSEMBLIES

(a) Using a ridge reamer, remove all the carbon from the top of the cylinder.

(b) Push the piston, connecting rod assembly and upper bearing through the top of the cylinder block.

- Keep the bearings, connecting rod and cap together.
- Arrange the piston and connecting rod assemblies in correct order.



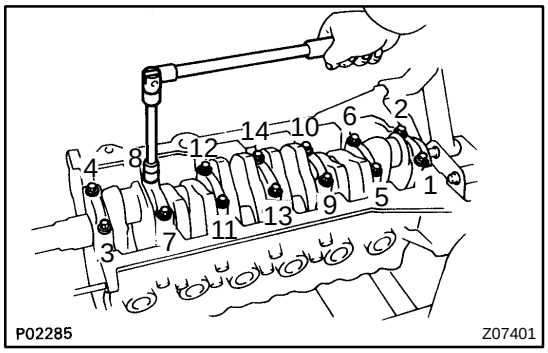
18. CHECK CRANKSHAFT THRUST CLEARANCE

Using a dial indicator, measure the thrust clearance while prying the crankshaft back and forth with a screwdriver.

Standard thrust clearance:
0.020 - 0.220 mm (0.0008 - 0.0087 in.)
Maximum thrust clearance: 0.30 mm (0.0118 in.)

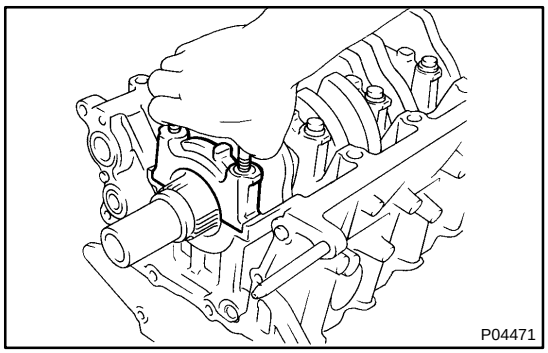
If the thrust clearance is greater than maximum, replace the thrust washers as a set.

Thrust washer thickness:
1.940 - 1.990 mm (0.0764 - 0.0783 in.)



19. REMOVE MAIN BEARING CAPS AND CHECK OIL CLEARANCE

(a) Uniformly loosen and remove the 14 main bearing cap bolts, in several passes, in the sequence shown.



(b) Using the removed main bearing cap bolts, pry the main bearing cap back and forth, and remove the main bearing caps, lower bearings and lower thrust washers (No.4 main bearing cap only).

HINT:

- Keep the lower bearing and main bearing cap together.
- Arrange the main bearing caps and lower thrust washers in correct order.

(c) Lift out the crankshaft.

HINT:

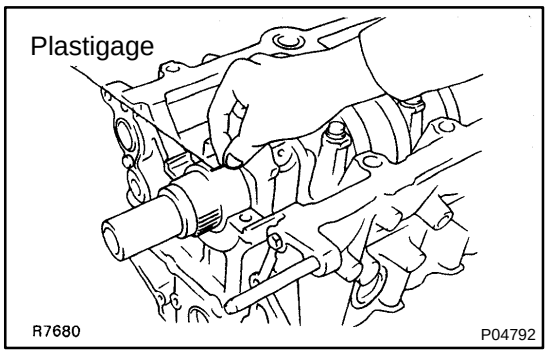
Keep the upper bearing and upper thrust washers together with the cylinder block.

(d) Clean each main journal and bearing.

(e) Check each main journal and bearing for pitting and scratches.

If the journal or bearing is damaged, replace the bearings. If necessary, grind or replace the crankshaft.

(f) Place the crankshaft on the cylinder block.

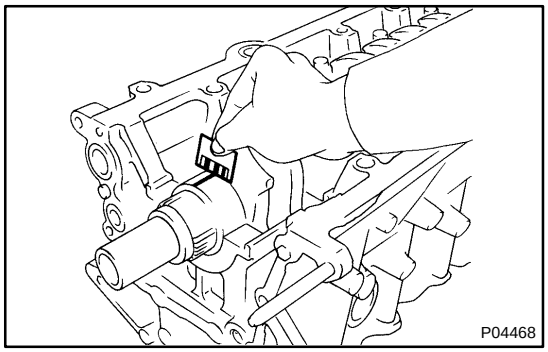


(g) Lay a strip of Plastigage across each journal.
(h) Install the main bearing caps (See page EM-95).

NOTICE:

Do not turn the crankshaft.

(i) Remove the main bearing caps (See procedures (a) and (b) above).



(j) Measure the Plastigage at its widest point.

Standard clearance:

STD	0.026 - 0.040 mm (0.0010 - 0.0016 in.)
U/S 0.25	0.025 - 0.061 mm (0.0010 - 0.0024 in.)

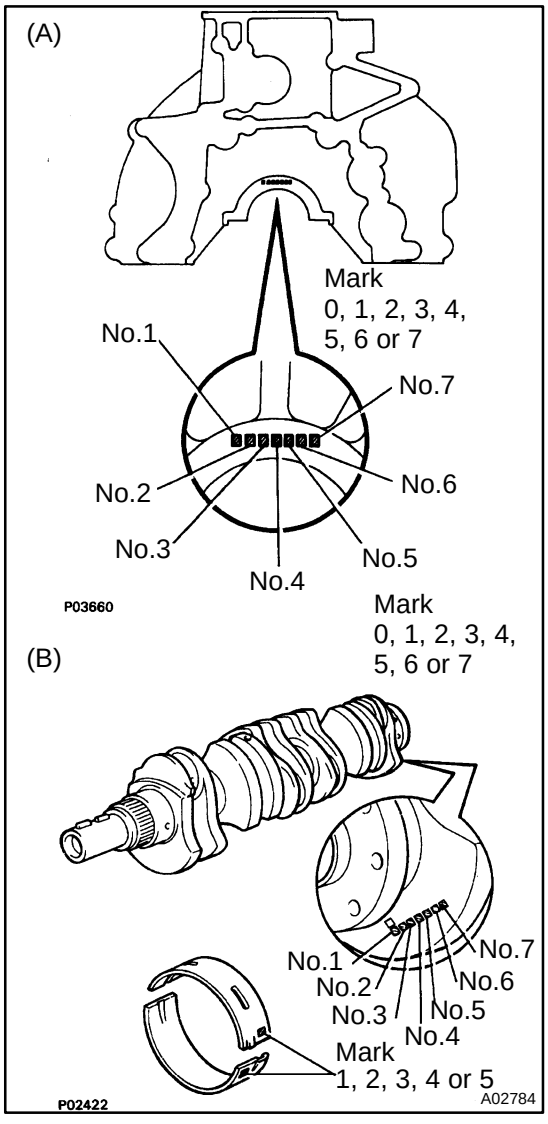
Maximum clearance:

STD	0.06 mm (0.0024 in.)
U/S 0.25	0.08 mm (0.0031 in.)

If the oil clearance is greater than maximum, replace the bearings. If necessary, grind or replace the crankshaft.

HINT:

If using a standard bearing, replace with one having the same number. If the number of the bearing cannot be determined, select the correct bearing by adding together the numbers imprinted on the cylinder block and crankshaft, then refer to the table below for the appropriate bearing number. There are 5 sizes of standard bearings, marked ”1”, ”2”, ”3”, ”4” and ”5” accordingly.



	Total number ” ” : Number mark				
Cylinder block (A) + Crankshaft (B) =	0 - 2	3 - 5	6 - 8	9 - 11	12 - 14
Use bearing	”1”	”2”	”3”	”4”	”5”

EXAMPLE:
Cylinder block ”3” (A) + Crankshaft ”4” (B)
= Total number 7 (Use bearing ”3”)

Standard sized bearing selection chart:

Crankshaft number mark	Cylinder block number mark							
	0	1	2	3	4	5	6	7
0	1	1	1	2	2	2	3	3
1	1	1	2	2	2	3	3	3
2	1	2	2	2	3	3	3	4
3	2	2	2	3	3	3	4	4
4	2	2	3	3	3	4	4	4
5	2	3	3	3	4	4	4	4
6	3	3	3	4	4	5	5	5
7	3	3	4	4	5	5	5	5

EXAMPLE:
Cylinder block "3", Crankshaft "4" = Use bearing "3"

Reference

Cylinder block main journal bore diameter (A):

Mark "0"	66.020 - 66.022 mm (2.59922 - 2.59929 in.)
Mark "1"	66.022 - 66.024 mm (2.59929 - 2.59936 in.)
Mark "2"	66.024 - 66.026 mm (2.59936 - 2.59944 in.)
Mark "3"	66.026 - 66.028 mm (2.59944 - 2.59952 in.)
Mark "4"	66.028 - 66.030 mm (2.59952 - 2.59960 in.)
Mark "5"	66.030 - 66.032 mm (2.59960 - 2.59968 in.)
Mark "6"	66.032 - 66.034 mm (2.59968 - 2.59976 in.)
Mark "7"	66.034 - 66.036 mm (2.59976 - 2.59984 in.)

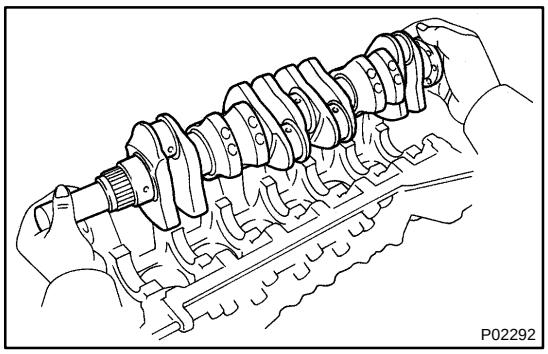
Crankshaft main journal diameter (B):

Mark "0"	61.998 - 62.000 mm (2.44086 - 2.44094 in.)
Mark "1"	61.996 - 61.998 mm (2.44078 - 2.44086 in.)
Mark "2"	61.994 - 61.996 mm (2.44070 - 2.44078 in.)
Mark "3"	61.992 - 61.994 mm (2.44063 - 2.44070 in.)
Mark "4"	61.990 - 61.992 mm (2.44055 - 2.44063 in.)
Mark "5"	61.988 - 61.990 mm (2.44047 - 2.44055 in.)
Mark "6"	61.986 - 61.988 mm (2.44039 - 2.44047 in.)
Mark "7"	61.984 - 61.986 mm (2.44031 - 2.44039 in.)

Standard bearing center wall thickness:

Mark "1"	1.994 - 1.997 mm (0.0785 - 0.0786 in.)
Mark "2"	1.997 - 2.000 mm (0.0786 - 0.0787 in.)
Mark "3"	2.000 - 2.003 mm (0.0787 - 0.0789 in.)
Mark "4"	2.003 - 2.006 mm (0.0789 - 0.0790 in.)
Mark "5"	2.006 - 2.009 mm (0.0790 - 0.0791 in.)

(k) Completely remove the Plastigage.



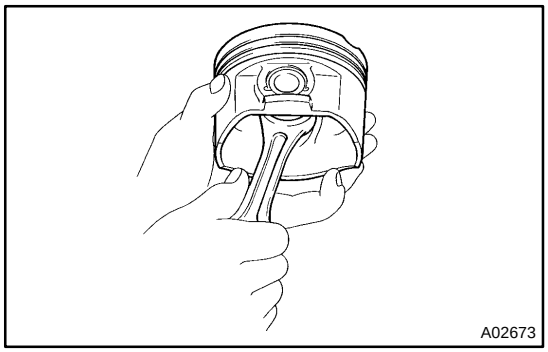
20. REMOVE CRANKSHAFT

(a) Lift out the crankshaft

(b) Remove the upper bearings and upper thrust washers from the cylinder block.

HINT:

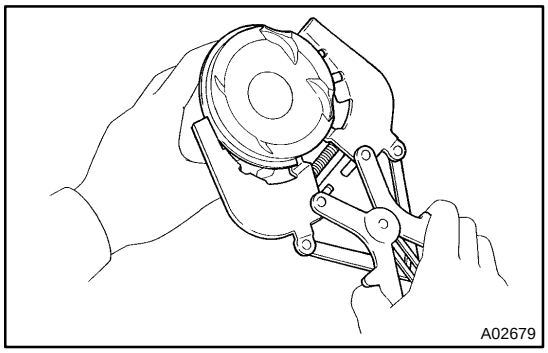
Arrange the main bearing caps, bearings and thrust washers in the correct order.



21. CHECK FIT BETWEEN PISTON AND PISTON PIN

Try to move the piston back and forth on the piston pin.

If any movement is felt, replace the piston and pin as a set.



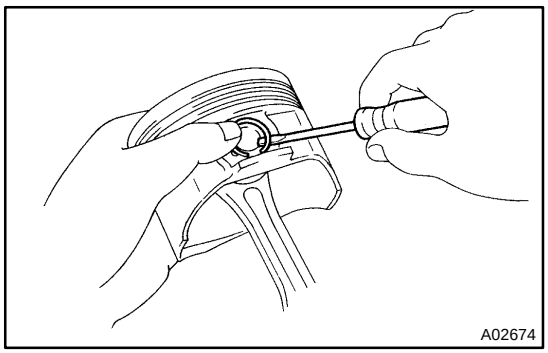
22. REMOVE PISTON RINGS

(a) Using a piston ring expander, remove the 2 compression rings.

(b) Remove the 2 side rails and oil ring expander by hand.

HINT:

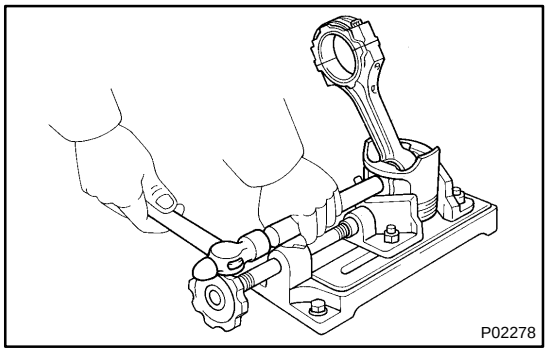
Arrange the piston rings in correct order only.



23. DISCONNECT CONNECTING ROD FROM PISTON

(a) Using a small screwdriver, remove the 2 snap rings.

(b) Gradually heat the piston to about 80˚C (176˚F).



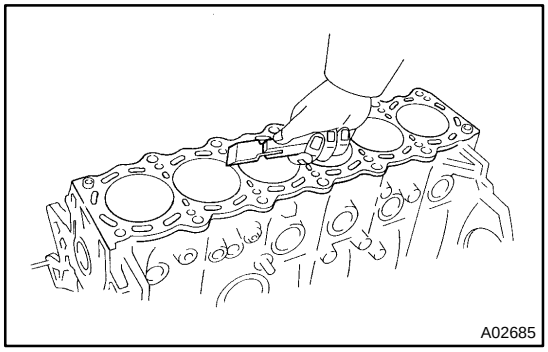
(c) Using a plastic-faced hammer and brass bar, lightly tap out the piston pin and remove the connecting rod.

HINT:

- The piston and pin are a matched set.
- Arrange the pistons, pins, rings, connecting rods and bearings in the correct order.

EM0DL-08

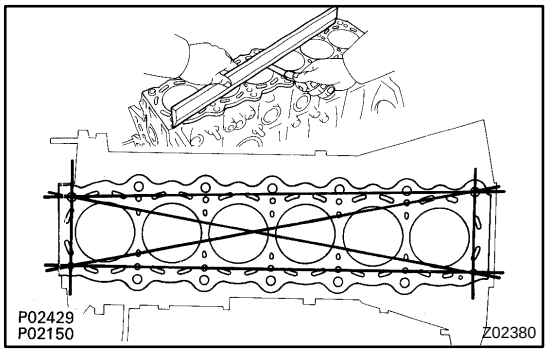
INSPECTION



1. CLEAN CYLINDER BLOCK

(a) Remove the gasket material.
Using a gasket scraper, remove all the gasket material from the cylinder block surface.

(b) Clean the cylinder block.
Using a soft brush and solvent, thoroughly clean the cylinder block.

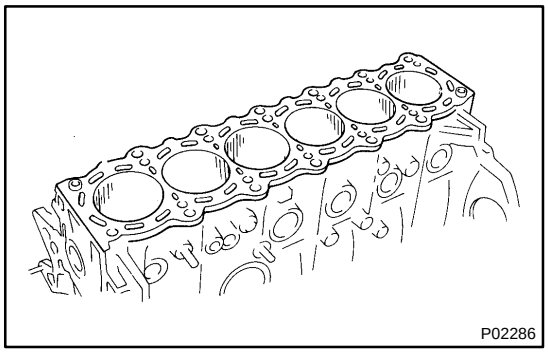


2. INSPECT CYLINDER BLOCK SURFACE FOR FLATNESS

Using precision straight edge and feeler gauge, measure the top surfaces of the cylinder block for warpage.

Maximum warpage: 0.07 mm (0.0028 in.)

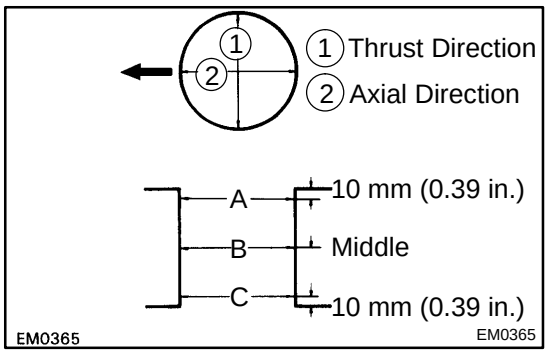
If warpage is greater than maximum, replace the cylinder block.



3. INSPECT CYLINDER FOR VERTICAL SCRATCHES

Visually check the cylinder for vertical scratches.

If deep scratches are present, replace the cylinder block.



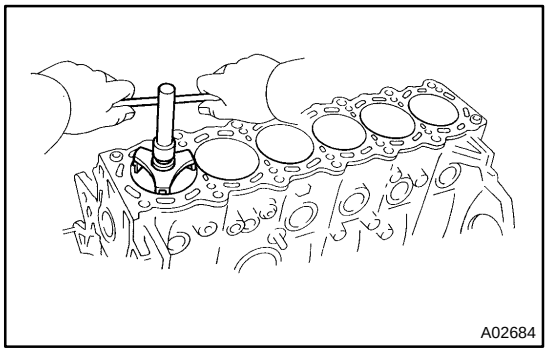
4. INSPECT CYLINDER BORE DIAMETER

Using a cylinder gauge, measure the cylinder bore diameter at positions A, B and C in the thrust and axial directions.

Standard diameter:
86.000 - 86.013 mm (3.3858 - 3.3863 in.)

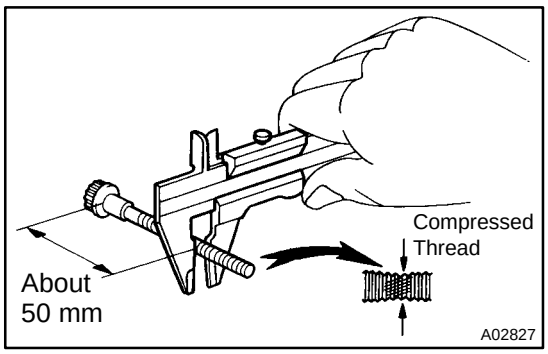
Maximum diameter: 86.02 mm (3.3866 in.)

If the diameter is greater than maximum, replace the cylinder block.



5. REMOVE CYLINDER RIDGE

If the wear is less than 0.2 mm (0.008 in.), using a ridge reamer, grind the top of the cylinder.

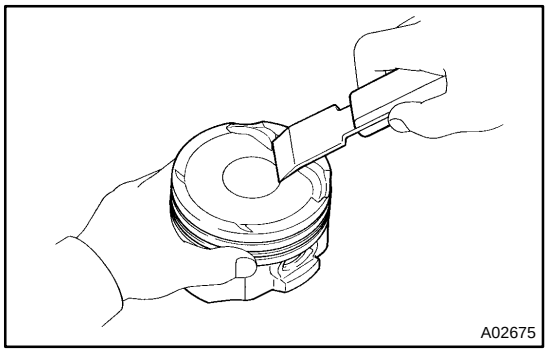


6. INSPECT MAIN BEARING CAP BOLTS

Using vernier calipers, measure the minimum diameter of the compressed thread at the measuring point.

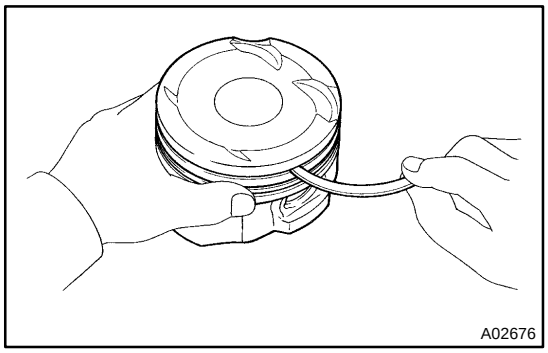
Standard diameter:
9.96 - 9.97 mm (0.3921 - 0.3925 in.)
Minimum diameter: 9.7 mm (0.382 in.)

If the diameter is less than minimum, replace the bolt.



7. CLEAN PISTON

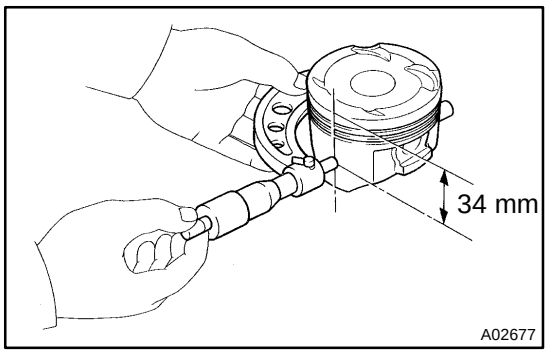
(a) Using a gasket scraper, remove the carbon from the piston top.



(b) Using a groove cleaning tool or broken ring, clean the piston ring grooves.

(c) Using solvent and a brush, thoroughly clean the piston.

NOTICE:
Do not use a wire brush.



8. INSPECT PISTON OIL CLEARANCE

(a) Using a micrometer, measure the piston diameter at right angles to the piston pin center line, 34 mm (1.34 in.) from the piston head.

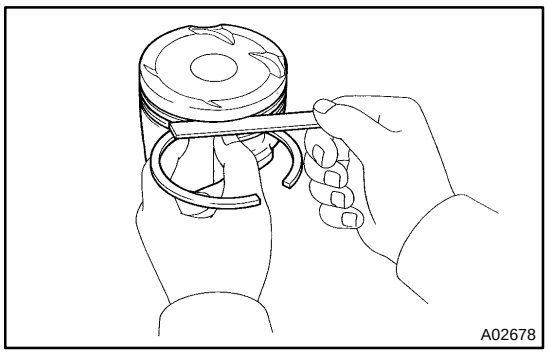
Piston diameter:
85.945 - 85.965 mm (3.3837 - 3.3844 in.)

(b) Measure the cylinder bore diameter in the thrust directions (See step 4).

(c) Subtract the piston diameter measurement from the cylinder bore diameter measurement.

Standard oil clearance:
0.035 - 0.068 mm (0.0014 - 0.0027 in.)
Maximum oil clearance: 0.10 mm (0.0039 in.)

If the oil clearance is greater than maximum, replace all the 6 pistons. If necessary, replace the cylinder block.



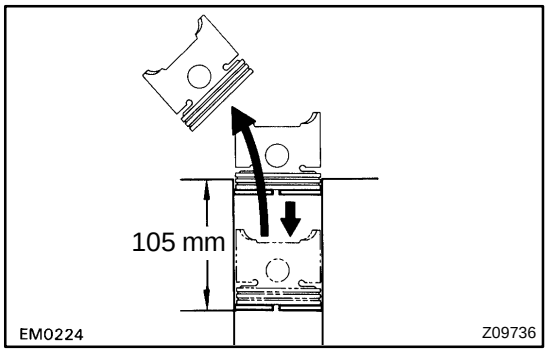
9. INSPECT PISTON RING GROOVE CLEARANCE

Using a feeler gauge, measure the clearance between new piston ring and the wall of the piston ring groove.

Ring groove clearance:

No.1	0.011 - 0.070 mm (0.0004 - 0.0028 in.)
No.2	0.030 - 0.070 mm (0.0012 - 0.0028 in.)

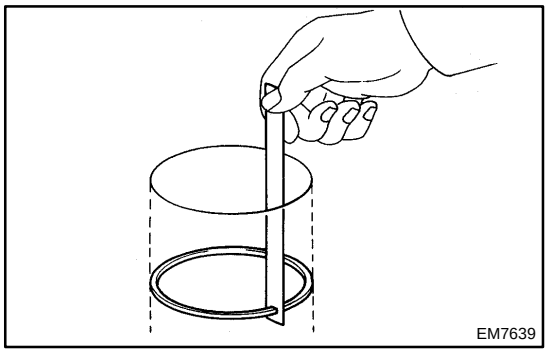
If the clearance is not as specified, replace the piston.



10. INSPECT PISTON RING END GAP

(a) Insert the piston ring into the cylinder bore.

(b) Using a piston, push the piston ring a little beyond the bottom of the ring travel, 105 mm (4.13 in.) from the top of the cylinder block.



(c) Using a feeler gauge, measure the ring end gap.

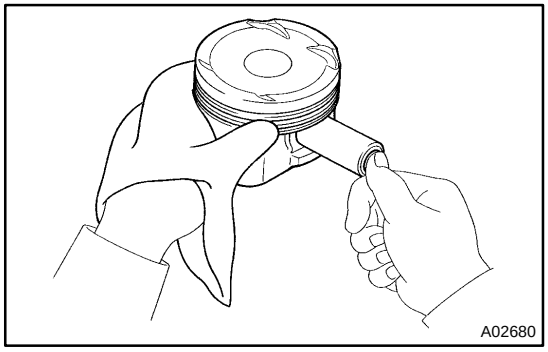
Standard ring end gap:

No.1	0.300 - 0.470 mm (0.0118 - 0.0185 in.)
No.2	0.350 - 0.520 mm (0.0138 - 0.0205 in.)
Oil (Side rail)	0.130 - 0.450 mm (0.0051 - 0.0177 in.)

Maximum ring end gap:

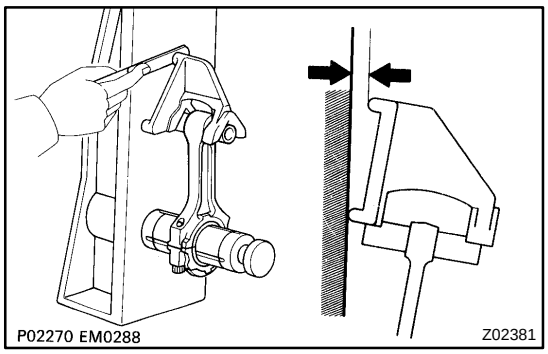
No.1	1.07 mm (0.0421 in.)
No.2	1.12 mm (0.0441 in.)
Oil (Side rail)	1.05 mm (0.0413 in.)

If the end gap is greater than maximum, replace the piston ring.
If the end gap is greater than maximum, even with a new piston ring, replace the cylinder block.



11. INSPECT PISTON PIN FIT

At 80°C (176°F), you should be able to push the piston pin into the piston pin hole with your thumb.



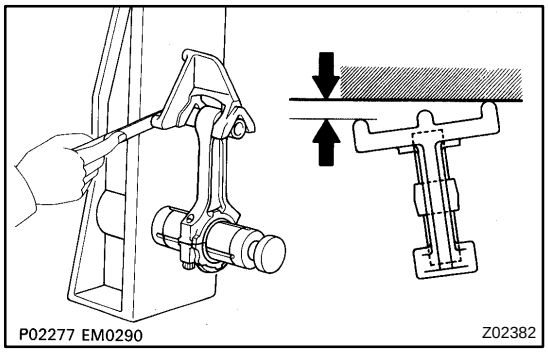
12. INSPECT CONNECTING ROD ALIGNMENT

Using a feeler gauge and rod aligner, check the connecting rod alignment.

- Check for out-of-alignment.

Maximum out-of-alignment:
0.05 mm (0.0020 in.) per 100 mm (3.94 in.)

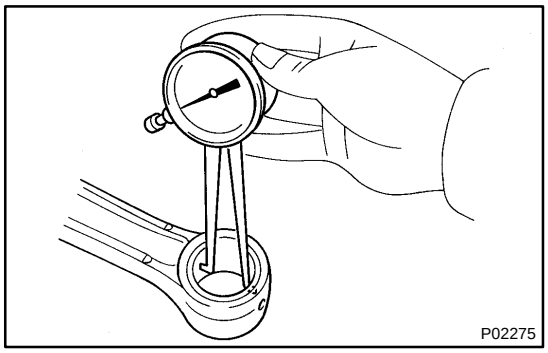
If out-of-alignment is greater than maximum, replace the connecting rod assembly.



- Check for twist.

Maximum twist:
0.15 mm (0.0059 in.) per 100 mm (3.94 in.)

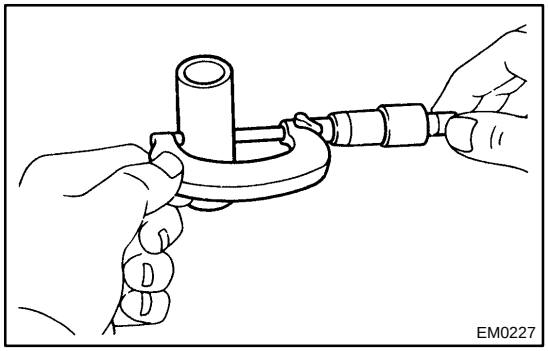
If twist is greater than maximum, replace the connecting rod assembly.



13. INSPECT PISTON PIN OIL CLEARANCE

(a) Using a caliper gauge, measure the inside diameter of the connecting rod bushing.

Bushing inside diameter:
22.005 - 22.014 mm (0.8663 - 0.8667 in.)



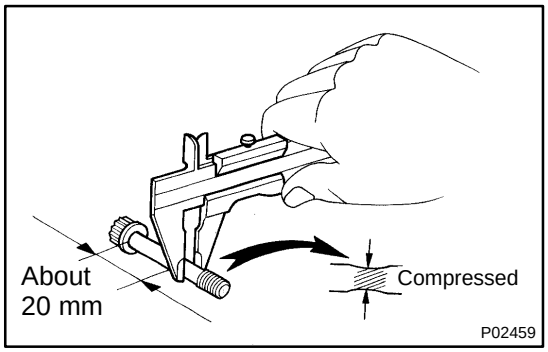
(b) Using a micrometer, measure the piston pin diameter.

Piston pin diameter:
21.997 - 22.006 mm (0.8660 - 0.8664 in.)

(c) Subtract the piston pin diameter measurement from the bushing in side diameter measurement.

Standard oil clearance:
0.005 - 0.011 mm (0.0002 - 0.0004 in.)
Maximum oil clearance: 0.05 mm (0.0020 in.)

If the oil clearance is greater than maximum, replace the bushing. If necessary, replace the piston and piston pin as a set.

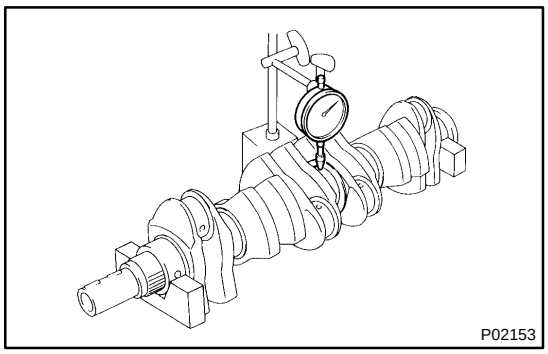


14. INSPECT CONNECTING ROD BOLTS

Using vernier calipers, measure the minimum diameter of the compressed bolt at the measuring point.

Standard diameter: 8.1 - 8.3 mm (0.319 - 0.327 in.)
Minimum diameter: 8.0 mm (0.315 in.)

If the diameter is less than minimum, replace the connecting rod bolt.



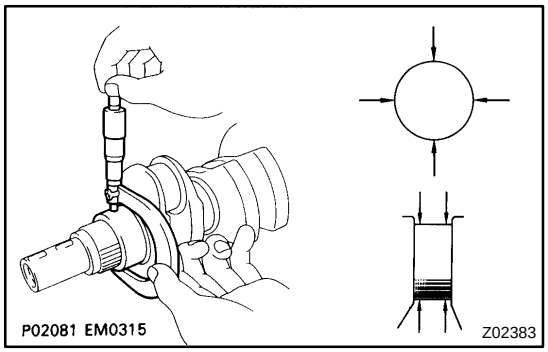
15. INSPECT CRANKSHAFT FOR RUNOUT

(a) Place the crankshaft on V-blocks.

(b) Using a dial indicator, measure the circle runout at the center journal.

Maximum circle runout: 0.06 mm (0.0024 in.)

If the circle runout is greater than maximum, replace the crankshaft.



16. INSPECT MAIN JOURNALS AND CRANK PINS

(a) Using a micrometer, measure the diameter of each main journal and crank pin.

Main journal diameter:

STD	61.984 - 62.000 mm (2.4403 - 2.4409 in.)
U/S 0.25	61.745 - 61.755 mm (2.4309 - 2.4313 in.)

Crank pin diameter:

STD	51.982 - 52.000 mm (2.0465 - 2.0472 in.)
U/S 0.25	51.745 - 51.755 mm (2.0372 - 2.0376 in.)

If the diameter is not as specified, check the oil clearance (See page EM-80).

(b) Check each main journal and crank pin for taper and out-of-round as shown.

Maximum taper and out-of round:
0.02 mm (0.0008 in.)

If the taper or out-of-round is greater than maximum, grind or replace the crankshaft.

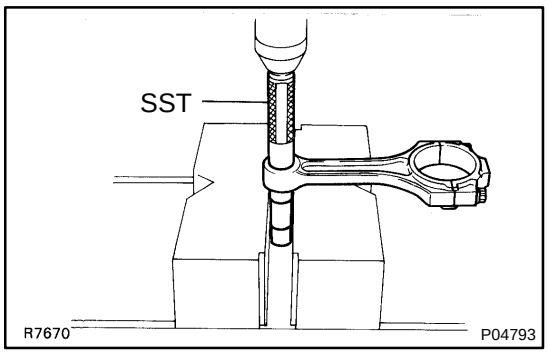
17. IF NECESSARY, GRIND AND HONE MAIN JOURNALS AND/OR CRANK PINS

- Grind and hone the main journals and/or crank pins to the finished undersized diameter (See procedure step 16).
- Install new main journal and/or crank pin undersized bearings.

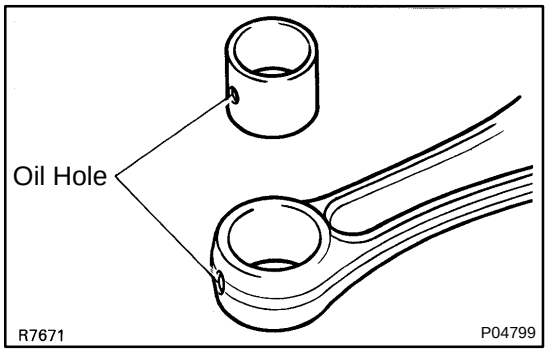
EM0DM-07

REPLACEMENT

1. REPLACE CONNECTING ROD BUSHING

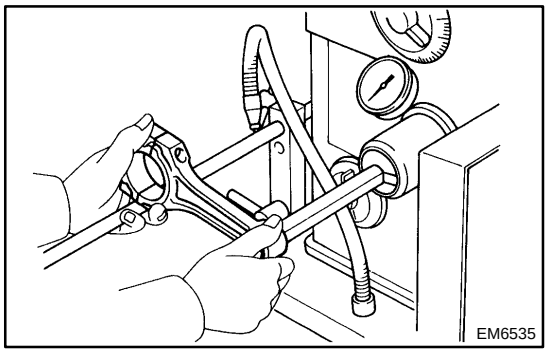


(a) Using SST and a press, press out the bushing.
SST 09222-30010

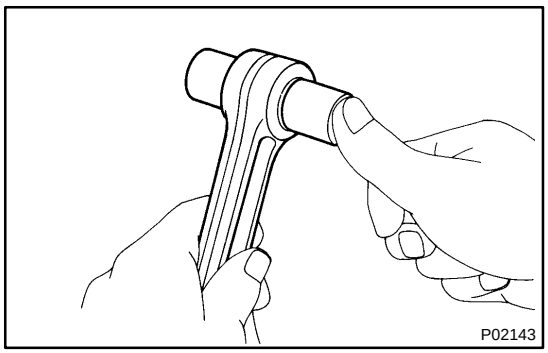


(b) Align the oil holes of a new bushing and the connecting rod.

(c) Using SST and a press, press in the bushing.
SST 09222-30010

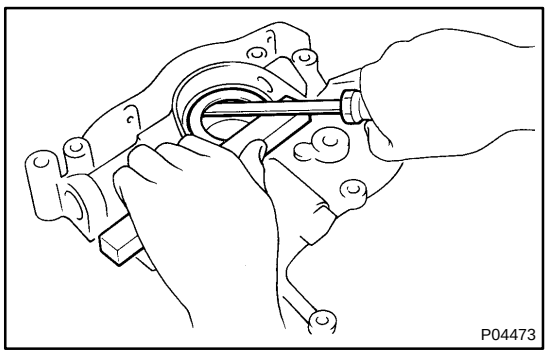


(d) Using a pin hole grinder, bore the bushing to obtain the standard specified clearance (See page EM-87) between the bushing and piston pin.



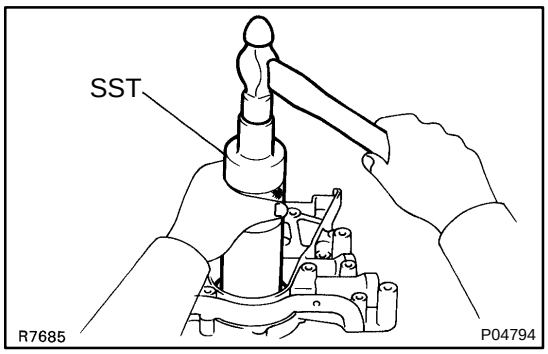
(e) Check the piston pin fit at room temperature.
Coat the piston pin with engine oil and push it into the connecting rod with your thumb.

2. REPLACE CRANKSHAFT FRONT OIL SEAL

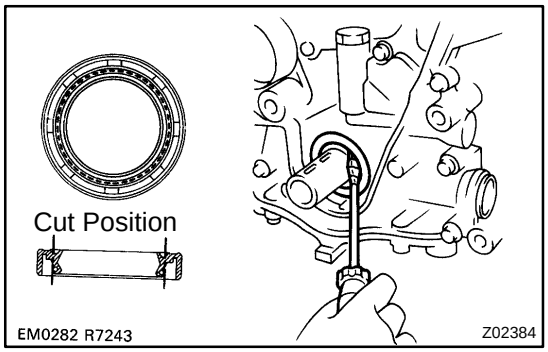


HINT:
There are 2 methods ((a) and (b)) to replace the oil seal.

(a) If the oil pump is removed form the cylinder block.
(1) Using a screwdriver, pry out the oil seal.



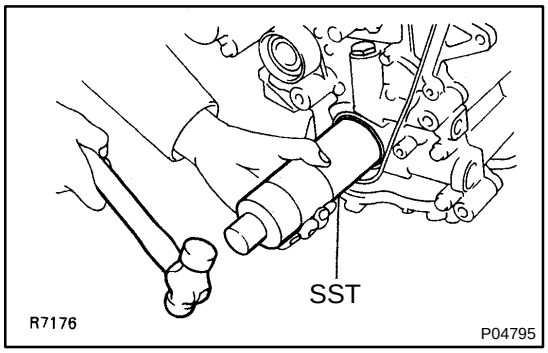
(2) Using SST and a hammer, tap in a new oil seal until its surface is flush with the oil pump body edge.
SST 09316-6001 1 (09316-00011)
(3) Apply MP grease to the oil seal lip.



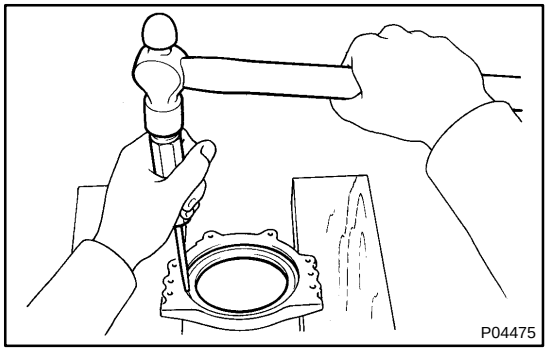
(b) If the pump is installed on the cylinder block.
(1) Using a knife, cut off the oil seal lip.
(2) Using a screwdriver, pry out the oil seal.

NOTICE:

Be careful not to damage the crankshaft. Tape the screwdriver tip.



(3) Apply MP grease to a new oil seal lip.
(4) Using SST and a hammer, tap in the oil seal until its surface is flush with the oil pump body edge.
SST 09316-6001 1 (09316-00011)

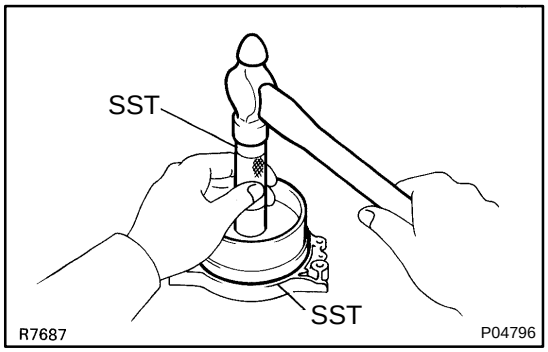


3. REPLACE CRANKSHAFT REAR OIL SEAL

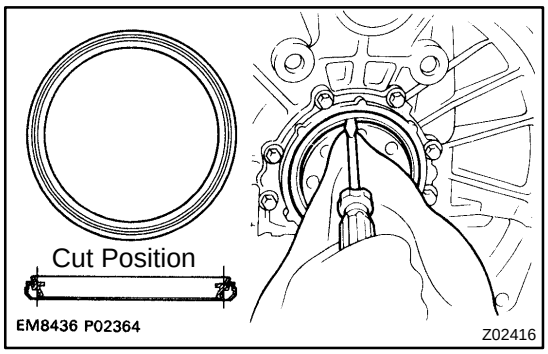
HINT:

There are 2 methods ((a) and (b)) to replace the oil seal.

(a) If the rear oil seal retainer is removed from the cylinder block.
(1) Using a screwdriver and hammer, tap out the oil seal.



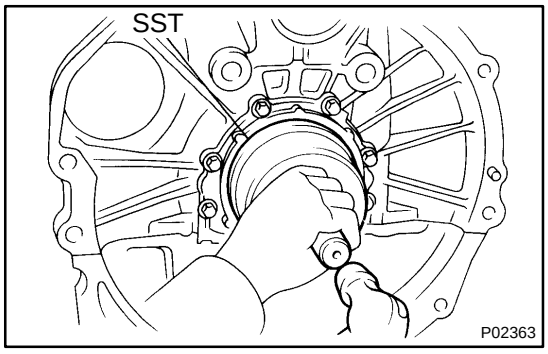
(2) Using SST and a hammer, tap in a new oil seal until its surface is flush with the rear oil seal retainer edge.
SST 09223-15030, 09950-70010 (09951-07100)
(3) Apply MP grease to the oil seal lip.



(b) If the rear seal retainer is installed on the cylinder block.
(1) Using a knife, cut off the oil seal lip.
(2) Using a screwdriver, pry out the oil seal.

NOTICE:

Be careful not to damage the crankshaft. Tape the screwdriver tip.



(3) Apply MP grease to a new oil seal lip.
(4) Using SST and a hammer, tap in the oil seal until its surface is flush with the rear oil seal retainer edge.

SST 09223-15030, 09950-70010 (09951-07100)

EM0DN-06

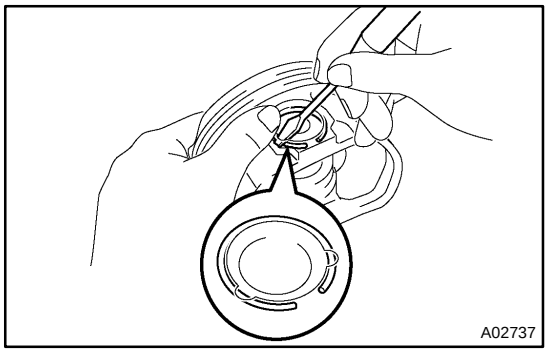
REASSEMBLY

HINT:

- Thoroughly clean all parts to be assembled.
- Before installing the parts, apply fresh engine oil to all sliding and rotating surfaces.
- Replace all gaskets, O-rings and oil seals with new parts.

NOTICE:

Apply a generous amount of oil on the sliding surface of the bearing, and not on the back of it or on the surface to which it is installed.



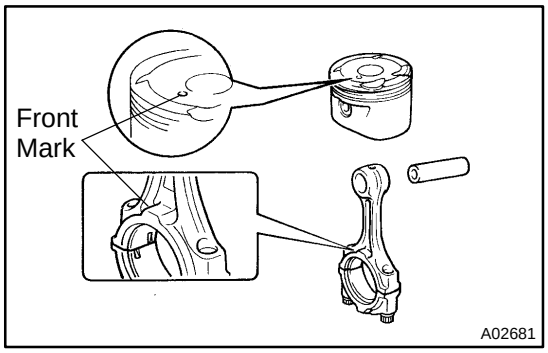
1. ASSEMBLE PISTON AND CONNECTING ROD

(a) Using a small screwdriver, install a new snap ring on one side of the piston pin hole.

HINT:

Be sure that end gap of the snap ring is not aligned with the pin hole cutout portion of the piston.

(b) Gradually heat the piston to about 80˚C (176˚F).



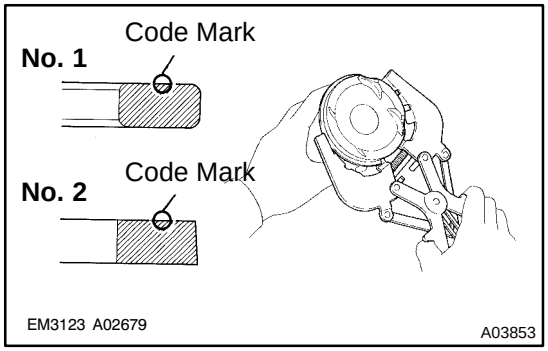
(c) Coat the piston pin with engine oil.

(d) Align the front marks of the piston and connecting rod, and push in the piston pin with your thumb.

(e) Install a new snap ring at the other end of the piston pin hole.

HINT:

Be sure that end gap of the snap ring is not aligned with the pin hole cutout portion of the piston.



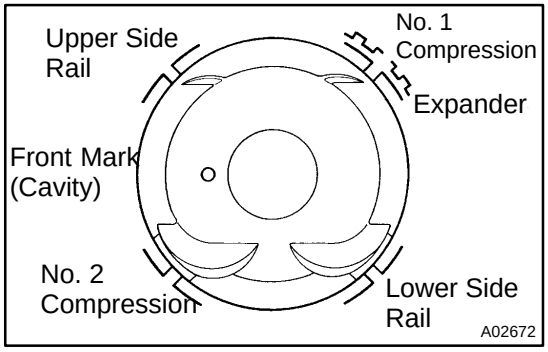
2. INSTALL PISTON RINGS

(a) Install the oil ring expander and 2 side rails by hand.

(b) Using a piston ring expander, install the 2 compression rings with the code mark facing up.

Code mark:

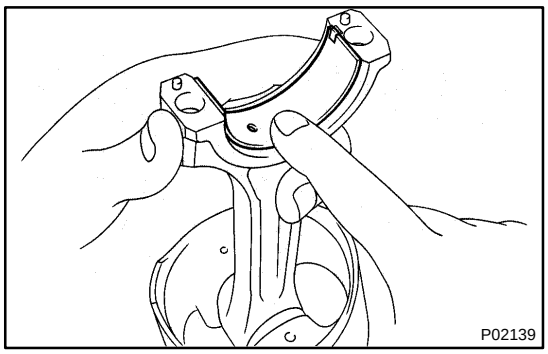
No. 1	1T
No. 2	2T



(c) Position the piston rings so that the ring ends are as shown.

NOTICE:

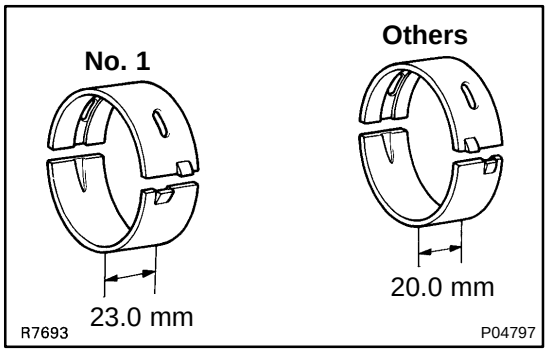
Do not align the piston ring ends.



3. INSTALL BEARINGS

(a) Align the bearing claw with the groove of the connecting rod and connecting cap.

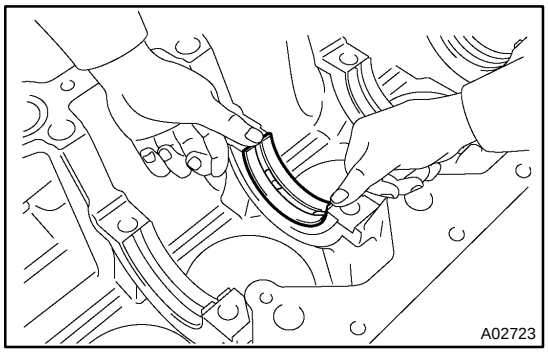
(b) Install the bearings in the connecting rod and connecting rod cap.



4. INSTALL MAIN BEARINGS

HINT:

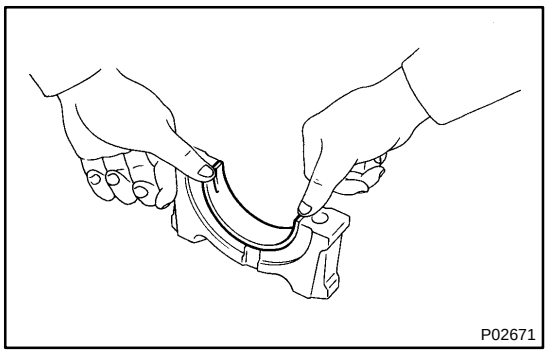
- Main bearings come in widths of 20.0 mm (0.787 in.) and 23.0 mm (0.906 in.). Install the 23.0 mm bearings in the No.1 cylinder block journal position with the main bearing cap. Install the 20.0 mm bearings in the other positions.
- Upper bearings have an oil groove and oil holes; lower bearings do not.



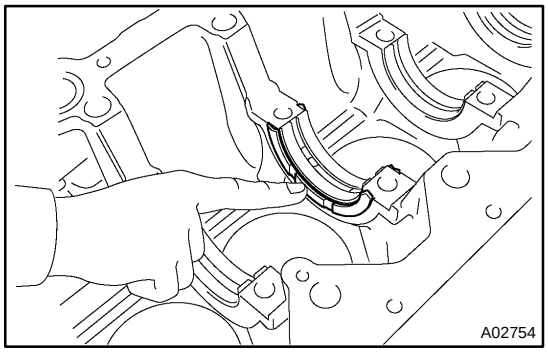
(a) Align the bearing claw with the claw groove of the main bearing cap or cylinder block.

NOTICE:

Install the bearing with the oil hole in the cylinder block.



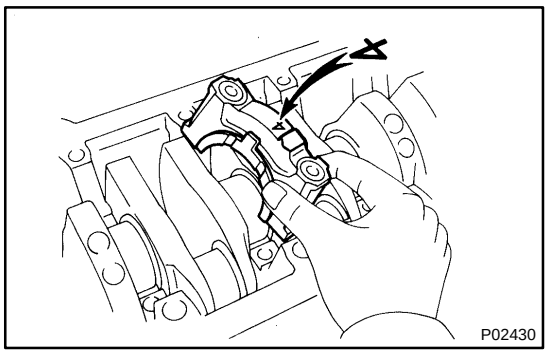
(b) Install the bearings in the cylinder block and main bearing caps.



5. INSTALL UPPER THRUST WASHERS

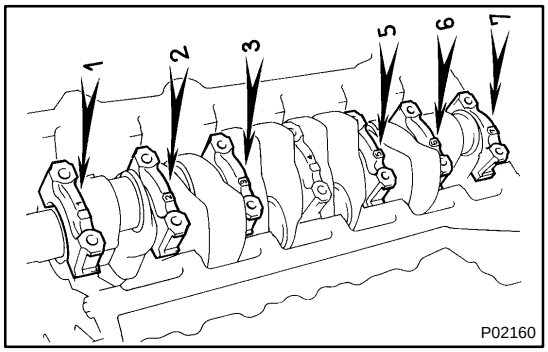
Install the 2 thrust washers under the No.4 main journal position of the cylinder block with the oil grooves facing outward.

6. PLACE CRANKSHAFT ON CYLINDER BLOCK



7. PLACE MAIN BEARING CAP AND LOWER THRUST WASHERS ON CYLINDER BLOCK

(a) Install the lower thrust washers on the No.4 main bearing with the grooves facing outward.

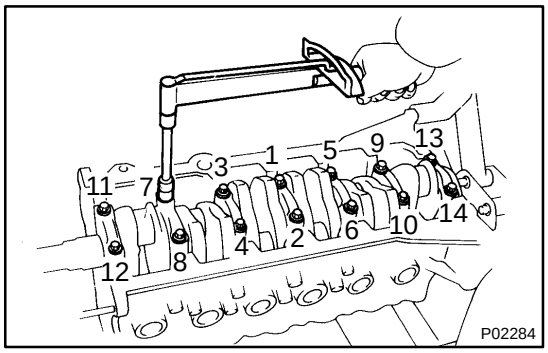


(b) Install the main bearing caps in numerical order with the arrows facing forward.

8. INSTALL MAIN BEARING CAP BOLTS

HINT:

- The main bearing cap bolts are tightened in 2 progressive steps (steps (b) and (d)).
- If any of the main bearing bolts break or deform, replace them.

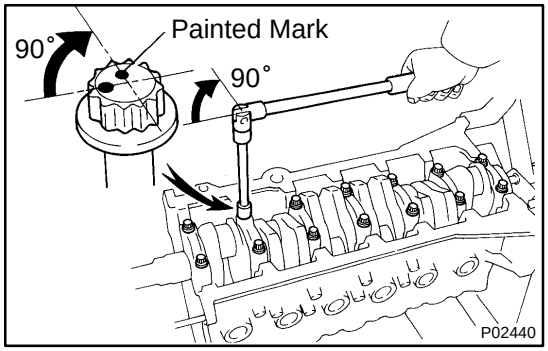


(a) Apply a light coat of engine oil on the threads and under the heads of the main bearing cap bolts.

(b) Install and uniformly tighten the 14 main bearing cap bolts, in several passes, in the sequence shown.

Torque: 45 N·m (450 kgf·cm, 33 ft·lbf)

If any one of the main bearing cap bolts does not meet the torque specification, replace the main bearing cap bolt.



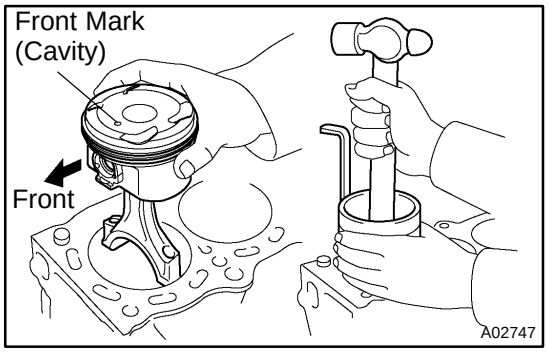
(c) Mark the front of the main bearing cap bolt head with paint.

(d) Retighten the main bearing cap bolts 90° in the numerical order shown above.

(e) Check that the painted mark is now at a 90° angle to the front.

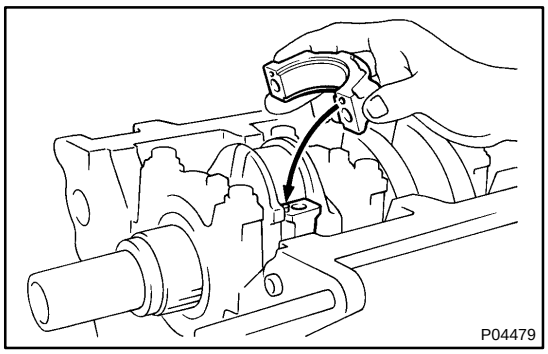
(f) Check that the crankshaft turns smoothly.

9. CHECK CRANKSHAFT THRUST CLEARANCE (See page EM-80)



10. INSTALL PISTON AND CONNECTING ROD ASSEMBLIES

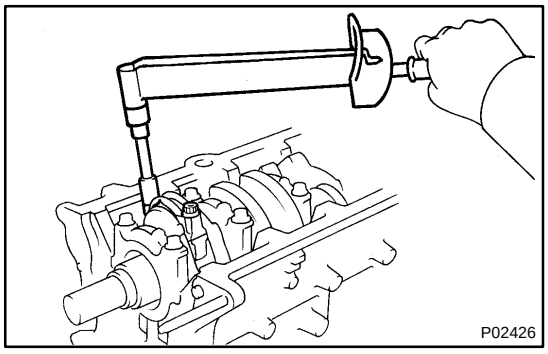
Using a piston ring compressor, push the correctly numbered piston and connecting rod assemblies into each cylinder with the front mark of the piston facing forward.



11. PLACE CONNECTING ROD CAP ON CONNECTING ROD

(a) Match the numbered connecting rod cap with the connecting rod.

(b) Install the connecting rod cap with by aligning the dowel pin to the corresponding hole.



12. INSTALL CONNECTING ROD CAP BOLTS

HINT:

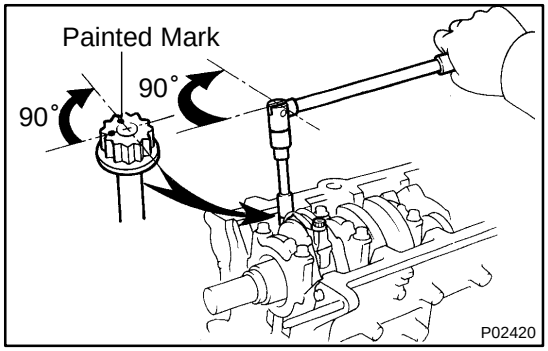
- The connecting rod cap bolts are tightened in 2 progressive steps (steps (b) and (d)).
- If any of the connecting rod bolts break or deform, replace them.

(a) Apply a light coat of engine oil on the threads and under the heads of the connecting rod cap bolts.

(b) Install and alternately tighten the bolts of the connecting rod cap in several passes.

Torque: 30 N·m (300 kgf·cm, 22 ft·lbf)

If any one of the connecting rod cap bolts does not meet the torque specification, replace the cap bolt.



(c) Mark the front of the connecting rod cap bolt with paint.

(d) Retighten the connecting rod cap bolts 90° in the numerical order shown.

(e) Check that the painted mark is now at a 90° angle to the front.

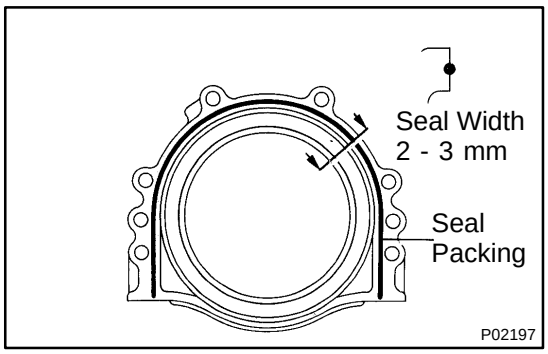
(f) Check that the crankshaft turns smoothly.

13. CHECK CONNECTING ROD THRUST CLEARANCE (See page EM-80)

14. INSTALL REAR OIL SEAL RETAINER

(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the retainer and cylinder block.

- Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces and sealing groove.
- Thoroughly clean all components to remove all debris.
- Using a non-residue solvent, clean both sealing surfaces.



(b) Apply seal packing to the retainer as shown in the illustration.

Seal packing: Part No.08826-00080 or equivalent

- Install a nozzle that has been cut to a 2 - 3 mm (0.08 - 0.12 in.) opening.
- Parts must be assembled within 3 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.

(c) Install the retainer with the 6 bolts.

Torque: 6.0 N·m (60 kgf·cm, 53 in.·lbf)

15. INSTALL OIL PUMP (See page LU-12)

16. INSTALL RH ENGINE MOUNTING BRACKET AND INSULATOR ASSEMBLY

Install the mounting bracket with the 4 bolts.

Torque: 59 N·m (590 kgf·cm, 44 ft·lbf)

17. INSTALL LH ENGINE MOUNTING BRACKET AND INSULATOR ASSEMBLY

Install the mounting bracket with the 4 bolts.

Torque: 59 N·m (590 kgf·cm, 44 ft·lbf)

18. INSTALL FUEL INLET PIPE

Install the fuel inlet pipe with the 2 bolts.

Torque: 29 N·m (290 kgf·cm, 21 ft·lbf)

19. INSTALL NO. 1 OIL PIPE

Install the oil pipe with 2 new gaskets and the union bolt.

Torque: 55 N·m (550 kgf·cm, 41 ft·lbf)

20. INSTALL OIL FILTER AND BRACKET ASSEMBLY

(a) Install a new O-ring to the oil filter bracket.

(b) Install a new gasket to the union bolt.

(c) Install the oil filter bracket with the union bolt.

Torque: 90 N·m (900 kgf·cm, 65 ft·lbf)

21. INSTALL OIL PRESSURE SWITCH (See page LU-1) AND KNOCK SENSORS (See page SF-69)

22. INSTALL CYLINDER HEAD (See page EM-53)

23. INSTALL WATER PUMP (See page CO-9)

24. INSTALL NO. 2 WATER BYPASS PIPE WITH HOSE

(a) Install the water bypass pipe with the bolt and 2 nuts.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

(b) Connect the water bypass hose to the hose clamp.

25. INSTALL TIMING PULLEYS AND BELT (See page EM-24)

26. INSTALL GENERATOR

Install the generator and pipe bracket with the bolt and nut.

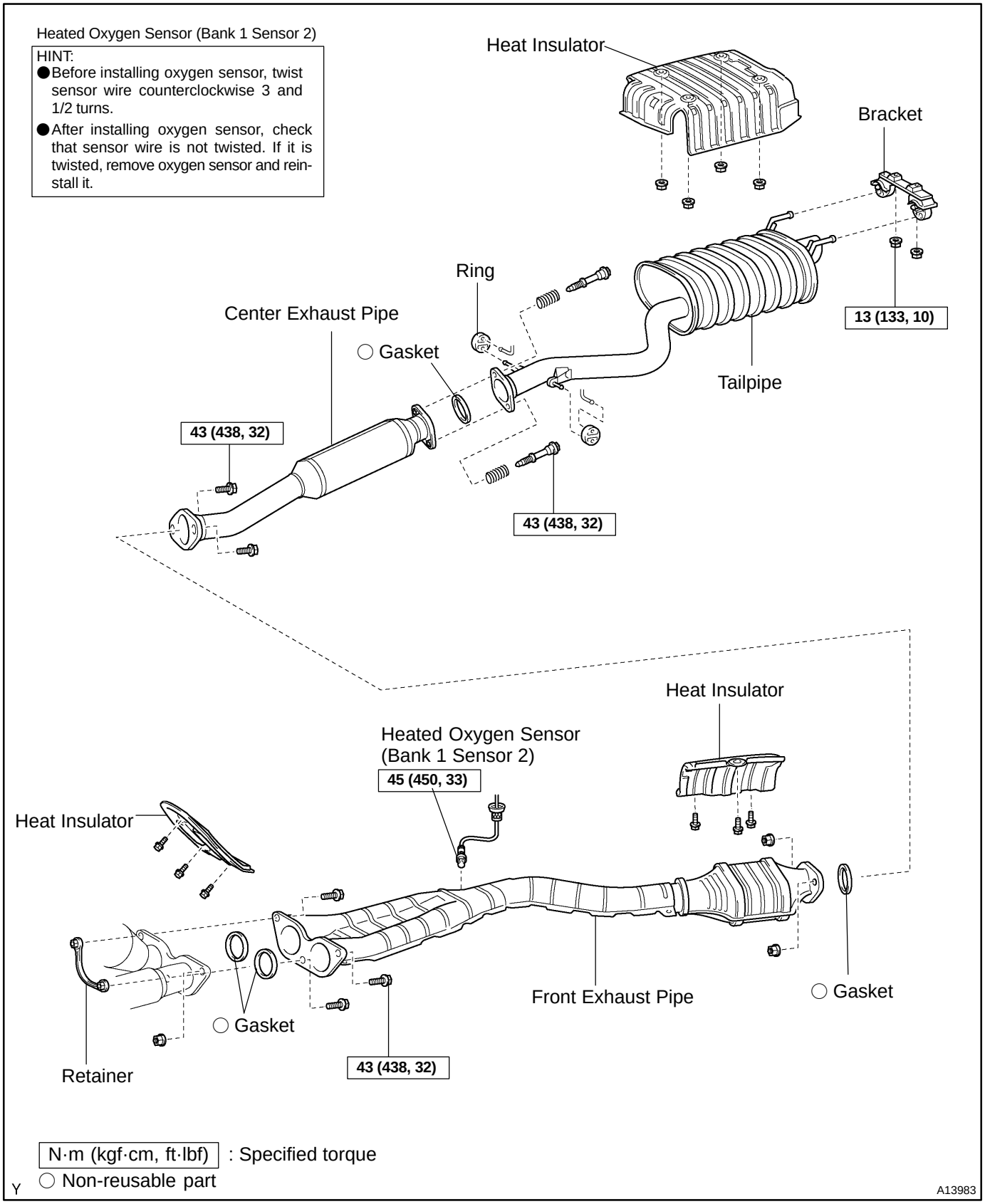
Torque: 40 N·m (400 kgf·cm, 30 ft·lbf)

27. REMOVE ENGINE STAND FROM ENGINE

EXHAUST SYSTEM

COMPONENTS

EM0DO-08



EMISSION CONTROL SYSTEM

EC00B-05

PURPOSE

The emission control systems are installed to reduce the amount of CO, HC and NOx exhausted from the engine (3) and (4)), to prevent the atmospheric release of blow-by gas-containing HC (1) and evaporated fuel containing HC being released from the fuel tank (2).
The function of each system is shown in these table.

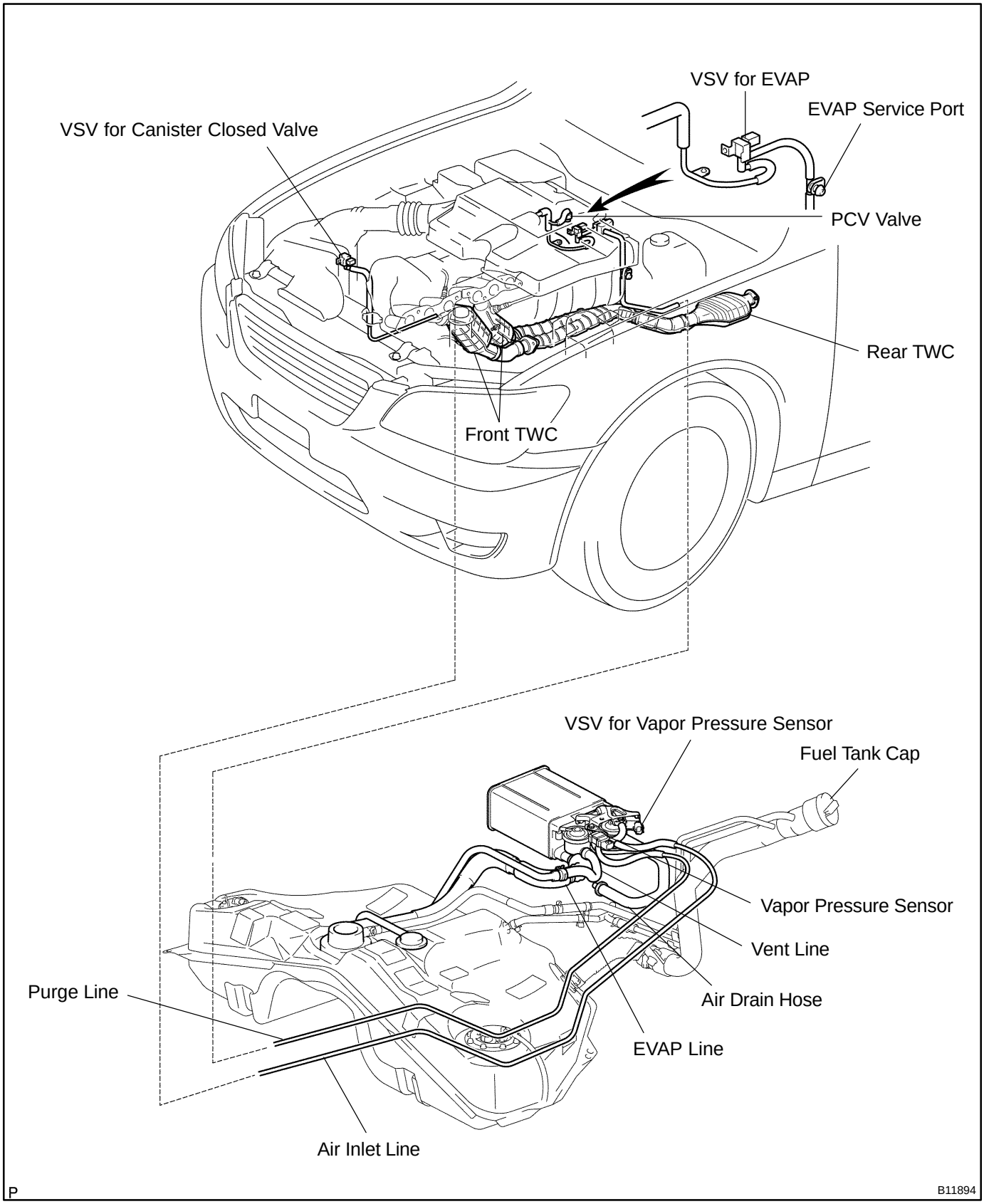
System	Abbreviation	Function
(1) Positive Crankcase Ventilation	PCV	Reduces blow-by gas (HC)
(2) Evaporative Emission Control	EVAP	Reduces evaporated HC
(3) Three-Way Catalytic Converter	TWC	Reduces CO, HC and NOx
(4) Sequential Multiport Fuel Injection *	SFI	Injects a precisely timed, optimum amount of fuel for reduced exhaust emissions

Remark: *For inspection and repair of the SFI system, refer to the SF section this manual.

PARTS LAYOUT AND SCHEMATIC DRAWING

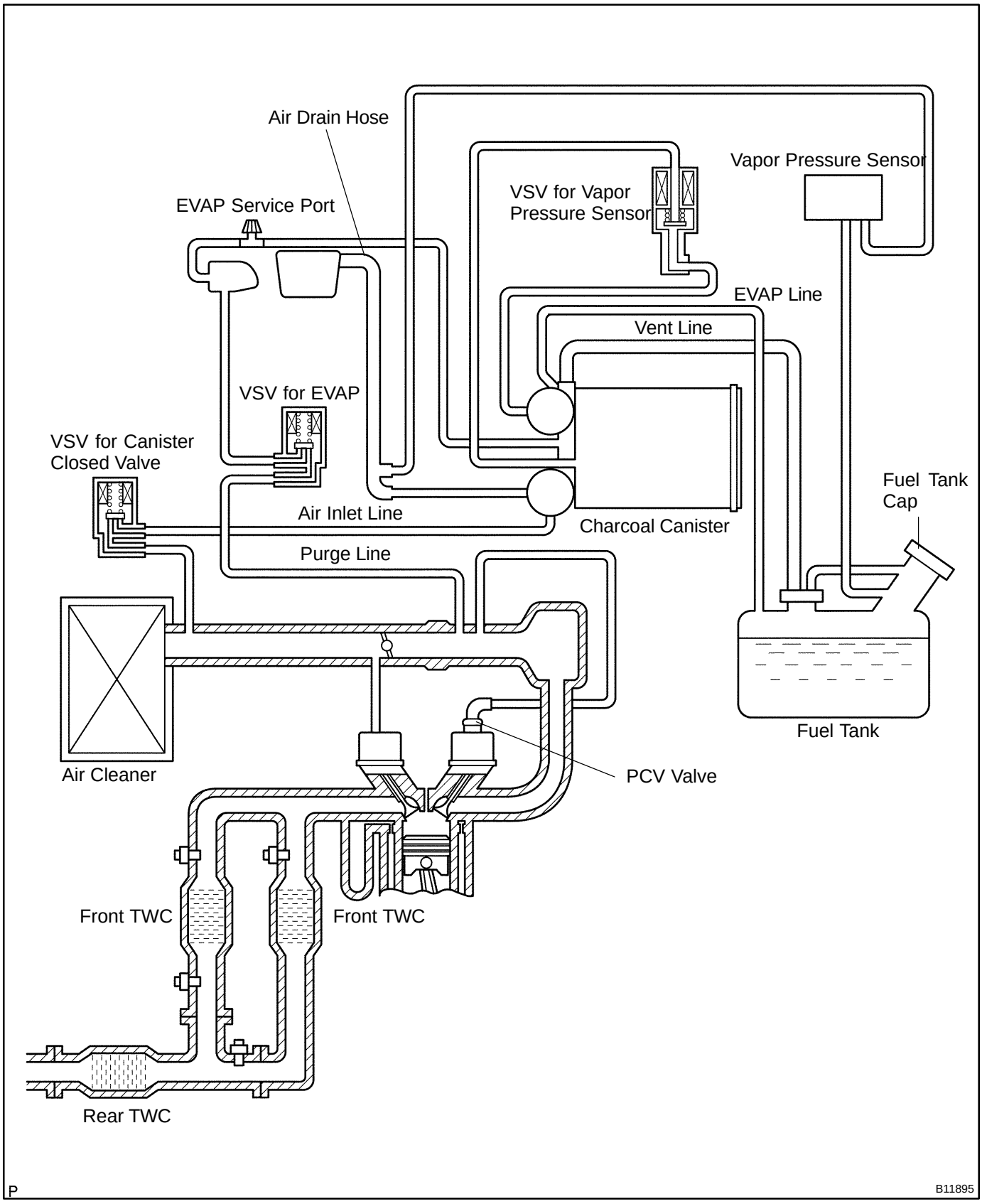
EC04V-10

LOCATION



EC04W-14

DRAWING



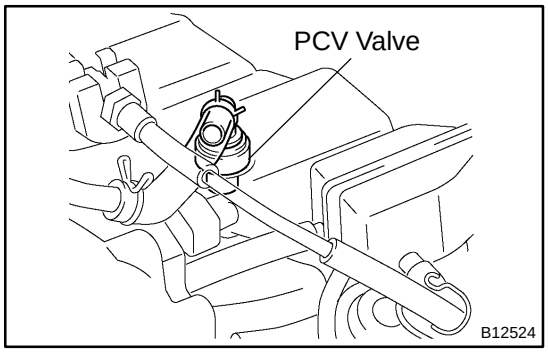
POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM

EC04X-09

INSPECTION

1. REMOVE ENGINE COVER

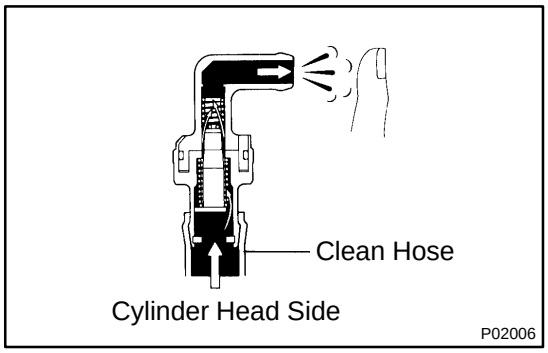
Remove 4 nuts and engine cover.



2. REMOVE PCV VALVE

(a) Disconnect the PCV hose from the PCV valve.

(b) Remove the PCV valve.



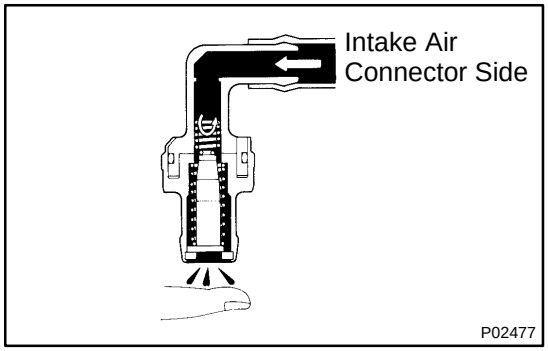
3. INSTALL CLEAN HOSE TO PCV VALVE

4. INSPECT PCV VALVE OPERATION

(a) Blow air into the cylinder head side, and check that air passes through easily.

CAUTION:

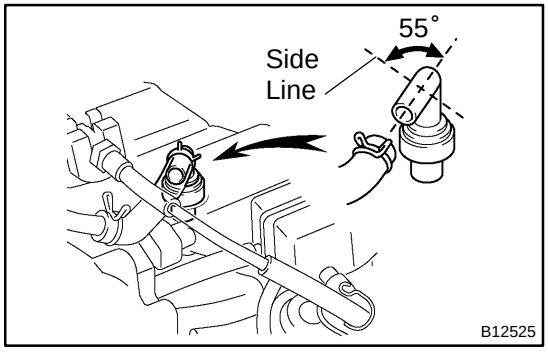
- **Do not suck air through the valve.**
- **Petroleum substances inside the valve are harmful.**



(b) Blow air into the intake air connector side, and check that air passes through with difficulty.

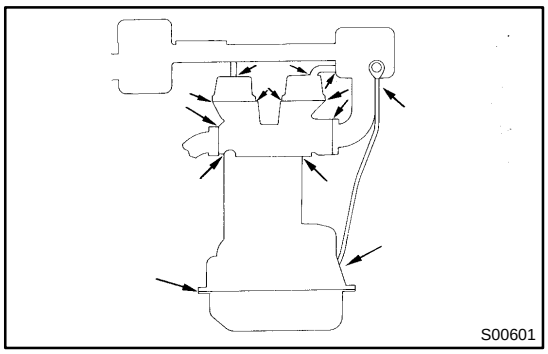
If operation is not as specified, replace the PCV valve.

5. REMOVE CLEAN HOSE FROM PCV VALVE



6. REINSTALL PCV VALVE

The port faces in the direction indicated in the illustration.



7. VISUALLY INSPECT HOSES, CONNECTIONS AND GASKETS

Check for cracks, leaks or damage.

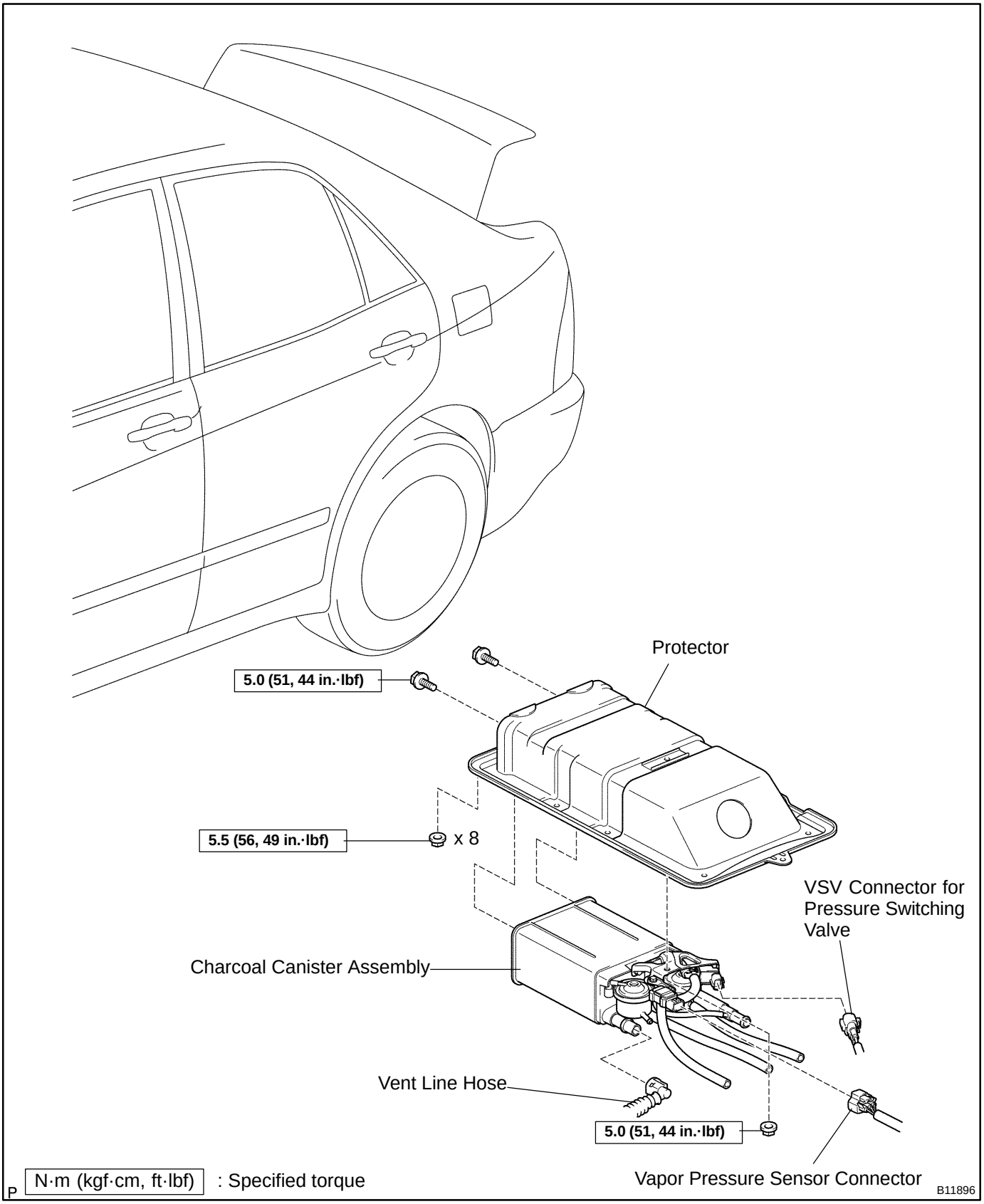
8. REINSTALL ENGINE COVER

Install the engine cover with the 4 nuts.

EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM

EC053-08

COMPONENTS



EC0BD-05

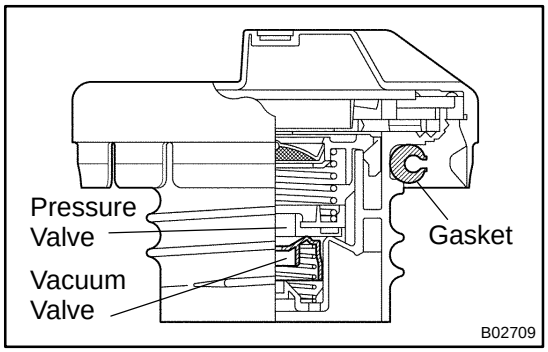
INSPECTION

1. INSPECT LINES AND CONNECTORS

Visually check for loose connections, sharp bends or damage.

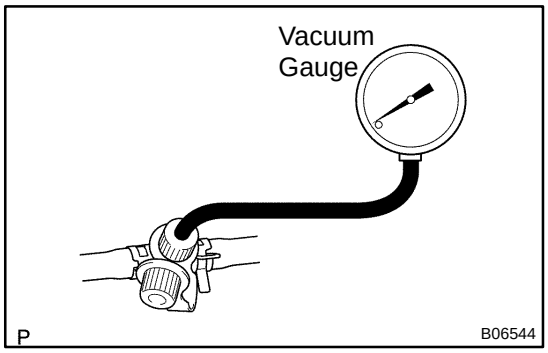
2. INSPECT FUEL TANK FILLER PIPE

Visually check for deformation, cracks or fuel leakage.



3. VISUALLY INSPECT FUEL TANK CAP

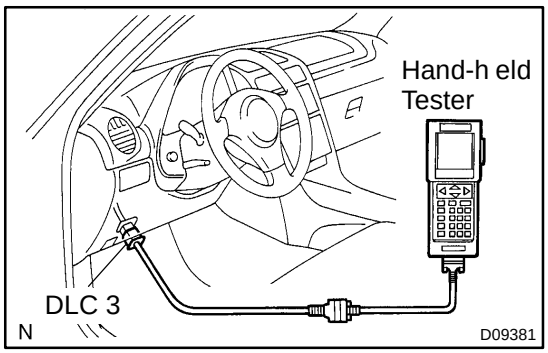
Check if the cap and/or gasket are deformed or damaged.
If necessary, repair or replace the cap.



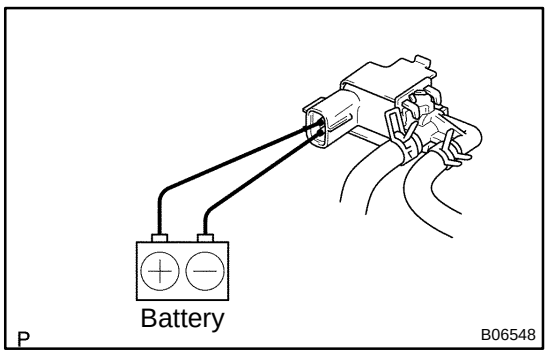
4. INSPECT EVAP SYSTEM LINE

(a) Warm up the engine and stop the engine.
Allow the engine to warm up to normal operating temperature.

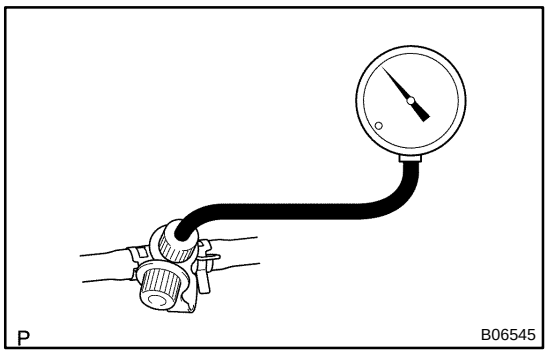
(b) Install a vacuum gauge (EVAP control system test equipment vacuum gauge) to the EVAP service port on the purge line.



(c) Hand-held Tester:
Forced driving of the VSV for the EVAP.
(1) Connect a hand-held tester to the DLC3.
(2) Start the engine.
(3) Push the hand-held tester main switch ON.
(4) Select the following menu items: DIAGNOSIS/ENHANCED OBDII / ACTIVE TEST / EVAP VSV (ALONE).



(d) If you have no Hand-held Tester:
Forced driving of the VSV for the EVAP.
(1) Disconnect the VSV connector for the EVAP.
(2) Connect the positive (+) and negative (-) leads from the battery to the VSV terminals for the EVAP.
(3) Start the engine.



(e) Check the vacuum at idle.
Vacuum:
Maintain at 0.368 - 19.713 in.Hg (5 - 268 in.Aq) for over 5 seconds

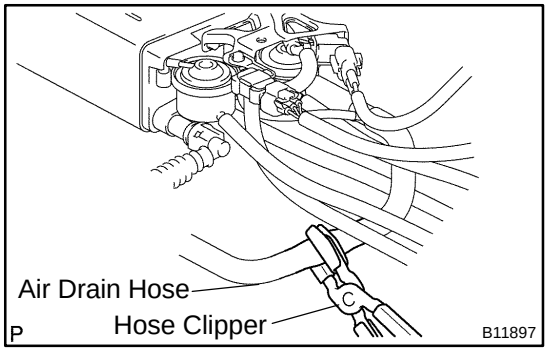
HINT:
If the vacuum does not change, you can conclude that the hose connecting the VSV to the service port has come loose or is blocked, or the VSV is malfunctioning.

(f) Hand-held Tester:
Conclude forced driving of the VSV for the EVAP.
(1) Stop the engine.
(2) Disconnect the hand-held tester from the DLC3.

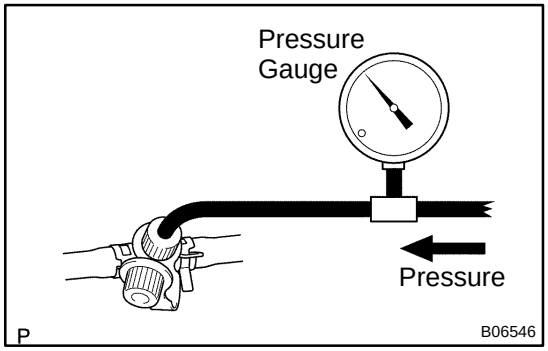
(g) If you have no Hand-held Tester:
Conclude forced driving of the VSV for the EVAP.
(1) Stop the engine.
(2) Disconnect the positive (+) and negative (-) leads from the battery from the VSV terminals for the EVAP.
(3) Connect the VSV connector for the EVAP.

(h) Disconnect the vacuum gauge from the EVAP service port on the purge line.

(i) Connect a pressure gauge to the EVAP service port on the purge line.

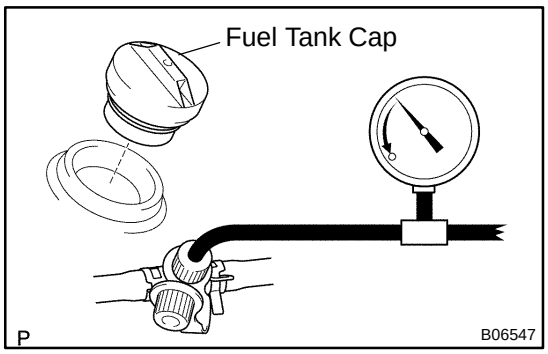


(j) Check the pressure.
(1) Close off the air drain hose at the marked position of the canister with a hose clipper or similar instrument.



(2) Add the pressure (13.5 - 15.5 in.Aq) from the EVAP service port.
Pressure:
2 minutes after the pressure is added, the gauge should be over 7.7 - 8.8 in.Aq.

HINT:
If you can't add pressure, you can conclude that the hose connecting the VSV - canister - fuel tank has slipped off or the VSV is open.

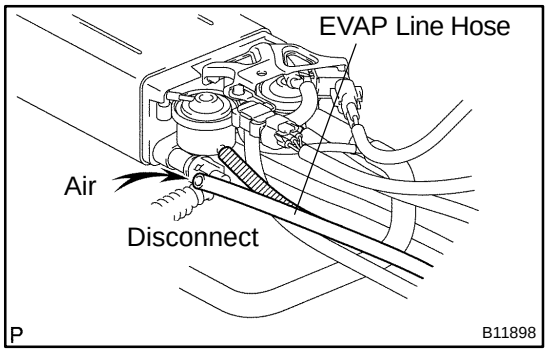


(3) Check if the pressure decreases when the fuel tank cap is removed while adding pressure.

HINT:

If the pressure does not decrease when the filler cap is removed, then you can conclude that the hose connecting the service port to the fuel tank is blocked, etc.

(k) Disconnect the pressure gauge from the EVAP service port on the purge line.



5. CHECK AIRTIGHTNESS IN FUEL TANK AND FILLER PIPE

(a) Disconnect the EVAP line hose from the charcoal canister side and then pressurize and make the internal pressure in the fuel tank 4 kPa (41 gf/cm^2, 0.58 psi).

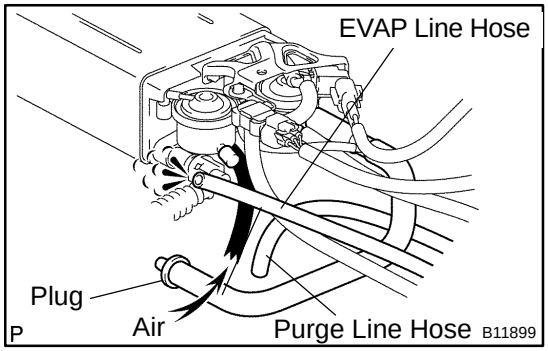
(b) Check that the internal pressure of the fuel tank can be hold for 1 minute.

(c) Check the connected portions of each hose and pipe.

(d) Check the installed parts on the fuel tank.

If there is no abnormality, replace the fuel tank and filler pipe.

(e) Reconnect the EVAP line hose to the charcoal canister.



6. INSPECT FUEL CUTOFF VALVE AND FILL CHECK VALVE

(a) Disconnect the purge line hose and EVAP line hose from the charcoal canister.

(b) Plug the EVAP port with a cap.

(c) Disconnect the air drain hose from the canister tank, and plug its.

(d) Pressurize 4 kPa (41 gf/cm^2, 0.58 psi) to the purge port and check that there is ventilation through the EVAP line hose.

HINT:

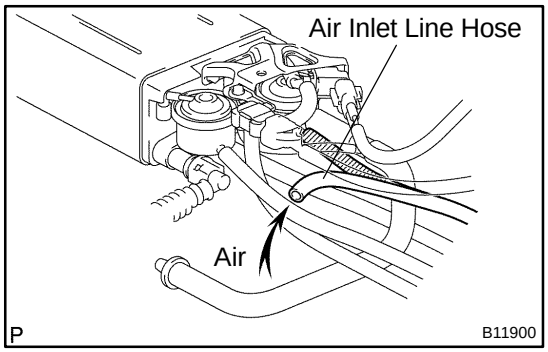
In the condition that the fuel fuel is full, as the float value of the fill check valve is closed and has no ventilation, it is necessary to check the fuel amount (volume).

(e) Check if there is any stuck in the vent line hose and EVAP line hose.

If there is no stuck in hoses, replace the fuel cutoff valve and fill check valve.

(f) Reconnect the purge line hose and EVAP line hose to the charcoal canister.

(g) Reconnect the air drain hose to the canister tank.



7. CHECK AIR INLET LINE

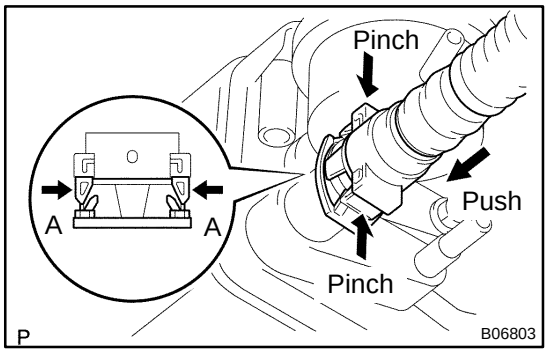
(a) Disconnect the air inlet line hose from the charcoal canister.

(b) Check that there is ventilation in the air inlet line.

(c) Reconnect the air inlet line hose to the charcoal canister.

8. REMOVE CHARCOAL CANISTER ASSEMBLY

(a) Remove the luggage trim from body.



(b) Remove the charcoal canister assembly.

(1) Disconnect the purge line hose, EVAP line hose and air inlet line from the charcoal canister.

(2) Disconnect the vent line hose from the charcoal canister.

Push the connector deep inside, pinch portion A, and pull out the connector.

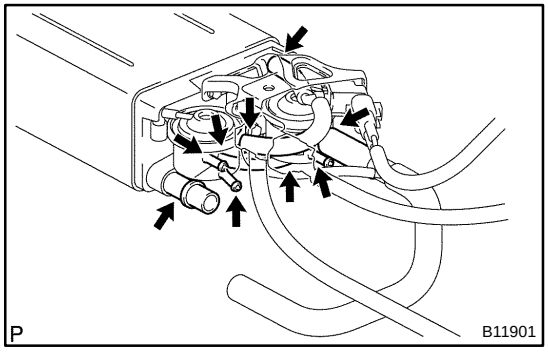
(3) Disconnect the air drain hose from the canister tank.

(4) Remove the 8 nuts and the charcoal canister assembly with protector.

(5) Disconnect the vapor pressure sensor connector.

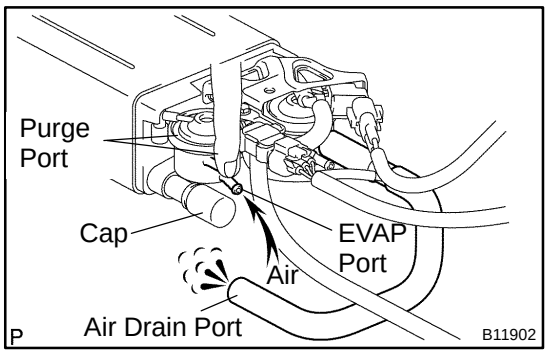
(6) Disconnect the VSV connector for vapor pressure sensor.

(7) Remove the 2 bolts, nut and the charcoal canister assembly from the protector.



9. INSPECT CHARCOAL CANISTER

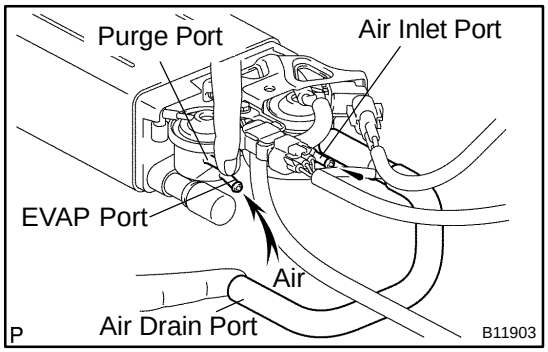
(a) Visually check the charcoal canister for cracks or damage.



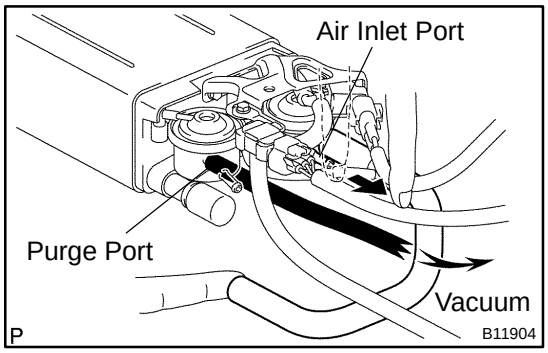
(b) Inspect the charcoal canister operation.

(1) Plug the vent port with a cap.

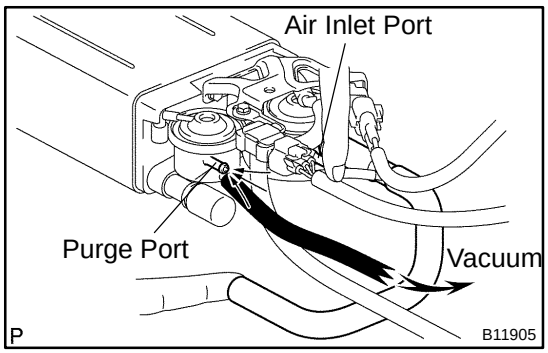
(2) While holding the purge port closed, blow air (1.76 kPa, 18 gf/cm^2, 0.26 psi) into the EVAP port and check that air flows from the air drain port.



(3) While holding the purge port and the air drain port closed, blow air (1.76 kPa, 18 gf/cm^2, 0.26 psi) into the EVAP port and check that air does not flow from the air inlet port.



(4) Apply vacuum (3.43 kPa, 25.7 mmHg, 1.01 in.Hg) to the purge port, check that the vacuum does not decrease when the air inlet port is closed, and check that the vacuum decreases when the air inlet port is released.



(5) While holding the air inlet port closed, apply vacuum (3.43 kPa, 25.7 mmHg, 1.01 in.Hg) to the EVAP port and check that air flows into the purge port.

If operation is not as specified, replace the charcoal canister.

10. INSPECT VSV FOR EVAP (See page SF-56)

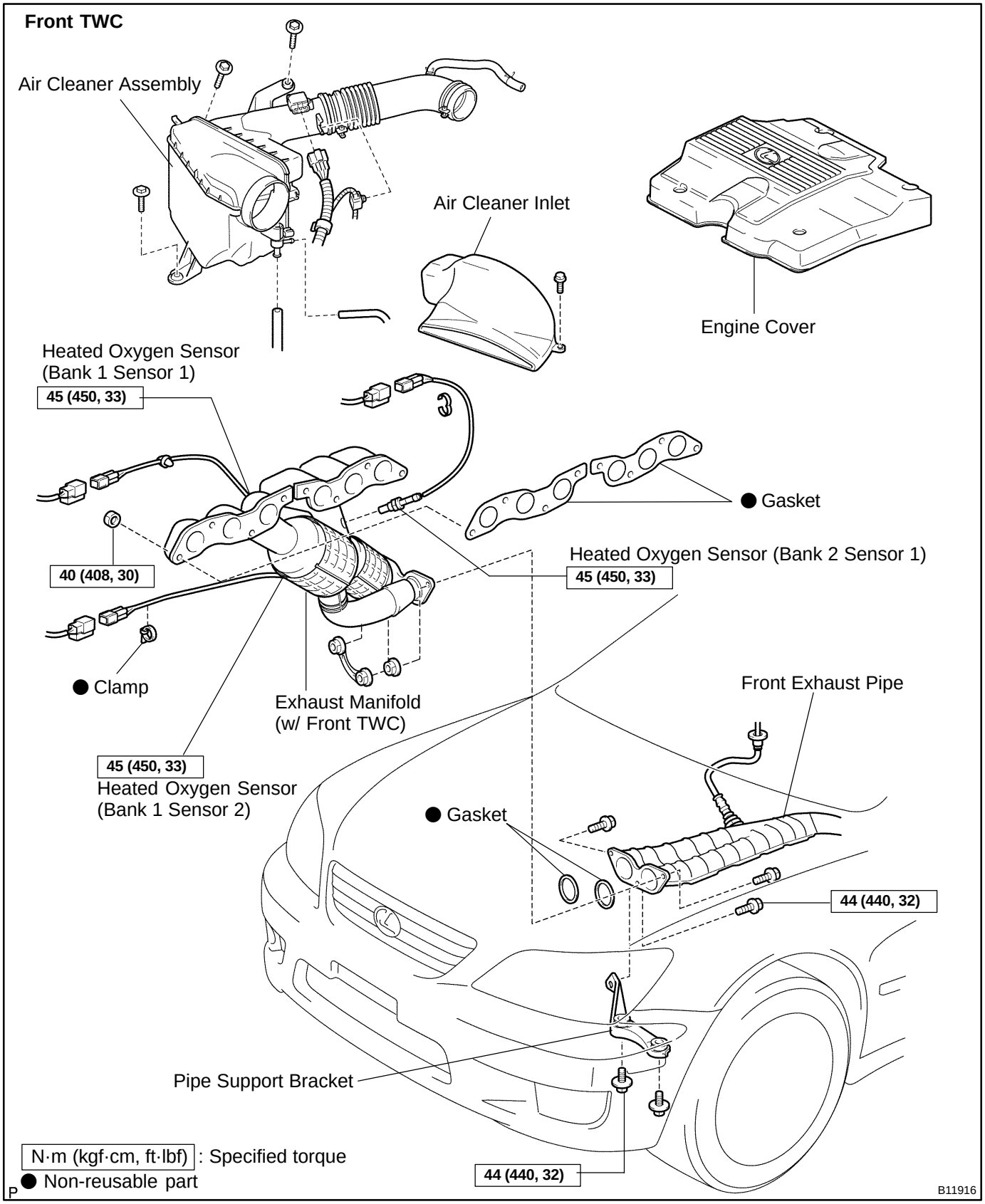
11. INSPECT VAPOR PRESSURE SENSOR (See page SF-67)

12. REINSTALL CHARCOAL CANISTER ASSEMBLY

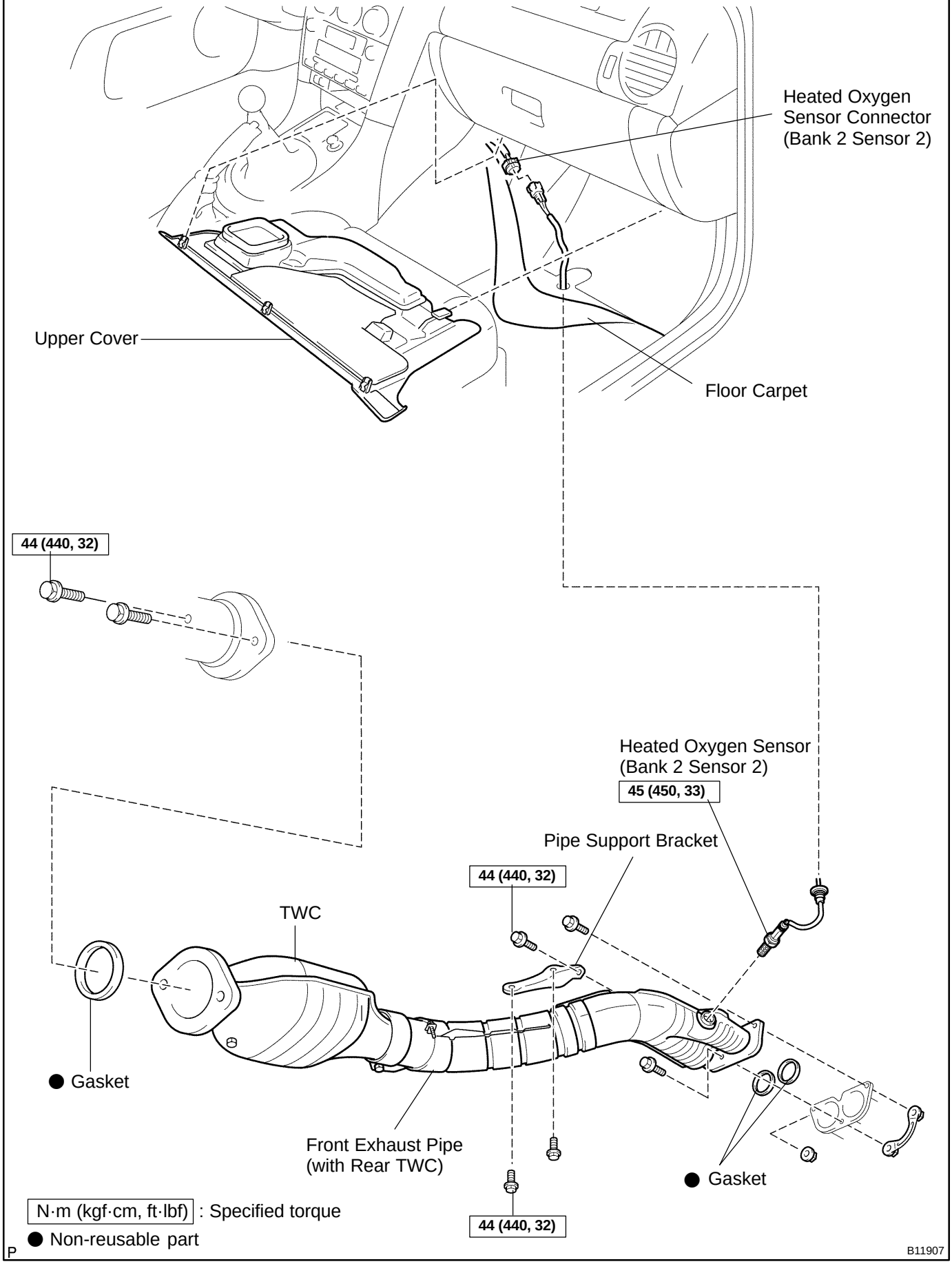
THREE-WAY CATALYTIC CONVERTER (TWC) SYSTEM

COMPONENTS

EC0DF-07



Rear TWC


Heated Oxygen Sensor Connector (Bank 2 Sensor 2)
Upper Cover
Floor Carpet
44 (440, 32)
Heated Oxygen Sensor (Bank 2 Sensor 2)
45 (450, 33)
Pipe Support Bracket
44 (440, 32)
TWC
● Gasket
Front Exhaust Pipe (with Rear TWC)
● Gasket
44 (440, 32)
N·m (kgf·cm, ft·lbf) : Specified torque
● Non-reusable part
P
B11907

EC04Z-01

INSPECTION

1. INSPECT EXHAUST PIPE ASSEMBLY

(a) Check the connections for looseness or damage.

(b) Check the clamps for weakness, cracks or damage.

2. INSPECT TWC

Check for dents or damage.

If any part of the protector is damaged or dented to the extent that it contacts the TWC, repair or replace it.

3. INSPECT TWC HEAT INSULATOR

(a) Check the heat insulator for damage.

(b) Check for adequate clearance between the catalytic converter and heat insulator.

EC050-07

REPLACEMENT

1. **REMOVE ENGINE COVER**
2. **REMOVE AIR CLEANER INLET**
3. **REMOVE AIR CLEANER ASSEMBLY AND MAF METER (See page EM-65)**
4. **DISCONNECT HEATED OXYGEN SENSORS (BANK 1 SENSOR 1, 2) FROM EXHAUST MANIFOLD**

(a) Disconnect the 3 oxygen sensor connectors.

(b) Disconnect the 2 oxygen sensors from the exhaust manifold.

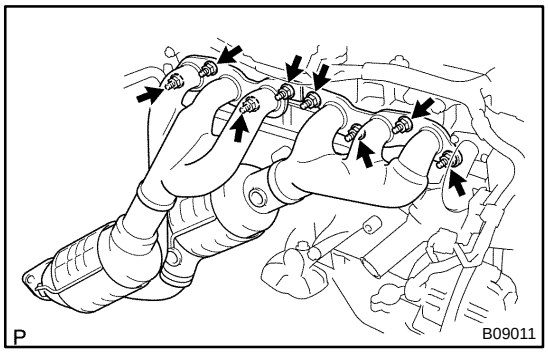
5. **REMOVE FRONT EXHAUST PIPE (WITH REAR TWC)**

(a) Take out the front side of the floor carpet.

(b) Disconnect the heated oxygen sensor (bank 2 sensor 2) connector.

(c) Remove the 2 bolts and pipe support bracket.

(d) Remove the 5 bolts, front exhaust pipe and 3 gaskets.



6. **REMOVE EXHAUST MANIFOLD (WITH FRONT TWC)**

(a) Using a 14 mm deep socket wrench, remove the 8 nuts, exhaust manifold and 2 gaskets.

(b) Remove the heated oxygen sensor (bank 2 sensor 1) form the exhaust manifold.

7. **REINSTALL EXHAUST MANIFOLD (WITH FRONT TWC)**

(a) Install the heated oxygen sensor (bank 2 sensor 1) to the exhaust manifold.

Torque: 45 N·m (450 kgf·cm, 33 ft·lbf)

(b) Install 2 new gaskets to the cylinder head.

(c) Using a 14 mm deep socket wrench, install a new exhaust manifold with 8 new nuts. Uniformly tighten the nuts in several passes.

Torque: 40 N·m (408 kgf·cm, 30 ft·lbf)

8. **REINSTALL FRONT EXHAUST PIPE (WITH REAR TWC)**

(a) Reinstall new 3 gaskets and front exhaust pipe with 5 bolts and support bracket.

Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)

(b) Reinstall the pipe support bracket with the 2 bolts.

Torque: 44 N·m (440 kgf·cm, 32 ft·lbf)

9. **RECONNECT HEATED OXYGEN SENSORS (BANK 1 SENSOR 1, 2) TO EXHAUST MANIFOLD**

(a) Install the 2 oxygen sensors to the exhaust manifold.

Torque: 45 N·m (450 kgf·cm, 33 ft·lbf)

(b) Connect the 3 oxygen sensor connectors.

10. **REINSTALL AIR CLEANER ASSEMBLY AND MAF MATER (See page EM-71)**
11. **REINSTALL AIR CLEANER INLET**

12. REINSTALL ENGINE COVER

SFI SYSTEM

PRECAUTION

SF0N1-08

HINT:

Any diagnostic trouble code retained by the ECM will be erased when the battery negative (-) terminal cable is removed from the battery. Therefore, if necessary, read the diagnostic trouble code(s) before removing the negative (-) terminal cable from the battery.

1. BEFORE WORKING ON FUEL SYSTEM, DISCONNECT NEGATIVE (-) TERMINAL CABLE FROM BATTERY

2. DO NOT SMOKE OR WORK NEAR AN OPEN FLAME WHEN WORKING ON FUEL SYSTEM

3. KEEP GASOLINE AWAY FROM RUBBER OR LEATHER PARTS

4. MAINTENANCE PRECAUTIONS

(a) Precaution when the connecting gauge.
Use battery as the power source for the timing light, etc.

(b) In the event of engine misfire, these precautions should be taken.
  (1) Check proper connection of battery terminals, etc.
  (2) Handle high-tension cords carefully.
  (3) After repair work, check that the ignition coil terminals and all other ignition system lines are reconnected securely.
  (4) When cleaning the engine compartment, be especially careful to protect the electrical system from water.

(c) Precautions when the handling heated oxygen sensors.
  (1) Do not allow oxygen sensor to drop or hit against an object.
  (2) Do not allow the sensor to come into contact with water.

5. IF VEHICLE IS EQUIPPED WITH MOBILE RADIO SYSTEM (HAM, CB, ETC.)

If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.

6. AIR INDUCTION SYSTEM

(a) Separation of the engine oil dipstick, oil filler cap, PCV hose, etc. may cause the engine to run out of tune.

(b) Disconnection, looseness or cracks in the parts of the air induction system between the throttle body and cylinder head will cause air suction and cause the engine to run out of tune.

7. ELECTRONIC CONTROL SYSTEM

(a) Before removing SFI wiring connectors, terminals, etc., first disconnect the power by either turning the ignition switch OFF or disconnecting the negative (-) terminal cable from the battery.

HINT:

Always check the diagnostic trouble code before disconnecting the negative (-) terminal cable from the battery.

(b) When installing the battery, be especially careful not to incorrectly connect the positive (+) and negative (-) cable terminals.

(c) Do not permit parts to receive a severe impact during removal or installation. Handle all SFI parts carefully, especially the ECM.

(d) Do not be careless during troubleshooting as there are numerous transistor circuits and even slight terminal contact can further troubles.

(e) Do not open the ECM cover.

(f) When inspecting during rainy weather, take care to prevent entry of water. Also, when washing the engine compartment, prevent water from getting on the SFI parts and wiring connectors.

(g) Parts should be replaced as an assembly.

(h) Care is required when pulling out and inserting wiring connectors.

(1) Release the lock and pull out the connector, pulling on the connectors.

(2) Fully insert the connector and check that it is locked.

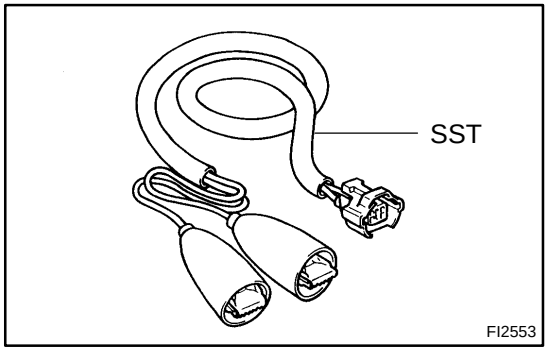
(i) When inspecting a connector with a volt/ohmmeter.

(1) Carefully take out the water-proofing rubber if it is a water-proof type connector.

(2) Insert the test probe into the connector from wiring side when checking the continuity, amperage or voltage.

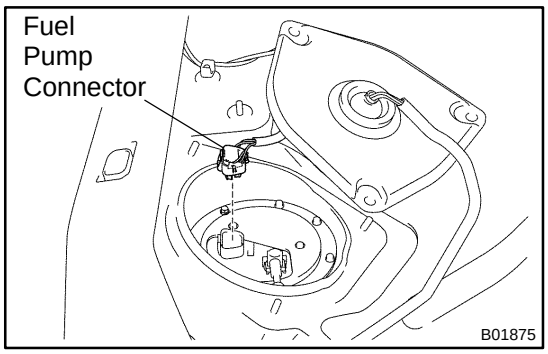
(3) Do not apply unnecessary force to the terminal.

(4) After checking, install the water-proofing rubber on the connector securely.



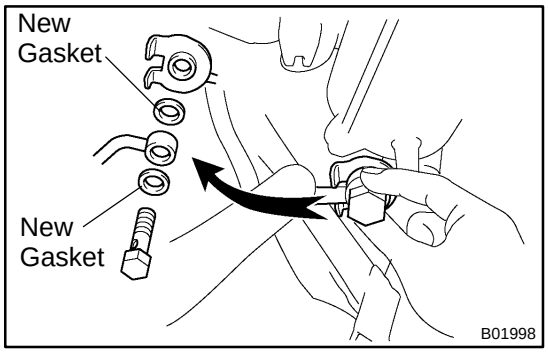
(5) Use SST for inspection or test of the injector or its wiring connector.

SST 09842-30070

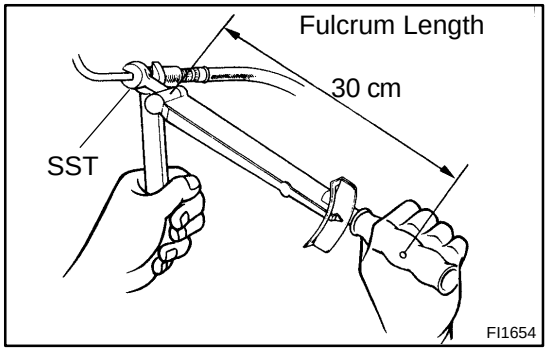


8. FUEL SYSTEM

(a) When disconnecting the high pressure fuel line, a large amount of gasoline will spill out, so observe these procedures:
   (1) Disconnect the fuel pump connector.
   (2) Start the engine. After the engine has stopped on its own, turn the ignition switch OFF.
   (3) Put a container under the connection.
   (4) Slowly loosen the connection.
   (5) Disconnect the connection.
   (6) Plug the connection with a rubber plug.
   (7) Reconnect the fuel pump connector.



(b) When connecting the flare nut or union bolt on the high pressure pipe union, observe these procedures:
   (1) Union Bolt Type:
   Always use a new gasket.
   (2) Union Bolt Type:
   Tighten the union bolt by hand.
   (3) Union Bolt Type:
   Tighten the union bolt to the specified torque.
   Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



   (4) Flare Nut Type:
   Apply a light coat of engine oil to the flare and tighten the flare nut by hand.
   (5) Flare Nut Type:
   Using SST, tighten the flare nut to the specified torque.
   SST 09023-12701

NOTICE:

Do not rotate the fuel pipe, when tightening the flare nut.

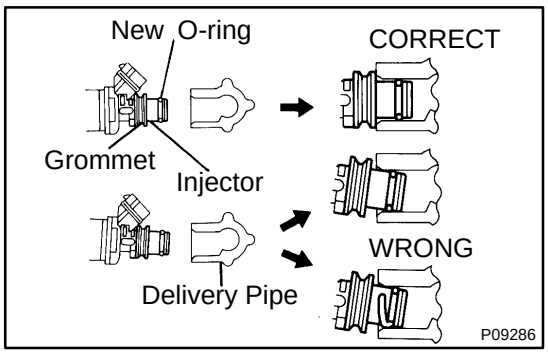
Torque:

30 N·m (310 kgf·cm, 22 ft·lbf) for using SST

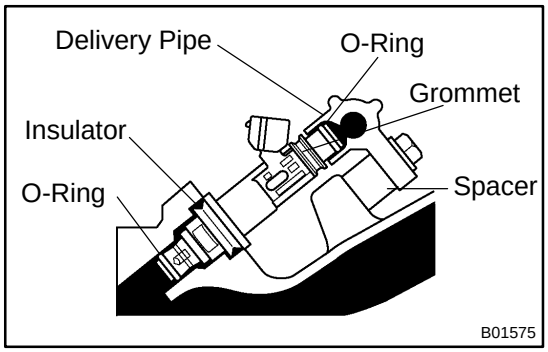
38 N·m (387 kgf·cm, 28 ft·lbf)

HINT:

Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).

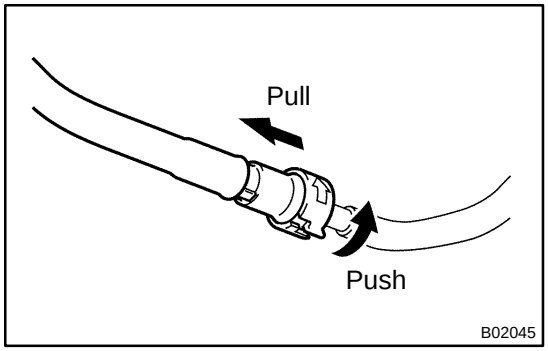


(c) Observe these precautions when removing and installing the injectors.
(1) Never reuse the O-ring.
(2) When placing a new O-ring on the injector, take care not to damage it in any way.
(3) Coat a new O-ring with spindle oil or gasoline before installing-never use engine, gear or brake oil.

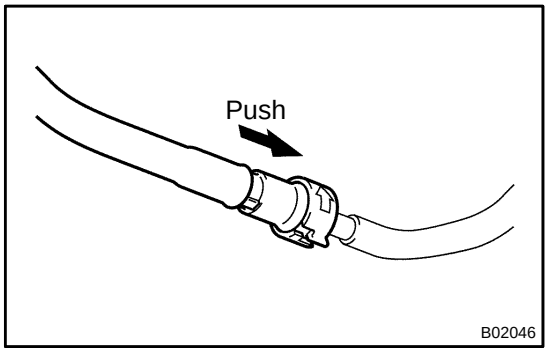


(d) Install the injector to the delivery pipe and intake manifold as shown in the illustration.
Before installing the injector, must apply spindle oil or gasoline on the place where a delivery pipe or an intake manifold touches an O-ring of the injector.

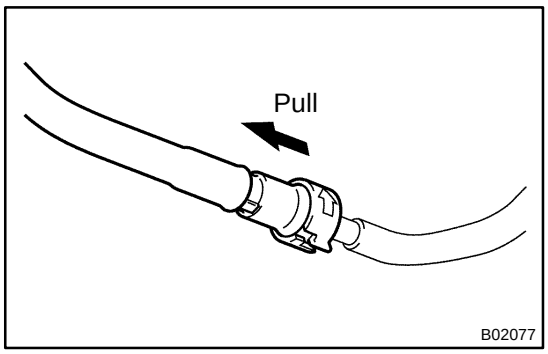
(e) Quick Type:
Observe these precautions when disconnecting the fuel tube connector:
(1) Check if there is any dirt like mud on the pipe and around the connector before disconnecting them and clean the dirt away.
(2) Be sure to disconnect with hands.



(3) When the connector and the pipe are stuck, push and pull the connector to free to disconnect and pull it out. Do not use any tool at this time.
(4) Inspect if there is any dirt or the likes on the seal surface of the disconnected pipe and clean it away.
(5) Prevent the disconnected pipe and connector from damaging and mixing foreign objects by covering them with a vinyl bag.

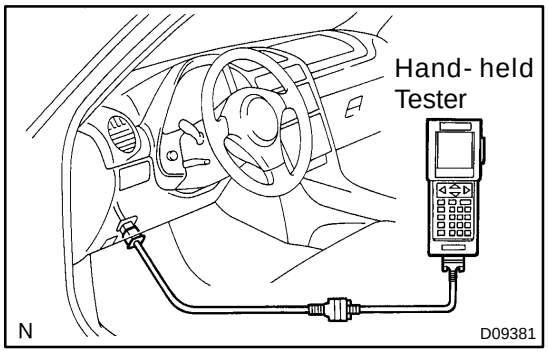


(f) Quick Type:
Observe these precautions when connecting the fuel tube connector:
(1) Check if there is any damage or foreign objects on the connected part of the pipe.
(2) Match the axis of the connector with axis of the pipe, and push in the connector until the connector makes a ”click” sound. In case the connections is tight, apply little amount of new engine oil on the tip of the pipe.



(3) After having finished the connection, check if the pipe and the connector are securely connected by pulling them.
(4) Check if there is any fuel leakage.

(g) Observe these precautions when handling nylon tube.
(1) Pay attention not to turn the connected part of the nylon tube and quick connector with force when connecting them.
(2) Pay attention not to kink the nylon tube.
(3) Do not remove the EPDM protector on the outside of the nylon tube.
(4) Must not close the piping with the nylon tube by bending it.



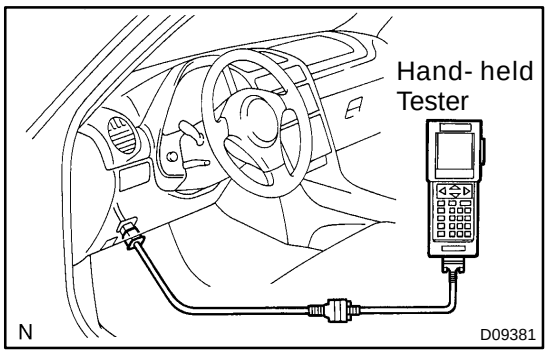
(h) Check that there are no fuel leaks after doing maintenance anywhere on the fuel system.
(1) Connect a hand-held tester to the DLC3.
(2) Connect the hand-held tester to the DLC3.
(3) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / FUEL PUMP / SPD.

NOTICE:
Do not start the engine.

(4) Please refer to the hand-held tester operator's manual for further details.
(5) If you have no hand-held tester, connect the positive (+) and negative (-) leads from the battery to the fuel pump connector (See page SF-6).
(6) Check that there are no leaks from any part of the fuel system.
(7) Turn the ignition switch OFF.
(8) Disconnect the hand-held tester from the DLC3.
(9) Start the engine.

NOTICE:
Keep cranking the engine until the air is removed from the fuel line.

(10) After the engine starts, check again that there are no fuel leaks.



FUEL PUMP

SF0N2-10

ON-VEHICLE INSPECTION

1. CHECK FUEL PUMP OPERATION

(a) Connect a hand-held tester to the DLC3.

(b) Turn the ignition switch ON and hand-held tester main switch ON.

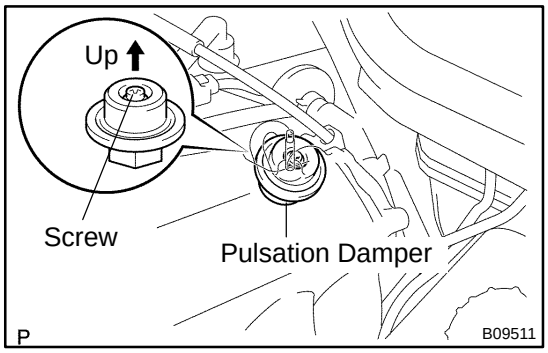
NOTICE:

Do not start the engine.

(c) Select the following menu items: DIAGNOSIS/ENHANCED OBD ll / ACTIVE TEST / FUEL PUMP / SPD.

(d) Please refer to the hand-held tester operator's manual for further details.

(e) If you have no hand-held tester, connect the positive (+) and negative (-) leads from the battery to the fuel pump connector (See step 3).

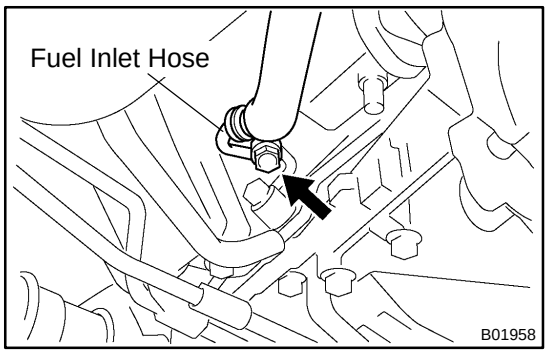


(f) Check that the pulsation damper screw rises up when the fuel pump operates.

If there is no pressure, check the fusible link, fuses, EFI main relay, fuel pump ECU, fuel pump, ECM and wiring connections.

(g) Turn the ignition switch OFF.

(h) Disconnect the hand-held tester from the DLC3.



2. CHECK FUEL PRESSURE

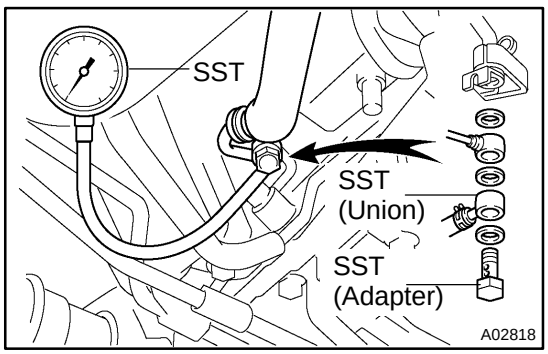
(a) Check the battery positive voltage is above 12 V.

(b) Disconnect the negative (-) terminal cable from the battery.

(c) Remove the union bolt and 2 gaskets, and disconnect the fuel inlet hose from the fuel pipe support.

NOTICE:

- **Put a shop towel under the fuel pipe support.**
- **Slowly loosen the union bolt.**

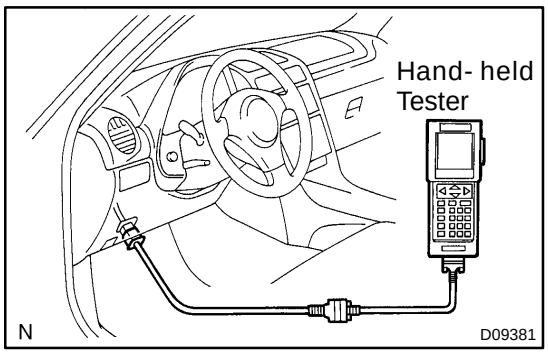


(d) Install the fuel inlet hose and SST (pressure gauge) to the fuel pipe support with the 3 gaskets and SST (union and adapter).

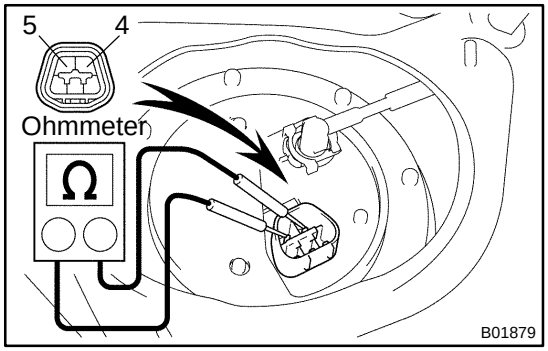
SST 09268-45014 (09268-41190, 90405-06167)

Torque: 29 N·m (300 kgf·cm, 21 ft·lbf)

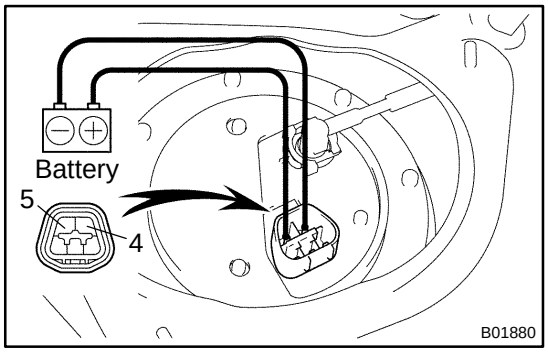
(e) Wipe off any splattered gasoline.



(f) Connect a hand-held tester to the DLC3 (See step 1 in check fuel pump operation (a) to (e)).
(g) Measure the fuel pressure.
Fuel pressure:
304 - 343 kPa (3.1 - 3.5 kgf/cm^2, 44 - 50 psi)
If pressure is high, replace the fuel pressure regulator.
If pressure is low, check the fuel hoses and connections, fuel pump, fuel filter and fuel pressure regulator.
(h) Disconnect the hand-held tester from the DLC3.
(i) Start the engine.
(j) Measure the fuel pressure at idle.
Fuel pressure:
304 - 343 kPa (3.1 - 3.5 kgf/cm^2, 44 - 50 psi)
(k) Stop the engine.
(l) Check that the fuel pressure remains as specified for 5 minutes after the engine has stopped.
Fuel pressure: 147 kPa (1.5 kgf/cm^2, 21 psi) or more
If pressure is not as specified, check the fuel pump, pressure regulator and/or injectors.
(m) After checking fuel pressure, disconnect the negative (-) terminal cable from the battery and carefully remove SST to prevent gasoline from splashing.
SST 09268-45014
(n) Reconnect the fuel inlet hose to the fuel pipe support with 2 new gaskets and the union bolt.
Torque: 29 N·m (300 kgf·cm, 21 ft·lbf)
(o) Reconnect the negative (-) terminal cable to the battery.
(p) Check for fuel leaks.



3. INSPECT FUEL PUMP
(a) Remove the rear seat cushion.
(b) Remove the 3 cap nuts and floor service hole cover.
(c) Disconnect the fuel pump & sender gauge connector.
(d) Using an ohmmeter, measure the resistance between terminals 4 and 5.
Resistance: 0.2 - 3.0 Ω at 20˚C (68˚F)
If the resistance is not as specified, replace the fuel pump.



(e) Inspect the fuel pump operation.
Connect the positive (+) lead from the battery to terminal 4 of the connector, and the negative (-) lead to terminal 5. Check that the fuel pump operates.

NOTICE:
- **These tests must be done quickly (within 10 seconds) to prevent the coil burning out.**
- **Keep the fuel pump as far away from the battery as possible.**
- **Always do the switching at the battery side.**

If operation is not as specified, replace the fuel pump.

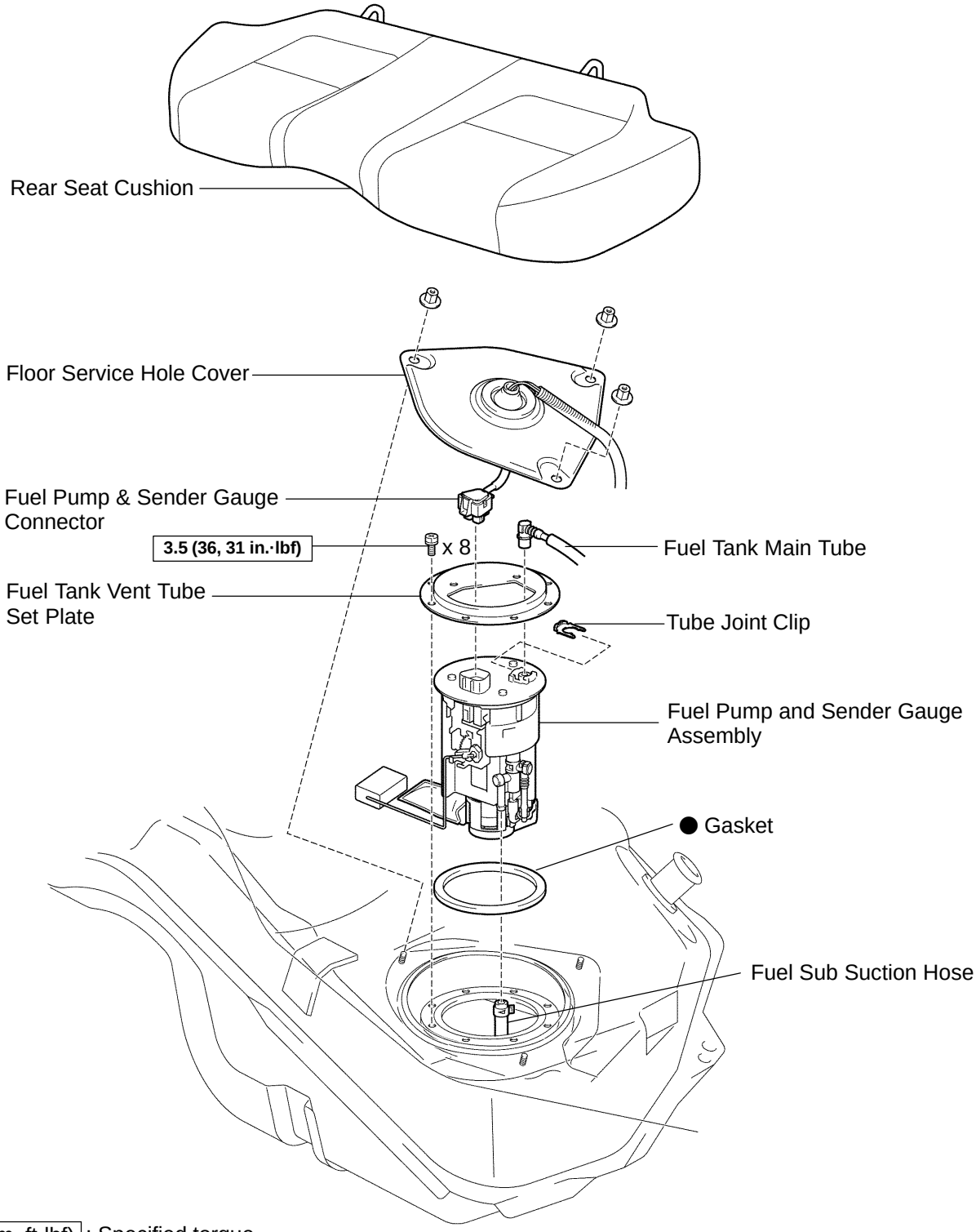
(f) Reconnect the fuel pump & sender gauge connector.

(g) Reinstall the floor service hole cover with the cap nuts.

(h) Reinstall the rear seat cushion.

SF0N3-10

COMPONENTS

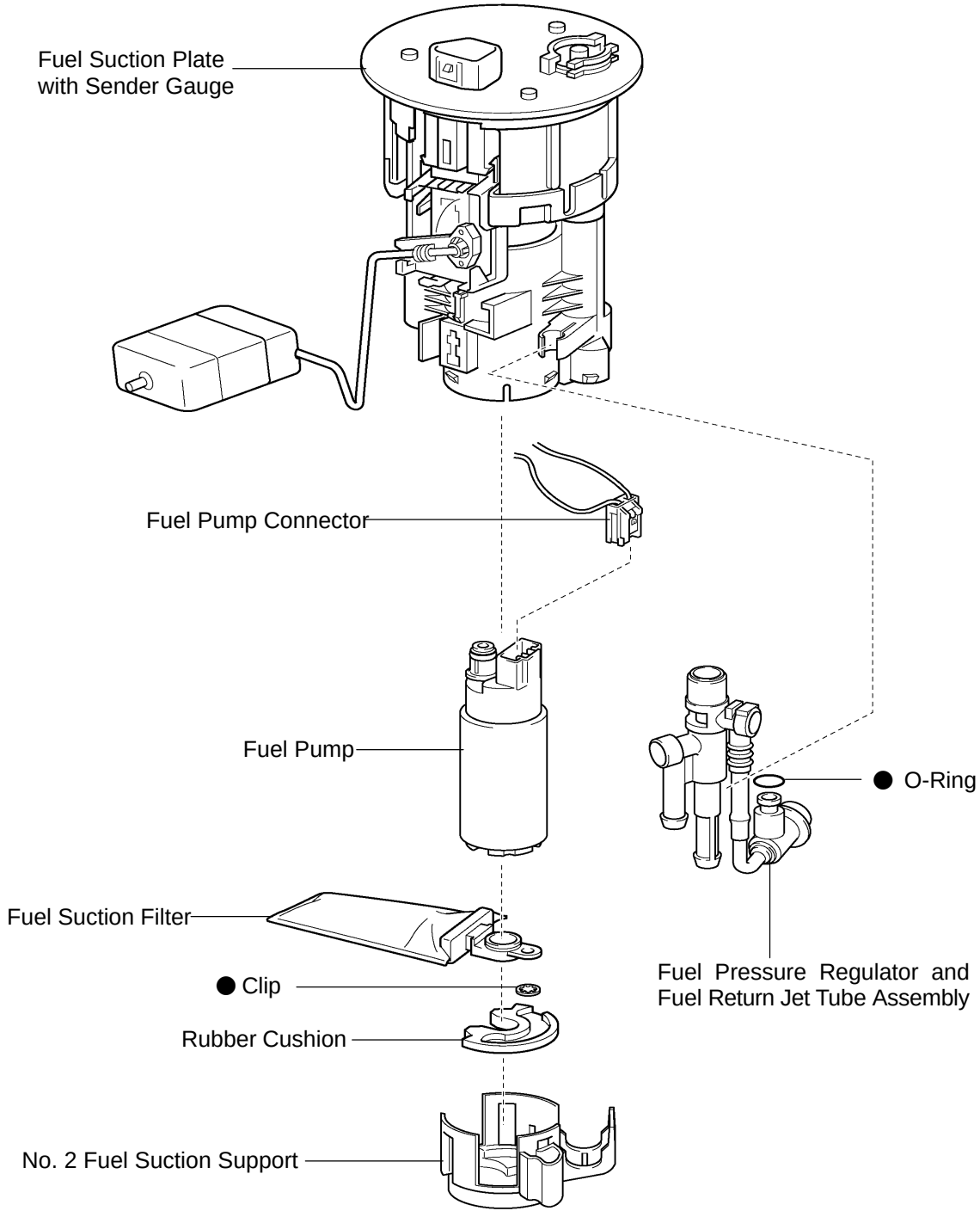


N·m (kgf·cm, ft·lbf) : Specified torque

● Non-reusable part

P

B11928


Fuel Suction Plate
with Sender Gauge
Fuel Pump Connector
Fuel Pump
● O-Ring
Fuel Suction Filter
Fuel Pressure Regulator and
Fuel Return Jet Tube Assembly
● Clip
Rubber Cushion
No. 2 Fuel Suction Support
Y
● Non-reusable part
B10328

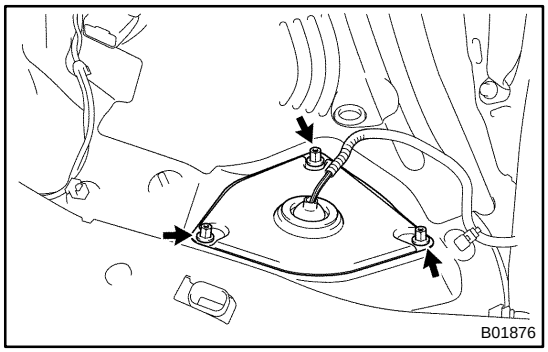
SF1LB-02

REMOVAL

CAUTION:

Do not smoke or work near an open frame when working the fuel pump.

1. REMOVE REAR SEAT CUSHION



2. REMOVE FLOOR SERVICE HOLE COVER

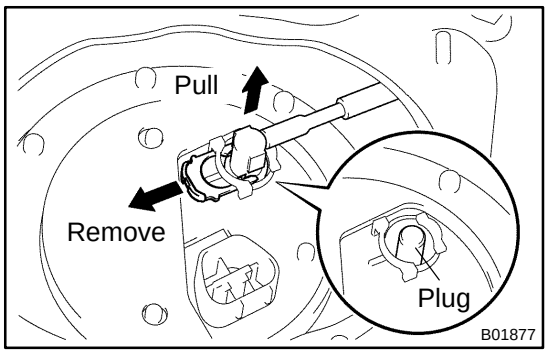
Remove the 3 cap nuts and service hole cover.

3. DISCONNECT FUEL PUMP & SENDER GAUGE CONNECTOR

4. DISCONNECT FUEL TANK MAIN TUBE (FUEL TUBE CONNECTOR) FROM FUEL SECTION PLATE

CAUTION:

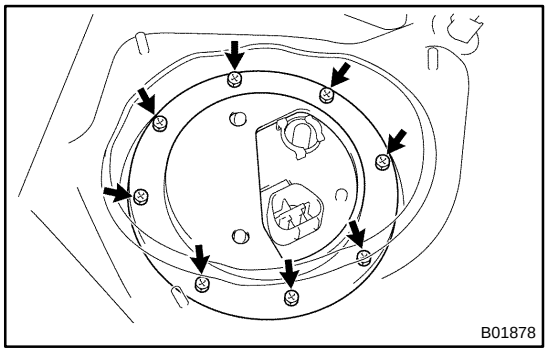
- **Perform disconnecting operation of the fuel tube connector (quick type) after observing precaution (See page SF-1).**
- **As there is retained pressure in the fuel line, prevent it from splashing inside the vehicle compartment.**



(a) Remove the tube joint clip.

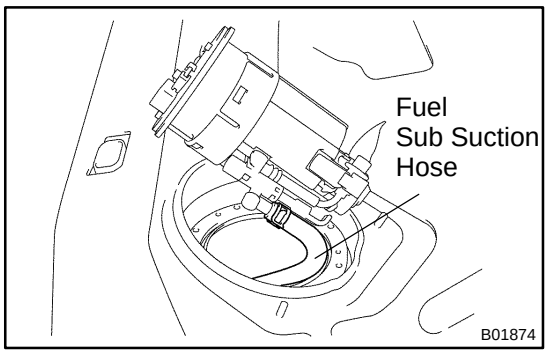
(b) Pull out the fuel main tube.

(c) Plug the port of the fuel suction plate with a clean rubber cap.



5. REMOVE FUEL PUMP AND SENDER GAUGE ASSEMBLY FROM FUEL TANK

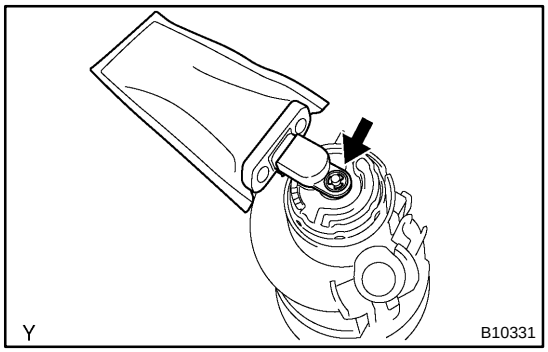
(a) Remove the 8 bolts and fuel tank vent tube set plate.



(b) Lift up the fuel pump and sender gauge assembly, and disconnect the fuel sub suction hose from the fuel return jet tube and remove the fuel pump, sender gauge assembly and gasket.

6. REMOVE NO. 2 FUEL SUCTION SUPPORT (See page SF-17)

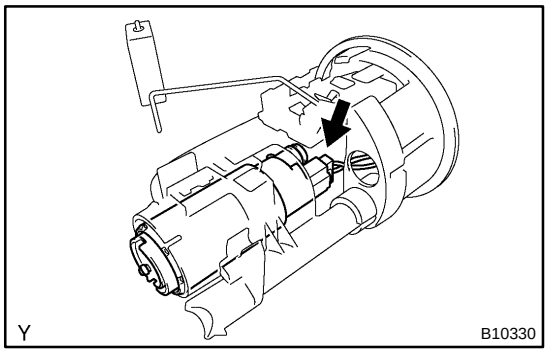
7. REMOVE FUEL PRESSURE REGULATOR AND FUEL RETURN JET TUBE ASSEMBLY (See page SF-17)



8. REMOVE FUEL SUCTION FILTER

(a) Remove the clip.

(b) Pull out the suction filter.



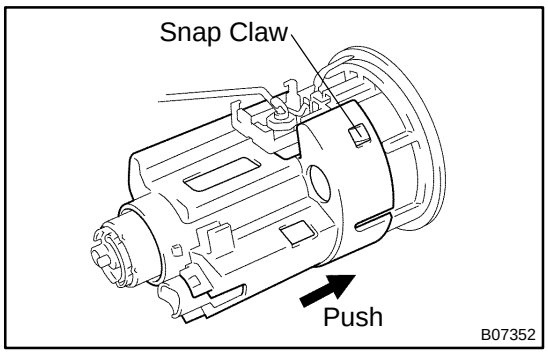
9. REMOVE FUEL PUMP

(a) Disconnect the fuel pump connector from the fuel pump.

(b) Pull out the fuel pump.

SF1LC-03

INSTALLATION

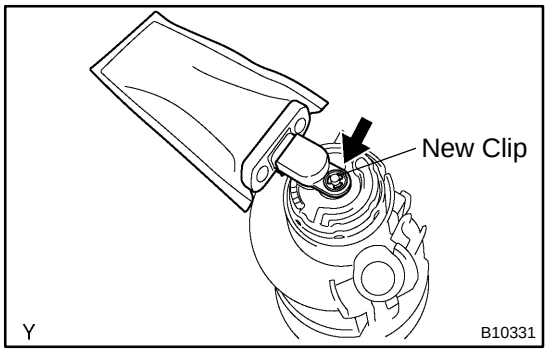


1. INSTALL FUEL PUMP

(a) Apply a light coat of gasoline to the O-ring.

(b) Push in the fuel pump.

(c) Connect the fuel pump connector.

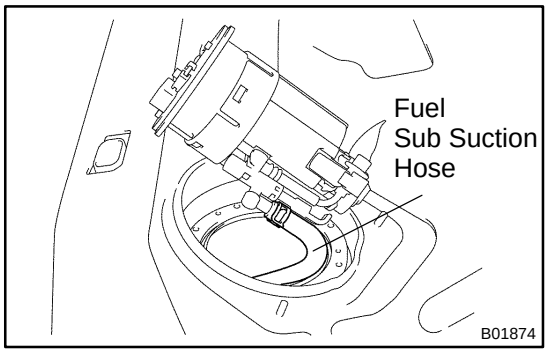


2. INSTALL FUEL SUCTION FILTER

Install the suction filter with a new clip.

3. INSTALL FUEL PRESSURE REGULATOR AND FUEL RETURN JET TUBE ASSEMBLY (See page SF-18)

4. INSTALL NO. 2 FUEL SUCTION SUPPORT (See page SF-18)

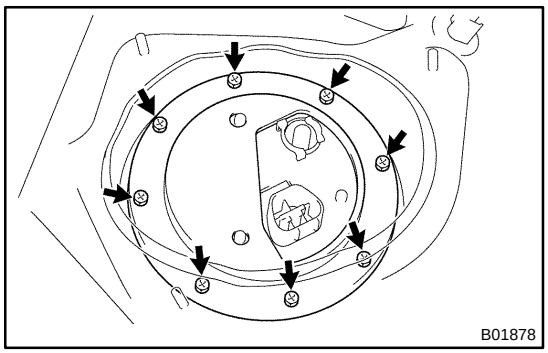


5. INSTALL FUEL PUMP AND SENDER GAUGE ASSEMBLY TO FUEL TANK

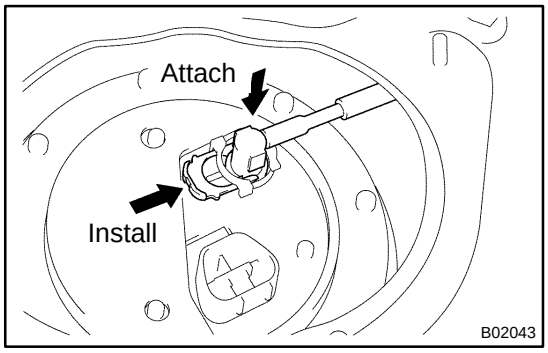
(a) Install a new gasket to the fuel suction plate.

(b) Connect the fuel sub suction hose to the fuel return jet tube.

(c) Attach the fuel pump and sender gauge assembly to the fuel tank.



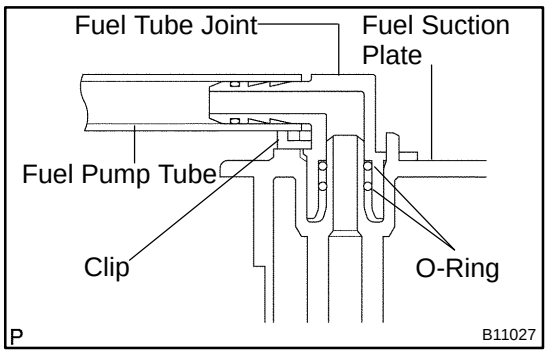
(d) Install the fuel tank vent tube set plate with the 8 bolts.
Torque: 3.5 N·m (36 kgf·cm, 31 in.·lbf)

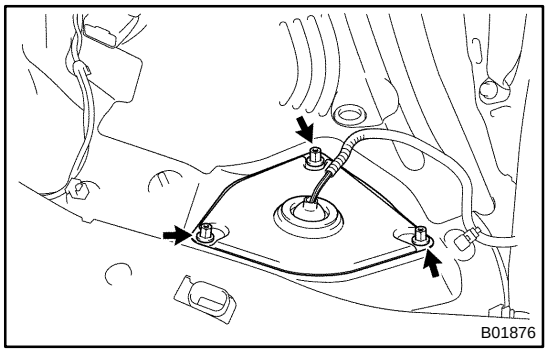


6. CONNECT FUEL TANK MAIN TUBE (FUEL TUBE CONNECTOR) TO FUEL SUCTION PLATE

(a) Attach the fuel tube connector to the port of the fuel suction plate.

(b) Install the tube joint clip.





NOTICE:

- **Check that the connector is inserted fully and securely.**
- **Check that the clip of the tube joint is on the collar of the connector.**
- **After installing the clip of the tube joint, check that the connector is not pulled off.**

7. CONNECT FUEL PUMP & SENDER GAUGE CONNECTOR

8. CHECK FOR FUEL LEAKS (See page SF-1)

9. INSTALL FLOOR SERVICE HOLE COVER

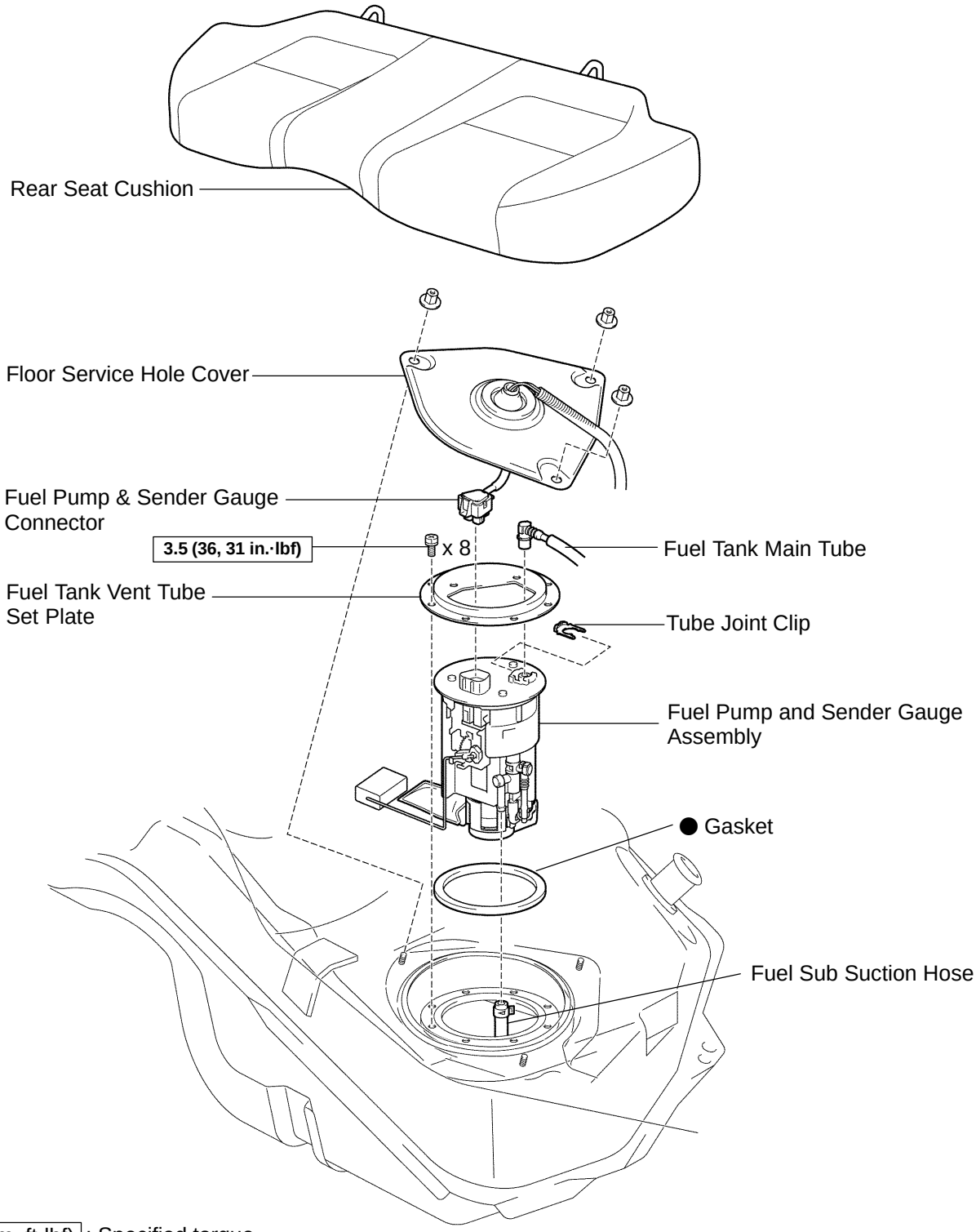
Install the service hole cover with the 3 cap nuts.

10. INSTALL REAR SEAT CUSHION

FUEL PRESSURE REGULATOR

SF0N6-07

COMPONENTS

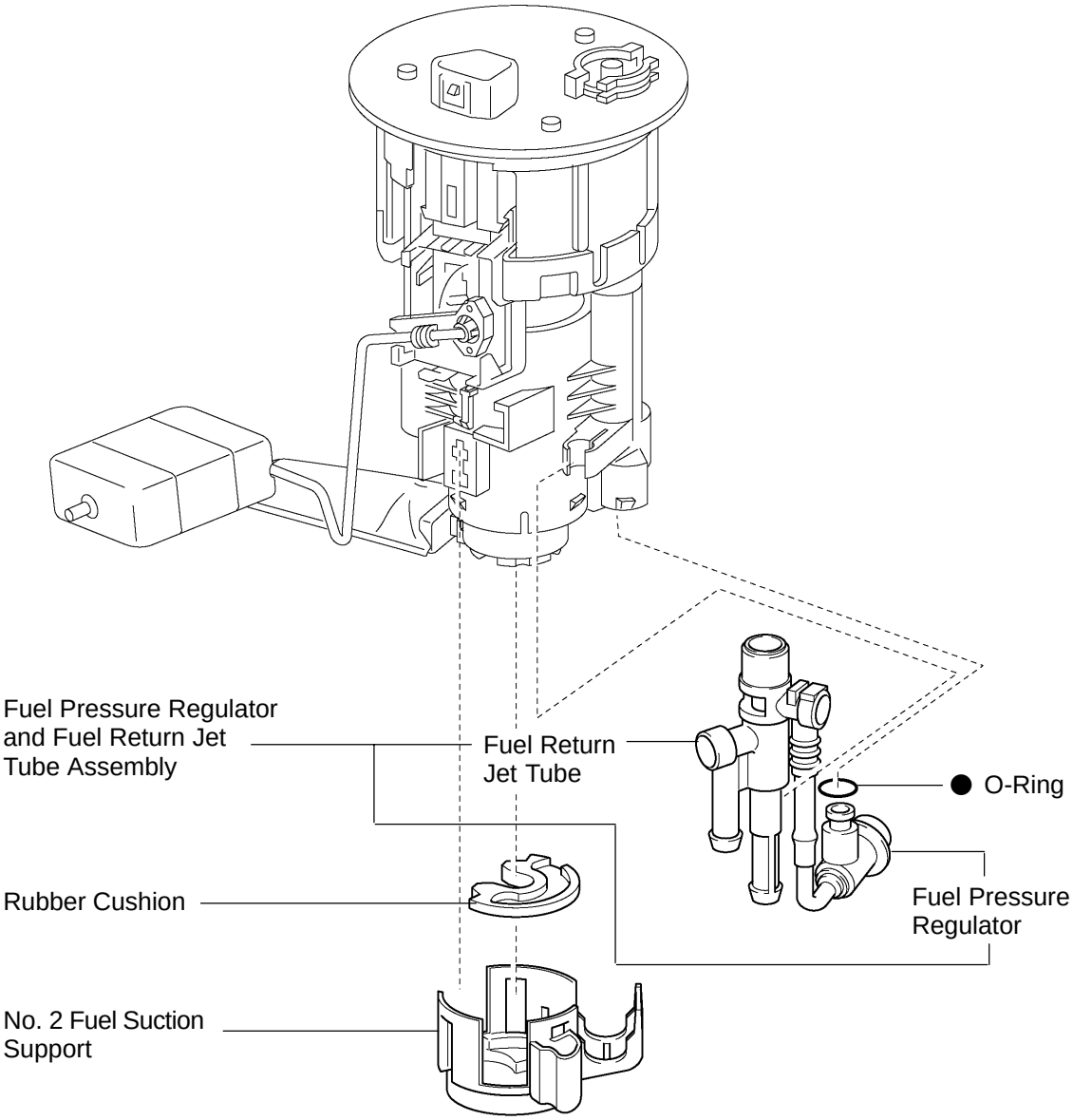


N·m (kgf·cm, ft·lbf) : Specified torque

● Non-reusable part

P

B11928



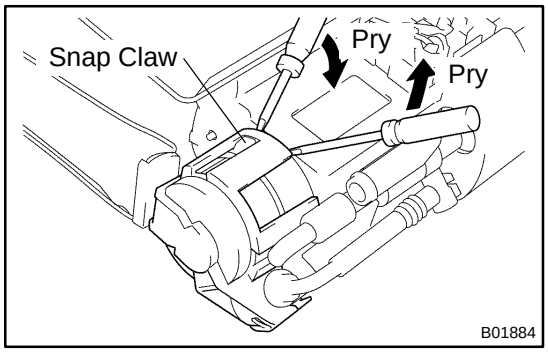
Y ● Non-reusable part

B10327

SF0N7-09

REMOVAL

1. REMOVE FUEL PUMP AND SENDER GAUGE ASSEMBLY FROM FUEL TANK (See page SF-11)



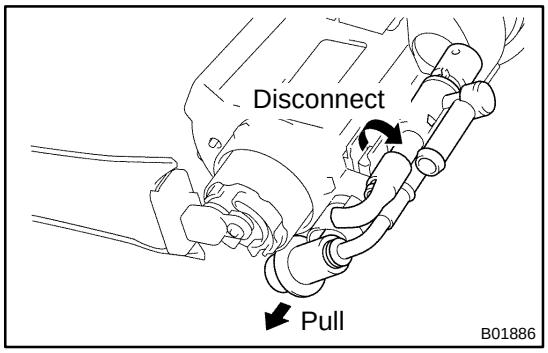
2. REMOVE NO. 2 FUEL SUCTION SUPPORT

(a) Using 2 screwdrivers, disconnect the 4 snap claws from the claw holes and remove the fuel suction support.

NOTICE:

Be careful not to damage the suction supports.

(b) Remove the rubber cushion.



3. REMOVE FUEL PRESSURE REGULATOR AND FUEL RETURN JET TUBE ASSEMBLY

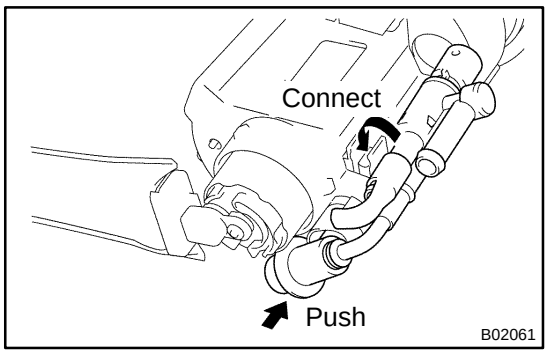
(a) Disconnect the fuel return jet tube from the clamp of the No.2 fuel suction support.

(b) Pull out the fuel pressure regulator from the fuel filter, and remove the fuel pressure regulator and fuel return jet tube assembly.

(c) Remove the O-ring from the fuel pressure regulator.

SF0N8-09

INSTALLATION



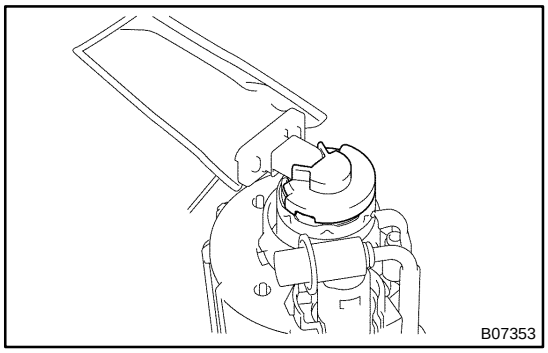
1. INSTALL FUEL PRESSURE REGULATOR AND FUEL RETURN JET TUBE ASSEMBLY

(a) Apply a light coat of gasoline to a new O-ring, and install it to the fuel pressure regulator.

(b) Push in the fuel pressure regulator to the fuel filter.

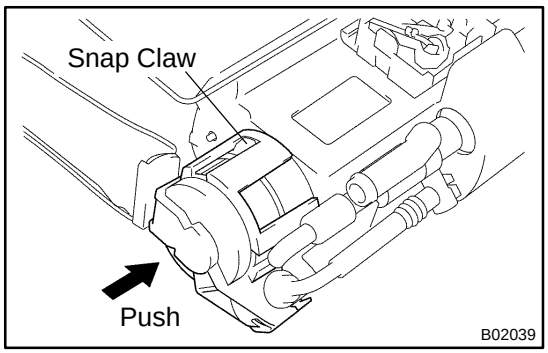
(c) Check that the fuel pressure regulator rotates smoothly. If it does not rotates smoothly, the O-ring may be pinched, so remove the fuel pressure regulator and perform again steps (b) and (c) above.

(d) Connect the fuel return jet tube to the clamp of the No. 2 fuel suction support.



2. INSTALL NO. 2 FUEL SUCTION SUPPORT

(a) Install the rubber cushion to the fuel pump.



(b) Push the fuel suction support, and attach the 4 snap claws to the claw holes.

3. INSTALL FUEL PUMP AND SENDER GAUGE ASSEMBLY TO FUEL TANK (See page SF-13)

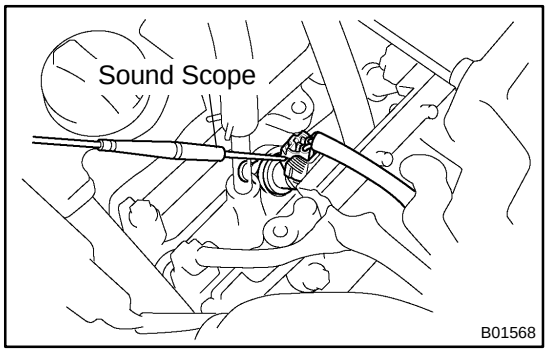
INJECTOR

SF0N9-10

ON-VEHICLE INSPECTION

1. REMOVE ENGINE COVER

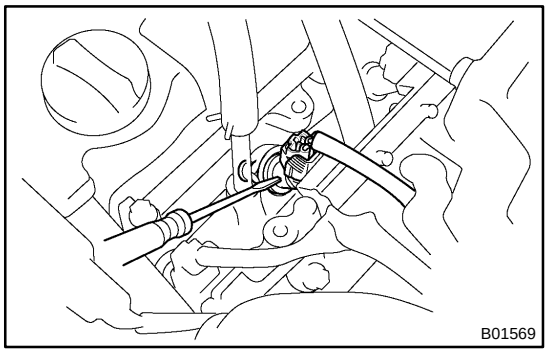
Remove 4 nuts and engine cover.



2. INSPECT INJECTOR OPERATION

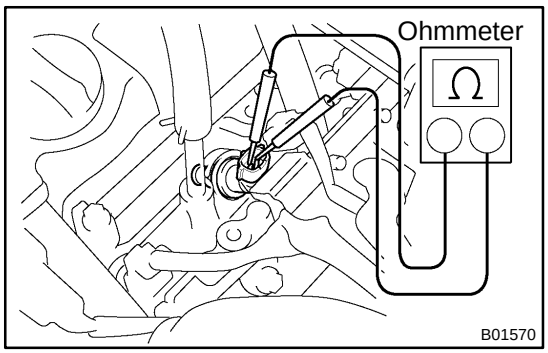
Check operation sound from each injector.

(1) With the engine running or cranking, use a sound scope to check that there is normal operating noise in proportion to engine speed.



(2) If you have no sound scope, you can check the injector transmission operation with a screwdriver.

If no sound or an unusual sound is heard, check the wiring connector, injector or injection signal from the ECM.



3. INSPECT INJECTOR RESISTANCE

(a) Disconnect the injector connectors.

(b) Using an ohmmeter, measure the resistance between the terminals.

Resistance: 13.4 - 14.2 Ω at 20°C (68°F)

If the resistance is not as specified, replace the injector.

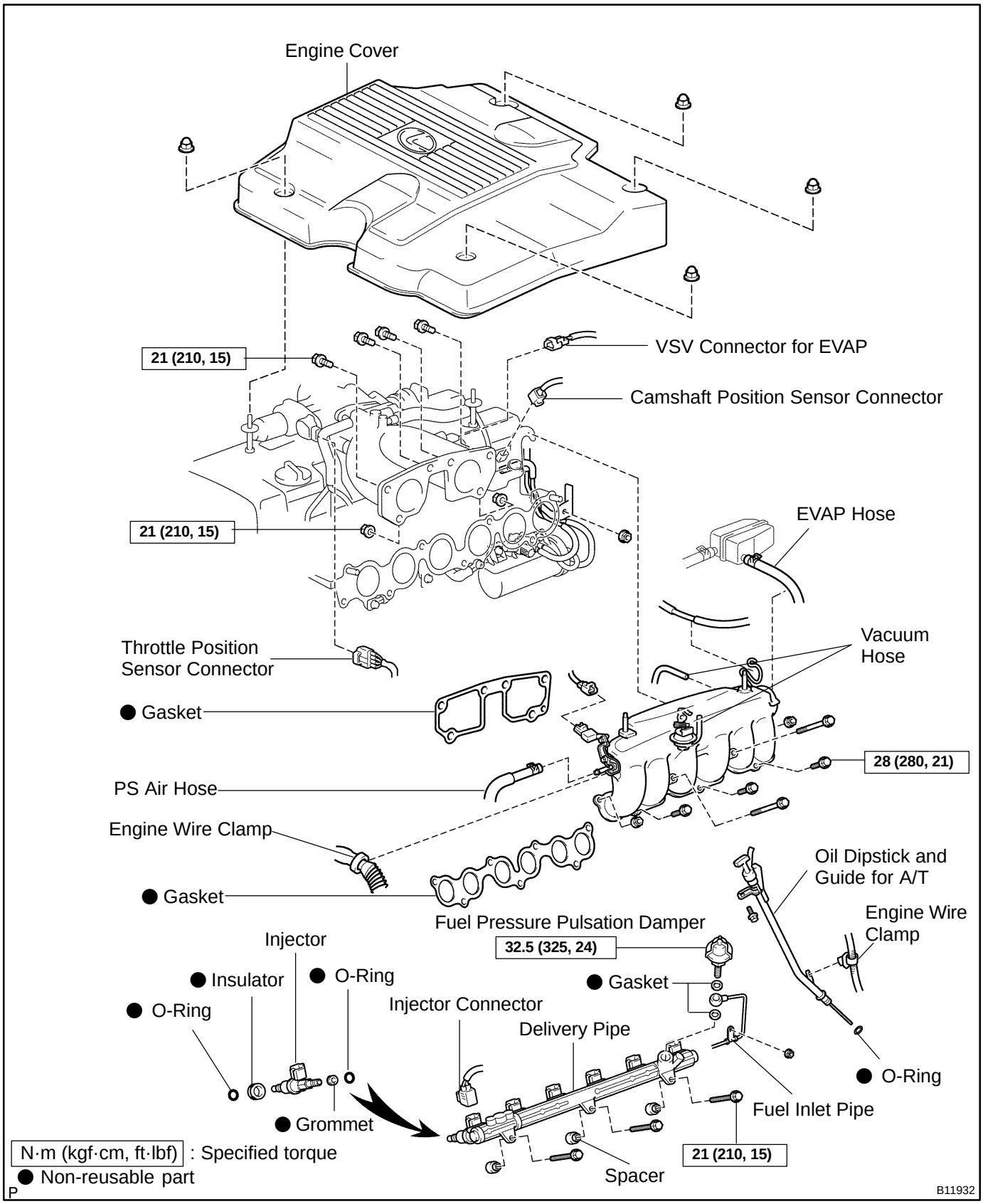
(c) Reconnect the injector connectors.

4. REINSTALL ENGINE COVER

Install the engine cover with the 4 nuts.

SF151-05

COMPONENTS



SF0NB-08

REMOVAL

1. REMOVE ENGINE COVER

Remove the 4 nuts and engine cover.

2. REMOVE AIR INTAKE CHAMBER (See page SF-46)

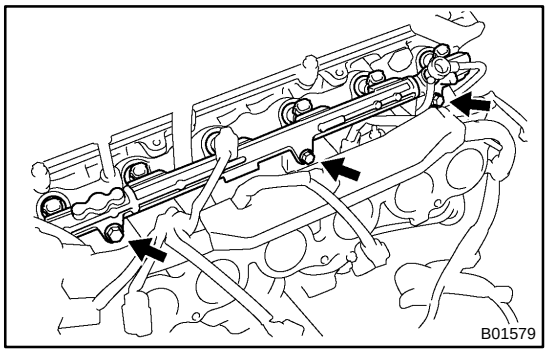
3. REMOVE FUEL PRESSURE PULSATION DAMPER (See page SF-26)

4. REMOVE DELIVERY PIPE AND INJECTORS

NOTICE:

- **Be careful not to drop the injectors when removing the delivery pipe.**
- **Pay attention to put any hung load on the injector to and from the side direction.**

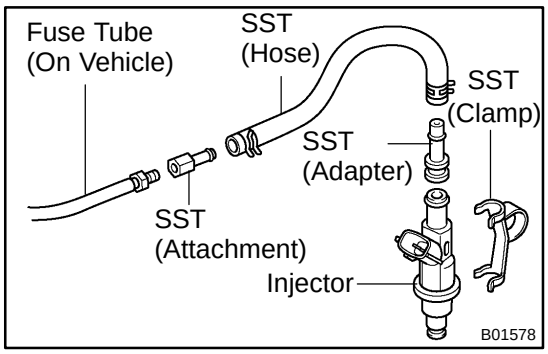
(a) Disconnect the 6 injector connectors.
(b) Disconnect the camshaft position sensor connector.
(c) Disconnect the throttle position sensor connector.
(d) Disconnect the VSV connector for EVAP.



(e) Remove the 3 bolts and delivery pipe together with the 6 injectors.
(f) Pull out the 6 injectors from the delivery pipe.
(g) Remove the 2 O-rings, grommet and insulator from each injector.
(h) Remove the 3 spacers from the intake manifold.

SF0NC-09

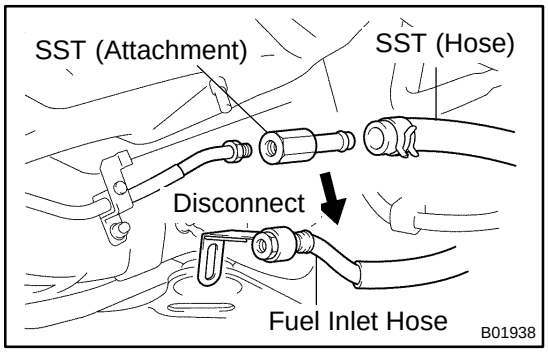
INSPECTION



1. INSPECT INJECTOR INJECTION

CAUTION:

Keep injector clear of sparks during the test.

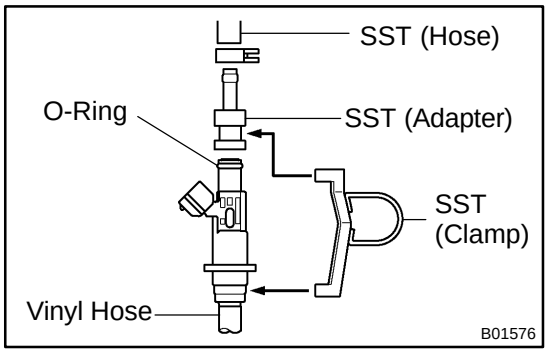


(a) Remove the nut, and disconnect the fuel inlet hose from the fuel main tube.

(b) Temporarily install SST (attachment) to the fuel main tube.
SST 09268-41047 (09268-52011)

(c) Tighten the flare nut on the fuel main tube (See page SF-1).

(d) Connect SST (hose) to the SST (attachment).
SST 09268-41047



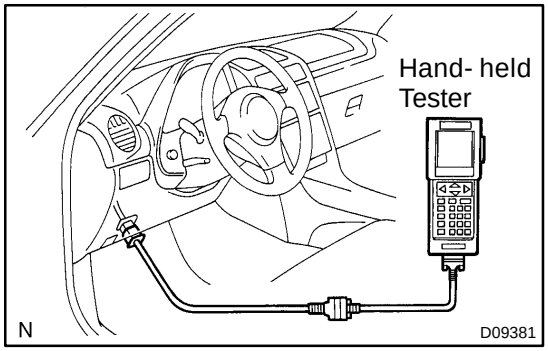
(e) Install the O-ring to the injector.

(f) Connect SST (hose) to the injector with SST (adapter), and hold the injector and adapter with SST (clamp).
SST 09268-41047 (09268-41110, 09268-41300)

(g) Put the injector into the graduated cylinder.

CAUTION:

Install a suitable vinyl hose onto the injector to prevent gasoline from splashing out.



(h) Connect the hand-held tester to the DLC3.

(i) Connect the battery negative (-) terminal cable to the battery.

(j) Turn the ignition switch ON and hand-held tester main switch ON.

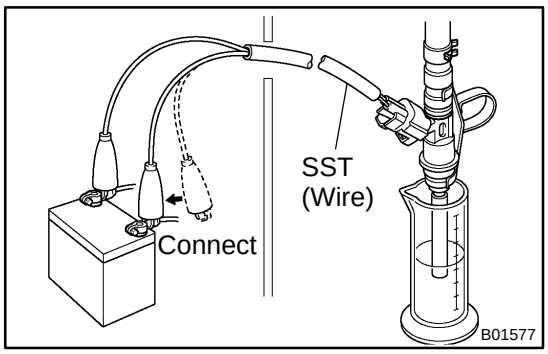
NOTICE:

Do not start the engine.

(k) Select the ACTIVE TEST mode on the hand-held tester.

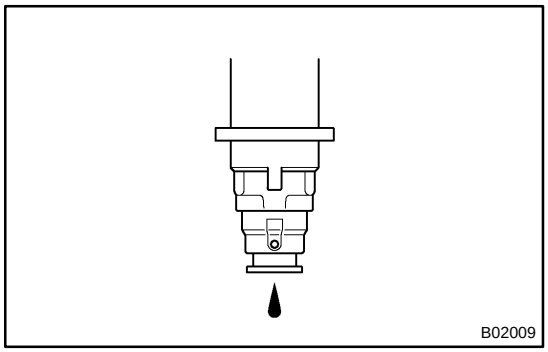
(l) Please refer to the hand-held tester operator's manual for further details.

(m) If you have no hand-held tester, connect the positive (+) and negative (-) leads from the battery to the fuel pump connector (See page SF-6).



(n) Connect SST (wire) to the injector and battery for 15 seconds, and measure the injection volume with a graduated cylinder. Test each injector 2 or 3 times.
SST 09842-30070
Injection volume:
60 - 73 cm^3 (3.7 - 4.5 cu in.) per 15 sec.
Difference between each injector:
13 cm^3 (0.8 cu in.) or less

If the injection volume is not as specified, replace the injector.



2. INSPECT LEAKAGE

(a) In the condition above, disconnect the test probes of SST (wire) from the battery and check the fuel leakage from the injector.
SST 09842-30070
Fuel drop: 1 drop or less per 12 min.

(b) Turn the ignition switch OFF.

(c) Disconnect the negative (-) terminal cable from the battery.

(d) Remove the SST.
SST 09268-41047, 09842-30070

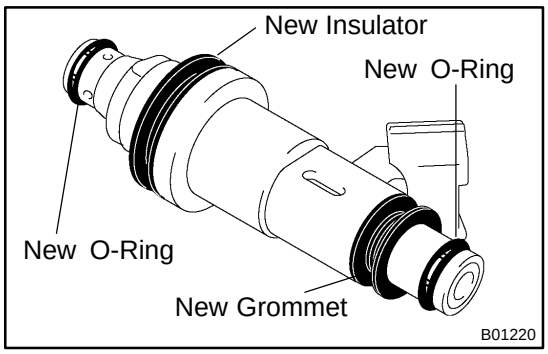
(e) Reconnect the fuel inlet hose to the fuel main tube (See page SF-1).

(f) Install the fuel inlet hose with the nut.
Torque: 9 N·m (90 kgf·cm, 80 in.·lbf)

(g) Disconnect the hand-held tester from the DLC3.

SF0ND-08

INSTALLATION

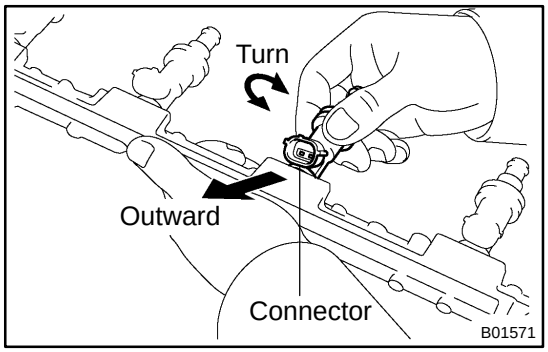


1. INSTALL INJECTORS AND DELIVERY PIPE

(a) Install new insulator and grommet to each injector.

(b) Apply a light coat of spindle oil or gasoline to 2 new O-rings and install them to each injector.

(c) Apply a light coat of spindle oil or gasoline on the place where a delivery pipe touches an O-ring of the injector.



(d) While turning the injector clockwise and counterclockwise, push it to the delivery pipe. Install the 6 injectors.

(e) Position the injector connector outward.

(f) Place the 3 spacers in position on the intake manifold.

(g) Apply a light coat of spindle oil or gasoline on the place where a intake manifold touches an O-ring of the injector.

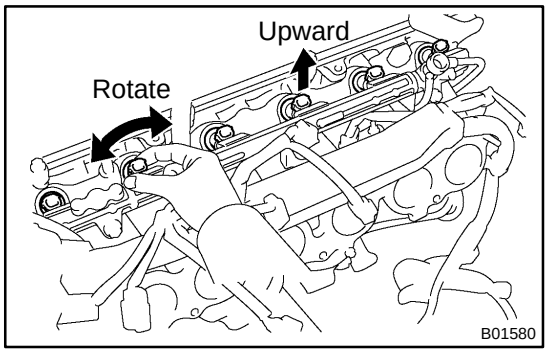
(h) Place the 6 injectors together with the delivery pipe and 3 bolts in position on the intake manifold.

(i) Temporarily install the 3 bolts holding the delivery pipe to the intake manifold.

(j) Check that the injectors rotate smoothly.

HINT:

If injectors do not rotate smoothly, the probable cause is incorrect installation of O-rings. Replace the O-rings.



(k) Position the injector connector upward.

(l) Connect the 6 injector connectors.

HINT:

The Nos.1, 3, 5 injector connectors and dark gray, and the Nos. 2, 4, 6 injector connectors are brown.

(m) Tighten the 3 bolts holding the delivery pipe to the intake manifold.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

(n) Connect the camshaft position sensor connector.

(o) Connect the throttle position sensor connector.

(p) Connect the VSV connector for EVAP.

2. INSTALL FUEL PRESSURE PULSATION DAMPER (See page SF-27)

3. INSTALL AIR INTAKE CHAMBER (See page SF-49)

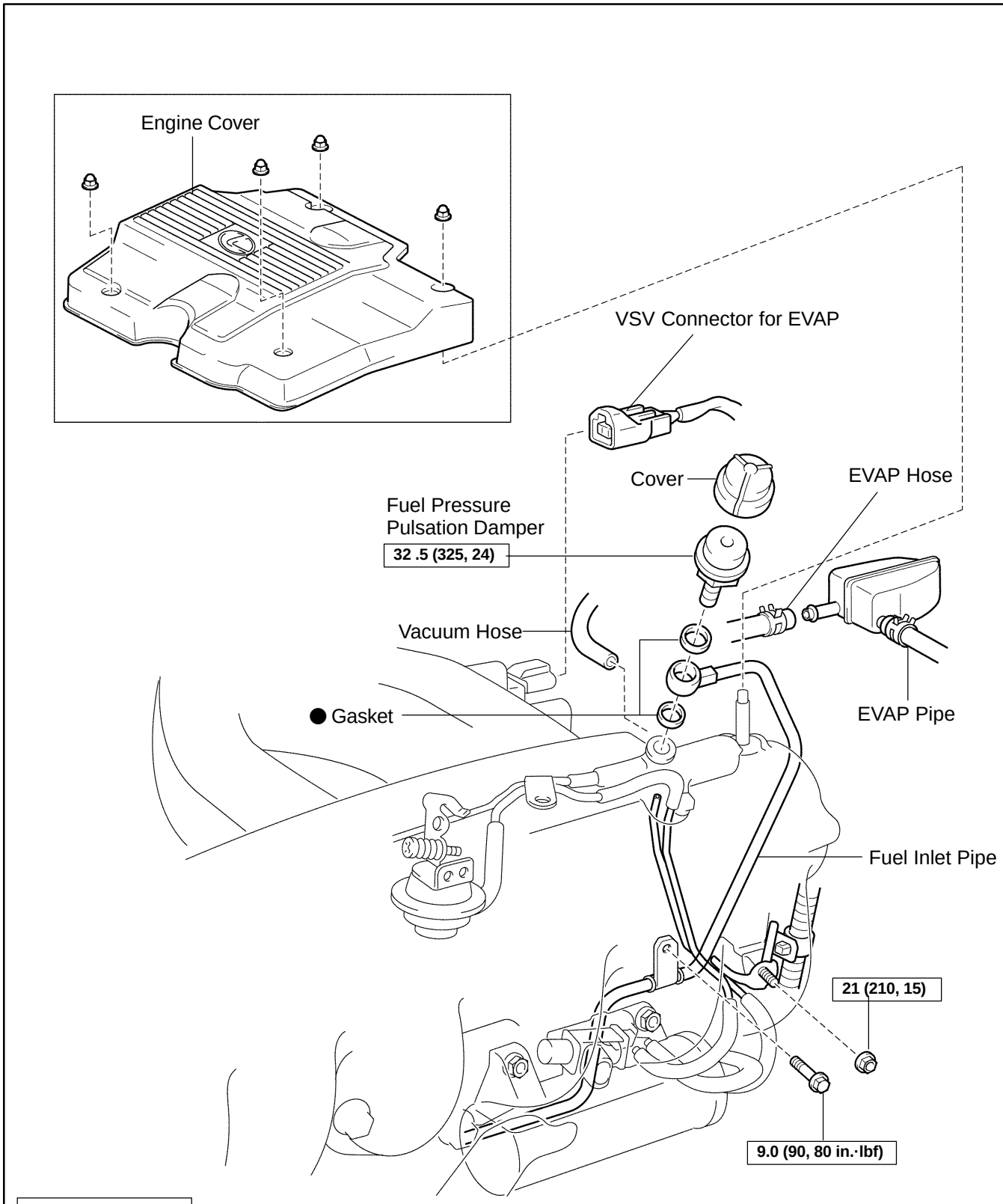
4. INSTALL ENGINE COVER

Install the engine cover with the 4 nuts.

FUEL PRESSURE PULSATION DAMPER

COMPONENTS

SF0NE-10

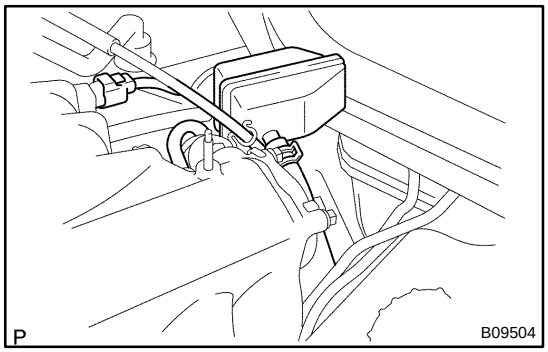


SF0NF-07

REMOVAL

1. REMOVE ENGINE COVER

Remove the 4 nuts and engine cover.

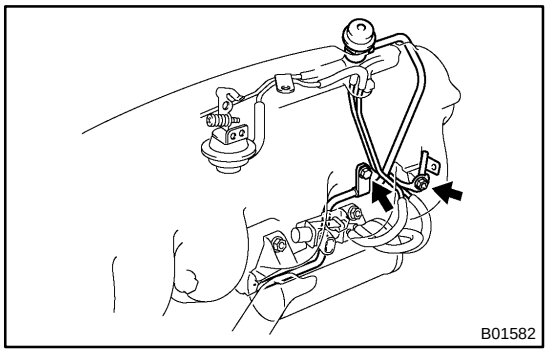


2. DISCONNECT CONNECTOR AND HOSES

(a) Disconnect the VSV connector for the EVAP.

(b) Disconnect the EVAP hose from the EVAP pipe.

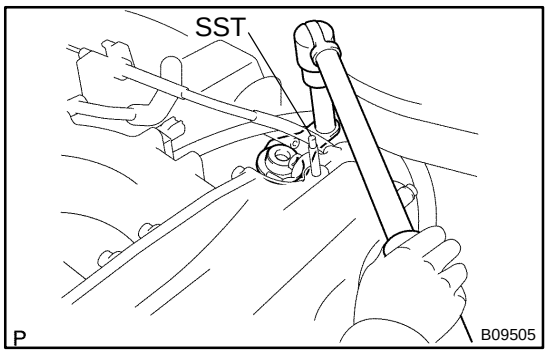
(c) Disconnect the vacuum hose (from No. 2 vacuum pipe) from the air intake chamber.



3. REMOVE FUEL PRESSURE PULSATION DAMPER

(a) Remove the nut holding the No. 2 vacuum pipe to the intake manifold.

(b) Remove the bolt holding the fuel inlet pipe to the intake manifold.



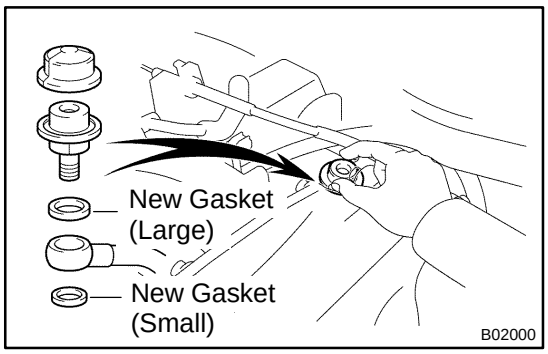
(c) Using SST, remove the pulsation damper and 2 gaskets.
SST 09612-24014 (09617-24011)

CAUTION:

- **Put a shop towel under the delivery pipe.**
- **Slowly loosen the pulsation damper.**

SF0NG-08

INSTALLATION

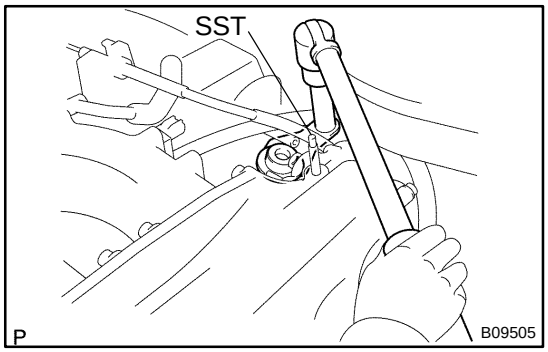


1. INSTALL FUEL PRESSURE PULSATION DAMPER

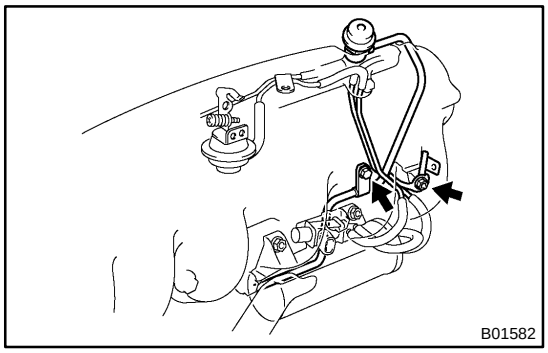
(a) Install the fuel inlet pipe and pulsation damper with 2 new gaskets.

HINT:

Different the gaskets are used for the upper (large side) and lower (small side).

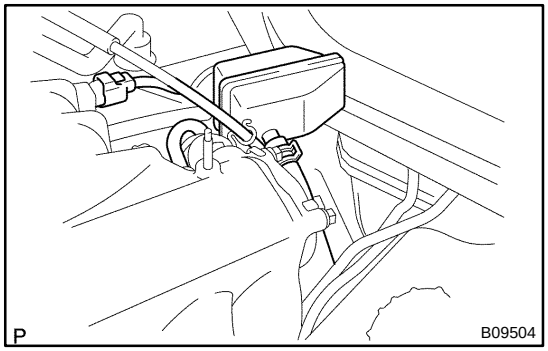


(b) Using SST, tighten the pulsation damper.
SST 09612-24014 (09617-24011)
Torque: 32.5 N·m (325 kgf·cm, 24 ft·lbf)



(c) Install the bolt holding the fuel inlet pipe to the intake manifold.
Torque: 9.0 N·m (90 kgf·cm, 80 in.·lbf)

(d) Install the nut holding the No. 2 vacuum pipe to the intake manifold.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)



2. CONNECT CONNECTOR AND HOSES

(a) Connect the vacuum hose (from No. 2 vacuum pipe) to the air intake chamber.

(b) Connect the EVAP hose to the EVAP pipe.

(c) Connect the VSV connector for the EVAP.

3. INSTALL ENGINE COVER

Install the engine cover with the 4 nuts.

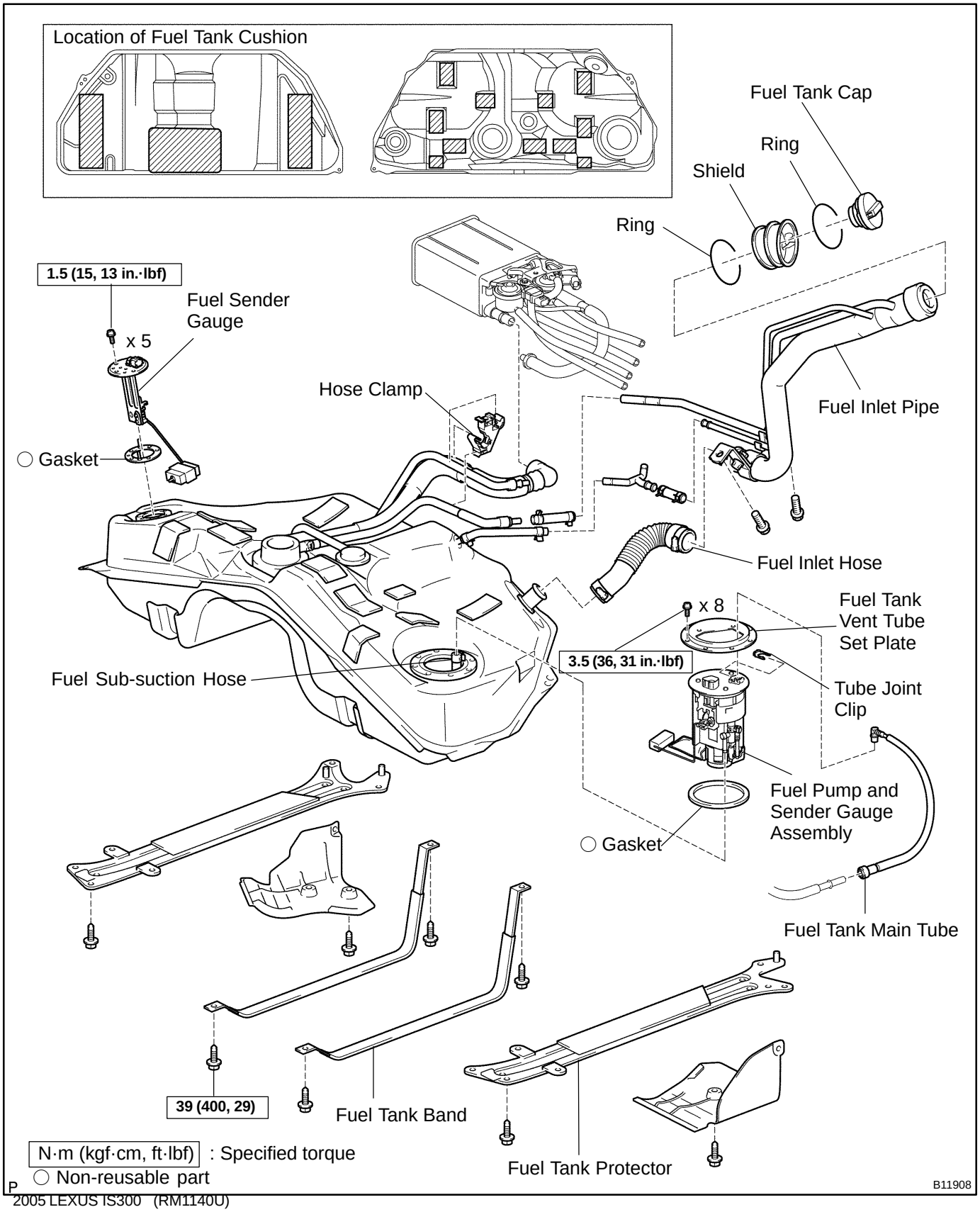
FUEL TANK AND LINE

SF0NH-07

COMPONENTS

CAUTION:

- **Always use new gaskets when replacing the fuel tank or component parts.**
- **Apply the proper torque to all parts tightened**



SF0NI-10

INSPECTION

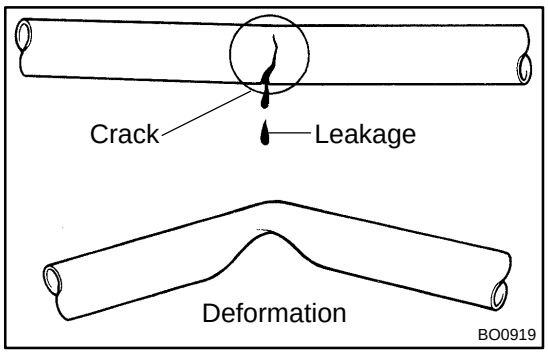
INSPECT FUEL TANK AND LINE

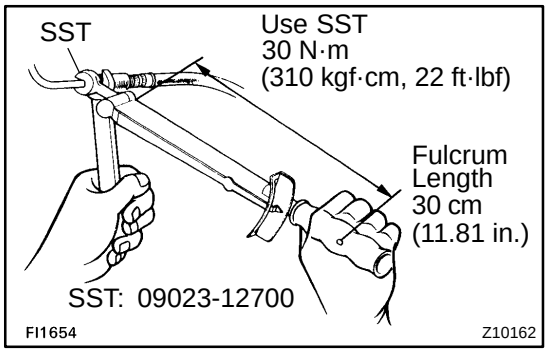
(a) Check the fuel lines for cracks or leakage, and all connections for deformation.

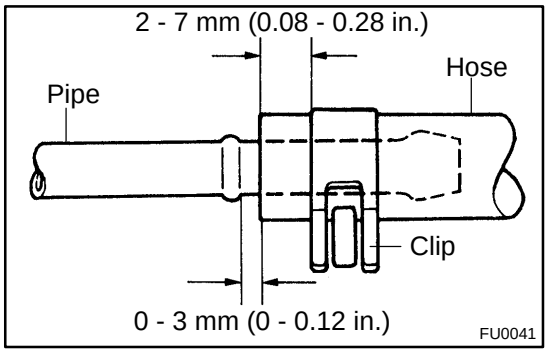
(b) Check the fuel tank vapor vent system hoses and connections for looseness, sharp bends or damage.

(c) Check the fuel tank for deformation, cracks, fuel leakage or tank band looseness.

(d) Check the filler neck for damage or fuel leakage.







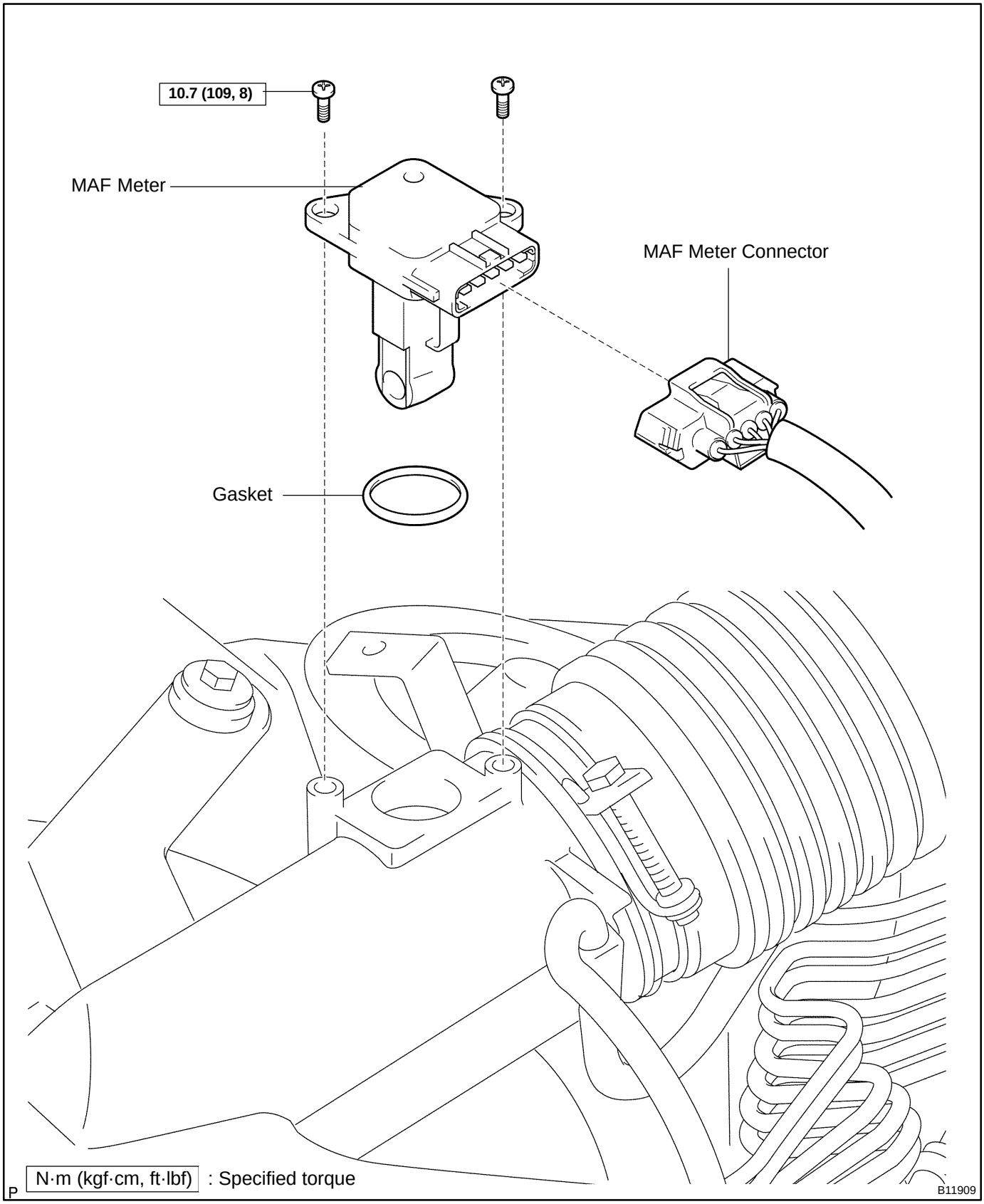
(e) Hose and pipe connections are as shown in the illustration.

If a problem is found, repair or replace the parts as necessary.

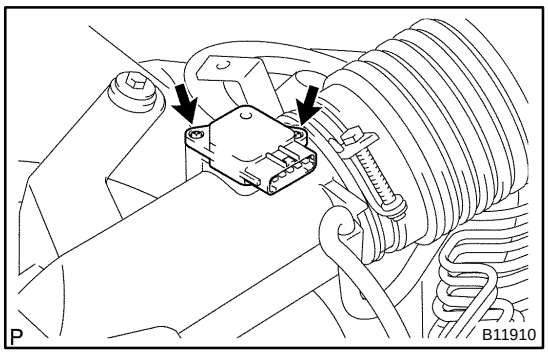
MASS AIR FLOW (MAF) METER

COMPONENTS

SF0NJ-11



SF0NK-07

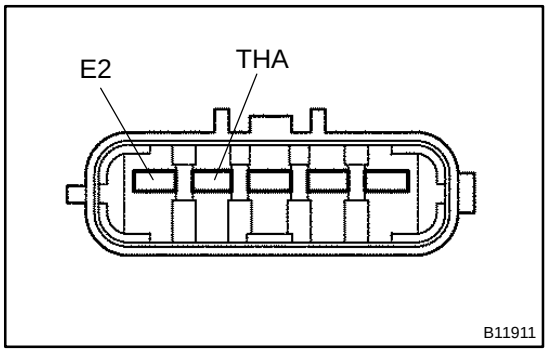


INSPECTION

1. REMOVE MAF METER

(a) Disconnect the MAF meter connector.

(b) Remove the 2 screws, MAF meter and gasket.

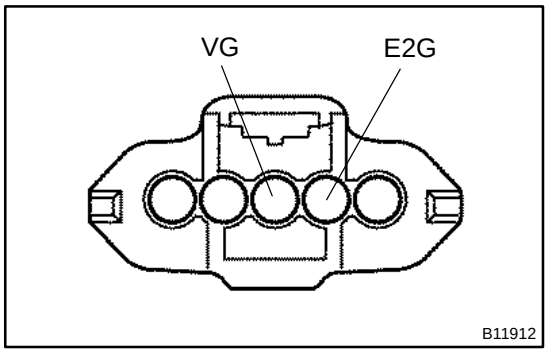


2. INSPECT MAF METER RESISTANCE

Using an ohmmeter, measure the resistance between terminals THA and E2.

Resistance	Temperature
13.6 - 18.4 kΩ	-20˚C (-4˚F)
2.21 - 2.69 kΩ	20˚C (68˚F)
0.493 - 0.667 kΩ	60˚C (140˚F)

If the resistance is not as specified, replace the MAF meter.



3. INSPECT MAF METER OPERATION

(a) Connect the MAF meter connector.

(b) Connect the negative (-) terminal cable to the battery.

(c) Turn the ignition switch ON.

(d) Using a voltmeter, connect the positive (+) tester probe to terminal VG, and negative (-) tester probe to terminal E2G.

(e) Blow air into the MAF meter, and check that the voltage fluctuates.

If operation is not as specified, replace the MAF meter.

(f) Turn the ignition switch OFF.

(g) Disconnect the negative (-) terminal cable from the battery.

(h) Disconnect the MAF meter connector.

4. REINSTALL MAF METER

(a) Install the gasket to the MAF meter.

(b) Install the MAF meter with the 2 screws.

Torque: 10.7 N·m (109 kgf·cm 8 ft·lbf)

(c) Connect the MAF meter connector.

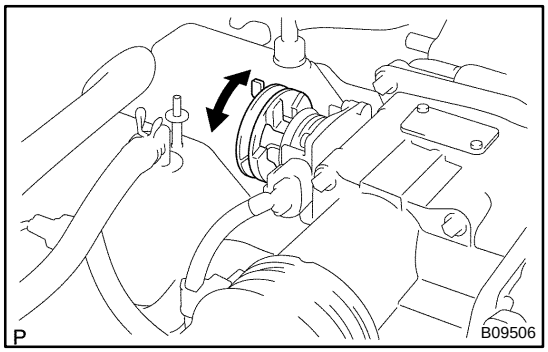
THROTTLE BODY

SF0NL-10

ON-VEHICLE INSPECTION

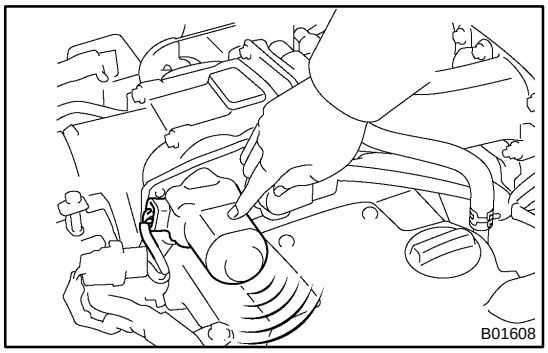
1. REMOVE ENGINE COVER

Remove the 4 nuts and engine cover.



2. INSPECT SYSTEM OPERATION

(a) Check that the throttle linkage moves smoothly.

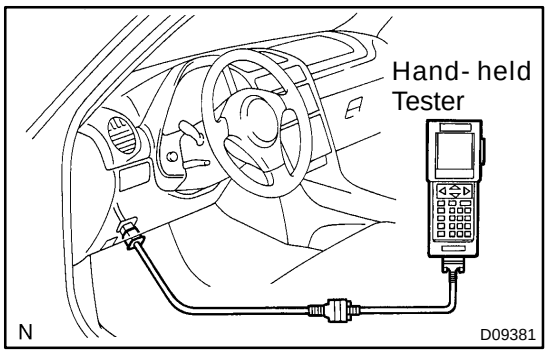


(b) Inspect the throttle control motor for operating sound.

(1) Turn the ignition switch ON.

(2) When turning the accelerator pedal position sensor lever, check the running sound of the motor. Also, check that there is no friction sound.

If operation is not as specified, check the throttle control motor, wiring and ECM.



(c) Inspect the throttle position sensor and accelerator pedal position sensor function.

(1) Connect the hand-held tester to the DLC3.

(2) When turning the accelerator pedal position sensor lever to the full-open position.

(3) Select the following menu, DIAGNOSIS / ENHANCED OBD ll / DATA LIST / THROTTLE POS.

Throttle valve opening percentage: 60 % or more

If operation is not as specified, check that the throttle position sensor, accelerator pedal position sensor, wiring and ECM.

(d) Start the engine, and check that the Malfunction Indicator Lamp (MIL) does not light up.

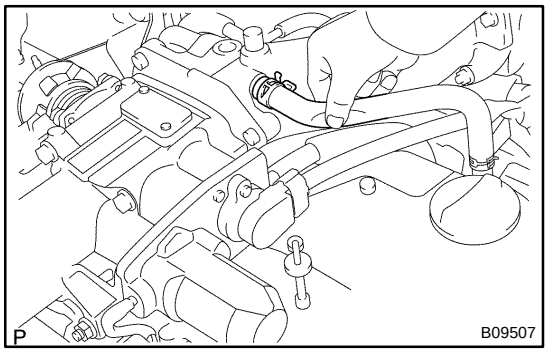
(e) Inspect the air assist system.

(1) Allow the engine to warm up to normal operating temperature.

(2) Turn the A/C switch ON and OFF, and check the idle speed.

Idle speed (Transmission in neutral):
700 ± 50 rpm (A/C OFF)
750 ± 50 rpm (A/C ON)

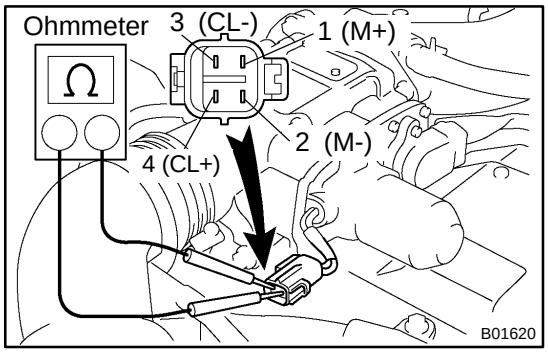
NOTICE:
Perform inspection under condition without electrical load.



(3) With engine idling, pinch the air assist hose and check that engine speed drops, and then returns back up to idle speed.

If operation is not as specified, check the throttle body, wiring and ECM.

(f) After checking the above (b) to (e), perform the diving test and check that there is no sense of incongruity.



3. INSPECT THROTTLE CONTROL MOTOR

(a) Disconnect the throttle control motor connector.

(b) Using an ohmmeter, measure the resistance between terminal 3 (CL-) and 4 (CL+).

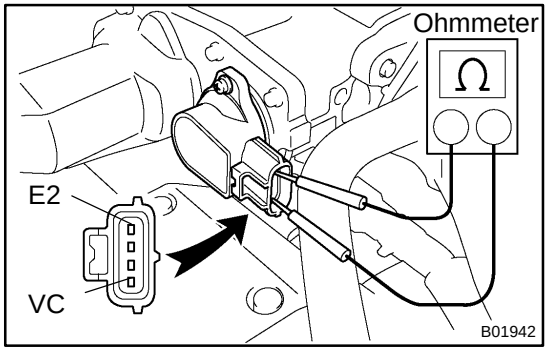
Resistance: 4.2 - 5.2 Ω at 20˚C (68˚F)

(c) Using an ohmmeter, measure the resistance between terminal 1 (M+) and 2 (M-).

Resistance: 0.3 - 100 Ω at 20˚C (68˚F)

If the resistance is not as specified, replace the throttle control motor (See page SF-37).

(d) Reconnect the throttle control motor connector.



4. INSPECT THROTTLE POSITION SENSOR

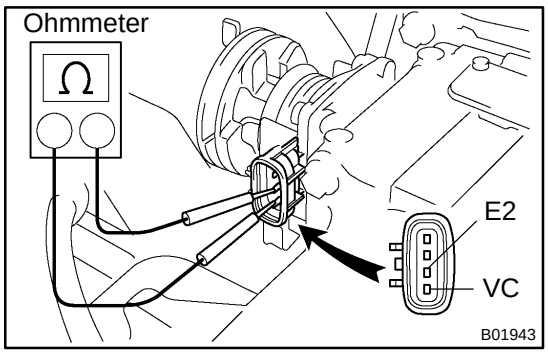
(a) Disconnect the throttle position sensor connector.

(b) Using an ohmmeter, measure the resistance between terminals VC and E2.

Resistance: 1.2 - 3.2 kΩ at 20˚C (68˚F)

If the resistance is not as specified, replace the throttle position sensor (See page SF-37).

(c) Reconnect the throttle position sensor connector.



5. INSPECT ACCELERATOR PEDAL POSITION SENSOR

(a) Disconnect the accelerator pedal position sensor connector.

(b) Using an ohmmeter, measure the resistance between terminals VC and E2.

Resistance: 1.2 - 3.2 kΩ at 20˚C (68˚F)

If the resistance is not as specified, replace the accelerator pedal position sensor (See page SF-37).

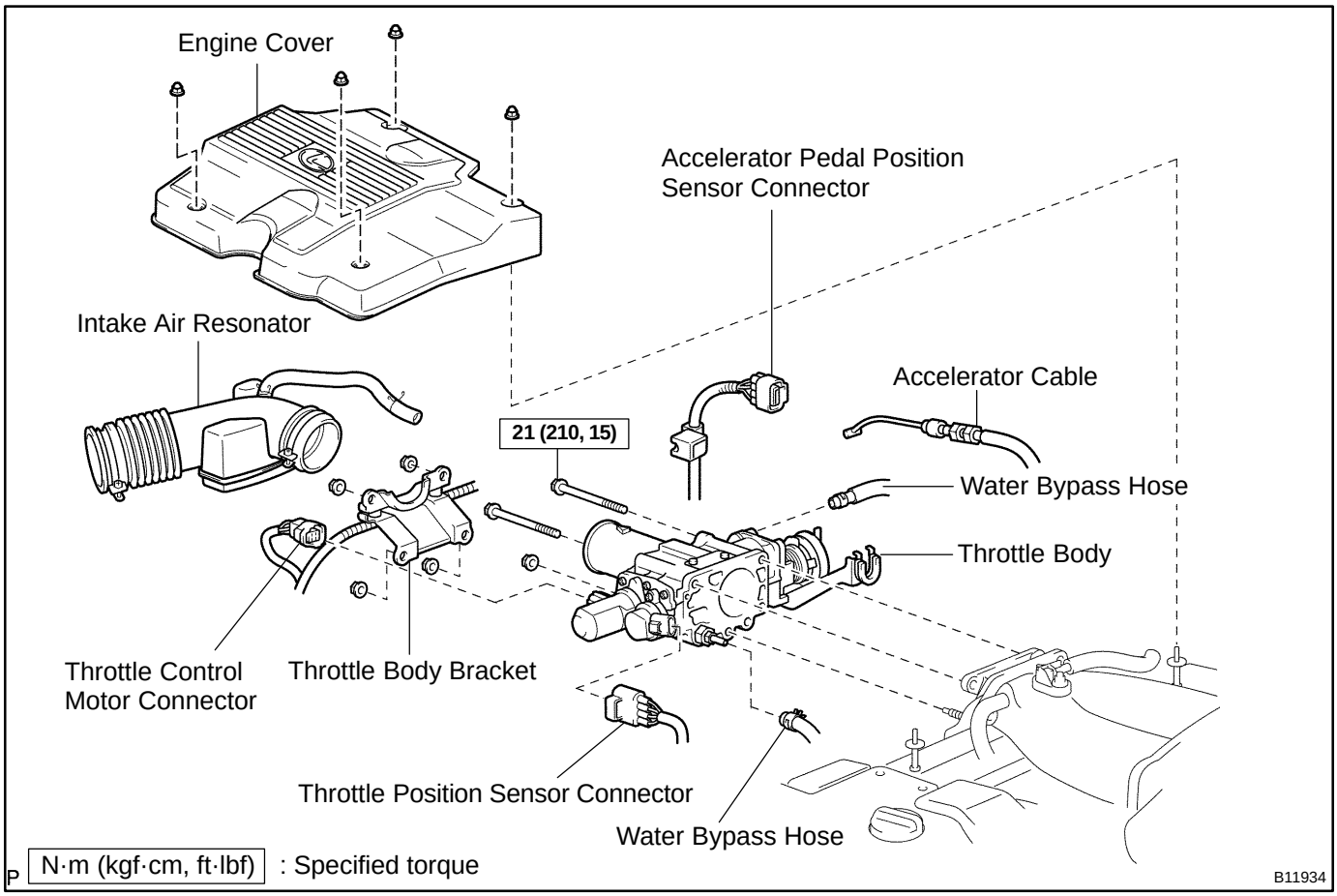
(c) Reconnect the accelerator pedal position sensor connector.

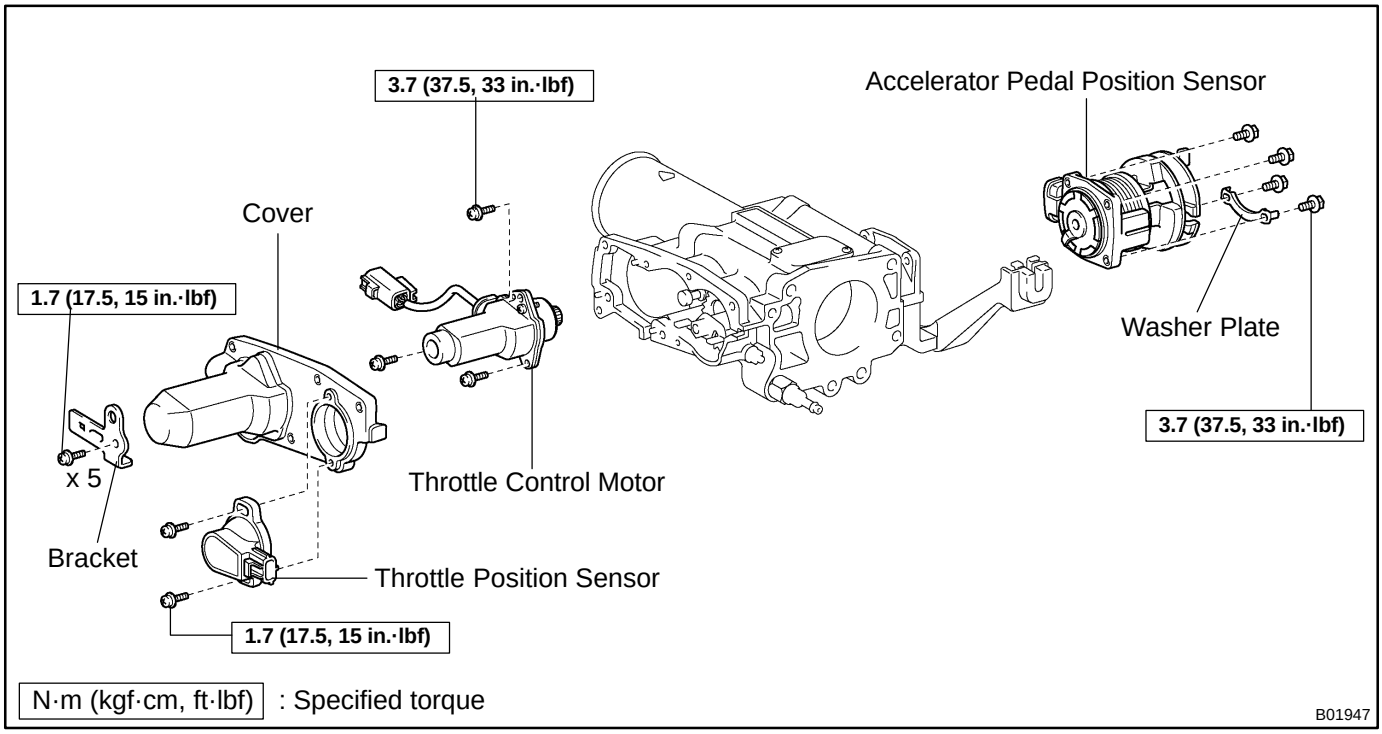
6. REINSTALL ENGINE COVER

Install the engine cover with the 4 nuts.

SF0NM-13

COMPONENTS





SF0NN-08

REMOVAL

1. DRAIN ENGINE COOLANT

2. REMOVE ENGINE COVER

Remove the 4 nuts and engine cover.

3. REMOVE INTAKE AIR RESONATOR

4. REMOVE THROTTLE BODY BRACKET AND THROTTLE BODY

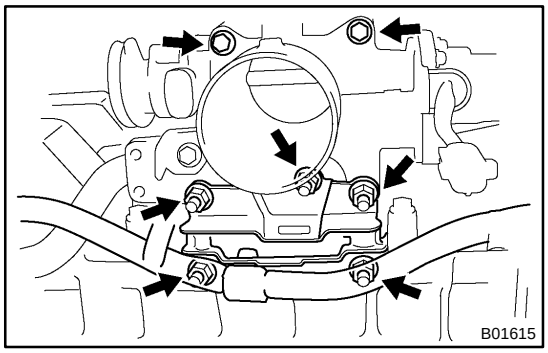
(a) Disconnect the accelerator cable.

(b) Disconnect the throttle position sensor connector.

(c) Disconnect the throttle control motor connector.

(d) Disconnect the accelerator pedal position sensor connector.

(e) Disconnect the engine wire clamp from the clamp bracket of throttle body.



(f) Remove the 2 bolts and nut holding the throttle body to the intake air connector.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

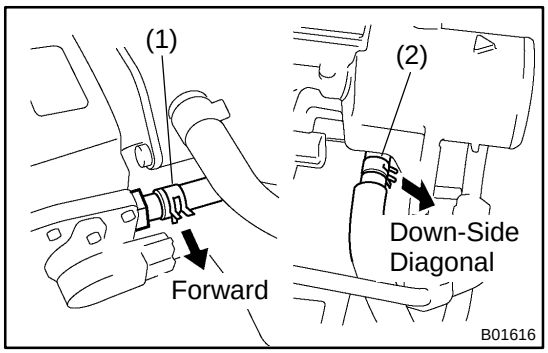
(g) Remove the 4 nuts and throttle body bracket.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

(h) Slightly slide the throttle body away from the intake air connector.

NOTICE:

When putting up the throttle body, do not hold the motor part.



(i) Disconnect the 2 water bypass hoses from the throttle body, and remove the throttle body.

HINT:

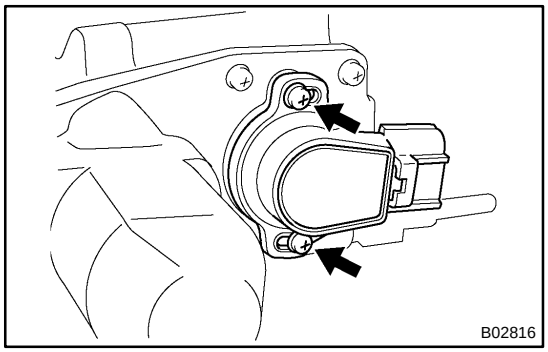
- At the time of installation, please refer to the following items.
- Connect the water bypass hose with its discrimination mark downward.
- Install the with its craw direction for (1) forward and down-side diagonal (engine side about 45˚) for (2).

SF0NO-09

REPLACEMENT

NOTICE:

- **To prevent deterioration, do not shock the throttle position sensor and accelerator pedal position sensor.**
- **Mixing of the foreign objects may cause the gear locking, so thoroughly check that there is no stuck of any foreign objects and clean up if any.**

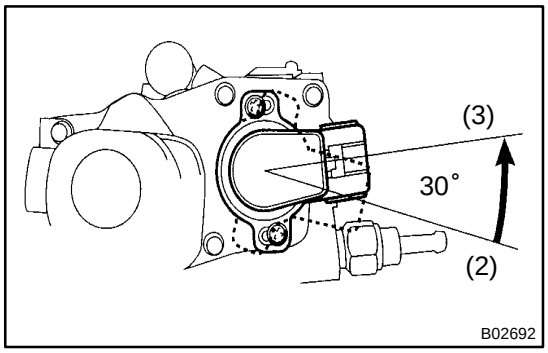


1. REPLACE THROTTLE POSITION SENSOR

(a) Remove the 2 set screws and throttle position sensor.

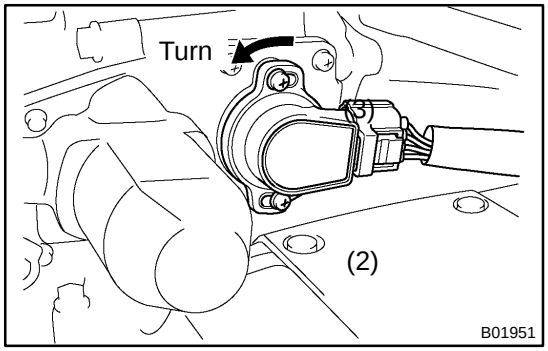
(b) Reinstall the throttle position sensor.

(1) Check that the throttle valve is under the condition of the opener opening angle (about 3.5˚).



(2) Install the sensor to the place where is at 30˚ rotated to the right from the specified installation position.

(3) Gradually turn sensor counterclockwise until it touches the throttle valve shaft and temporarily torque the 2 set screws.



(c) Adjust the throttle position sensor.

(1) Connect the throttle position sensor connector.

NOTICE:

At this time, do not connect the throttle control motor connector.

(2) Connect the hand-held tester or OBD II scan tool to the DLC3.

(3) Turn the ignition switch ON.

NOTICE:

After turning the ignition switch ON, do not depress the accelerator pedal.

(4) While reading the value of the throttle valve opening percentage (THROTTLE POS) of the CURRENT DATA, turn the throttle position sensor slowly to left and set the sensor at the center value of the standard value, and then torque the screws.

Torque: 1.7 N·m (17.5 kgf·cm, 15 in.·lbf)

Standard throttle valve opening percentage:

14.8 ± 0.8 %

NOTICE:

At the time of tightening the screw, as the sensor itself tends to turn causing to slanting, check that it is within the standard value after having finished the torque.

(5) Fully close the throttle valve with a screwdriver and check that the value of the throttle valve opening percentage (THROTTLE POS) of the CURRENT DATA stays with the standard value.

Standard throttle valve opening percentage:

10 - 14 %

If the throttle valve opening percentage is not as specified, repeat steps (4) through (5).

(6) Paint the sensor set screws.

(7) Turn the ignition switch OFF.

(8) Disconnect the hand-held tester or OBD II scan tool from the DLC3.

(9) Disconnect the throttle position sensor connector.

2. REPLACE THROTTLE CONTROL MOTOR

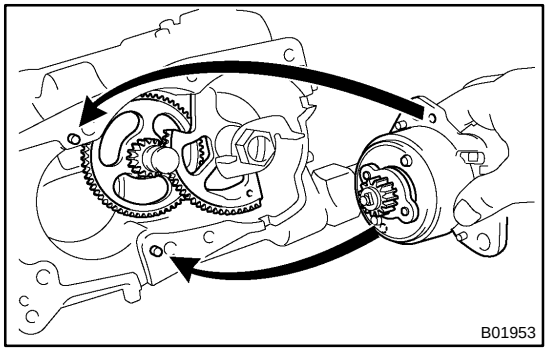
(a) Remove the throttle position sensor.

(b) Remove the throttle control motor.

(1) Disconnect the connector from the bracket.

(2) Remove the 5 screws, bracket and cover.

(3) Remove the 3 screws and throttle control motor.



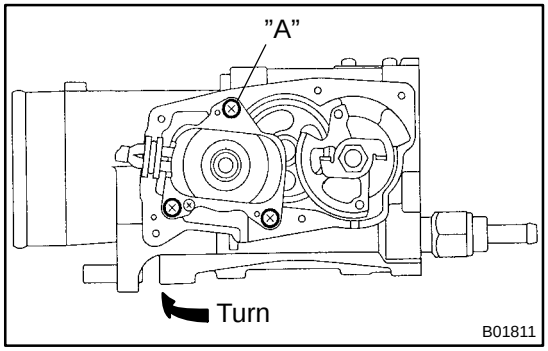
(c) Reinstall the throttle control motor.

(1) Apply the grease thinly on the whole surface of the gear teeth.

NOTICE:

Do not apply the grease other than specified because grease has been already applied to the component to be replaced.

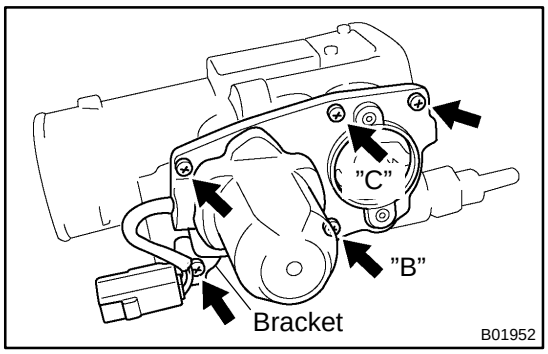
(2) Align the protrusions of the motor with the positioning pin holes of the throttle body.



(3) Rotate the motor to the direction marked with an arrow and temporarily install the set screw "A" under the condition that there is no wobbles in the motor and the positioning pin.

(4) Tighten the 3 set screws.

Torque: 3.7 N·m (37.5 kgf·cm, 33 in.·lbf)



(5) Temporarily install the cover with the 2 screws "B" and "C".

NOTICE:

The grommet of motor not be caught.

(6) Tighten the 5 screws.

Torque: 1.7 N·m (17.5 kgf·cm, 15 in.·lbf)

(7) Connect the connector to the bracket.

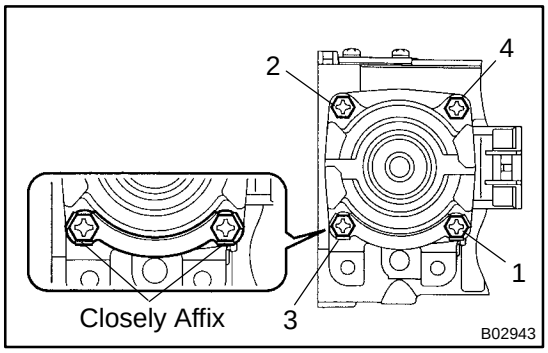
(d) Reinstall and adjust the throttle position sensor (See step 1).

3. REPLACE ACCELERATOR PEDAL POSITION SENSOR

(a) Remove the accelerator pedal position sensor.

(1) Using a small screwdriver, pry the 4 stoppers of the washer plate.

(2) Remove the 4 set bolts, washer plate and accelerator pedal position sensor.



(b) Reinstall the accelerator pedal position sensor.

(1) Install the accelerator pedal position sensor to the throttle body.

(2) Torque the 4 bolts in the order shown in the illustration through the washer plate.

Torque: 3.7 N·m (37.5 kgf·cm, 33 in.·lbf)

(3) Bend the stopper of the washer plate and closely affix to the bolts.

(c) Inspect the accelerator pedal position sensor.

(1) Connect the accelerator pedal position sensor connector.

(2) Connect the hand-held tester or OBD II scan tool to the DLC3.

(3) Turn the ignition switch ON.

NOTICE:

After turning the ignition switch ON, do not depress the accelerator pedal.

(4) Check that the ACCEL POS #1 (VPA) voltage of the CURRENT DATA shows the standard value.

Standard accelerator pedal position voltage:

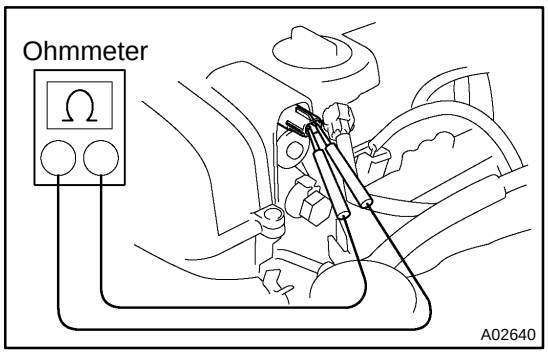
0.3 - 0.9 V

4. AFTER INSTALL THROTTLE BODY, INSPECT SYSTEM OPERATION (See page SF-32)

SF0NP-09

INSTALLATION

Installation is in the reverse order of removal (See page SF-36).



CAMSHAFT TIMING OIL CONTROL VALVE

SF0NR-10

ON-VEHICLE INSPECTION

1. INSPECT OIL CONTROL VALVE RESISTANCE

(a) Disconnect the oil control valve connector.

(b) Using an ohmmeter, measure the resistance between the terminals.

Resistance: 5.5 - 12 Ω at 20˚C (68˚F)

If the resistance is not as specified, replace the valve.

(c) Reconnect the oil control valve connector.

2. INSPECT VVT-i OPERATION

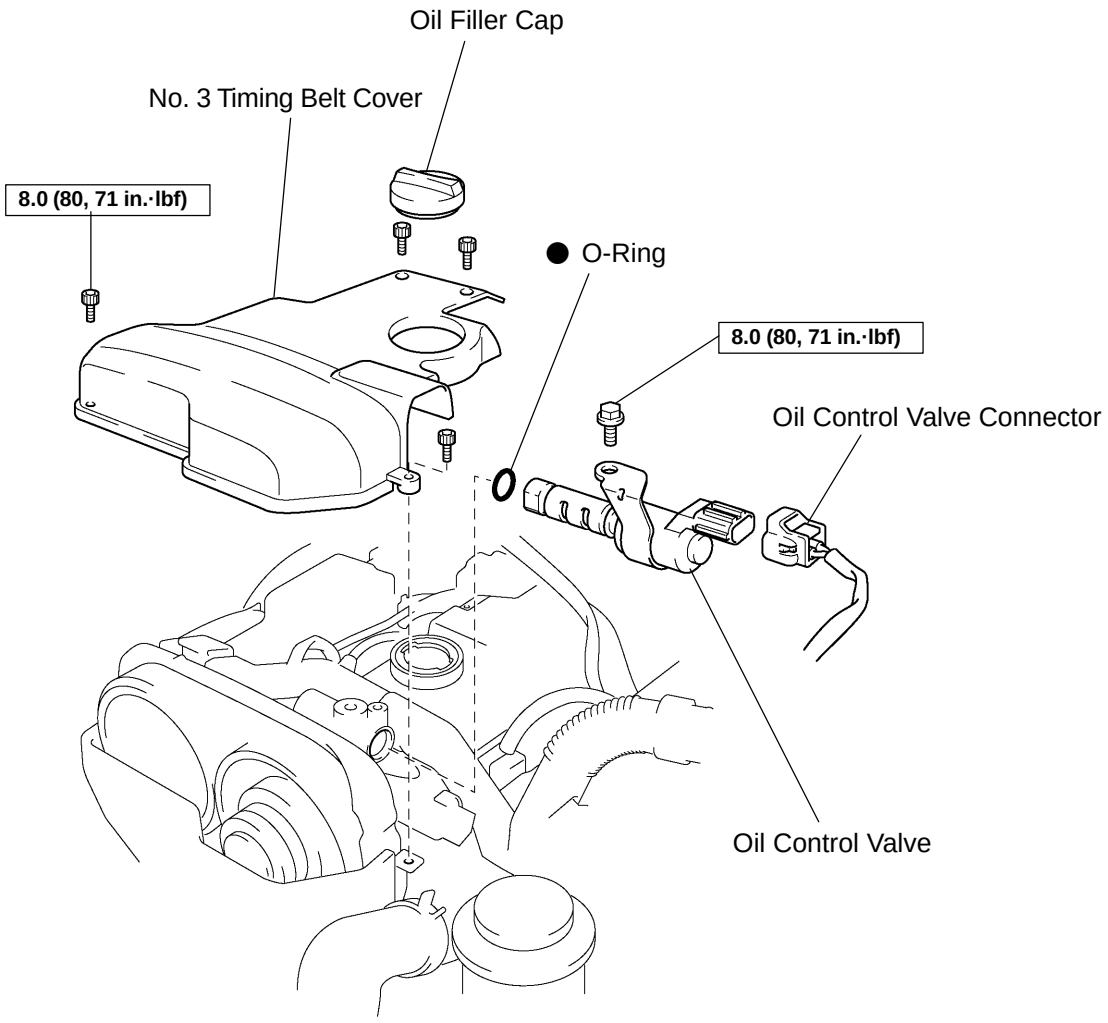
(a) Allow the engine to warm up to normal operating temperature.

(b) Check that the engine stalls or becomes in rough-idling state when the battery positive voltage is applied to the oil control valve with the engine idling.

If operation is not as specified, check the oil control valve (see page SF-43), VVT-i pulley, intake camshaft, wiring and ECM.

SF0NQ-10

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

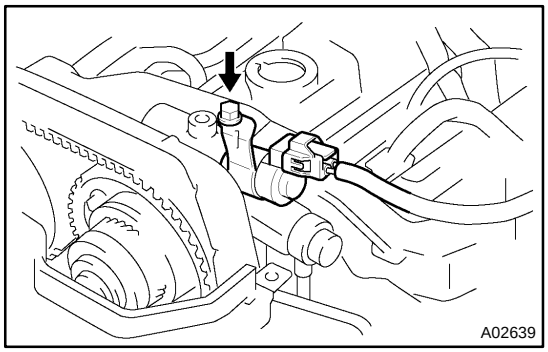
● Non-reusable part

B11945

SF0NS-05

INSPECTION

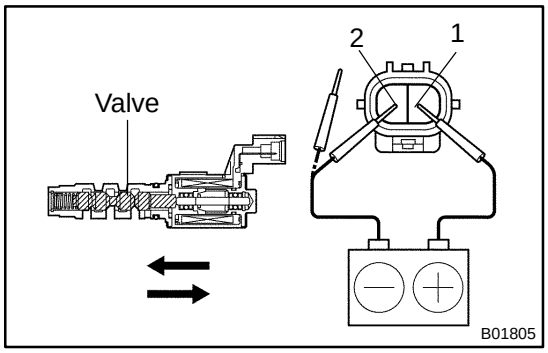
1. REMOVE NO. 3 TIMING BELT COVER



2. REMOVE OIL CONTROL VALVE

(a) Disconnect the oil control valve connector.

(b) Remove the bolt, oil control valve and O-ring.



3. INSPECT OIL CONTROL VALVE OPERATION

Connect positive (+) lead from the battery to terminal 1 and negative (-) lead to terminal 2, and check the movement of the valve.

Battery positive voltage is applied	Valve moves in ← direction
Battery positive voltage is cut off	Valve moves in → direction

If operation is not as specified, replace the valve.

4. REINSTALL OIL CONTROL VALVE

(a) Install a new O-ring to the oil control valve.

(b) Install the oil control valve with the bolt.

Torque: 8.0 N·m (80 kgf·cm, 71 in.·lbf)

(c) Connect the oil control valve connector.

5. REINSTALL NO. 3 TIMING BELT COVER

Torque: 8.0 N·m (80 kgf·cm, 71 in.·lbf)

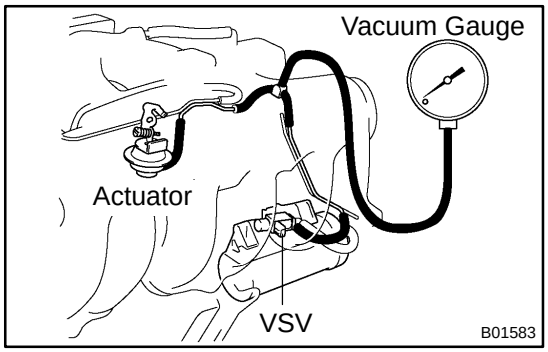
ACOUSTIC CONTROL INDUCTION SYSTEM (ACIS)

SF0NT-07

ON-VEHICLE INSPECTION

1. REMOVE ENGINE COVER

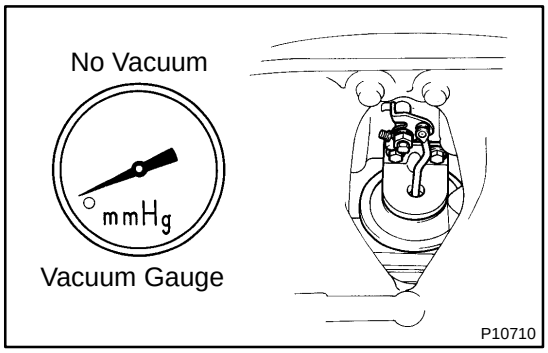
Remove the 4 nuts and engine cover.



2. CONNECT VACUUM GAUGE

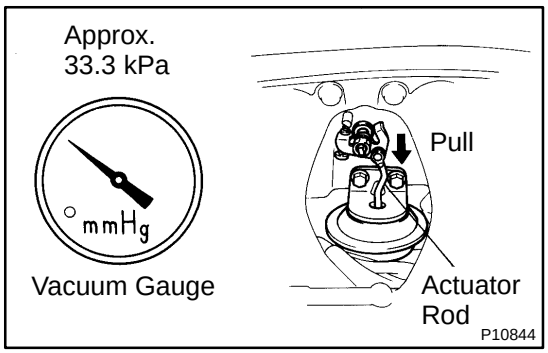
Using a 3-way connector, connect vacuum gauge to the hose between the actuator and VSV.

3. START ENGINE



4. INSPECT INTAKE AIR CONTROL VALVE

(a) While the engine is idling, check that the vacuum gauge needle does not move.



(b) Rapidly depress the accelerator pedal to fully open position and check that the vacuum gauge needle momentarily fluctuates approx. 33.3 kPa (250 mmHg, 9.84 in.Hg) or more. (The actuator rod is pulled down.)

5. REMOVE VACUUM GAUGE

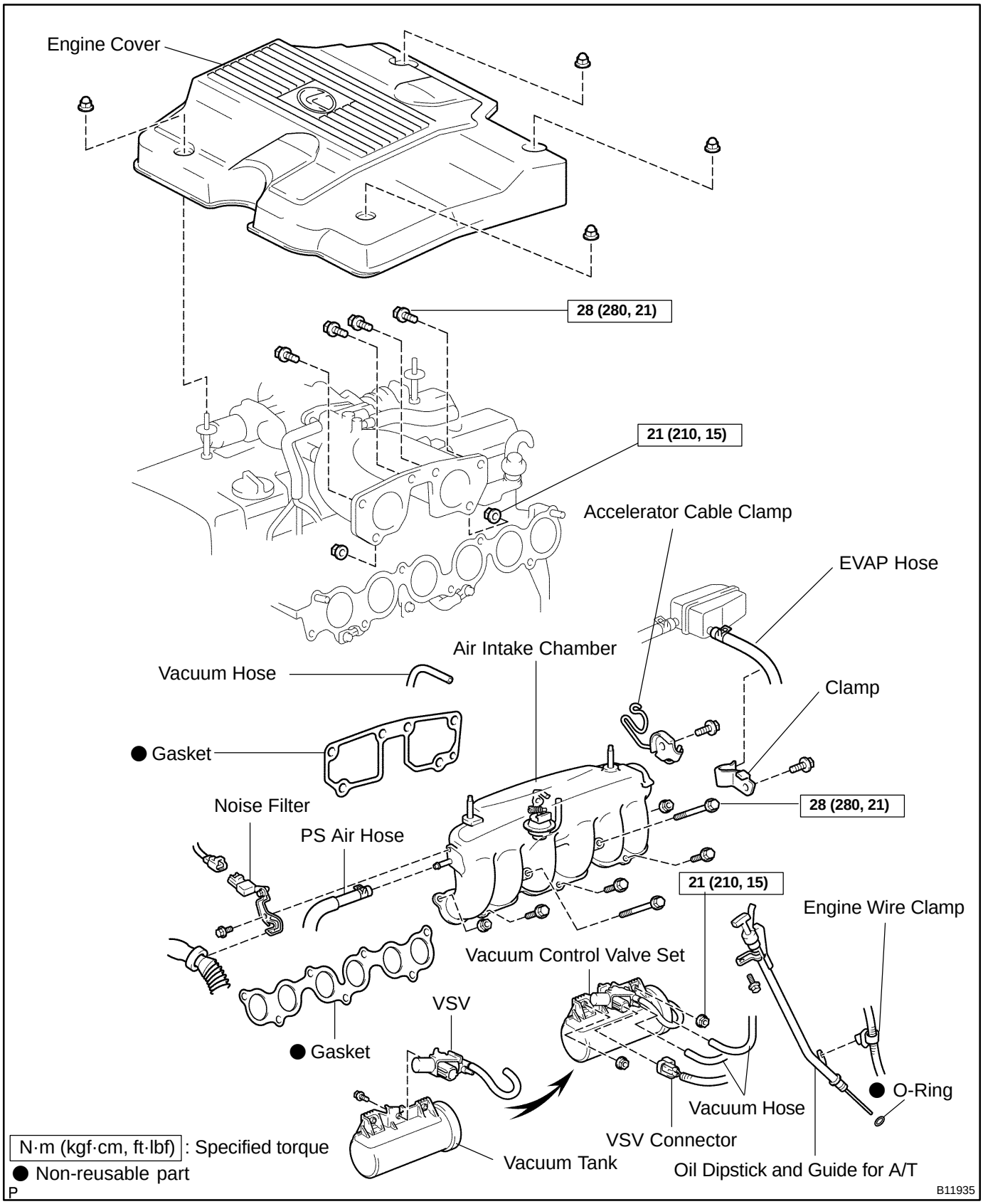
Remove the vacuum gauge, and reconnect the vacuum hoses to their proper locations.

6. REINSTALL ENGINE COVER

Reinstall the engine cover with the 4 nuts.

SF0NU-07

COMPONENTS

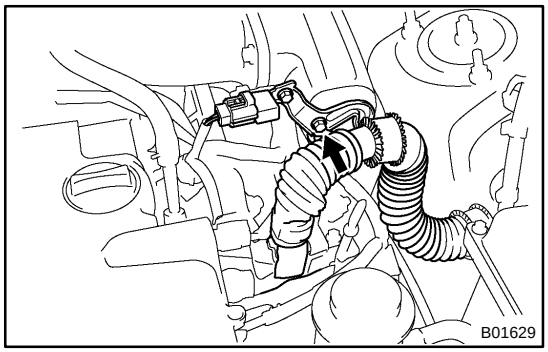


SF0NV-07

REMOVAL

1. REMOVE ENGINE COVER

Remove the 4 nuts and engine cover.



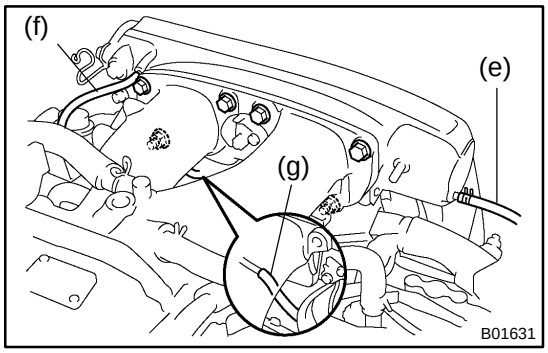
2. REMOVE OIL DIPSTICK AND GUIDE FOR A/T (See page EM-65)

3. REMOVE AIR INTAKE CHAMBER (WITH INTAKE AIR CONTROL VALVE)

(a) Disconnect the noise filter connector.

(b) Disconnect the engine wire clamp from the bracket.

(c) Remove the bolt, bracket and noise filter.



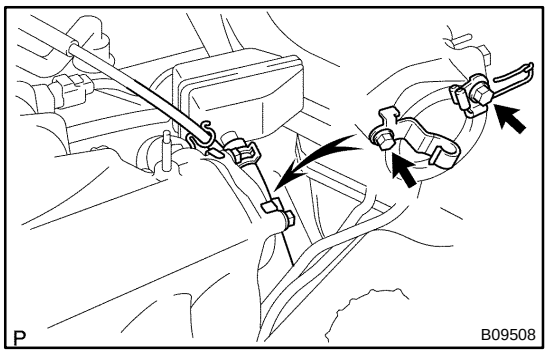
(d) Remove the 4 bolts and 2 nuts holding the intake air connector to the air intake chamber,

Torque: 28 N·m (280 kgf·cm, 21 ft·lbf)

(e) Disconnect the PS air hose from the air intake chamber.

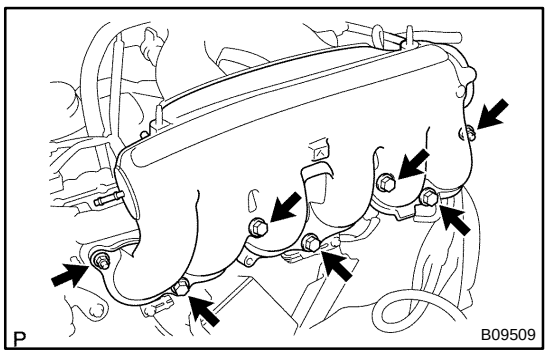
(f) Disconnect the vacuum hose (from No.2 vacuum pipe) from the air intake chamber.

(g) Disconnect the vacuum hose (from actuator for ACIS) from the No. 1 vacuum pipe.



(h) Disconnect the accelerator cable, and remove the bolt and accelerator cable clamp.

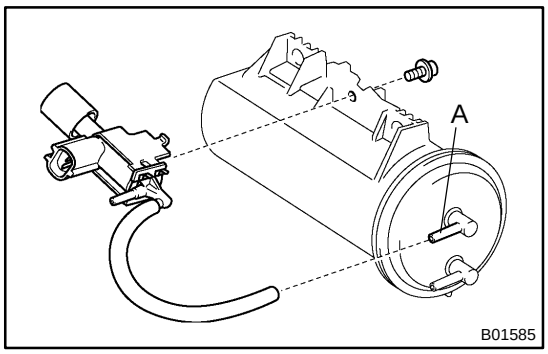
(i) Disconnect the EVAP hose, and remove the bolt and clamp.



(j) Remove the 5 bolts, 2 nuts, air intake chamber and 2 gaskets.

Torque: 28 N·m (280 kgf·cm, 21 ft·lbf)

4. REMOVE VACUUM CONTROL VALVE SET (See page SF-48)



5. REMOVE VSV FROM VACUUM TANK

(a) Disconnect the vacuum hose from port A of the vacuum tank.

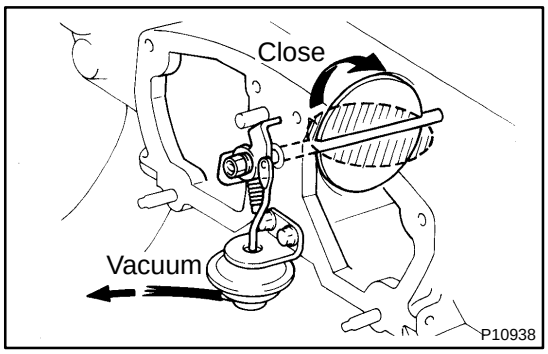
(b) Remove the screw and VSV.

SF0NW-06

INSPECTION

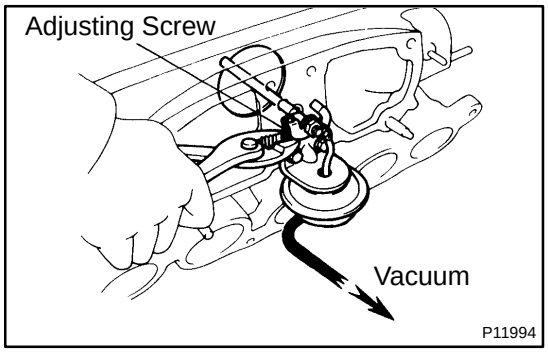
1. INSPECT INTAKE AIR CONTROL VALVE

(a) With 53.3 kPa (400 mmHg, 15.75 in.Hg) of vacuum applied to the actuator, check that the actuator rod moves.



If operation is not as specified, turn the adjusting screw.

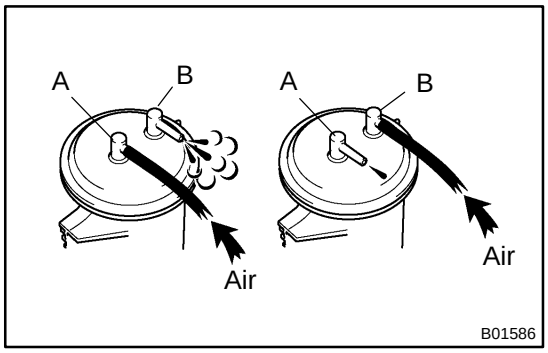
(b) 1 minute after applying the vacuum in (a), check that the actuator rod does not return.



2. INSPECT VACUUM TANK

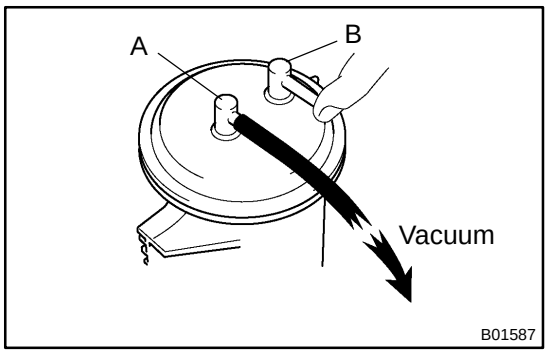
(a) Check that air flows from ports A to B.

(b) Check that air does not flow ports B to A.



(c) Plug port B with your finger, and apply 53.3 kPa (400 mmHg, 15.75 in.Hg) of vacuum to port A, and check that there is no change in vacuum after 1 minute.

If operation is not as specified, replace the vacuum tank.

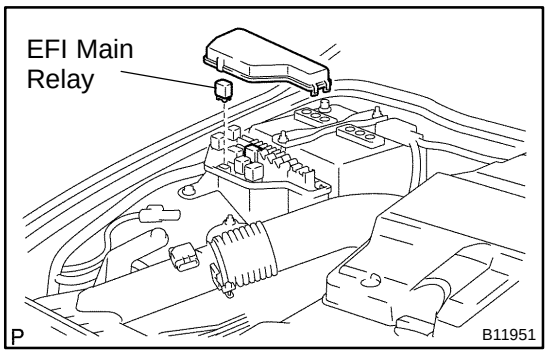


3. INSPECT VSV (See page SF-48)

SF0NX-04

INSTALLATION

Installation is in the reverse order of removal (See page SF-46).

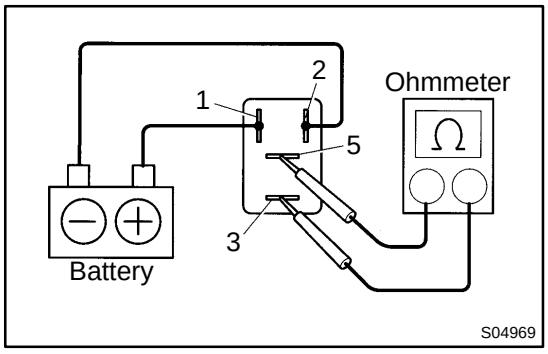


EFI MAIN RELAY

SF1ZJ-01

INSPECTION

1. **REMOVE RELAY BOX COVER**
2. **REMOVE EFI MAIN RELAY (Marking: EFI)**



3. **INSPECT EFI MAIN RELAY**

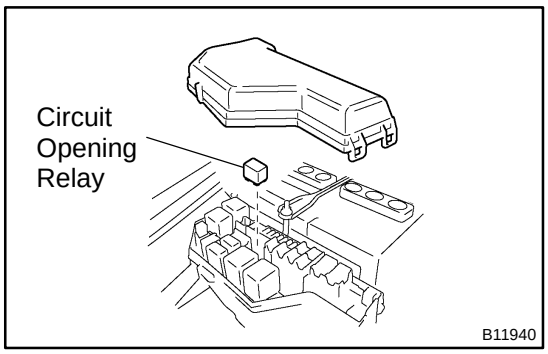
(1) Using an ohmmeter, measure the resistance between the terminals.

Standard:

Tester Connection	Specified Condition
3 - 5	10 kΩ or higher
3 - 5	Below 1 Ω (Apply battery voltage to terminals 1 and 2)

If the resistance is not as specified, replace the relay.

4. **REINSTALL EFI MAIN RELAY**
5. **REINSTALL RELAY BOX COVER**



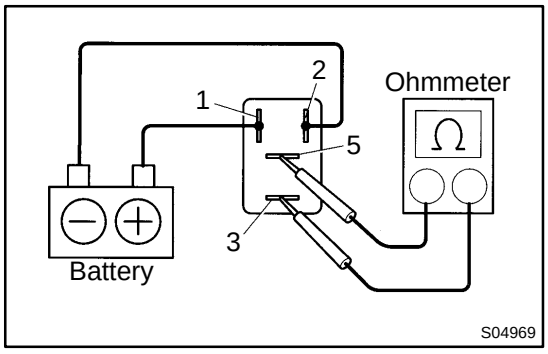
CIRCUIT OPENING RELAY

SF1ZK-01

INSPECTION

1. REMOVE RELAY BOX COVER

2. REMOVE CIRCUIT OPENING RELAY



3. INSPECT CIRCUIT OPENING RELAY

(2) Using an ohmmeter, measure the resistance between the terminals.

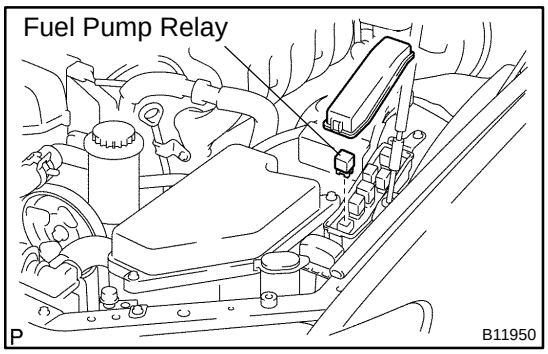
Standard:

Tester Connection	Specified Condition
3 - 5	10 kΩ or higher
3 - 5	Below 1 Ω (Apply battery voltage to terminals 1 and 2)

If the resistance is not as specified, replace the relay.

4. REINSTALL CIRCUIT OPENING RELAY

5. REINSTALL RELAY BOX COVER



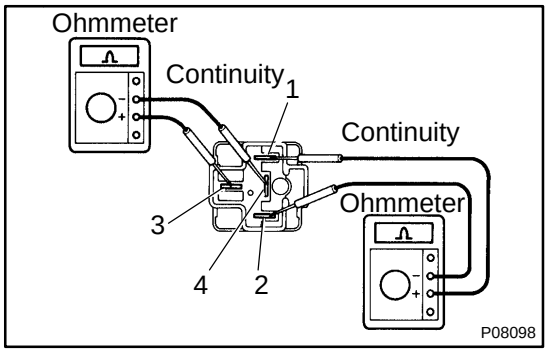
FUEL PUMP RELAY

SF1LG-04

INSPECTION

1. REMOVE RELAY BOX COVER

2. REMOVE FUEL PUMP RELAY (Marking: FUEL PMP)



3. INSPECT FUEL PUMP RELAY

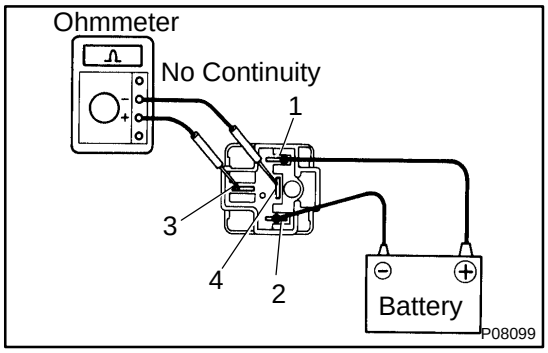
(a) Inspect the relay continuity.

(1) Using an ohmmeter, check that there is continuity between terminals 1 and 2.

If there is no continuity, replace the relay.

(2) Check that there is continuity between terminals 3 and 4.

If there is no continuity, replace the relay.



(b) Inspect the relay operation.

(1) Apply battery positive voltage across terminals 1 and 2.

(2) Using an ohmmeter, check that there is no continuity between terminals 3 and 4.

If there is continuity, replace the relay.

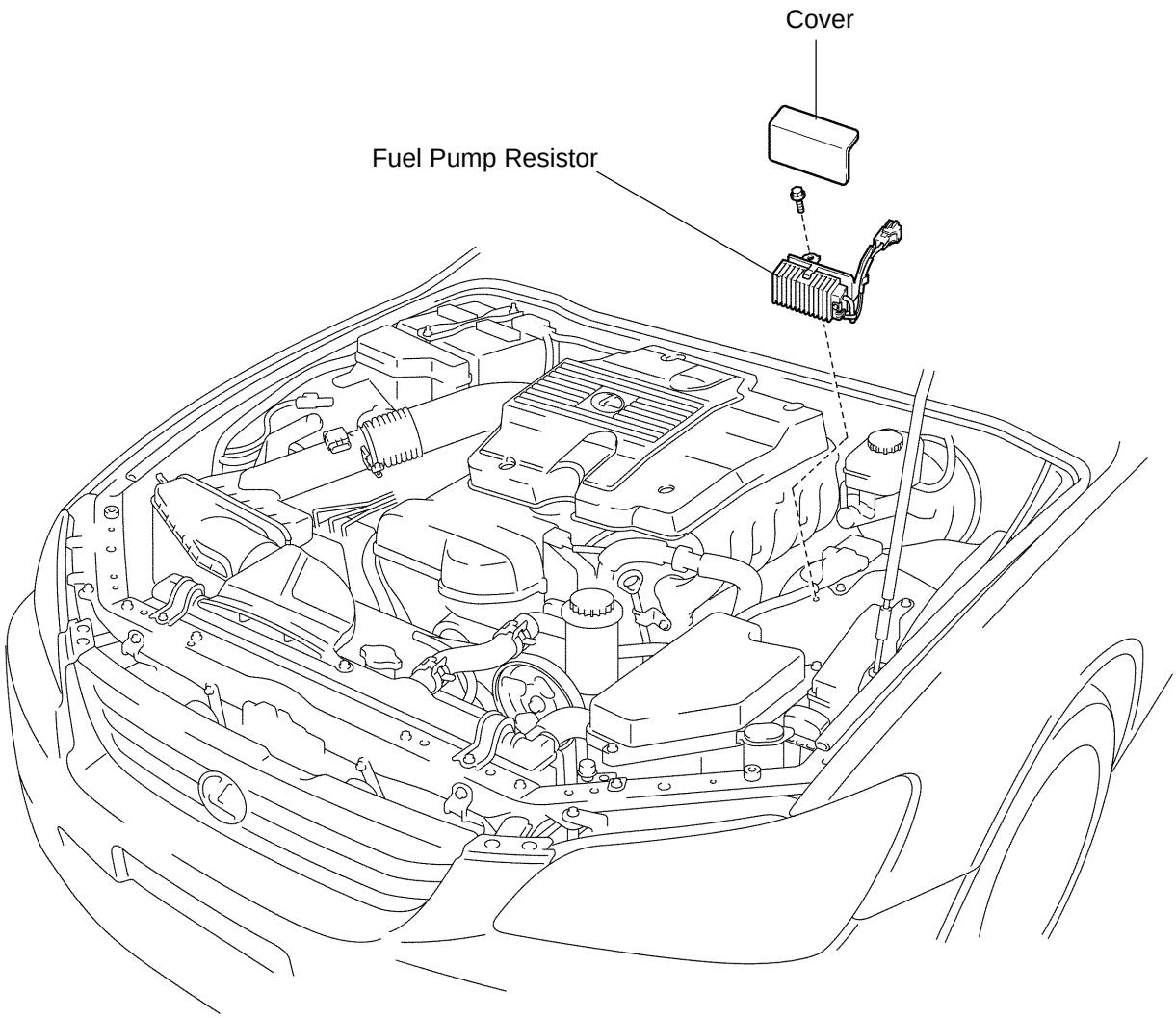
4. REINSTALL FUEL PUMP RELAY

5. REINSTALL RELAY BOX COVER

FUEL PUMP RESISTOR

COMPONENTS

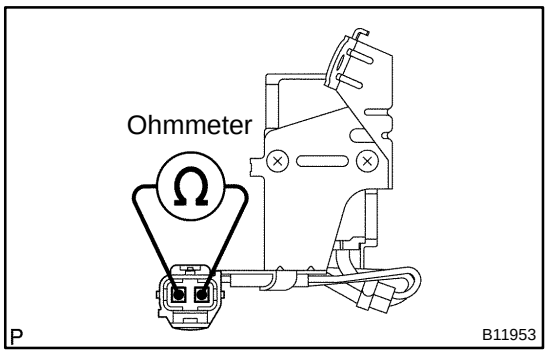
SF1LF-03



P

B11952

SF0FX-09



INSPECTION

INSPECT FUEL PUMP RESISTOR

Using an ohmmeter, measure the resistance between the terminals.

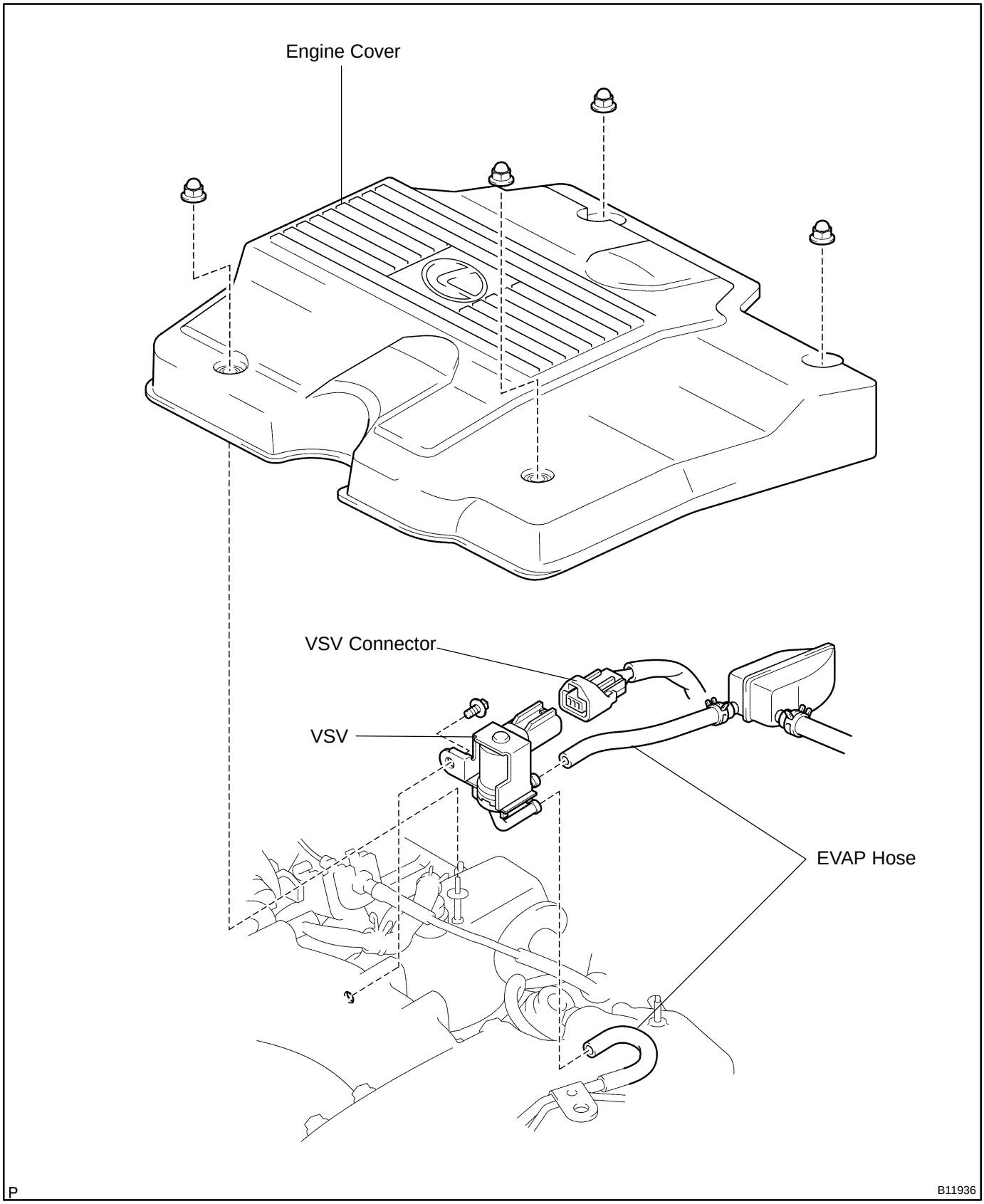
Resistance: 0.30 - 0.35 Ω at 20˚C (68˚F)

If the resistance is not as specified, replace the resistor.

VSV FOR EVAPORATIVE EMISSION (EVAP)

SF0NZ-07

COMPONENTS



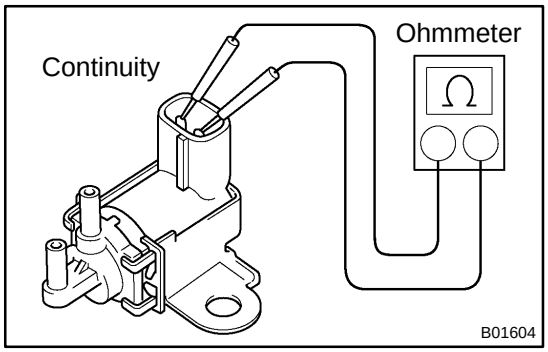
SF0O0-08

INSPECTION

1. REMOVE ENGINE COVER

Remove the 4 nuts and engine cover.

2. REMOVE VSV



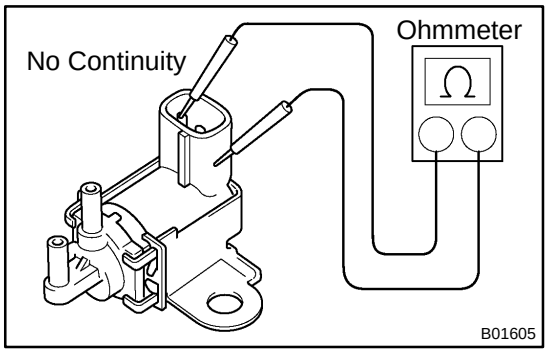
3. INSPECT VSV

(a) Inspect the VSV for open circuit.

Using an ohmmeter, check that there is continuity between the terminals.

Resistance: 27 - 33 Ω at 20˚C (68˚F)

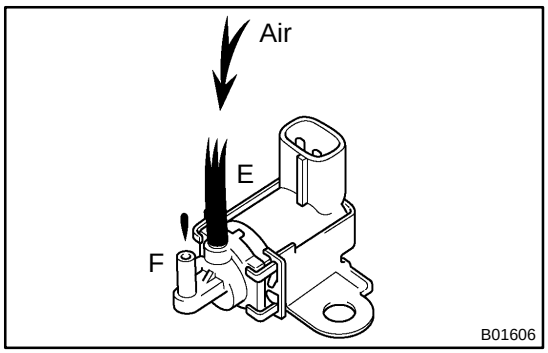
If there is no continuity, replace the VSV.



(b) Inspect the VSV for ground.

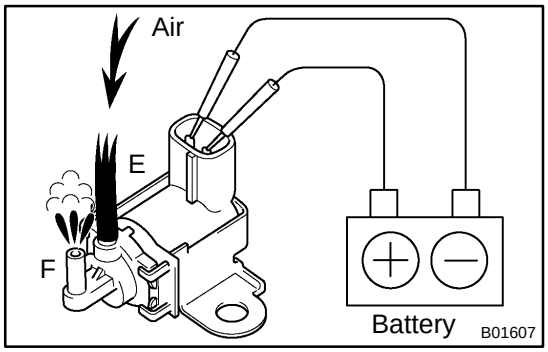
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



(c) Inspect the VSV operation.

(1) Check that air does not flows from port E to F.



(2) Apply battery positive voltage across the terminals.

(3) Check that air flows from port E to F.

If operation is not specified, replace the VSV.

4. REINSTALL VSV

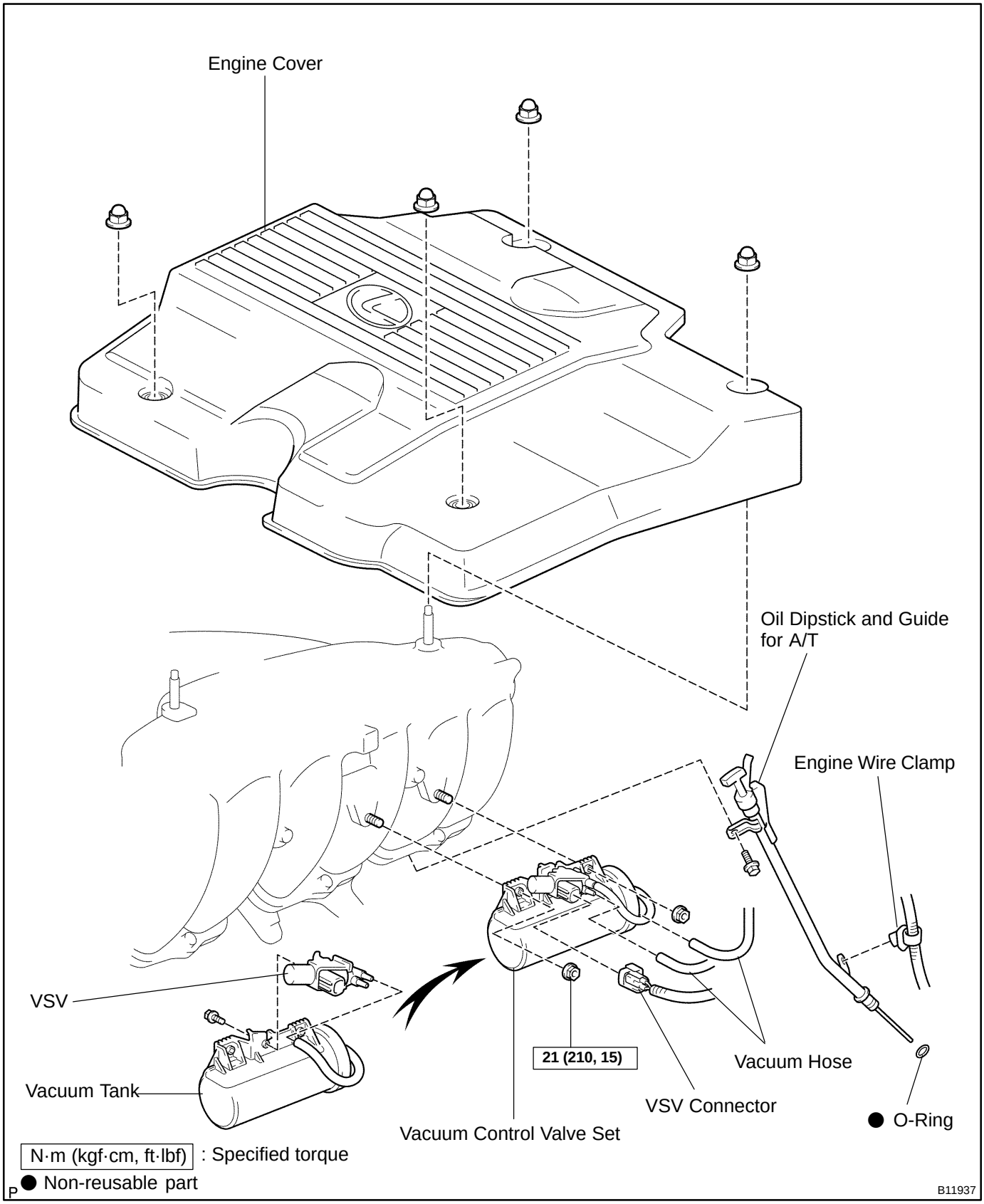
5. REINSTALL ENGINE COVER

Install the engine cover with the 4 nuts.

VSV FOR ACOUSTIC CONTROL INDUCTION SYSTEM (ACIS)

SF0O1-06

COMPONENTS



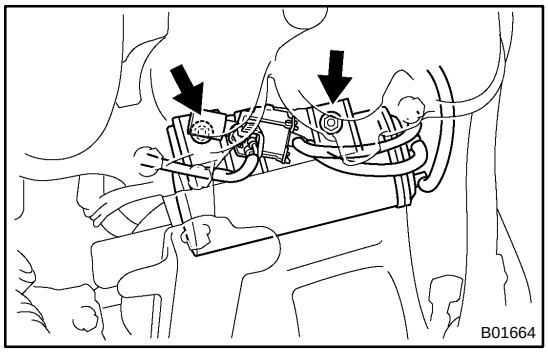
SF0O2-08

INSPECTION

1. REMOVE ENGINE COVER

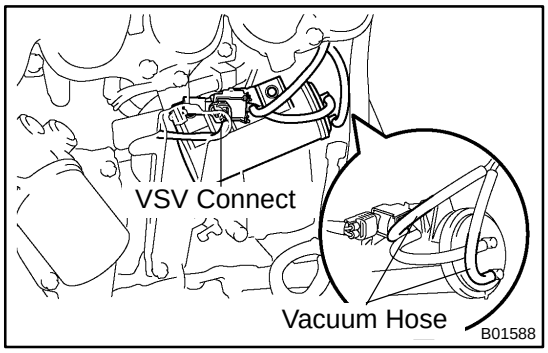
Remove the 4 nuts and engine cover.

2. REMOVE OIL DIPSTICK AND GUIDE FOR A/T (See page EM-65)



3. REMOVE VACUUM CONTROL VALVE SET

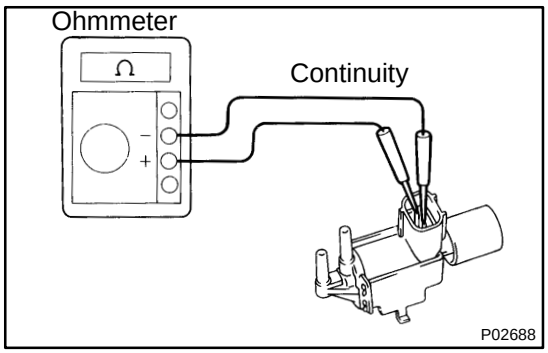
(a) Remove the 2 nuts, and disconnect the vacuum tank from the intake manifold.



(b) Disconnect VSV connector and vacuum hoses, and remove the vacuum control valve set.

4. REMOVE VSV

Remove the screw, vacuum hose and VSV.



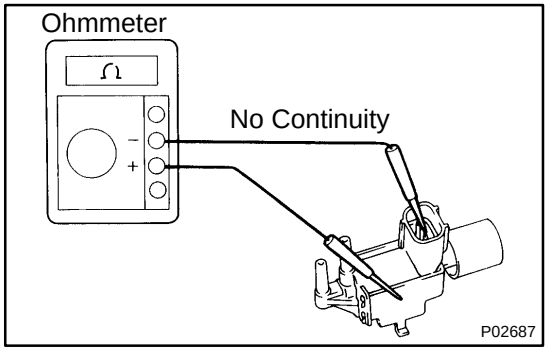
5. INSPECT VSV

(a) Inspect the VSV for open circuit.

Using an ohmmeter, check that there is continuity between the terminals.

Resistance: 38.5 - 44.5 Ω at 20˚C (68˚F)

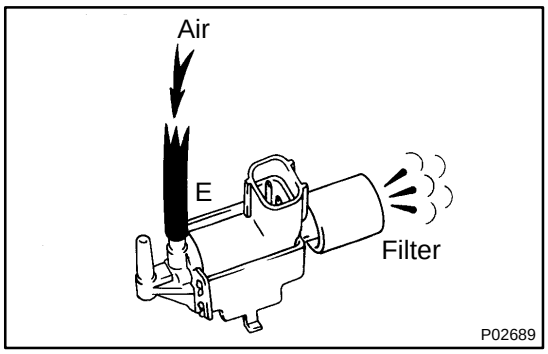
If there is no continuity, replace the VSV.



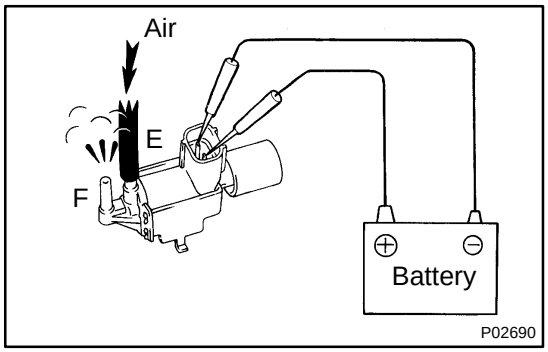
(b) Inspect the VSV for ground.

Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



(c) Inspect the VSV operation.
(1) Check that air flows from port E to the filter.



(2) Apply battery positive voltage across the terminals.
(3) Check that air flows from port E to F.

6. REINSTALL VSV

(a) Install the VSV with the screw to the vacuum tank.
(b) Install the vacuum hose.

7. REINSTALL VACUUM CONTROL VALVE SET

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

8. REINSTALL OIL DIPSTICK AND GUIDE FOR A/T

HINT:
Using a new O-ring.

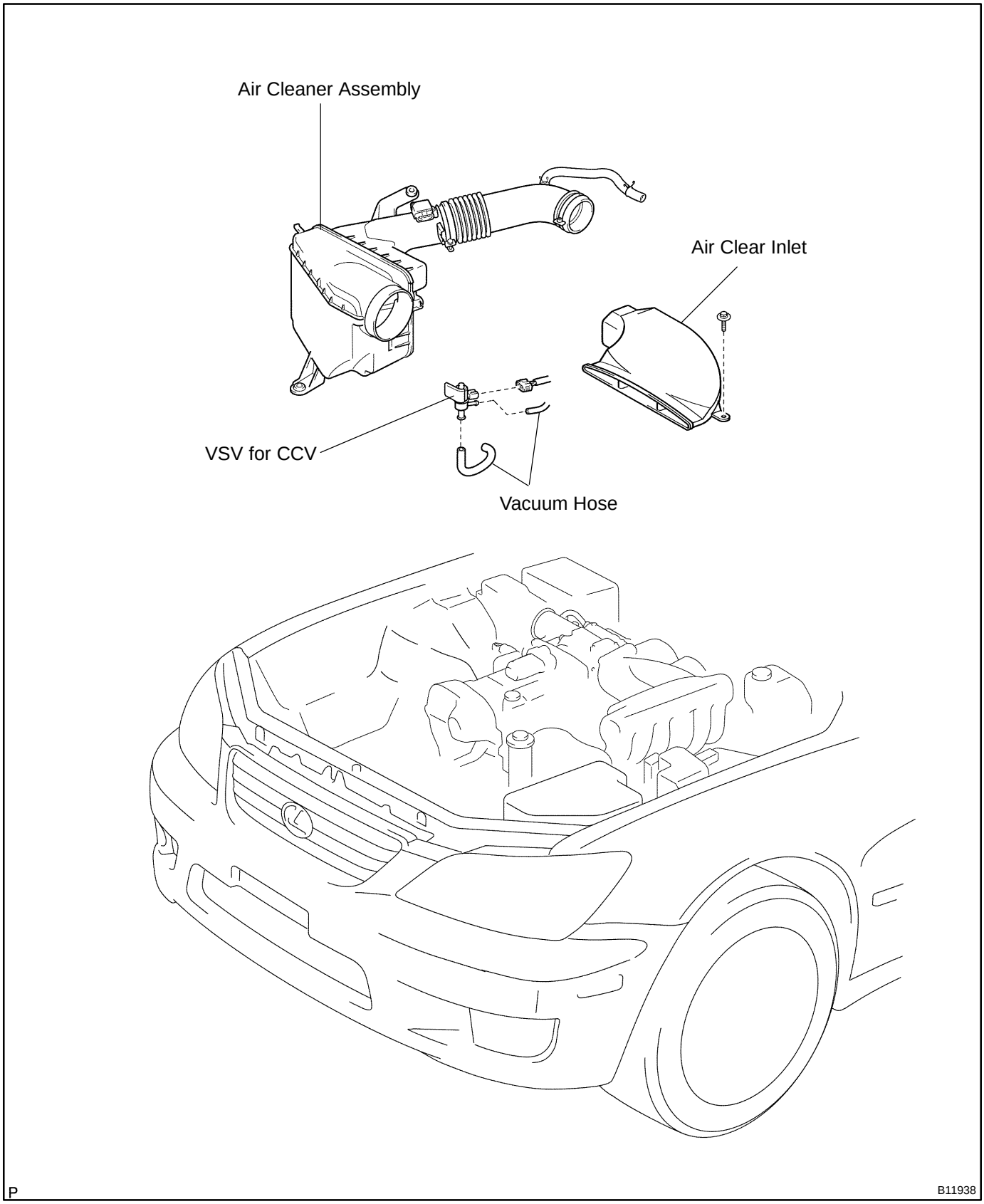
9. REINSTALL ENGINE COVER

Reinstall the engine cover with the 4 nuts.

VSV FOR CANISTER CLOSED VALVE (CCV)

COMPONENTS

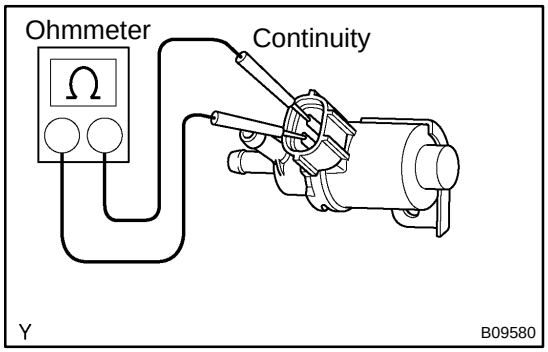
SF1LD-03



SF1LE-03

INSPECTION

1. REMOVE VSV



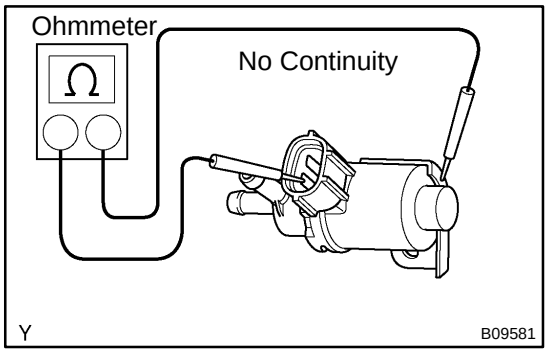
2. INSPECT VSV

(a) Inspect the VSV for open circuit.

Using an ohmmeter, check that there is continuity between terminals.

Resistance: 24 - 30 Ω at 20˚C (68˚F)

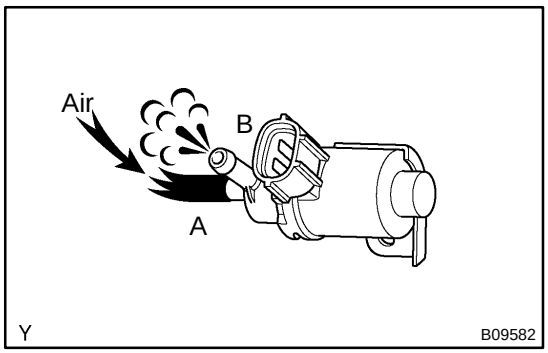
If there is no continuity, replace the VSV.



(b) Inspect the VSV for ground.

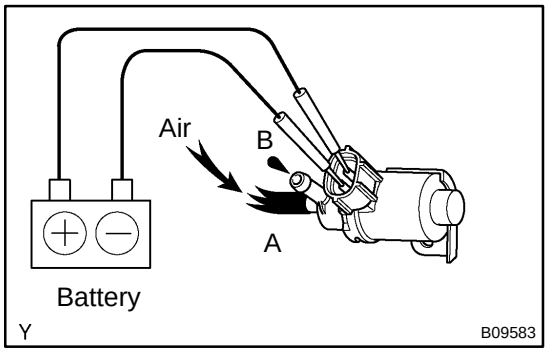
Check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



(c) Inspect the VSV operation.

(1) Check that air flows from port B to A.



(2) Apply battery positive voltage across the terminals.

(3) Check that air flows with difficulty from port B to A.

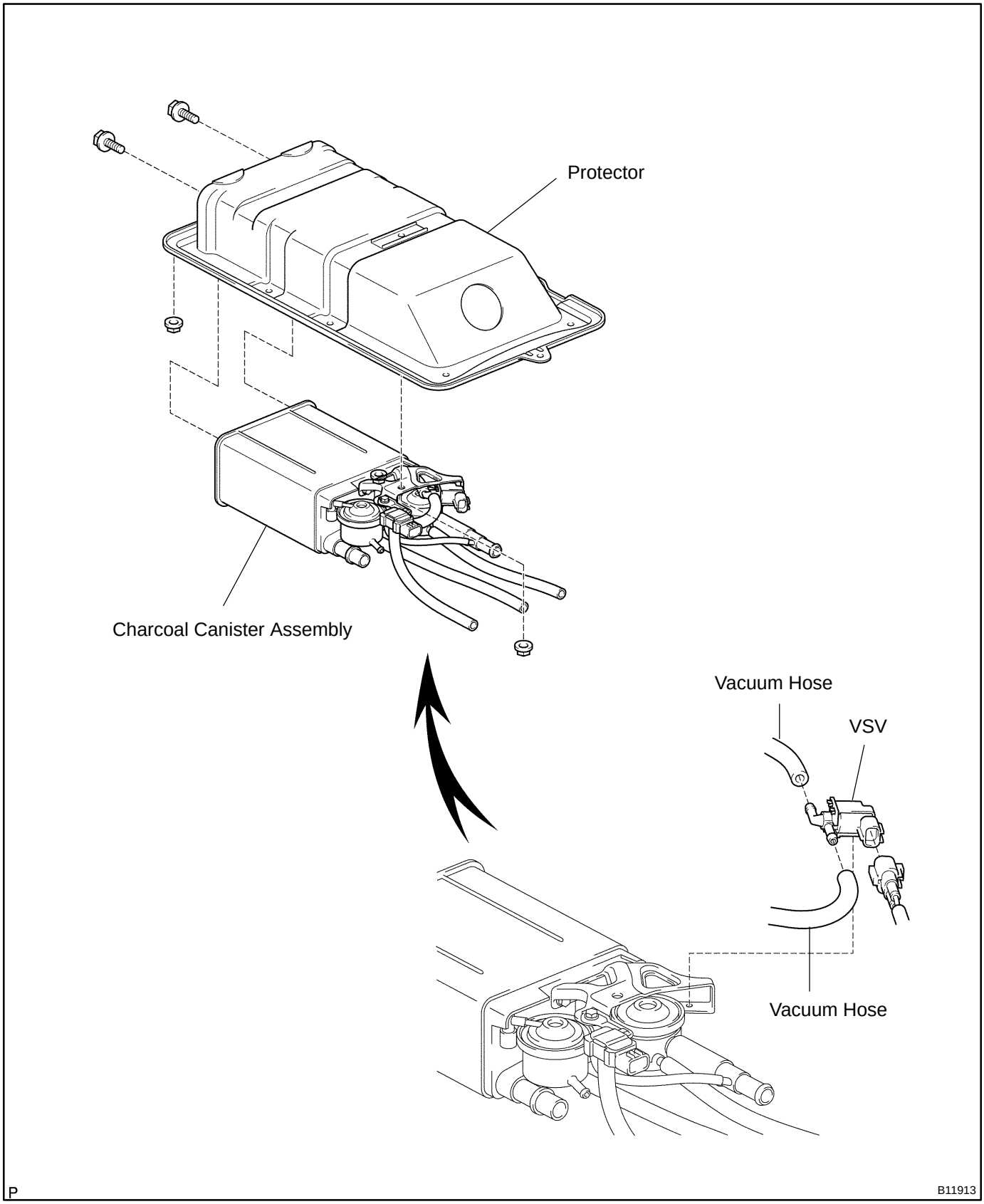
If operation is not as specified, replace the VSV.

3. REINSTALL VSV

VSV FOR PRESSURE SWITCHING VALVE

SF0O3-06

COMPONENTS

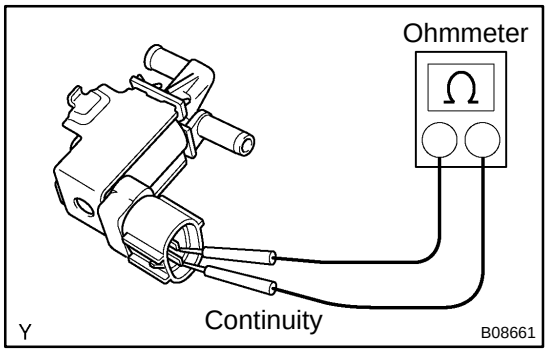


SF0O4-03

INSPECTION

1. REMOVE CHARCOAL CANISTER ASSEMBLY

2. REMOVE VSV FROM CHARCOAL CANISTER



3. INSPECT VSV

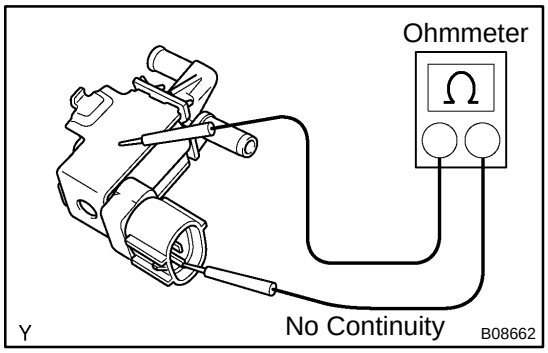
(a) Inspect the VSV for open circuit.

Using an ohmmeter, check that there is continuity between the terminals.

Resistance:

20˚C (68˚F)	37 - 44 Ω
120˚C (248˚F)	51 - 62 Ω

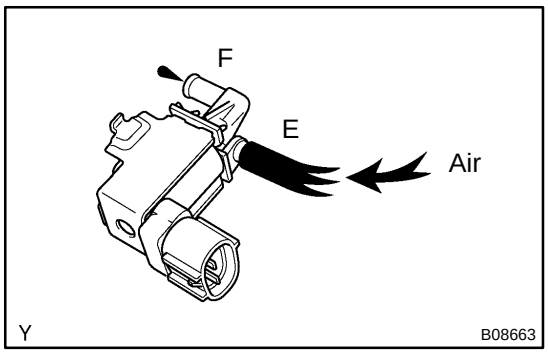
If there is no continuity, replace the VSV.



(b) Inspect the VSV for ground.

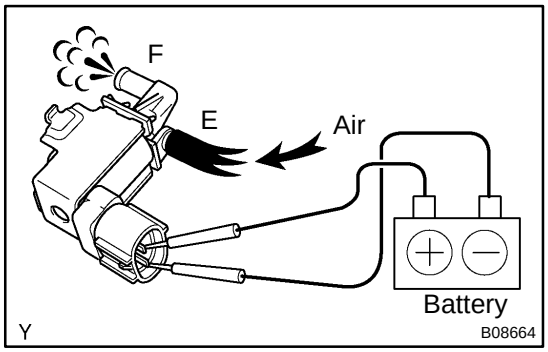
Check that there is no continuity between each terminals and the body.

If there is continuity, replace the VSV.



(c) Inspect the VSV operation.

(1) Check that the air does not from port E to F.



(2) Apply battery positive voltage across the terminals.

(3) Check that the air flows from port E to F.

If operation is not specified, replace the VSV.

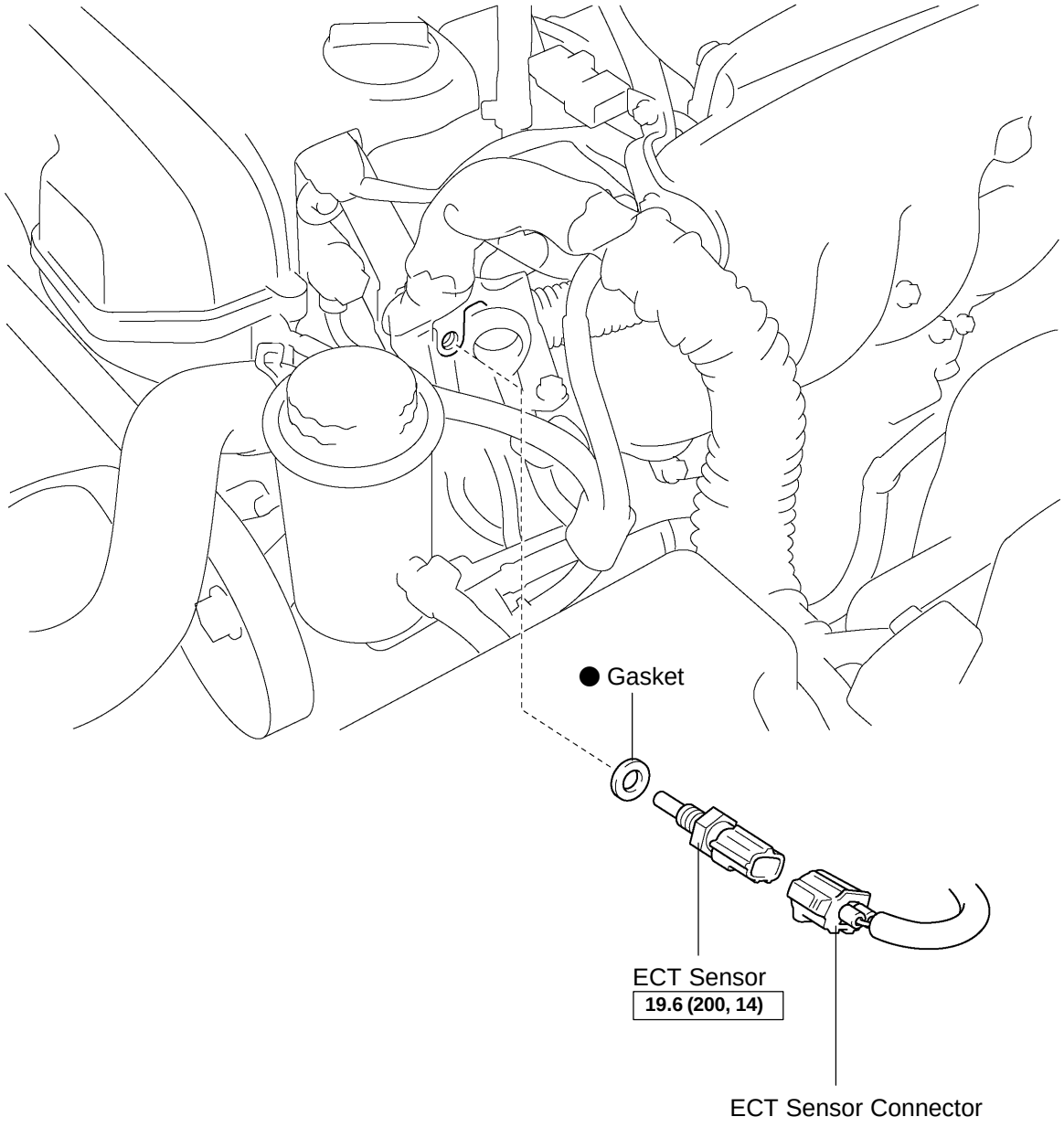
4. REINSTALL VSV TO CHARCOAL CANISTER

5. REINSTALL CHARCOAL CANISTER ASSEMBLY

ENGINE COOLANT TEMPERATURE (ECT) SENSOR

SF0O5-08

COMPONENTS

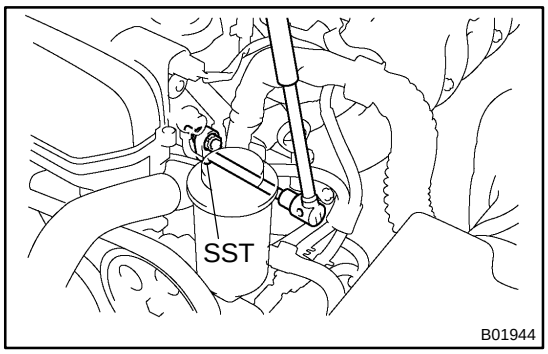


N·m (kgf·cm, ft·lbf) : Specified torque

● Non-reusable part

B02006

SF0O6-06



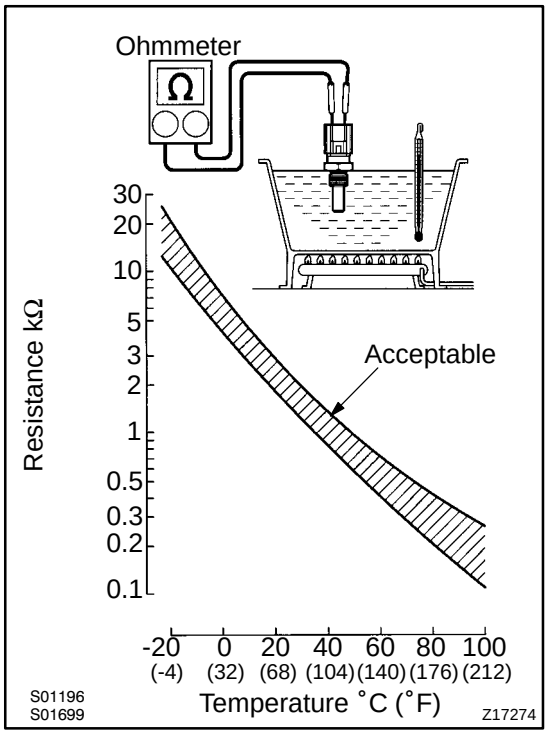
INSPECTION

1. DRAIN ENGINE COOLANT

2. REMOVE ECT SENSOR

(a) Disconnect the ECT sensor connector.

(b) Using SST, remove the ECT sensor and gasket.
SST 09205-76030



3. INSPECT ECT SENSOR

Using an ohmmeter, measure the resistance between the terminals.

Resistance: Refer to the graph

If the resistance is not as specified, replace the ECT sensor.

4. REINSTALL ECT SENSOR

(a) Install a new gasket to the ECT sensor.

(b) Using SST, install the ECT sensor.
SST 09205-76030
Torque: 19.6 N·m (200 kgf·cm, 14 ft·lbf)

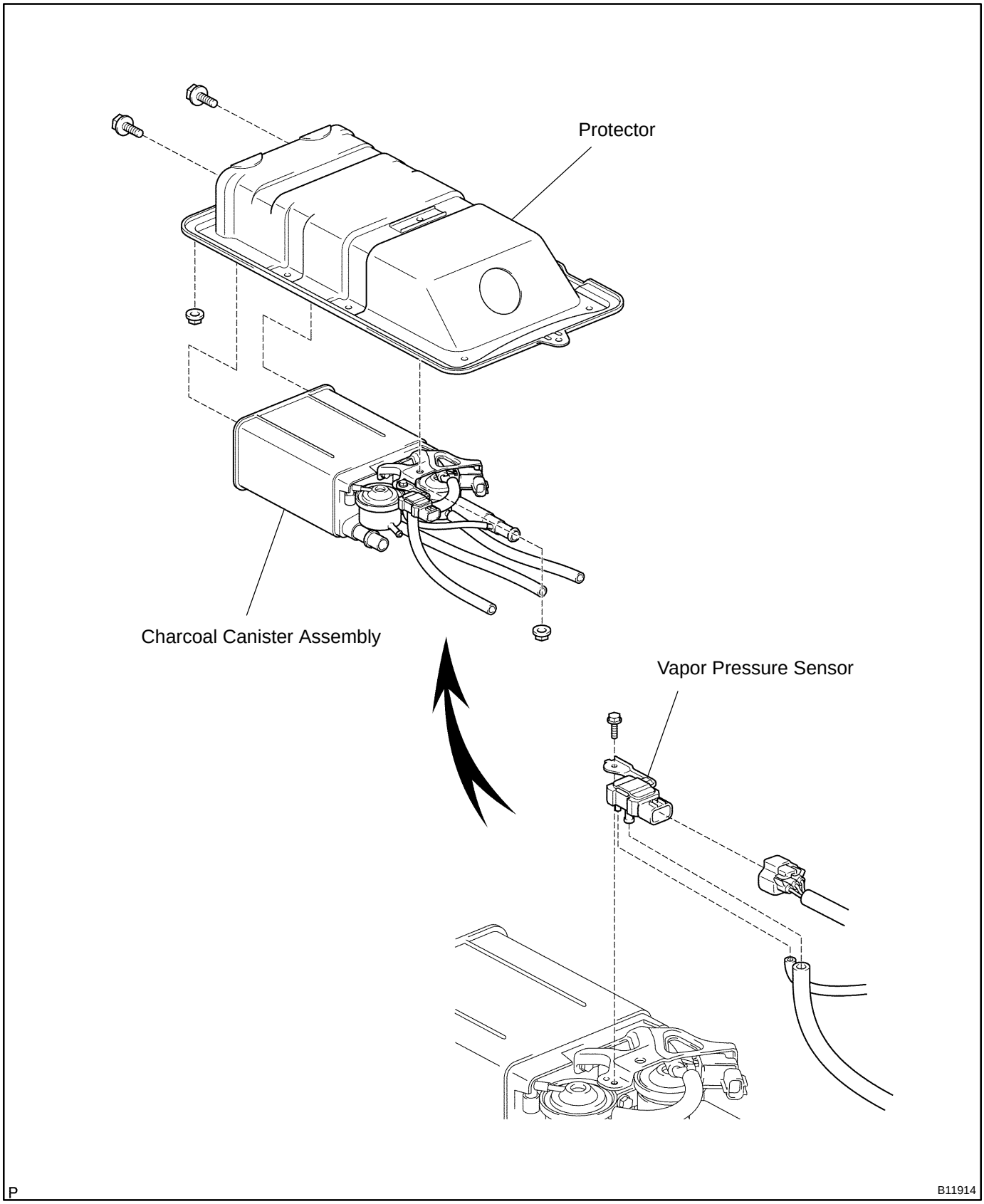
(c) Connect the ECT sensor connector.

5. REFILL WITH ENGINE COOLANT

VAPOR PRESSURE SENSOR

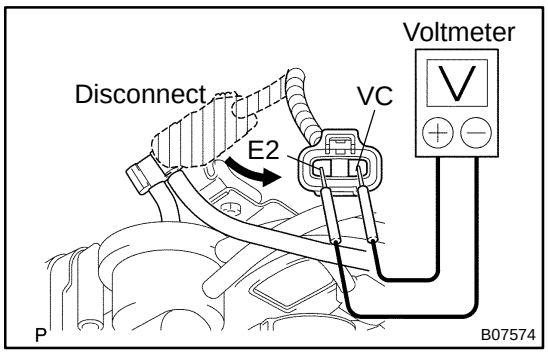
COMPONENTS

SF0ZQ-05



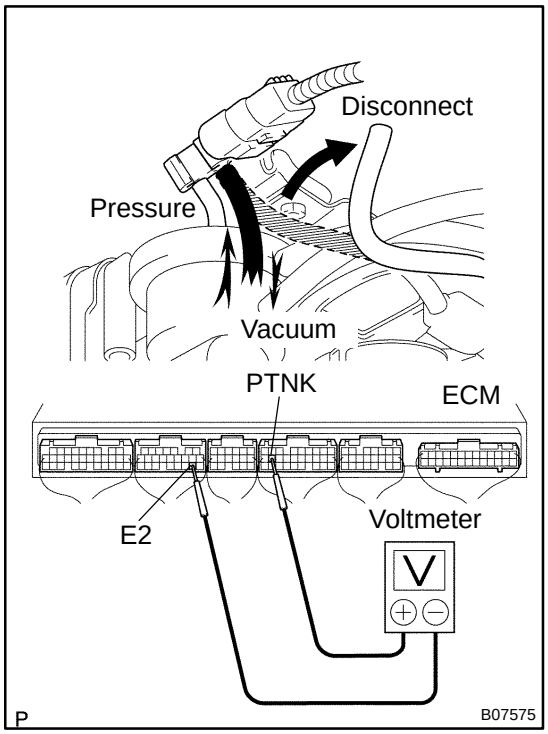
SF0O8-03

INSPECTION



1. INSPECT POWER SOURCE VOLTAGE OF VAPOR PRESSURE SENSOR

(a) Disconnect the vapor pressure sensor connector.
(b) Turn the ignition switch ON.
(c) Using a voltmeter, measure the voltage between connector terminals VC and E2 of the wiring harness side.
Voltage: 4.5 - 5.5 V
(d) Turn the ignition switch OFF.
(e) Reconnect the vapor pressure sensor connector.



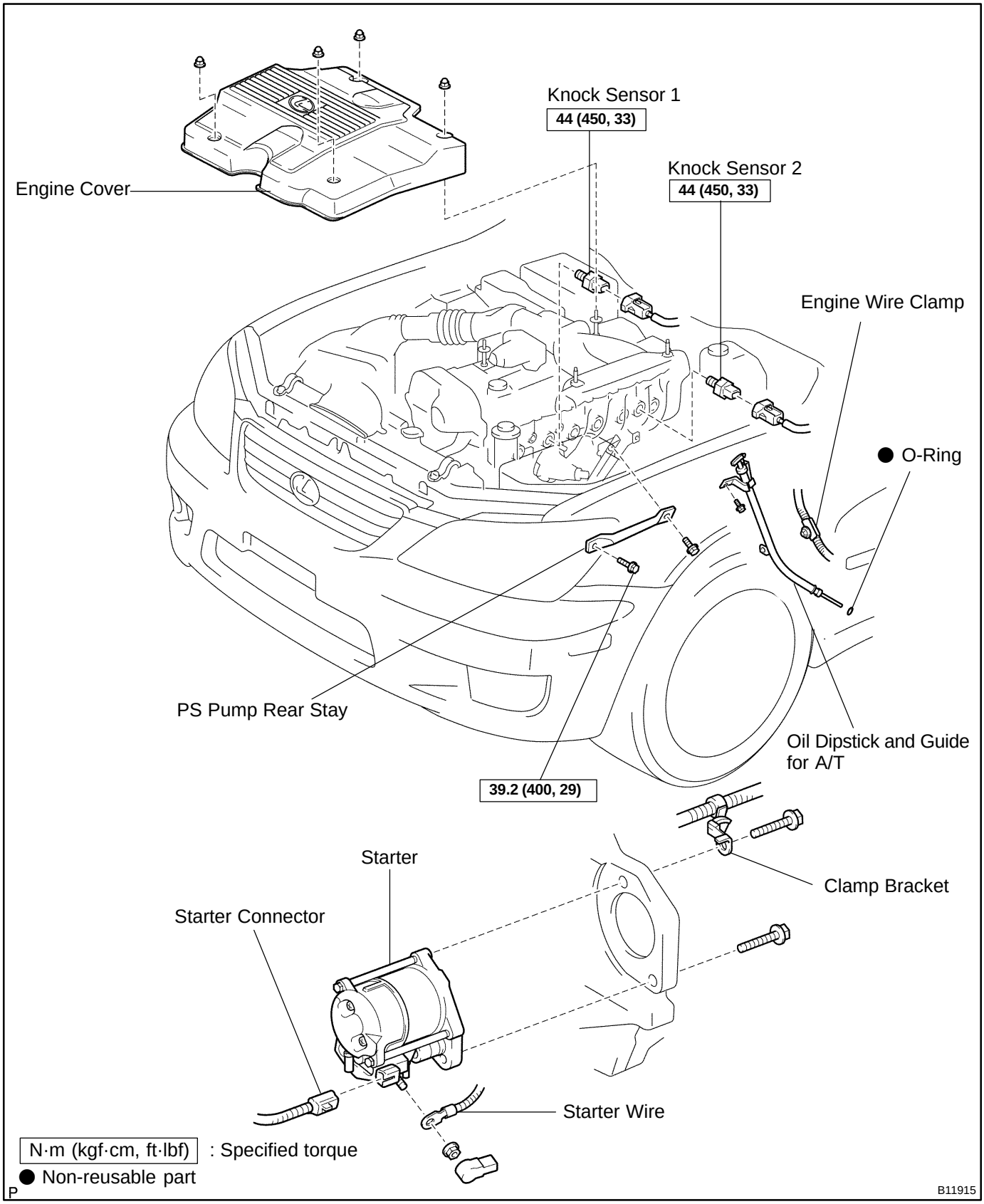
2. INSPECT POWER OUTPUT OF VAPOR PRESSURE SENSOR

(a) Turn the ignition switch ON.
(b) Disconnect the vacuum hose from the vapor pressure sensor.
(c) Connect a voltmeter to terminals PTNK and E2 of the ECM, and measure the output voltage under these conditions:
(1) Apply vacuum (2.0 kPa (15 mmHg, 0.59 in.Hg)) to the vapor pressure sensor.
Voltage: 1.3 - 2.1 V
(2) Release the vacuum from the vapor pressure sensor.
Voltage: 3.0 - 3.6 V
(3) Apply pressure (1.5 kPa (15 gf/cm^2, 0.22 psi)) to the vapor pressure sensor.
Voltage: 4.2 - 4.8 V
(d) Turn the ignition switch OFF.
(e) Reconnect the vacuum hose to the vapor pressure sensor.

KNOCK SENSOR

COMPONENTS

SF0O9-08

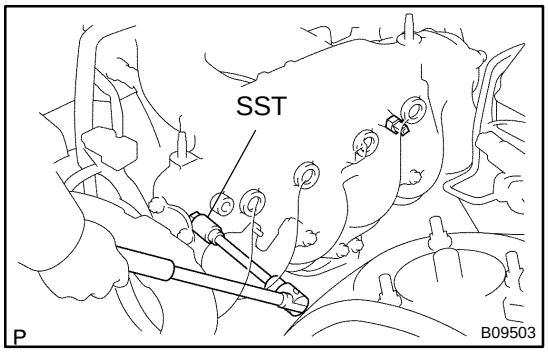


SF0OA-07

INSPECTION

1. REMOVE ENGINE COVER

Remove the 4 nuts and engine cover.



2. REMOVE PS PUMP REAR STAY

3. REMOVE KNOCK SENSOR 1

(a) Disconnect the knock sensor connector.

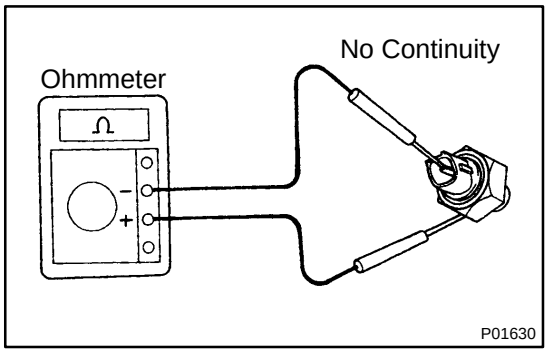
(b) Using SST, remove the knock sensor.

SST 09816-30010

4. REMOVE OIL DIPSTICK AND GUIDE FOR A/T (See page EM-65)

5. REMOVE STARTER (See page ST-4)

6. REMOVE KNOCK SENSOR 2 (See step 2)



7. INSPECT KNOCK SENSORS

Using an ohmmeter, check that there is no continuity between the terminal and body.

If there is continuity, replace the sensor.

8. REINSTALL KNOCK SENSORS

(a) Using SST, install the knock sensor.

SST 09816-30010

Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

(b) Connect the knock sensor connector.

9. REINSTALL STARTER (See page ST-16)

10. REINSTALL OIL DIPSTICK AND GUIDE FOR A/T

HINT:

Use a new O-ring.

11. REINSTALL PS PUMP REAR STAY

Torque: 39.2 N·m (400 kgf·cm, 29 ft·lbf)

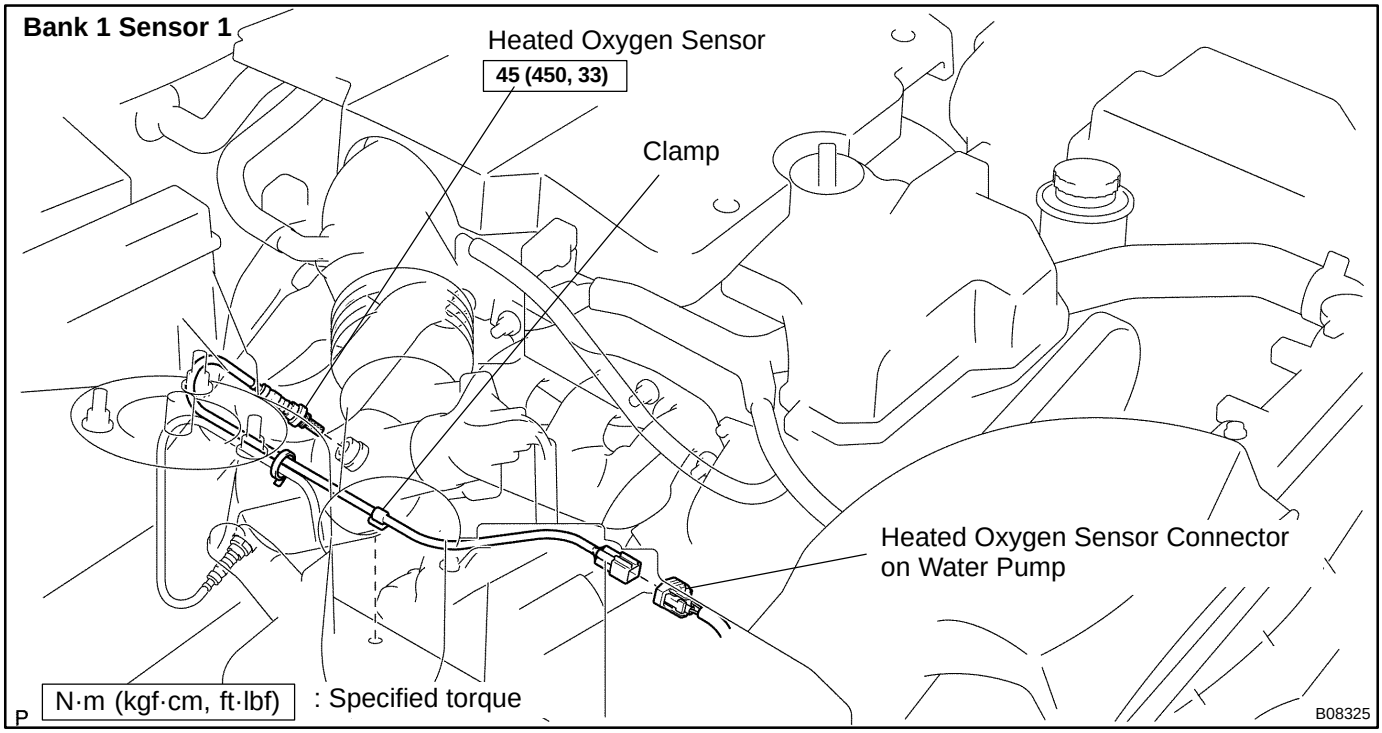
12. REINSTALL ENGINE COVER

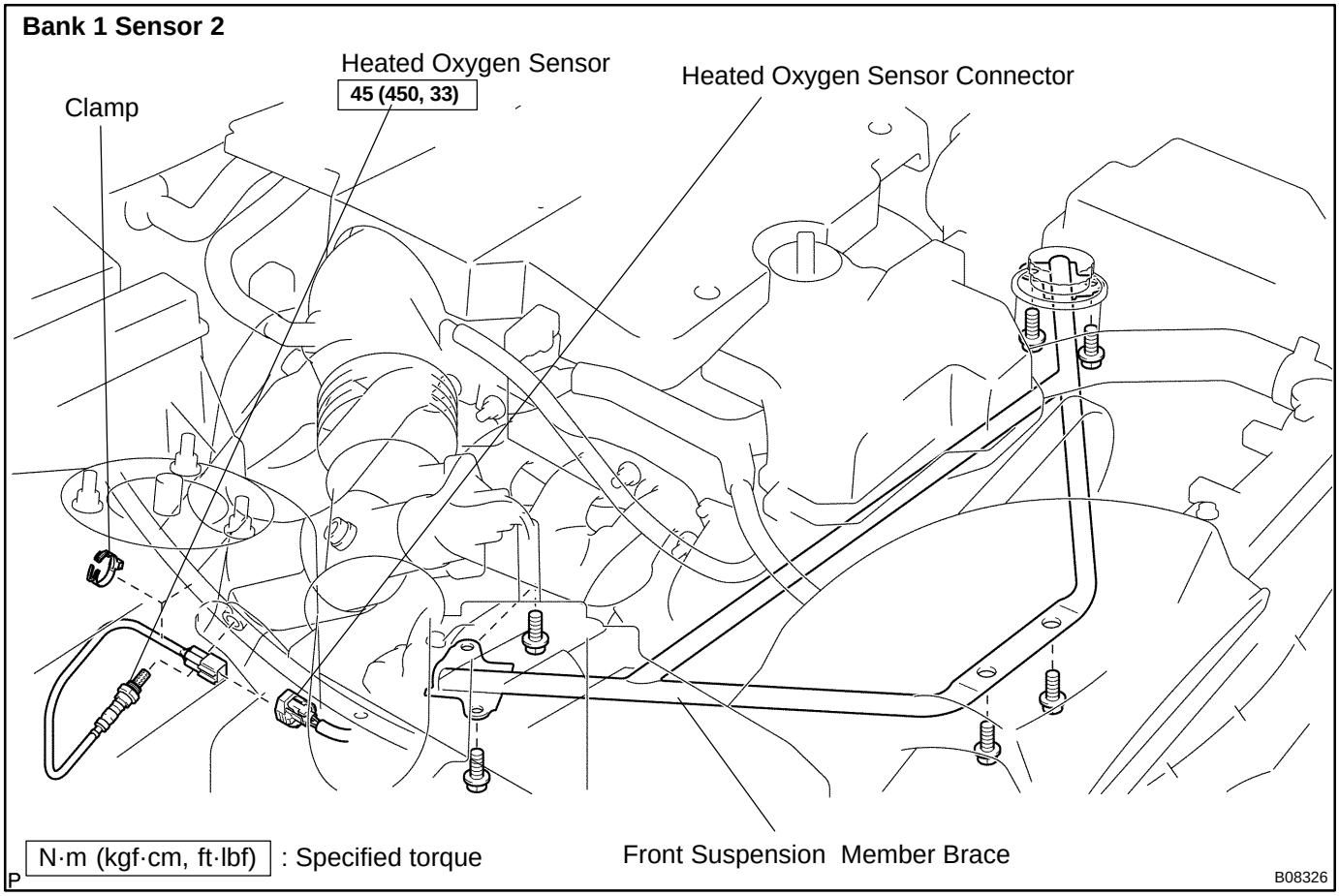
Reinstall the engine cover with the 4 nuts.

HEATED OXYGEN SENSOR

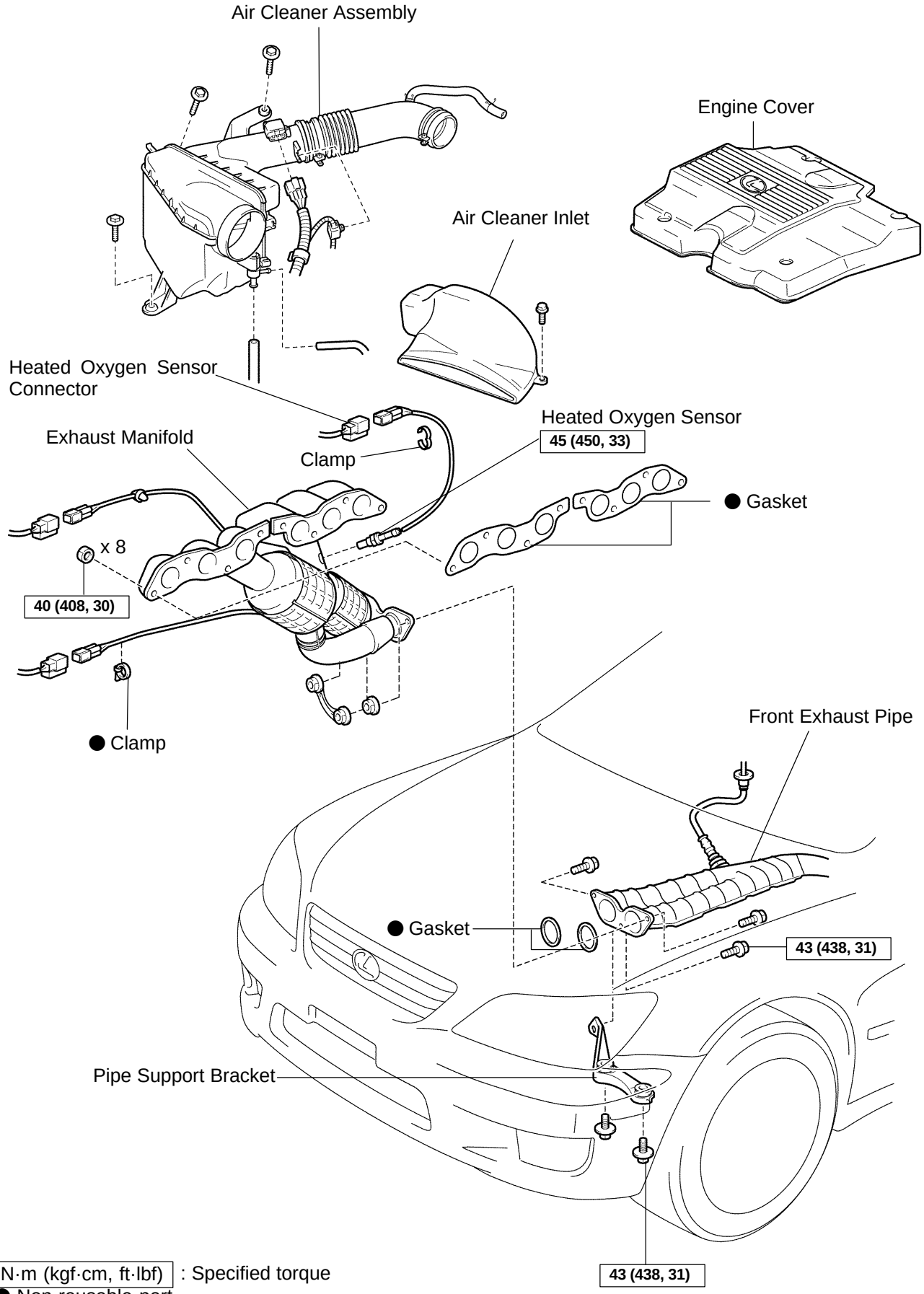
SF0OB-07

COMPONENTS





Bank 2 Sensor 1

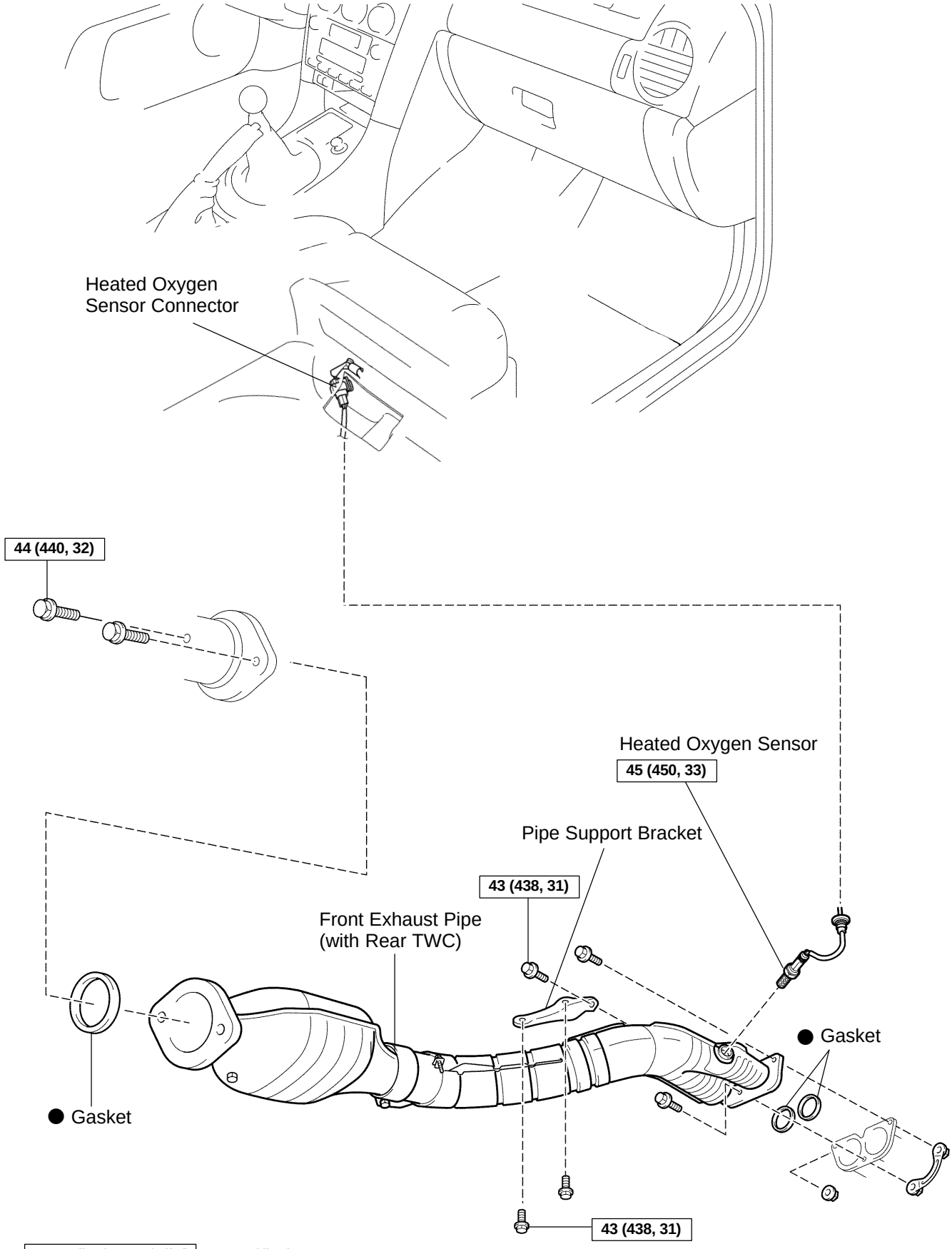


P

N·m (kgf·cm, ft·lbf) : Specified torque
● Non-reusable part

B11916

Bank 2 Sensor 2



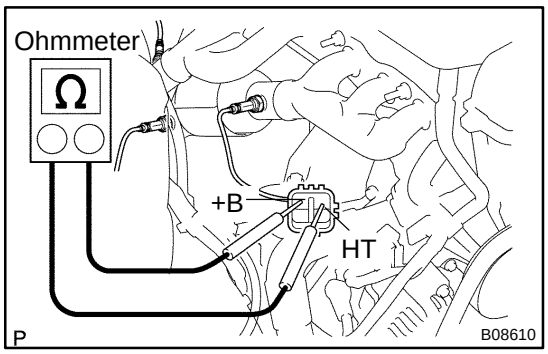
N·m (kgf·cm, ft·lbf) : Specified torque

● Non-reusable part

P

F20085

SF0OC-11



INSPECTION

1. Bank 1, 2 Sensor 1, and Bank 1 Sensor 2:
INSPECT HEATER RESISTANCE OF HEATED OXYGEN SENSORS

(a) Disconnect the oxygen sensor connectors.

(b) Using an ohmmeter, measure the resistance between the terminals +B and HT.

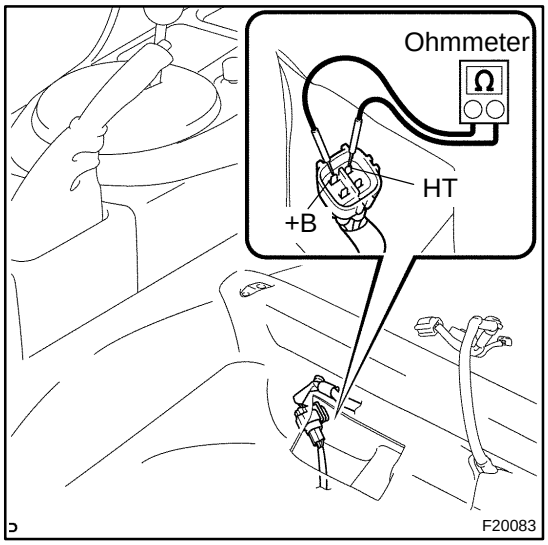
Resistance:

20˚C (68˚F)	11 - 16 Ω
800˚C (1,472˚F)	23 - 32 Ω

If the resistance is not as specified, replace the sensor.

Torque: 45 N·m (450 kgf·cm, 33 ft·lbf)

(c) Reconnect the oxygen sensor connectors.



2. Bank 2 Sensor 2:
INSPECT HEATER RESISTANCE OF HEATED OXYGEN SENSOR

(a) Remove the front seat assembly RH.

(b) Remove the air duct guide rear RH.

(c) Disconnect the oxygen sensor connector.

(d) Using an ohmmeter, measure the resistance between the terminals +B and HT.

Resistance:

20˚C (68˚F)	11 - 16 Ω
800˚C (1,472˚F)	23 - 32 Ω

If the resistance is not as specified, replace the sensor.

Torque: 45 N·m (450 kgf·cm, 33 ft·lbf)

(e) Reconnect the oxygen sensor connector.

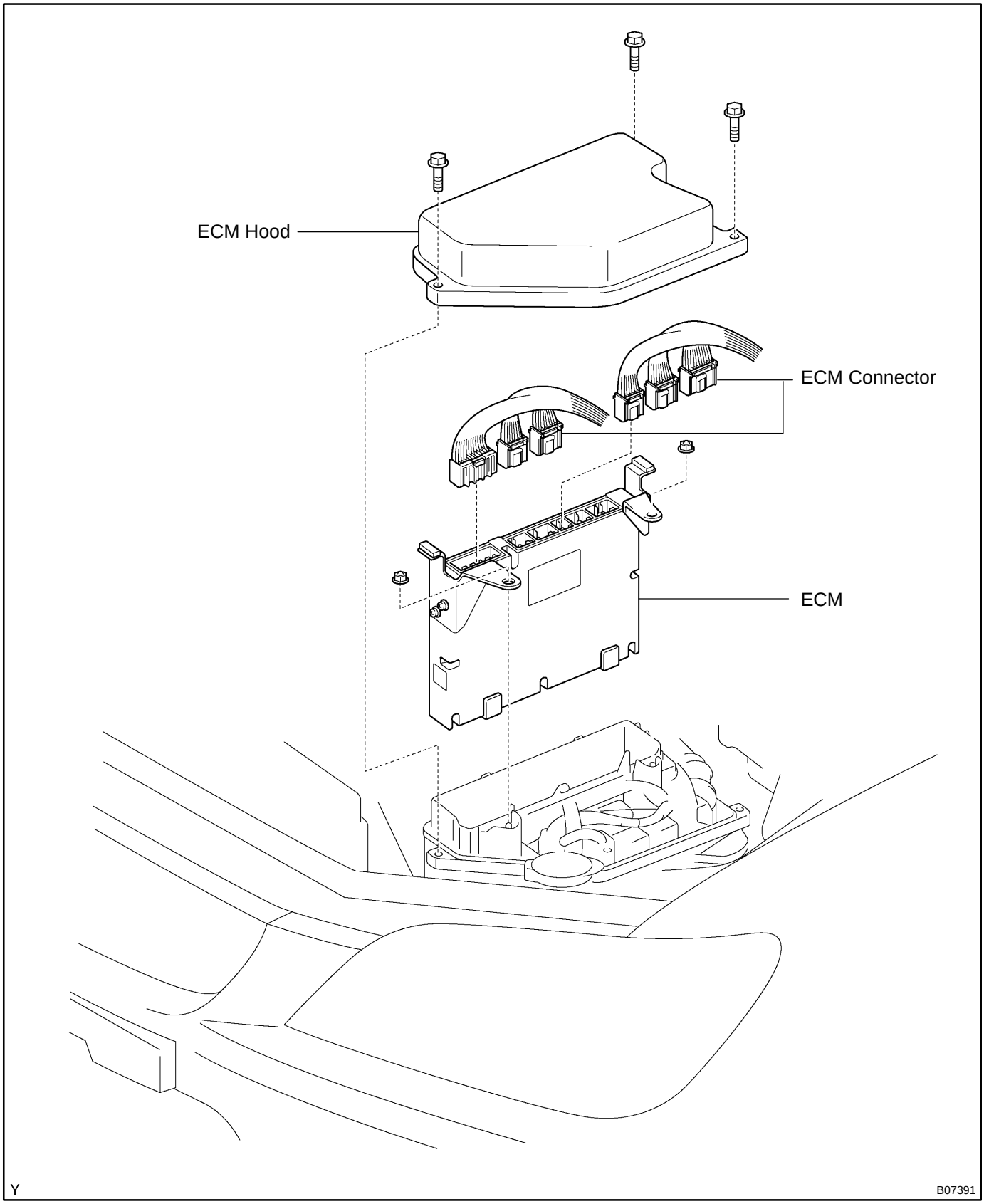
(f) Install the air duct guide rear RH.

(g) Install the front seat assembly RH.

ENGINE CONTROL MODULE (ECM)

SF0OF-14

COMPONENTS



SF0OG-04

INSPECTION

1. REMOVE ECM
2. INSPECT ECM (See page DI-41)
3. REINSTALL ECM

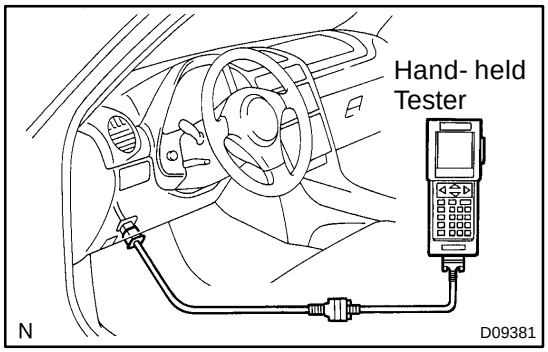
FUEL CUT RPM

SF0OH-09

INSPECTION

1. WARM UP ENGINE

Allow the engine to warm up to normal operating temperature.

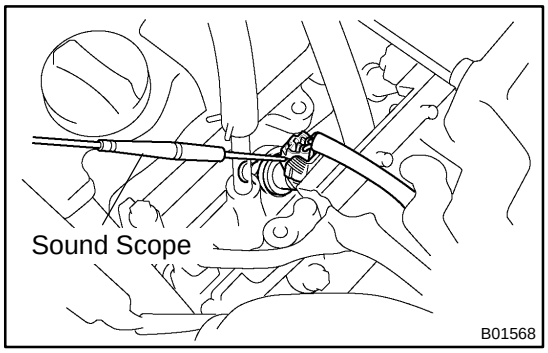


2. CONNECT HAND-HELD TESTER OR OBD II SCAN TOOL

(a) Connect the hand-held tester or OBD II scan tool to the DLC3.

(b) Select the following menu items: DIAGNOSIS / ENHANCED OBD ll / DATA LIST / ENGINE SPD.

(c) Please refer to the hand-held tester or OBD II scan tool operator's manual for further details.



3. INSPECT FUEL CUT-OFF OPERATION

(a) Increase the engine speed to at least 3,000 rpm.

(b) Check for injector operating noise.

(c) Check that when the throttle lever is released, injector operation noise stops momentarily and then resumes.

HINT:

Measure with the A/C OFF.

Fuel return rpm: 1,000 rpm

4. DISCONNECT HAND-HELD TESTER OR OBD II SCAN TOOL

COOLANT

CO09W-05

INSPECTION

HINT:

Check the coolant level when the engine is cold.

1. CHECK ENGINE COOLANT LEVEL AT RESERVOIR

The engine coolant should be between the LOW and FULL lines when the engine is cold.

If low, check for leakge and add Toyota Super Long Life Coolant or similar high quality ethylene glycol based non-silicate, non-amine, non-nitrite, and non-borate coolant with long-life hybrid organic acid technology up to the FULL line.

2. CHECK ENGINE COOLANT QUALITY

(a) Remove the radiator cap.

CAUTION:

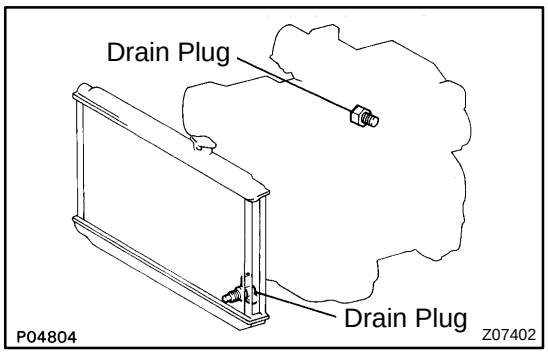
To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot. Thermal expansion will cause hot engine coolant and steam to blow out from the radiator.

(b) Check for any excessive deposits of rust or scale around the radiator cap and radiator filler hole; the coolant should be free of oil.

If excessively dirty, replace the coolant.

(c) Reinstall the radiator cap.

CO09X-08



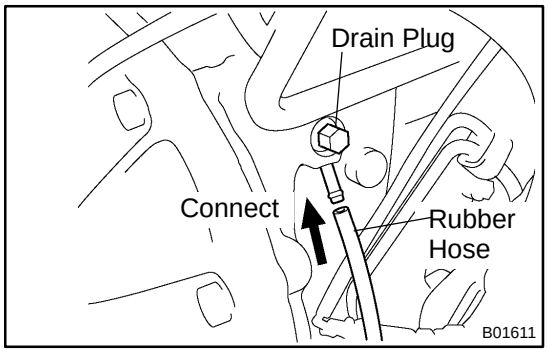
REPLACEMENT

1. DRAIN ENGINE COOLANT

CAUTION:

To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot. Thermal expansion will cause hot engine coolant and steam to blow out from the radiator.

(a) Loosen the 2 drain plugs (for the engine and radiator).



HINT:

To prevent the coolant from spraying over the cylinder block, connect the rubber hose (inside diameter 6 - 8 mm (0.24 - 0.31 in.)) in the market to the union pipe under the drain plug.

(b) Remove the radiator cap and drain the coolant.

(c) Close the 2 drain plugs.

Torque: 30 N·m (300 kgf·cm, 22 ft·lbf) for engine

2. ADD ENGINE COOLANT

(a) Pour coolant into the radiator until it overflows.

Capacity (w/ Heater):

7.5 liters (7.9 US qts, 6.6 lmp. qts)

HINT:

- Use of improper coolants may damage the engine cooling system.
- Only use Toyota Super Long Life Coolant or similar high quality ethlene glycol based non-silicate, non-amine, non-nitrite, and non-borate coolant with long-life hybrid organic acid technology (coolant with long-life hybrid organic acid technology consists of a combination of low phosphates and organic acids).
- New Toyota vehicles are filled with Toyota Super Long Life Coolant. When replacing the coolant, Toyota Super Long Life Coolant (color is pink, premixed ethyleneglycol concentration is approximately 50 % and freezing temperature is -35˚C (-31˚F)) is recommended.

NOTICE:

Do not substitute plain water for engine coolant.

(b) Check the coolant level inside the radiator by squeezing the inlet and outlet radiator hoses several times by hand. If the coolant level goes down, add coolant.

(c) Install the radiator cap securely.

(d) Slowly pour coolant into the radiator reservoir until it reaches the FULL line.

(e) Warm up the engine until the cooling fan operates.

- Set the air conditioning as follows while warming up the engine.

	Automatic air conditioning system
Set control as follows	Fan speed - Any setting except OFF Temperature - To the highest temperature Air condition switch OFF AUTO switch OFF

- Maintain the engine speed at 2,000 to 2,500 rpm and warm up the engine until the cooling fan operates.

(f) Squeeze the inlet and outlet radiator hoses several times by hand while warning up the engine.

(g) Stop the engine and wait until the coolant cools down.

(h) Remove the radiator cap and check the coolant level inside the radiator.
(i) If the coolant level is below the full level, perform the steps from (a) through (h) and repeat the operation until the coolant level remains the full level.
(j) Recheck the coolant level inside the radiator reservoir tank. If it is below the full level, add coolant.

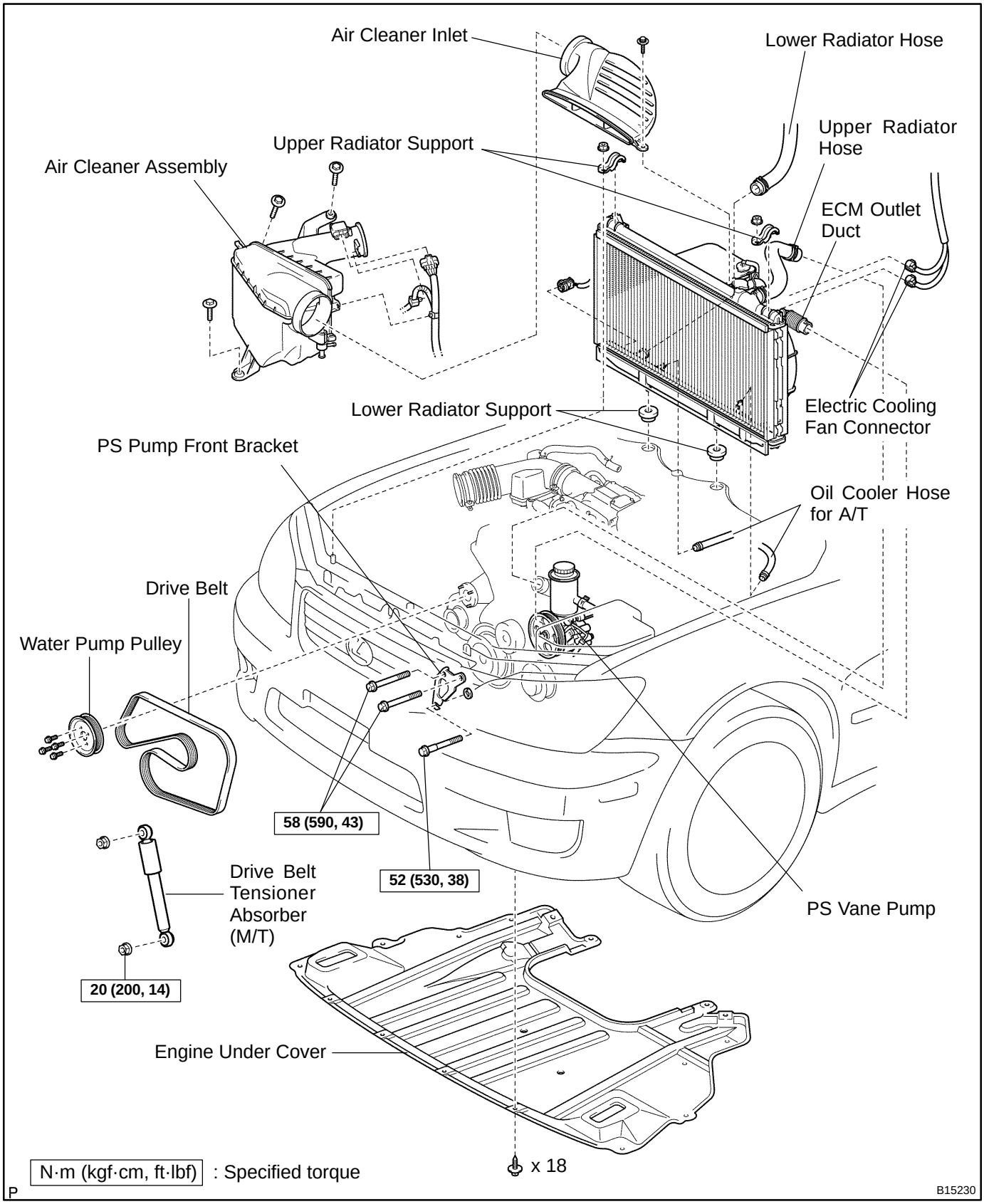
3. CHECK FOR ENGINE COOLANT LEAKS

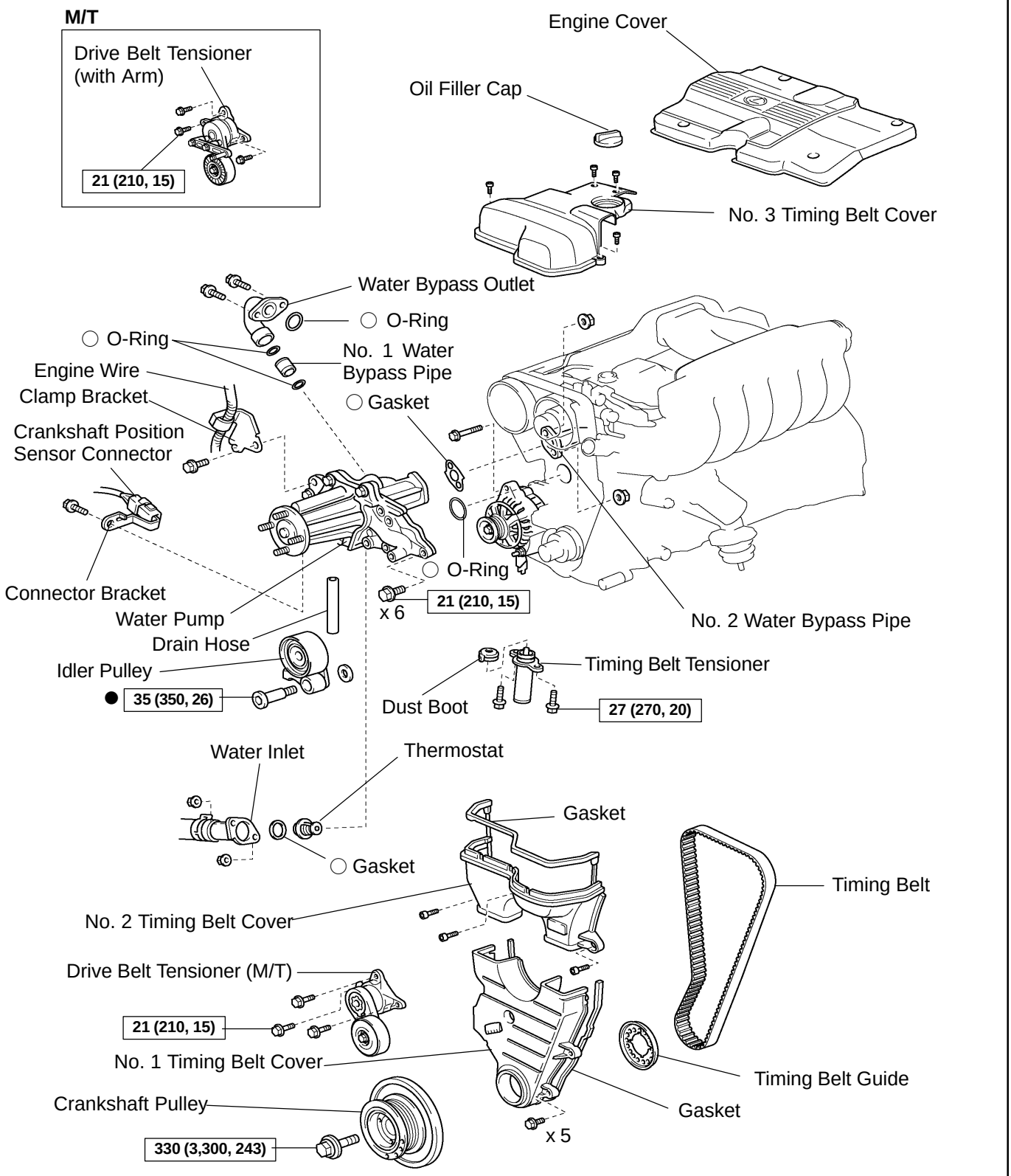
(a) Fill the radiator with engine coolant and attach a radiator cap tester.
(b) Pump it to 177 kPa (1.8 kgf/cm^2, 26 psi) and check for leakage.

WATER PUMP

COMPONENTS

CO09Y-08



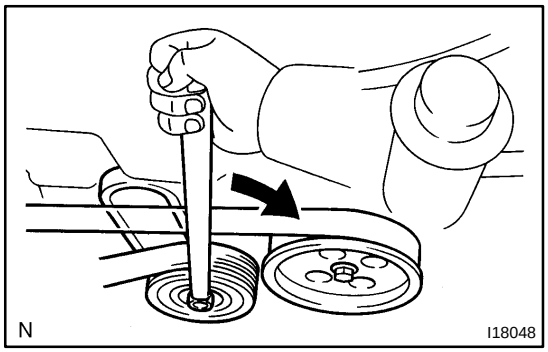

M/T
Drive Belt Tensioner (with Arm)
21 (210, 15)
Engine Cover
Oil Filler Cap
No. 3 Timing Belt Cover
Water Bypass Outlet
O-Ring
O-Ring
No. 1 Water Bypass Pipe
Engine Wire
Clamp Bracket
Gasket
Crankshaft Position Sensor Connector
Connector Bracket
Water Pump
Drain Hose
Idler Pulley
35 (350, 26)
O-Ring
x 6
21 (210, 15)
No. 2 Water Bypass Pipe
Timing Belt Tensioner
Dust Boot
27 (270, 20)
Water Inlet
Thermostat
Gasket
Gasket
Timing Belt
No. 2 Timing Belt Cover
Drive Belt Tensioner (M/T)
21 (210, 15)
No. 1 Timing Belt Cover
Timing Belt Guide
Crankshaft Pulley
330 (3,300, 243)
Gasket
x 5
Y
N·m (kgf·cm, ft·lbf) : Specified torque
Non-reusable part
Precoated part
B15232

CO09Z-07

REMOVAL

1. **REMOVE RADIATOR ASSEMBLY (See page CO-19)**
2. **M/T:**
   REMOVE DRIVE BELT TENSIONER ABSORBER

Remove the 2 nuts and absorber.



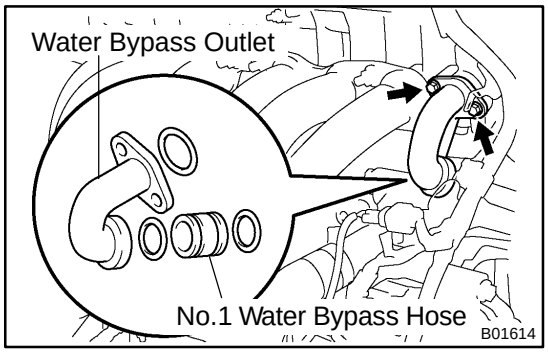
3. **REMOVE DRIVE BELT AND WATER PUMP PULLEY**

(a) Loosen the 4 nuts holding the water pump pulley to the water pump.

(b) Using SST, loosen the drive belt tension by turning the drive belt tensioner clockwise, and remove the drive belt.
SST 09216-00041

(c) Remove the 4 nuts and water pump pulley.

4. **REMOVE TIMING BELT AND IDLER PULLEY (See page EM-17)**

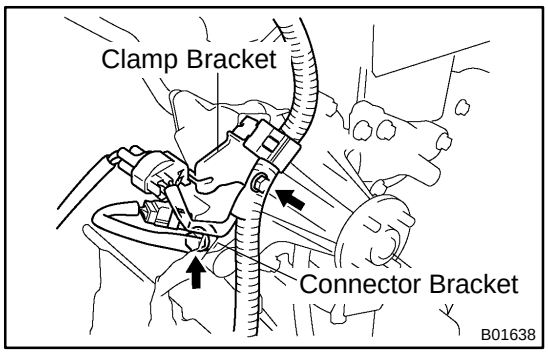


5. **REMOVE WATER BYPASS OUTLET AND NO. 1 WATER BYPASS PIPE**

(a) Remove the 2 bolts, water bypass outlet and No. 1 water bypass pipe.

(b) Remove the 3 O-rings from the water bypass outlet and No. 1 water bypass pipe.

6. **REMOVE WATER INLET AND THERMOSTAT (See page CO-12)**

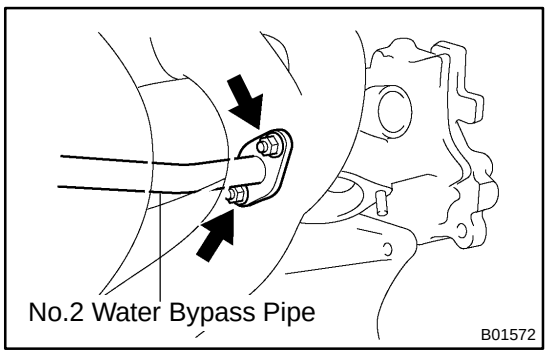


7. **REMOVE WATER PUMP**

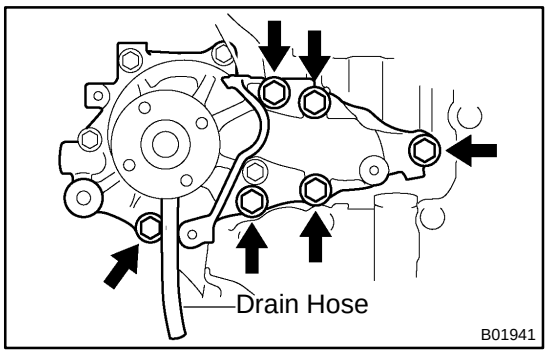
(a) Loosen the nut and remove the bolt, slide the generator away from the water pump.

(b) Remove the bolt, and disconnect the clamp bracket (for engine wire).

(c) Remove the bolt, and disconnect the connector bracket (for crankshaft position sensor connector).

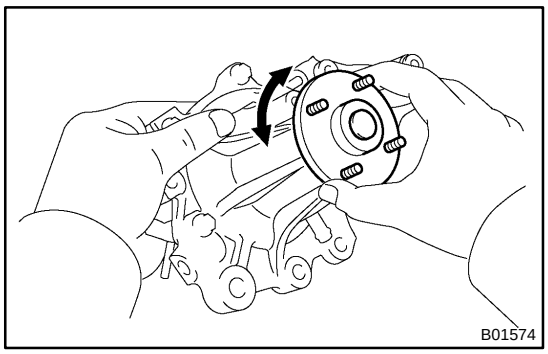


(d) Remove the 2 nuts, and disconnect the No. 2 water bypass pipe from the water pump.



(e) Remove the 6 bolts, water pump and gasket.
(f) Remove the drain hose.
(g) Remove the O-ring from the cylinder block.

CO0A0-06



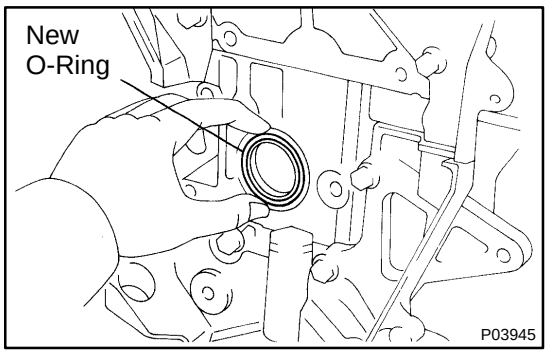
INSPECTION

INSPECT WATER PUMP

Turn the pulley seat, and check that the water pump bearing is not rough or noisy.

If necessary, replace the water pump.

CO0A1-06

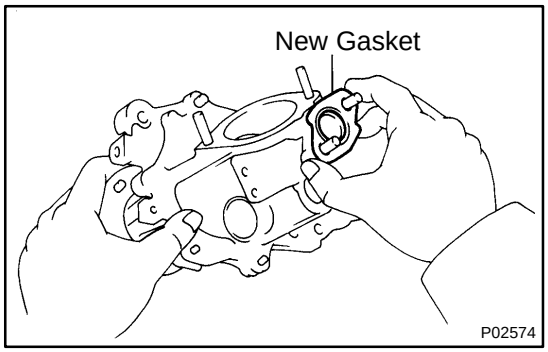


INSTALLATION

1. INSTALL WATER PUMP

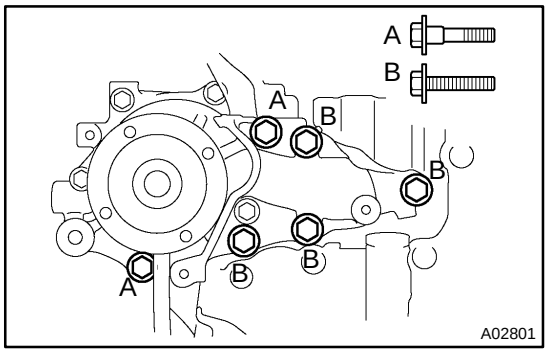
(a) Install a new O-ring to the cylinder block.

(b) Install the drain hose.



(c) Install a new gasket to the water pump.

(d) Connect the water pump to the water bypass pipe. Do not install the nut yet.



(e) Install the water pump with the 2 bolts (A) and 4 bolts (B).
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

HINT:

Hand tighten the (A) bolts first.

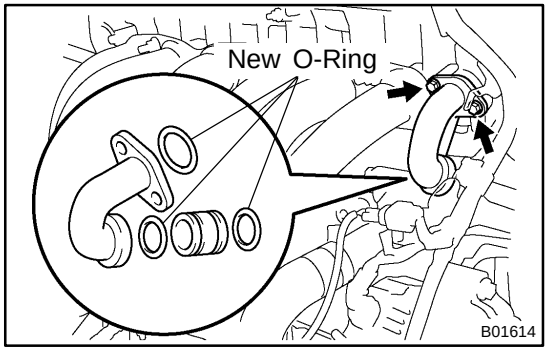
(f) Install the 2 nuts holding the No. 2 water bypass pipe to the water pump.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

(g) Install the connector bracket (for crankshaft position sensor connector) with the bolt.

(h) Install the clamp bracket (for engine wire) with the bolt.

(i) Install the generator with the bolt and nut.
Torque: 40 N·m (400 kgf·cm, 30 ft·lbf)

2. INSTALL THERMOSTAT AND WATER INLET (See page CO-14)



3. INSTALL NO. 1 WATER BYPASS PIPE AND WATER BYPASS OUTLET

(a) Install 2 new O-rings to the No. 1 water bypass pipe.

(b) Install a new O-ring and the water bypass outlet with the 2 bolts.
Torque: 9.0 N·m (90 kgf·cm, 80 in.·lbf)

4. INSTALL IDLER PULLEY AND TIMING BELT (See page EM-24)

5. INSTALL WATER PUMP PULLEY AND DRIVE BELT
Torque: 14 N·m (140 kgf·cm, 10 ft·lbf)

6. **M/T:**
   INSTALL DRIVE BELT TENSIONER ABSORBER

Install the absorber with the 2 nuts.

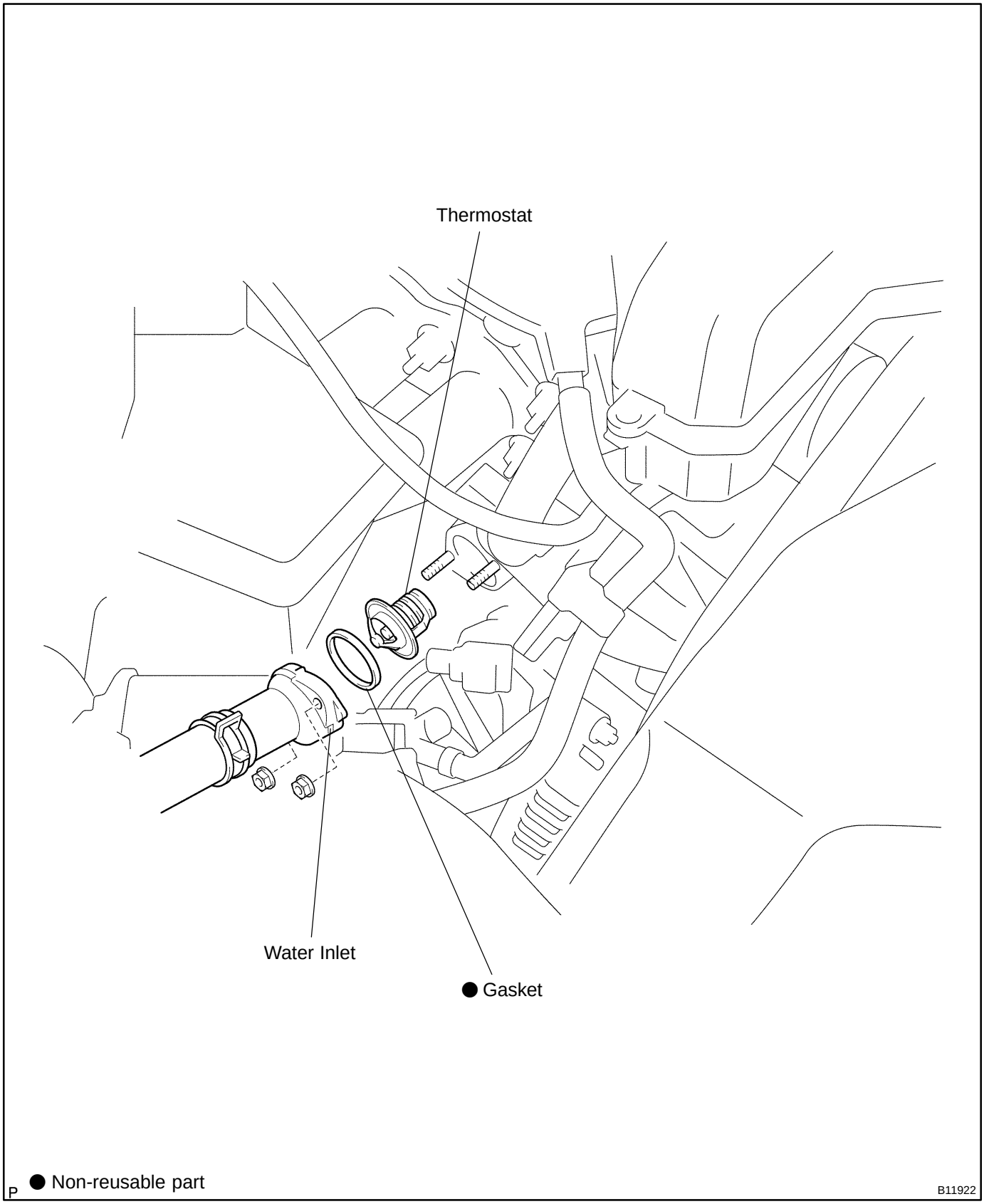
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

7. **INSTALL RADIATOR ASSEMBLY (See page CO-24)**

THERMOSTAT

COMPONENTS

CO0A2-05



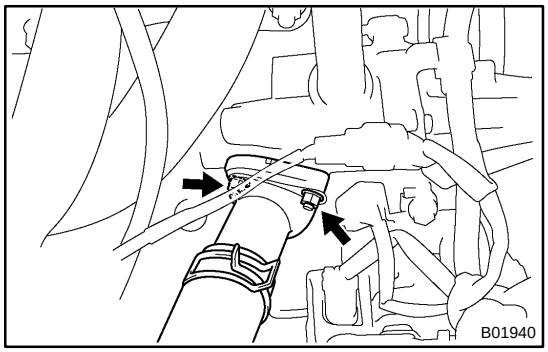
CO0A3-07

REMOVAL

HINT:

Removal of the thermostat would have an adverse effect, causing a lowering of cooling efficiency. Do not remove the thermostat, even if the engine tends to overheat.

1. DRAIN ENGINE COOLANT



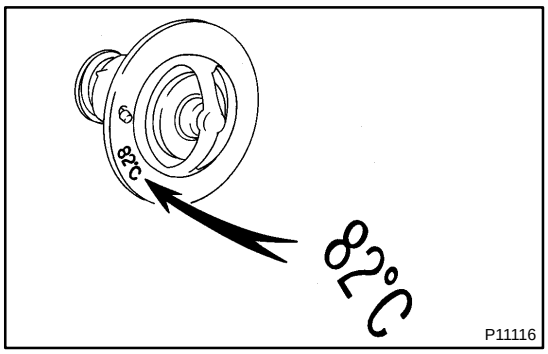
2. REMOVE THERMOSTAT

(a) Remove the 2 nuts holding the water inlet to the water pump, and disconnect the water inlet from the water pump.

(b) Remove the thermostat.

(c) Remove the gasket from the thermostat.

CO0A4-07

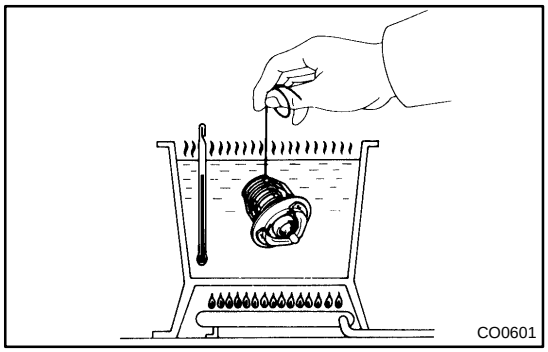


INSPECTION

INSPECT THERMOSTAT

HINT:

The thermostat is numbered with the valve opening temperature.

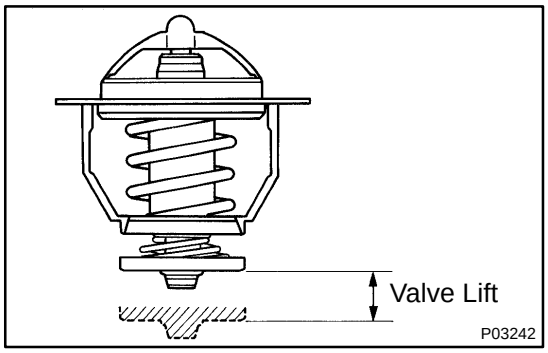


(a) Immerse the thermostat in water and gradually heat the water.

(b) Check the valve opening temperature.

Valve opening temperature: 80 - 84˚C (176 - 183˚F)

If the valve lift is not as specified, replace the thermostat.



(c) Check the valve lift.

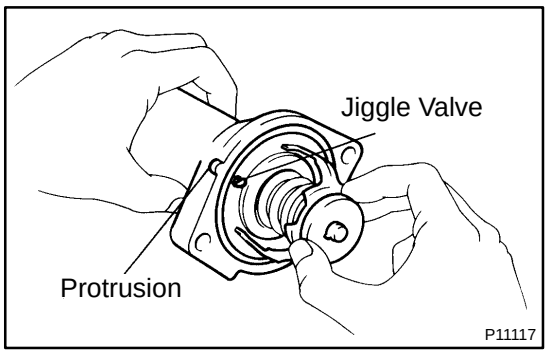
Valve lift: 8.5 mm (0.335 in.) or more at 95˚C (203˚F)

If the valve lift is not as specified, replace the thermostat.

(d) Check that the valve is fully closed when the thermostat is at low temperatures (below 40˚C (104˚F)).

If not closed, replace the thermostat.

CO0A5-06



INSTALLATION

1. PLACE THERMOSTAT IN WATER INLET

(a) Install a new gasket to the thermostat.

(b) Align the jiggle valve of the thermostat with the protrusion of the water inlet.

2. INSTALL WATER INLET

Install the water inlet with the 2 nuts.

Torque: 9.0 N·m (90 kgf·cm, 80 in.·lbf)

3. FILL WITH ENGINE COOLANT

4. START ENGINE AND CHECK FOR COOLANT LEAKS

RADIATOR

CO0A6-01

ON-VEHICLE CLEANING

CLEAN RADIATOR

Using water or a steam cleaner, remove any mud or dirt from the radiator core.

NOTICE:

If using a high pressure type cleaner, be careful not to deform the fins of the radiator core. (i.e. Maintain a distance between the cleaner nozzle and radiator core.)

CO0A7-06

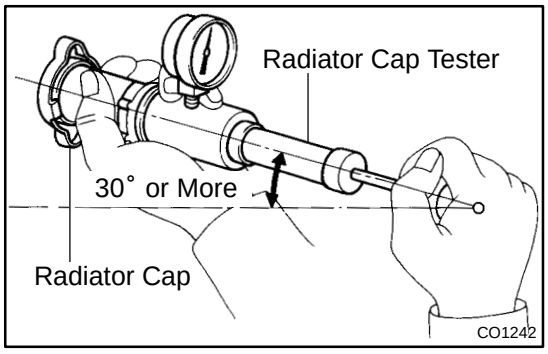
ON-VEHICLE INSPECTION

1. REMOVE RADIATOR CAP

Remove the radiator cap from the radiator.

CAUTION:

To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.



2. INSPECT RADIATOR CAP

NOTICE:

- **If the radiator cap has contaminations, always rinse it with water.**
- **Before using a radiator cap tester, wet the relief valve and pressure valve with engine coolant or water.**
- **When performing steps (a) and (b) below, keep the tester at an angle of over 30° above the horizontal.**

(a) Using a radiator cap tester, slowly pump the tester and check that air is coming from the vacuum valve.

Pump speed: 1 push/(3 seconds or more)

NOTICE:

Push the pump at a constant speed.

If air is not coming from the vacuum valve, replace the radiator cap.

(b) Pump the radiator cap tester, and measure the relief valve opening pressure.

Pump speed: 1 push within 1 second

NOTICE:

This pump speed is for the first pump only (in order to close the vacuum valve). After this, the pump speed can be reduced.

Standard opening pressure:

93 - 123 kPa (0.95 - 1.25 kgf/cm^2, 13.5 - 17.8 psi)

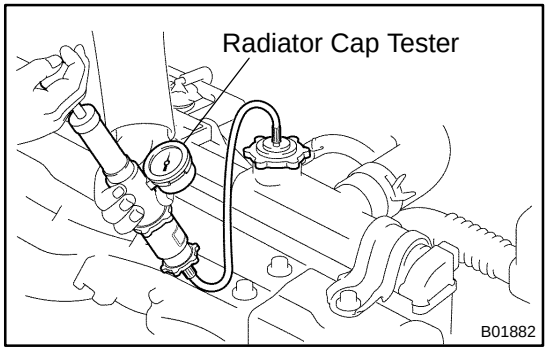
Minimum opening pressure:

78 kPa (0.8 kgf/cm^2, 11.4 psi)

HINT:

Use the tester's maximum reading as the opening pressure.

If the opening pressure is less than minimum, replace the radiator cap.



3. INSPECT COOLING SYSTEM FOR LEAKS

(a) Fill the radiator with coolant and attach a radiator cap tester.

(b) Warm up the engine.

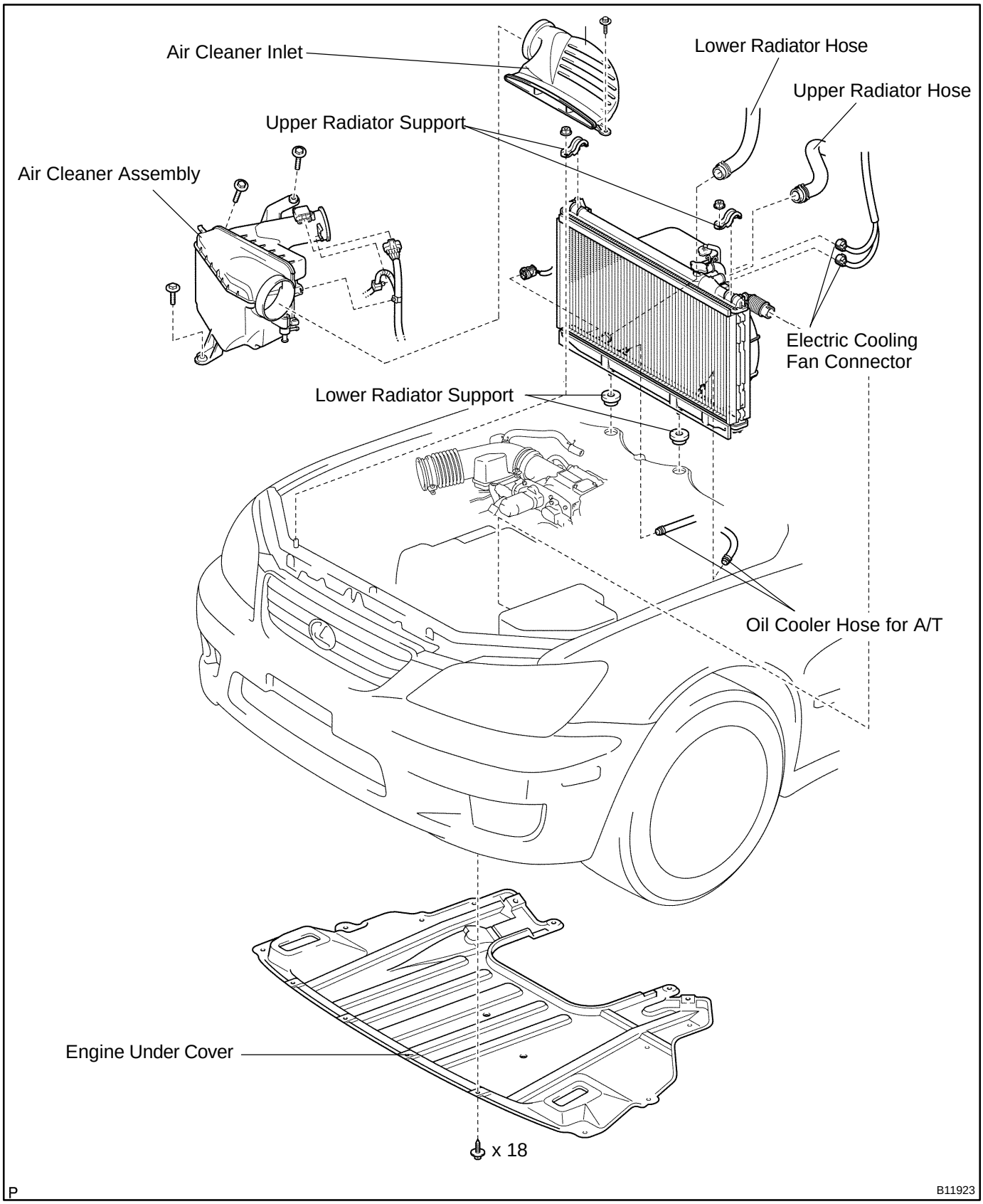
(c) Pump it to 118 kPa (1.2 kgf/cm^2, 17.1 psi), and check that the pressure does not drop.

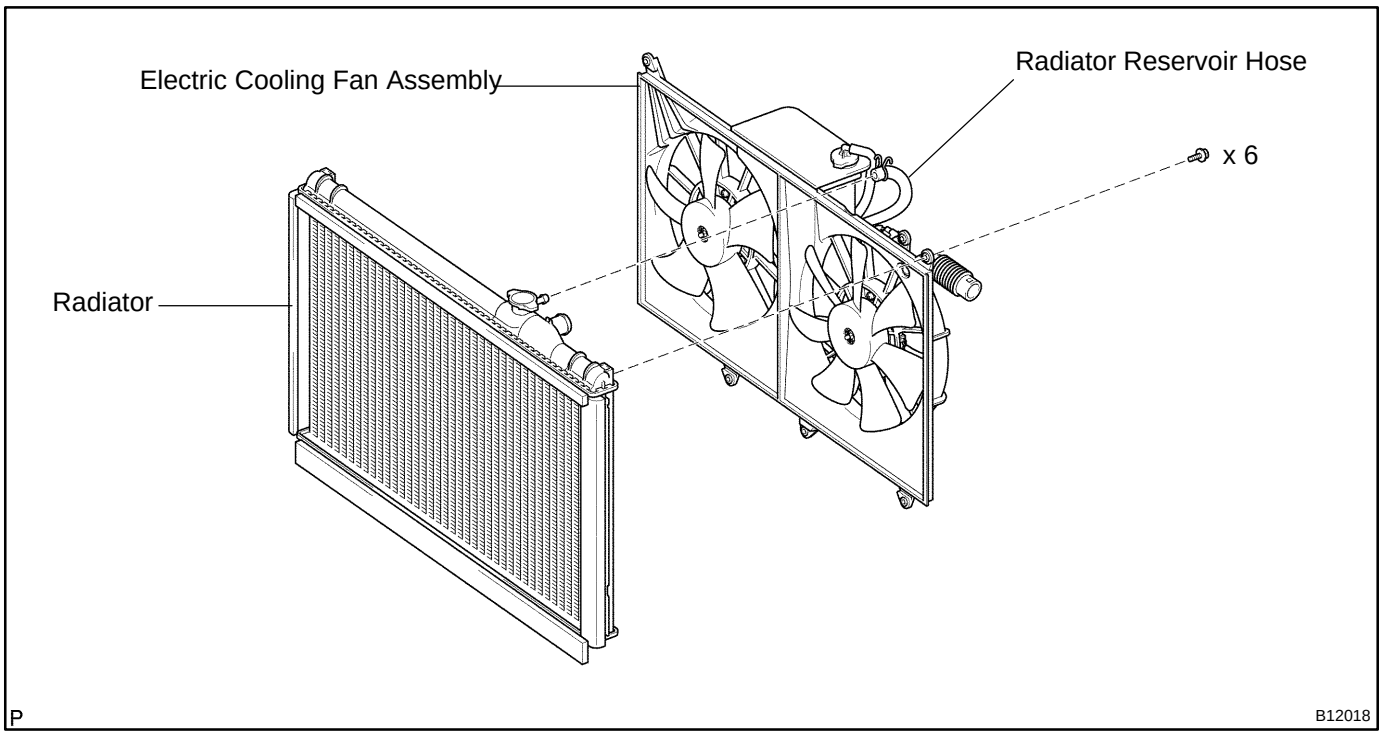
If the pressure drops, check the hoses, radiator or water pump for leaks. If no external leaks are found, check the heater core, cylinder block and head.

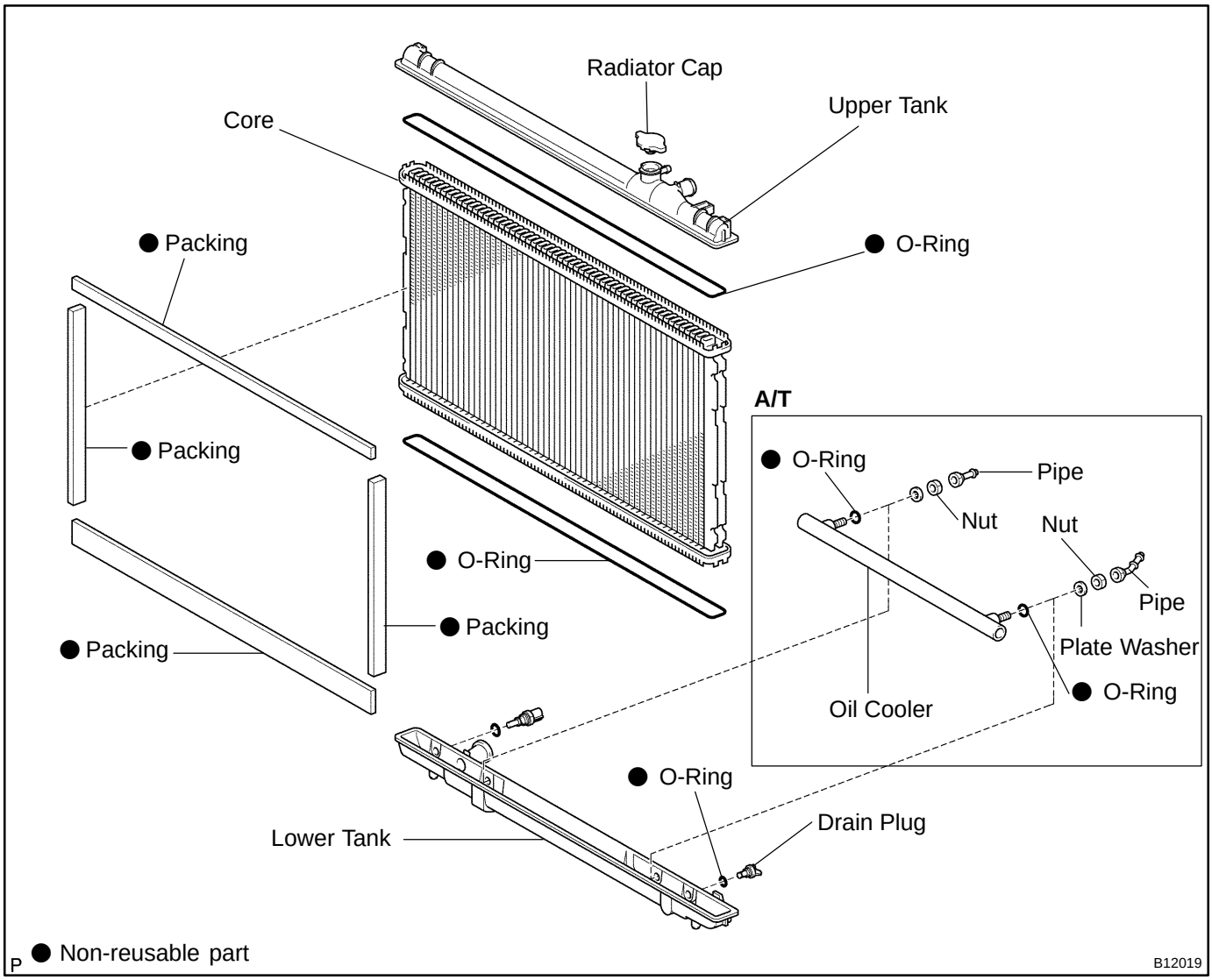
4. REINSTALL RADIATOR CAP

CO0A8-07

COMPONENTS




Electric Cooling Fan Assembly
Radiator Reservoir Hose
x 6
Radiator
P
B12018


Radiator Cap
Upper Tank
Core
● Packing
● O-Ring
● Packing
A/T
● O-Ring
Pipe
Nut
Nut
Pipe
Plate Washer
● O-Ring
Oil Cooler
● O-Ring
● Packing
● Packing
● O-Ring
Lower Tank
Drain Plug
P ● Non-reusable part
B12019

CO0A9-07

REMOVAL

1. REMOVE ENGINE UNDER COVER

2. DRAIN ENGINE COOLANT

3. REMOVE AIR CLEANER INLET

4. REMOVE AIR CLEANER AND MAF METER ASSEMBLY

5. REMOVE RADIATOR AND ELECTRIC COOLING FAN ASSEMBLY

(a) Disconnect the upper radiator hose from the radiator.

(b) Disconnect the lower radiator hose from the radiator.

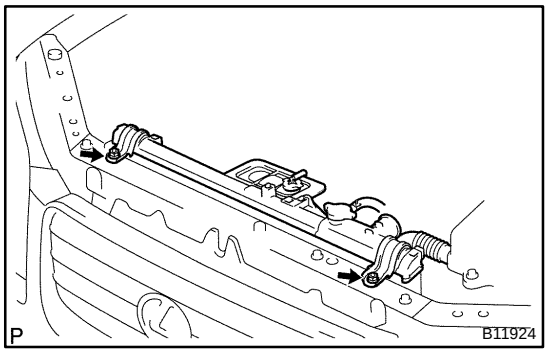
(c) Disconnect the ECM outlet duct from the ECM box.

(d) Disconnect the wire for electric cooling fan from the clamp on the electric cooling fan.

(e) Disconnect the 2 electric cooling fan connectors.

(f) Disconnect the ECT switch connector for electric cooling fan.

(g) A/T:
Disconnect the 2 oil cooler hoses for A/T from the radiator.



(h) Remove the 2 nuts and 2 upper radiator supports.

(i) Lift out the radiator and cooling fan assembly.

(j) Remove the 2 lower radiator supports.

6. REMOVE ELECTRIC COOLING FAN FROM RADIATOR

(a) Disconnect the radiator reservoir hose from the radiator.

(b) Remove the 6 bolts and electric cooling fan.

CO0AA-08

DISASSEMBLY

1. REMOVE PACKINGS

2. REMOVE RADIATOR CAP

3. REMOVE DRAIN PLUG

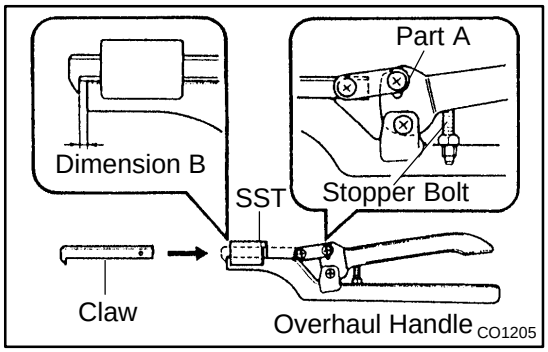
(a) Remove the drain plug.

(b) Remove the O-ring.

4. REMOVE ECT SWITCH

(a) Remove the ECT switch.

(b) Remove the O-ring.



5. ASSEMBLE SST

SST 09230-01010

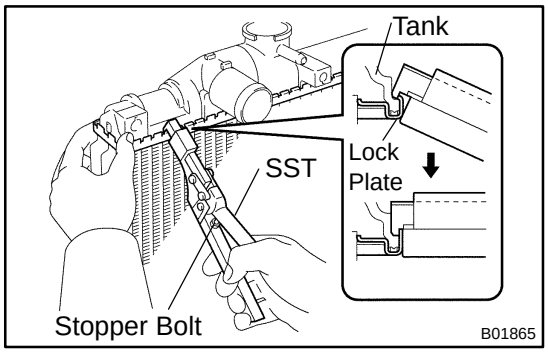
(a) Install the claw to the overhaul handle, inserting it in the hole in part A as shown in the diagram.

(b) While gripping the handle, adjust the stopper bolt so that dimension B is as shown in the illustration.

Dimension B: 0.2 - 0.3 mm (0.008 - 0.012 in.)

NOTICE:

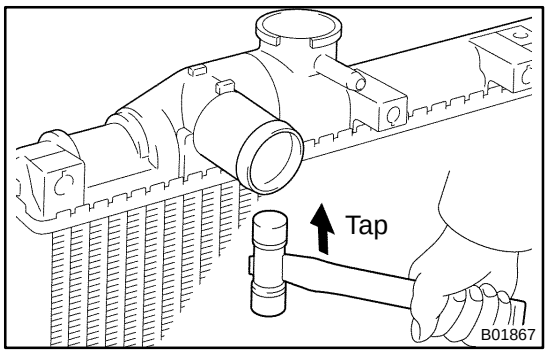
If this adjustment is not done the claw may be damaged.



6. UNCAULK LOCK PLATES

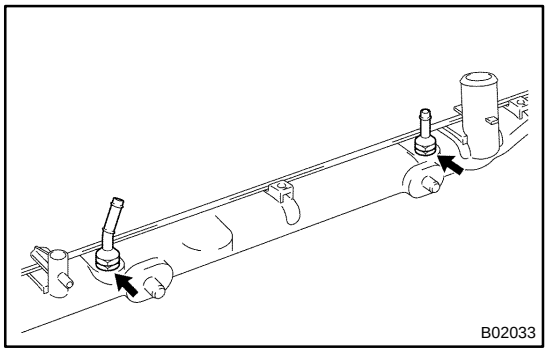
Using SST to release the caulking, squeeze the handle until stopped by the stopper bolt.

SST 09230-01010



7. REMOVE TANKS AND O-RINGS

Lightly tap the bracket of the radiator (or radiator inlet or outlet) with a soft-faced hammer, and remove the tank and the O-ring.



8. A/T:

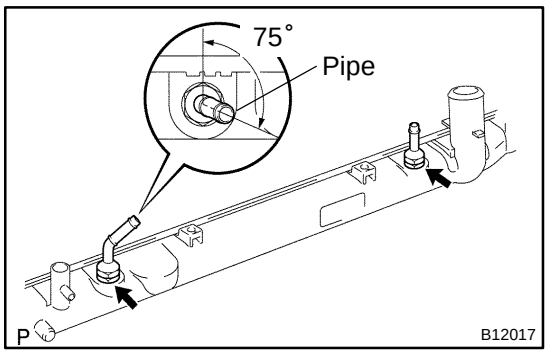
REMOVE OIL COOLER FROM LOWER TANK

(a) Loosen the nut, and remove the cooler pipe. Remove the 2 cooler pipes.

(b) Remove the 2 nuts and 2 plate washers.

(c) Remove the oil cooler and 2 O-rings.

CO0AB-06



REASSEMBLY

1. A/T:

INSTALL OIL COOLER TO LOWER TANK

(a) Install 2 new O-rings to the oil cooler.

(b) Install the oil cooler to the lower tank with the 2 plate washers and 2 nuts.

Torque: 8.3 N·m (85 kgf·cm, 74 in.·lbf)

(c) Install the cooler pipes in the direction indicated in the illustration.

Torque: 14.7 N·m (150 kgf·cm, 11 ft·lbf)

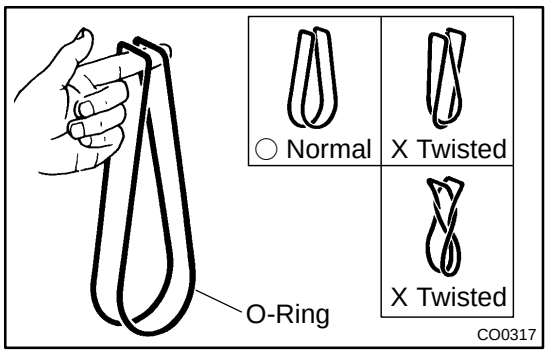
2. INSPECT LOCK PLATE FOR DAMAGE

HINT:

- If the sides of the lock plate groove are deformed, reassembly of the tank will be impossible.
- Therefore, first correct any deformation with pliers or similar object. Water leakage will result if the bottom of the lock plate groove is damaged or dented.

NOTICE:

The radiator can only be recaulked 2 times. After the 2nd time, the radiator core must be replaced.

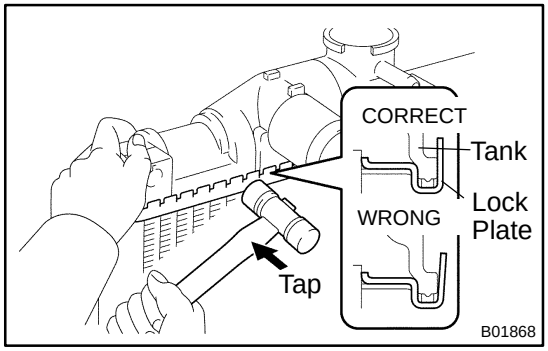


3. INSTALL NEW O-RINGS AND TANKS

(a) After checking that there are no foreign objects in the lock plate groove, install a new O-ring without twisting it.

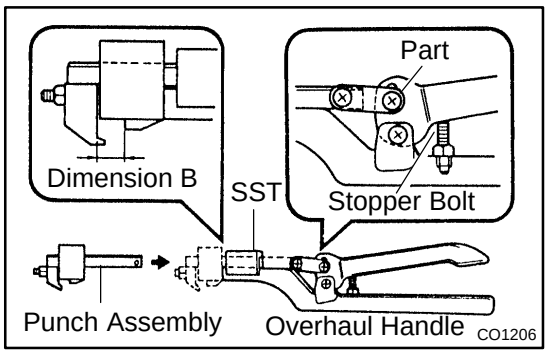
HINT:

When cleaning the lock plate groove, lightly rub it with sand paper without scratching it.



(b) Install the tank without damaging the O-ring.

(c) Tap the lock plate with a soft-faced hammer so that there is no gap between it and the tank.



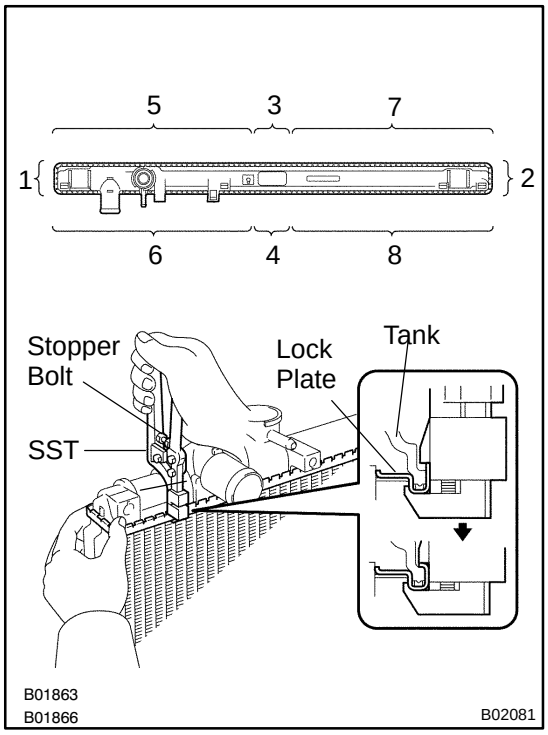
4. ASSEMBLE SST

SST 09230-01010, 09231-14010

(a) Install the punch assembly to the overhaul handle, inserting it in the hole in part A as shown in the illustration.

(b) While gripping the handle, adjust the stopper bolt so that dimension B is as shown in the illustration.

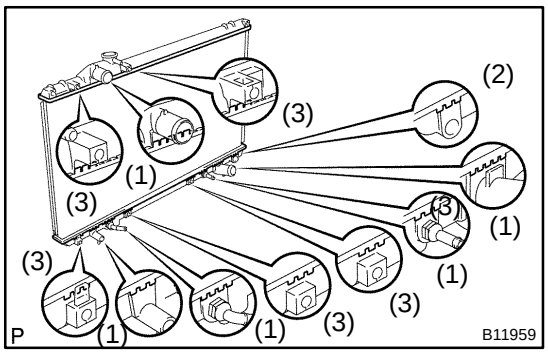
Dimension B: 8.4 mm (0.331 in.)



5. CAULK LOCK PLATE

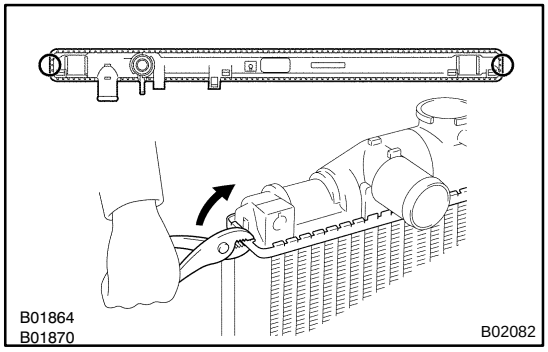
(a) Lightly press SST against the lock plate in the order shown in the illustration. After repeating this a few times, fully caulk the lock plate by squeezing the handle until stopped by the stopper plate.

SST 09230-01010

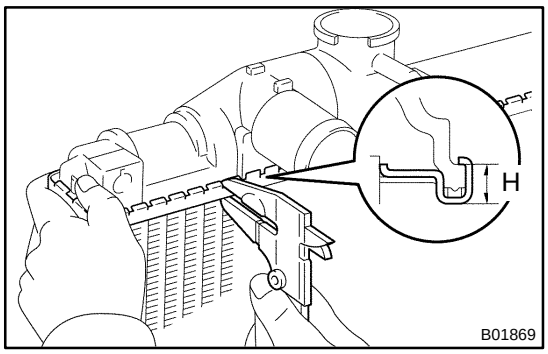


HINT:

- Do not stake the areas protruding around the ports (1), flange (2) and bracket (3).



- The points shown in the illustration cannot be staked with the SST. Use pliers or similar object and be careful not to damage the core plates.



(b) Check the lock plate height (H) after completing the caulking.

Plate height (H): 7.40 - 7.80 mm (0.2913 - 0.3071 in.)

If not within the specified height, adjust the stopper bolt of the handle again and caulk again.

6. INSTALL ECT SWITCH

(a) Install a new O-ring to the ECT switch.

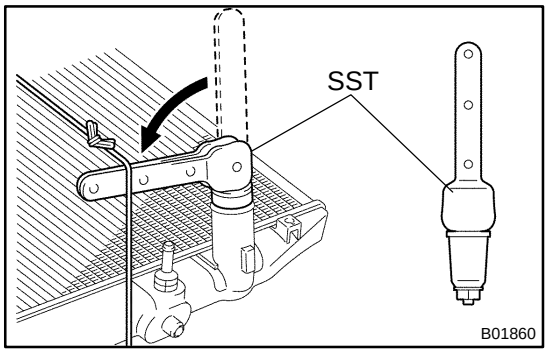
(b) Install the ECT switch.

7. INSTALL DRAIN PLUG

(a) Install a new O-ring to the drain plug.

(b) Install the drain plug.

8. INSTALL RADIATOR CAP



9. INSPECT FOR WATER LEAKS

(a) Tighten the drain plug.

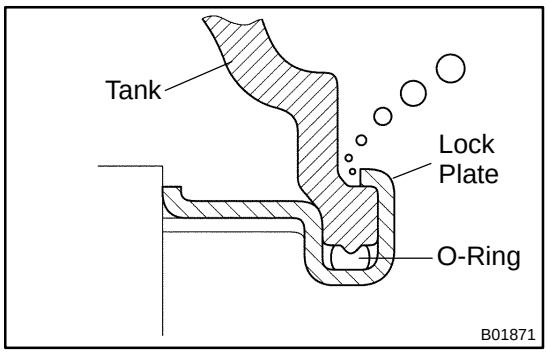
(b) Plug the inlet pipes of the radiator with SST.

SST 09230-01010

(c) Using a radiator cap tester, apply pressure to the radiator.

Test pressure: 177 kPa (1.8 kgf/cm^2, 26 psi)

(d) Submerge the radiator in water.



(e) Inspect for leaks.

HINT:

On radiators with resin tanks, there is a clearance between the tank and lock plate where a minute amount of air will remain, giving the appearance of an air leak when the radiator is submerged in water. Therefore, before doing the water leak test, first swish the radiator around in the water until all air bubbles disappear.

10. INSTALL NEW PACKINGS

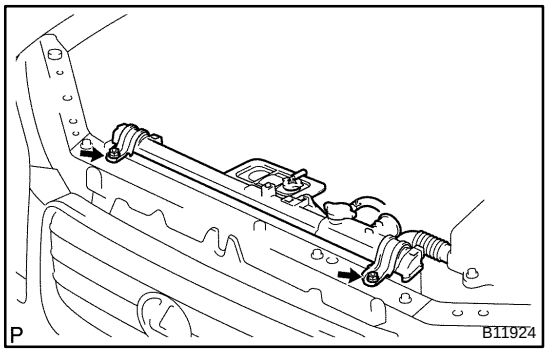
CO0AC-06

INSTALLATION

1. INSTALL ELECTRIC COOLING FAN TO RADIATOR

(a) Install the electric cooling fan with the 6 bolts.
Torque: 5.0 N·m (50 kgf·cm, 44 in.·lbf)

(b) Connect the radiator reservoir hose to the radiator.



2. INSTALL RADIATOR AND ELECTRIC COOLING FAN ASSEMBLY

(a) Install the 2 lower radiator supports to the radiator.

(b) Attach the 2 lower radiator supports on the radiator to the body bracket.

(c) Install the radiator and electric cooling fan assembly with the 2 upper radiator supports and 2 nuts.
Torque: 13.5 N·m (135 kgf·cm, 10 ft·lbf)

(d) Connect the upper radiator hose to the radiator.

(e) Connect the lower radiator hose to the radiator.

(f) Connect the ECM outlet duct to the ECM box.

(g) Connect the wire for electric cooling fan to the clamp on the electric cooling fan.

(h) Connect the 2 electric cooling fan connectors.

(i) Connect the ECT switch connector for electric cooling fan.

(j) A/T:
Connect the 2 oil cooler hoses for A/T to the radiator.

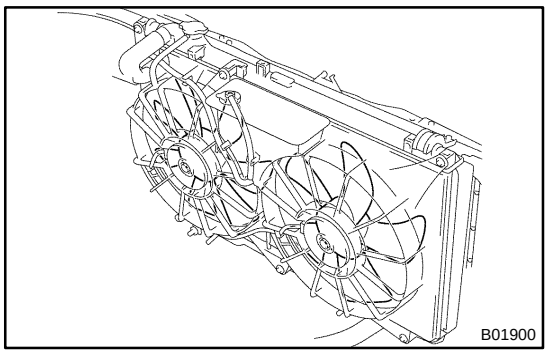
3. INSTALL AIR CLEANER AND MAF METER ASSEMBLY

4. INSTALL AIR CLEANER INLET

5. FILL WITH ENGINE COOLANT

6. START ENGINE AND CHECK FOR ENGINE COOLANT AND A/T FLUID LEAKS

7. INSTALL ENGINE UNDER COVER



ELECTRIC COOLING FAN

CO0AD-09

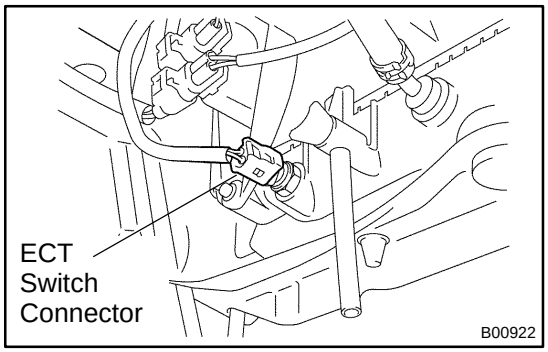
ON-VEHICLE INSPECTION

1. CHECK COOLING FAN OPERATION WITH LOW TEMPERATURE (Below 83˚C (181˚F))

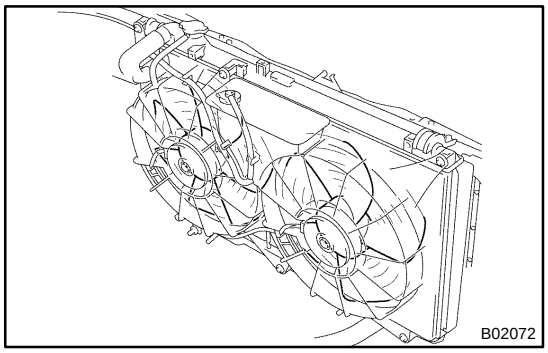
(a) Turn the ignition switch ON.

(b) Check that the cooling fan stops.

If not, check the cooling fan relay and ECT switch, and check for a separated connector or severed wire between the cooling fan relay and ECT switch.



(c) Disconnect the ECT switch connector.



(d) Check that the cooling fan rotates.

If not, check the fuses, radiator fan main relay, cooling fan relay, cooling fan, and check for a short circuit between the cooling fan relay and ECT switch.

(e) Reconnect the ECT switch connector.

2. CHECK COOLING FAN OPERATION WITH HIGH TEMPERATURE (Above 93˚C (199˚F))

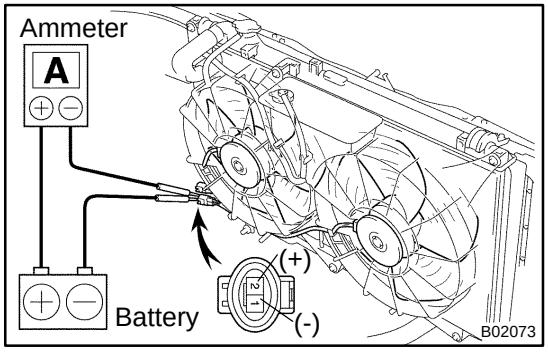
(a) Start the engine, and raise coolant temperature to above 93˚C (199˚F).

HINT:

Coolant temperature is the detected value by the ECT switch on the radiator lower tank.

(b) Check that the cooling fan rotates.

If not, replace the ECT switch.



3. INSPECT COOLING FANS

(a) Disconnect the cooling fan connector.

(b) Connect battery and ammeter to the cooling fan connector.

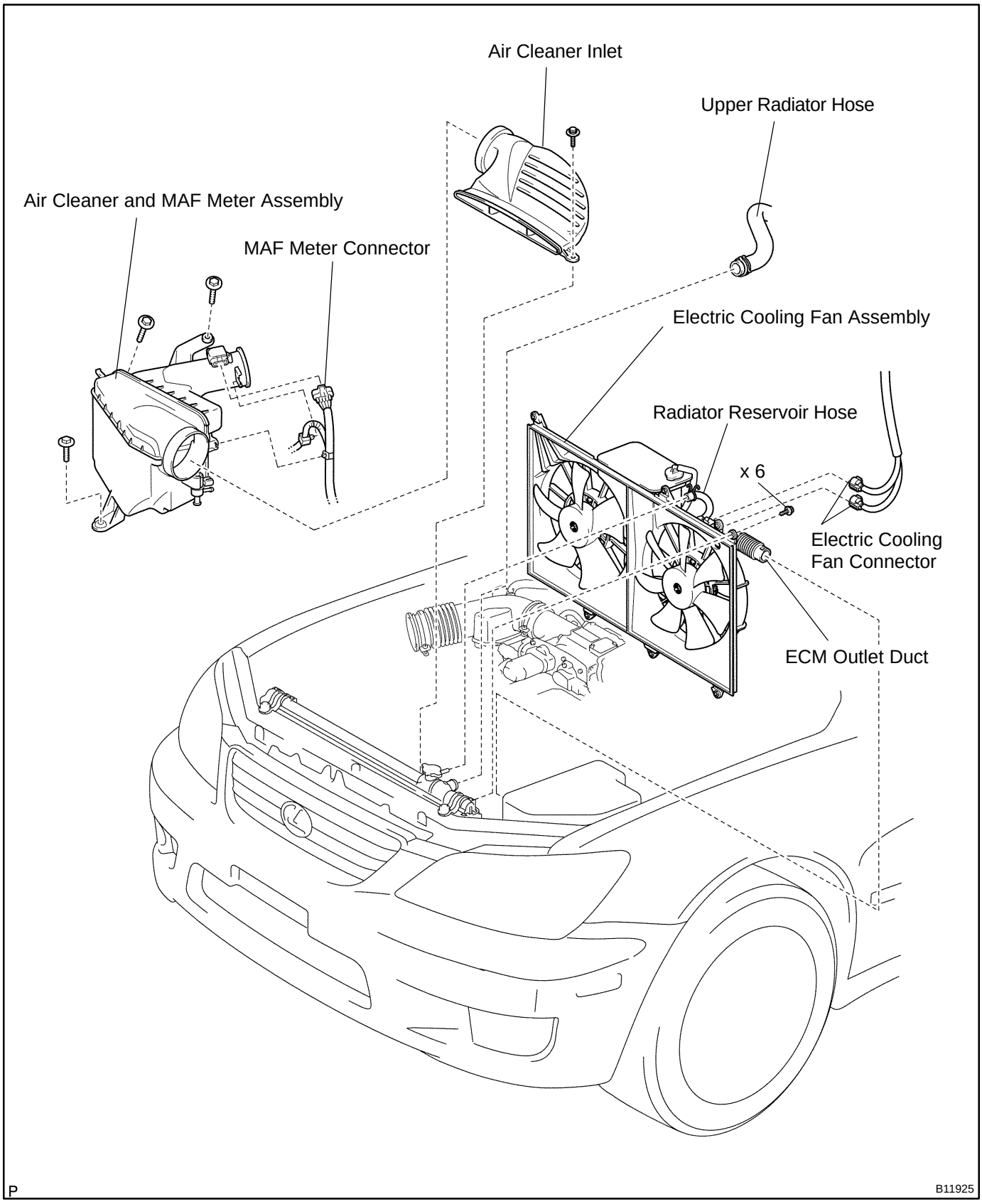
(c) Check that the cooling fan rotates smoothly, and check the reading on the ammeter.

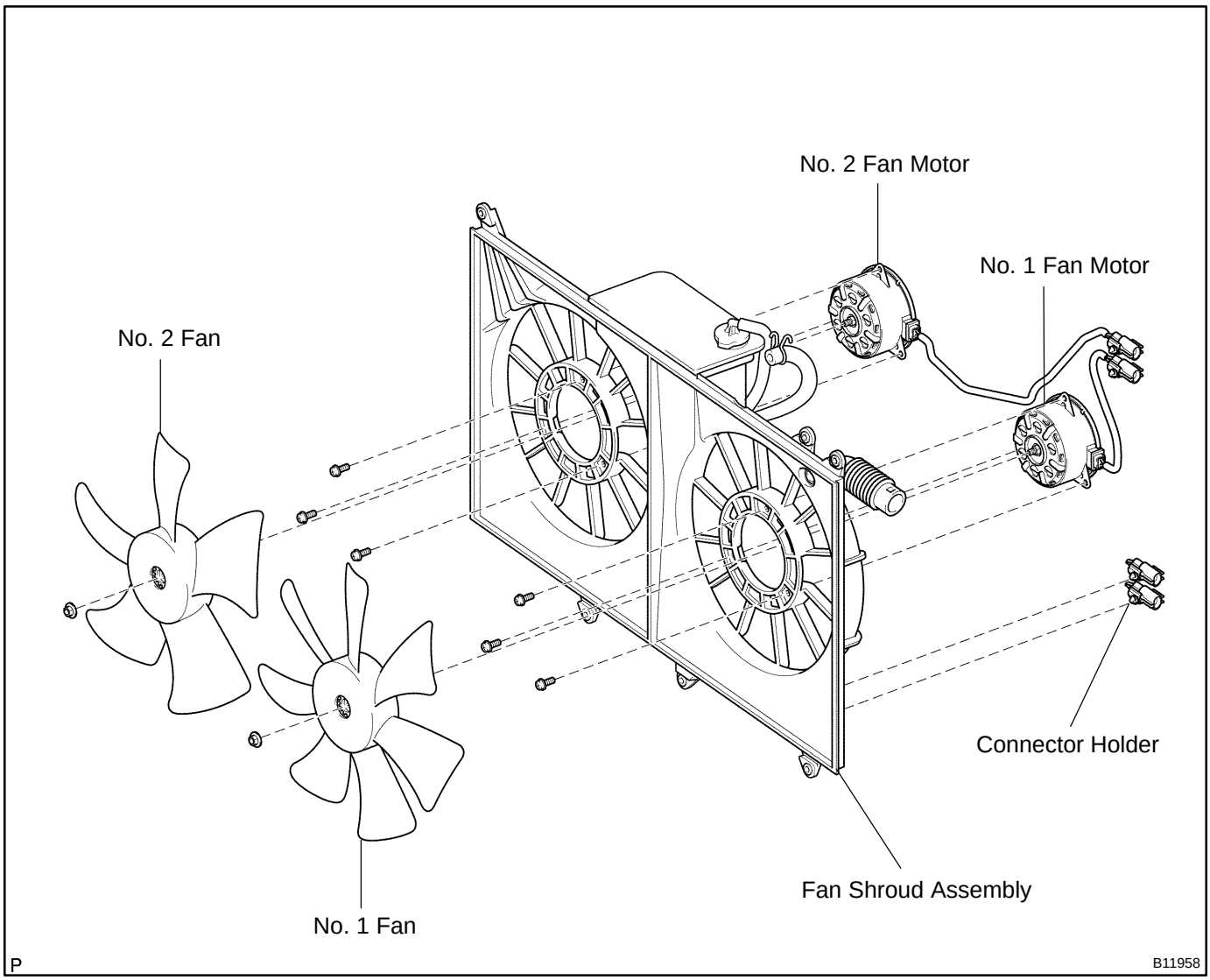
Standard amperage: 8.5 - 11.5 A at 20˚C (68˚F)

(d) Reconnect the cooling fan connector.

CO0AE-10

COMPONENTS




No. 2 Fan Motor
No. 1 Fan Motor
No. 2 Fan
Connector Holder
Fan Shroud Assembly
No. 1 Fan
P
B11958

CO0AF-10

REMOVAL

1. DRAIN ENGINE COOLANT

2. REMOVE AIR CLEANER INLET

3. REMOVE AIR CLEANER AND MAF METER ASSEMBLY

4. REMOVE ELECTRIC COOLING FAN

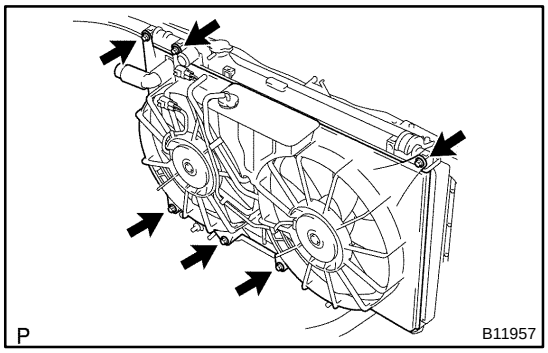
(a) Disconnect the upper radiator hose from the radiator.

(b) Disconnect the ECM outlet duct from the ECM box.

(c) Disconnect the wire for electric cooling fan from the clamp on the electric cooling fan.

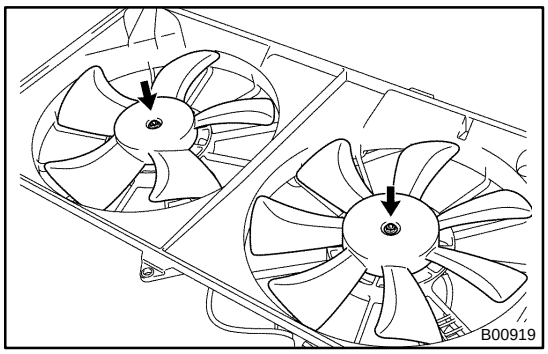
(d) Disconnect the 2 electric cooling fan connectors.

(e) Disconnect the radiator reservoir hose from the radiator.



(f) Remove the 6 bolts and electric cooling fan.

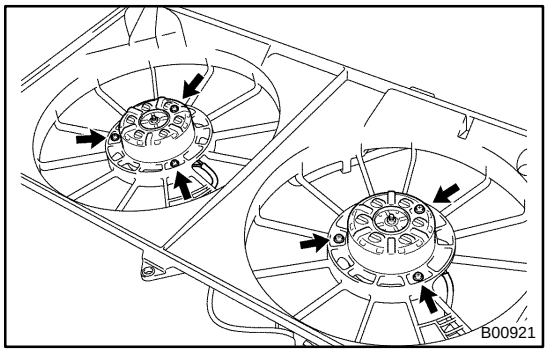
CO0AG-07



DISASSEMBLY

1. REMOVE FANS

Remove the nut and fan. Remove the 2 fans.



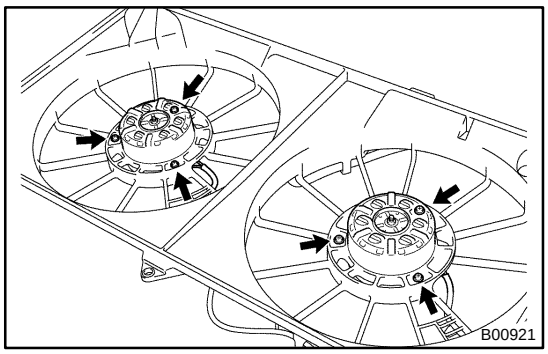
2. REMOVE FAN MOTORS

(a) Disconnect the wires and connector holders from the fan shroud.

(b) Remove the 3 screws and fan motor. Remove the 2 fan motors.

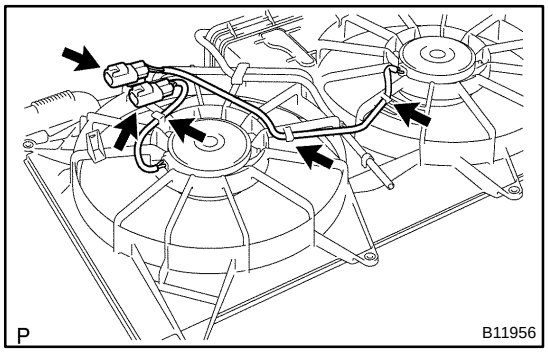
CO0AH-06

REASSEMBLY

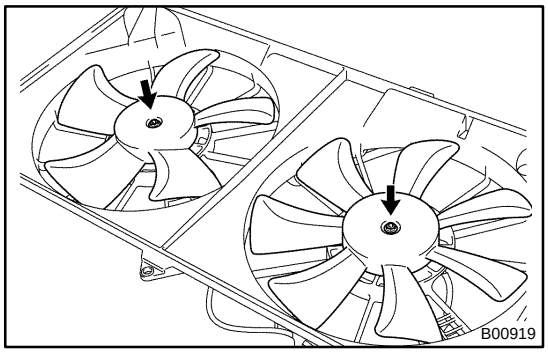


1. INSTALL FAN MOTORS

(a) Install the fan motor with the 3 screws. Install the 2 fan motors.



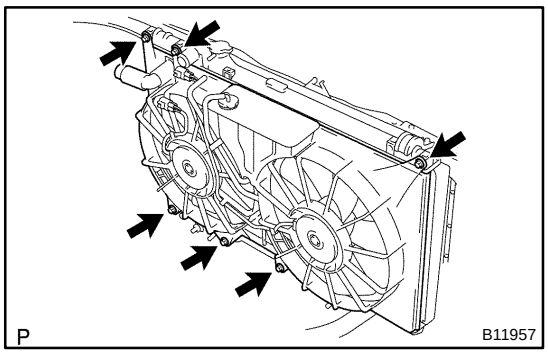
(b) Install the wires and connector holders to the fan shroud as shown in the illustration.



2. INSTALL FANS

Install the fan with the nut. Install the 2 fans.

CO0AI-08



INSTALLATION

1. INSTALL ELECTRIC COOLING FAN

(a) Install the electric cooling fan with the 6 bolts.
Torque: 5.0 N·m (50 kgf·cm, 44 in.·lbf)

(b) Connect the upper radiator hose to the radiator.

(c) Connect the ECM outlet duct to the ECM box.

(d) Connect the wire for electric cooling fan to clamp on the electric cooling fan.

(e) Connect the 2 electric cooling fan connectors.

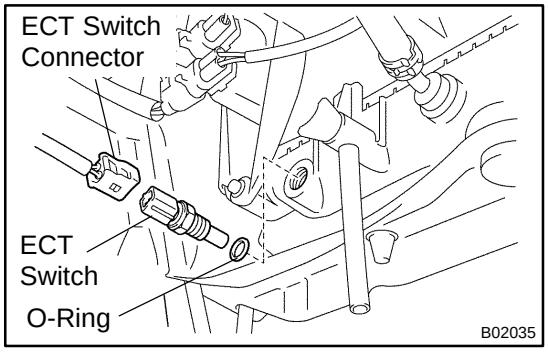
(f) Connect the radiator reservoir hose to the radiator.

2. INSTALL AIR CLEANER AND MAF METER ASSEMBLY

3. INSTALL AIR CLEANER INLET

4. FILL WITH ENGINE COOLANT

5. START ENGINE AND CHECK FOR COOLANT LEAKS



ENGINE COOLANT TEMPERATURE (ECT) SWITCH

CO0AJ-10

INSPECTION

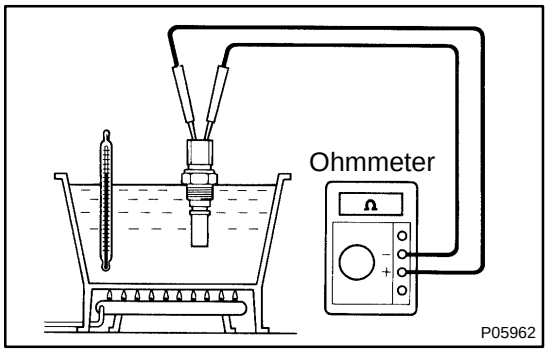
1. DRAIN ENGINE COOLANT

2. REMOVE ECT SWITCH

(a) Disconnect the connector.

(b) Remove the ECT switch.

(c) Remove the O-ring from the ECT switch.



3. INSPECT ECT SWITCH

(a) Using an ohmmeter, check that there is no continuity between the terminals when the coolant temperature is above 93˚C (199˚F).

If there is continuity, replace the switch.

(b) Using an ohmmeter, check that there is continuity between the terminals when the coolant temperature is below 83˚C (181˚F).

If there is no continuity, replace the switch.

4. REINSTALL ECT SWITCH

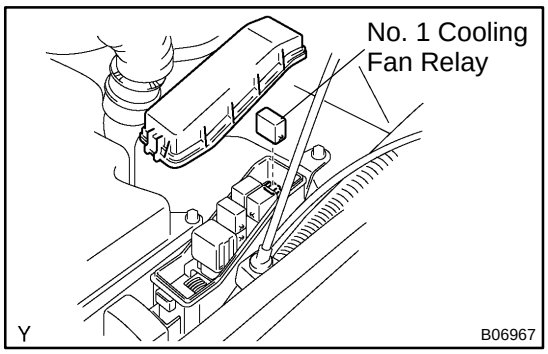
(a) Install a new O-ring to the ECT switch.

(b) Install the ECT switch.

(c) Connect the connector.

5. REFILL WITH ENGINE COOLANT

6. START ENGINE AND CHECK FOR COOLANT LEAKS



COOLING FAN RELAY

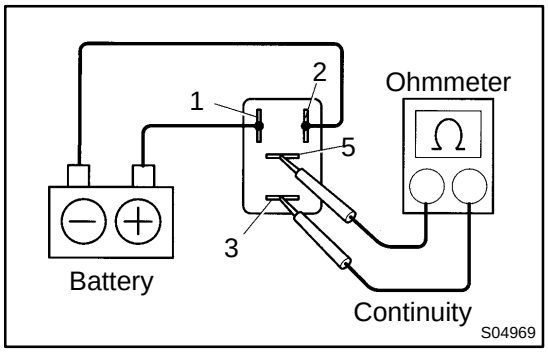
CO1DJ-01

INSPECTION

1. INSPECT NO. 1 COOLING FAN RELAY

(a) Remove the relay box cover.

(b) Remove the No. 1 cooling fan relay (Marking: FAN NO.1).



(c) Inspect the resistance.

(1) Using an ohmmeter, measure the resistance between the terminals.

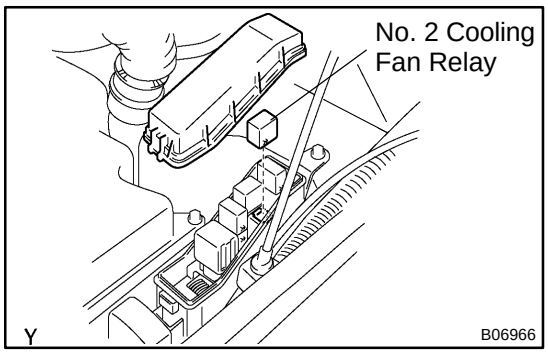
Standard:

Tester Connection	Specified Condition
3 - 5	10 kΩ or higher
3 - 5	Below 1 Ω (Apply battery voltage to terminals 1 and 2)

If the resistance is not as specified, replace the relay.

(d) Reinstall the No. 1 cooling fan relay.

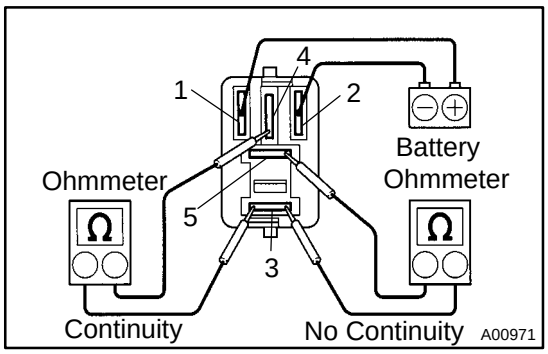
(e) Reinstall the relay box cover.



2. INSPECT NO. 2 COOLING FAN RELAY

(a) Remove the relay box cover.

(b) Remove the No. 2 cooling fan relay (Marking: FAN NO.2).



(c) Inspect the resistance.

(1) Using an ohmmeter, measure the resistance between the terminals.

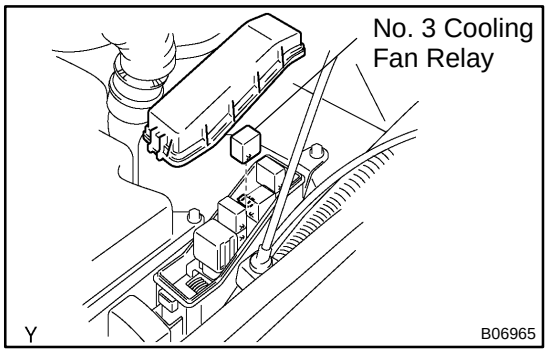
Standard:

Tester Connection	Specified Condition
3 - 4	Below 1 Ω
3 - 4	10 kΩ or higher (Apply battery voltage to terminals 1 and 2)
3 - 5	10 kΩ or higher
3 - 5	Below 1 Ω (Apply battery voltage to terminals 1 and 2)

If the resistance is not as specified, replace the relay.

(d) Reinstall the No. 2 cooling fan relay.

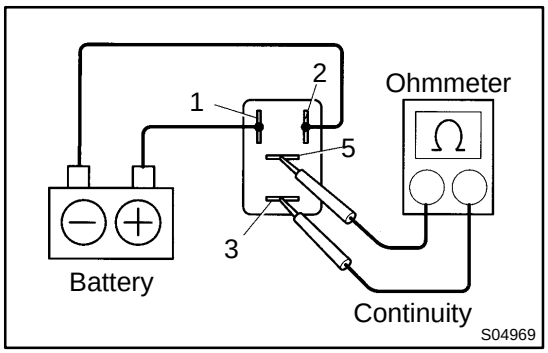
(e) Reinstall the relay box cover.



3. INSPECT NO. 3 COOLING FAN RELAY

(a) Remove the relay box cover.

(b) Remove the No. 3 cooling fan relay (Marking: FAN NO.3).



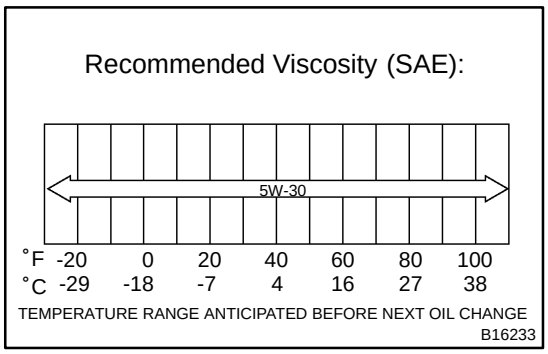
(c) Inspect the resistance.

(1) Using an ohmmeter, measure the resistance between the terminals.

If the resistance is not as specified, replace the relay.

(d) Reinstall the No. 3 cooling fan relay.

(e) Reinstall the relay box cover.



OIL AND FILTER

INSPECTION

LU05G-11

1. CHECK OIL QUALITY

Check the oil for deterioration, entry of water, discoloring or thinning.

If oil quality is visibly poor, replace the oil.

Oil grade:

API grade SL Energy-Conserving or ILSAC multi-grade engine oil.

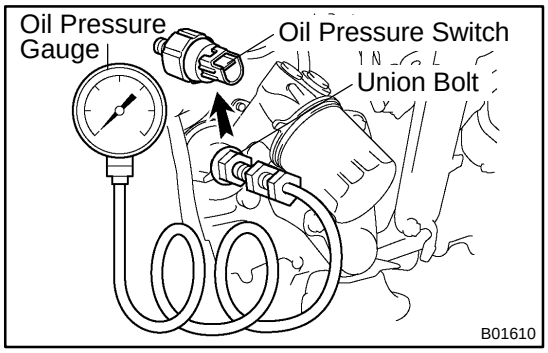
2. CHECK ENGINE OIL LEVEL

After warming up the engine and then 5 minutes after the engine stop, oil level should be between the low level and full level marks of the dipstick.

If low, check for leakage and add oil up to the full level mark.

NOTICE:

Do not fill with engine oil above the full level mark.



3. REMOVE OIL PRESSURE SWITCH AND INSTALL OIL PRESSURE GAUGE

(a) Disconnect the oil pressure switch connector.

(b) Using SST, remove the oil pressure switch.

SST 09268-46021

(c) Install an oil pressure gauge.

4. WARM UP ENGINE

Allow the engine to warm up to normal operating temperature.

5. CHECK OIL PRESSURE

Oil pressure:

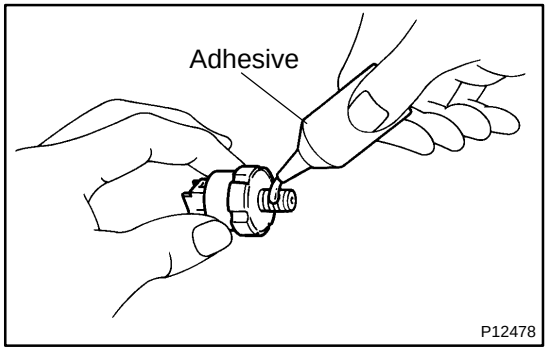
Idle	49 kPa (0.5 kgf/cm^2, 7 psi) or more
3,000 rpm	324 kPa (3.3 kgf/cm^2, 47 psi) or more

6. REMOVE OIL PRESSURE GAUGE AND REINSTALL OIL PRESSURE SWITCH

(a) Remove the oil pressure gauge.

(b) Tighten the union bolt.

Torque: 90 N·m (900 kgf·cm, 66 ft·lbf)



(c) Apply adhesive to 2 or 3 threads of the oil pressure switch.

Adhesive:

Part No.08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(d) Using SST, install the oil pressure switch.

SST 09268-46021

Torque: 15 N·m (150 kgf·cm, 11 ft·lbf)

(e) Connect the oil pressure switch connector.

7. START ENGINE AND CHECK FOR LEAKS

LU05H-11

REPLACEMENT

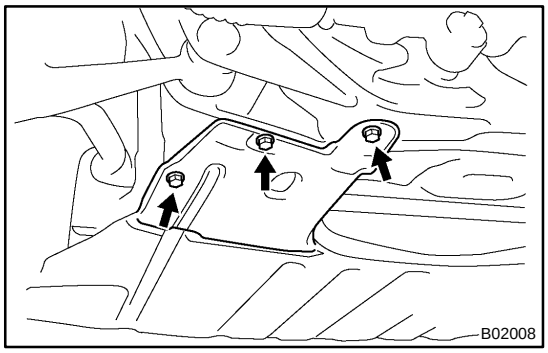
CAUTION:

- **Prolonged and repeated contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer.**
- **Exercise caution in order to minimize the length and frequency of contact of your skin to used oil. Wear protective clothing and gloves. Wash your skin thoroughly with soap and water, or use water-less hand cleaner, to remove any used engine oil. Do not use gasoline, thinners, or solvents.**
- **In order to preserve the environment, used oil and used oil filters must be disposed of only at designated disposal sites.**

1. DRAIN ENGINE OIL

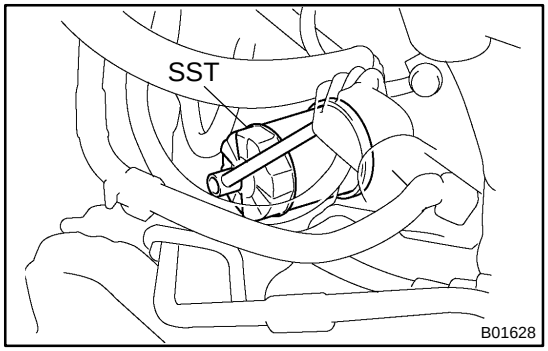
(a) Remove the oil filler cap.

(b) Remove the oil drain plug, and drain the oil into a container.



2. REPLACE OIL FILTER

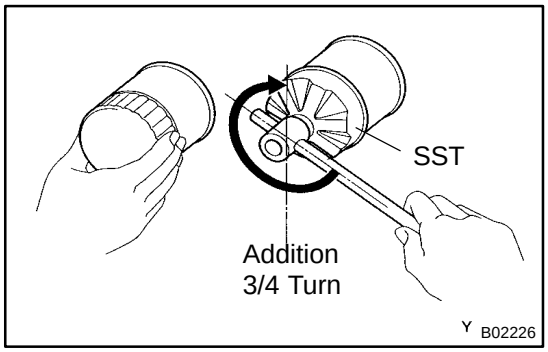
(a) Remove the 3 screws, and bend the engine under cover.



(b) Using SST, remove the oil filter.
SST 09228-07501

(c) Clean the oil filter contact surface on the oil filter mounting.

(d) Lubricate the filter rubber gasket with clean engine oil.



(e) Tighten the oil filter by hand until the rubber gasket contacts the seat of the filter mounting.

(f) Using SST, tighten it an additional 3/4 turn to seat the filter.
SST 09228-07501

(g) Reinstall the engine under cover with the 3 screws.

3. FILL WITH ENGINE OIL

(a) Clean and install the oil drain plug with a new gasket.
Torque: 38 N·m (380 kgf·cm, 28 ft·lbf)

(b) Fill with fresh engine oil.

Capacity:

Drain and refill	w/ Oil filter change	5.4 liters (5.7 US qts, 4.8 Imp. qts)
	w/o Oil filter change	5.1 liters (5.4 US qts, 4.5 Imp. qts)
Dry fill		6.5 liters (6.9 US qts, 5.7 Imp. qts)

(c) Reinstall the oil filler cap.

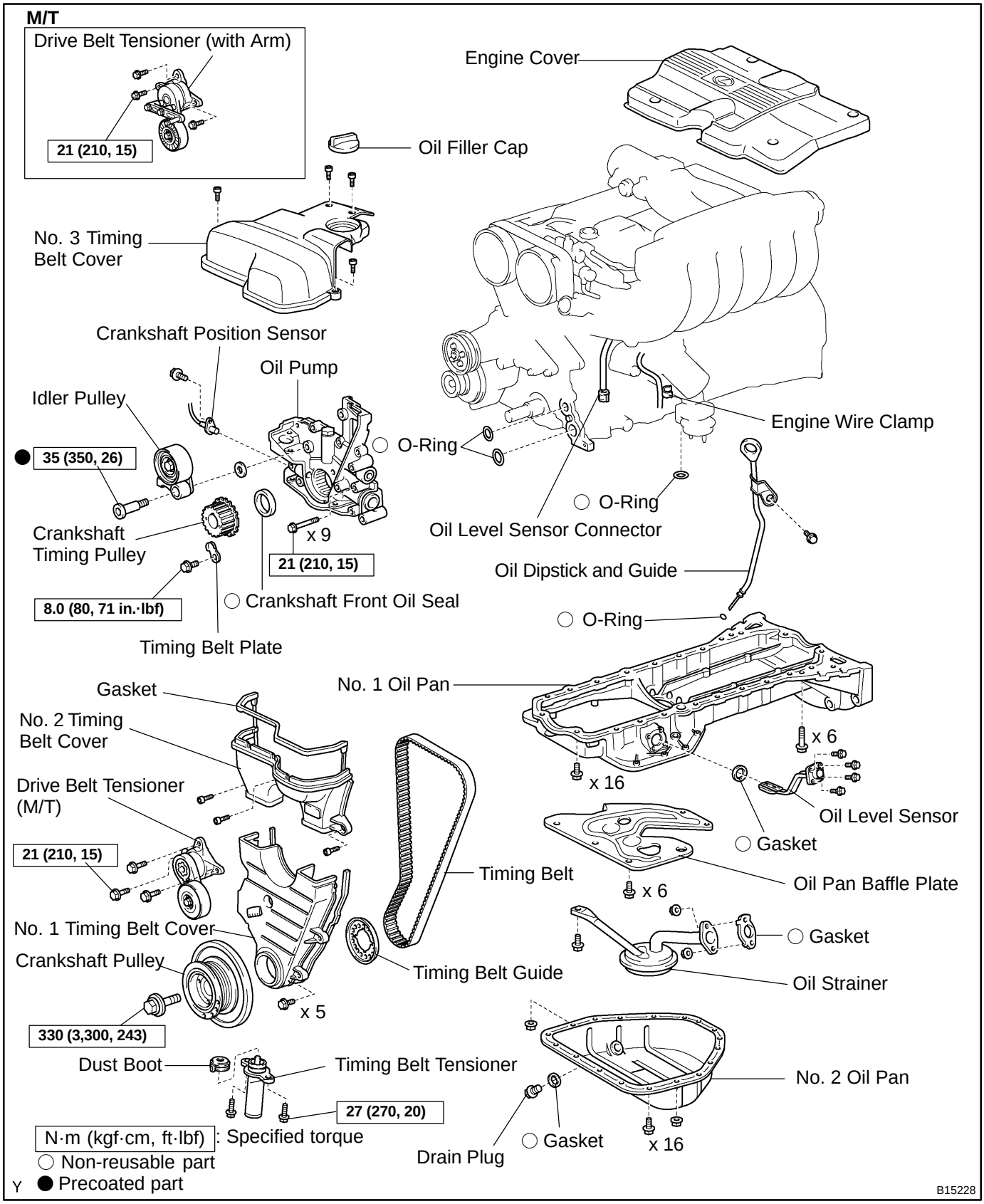
4. START ENGINE AND CHECK FOR OIL LEAKS

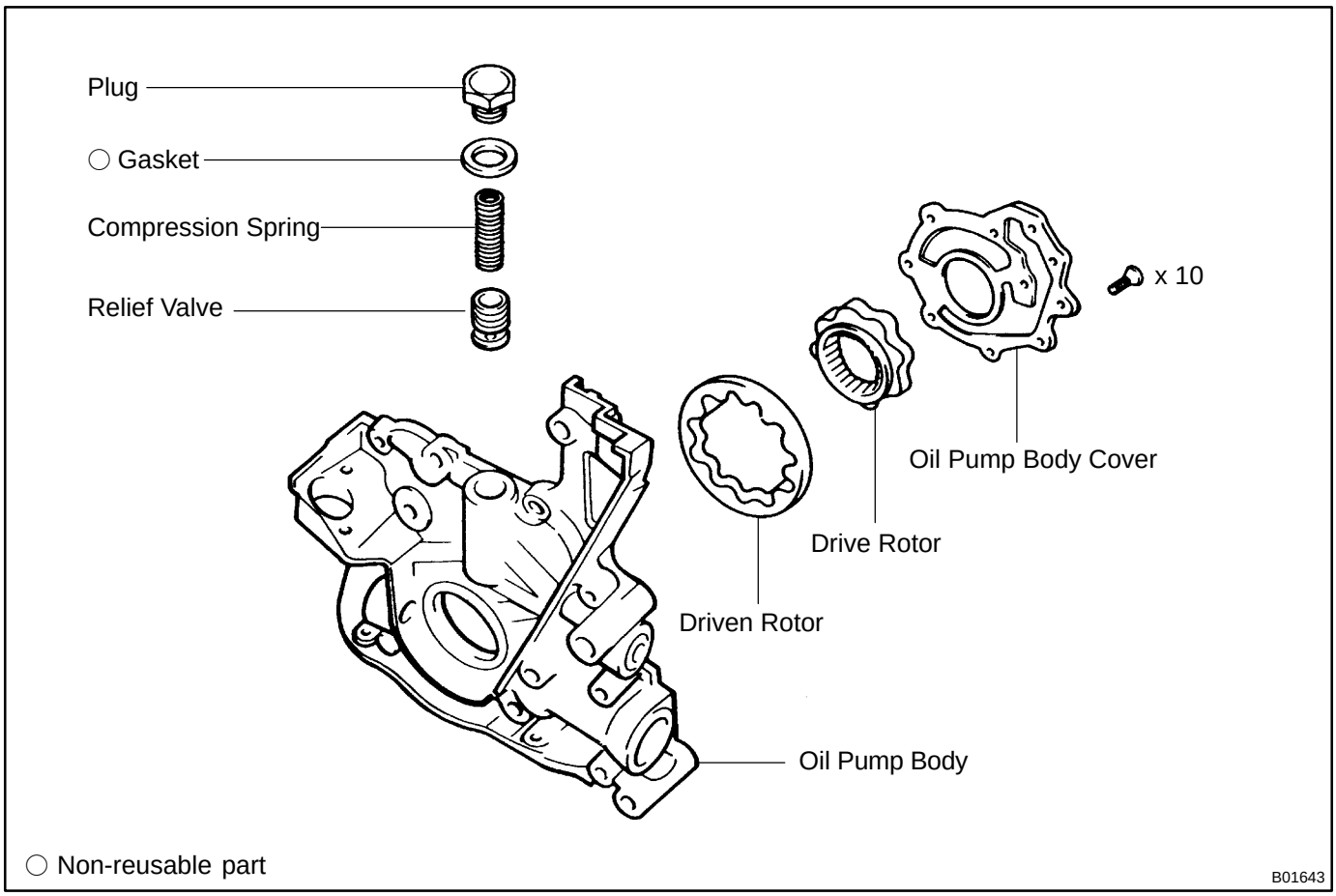
5. RECHECK ENGINE OIL LEVEL

OIL PUMP

COMPONENTS

LU05I-09




Plug
○ Gasket
Compression Spring
Relief Valve
x 10
Oil Pump Body Cover
Drive Rotor
Driven Rotor
Oil Pump Body
○ Non-reusable part
B01643

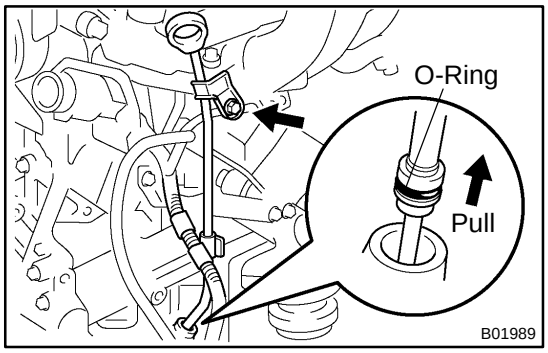
LU05J-07

REMOVAL

HINT:

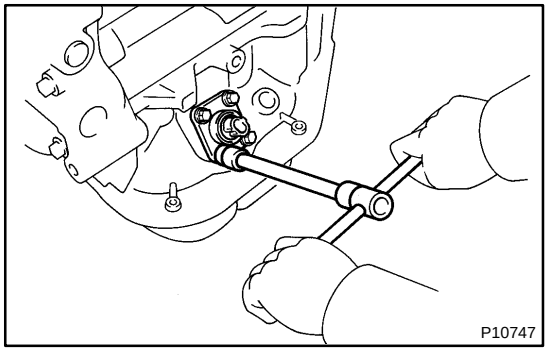
When repairing the oil pump, the oil pan and strainer should be removed and cleaned.

1. **REMOVE ENGINE WITH TRANSMISSION (See page EM-65)**
2. **SEPARATE ENGINE AND TRANSMISSION (See page EM-65)**
3. **INSTALL ENGINE TO ENGINE STAND FOR REMOVAL**
4. **REMOVE CRANKSHAFT POSITION SENSOR**
5. **REMOVE TIMING BELT, IDLER PULLEY AND CRANKSHAFT TIMING PULLEY (See page EM-17)**



6. **REMOVE OIL DIPSTICK AND GUIDE**

(a) Disconnect the engine wire clamp from the dipstick guide.
(b) Remove the bolt.
(c) Pull out the dipstick guide together with the dipstick.
(d) Remove the O-ring from the dipstick guide.

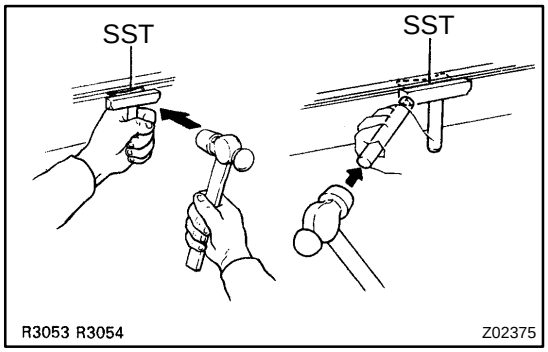


7. **REMOVE OIL LEVEL SENSOR**

(a) Disconnect the level sensor connector.
(b) Remove the 4 bolts and level sensor.
(c) Remove the gasket from the level sensor.

NOTICE:

Be careful not to drop the oil level sensor when removing it.

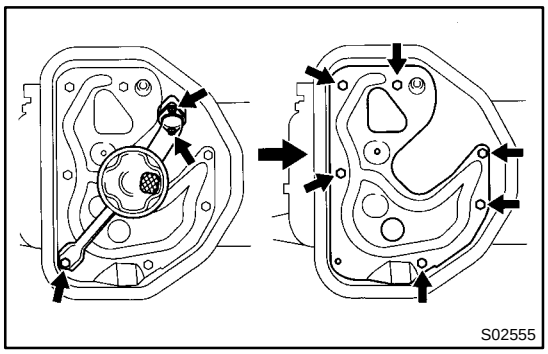


8. **REMOVE NO. 2 OIL PAN**

(a) Remove the 16 bolts and 2 nuts.
(b) Insert the blade of SST between the No. 1 and No. 2 oil pan, break the seal of the applied sealer and remove the No. 2 oil pan.
SST 09032-00100

NOTICE:

Be careful not to damage the No. 2 oil pan contact surface of the No.1 oil pan. Be careful not to damage the oil pan flange.

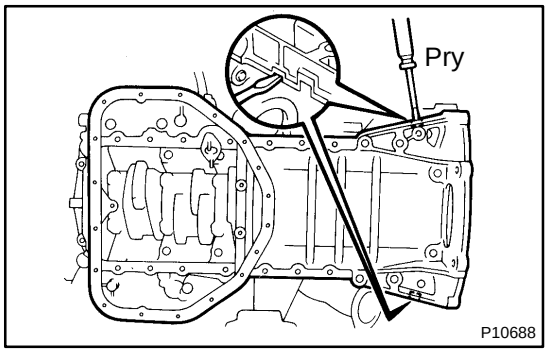


9. REMOVE OIL STRAINER

Remove the bolt, 2 nuts, oil strainer and gasket.

10. REMOVE OIL PAN BAFFLE PLATE

Remove the 6 bolts and baffle plate.



11. REMOVE NO. 1 OIL PAN

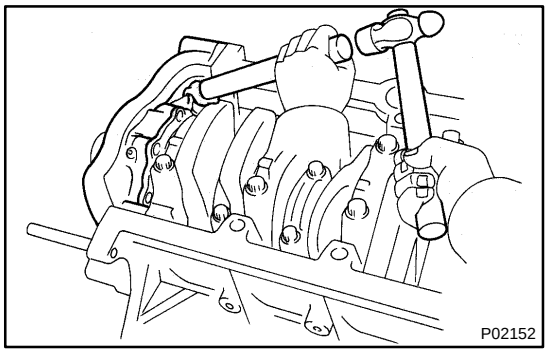
(a) Remove the 22 bolts.

(b) Remove the No. 1 oil pan by prying the portions between the cylinder block and No. 1 oil pan with a screwdriver.

NOTICE:

Be careful not to damage the contact surfaces of the cylinder block and No. 1 oil pan.

(c) Remove the O-ring from the cylinder block.



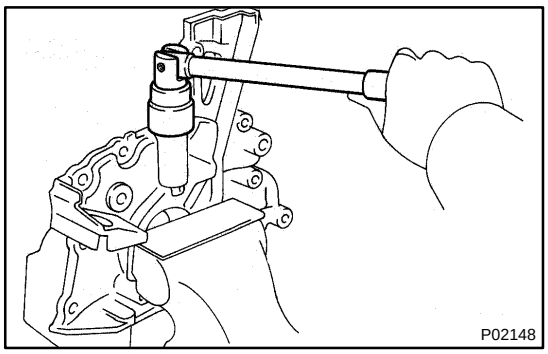
12. REMOVE OIL PUMP

(a) Remove the 9 bolts.

(b) Using a hammer and a brass bar, remove the oil pump by carefully tapping the oil pump body.

(c) Remove the 2 O-rings from the cylinder block.

LU05K-08



DISASSEMBLY

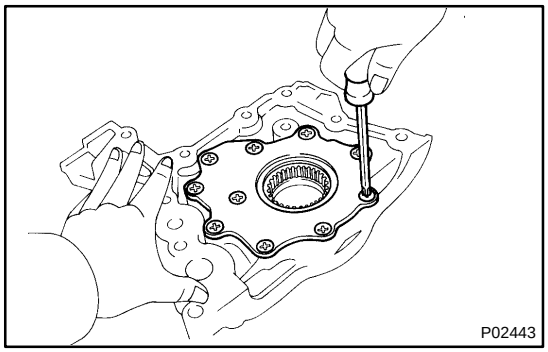
1. REMOVE RELIEF VALVE

(a) Carefully mount the pump body in a soft jaw vise.

(b) Remove the plug, gasket, compression spring and relief valve.

NOTICE:

Be careful not to damage the pump body.

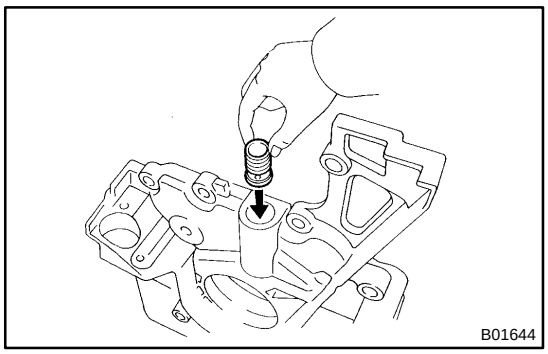


2. REMOVE DRIVE AND DRIVEN ROTORS

Remove the 10 screws, pump body cover, the drive and driven rotors.

LU05L-09

INSPECTION



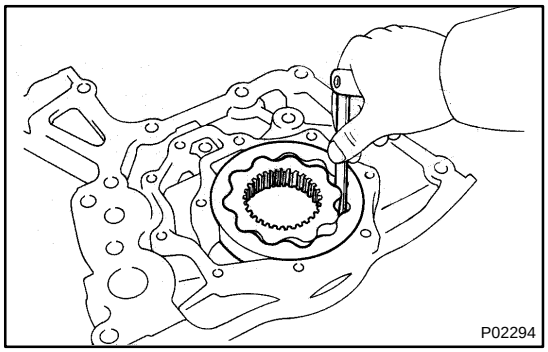
1. INSPECT RELIEF VALVE

Coat the valve with engine oil and check that it falls smoothly into the valve hole under its own weight.

If it doesn't, replace the relief valve. If necessary, replace the oil pump assembly.

2. INSPECT ROTORS

(a) Place the rotors into the oil pump body (See page LU-1 1).



(b) Inspect the rotors for the tip clearance.

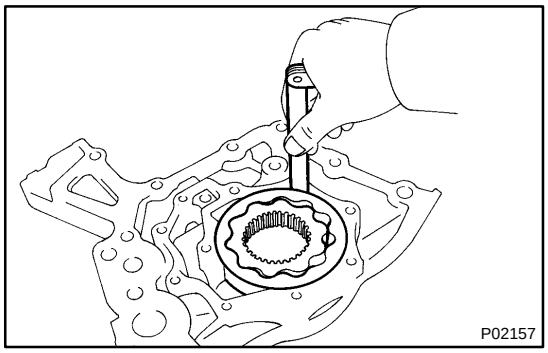
Using a feeler gauge, measure the clearance between the drive and driven rotors.

Standard tip clearance:

0.060 - 0.240 mm (0.0024 - 0.0094 in.)

Maximum tip clearance: 0.30 mm (0.0118 in.)

If the tip clearance is greater than maximum, replace the rotors as a set.



(c) Inspect the rotor for the body clearance.

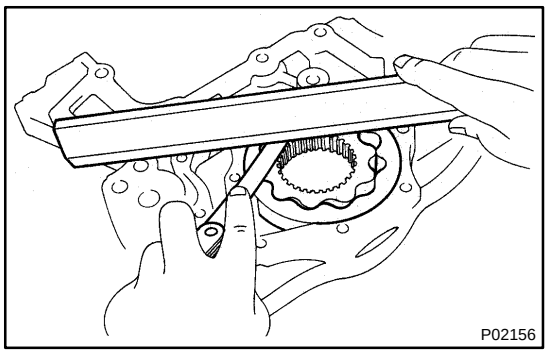
Using a feeler gauge, measure the clearance between the driven rotor and pump body.

Standard body clearance:

0.100 - 0.175 mm (0.0039 - 0.0069 in.)

Maximum body clearance: 0.20 mm (0.0079 in.)

If the body clearance is greater than maximum, replace the rotors as a set. If necessary, replace the oil pump assembly.



(d) Inspect the rotors for the side clearance.

Using a feeler gauge and precision straight edge, measure the clearance between the rotors and precision straight edge.

Standard side clearance:

0.030 - 0.090 mm (0.0012 - 0.0035 in.)

Maximum side clearance: 0.12 mm (0.0047 in.)

If the side clearance is greater than maximum, replace the rotors as a set. If necessary, replace the oil pump assembly.

(e) Remove the rotors.

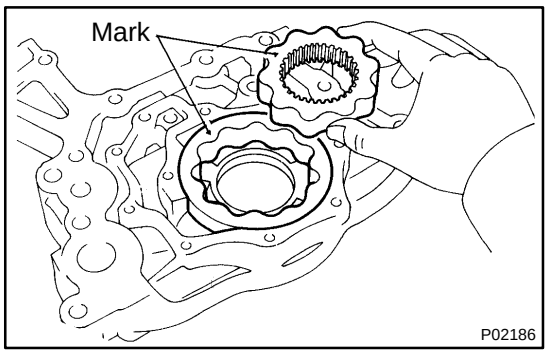
LU05M-04

REPLACEMENT

REPLACE FRONT CRANKSHAFT OIL SEAL (See page EM-92)

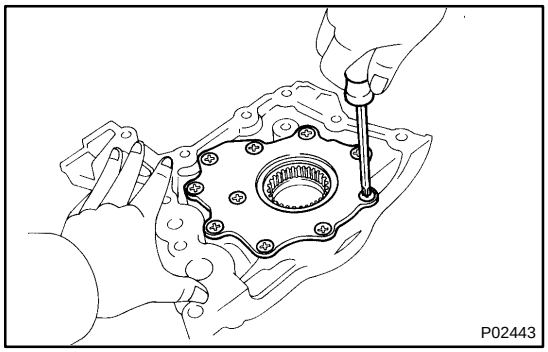
LU05N-08

REASSEMBLY

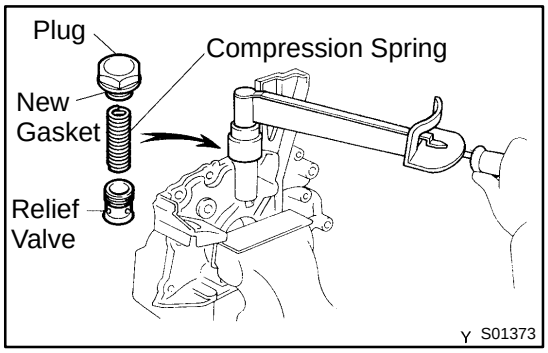


1. INSTALL DRIVE AND DRIVEN ROTORS

(a) Place the drive and driven rotors into oil pump body with the mark facing upward.



(b) Install the pump body cover with the 10 screws.
Torque: 10 N·m (105 kgf·cm, 8 ft·lbf)



2. INSTALL RELIEF VALVE

(a) Carefully mount the pump body in a soft jaw vise.

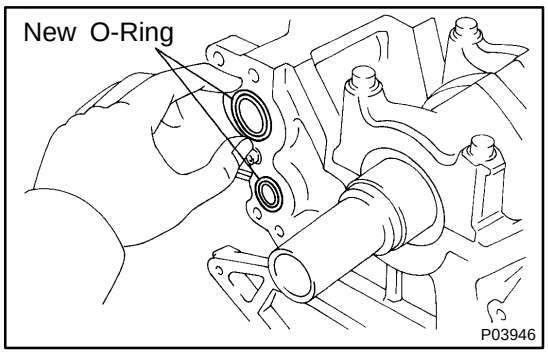
NOTICE:

Be careful not to damage the pump body.

(b) Insert the relief valve and compression spring into the oil pump body hole.

(c) Install the plug with a new gasket.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

LU05O-08



INSTALLATION

1. INSTALL OIL PUMP

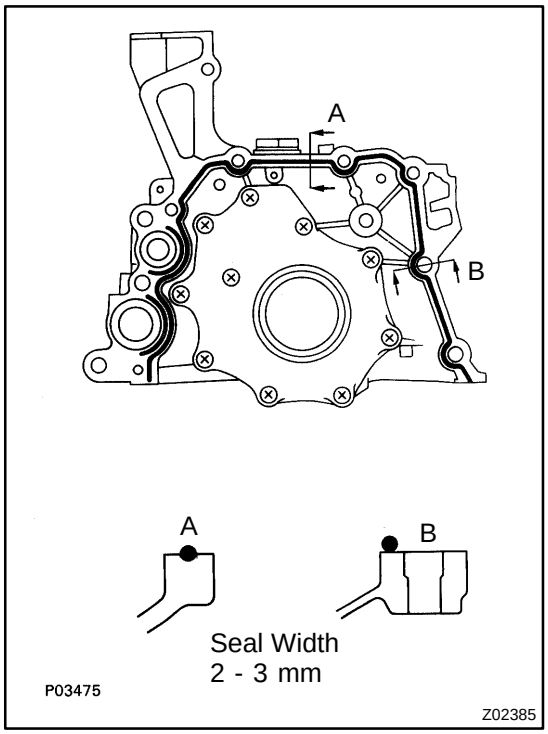
(a) Place 2 new O-rings in position on the cylinder block.

(b) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the oil pump and cylinder block.

- Using a razor blade gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces and sealing groove.
- Thoroughly clean all components to remove all the debris.
- Using a non-residue solvent, clean both sealing surfaces.

NOTICE:

Do not use a solvent which will affect the painted surfaces.



(c) Apply seal packing to the oil pump as shown in the illustration.

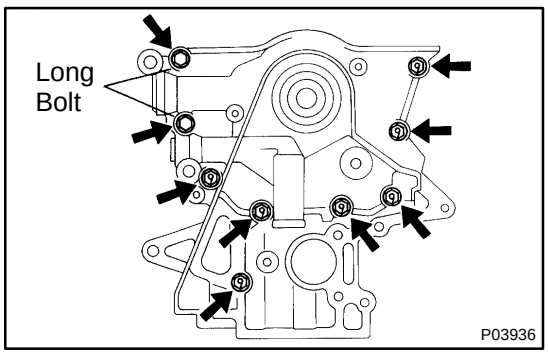
Seal packing: Part No.08826-00080 or equivalent

- Install a nozzle that has been cut to a 2 - 3 mm (0.08 - 0.12 in.) opening.

HINT:

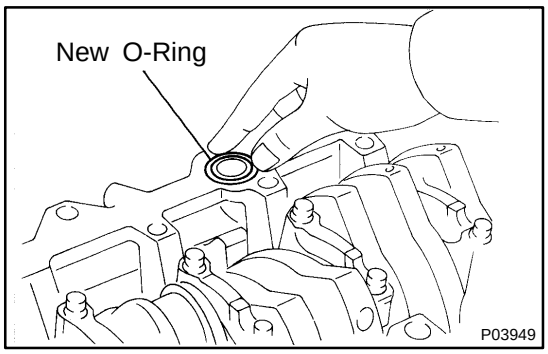
Avoid applying an excessive amount to the surface. Be particularly careful near oil passages.

- Parts must be assembled within 5 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.



(d) Install the oil pump with the 9 bolts.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)



2. INSTALL NO. 1 OIL PAN

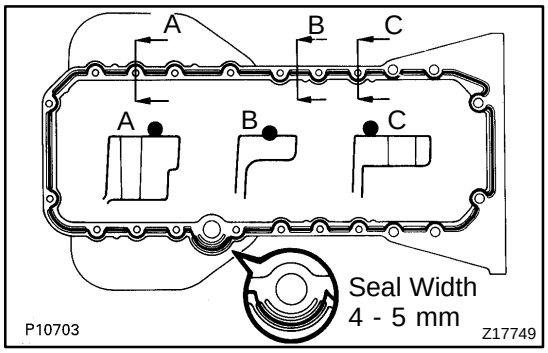
(a) Place a new O-ring in the position on the cylinder block.

(b) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the No. 1 oil pan and cylinder block.

- Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces and sealing groove.
- Thoroughly clean all components to remove all the debris.
- Using a non-residue solvent, clean both sealing surfaces.

NOTICE:

Do not use a solvent which will affect the painted surfaces.



(c) Apply seal packing to the No. 1 oil pan as shown in the illustration.

Seal packing: Part No.08826-00080 or equivalent

- Install a nozzle that has been cut to a 4 - 5 mm (0.16 - 0.20 in.) opening.

HINT:

Avoid applying an excessive amount to the surface.

- Parts must be assembled within 5 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.

(d) Install the No.1 oil pan with the 22 bolts.

Torque:

21 N·m (210 kgf·cm, 15 ft·lbf) for 12 mm head

40 N·m (400 kgf·cm, 30 ft·lbf) for 14 mm head

3. INSTALL OIL PAN BAFFLE PLATE

Torque: 9.0 N·m (90 kgf·cm, 80 in.·lbf)

4. INSTALL OIL STRAINER

Install a new gasket and the oil strainer with the bolt and 2 nuts.

Torque: 9.0 N·m (90 kgf·cm, 80 in.·lbf)

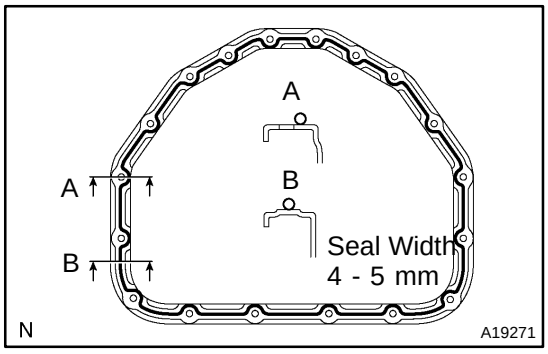
5. INSTALL NO. 2 OIL PAN

(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the No. 1 and No. 2 oil pans.

- Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces and sealing groove.
- Thoroughly clean all components to remove all the debris.

● Using a non-residue solvent, clean both sealing surfaces.

NOTICE:
Do not use a solvent which will affect the painted surfaces.

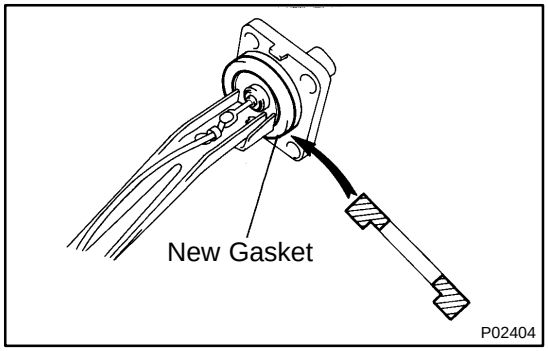


(b) Apply seal packing to the No. 2 oil pan as shown in the illustration.
Seal packing: Part No.08826-00080 or equivalent
Install a nozzle that has been cut to a 4 - 5 mm (0.16 - 0.20 in.) opening.

HINT:
Avoid applying an excessive amount to the surface.

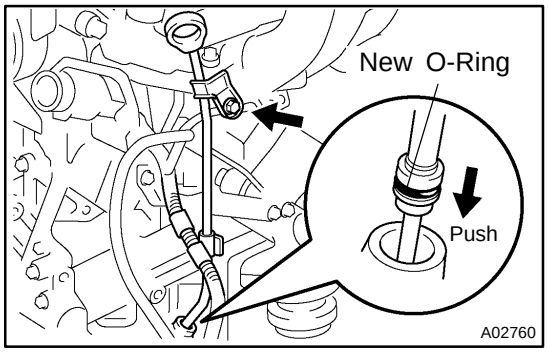
● Parts must be assembled within 5 minutes of application. Otherwise the material must be removed and reapplied.
● Immediately remove nozzle from the tube and reinstall cap.

(c) Install the No. 2 oil pan with the 16 bolts and 2 nuts.
Torque: 9.0 N·m (90 kgf·cm, 80 in.·lbf)



6. INSTALL OIL LEVEL SENSOR

(a) Install a new gasket to the level sensor.
(b) Install the level sensor with the 4 bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)
(c) Connect the level sensor connector.



7. INSTALL OIL DIPSTICK GUIDE AND DIPSTICK

(a) Install a new O-ring on the dipstick guide.
(b) Apply soapy water on the O-ring.
(c) Push in the dipstick guide into the guide hole of the No. 1 oil pan.
(d) Install the dipstick guide with the bolt.
(e) Install the dipstick.
(f) Connect the engine wire clamp to the dipstick guide.

8. INSTALL CRANKSHAFT TIMING PULLEY, IDLER PULLEY AND TIMING BELT (See page EM-24)

9. **INSTALL CRANKSHAFT POSITION SENSOR**
   Torque: 9.0 N·m (90 kgf·cm, 80 in.·lbf)
10. **REMOVE ENGINE STAND FROM ENGINE**
11. **ASSEMBLY ENGINE AND TRANSMISSION (See page EM-71)**
12. **INSTALL ENGINE WITH TRANSMISSION (See page EM-71)**

IGNITION SYSTEM

IG0K5-04

ON-VEHICLE INSPECTION

NOTICE:

"Cold" and "Hot" in these sentences express the temperature of the coils themselves. "Cold" is from -10 °C (14°F) to 50°C (122°F) and "Hot" is from 50°C (122°F) to 100°C (212°F).

1. INSPECT IGNITER AND SPARK TEST

Check that the spark occurs.

(1) Remove the ignition coil (See page IG-7).
(2) Using a 16 mm plug wrench, remove the spark plug.
(3) Install the spark plug to the ignition coil, and connect the ignition coil connector.
(4) Ground the spark plug.
(5) Check if spark occurs while engine is being cranked.

NOTICE:

To prevent excess fuel being injected from the injectors during this test, do not crank the engine for more 5 - 10 seconds at a time.

If the spark does not occur, do the test as follows:

SPARK TEST

NO

CHECK CONNECTION OF IGNITION COIL CONNECTOR → BAD → Connect securely.

OK

CHANGE IT TO NORMAL IGNITION COIL (WITH IGNITER) AND PERFORM SPARK TEST AGAIN → OK → Replace the ignition coil (with igniter).

NO

CHECK POWER SUPPLY TO IGNITION COIL (WITH IGNITER)
1. Turn ignition switch to ON.
2. Check that there is battery voltage at ignition coil positive (+) terminal.

→ BAD → Check wiring between ignition switch to ignition coil (with igniter).

OK

CHECK RESISTANCE OF CAMSHAFT POSITION SENSOR (See step 3)

	Cold	Hot
Resistance:	1,630 - 2,740 Ω	2,065 - 3.225 Ω

→ BAD → Replace the camshaft position sensor.

OK

CHECK RESISTANCE OF CRANKSHAFT POSITION SENSOR (See step 4)

	Cold	Hot
Resistance:	985 - 1,600 Ω	1,265 - 1,890 Ω

→ BAD → Replace the crankshaft position sensor.

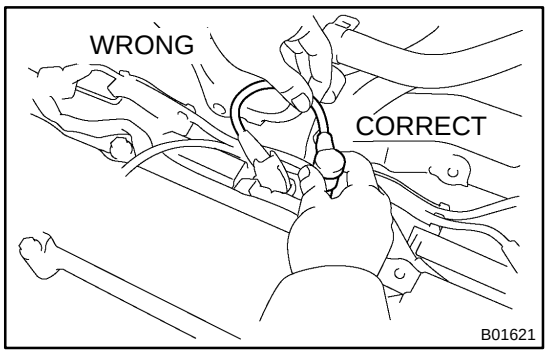
OK

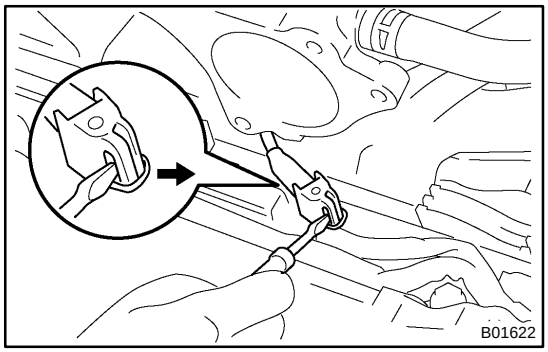
CHECK IGT SIGNAL FROM ECM (See page DI-201) → BAD → Check ECM (See page IN-33)

OK

REPAIR WIRING BETWEEN IGNITION COIL AND ECM

(6) Using a 16 mm plug wrench, reinstall the spark plug.
Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)
(7) Reinstall the ignition coil (See page IG-9).





2. INSPECT HIGH-TENSION CORDS

(a) Remove the No.3 timing belt cover.

(b) Remove the throttle body gasket (See page IG-7).

(c) Disconnect the high-tension cord set from the spark plugs.

Disconnect the high-tension cords at the rubber boot. DO NOT pull on the cords.

NOTICE:

Pulling on or bending the cords may damage the conductor inside.

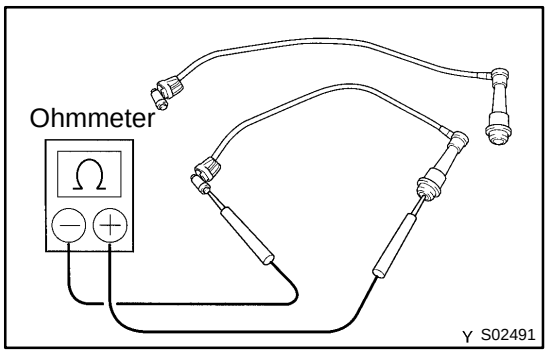
(d) Disconnect the high-tension cord set from the ignition coils.

(1) Using a screwdriver, lift up the lock claw and disconnect the holder from the ignition coils.

(2) Disconnect the high-tension cord at the grommet. DO NOT pull on the cord.

NOTICE:

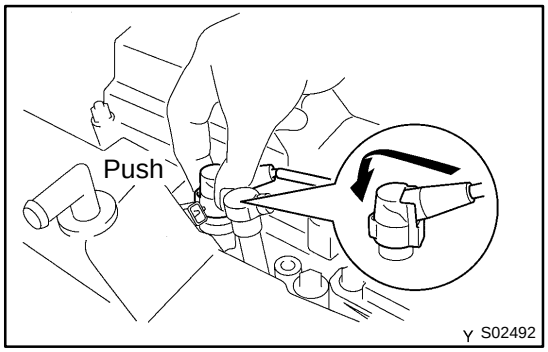
- **Pulling on or bending the cords may damage the conductor inside.**
- **Do not wipe any of the oil from the grommet after the high-tension cord is disconnected.**



(e) Using an ohmmeter, measure the resistance.

Maximum resistance: 25 kΩ per cord

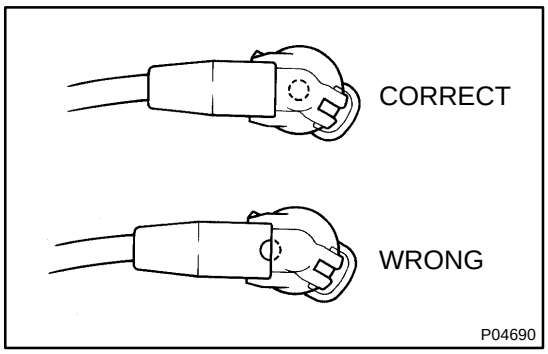
If the resistance is greater than the maximum, check the terminals. If necessary, replace the high-tension cord.



(f) Reconnect the high-tension cord set to the ignition coils.

(1) Assemble the holder and grommet.

(2) Align the spline of the ignition coil with the spline of the holder, and push in the cord.



NOTICE:

Check that the holder is correctly installed to the grommet as shown in the illustration.

(3) Check that the lock claw of the holder is engaged by lightly pulling the holder.

(g) Reconnect the high-tension cord set to the spark plugs.

(h) Reinstall the throttle body gasket (See page IG-9).

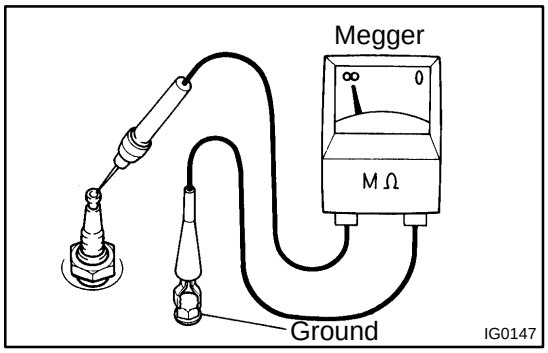
(i) Reinstall the No.3 timing belt cover.

3. INSPECT SPARK PLUGS

NOTICE:

- **Never use a wire brush for cleaning.**
- **Never attempt to adjust the electrode gap on used a spark plug.**

(a) Remove the ignition coils and high-tension cord set assembly (See page IG-7).



(b) Inspect the electrode.

- Using a megger (insulation resistance meter), measure the insulation resistance.

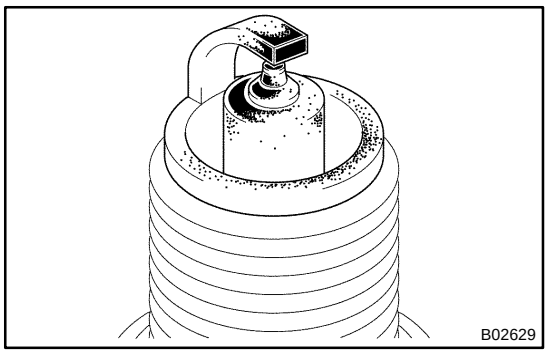
Standard correct insulation resistance:

10 MΩ or more

If the resistance is less than specified, proceed to step (d).

HINT:

If a megger is not available, the following simple method of inspection provides fairly accurate results.



- Simple Method:
  - Quickly race the engine 5 times to 4,000 rpm.
  - Remove the spark plug (See step c).
  - Visually check the spark plug.
    If the electrode is dry ... OK
    If the electrode is wet ... Proceed to step (d)
  - Reinstall the spark plug (See step g).

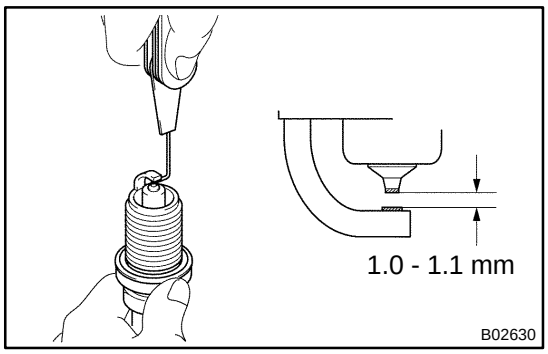
(c) Using a 16 mm plug wrench, remove the 6 spark plugs.

(d) Visually check the spark plug for thread damage and insulator damage.

If abnormal, replace the spark plug.

Recommended spark plug:

DENSO made	SK16R-P11



(e) Inspect the electrode gap.

Maximum electrode gap for used spark plug:
1.2 mm (0.047 in.)

If the gap is greater than maximum, replace the spark plug.

Correct electrode gap for new spark plug:
1.1 mm (0.043 in.)

NOTICE:

If adjusting the gap of a new spark plug, bend only the base of the ground electrode. Do not touch the tip. Never attempt to adjust the gap on the used plug.

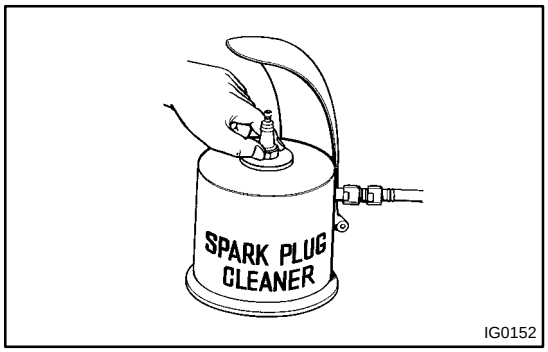
(f) Clean the spark plugs.

If the electrode has traces of wet carbon, allow it to dry and then clean with a spark plug cleaner.

Air pressure: Below 588 kPa (6 kgf/cm^2, 85 psi)
Duration: 20 seconds or less

HINT:

If there are traces of oil, remove it with gasoline before using the spark plug cleaner.



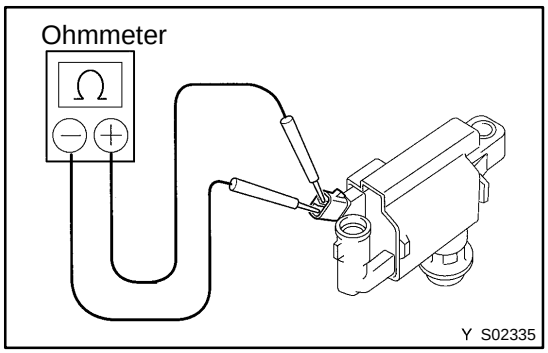
(g) Using a 16 mm plug wrench, reinstall the 6 spark plugs.

Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)

(h) Reinstall the ignition coils and high-tension cord set assembly (See page IG-9).

4. INSPECT IGNITION COILS

(a) Remove the ignition coil assembly (See page IG-7).

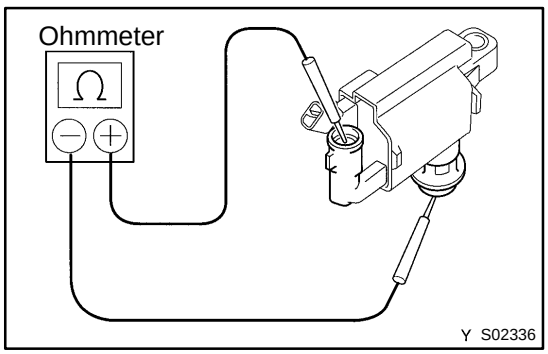


(b) Using an ohmmeter, measure the resistance between the positive (+) and negative (-) terminals.

Primary coil resistance:

Cold	0.33 - 0.52 Ω
Hot	0.42 - 0.61 Ω

If the resistance is not as specified, replace the ignition coil.



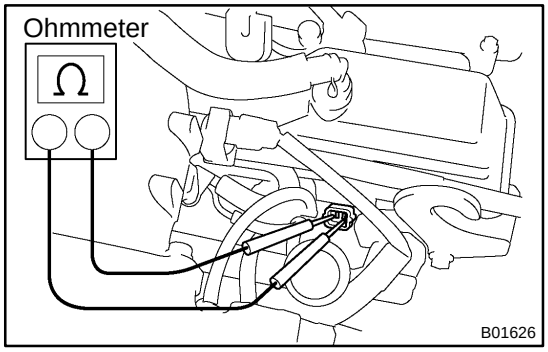
(c) Using an ohmmeter, measure the resistance between the positive (+) and high-tension terminal.

Secondary coil resistance:

Cold	8.5 - 14.7 kΩ
Hot	10.8 - 17.2 kΩ

If the resistance is not as specified, replace the ignition coil.

(d) Reinstall the ignition coil assembly (See page IG-9).



5. INSPECT CAMSHAFT POSITION SENSOR

(a) Disconnect the sensor connector.

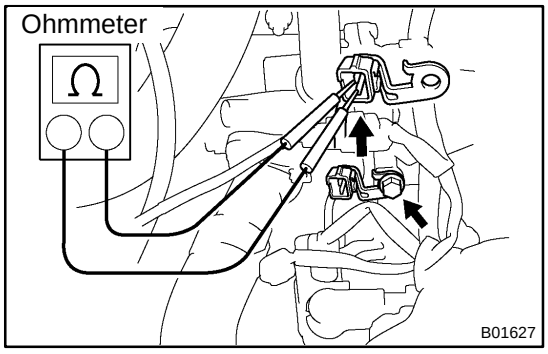
(b) Using an ohmmeter, measure the resistance between terminals.

Resistance:

Cold	835 - 1,400 Ω
Hot	1,060 - 1,645 Ω

If the resistance is not as specified, replace the sensor.

(c) Reconnect the camshaft position sensor connector.



6. INSPECT CRANKSHAFT POSITION SENSOR

(a) Disconnect the sensor connector.

(b) Remove the bolt holding the connector bracket to the water pump.

(c) Using an ohmmeter, measure the resistance between terminals.

Resistance:

Cold	1,630 - 2,740 Ω
Hot	2,065 - 3,225 Ω

If the resistance is not as specified, replace the sensor.

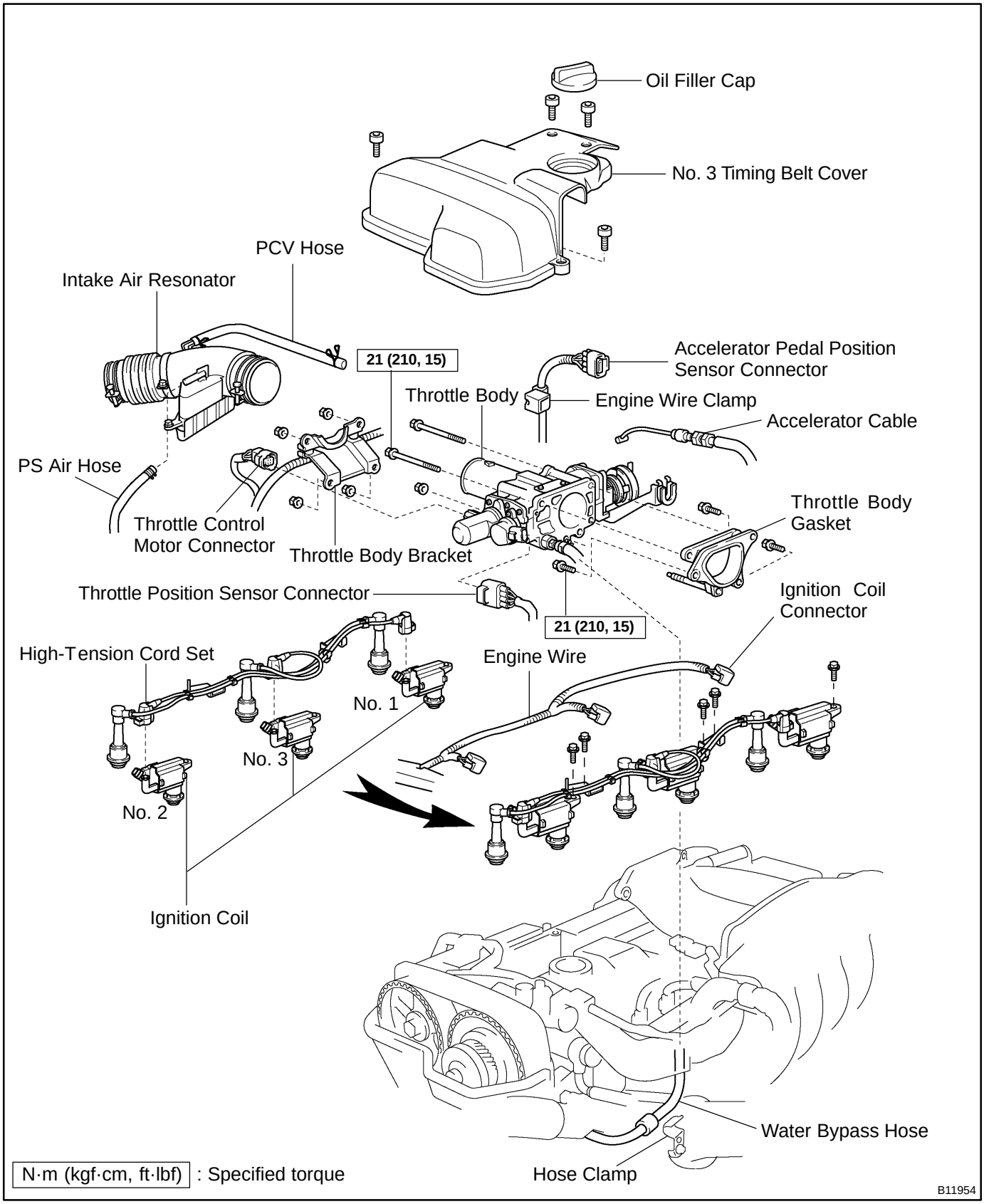
(d) Reinstall the bolt holding the connector bracket to the water pump.

(e) Reconnect the sensor connector.

IGNITION COIL

COMPONENTS

IG05T-08



IG05U-06

REMOVAL

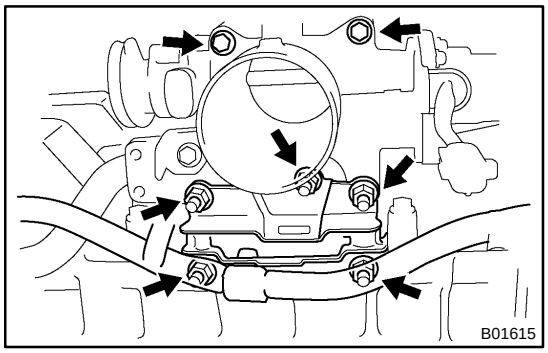
1. REMOVE INTAKE AIR RESONATOR

2. REMOVE NO. 3 TIMING BELT COVER

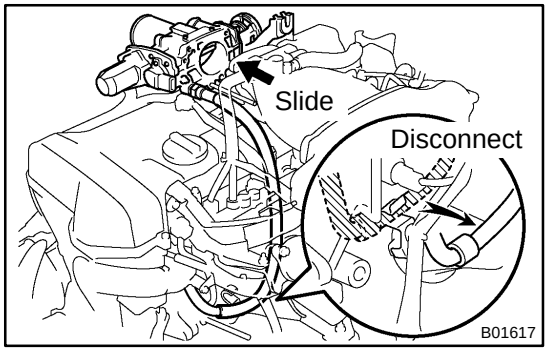
Using a 5 mm hexagon wrench, remove the 4 bolts, oil filler cap and No.3 timing belt cover.

3. DISCONNECT THROTTLE BODY FROM INTAKE AIR CONNECTOR WITHOUT DISCONNECTING WATER BYPASS HOSES

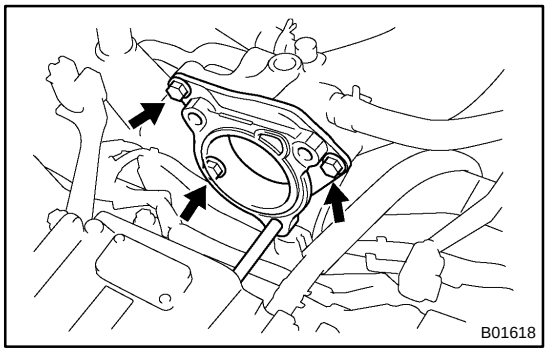
(a) Disconnect the accelerator cable.
(b) Disconnect the throttle position sensor connector.
(c) Disconnect the throttle control motor connector.
(d) Disconnect the accelerator pedal position sensor connector.
(e) Disconnect the engine wire clamp from the clamp bracket of the throttle body.



(f) Remove the 2 bolts and nut holding the throttle body to the intake air connector.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)
(g) Remove the 4 nuts and the throttle body bracket.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

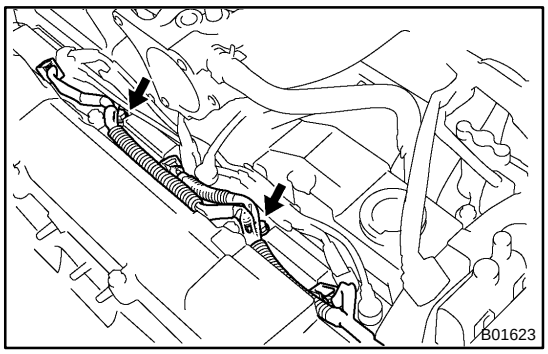


(h) Disconnect the water bypass hose from the hose clamp on the oil filter bracket.
(i) Slightly slide the throttle body away from the intake air connector.



4. REMOVE THROTTLE BODY GASKET

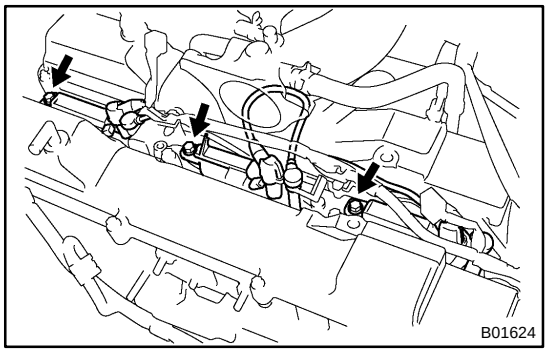
Remove the 3 bolts and throttle body gasket.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)



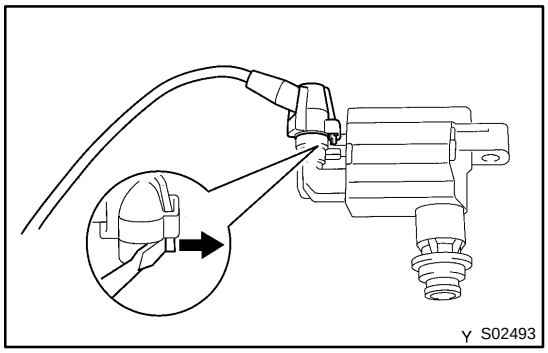
5. REMOVE IGNITION COILS AND HIGH- TENSION CORDS SET ASSEMBLY

(a) Disconnect the 3 connectors from the ignition coils.

(b) Remove the 2 bolts, and disconnect the clamps from the engine wire.



(c) Remove the 3 bolts, the ignition coils and high-tension cord set assembly.
Torque: 8.0 N·m (80 kgf·cm, 71 in.·lbf)



6. REMOVE IGNITION COILS FROM HIGH- TENSION CORD SET

IG00X-04

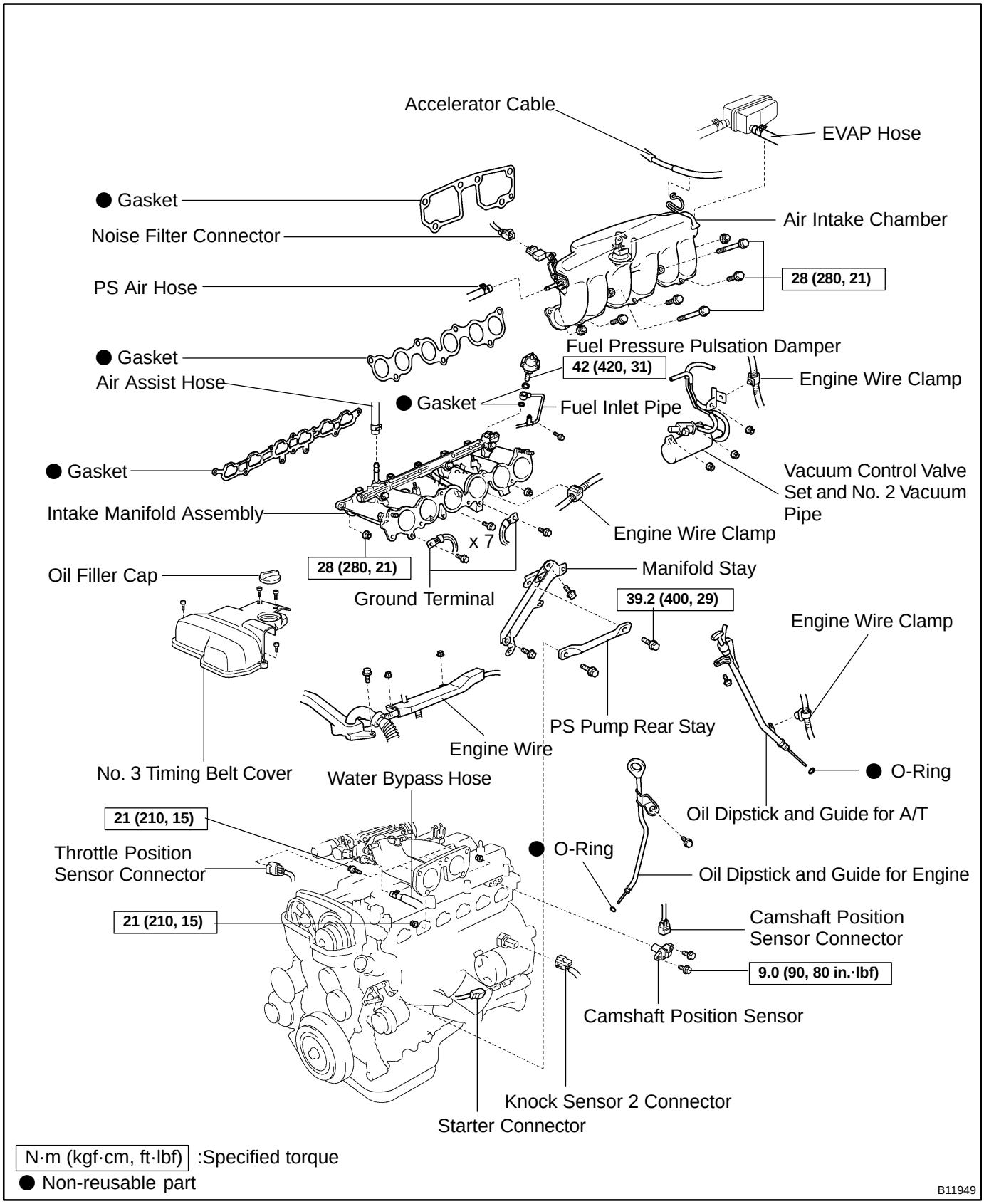
INSTALLATION

Installation is in the reverse order of removal (See page IG-7).

CAMSHAFT POSITION SENSOR

COMPONENTS

IG05V-08



IG05W-06

REMOVAL

1. DRAIN ENGINE COOLANT

2. REMOVE OIL DIPSTICK AND GUIDE FOR ENGINE (See page LU-6)

3. REMOVE OIL DIPSTICK AND GUIDE FOR A/T (See page EM-65)

4. REMOVE AIR INTAKE CHAMBER (See page SF-46)

5. REMOVE VACUUM CONTROL VALVE SET AND NO. 2 VACUUM PIPE (See page EM-34)

6. REMOVE NO. 3 TIMING BELT COVER

7. DISCONNECT HOSES AND ENGINE WIRE

(a) Disconnect the air assist hose from the intake manifold.

(b) Disconnect the water bypass hose (from the water outlet) from the throttle body.

(c) Disconnect the 2 ground terminals from the intake manifold.

HINT:

At time of the installation, tighten so that each calking part should inside.

(d) Disconnect the throttle position sensor connector.

(e) Disconnect the 6 injector connectors.

(f) Disconnect the camshaft position sensor connector.

(g) Disconnect the knock sensor 2 connector.

(h) Disconnect the starter connector.

(i) Disconnect the engine wire clamp from the clamp bracket on the intake manifold.

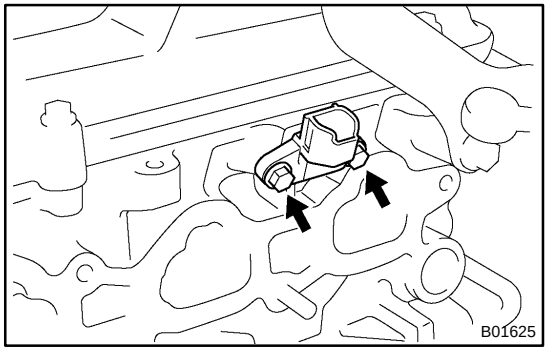
(j) Remove the 3 nuts, and disconnect the engine wire protector from the intake manifold.

8. REMOVE FUEL PRESSURE PULSATION DAMPER (See page SF-26)

9. REMOVE PS PUMP REAR STAY

Torque: 39.2 N·m (400 kgf·cm, 29 ft·lbf)

10. REMOVE INTAKE MANIFOLD ASSEMBLY (See page EM-34)



11. REMOVE CAMSHAFT POSITION SENSOR

Remove the 2 bolts and sensor.

Torque: 9.0 N·m (90 kgf·cm, 80 in.·lbf)

IG05X-03

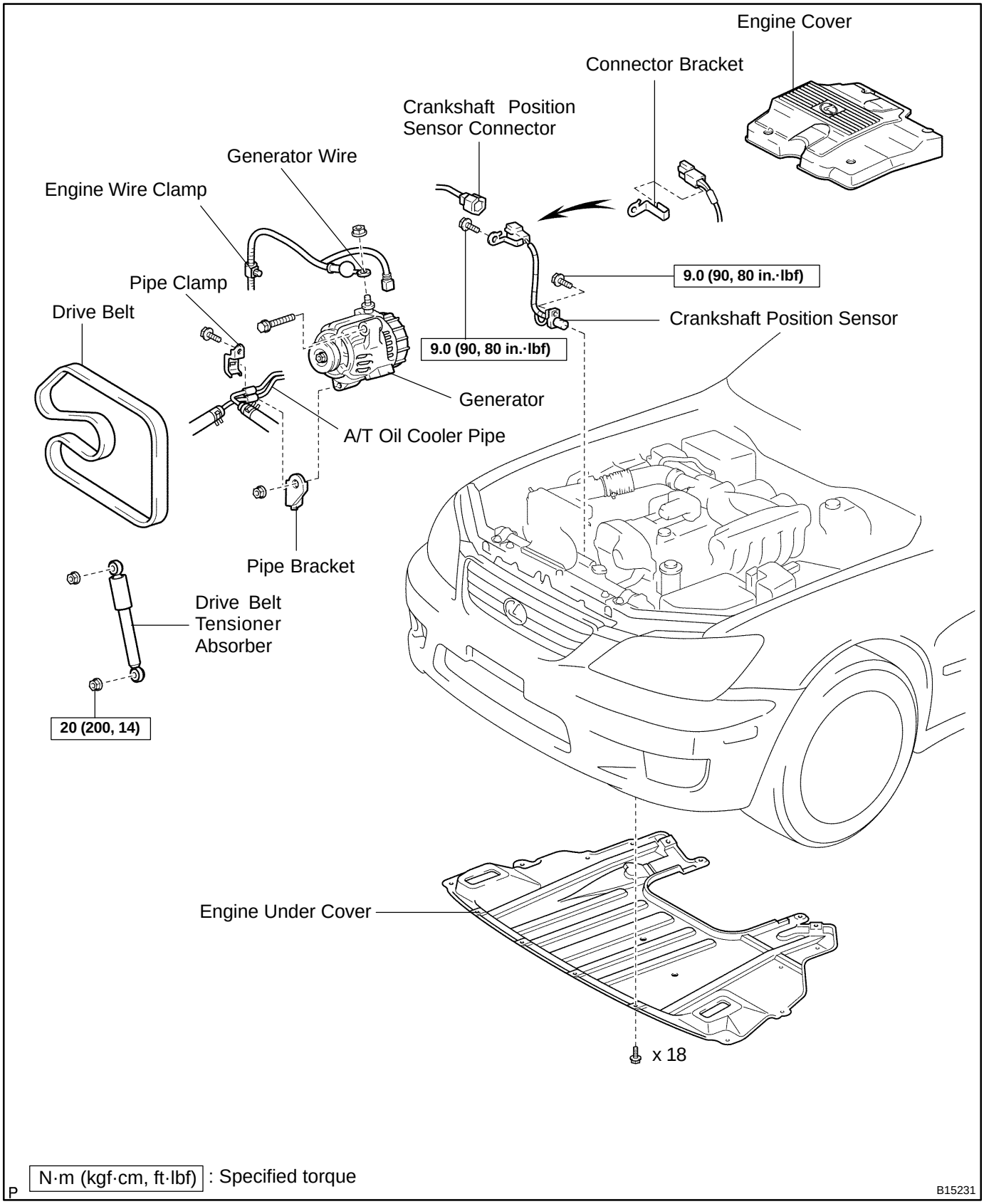
INSTALLATION

Installation is in the reverse order of removal (See page IG-1 1).

CRANKSHAFT POSITION SENSOR

IG060-09

COMPONENTS



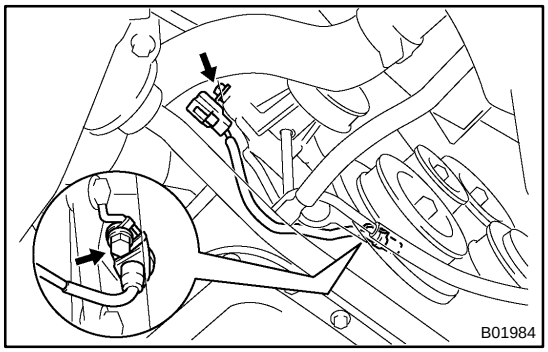
IG05Y-08

REMOVAL

1. REMOVE GENERATOR (See page CH-6)

2. DISCONNECT CRANKSHAFT POSITION SENSOR CONNECTOR

(a) Disconnect the sensor connector.



(b) Remove the bolt holding the connector bracket to the water pump.

3. REMOVE CRANKSHAFT POSITION SENSOR

(a) Remove the bolt and sensor.

Torque: 9.0 N·m (90 kgf·cm, 80 in.·lbf)

(b) Remove the connector bracket from the connector.

IG05Z-04

INSTALLATION

Installation is in the reverse order of removal (See page IG-14).

STARTING SYSTEM

ST04X-01

ON-VEHICLE INSPECTION

NOTICE:

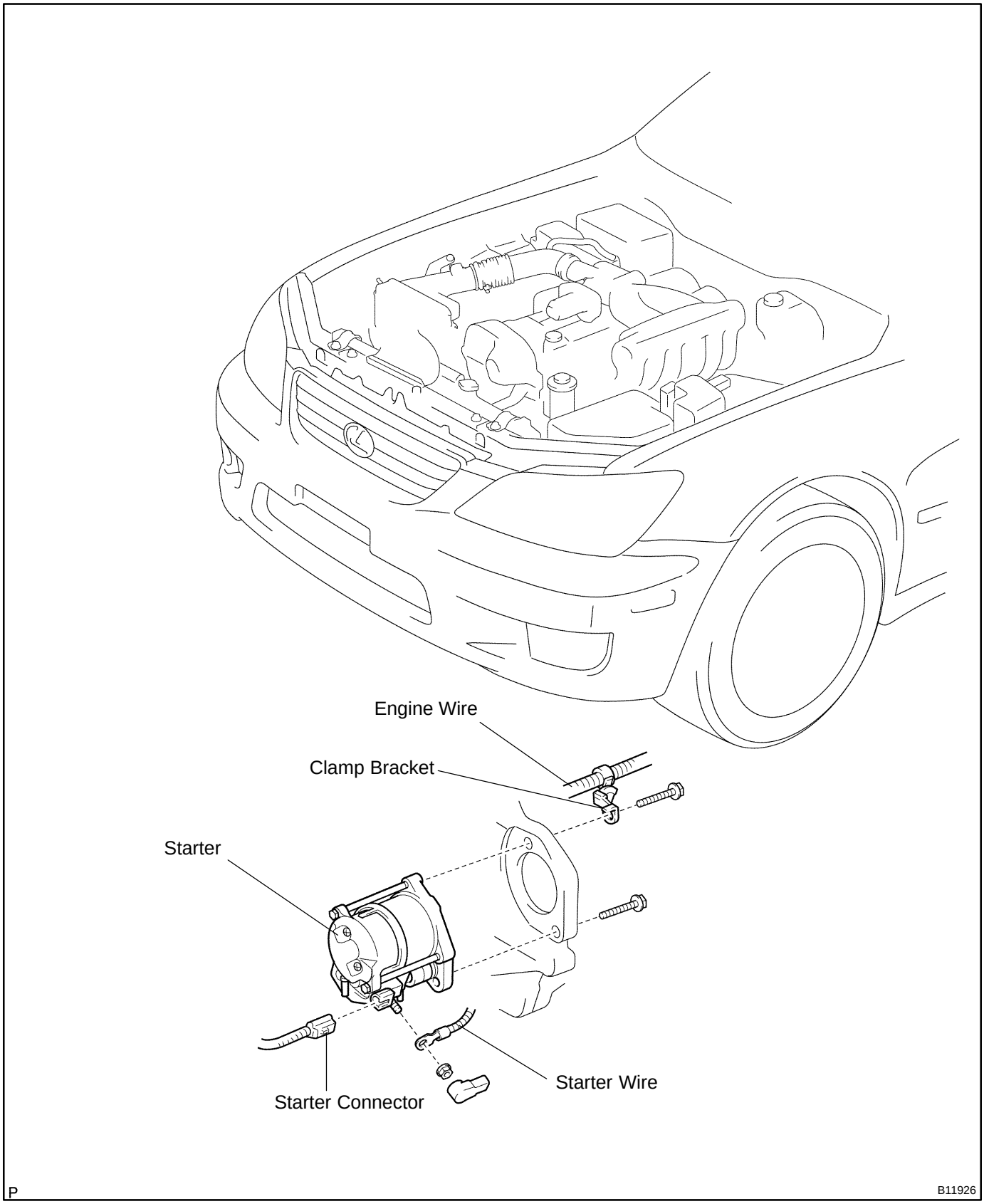
Before changing the starter, check the following items again:

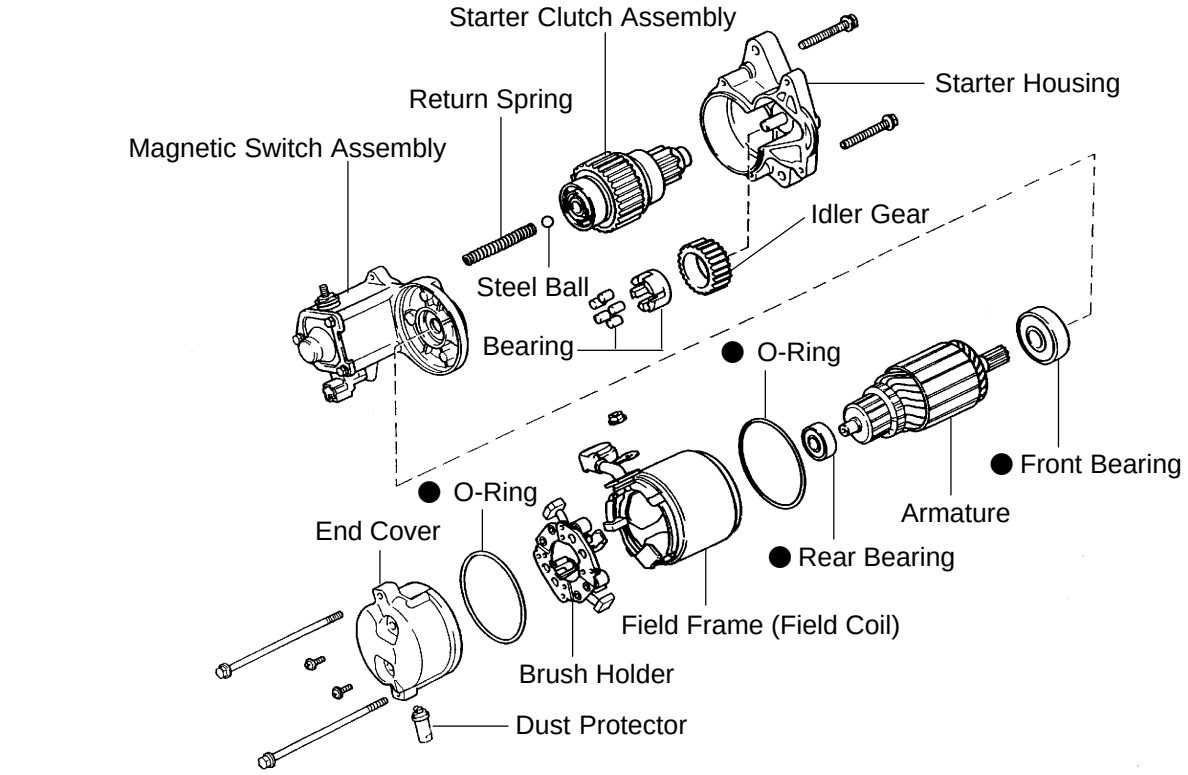
- **Connector connection**
- **Accessory installation, e.g.: theft deterrent system**

STARTER

COMPONENTS

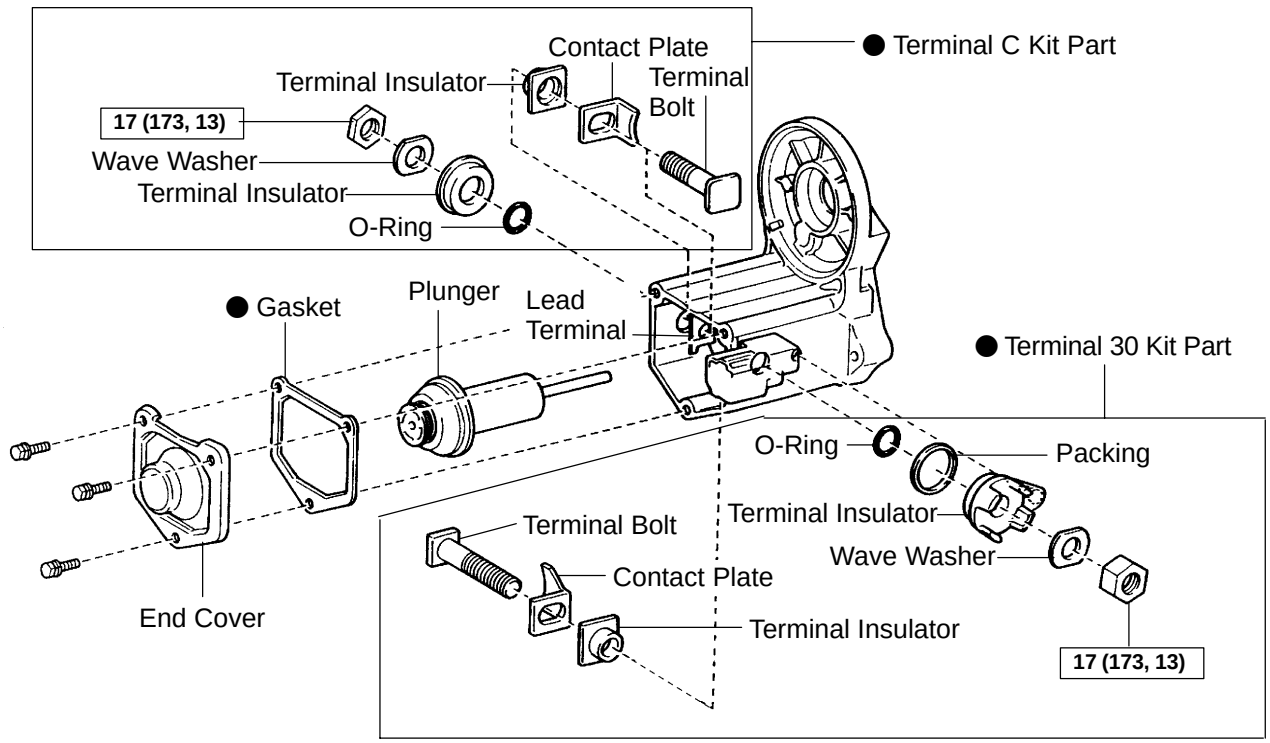
ST04Y-04





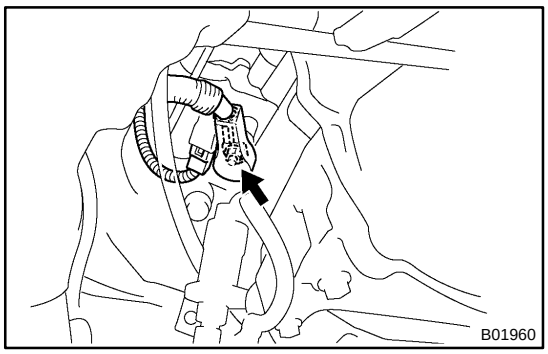
B01640

Magnetic Switch Assembly



B11947

ST04Z-04

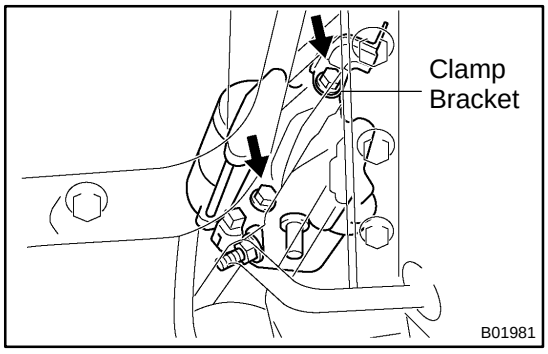


REMOVAL

REMOVE STARTER

(a) Remove the rubber cap and nut, and disconnect the starter wire.

(b) Disconnect the starter connector.



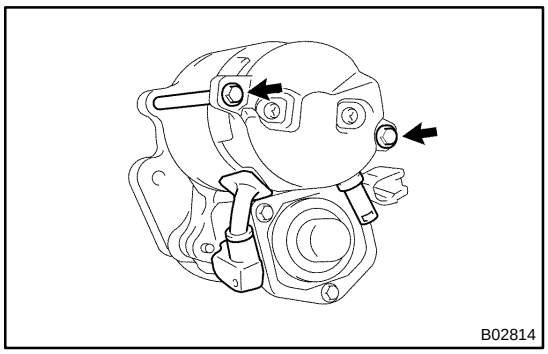
(c) Remove the 2 bolts and starter.
Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)

HINT:

At time of the installation, when installing the upper bolt, tighten it together with the clamp bracket.

ST050-05

DISASSEMBLY

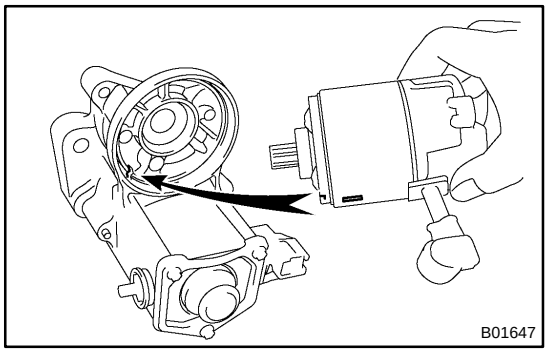

B02814

1. REMOVE DUST PROTECTOR

2. REMOVE FIELD FRAME AND ARMATURE

(a) Remove the nut, and disconnect the lead wire from the magnetic switch terminal.
Torque: 5.9 N·m (60 kgf·cm, 52 in.·lbf)

(b) Remove the 2 through bolts.
Torque: 5.9 N·m (60 kgf·cm, 52 in.·lbf)


B01647

(c) Pull out the field frame together with the armature.

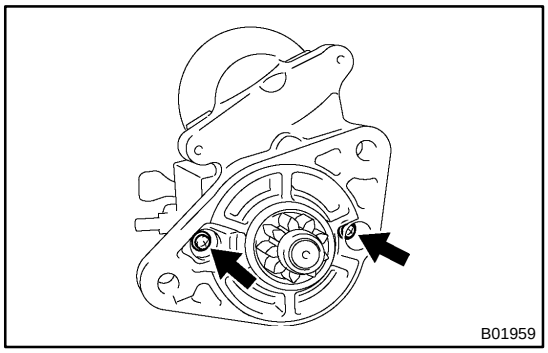
HINT:

At the time of reassembly, align the protrusion of the field frame with the cutout of the magnetic switch.

(d) Remove the O-ring from the field frame.

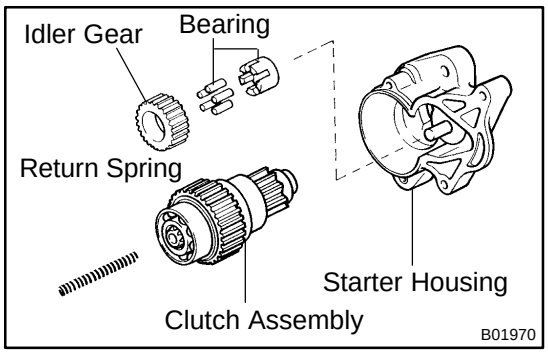
HINT:

At the time of reassembly, use a new O-ring.


B01959

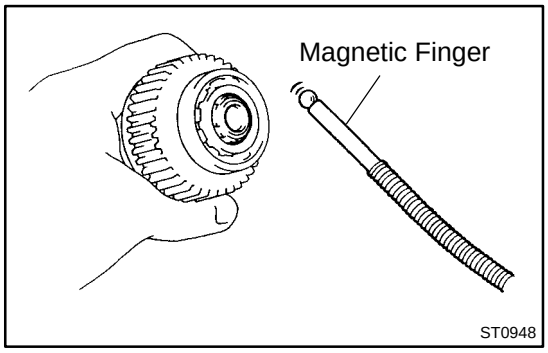
3. REMOVE STARTER HOUSING, CLUTCH ASSEMBLY AND GEAR

(a) Remove the 2 bolts.
Torque: 5.9 N·m (60 kgf·cm, 52 in.·lbf)



B01970

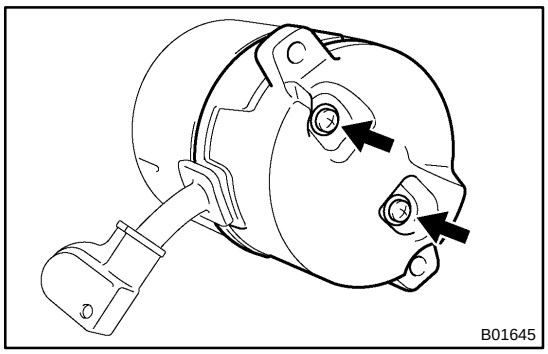
(b) Remove the starter housing, idler gear, bearing, clutch assembly and return spring from the magnetic switch.



ST0948

4. REMOVE STEEL BALL

Using a magnetic finger, remove the steel ball from the clutch shaft hole.



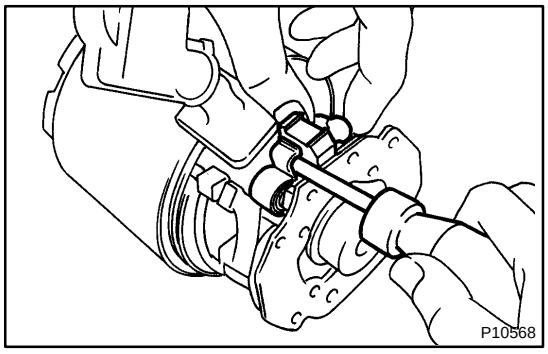
5. REMOVE BRUSH HOLDER

(a) Remove the 2 screws and end cover from the field frame.
Torque: 1.5 N·m (15 kgf·cm, 13 in.·lbf)

(b) Remove the O-ring from the field frame.

HINT:

At the time of reassembly, use a new O-ring.



(c) Using a screwdriver, hold the spring back and disconnect the brush from the brush holder. Disconnect the 4 brushes, and remove the brush holder.

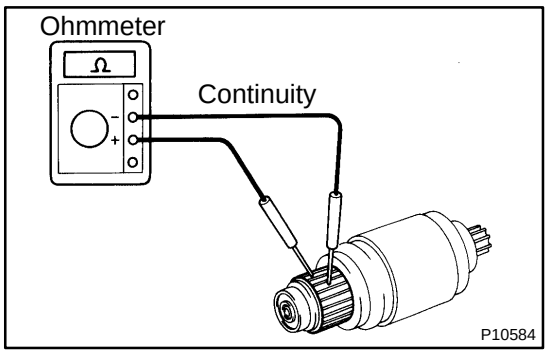
NOTICE:

At the time of reassembly, check that the positive (+) lead wires are not grounded.

6. REMOVE ARMATURE FROM FIELD FRAME

ST051-06

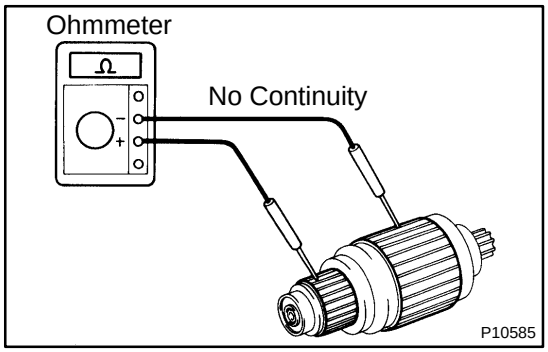
INSPECTION



1. INSPECT ARMATURE COIL

(a) Check the commutator for open circuit.
Using an ohmmeter, check that there is continuity between the segments of the commutator.

If there is no continuity between any segment, replace the armature.



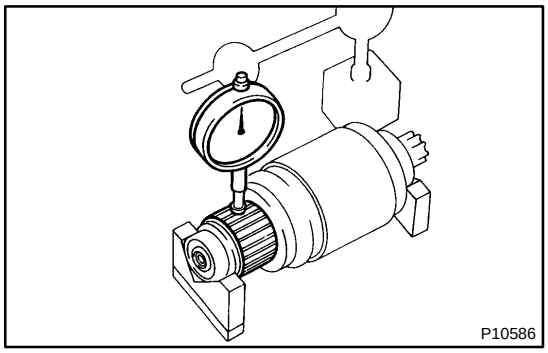
(b) Check the commutator for ground.
Using an ohmmeter, check that there is no continuity between the commutator and armature coil core.

If there is no continuity, replace the armature.

2. INSPECT COMMUTATOR

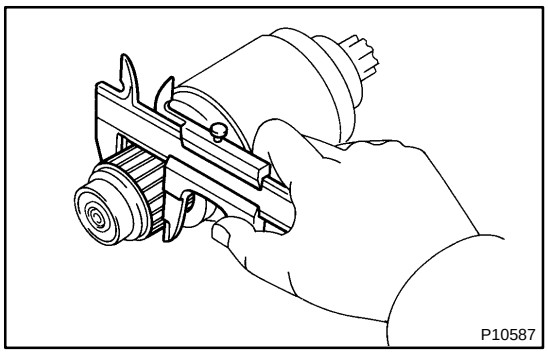
(a) Check the commutator for the dirty and burnt surfaces.

If the surface is dirty or burnt, correct it with sandpaper (No.400) or on a table.



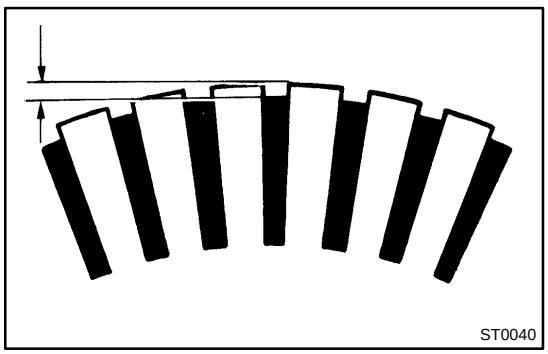
(b) Check for the commutator circle runout.
(1) Place the commutator on V-blocks.
(2) Using a dial gauge, measure the circle runout.
Maximum circle runout: 0.05 mm (0.0020 in.)

If the circle runout is greater than maximum, correct it on a lathe.



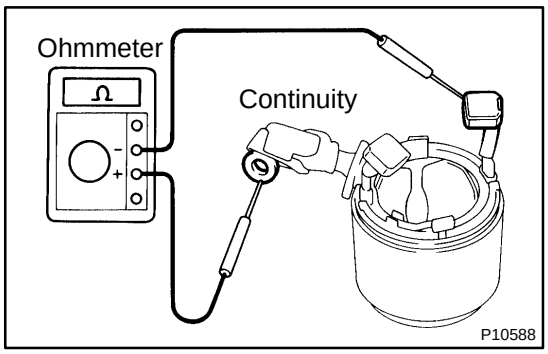
(c) Using a vernier caliper, measure the commutator diameter.
Standard diameter: 30.0 mm (1.181 in.)
Minimum diameter: 29.0 mm (1.412 in.)

If the diameter is less than minimum, replace the armature.



(d) Check that the undercut depth is clean and free of foreign materials. Smooth out the edge.
Standard undercut depth: 0.6 mm (0.024 in.)
Minimum undercut depth: 0.2 mm (0.008 in.)

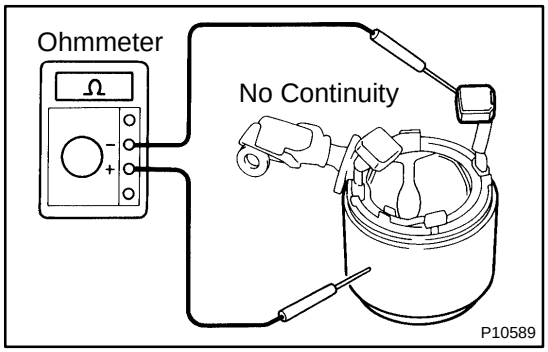
If the undercut depth is less than minimum, correct it with a hacksaw blade.



3. INSPECT FIELD COIL

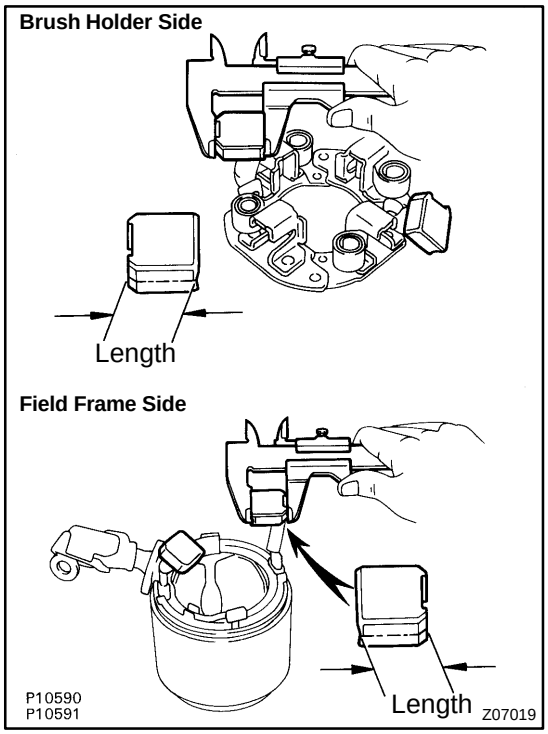
(a) Check the field coil for open circuit.
Using an ohmmeter, check that there is continuity between the lead wire and field coil brush lead.

If there is no continuity, replace the field frame.



(b) Check the field coil for ground.
Using an ohmmeter, check that there is no continuity between the field coil end and field frame.

If there is continuity, replace the field frame.

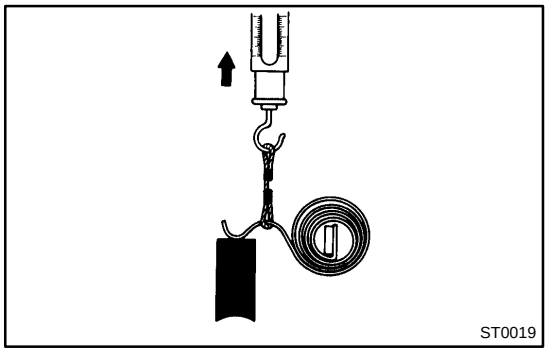


4. INSPECT BRUSHES

Using a vernier caliper, measure the brush length.

Standard length: 15.5 mm (0.610 in.)
Minimum length: 10.0 mm (0.394 in.)

If the length is less than minimum, replace the brush holder and field frame.

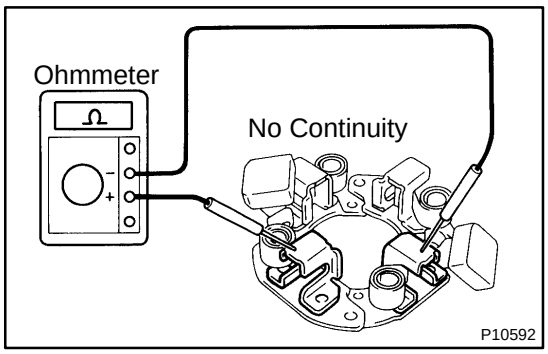


5. INSPECT BRUSH SPRINGS

Check the brush spring load. Take the pull scale reading the instant the brush spring separates from the brush.

Standard spring installed load:
17.6 - 23.5 N (1.8 - 2.4 kgf, 3.9 - 5.3 lbf)
Minimum spring installed load:
11.8 N (1.2 kgf, 2.6 lbf)

If the installed load is less than minimum, replace the brush springs.



6. INSPECT BRUSH HOLDER

Check the brush holder insulator. Using an ohmmeter, check that there is no continuity between the positive (+) and negative (-) brush holders.

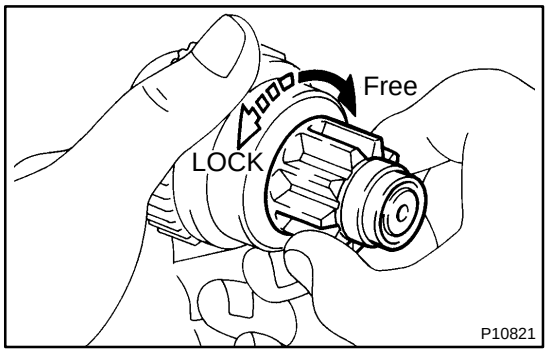
If there is continuity, repair or replace the brush holder.

7. INSPECT CLUTCH AND GEAR

(a) Check the gear teeth on the pinion gear, idle gear and the clutch assembly for wear or damage.

If damaged, replace the gear or clutch assembly.

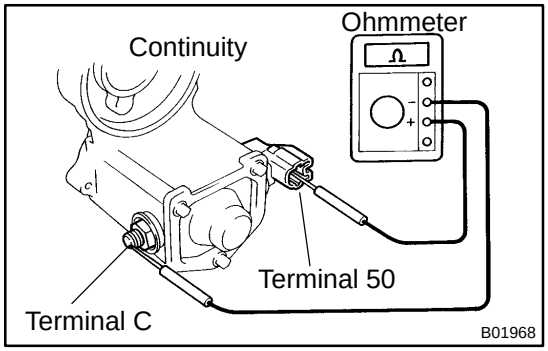
If damaged, also check the drive plate ring gear for wear or damage.



(b) Check the clutch pinion gear.

Rotate the pinion gear counterclockwise, and check that it turns freely. Try to rotate the pinion gear clockwise and check that it locks.

If necessary, replace the clutch assembly.

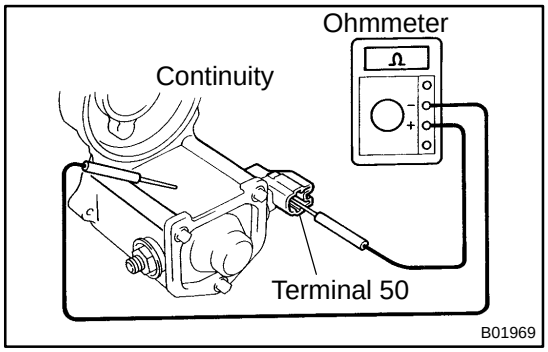


8. INSPECT MAGNETIC SWITCH

(a) Check the pull -in coil for open circuit.

Using an ohmmeter, check that there is continuity between terminals 50 and C.

If there is no continuity, check and replace the magnetic switch.



(b) Check the hold-in coil for open circuit.

Using an ohmmeter, check that there is continuity between terminal 50 and the switch body.

If there is no continuity, replace the magnetic switch.

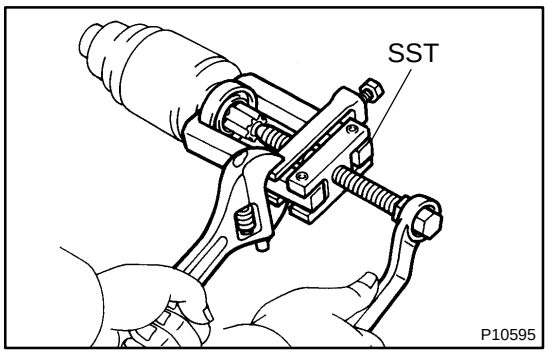
9. INSPECT BEARING

Turn the bearing by hand and while apply inward force.

If resistance is felt or bearing sticks, replace the bearing (See page ST-10).

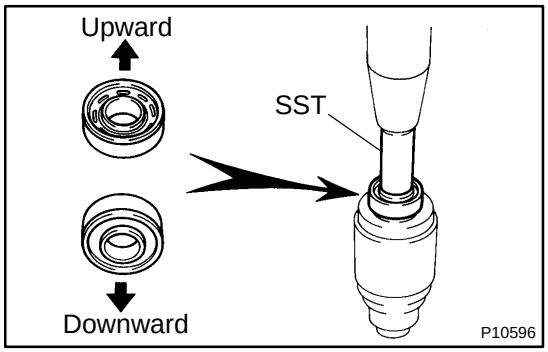
ST052-08

REPLACEMENT



1. REPLACE FRONT BEARING

(a) Using SST, remove the bearing.
SST 09286-4601 1

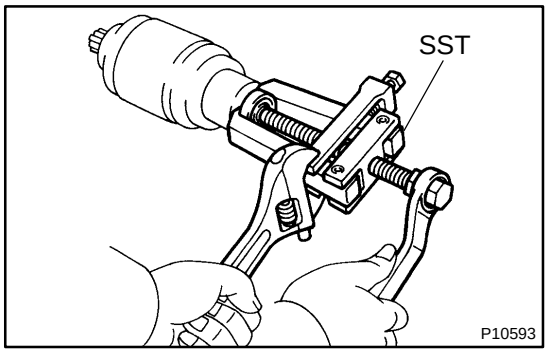


(b) Using SST and a press, press in a new bearing.

NOTICE:

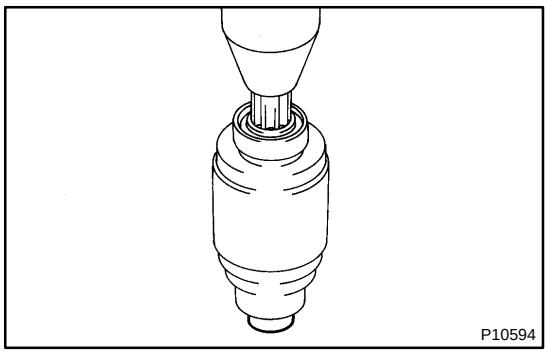
Be careful of the bearing installation direction.

SST 09820-00031

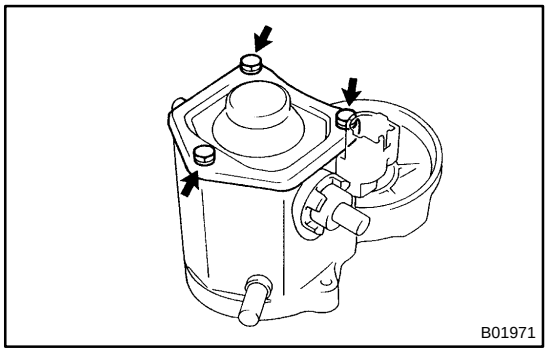


2. REPLACE REAR BEARING

(a) Using SST, remove the bearing.
SST 09286-4601 1

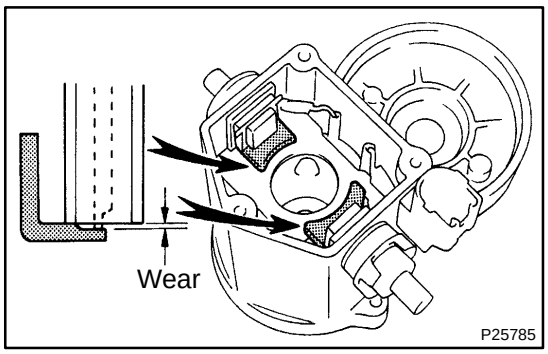


(b) Using a press, press in a new rear bearing.



3. REPLACE MAGNETIC SWITCH TERMINAL PARTS

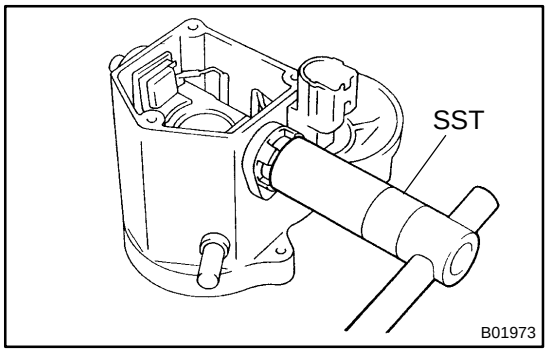
(a) Remove the 3 bolts, end cover, gasket and plunger.



(b) Using vernier calipers, measure the contact plate for depth of wear.

Maximum wear: 0.9 mm (0.035 in.)

If the depth of wear is greater than the maximum, replace the contact plate.



(c) Remove the terminal kit parts.

(1) Using SST, loosen the terminal nuts.

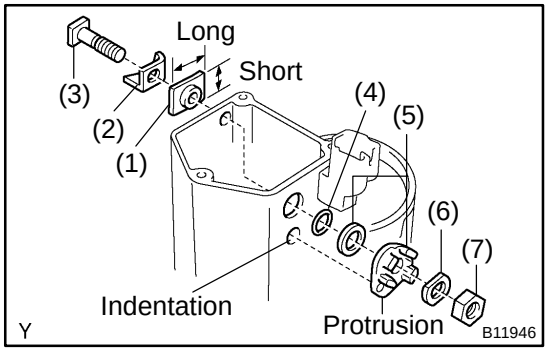
SST 09810-38140

(2) Terminal C:

Remove the terminal nut, wave washer, terminal insulator (outside), O- ring, terminal bolt, contact plate and terminal insulator (inside).

(3) Terminal 30:

Remove the terminal nut, wave washer, terminal insulator (outside), packing, O-ring, terminal bolt, contact plate and terminal insulator (inside).



(d) Temporarily install new terminal 30 kit parts:

(1) Install a new terminal insulator (inside).

(2) Install a new contact plate.

(3) Install a new terminal bolt.

(4) Install a new O-ring.

(5) Install a new packing and terminal insulator (outside).

Install the packing to the terminal insulator, and install them.

HINT:

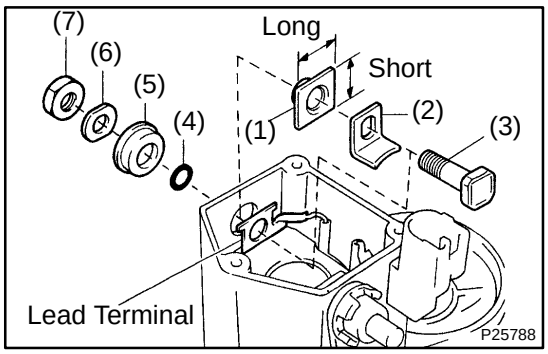
Match the protrusion of the insulator with the indentation of the housing.

(6) Install a new wave washer.

(7) Install a new terminal nut.

NOTICE:

Be careful to install the terminal insulators in the correct direction.

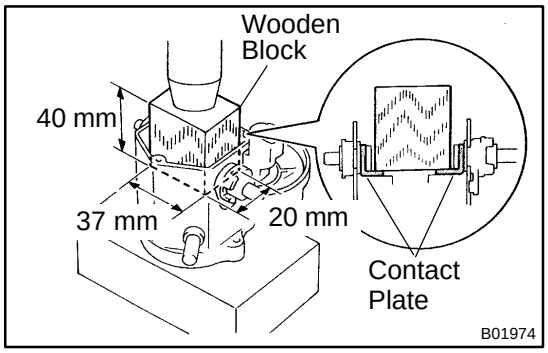


(e) Temporarily install new terminal C kit parts:
(1) Install a new terminal insulator (inside).
(2) Install a new contact plate.
(3) Install a new terminal bolt.
(4) Install a new O-ring.
(5) Install a new terminal insulator (outside).
(6) Install a new wave washer.
(7) Install a new terminal nut.

NOTICE:

Be careful to install the terminal insulators in the correct direction.

(f) Temporarily tighten the terminal nuts.



(g) Tighten the terminal nut
(1) Put a wooden block on the contact plate and press it down with a hand press.

Dimensions of wooden block:
20 x 37 x 40 mm (0.79 x 1.46 x 1.57 in.)
Press force:
981 N (100 kgf, 221 lbf)

NOTICE:

- **Check the diameter of the hand press ram. Then calculate the gauge pressure of the press when 981 N (100 kgf, 221 lbf) of force is applied.**
  Gauge pressure:

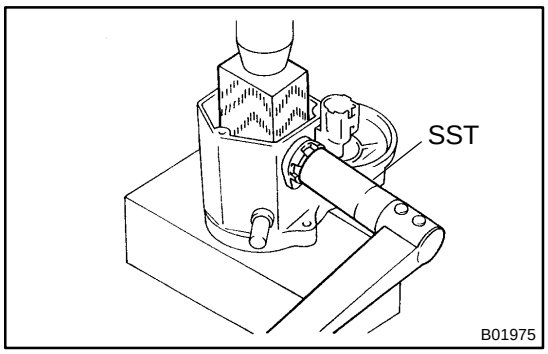
$$(\text{kgf/cm}^2) = \frac{100\ \text{kgf}}{\left(\frac{\text{Ram diameter (cm)}}{2}\right)^2 \times 3.14\ (\pi)}$$

$$(\text{psi}) = \frac{221\ \text{lbf}}{\left(\frac{\text{Ram diameter (in.)}}{2}\right)^2 \times 3.14\ (\pi)}$$

$$(\text{kPa}) = (\text{kgf/cm}^2) \times 98.1$$

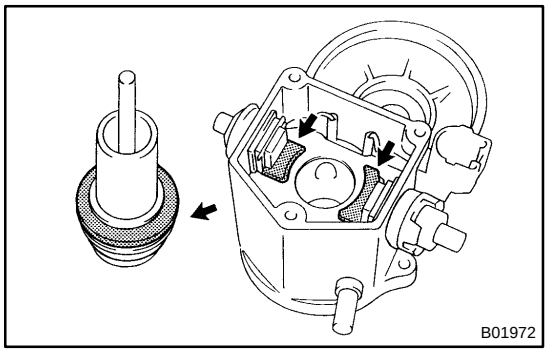
$$(\text{kPa}) = (\text{psi}) \times 6.9$$

- **If the contact plate is not pressed down with the specified pressure, the contact plate may tilt due to coil deformation or the tightening of the nut.**



(2) Using SST, tighten the nuts to the specified torque.
SST 09810-38140
Torque: 17 N·m (173 kgf·cm, 13 ft·lbf)

NOTICE:
If the nut is over tightened, it may cause cracks on the inside of the insulator.



(h) Clean the contact surfaces of the remaining contact plate and plunger with a dry shop rag.

(i) Reinstall the plunger, new gasket, end cover and lead clamp with the 3 bolts.
Torque: 2.5 N·m (26 kgf·cm, 22 in.·lbf)

ST053-03

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page ST-5).

HINT:

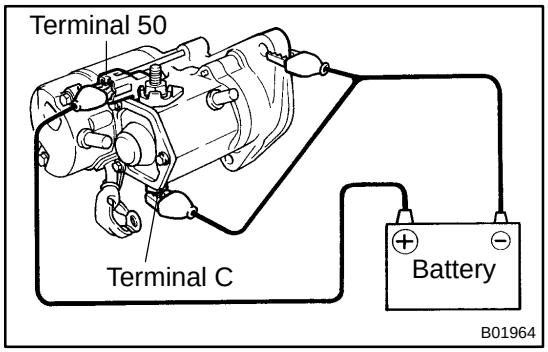
Before reassembly, use high-temperature grease to lubricate the bearings and gears.

ST054-06

TEST

NOTICE:

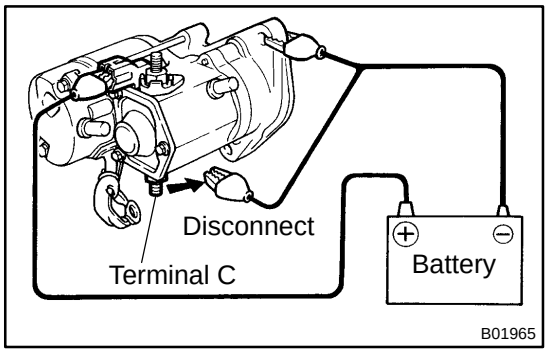
These tests must be done within 3 to 5 seconds to avoid burning out the coil.



1. DO PULL-IN TEST

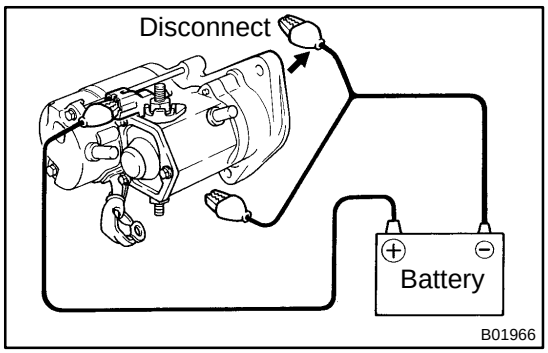
(a) Disconnect the field coil lead wire from terminal C.

(b) Connect the battery to the magnetic switch as shown. Check that the pinion gear moves outward.



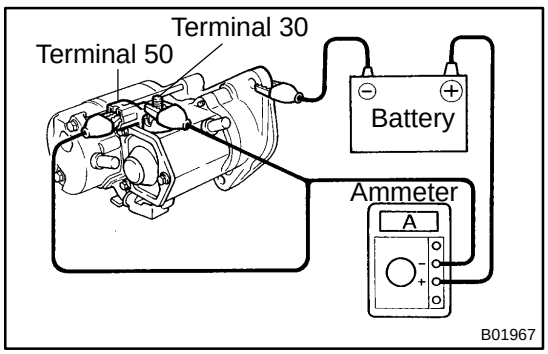
2. DO HOLD-IN TEST

While connected as above with the pinion gear out, disconnect the negative (-) lead from terminal C. Check that the pinion gear remains out.



3. INSPECT CLUTCH PINION GEAR RETURN

Disconnect the negative (-) lead from the starter body. Check that the pinion gear returns inward.



4. DO NO-LOAD PERFORMANCE TEST

(a) Connect the battery and ammeter to the starter as shown.

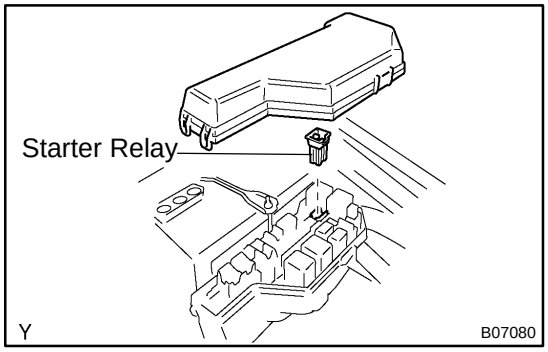
(b) Check that the starter rotates smoothly and steadily with the pinion gear moving out. Check that the ammeter shows the specified current.

Specified current: 90 A or less at 11.5 V

ST055-03

INSTALLATION

Installation is in the reverse order of removal (See page ST-4).



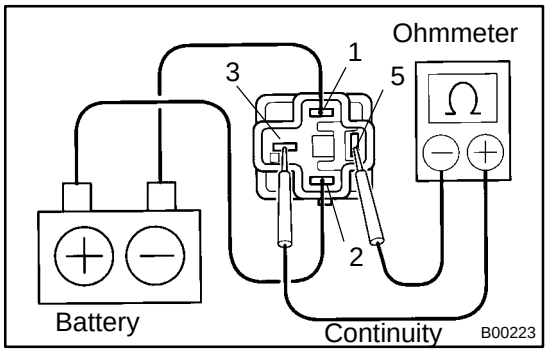
STARTER RELAY

ST0Q3-01

INSPECTION

1. REMOVE RELAY BOX COVER

2. REMOVE STARTER RELAY



3. INSPECT STARTER RELAY

(1) Using an ohmmeter, measure the resistance between the terminals.

Standard:

Tester Connection	Specified Condition
3 - 5	10 kΩ or higher
3 - 5	Below 1 Ω (Apply battery voltage to terminals 1 and 2)

If the resistance is not as specified, replace the relay.

4. REINSTALL STARTER RELAY

5. REINSTALL RELAY BOX COVER

CHARGING SYSTEM

CH043-05

ON-VEHICLE INSPECTION

CAUTION:

- **Check that the battery cables are connected to the correct terminals.**
- **Disconnect the battery cables when the battery is given a quick charge.**
- **Do not do tests with a high voltage insulation resistance tester.**
- **Never disconnect the battery while the engine is running.**

1. CHECK BATTERY ELECTROLYTE LEVEL

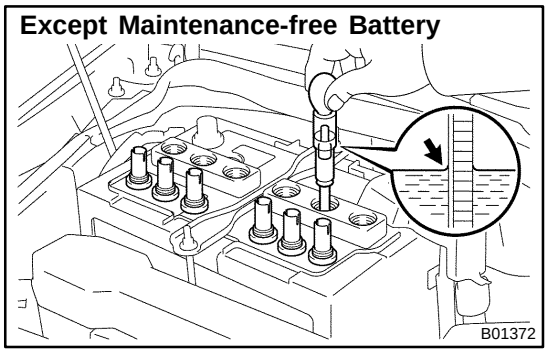
Check the electrolyte quantity of each cell.

Maintenance-free Battery:

If under the lower level, replace the battery (or add distilled water if possible). Check the charging system.

Except Maintenance-free Battery:

If under the lower level, add distilled water.

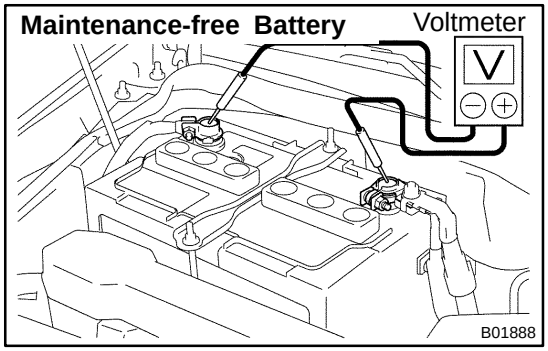


2. Except Maintenance-free Battery: CHECK BATTERY SPECIFIC GRAVITY

Check the specific gravity of each cell.

Standard specific gravity: 1.25 - 1.29 at 20˚C (68˚F)

If the specific gravity is less than specification, charge the battery.



3. Maintenance-free Battery: CHECK BATTERY POSITIVE VOLTAGE

(a) After having driven the vehicle and in the case that 20 minutes have not passed after having stopped the engine, turn the ignition switch ON and turn on the electrical system (headlight, blower motor, rear defogger etc.) for 60 seconds to remove the surface charge.

(b) Turn the ignition switch OFF and turn off the electrical systems.

(c) Measure the battery positive voltage between the negative (-) and positive (+) terminals of the battery.

Standard voltage: 12.5 - 12.9 V at 20˚C (68˚F)

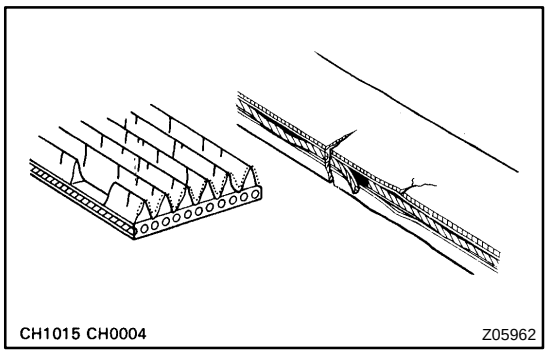
If the voltage is less than specification, charge the battery.

4. CHECK BATTERY TERMINALS AND FUSES

(a) Check that the battery terminals are not loose or corroded.

If the terminals are corroded, clean the terminals.

(b) Check the fusible link and fuses for continuity.



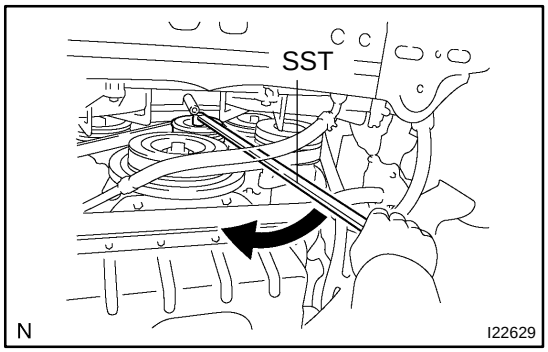
5. INSPECT DRIVE BELT

(a) Visually check the drive belt for excessive wear, frayed cords, etc.

If necessary, replace the drive belt.

HINT:

- Cracks on the rib side of a drive belt are considered acceptable. If the drive belt has chunks missing from the ribs, it should be replaced.



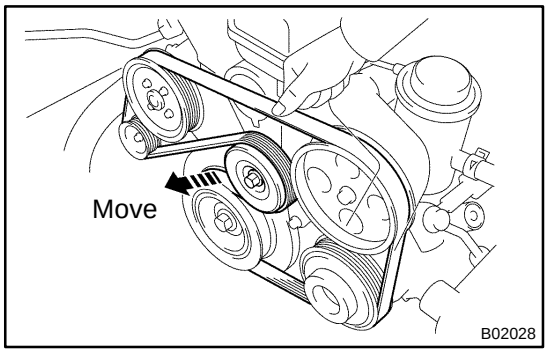
(b) Check the belt tensioner operation.

(1) Remove the engine under cover.

(2) Using SST, the drive belt tension can be released by turning the belt tensioner clockwise from the bottom side.

SST 09216-00041

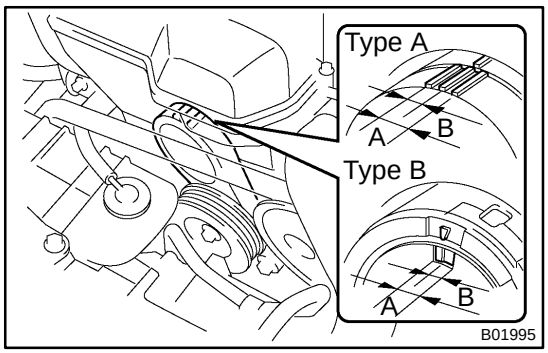
(3) Install the engine under cover.



(4) Check that the belt tensioner moves downward when the drive belt is pressed down at the points indicated in the illustration with approx. 98 N (10 kgf, 22.0 lbf) of force.

(5) Check the alignment of the belt tensioner pulley to make sure the drive belt will not slip off the pulley.

If necessary, replace the belt tensioner.

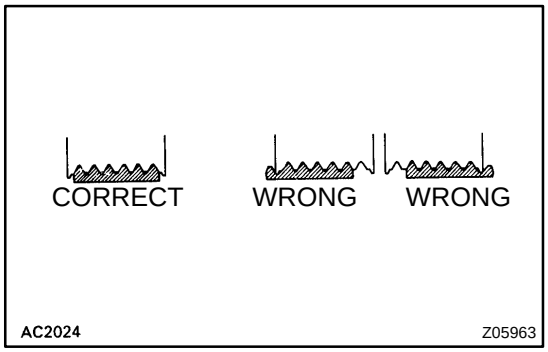


(6) Check that the arrow mark on the belt tensioner falls within area A of the scale.

If it is outside area A, replace the drive belt.

HINT:

- When a new belt is installed, it should lie within area B. If not, the drive belt is not correct.



- After installing a drive belt, check that it fits properly in the ribbed grooves.
- Check by hand to confirm that the belt has not slipped out of the groove on the bottom of the pulley.

6. VISUALLY CHECK GENERATOR WIRING AND LISTEN FOR ABNORMAL NOISES

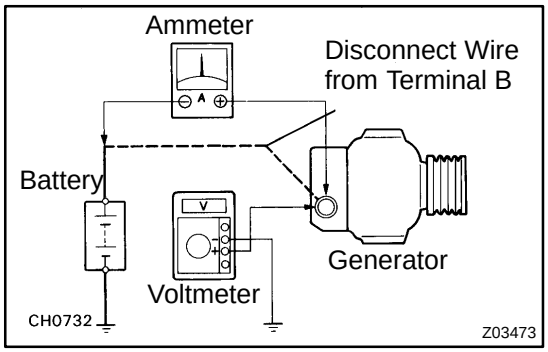
(a) Check that the wiring is in good condition.

(b) Check that there is no abnormal noise from the generator while the engine is running.

7. CHECK CHARGE WARNING LIGHT CIRCUIT

(a) Warm up the engine and then turn it off.
(b) Turn off all accessories.
(c) Turn the ignition switch ”ON”. Check that the charge warning light is lit.
(d) Start the engine. Check that the light goes off.

If the light does not go off as specified, troubleshoot the charge light circuit.



8. INSPECT CHARGING CIRCUIT WITHOUT LOAD

HINT:
If a battery/generator tester is available, connect the tester to the charging circuit as per manufacturer’s instructions.

(a) If a tester is not available, connect a voltmeter and ammeter to the charging circuit as follows:
- Disconnect the wire from terminal B of the generator, and connect it to the negative (-) probe of the ammeter.
- Connect the positive (+) probe of the ammeter to terminal B of the generator.
- Connect the positive (+) probe of the voltmeter to terminal B of the generator.
- Ground the negative (-) probe of the voltmeter.

(b) Check the charging circuit as follows:
With the engine running from idling to 2,000 rpm, check the reading on the ammeter and voltmeter.
Standard amperage: 10 A or less
Standard voltage: 13.2 - 14.8 V

If the voltmeter reading is more than standard voltage, replace the voltage regulator.
If the voltmeter reading is less than standard voltage, check the voltage regulator (See page CH-9).

9. INSPECT CHARGING CIRCUIT WITH LOAD

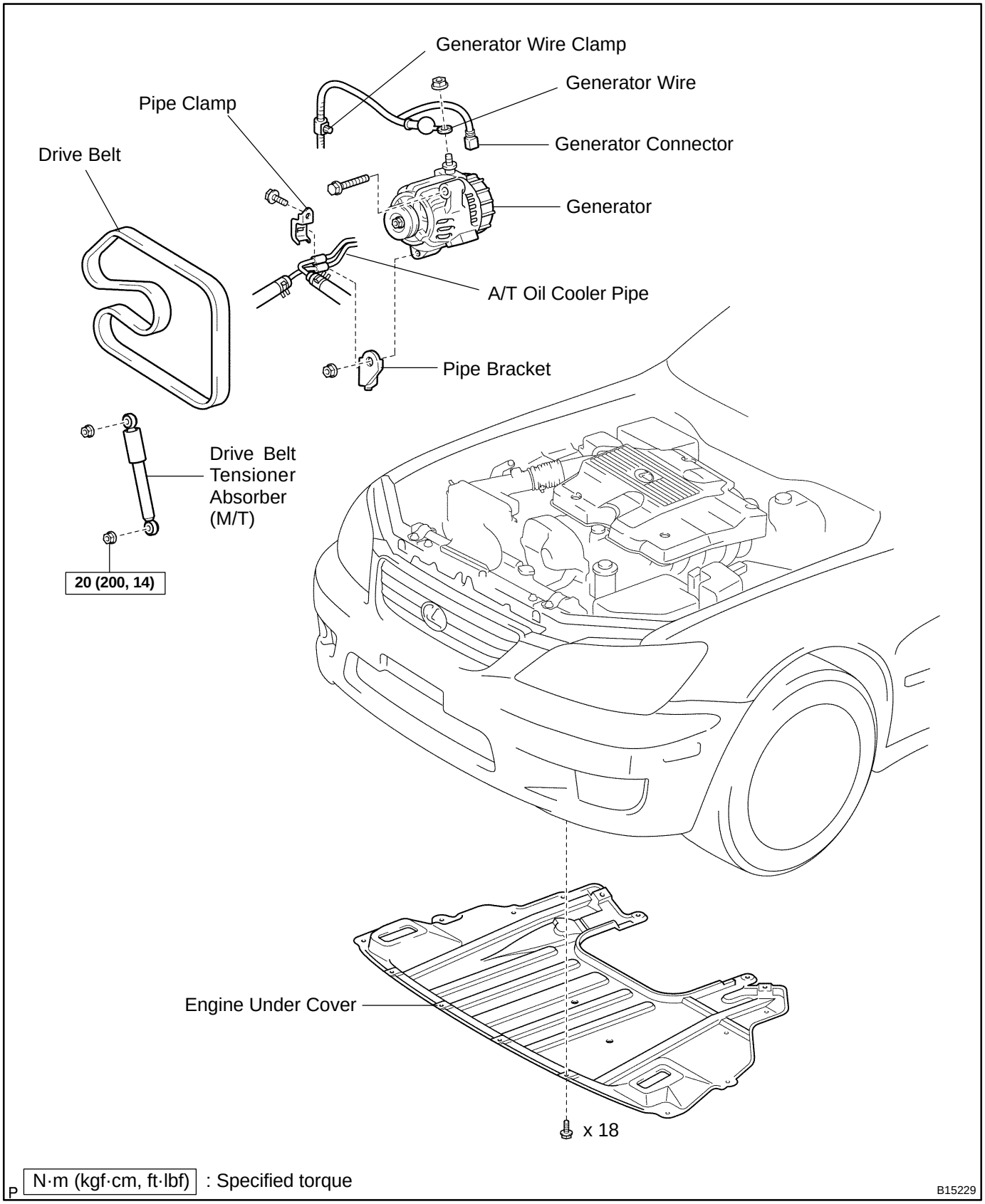
(a) With the engine running at 2,000 rpm, turn on the high beam headlights and place the heater blower switch at ”HI”.
(b) Check the reading on the ammeter.
Standard amperage: 30 A or more

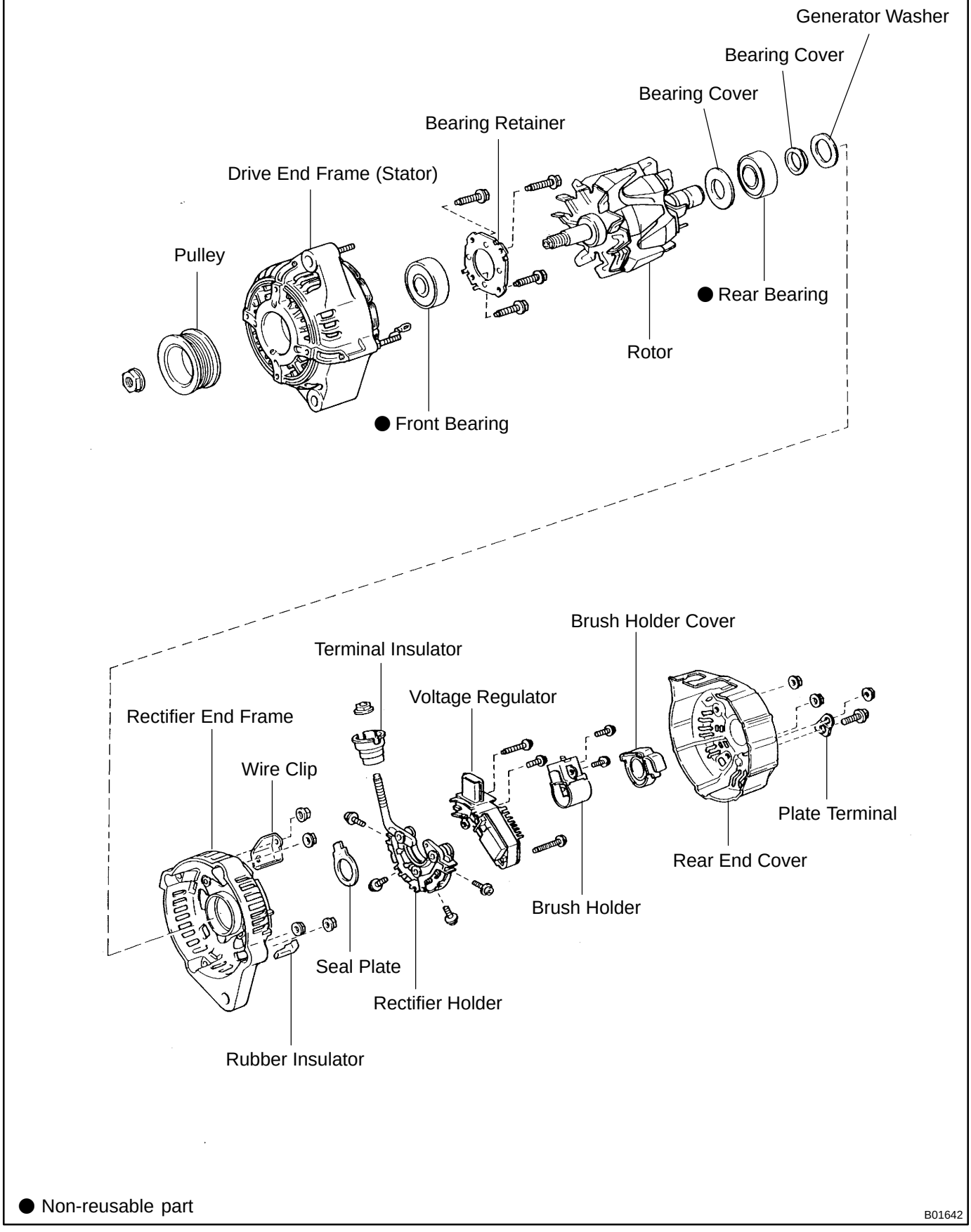
If the ammeter reading is less than the standard amperage, repair the generator.
HINT:
If the battery is fully charged, the indication will sometimes be less than standard amperage.

GENERATOR

COMPONENTS

CH044-09




Generator Washer
Bearing Cover
Bearing Cover
Bearing Retainer
Drive End Frame (Stator)
Pulley
● Rear Bearing
Rotor
● Front Bearing
Brush Holder Cover
Terminal Insulator
Voltage Regulator
Rectifier End Frame
Wire Clip
Plate Terminal
Rear End Cover
Brush Holder
Seal Plate
Rectifier Holder
Rubber Insulator
● Non-reusable part
B01642

CH045-08

REMOVAL

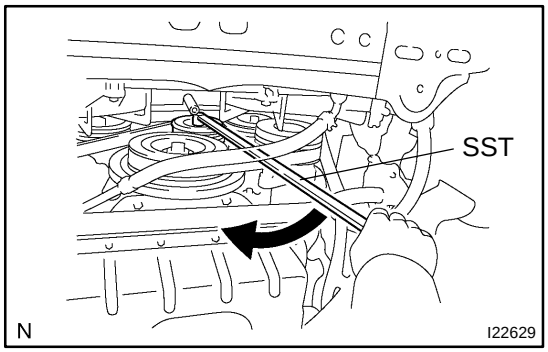
1. REMOVE ENGINE UNDER COVER

2. M/T:

REMOVE DRIVE BELT TENSIONER ABSORBER

Remove the 2 nuts and absorber.

Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)



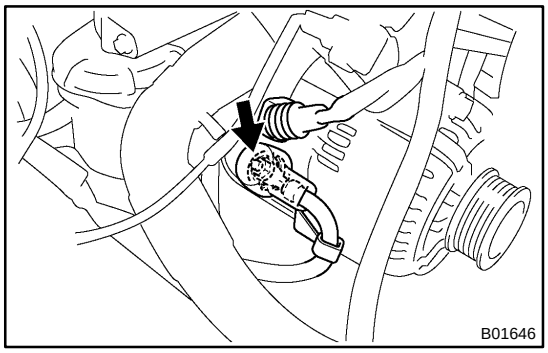
3. REMOVE DRIVE BELT

Using SST, loosen the belt tension by turning the belt tensioner clockwise from the bottom side, and remove the drive belt.

SST 09216-00041

NOTICE:

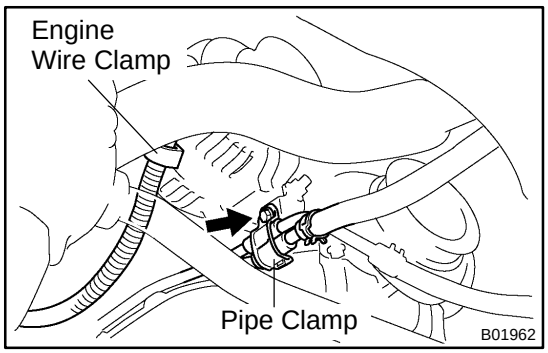
At the time of installation, do an on-vehicle inspection (See page CH-1).



4. REMOVE GENERATOR

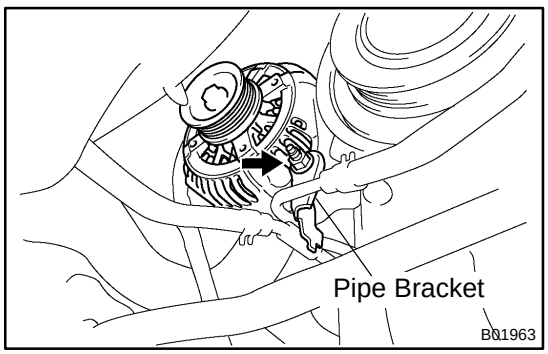
(a) Disconnect the generator connector.

(b) Remove the rubber cap and nut, and disconnect the generator wire.



(c) Disconnect the engine wire clamp from the wire clip on the generator.

(d) Remove the bolt and pipe clamp, and disconnect the 2 A/T oil cooler pipes from the generator.

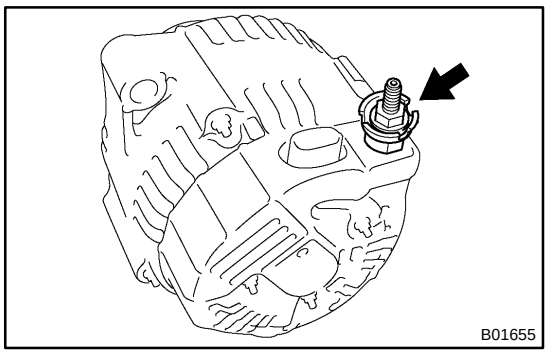


(e) Remove the bolt, nut, pipe bracket and generator.

Torque: 40 N·m (400 kgf·cm, 30 ft·lbf)

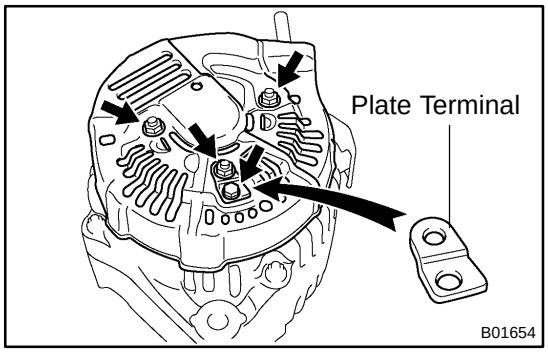
CH046-10

DISASSEMBLY

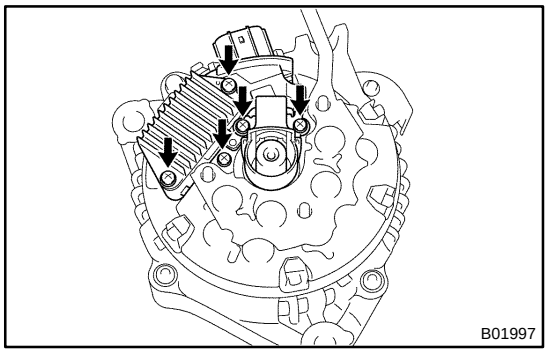


1. REMOVE REAR END COVER

(a) Remove the nut and terminal insulator.



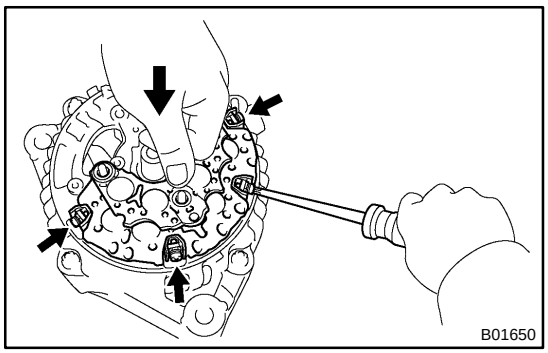
(b) Remove the bolt, 3 nuts, plate terminal, end cover and brush holder cover.



2. REMOVE BRUSH HOLDER AND VOLTAGE REGULATOR

(a) Remove the 5 screws, brush holder and voltage regulator.

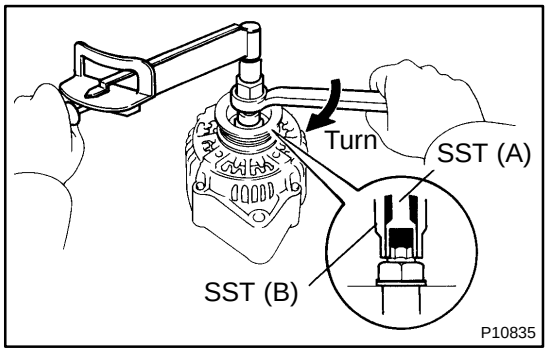
(b) Remove the seal plate from the rectifier end frame.



3. REMOVE RECTIFIER HOLDER

(a) Remove the 4 screws and rectifier holder.

(b) Remove the 4 rubber insulators.



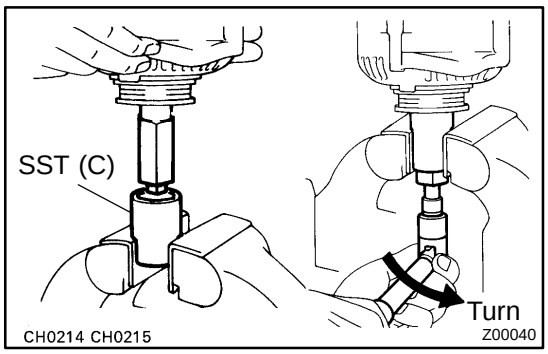
4. REMOVE PULLEY

(a) Hold SST (A) with a torque wrench, and tighten SST (B) clockwise to the specified torque.

SST 09820-6301 1

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

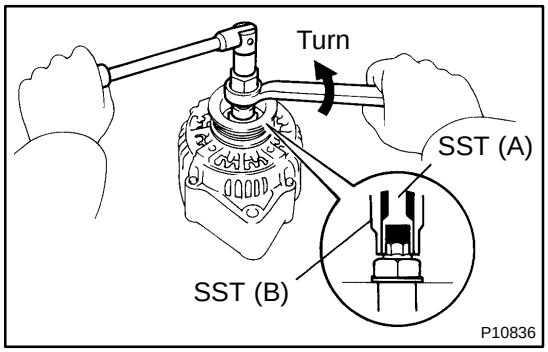
(b) Check that SST (A) is secured to the rotor shaft.



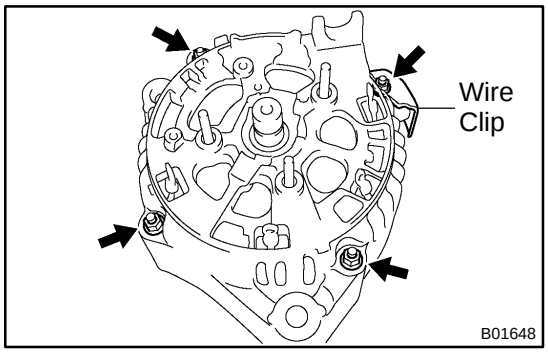
(c) Mount SST (C) in a vise.
(d) Insert SST (B) into SST (C), and attach the pulley nut to SST (C).
(e) To loosen the pulley nut, turn SST (A) in the direction shown in the illustration.

NOTICE:
To prevent damage to the rotor shaft, do not loosen the pulley nut more than one-half of a turn.

(f) Remove the generator from SST (C).

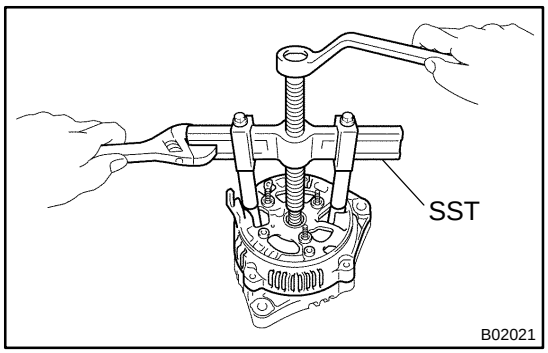


(g) Turn SST (B), and remove SST (A and B).
(h) Remove the pulley nut and pulley.



5. REMOVE RECTIFIER END FRAME

(a) Remove the 4 nuts and wire clip.

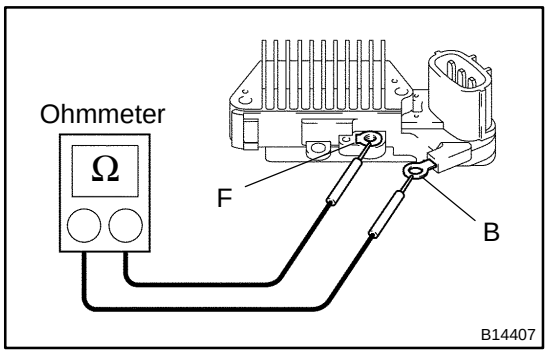


(b) Using SST, remove the rectifier end frame.
SST 09950- 40011 (09951- 04020, 09952- 04010, 09953-04030, 09954-04010, 09955-04041)
(c) Remove the generator washer.

6. REMOVE ROTOR FROM DRIVE END FRAME

CH047-07

INSPECTION



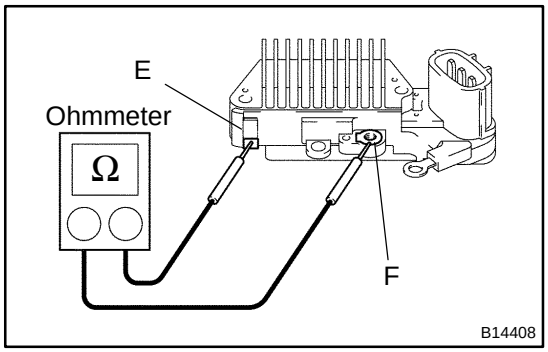
1. INSPECT VOLTAGE REGULATOR

(a) Using an ohmmeter, check the continuity between terminals F and B.

Standard:

When the positive and negative poles between terminals F and B are exchanged, there is continuity in one way but no continuity in another way.

If the continuity is not as specified, replace the regulator.

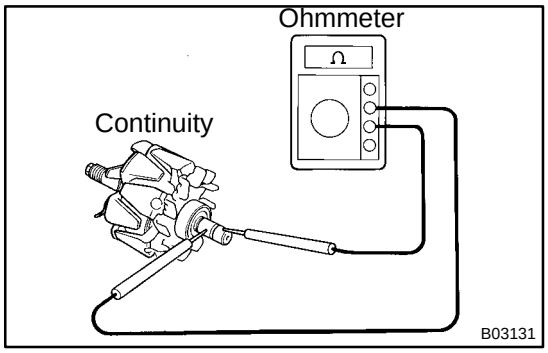


(b) Using an ohmmeter, check the continuity between terminals F and E.

Standard:

When the positive and negative poles between terminals F and E are exchanged, there is continuity in one way but no continuity in another way.

If the continuity is not as specified, replace the regulator.



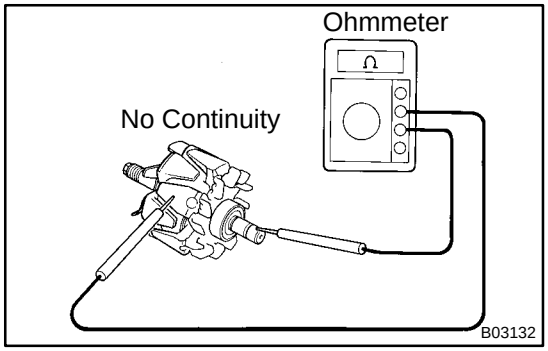
2. INSPECT ROTOR

(a) Check rotor for open circuit.

Using an ohmmeter, check that there is continuity between the slip rings.

Standard resistance: 2.1 - 2.5 Ω at 20˚C (68˚F)

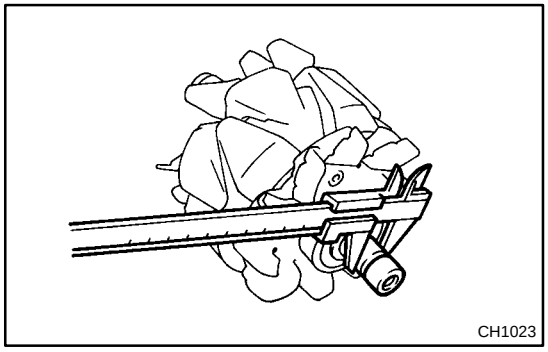
If there is no continuity, replace the rotor.



(b) Check the rotor for ground.

Using an ohmmeter, check that there is no continuity between the slip ring and rotor.

If there is continuity, replace the rotor.



(c) Check that the slip rings are not rough or scored.

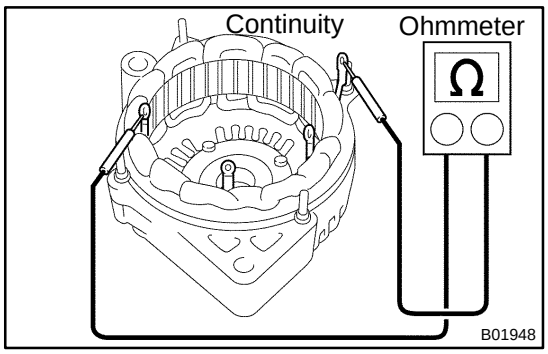
If rough or scored, replace the rotor.

(d) Using vernier calipers, measure the slip ring diameter.

Standard diameter: 14.2 - 14.4 mm (0.559 - 0.567 in.)

Minimum diameter: 12.8 mm (0.504 in.)

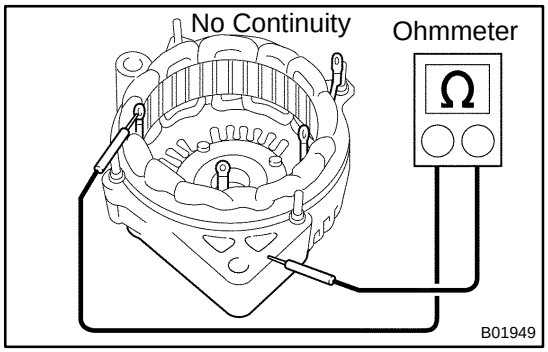
If the diameter is less than minimum, replace the rotor.



3. INSPECT STATOR (DRIVE END FRAME)

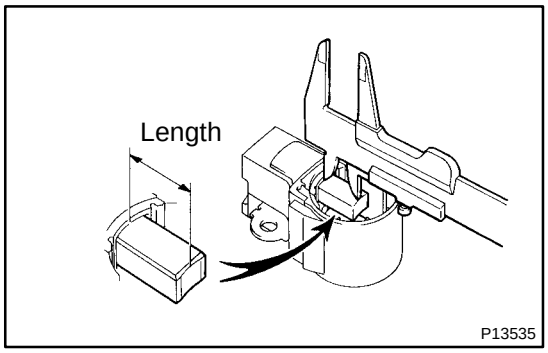
(a) Check the stator for open circuit.
Using an ohmmeter, check that there is continuity between the coil leads.

If there is no continuity, replace the drive end frame assembly.



(b) Check the stator for ground.
Using an ohmmeter, check that there is no continuity between the coil lead and drive end frame.

If there is continuity, replace the drive end frame assembly.

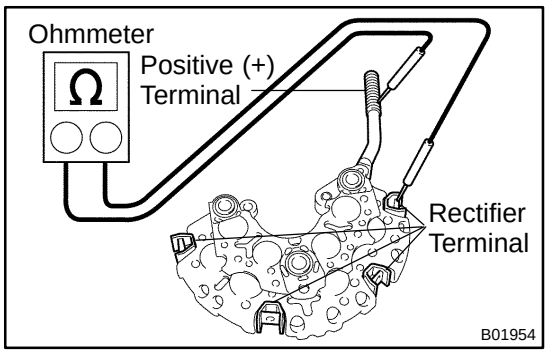


4. INSPECT BRUSHES

Using vernier calipers, measure the exposed brush length.

Standard exposed length:
9.5 - 11.5 mm (0.374 - 0.453 in.)
Minimum exposed length: 1.5 mm (0.059 in.)

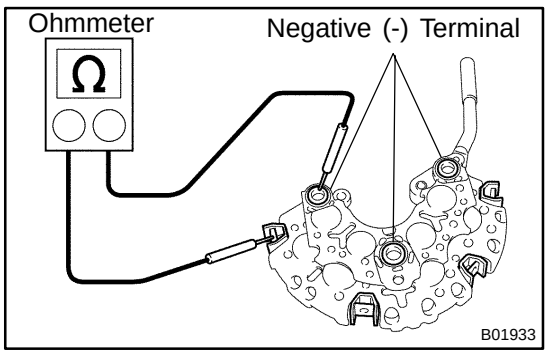
If the exposed length is less than minimum, replace the brush holder assembly.



5. INSPECT RECTIFIERS (RECTIFIER HOLDER)

(a) Check the positive (+) rectifier.
(1) Using an ohmmeter, connect one tester prob to the positive (+) terminal and the other to each rectifier terminal.
(2) Reverse the polarity of the tester probes and repeat step (a).
(3) Check that one shows continuity and the other shows no continuity.

If continuity is not as specified, replace the rectifier holder.



(b) Check the negative (-) rectifier.
(1) Using an ohmmeter, connect one tester probe to each negative (-) terminal and the other to each rectifier terminal.
(2) Reverse the polarity of the tester probes and repeat step (a).
(3) Check that one shows continuity and the other shows no continuity.

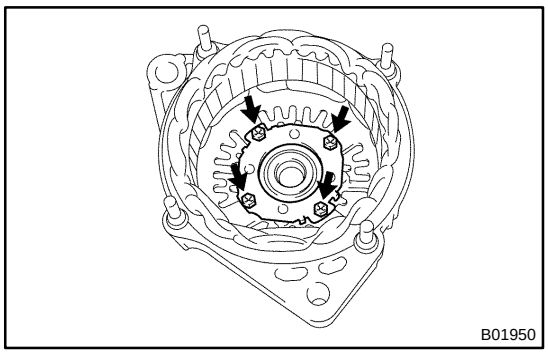
If continuity is not as specified, replace the rectifier holder.

6. INSPECT BEARING

Check the bearing is not rough or worn.

If necessary, replace the bearing (See page CH-12).

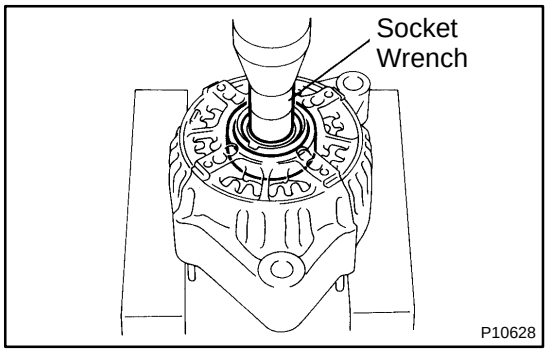
CH048-08


B01950

REPLACEMENT

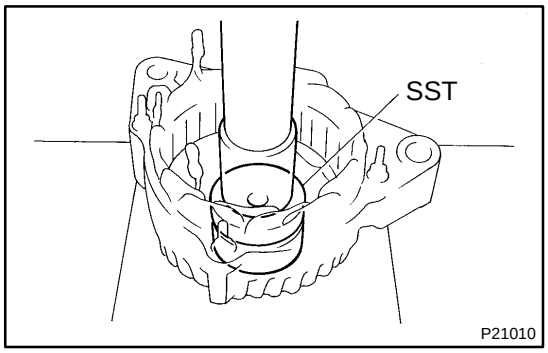
1. REPLACE FRONT BEARING

(a) Remove the 4 screws and bearing retainer.



P10628

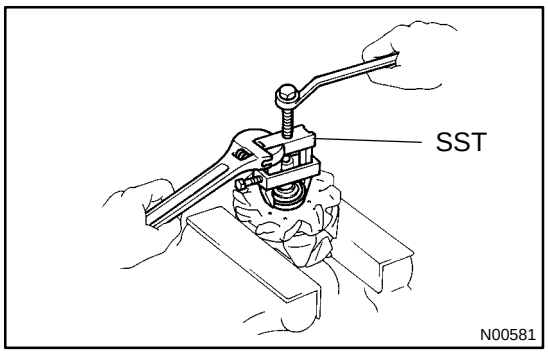
(b) Using a socket wrench and press, press out the bearing.



P21010

(c) Using SST and a press, press in a new bearing.
SST 09950-60010 (09951-00500)

(d) Install the bearing retainer with the 4 screws.
Torque: 3.0 N·m (31 kgf·cm 27 in.·lbf)

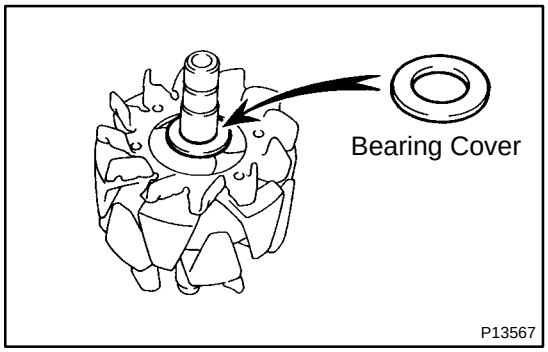


N00581

2. REPLACE REAR BEARING

(a) Using SST, remove the bearing cover (outside) and bearing.
SST 09820-00021

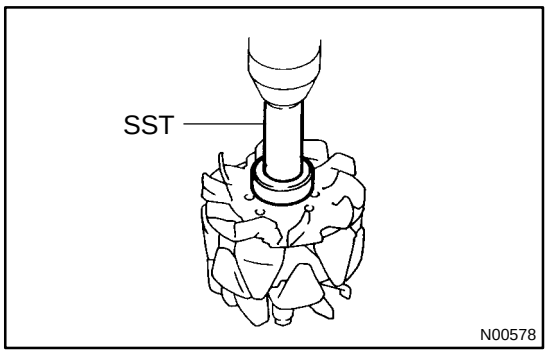
NOTICE:
Be careful not to damage the fan.



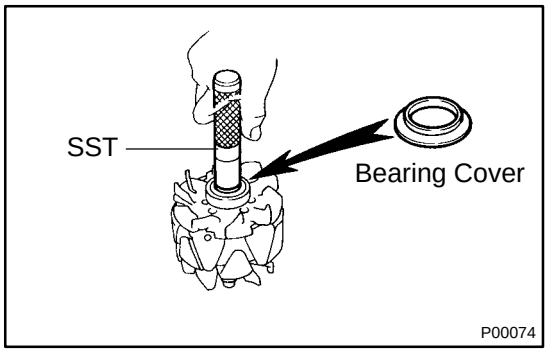
P13567

(b) Remove the bearing cover (inside).

(c) Place the bearing cover (inside) on the rotor.



(d) Using SST and a press, press in a new bearing.
SST 09820-00031



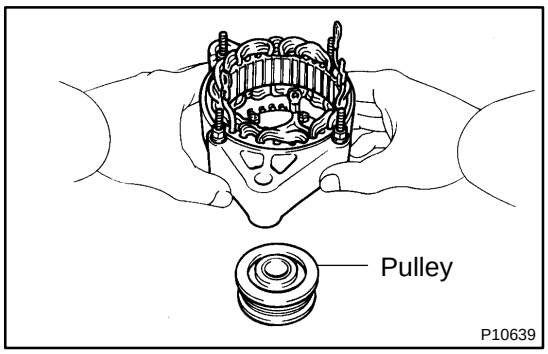
(e) Using SST, push in the bearing cover (outside).
SST 09285-76010

CH049-07

REASSEMBLY

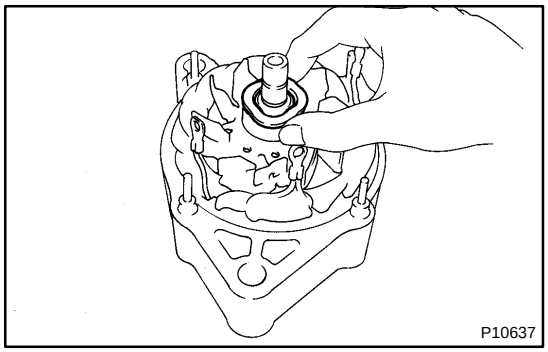
1. PLACE DRIVE END FRAME ON PULLEY

2. INSTALL ROTOR TO DRIVE END FRAME

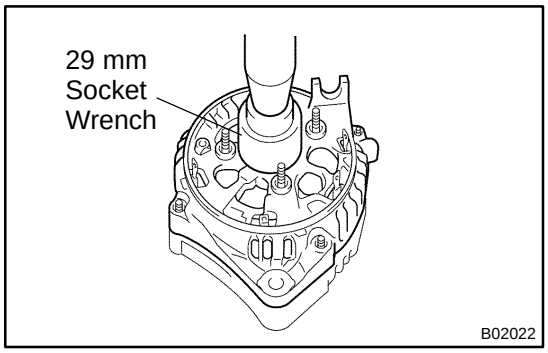


3. INSTALL RECTIFIER END FRAME

(a) Place the generator washer on the rotor.

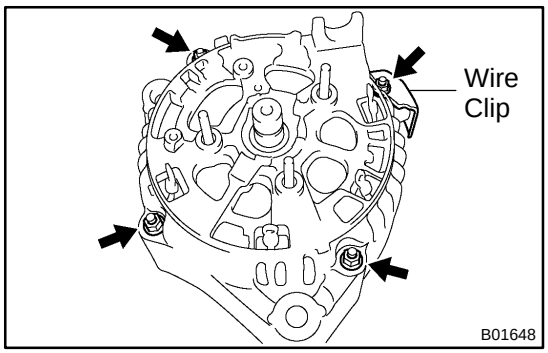


(b) Using a 29 mm socket wrench and press, slowly press in the rectifier end frame.



(c) Install the 3 nuts.
Torque: 4.5 N·m (46 kgf·cm, 40 in.·lbf)

(d) Install the wire clip with the nut.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

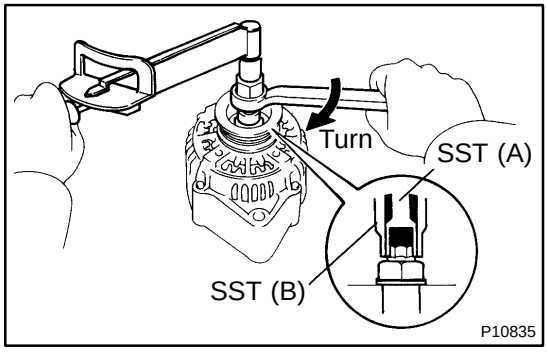


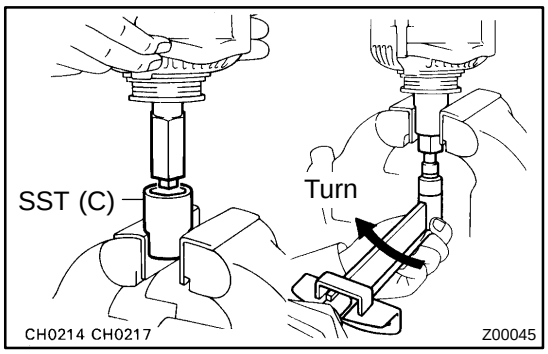
4. INSTALL PULLEY

(a) Install the pulley to the rotor shaft by tightening the pulley nut by hand.

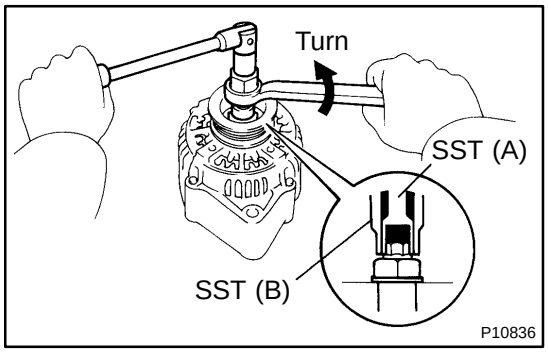
(b) Hold SST (A) with a torque wrench, and tighten SST (B) clockwise to the specified torque.
SST 09820-6301 1
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

(c) Check that SST (A) is secured to the pulley shaft.

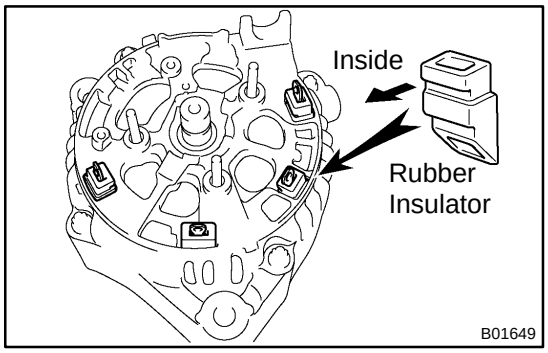




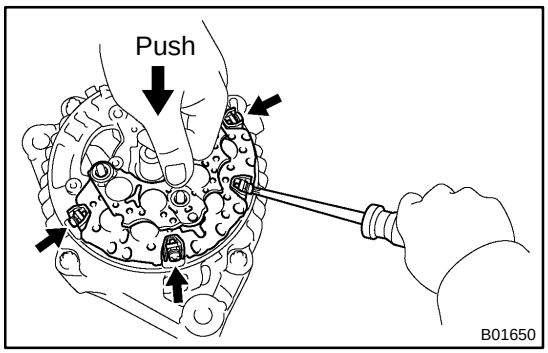
(d) Mount SST (C) in a vise.
(e) Insert SST (B) into SST (C), and attach the pulley nut to SST (C).
(f) To torque the pulley nut, turn SST (A) in the direction shown in the illustration.
Torque: 110.5 N·m (1,125 kgf·cm, 81 ft·lbf)
(g) Remove the generator from SST (C).



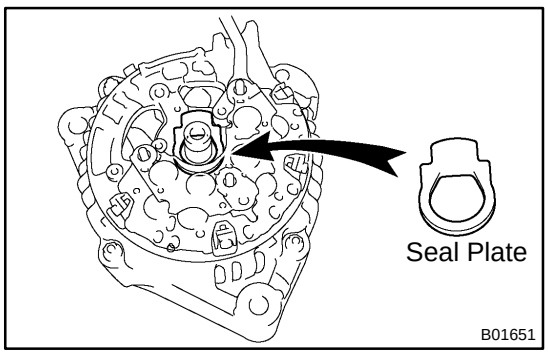
(h) Turn SST (B), and remove SST (A and B).



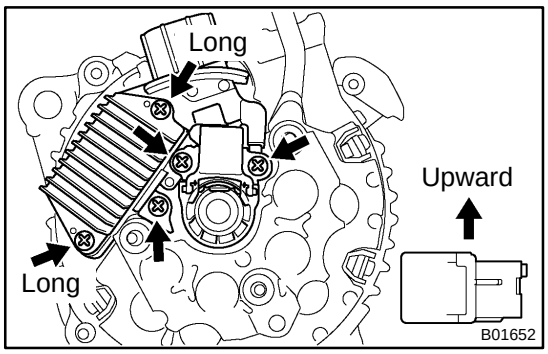
5. INSTALL RECTIFIER HOLDER
(a) Install the 4 rubber insulators on the lead wires.



(b) Install the rectifier holder while pushing it with the 4 screws.
Torque: 2.9 N·m (30 kgf·cm, 26 in.·lbf)



6. INSTALL VOLTAGE REGULATOR AND BRUSH HOLDER
(a) Place the seal plate on the rectifier end frame.



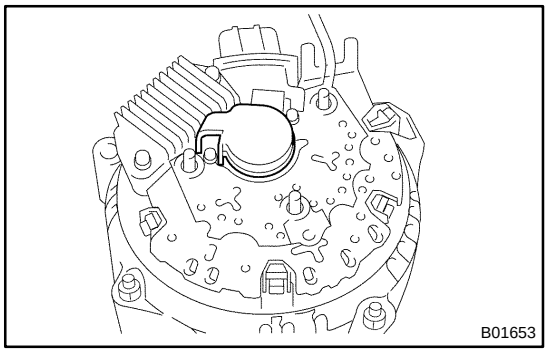
(b) Place the voltage regulator and brush holder on the rectifier end frame.

NOTICE:

Be careful of the holder installation direction.

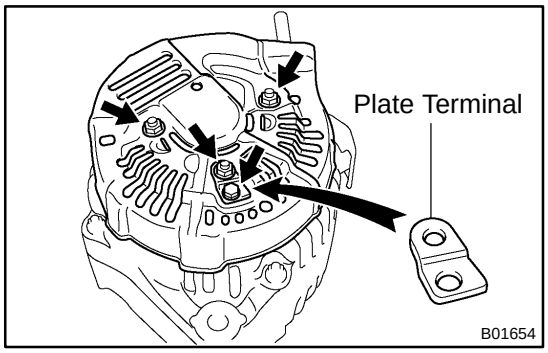
(c) Install the 5 screws.

Torque: 2.0 N·m (20 kgf·cm, 18 in.·lbf)



7. INSTALL REAR END COVER

(a) Place the brush holder cover on the brush holder.



(b) Install the end cover and plate terminal with the bolt and 3 nuts.

Torque:

4.4 N·m (45 kgf·cm, 39 in.·lbf) for nut

3.9 N·m (39 kgf·cm, 35 in.·lbf) for bolt

(c) Install the terminal insulator with the nut.

Torque: 6.5 N·m (67 kgf·cm, 58 in.·lbf)

8. CHECK THAT ROTOR ROTATES SMOOTHLY

CH04A-04

INSTALLATION

Installation is in the reverse order of removal (See page CH-6).

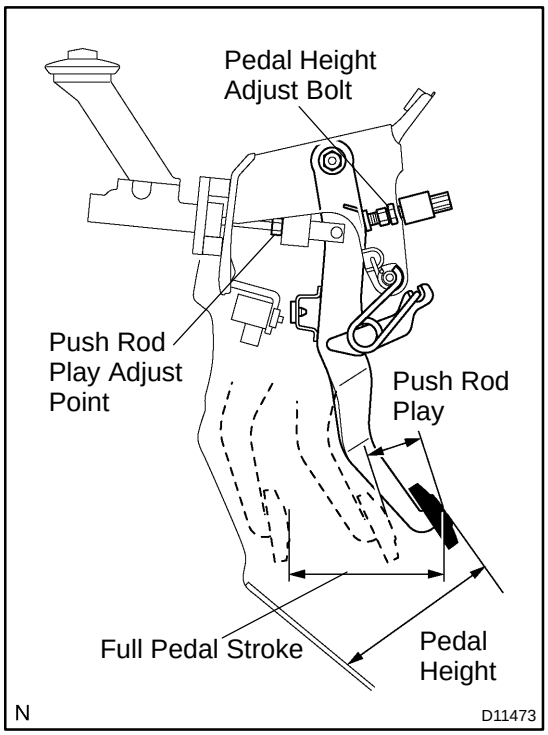
TROUBLESHOOTING

CL0CY-01

PROBLEM SYMPTOMS TABLE

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

Symptom	Suspect Area	See page
Clutch grabs/chatters	1. Engine mounting (Loosen)	-
	2. Clutch disc (Runout is excessive)	CL-14
	3. Clutch disc (Oily)	CL-14
	4. Clutch disc (Worn out)	CL-14
	5. Clutch disc (Damaged torsion rubber)	CL-14
	6. Clutch disc (Glazed)	CL-14
	7. Diaphragm spring (Out of tip alignment)	CL-18
Clutch pedal spongy	1. Clutch line (Air in line)	-
	2. Master cylinder cup (Damaged)	CL-4
	3. Release cylinder cup (Damaged)	CL-9
Clutch noisy	1. Release bearing (Worn, dirty or damaged)	CL-14
	2. Pilot bearing (Worn or damaged)	CL-14
	3. Input shaft bearing (Worn, dirty or damaged)	-
	4. Clutch disc torsion rubber (Damaged)	CL-14
Clutch slips	1. Clutch pedal (Free play out of adjustment)	CL-2
	2. Clutch disc (Oily)	CL-14
	3. Clutch disc (Worn out)	CL-14
	4. Diaphragm spring (Damaged)	CL-14
	5. Pressure plate (Distortion)	CL-14
	6. Flywheel (Distortion)	-
Clutch does not disengage	1. Clutch pedal (Free play out of adjustment)	CL-2
	2. Clutch line (Air in line)	-
	3. Master cylinder cup (Damaged)	CL-4
	4. Release cylinder cup (Damaged)	CL-9
	5. Input shaft bearing (Worn, dirty or damaged)	-
	6. Pilot bearing (Worn or damaged)	CL-14
	7. Clutch disc (Out of true)	CL-14
	8. Clutch disc (Runout is excessive)	CL-14
	9. Clutch disc (Lining broken)	CL-14
	10. Clutch disc (Dirty or burred)	CL-14
	11. Clutch disc (Oily)	CL-14
	12. Clutch disc (Lack of spline grease)	CL-18
	13. Diaphragm spring (Damaged)	CL-14
	14. Diaphragm spring (Out of tip alignment)	CL-18
	15. Pressure plate (Distortion)	CL-14



CLUTCH PEDAL

INSPECTION

CL0CZ-01

1. CHECK PEDAL HEIGHT

Pedal height from asphalt sheet:
162 - 172 mm (6.38 - 6.77 in.)

2. IF NECESSARY, ADJUST PEDAL HEIGHT

(a) Remove the lower finish panel (See page BO-135).

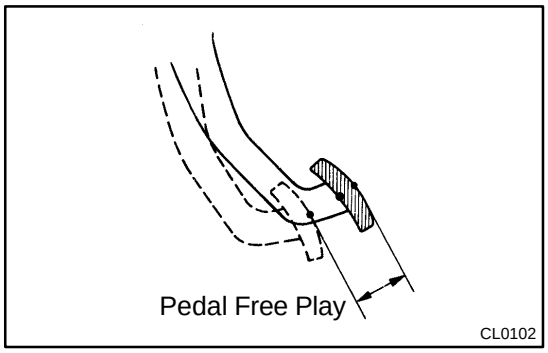
(b) Loosen the lock nut and clutch switch until the height is correct. Tighten the lock nut.

Torque: 15.7 N·m (160 kgf·cm, 12 ft·lbf)

HINT:

Before rotating the clutch switch for pedal height adjustment, disconnect the clutch switch connector.

(c) Install the lower finish panel (See page BO-135).



3. CHECK THAT PEDAL FREE PLAY AND PUSH ROD PLAY ARE CORRECT

(a) Depress the pedal until the clutch resistance begins to felt.

Pedal free play: 5.0 - 15.0 mm (0.197 - 0.591 in.)

(b) Gently push on the pedal until the resistance begins to increase a little.

Push rod play at pedal top:
1.0 - 5.0 mm (0.039 - 0.197 in.)

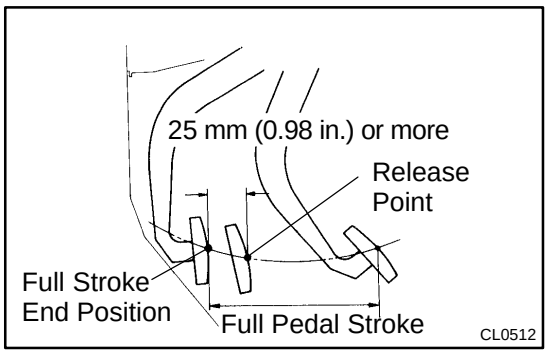
4. IF NECESSARY, ADJUST PEDAL FREE PLAY AND PUSH ROD PLAY

(a) Loosen the lock nut and turn the push rod until the free play and push rod play are correct.

(b) Tighten the lock nut.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

(c) After adjusting the pedal free play, check the pedal height.



5. INSPECT FULL PEDAL STROKE

Full pedal stroke: 142.0 - 147.5 mm (5.591 - 5.807 in.)

6. INSPECT CLUTCH RELEASE POINT

(a) Pull the parking brake lever and install wheel stopper.

(b) Start the engine and idle the engine.

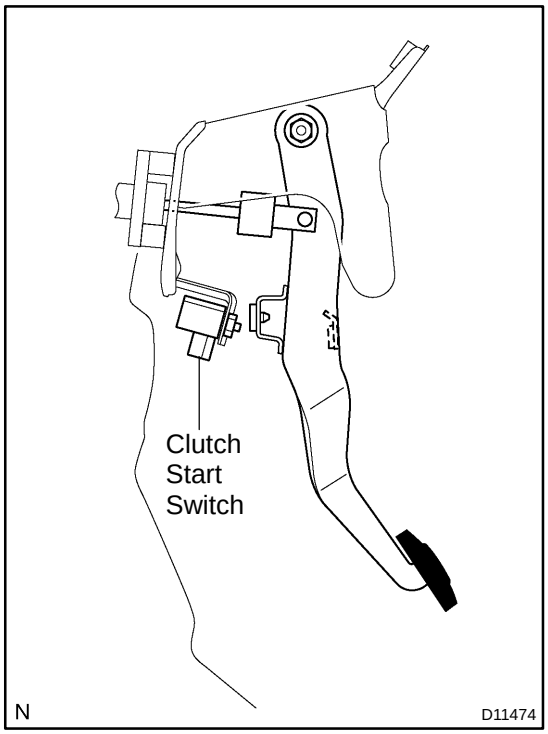
(c) Without depressing the clutch pedal, slowly shift the shift lever into the reverse position until the gears contact.

(d) Gradually depress the clutch pedal and measure the stroke distance from the point the gear noise stops (release point) up to the full stroke end position.

Standard distance: 25 mm (0.98 in.) or more
(From pedal stroke end position to release point)

If the distance is not as specified, do the following operation.

- Inspect pedal height.
- Inspect push rod play and pedal free play.
- Bleed the clutch line.
- Inspect the clutch cover and disc.

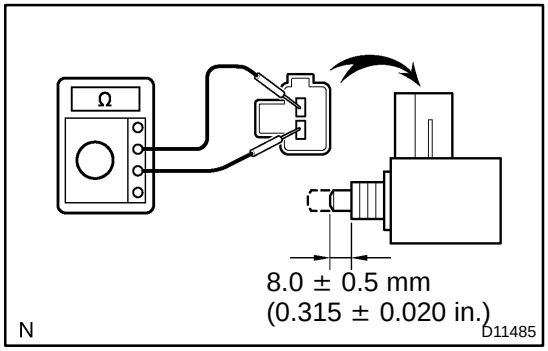


7. CHECK CLUTCH START SYSTEM

(a) Check that the engine does not start when the clutch pedal is released.

(b) Check that the engine starts when the clutch pedal is fully depressed.

If necessary, replace the clutch start switch.



8. INSPECT CONTINUITY OF CLUTCH START SWITCH

(a) Check that there is continuity between the terminals when the switch is ON (pushed).

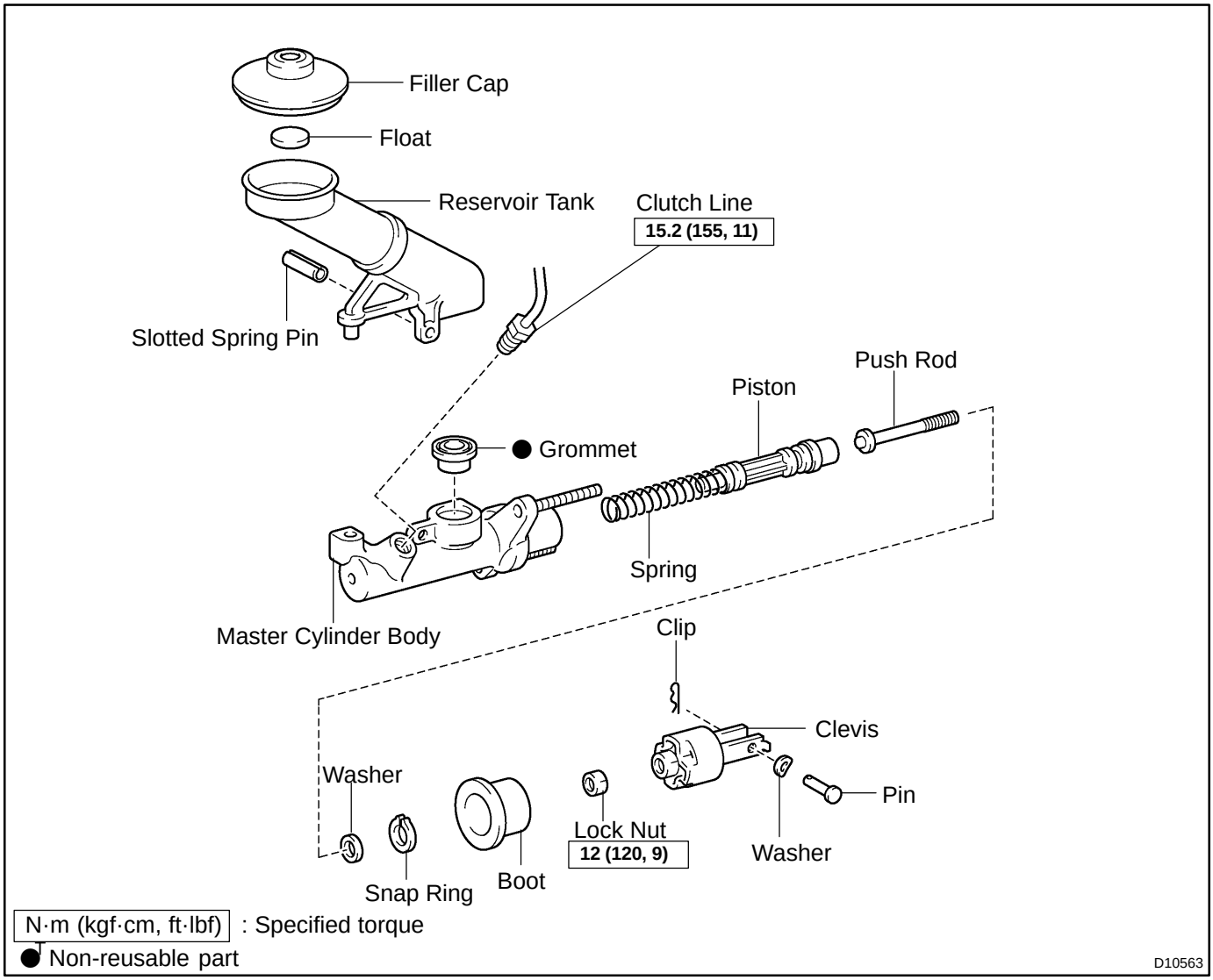
(b) Check that there is no continuity between the terminals when the switch is OFF (free).

If continuity is not as specified, replace the switch.

CLUTCH MASTER CYLINDER

COMPONENTS

CL0D0-01

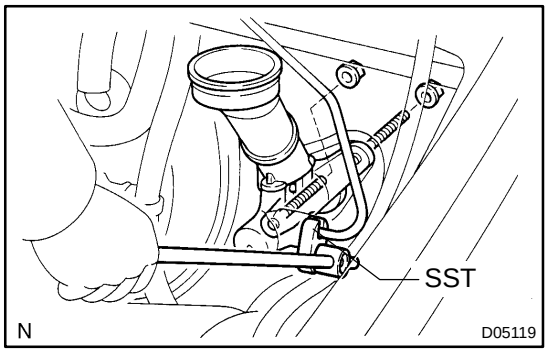


CL0D1-02

REMOVAL

1. DRAIN OUT FLUID WITH SYRINGE

2. REMOVE LOWER FINISH PANEL (See page BO-135)



3. DISCONNECT CLUTCH LINE UNION

Using SST, disconnect the clutch line. Use a container to catch the fluid.

SST 09023-00101

Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

4. REMOVE CLIP AND PIN

(a) Using needle nose pliers, remove the clip.

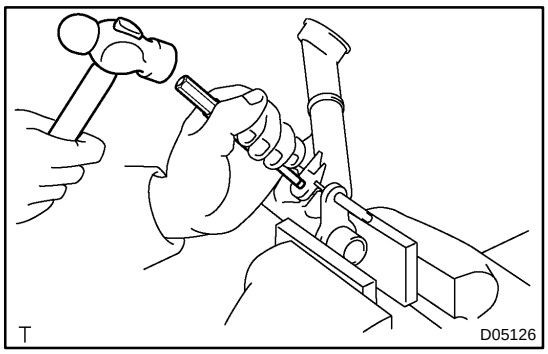
(b) Remove the pin and washer.

5. REMOVE 2 MOUNTING NUTS AND PULL OUT MASTER CYLINDER

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

CL0D2-01

DISASSEMBLY



1. REMOVE RESERVOIR TANK

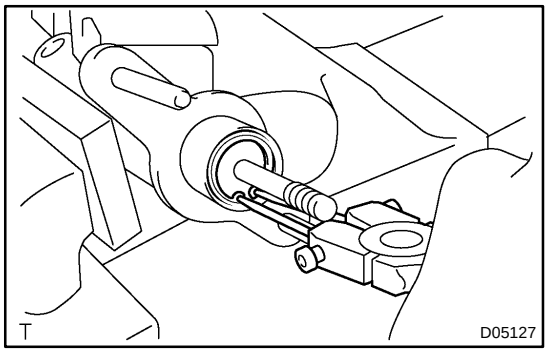
(a) Using a pin punch (5 mm) and a hammer, drive out the slotted spring pin.

(b) Remove the reservoir tank and grommet.

2. REMOVE CLEVIS AND BOOT

(a) Loosen the lock nut to remove the clevis and remove the lock nut.

(b) Remove the boot.



3. REMOVE PUSH ROD

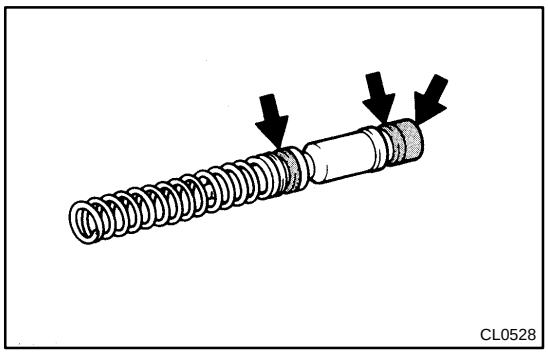
(a) While pushing the push rod, using snap ring pliers remove the snap ring.

(b) Remove the push rod and washer.

4. REMOVE PISTON AND SPRING

CL0D3-01

REASSEMBLY



1. COAT PARTS WITH LITHIUM SOAP BASE GLYCOL GREASE, AS SHOWN

2. INSERT PISTON AND SPRING INTO CYLINDER

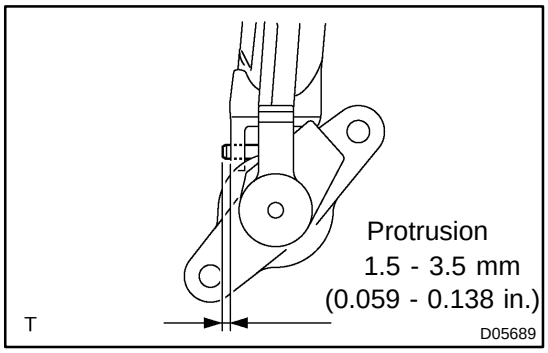
3. INSTALL PUSH ROD AND BOOT

(a) Install the washer to the push rod.

(b) Push the push rod to the piston, using snap ring pliers, install the snap ring.

(c) Install the boot.

4. TEMPORARILY INSTALL LOCK NUT AND CLEVIS



5. INSTALL RESERVOIR TANK

(a) Install the reservoir tank and a new grommet.

(b) Using a pin punch (5 mm) and a hammer, drive in the slotted spring pin.

CL0D4-01

INSTALLATION

Installation is in the reverse order of removal (See page CL-5).

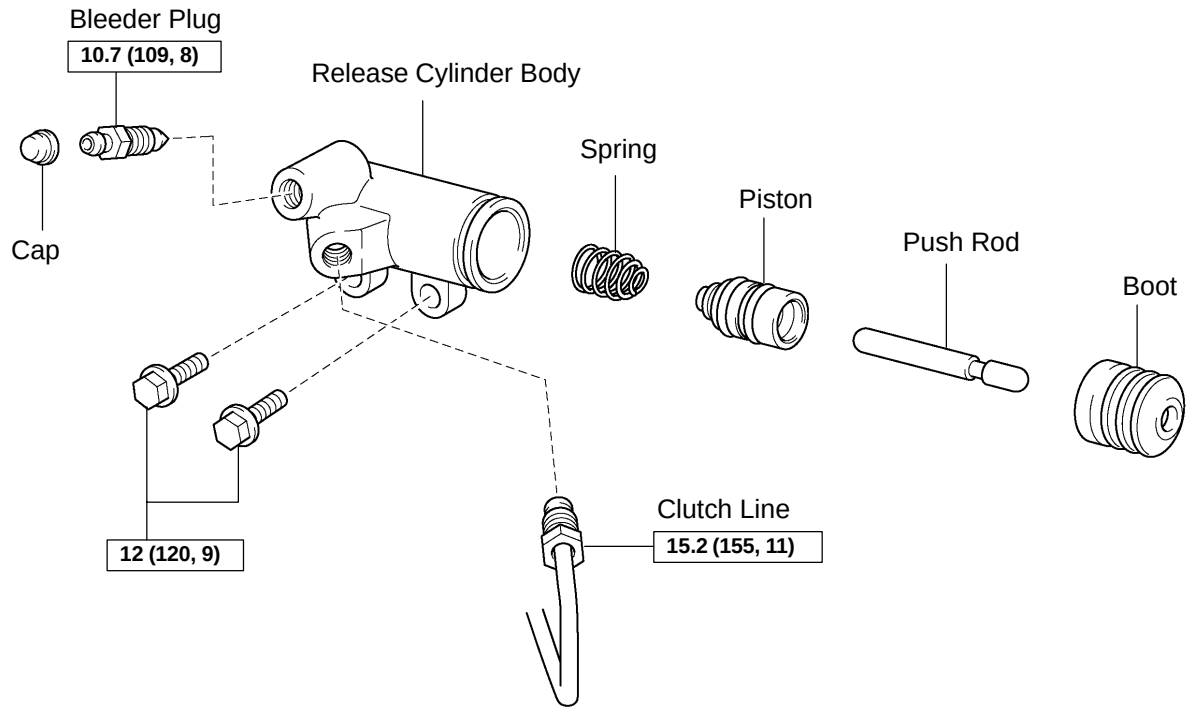
HINT:

After installation, adjust the clutch pedal and bleed the clutch system.

CLUTCH RELEASE CYLINDER

CL0D5-01

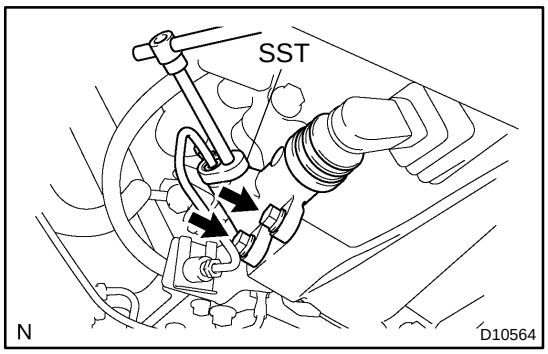
COMPONENTS



N N·m (kgf·cm, ft·lbf) : Specified torque

D11475

CL0D6-02



REMOVAL

1. DISCONNECT CLUTCH LINE

Using SST, disconnect the clutch line. Use a container to catch the fluid.

SST 09023-00101

Torque: 15.2 N·m (155 kgf·cm, 11 ft·lbf)

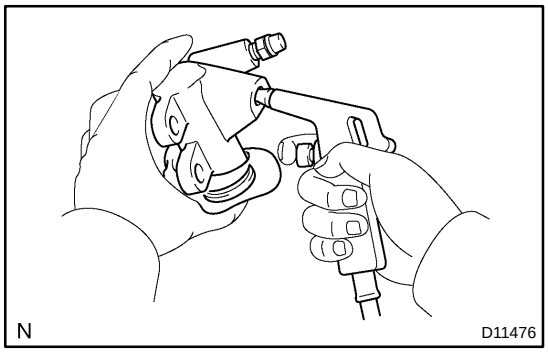
2. REMOVE 2 BOLTS AND PULL OUT RELEASE CYLINDER

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

CL0D7-01

DISASSEMBLY

1. PULL OUT PUSH ROD WITH BOOT



2. REMOVE PISTON WITH SPRING

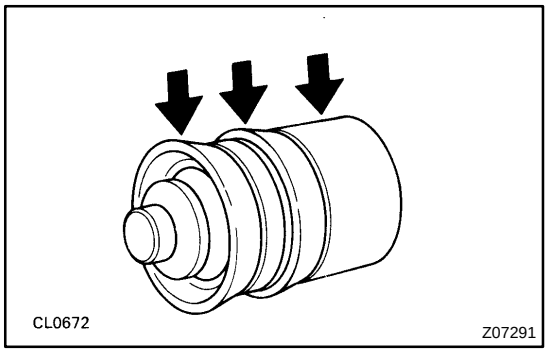
Using compressed air, remove the piston and spring from the cylinder.

3. REMOVE BLEEDER PLUG AND CAP

CL0D8-01

REASSEMBLY

1. **INSTALL BLEEDER PLUG AND CAP**
   Torque: 10.7 N·m (109 kgf·cm, 8 ft·lbf)



2. **COAT PISTON WITH LITHIUM SOAP BASE GLYCOL GREASE, AS SHOWN**
3. **INSTALL PISTON WITH SPRING INTO CYLINDER**
4. **INSTALL BOOT WITH PUSH ROD TO CYLINDER**

CL0D9-01

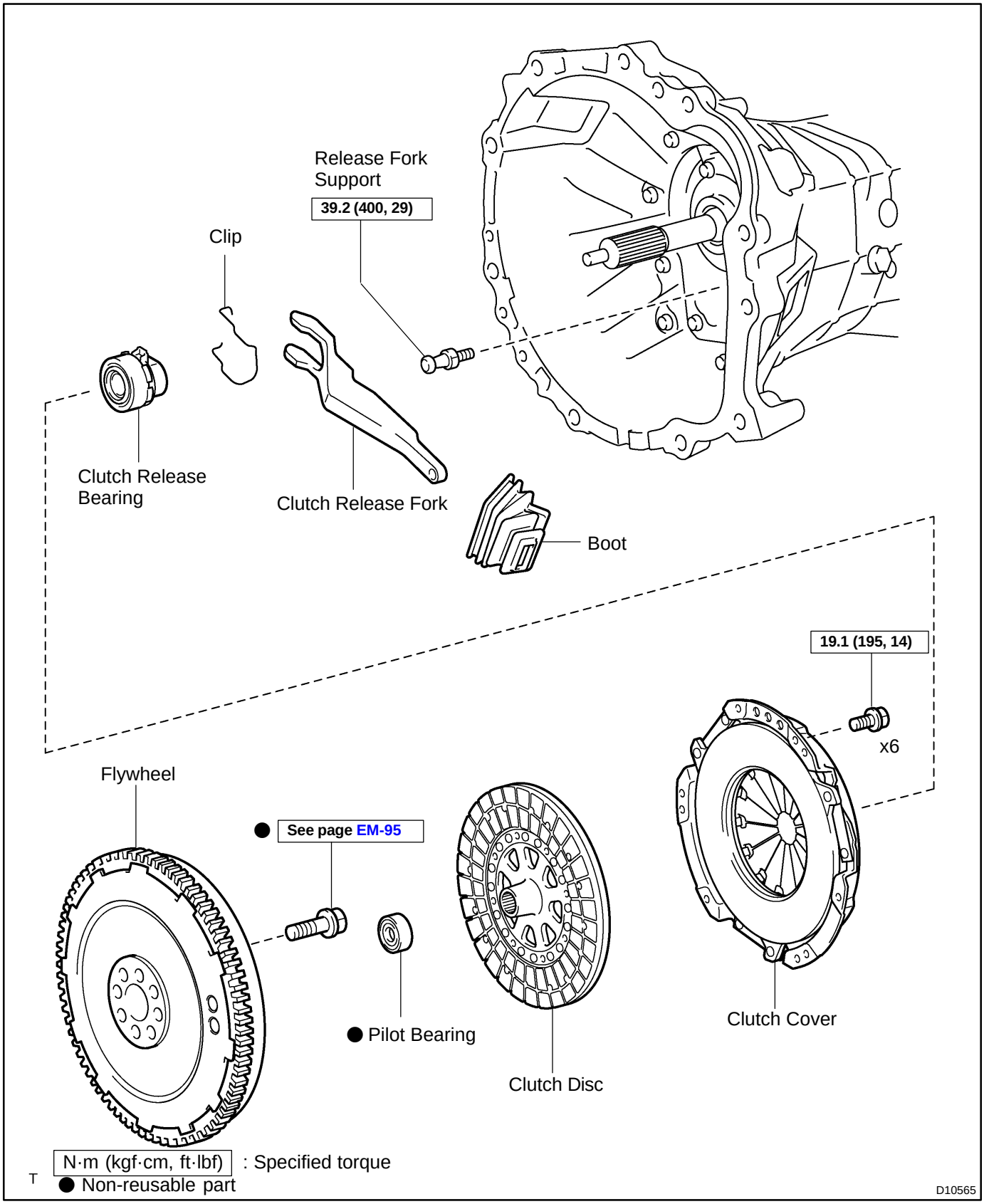
INSTALLATION

Installation is in the reverse order of removal (See page CL-10).

CLUTCH UNIT

COMPONENTS

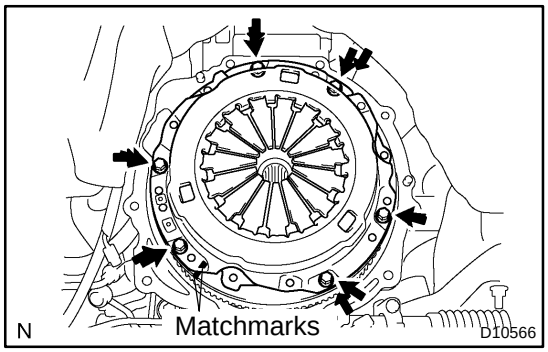
CL0DA-01



CL0DB-01

REMOVAL

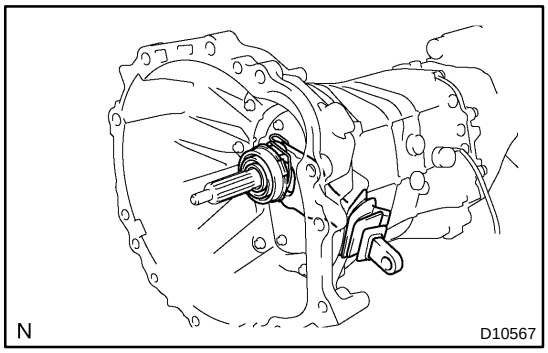
1. REMOVE TRANSMISSION FROM ENGINE
(See page MT-5)



2. REMOVE CLUTCH COVER AND DISC

(a) Place matchmarks on the flywheel and clutch cover.
(b) Loosen each set bolt one turn at a time until spring tension is released.
(c) Remove the set bolts, and pull off the clutch cover with the clutch disc.

NOTICE:
Do not drop the clutch disc.

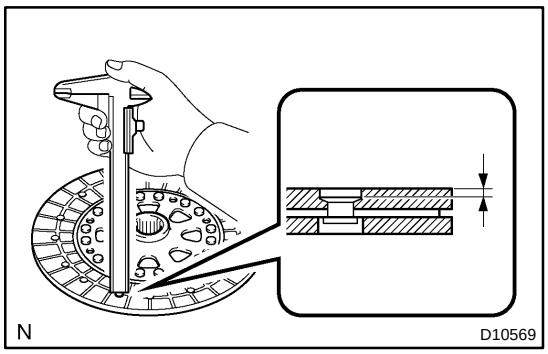


3. REMOVE BOOT, RELEASE BEARING AND FORK FROM TRANSMISSION

(a) Remove the boot from the transmission.
(b) Remove the release bearing together with the fork and then separate them.
(c) Remove the clip from the release bearing.

CL0DC-01

INSPECTION

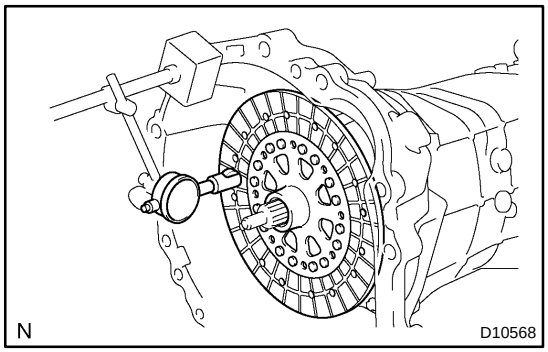


1. INSPECT CLUTCH DISC FOR WEAR OR DAMAGE

Using vernier calipers, measure the rivet head depth.

Minimum rivet depth: 0.3 mm (0.012 in.)

If it is not as specified, replace the clutch disc.

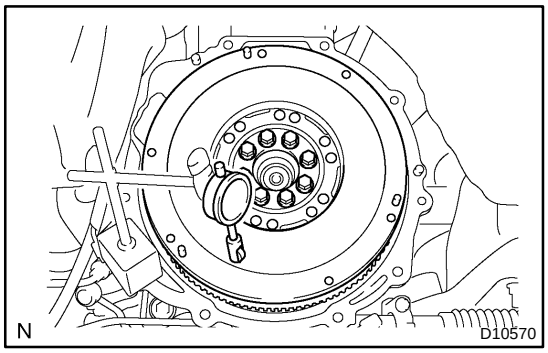


2. INSPECT CLUTCH DISC RUNOUT

Using a dial indicator with roller instrument, check the disc runout.

Maximum runout: 0.8 mm (0.031 in.)

If it is not as specified, replace the clutch disc.

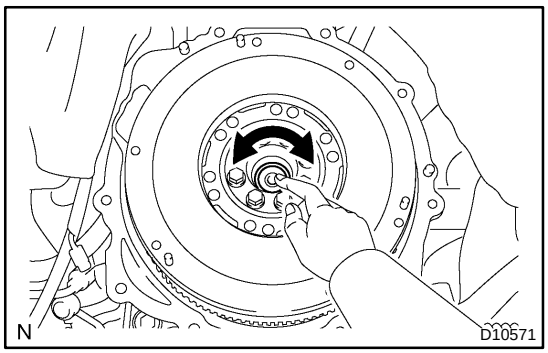


3. INSPECT FLYWHEEL RUNOUT

Using a dial indicator with roller instrument, check the flywheel runout.

Maximum runout: 0.1 mm (0.004 in.)

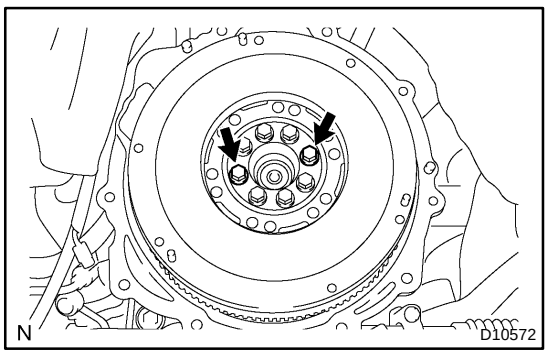
If it is not as specified, replace the flywheel.



4. INSPECT PILOT BEARING

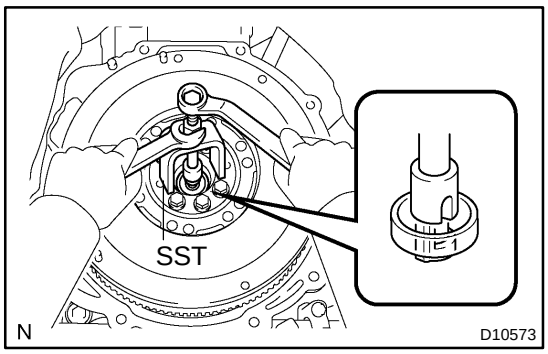
Turn the bearing by hand while applying force in the axial direction.

If the bearing sticks or has much resistance, replace the pilot bearing.

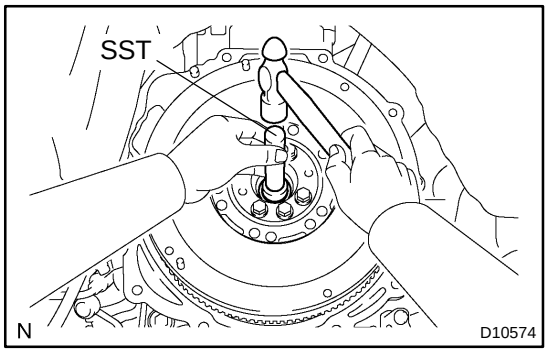


5. IF NECESSARY, REPLACE PILOT BEARING

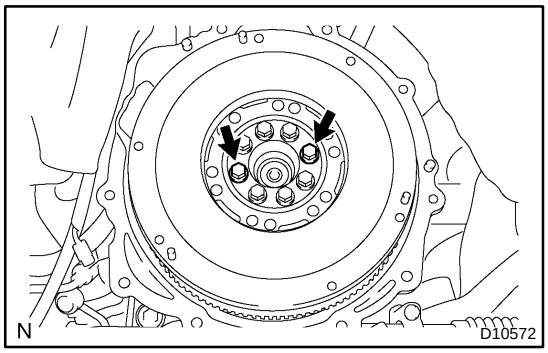
(a) Remove the 2 bolts at diametrically opposite points.



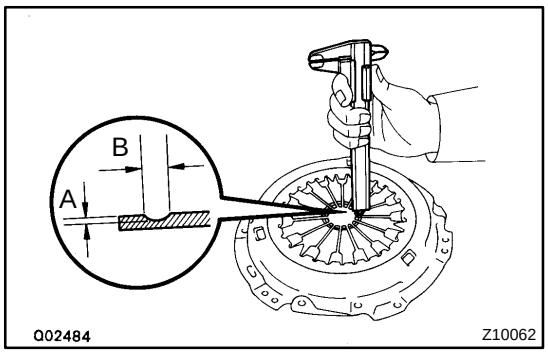
(b) Using SST, remove the pilot bearing.
SST 09303-3501 1



(c) Using SST and a hammer, drive in a new pilot bearing.
SST 09304-12012



(d) Install the 2 new bolts.
(e) First, torque the 2 bolts uniformly a little at a time.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)
(f) Then tighten the 2 bolts and additional 80 - 100°.

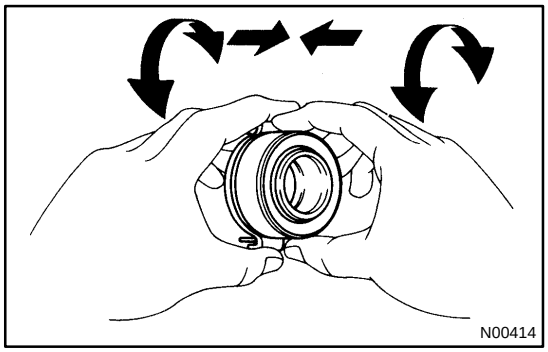


6. INSPECT DIAPHRAGM SPRING FOR WEAR

Using calipers, measure the diaphragm spring for depth and width of wear.

Maximum depth: A 0.6 mm (0.024 in.)
Maximum width: B 5.0 mm (0.197 in.)

If it is not as specified, replace the clutch cover.



7. INSPECT RELEASE BEARING

Turn the bearing by hand while applying force in the axial direction.

HINT:

The bearing is permanently lubricated and requires no cleaning or lubrication.

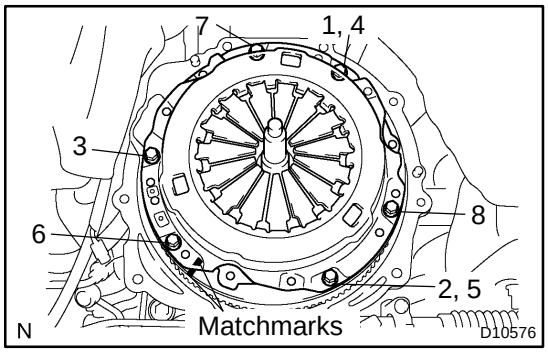
If necessary, replace the release bearing.

CL0DD-01

INSTALLATION

1. INSTALL CLUTCH DISC AND CLUTCH COVER ON FLYWHEEL

(a) Insert SST in the clutch disc, and then set them.
SST 09301-001 10



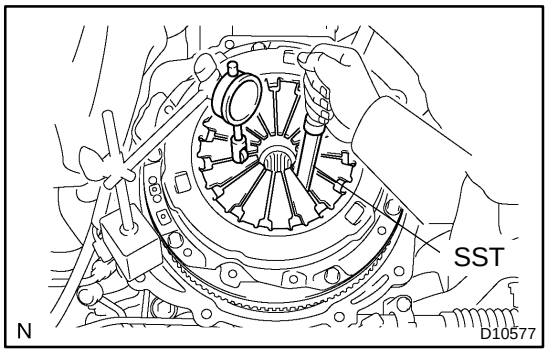
(b) Align the matchmarks on the clutch cover and flywheel.

(c) Following the procedures shown in the illustration, tighten the 6 bolts in the order starting the bolt locating near the knock pin on the top.

Torque: 19.1 N·m (195 kgf·cm, 14 ft·lbf)

HINT:

- Following the order in the illustration, tighten the bolts at a time evenly.
- Move SST up and down, right and left lightly, after checking that the disc is in the center, tighten the bolts.



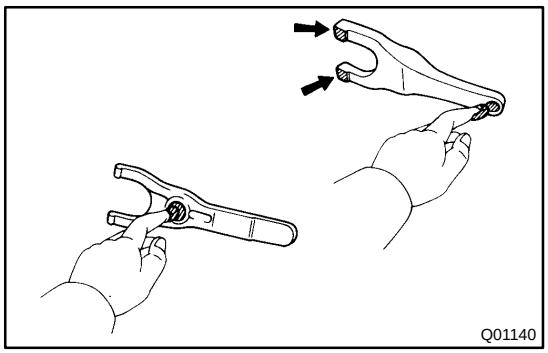
2. CHECK DIAPHRAGM SPRING TIP ALIGNMENT

Using a dial indicator with roller instrument, check the diaphragm spring tip alignment.

Maximum non-alignment: 0.5 mm (0.020 in.)

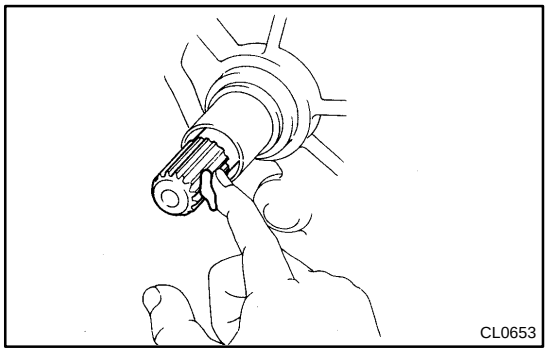
If the alignment is not as specified, with SST, adjust the diaphragm spring tip alignment.

SST 09333-00013



3. APPLY MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE (NLGI NO.2)

(a) Apply release hub grease to the release fork and release bearing contact, release fork and push rod contact and release fork pivot points.



(b) Apply clutch spline grease to the clutch disc spline.

HINT:

Recommended grease part number 08887-01706 (100 g).

4. INSTALL BOOT, RELEASE BEARING AND FORK TO TRANSMISSION

(a) Install the clip to the release bearing.

(b) Install the release bearing to the release fork, and then install them to the transmission.

(c) Install the boot to the transmission.

5. INSTALL TRANSMISSION TO ENGINE
(See page MT-8)

MANUAL TRANSMISSION SYSTEM

MT0BW-02

PRECAUTION

When working with FIPG material, you must observe the following items.

- **Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.**
- **Thoroughly clean all components to remove all the loose material.**
- **Clean both sealing surfaces with a non-residue solvent.**
- **Apply FIPG in an approx. 1.2 mm (0.047 in.) wide bead along the sealing surface.**
- **Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.**

TROUBLESHOOTING

MT0BX-02

PROBLEM SYMPTOMS TABLE

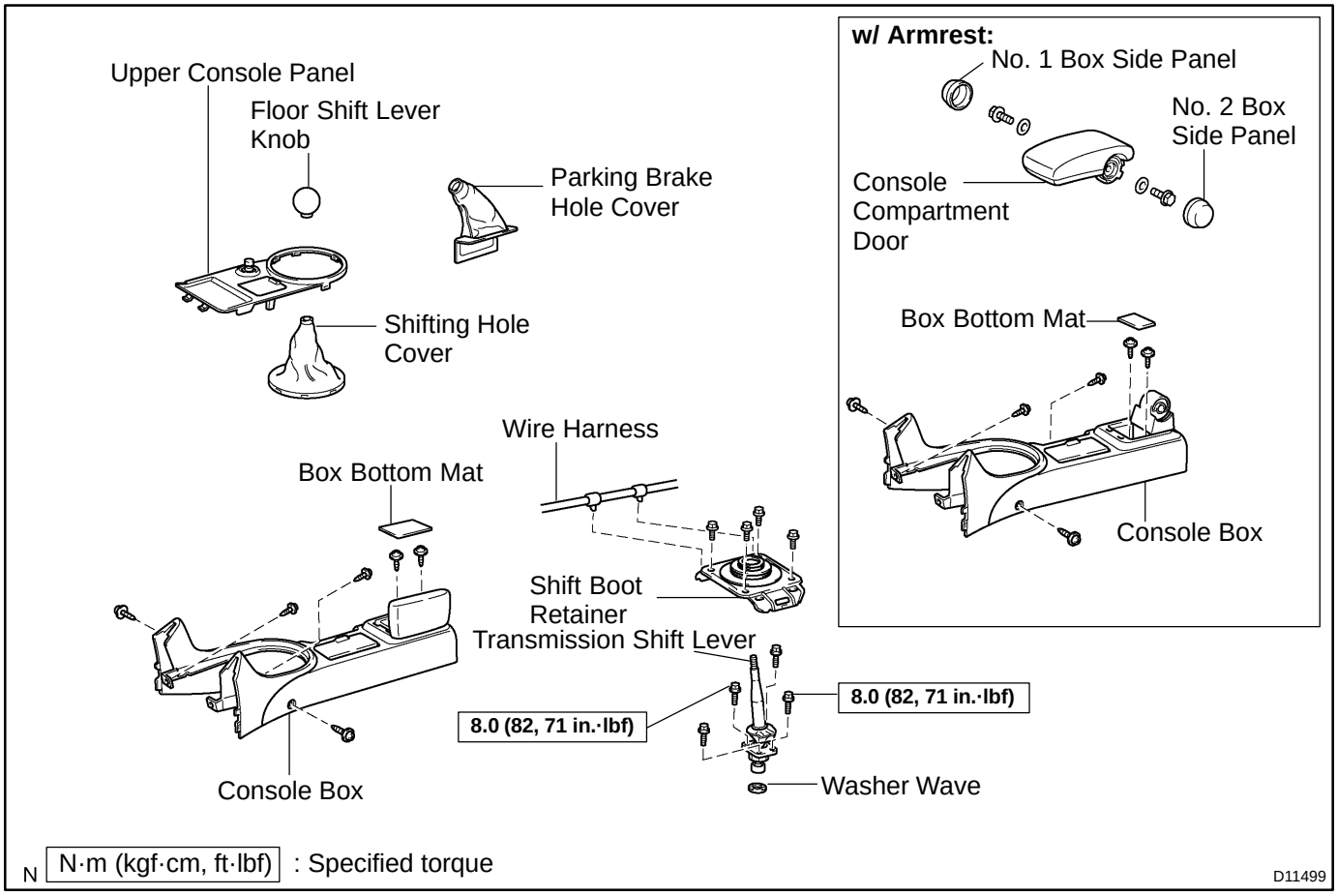
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

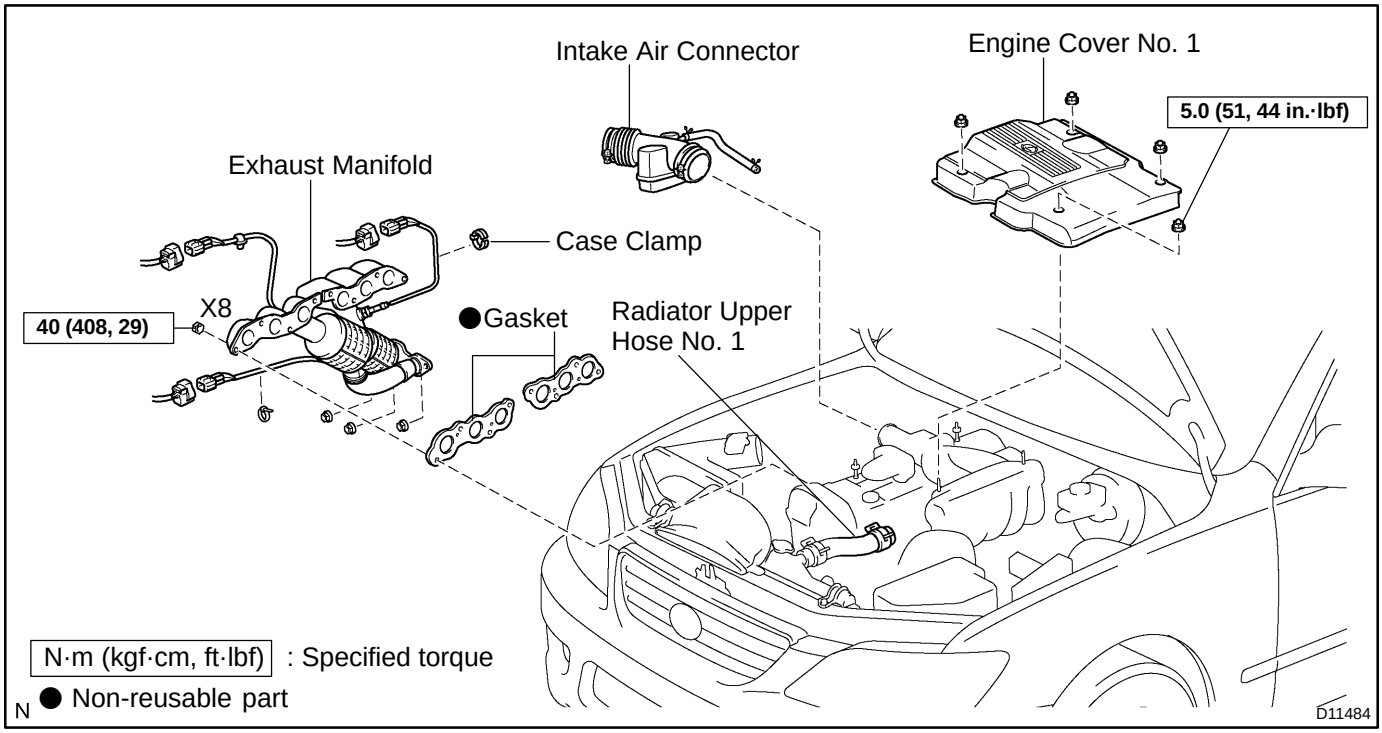
Symptom	Suspect Area	See page
Noise	1. Oil (Level low)	MT-8
	2. Oil (Wrong)	MT-8
	3. Gear (Worn or damaged)	MT-11
	4. Bearing (Worn or damaged)	MT-11
Oil leakage	1. Oil (Level too high)	MT-8
	2. Gasket (Damaged)	MT-11
	3. Oil seal (Worn or damaged)	MT-11
	4. O-Ring (Worn or damaged)	MT-11
Hard to shift or will not shift	1. Synchronizer ring (Worn or damaged)	MT-25 MT-30 MT-38
	2. Shift key spring (Damaged)	MT-30 MT-38
Jumps out of gear	1. Locking ball spring (Damaged)	MT-11
	2. Shift fork (Worn)	MT-11
	3. Gear (Worn or damaged)	MT-11
	4. Bearing (Worn or damaged)	MT-11

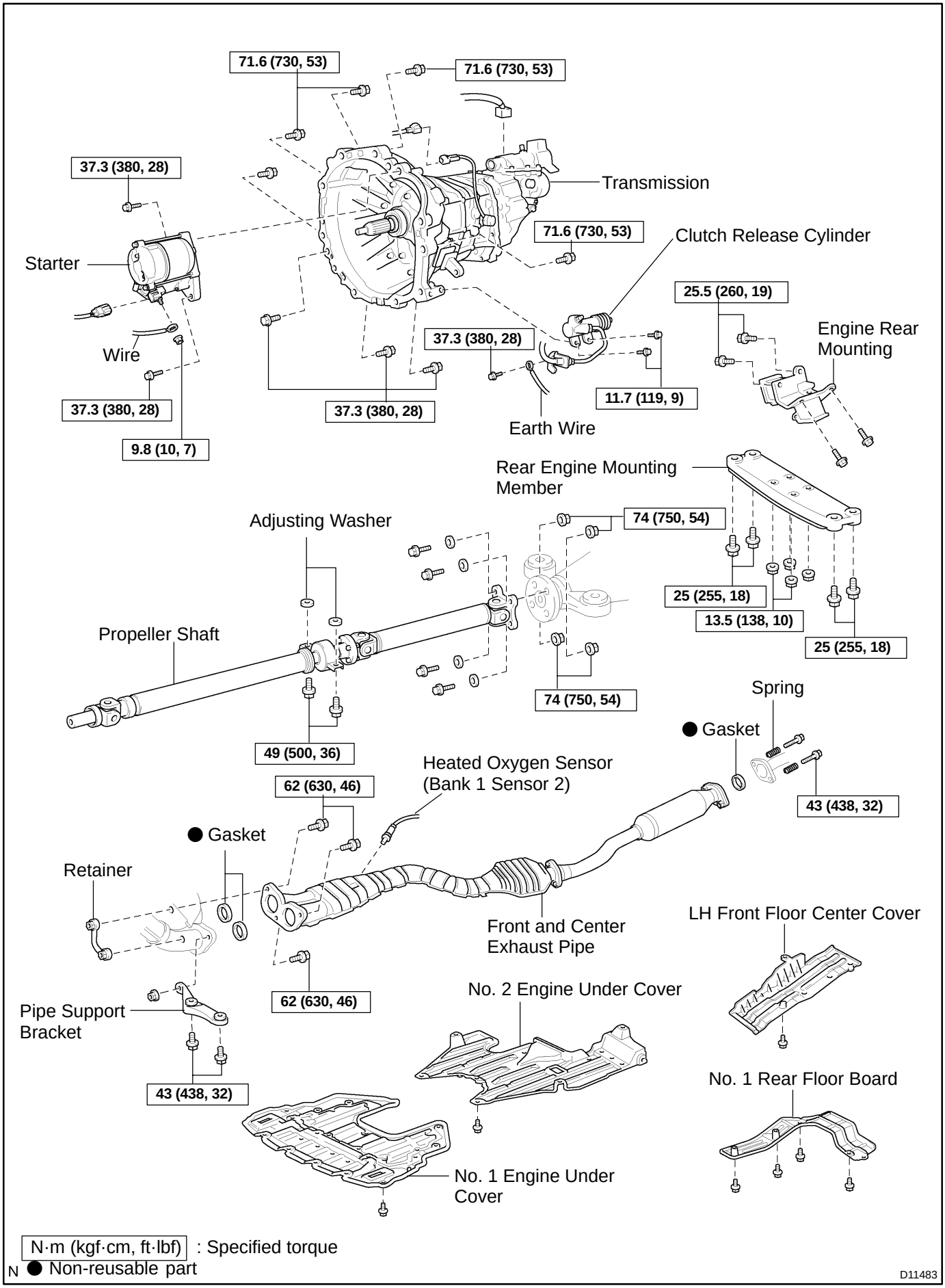
MANUAL TRANSMISSION UNIT

COMPONENTS

MT0FS-02



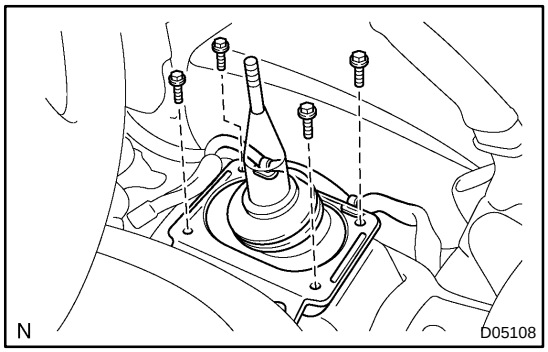



71.6 (730, 53)
71.6 (730, 53)
37.3 (380, 28)
Transmission
71.6 (730, 53)
Clutch Release Cylinder
Starter
25.5 (260, 19)
Engine Rear Mounting
37.3 (380, 28)
Wire
37.3 (380, 28)
11.7 (119, 9)
37.3 (380, 28)
Earth Wire
9.8 (10, 7)
Rear Engine Mounting Member
Adjusting Washer
74 (750, 54)
25 (255, 18)
13.5 (138, 10)
Propeller Shaft
25 (255, 18)
74 (750, 54)
Spring
● Gasket
49 (500, 36)
Heated Oxygen Sensor (Bank 1 Sensor 2)
62 (630, 46)
43 (438, 32)
● Gasket
Retainer
Front and Center Exhaust Pipe
LH Front Floor Center Cover
62 (630, 46)
No. 2 Engine Under Cover
Pipe Support Bracket
43 (438, 32)
No. 1 Rear Floor Board
No. 1 Engine Under Cover
N·m (kgf·cm, ft·lbf) : Specified torque
N ● Non-reusable part
D11483

MT0FT-01

REMOVAL

1. REMOVE UPPER CONSOLE PANEL AND CONSOLE BOX (See page BO-139)

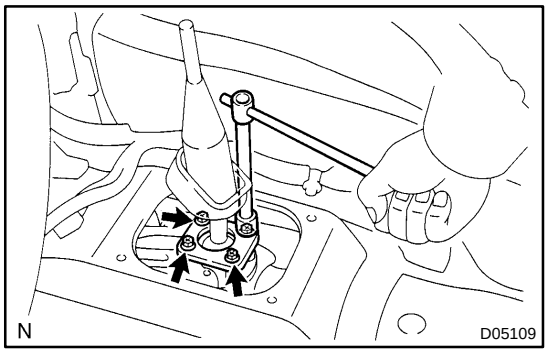


2. REMOVE SHIFT BOOT RETAINER

(a) Disconnect the 2 wire harness clamps.

(b) Remove the 4 bolts and shift boot retainer.

3. REMOVE SHIFT BOOT



4. REMOVE TRANSMISSION SHIFT LEVER

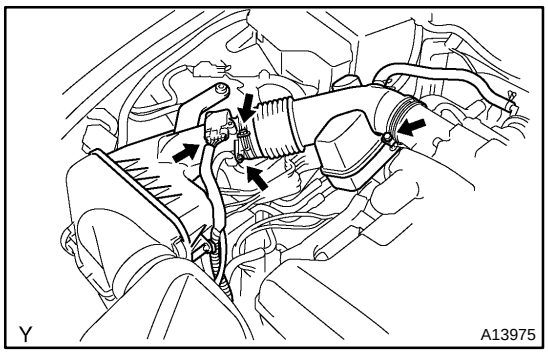
Remove the 4 bolts, transmission shift lever and washer washer.

5. REMOVE ENGINE COVER NO. 1

6. REMOVE NO. 1 AND NO. 2 ENGINE UNDER COVERS

7. DRAIN ENGINE COOLANT

8. DISCONNECT RADIATOR UPPER HOSE NO. 1 FROM ENGINE

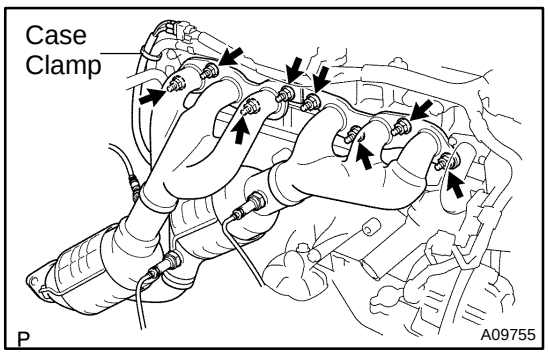


9. REMOVE INTAKE AIR CONNECTOR

(a) Disconnect the MAF meter connector.

(b) Disconnect the engine wire harness clamp from the air cleaner case.

(c) Loosen the 2 hose clamp bolts, remove the intake air connector from the throttle body.



10. REMOVE EXHAUST MANIFOLD

(a) Remove the case clamp.

(b) Disconnect the heated oxygen sensor (bank 2 sensor 1) connector.

(c) Remove the 8 nuts, exhaust manifold and 2 gaskets.

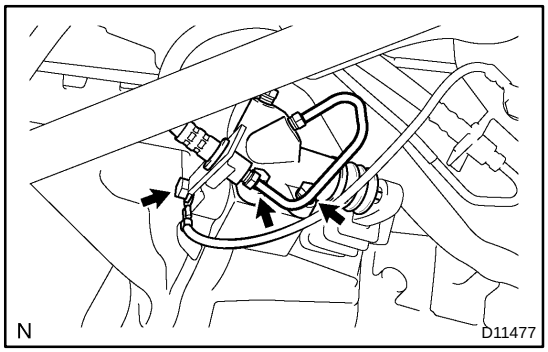
11. RAISE VEHICLE

NOTICE:

Make sure that the vehicle is securely supported.

12. DRAIN TRANSMISSION OIL

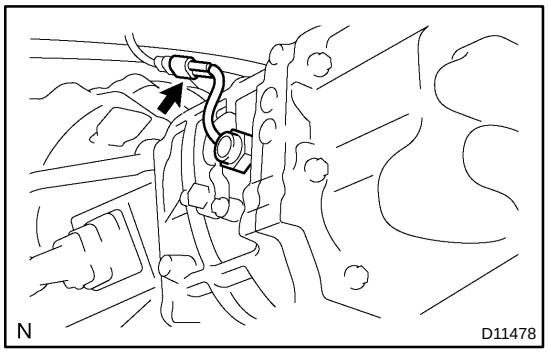
13. **REMOVE LH FRONT FLOOR CENTER COVER**
14. **REMOVE NO. 1 REAR FLOOR BOARD**
15. **REMOVE FRONT AND CENTER EXHAUST PIPES (See page EM-100)**
16. **REMOVE PROPELLER SHAFT (See page PR-4)**



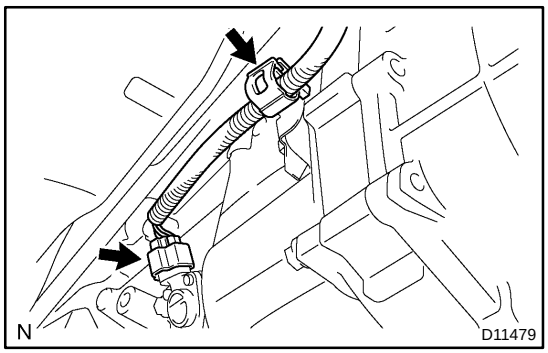
17. **DISCONNECT CLUTCH RELEASE CYLINDER, CLUTCH LINE BRACKET AND EARTH WIRE**

(a) Remove the 2 bolts and disconnect the clutch release cylinder.

(b) Remove the bolt and disconnect the clutch line bracket and earth wire.



18. **DISCONNECT BACK-UP LIGHT SWITCH CONNECTOR**



19. **DISCONNECT SPEED SENSOR CONNECTOR AND WIRE HARNESS**

(a) Disconnect the connector.

(b) Disconnect the wire harness from the clamp.

20. **REMOVE STARTER**

(a) Disconnect the connector.

(b) Remove the nut and wire.

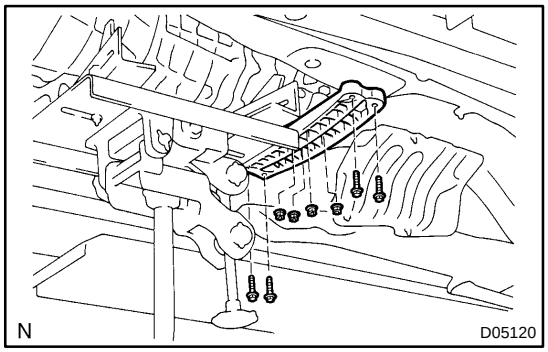
(c) Remove the 2 bolts and starter.

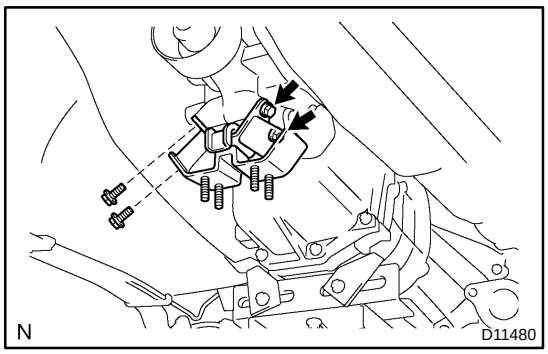
21. **JACK UP TRANSMISSION SLIGHTLY**

Using a transmission jack, support the transmission.

22. **REMOVE REAR ENGINE MOUNTING MEMBER**

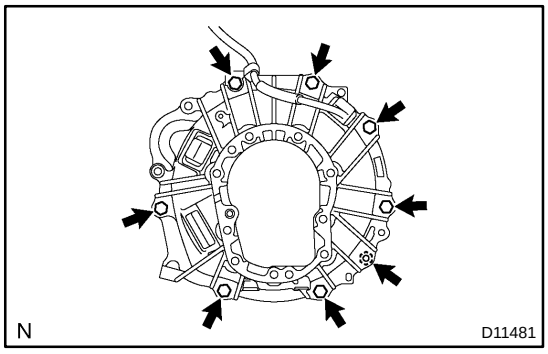
Remove the 4 bolts, 4 nuts and rear engine mounting member.





23. REMOVE ENGINE REAR MOUNTING

Remove the 4 bolts and engine rear mounting.



24. REMOVE TRANSMISSION

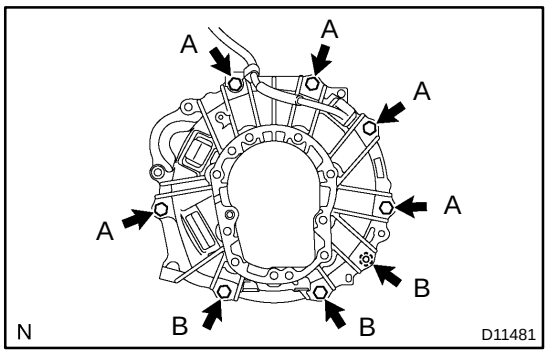
Remove the 8 bolts, wire harness clamp and transmission.

HINT:

After separating the transmission from the engine, turn the transmission a little in the clockwise. At the condition that the transmission housing does not contact the body, lower the jack.

MT0FU-02

INSTALLATION



1. INSTALL TRANSMISSION

(a) Raise the engine front side.

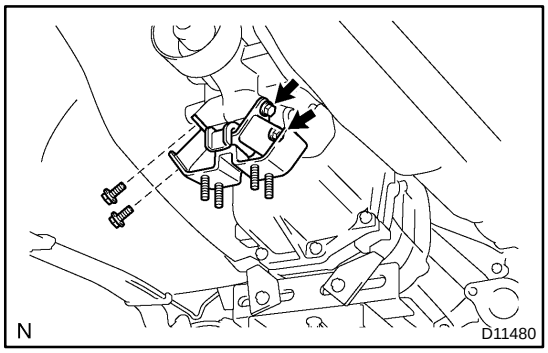
(b) Align the input spline with a clutch disc and install the transmission to the engine.

HINT:

Turn the transmission a little in the clockwise and jack up until just before the transmission housing touches the body.

(c) Install the transmission and wire harness clamp with the 8 bolts.

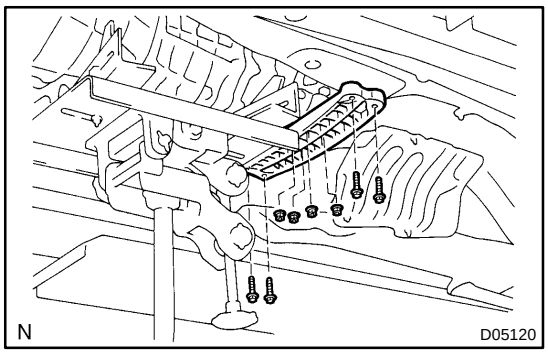
Torque:
Bolt A (12 mm head bolt):
71.6 N·m (730 kgf·cm, 53 ft·lbf)
Bolt B (10 mm head bolt):
37.3 N·m (380 kgf·cm, 28 ft·lbf)



2. INSTALL ENGINE REAR MOUNTING

Install the engine rear mounting with 4 the bolts.

Torque: 25.5 N·m (260 kgf·cm, 19 ft·lbf)



3. INSTALL REAR ENGINE MOUNTING MEMBER

Install the rear engine mounting member with the 4 bolts and 4 nuts.

Torque:
Bolt: 25 N·m (255 kgf·cm, 18 ft·lbf)
Nut: 13.5 N·m (138 kgf·cm, 10 ft·lbf)

4. INSTALL STARTER

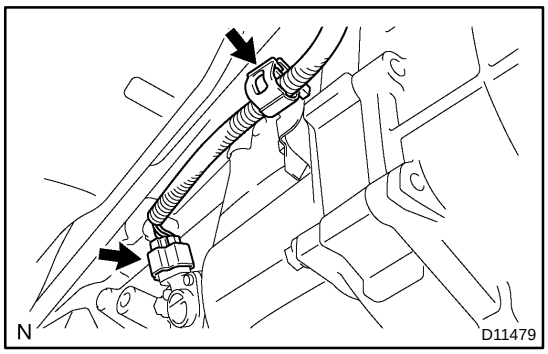
(a) Install the starter with the 2 bolts.

Torque: 37.3 N·m (380 kgf·cm, 28 ft·lbf)

(b) Install the wire with the nut.

Torque: 9.8 N·m (10 kgf·cm, 7 ft·lbf)

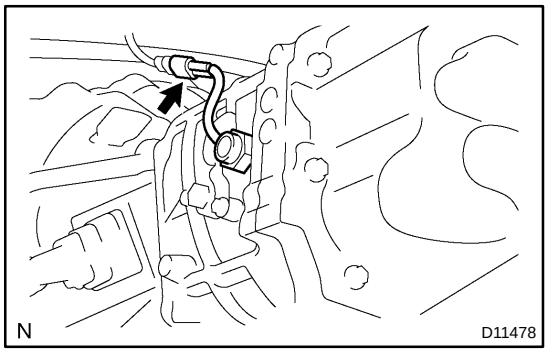
(c) Connect the connector.



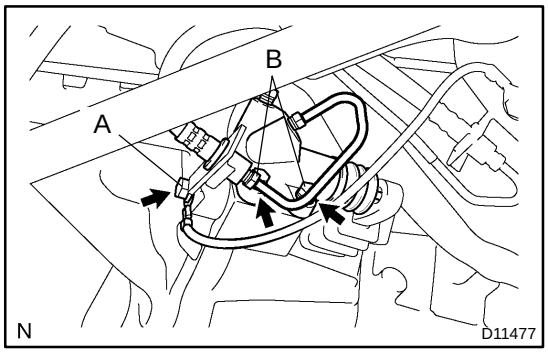
5. CONNECT SPEED SENSOR CONNECTOR AND WIRE HARNESS

(a) Connect the wire harness to the clamp.

(b) Connect the connector.



6. CONNECT BACK-UP LIGHT SWITCH CONNECTOR



7. CONNECT CLUTCH RELEASE CYLINDER, CLUTCH LINE BRACKET AND EARTH WIRE

(a) Connect the clutch line and earth wire with the bolt.

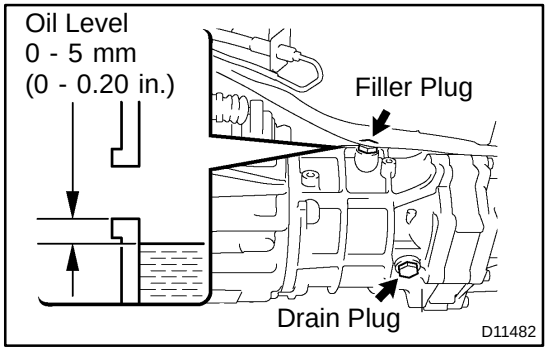
Torque:
Bolt A: 37.3 N·m (380 kgf·cm, 28 ft·lbf)

(b) Connect the clutch release cylinder with the 2 bolts.

Torque:
Bolt B: 11.7 N·m (119 kgf·cm, 9 ft·lbf)

8. INSTALL PROPELLER SHAFT (See page PR-10)

9. INSTALL FRONT AND CENTER EXHAUST PIPES (See page EM-100)



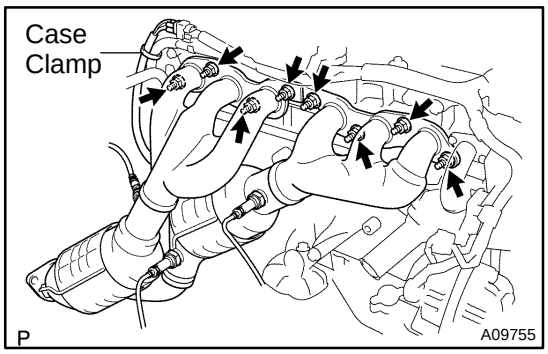
10. FILL WITH TRANSMISSION OIL

Torque:
Filler and Drain plug:
38 N·m (387 kgf·cm, 28 ft·lbf)
Oil grade: API GL-4 or GL-5
Viscosity: SAE 75W-90
Capacity: 2.6 litter (2.7 US qts, 2.3 Imp. qts)

11. INSTALL NO. 1 REAR FLOOR BOARD

12. INSTALL LH FRONT FLOOR CENTER COVER

13. LOWER VEHICLE



14. INSTALL EXHAUST MANIFOLD

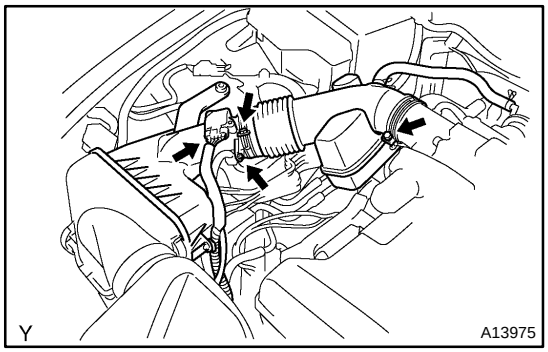
(a) Install 2 new gaskets to the cylinder head.

(b) Install the exhaust manifold with the 8 nuts. Uniformly tighten the nuts in several passes.

Torque: 40 N·m (408 kgf·cm, 29 ft·lbf)

(c) Connect the heated oxygen sensor (bank 2 sensor 1) connector.

(d) Install the case clamp.



15. INSTALL INTAKE AIR CONNECTOR

(a) Install the intake air resonator to the throttle body, tighten the 2 hose clamp bolts.

(b) Connect the PCV hose to the No. 2 cylinder head cover.

(c) Connect the engine wire harness clamp to the air cleaner case.

(d) Connect the MAF meter connector.

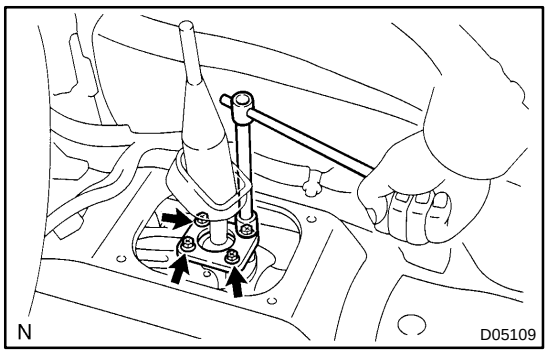
16. CONNECT RADIATOR UPPER HOSE NO. 1 FROM ENGINE

17. FILL WITH ENGINE COOLANT

18. INSTALL ENGINE COVER NO. 1

Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

19. INSTALL NO. 1 AND NO. 2 ENGINE UNDER COVERS



20. INSTALL TRANSMISSION SHIFT LEVER

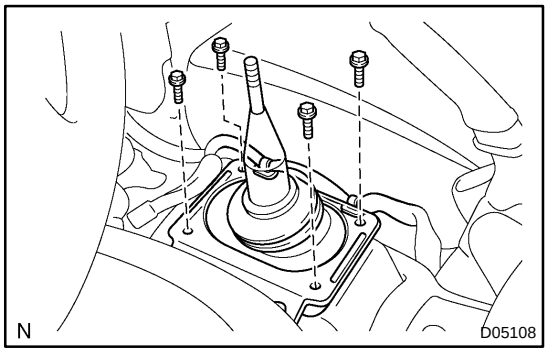
(a) Install the washer.

(b) Apply MP grease to the tip of shift lever.

(c) Install the shift lever with the 4 bolts.

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

21. INSTALL SHIFT BOOT



22. INSTALL SHIFT BOOT RETAINER

(a) Install the shift boot retainer with the 4 bolts.

(b) Connect the 2 wire harness clamps.

23. INSTALL UPPER CONSOLE PANEL AND CONSOLE BOX (See page BO-149)

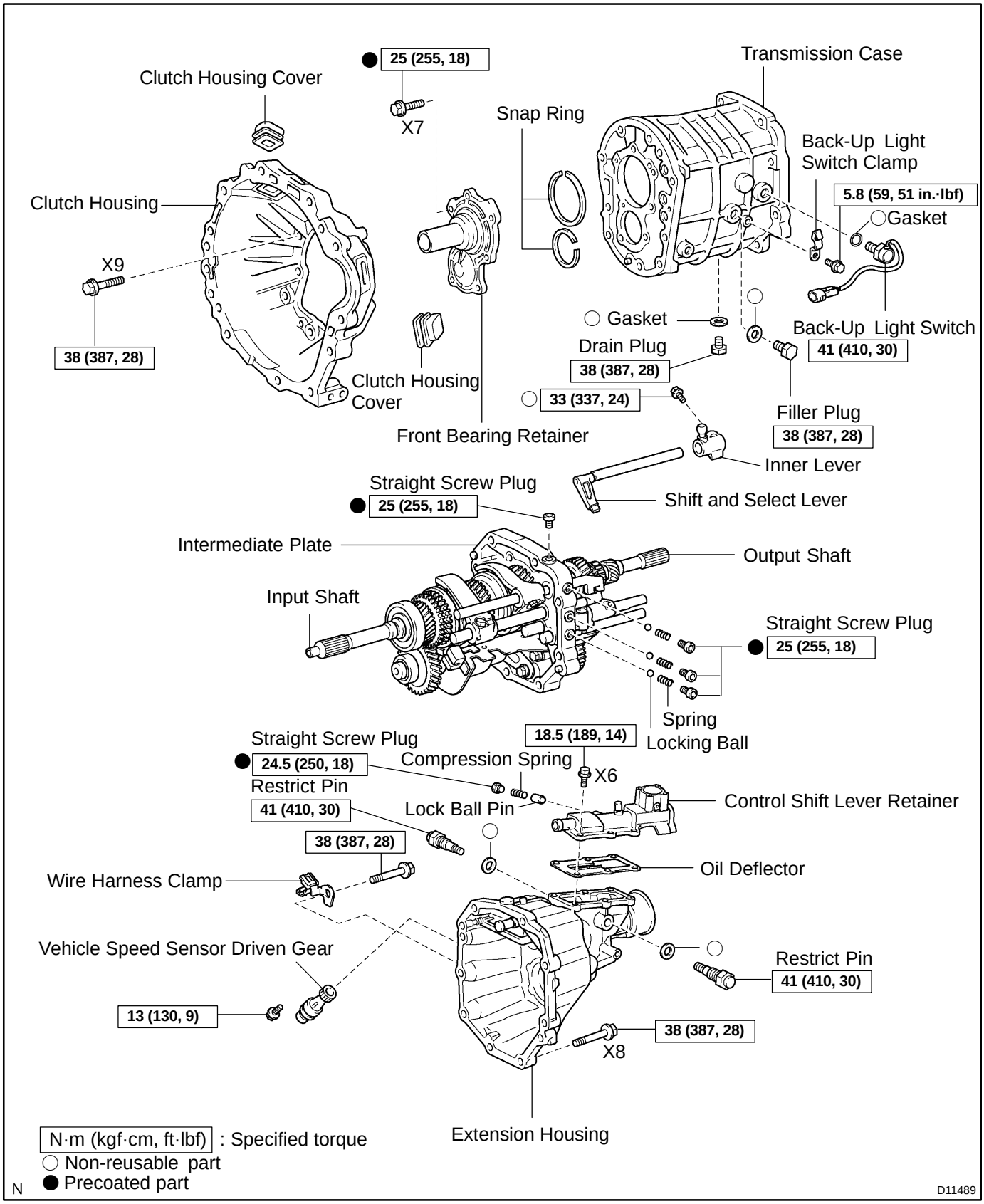
24. DO ROAD TEST

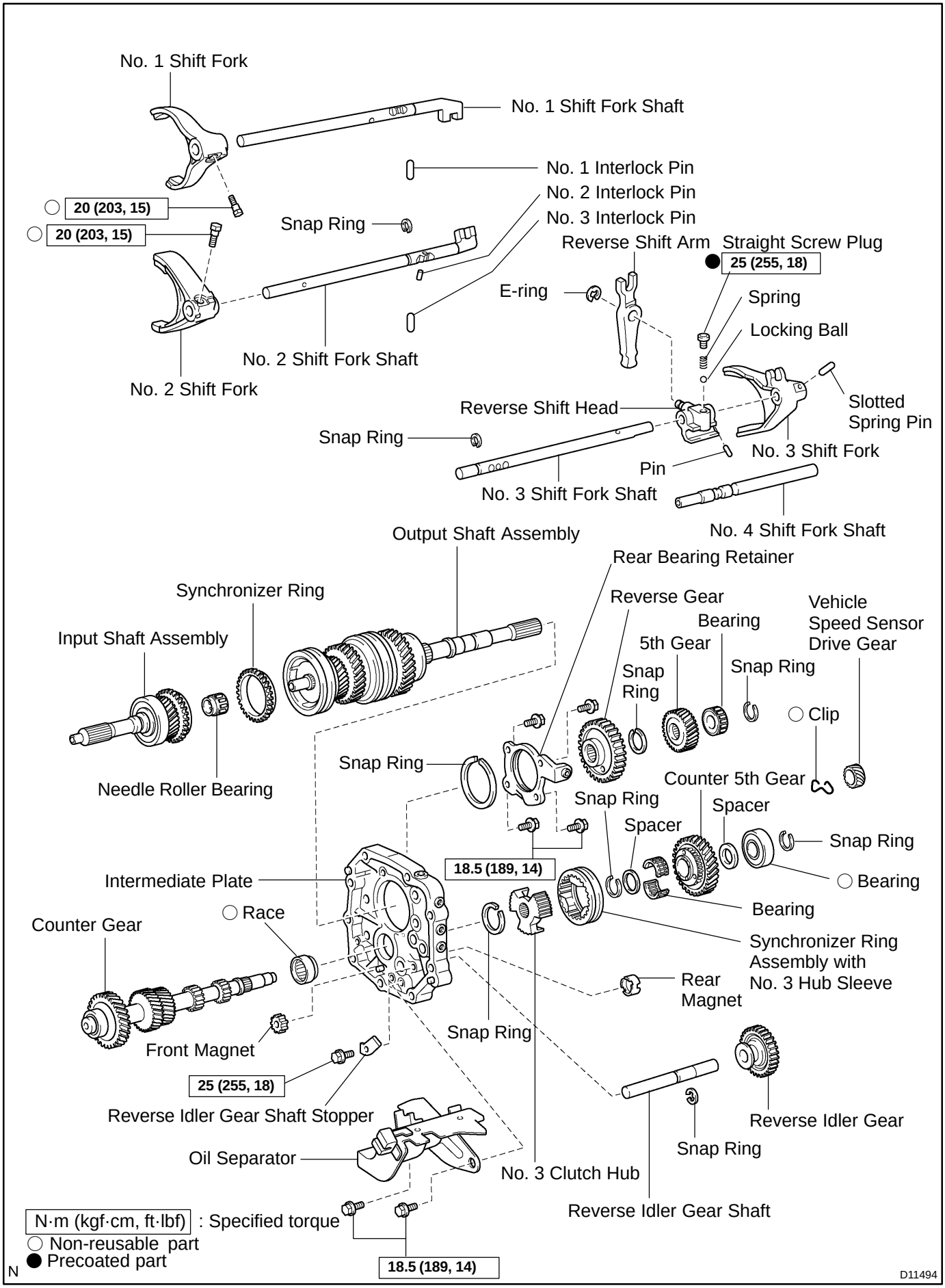
Check for abnormal noises and smooth shifting.

MANUAL TRANSMISSION ASSEMBLY

MT0C1-03

COMPONENTS




No. 1 Shift Fork
No. 1 Shift Fork Shaft
No. 1 Interlock Pin
No. 2 Interlock Pin
No. 3 Interlock Pin
20 (203, 15)
20 (203, 15)
Snap Ring
Reverse Shift Arm
Straight Screw Plug
25 (255, 18)
E-ring
Spring
Locking Ball
No. 2 Shift Fork Shaft
No. 2 Shift Fork
Reverse Shift Head
Slotted Spring Pin
Snap Ring
No. 3 Shift Fork
Pin
No. 3 Shift Fork Shaft
No. 4 Shift Fork Shaft
Output Shaft Assembly
Rear Bearing Retainer
Synchronizer Ring
Reverse Gear
Bearing
Vehicle Speed Sensor Drive Gear
Input Shaft Assembly
5th Gear
Snap Ring
Snap Ring
Clip
Needle Roller Bearing
Snap Ring
Counter 5th Gear
Snap Ring
Spacer
Spacer
Snap Ring
18.5 (189, 14)
Intermediate Plate
Bearing
Race
Bearing
Counter Gear
Synchronizer Ring Assembly with No. 3 Hub Sleeve
Rear Magnet
Snap Ring
Front Magnet
25 (255, 18)
Reverse Idler Gear Shaft Stopper
Reverse Idler Gear
Oil Separator
Snap Ring
No. 3 Clutch Hub
Reverse Idler Gear Shaft
N·m (kgf·cm, ft·lbf) : Specified torque
Non-reusable part
Precoated part
18.5 (189, 14)
N
D11494

MT0FW-02

DISASSEMBLY

1. REMOVE BACK-UP LIGHT SWITCH WITH GASKET

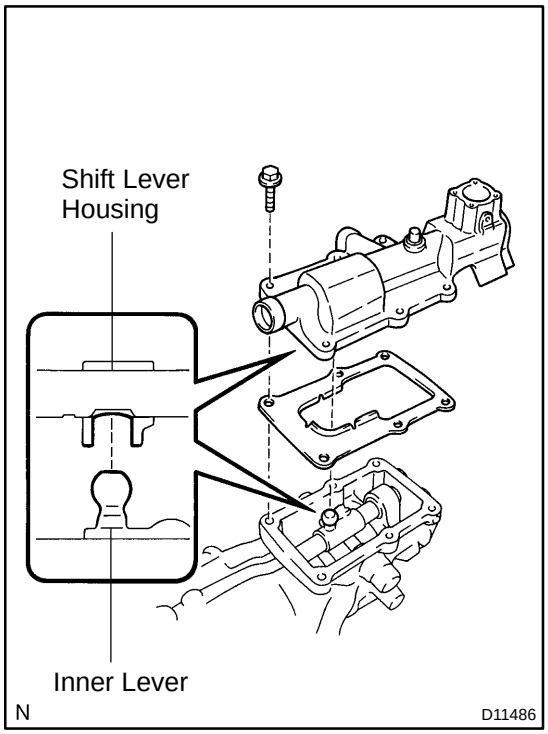
(a) Remove the bolt and disconnect the back-up light switch clamp.
Torque: 5.8 N·m (59 kgf·cm, 51 in.·lbf)

(b) Remove the back-up light switch with the gasket.
Torque: 41 N·m (410 kgf·cm, 30 ft·lbf)

2. REMOVE BOLT AND VEHICLE SPEED SENSOR DRIVEN GEAR
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

3. REMOVE CLUTCH HOUSING FROM TRANSMISSION CASE

Remove the 9 bolts and clutch housing.
Torque: 38 N·m (387 kgf·cm, 28 ft·lbf)

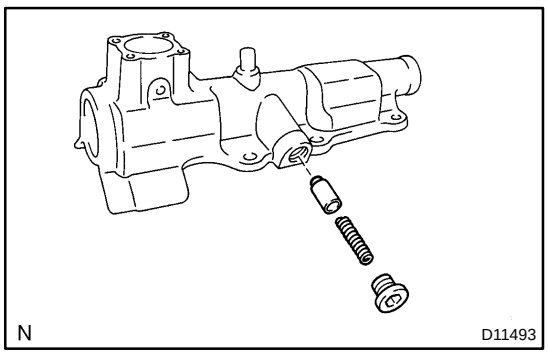


4. REMOVE CONTROL SHIFT LEVER RETAINER ASSEMBLY

(a) Remove the 6 bolts.
Torque: 18.5 N·m (189 kgf·cm, 14 ft·lbf)

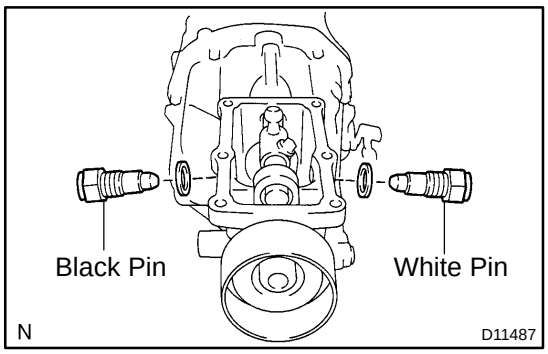
(b) Remove the control shift lever retainer assembly and oil deflector.

HINT:
At the time of installation, please refer to the following item.
Be sure to spline the small ball portion of inner lever into the shift lever housing.
(At this time, pay attention so that the retainer assy will not move to forth and back.)



(c) Using a hexagon wrench (10 mm), remove the straight screw plug.
Sealant: Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 24.5 N·m (250 kgf·cm, 18 ft·lbf)

(d) Using a magnetic finger, remove the compression spring and lock ball pin.



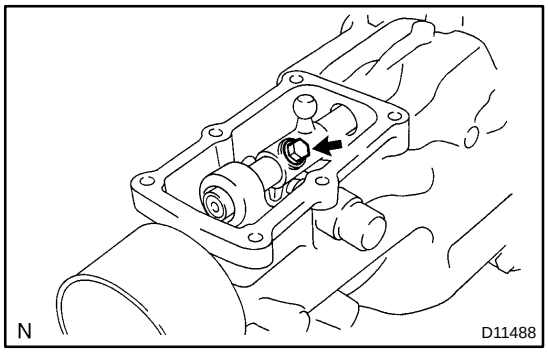
5. REMOVE 2 RESTRICT PINS AND GASKETS

(a) Remove the restrict pin (color: black) with the gasket.
Torque: 41 N·m (418 kgf·cm, 30 ft·lbf)

HINT:

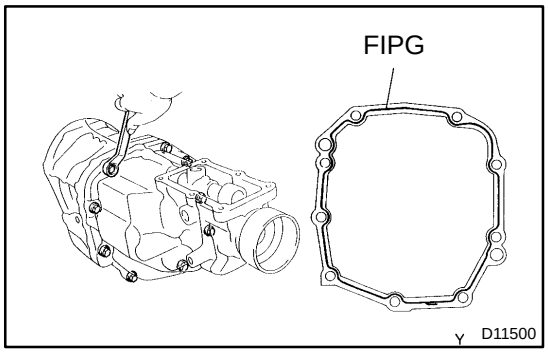
Install the black pin on the reverse gear/5th gear side.

(b) Remove the restrict pin (color: white) with the gasket.
Torque: 41 N·m (418 kgf·cm, 30 ft·lbf)



6. REMOVE EXTENSION HOUSING

(a) Remove the shift lever housing set bolt.
Torque: 33 N·m (337 kgf·cm, 24 ft·lbf)

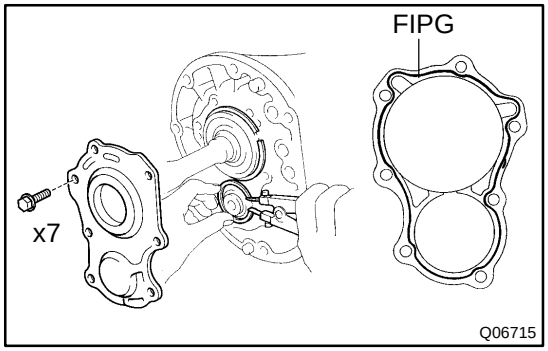


(b) Remove the 9 bolts and wire harness clamp from the extension housing.
Torque: 38 N·m (387 kgf·cm, 28 ft·lbf)

(c) Using a plastic hammer, carefully tap the extension housing.

(d) Pull out the extension housing and inner lever.
FIPG: Part No. 08826-00090, THREE BOND 1281 or equivalent

7. REMOVE SHIFT AND SELECT LEVER

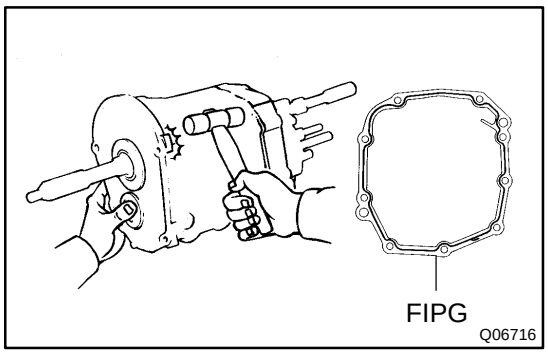


8. REMOVE FRONT BEARING RETAINER AND BEARING SNAP RING

(a) Remove the 7 bolts.
Sealant: Part No.08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

(b) Remove the front bearing retainer.
FIPG: Part No. 08826-00090, THREE BOND 1281 or equivalent

(c) Using a snap ring expander, remove the 2 bearing snap rings.



9. SEPARATE INTERMEDIATE PLATE FROM TRANSMISSION CASE

(a) Using a plastic hammer, carefully tap the transmission case.

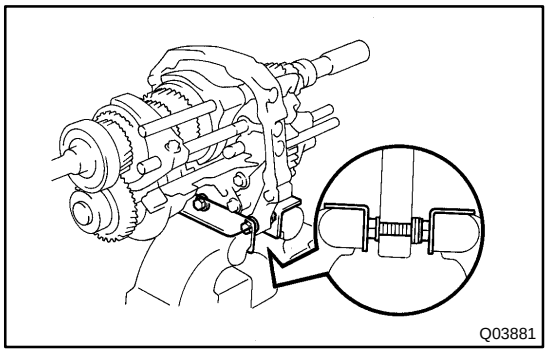
(b) Pull the transmission case from the intermediate plate.

HINT:

At the time of installation, please refer to the following item.

Align each bearing outer race and each shift fork shaft end with the case holes.

FIPG: Part No. 08826-00090, THREE BOND 1281 or equivalent



10. MOUNT INTERMEDIATE PLATE IN VISE

(a) Use the 2 long clutch housing bolts, plate washers and suitable nuts, as shown.

NOTICE:

Increase or decrease plate washers so that the bolt tip does not protrude from the nut.

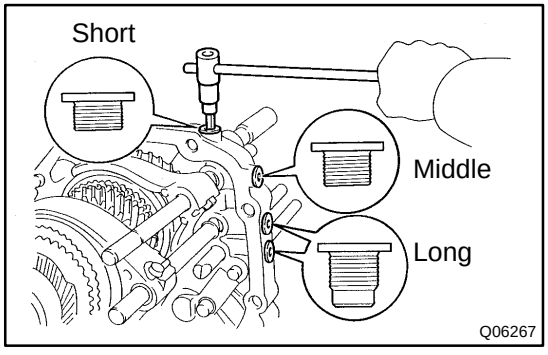
(b) Mount the intermediate plate in a vise.

11. REMOVE OIL SEPARATOR

Remove the 2 bolts and oil separator.

Torque: 18.5 N·m (189 kgf·cm, 14 ft·lbf)

12. REMOVE FRONT MAGNET



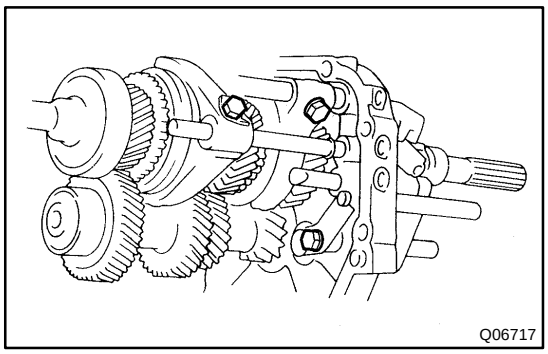
13. REMOVE LOCKING BALL AND SPRING

(a) Using a hexagon wrench (6 mm), remove the 4 straight screw plugs.

Sealant: Part No.08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

(b) Using a magnetic finger, remove the 3 springs and balls.



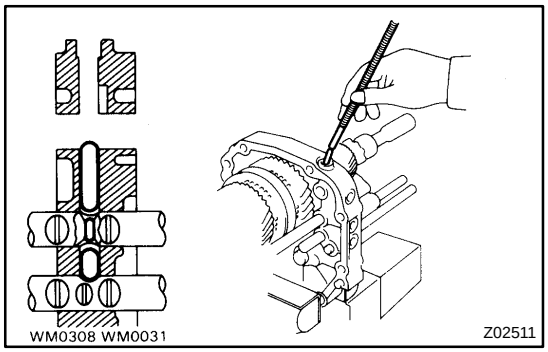
14. REMOVE SHIFT FORK, SHIFT FORK SHAFT AND REVERSE IDLER GEAR

(a) Remove the No. 1 and No. 2 shift forks set bolts.
Torque: 20 N·m (203 kgf·cm, 15 ft·lbf)

(b) Remove the bolt and reverse idler gear shaft stopper.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

(c) Remove the reverse idler gear and shaft with the snap ring.

(d) Remove the No. 1 shift fork and shaft.

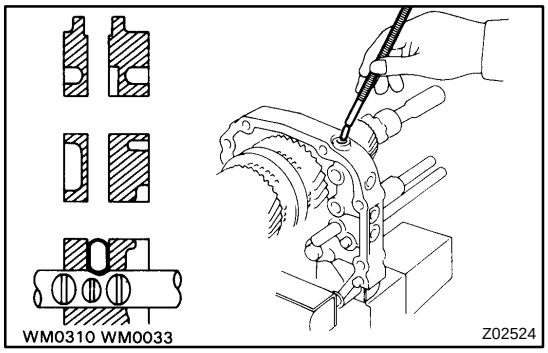


(e) Using a magnetic finger, remove the No. 1 and No. 2 interlock pins.

HINT:
At the time of installation, please refer to the following item.
Apply MP grease to the No. 1 and No. 2 interlock pins.

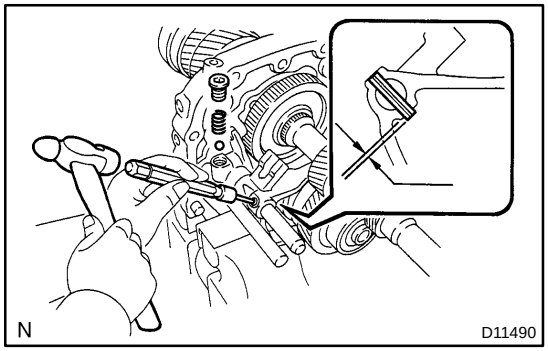
(f) Using 2 screwdrivers and a hammer, tap out the No. 2 shift fork shaft snap ring.

(g) Remove the No. 2 shift fork and shaft.



(h) Using a magnetic finger, remove the No. 3 interlock pin.

HINT:
At the time of installation, please refer to the following item.
Apply MP grease to the No. 3 interlock pin.

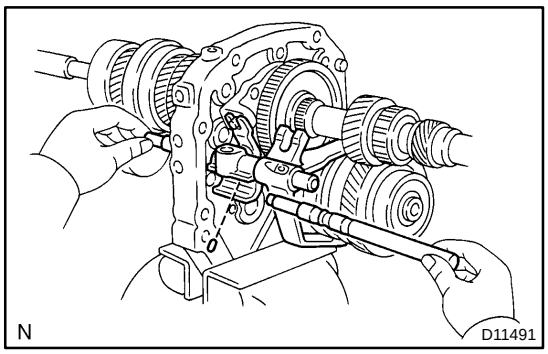


(i) Using a pin punch (5 mm) and hammer, drive out the No. 3 shift fork pin.

HINT:
At the time of installation, please refer to the following item.
Using a pin punch (5 mm) and a hammer, install the No. 3 shift fork pin.
Drive in depth: 0 - 0.5 mm (0 - 0.020 in.)

(j) Using a hexagon wrench (6 mm), remove the straight screw plug.
Sealant: Part No.08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

(k) Using a magnetic finger, remove the spring and ball.

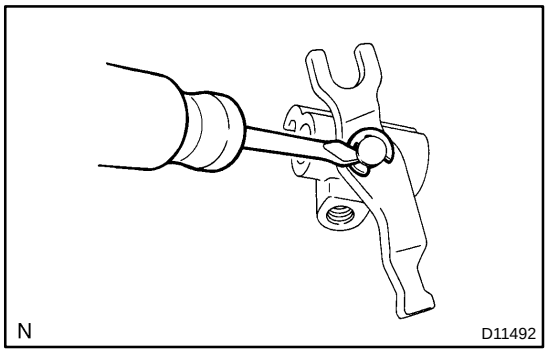


(l) Pull out the No. 4 shift fork shaft.
(m) Remove the pin from the reverse shift head.

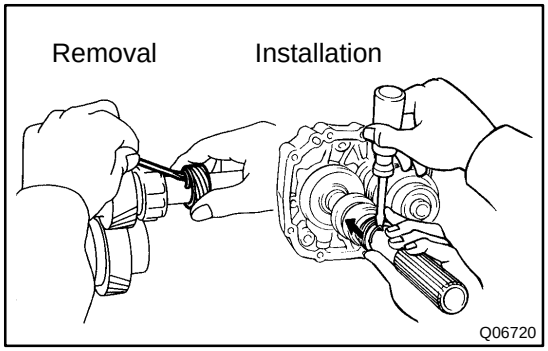
HINT:
At the time of installation, please refer to the following item.
Apply MP grease to the pin.

(n) Remove the No. 3 shift fork, fork shaft and reverse shift arm with the snap ring.

HINT:
At the time of installation, please refer to the following item.
Align the No. 3 shift fork with the No. 3 hub sleeve groove, put the reverse shift arm into the pivot of bearing retainer and align the reverse shift arm shoe with the reverse idler gear groove.

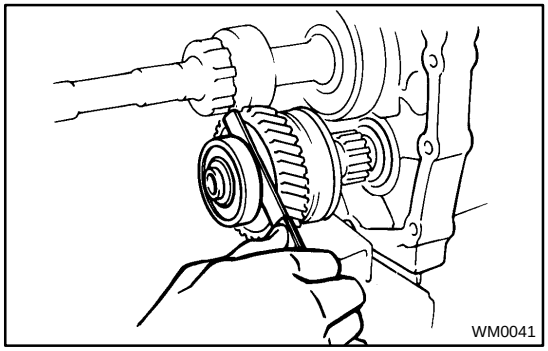


(o) Using a screwdriver, remove the E-ring, separate the reverse shift head and reverse shift arm.



15. REMOVE VEHICLE SPEED SENSOR DRIVE GEAR

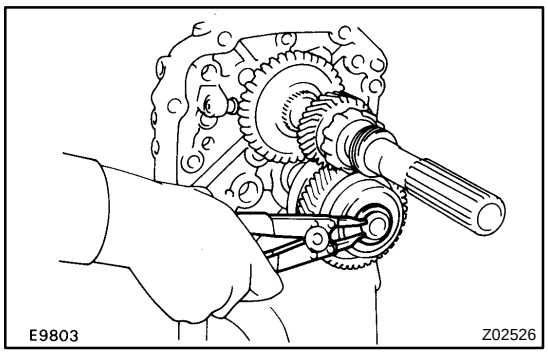
Pry out both ends of the clip and remove the drive gear.



16. INSPECT COUNTER 5TH GEAR THRUST CLEARANCE

Using a feeler gauge, measure the counter 5th gear thrust clearance.

Standard clearance:
0.10 - 0.41 mm (0.0039 - 0.0161 in.)
Maximum clearance:
0.41 mm (0.0161 in.)



17. REMOVE COUNTER REAR BEARING, SPACER, COUNTER 5TH GEAR AND NEEDLE ROLLER BEARING

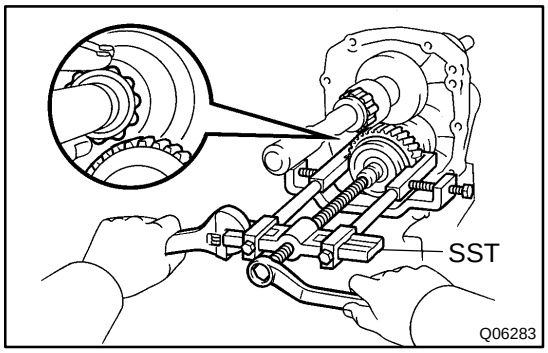
(a) Using a snap ring expander, remove the snap ring.

HINT:

At the time of installation, please refer to the following item.

Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)
1	1.90 - 1.95 (0.0748 - 0.0768)
2	1.96 - 2.01 (0.0772 - 0.0791)
3	2.02 - 2.07 (0.0795 - 0.0815)
4	2.08 - 2.13 (0.0819 - 0.0839)
5	2.14 - 2.19 (0.0843 - 0.0862)
6	2.20 - 2.25 (0.0866 - 0.0886)
7	2.26 - 2.31 (0.0890 - 0.0909)

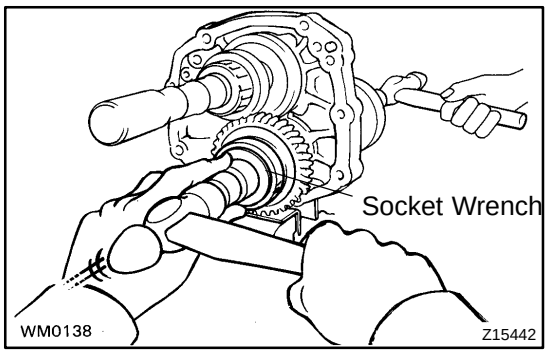


(b) Using SST, remove the rear bearing, spacer, counter 5th gear and bearing.

SST 09950- 40011 (09951- 04020,09953- 04030, 09954- 04010, 09955- 04051, 09957- 04010, 09958-0401 1)

NOTICE:

Be careful not to catch the output shaft rear bearing roller on the counter 5th gear.

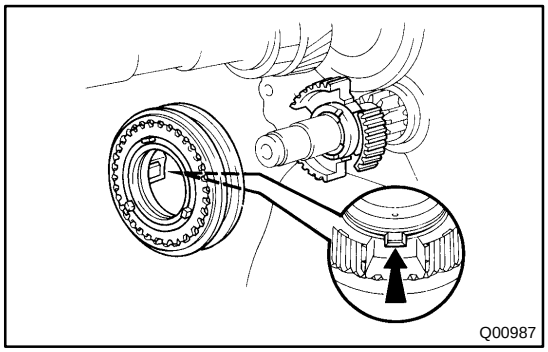


(c) Remove the spacer.

HINT:

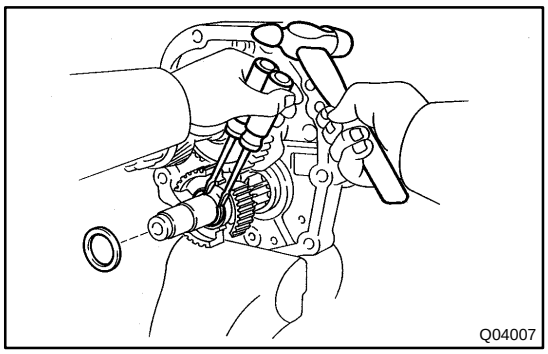
At the time of installation, please refer to the following items.

- Install the counter 5th gear with the 5th gear gaps aligned with the synchronizer cone ring pin.
- Using a socket wrench and hammer, drive in the bearing.
- When driving in the bearing support the counter shaft in front with a 1.4 - 2.3 kg (3 - 5 lb) hammer or equivalent.



18. REMOVE SYNCHRONIZER RING ASSEMBLY WITH NO. 3 HUB SLEEVE AND NO. 3 CLUTCH HUB

(a) Remove the synchronizer ring assembly with the No. 3 hub sleeve from the No. 3 clutch hub.



(b) Remove the spacer.

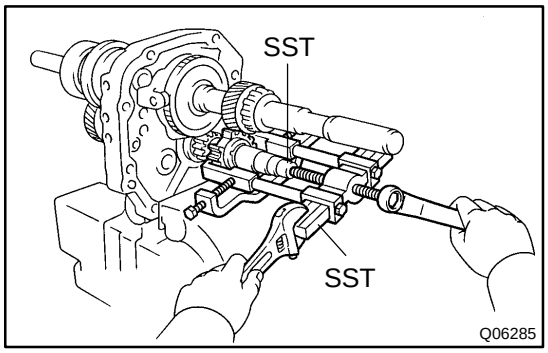
(c) Using 2 screwdrivers and a hammer, tap out the snap ring.

HINT:

At the time of installation, please refer to the following item.

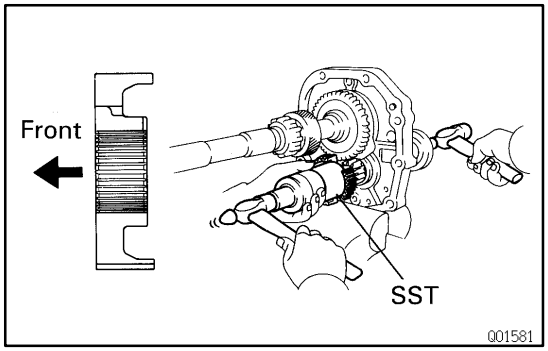
Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)
2	2.06 - 2.11 (0.0811 - 0.0831)
3	2.12 - 2.17 (0.0835 - 0.0854)
4	2.18 - 2.23 (0.0858 - 0.0878)
5	2.24 - 2.29 (0.0882 - 0.0902)



(d) Using SST, remove the No. 3 clutch hub.

SST 09950- 40011 (09951- 04020, 09952- 04010, 09953- 04020, 09954- 04010, 09955- 04051, 09957-04010, 09958-04011)
09950-60010 (09951-00200)

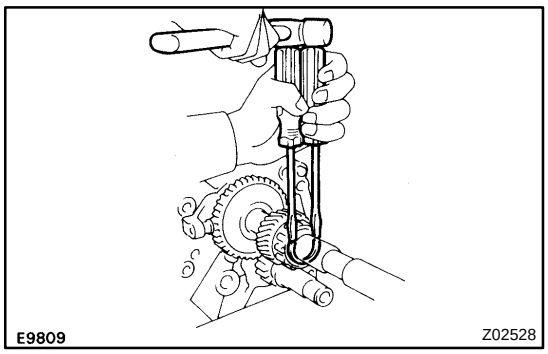


HINT:

At the time of installation, please refer to the following items.

- Using SST and a hammer, drive in the No. 3 clutch hub.
  SST 09316-6001 1 (09316-00011, 09316-00071)
- When installing the No. 3 clutch hub, support the counter shaft in front with a 1.4 - 2.3 kg (3 - 5 lb) hammer or equivalent.

19. REMOVE REAR MAGNET



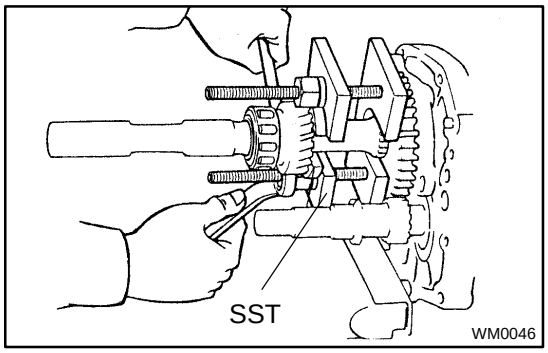
20. REMOVE OUTPUT SHAFT REAR BEARING AND 5TH GEAR

(a) Using 2 screwdrivers and a hammer, tap out the snap ring.

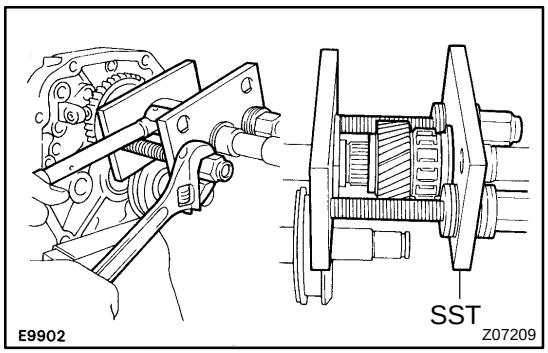
HINT:

At the time of installation, please refer to the following item.
Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)
8	2.31 - 2.36 (0.0909 - 0.0929)
9	2.37 - 2.42 (0.0933 - 0.0953)
10	2.43 - 2.48 (0.0957 - 0.0976)
11	2.49 - 2.54 (0.0980 - 0.1000)
12	2.55 - 2.60 (0.1004 - 0.1024)
13	2.61 - 2.66 (0.1028 - 0.1047)
14	2.68 - 2.73 (0.1055 - 0.1075)
15	2.74 - 2.79 (0.1079 - 0.1098)

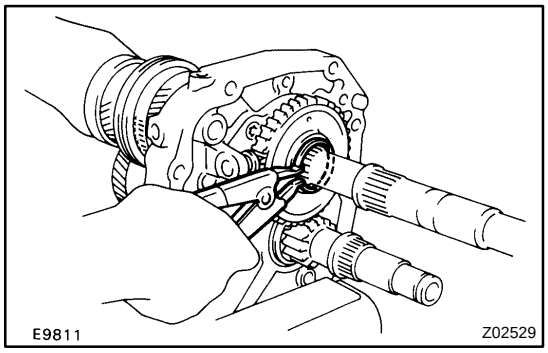


(b) Using SST, remove the rear bearing and 5th gear.
SST 09312-20012 (09313-00030, 09313-00040, 09313-00050)



HINT:

At the time of installation, please refer to the following item.
Using SST, install the 5th gear and rear bearing.
SST 09312-20012 (09313-00010, 09313-00030, 09313-00040, 09313-00050)

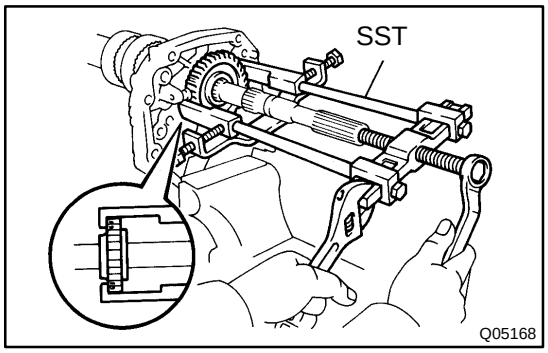


21. REMOVE REVERSE GEAR

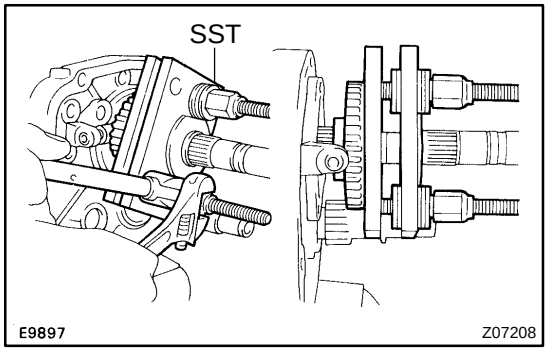
(a) Using a snap ring expander, remove the snap ring.

HINT:
At the time of installation, please refer to the following item.
Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)
5	2.25 - 2.30 (0.0886 - 0.0906)
11	2.30 - 2.35 (0.0906 - 0.0925)
12	2.35 - 2.40 (0.0925 - 0.0945)
13	2.40 - 2.45 (0.0945 - 0.0965)
14	2.45 - 2.50 (0.0965 - 0.0984)
15	2.50 - 2.55 (0.0984 - 0.1004)
16	2.55 - 2.60 (0.1004 - 0.1024)
17	2.61 - 2.66 (0.1028 - 0.1047)
18	2.67 - 2.72 (0.1051 - 0.1071)
19	2.73 - 2.78 (0.1075 - 0.1094)
20	2.79 - 2.84 (0.1098 - 0.1118)
21	2.85 - 2.90 (0.1122 - 0.1142)
22	2.91 - 2.96 (0.1146 - 0.1165)
23	2.97 - 3.02 (0.1169 - 0.1189)



(b) Using SST, remove the reverse gear.
SST 09950- 40011 (09951- 04020, 09952- 04010, 09953- 04020, 09954- 04040, 09955- 04051, 09958-0401 1)



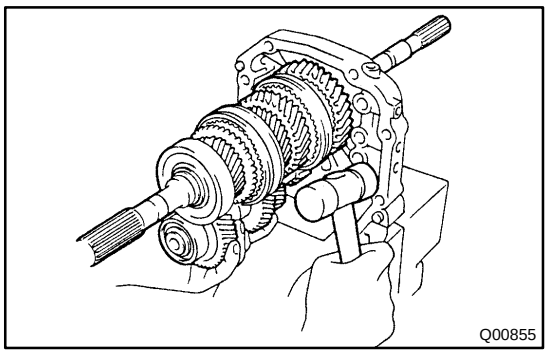
HINT:
At the time of installation, please refer to the following item.
Using SST, install the reverse gear.
SST 09312-20012 (09313-00030, 09313-00040, 09313-00050)

22. REMOVE REAR BEARING RETAINER

(a) Using a torx socket wrench (T40), unscrew the 4 torx screws and remove the rear bearing retainer.
Torque: 18.5 N·m (189 kgf·cm, 14 ft·lbf)

(b) Using a snap ring expander, remove the 2 snap rings.

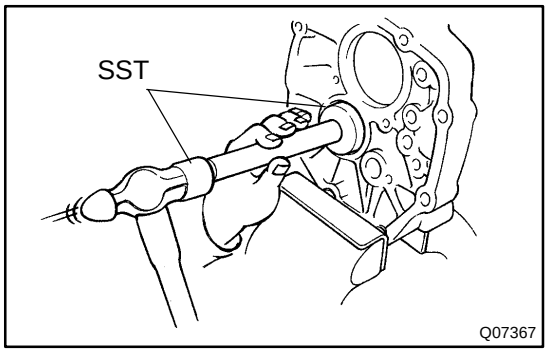
HINT:
At the time of installation, please refer to the following item.
Be sure the snap ring is flush with the intermediate plate surface.



23. REMOVE OUTPUT SHAFT AND COUNTER GEAR FROM INTERMEDIATE PLATE

(a) Remove the output shaft, input shaft and counter gear as a unit from the intermediate plate by pulling on the counter gear and tapping on the intermediate plate with a plastic hammer.

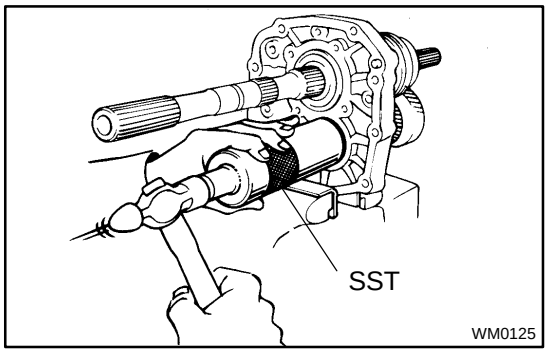
(b) Remove the input shaft from the output shaft.



HINT:

At the time of installation, please refer to the following items.

- Before installing the output shaft, use SST to remove the counter gear center bearing outer race.
  SST 09950-60010 (09951-00510), 09950-70010 (09951-07150)
- Install the outer race after installing the counter gear.
- Install the output shaft into the intermediate plate by pulling on the output shaft and tapping on the intermediate plate.



HINT:

At the time of installation, please refer to the following items.

- Apply gear oil to the needle roller bearing.
- Install the needle roller bearing to the input shaft.
- Install the input shaft and counter gear together.
- Using SST and a hammer, install the counter gear center bearing outer race.
  SST 09316-6001 1 (09316-00011)
- Be careful not to damage the bearing rollers.

MT0C3-02

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page MT-23).

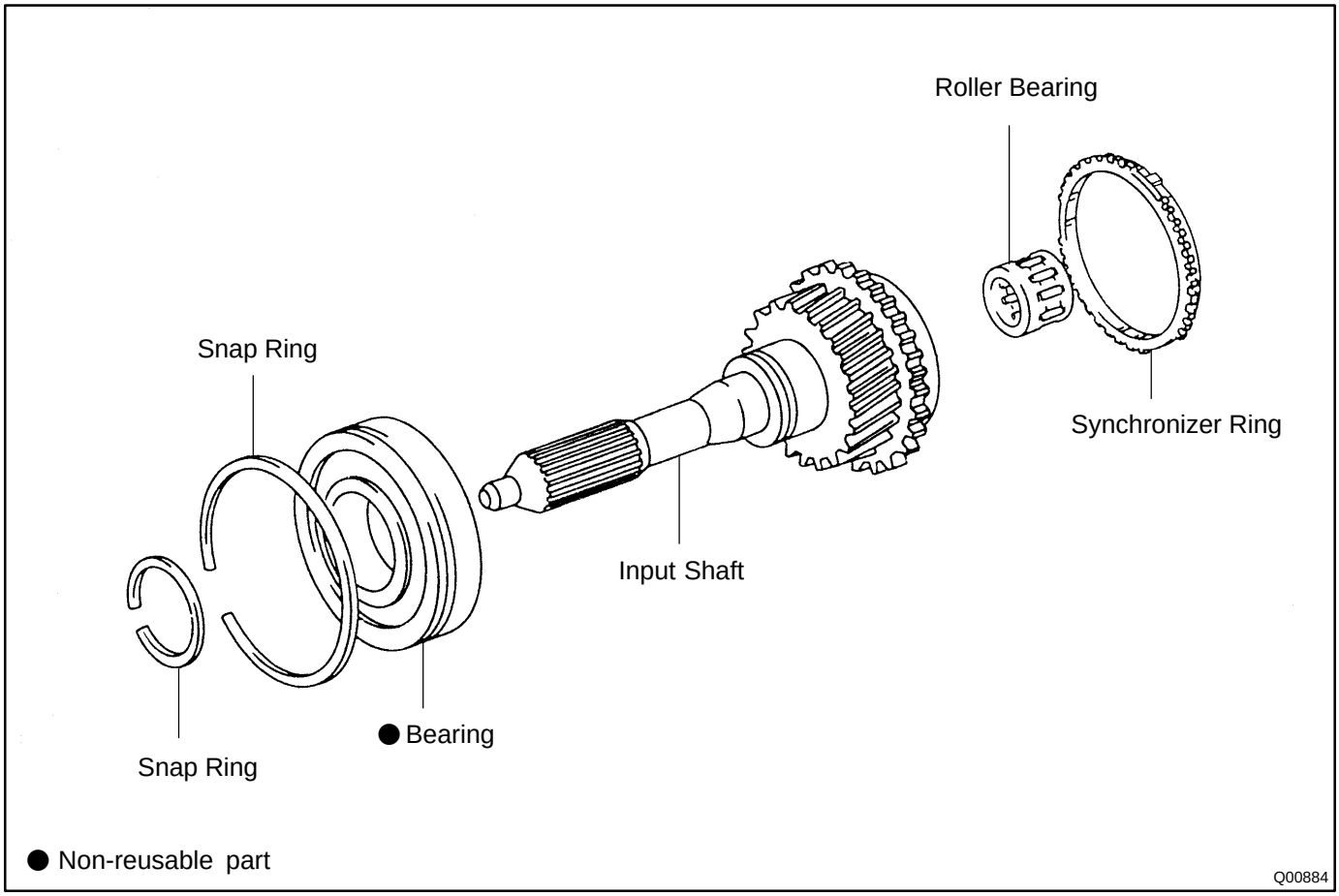
HINT:

Coat all of the sliding and rotating surfaces with gear oil before assembly.

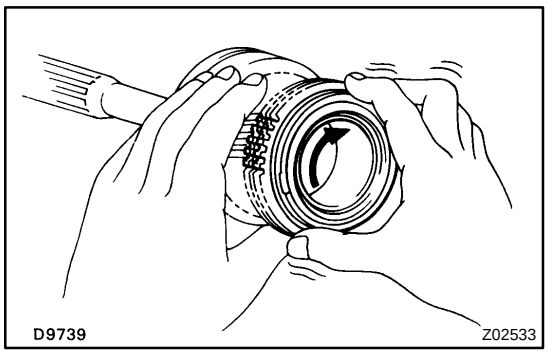
INPUT SHAFT

COMPONENTS

MT0C4-02



MT0C5-02



INSPECTION

INSPECT SYNCHRONIZER RING

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring.

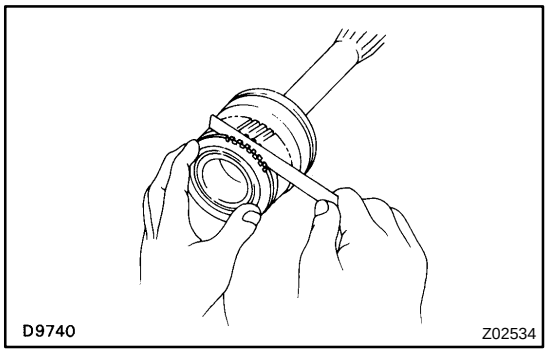
Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.



(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

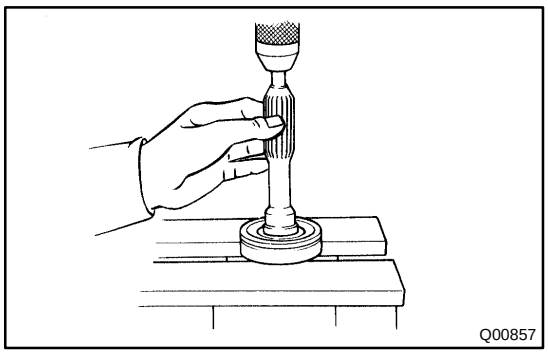
Minimum clearance: 0.7 mm (0.028 in.)

If the clearance is less than the minimum, replace the synchronizer ring and gear cone by applying a small amount of fine lapping compound.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

MT0C6-02

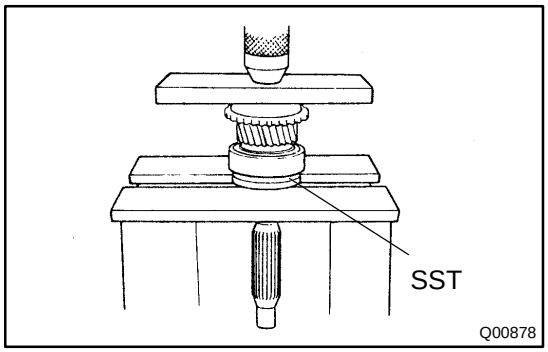

Q00857

REPLACEMENT

IF NECESSARY, REPLACE INPUT SHAFT BEARING

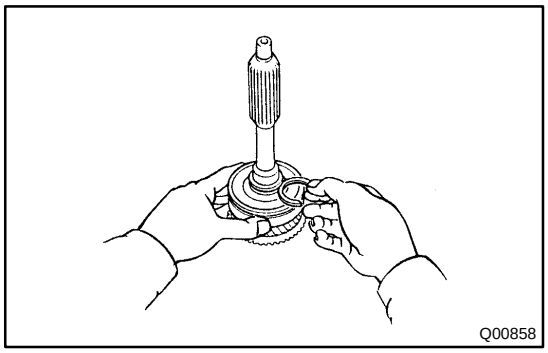
(a) Using a snap ring expander, remove the snap ring.

(b) Using a press, remove the bearing.



Q00878

(c) Using SST and a press, install a new bearing.
SST 09506-35010


Q00858

(d) Select a snap ring that will allow minimum axial play.

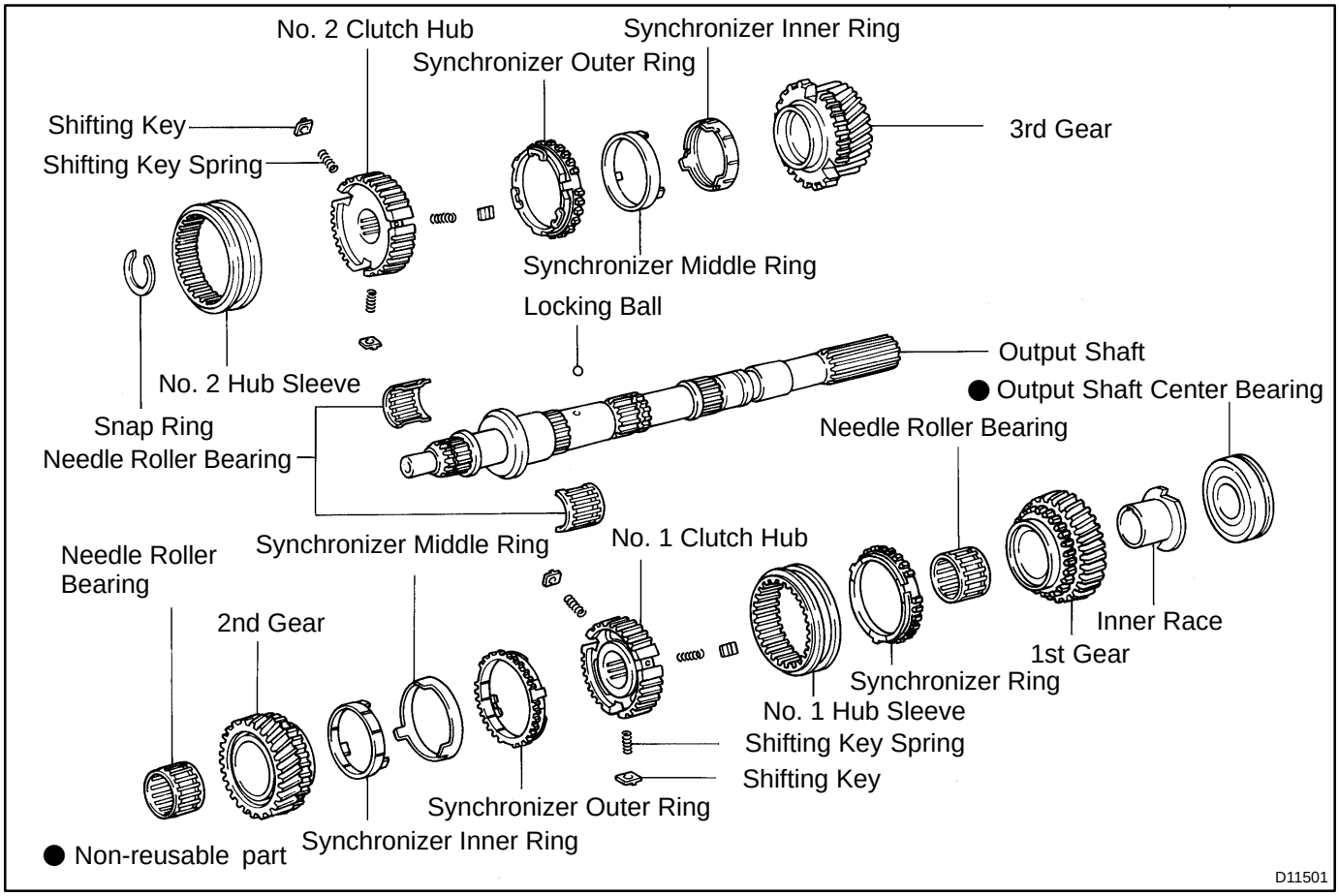
Mark	Thickness mm (in.)
1	2.05 - 2.10 (0.0807 - 0.0827)
2	2.10 - 2.15 (0.0827 - 0.0846)
3	2.15 - 2.20 (0.0846 - 0.0866)
4	2.20 - 2.25 (0.0866 - 0.0886)
5	2.25 - 2.30 (0.0886 - 0.0906)
11	2.30 - 2.35 (0.0906 - 0.0925)
12	2.35 - 2.40 (0.0925 - 0.0945)

(e) Using a snap ring expander, install the snap ring.

OUTPUT SHAFT

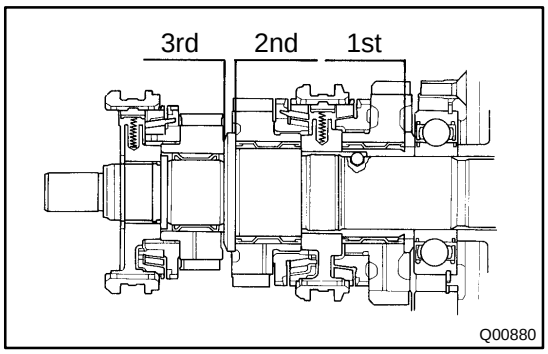
COMPONENTS

MT0C7-02



MT0C8-02

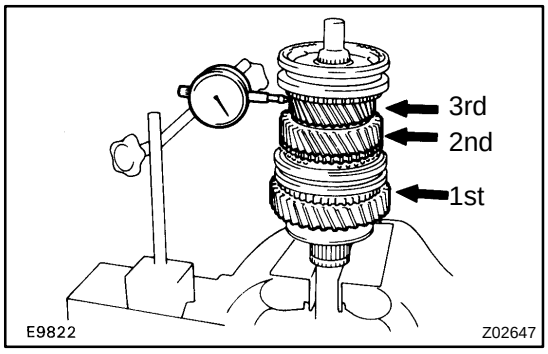
DISASSEMBLY



1. INSPECT EACH GEAR THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance of each gear.

Standard clearance:
0.10 - 0.25 mm (0.0039 - 0.0098 in.)
Maximum clearance:
0.25 mm (0.0098 in.)

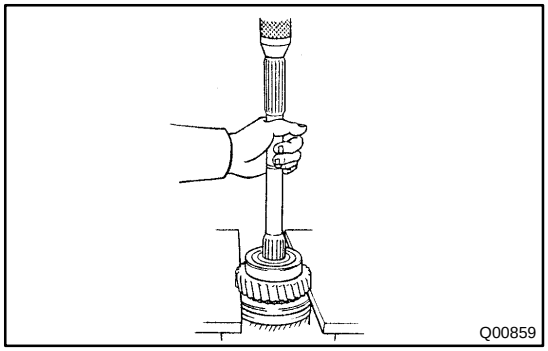


2. INSPECT EACH GEAR RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance of each gear.

Standard clearance:
1st and 2nd gears:
0.009 - 0.060 mm (0.0004 - 0.0024 in.)
3rd gear: 0.015 - 0.066 mm (0.0006 - 0.0026 in.)
Maximum clearance:
1st and 2nd gears: 0.060 mm (0.0024 in.)
3rd gear: 0.066 mm (0.0026 in.)

If the clearance exceeds the maximum, replace the gear, shaft or needle roller bearing.

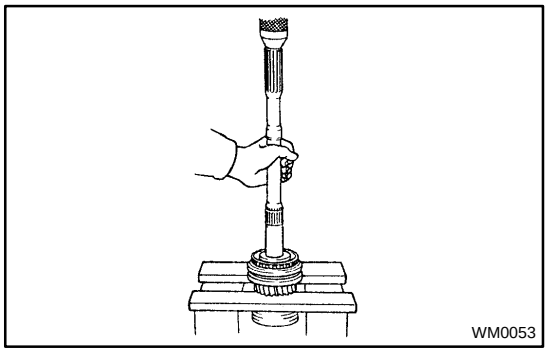


3. REMOVE OUTPUT SHAFT CENTER BEARING AND 1ST GEAR ASSEMBLY

(a) Shift the No. 1 hub sleeve onto the 2nd gear.
(b) Using a press, remove the center bearing, 1st gear, needle roller bearing, inner race and synchronizer ring.

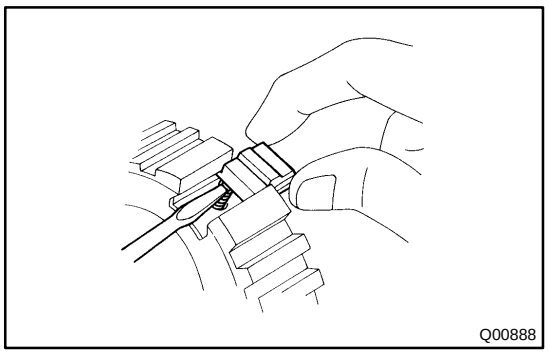
4. REMOVE LOCKING BALL ON OUTPUT SHAFT

Using a magnetic finger, remove the locking ball.



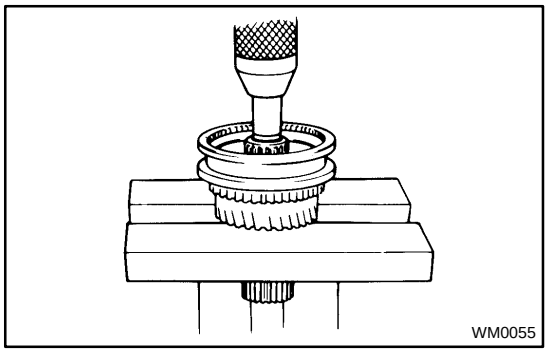
5. REMOVE NO. 1 HUB SLEEVE ASSEMBLY, 2ND GEAR AND NEEDLE ROLLER BEARING

Using a press, remove the parts from the shaft as an assembly.



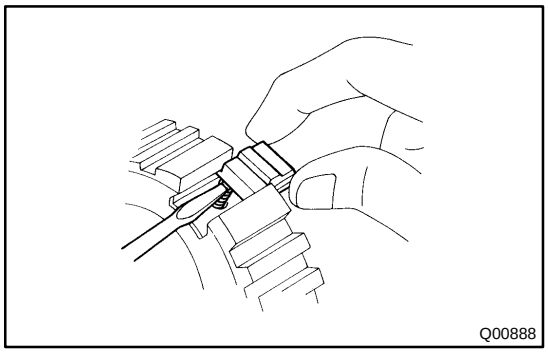
6. REMOVE NO. 1 HUB SLEEVE, SHIFTING KEY AND SPRING FROM NO. 1 CLUTCH HUB

(a) Remove the No. 1 hub sleeve from the No. 1 clutch hub.
(b) Push the shifting key spring with a screwdriver, remove the 3 shifting keys and key springs.



7. REMOVE NO. 2 HUB SLEEVE ASSEMBLY AND 3RD GEAR

(a) Using a snap ring expander, remove the snap ring.
(b) Using a press, remove the No. 2 hub sleeve, synchronizer ring and 3rd gear.

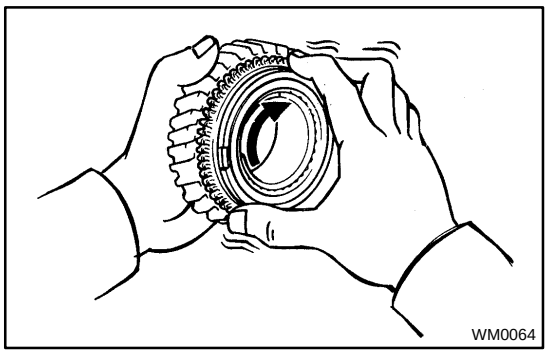


8. REMOVE NO. 2 HUB SLEEVE, SHIFTING KEY AND SPRING FROM NO. 2 CLUTCH HUB

(a) Remove the No. 2 hub sleeve from the No. 2 clutch hub.
(b) Push the shifting key spring with a screwdriver, remove the 3 shifting keys and key springs.

MT0C9-02

INSPECTION



1. INSPECT 1ST GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

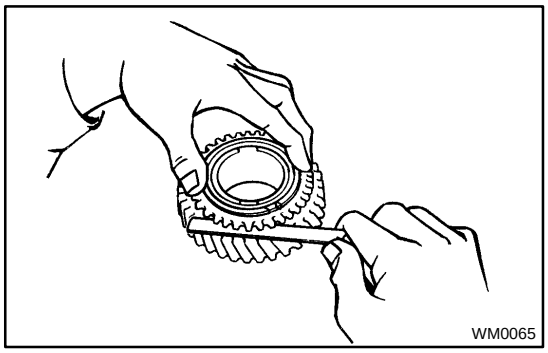
(b) Check the braking effect of the synchronizer ring.
Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.

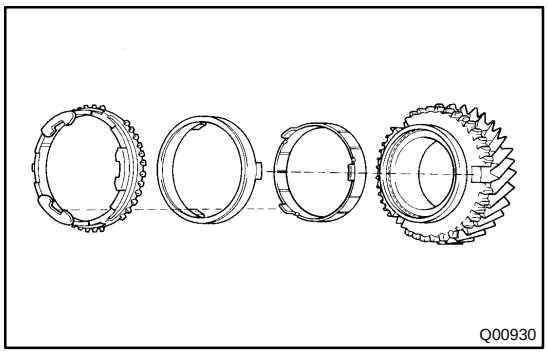


(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.
Minimum clearance: 0.7 mm (0.028 in.)

If the clearance is less than the minimum, replace the synchronizer ring and gear cone by applying a small amount of fine lapping compound.

NOTICE:

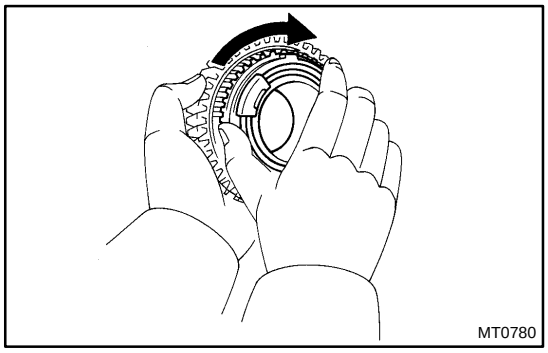
Ensure the fine lapping compound is completely washed off after rubbing.



2. INSPECT 2ND AND 3RD GEARS SYNCHRONIZER RING

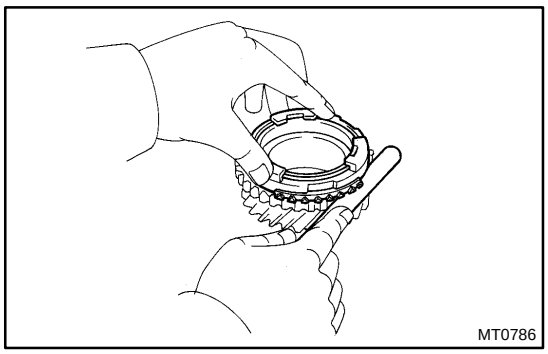
(a) Check for wear or damage.

(b) Install the synchronizer inner ring, middle ring and outer ring to each gear.

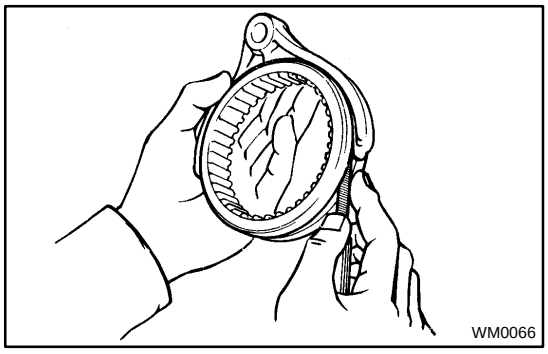


(c) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

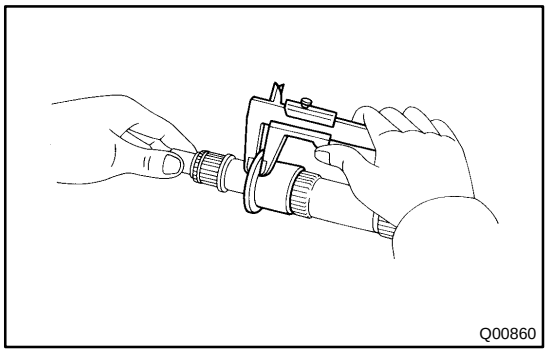
If it does not lock, replace the synchronizer ring.


MT0786

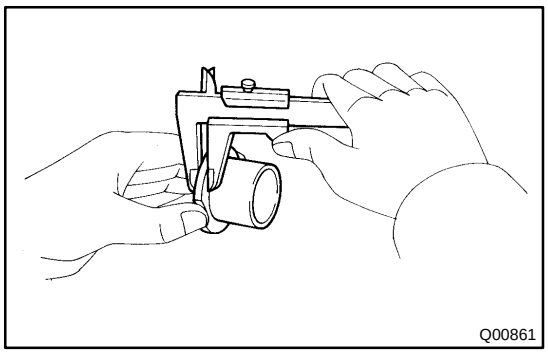
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and the gear spline end.
Minimum clearance:
2nd gear: 0.74 mm (0.0291 in.)
3rd gear : 0.70 mm (0.0276 in.)
If the clearance is less than the minimum, replace the synchronizer ring.


WM0066

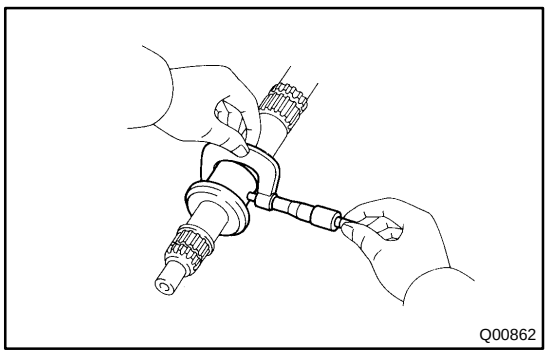
3. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE
Using a feeler gauge, measure the clearance between the hub sleeves and shift forks.
Maximum clearance: 0.5 mm (0.020 in.)
If the clearance exceeds the maximum, replace the shift fork or hub sleeve.


Q00860

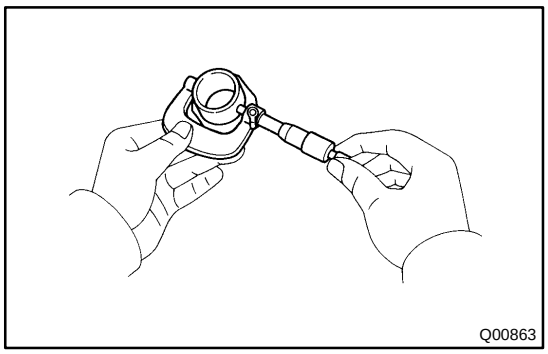
4. INSPECT OUTPUT SHAFT AND INNER RACE
(a) Using vernier calipers, measure the output shaft flange thickness.
Minimum thickness: 5.70 mm (0.2244 in.)
If the thickness is less than the minimum, replace the output shaft.


Q00861

(b) Using vernier calipers, measure the inner race flange thickness.
Minimum thickness: 4.78 mm (0.1881 in.)
If the thickness is less than the minimum, replace the inner race.

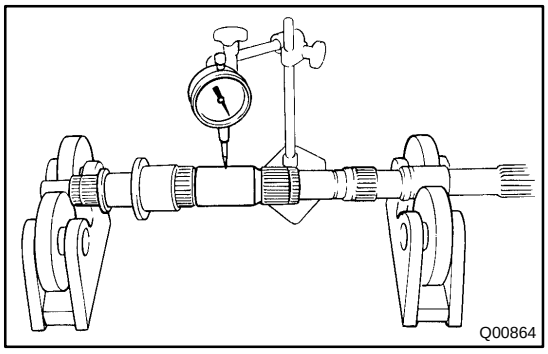

Q00862

(c) Using a micrometer, measure the outer diameter of the output shaft journal.
Minimum diameter:
2nd gear: 42.975 mm (1.6919 in.)
3rd gear: 31.969 mm (1.2586 in.)
If the outer diameter is less than the minimum, replace the output shaft.



(d) Using a micrometer, measure the outer diameter of the inner race.
Minimum diameter: 42.975 mm (1.6919 in.)

If the outer diameter is less than the minimum, replace the inner race.

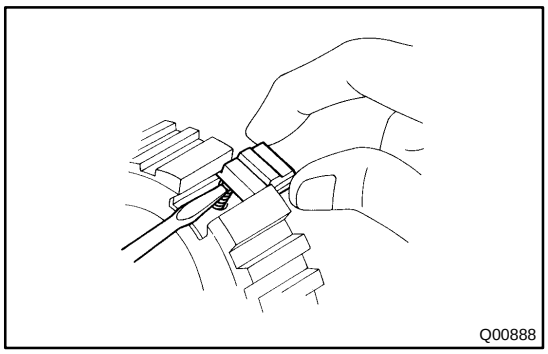


(e) Using a dial indicator, check the shaft runout.
Maximum runout: 0.03 mm (0.0012 in.)

If the runout exceeds the maximum, replace the output shaft.

MT0CA-02

REASSEMBLY


Q00888

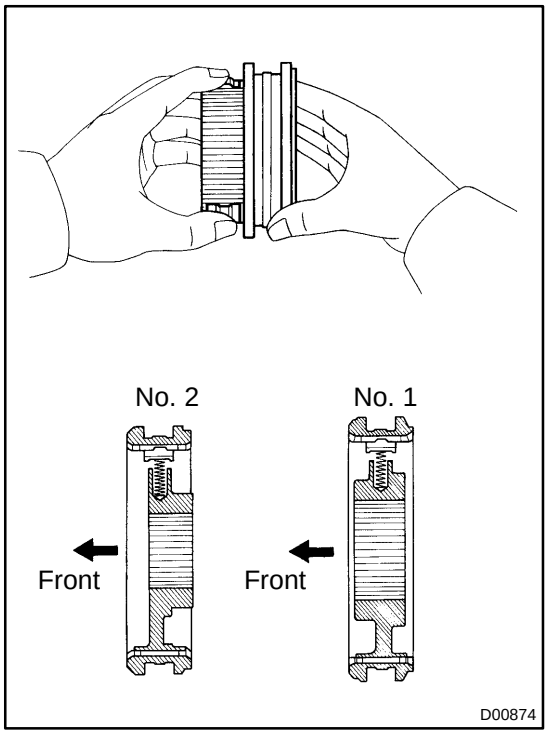
HINT:

Coat all of the sliding and rotating surfaces with gear oil before reassembly.

1. INSTALL NO. 1 AND NO. 2 CLUTCH HUBS INTO HUB SLEEVE

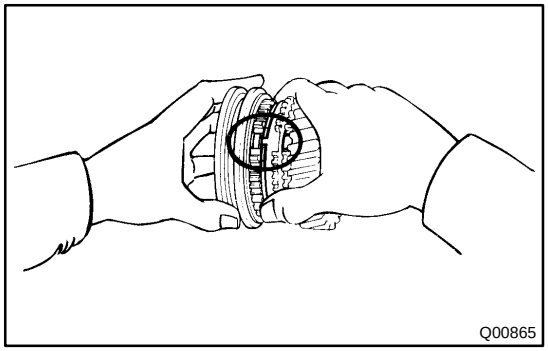
(a) Install the 3 shifting key springs to the clutch hub.

(b) While pushing the shifting key spring with a screwdriver, install the 3 shifting keys.



D00874

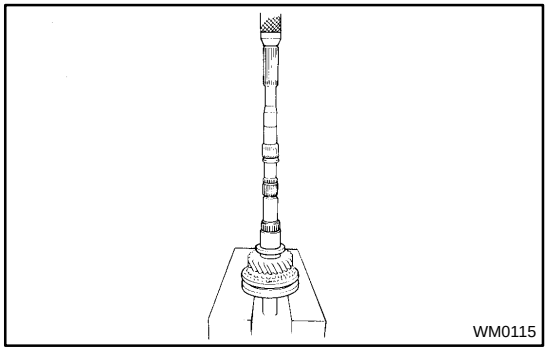
(c) While pushing the 3 shifting keys, install the clutch hub to the hub sleeve, as shown.


Q00865

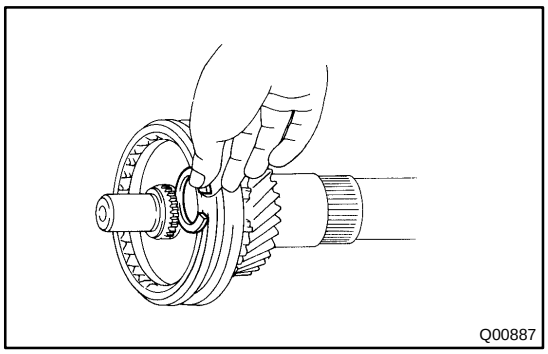
2. INSTALL 3RD GEAR AND NO. 2 CLUTCH HUB ON OUTPUT SHAFT

(a) Apply gear oil to the shaft.

(b) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.


WM0115

(c) Using a press, install the 3rd gear and No. 2 clutch hub.


Q00887

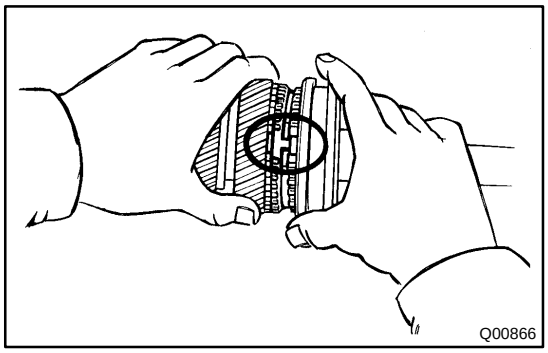
3. INSTALL SNAP RING

(a) Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)
C-1	1.75 - 1.80 (0.0689 - 0.0709)
D	1.80 - 1.85 (0.0709 - 0.0728)
11	1.86 - 1.91 (0.0732 - 0.0752)
12	1.92 - 1.97 (0.0756 - 0.0776)
13	1.98 - 2.03 (0.0780 - 0.0799)
14	2.04 - 2.09 (0.0803 - 0.0823)
15	2.10 - 2.15 (0.0827 - 0.0846)

(b) Using a snap ring expander, install the snap ring.

4. INSPECT 3RD GEAR THRUST CLEARANCE
(See page MT-28)

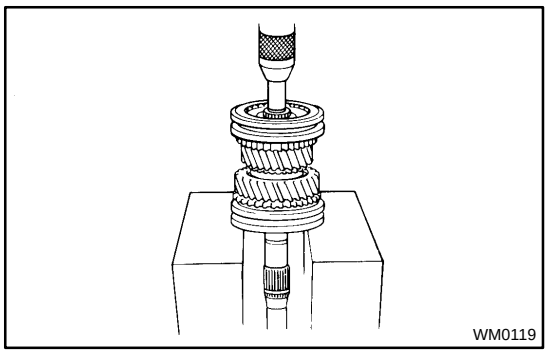

Q00866

5. INSTALL 2ND GEAR AND NO. 1 CLUTCH HUB

(a) Apply gear oil to the shaft and needle roller bearing.

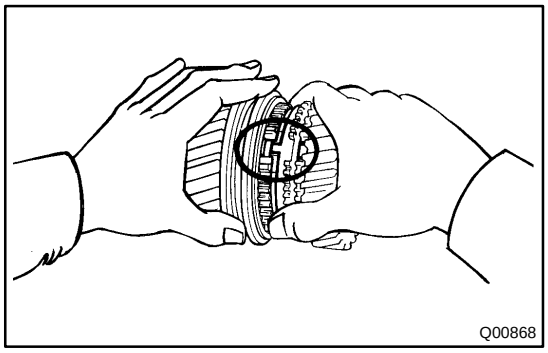
(b) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.

(c) Install the needle roller bearing in the 2nd gear.


WM0119

(d) Using a press, install the 2nd gear and No. 1 clutch hub.

6. INSPECT 2ND GEAR THRUST CLEARANCE
(See page MT-28)


Q00868

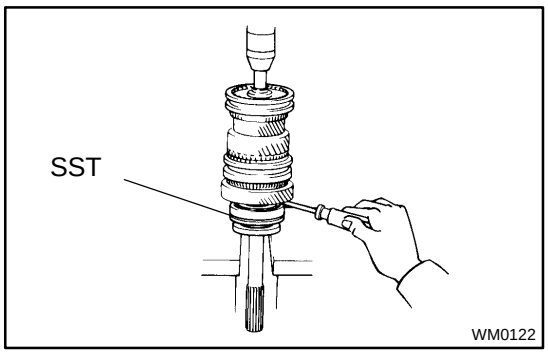
7. INSTALL LOCKING BALL AND 1ST GEAR ASSEMBLY

(a) Install the locking ball in the shaft.

(b) Apply gear oil to the bearing.

(c) Assemble the 1st gear, synchronizer ring, needle roller bearing and bearing inner race.

(d) Install the assembly on the output shaft with the synchronizer ring slots aligned with the shifting keys and turn the inner race to align it with the locking ball.



8. INSTALL OUTPUT SHAFT CENTER BEARING

Using SST and a press, install the center bearing on the output shaft with the outer race snap ring groove toward the rear.

HINT:

Hold the 1st gear inner race to prevent it from falling.

SST 09506-35010

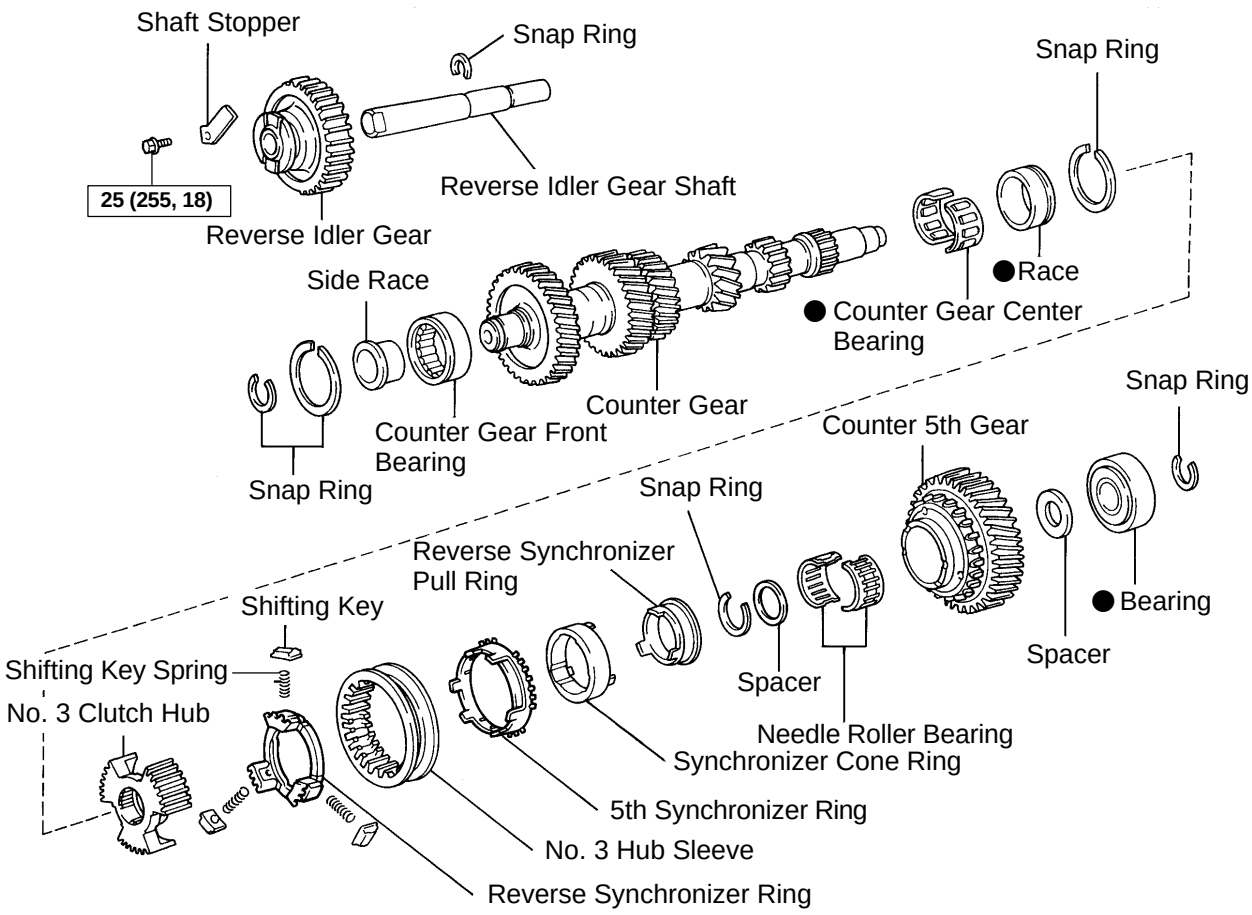
9. INSPECT 1ST GEAR THRUST CLEARANCE

(See page MT-28)

COUNTER GEAR AND REVERSE IDLER GEAR

COMPONENTS

MT0CB-02



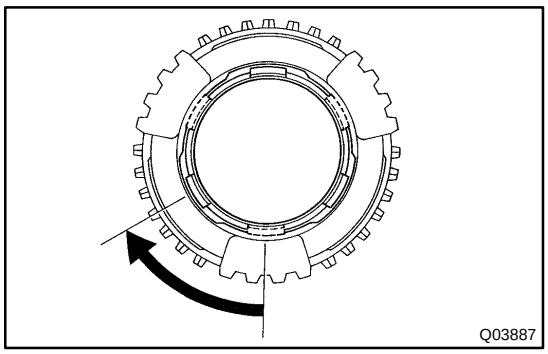
N·m (kgf·cm, ft·lbf) : Specified torque
● Non-reusable part

Z15652

MT0CC-02

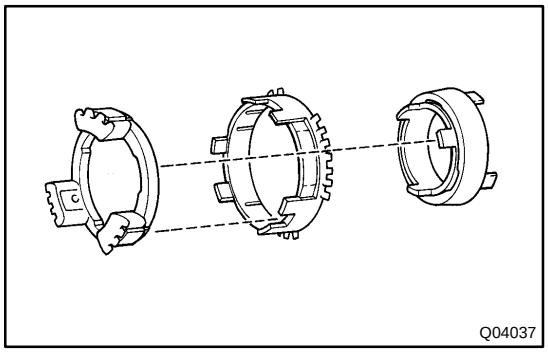
DISASSEMBLY

REMOVE NO. 3 HUB SLEEVE, SHIFTING KEY AND SPRING FROM SYNCHRONIZER RING

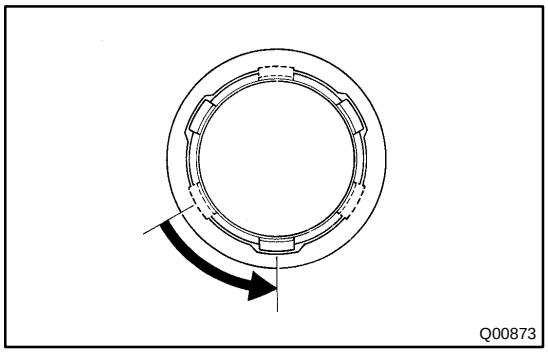


(a) Remove the synchronizer ring assembly from the No. 3 hub sleeve.

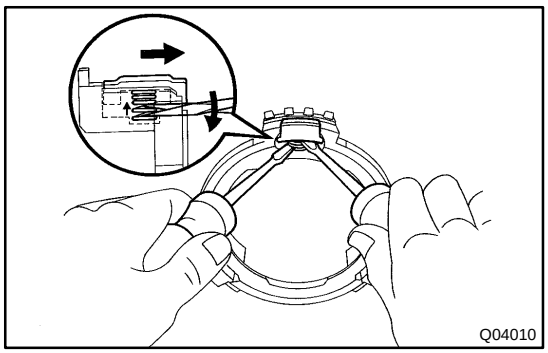
(b) Turn the reverse synchronizer pull ring.



(c) Remove the reverse synchronizer ring and 5th synchronizer ring from the synchronizer pull ring and cone ring.



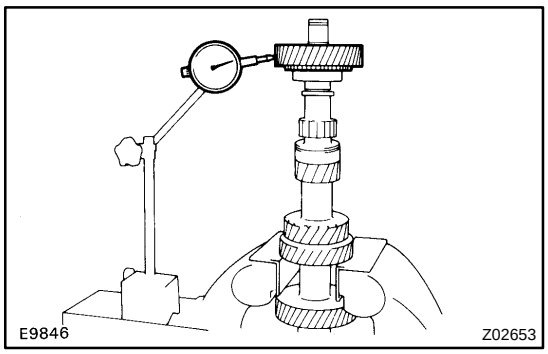
(d) Turn the reverse synchronizer pull ring and separate the pull ring and cone ring.



(e) Remove the 3 shifting keys and key springs by carefully levering up the shifting key spring with one screwdriver and levering the shifting key away from the reverse synchronizer ring with another screwdriver.

MT0FV-01

INSPECTION



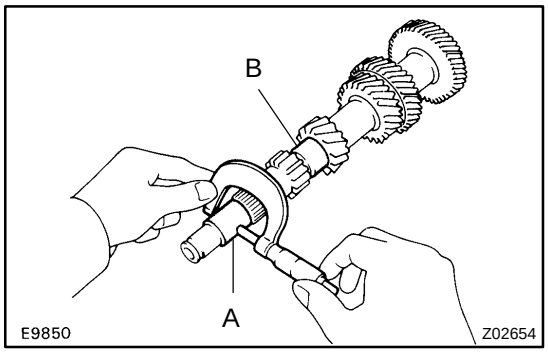
1. INSPECT COUNTER 5TH GEAR RADIAL CLEARANCE

(a) Install the spacer, counter 5th gear and needle roller bearing to the counter gear.

(b) Using a dial indicator, measure the counter 5th gear radial clearance.

Standard clearance:
0.009 - 0.060 mm (0.0004 - 0.0024 in.)
Maximum clearance:
0.060 mm (0.0024 in.)

If the clearance exceeds the maximum, replace the counter gear, needle roller bearing or counter 5th gear.

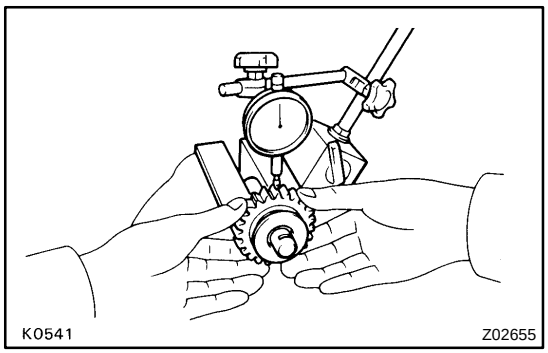


2. INSPECT COUNTER GEAR

Using a micrometer, measure the outer diameter of the counter shaft journal.

Minimum diameter:
Part A: 26.975 mm (1.0620 in.)
Part B: 29.950 mm (1.1791 in.)

If the outer race is less than the minimum, replace the counter gear.

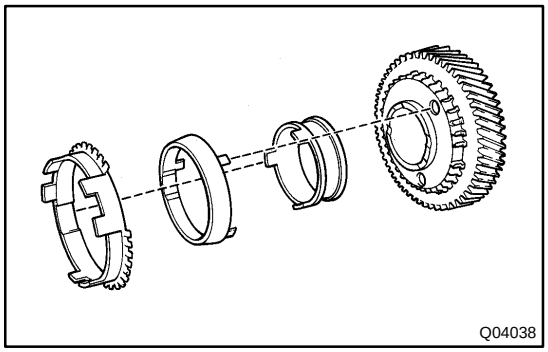


3. INSPECT REVERSE IDLER GEAR RADIAL CLEARANCE

Using a dial indicator, measure the reverse idler gear radial clearance.

Standard clearance:
0.041 - 0.074 mm (0.0016 - 0.0029 in.)
Maximum clearance:
0.074 mm (0.0029 in.)

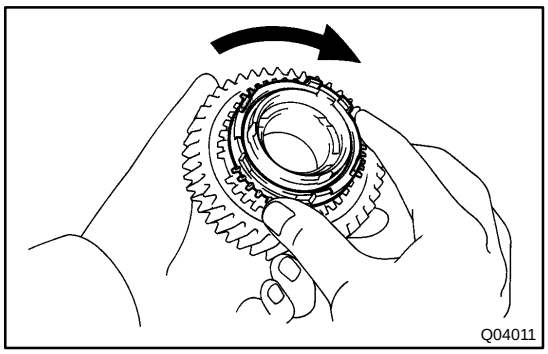
If the clearance exceeds the maximum, replace the gear or shaft.



4. INSPECT 5TH GEAR SYNCHRONIZER RING

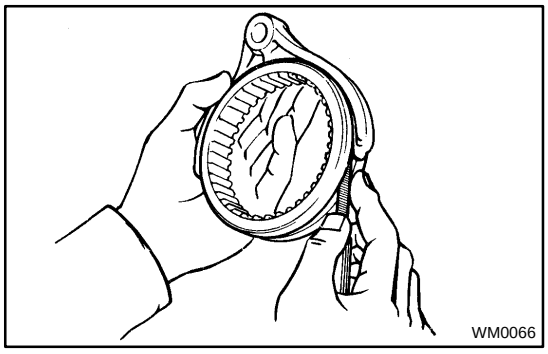
(a) Check for wear or damage.

(b) Install the synchronizer pull ring, cone ring and outer ring to the 5th gear.



(c) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If it does not lock, replace the synchronizer ring.



5. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

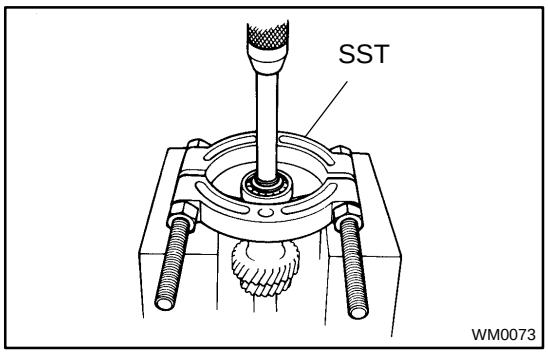
Using a feeler gauge, measure the clearance between the hub sleeves and shift forks.

Maximum clearance: 0.84 mm (0.0331 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.

MT0CE-02

REPLACEMENT

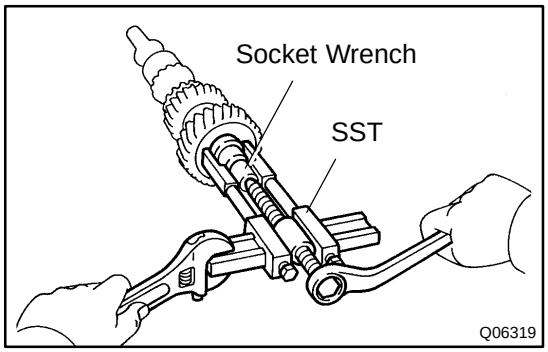


1. IF NECESSARY, REPLACE COUNTER GEAR FRONT BEARING AND SIDE RACE

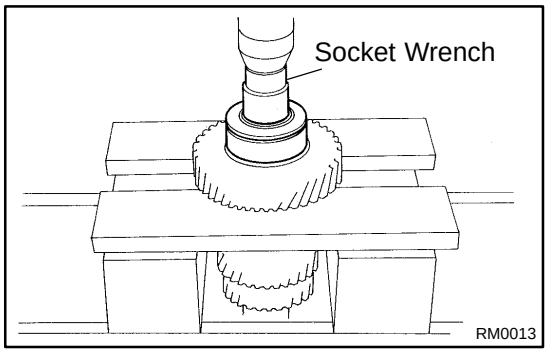
(a) Using a snap ring expander, remove the snap ring.

(b) Using SST and a press, press out the bearing.
SST 09950-00020

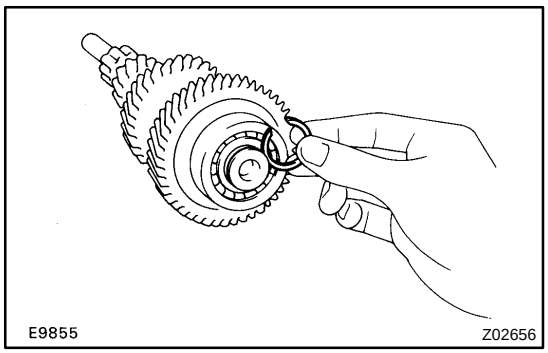
(c) Check the side race for wear or damage.



(d) If necessary, remove the side race.
Using SST and a socket wrench, remove the side race.
SST 09950- 40011 (09951- 04020, 09952- 04010, 09953-04020, 09954-04010, 09955-04071)



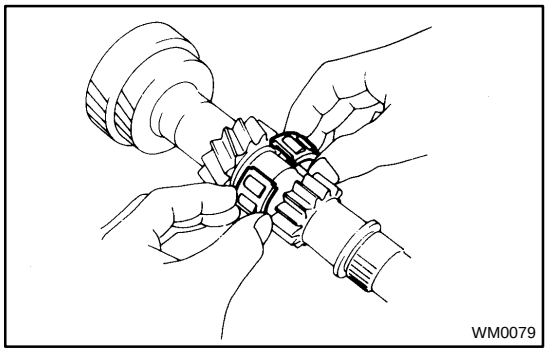
(e) Using a socket wrench and press, install a new bearing, side race and inner race.



(f) Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)
A	2.05 - 2.10 (0.0807 - 0.0827)
B	2.10 - 2.15 (0.0827 - 0.0846)
C	2.15 - 2.20 (0.0846 - 0.0866)
D	2.20 - 2.25 (0.0866 - 0.0886)
E	2.25 - 2.30 (0.0886 - 0.0906)
F	2.30 - 2.35 (0.0906 - 0.0925)

(g) Using a snap ring expander, install the snap ring.



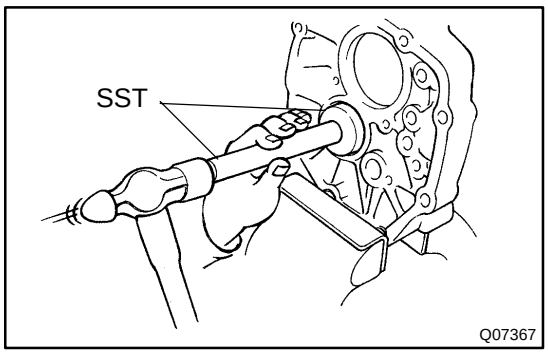
2. IF NECESSARY, REPLACE COUNTER GEAR CENTER BEARING

(a) Remove the bearing from the counter gear.

(b) Install a new bearing on the counter gear.

HINT:

Engage the roller cages.



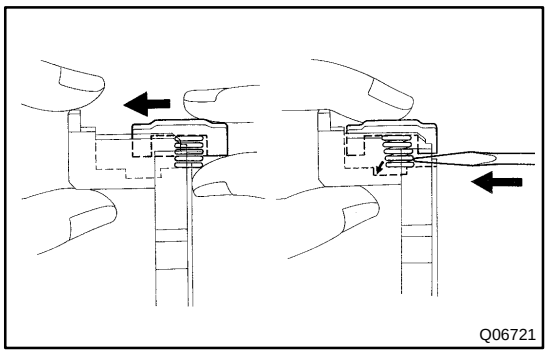
(c) Using SST and a hammer, tap out the bearing outer race.
SST 09950-60010 (09951-00510), 09950-70010 (09951-07150)

HINT:
The outer race will be installed later, as the transmission is assembled.

MT0CF-02

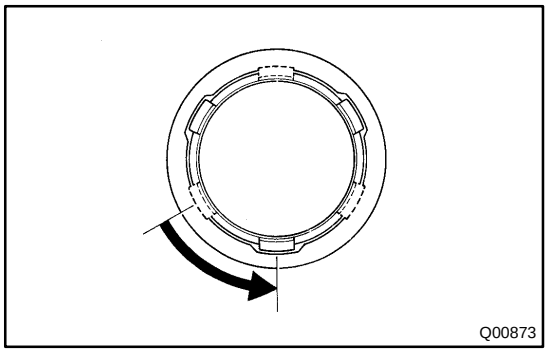
REASSEMBLY

INSTALL SYNCHRONIZER RING ASSEMBLY TO NO. 3 HUB SLEEVE

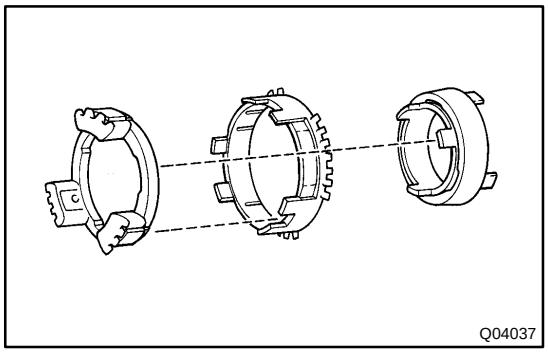


(a) Push the synchronizer key spring, install the shifting key and key spring to the reverse synchronizer ring.

(b) Using a screwdriver, push the 3 key springs into the synchronizer ring spring gaps.

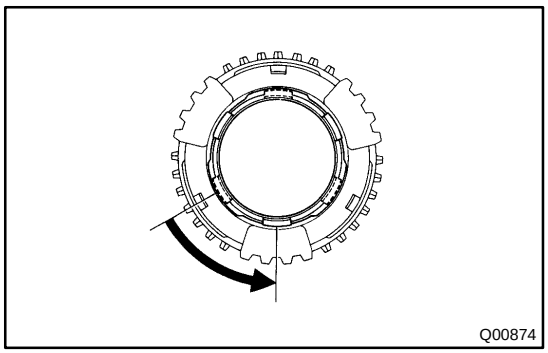


(c) Install the synchronizer cone ring to the reverse synchronizer pull ring and turn the pull ring.

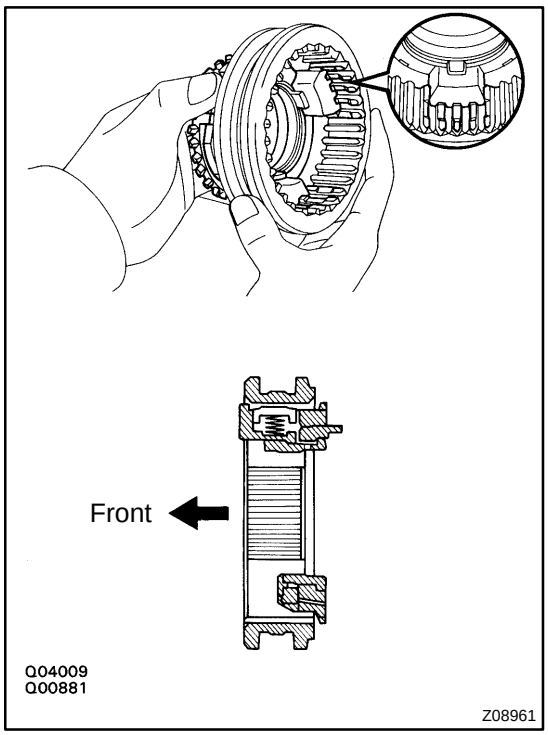


(d) Install the 5th synchronizer ring.

(e) Install the reverse synchronizer ring.



(f) Turn the reverse synchronizer pull ring.

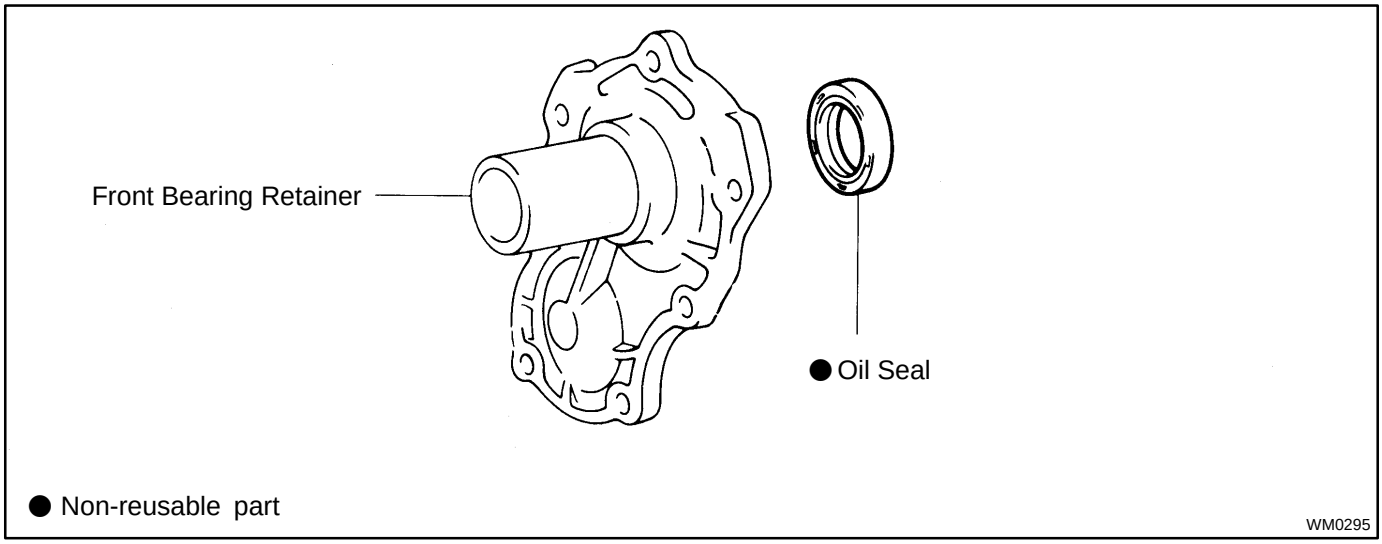


(g) While pushing 3 shifting keys, install the synchronizer ring assembly to the No. 3 hub sleeve.

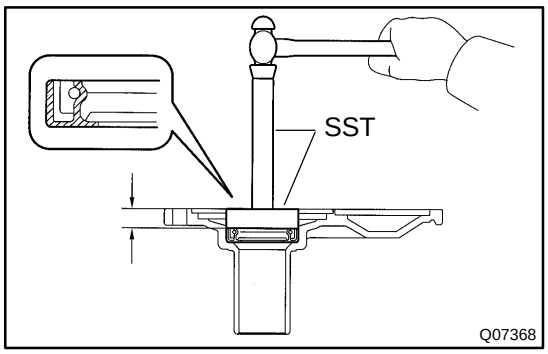
FRONT BEARING RETAINER OIL SEAL

MT0CG-02

COMPONENTS



MT0CH-02



REPLACEMENT

IF NECESSARY, REPLACE FRONT BEARING RETAINER OIL SEAL

(a) Using a screwdriver, pry out the oil seal.

(b) Using SST and a press, install a new oil seal.

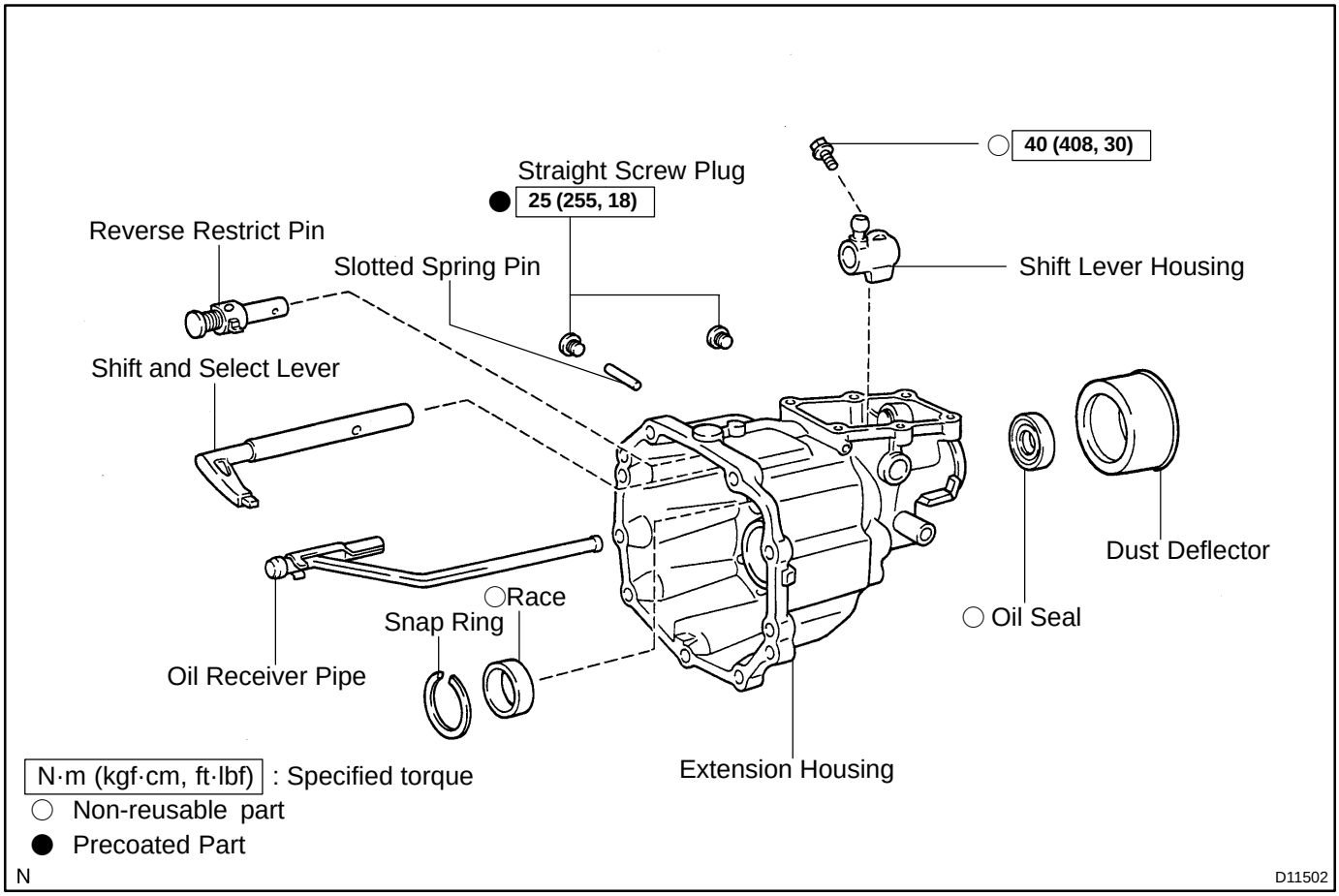
SST 09950-60010 (09951-00440), 09950-70010 (09951-07150)

Drive in depth: 12.2 ± 0.5 mm (0.480 ± 0.020 in.)

EXTENSION HOUSING

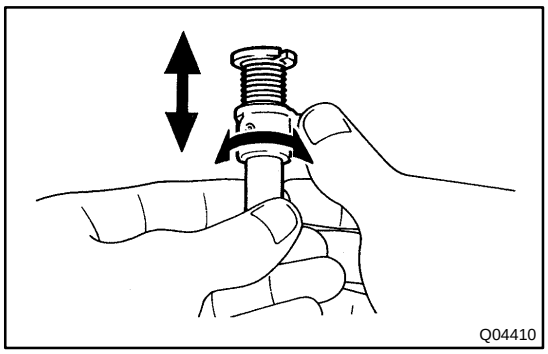
COMPONENTS

MT0CI-02



MT0CJ-02

REPLACEMENT


Q04410

1. REMOVE REVERSE RESTRICT PIN

(a) Using a hexagon wrench, remove the screw plug.

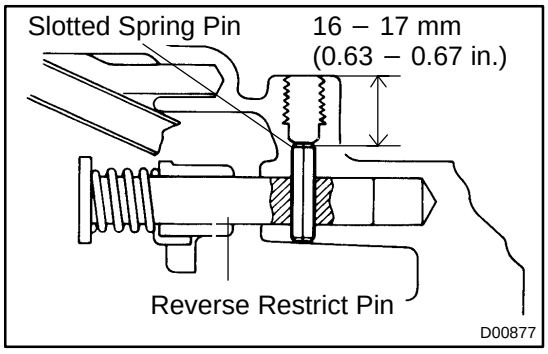
(b) Using a pin punch and hammer, drive out the slotted spring pin.

(c) Pull off the lever housing and slide out the shaft.

2. INSPECT REVERSE RESTRICT PIN

(a) Turn and push the reverse restrict pin by hand.

(b) Check for smooth operation.



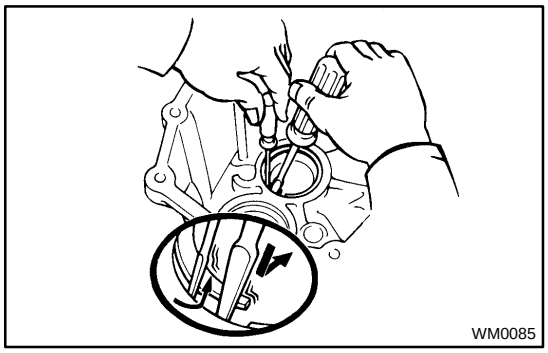
3. INSTALL REVERSE RESTRICT PIN

(a) Install the lever housing.

(b) Using a pin punch and hammer, drive in the slotted spring pin, as shown.
Drive in depth: 16 – 17 mm (0.63 – 0.67 in.)

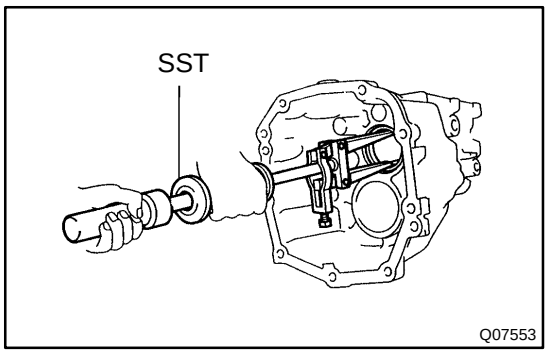
(c) Apply sealant to the plug.
Sealant: Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(d) Install and torque the screw plug.
Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)


WM0085

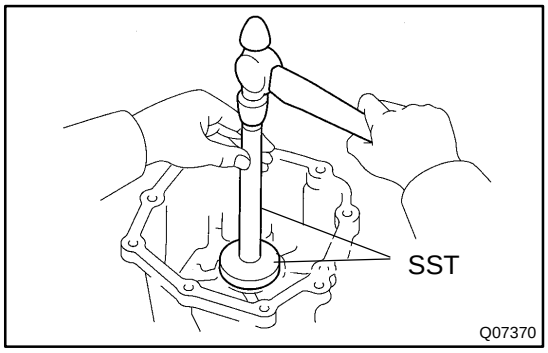
4. IF NECESSARY, REPLACE REAR BEARING OUTER RACE

(a) Using 2 screwdrivers, remove the snap ring.



Q07553

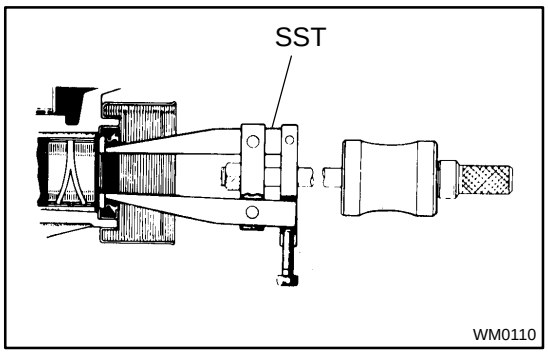
(b) Using SST, remove the outer race.
SST 09308-00010



Q07370

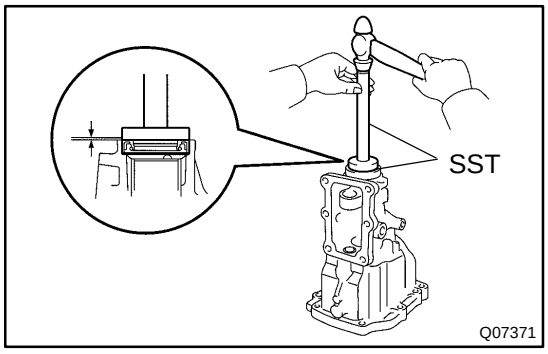
(c) Using SST, install a new outer race.
SST 09950- 60010 (09951- 00560), 09950- 70010 (09951-07150)

(d) Using a screwdriver, install the snap ring.



5. IF NECESSARY, REPLACE OIL SEAL

(a) Using SST, remove the oil seal.
SST 09308-00010 or
09308-10010 w/ output shaft installed



(b) Using SST and a hammer, drive in a new oil seal.
SST 09950- 60010 (09951- 00560), 09950- 70010 (09951-07150)
Drive in depth: 0 ± 0.5 mm (0 ± 0.020 in.)

AUTOMATIC TRANSMISSION SYSTEM

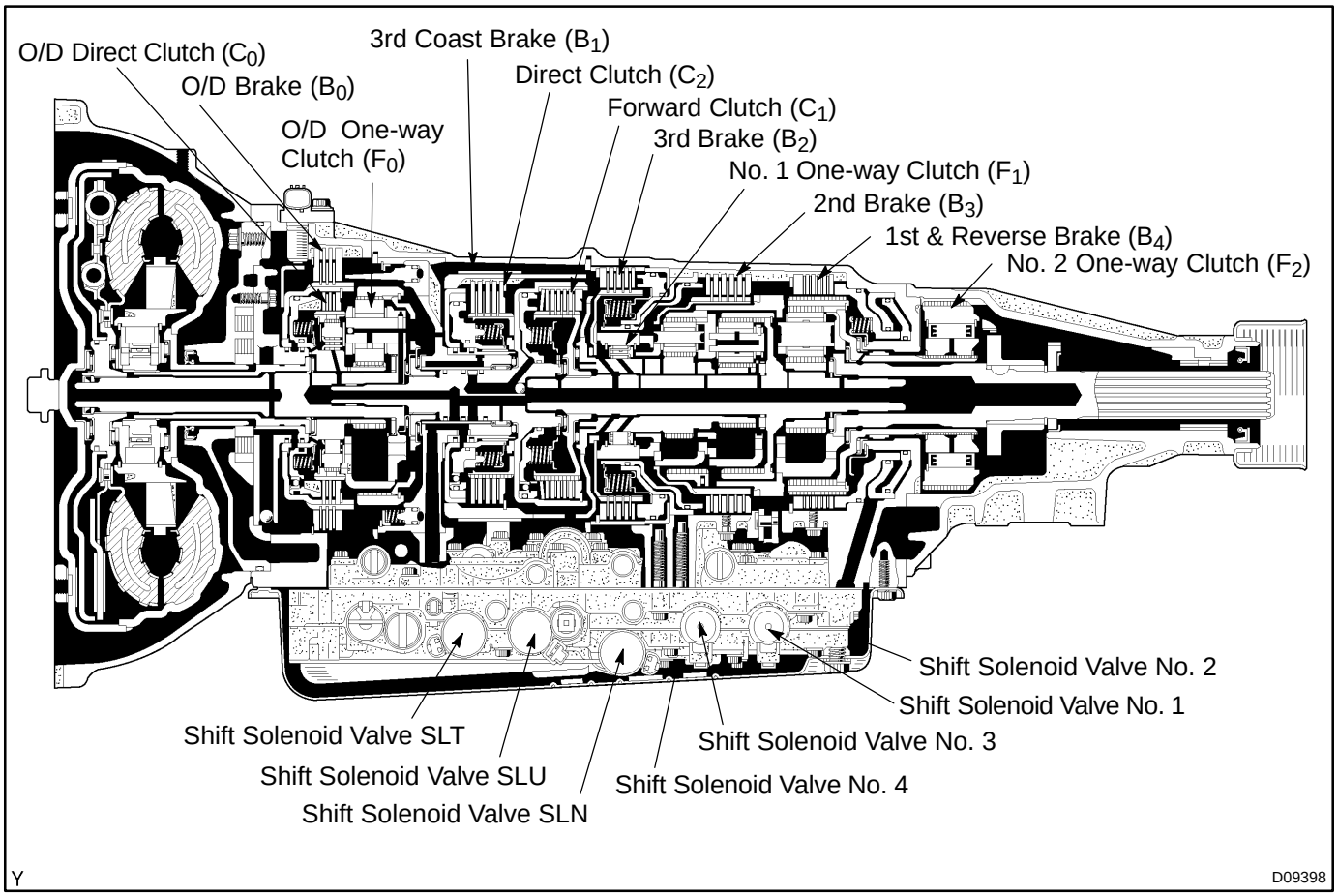
AT0HC-01

PRECAUTION

If the vehicle is equipped with a mobile communication system, refer to the precautions in the IN section.

AT05W-05

OPERATION



Shift Lever Position	Gear Position	S1	S2	S3	S4	C_0	C_1	C_2	B_0	B_1	B_2	B_3	B_4	F_0	F_1	F_2
P	Park	ON	OFF	ON	OFF	○										
R	Reverse	ON	OFF	OFF	OFF			○	○				○			
N	Neutral	ON	OFF	ON	OFF	○										
D M (5)*	1st	ON	OFF	OFF	OFF	○	○							○		○
	2nd	ON	ON	OFF	OFF	○	○					○		○		
	3rd	OFF	ON	OFF	OFF	○	○				○			○	○	
	4th	OFF	OFF	ON	OFF	○	○	○			○			○		
	5th	OFF	OFF	OFF	ON		○	○	○		○					
3	1st	ON	OFF	OFF	OFF	○	○							○		○
	2nd	ON	ON	OFF	OFF	○	○					○		○		
	3rd	OFF	ON	ON	OFF	○	○			○	○			○	○	
2	1st	ON	OFF	ON	OFF	○	○							○		○
	2nd	ON	ON	OFF	OFF	○	○					○		○		
L	1st	ON	OFF	OFF	OFF	○	○						○	○		○

○ : Operating

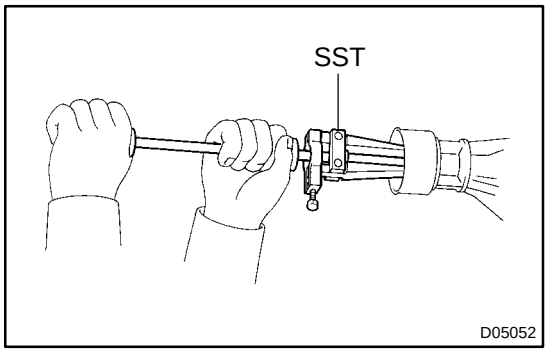
* : When the shift lever position is ”M” and the gear position indicator shows ”5”.

EXTENSION HOUSING OIL SEAL

AT0HE-02

ON-VEHICLE REPAIR

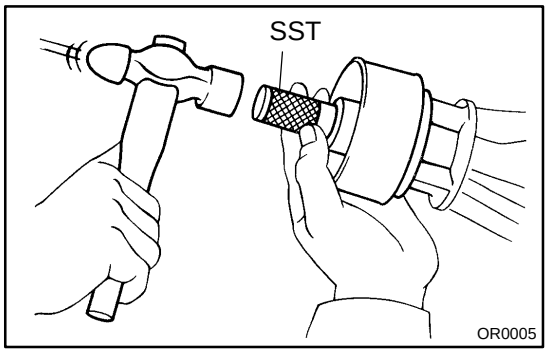
1. **REMOVE NO. 1 AND NO. 2 ENGINE UNDER COVERS**
2. **REMOVE LH FRONT FLOOR CENTER COVER**
3. **REMOVE NO. 1 REAR FLOOR BOARD**
4. **REMOVE EXHAUST PIPE ASSEMBLY**
   (See page EM-100)
5. **REMOVE PROPELLER SHAFT (See page PR-4)**



6. **REMOVE REAR OIL SEAL**

Using SST, remove the oil seal.

SST 09308-00010



7. **INSTALL NEW OIL SEAL**

(a) Using SST and a hammer, carefully drive a new oil seal in as far as it will go.

SST 09325-20010

NOTICE:

Clean the extension housing before removing the oil seal.

(b) Coat the lip of a new oil seal with MP grease.

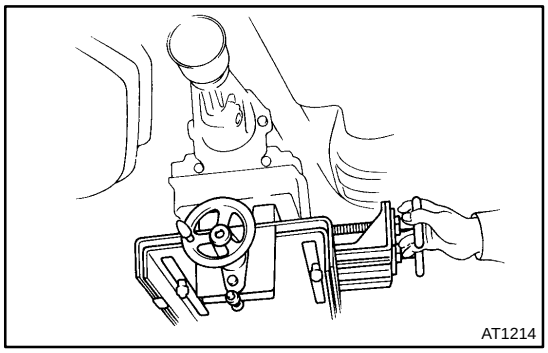
8. **INSTALL PROPELLER SHAFT (See page PR-10)**
9. **INSTALL EXHAUST PIPE ASSEMBLY**
   (See page EM-100)
10. **FILL ATF AND CHECK FLUID LEVEL**
    (See page DI-338)
11. **REMOVE NO. 1 REAR FLOOR BOARD**
12. **REMOVE LH FRONT FLOOR CENTER COVER**
13. **INSTALL NO. 1 AND NO. 2 ENGINE UNDER COVERS**

SENSOR ROTOR

AT0HF-02

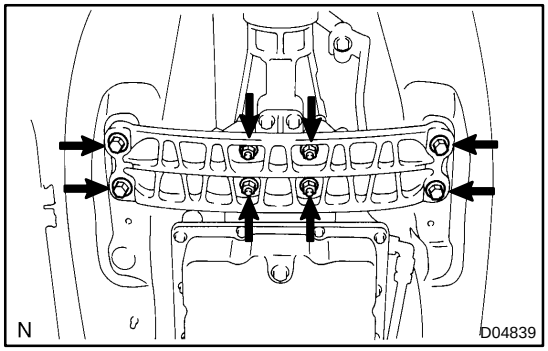
ON-VEHICLE REPAIR

1. **RAISE VEHICLE AND POSITION PAN TO CATCH ANY FLUID THAT MAY DRIP**
2. **REMOVE NO. 1 AND NO. 2 ENGINE UNDER COVERS**
3. **REMOVE LH FRONT FLOOR CENTER COVER**
4. **REMOVE NO. 1 REAR FLOOR BOARD**
5. **REMOVE EXHAUST PIPE (See page EM-100)**
6. **REMOVE PROPELLER SHAFT (See page PR-4)**
7. **REMOVE VEHICLE SPEED SENSOR (See page AT-7)**



8. JACK UP TRANSMISSION SLIGHTLY

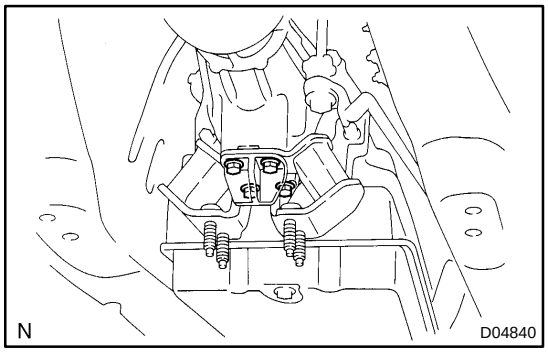
Securely support the transmission on a transmission jack. Lift the transmission slightly from the rear support member.



9. REMOVE ENGINE REAR SUPPORT MEMBER

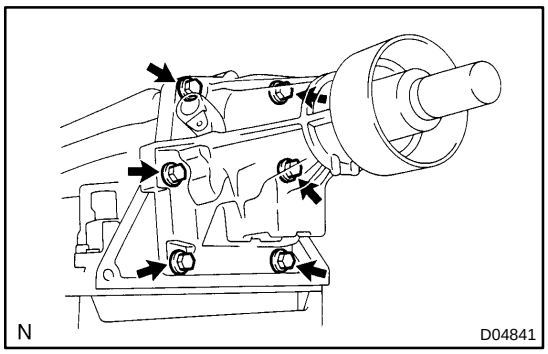
(a) Remove the 4 nuts.

(b) Remove the 4 bolts and rear support member.



10. REMOVE TRANSMISSION MOUNTING BRACKET

Remove the 4 bolts and the transmission mounting bracket from the transmission.



11. REMOVE EXTENSION HOUSING

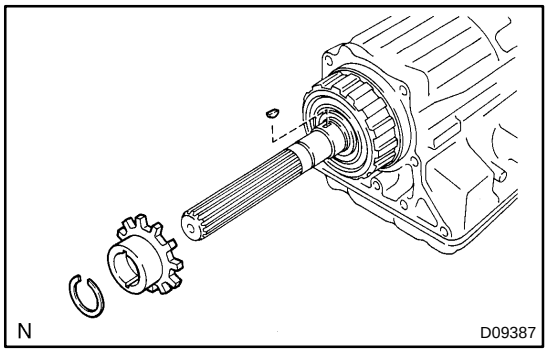
(a) Remove the 6 bolts.

(b) Remove the extension housing.

HINT:

If necessary, tap the extension housing with a plastic hammer.

(c) Remove the extension housing gasket.



12. REMOVE SENSOR ROTOR AND KEY

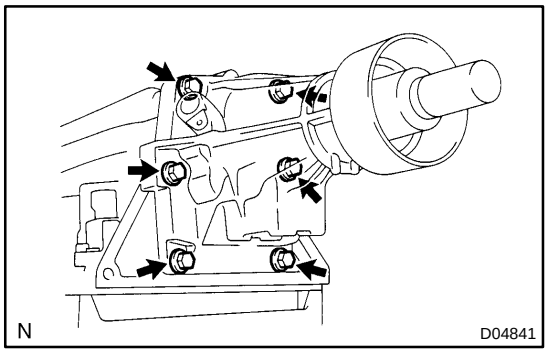
(a) Using a snap ring expander, remove the snap ring.

(b) Remove the sensor rotor and key.

13. INSTALL KEY AND SENSOR ROTOR

(a) Install the key and sensor rotor.

(b) Using a snap ring expander, install a new snap ring.



14. INSTALL EXTENSION HOUSING

(a) Install a new extension housing gasket.

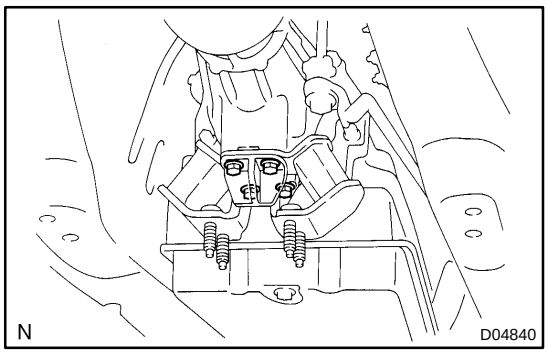
(b) Install the extension housing with the 6 bolts.

Torque: 34 N·m (345 kgf·cm, 25 ft·lbf)

HINT:

Coat the thread of the all bolts with sealant.

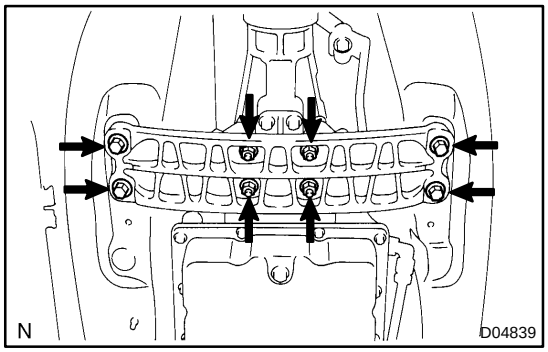
Sealant:
Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent



15. INSTALL TRANSMISSION MOUNTING BRACKET

Install the transmission mounting bracket with the 4 bolts to the transmission.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



16. INSTALL ENGINE REAR SUPPORT MEMBER

(a) Install the rear support member with the 4 bolts.

Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)

(b) Install the 4 nuts.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

17. REMOVE JACK

18. INSTALL VEHICLE SPEED SENSOR (See page AT-7)

19. INSTALL PROPELLER SHAFT (See page PR-10)

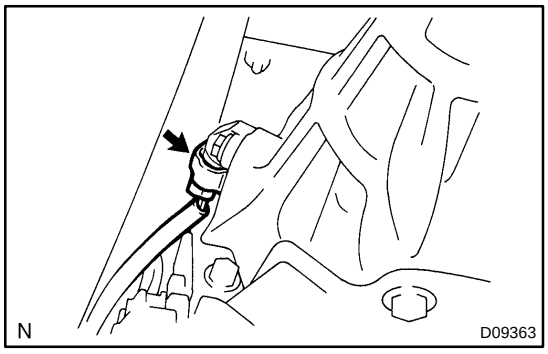
20. INSTALL EXHAUST PIPE (See page EM-100)
21. FILL ATF AND CHECK FLUID LEVEL (See page DI-338)
22. INSTALL NO. 1 REAR FLOOR BOARD
23. INSTALL LH FRONT FLOOR CENTER COVER
24. INSTALL NO. 1 AND NO. 2 ENGINE UNDER COVERS

VEHICLE SPEED SENSOR

AT0XV-01

ON-VEHICLE REPAIR

1. **REMOVE NO. 1 AND NO. 2 ENGINE UNDER COVERS**
2. **REMOVE LH FRONT FLOOR CENTER COVER**
3. **REMOVE NO. 1 REAR FLOOR BOARD**



4. **DISCONNECT VEHICLE SPEED SENSOR CONNECTOR**
5. **REMOVE VEHICLE SPEED SENSOR**

(a) Remove the bolt and vehicle speed sensor.

(b) Remove the O-ring from the vehicle speed sensor.

6. **INSTALL VEHICLE SPEED SENSOR**

(a) Coat a new O-ring with ATF and install it to the vehicle speed sensor.

(b) Install the vehicle speed sensor to the extension housing and torque the bolt.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

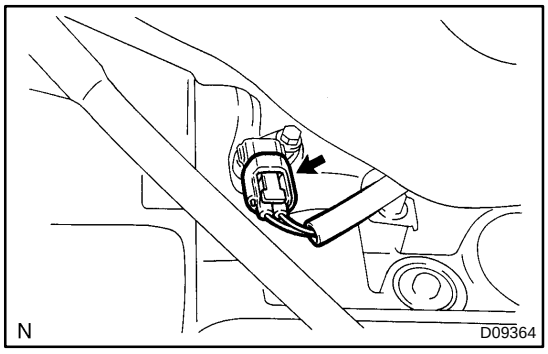
7. **INSTALL NO. 1 REAR FLOOR BOARD**
8. **INSTALL LH FRONT FLOOR CENTER COVER**
9. **INSTALL NO. 1 AND NO. 2 ENGINE UNDER COVERS**

O/D DIRECT CLUTCH SPEED SENSOR

AT0XW-01

ON-VEHICLE REPAIR

1. **REMOVE NO. 1 AND NO. 2 ENGINE UNDER COVERS**
2. **REMOVE LH FRONT FLOOR CENTER COVER**
3. **REMOVE NO. 1 REAR FLOOR BOARD**



4. **DISCONNECT O/D DIRECT CLUTCH SPEED SENSOR CONNECTOR**
5. **REMOVE O/D DIRECT CLUTCH SPEED SENSOR**

(a) Remove the bolt and O/D direct clutch speed sensor.

(b) Remove the O-ring from the O/D direct clutch speed sensor.

6. **INSTALL O/D DIRECT CLUTCH SPEED SENSOR**

(a) Coat a new O-ring with ATF and install it to the O/D direct clutch speed sensor.

(b) Install the O/D direct clutch speed sensor to the transmission case and torque the bolt.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

7. **INSTALL NO. 1 REAR FLOOR BOARD**
8. **INSTALL LH FRONT FLOOR CENTER COVER**
9. **INSTALL NO. 1 AND NO. 2 ENGINE UNDER COVERS**

ATF TEMPERATURE SENSOR

AT05Y-03

ON-VEHICLE REPAIR

CAUTION:

When working with FIPG material, you must observe the following items.

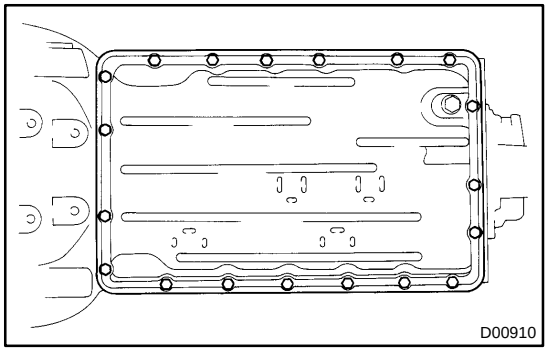
- **Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.**
- **Thoroughly clean all components to remove all the loose material.**
- **Clean both sealing surfaces with a non-residue solvent.**
- **Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.**
- **Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.**

1. REMOVE NO. 1 AND NO. 2 ENGINE UNDER COVERS

2. REMOVE LH FRONT FLOOR CENTER COVER

3. REMOVE NO. 1 REAR FLOOR BOARD

4. REMOVE DRAIN PLUG WITH GASKET AND DRAIN ATF

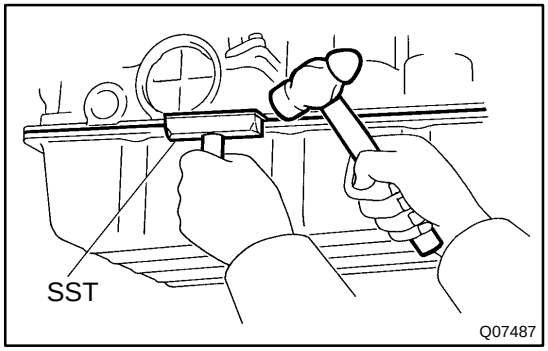


5. REMOVE OIL PAN

NOTICE:

Some fluid will remain in the oil pan.

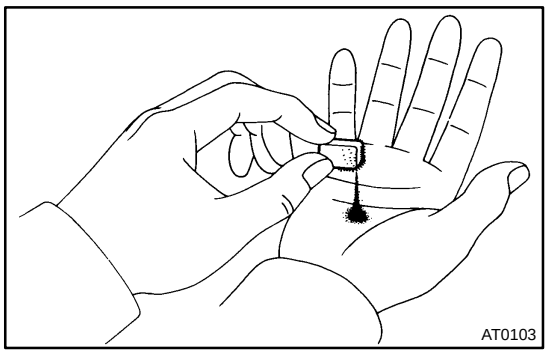
(a) Remove the 19 bolts.



(b) Install the blade of SST between the transmission case and oil pan, cut off applied sealer, and remove the oil pan.
SST 09032-00100

NOTICE:

When removing the oil pan, be careful not to damage the oil pan flange.

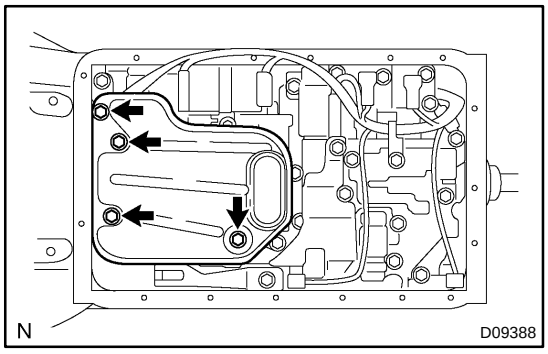


6. EXAMINE PARTICLES IN PAN

Remove the magnets and use them to collect steel particles. Carefully look at the foreign matter and particles in the pan and on the magnets to anticipate the type of wear you will find in the transmission.

Steel (magnetic) ... bearing, gear and clutch plate wear

Brass (non-magnetic) ... bushing wear

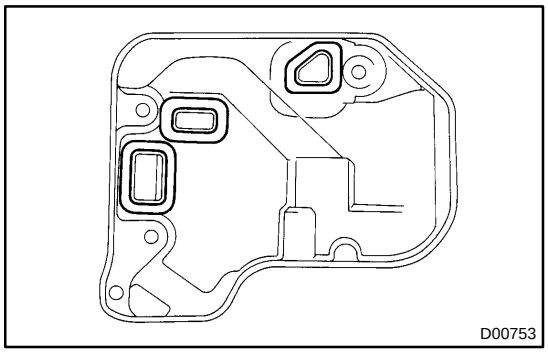


7. REMOVE OIL STRAINER

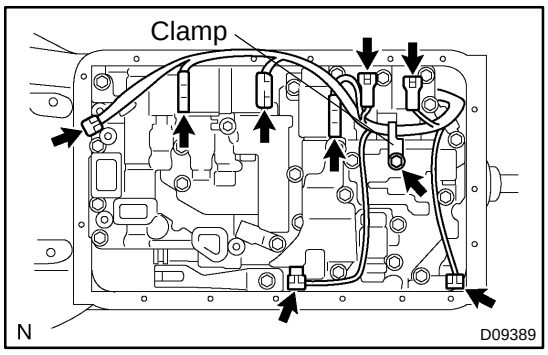
NOTICE:

Be careful as some fluid will come out of the oil strainer.

(a) Remove the 4 bolts and oil strainer.



(b) Remove the 3 gaskets from the oil strainer.

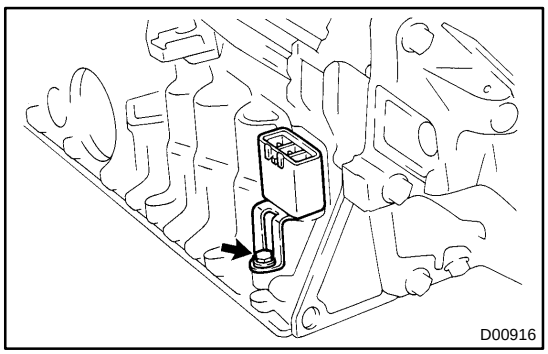


8. REMOVE SOLENOID WIRING WITH ATF TEMPERATURE SENSOR

(a) Disconnect the ATF temperature sensor and remove the O-ring.

(b) Remove the bolt and clamp.

(c) Disconnect the 7 connectors from the solenoid valves.

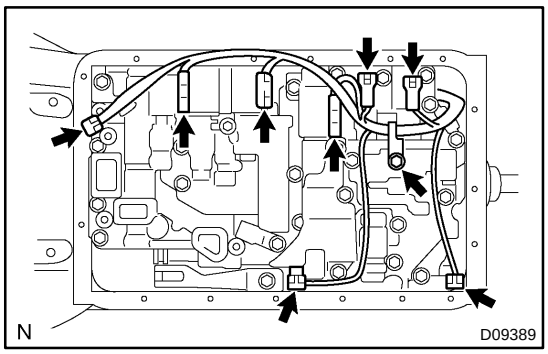


(d) Remove the bolt, solenoid connector and O-ring.

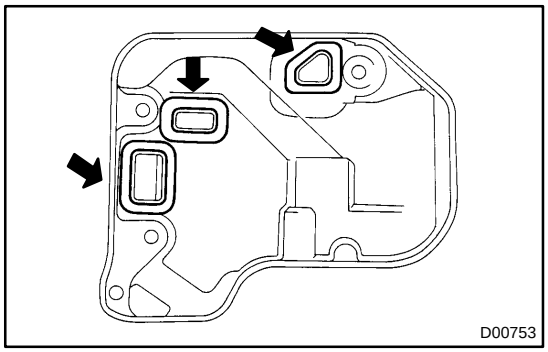
9. INSTALL SOLENOID WIRING WITH ATF TEMPERATURE SENSOR

(a) Install the solenoid connector and a new O-ring with the bolt.

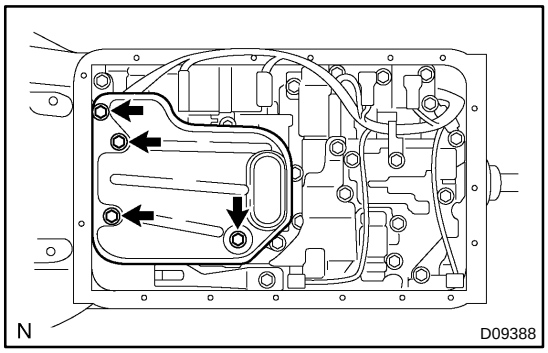
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



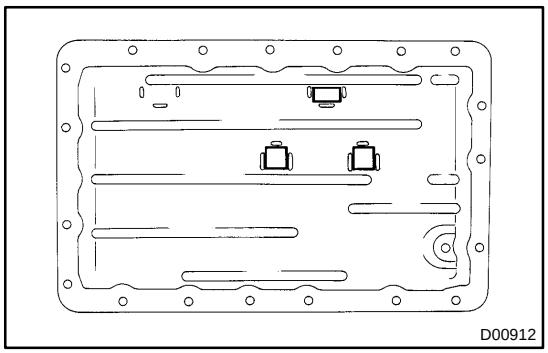
(b) Connect the 7 connectors to the solenoid valves.
(c) Install the clamp with the bolt.
Torque: 6.4 N·m (65 kgf·cm, 56 in.·lbf)
(d) Install a new O-ring and connect the ATF temperature sensor.



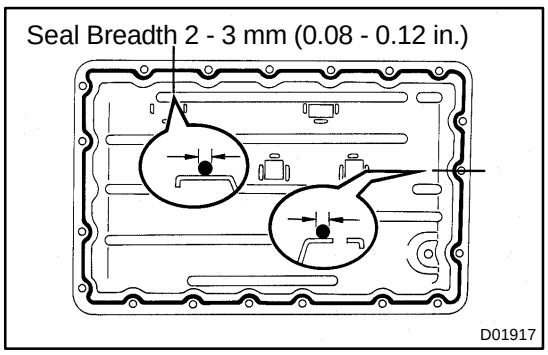
10. INSTALL OIL STRAINER
(a) Install 3 new gaskets.



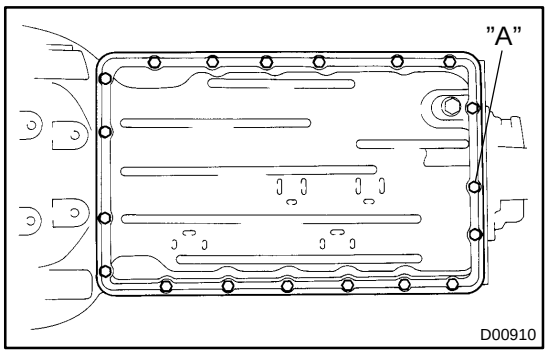
(b) Install the oil strainer with the 4 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



11. INSTALL OIL PAN
(a) Install the 3 magnets in the indications of the oil pan.



(b) Remove any packing material and be careful not to drop oil on the contacting surfaces of the transmission case and oil pan.
(c) Apply FIPG to the oil pan.
FIPG:
Part No. 08826-00090, THREE BOND 1281 or equivalent



(d) Install the oil pan with the 19 bolts.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

HINT:

Replace the only "A" bolt with a new one.

12. INSTALL DRAIN PLUG WITH NEW GASKET
Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)

13. FILL FLUID AND CHECK FLUID (See page DI-338)

14. INSTALL NO. 1 REAR FLOOR BOARD

15. INSTALL LH FRONT FLOOR CENTER COVER

16. INSTALL NO. 1 AND NO. 2 ENGINE UNDER COVERS

VALVE BODY ASSEMBLY

AT05Z-03

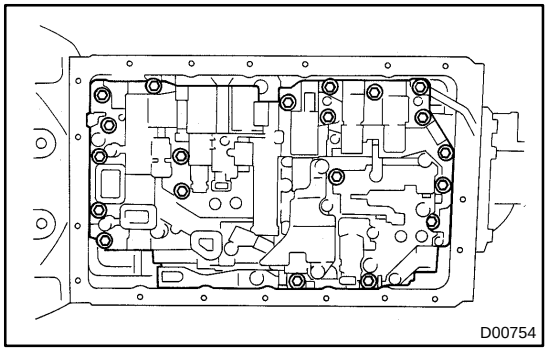
ON-VEHICLE REPAIR

CAUTION:

When working with FIPG material, you must observe the following items.

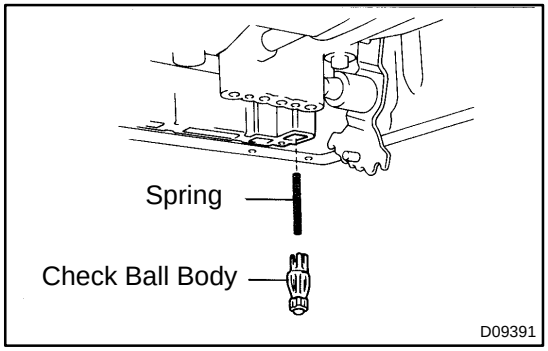
- **Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.**
- **Thoroughly clean all components to remove all the loose material.**
- **Clean both sealing surfaces with a non-residue solvent.**
- **Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.**
- **Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.**

1. **REMOVE NO. 1 AND NO. 2 ENGINE UNDER COVERS**
2. **REMOVE LH FRONT FLOOR CENTER COVER**
3. **REMOVE NO. 1 REAR FLOOR BOARD**
4. **REMOVE DRAIN PLUG WITH GASKET AND DRAIN ATF**
5. **REMOVE OIL PAN (See page AT-9)**
6. **EXAMINE PARTICLES IN PAN (See page AT-9)**
7. **REMOVE OIL STRAINER (See page AT-9)**
8. **REMOVE SOLENOID WIRING WITH ATF TEMPERATURE SENSOR (See page AT-9)**



9. REMOVE VALVE BODY

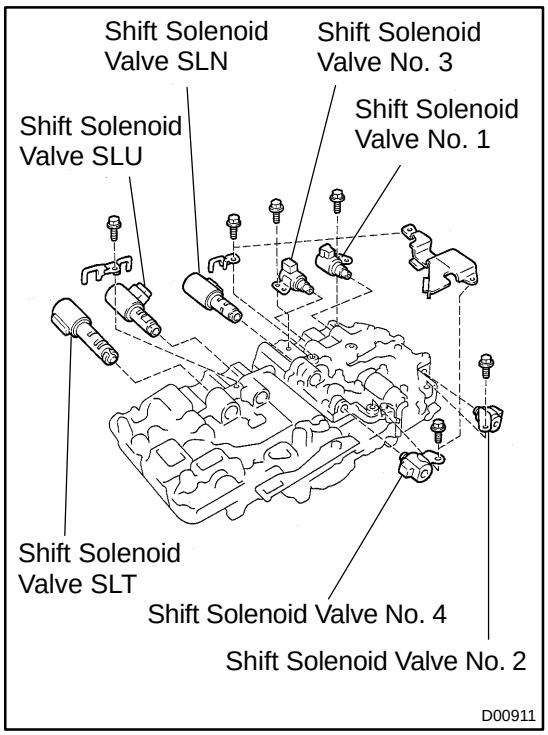
Remove the 20 bolts and valve body.



10. REMOVE CHECK BALL BODY AND SPRING

NOTICE:

Do not drop the check ball body and spring.



11. REMOVE SOLENOID VALVE

(a) Remove the 3 bolts and shift solenoid valve No. 1, No. 2 and No. 3.

(b) Remove the 2 bolts, oil guide plate, lock plate, shift solenoid valve SLN and No. 4.

(c) Remove the 6 O-rings from each shift solenoid valve.

(d) Remove the bolt, lock plate and shift solenoid valve SLU and SLT.

12. INSTALL SOLENOID VALVE

(a) Install the shift solenoid valve SLU and SLT and the lock plate with the bolt.

Torque: 6.4 N·m (65 kgf·cm, 56 in.·lbf)

(b) Coat 6 new O-rings with ATF.

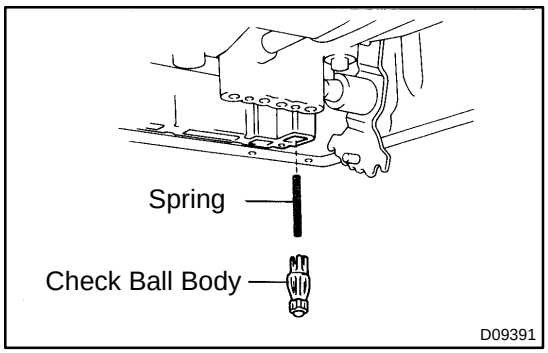
(c) Install the 6 O-rings to the each solenoid valve.

(d) Install the shift solenoid valve SLN, No. 4, lock plate and oil guide plate with the 2 bolts.

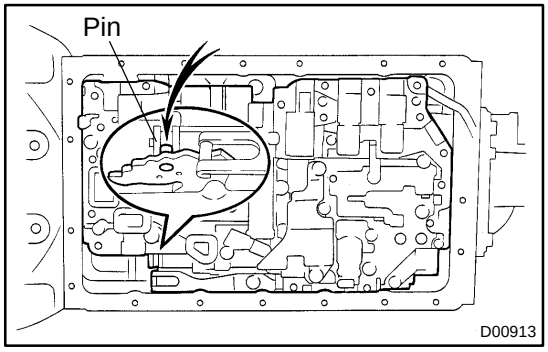
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

(e) Install the shift solenoid valve No. 1, No. 2 and No. 3 with the 3 bolts.

Torque:
Shift solenoid valve No. 1 and No. 3:
6.4 N·m (65 kgf·cm, 56 in.·lbf)
Shift solenoid valve No. 2:
10 N·m (100 kgf·cm, 7 ft·lbf)

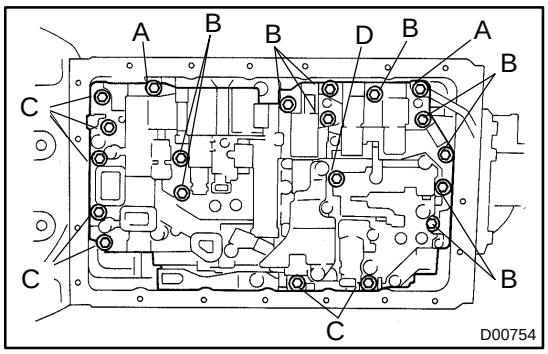


13. INSTALL CHECK BALL BODY AND SPRING



14. INSTALL VALVE BODY

(a) Align the groove of the manual valve to pin of the lever.



(b) Install the 20 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)
Bolt length:
Bolt A: 23 mm (0.91 in.)
Bolt B: 28 mm (1.10 in.)
Bolt C: 36 mm (1.42 in.)
Bolt D: 55 mm (2.17 in.)

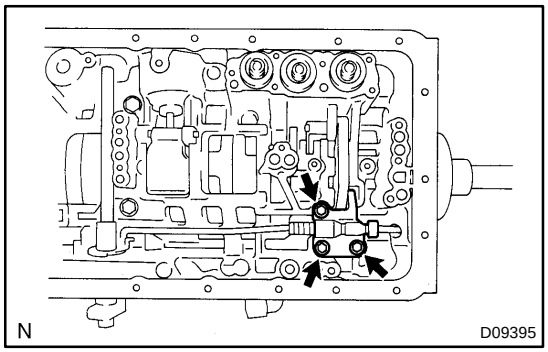
15. **INSTALL SOLENOID WIRING WITH ATF TEMPERATURE SENSOR (See page AT-9)**
16. **INSTALL OIL STRAINER (See page AT-9)**
17. **INSTALL OIL PAN (See page AT-9)**
18. **INSTALL DRAIN PLUG WITH NEW GASKET**
Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)
19. **FILL FLUID AND CHECK FLUID (See page DI-338)**
20. **INSTALL NO. 1 REAR FLOOR BOARD**
21. **INSTALL LH FRONT FLOOR CENTER COVER**
22. **INSTALL NO. 1 AND NO. 2 ENGINE UNDER COVERS**

PARKING LOCK PAWL

AT0HL-02

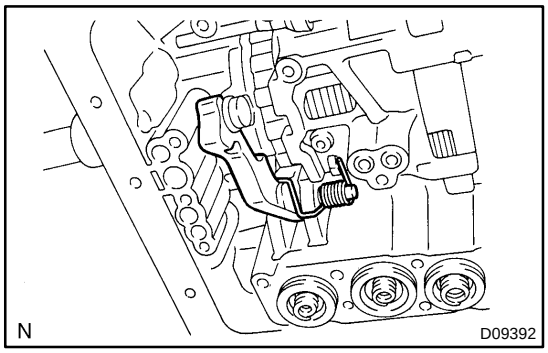
ON-VEHICLE REPAIR

1. REMOVE NO. 1 AND NO. 2 ENGINE UNDER COVERS
2. REMOVE LH FRONT FLOOR CENTER COVER
3. REMOVE NO. 1 REAR FLOOR BOARD
4. REMOVE VALVE BODY (See page AT-13)



5. REMOVE PARKING LOCK PAWL BRACKET

Remove the 3 bolts and parking lock pawl bracket.



6. REMOVE SPRING FROM PARKING LOCK PAWL SHAFT
7. REMOVE PARKING LOCK PAWL SHAFT AND PARKING LOCK PAWL
8. INSTALL PARKING LOCK PAWL AND PARKING LOCK PAWL SHAFT
9. INSTALL SPRING TO PARKING LOCK PAWL SHAFT
10. INSTALL PARKING LOCK PAWL BRACKET

Install the parking lock pawl bracket with the 3 bolts.

Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

HINT:

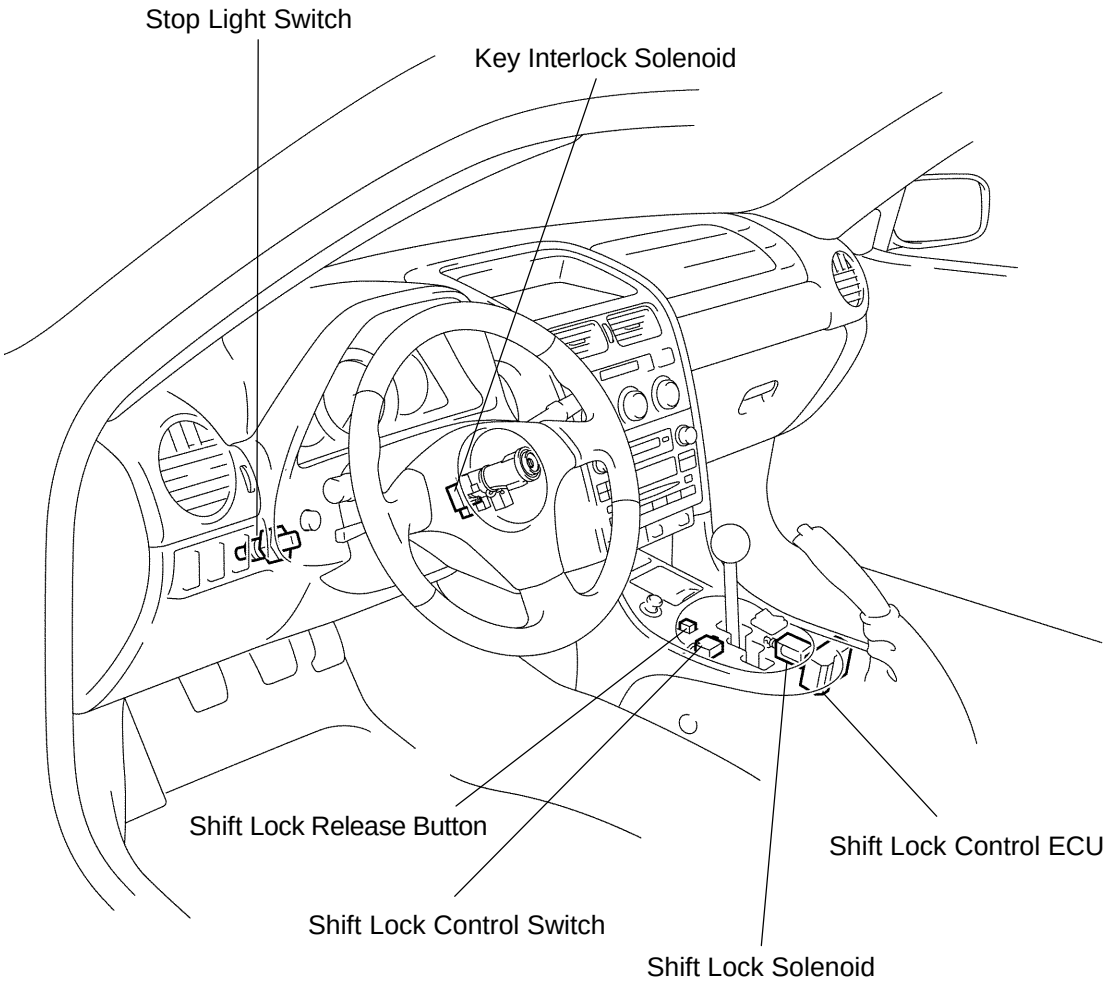
- Push the lock rod fully forward.
- Check that the parking lock pawl operates smoothly.

11. INSTALL VALVE BODY (See page AT-13)
12. INSTALL NO. 1 REAR FLOOR BOARD
13. INSTALL LH FRONT FLOOR CENTER COVER
14. INSTALL NO. 1 AND NO. 2 ENGINE UNDER COVERS

SHIFT LOCK SYSTEM

AT0HM-02

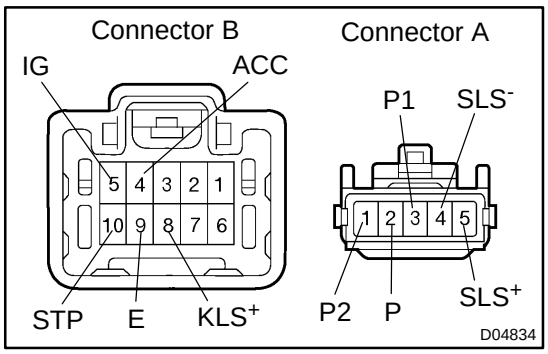
LOCATION



P

D09393

AT0HN-02



INSPECTION

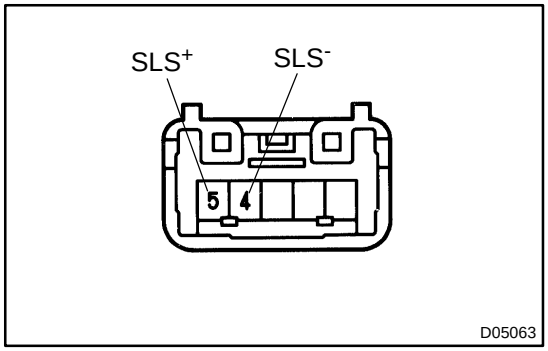
1. INSPECT SHIFT LOCK CONTROL ECU

Using a voltmeter, measure the voltage at each terminal.

HINT:

Do not disconnect the shift lock control ECU connector.

Terminal	Measuring condition	Voltage (V)
B4 - B9 (ACC - E)	Ignition switch ACC	10 - 14
B5 - B9 (IG - E)	Ignition switch ON	10 - 14
B8 - B9 (KLS^+ - E)	4. Ignition switch ACC and P position 5. Ignition switch ACC and except P position 6. Ignition switch ACC and except P position (After approx. 1 second)	0 7.5 - 11.5 6 - 9
B10 - B9 (STP - E)	Depressing brake pedal	10 - 14
A5 - A4 (SLS^+ - SLS^-)	1. Ignition switch ON and P position 2. Depress brake pedal 3. Depress brake pedal (After approx. 1 second) 4. Shift between P and N position under conditions above 5. Shift D position under conditions above	0 8 - 15 6 - 11 6 - 11 0
A3 - A2 (P1 - P)	1. Ignition switch ON, P position and depress brake pedal 2. Shift except P position under condition above	0 12
A1 - A2 (P2 - P)	1. Ignition switch ON, P position and depress brake pedal 2. Shift except P position under conditions above	12 0



2. INSPECT SHIFT LOCK SOLENOID

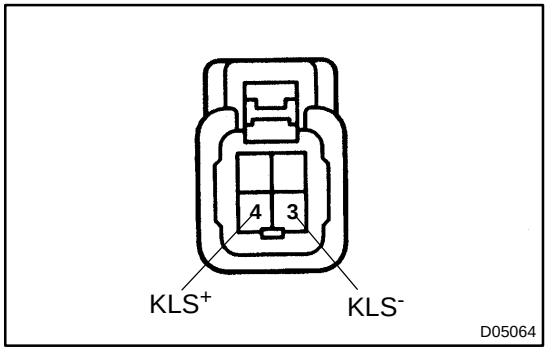
(a) Disconnect the solenoid connector.

(b) Using an ohmmeter, measure resistance between terminals.

If resistance value is not as specified, replace the solenoid.

(c) Check the solenoid operating sound when connecting the battery positive terminal to 5 (SLS^+) and battery negative terminal to 4 (SLS^-).

If the solenoid does not operate, replace the solenoid.



3. INSPECT KEY INTERLOCK SOLENOID

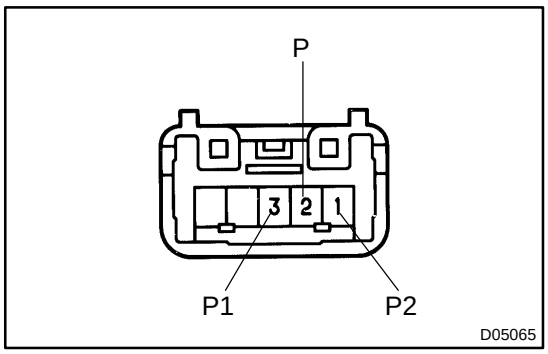
(a) Disconnect the solenoid connector.

(b) Using an ohmmeter, measure resistance between terminals.

If resistance valve is not as specified, replace the solenoid.

(c) Check the solenoid operating sound when connecting the battery positive terminal to 4 (KLS^+) and battery negative terminal to 3 (KLS^-).

If the solenoid does not operate, replace the solenoid.



4. INSPECT SHIFT LOCK CONTROL SWITCH

(a) Disconnect the shift lock control switch.

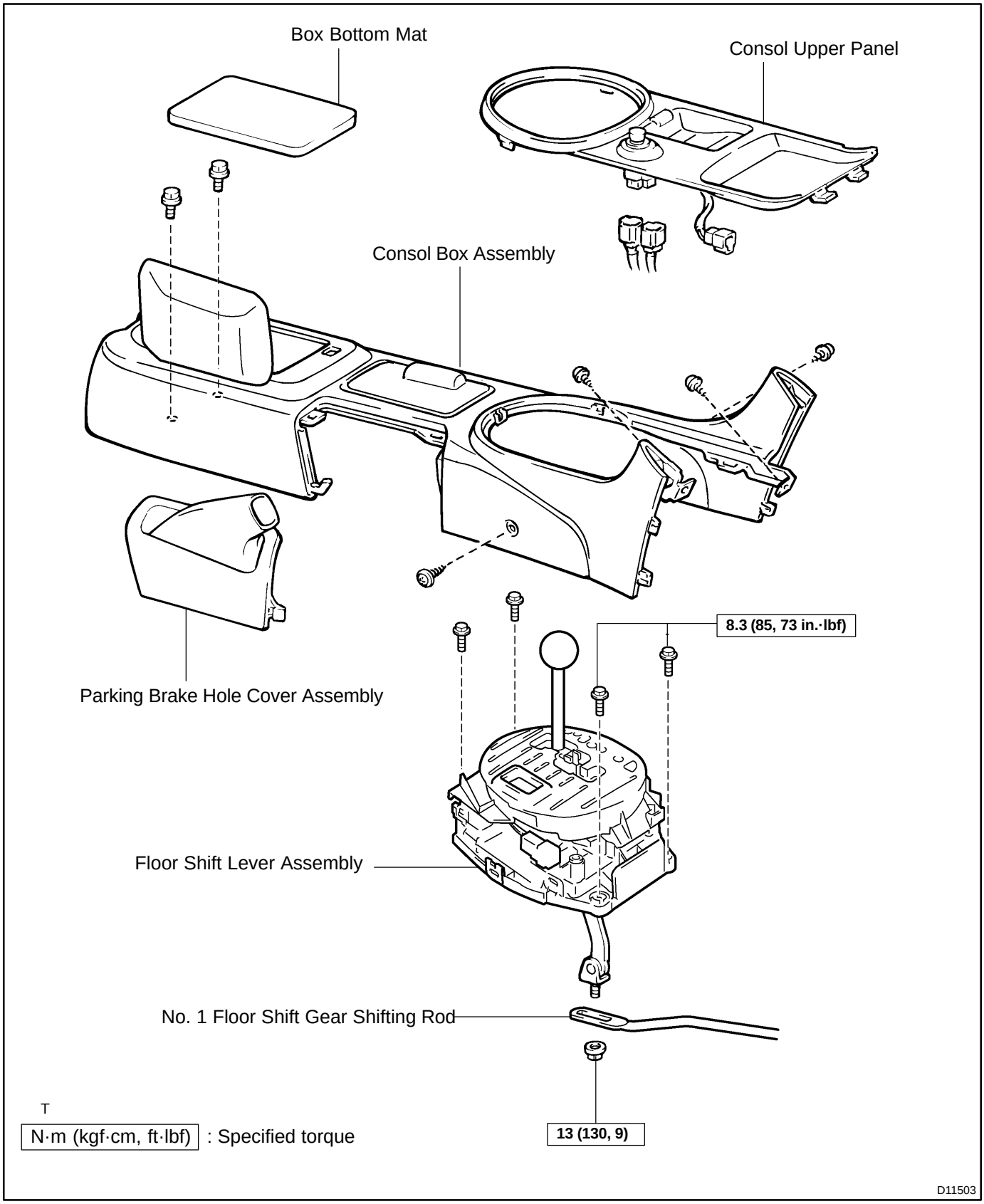
(b) Inspect that continuity exists between each terminal.

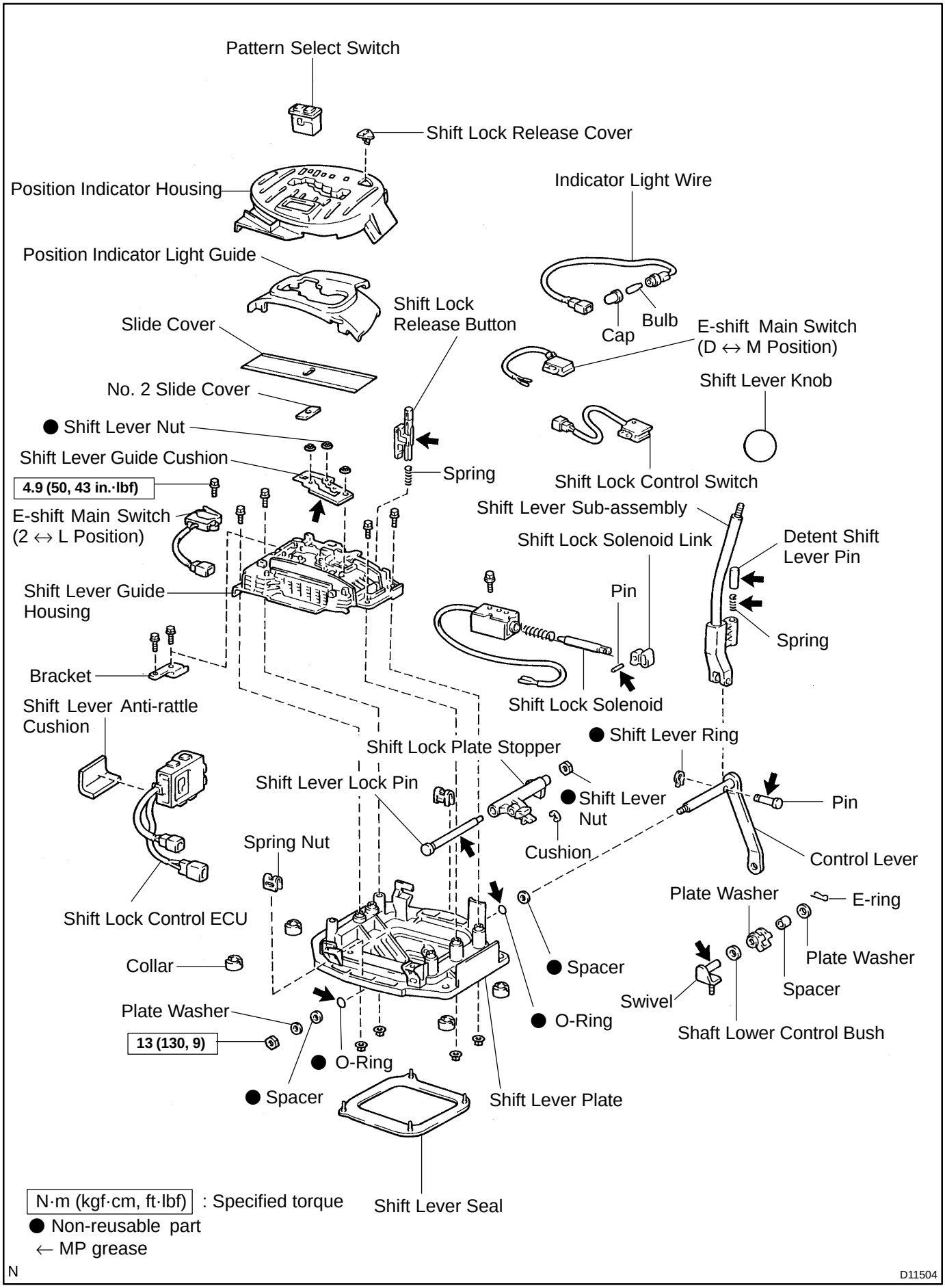
Shift position	Terminal condition to terminal number	Specified value
P position (Release button is not pushed)	P - P1	Continuity
P position (Release button is pushed)	P - P1 P - P2	Continuity
Except P position	P - P2	Continuity

FLOOR SHIFT ASSEMBLY

COMPONENTS

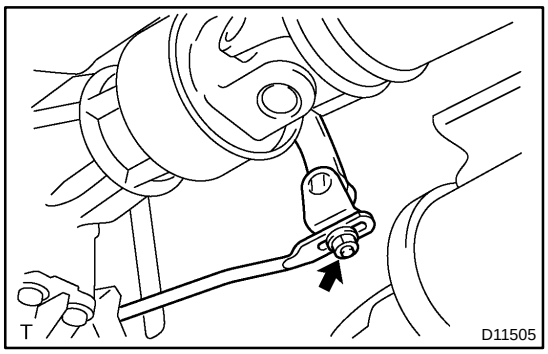
AT0HO-02




Pattern Select Switch
Shift Lock Release Cover
Position Indicator Housing
Indicator Light Wire
Position Indicator Light Guide
Shift Lock Release Button
Slide Cover
Cap
Bulb
E-shift Main Switch (D ↔ M Position)
No. 2 Slide Cover
Shift Lever Knob
● Shift Lever Nut
Shift Lever Guide Cushion
Spring
Shift Lock Control Switch
4.9 (50, 43 in.·lbf)
Shift Lever Sub-assembly
E-shift Main Switch (2 ↔ L Position)
Shift Lock Solenoid Link
Detent Shift Lever Pin
Shift Lever Guide Housing
Pin
Spring
Bracket
Shift Lock Solenoid
Shift Lever Anti-rattle Cushion
● Shift Lever Ring
Shift Lock Plate Stopper
Shift Lever Lock Pin
● Shift Lever Nut
Pin
Spring Nut
Cushion
Control Lever
Plate Washer
E-ring
Shift Lock Control ECU
Collar
● Spacer
Plate Washer
Spacer
Swivel
Plate Washer
13 (130, 9)
● O-Ring
Shaft Lower Control Bush
● O-Ring
● Spacer
Shift Lever Plate
Shift Lever Seal
N·m (kgf·cm, ft·lbf) : Specified torque
● Non-reusable part
← MP grease
N
D11504

AT0HP-02

REMOVAL



1. SEPARATE NO. 1 FLOOR SHIFT GEAR SHIFTING ROD

(a) Shift into the N position.

(b) Remove the nut and separate the No. 1 floor shift gear shifting rod from the connecting rod swivel.

2. REMOVE CONSOLE BOX ASSEMBLY

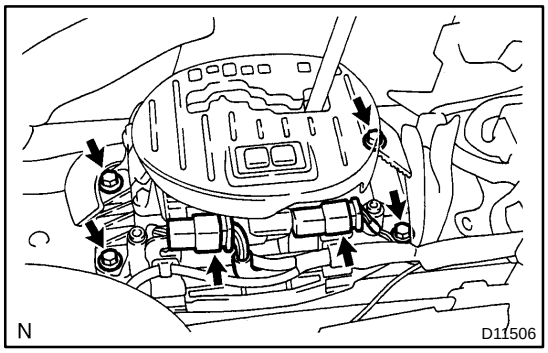
(See page BO-139)

(a) Remove the console upper panel.

(b) Remove the box bottom mat.

(c) Remove the parking brake hole cover assembly.

(d) Remove the console box assembly.



3. REMOVE FLOOR SHIFT LEVER ASSEMBLY

(a) Remove the 4 bolts.

(b) Disconnect the 2 connectors.

(c) Remove the floor shift lever assembly.

AT0HQ-02

DISASSEMBLY

1. REMOVE SHIFT LEVER KNOB

2. REMOVE POSITION INDICATOR HOUSING

(a) Using a small screwdriver, remove the shift lock release cover from the position indicator housing.

(b) Disconnect the pattern select switch connector.

(c) Remove the position indicator housing assembly.

(d) Remove the pattern select switch from the position indicator housing assembly.

3. REMOVE POSITION INDICATOR LIGHT GUIDE

(a) Disconnect the indicator light wire from the position indicator light guide.

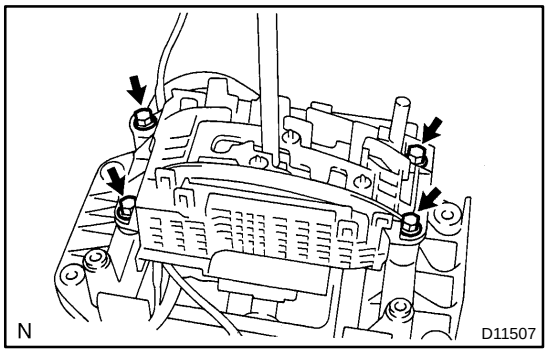
(b) Remove the position indicator light guide.

4. REMOVE SLIDE COVER AND NO. 2 SLIDE COVER

5. REMOVE SHIFT LEVER GUIDE HOUSING

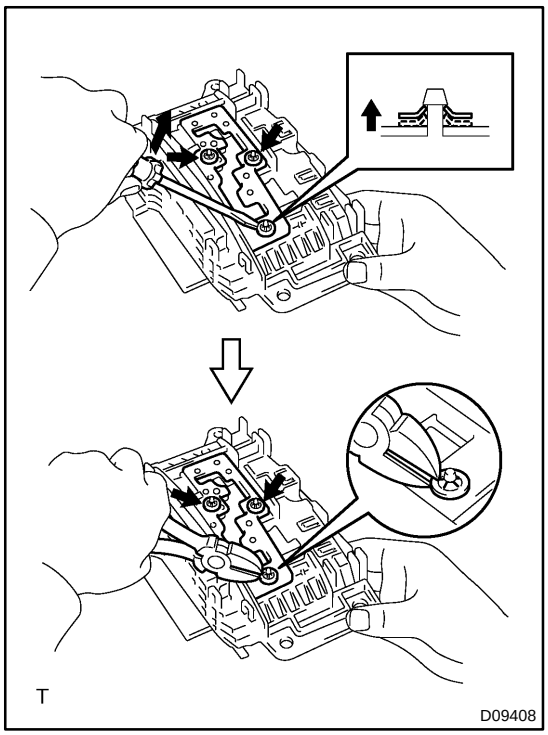
(a) Disconnect the shift lock control ECU connector and indicator light wire from the shift lever plate.

(b) Remove the 2 E-shift main switches and shift lock control switch from the shift lever guide housing.



(c) Remove the 4 bolts, nuts and shift lever guide housing assembly.

(d) Remove the bulb and cap and from the indicator light wire.



6. DISASSEMBLE SHIFT LEVER GUIDE HOUSING

(a) Using a screwdriver, ply and push up 3 shift lever nuts.

(b) Using nippers, cut the 3 shift lever nuts off then.

HINT:

Remove the shift lever lock pin of shift lever nut in the same way.

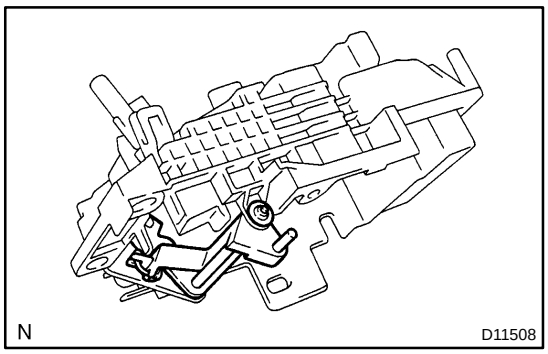
(c) Remove the shift lever guide cushion.

(d) Remove the 3 screws, shift lock control ECU and shift lock solenoid.

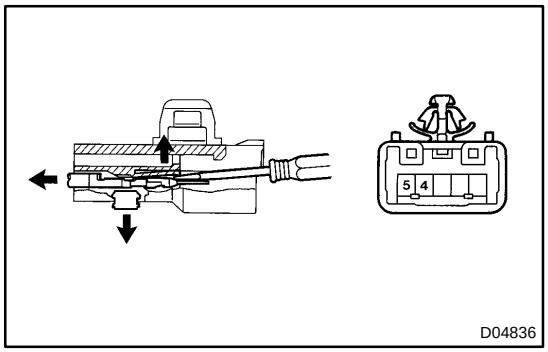
(e) Remove the shift lock control ECU bracket and shift lever anti-rattle cushion from the shift lock control ECU.

(f) Disconnect the E-shift main switch connector from the shift lever guide housing.

(g) Remove the shift lock release button and spring.



(h) Remove the shift lever lock pin, shift lock plate stopper and cushion.



7. DISCONNECT SHIFT LOCK CONTROL ECU, SHIFT LOCK SOLENOID, SHIFT LOCK CONTROL SWITCH AND E-SHIFT MAIN SWITCH

(a) Disengage the secondary locking device of shift lock solenoid.

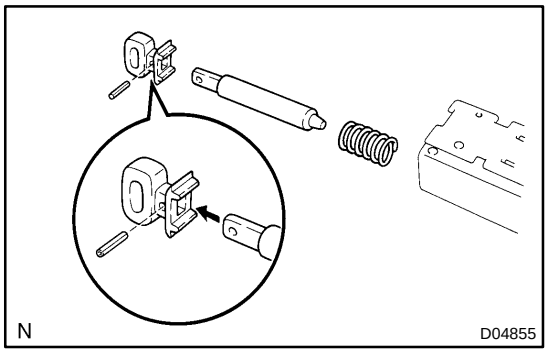
(b) Release the locking lug of the terminals 4 and 5, and pull the terminals out from the rear.

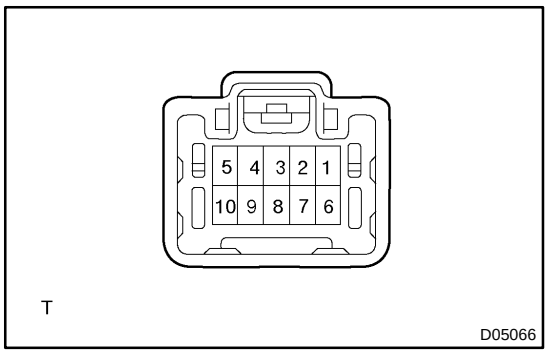
HINT:

Remove the E-shift main switch in the same way.

(c) Remove the shift lock solenoid.

(d) Using 2 mm dia. steel wire, remove the pin the remove the shift lock solenoid link from the shift lock solenoid plunger.

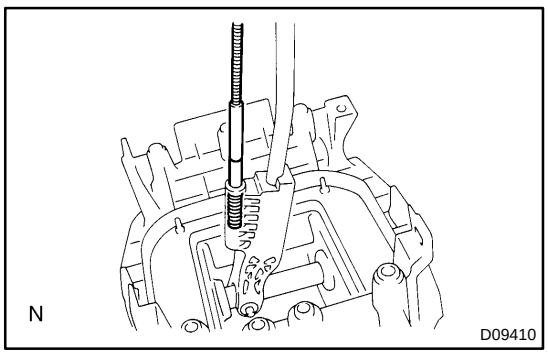




(e) Disengage the secondary locking device of shift lock solenoid.

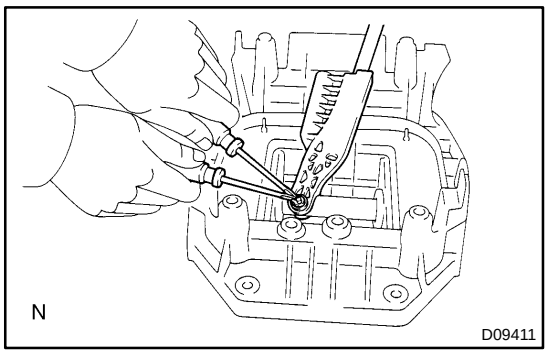
(f) Release the locking lag of the terminals 1 and 6, and pull the terminals out from the rear.

(g) Remove the E-shift main switch.

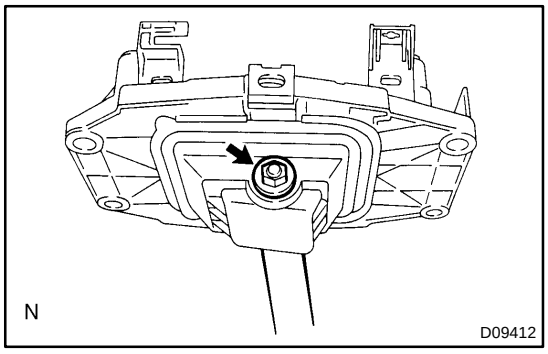


8. REMOVE SHIFT LEVER SUB-ASSEMBLY

(a) Using a magnetic finger, remove the detent shift lever pin and spring.

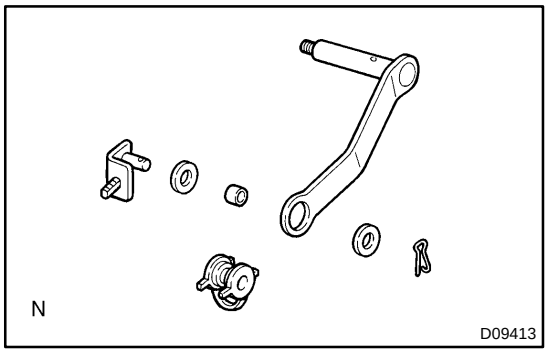


(b) Using 2 screwdrivers, remove the shift lever ring.
(c) Remove the pin and shift lever sub-assembly.



9. DISASSEMBLE SHIFT LEVER PLATE

(a) Remove the nut, control lever, plate washer, 2 spacers and 2 O-ring.



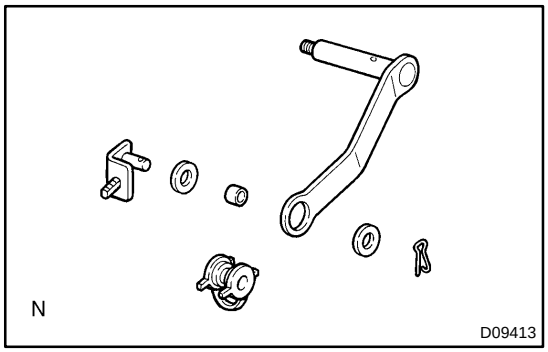
(b) Using pliers, remove the E-ring.
(c) Remove the swivel, 2 plate washer, shaft lower control bush and spacer.
(d) Remove the shift lever seal.
(e) Remove the 4 collars.
(f) Remove the 2 spring nuts.

AT0HR-02

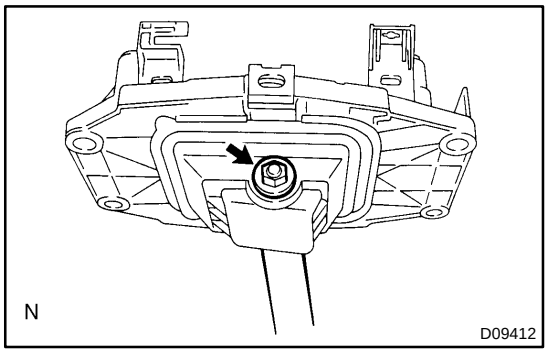
REASSEMBLY

1. REASSEMBLE SHIFT LEVER PLATE

(a) Install the 2 spring nuts.
(b) Install the 4 collars.
(c) Install the shift lever seal.



(d) Install the shaft lower control bush, spacer, 2 plate washers and swivel.
(e) Using pliers, install the E-ring.

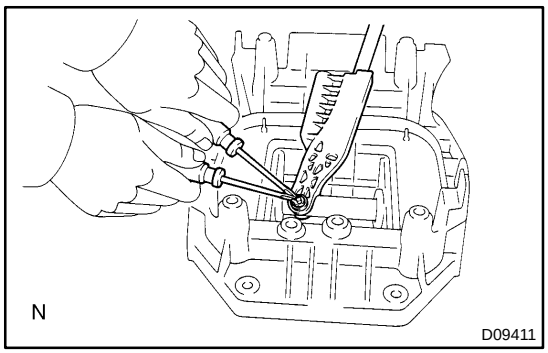


(f) Apply MP grease to the new 2 O-rings.
(g) Install the 2 O-rings, 2 new spacers, plate washer, control lever and nut.

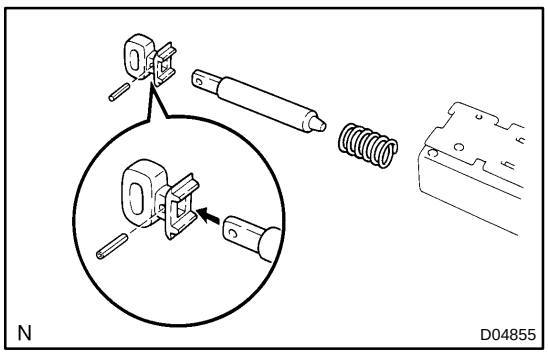
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

2. INSTALL SHIFT LEVER SUB-ASSEMBLY

(a) Apply MP grease to the pin.
(b) Install the shift lever sub-assembly and pin.



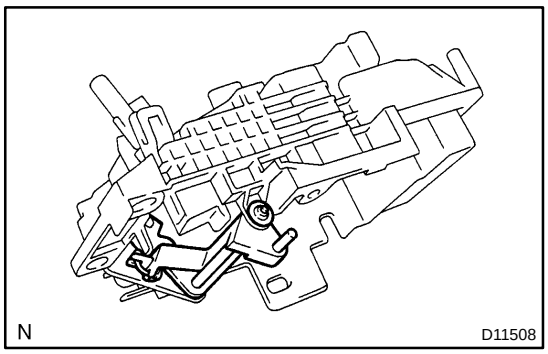
(c) Using 2 screwdriver, install the shift lever ring.
(d) Apply MP grease to the detent shift lever pin and spring.
(e) Install the detent shift lever pin and spring.



3. REASSEMBLE SHIFT LOCK SOLENOID

(a) Apply MP grease to the shift lock solenoid link.
(b) Install the shift lock solenoid link and pin to the shift lock solenoid plunger.
(c) Install the shift lock solenoid link with shift lock solenoid plunger and spring to the shift lock solenoid.

4. CONNECT SHIFT LOCK CONTROL ECU, SHIFT LOCK SOLENOID, SHIFT LOCK CONTROL SWITCH AND E-SHIFT MAIN SWITCH



5. REASSEMBLE SHIFT LEVER GUIDE HOUSING

(a) Apply MP grease to the shift lever lock pin.

(b) Install the shift lever lock pin, shift lock plate stopper and cushion to the shift lever guide housing.

(c) Install the new shift lever nut to the shift lever lock pin by knocking them lightly via the 10 mm seated nut.

HINT:

Install the shift lever guide cushion of the shift lever nut in the same way.

(d) Apply MP grease to the shift lock release button.

(e) Install the spring and shift lock release button.

(f) Connect the E-shift main switch connector to the shift lever guide housing.

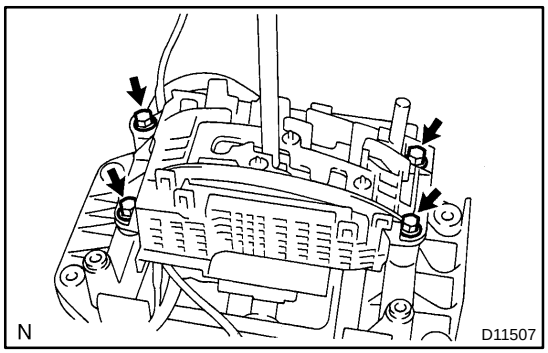
(g) Install the shift lock control ECU bracket and shift lever anti-rattle cushion to the shift lock control ECU.

(h) Install the shift lock control ECU and shift lock solenoid with the 3 screws to the shift lever guide housing.

(i) Install the shift lever guide cushion with new 3 shift lever nuts.

6. INSTALL SHIFT LEVER GUIDE HOUSING

(a) Install the bulb and cap to the indicator light wire.



(b) Install the shift lever guide housing assembly with the 4 bolts and nuts to the shift lever plate.

Torque: 4.9 N·m (50 kgf·cm, 43 in.·lbf)

(c) Install the 2 E-shift main switches and shift lock control switch to the shift lever guide housing.

(d) Connect the shift lock control ECU and indicator light wire connector to the shift lever plate.

7. INSTALL SLIDE COVER AND NO. 2 SLIDE COVER

8. INSTALL POSITION INDICATOR LIGHT GUIDE

(a) Install the position indicator light guide.

(b) Connect the indicator light wire to the position indicator light guide.

9. INSTALL POSITION INDICATOR HOUSING

(a) Install the pattern select switch to the position indicator housing.

(b) Install the position indicator housing.

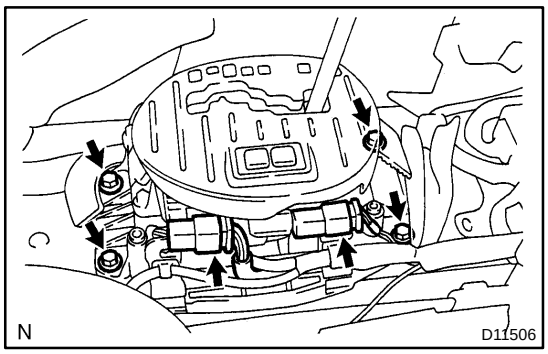
(c) Connect the pattern select switch connector.

(d) Install the shift lock release cover to the position indicator housing.

10. INSTALL SHIFT LEVER KNOB

AT0HS-02

INSTALLATION



1. INSTALL FLOOR SHIFT LEVER ASSEMBLY

(a) Connect the 2 connectors to the floor shift lever assembly.

(b) Install the floor shift lever assembly with the 4 bolts.

Torque: 8.3 N·m (85 kgf·cm, 73 in.·lbf)

2. INSTALL CONSOLE BOX ASSEMBLY

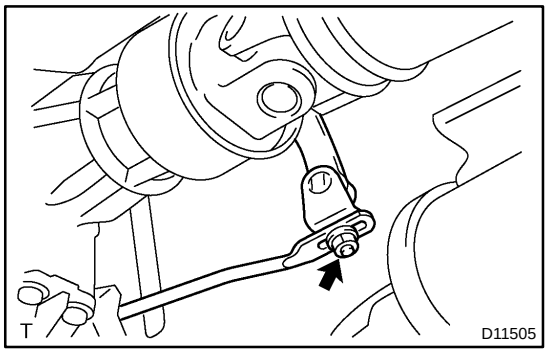
(See page BO-149)

(a) Install the console box assembly.

(b) Install the parking brake hole cover assembly.

(c) Install the box bottom mat.

(d) Install the console upper panel.



3. INSTALL NO. 1 FLOOR SHIFT GEAR SHIFTING ROD

(a) Shift into the N position.

(b) Connect the No. 1 floor shift gear shifting rod and connecting rod swivel with the nut.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

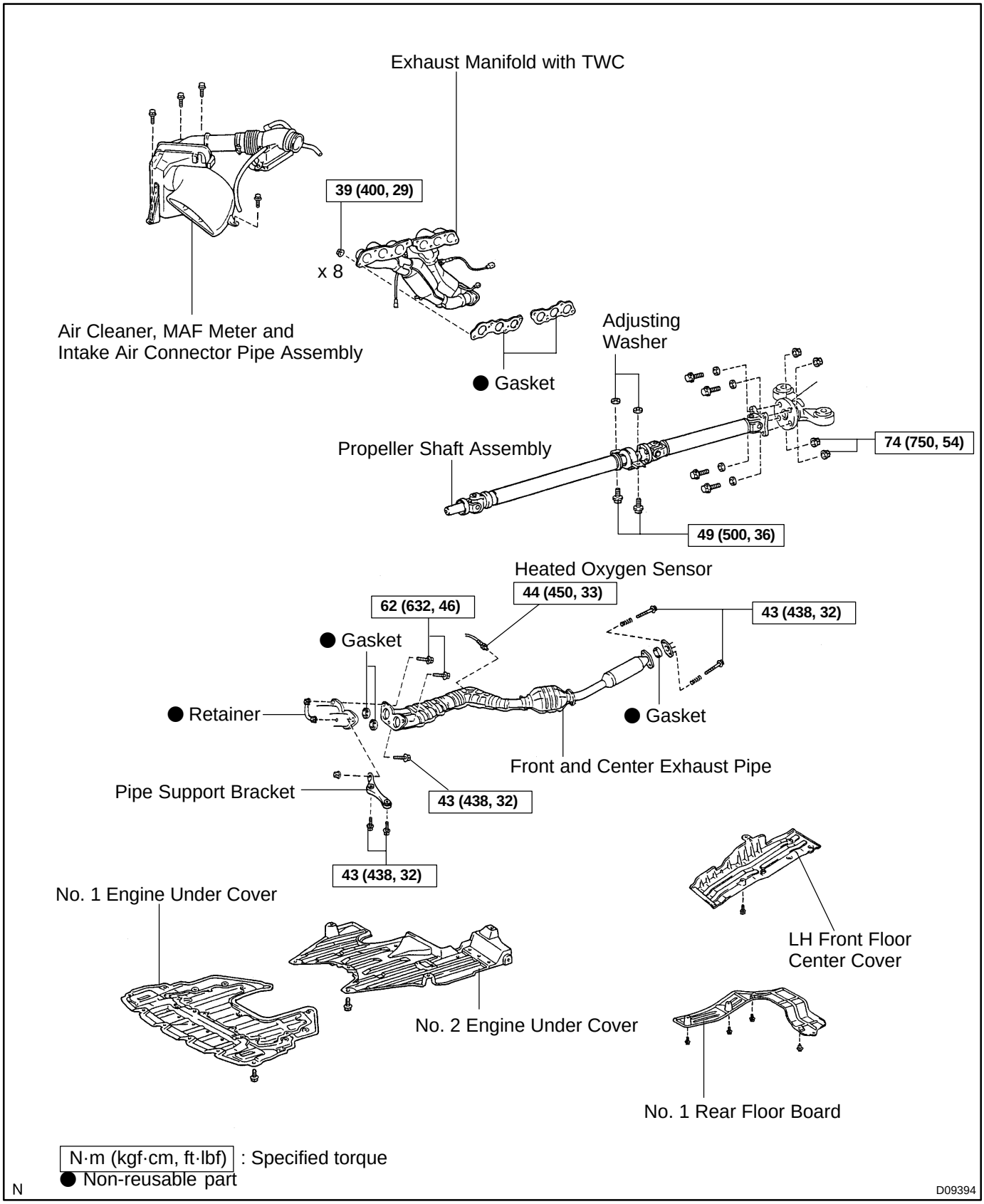
4. CHECK SHIFTING LEVER POSITION

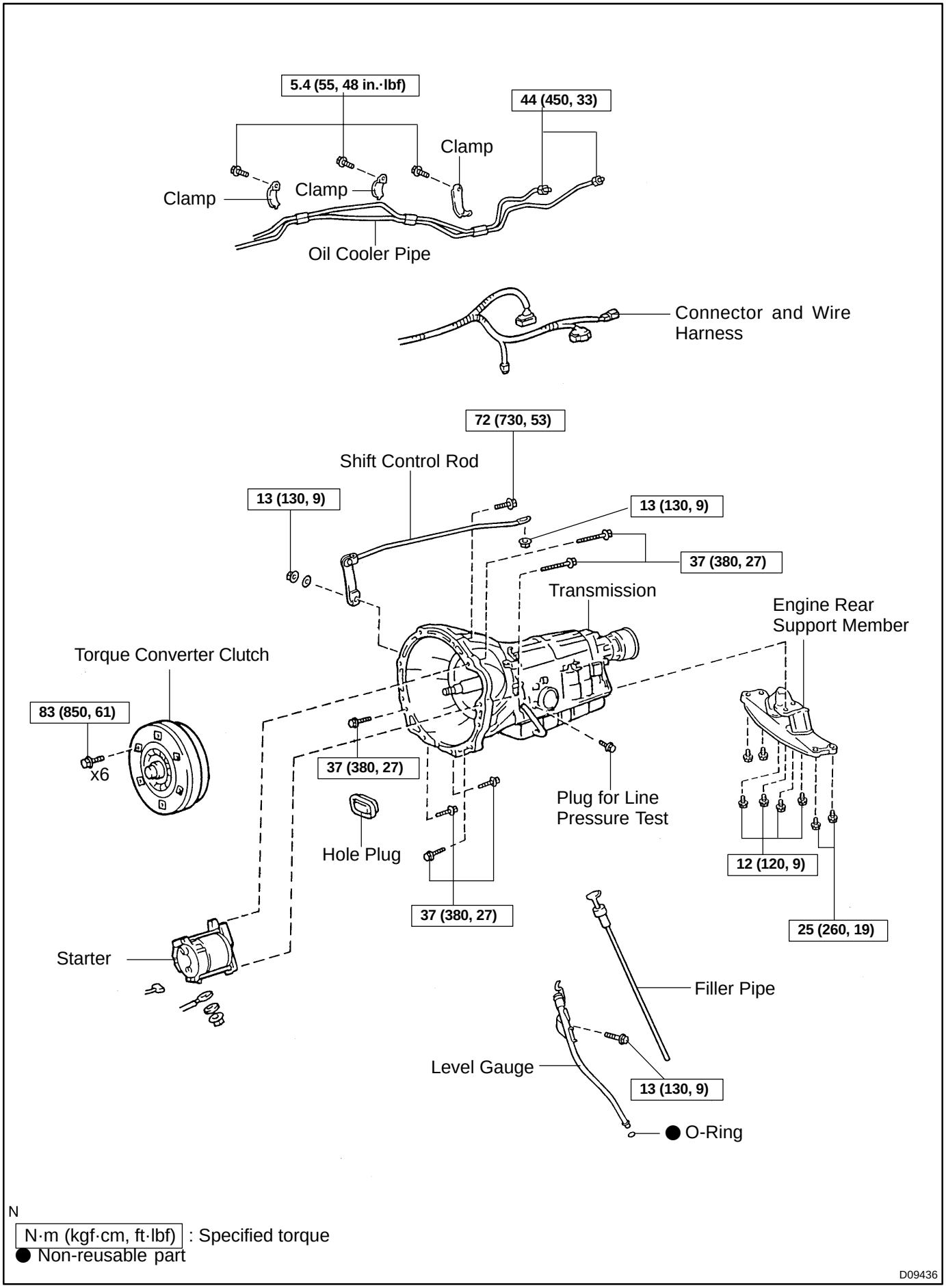
(See page DI-338)

AUTOMATIC TRANSMISSION UNIT

AT0XX-03

COMPONENTS




5.4 (55, 48 in.·lbf)
44 (450, 33)
Clamp
Clamp
Clamp
Oil Cooler Pipe
Connector and Wire Harness
72 (730, 53)
Shift Control Rod
13 (130, 9)
13 (130, 9)
37 (380, 27)
Transmission
Engine Rear Support Member
Torque Converter Clutch
83 (850, 61)
x6
37 (380, 27)
Plug for Line Pressure Test
Hole Plug
12 (120, 9)
37 (380, 27)
25 (260, 19)
Starter
Filler Pipe
Level Gauge
13 (130, 9)
● O-Ring
N
N·m (kgf·cm, ft·lbf) : Specified torque
● Non-reusable part
D09436

AT0XY-01

REMOVAL

1. REMOVE LEVEL GAUGE

2. REMOVE FILLER PIPE

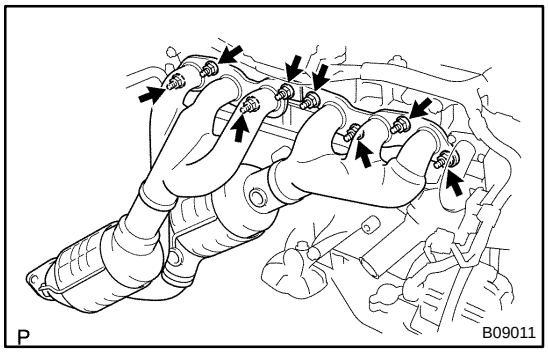
Remove the bolt and filler pipe with the O-ring.

HINT:

At the time of installation, please refer to the following item.

Replace the used O-ring with a new one.

3. REMOVE AIR CLEANER, MAF METER AND INTAKE AIR CONNECTOR PIPE ASSEMBLY



4. REMOVE EXHAUST MANIFOLD WITH TWC

(a) Disconnect the 3 connectors.

(b) Remove the 8 nuts, 2 gaskets and exhaust manifold with the TWC.

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

HINT:

At the time of installation, please refer to the following item.

Replace the used gaskets with new ones.

5. RAISE VEHICLE

NOTICE:

Make sure that the vehicle is securely supported.

6. REMOVE NO. 1 AND NO. 2 ENGINE UNDER COVERS

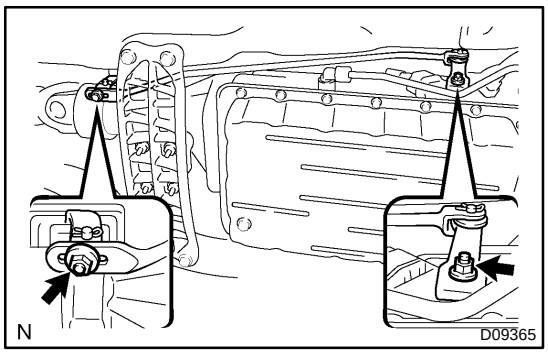
7. REMOVE LH FRONT FLOOR CENTER COVER

8. REMOVE NO. 1 REAR FLOOR BOARD

9. DRAIN ENGINE COOLANT

10. REMOVE UPPER RADIATOR HOSE FROM RADIATOR

11. REMOVE FRONT AND CENTER EXHAUST PIPES (See page EM-100)



12. REMOVE SHIFT CONTROL ROD

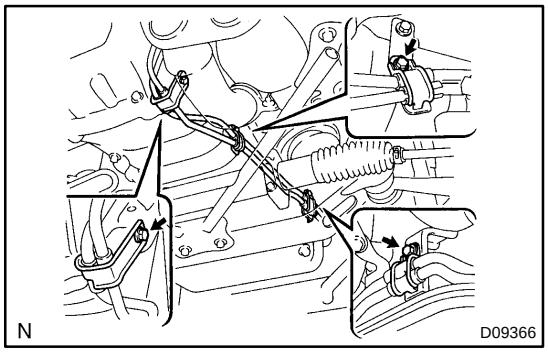
(a) Remove the nut and washer, and disconnect the rod.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(b) Remove the nut and shift control rod.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

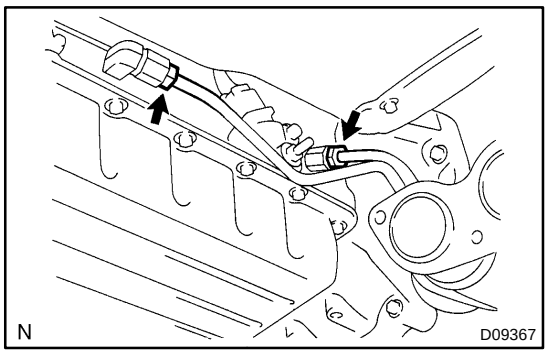
13. REMOVE PROPELLER SHAFT (See page PR-4)



14. DISCONNECT OIL COOLER PIPE

(a) Remove the 3 bolts and 3 clamps.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

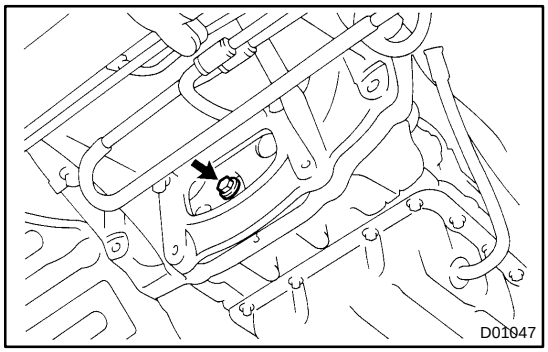


(b) Loosen the 2 union nuts from the transmission.
Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

NOTICE:

Be careful not to damage the oil cooler pipe.

(c) Disconnect the 2 oil cooler pipes from the transmission.



15. REMOVE TORQUE CONVERTER CLUTCH MOUNTING BOLT

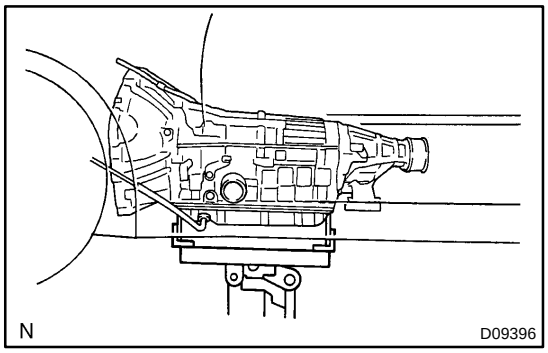
(a) Remove the hole plug.

(b) Turn the crankshaft to gain access to each bolt.

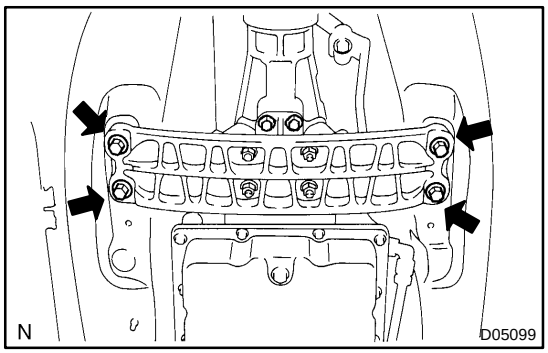
(c) Hold the crankshaft pulley nut with a wrench and remove the 6 bolts.
Torque: 48 N·m (490 kgf·cm, 35 ft·lbf)

HINT:

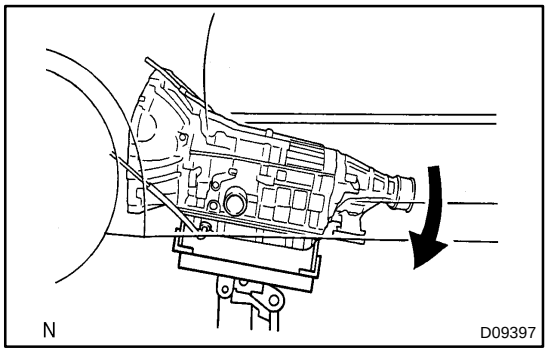
At the time of installation, please refer to the following item.
First install black colored bolt and then the 5 other bolts.



16. SUPPORT TRANSMISSION WITH JACK



17. REMOVE 4 ENGINE REAR SUPPORT MEMBER SET BOLTS
Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)



18. DISCONNECT CONNECTORS AND WIRE HARNESS

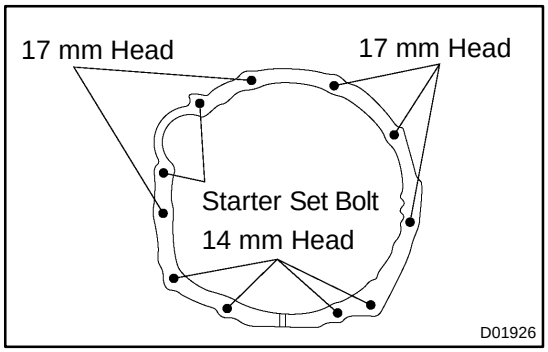
(a) Tilt down the transmission.

NOTICE:

Take care so that the cooling fan does not come in contact with the fan shroud.

(b) Disconnect the following connectors:
(1) O/D direct clutch speed sensor connector
(2) Vehicle speed sensor connector
(3) Park/neutral position switch connector
(4) Solenoid connector

(c) Disconnect the wire harness from the clamps on the transmission.



19. REMOVE STARTER

(a) Disconnect the connector and wire from the starter.

(b) Remove the 2 bolts and starter.

Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)

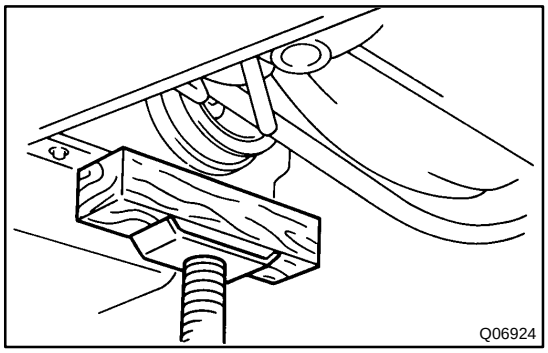
20. REMOVE TRANSMISSION

Remove the 9 bolts, ground cable and transmission.

Torque:

17 mm head: 72 N·m (730 kgf·cm, 53 ft·lbf)

14 mm head: 37 N·m (380 kgf·cm, 27 ft·lbf)



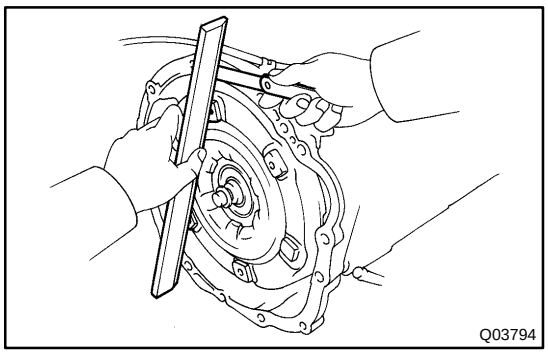
HINT:

At the time of installation, please refer to the following item.

Lift the front side of the engine.

AT0HV-02

INSTALLATION



1. CHECK TORQUE CONVERTER CLUTCH INSTALLATION

Using calipers and a straight edge, measure from the distance from the installed surface of the transmission housing to the installed surface of the torque converter clutch.

Correct distance: More than 0.1 mm (0.004 in.)

If the distance is less than the standard, check for an improper installation.

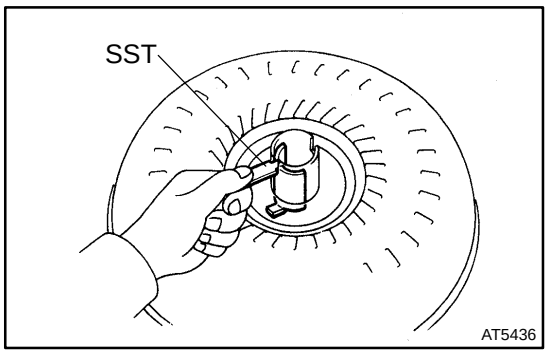
2. INSTALL TRANSMISSION

Installation is in the reverse order of removal (See page AT-31).

HINT:

After installation, check and inspect items as follows.

- Adjust the shift lever position (See page DI-338).
- Fill ATF and check fluid level (See page DI-338).
- Do the road test (See page DI-338).
- Fill with engine coolant (See page CO-2).



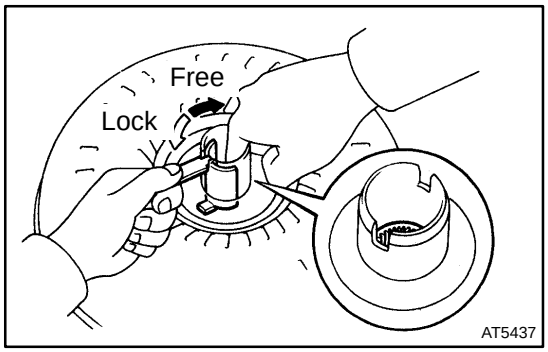
TORQUE CONVERTER CLUTCH AND DRIVE PLATE

AT06D-03

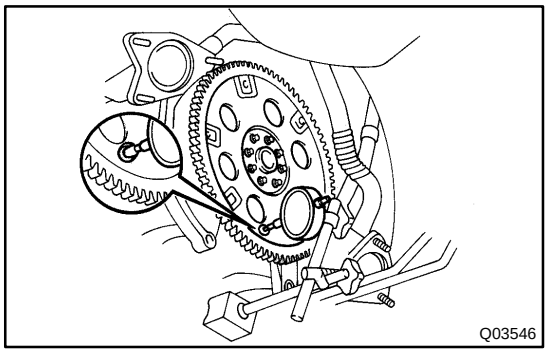
INSPECTION

1. INSPECT ONE-WAY CLUTCH

(a) Install SST so that it fits in the notch of the converter hub and outer race of the one-way clutch.
SST 09350-30020 (09351-32020)



(b) Press on the serrations of starter with a finger and rotate it.
Check if it rotates smoothly when turned clockwise and locks up when turned counterclockwise.



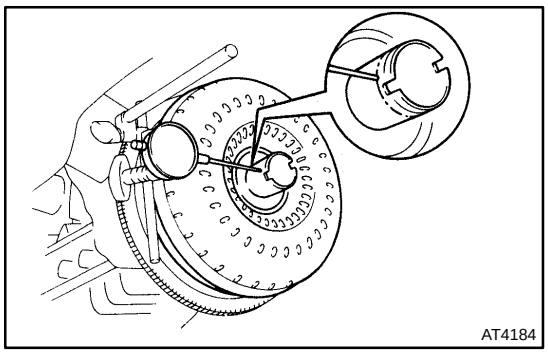
2. MEASURE DRIVE PLATE RUNOUT AND INSPECT RING GEAR

Set up a dial indicator and measure the drive plate runout.

Maximum runout: 0.20 mm (0.0079 in.)

If runout exceeds 0.20 mm (0.0079 in.) or if the ring gear is damaged, replace the drive plate. If installing a new drive plate, note the orientation of spacers and tighten the bolts.

Torque: 83 N·m (850 kgf·cm, 61 ft·lbf)



3. MEASURE TORQUE CONVERTER CLUTCH SLEEVE RUNOUT

(a) Temporarily mount the torque converter clutch to the drive plate. Set up a dial indictor.

Maximum runout: 0.30 mm (0.0118 in.)

If runout exceeds 0.30 mm (0.0118 in.), try to correct by reorienting the installation of the torque converter clutch.

If excessive runout cannot be corrected, replace the torque converter clutch.

HINT:

Mark the position of the torque converter clutch to ensure correct installation.

(b) Remove the torque converter clutch.

TROUBLESHOOTING

PR05A-02

PROBLEM SYMPTOMS TABLE

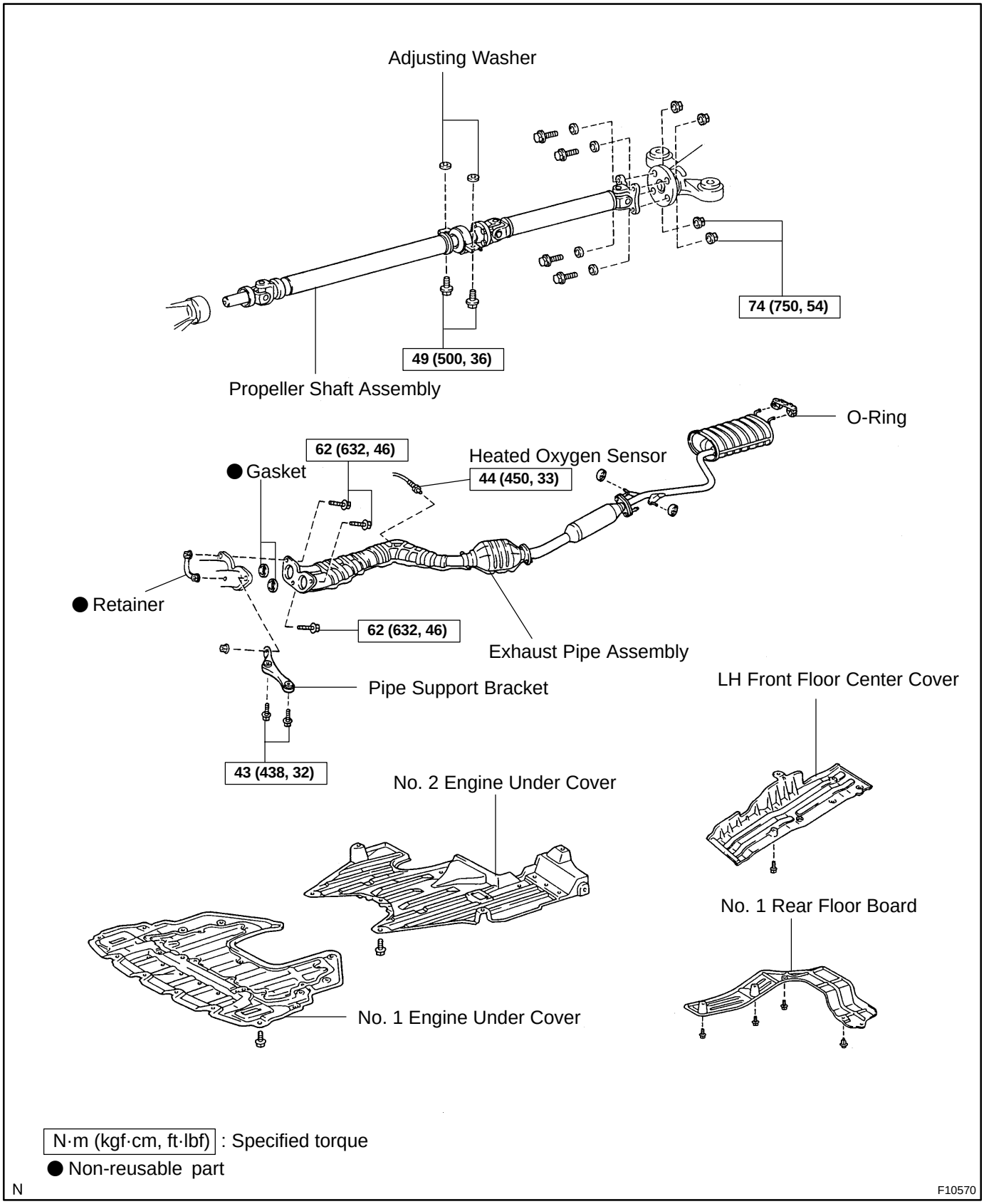
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

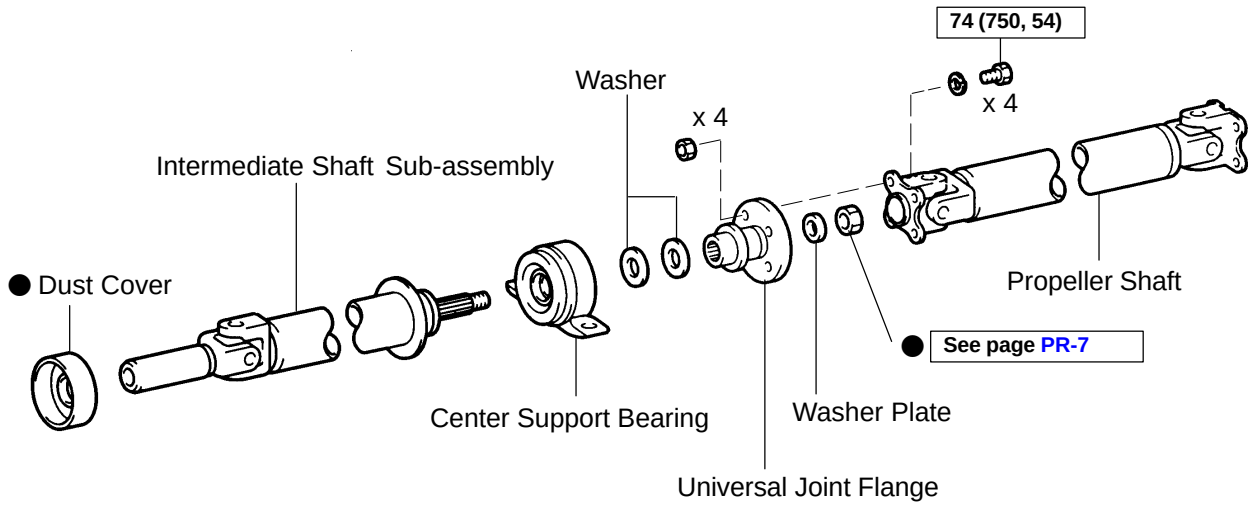
Symptom	Suspect Area	See page
Noise	1. Sleeve yoke spline (Worn) 2. Spider bearing (Worn or stuck)	- PR-6
Vibration	1. Sleeve yoke spline (Stuck) 2. Propeller shaft (Runout) 3. Propeller shaft (Imbalance)	- PR-6 -

PROPELLER SHAFT ASSEMBLY

COMPONENTS

PR05B-04





N·m (kgf·cm, ft·lbf) : Specified torque
● Non-reusable part

F08147

PR05C-02

REMOVAL

1. REMOVE NO. 1 AND NO. 2 ENGINE UNDER COVERS

2. REMOVE LH FRONT FLOOR CENTER COVER

3. REMOVE NO. 1 REAR FLOOR BOARD

4. REMOVE EXHAUST PIPE ASSEMBLY

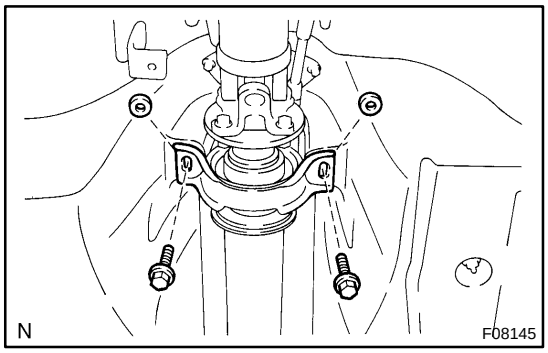
(a) Disconnect the heated oxygen sensor.

(b) Remove the 5 bolts, pipe support bracket, retainer and nut from the exhaust manifold.

(c) Disconnect the exhaust pipe assembly from the 4 O-rings.

(d) Remove the exhaust pipe assembly.

(e) Remove the 2 gaskets from exhaust pipe assembly.



5. REMOVE PROPELLER SHAFT

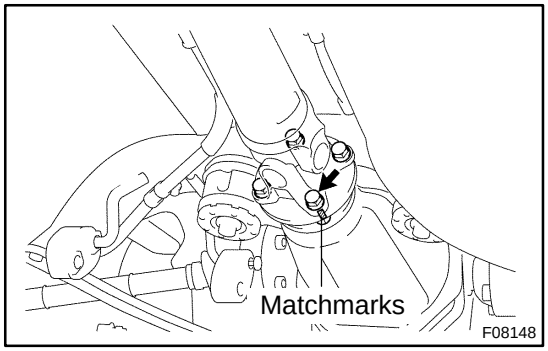
(a) Remove the 2 center support bearing set bolts and adjusting washers.

HINT:

Production vehicles are not equipped with adjusting washers.

NOTICE:

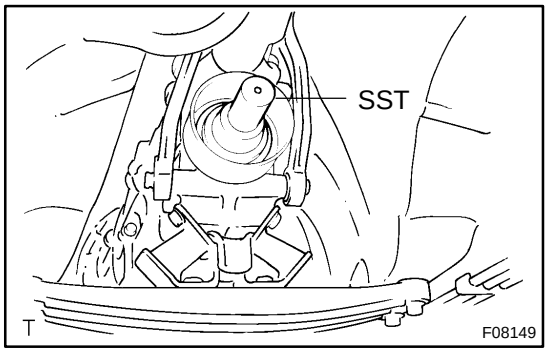
When removing the set bolts, support the center support bearing by hand so that the transmission and intermediate shaft, and propeller shaft and differential, remain in a straight line.



(b) Place matchmarks on the differential companion flange and propeller shaft.

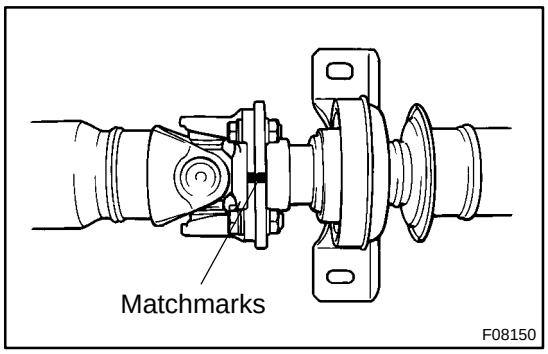
(c) Remove the 4 bolts, washers and nuts.

(d) Pull the yoke from the transmission.



(e) Install SST in the transmission to prevent oil leakage.
SST 09325-20010

PR05D-01



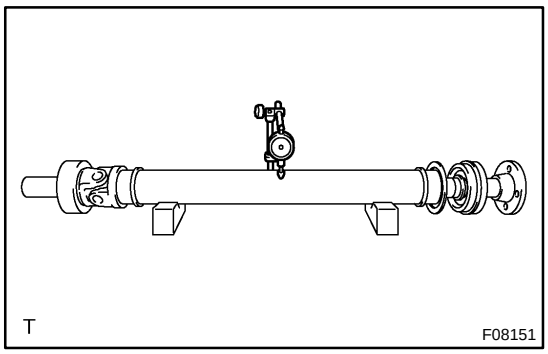
DISASSEMBLY

DISASSEMBLE PROPELLER SHAFT

(a) Place matchmarks on the universal joint flange and propeller shaft flange.
(b) Remove the 4 bolts, washers and nuts.
(c) Separate the intermediate shaft and propeller shaft.

PR05E-01

INSPECTION

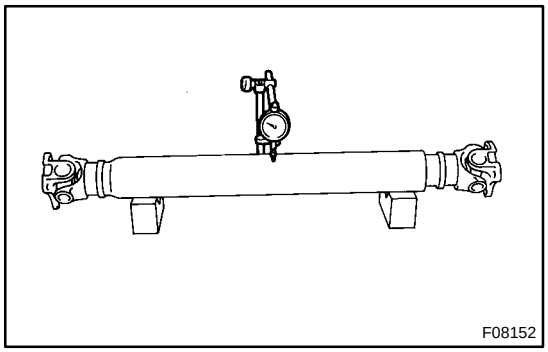


1. INSPECT RUNOUT OF INTERMEDIATE SHAFT

Using a dial indicator, inspect the intermediate shaft runout.

Maximum runout: 0.8 mm (0.031 in.)

If the runout is greater than the maximum, replace the intermediate shaft sub-assembly.

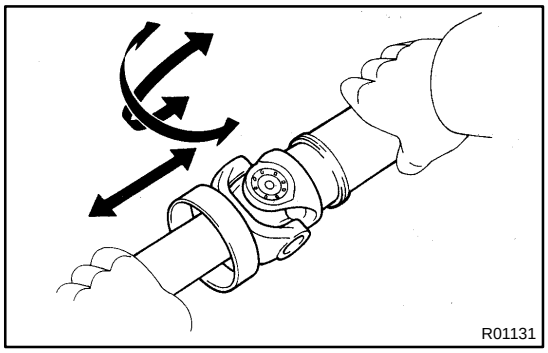


2. INSPECT RUNOUT OF PROPELLER SHAFT

Using a dial indicator, inspect the propeller shaft runout.

Maximum runout: 0.8 mm (0.031 in.)

If the runout is greater than the maximum, replace the propeller shaft assembly.

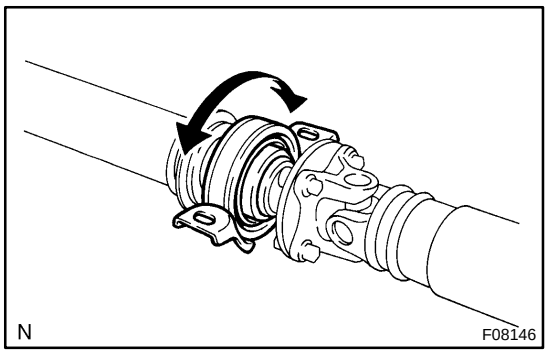


3. INSPECT SPIDER BEARING

(a) Check if the spider bearing rotates smoothly.

(b) Check if there any play in the spider bearing.

If necessary, replace the propeller shaft assembly or intermediate shaft sub-assembly.



4. INSPECT CENTER SUPPORT BEARING

(a) Check if the bearing turns smoothly.

(b) Check for crack in or damage to the cushion.

If the center support bearing is damaged, worn or does not turn smoothly, replace it.

PR05F-02

REPLACEMENT

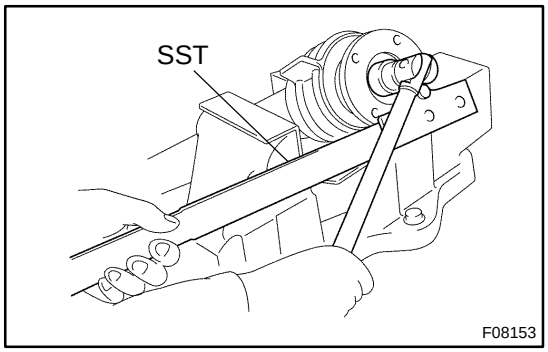
NOTICE:

Be careful not to grip the propeller shaft tube too tightly in the vise as will cause deformation.

1. REPLACE CENTER SUPPORT BEARING

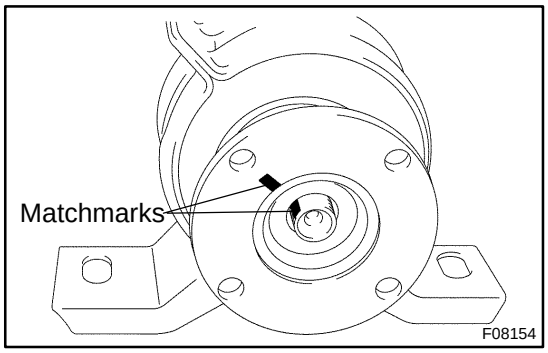
(a) Using a chisel and hammer, unstake the staked part of the nut.

(b) Mount the intermediate shaft sub-assembly in a vise.

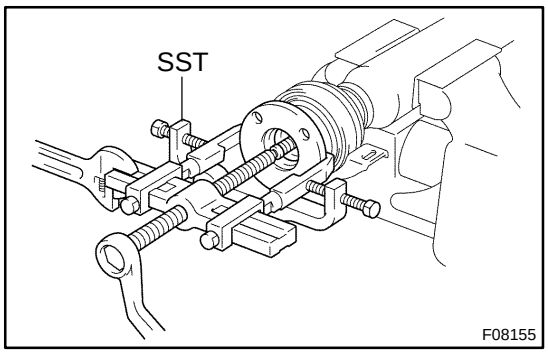


(c) Using SST to hold the universal joint flange, remove the nut.
SST 09930-00021

(d) Remove the washer plate.



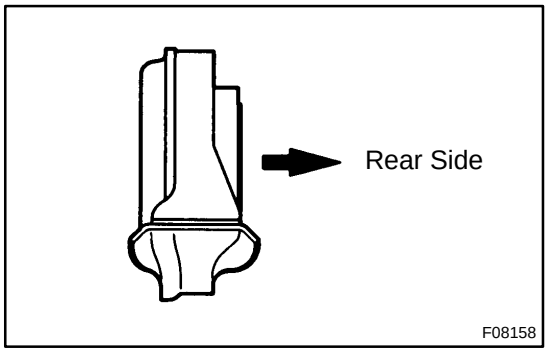
(e) Place matchmarks on the universal joint flange and intermediate shaft.



(f) Using SST, remove the universal joint flange.
SST 09950-4001 1 (09951-04020, 09952-04010, 09953-04030, 09954-04010, 09955-04061, 09957-04010, 09958-04011)

(g) Remove the 2 washers.

(h) Remove the center support bearing.

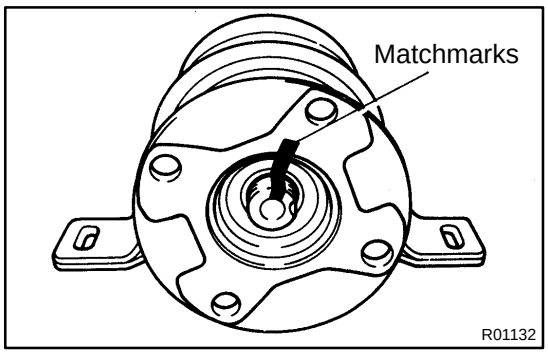


(i) Install a new center support bearing to intermediate shaft.

HINT:

Install the center support bearing in the direction, as shown.

(j) Install the 2 washers.

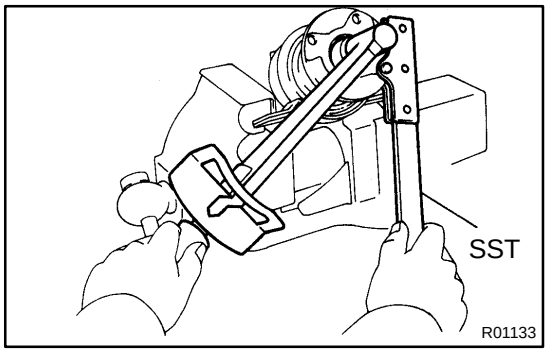


(k) Align the matchmarks on the universal joint flange and intermediate shaft, and install the universal joint flange.

HINT:

If replacing either the center flange or intermediate shaft, reassemble them so that the front yoke of the intermediate shaft and the rear yoke of the propeller shaft are facing in the same direction.

(l) Install the washer plate.

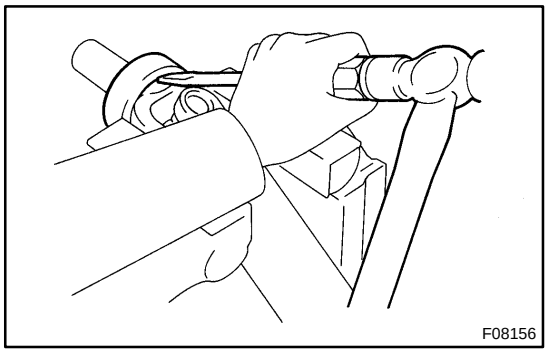


(m) Using SST to hold the flange, install a new nut.
SST 09330-00021
Torque: 181 N·m (1,850 kgf·cm, 134 ft·lbf)

(n) Loosen the nut.

(o) Torque the nut again.
Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)

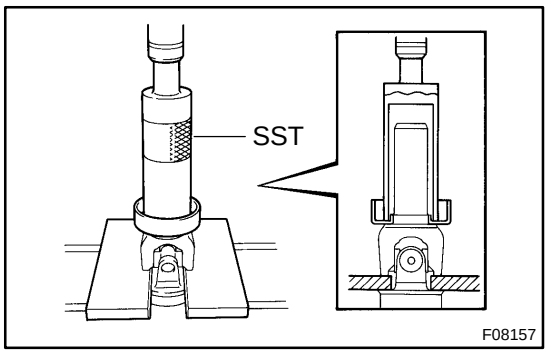
(p) Using a chisel and hammer, stake the nut.



2. REPLACE DUST COVER

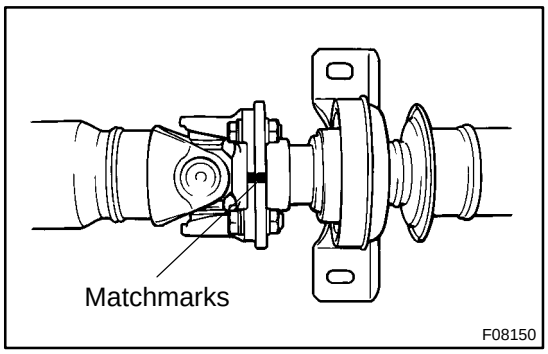
(a) Mount the intermediate shaft sub-assembly in a vise.

(b) Using a screwdriver and hammer, remove the dust cover.



(c) Using SST and press, install a new dust cover.
SST 09316-6001 1 (09316-00011)

PR05G-03



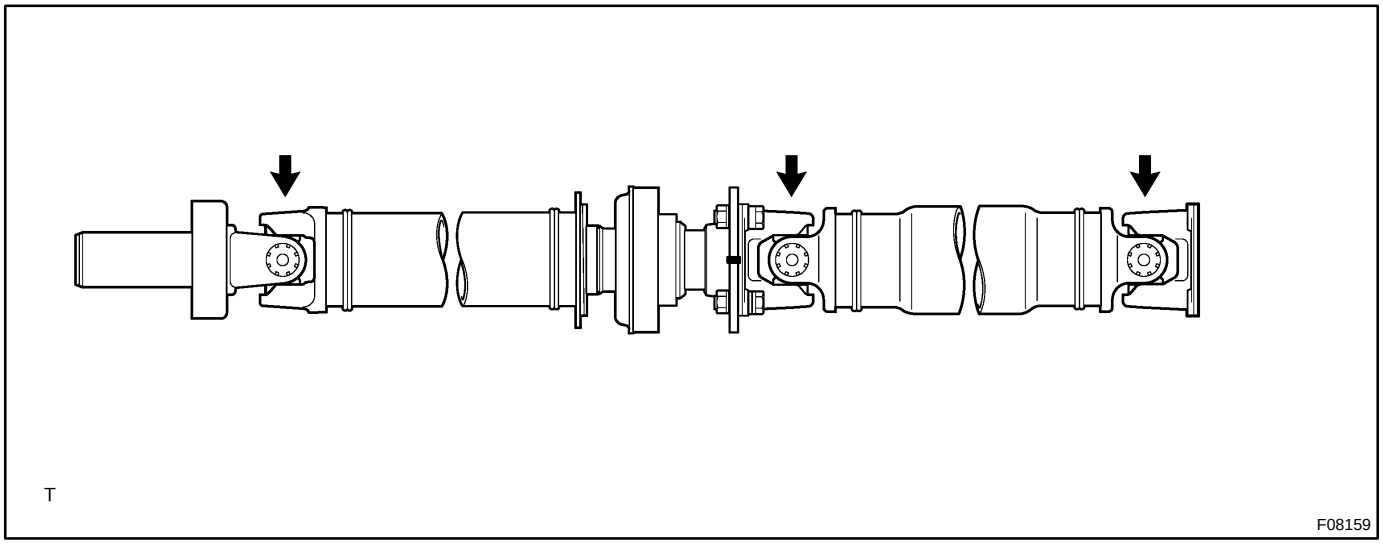
REASSEMBLY

REASSEMBLE PROPELLER SHAFT

(a) Assemble the propeller shaft, align the matchmarks on the universal joint flange and propeller shaft flange, and connect the flanges with the 4 bolts, washers and nuts.

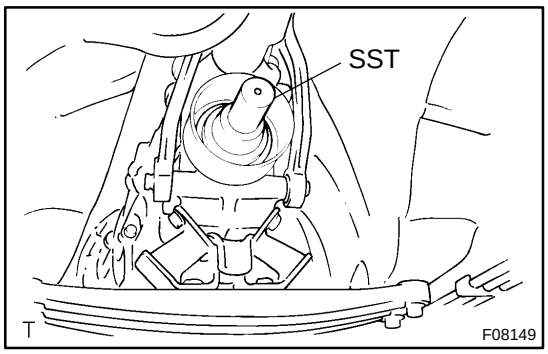
(b) Torque the 4 nuts.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)

HINT:
Assemble the propeller shaft so that each joint faces in the direction as shown in the illustration.



PR05H-04

INSTALLATION



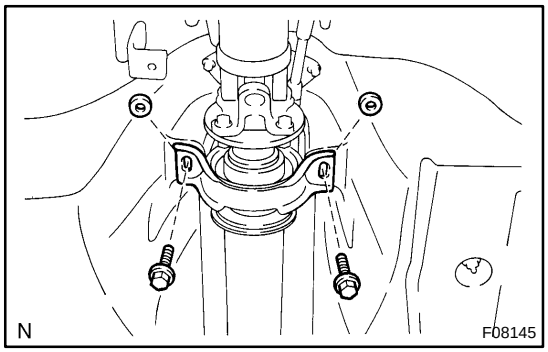
1. INSTALL PROPELLER SHAFT

(a) Remove the SST.
SST 09325-20010

(b) Insert the propeller shaft assembly to the transmission.

NOTICE:

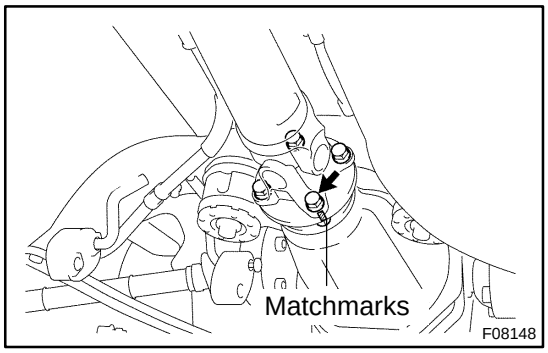
Support the center support bearing by hand so that the transmission and intermediate shaft, and propeller shaft and differential, remain in a straight line.



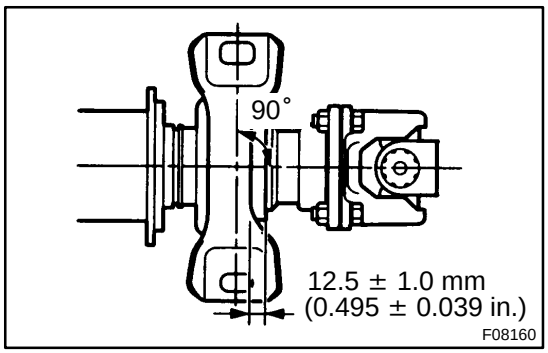
(c) Temporarily install the 2 center support bearing set bolts with the adjusting washers.

HINT:

Use the adjusting washers which were removed.



(d) Align the matchmarks on the differential companion flange and propeller shaft, and install the propeller shaft on the differential with the 4 bolts, washers and nuts.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)



(e) Torque the 2 center support bearing set bolts.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

HINT:

Adjust the center support bearing to keep the dimension, as shown with the vehicle in the unladen condition.

Under the same condition, check if the center line of the center support bearing is at right angles to the shaft axial direction.

2. INSTALL EXHAUST PIPE ASSEMBLY

(a) Connect the exhaust pipe assembly to the 4 O-rings.

(b) Install the exhaust pipe assembly with 2 new gaskets, 5 bolts, pipe support bracket, retainer and nut.
Torque: 62 N·m (632 kgf·cm, 46 ft·lbf)

(c) Connect the heated oxygen sensor.
Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

3. INSTALL NO. 1 REAR FLOOR BOARD

4. INSTALL LH FRONT FLOOR CENTER COVER

5. INSTALL NO. 1 AND NO. 2 ENGINE UNDER COVERS

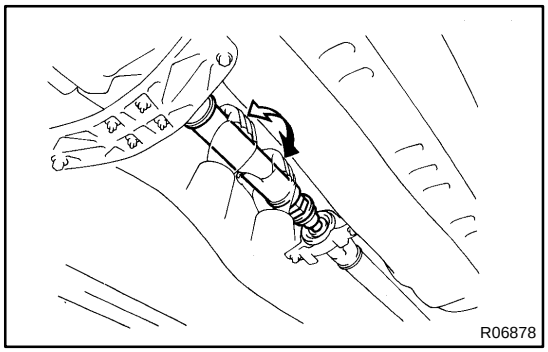
JOINT ANGLE

PR05I-01

ADJUSTMENT

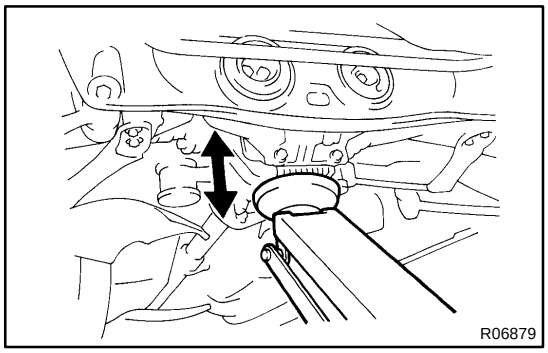
NOTICE:

When doing operations which involve the removal and installation of the propeller shaft, always check the joint. Make adjustments if necessary.

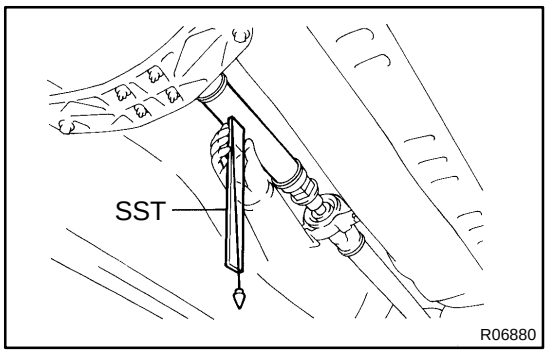


1. STABILIZE PROPELLER SHAFT AND DIFFERENTIAL

(a) Turn the propeller shaft several times by hand to stabilize the center support bearing.

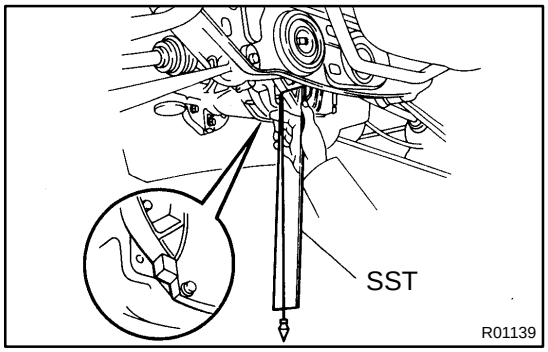


(b) Using a jack, raise and lower the differential to stabilize the differential mounting cushion.



2. CHECK JOINT ANGLE OF NO. 2 JOINT AND NO. 3 JOINT

(a) Using SST, measure the installation angle of the intermediate shaft and propeller shaft.
SST 09370-50010



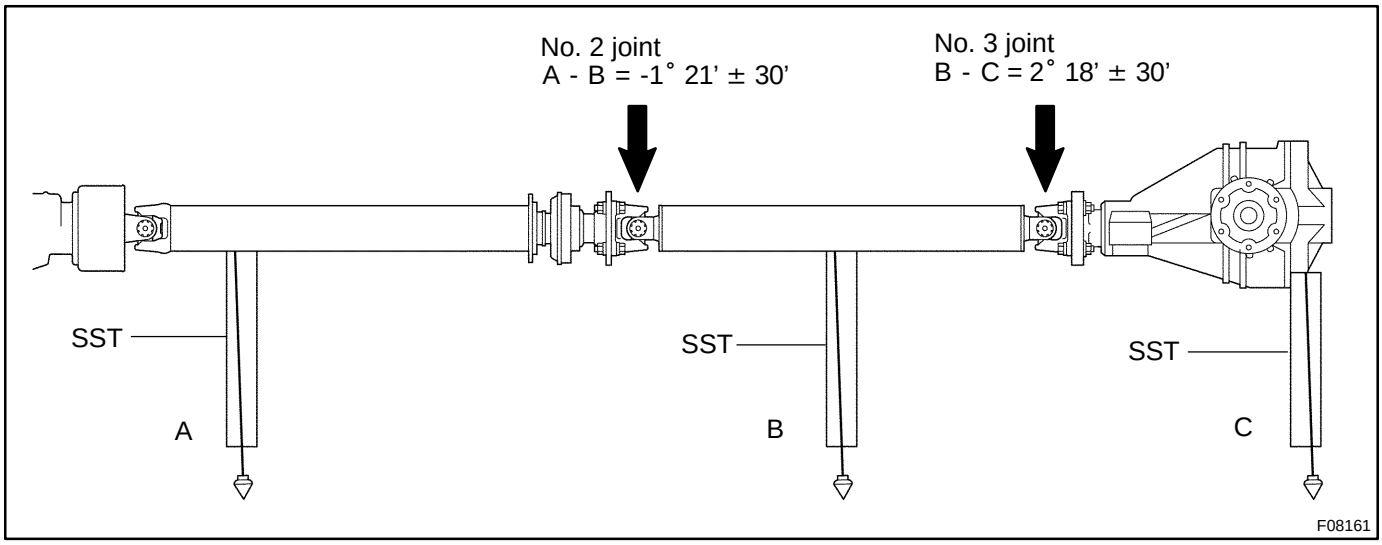
(b) Using SST, measure the installation angle of the differential.
SST 09370-50010

HINT:

Measure the installation angle by placing the SST in the position, as shown in the illustration.

(c) Calculate the No. 2 joint angle.
No. 2 joint angle:
A - B = -1° 21' ± 30'
A: Intermediate shaft installation angle
B: Propeller shaft installation angle

(d) Calculate the No. 3 joint angle.
No. 3 joint angle:
B - C = 2° 18' ± 30'
B: Propeller shaft installation angle
C: Differential installation angle



If the measured angle is not within the specification, adjust it with the center support bearing adjusting washer and differential adjusting shim.

Center support bearing adjusting washer thickness:

Thickness mm (in.)	Thickness mm (in.)
2.0 (0.079)	9.0 (0.354)
4.5 (0.177)	11.0 (0.433)
6.5 (0.256)	13.5 (0.531)

NOTICE:

- **Left and right washers should be the same thickness.**
- **2 washers should not be assembled together.**
- **Some vehicles are not assembled with washers.**

TROUBLESHOOTING

SA0R1-07

PROBLEM SYMPTOMS TABLE

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

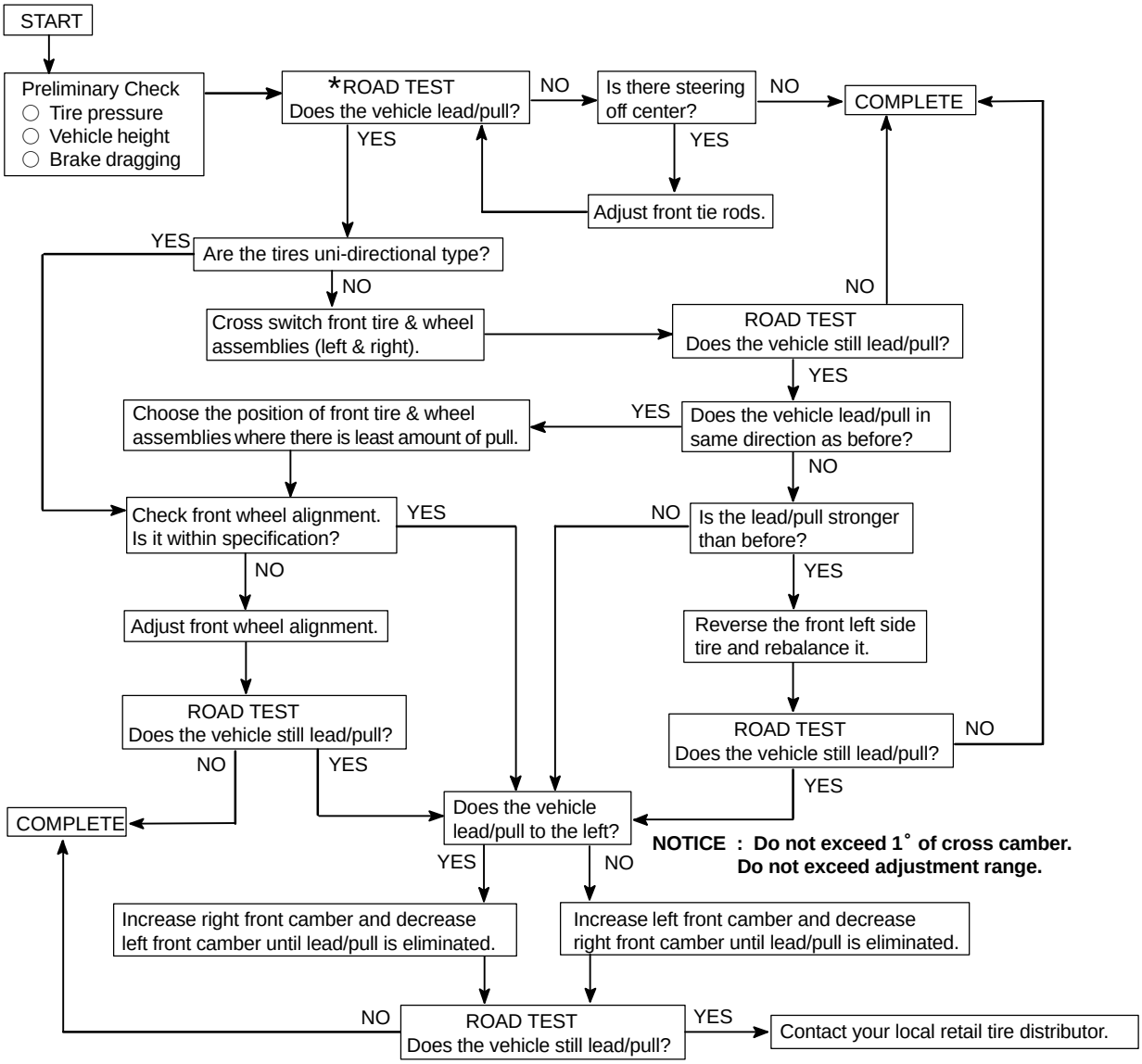
Symptom	Suspect Area	See page
Bottoming	1. Vehicle (Overloaded)	-
	2. Spring (Weak)	SA-19
		SA-109
	3. Shock absorber (Worn)	SA-23
		SA-114
Sways/pitches	1. Tire (Worn or improperly inflated)	SA-3
	2. Stabilizer bar (Bent or broken)	SA-44
		SA-130
	3. Shock absorber (Worn)	SA-23
		SA-114
Front wheel shimmy	1. Tire (Worn or improperly inflated)	SA-3
	2. Wheel (Out of balance)	SA-3
	3. Shock absorber (Worn)	SA-23
	4. Wheel alignment (Incorrect)	SA-5
	5. Ball joint (Worn)	SA-31
		SA-39
		SA-42
	6. Hub bearing (Loose or worn)	SA-12
	7. Steering linkage (Loose or worn)	-
	8. Steering gear (Out of adjustment or broken)	SR-46
Abnormal tire wear	1. Tire (Improperly inflated)	SA-3
	2. Wheel alignment (Incorrect)	SA-5
		SA-9
	3. Shock absorber (Worn)	SA-23
		SA-114
	4. Suspension parts (Worn)	-
Noise in rear differential	1. Oil level (Low or wrong grade)	SA-69
	2. Excessive backlash between pinion and ring gear	SA-76
	3. Ring, pinion or side gears (Worn or chipped)	SA-76
	4. Side bearing (Worn)	SA-76
Oil leak from rear differential	1. Oil level (Too high or wrong grade)	SA-69
	2. Drive pinion oil seal (Worn or damaged)	SA-67
	3. Side gear oil seal (Worn or damaged)	SA-72
	4. Companion flange (Loose or damaged)	SA-81
	5. Side gear shaft (Damaged)	SA-76

SA28F-01

REPAIR PROCEDURES

HINT:

This is a flow chart for vehicle pull.



* Select a flat road where the vehicle can be driven in a straight line for 100 meters at a constant speed of 35mph. Please confirm safety and set the steering wheel to its straight position. Drive the vehicle in a straight line for 100 meters at a constant speed of 35mph without holding the steering wheel.

(1) The vehicle can keep straight but the steering wheel has some angle.
→ STEERING OFF CENTER (See page SR-9)

(2) The vehicle cannot keep straight.
→ STEERING PULL

TIRE AND WHEEL

SA28G-01

INSPECTION

1. INSPECT TIRE

(a) Check the tires for wear and proper inflation pressure.

Cold tire inflation pressure:

(SEDAN):

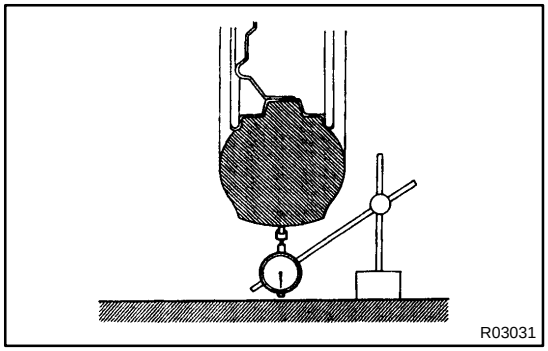
Tire size	Front kpa (kgf/cm^2,psi)	Rear kpa (kgf/cm^2,psi)
215/45ZR17	230 (2.3, 33) *1 300 (3.0, 44) *2	230 (2.3, 33) *1 300 (3.0, 44) *2
P205/55R16 89V	230 (2.3, 33) *1 300 (3.0, 44) *2	230 (2.3, 33) *1 300 (3.0, 44) *2

(WAGON):

Tire size	Front kpa (kgf/cm^2,psi)	Rear kpa (kgf/cm^2,psi)
215/45ZR17	230 (2.3, 33) *1 300 (3.0, 44) *2	-
225/45ZR17	-	240 (2.4, 35) *1 310 (3.1, 45) *2
P205/55R16 89V	230 (2.3, 33) *1 300 (3.0, 44) *2	230 (2.3, 33) *1 320 (3.2, 46) *2

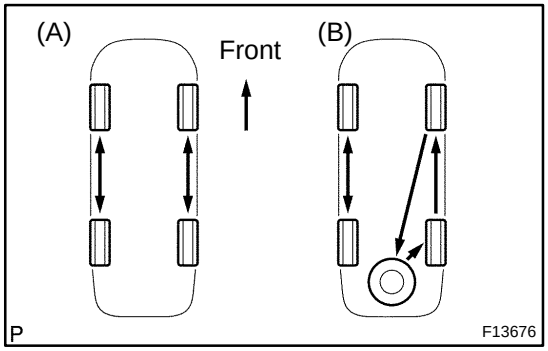
*1: For driving under 160 km/h (100 mph)

*2: For driving at 160 km/h (100 mph) or over



(b) Check the tire runout.

Tire runout: 1.4 mm (0.055 in.) or less



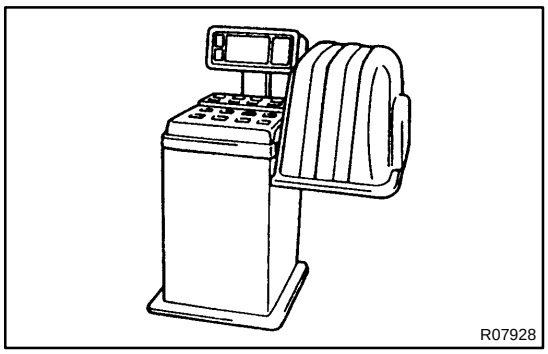
2. ROTATING TIRES

NOTICE:

Tires must not be rotated for wagon due to the difference in size between the front and rear tires.

HINT:

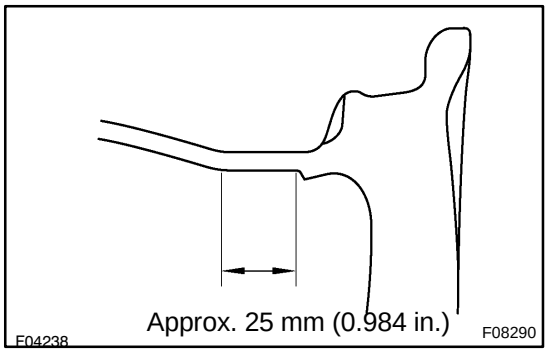
- Rotate tires as shown in the illustration as rotation.
- Rotate as shown in (B) if the spare tire is included in the rotation.



3. INSPECT WHEEL BALANCE

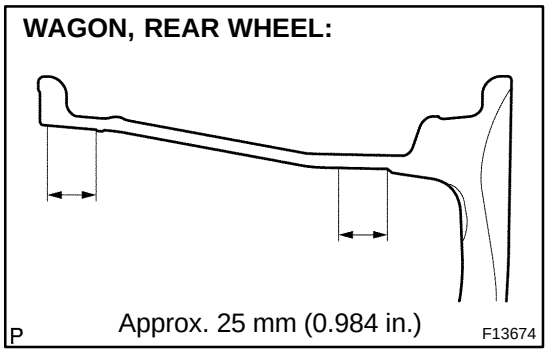
(a) Check and adjust the off-the-car balance.

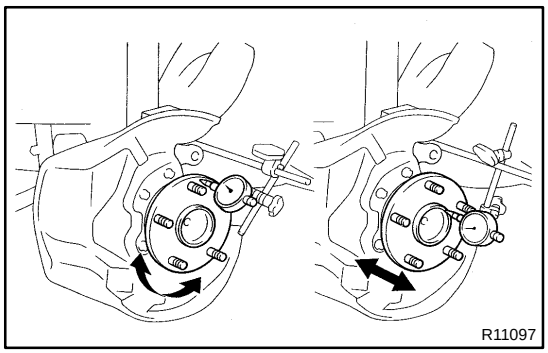
(b) If necessary, check and adjust the on-the-car balance.
Imbalance after adjustment: 8.0 g (0.018 lb) or less



NOTICE:

- **Adhere the sticking type balance weight to the flat position as shown in the illustration.**
- **Push the balance weight securely with a finger to adhere it to the position.**
  (Pushing force: 10 kgf/more than 2 secs.)
- **After cleaning the surface which the balance weight will be adhered to of dirt, oil and water with a cleaning detergent, adhere the balance weight to the surface.**
- **Do not touch the sticking surface of the tape.**
- **Do not use the once used balance weight.**
- **Please use the TOYOTA genuine sticking type balance weight.**





4. CHECK WHEEL BEARING LOOSENESS

(a) Check the backlash in the bearing shaft direction.
Maximum: 0.05 mm (0.0020 in.)

(b) Check the axle hub deviation.
Maximum: 0.05 mm (0.0020 in.)

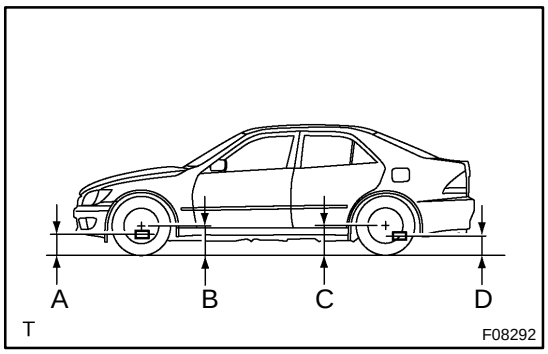
5. CHECK FRONT SUSPENSION FOR LOOSENESS

6. CHECK STEERING LINKAGE FOR LOOSENESS

7. CHECK BALL JOINT FOR LOOSENESS AND EXCESSIVE PLAY (See page SA-39)

8. CHECK SHOCK ABSORBER WORKS PROPERLY

- Check if oil leaks
- Check mounting bushings for wear
- Bounce front and rear of the vehicle



FRONT WHEEL ALIGNMENT

SA1IU-07

INSPECTION

1. MEASURE VEHICLE HEIGHT

Vehicle height (SEDAN):

(Canada):

Front vehicle height	Rear vehicle height
66 mm (2.60 in.)	66 mm (2.60 in.)

(Except Canada):

Front vehicle height	Rear vehicle height
72 mm (2.83 in.)	85 mm (3.35 in.)

Vehicle height (WAGON):

(Canada):

Front vehicle height	Rear vehicle height
56 mm (2.20 in.)	58 mm (2.28 in.)

(Except Canada):

Front vehicle height	Rear vehicle height
66 mm (2.60 in.)	66 mm (2.60 in.)

Measuring points:

A: Ground clearance of the front No .1 lower suspension arm mounting bolt center.

B: Ground clearance of the front wheel center.

C: Ground clearance of the rear wheel center.

D: Ground clearance of the No. 2 lower suspension arm mounting bolt (Suspension member side) tail center.

Vehicle height:

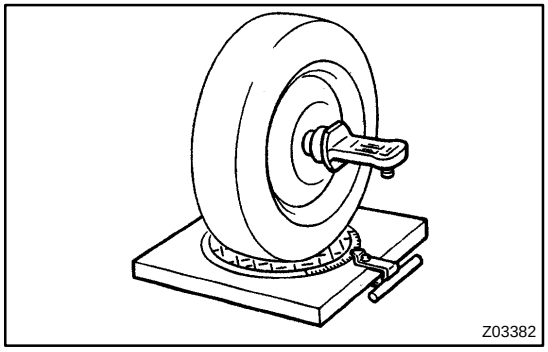
Front: B - A

Rear: C - D

NOTICE:

Before inspecting the wheel alignment, adjust the vehicle height to the specified value.

If the vehicle height is not the specified value, try to adjust it by pushing down on or lifting the body.



2. INSTALL CAMBER-CASTER-KINGPIN GAUGE OR POSITION VEHICLE ON WHEEL ALIGNMENT TESTER

Follow the specific instructions of the equipment manufacturer.

3. INSPECT CAMBER, CASTER AND STEERING AXIS INCLINATION

Camber, caster and steering axis inclination (SEDAN): (Canada):

Camber Right-left error	-0 °21' ± 30' (-0.35° ± 0.5°) 30' (0.5°) or less
Caster Right-left error	5°46' ± 30' (5.77° ± 0.5°) 30' (0.5°) or less
Steering axis inclination Right-left error	9°16' ± 30' (9.27°± 0.5°) 30' (0.5°) or less

(Except Canada):

Camber Right-left error	-0 °30' ± 30' (-0.5° ± 0.5°) 30' (0.5°) or less
Caster Right-left error	6°07' ± 30' (6.12° ± 0.5°) 30' (0.5°) or less
Steering axis inclination Right-left error	9°25' ± 30' (9.42°± 0.5°) 30' (0.5°) or less

Camber, caster and steering axis inclination (WAGON): (Canada):

Camber Right-left error	-0 °05' ± 30' (-0.08° ± 0.5°) 30' (0.5°) or less
Caster Right-left error	5°31' ± 30' (5.52° ± 0.5°) 30' (0.5°) or less
Steering axis inclination Right-left error	8°59' ± 30' (8.98°± 0.5°) 30' (0.5°) or less

(Except Canada):

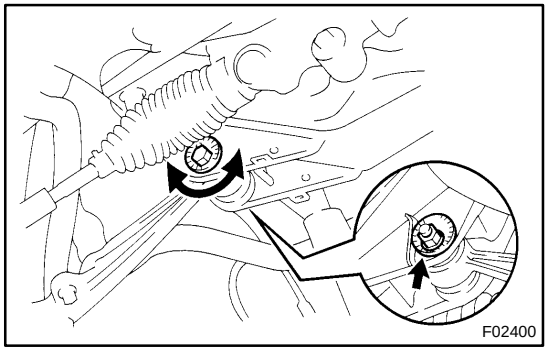
Camber Right-left error	-0 °21' ± 30' (-0.35° ± 0.5°) 30' (0.5°) or less
Caster Right-left error	5°46' ± 30' (5.77° ± 0.5°) 30' (0.5°) or less
Steering axis inclination Right-left error	9°16' ± 30' (9.27°± 0.5°) 30' (0.5°) or less

If the caster and steering axis inclination are not within the specified values, after the camber has been correctly adjusted, recheck the suspension parts for damaged and/or worn out parts.

4. ADJUST CAMBER

HINT:

After adjusting the camber, inspect the caster and toe-in.



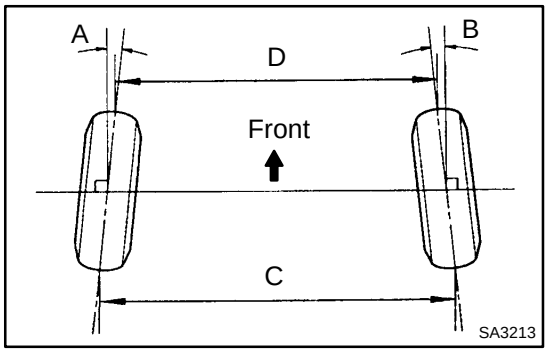
(a) Loosen the camber adjusting cam nut of the No. 1 lower suspension arm.

(b) Turn the camber adjusting cam of the No. 1 lower suspension arm and adjust the camber.

HINT:

- Try to adjust the camber to the center of the specified value.
- Camber will change about 7.5' (0.13°) with each graduation of the adjusting cam.

(c) Torque the camber adjusting cam nut of the No. 1 lower suspension arm.
Torque: 184 N·m (1,880 kgf·cm, 136 ft·lbf)



5. INSPECT TOE-IN

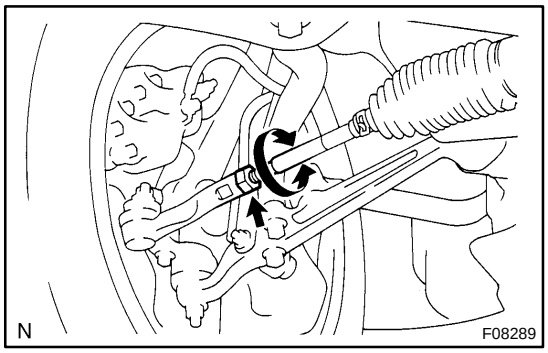
Toe-in:

Toe-in (total)	A + B: 0°06' ± 12' (0.1° ± 0.2°) C - D: 1 ± 2 mm (0.04 ± 0.08 in.)

If the toe-in is not within the specified value, adjust it at the rack ends.

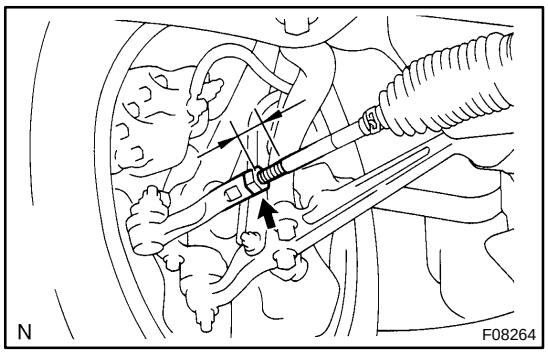
6. ADJUST TOE-IN

(a) Using pliers, remove the boot clips.



(b) Loosen the tie rod end lock nuts.
(c) Turn the right and left rack ends by an equal amount to adjust the toe-in.

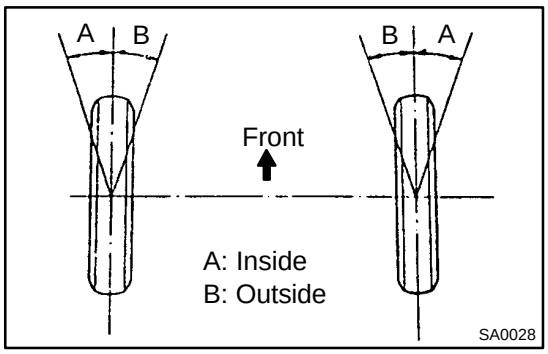
HINT:
Try to adjust the toe-in to the center of the specified value.



(d) Make sure that the lengths of the right and left rack ends are same.
Rack end length difference: 1.5 mm (0.059 in.) or less
(e) Torque the tie rod end lock nuts.
Torque: 56 N·m (570 kgf·cm, 41 ft·lbf)
(f) Place the boots on the seats and using pliers, install the clips.

HINT:
Make sure that the boots are not twisted.

(g) Perform the zero point calibration of yaw rate and deceleration sensor (See page DI-507).



7. INSPECT WHEEL ANGLE

Turn the steering wheel fully, and measure the turning angle.

Wheel turning angle (SEDAN):

(Canada):

Inside wheel	41˚02' (39˚02' - 42˚02') 41.03˚ (39.03˚ - 42.03˚)
Outside wheel (Reference)	33˚30' 33.5˚

(Except Canada):

Inside wheel	41˚01' (39˚01' - 42˚01') 41.02˚ (39.02˚ - 42.02˚)
Outside wheel (Reference)	33˚23' 33.38˚

Wheel turning angle (WAGON):

(Canada):

Inside wheel	41˚03' (39˚03' - 42˚03') 41.05˚ (39.05˚ - 42.05˚)
Outside wheel (Reference)	33˚40' 33.6˚

(Except Canada):

Inside wheel	41˚02' (39˚02' - 42˚02') 41.03˚ (39.03˚ - 42.03˚)
Outside wheel (Reference)	33˚30' 33.5˚

If the right and left inside wheel angles differ from the specified value, inspect the toe-in.

REAR WHEEL ALIGNMENT

SA0R4-08

INSPECTION

1. MEASURE VEHICLE HEIGHT (See page SA-5)

2. INSTALL CAMBER-CASTER-KINGPIN GAUGE OR POSITION VEHICLE ON WHEEL ALIGNMENT TESTER

Follow the specific instructions of the equipment manufacturer.

3. INSPECT CAMBER

Camber (SEDAN):

(Canada):

Camber	-0 °23' ± 30' (-0.38° ± 0.5°)
Right-left error	30' (0.5°) or less

(Except Canada):

Camber	-0 °55' ± 30' (-0.92° ± 0.5°)
Right-left error	30' (0.5°) or less

Camber (WAGON):

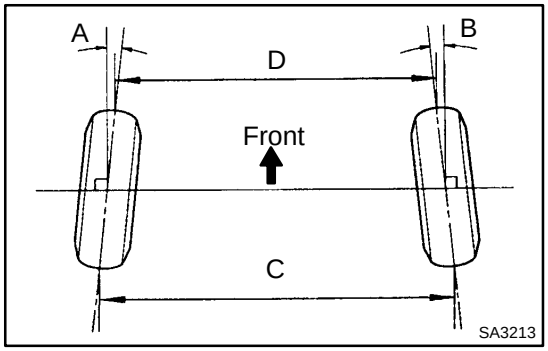
(Canada):

Camber	-0 °04' ± 30' (-0.07° ± 0.5°)
Right-left error	30' (0.5°) or less

(Except Canada):

Camber	-0 °23' ± 30' (-0.38° ± 0.5°)
Right-left error	30' (0.5°) or less

If the camber is not within the specified valve, after the toe-in is inspected, see step 5. to adjust.

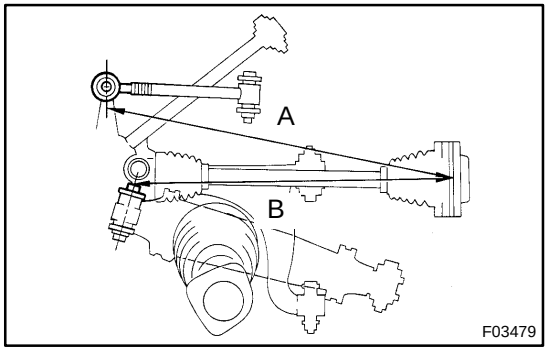


4. INSPECT TOE-IN

Toe-in:

Toe-in (total)	A + B: 0°12' ± 12' (0.2° ± 0.2°) C - D: 2 ± 2 mm (0.08 ± 0.08 in.)

If the toe-in is not within the specified valve, after the camber is inspected, see step 5. to adjust.



5. ADJUST CAMBER AND TOE-IN

(a) Measure the lengths of the toe control link "A" and No. 2 lower suspension arm "B", as shown in the illustration.

(b) Obtain the difference between "A" and "B".

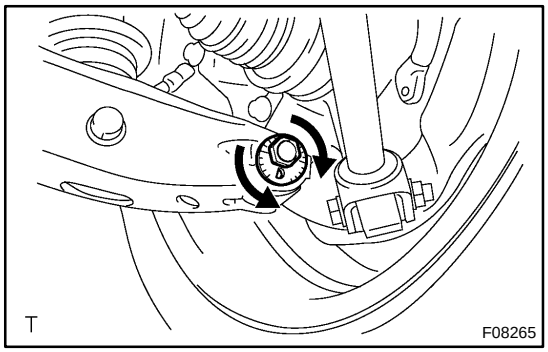
(c) Employ the same manner described above to the other side.

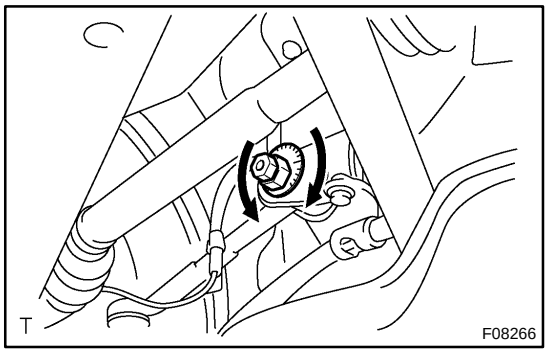
(d) Obtain the difference between right and left from the values obtained above.

Right and left difference: 4.0 mm (0.157 in.) or less

If they are not within the specified value, adjust the lengths of them by turning the adjusting cam.

(e) Inspect the camber and toe-in.





(f) Adjust the camber.

(1) Loosen the camber adjusting cam nut of the No. 2 lower suspension arm.

(2) Turn the camber adjusting cam of the No. 2 lower suspension arm and adjust the camber.

HINT:

Camber will change about 5.0' (0.08°) with each graduation of the adjusting cam.

(3) Torque the camber adjusting cam nut.

Torque: 110 N·m (1,120 kgf·cm, 81 ft·lbf)

(g) Adjust the toe-in.

(1) Loosen the camber adjusting cam nut of the toe control link.

(2) Turn the camber adjusting cam of the toe control link and adjust the toe-in.

HINT:

Toe-in will change about 4.0 mm (0.157 in.) with each graduation of the adjusting cam.

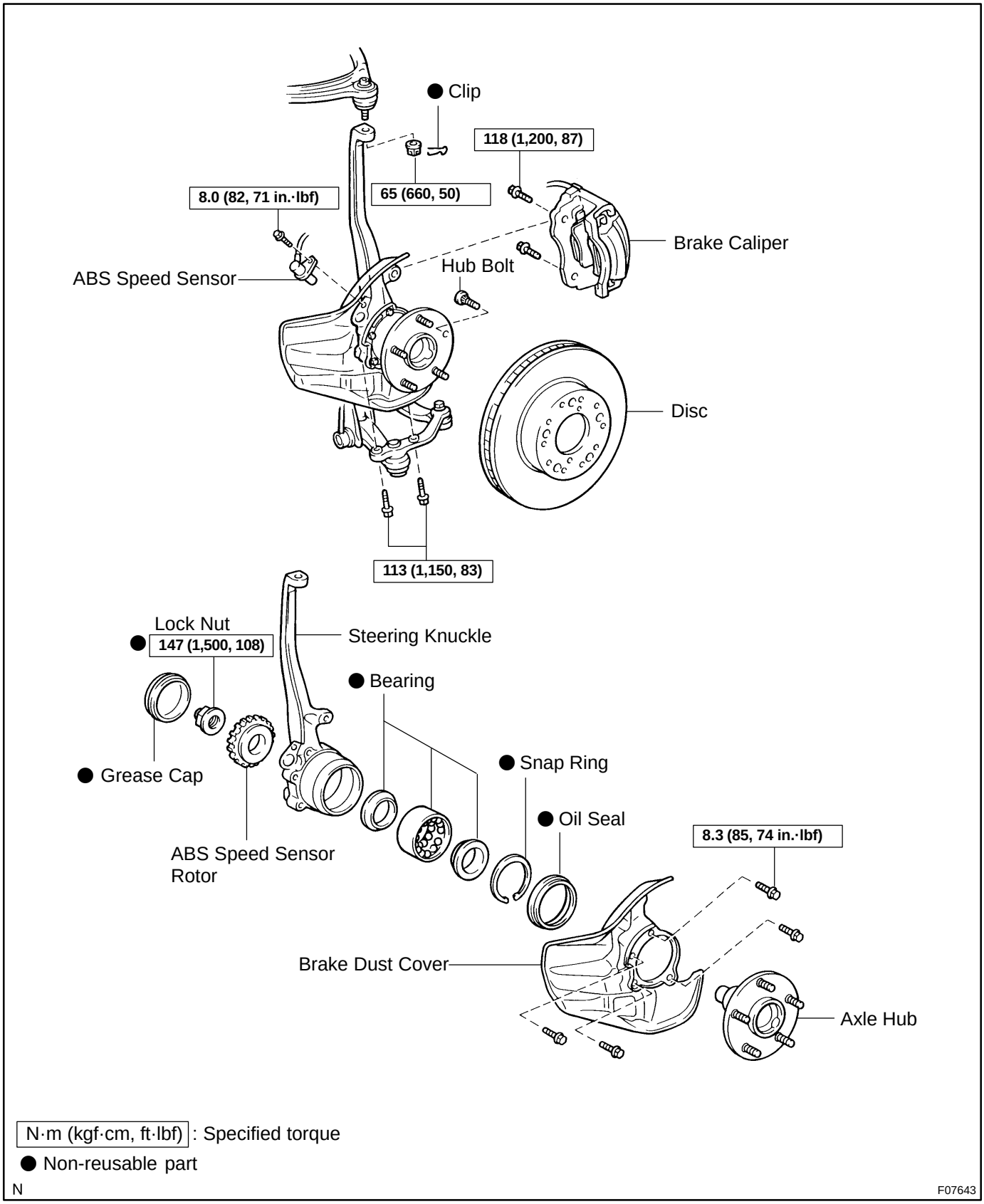
(3) Torque the camber adjusting cam nut.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

FRONT AXLE HUB

COMPONENTS

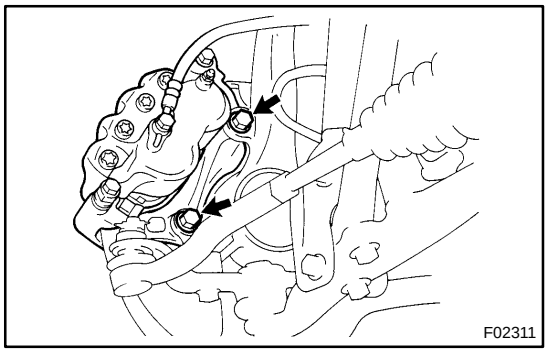
SA0R5-08



SA0R6-06

REMOVAL

1. REMOVE FRONT WHEEL

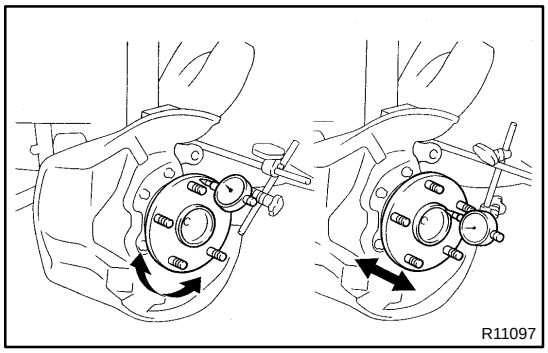


2. REMOVE FRONT BRAKE CALIPER AND DISC

(a) Remove the 2 bolts and brake caliper from the steering knuckle.

(b) Support the brake caliper securely.

(c) Remove the disc.



3. CHECK BEARING BACKLASH AND AXLE HUB DEVIATION

(a) Using a dial indicator near the center of the axle hub and check the backlash in the bearing shaft direction.

Maximum: 0.05 mm (0.0020 in.)

If the backlash exceeds the maximum, replace the bearing.

(b) Using a dial indicator, check the deviation at the surface of the axle hub outside the hub bolt.

Maximum: 0.05 mm (0.0020 in.)

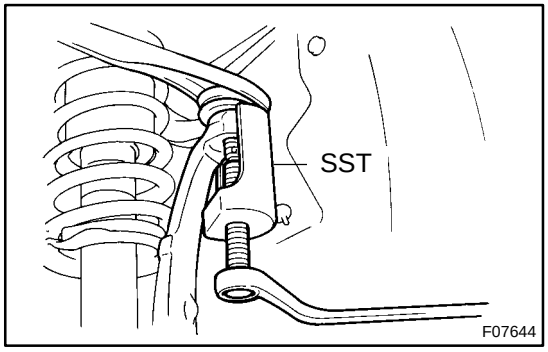
If the deviation exceeds the maximum, replace the axle hub.

4. REMOVE ABS SPEED SENSOR

Remove the bolt and disconnect the ABS speed sensor from the steering knuckle.

5. REMOVE STEERING KNUCKLE WITH AXLE HUB

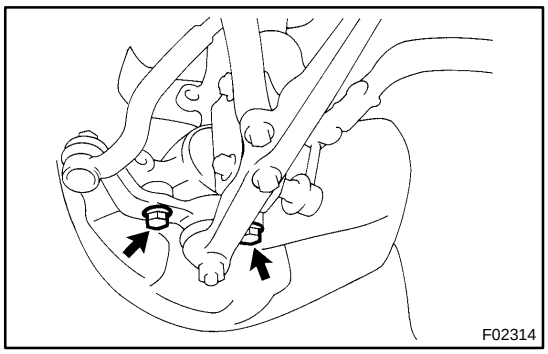
(a) Remove the clip and nut.



(b) Using SST, remove the steering knuckle from the upper suspension arm.

SST 09610-20012

(c) Temporarily install the steering knuckle to the upper suspension arm with the nut.



(d) Remove the 2 bolts and disconnect the lower ball joint from the steering knuckle.

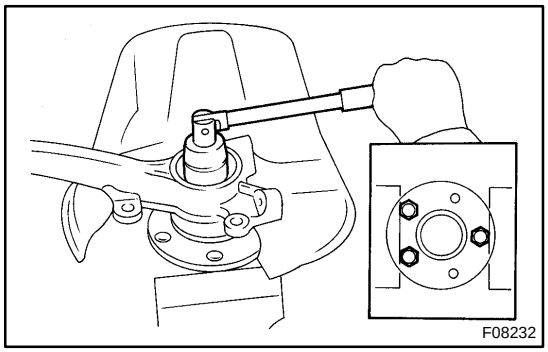
(e) Remove the nut and steering knuckle with the axle hub from the upper suspension arm.

SA0R7-09

DISASSEMBLY

1. REMOVE GREASE CAP

Using a screwdriver and hammer, remove the grease cap from the steering knuckle.



2. REMOVE LOCK NUT

(a) Mount the axle hub in a soft jaw vise.

HINT:

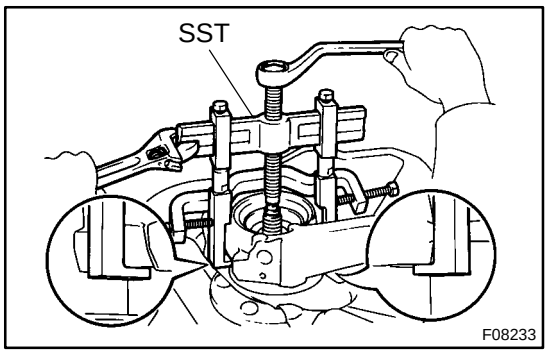
Close the vise until it holds hub bolts. Do not tighten further.

(b) Using a chisel and hammer, loosen the staked part of the lock nut.

(c) Using a socket wrench (32 mm), remove the lock nut.

3. REMOVE ABS SPEED SENSOR ROTOR AND AXLE HUB

(a) Remove the 4 bolts and shift the brake dust cover toward the outside.



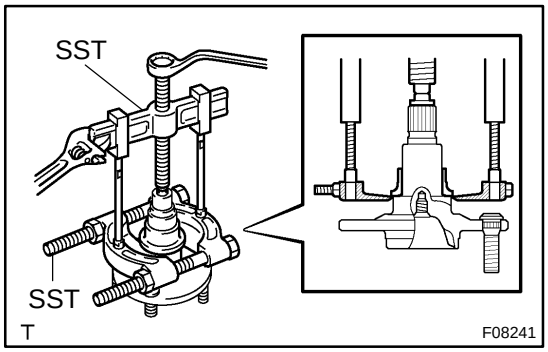
(b) Using SST, remove the ABS speed sensor rotor and axle hub from the steering knuckle.

SST 09950- 40011 (09951- 04020, 09952- 04010, 09953-04020, 09954-04010, 09955-04051, 09957-04010, 09958-04011)

NOTICE:

Take care not to scratch the serrations of the sensor rotor.

(c) Remove the brake dust cover.



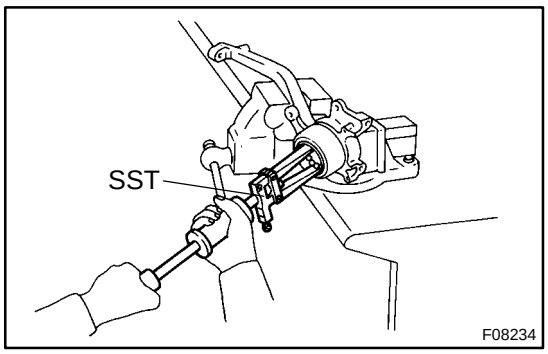
4. REMOVE INNER RACE (OUTSIDE)

Using SST, remove the inner race from the axle hub.

SST 09950- 00020, 09950- 40011 (09951- 04020, 09953- 04030, 09957- 04010), 09950- 50013 (09952-05010, 09954-05031, 09955-05040)

NOTICE:

Be careful not to damage the axle hub.



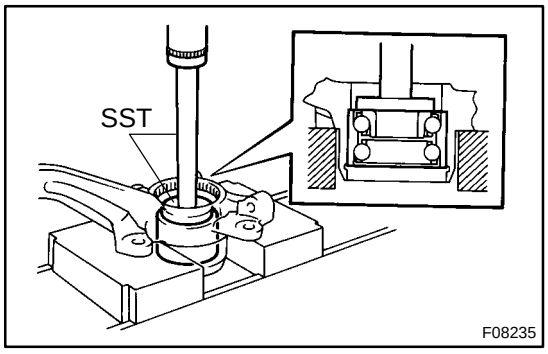
5. REMOVE OIL SEAL

Using SST, remove the oil seal from the steering knuckle.

SST 09308-00010

6. REMOVE BEARING

(a) Using snap ring pliers, remove the snap ring from the steering knuckle.

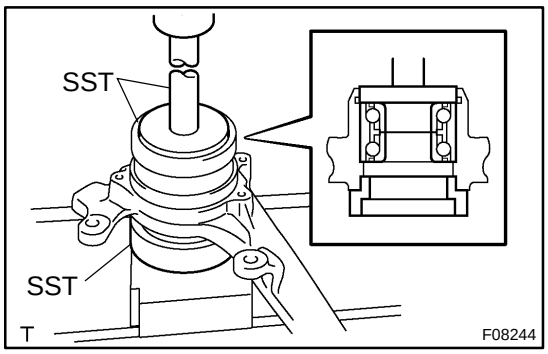


(b) Using SST and a press, remove the bearing from the steering knuckle.

SST 09950- 60010 (09951- 00560), 09950- 70010 (09951-07150)

SA0R8-07

REASSEMBLY



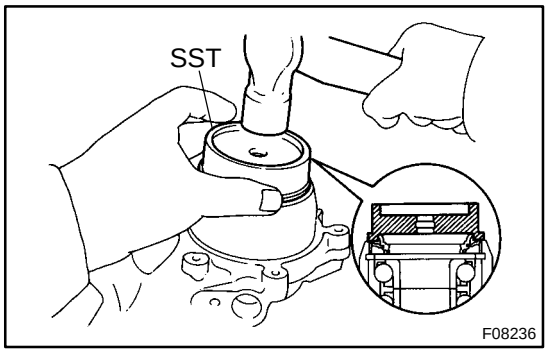
1. INSTALL BEARING

(a) Using SST and a press, install a new bearing to the steering knuckle.
SST 09502- 24010, 09950- 60020 (09951- 00710), 09950-70010 (09951-07150)

NOTICE:

If the inner race and balls come loose from the bearing outer race, make sure that they are installed on the same side as before.

(b) Using snap ring pliers, install a new snap ring to the steering knuckle.



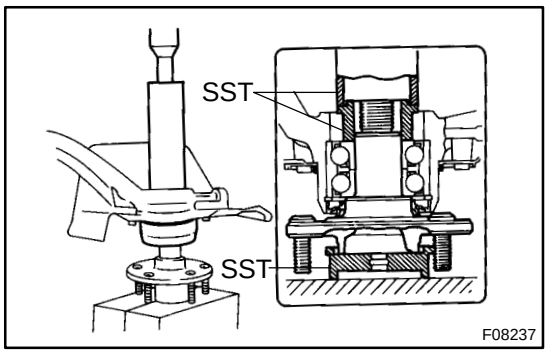
2. INSTALL OIL SEAL

(a) Using SST and a hammer, install a new oil seal until it is flush with the end surface of the steering knuckle.
SST 09608-32010

(b) Coat MP grease to the oil seal lip.

3. INSTALL AXLE HUB

(a) Install the brake dust cover to the steering knuckle with the 4 bolts.
Torque: 8.3 N·m (85 kgf·cm, 74 in.·lbf)



(b) Using SST and a press, install the axle hub to the steering knuckle.
SST 09316- 60011 (09316- 00011, 09316- 00071), 09608-32010

4. INSTALL ABS SPEED SENSOR ROTOR

Install the speed sensor rotor to the steering knuckle with its concave surface facing to the inner side.

NOTICE:

Do not scratch the serrations of the sensor rotor.

5. INSTALL LOCK NUT

(a) Using a socket wrench (32 mm), install a new lock nut.
Torque: 147 N·m (1,500 kgf·cm, 108 ft·lbf)

(b) Using a chisel and hammer, stake the lock nut.

6. INSTALL GREASE CAP

Using a screwdriver and hammer, install the grease cap to the steering knuckle.

SA0R9-06

INSTALLATION

1. INSTALL STEERING KNUCKLE WITH AXLE HUB

(a) Temporarily install the steering knuckle to the upper suspension arm with the nut.

(b) Connect the steering knuckle to the lower ball joint with the 2 bolts.

Torque: 113 N·m (1,150 kgf·cm, 83 ft·lbf)

(c) Torque the nut on the upper side of the steering knuckle.

Torque: 65 N·m (660 kgf·cm, 50 ft·lbf)

(d) Install a new clip.

If the holes for the clip are not aligned, tighten the nut further up to 60°.

2. CONNECT ABS SPEED SENSOR TO STEERING KNUCKLE

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

3. CHECK BEARING BACKLASH AND AXLE HUB DEVIATION (See page SA-12)

4. INSTALL DISC AND BRAKE CALIPER

Install the disc, brake caliper and 2 bolts.

Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

5. INSTALL FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

6. DEPRESS BRAKE PEDAL SEVERAL TIMES

7. CHECK FRONT WHEEL ALIGNMENT (See page SA-5)

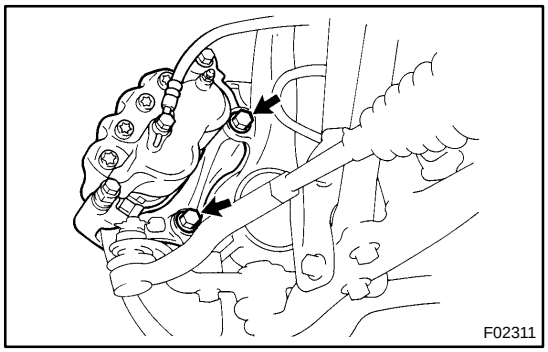
8. CHECK ABS SPEED SENSOR SIGNAL (See page DI-437 or DI-507)

FRONT WHEEL HUB BOLT

SA0RA-05

REPLACEMENT

1. REMOVE FRONT WHEEL

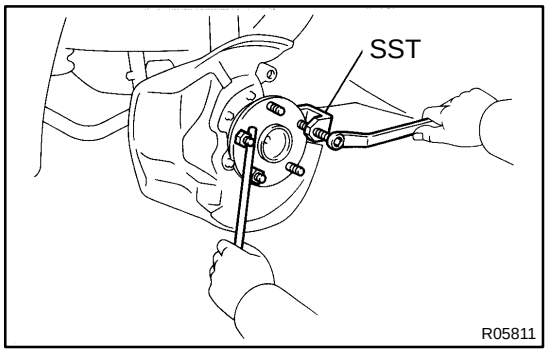


2. REMOVE BRAKE CALIPER AND DISC

(a) Remove the 2 bolts and brake caliper from the steering knuckle.

(b) Support the brake caliper securely.

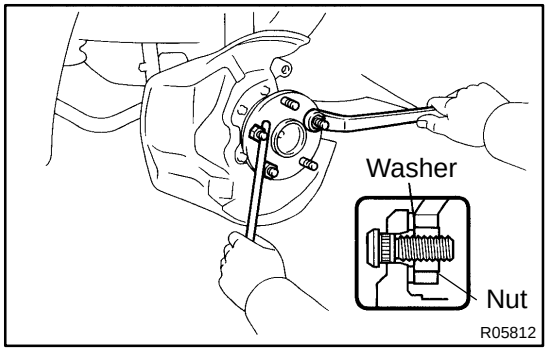
(c) Remove the disc.



3. REMOVE HUB BOLT

Using SST and a brass bar or an equivalent to hold, remove the hub bolt.

SST 09628-1001 1



4. INSTALL HUB BOLT

(a) Install a washer and nut to a new hub bolt, as shown in the illustration.

(b) Using a brass bar or an equivalent to hold, install the hub bolt by torquing the nut.

5. INSTALL DISC AND BRAKE CALIPER

(a) Install the disc.

(b) Install the brake caliper and 2 bolts to the steering knuckle.

Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

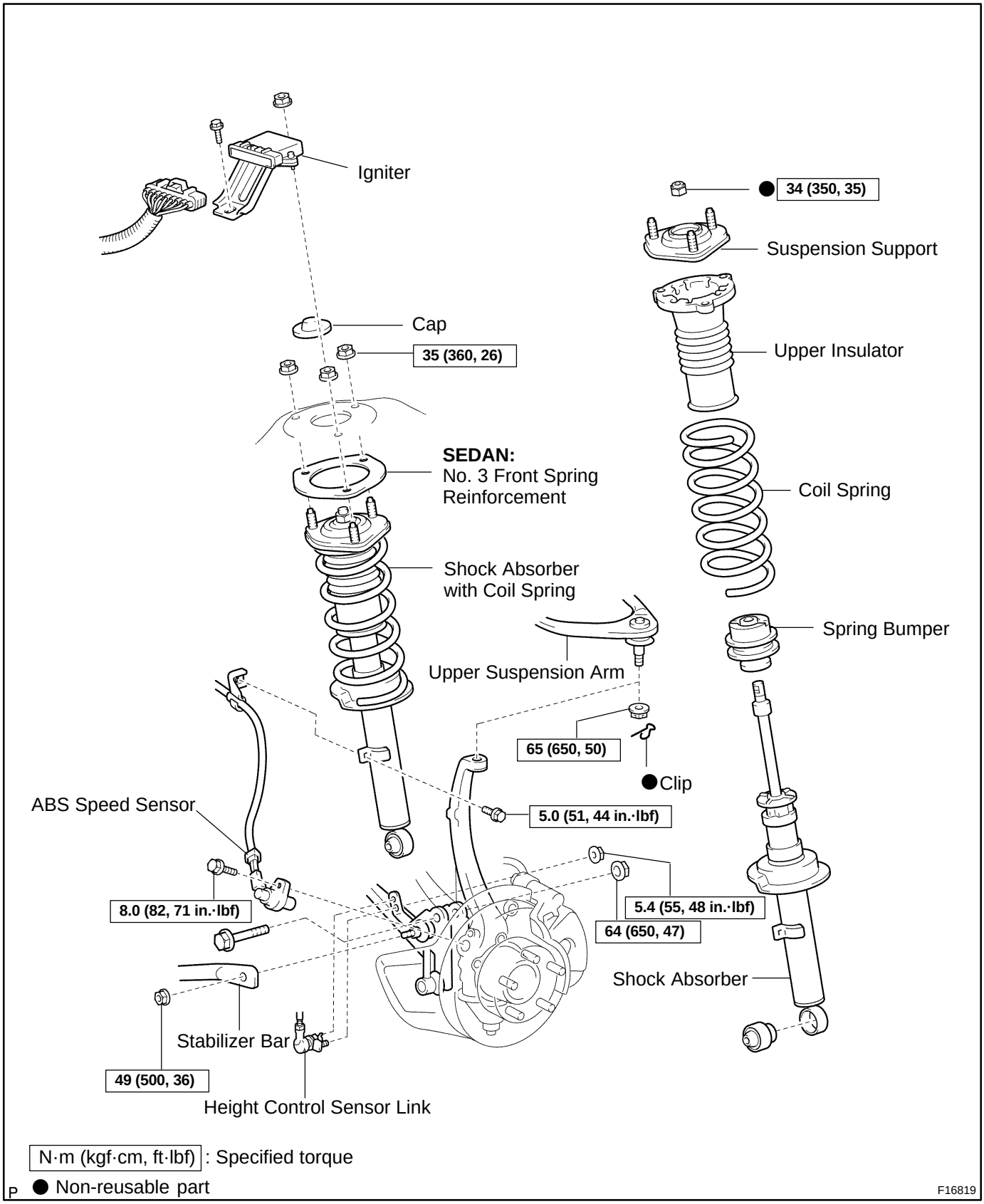
6. INSTALL FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

FRONT SHOCK ABSORBER

SA0RB-11

COMPONENTS



SA20I-02

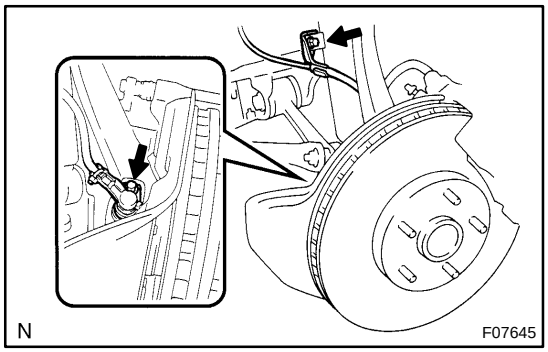
REMOVAL

1. REMOVE FRONT WHEEL

2. REMOVE IGNITER

(a) Disconnect the connector.

(b) Remove the bolt, nut and igniter.



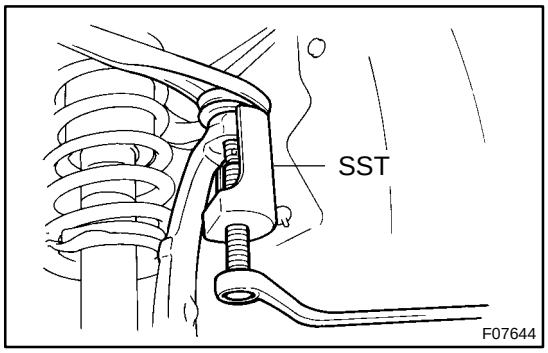
3. DISCONNECT ABS SPEED SENSOR AND WIRE HARNESS CLAMP

(a) Remove the bolt and disconnect the ABS speed sensor from the steering knuckle.

(b) Remove the bolt and disconnect the ABS speed sensor wire harness clamp from the shock absorber.

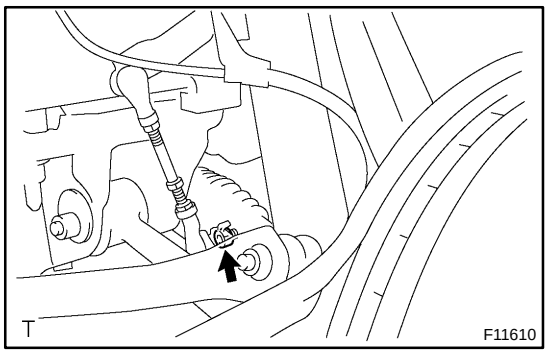
4. DISCONNECT UPPER SUSPENSION ARM FROM STEERING KNUCKLE

(a) Remove the clip and nut.



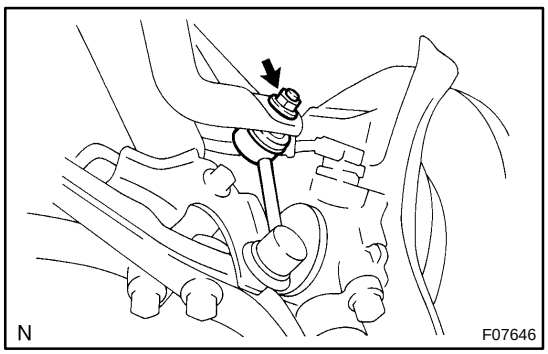
(b) Using SST, disconnect the upper suspension arm.
SST 09610-20012

(c) Support the steering knuckle securely.



5. DISCONNECT HEIGHT CONTROL SENSOR LINK

Remove the nut and disconnect the height control sensor link from lower arm.

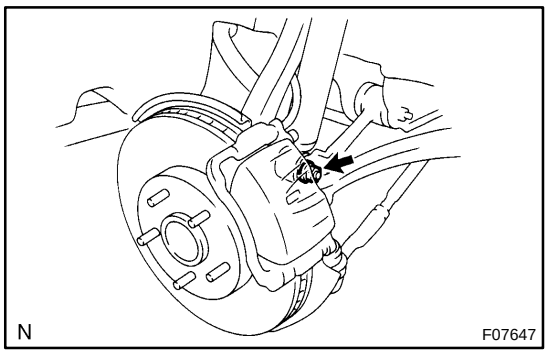


6. DISCONNECT STABILIZER BAR LINK FROM STABILIZER BAR

Remove the nut and disconnect the stabilizer bar link.

HINT:

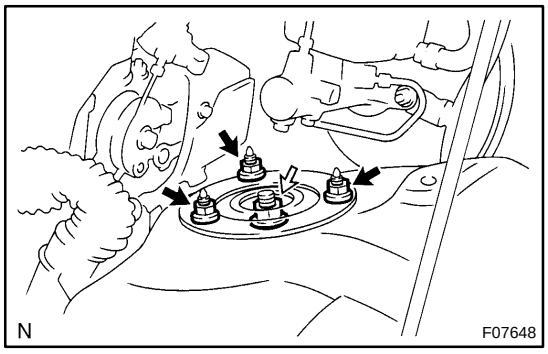
If the ball joint turns together with the nut, use a 5 mm hexagon wrench to hold the stud.



7. REMOVE FRONT SHOCK ABSORBER WITH COIL SPRING

(a) Remove the nut and bolt, and disconnect the shock absorber from the shock absorber bracket.

(b) Remove the cap from the suspension support.



(c) Loosen the nut in the center of the suspension support.

NOTICE:

Do not remove it.

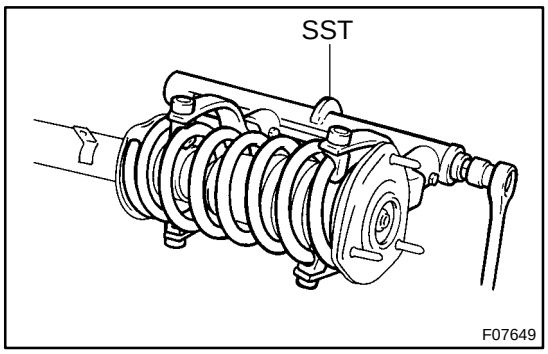
HINT:

If not disassembling the shock absorber, it is not necessary to loosen the nut.

(d) Remove the 3 nuts and shock absorber with coil spring from the body.

(e) SEDAN:
Remove the No. 3 front spring reinforcement from the shock absorber.

SA0RD-08



DISASSEMBLY

REMOVE SUSPENSION SUPPORT AND COIL SPRING

(a) Using SST, compress the coil spring.
SST 09727- 30021 (09727- 00010, 09727- 00021, 09727-00031)

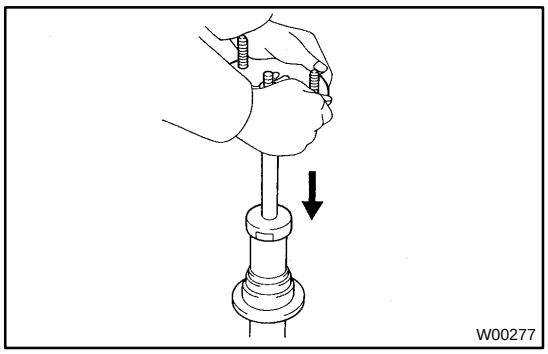
NOTICE:

Do not use an impact wrench. It will damage the SST.

(b) Remove the suspension support nut.

(c) Remove the suspension support, upper insulator, coil spring and spring bumper from the shock absorber.

SA0RE-07



INSPECTION

INSPECT SHOCK ABSORBER

Compress and extend the shock absorber rod and check that there is no abnormal resistance or unusual operation sounds. If there is any abnormality, replace the shock absorber with a new one.

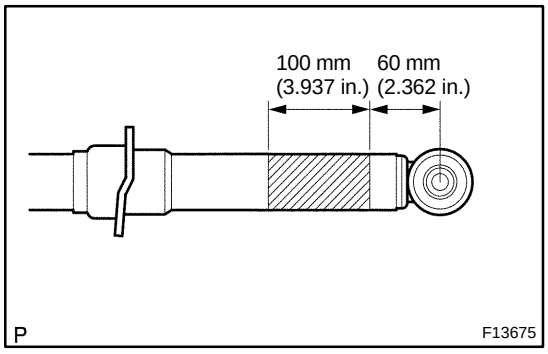
NOTICE:

When discarding the shock absorber, see DISPOSAL on page SA-24 .

SA0RF-07

DISPOSAL

1. FULLY EXTEND SHOCK ABSORBER PISTON ROD



2. DRILL HOLE TO DISCHARGE GAS FROM CYLINDER

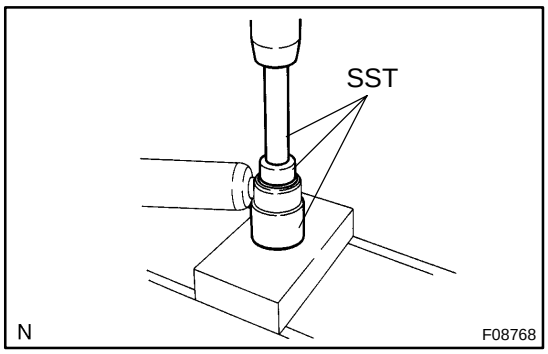
(a) Place the shock absorber horizontally to prevent the oil from coming out.

(b) Using a drill, make a hole on the top of the shell as shown to discharge the gas inside.

CAUTION:

- **When drilling, chips may fly out, work carefully.**
- **The gas is colorless, odorless and non-poisonous.**

SA28H-01

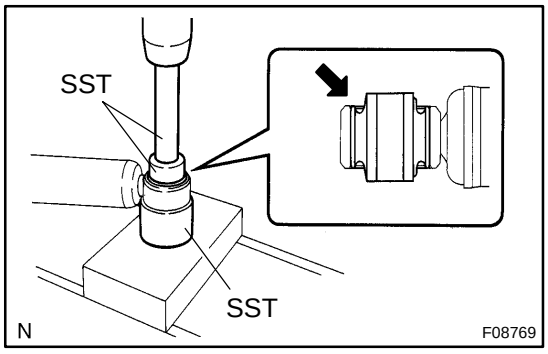


REPLACEMENT

1. REMOVE BUSHING

Using SST and a press, remove the bushing.

SST 09710-28021 (09710-08031),
09710-30021 (09710-03131),
09950-70010 (09951-07100)



2. INSTALL BUSHING

Using SST and a press, install a new bushing.

SST 09710-28021 (09710-08031),
09710-30021 (09710-03131),
09950-70010 (09951-07100)

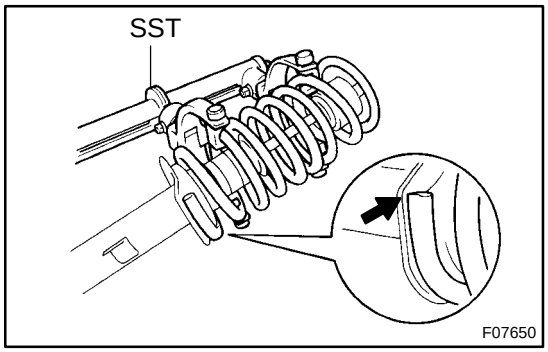
HINT:

Install the bushing until it is flush with the bushing bracket of the shock absorber.

SA0RG-08

REASSEMBLY

1. INSTALL SPRING BUMPER TO PISTON ROD



2. INSTALL COIL SPRING

(a) Using SST, compress the coil spring.

SST 09727- 30021 (09727- 00010, 09727- 00021, 09727-00031)

NOTICE:

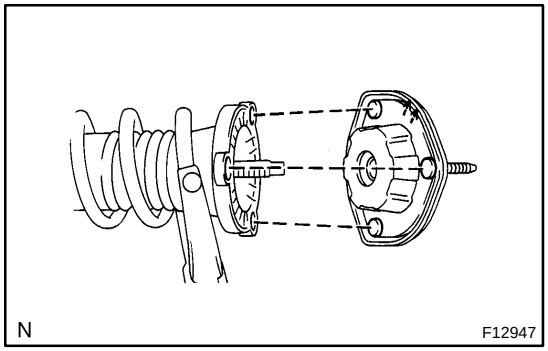
Do not use an impact wrench. It will damage the SST.

(b) Install the coil spring to the shock absorber.

HINT:

Fit the lower end of the coil spring into the gap of the spring seat of the shock absorber.

3. INSTALL UPPER INSULATOR TO SHOCK ABSORBER



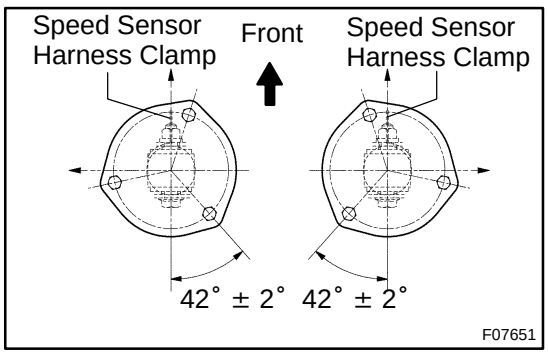
4. INSTALL SUSPENSION SUPPORT

(a) Install the suspension support to the shock absorber, as shown in the illustration.

HINT:

Align the bolt of the suspension support with the cut-out of the upper insulator.

(b) Temporarily tighten a new lock nut.



(c) Align the suspension support with the shock absorber lower bolt as shown in the illustration.

5. REMOVE SST

SST 09727- 30021 (09727- 00010, 09727- 00021, 09727-00031)

HINT:

After removing the SST, recheck the direction of the suspension support.

SA20J-02

INSTALLATION

1. INSTALL FRONT SHOCK ABSORBER WITH COIL SPRING

(a) SEDAN:
Install the No. 3 front spring reinforcement to the shock absorber.

(b) Install the shock absorber to the body with the 3 nuts.
Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

(c) Connect the shock absorber to the shock absorber bracket with the bolt and nut.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

HINT:
After stabilizing the suspension, torque the nut.

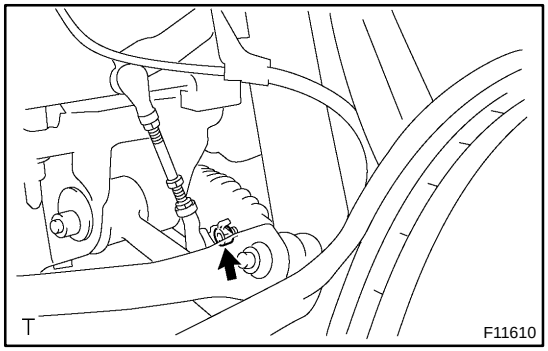
(d) Torque the nut in the center of the suspension support.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

HINT:
If the shock absorber has not been disassembled, it is not necessary to torque the nut.

(e) Install the cap to the suspension support.

2. CONNECT STABILIZER BAR LINK TO STABILIZER BAR
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

HINT:
If the ball joint turns together with the nut, use a 5 mm hexagon wrench to hold the stud.



3. CONNECT HEIGHT CONTROL SENSOR LINK

(a) Set the lower arm to the vehicle height.

(b) Install the sensor link to the lower arm bracket with a nut.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

NOTICE:

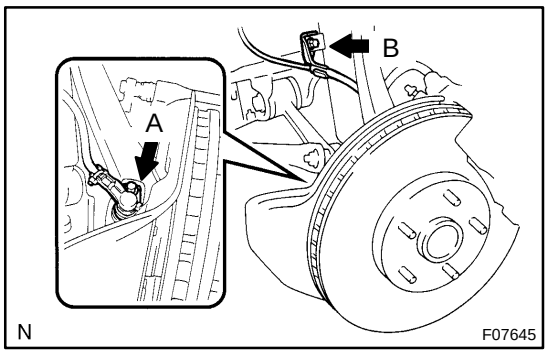
- **Be careful not to brake the link fixing pin until the above operation is completed.**
- **The pin can the broken after completion of the above, however, the sensor arm rotation angle shall not exceed the range of ±70° from the standard vehicle height.**

4. CONNECT UPPER SUSPENSION ARM TO STEERING KNUCKLE

(a) Connect the upper suspension arm with the nut.
Torque: 65 N·m (660 kgf·cm, 50 ft·lbf)

(b) Install a new clip.

If the holes for the clip are not aligned, tighten the nut further up to 60°.



5. CONNECT ABS SPEED SENSOR AND WIRE HARNESS CLAMP
Torque:
Bolt A: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
Bolt B: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

6. INSTALL IGNITER

(a) Install the bolt, nut and igniter.

(b) Connect the connector.

7. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

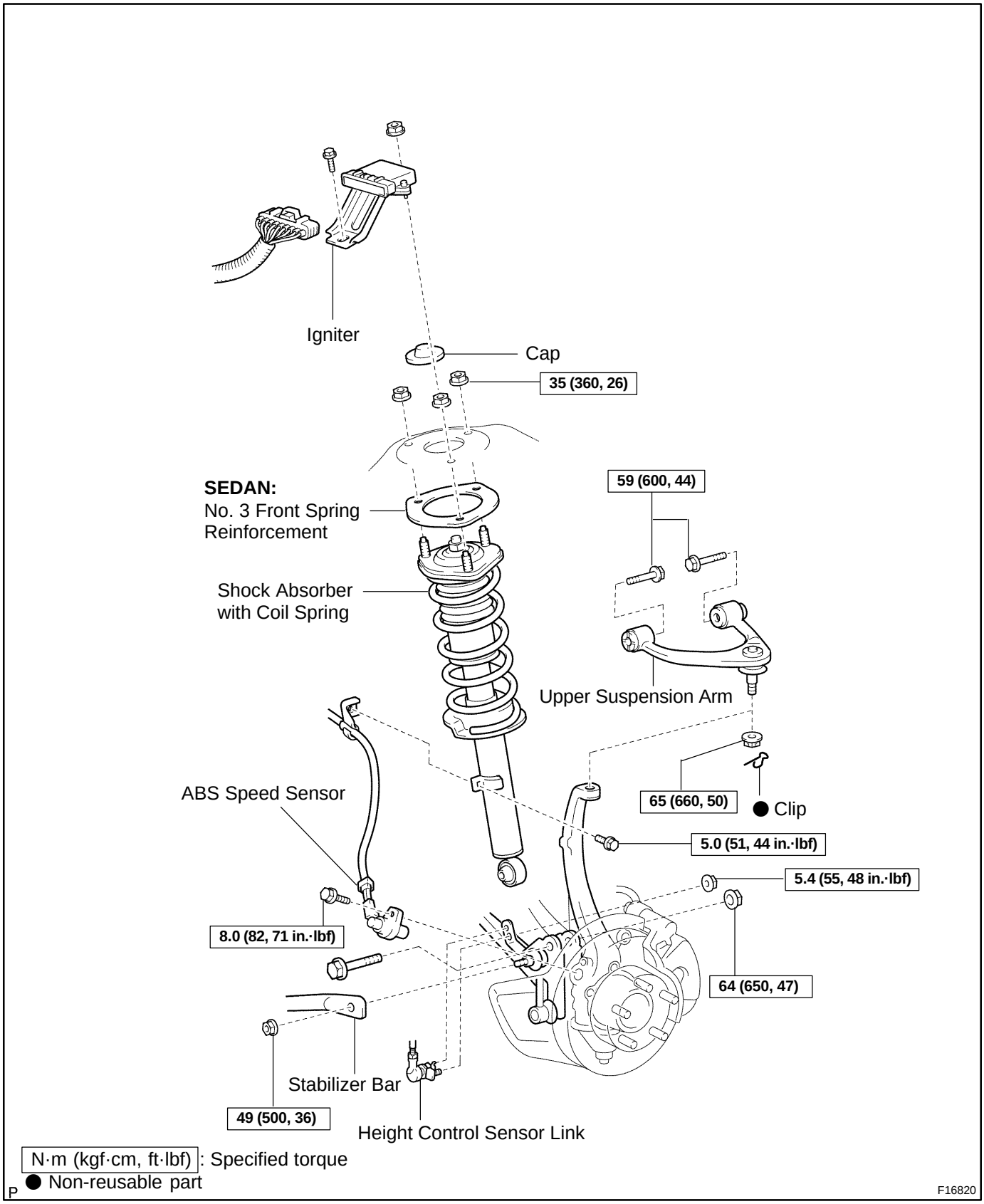
8. CHECK FRONT WHEEL ALIGNMENT
(See page SA-5)

9. CHECK ABS SPEED SENSOR SIGNAL
w/ VSC (See page DI-507)
w/o VSC (See page DI-437)

FRONT UPPER SUSPENSION ARM

SA0RI-09

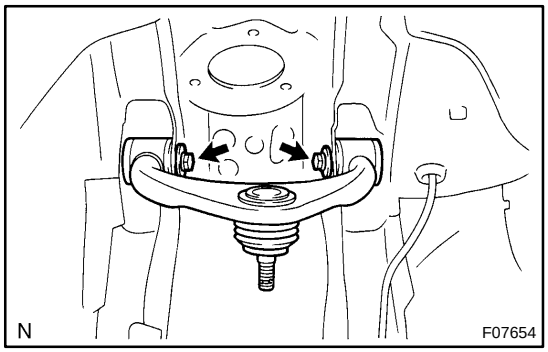
COMPONENTS



SA0RJ-06

REMOVAL

1. **REMOVE FRONT WHEEL**
2. **REMOVE FRONT SHOCK ABSORBER**
   (See page SA-20)



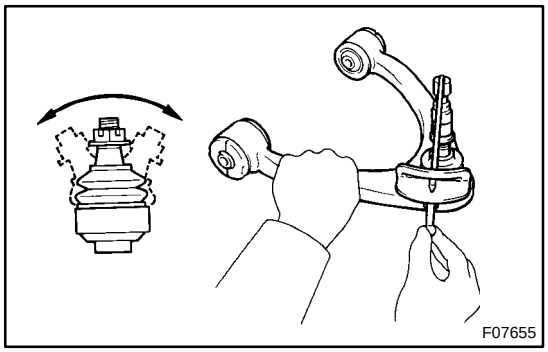
3. **REMOVE UPPER SUSPENSION ARM**

Remove the 2 bolts and upper suspension arm from the body.

SA0RK-07

INSPECTION

1. INSPECT UPPER SUSPENSION ARM BALL JOINT BOOT FOR DAMAGE



2. INSPECT UPPER SUSPENSION ARM BALL JOINT FOR ROTATION CONDITION

(a) As shown in the illustration, flip the ball joint stud back and forth 5 times, before installing the nut.

(b) Using a torque wrench, turn the nut continuously 1 turn per 2 - 4 seconds and take the torque reading on the 5th turn.

Turning torque:

1.0 - 3.4 N·m (10 - 35 kgf·cm, 9 - 30 in.·lbf)

SA0RL-08

INSTALLATION

1. INSTALL UPPER SUSPENSION ARM TO BODY
Torque: 59 N·m (600 kgf·cm, 44 ft·lbf)

HINT:

After stabilizing the suspension, torque the bolt.

2. INSTALL FRONT SHOCK ABSORBER (See page SA-27)

3. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

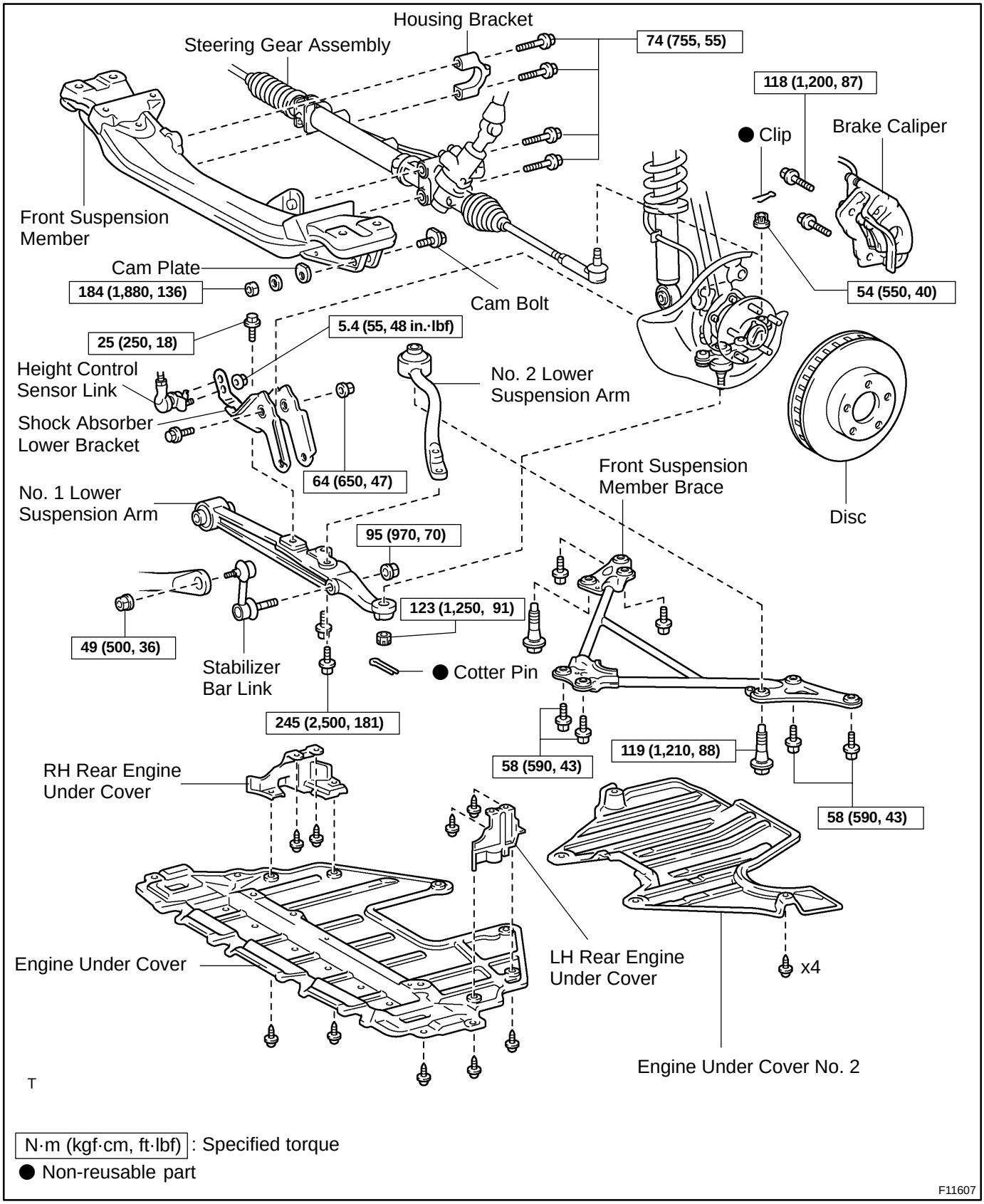
4. CHECK FRONT WHEEL ALIGNMENT (See page SA-5)

5. CHECK ABS SPEED SENSOR SIGNAL
w/ VSC (See page DI-507)
w/o VSC (See page DI-437)

FRONT LOWER SUSPENSION ARM

SA0RM-08

COMPONENTS



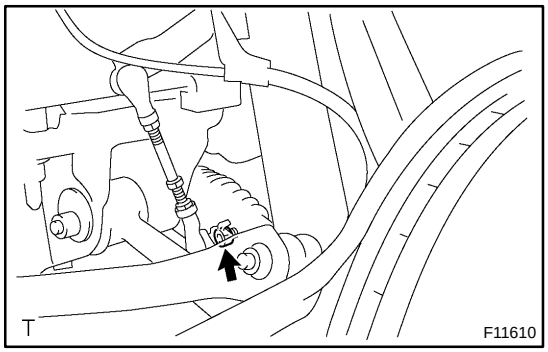
SA20K-02

REMOVAL

1. REMOVE FRONT WHEEL

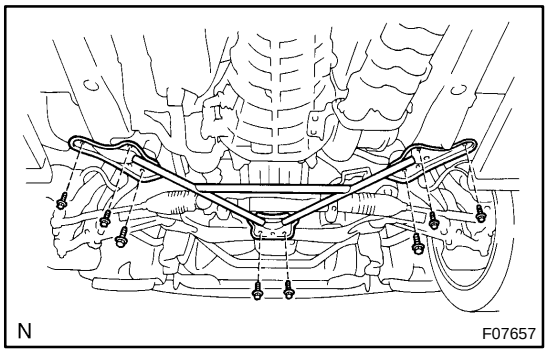
2. REMOVE ENGINE UNDER COVER AND ENGINE UNDER COVER NO. 2

3. REMOVE RH AND LH REAR ENGINE UNDER COVER



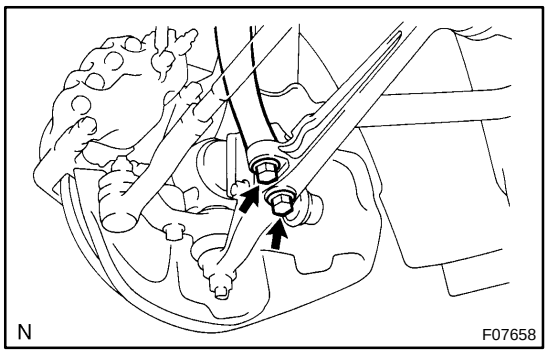
4. DISCONNECT HEIGHT CONTROL SENSOR LINK

Remove the nut and disconnect the height control sensor link from lower arm.



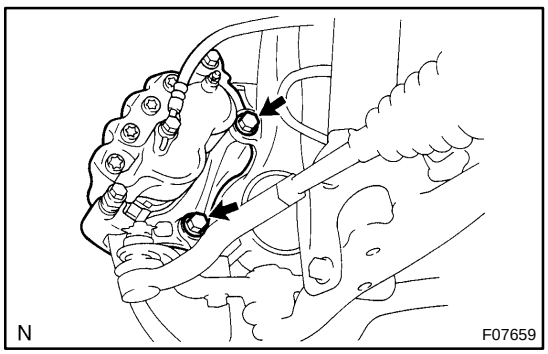
5. REMOVE FRONT SUSPENSION MEMBER BRACE

Remove the 8 bolts and suspension member brace.



6. REMOVE NO. 2 LOWER SUSPENSION ARM

Remove the 2 bolts and No. 2 lower suspension arm from the No. 1 lower suspension arm.



7. REMOVE BRAKE CALIPER AND DISC

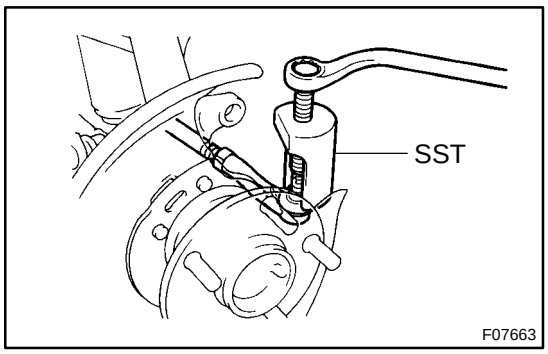
(a) Remove the 2 bolts and brake caliper from the steering knuckle.

(b) Support the brake caliper securely.

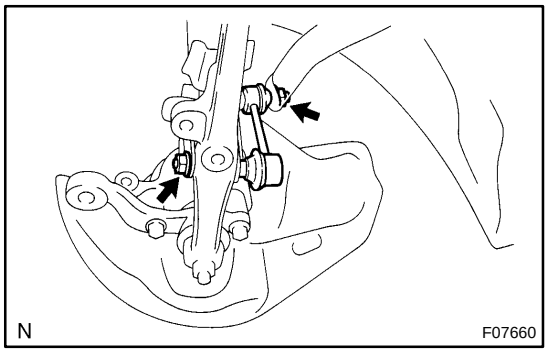
(c) Remove the disc.

8. DISCONNECT TIE ROD END FROM LOWER BALL JOINT

(a) Remove the clip and nut.



(b) Using SST, disconnect the tie rod end.
SST 09610-20012

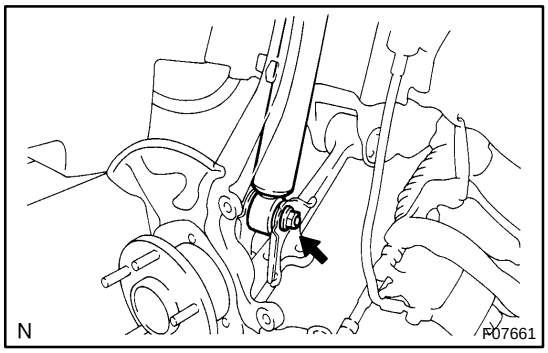


9. REMOVE STABILIZER BAR LINK

Remove the 2 nuts and stabilizer bar link.

HINT:

If the ball joint turns together with the nut, use a hexagon wrench (5 mm) to hold the stud.

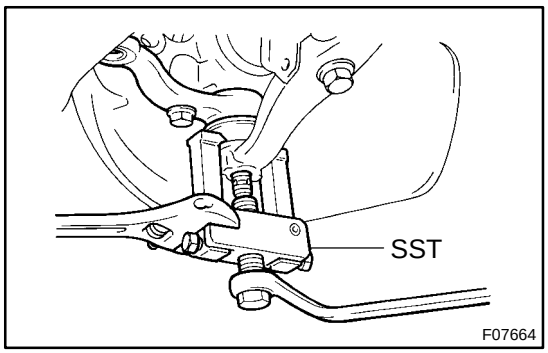


10. DISCONNECT SHOCK ABSORBER FROM SHOCK ABSORBER BRACKET

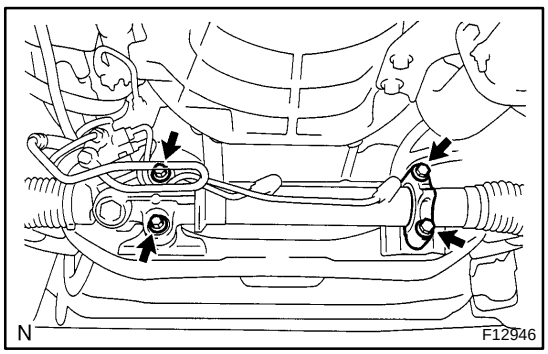
Remove the nut and bolt and disconnect the shock absorber.

11. DISCONNECT LOWER BALL JOINT FROM NO. 1 LOWER SUSPENSION ARM

(a) Remove the cotter pin and nut.



(b) Using SST, disconnect the lower ball joint.
SST 09628-6201 1



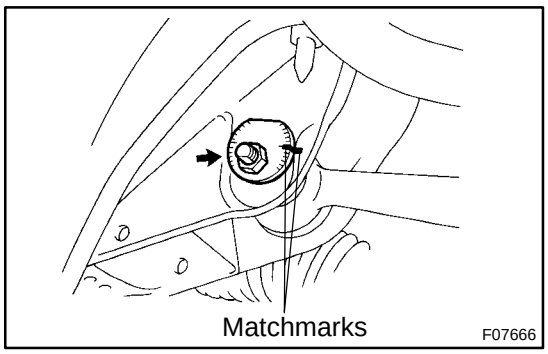
12. DISCONNECT STEERING GEAR ASSEMBLY

(a) Remove the 4 bolts, housing bracket and disconnect the steering gear assembly.

NOTICE:

Be careful not to damage the return tube and pressure feed tube.

(b) Support the steering gear assembly securely.



13. REMOVE NO. 1 LOWER SUSPENSION ARM

(a) Place matchmarks on the cam plate and suspension member.

(b) Remove the nut, washer, cam plate, cam bolt and No.1 lower suspension arm from the suspension member.

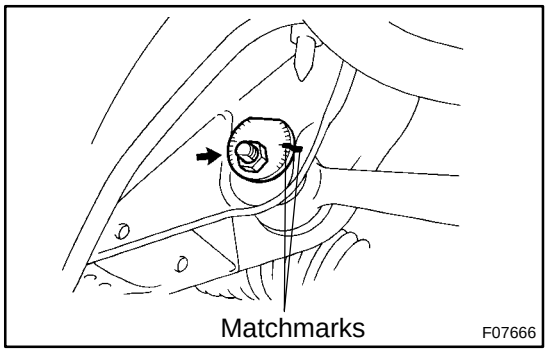
14. REMOVE SHOCK ABSORBER LOWER BRACKET

Remove the bolt and shock absorber lower bracket from the No. 1 lower suspension arm.

SA20L-02

INSTALLATION

1. INSTALL SHOCK ABSORBER LOWER BRACKET TO NO. 1 LOWER SUSPENSION ARM
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



2. INSTALL NO. 1 LOWER SUSPENSION ARM

(a) Install the No. 1 lower suspension arm to the suspension member with the cam bolt, cam plate, washer and nut.
Torque: 184 N·m (1,880 kgf·cm, 136 ft·lbf)

HINT:

After stabilizing the suspension, align the matchmarks on the cam plate and suspension member, and torque the nut.

(b) Connect the lower ball joint to the No. 1 lower suspension arm with the nut.
Torque: 123 N·m (1,250 kgf·cm, 91 ft·lbf)

(c) Install a new cotter pin.

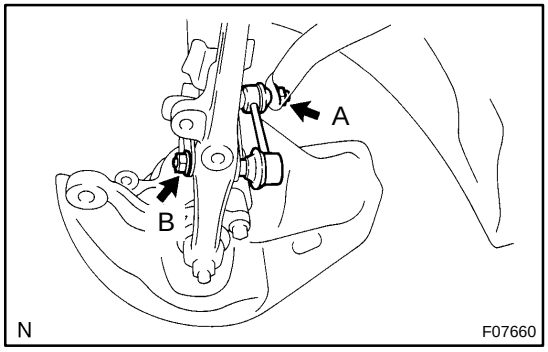
If the holes for the cotter pin are not aligned, tighten the nut further up to 60°.

3. CONNECT STEERING GEAR ASSEMBLY
Torque: 74 N·m (755 kgf·cm, 55 ft·lbf)

NOTICE:

Be careful not to damage the return tube and pressure feed tube.

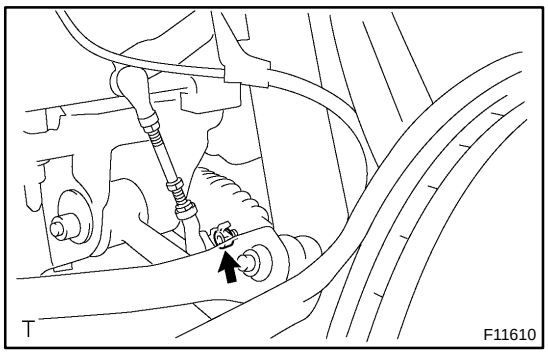
4. CONNECT SHOCK ABSORBER TO FRONT SHOCK ABSORBER BRACKET
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)



5. INSTALL STABILIZER BAR LINK
Torque:
Nut A: 49 N·m (500 kgf·cm, 36 ft·lbf)
Nut B: 95 N·m (970 kgf·cm, 70 ft·lbf)

HINT:

If the ball joint turns together with the nut, use a hexagon wrench (5 mm) to hold the stud.



6. CONNECT HEIGHT CONTROL SENSOR LINK

(a) Set the lower arm to the vehicle height.

(b) Install the sensor link to the lower arm bracket with a nut.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

NOTICE:

- **Be careful not to brake the link fixing pin until the above operation is completed.**
- **The pin can the broken after completion of the above, however, the sensor arm rotation angle shall not exceed the range of ±70° from the standard vehicle height.**

7. CONNECT TIE ROD END TO LOWER BALL JOINT

(a) Connect the tie rod end to the lower ball joint with the nut.

Torque: 54 N·m (550 kgf·cm, 40 ft·lbf)

(b) Install a new clip.

HINT:

If the holes for the clip are not aligned, tighten the nut further up to 60°.

8. INSTALL DISC AND BRAKE CALIPER

Install the disc, brake caliper and 2 bolts.

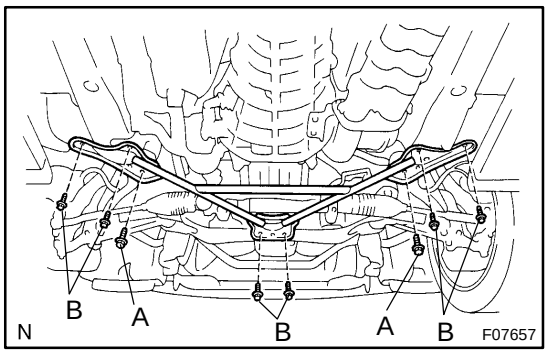
Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

9. CONNECT NO. 2 LOWER SUSPENSION ARM TO NO. 1 LOWER SUSPENSION ARM

Torque: 245 N·m (2,500 kgf·cm, 181 ft·lbf)

HINT:

After stabilizing the suspension, torque the bolt.



10. INSTALL FRONT SUSPENSION MEMBER BRACE

Torque:

Bolt A: 119 N·m (1,210 kgf·cm, 88 ft·lbf)

Bolt B: 58 N·m (590 kgf·cm, 43 ft·lbf)

HINT:

- Install the bolt A through the No.2 lower suspension arm.
- After stabilizing the suspension, torque the bolt A.

11. INSTALL RH AND LH REAR ENGINE UNDER COVER

12. INSTALL ENGINE UNDER COVER AND ENGINE UNDER COVER NO. 2

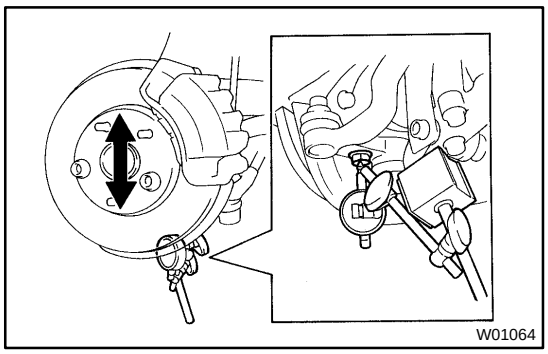
13. INSTALL FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

14. DEPRESS BRAKE PEDAL SEVERAL TIMES

15. CHECK FRONT WHEEL ALIGNMENT

(See page SA-5)



FRONT LOWER BALL JOINT

SA0RP-06

ON-VEHICLE INSPECTION

INSPECT LOWER BALL JOINT EXCESSIVE PLAY ON-VEHICLE

(a) Remove the front wheel and install the hub nuts to the disc.

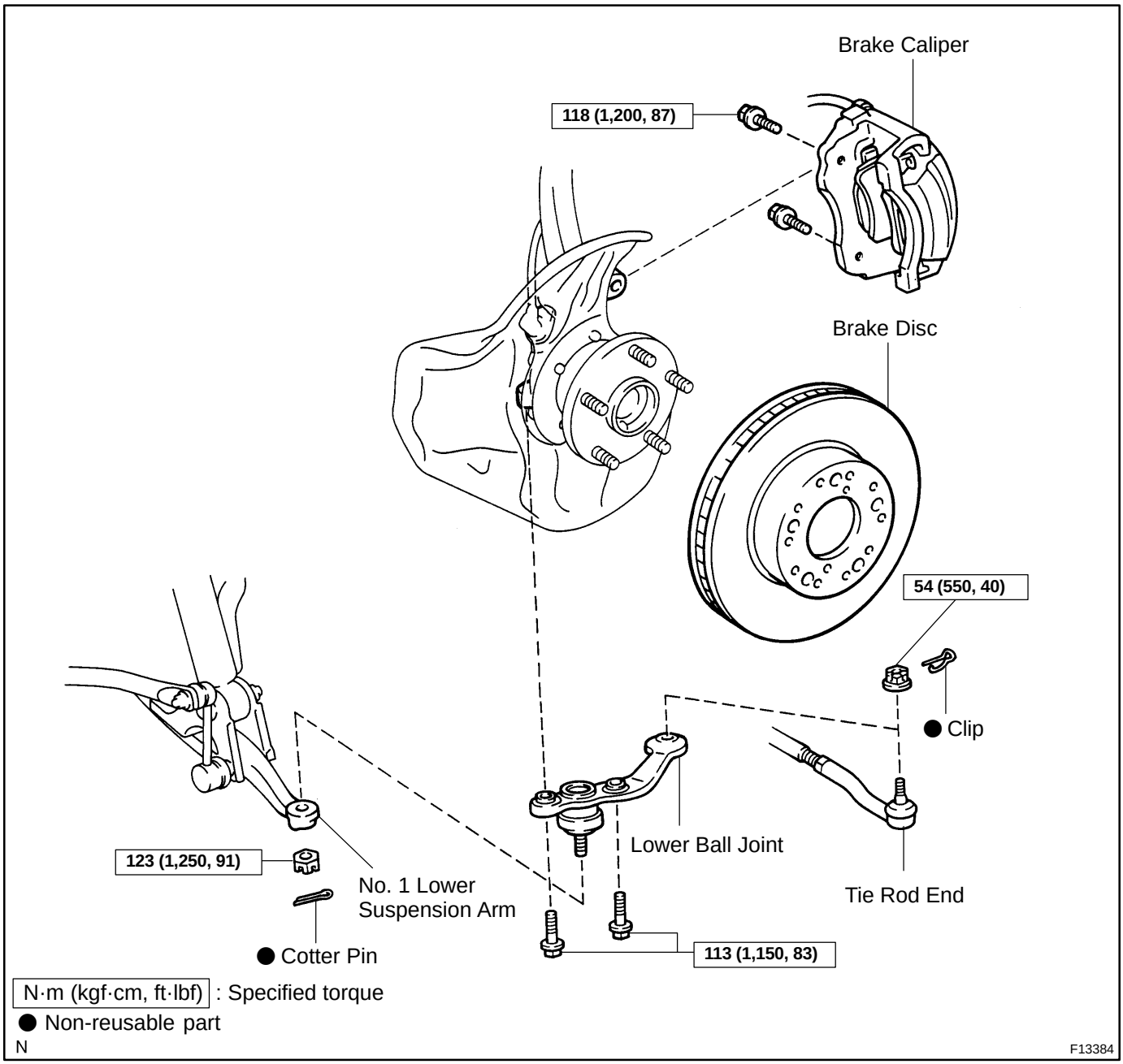
(b) Using a dial indicator, check the lower ball joint for excessive play when you push the hub nuts up and down with a force of 294 N (30 kgf, 66 lbf).

Maximum: 0.9 mm (0.035 in.)

If it is not within the specified value, replace the lower ball joint.

SA0RQ-06

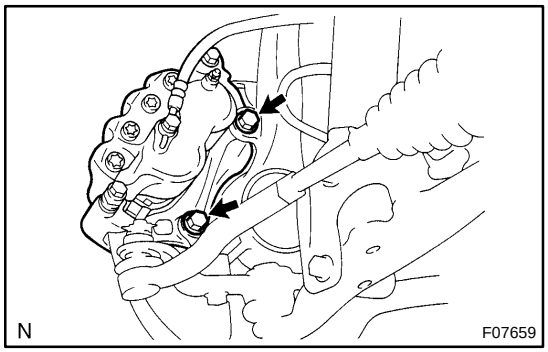
COMPONENTS



SA0RR-05

REMOVAL

1. REMOVE FRONT WHEEL



2. REMOVE BRAKE CALIPER

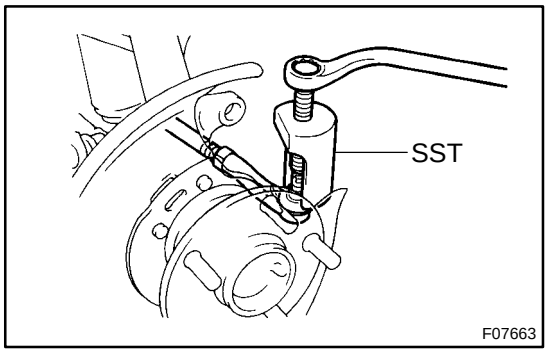
(a) Remove the 2 bolts and brake caliper from the steering knuckle.

(b) Support the brake caliper securely.

(c) Remove the disc.

3. DISCONNECT TIE ROD END FROM LOWER BALL JOINT

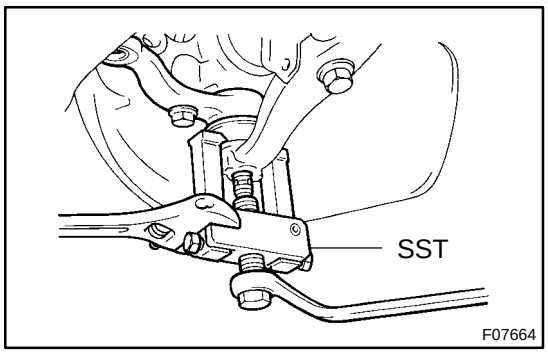
(a) Remove the clip and nut.



(b) Using SST, disconnect the tie rod end.
SST 09610-20012

4. DISCONNECT LOWER BALL JOINT FROM LOWER SUSPENSION ARM

(a) Remove the cotter pin and nut.



(b) Using SST, remove the lower ball joint.
SST 09628-6201 1

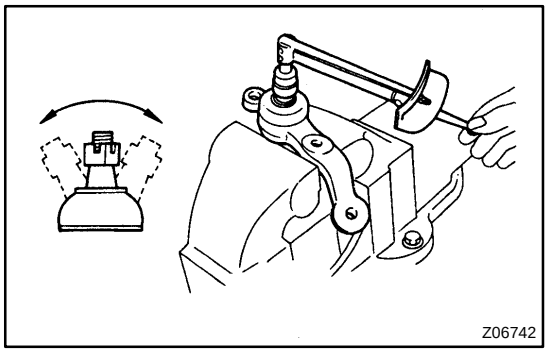
5. REMOVE LOWER BALL JOINT

Remove the 2 bolts and lower ball joint from the steering knuckle.

SA1IX-03

INSPECTION

1. INSPECT LOWER BALL JOINT BOOT FOR DAMAGE



2. INSPECT LOWER BALL JOINT FOR ROTATION CONDITION

(a) As shown in the illustration, flip the ball joint stud back and forth 5 times, before installing the nut.

(b) Using torque wrench, turn the nut continuously 1 turn per 2 - 4 seconds and take the torque reading on the 5th turn.

Turning torque:
0.5 - 3.0 N·m (5 - 30 kgf·cm, 0.4 - 26 in.·lbf)

SA0RT-03

INSTALLATION

1. INSTALL LOWER BALL JOINT

(a) Install the lower ball joint to the steering knuckle with the 2 bolts.
Torque: 113 N·m (1,150 kgf·cm, 83 ft·lbf)

(b) Connect the lower ball joint to the No. 1 lower suspension arm with the nut.
Torque: 123 N·m (1,250 kgf·cm, 91 ft·lbf)

(c) Install a new cotter pin.

If the holes for the cotter pin are not aligned, tighten the nut further up to 60°.

2. CONNECT TIE ROD END TO LOWER BALL JOINT

(a) Connect the tie rod end with the nut.
Torque: 54 N·m (550 kgf·cm, 40 ft·lbf)

(b) Install a new clip.

If the holes for the clip are not aligned, tighten the nut further up to 60°.

3. INSTALL DISC AND BRAKE CALIPER

Install the disc, brake caliper and 2 bolts.
Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

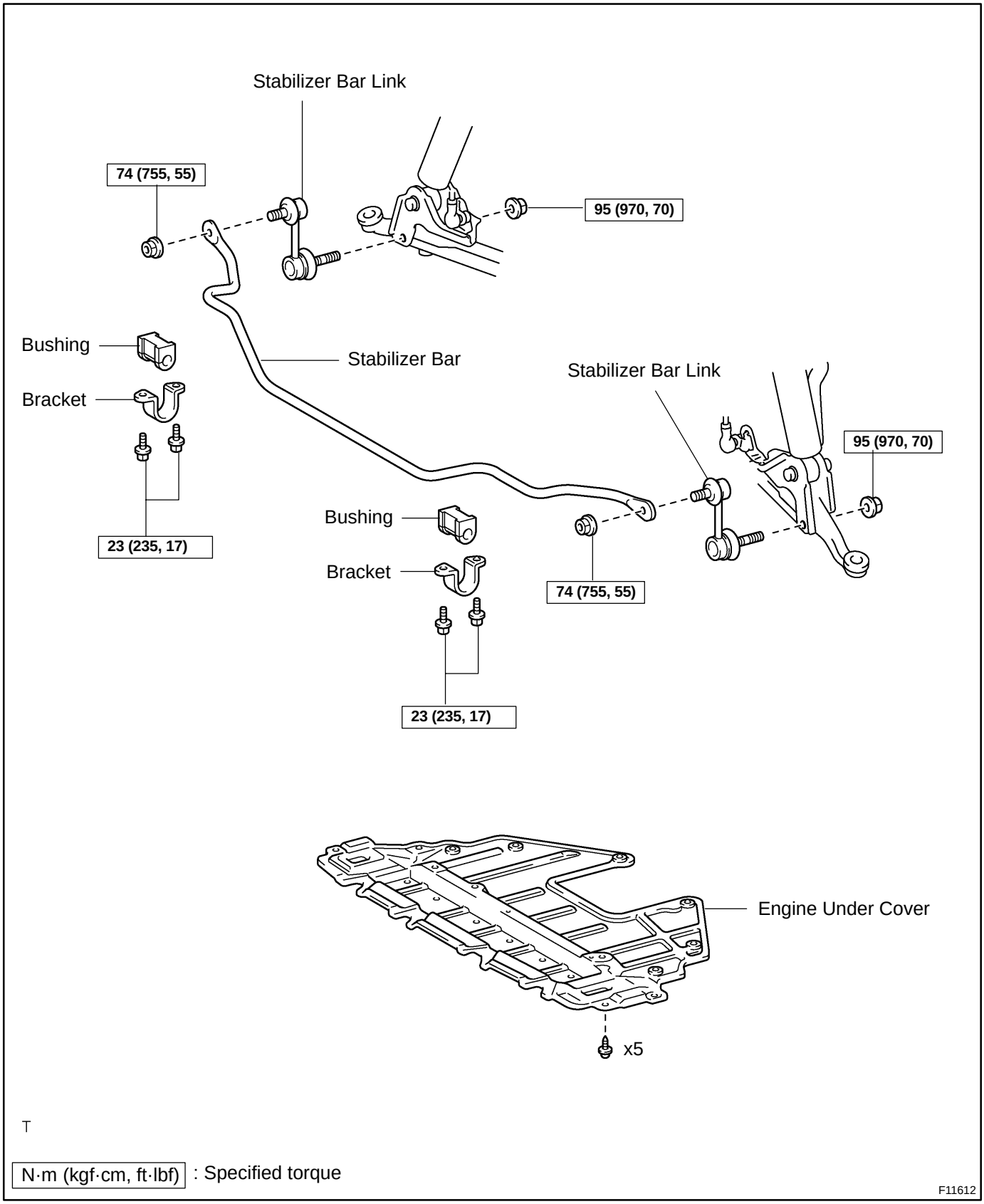
4. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

5. CHECK FRONT WHEEL ALIGNMENT (See page SA-5)

FRONT STABILIZER BAR

SA0RU-08

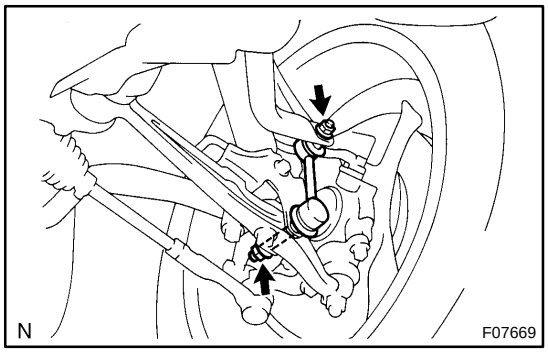
COMPONENTS



SA1IY-03

REMOVAL

1. REMOVE ENGINE UNDER COVER



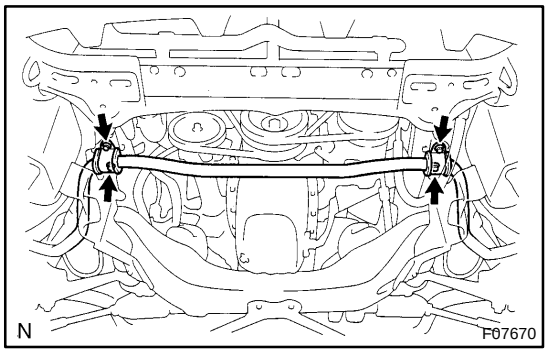
2. REMOVE RH AND LH STABILIZER BAR LINKS

(a) Remove the 2 nuts and stabilizer bar link.

HINT:

If the ball joint turns together with the nut, use a hexagon wrench (5 mm) to hold the stud.

(b) Employ the same manner described above to the other side.



3. REMOVE STABILIZER BAR

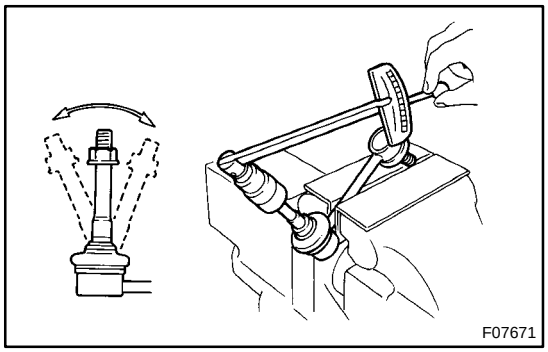
Remove the 4 bolts and stabilizer bar.

4. REMOVE 2 BRACKETS AND BUSHINGS FROM STABILIZER BAR

SA0RW-06

INSPECTION

1. INSPECT STABILIZER BAR LINK BALL JOINT BOOT FOR DAMAGE



2. INSPECT STABILIZER BAR LINK BALL JOINT FOR ROTATION CONDITION

(a) As shown in the illustration, flip the ball joint stud back and forth 5 times before installing the nut.

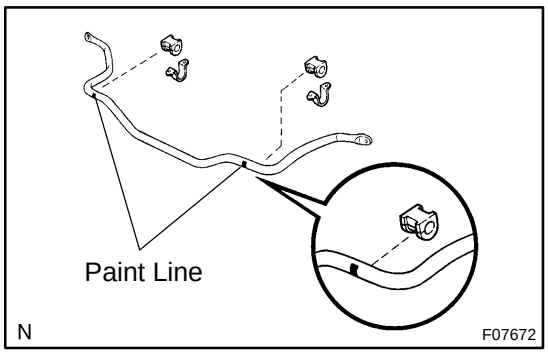
(b) Using a torque wrench, turn the stud continuously 1 turn per 2 - 4 seconds and take the torque reading on the 5th turn.

Turning torque:

0.05 - 1.9 N·m (0.5 - 20 kgf·cm, 0.4 - 16 in.·lbf)

SA1IZ-04

INSTALLATION



1. INSTALL 2 BUSHINGS AND BRACKETS TO STABILIZER BAR

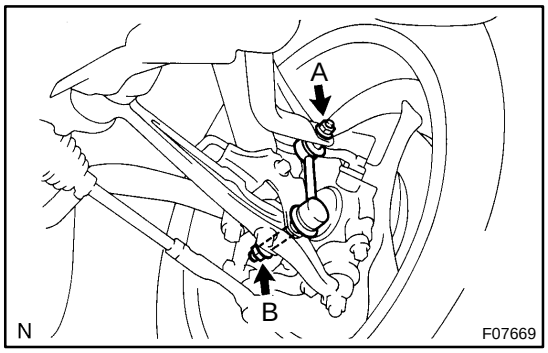
HINT:

- Install the bushing to the stabilizer bar so that the cutout of the bushing faces the front of the vehicle, as shown in the illustration.
- Install the bushing to the outside of the paint line on the stabilizer bar.

2. INSTALL STABILIZER BAR

Install the stabilizer bar to the body with the 4 bolts.

Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)



3. INSTALL RH AND LH STABILIZER BAR LINKS

Torque:

Nut A: 74 N·m (755 kgf·cm, 55 ft·lbf)

Nut B: 95 N·m (970 kgf·cm, 70 ft·lbf)

HINT:

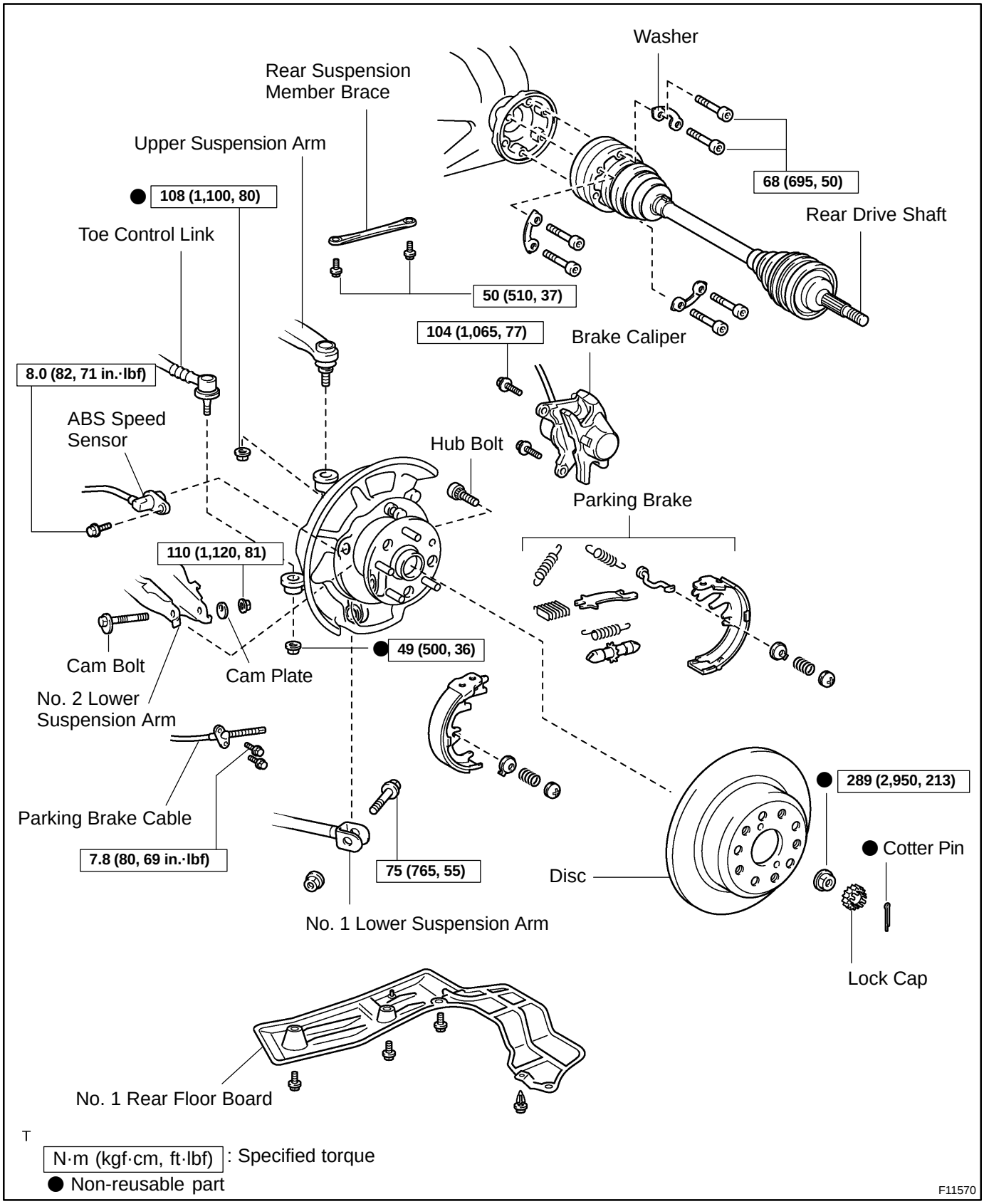
If the ball joint turns together with the nut, use a hexagon wrench (5 mm) to hold the stud.

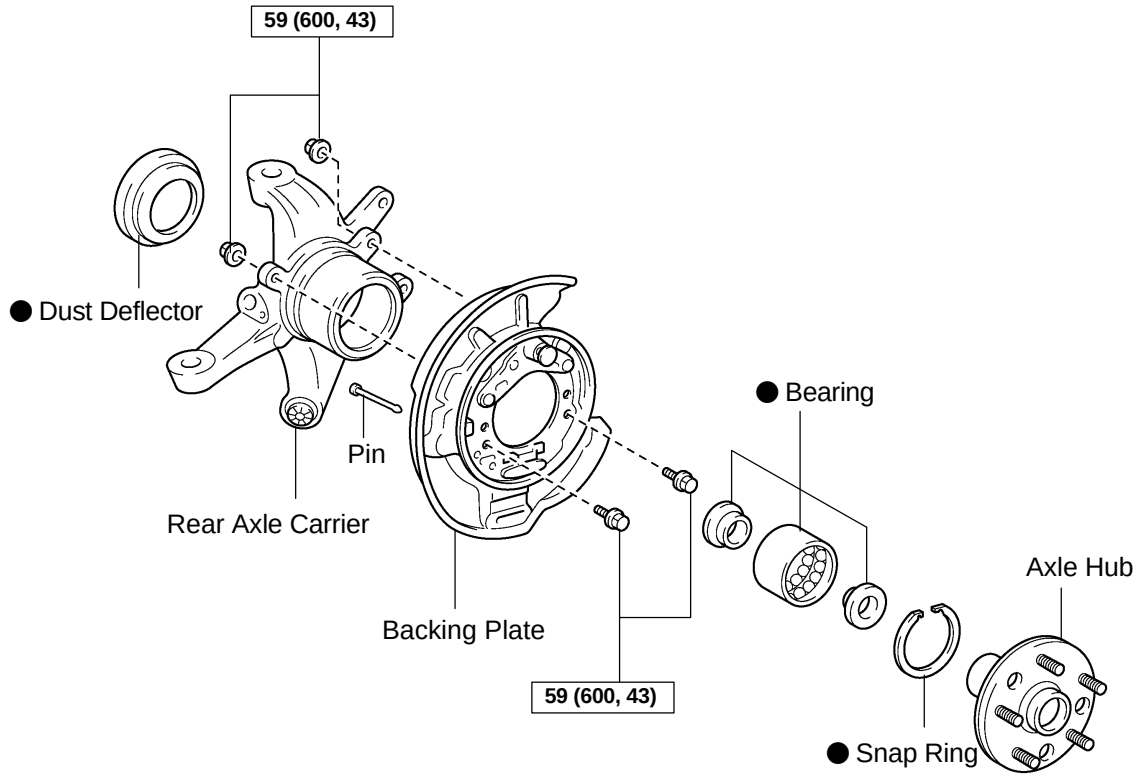
4. INSTALL ENGINE UNDER COVER

REAR AXLE CARRIER

COMPONENTS

SA1J0-04





T

N·m (kgf·cm, ft·lbf) : Specified torque

● Non-reusable part

F07674

SA1J1-03

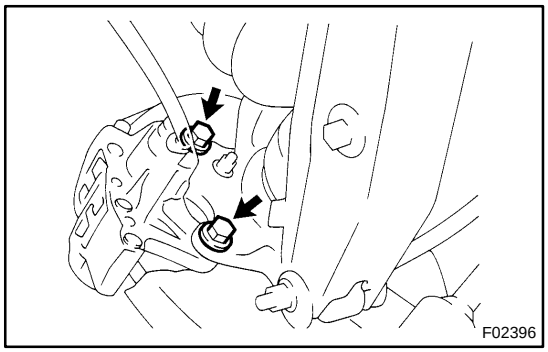
REMOVAL

1. REMOVE REAR WHEEL

2. DISCONNECT ABS SPEED SENSOR FROM REAR AXLE CARRIER

Remove the bolt and disconnect the ABS speed sensor.

3. REMOVE NO. 1 REAR FLOOR BOARD

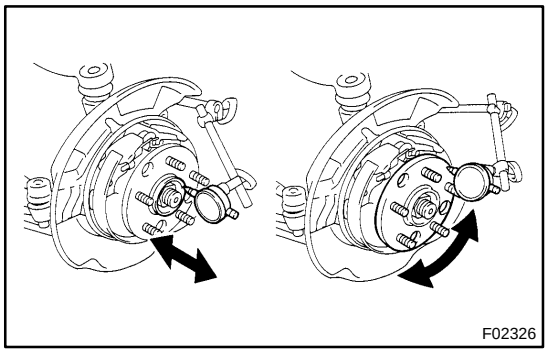


4. CHECK BEARING BACKLASH AND AXLE HUB DEVIATION

(a) Remove the 2 bolts and brake caliper from the axle carrier.

(b) Support the brake caliper securely.

(c) Remove the disc.



(d) Using a dial indicator near the center of the axle hub and check the backlash in the bearing shaft direction.

Maximum: 0.05 mm (0.0020 in.)

If the backlash exceeds the maximum, replace the bearing.

(e) Using a dial indicator, check the deviation at the surface of the axle hub outside the hub bolt.

Maximum: 0.07 mm (0.0028 in.)

If the deviation exceeds the maximum, replace the axle hub.

(f) Install the disc, brake caliper and 2 bolts to the axle carrier.

Torque: 104 N·m (1,065 kgf·cm, 77 ft·lbf)

5. REMOVE DRIVE SHAFT (See page SA-59)

6. REMOVE BRAKE CALIPER AND DISC

(a) Remove the 2 bolts and brake caliper from the axle carrier.

(b) Support the brake caliper securely.

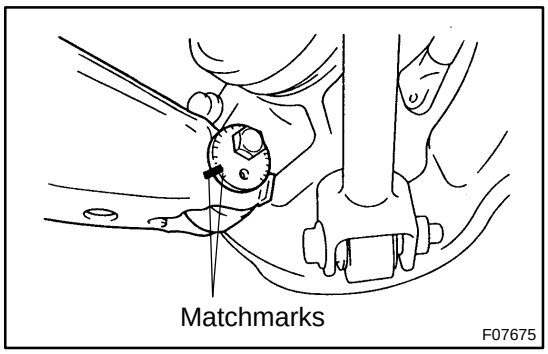
(c) Remove the disc.

7. REMOVE PARKING BRAKE SHOE

(See page BR-42)

8. DISCONNECT PARKING BRAKE CABLE FROM BACKING PLATE

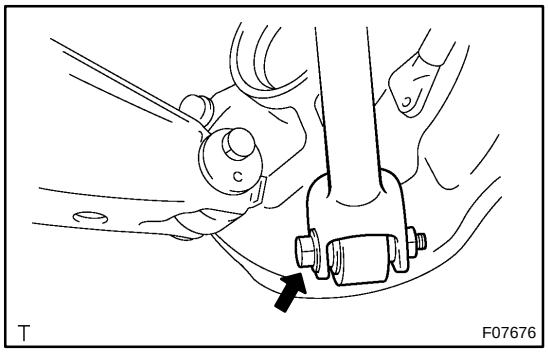
Remove the 2 bolts and disconnect the parking brake cable.



9. LOOSEN NO. 2 LOWER SUSPENSION ARM MOUNTING NUT (OUTSIDE)

(a) Place matchmarks on the cam bolt and No. 2 lower suspension arm.

(b) Loosen the nut of the No. 2 lower suspension arm (outside).

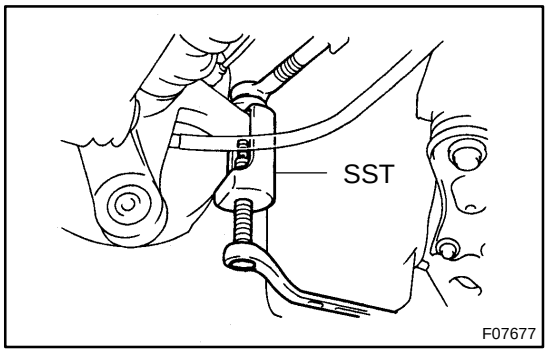


10. DISCONNECT NO. 1 LOWER SUSPENSION FROM REAR AXLE CARRIER

Remove the nut and bolt and disconnect the No. 1 lower suspension arm.

11. DISCONNECT TOE CONTROL LINK FROM AXLE CARRIER

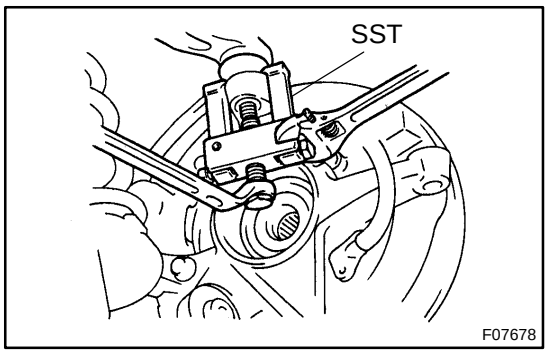
(a) Remove the nut.



(b) Using SST, disconnect the toe control link.
SST 09610-20012

12. DISCONNECT UPPER SUSPENSION ARM FROM REAR AXLE CARRIER

(a) Remove the nut.



(b) Using SST, disconnect the upper suspension arm.
SST 09628-6201 1

NOTICE:

Support the axle carrier.

13. REMOVE REAR AXLE CARRIER

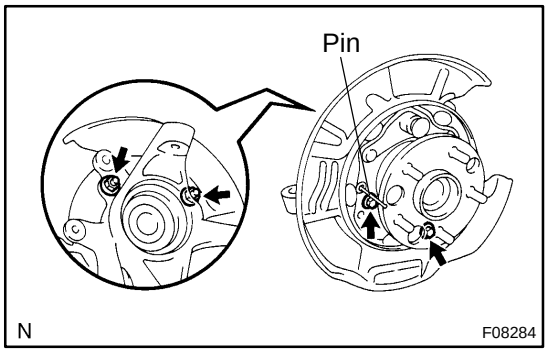
Remove the nut, cam plate, cam bolt and axle carrier from the No. 2 lower suspension.

SA1J2-04

DISASSEMBLY

1. REMOVE DUST DEFLECTOR

Using a screwdriver, remove the dust deflector.



2. REMOVE AXLE HUB

(a) Remove the 2 bolts, nuts and pin.

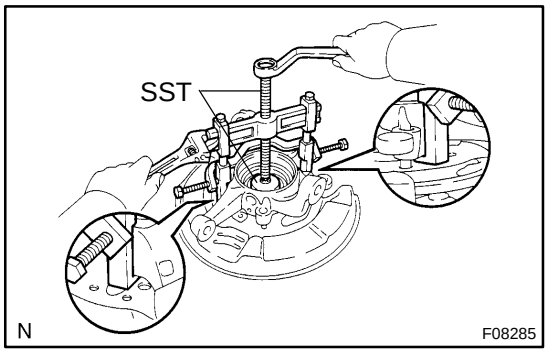
(b) Mount the axle carrier in a vise.

HINT:

Use a set of soft jaws in the vise to protect the axle carrier.

NOTICE:

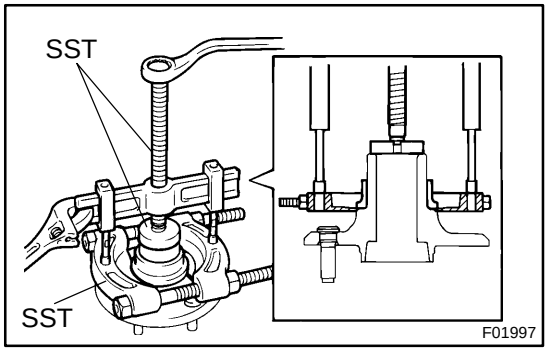
Do not tighten the vise too tight.



(c) Using SST, remove the axle hub from the axle carrier.

SST 09950- 40011 (09951- 04020, 09952- 04010, 09953- 04030, 09954- 04010, 09955- 04051, 09957-04010, 09958-04011), 09950-60010 (09951-00480)

(d) Remove the backing plate.



(e) Using SST, remove the bearing inner race from the axle hub.

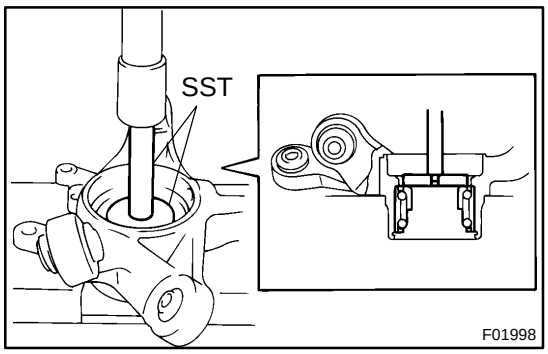
SST 09950- 00020, 09950- 40011 (09951- 04020, 09953- 04030, 09957- 04010), 09950- 50013 (09952-05010, 09954-05021, 09955-05040), 09950-60010 (09951-00480)

NOTICE:

Be careful not to damage the axle hub.

3. REMOVE BEARING

(a) Using snap ring pliers, remove the snap ring from the axle carrier.

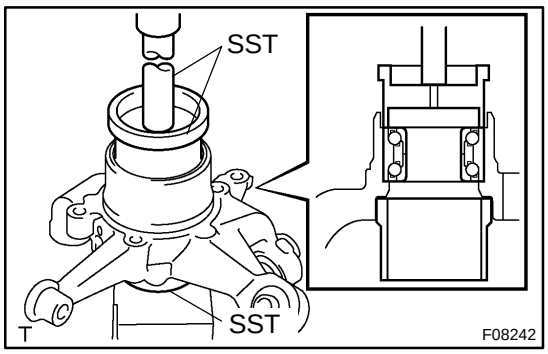


(b) Using SST and a press, remove the bearing from the axle carrier.

SST 09950-60010 (09951-00650),
09950-70010 (09951-07100)

SA0S1-05

REASSEMBLY



1. INSTALL BEARING

(a) Using SST and a press, install a new bearing to the axle carrier.

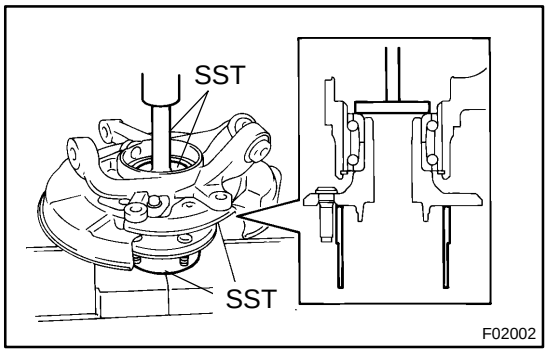
SST 09223-15020, 09527-17011, 09950-70010 (09951-07100)

(b) Using snap ring pliers, install a new snap ring to the axle carrier.

2. INSTALL AXLE HUB

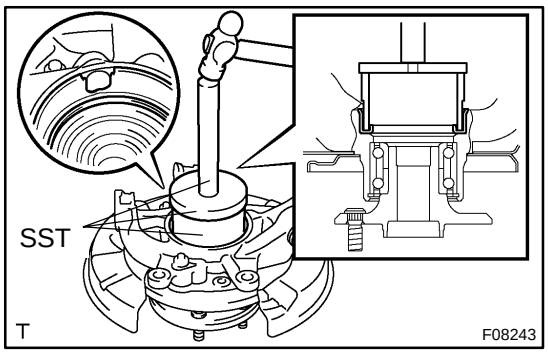
(a) Install the backing plate, pin, 2 bolts and nuts.

Torque: 59 N·m (600 kgf·cm, 43 ft·lbf)



(b) Using SST and a press, install the axle hub to the axle carrier.

SST 09527-17011, 09950-60020 (09551-00750), 09950-70010 (09951-07100)



3. INSTALL DUST DEFLECTOR

Using SST and a hammer, install a new dust deflector to the axle carrier.

SST 09527-17011, 09950-60020 (09951-01030), 09950-70010 (09951-07100)

HINT:

Align the speed sensor installation hole of dust deflector and that of axle carrier.

SA1J3-05

INSTALLATION

1. INSTALL REAR AXLE CARRIER

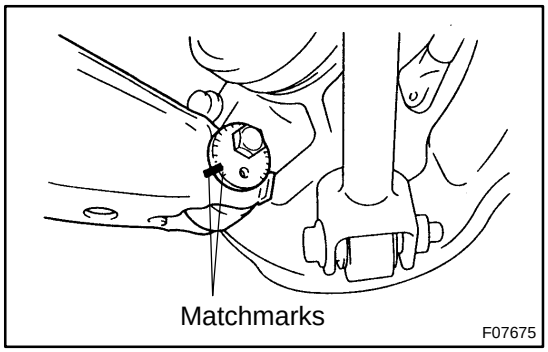
(a) Temporarily install the axle carrier to the upper suspension arm with a new nut.

(b) Connect the No. 1 lower suspension arm to the axle carrier with the bolt and nut.

Torque: 75 N·m (765 kgf·cm, 55 ft·lbf)

HINT:

After stabilizing the suspension, torque the nut.



(c) Connect the No. 2 lower suspension arm to the axle carrier with the cam bolt, cam plate and nut.

Torque: 110 N·m (1,120 kgf·cm, 81 ft·lbf)

HINT:

After stabilizing the suspension, align the matchmarks on the cam bolt and No. 2 lower suspension arm, torque the nut.

(d) Connect the toe control link to the axle carrier with a new nut.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

(e) Torque the nut on the upper side of the axle carrier.

Torque: 108 N·m (1,100 kgf·cm, 80 ft·lbf)

2. CONNECT PARKING BRAKE CABLE TO BACKING PLATE

Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

3. INSTALL PARKING BRAKE SHOE (See page BR-45)

4. INSTALL DISC AND BRAKE CALIPER

Install the disc, brake caliper and 2 bolts.

Torque: 104 N·m (1,065 kgf·cm, 77 ft·lbf)

5. INSTALL DRIVE SHAFT (See page SA-66)

6. INSTALL NO. 1 REAR FLOOR BOARD

7. CONNECT ABS SPEED SENSOR TO REAR AXLE CARRIER

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

8. CHECK BEARING BACKLASH AND AXLE HUB DEVIATION (See page SA-50)

9. INSTALL REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

10. DEPRESS BRAKE PEDAL SEVERAL TIMES

11. CHECK REAR WHEEL ALIGNMENT

(See page SA-9)

12. CHECK ABS SPEED SENSOR SIGNAL

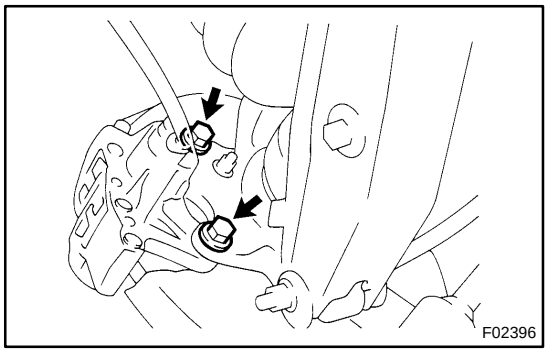
(See page DI-437 or DI-507)

REAR WHEEL HUB BOLT

SA0S3-05

REPLACEMENT

1. REMOVE REAR WHEEL

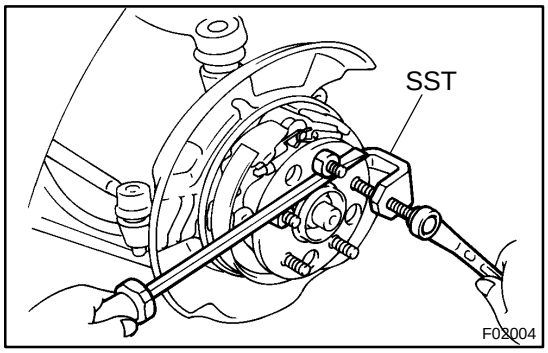


2. REMOVE BRAKE CALIPER AND DISC

(a) Remove the 2 bolts and brake caliper from the axle carrier.

(b) Support the brake caliper securely.

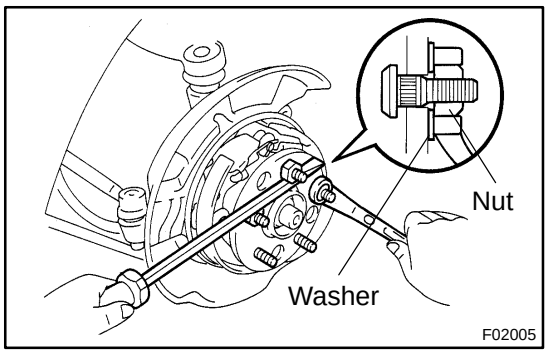
(c) Remove the disc.



3. REMOVE HUB BOLT

Using SST and a screwdriver or an equivalent to hold, remove the hub bolt.

SST 09628-1001 1



4. INSTALL HUB BOLT

(a) Install a washer and nut to a new bolt, as shown in the illustration.

(b) Using a screwdriver or an equivalent to hold, install the hub bolt by turning the nut.

5. INSTALL DISC AND BRAKE CALIPER

Install the disc, brake caliper and 2 bolts to the axle carrier.

Torque: 104 N·m (1,065 kgf·cm, 77 ft·lbf)

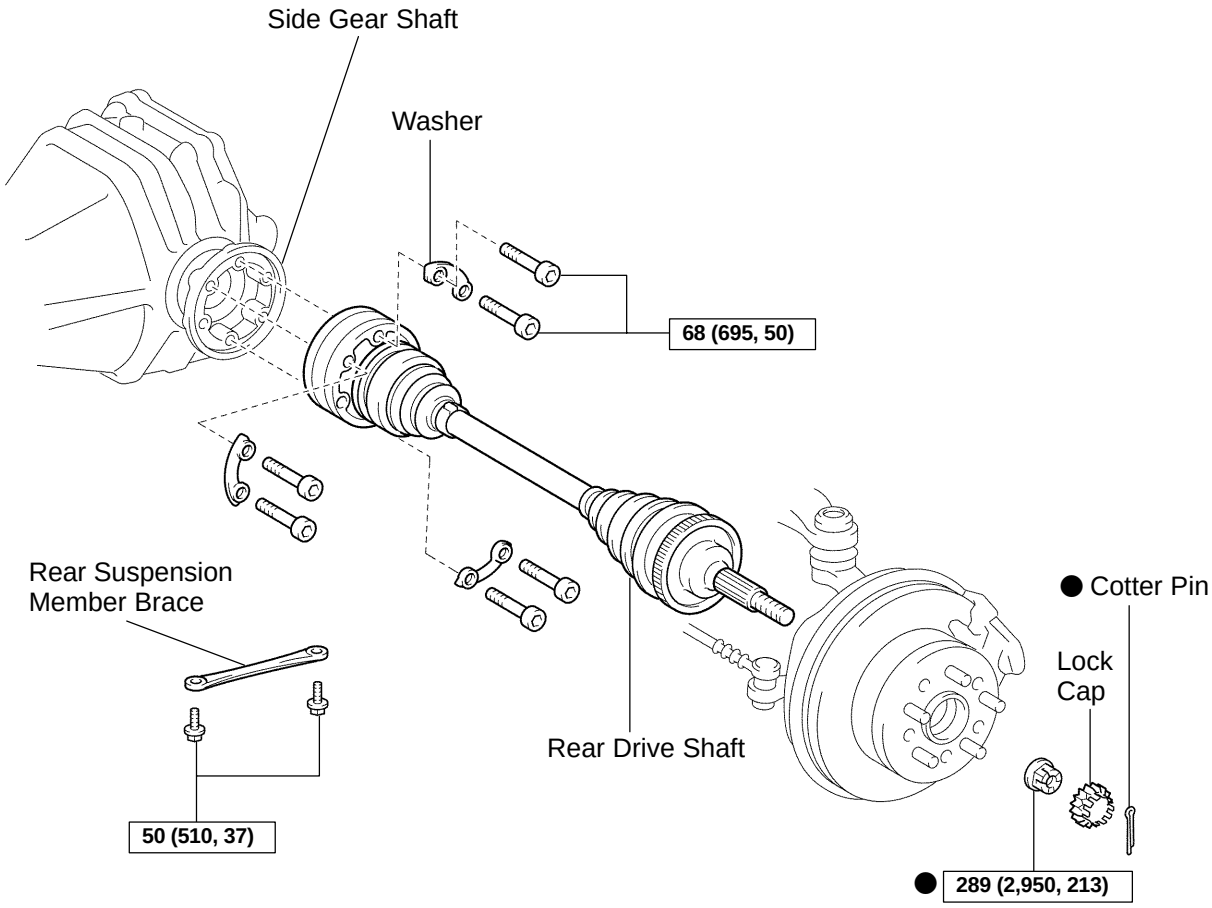
6. INSTALL REAR WHEEL

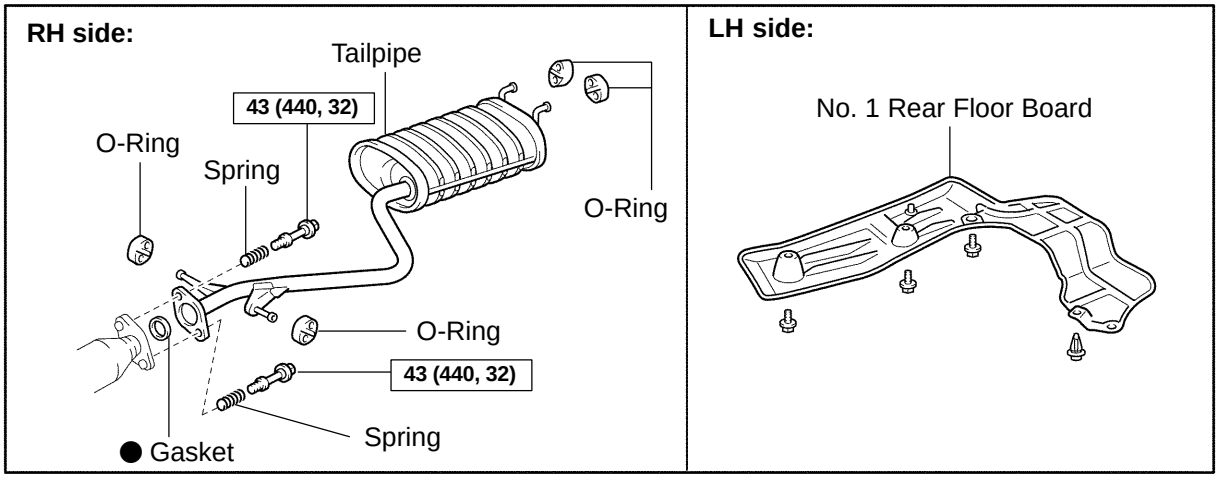
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

REAR DRIVE SHAFT

COMPONENTS

SA1J4-04

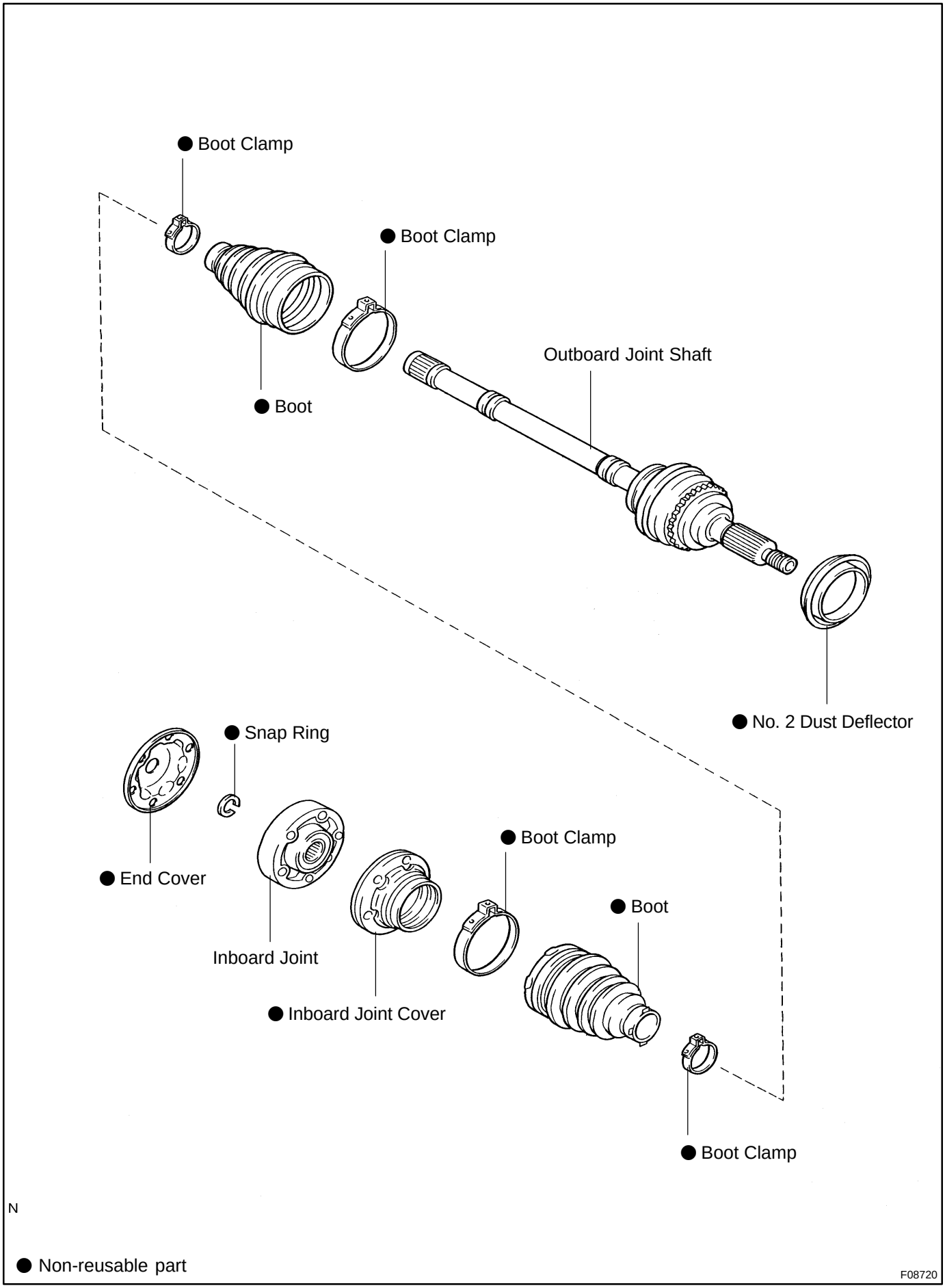




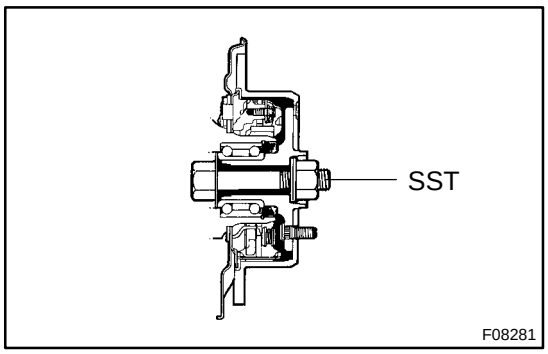
N·m (kgf·cm, ft·lbf) : Specified torque
● Non-reusable part

P

F13666


● Boot Clamp
● Boot Clamp
Outboard Joint Shaft
● Boot
● No. 2 Dust Deflector
● Snap Ring
● End Cover
● Boot Clamp
● Boot
Inboard Joint
● Inboard Joint Cover
● Boot Clamp
N
● Non-reusable part
F08720

SA1QX-03



REMOVAL

NOTICE:

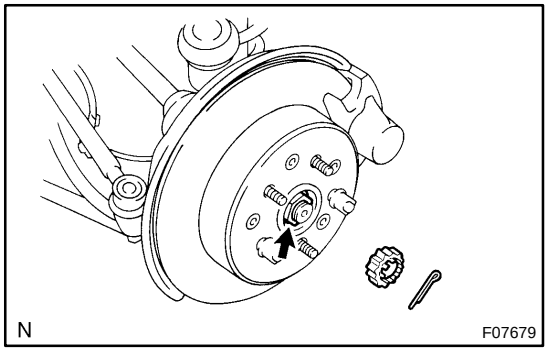
- **The hub bearing could be damaged if it is subjected to the vehicle weight, such as when moving the vehicle with the drive shaft removed.**
  Therefore, if it is absolutely necessary to place the vehicle weight on the hub bearing, first support it with SST.
  SST 09608-16042 (09608-02021, 09608-02041)
- **After disconnecting the drive shaft from the axle hub, work carefully so as not to damage the ABS speed sensor rotor serration on the drive shaft.**

1. REMOVE REAR WHEEL

2. LH side:
REMOVE NO. 1 REAR FLOOR BOARD

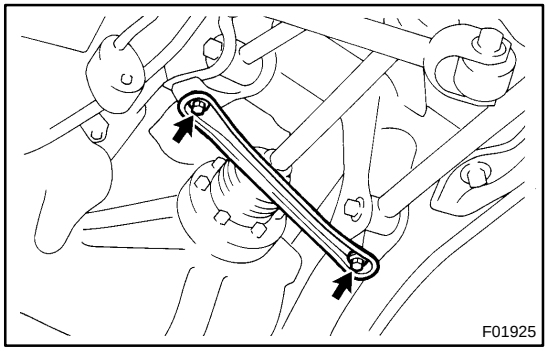
3. RH side:
REMOVE EXHAUST TAIL PIPE

(a) Remove the 2 bolts and disconnect the exhaust tail pipe from the center pipe.
(b) Disconnect the 4 O-rings and remove the exhaust tail pipe.
(c) Support the front pipe and center pipe securely.
(d) Remove the gasket.



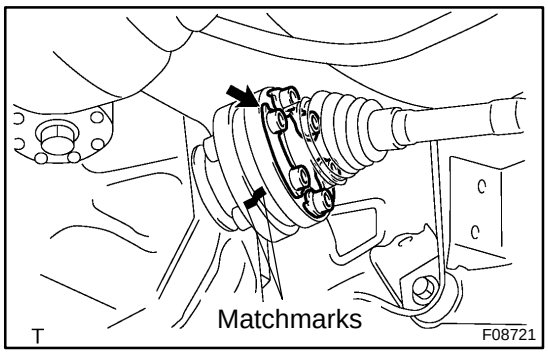
4. REMOVE COTTER PIN, LOCK CAP AND LOCK NUT

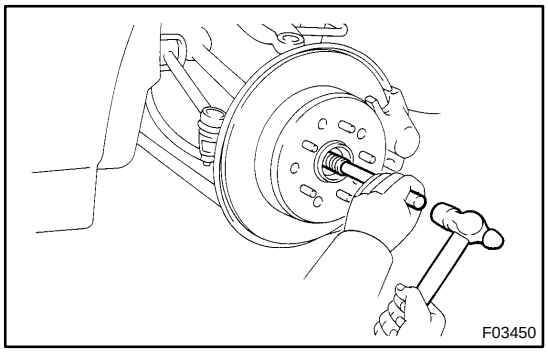
(a) Remove the cotter pin and lock cap.
(b) While depressing the brake pedal, using a socket wrench (32 mm), remove the nut.



5. REMOVE REAR SUSPENSION MEMBER BRACE

Remove the 2 bolts and suspension member brace.





6. REMOVE REAR DRIVE SHAFT

(a) Place matchmarks on the drive shaft and side gear shaft.

NOTICE:

Do not punch to marks.

(b) Using 8 mm hexagon wrench, remove the 6 hexagon bolts and 3 washers, while applying the brakes.

(c) Disconnect the inboard joint from the differential side gear shaft.

NOTICE:

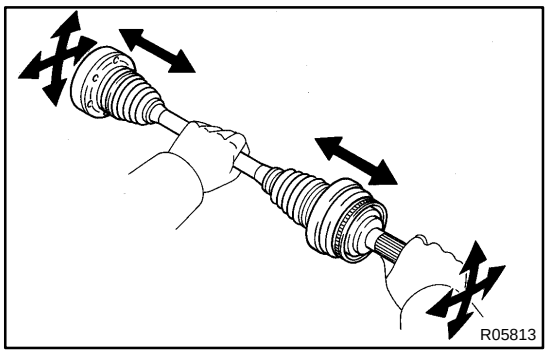
Be careful not to damage the boots and end cover.

(d) Using a brass bar and hammer, lightly tap the end of the drive shaft to disengage the axle hub and remove the drive shaft.

NOTICE:

Be careful not to damage the boots, ABS speed sensor rotor of the drive shaft and oil seal of the axle hub bearing.

SA0JZ-06



DISASSEMBLY

1. CHECK DRIVE SHAFT

(a) Check to see that the joints slide smoothly in the axial direction.

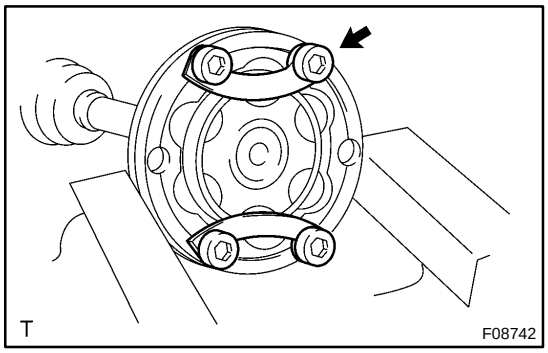
If a large angle is applied for the cross-groove type joint, the joint will be felt like it is catching, but this does not indicate an abnormality.

(b) Check the boots for damage or crack.

(c) Check the ABS speed sensor rotor for damage.

2. REMOVE END COVER

(a) Using a screwdriver, remove the end cover.



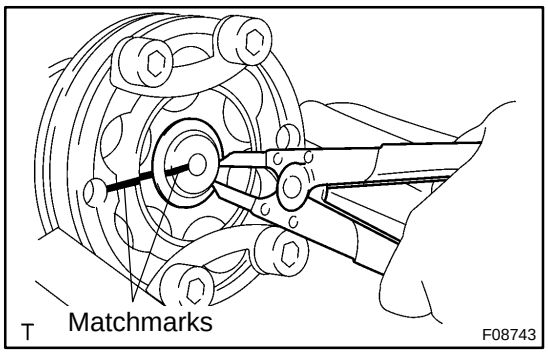
(b) Using bolts, nuts and washers, keep the inboard joint assembly not to take apart.

NOTICE:

Tighten the bolts by hand to avoid scratching the flange surface.

3. REMOVE INBOARD AND OUTBOARD JOINT BOOT CLAMPS

Using a side cutter, cut the boot clamps and remove them.



4. REMOVE INBOARD JOINT

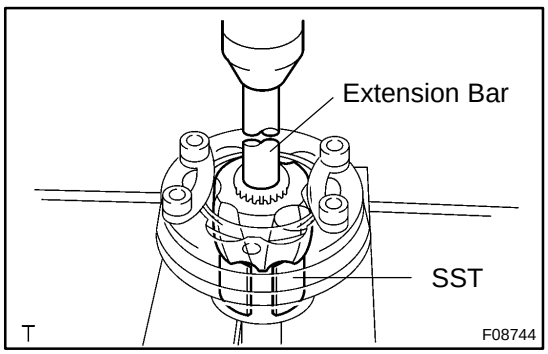
(a) Place matchmarks on the inboard joint and outboard joint shaft.

NOTICE:

Do not punch the marks.

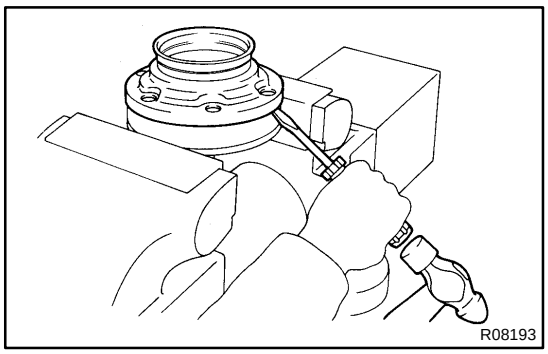
(b) Using a snap ring expander, remove the snap ring.

(c) Slide the inboard joint boot toward the outboard joint.



(d) Using SST, an extension bar and press, remove the inboard joint from the outboard joint shaft.
SST 09726-12023 (09726-01031)

(e) Remove the bolts, nuts and washers.

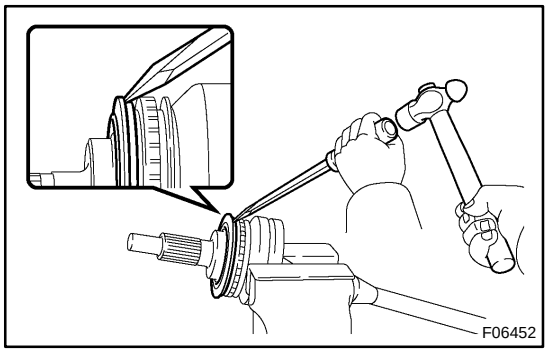


(f) Clamp the inboard joint in a soft jaw vise.
(g) Using a screwdriver and hammer, pry around the whole perimeter of the inboard joint cover and remove the inboard joint.

NOTICE:
To prevent the balls from falling, remove the inboard joint by holding the inner and outer races.

5. REMOVE BOOTS

Remove the inboard and outboard joint boots.



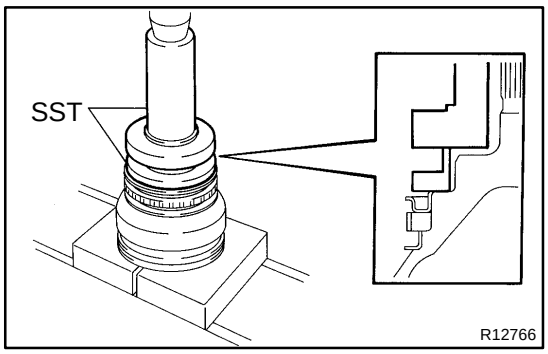
6. REMOVE NO. 2 DUST DEFLECTOR

(a) Clamp the outboard joint in a soft jaw vise.
(b) Using a screwdriver and hammer, remove the No. 2 dust deflector.

NOTICE:
Be careful not to damage the ABS speed sensor rotor.

SA0K0-08

REASSEMBLY



1. INSTALL NO. 2 DUST DEFLECTOR

Using SST and a press, install a new No. 2 dust deflector.

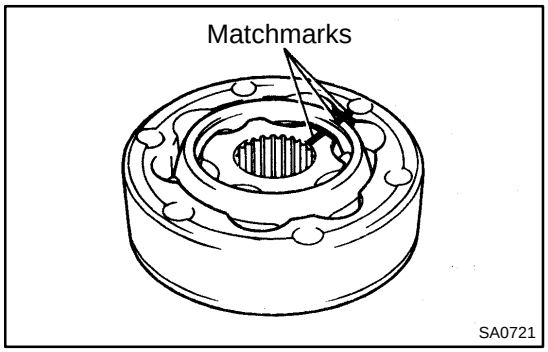
SST 09309-36010, 09502-12010

NOTICE:

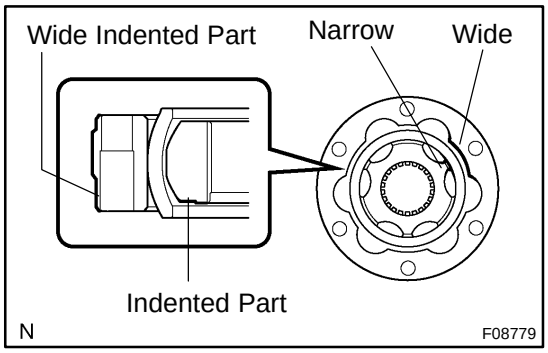
Be careful not to damage the ABS speed sensor rotor.

2. ASSEMBLE INBOARD JOINT

If the joint has come apart, reassemble it in the following order.



(a) Align the matchmarks placed before removal.



If the matchmarks have disappeared, do the following procedure.

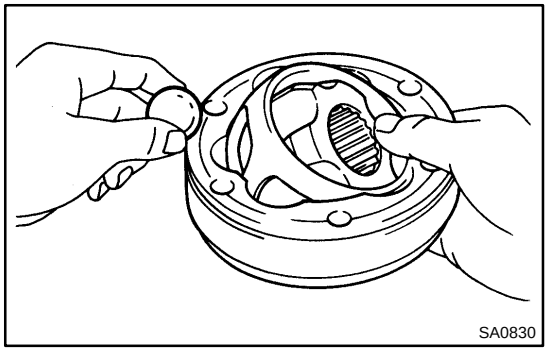
(1) Install the inner race to the cage.

(2) Install the outer race so that the wide indented part is at the same side as the indented part of the inner race.

HINT:

The cage does not have the specified attachment direction.

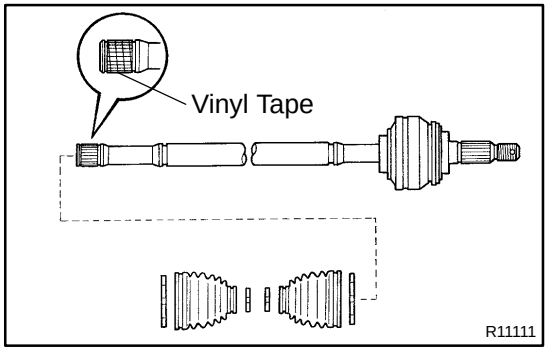
(3) Match the narrow projections of the inner race with the wide projections of the outer race.



(b) Tilt the cage and inner race to the side and insert the balls one by one.

NOTICE:

When the cage and inner race are tilted over, support the joint with your hand to prevent the balls from falling out.



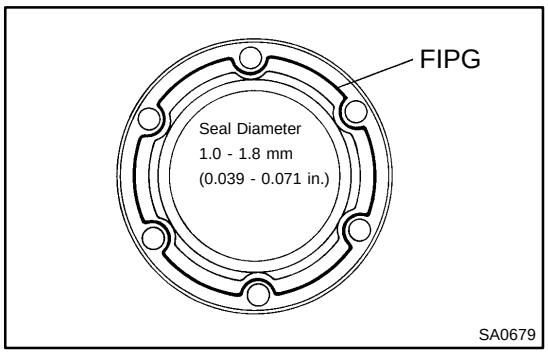
3. TEMPORARILY INSTALL BOOTS AND BOOT CLAMPS

(a) Place 4 new boot clamps to each new boot.

HINT:

Before installing the boots, wrap vinyl tape around the spline of the shaft to prevent boots from being damaged.

(b) Install the 2 boots with clamps to the drive shaft.



4. INSTALL INBOARD JOINT COVER

(a) Remove any packing material on the inboard joint.

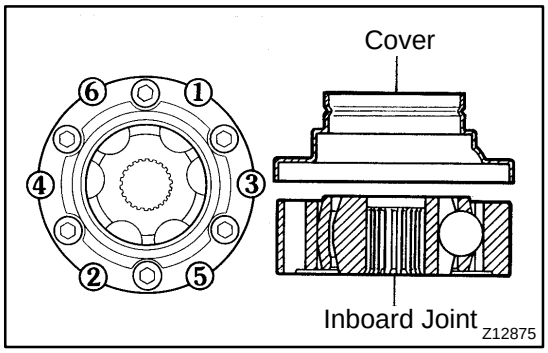
(b) Apply FIPG to a new inboard joint cover as shown in the illustration.

HINT:

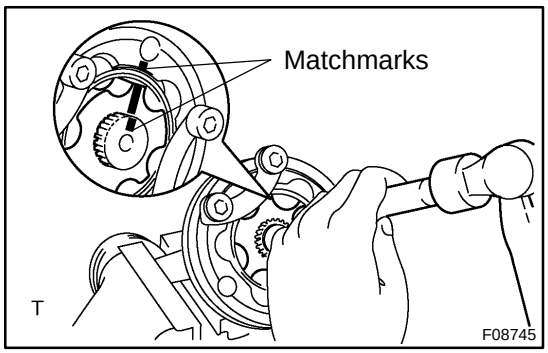
- Use FIPG supplied with a new end cover.
- Do not apply too much.

(c) Remove grease from the surface of the inboard joint facing to the cover.

(d) Align the bolt holes in the cover with those of the inboard joint, then insert the hexagon bolts.



(e) Using a plastic hammer, tap the rim of the inboard joint cover into place. Do this in the order shown, and repeat several times.



5. INSTALL INBOARD JOINT

(a) Align the matchmarks placed before removal.

(b) Using a brass bar and hammer, install the inboard joint to outboard joint shaft.

NOTICE:

Check that the brass bar is not touching the cage, but inner race.

(c) Using a snap ring expander, install a new snap ring.

6. ASSEMBLE BOOTS TO JOINTS

Before assembling the boots, pack with only the same amount of grease that was wiped off.

Grease capacity:

Outboard joint grease	170 - 180 g (0.37 - 0.40 lb, 6.0 - 6.3 oz.)
Inboard joint grease	144 - 154 g (0.32 - 0.34 lb, 5.1 - 5.4 oz.)

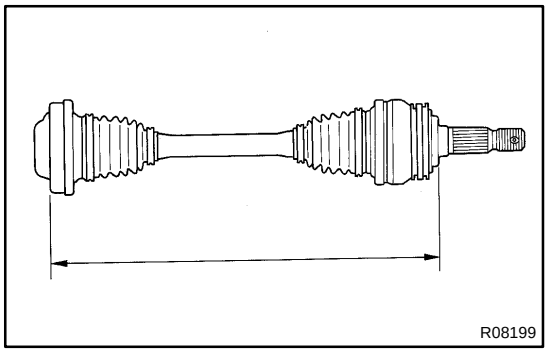
HINT:

Use the grease supplied in the boot kit.

NOTICE:

- **Keep grease off the joint connection groove of the boot.**

- **Pack with grease all over the ball contact surface inside the joint.**


R08199

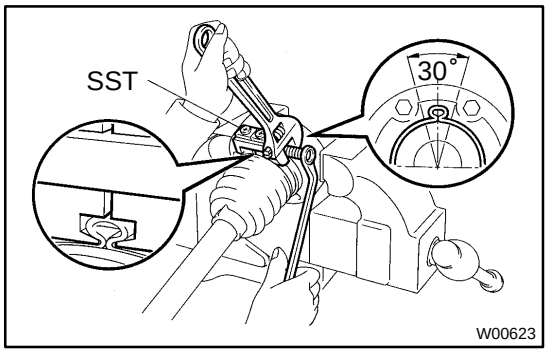
7. CHECK DRIVE SHAFT STANDARD LENGTH

Drive shaft standard length:

RH	585.35 mm (23.045 in.)
LH	539.75 mm (21.250 in.)

HINT:

The drive shaft is designed to move ±20 mm (0.79 in.) from the normal position.



W00623

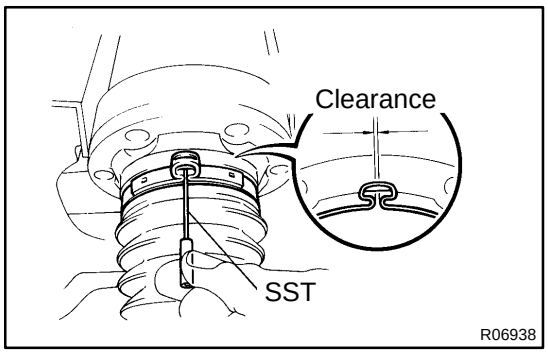
8. INSTALL NEW BOOT CLAMPS TO BOTH BOOTS

(a) Place SST onto the inboard joint large boot clamp.
SST 09521-24010

(b) Tighten SST so that the clamp is pinched.

NOTICE:

Do not overtighten the SST.



R06938

(c) Using SST, adjust the clearance of the clamp.
SST 09240-00020
Clearance: 0.8 mm (0.031 in.) or less

(d) Employ the same manner to the other clamps.

9. INSTALL END COVER

(a) Remove grease from the surface of the inboard joint facing to the cover.

(b) Apply FIPG supplied with a new end cover.

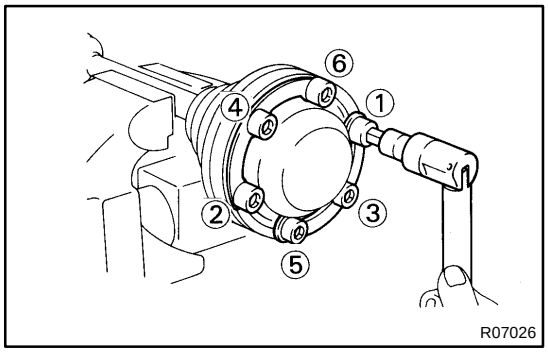
(c) Align the bolt holes in the cover with those of the inboard joint.

(d) Install the 6 hexagon bolts and 3 washers from the end cover side.

(e) Install 6 nuts to the boot side.

(f) Using a 8 mm hexagon wrench, tighten the bolts. Do this in the order shown, and repeat several times.

(g) Check that the claw of the end cover touches the inboard joint.



R07026

10. CHECK DRIVE SHAFT (See page SA-61)

SA1J8-05

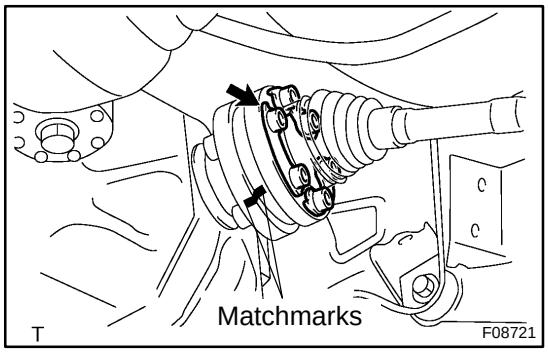
INSTALLATION

1. INSTALL REAR DRIVE SHAFT

(a) Install the drive shaft to the axle hub.

NOTICE:

Be careful not to damage the boots and ABS speed sensor rotor of the drive shaft and oil seal of the axle hub bearing.



(b) Align the matchmarks and connect the drive shaft to the side gear shaft.

NOTICE:

Be careful not to damage the boots and end cover.

(c) Using 8 mm hexagon wrench, install the 3 washers and 6 hexagon bolts, while applying the brakes.

Torque: 68 N·m (695 kgf·cm, 50 ft·lbf)

2. INSTALL REAR SUSPENSION MEMBER BRACE

Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

3. INSTALL LOCK NUT, LOCK CAP AND COTTER PIN

(a) While applying brakes, using a socket wrench (32 mm), install a new nut.

Torque: 289 N·m (2,950 kgf·cm, 213 ft·lbf)

(b) Install the lock cap and a new cotter pin.

If the holes for the cotter pin are not aligned, tighten the nut further up to 60°.

4. LH side:

INSTALL NO. 1 REAR FLOOR BOARD

5. RH side:

INSTALL EXHAUST TAIL PIPE

(a) Install a new gasket.

(b) Install the exhaust tail pipe to the 4 O-rings.

(c) Connect the exhaust tail pipe to the center pipe with the 2 bolts and 2 springs.

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

6. CHECK REAR WHEEL ALIGNMENT

(See page SA-9)

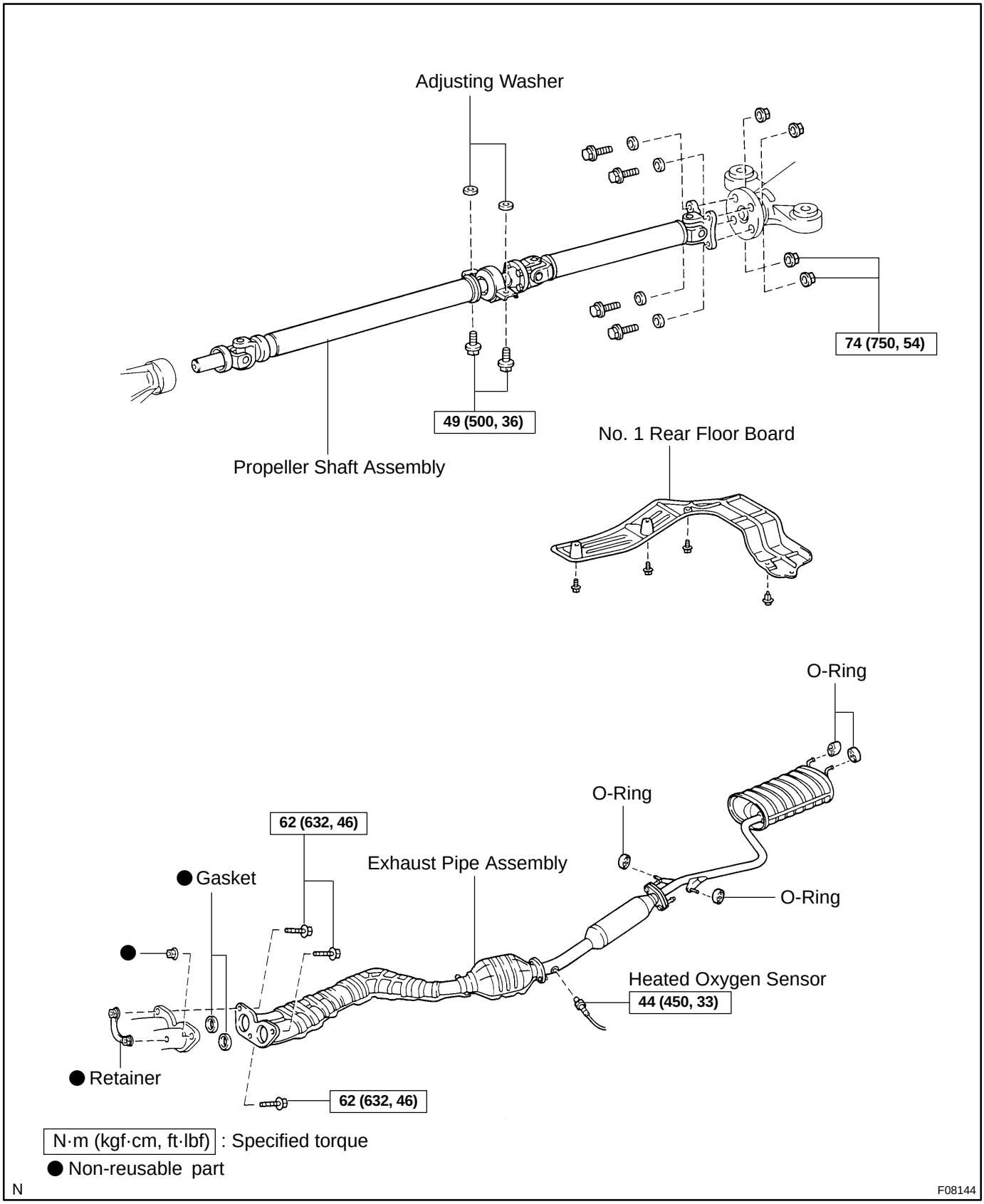
7. CHECK ABS SPEED SENSOR SIGNAL

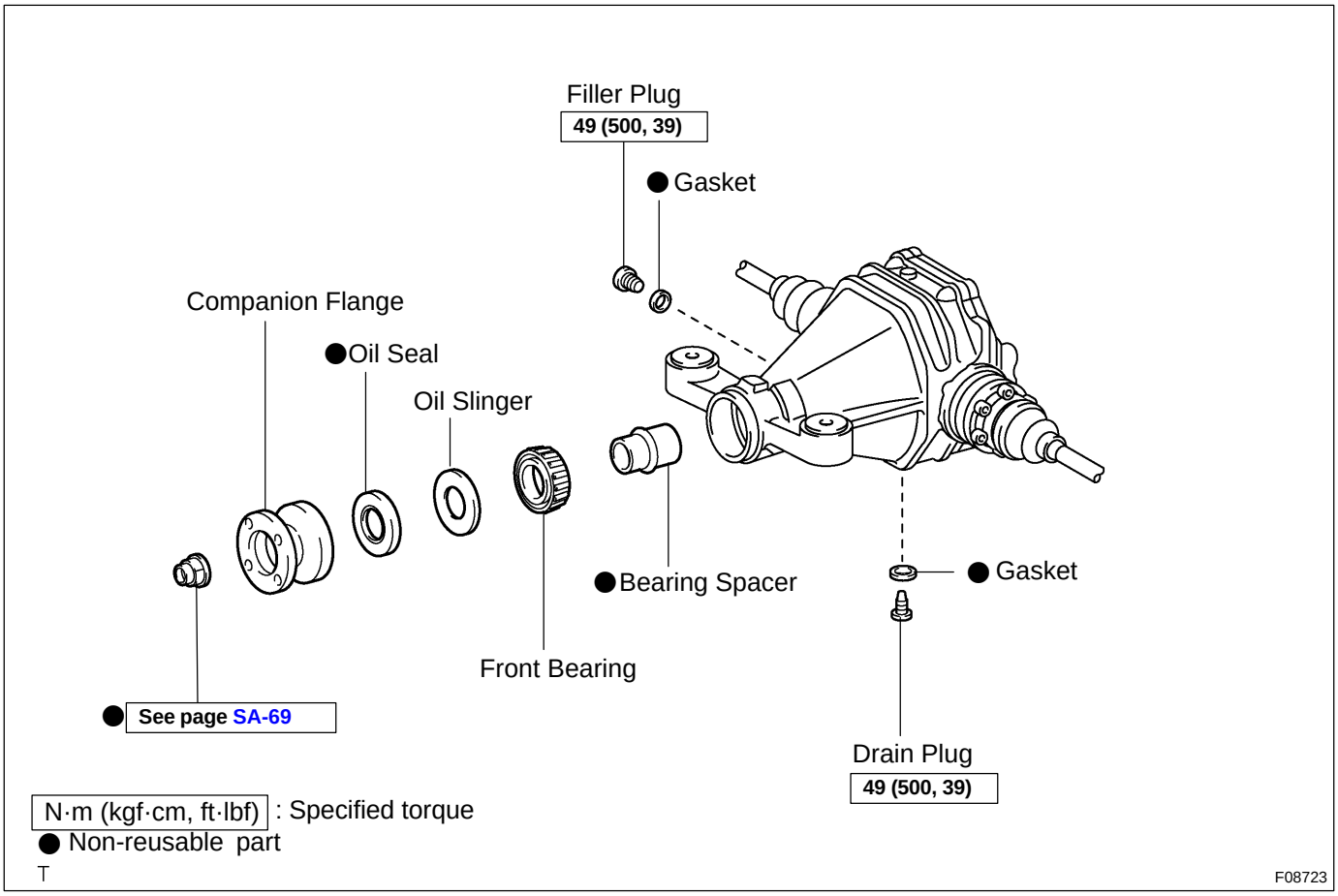
(See page DI-437 or DI-507)

REAR DIFFERENTIAL FRONT OIL SEAL

COMPONENTS

SA1J9-05

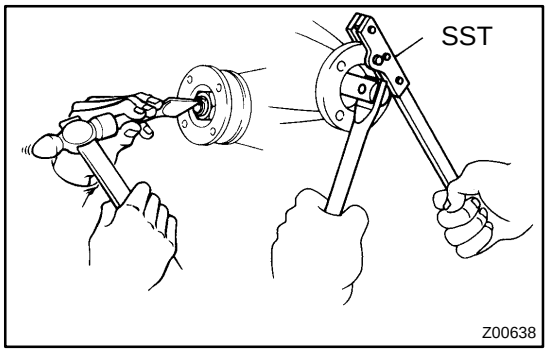



Filler Plug
49 (500, 39)
● Gasket
Companion Flange
●Oil Seal
Oil Slinger
●Bearing Spacer
Front Bearing
● Gasket
● See page SA-69
Drain Plug
49 (500, 39)
N·m (kgf·cm, ft·lbf) : Specified torque
● Non-reusable part
T
F08723

SA28E-01

REPLACEMENT

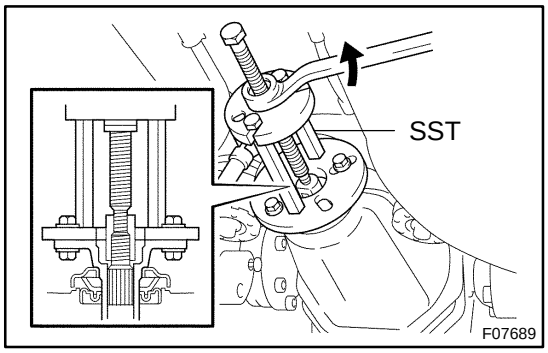
1. **REMOVE NO. 1 REAR FLOOR BOARD**
2. **DRAIN DIFFERENTIAL OIL**
3. **REMOVE EXHAUST PIPE ASSEMBLY**
4. **REMOVE PROPELLER SHAFT (See page PR-4)**



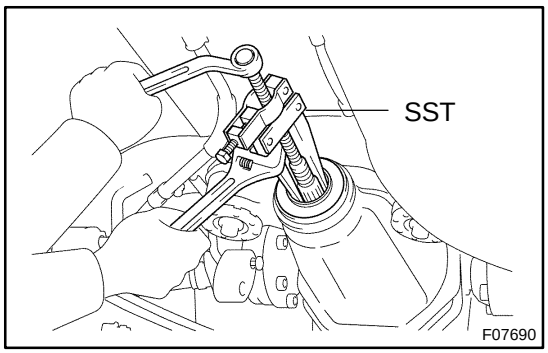
5. **REMOVE COMPANION FLANGE**

(a) Using a chisel and hammer, unstake the nut.

(b) Using SST to hold the flange, remove the nut.
SST 09330-00021



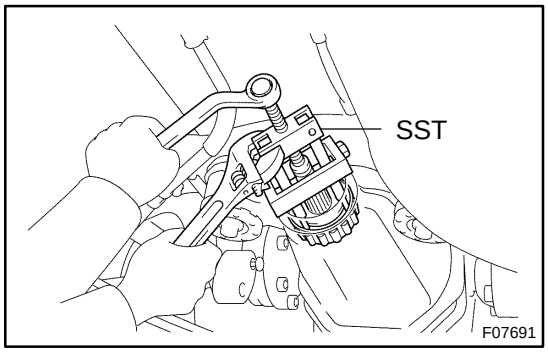
(c) Using SST, remove the companion flange.
SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03030)



6. **REMOVE REAR DIFFERENTIAL FRONT OIL SEAL AND OIL SLINGER**

(a) Using SST, remove the oil seal.
SST 09308-10010

(b) Remove the oil slinger.



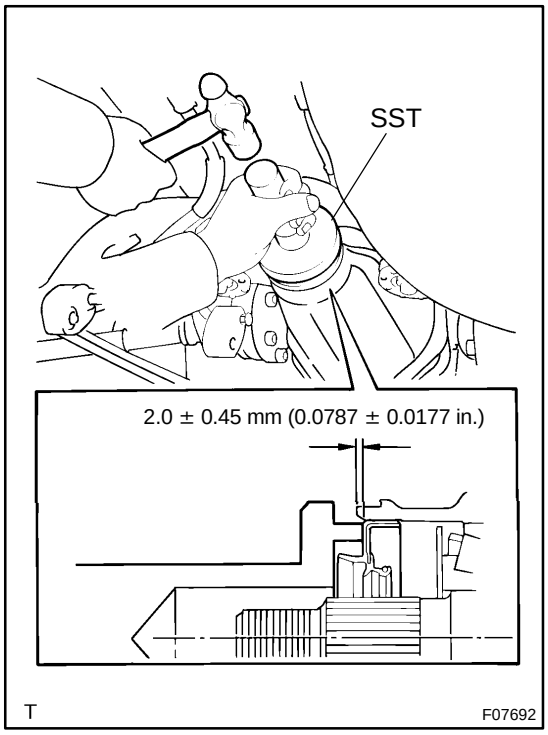
7. **REMOVE FRONT BEARING AND BEARING SPACER**

(a) Using SST, remove the front bearing from the drive pinion.
SST 09556-22010

(b) Remove the bearing spacer.

8. INSTALL BEARING SPACER, FRONT BEARING AND OIL SLINGER

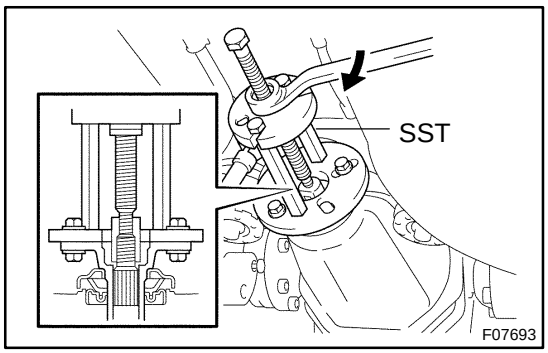
Install a new bearing spacer, front bearing and oil slinger.
HINT:
Install the bearing spacer with its larger diameter side facing the rearward.



9. INSTALL REAR DIFFERENTIAL FRONT OIL SEAL

(a) Using SST and hammer, install a new oil seal.
SST 09554-22010
Oil seal drive in depth:
2.00 ± 0.45 mm (0.0787 ± 0.0177 in.)

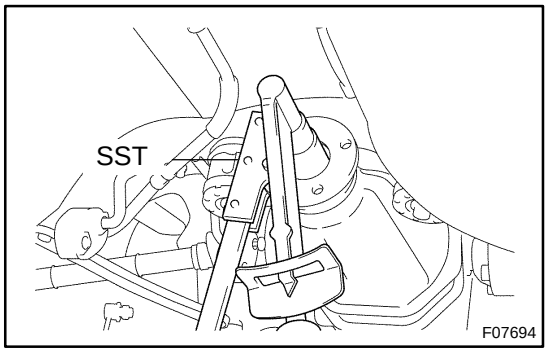
(b) Coat MP grease to the oil seal lip.



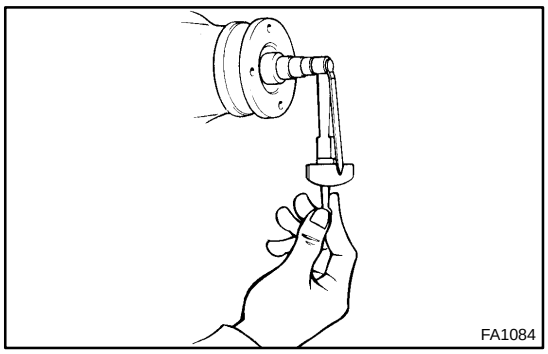
10. INSTALL COMPANION FLANGE

(a) Using SST, install the companion flange.
SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03030)

(b) Coat the threads of a new nut with hypoid gear oil LSD.



(c) Using SST to hold the flange, torque the nut while checking the preload.
SST 09330-00021



11. ADJUST DRIVE PINION PRELOAD

Using a torque wrench, measure the drive pinion preload using the backlash between the drive pinion and ring gear.

Preload (at starting):

New bearing:

0.98 - 1.57 N·m (10 - 16 kgf·cm, 8.7 - 13.9 in.·lbf)

Reused bearing:

0.49 - 0.78 N·m (5 - 8 kgf·cm, 4.3 - 6.9 in.·lbf)

If the preload is greater than the specified value, replace the bearing spacer.

If the preload is less than the specified value, retighten the nut with a force of 13 N·m (130 kgf·cm, 9 ft·lbf) at a time until the specified preload is reached.

Torque: 338 N·m (3,445 kgf·cm, 249 ft·lbf) or less

If the maximum torque is exceeded while retightening the nut, replace the bearing spacer and repeat the preload procedure. Do not loosen the pinion nut to reduce the preload.

12. STAKE DRIVE PINION NUT

Using a chisel and hammer, stake the nut.

13. INSTALL PROPELLER SHAFT (See page PR-10)

14. INSTALL EXHAUST PIPE ASSEMBLY

15. FILL AND CHECK DIFFERENTIAL OIL LEVEL

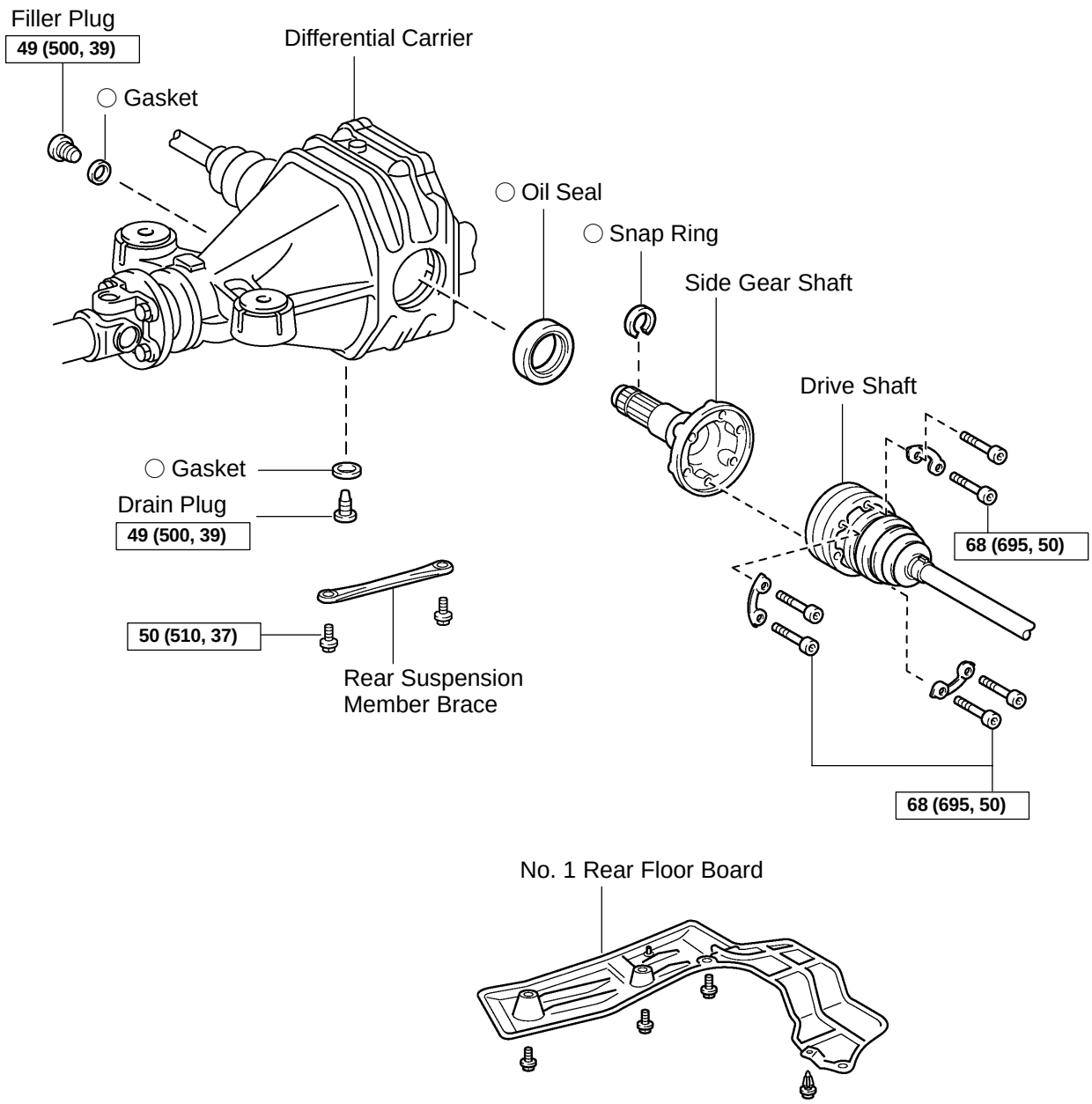
Torque: 49 N·m (500 kgf·cm, 39 ft·lbf)

16. INSTALL NO. 1 REAR FLOOR BOARD

REAR DIFFERENTIAL SIDE GEAR SHAFT OIL SEAL

SA0S9-08

COMPONENTS



N·m (kgf·cm, ft·lbf): Specified torque
○ Non-reusable part

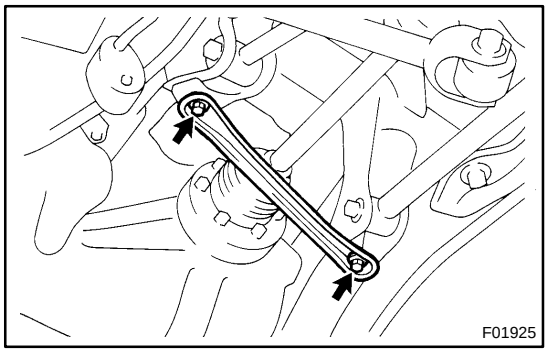
F11566

SA1QY-03

REPLACEMENT

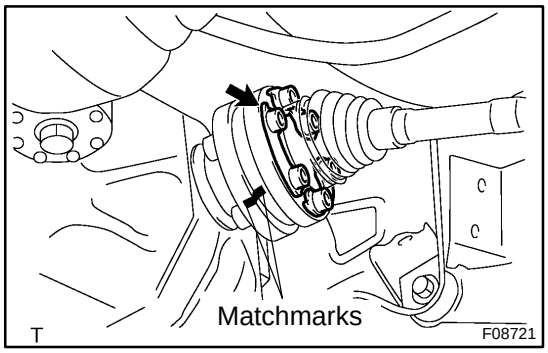
1. REMOVE NO. 1 REAR FLOOR BOARD

2. DRAIN DIFFERENTIAL OIL



3. REMOVE REAR SUSPENSION MEMBER BRACE

Remove the 2 bolts and suspension member brace.



4. DISCONNECT DRIVE SHAFT FROM SIDE GEAR SHAFT

(a) Place matchmarks on the drive shaft and side gear shaft.

NOTICE:

Do not punch the matchmarks.

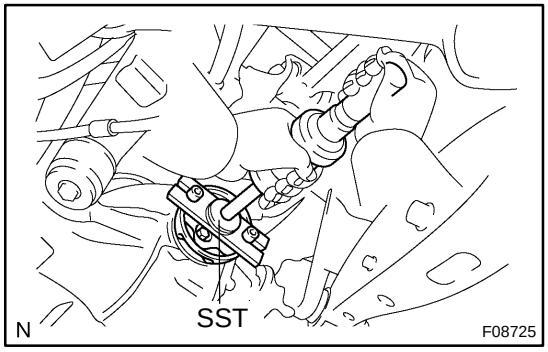
(b) Using a 8 mm hexagon wrench, remove the 6 hexagon bolts and 3 washers, while applying the brakes.

(c) Disconnect the drive shaft from the differential side gear shaft.

NOTICE:

Be careful not to damage the boots and end cover.

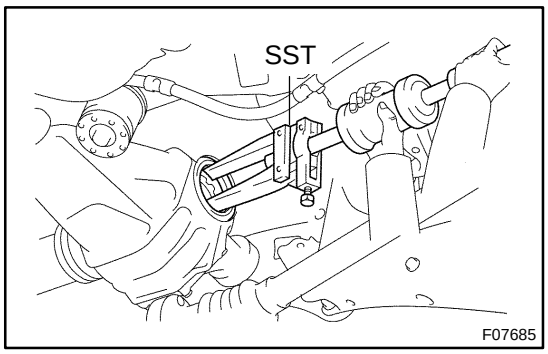
(d) Support the drive shaft securely.



5. REMOVE SIDE GEAR SHAFT

(a) Using SST and 2 bolts, remove the side gear shaft.
SST 09520-24010

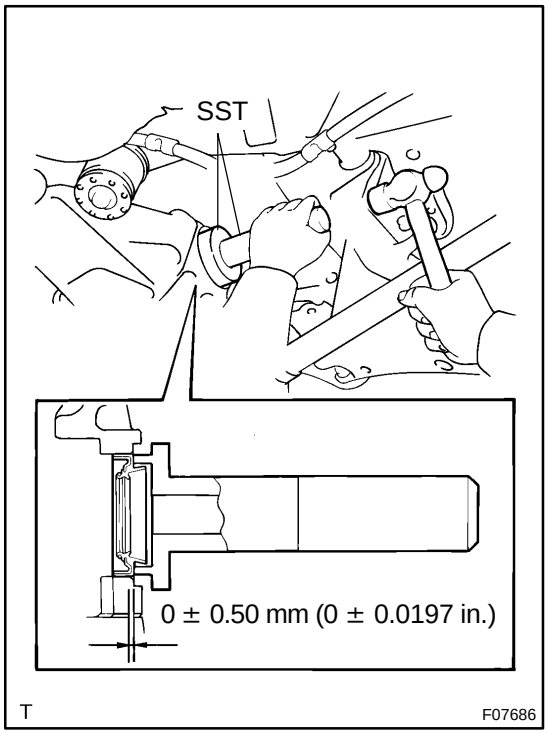
(b) Using needle-nose pliers, remove the snap ring from the side gear shaft.



6. REMOVE SIDE GEAR SHAFT OIL SEAL

Using SST, remove the oil seal.

SST 09308-00010



7. INSTALL SIDE GEAR SHAFT OIL SEAL

(a) Using SST and a hammer, install a new oil seal.

SST 09554-22010

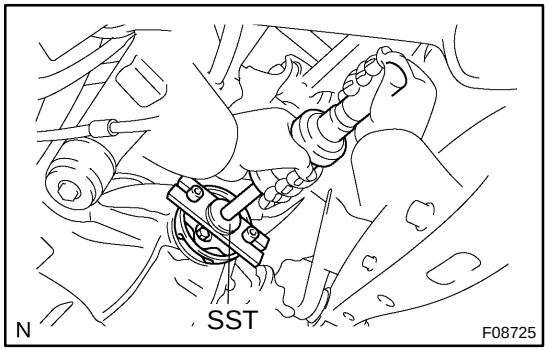
Oil seal drive in depth: 0 ± 0.50 mm (0 ± 0.0197 in.)

(b) Coat MP grease to the oil seal lip.

8. INSTALL SIDE GEAR SHAFT

(a) Using needle-nose pliers, install a new snap ring to the side gear shaft.

(b) Coat the MP grease to the snap ring.



(c) Using SST and 2 bolts, install the side gear shaft.

SST 09520-24010

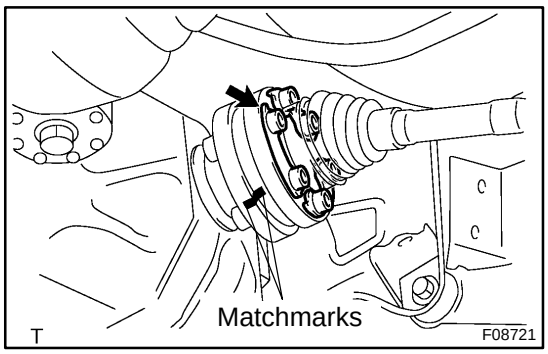
NOTICE:

Be careful not to damage the side gear shaft oil seal.

HINT:

- Before installing the side gear shaft, set the snap ring with it's opening side facing downward.
- Whether the side gear shaft is in contact with the side gear or not can be known from the sound or feeling when driving it.

(d) Check that the side gear shaft will not come out by trying to pull it out by hand.



9. CONNECT DRIVE SHAFT TO SIDE GEAR SHAFT

(a) Align the matchmarks and connect the drive shaft to the side gear shaft.

NOTICE:

Be careful not to damage the boots and end cover.

(b) Using a 8 mm hexagon wrench, install the 3 washers and 6 hexagon bolts, while applying the brakes.
Torque: 68 N·m (695 kgf·cm, 50 ft·lbf)

10. INSTALL REAR SUSPENSION MEMBER BRACE
Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

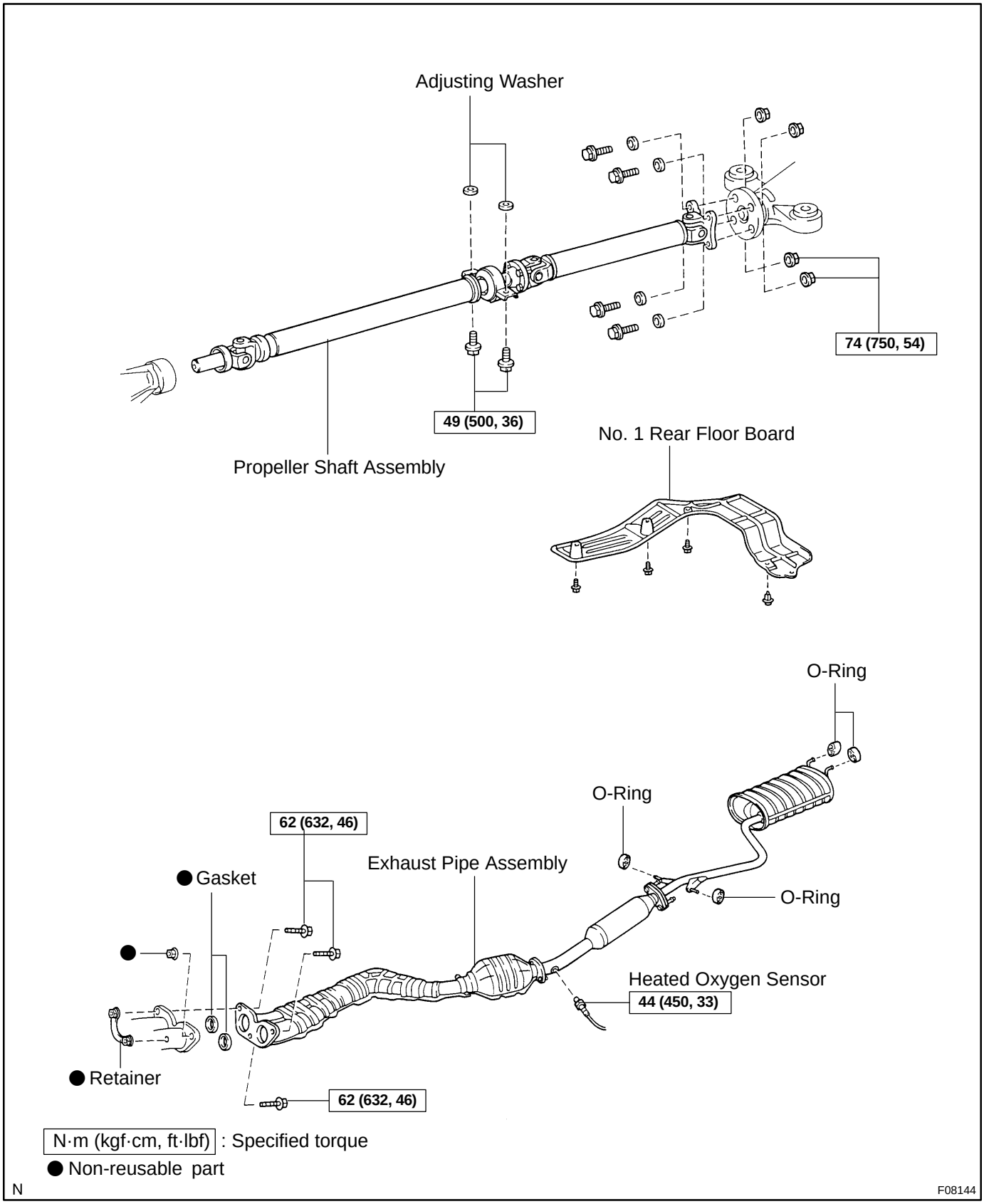
11. FILL AND CHECK DIFFERENTIAL OIL LEVEL
(See page SA-69)

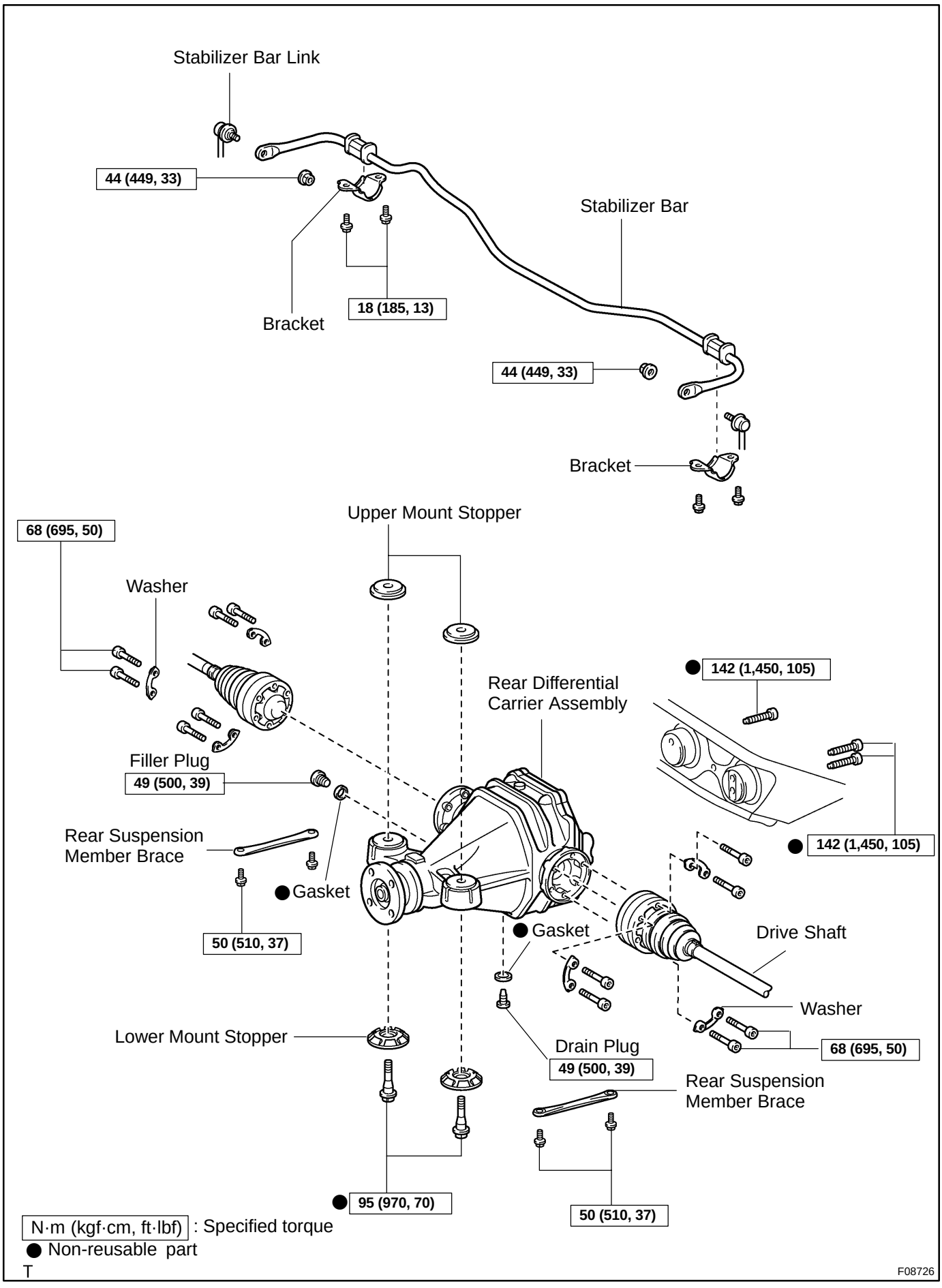
12. INSTALL NO. 1 REAR FLOOR BOARD

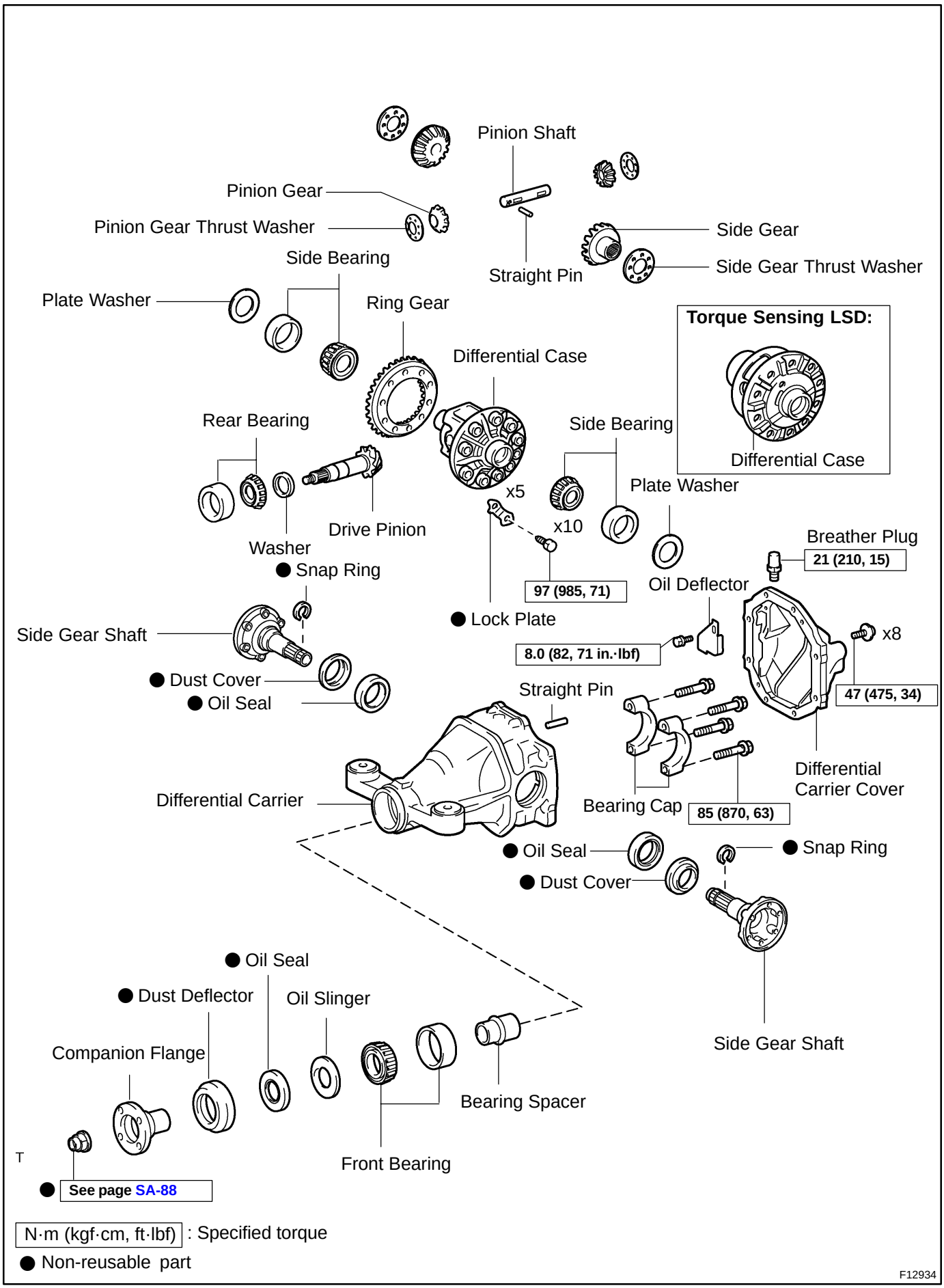
REAR DIFFERENTIAL CARRIER

SA1JC-05

COMPONENTS




Stabilizer Bar Link
44 (449, 33)
Stabilizer Bar
Bracket
18 (185, 13)
44 (449, 33)
Bracket
Upper Mount Stopper
68 (695, 50)
Washer
142 (1,450, 105)
Rear Differential Carrier Assembly
Filler Plug
49 (500, 39)
142 (1,450, 105)
Rear Suspension Member Brace
Gasket
50 (510, 37)
Gasket
Drive Shaft
Washer
Lower Mount Stopper
Drain Plug
49 (500, 39)
68 (695, 50)
Rear Suspension Member Brace
95 (970, 70)
50 (510, 37)
N·m (kgf·cm, ft·lbf) : Specified torque
Non-reusable part
T
F08726

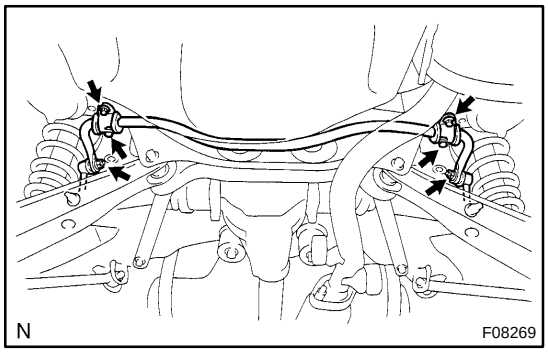

Pinion Shaft
Pinion Gear
Pinion Gear Thrust Washer
Side Gear
Side Gear Thrust Washer
Straight Pin
Side Bearing
Plate Washer
Ring Gear
Differential Case
Torque Sensing LSD:
Differential Case
Rear Bearing
Side Bearing
x5
x10
Plate Washer
Drive Pinion
Washer
Snap Ring
97 (985, 71)
Lock Plate
Breather Plug
21 (210, 15)
Oil Deflector
Side Gear Shaft
8.0 (82, 71 in.·lbf)
x8
Dust Cover
Oil Seal
Straight Pin
47 (475, 34)
Differential Carrier
Bearing Cap
85 (870, 63)
Differential Carrier Cover
Oil Seal
Snap Ring
Dust Cover
Side Gear Shaft
Oil Seal
Dust Deflector
Oil Slinger
Companion Flange
Bearing Spacer
Front Bearing
T
See page SA-88
N·m (kgf·cm, ft·lbf) : Specified torque
Non-reusable part
F12934

SA1JD-05

REMOVAL

1. REMOVE NO. 1 REAR FLOOR BOARD

2. DRAIN DIFFERENTIAL OIL



3. DISCONNECT 2 STABILIZER BAR BRACKETS

Remove the 4 bolts and 2 brackets from the rear suspension member.

4. DISCONNECT STABILIZER BAR LINK FROM STABILIZER BAR

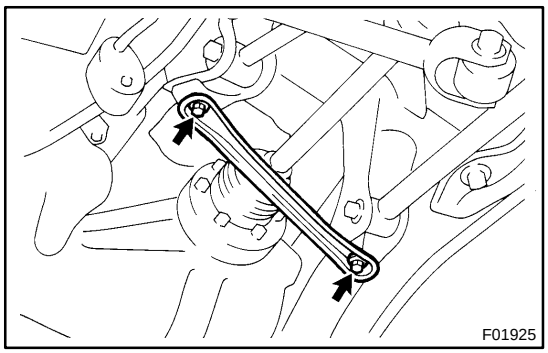
Remove the 2 nuts and disconnect the stabilizer bar links.

HINT:

If the ball joint turns together with the nut, use a hexagon wrench (5 mm) to hold the stud.

5. REMOVE PROPELLER SHAFT (See page PR-4)

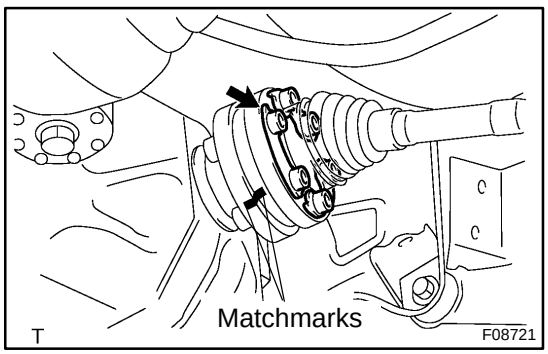
6. REMOVE EXHAUST PIPE ASSEMBLY



7. REMOVE RH AND LH REAR SUSPENSION MEMBER BRACES

(a) Remove the 2 bolts and suspension member brace.

(b) Employ the same manner described above to the other side.



8. DISCONNECT RH AND LH DRIVE SHAFTS FROM SIDE GEAR SHAFTS

(a) Place matchmarks on the drive shaft and side gear shaft.

NOTICE:

Do not punch the matchmarks.

(b) Using a 8 mm hexagon wrench, remove the 6 hexagon bolts and 3 washers, while applying the brakes.

(c) Disconnect the drive shaft from the differential side gear shaft.

NOTICE:

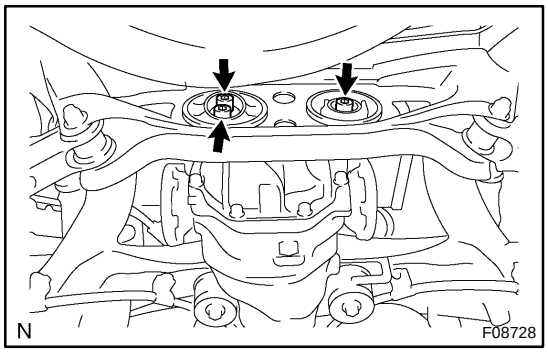
Be careful not to damage the boots and end cover.

(d) Support the drive shaft securely.

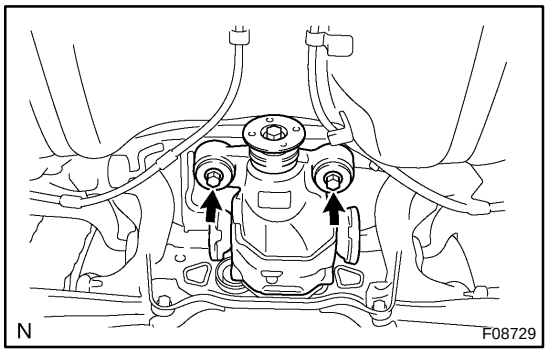
(e) Employ the same manner described above to the other side.

9. REMOVE REAR DIFFERENTIAL CARRIER ASSEMBLY

(a) Support the rear differential carrier assembly with a jack.



(b) Using a hexagon wrench (12 mm), remove the 3 hexagon bolts.



(c) Remove the 2 bolts, lower mount stoppers and rear differential carrier assembly from the rear suspension member.

NOTICE:

Do not let the rear differential carrier assembly interfere with the drive shaft.

(d) Remove the 2 upper mount stoppers from the rear differential carrier.

SA1JE-04

DISASSEMBLY

1. REMOVE DIFFERENTIAL CARRIER COVER

(a) Remove the 8 bolts from the carrier cover.

(b) Using a brass bar and hammer, separate the cover from the carrier.

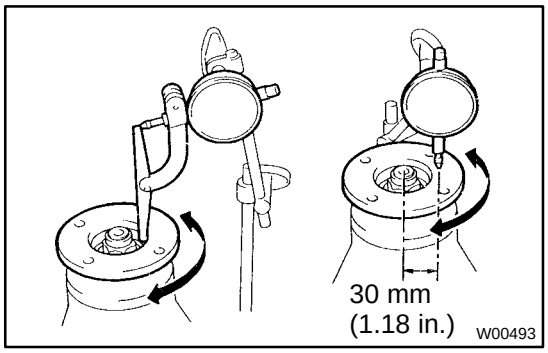
(c) Remove the breather plug from the differential carrier cover.

(d) Remove the bolt and oil deflector from the differential carrier cover.

2. REMOVE DIFFERENTIAL CARRIER STRAIGHT PIN

Using pliers, remove the straight pin from the differential carrier.

3. SET DIFFERENTIAL CARRIER TO OVERHAUL STAND, ETC.

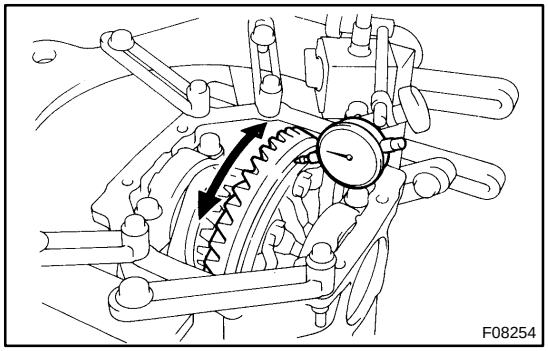


4. CHECK COMPANION FLANGE RUNOUT

Using a dial indicator, measure the vertical and lateral runout of the companion flange.

Maximum runout: 0.09 mm (0.0035 in.)

If the runout is greater than the maximum, replace the companion flange.

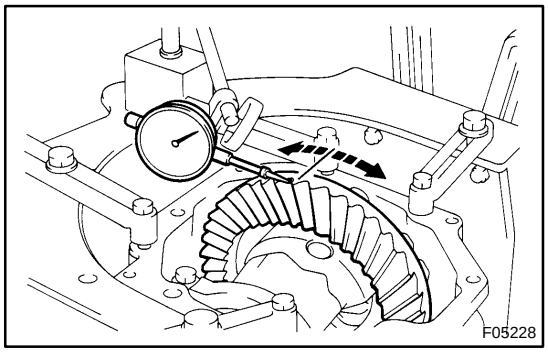


5. CHECK RING GEAR RUNOUT

Using a dial indicator, while turning the companion flange measure the ring gear runout.

Maximum runout: 0.07 mm (0.0028 in.)

If the runout is greater than the maximum, replace the ring gear and drive pinion as a set.



6. CHECK RING GEAR BACKLASH

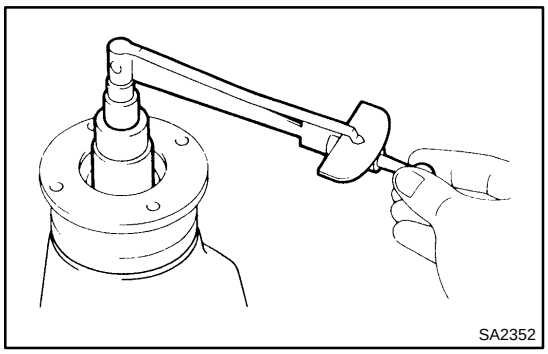
Using a dial indicator, while holding the companion flange measure the ring gear backlash.

Backlash: 0.13 - 0.18 mm (0.0051 - 0.0071 in.)

HINT:

Measure at 3 or more places on the circumference of the ring gear.

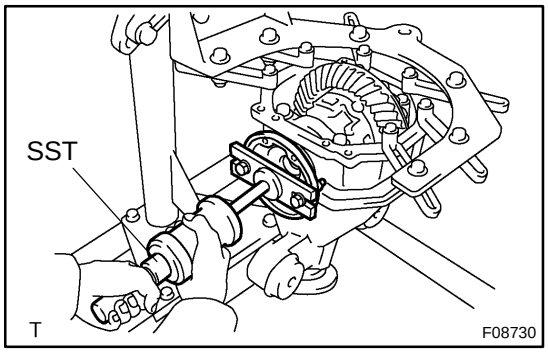
If the backlash is not within the specified value, adjust the backlash (See page SA-88).



7. MEASURE DRIVE PINION PRELOAD

Using a torque wrench, measure the drive pinion preload using the backlash of the drive pinion and ring gear.

Preload (at starting):
0.49 - 0.78 N·m (5 - 8 kgf·cm, 4.3 - 6.9 in.·lbf)



8. REMOVE SIDE GEAR SHAFTS

(a) Using SST and 2 bolts, remove the 2 side gear shafts from the differential carrier.
SST 09520-24010

(b) Using a screwdriver, remove the 2 snap rings from the side gear shafts.

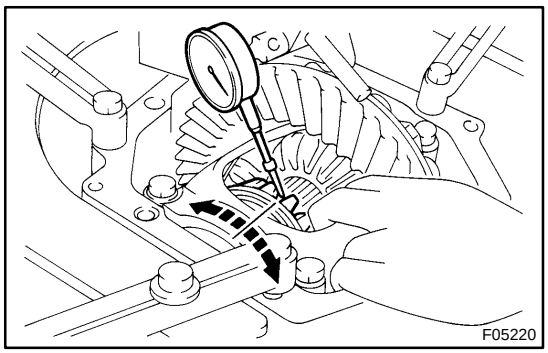
9. CHECK TOTAL PRELOAD

Using a torque wrench, measure the total preload with the teeth of the drive pinion and ring gear in contact.

Total preload (at starting):
Drive pinion preload plus
0.39 - 0.59 N·m (4 - 6 kgf·cm, 3.5 - 5.2 in.·lbf)

If necessary, disassemble and inspect the differential.

10. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION (See page SA-88)

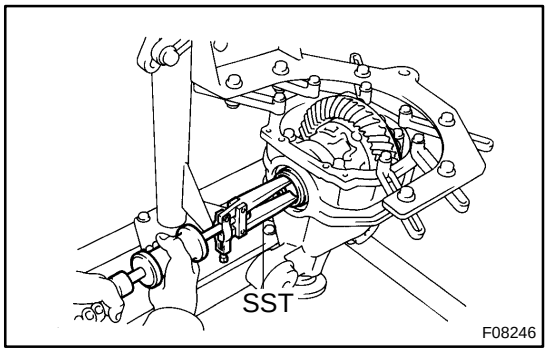


11. 2 pinion differential:
CHECK SIDE GEAR BACKLASH

Using a dial indicator, measure the side gear backlash while holding one pinion gear toward the differential case.

Backlash: 0.05 - 0.20 mm (0.0020 - 0.0079 in.)

If the backlash is not within the specified value, install the correct thrust washers (See page SA-88).

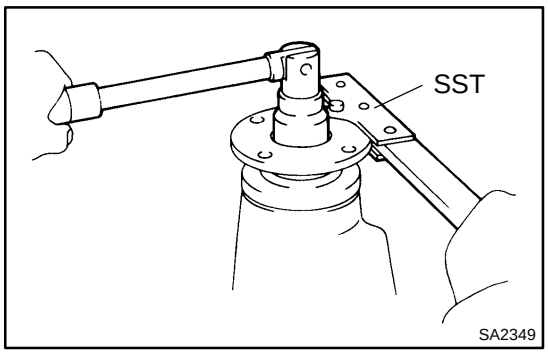


12. REMOVE SIDE GEAR SHAFT OIL SEALS

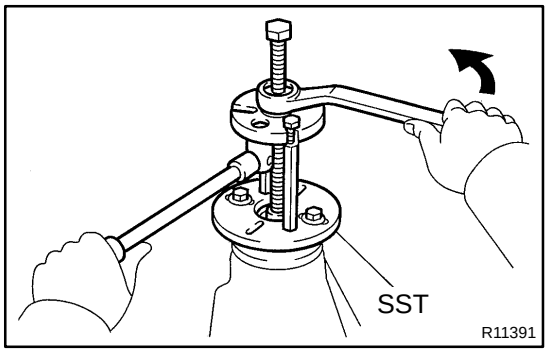
Using SST, remove the 2 side gear shaft oil seals.
SST 09308-00010

13. REMOVE COMPANION FLANGE

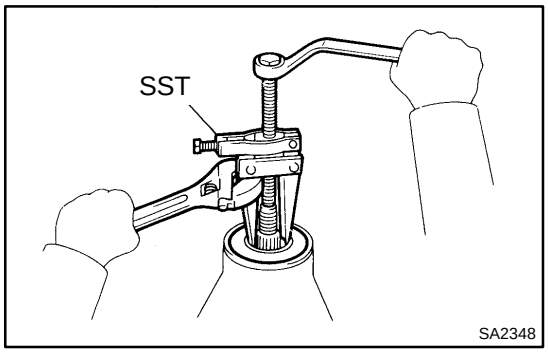
(a) Using a chisel and hammer, unstake the nut.



(b) Using SST to hold the flange, remove the nut.
SST 09330-00021



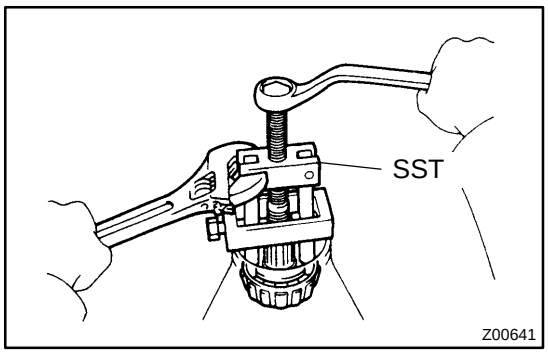
(c) Using SST, remove the companion flange.
SST 09950- 30012 (09951- 03010, 09953- 03010, 09954-03010, 09955-03030, 09956-03020)



14. REMOVE FRONT OIL SEAL AND OIL SLINGER

(a) Using SST, remove the oil seal from the differential carrier.
SST 09308-10010

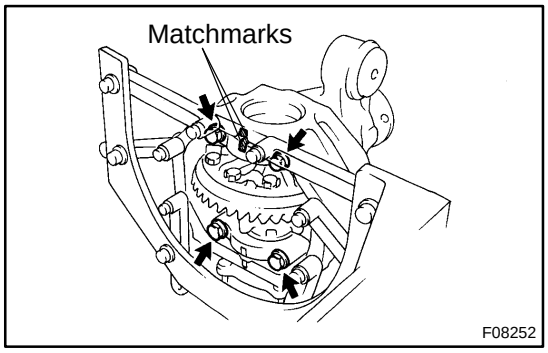
(b) Remove the oil slinger.



15. REMOVE FRONT BEARING

Using SST, remove the front bearing from the drive pinion.
SST 09556-22010

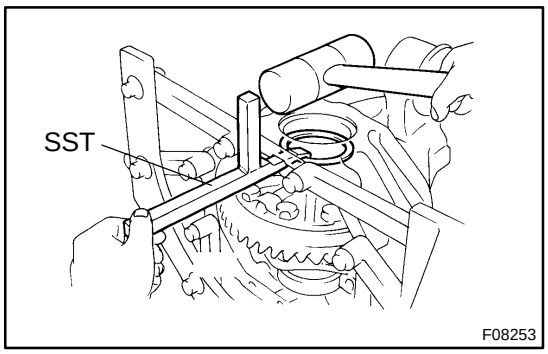
If the front bearing is damaged or worn, replace the front bearing.



16. REMOVE DIFFERENTIAL CASE ASSEMBLY

(a) Place matchmarks on the bearing cap and differential carrier.

(b) Remove the 4 bolts and 2 bearing caps.



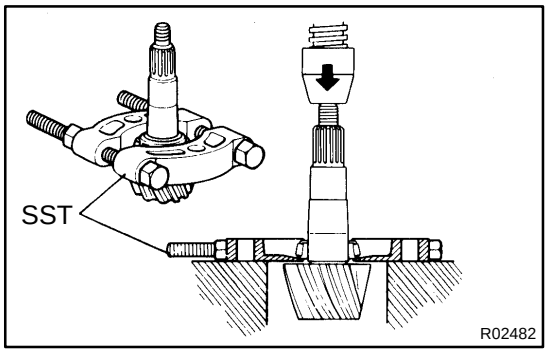
(c) Using SST and a plastic hammer, remove the 2 plate washers.
SST 09504-22012

HINT:
Measure the plate washer and note down the thickness.

(d) Remove the differential case with the bearing outer races from the differential carrier.

HINT:
Tag the bearing outer races to show the location for reassembling.

17. REMOVE DRIVE PINION AND BEARING SPACER FROM DIFFERENTIAL CARRIER

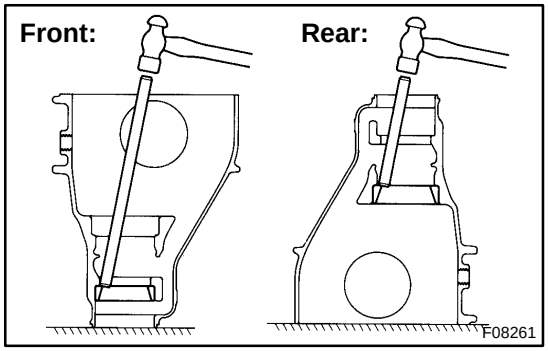


18. REMOVE REAR BEARING

(a) Using SST and a press, remove the rear bearing from the drive pinion.
SST 09950-00020

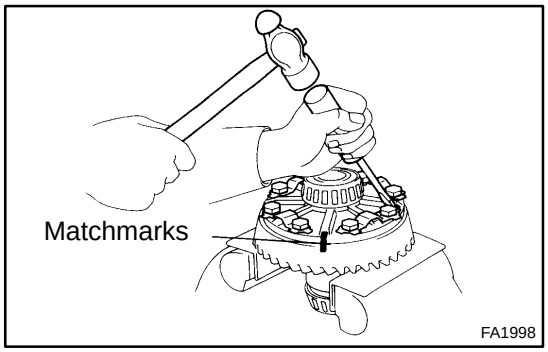
HINT:
If the drive pinion or ring gear is damaged, replace them as a set.

(b) Remove the washer.



19. REMOVE FRONT AND REAR BEARING OUTER RACES

Using a brass bar and hammer, remove the front and rear bearing outer races.



20. REMOVE RING GEAR

(a) Place matchmarks on the ring gear and differential case.

(b) Using a screwdriver and hammer, unstake the 5 lock plates.

(c) Remove the 10 bolts and 5 lock plates.

(d) Using a plastic hammer, tap around on the ring gear equally to separate it from the differential case.

21. CHECK DIFFERENTIAL CASE RUNOUT

(a) Place the bearing outer races on their respective bearings. Check that the right and left outer races are not interchanged.

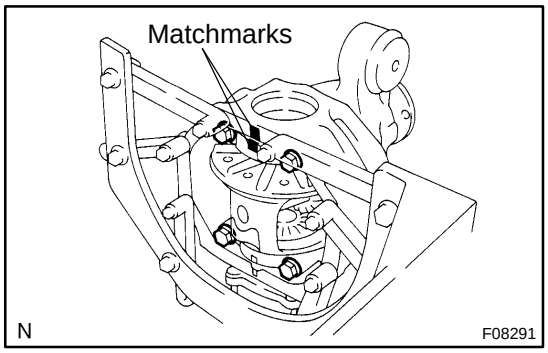
(b) Install the assembled plate washers onto the side bearings.

(c) Install the differential case in the differential carrier.

HINT:

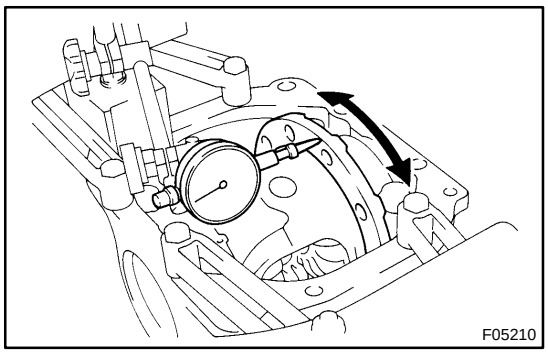
If it is difficult to install the differential case into the carrier, replace the plate washer with a thinner one.

However, select a plate washer that allows no clearance between it and the carrier.



(d) Align matchmarks on the bearing cap and differential carrier.

(e) Install and uniformly tighten the 4 bolts a little at a time.



(f) Using a dial indicator, while turning the companion flange measure the differential case runout.

Maximum runout: 0.07 mm (0.0028 in.)

If the runout is greater than the maximum, replace the differential case and side bearings as a set.

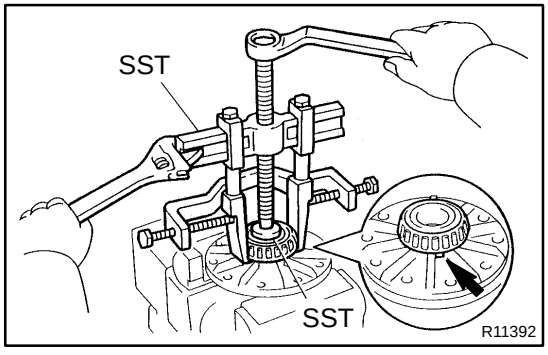
(g) Remove the differential case.

22. REMOVE SIDE BEARINGS

(a) 2 pinion differential:

Using SST, remove the 2 side bearings from the differential case.

SST 09950-40011 (09951-04020, 09952-04010, 09953-04030, 09954-04010, 09955-04061, 09957-04010, 09958-04011), 09950-60010 (09951-00480)

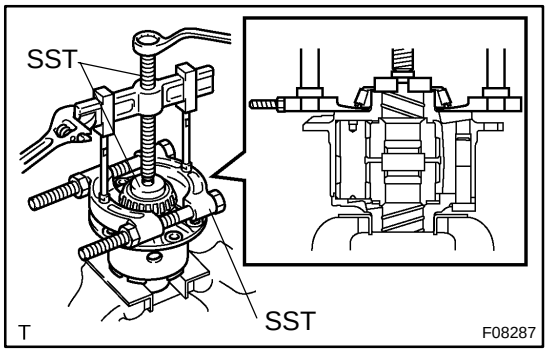


HINT:

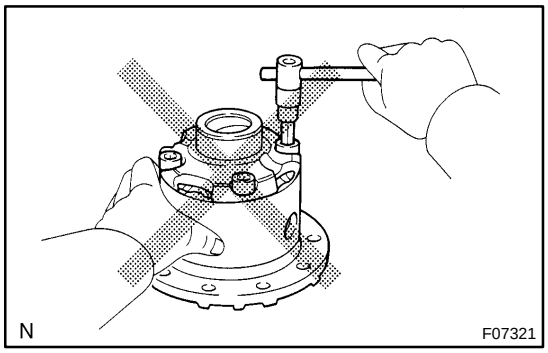
Fix the claws of SST to the notches in the differential case.

(b) Torque sensing LSD ring gear side:
Using SST, remove the side bearing from the differential case.
SST 09950- 40011 (09951- 04020, 09952- 04010, 09953- 04030, 09954- 04010, 09955- 04061, 09957- 04010, 09958- 04011), 09950- 60010 (09951-00480)

HINT:
Fix the claws of SST to the notches in the differential case.

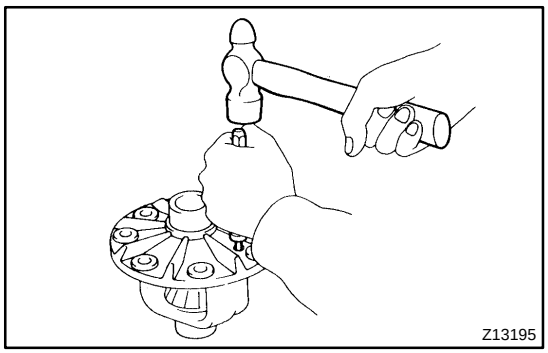


(c) Torque sensing LSD ring gear back side:
Using SST, remove the side bearing from the differential case.
SST 09950- 00020, 09950- 40011 (09951- 04020, 09953- 04030, 09957- 04010), 09950- 50012 (09952-05010, 09954-05030, 09955-05040)



23. 2 pinion differential:
DISASSEMBLE DIFFERENTIAL CASE ASSEMBLY

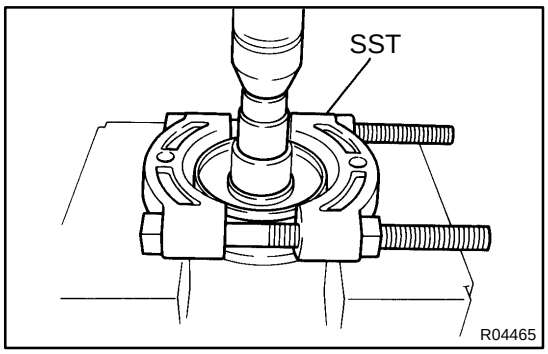
NOTICE:
If equipped with torque sensing LSD, do not disassemble the differential case.



(a) Using a pin punch (5 mm) and hammer, remove the straight pin.
(b) Remove the pinion shaft, 2 pinion gears, pinion gear thrust washers, side gears and side gear thrust washers from the differential case.

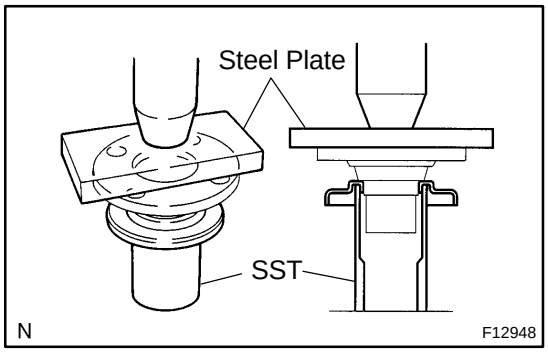
SA1R0-03

REPLACEMENT



1. REPLACE COMPANION FLANGE DUST DEFLECTOR, IF NECESSARY

(a) Using SST and a press, remove the dust deflector.
SST 09950-00020

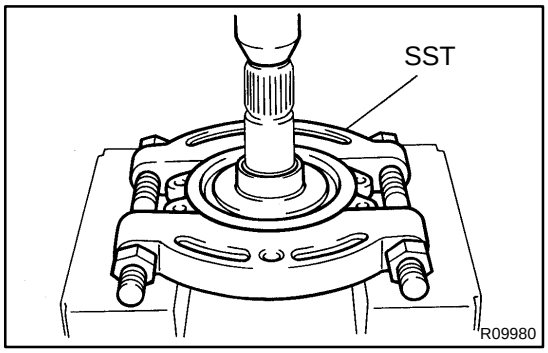


(b) Using SST and a press, install a new dust deflector.

NOTICE:

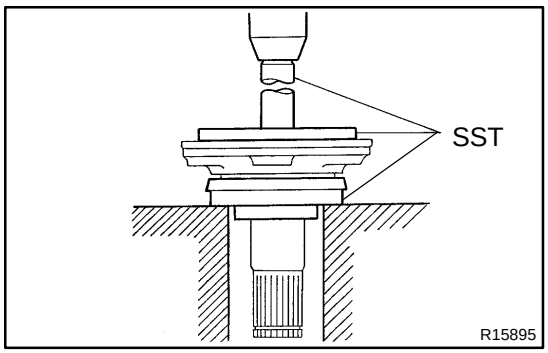
SST 09710-04061

Do not deform the dust deflector.



2. REPLACE SIDE GEAR SHAFT DUST COVER, IF NECESSARY

(a) Using SST and a press, remove the dust cover.
SST 09950-00020



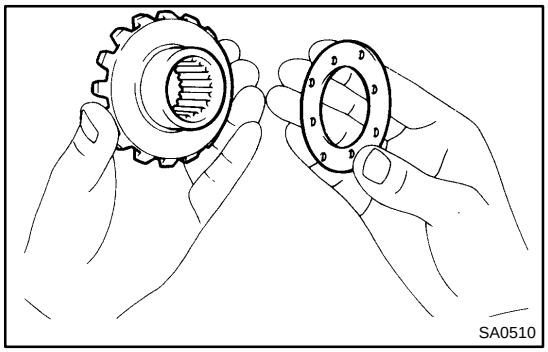
(b) Using SST and a press, install a new dust cover.
SST 09502-24010, 09950-60020 (09951-00780), 09950-70010 (09950-07150)

SA1JF-05

REASSEMBLY

HINT:

- Using a shop rag, clean off any foreign object from the parts.
- Apply all of the sliding and rotating surfaces with hypoid gear oil.


SA0510

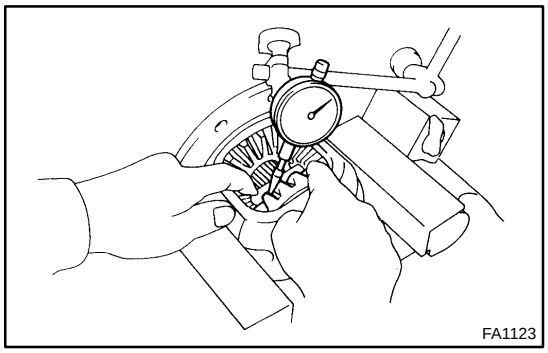
1. 2 pinion differential:
MEASURE SIDE GEAR BACKLASH AND REASSEMBLE DIFFERENTIAL CASE

(a) Install the 2 thrust washers to the 2 side gears.

(b) Install the 2 side gears, pinion gears, pinion gear thrust washers and pinion shaft in the differential case.

HINT:

Align the holes of the differential case and pinion shaft.

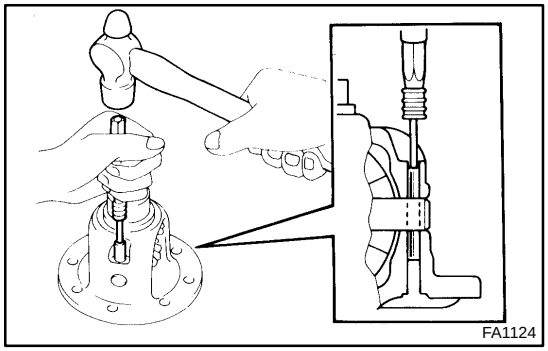

FA1123

(c) Using a dial indicator, measure the side gear backlash while holding one pinion gear toward the differential case.
Backlash: 0.05 - 0.20 mm (0.0020 - 0.0079 in.)

If the backlash is not within the specified value, install the side gear thrust washers with different thicknesses.

Thrust washer thickness:

Thickness mm (in.)	Thickness mm (in.)
1.6 (0.062)	1.8 (0.071)
1.7 (0.067)	-


FA1124

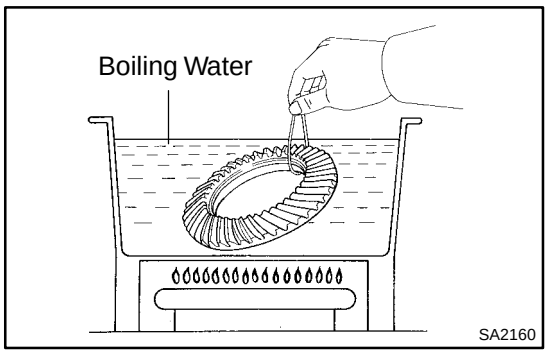
2. 2 pinion differential:
INSTALL STRAIGHT PIN AND STAKE DIFFERENTIAL CASE

(a) Using a 5 mm pin punch and hammer, install the straight pin through the differential case and hole of the pinion shaft.

(b) Using a chisel and hammer, stake the outside of the differential case pin hole.

3. INSTALL RING GEAR ON DIFFERENTIAL CASE

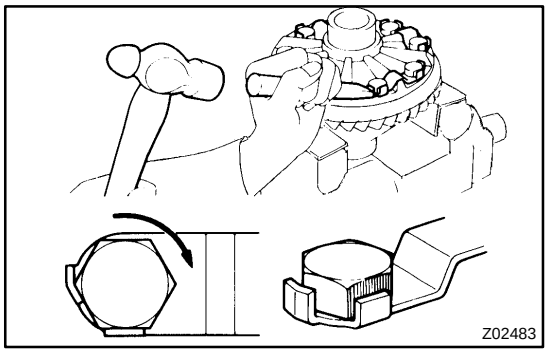
(a) Clean the contact surfaces of the differential case and ring gear.



(b) Heat the ring gear to approx. 100°C (212°F) in boiling water.
(c) Carefully take the ring gear out of the boiling water.
(d) After the moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.

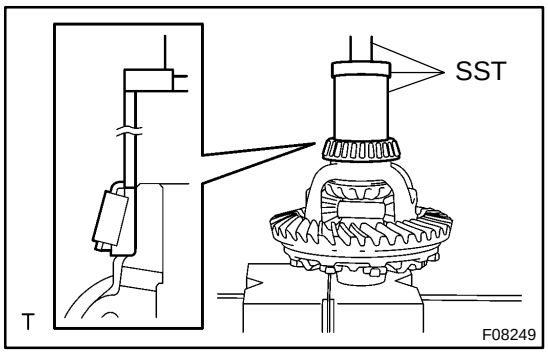
HINT:
Align the matchmarks on the ring gear and differential case.

(e) Temporarily install 5 new lock plates and 10 bolts so that the bolt holes in the ring gear and differential case are not misaligned.
(f) After the ring gear has cooled sufficiently, torque the 10 ring gear set bolts.
Torque: 97 N·m (985 kgf·cm, 71 ft·lbf)



(g) Using a chisel and hammer, stake the 5 lock plates.

HINT:
Stake the claws of the lock plates to fix the bolts. For the claw contacting the protruding portion of the bolt, stake only the half of it along the tightening direction.



4. INSTALL SIDE BEARINGS

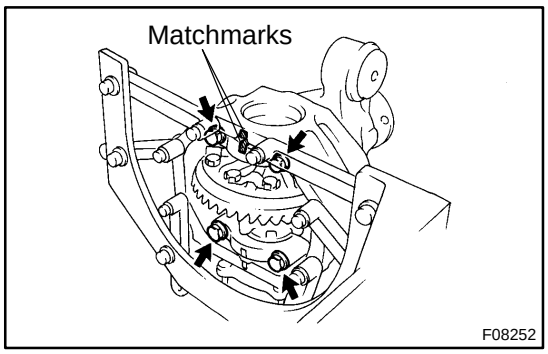
Using SST and a press, install the 2 bearings to the differential case.

SST 09710- 04081, 09950- 60010 (09951- 00600), 09950-70010 (09951-07100)

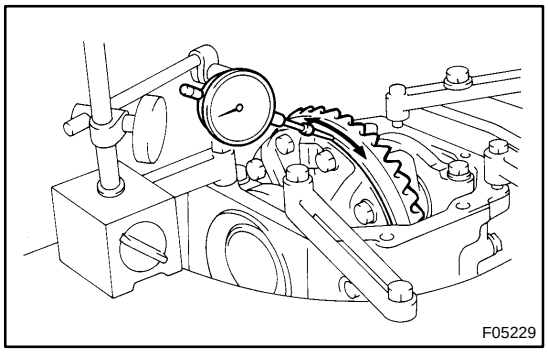
5. CHECK RING GEAR RUNOUT

(a) Place the bearing outer races on their respective bearings. Check that the right and left outer races are not interchanged.
(b) Install the assembled plate washers onto the side bearings.
(c) Install the differential case in the differential carrier.

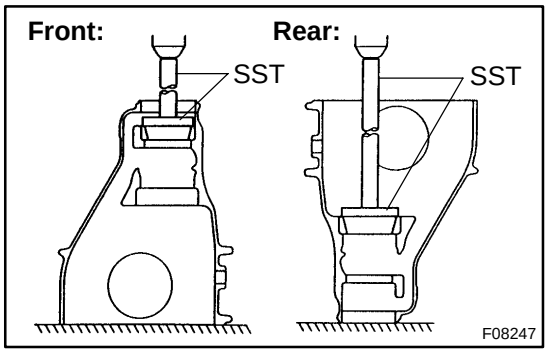
HINT:
If it is difficult to install the differential case into the carrier, replace the plate washer with a thinner one.
However, select a plate washer that allows no clearance between it and the carrier.



(d) Align matchmarks on the bearing cap and differential carrier.
(e) Install and uniformly tighten the 4 bolts a little at a time.



(f) Using a dial indicator, measure the ring gear runout.
Maximum runout: 0.07 mm (0.0028 in.)
(g) Remove the differential case.



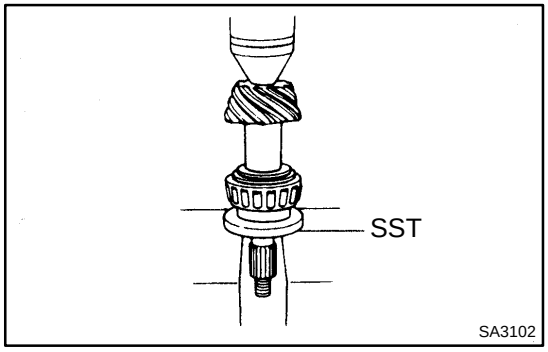
6. INSTALL FRONT AND REAR BEARING OUTER RACES

(a) Using SST and a press, install the front bearing outer race.
SST 09950- 60020 (09951- 00710), 09950- 70010 (09951-07150)
(b) Using SST and a press, install the rear bearing outer race.
SST 09950- 60020 (09951- 00790), 09950- 70010 (09951-07200)

7. INSTALL REAR BEARING

(a) Install the washer on the drive pinion.

HINT:
First fit a washer with the same thickness as the washer which was removed, then after checking the tooth contact pattern, replace the washer with one of a different thickness if necessary.



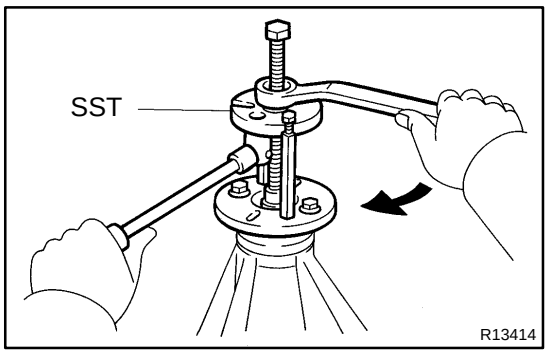
(b) Using SST and a press, install the rear bearing onto the drive pinion.
SST 09506-30012

8. TEMPORARILY ADJUST DRIVE PINION PRELOAD

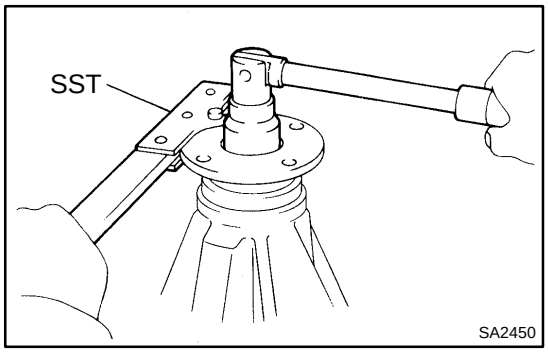
(a) Install the drive pinion and front bearing.

HINT:
Assemble the spacer and oil seal after adjusting the gear contact pattern.

(b) Install the oil slinger.



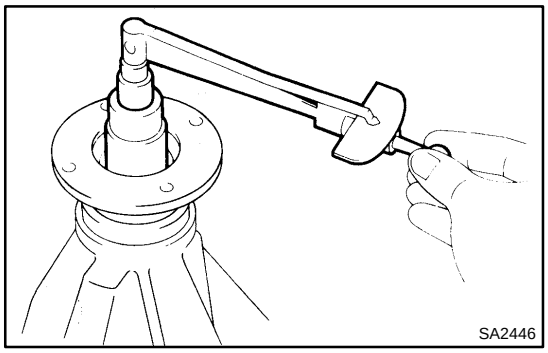
(c) Using SST, install the companion flange.
SST 09950- 30012 (09951- 03010, 09953- 03010, 09954-03010, 09955-03030, 09956-03020)



(d) Using SST to hold the flange and adjust the drive pinion preload by tightening the nut.

NOTICE:

- **Coat the nut and threads of the drive pinion with hypoid gear oil LSD.**
- **As there is no spacer, tighten the nut a little at a time, being careful not to overtighten.**



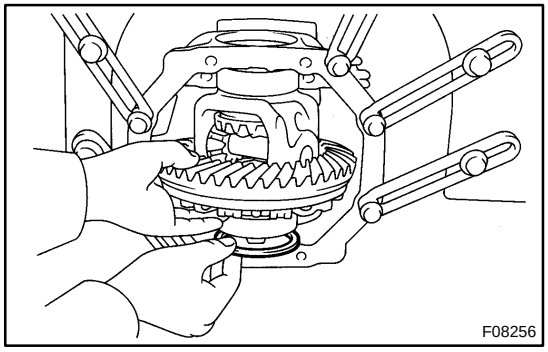
(e) Using a torque wrench, measure the drive pinion preload using the backlash between the drive pinion and ring gear.
Preload (at starting):
New bearing:
0.98 - 1.57 N·m (10 - 16 kgf·cm, 8.7 - 13.9 in.·lbf)
Reused bearing:
0.49 - 0.78 N·m (5 - 8 kgf·cm, 4.3 - 6.9 in.·lbf)

HINT:
Measure the drive pinion preload after turning the bearing clockwise and counterclockwise several times to make the bearing smooth.

9. INSTALL DIFFERENTIAL CASE IN DIFFERENTIAL CARRIER

(a) Place the bearing outer races on their respective bearings. Check that the right and left outer races are not interchanged.

(b) Install the differential case in the differential carrier.

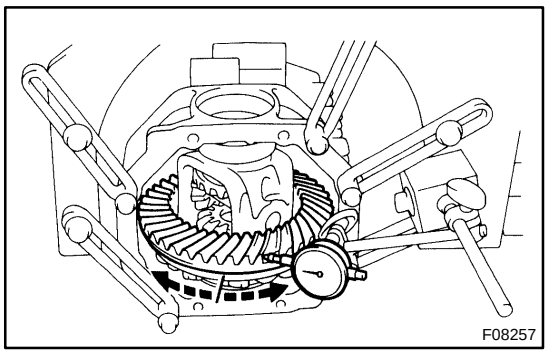


10. ADJUST RING GEAR BACKLASH

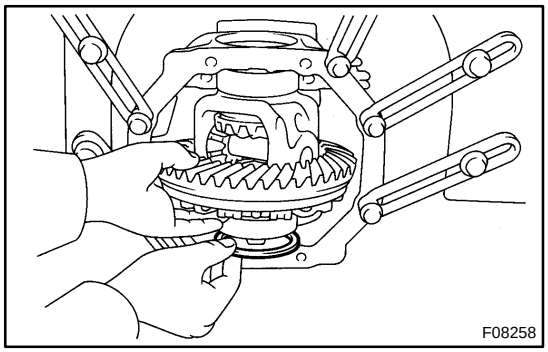
(a) Install the plate washer on the ring gear back side.

HINT:
Make sure that the ring gear has backlash.

(b) Tap on the ring gear with a plastic hammer so that the washer fits to the bearing.



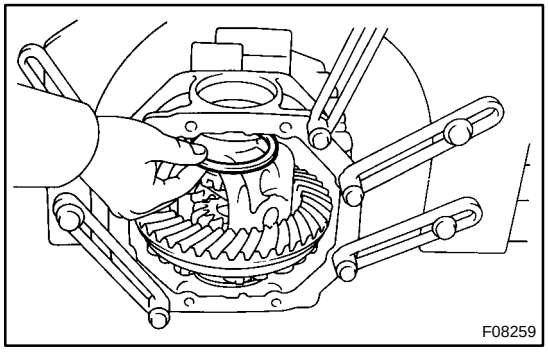
(c) Using a dial indicator, while holding the companion flange, measure the ring gear backlash.
Backlash (Reference):
0.13 - 0.18 mm (0.0051 - 0.0071 in.)



(d) Select a plate washer for back side ring gear, using the backlash as reference.

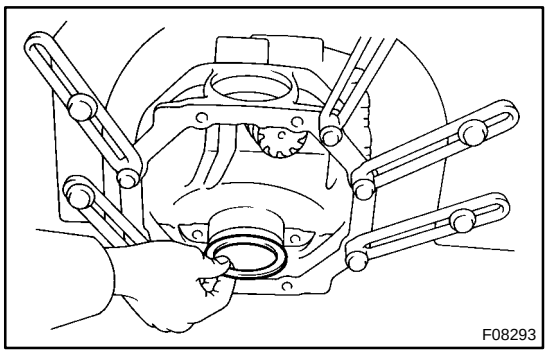
Side plate washer thickness:

Thickness mm (in.)	Thickness mm (in.)
2.58 (0.1016)	3.04 (0.1197)
2.60 (0.1024)	3.06 (0.1205)
2.62 (0.1031)	3.08 (0.1213)
2.64 (0.1039)	3.10 (0.1220)
2.66 (0.1047)	3.12 (0.1228)
2.68 (0.1055)	3.14 (0.1236)
2.70 (0.1063)	3.16 (0.1244)
2.72 (0.1071)	3.18 (0.1252)
2.74 (0.1079)	3.20 (0.1260)
2.76 (0.1087)	3.22 (0.1268)
2.78 (0.1094)	3.24 (0.1276)
2.80 (0.1102)	3.26 (0.1283)
2.82 (0.1110)	3.28 (0.1291)
2.84 (0.1118)	3.30 (0.1299)
2.86 (0.1126)	3.32 (0.1307)
2.88 (0.1134)	3.34 (0.1315)
2.90 (0.1142)	3.36 (0.1323)
2.92 (0.1150)	3.38 (0.1331)
2.94 (0.1157)	3.40 (0.1339)
2.96 (0.1165)	3.42 (0.1346)
2.98 (0.1173)	3.44 (0.1354)
3.00 (0.1181)	3.46 (0.1362)
3.02 (0.1189)	3.48 (0.1370)

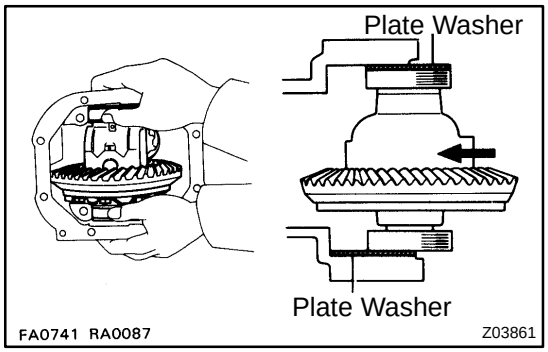


(e) Select a ring gear teeth side plate washer so that there is no clearance between the outer race and case.

(f) Remove the plate washers and differential case.

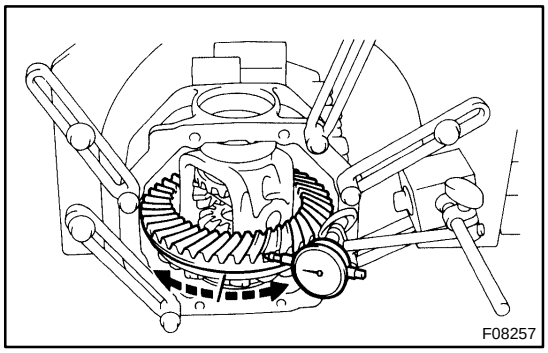


(g) Install the plate washer into the ring gear back side of the carrier.



(h) Place the other plate washer onto the differential case together with the outer race, and install the differential case with the outer race into the carrier.

(i) Tap on the ring gear with a plastic hammer so that the washers fit to the bearing.



(j) Using a dial indicator, while holding the companion flange measure the ring gear backlash.

Backlash: 0.13 - 0.18 mm (0.0051 - 0.0071 in.)

If the backlash is not within the specified value, adjust it by either increasing or decreasing the thickness of washers on both sides by an equal amount.

HINT:

There should be no clearance between the plate washer and case.

Make sure that there is ring gear backlash.

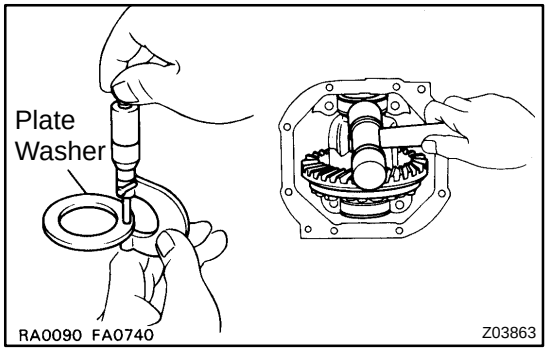
11. ADJUST SIDE BEARING PRELOAD

(a) Remove the ring gear teeth side plate washer and using a micrometer, measure the thickness.

(b) Using the backlash as a reference, install a new washer 0.06 - 0.09 mm (0.0024 - 0.0035 in.) thicker than the washer removed.

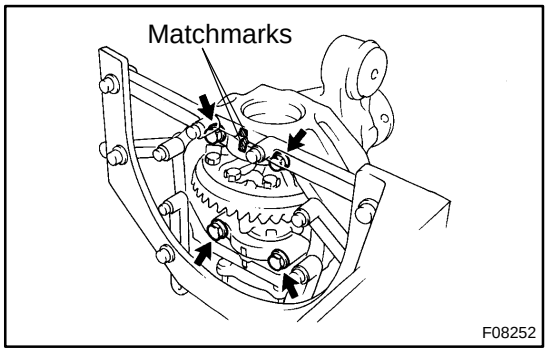
HINT:

Select a washer which can be pressed in 2/3 of the way with your finger.



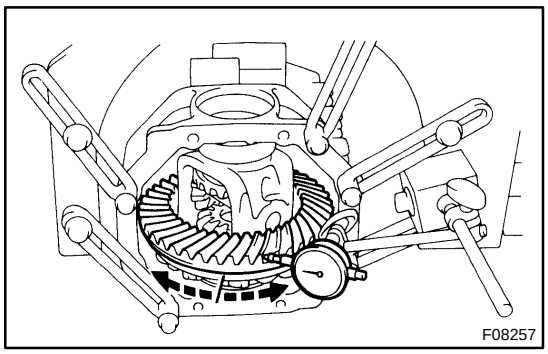
(c) Using a plastic hammer, install the plate washer.

(d) Align matchmarks on the bearing cap and differential carrier.



(e) Tighten the 4 bolts.

Torque: 85 N·m (870 kgf·cm, 63 ft·lbf)



(f) Using a dial indicator, while holding the companion flange adjust the ring gear backlash until it is within the specified value.

Backlash: 0.13 - 0.18 mm (0.0051 - 0.0071 in.)

If the backlash is not within the specified value, adjust by either increasing or decreasing the thickness of washers on both sides by an equal amount.

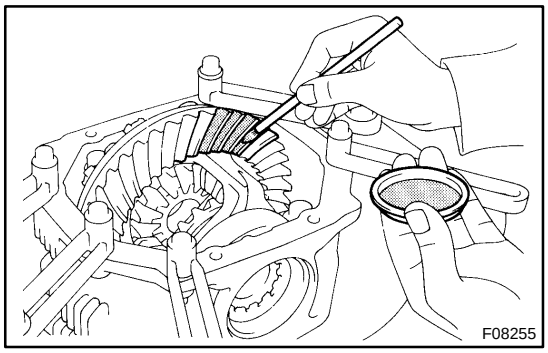
HINT:

The backlash will change by about 0.02 mm (0.0008 in.) corresponding to 0.03 mm (0.0012 in.) change in the plate washer.

12. MEASURE TOTAL PRELOAD

Using a torque wrench, measure the total preload with the teeth of the drive pinion and ring gear in contact.

Total preload (at starting):
Drive pinion preload plus
0.39 - 0.59 N·m (4 - 6 kgf·cm, 3.5 - 5.2 in.·lbf)

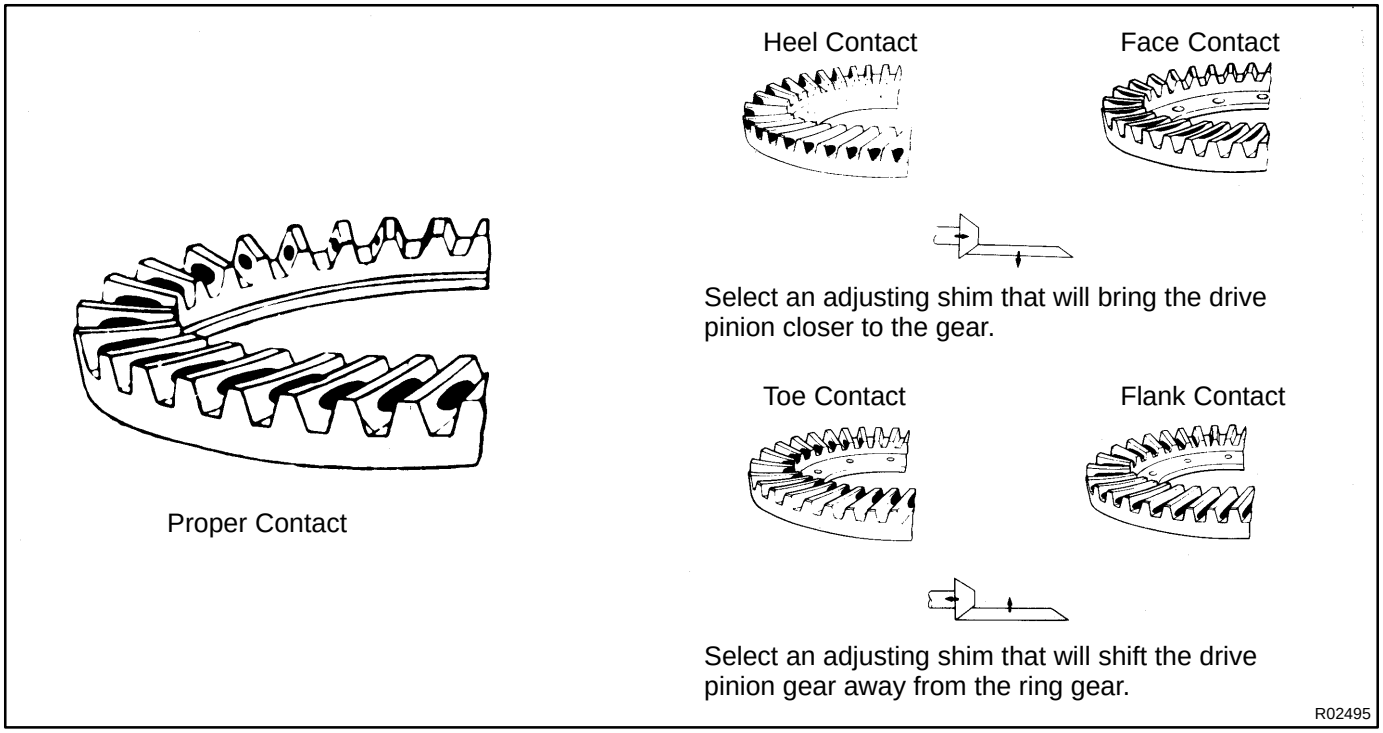


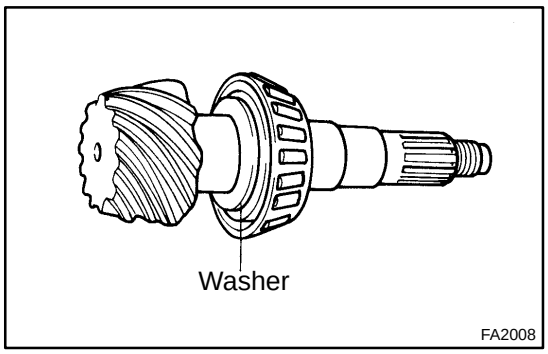
13. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION

(a) Coat 3 or 4 teeth at 3 different positions on the ring gear with red lead primer.

(b) Hold the companion flange firmly and rotate the ring gear in both directions.

(c) Inspect the tooth contact pattern.





If the teeth are not contacting properly, use the following table to select a proper washer for correction.

Washer thickness:

Thickness mm (in.)	Thickness mm (in.)
1.70 (0.0669)	2.03 (0.0799)
1.73 (0.0681)	2.06 (0.0811)
1.76 (0.0693)	2.09 (0.0822)
1.79 (0.0704)	2.12 (0.0835)
1.82 (0.0717)	2.15 (0.0847)
1.85 (0.0729)	2.18 (0.0858)
1.88 (0.0740)	2.21 (0.0870)
1.91 (0.0752)	2.24 (0.0882)
1.94 (0.0764)	2.27 (0.0894)
1.97 (0.0776)	2.30 (0.0906)
2.00 (0.0787)	2.33 (0.0918)

14. REMOVE COMPANION FLANGE (See page SA-81)

15. REMOVE OIL SLINGER

16. REMOVE FRONT BEARING (See page SA-81)

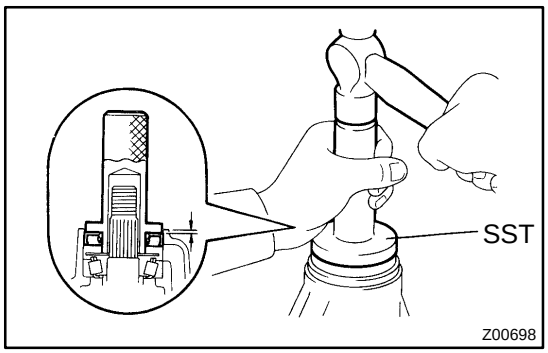
17. INSTALL BEARING SPACER

Install a new bearing spacer.

HINT:

Face the spacer with the large inner diameter to the rear side.

18. INSTALL FRONT BEARING AND OIL SLINGER



19. INSTALL FRONT OIL SEAL

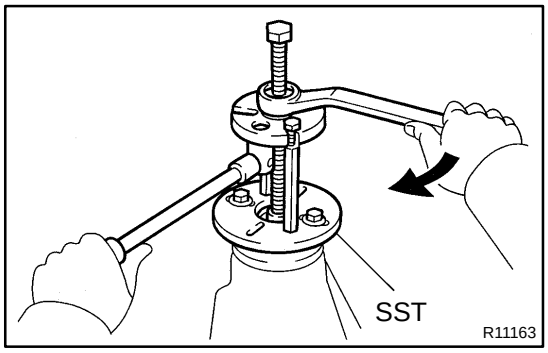
(a) Using SST and a hammer, install a new oil seal.

SST 09554-3001 1

Oil seal drive in depth:

2.00 ± 0.45 mm (0.0787 ± 0.0177 in.)

(b) Coat MP grease to the oil seal lip.

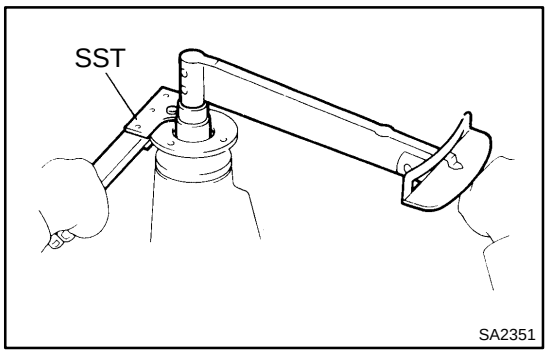


20. INSTALL COMPANION FLANGE

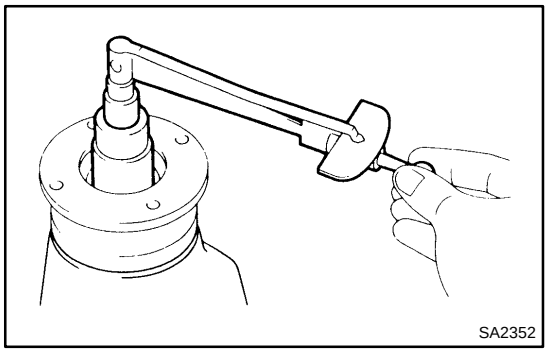
(a) Using SST, install the companion flange.

SST 09950- 30012 (09951- 03010, 09953- 03010, 09954-03010, 09955-03030, 09956-03020)

(b) Coat the thread of a new nut with hypoid gear oil LSD.



(c) Using SST to hold the flange, tighten the nut.
SST 09330-00021



21. ADJUST DRIVE PINION PRELOAD

Using a torque wrench, measure the drive pinion preload using the backlash between the drive pinion and ring gear.

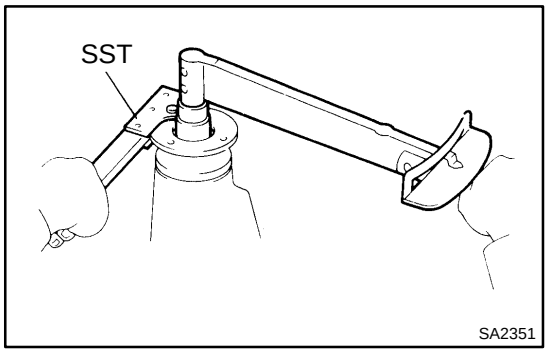
Preload (at starting):
New bearing:
0.98 - 1.57 N·m (10 - 16 kgf·cm, 8.7 - 13.9 in.·lbf)
Reused bearing:
0.49 - 0.78 N·m (5 - 8 kgf·cm, 4.3 - 6.9 in.·lbf)

If the preload is greater than the specified value, replace the bearing spacer.

If the preload is less than the specified value, retighten the nut with a force of 13 N·m (130 kgf·cm, 9 ft·lbf) at a time until the specified preload is reached.

SST 09330-00021
Torque: 338 N·m (3,443 kgf·cm, 249 ft·lbf) or less

If the maximum torque is exceeded while retightening the nut, replace the bearing spacer and repeat the preload procedure. Do not loosen the pinion nut to reduce the preload.



22. RECHECK TOTAL PRELOAD (See page SA-81)

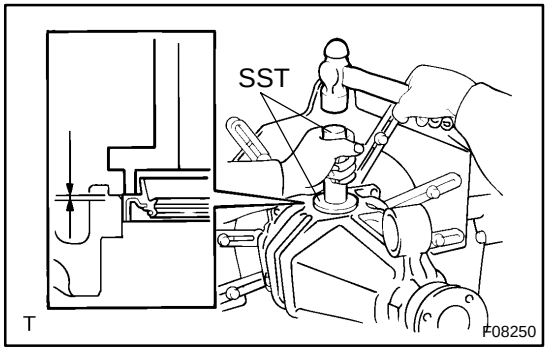
23. RECHECK RING GEAR BACKLASH (See page SA-81)

24. RECHECK TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION (See step. 13)

25. CHECK COMPANION FLANGE RUNOUT (See page SA-81)

26. STAKE DRIVE PINION NUT

Using a chisel and hammer, stake the nut.



27. INSTALL SIDE GEAR SHAFT OIL SEALS

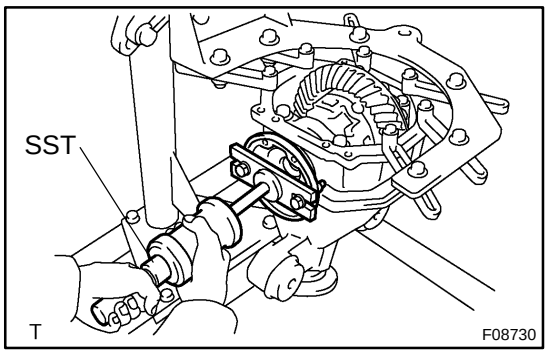
(a) Using SST and a press, install 2 new oil seals.
SST 09554-22010
Oil seal drive in depth:
0 ± 0.50 mm (0 ± 0.0197 in.)

(b) Coat MP grease to the oil seal lip.

28. INSTALL SIDE GEAR SHAFTS

(a) Using needle-nose pliers, install 2 new snap rings to the side gear shafts.

(b) Coat the MP grease to the snap rings



(c) Using SST and 2 bolts, install the side gear shaft to the differential carrier.
SST 09520-24010

NOTICE:

Be careful not to damage the side gear shaft oil seal.

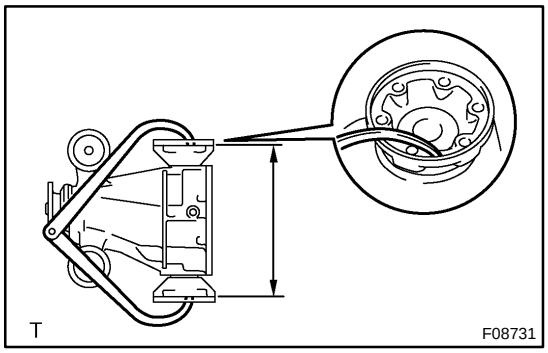
HINT:

- Before installing the side gear shaft, set the snap ring with it's opening side facing downward.
- Whether the side gear shaft is in contact with the side gear or not can be known from the sound or feeling when driving it.

(d) Check that the side gear shaft will not come out by trying to pull it out by hand.

(e) Employ the same manner described above to the other side.

29. REMOVE DIFFERENTIAL CARRIER FROM OVERHAUL STAND, ETC.



30. INSPECT DIFFERENTIAL CARRIER

Using vernier calipers, measure the distance between the right and left side gear shafts, as shown in the illustration.

Standard distance: 279.7 mm (11.012 in.) or less

31. INSTALL DIFFERENTIAL CARRIER STRAIGHT PIN

Using a plastic hammer, install the straight pin.

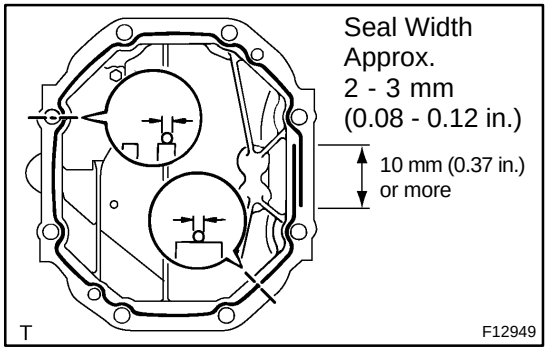
32. INSTALL DIFFERENTIAL CARRIER COVER

(a) Install the oil deflector with the bolt to the carrier cover.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

(b) Install the breather plug to the carrier cover.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

(c) Remove any old FIPG material and be careful not to drop oil on the contact surfaces of the differential carrier and carrier cover.

(d) Clean both installation surfaces of loose FIPG and oil material with gasoline or alcohol.



(e) Apply FIPG to the carrier cover, as shown in the illustration.
FIPG:
Part No. 08826-00090, THREE BOND 1281
or equivalent.

HINT:

- Allow on overlap of 10 mm (0.37 in.) or more between the start and end of FIPG application.
- Install the carrier cover within 3 minutes after applying FIPG.

(f) Install the differential carrier cover with the 8 bolts.
Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

HINT:

Do not add oil or drive the vehicle immediately after installing the cover, and leave it as it is for an hour or more.

Also, for 12 hours or more, avoid rapid acceleration/deceleration.

SA1JG-05

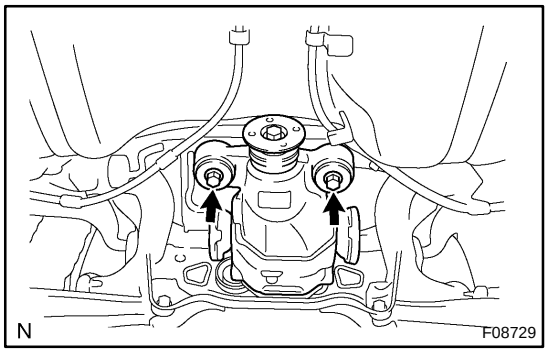
INSTALLATION

1. INSTALL REAR DIFFERENTIAL CARRIER ASSEMBLY

(a) Install the 2 upper mount stoppers on the rear differential carrier assembly.

HINT:

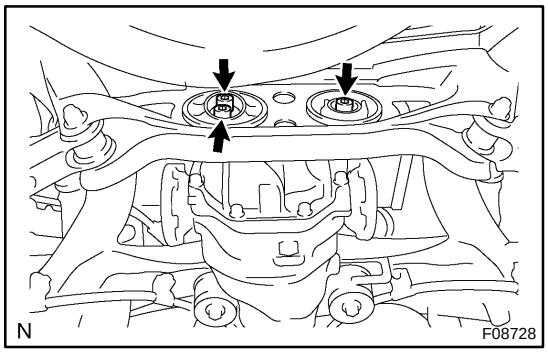
Use the upper mount stopper which was removed.



(b) Support the rear differential carrier assembly with a jack and temporally install the lower mount stoppers and 2 new front side set bolts.

NOTICE:

Do not let the rear differential carrier assembly interfere with the drive shaft.



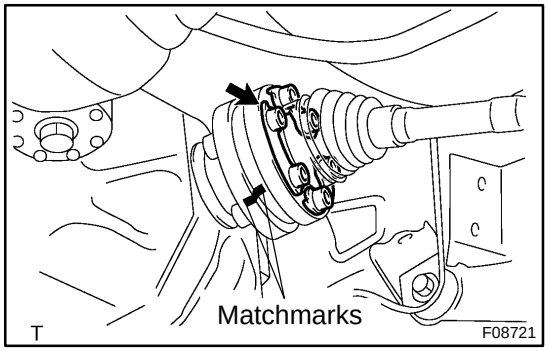
(c) Using a 12 mm hexagon wrench, install the 3 rear side set hexagon bolts.

Torque: 142 N·m (1,450 kgf·cm, 105 ft·lbf)

(d) Torque the 2 front side set bolts.

Torque: 95 N·m (970 kgf·cm, 70 ft·lbf)

(e) Lower the jack.



2. CONNECT RH AND LH DRIVE SHAFTS TO SIDE GEAR SHAFTS

(a) Align the matchmarks, and connect the drive shaft to the side gear shaft.

NOTICE:

Be careful not to damage the boots and end cover.

(b) Using a 8 mm hexagon wrench, install the 3 washers and 6 hexagon bolts, while applying the brakes.

Torque: 68 N·m (695 kgf·cm, 50 ft·lbf)

(c) Employ the same manner described above to the other side.

3. INSTALL RH AND LH REAR SUSPENSION MEMBER BRACES

Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

4. INSTALL PROPELLER SHAFT (See page PR-10)

5. INSTALL EXHAUST PIPE ASSEMBLY

6. CONNECT STABILIZER BAR LINK TO STABILIZER BAR

Torque: 44 N·m (449 kgf·cm, 33 ft·lbf)

HINT:

If the ball joint turns together with the nut, use a hexagon wrench (5 mm) to hold the stud.

7. CONNECT 2 STABILIZER BAR BRACKETS TO REAR SUSPENSION MEMBER

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

8. FILL AND CHECK DIFFERENTIAL OIL LEVEL

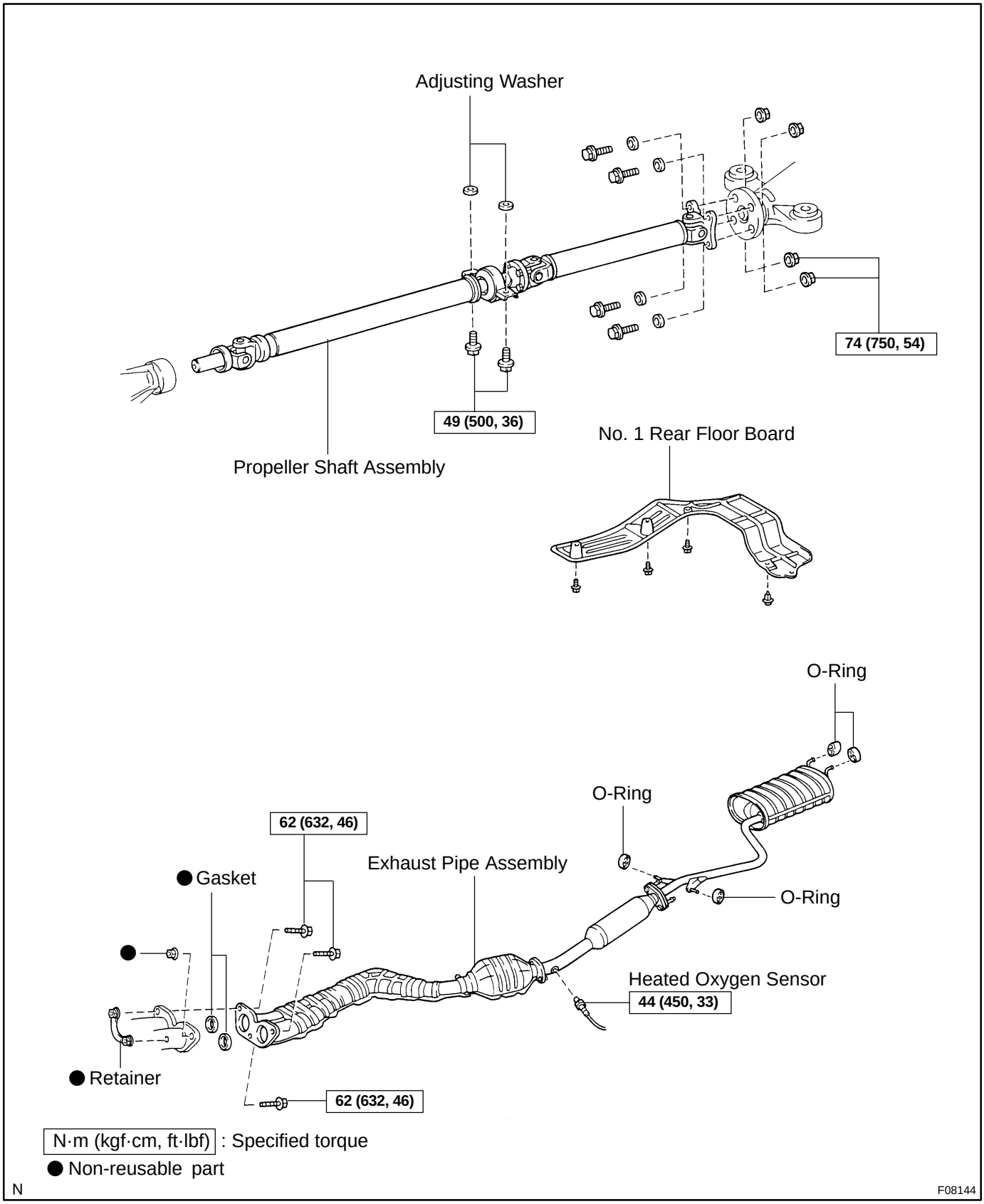
(See page SA-69)

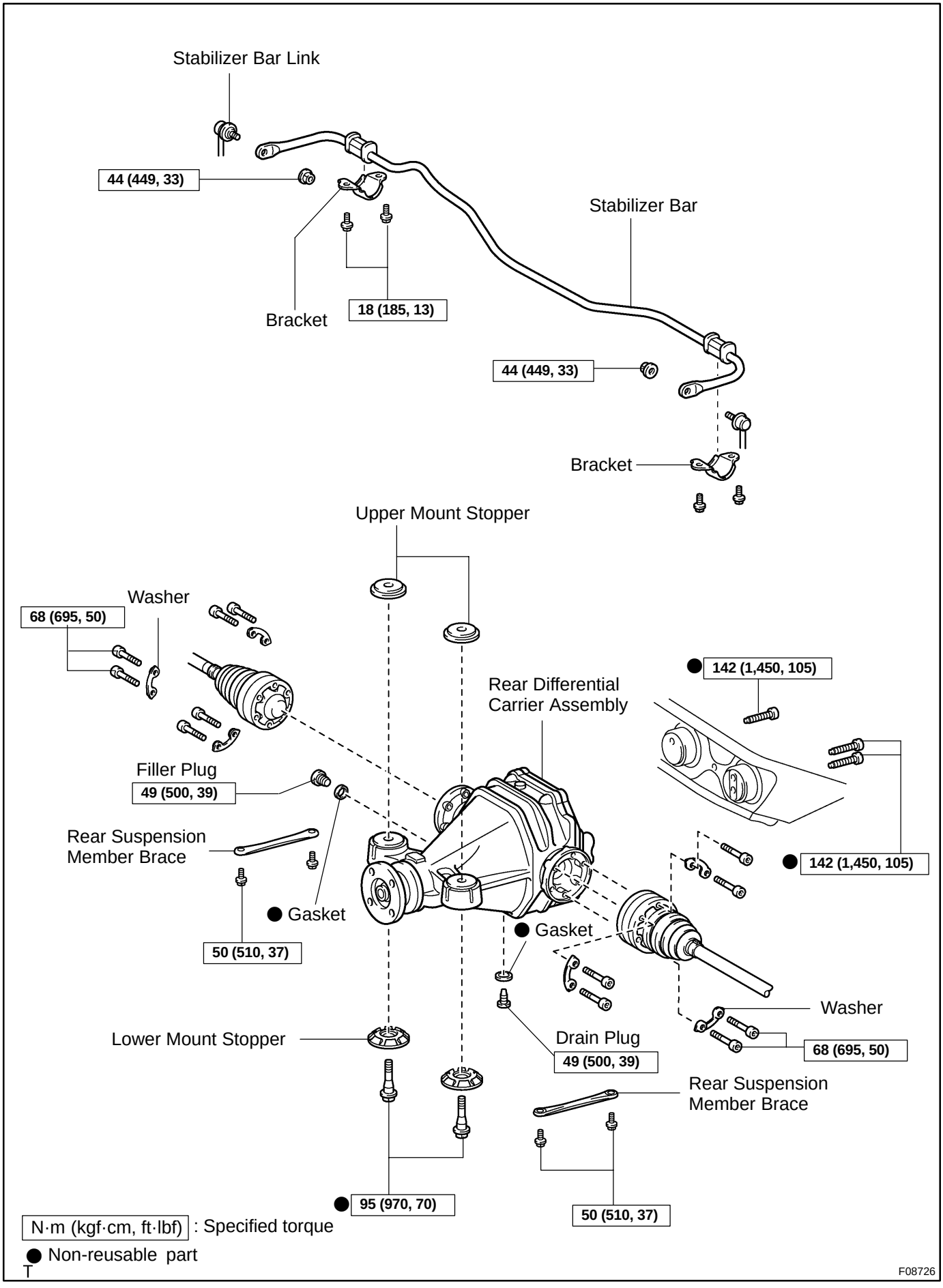
9. INSTALL NO. 1 REAR FLOOR BOARD

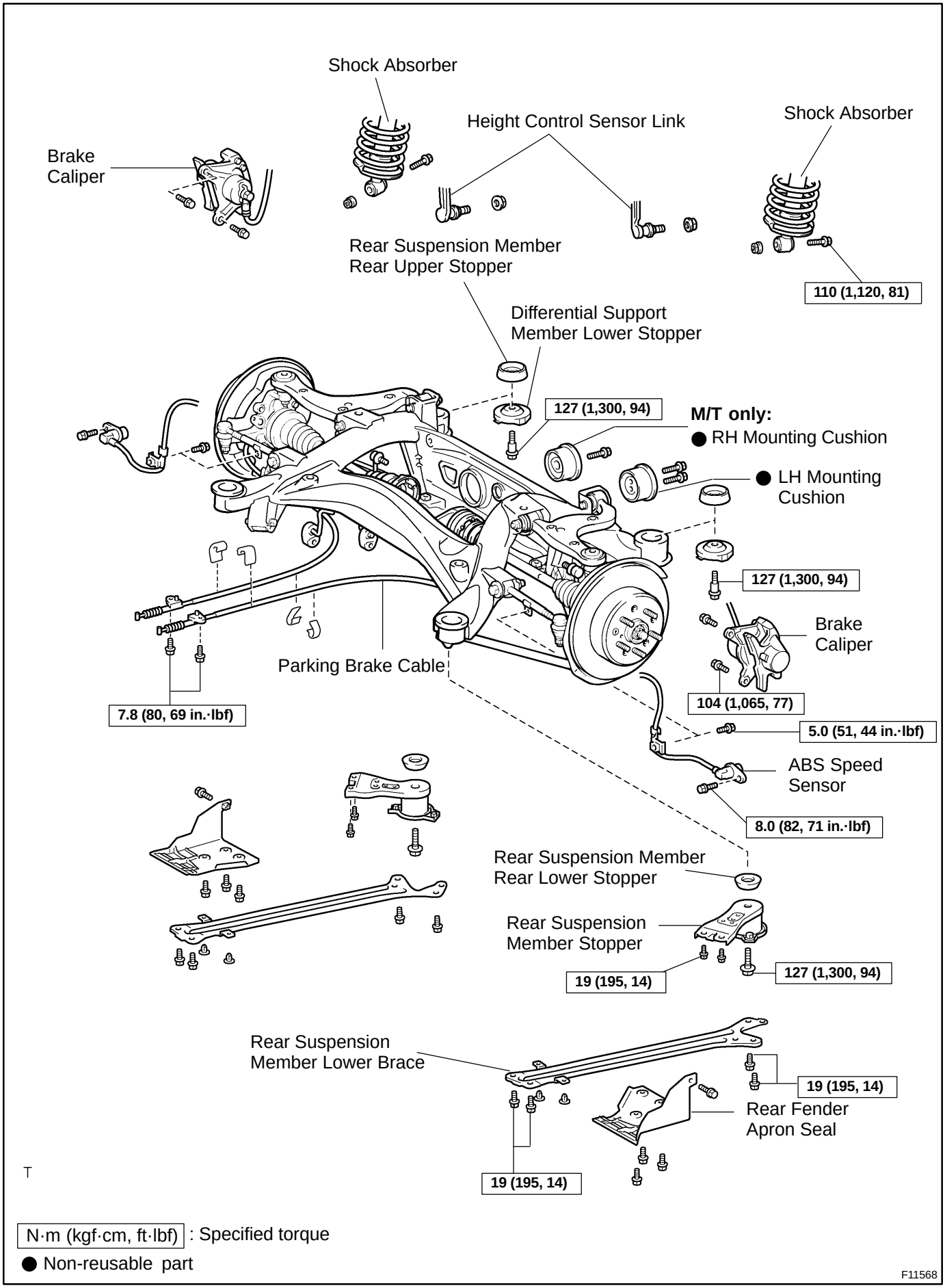
DIFFERENTIAL MOUNTING CUSHION

SA1JH-05

COMPONENTS



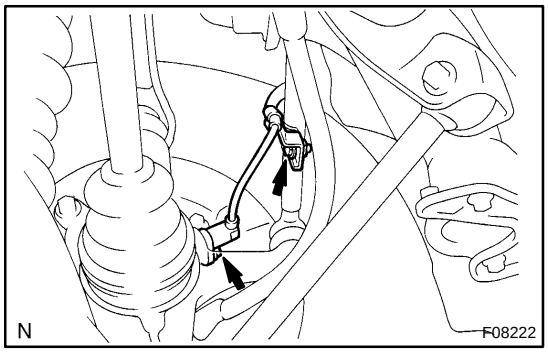

Stabilizer Bar Link
44 (449, 33)
Bracket
18 (185, 13)
Stabilizer Bar
44 (449, 33)
Bracket
Upper Mount Stopper
Washer
68 (695, 50)
Rear Differential
Carrier Assembly
142 (1,450, 105)
Filler Plug
49 (500, 39)
Rear Suspension
Member Brace
142 (1,450, 105)
Gasket
50 (510, 37)
Gasket
Washer
Lower Mount Stopper
Drain Plug
49 (500, 39)
68 (695, 50)
Rear Suspension
Member Brace
95 (970, 70)
50 (510, 37)
N·m (kgf·cm, ft·lbf) : Specified torque
Non-reusable part
F08726


Shock Absorber
Height Control Sensor Link
Shock Absorber
Brake Caliper
Rear Suspension Member Rear Upper Stopper
110 (1,120, 81)
Differential Support Member Lower Stopper
127 (1,300, 94)
M/T only:
● RH Mounting Cushion
● LH Mounting Cushion
127 (1,300, 94)
Brake Caliper
Parking Brake Cable
104 (1,065, 77)
7.8 (80, 69 in.·lbf)
5.0 (51, 44 in.·lbf)
ABS Speed Sensor
8.0 (82, 71 in.·lbf)
Rear Suspension Member Rear Lower Stopper
Rear Suspension Member Stopper
19 (195, 14)
127 (1,300, 94)
Rear Suspension Member Lower Brace
19 (195, 14)
Rear Fender Apron Seal
19 (195, 14)
T
N·m (kgf·cm, ft·lbf) : Specified torque
● Non-reusable part
F11568

SA20M-02

REPLACEMENT

1. **REMOVE REAR WHEELS**
2. **REMOVE REAR DIFFERENTIAL CARRIER ASSEMBLY (See page SA-79)**



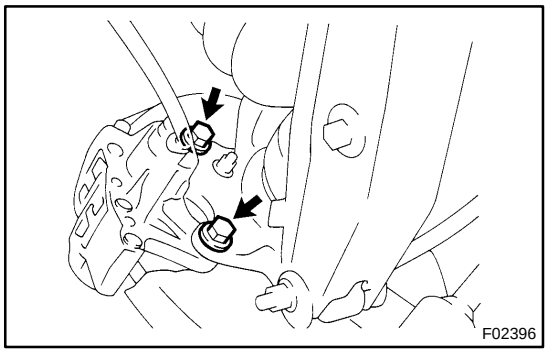
3. **DISCONNECT RH AND LH ABS SPEED SENSORS AND WIRE HARNESS**

(a) Remove the bolt and disconnect the ABS speed sensor from the rear axle carrier.

(b) Remove the bolt and disconnect the ABS speed sensor wire harness clamp from the toe control link.

(c) Employ the same manner described above to the other side.

4. **REMOVE RH AND LH REAR FENDER APRON SEALS**

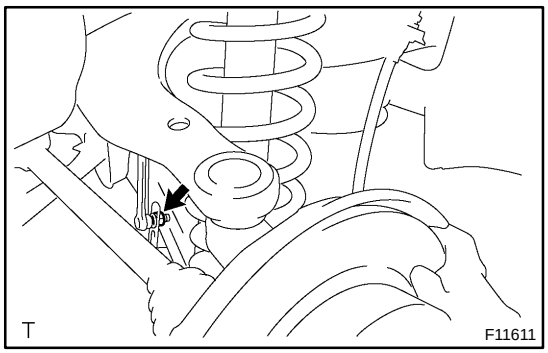


5. **REMOVE RH AND LH BRAKE CALIPERS**

(a) Remove the 2 bolts and brake caliper from the axle carrier.

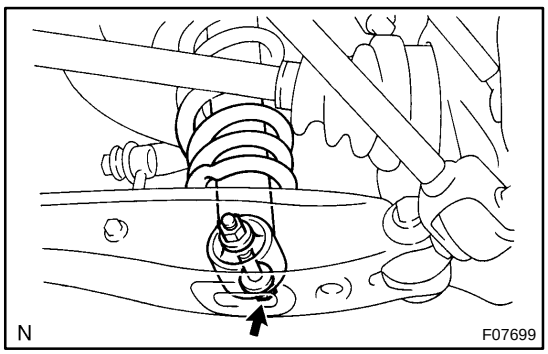
(b) Support the brake caliper securely.

(c) Employ the same manner described above to the other side.



6. **DISCONNECT HEIGHT CONTROL SENSOR LINK**

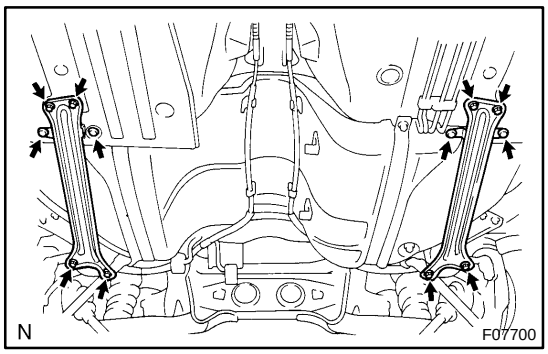
Remove the nut and disconnect the height control sensor link from lower arm bracket.



7. **DISCONNECT RH AND LH SHOCK ABSORBERS FROM NO. 2 LOWER SUSPENSION ARMS**

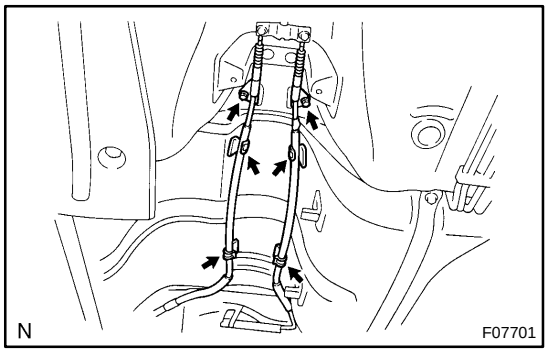
(a) Remove the nut and bolt, and disconnect the shock absorber.

(b) Employ the same manner described above to the other side.



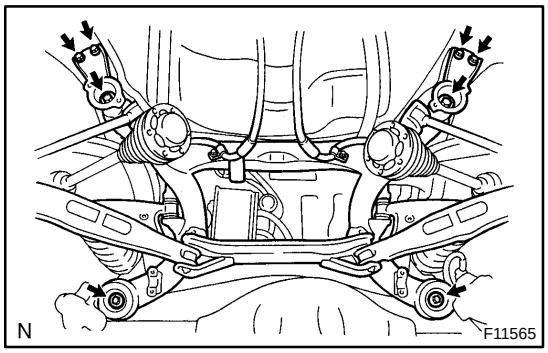
8. REMOVE RH AND LH REAR SUSPENSION MEMBER LOWER BRACES

Remove the 8 bolts, 4 clips and 2 lower braces.



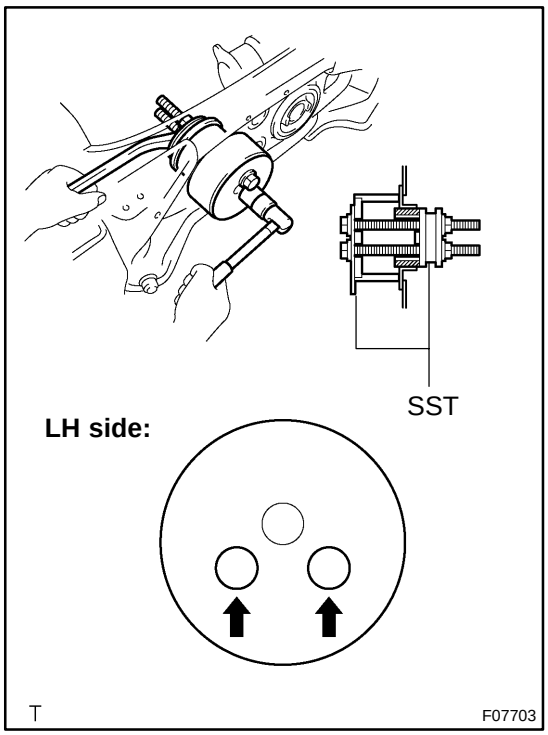
9. DISCONNECT PARKING BRAKE CABLE

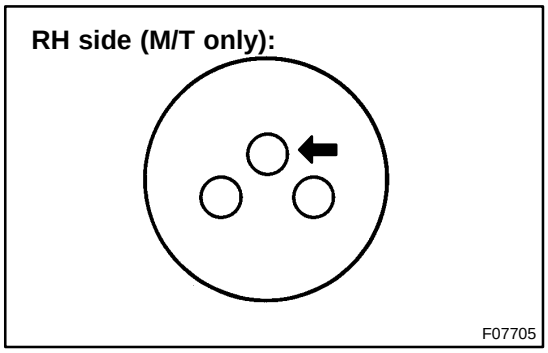
(a) Disconnect the parking brake cable from the 4 clamps.
(b) Remove the 2 bolts and disconnect the parking brake cable.



10. REMOVE REAR SUSPENSION MEMBER

(a) Support the rear suspension member with a jack.
(b) Remove the 8 bolts, 2 rear suspension member stoppers and 2 differential support member lower stoppers.
(c) Lower the rear suspension member.
(d) Remove the rear suspension member rear upper and lower stoppers from the rear suspension member.





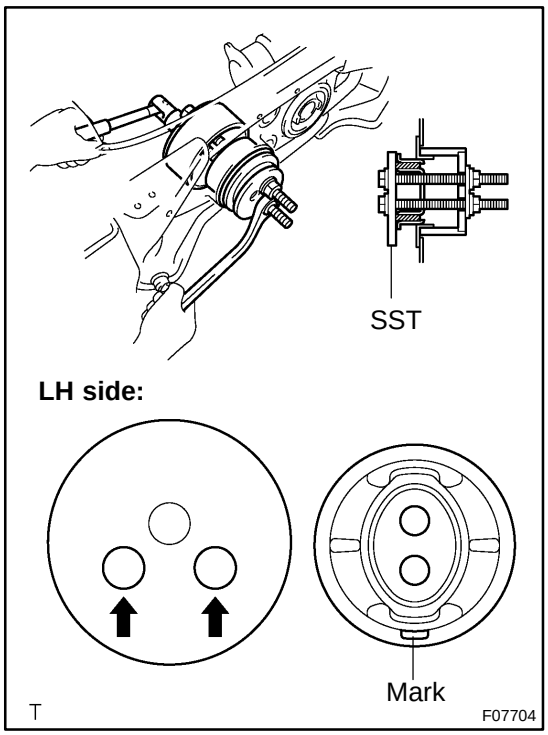
11. REMOVE DIFFERENTIAL MOUNTING CUSHION

Using SST, remove the differential mounting cushion.

SST 09316-12010, 09570-24010

NOTICE:

- **When driving out the mounting cushion, be careful not to touch the suspension member with the SST.**
- **Align the SST straight so that the bolt of the SST is parallel with the center line of the mounting cushion.**
- **When installing the bolts to the RH and LH differential mounting cushions, make sure that the bolts are passed through the correct holes in the SST, as shown in the illustration.**



12. INSTALL DIFFERENTIAL MOUNTING CUSHION

Using SST, install the cushion so that the marks are positioned, as shown in the illustration.

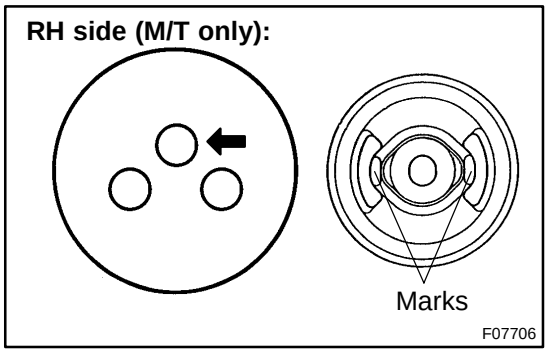
SST 09570-24010

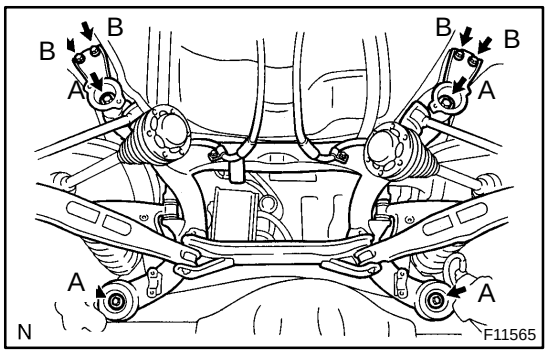
NOTICE:

- **Be careful not to confuse RH and LH sides, and its top and bottom.**
- **Set the SST after temporarily installing the differential mounting cushion into the member so as not to install at an angle.**
- **To confirm that the differential mounting cushion is aligned straight in relation to the member, check that the SST is fully in contact with all of the cushion.**

13. INSTALL REAR SUSPENSION MEMBER

(a) Install the rear suspension member rear upper and lower stoppers to the rear suspension member.





(b) Install the 2 differential support member lower stopper, rear suspension member stopper with the 8 bolts.

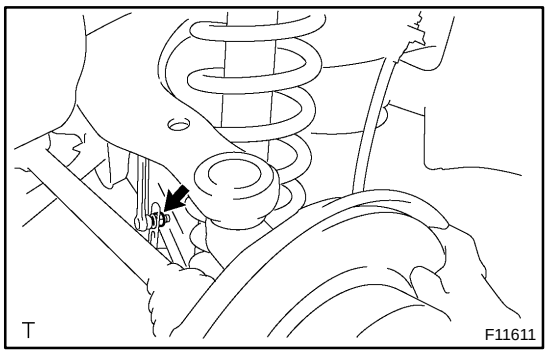
Torque:
A bolt: 127 N·m (1,300 kgf·cm, 94 ft·lbf)
B bolt: 19 N·m (195 kgf·cm, 14 ft·lbf)

(c) Lower the jack.

14. CONNECT PARKING BRAKE CABLE
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

15. INSTALL RH AND LH REAR SUSPENSION MEMBER LOWER BRACES
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

16. CONNECT RH AND LH SHOCK ABSORBERS TO NO. 2 LOWER SUSPENSION ARMS
Torque: 110 N·m (1,120 kgf·cm, 81 ft·lbf)



17. CONNECT HEIGHT CONTROL SENSOR LINK

(a) Set the lower arm to the vehicle height.

(b) Install the sensor link to the lower arm bracket with a nut.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

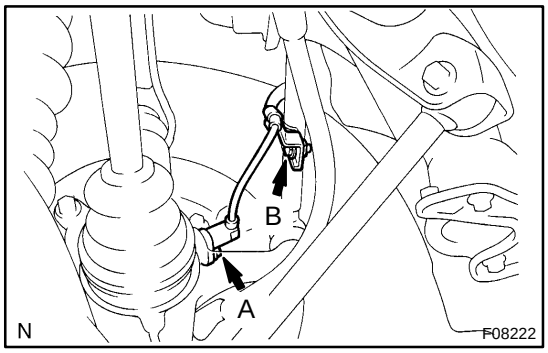
NOTICE:

- **Be careful not to brake the link fixing pin until the above operation is completed.**
- **The pin can be broken after completion of the above, however, the sensor arm rotation angle shall not exceed the range of ± 70° from the standard vehicle height.**

18. INSTALL RH AND LH BRAKE CALIPERS TO STEERING KNUCKLES

Torque: 104 N·m (1,065 kgf·cm, 77 ft·lbf)

19. INSTALL RH AND LH REAR FENDER APRON SEALS



20. CONNECT RH AND LH ABS SPEED SENSORS AND WIRE HARNESS

Torque:
Bolt A: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
Bolt B: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

21. INSTALL REAR DIFFERENTIAL CARRIER ASSEMBLY (See page SA-99)

22. INSTALL REAR WHEELS

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

23. DEPRESS BRAKE PEDAL SEVERAL TIMES

24. CHECK REAR WHEEL ALIGNMENT

(See page SA-9)

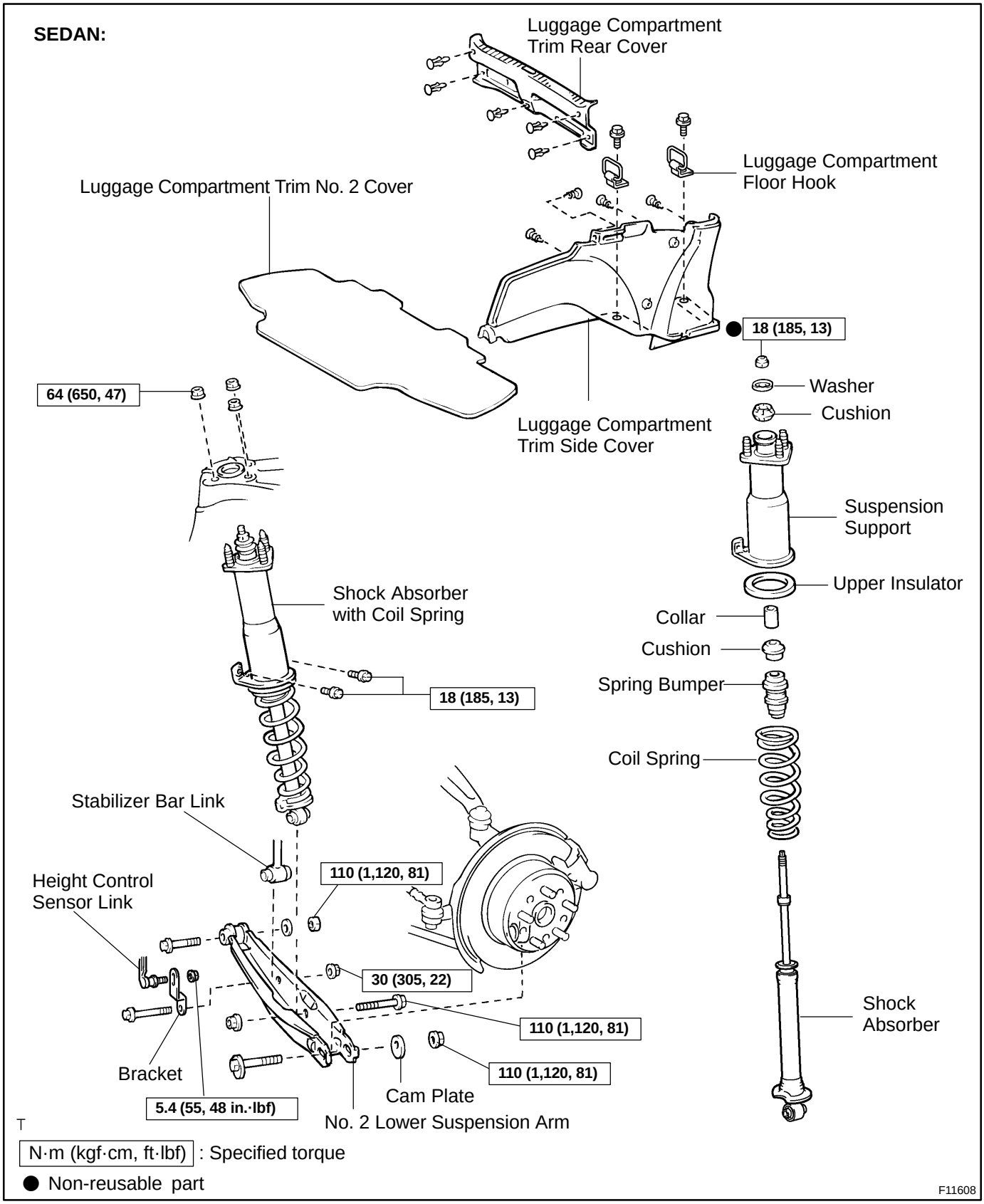
25. CHECK ABS SPEED SENSOR SIGNAL

w/o VSC (See page DI-437)
w/VSC (See page DI-507)

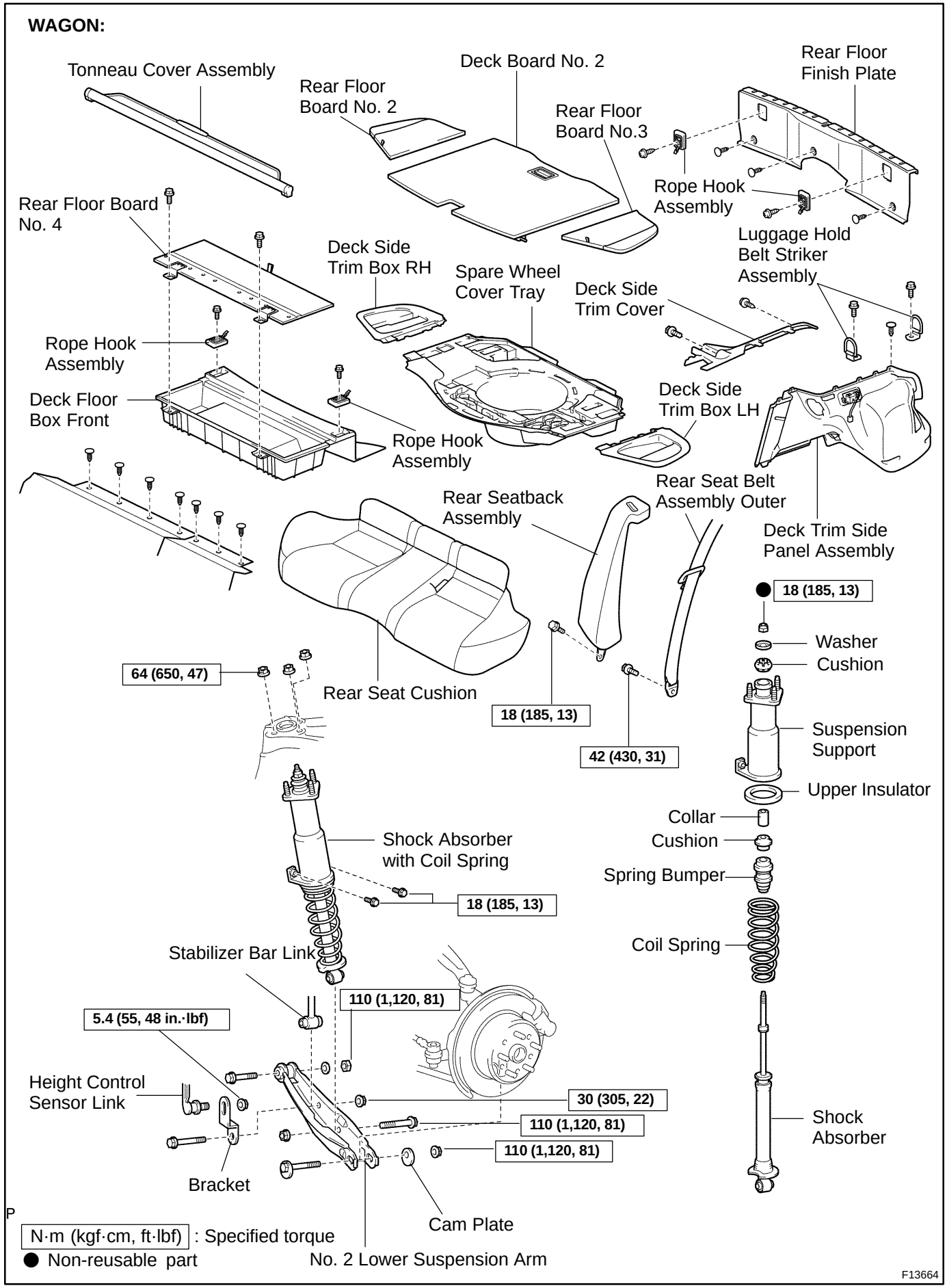
REAR SHOCK ABSORBER

COMPONENTS

SA28I-02



WAGON:


Tonneau Cover Assembly
Rear Floor Board No. 2
Deck Board No. 2
Rear Floor Board No.3
Rear Floor Finish Plate
Rope Hook Assembly
Rear Floor Board No. 4
Deck Side Trim Box RH
Spare Wheel Cover Tray
Deck Side Trim Cover
Luggage Hold Belt Striker Assembly
Rope Hook Assembly
Deck Floor Box Front
Rope Hook Assembly
Deck Side Trim Box LH
Rear Seatback Assembly
Rear Seat Belt Assembly Outer
Deck Trim Side Panel Assembly
18 (185, 13)
Washer
Cushion
64 (650, 47)
Rear Seat Cushion
18 (185, 13)
42 (430, 31)
Suspension Support
Upper Insulator
Collar
Cushion
Shock Absorber with Coil Spring
Spring Bumper
18 (185, 13)
Coil Spring
Stabilizer Bar Link
110 (1,120, 81)
5.4 (55, 48 in.·lbf)
Height Control Sensor Link
30 (305, 22)
110 (1,120, 81)
110 (1,120, 81)
Shock Absorber
Bracket
Cam Plate
N·m (kgf·cm, ft·lbf) : Specified torque
● Non-reusable part
No. 2 Lower Suspension Arm
F13664

SA28J-01

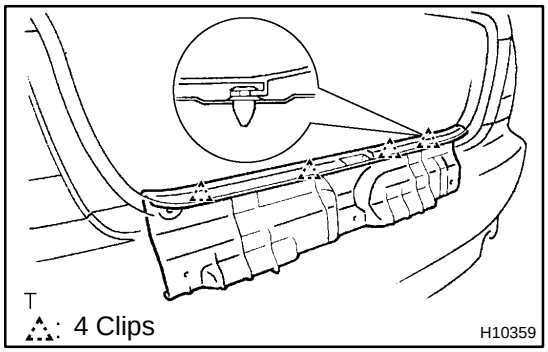
REMOVAL

1. REMOVE REAR WHEEL

2. SEDAN:

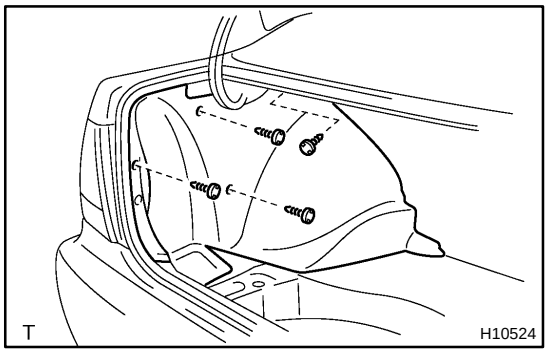
REMOVE LUGGAGE COMPARTMENT TRIM SIDE COVER

(a) Remove the luggage compartment trim No. 2 cover.



(b) Remove the luggage compartment trim rear cover.

(c) Remove the 2 bolts and 2 luggage compartment floor hooks.



(d) Remove the 4 screws and luggage compartment trim side cover.

3. WAGON:

REMOVE DECK TRIM SIDE PANEL ASSEMBLY

(a) Remove the rear seat cushion. (See page BO-204)

(b) Remove the tonneau cover assembly.

(c) Remove the bolt and rear seat belt assembly outer.

(d) Remove the side seatback assembly. (See page BO-204)

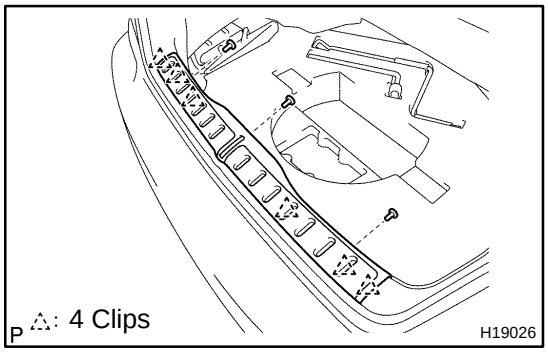
(e) Remove the seat board carpets.

(f) Remove the 2 bolts and rear floor board No. 4.

(g) Remove 2 bolts, 2 rope hook assemblies and deck floor box front.

(h) Remove the rear floor board No. 2, No. 3 and deck board No. 2.

(i) Remove the deck side trim box LH, RH and the spare wheel cover tray.



(j) Remove the 2 bolts and 2 rope hook assemblies.

(k) Remove the 3 clips.

(l) Using a screwdriver, remove the rear floor finish plate.

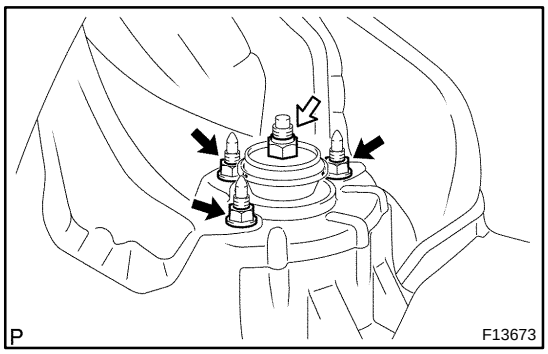
HINT:

Tape the screwdriver tip before use.

(m) Remove the deck trim side panel assembly. (See page BO-164)

4. REMOVE NO. 2 LOWER SUSPENSION ARM

(See page SA-34)



5. REMOVE REAR SHOCK ABSORBER WITH COIL SPRING

(a) Loosen the nut in the center of the suspension support.

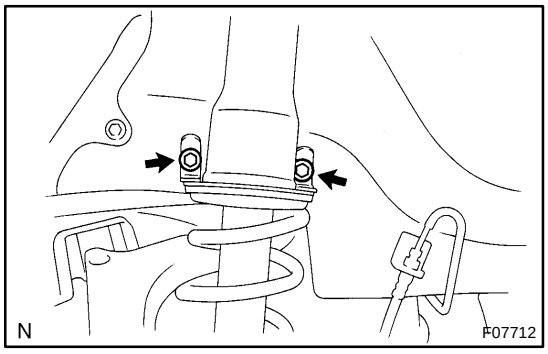
NOTICE:

Do not remove it.

HINT:

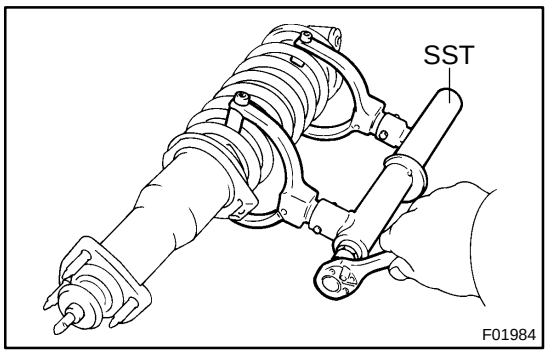
If not disassembling the shock absorber, it is not necessary to loosen the nut.

(b) Remove the 3 nuts from the body.



(c) Remove the 2 bolts and shock absorber with the coil spring from the body.

SA0SK-07



DISASSEMBLY

REMOVE SUSPENSION SUPPORT AND COIL SPRING

(a) Using SST, compress the coil spring.
SST 09727-30021 (09727-00010, 09727-00021, 09727-00031)

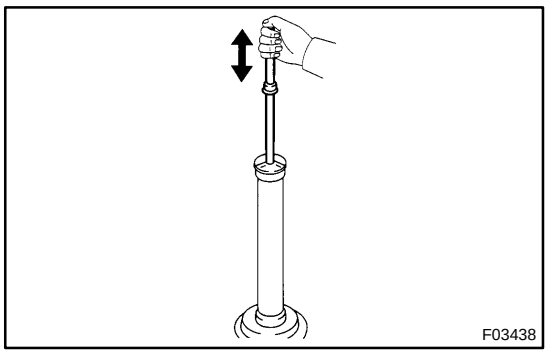
NOTICE:

Do not use an impact wrench. It will damage the SST.

(b) Remove the suspension support nut.

(c) Remove the washer, cushion, suspension support, upper insulator, coil spring, collar, cushion and spring bumper.

SA0SL-07



INSPECTION

INSPECT SHOCK ABSORBER

Compress and extend the shock absorber rod and check that there is no abnormal resistance or unusual sound during operation.

If there is any abnormality, replace the shock absorber with a new one.

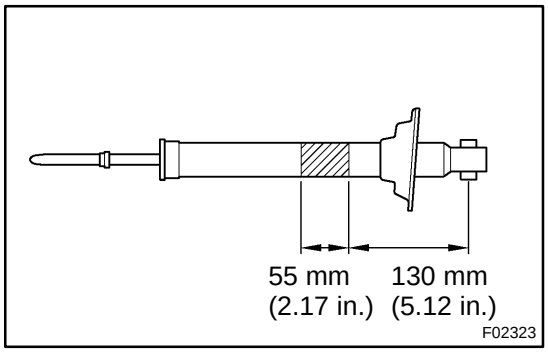
NOTICE:

When discarding the shock absorber, see DISPOSAL on page SA-1 15.

SA0SM-07

DISPOSAL

1. FULLY EXTEND SHOCK ABSORBER ROD



2. DRILL HOLE TO DISCHARGE GAS FROM CYLINDER

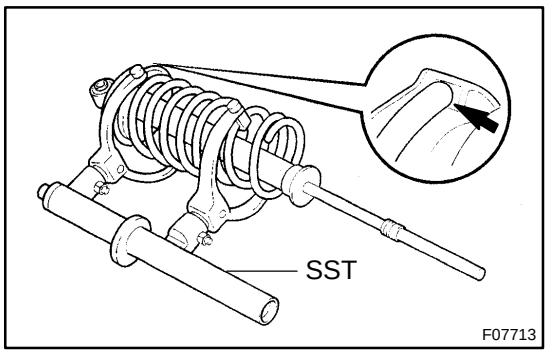
Using a drill, make a hole in the cylinder as shown to discharge the gas inside.

CAUTION:

- **When drilling, chips may fly out, work carefully.**
- **The gas is colorless, odorless and non-poisonous.**

SA0SN-08

REASSEMBLY



INSTALL SUSPENSION SUPPORT AND COIL SPRING

(a) Using SST, compress the coil spring.
SST 09727-30021 (09727-00010, 09727-00021, 09727-00031)

NOTICE:

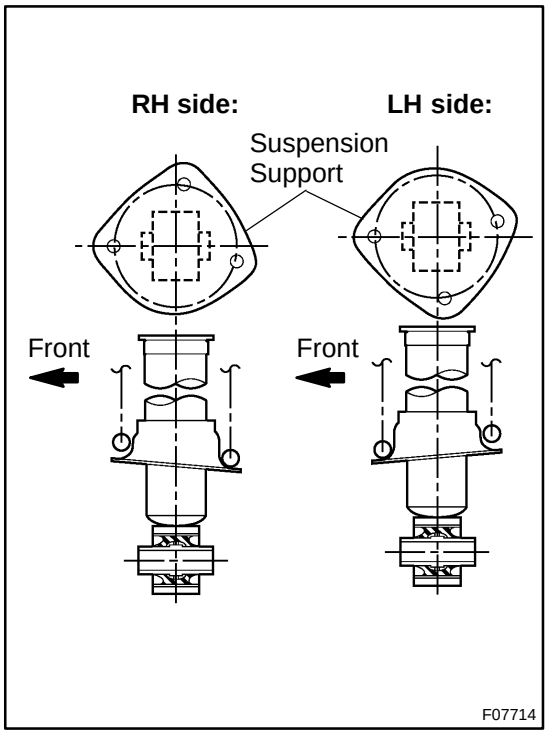
Do not use an impact wrench. It will damage the SST.

(b) Install the coil spring to the shock absorber.

HINT:

Fit the lower end of the coil spring into the gap of the spring seat of the shock absorber.

(c) Install the spring bumper, cushion, collar, upper insulator, suspension support, cushion and washer to the shock absorber and temporarily tighten a new nut.



(d) Rotate the suspension support, as shown in the illustration.

(e) Remove the SST.
SST 09727-30021 (09727-00010, 09727-00021, 09727-00031)

HINT:

After removing the SST, recheck the direction of the suspension support.

SA0SO-08

INSTALLATION

1. INSTALL REAR SHOCK ABSORBER WITH COIL SPRING

(a) Install the suspension support to the body with the 3 nuts.
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

(b) Connect the shock absorber with coil spring to the body with the 2 bolts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

(c) Torque the nut in the center of the suspension support.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

HINT:

If the shock absorber has not been disassembled, it is not necessary to torque the nut.

2. INSTALL NO. 2 LOWER SUSPENSION ARM (See page SA-125)

3. SEDAN:
INSTALL LUGGAGE COMPARTMENT TRIM SIDE COVER

(a) Install the 4 screws and luggage compartment trim side cover.

(b) Install the 2 bolts and 2 luggage compartment floor hooks.

(c) Install the luggage compartment trim rear cover and luggage compartment trim No. 2 cover.

4. WAGON:
INSTALL DECK TRIM SIDE PANEL ASSEMBLY

(a) Install the deck trim side panel assembly. (See page BO-169)

(b) Install the rear floor finish plate with 3 clips.

(c) Install the 2 rope hook assemblies and 2 bolts.

(d) Install the deck side trim box LH, RH and the spare wheel cover tray.

(e) Install the rear floor board No. 2, No. 3 and deck board No. 2.

(f) Install the 2 bolts, 2 rope hook assemblies and deck floor box front.

(g) Install the rear floor board No. 4 with 2 bolts.

(h) Install the seat board carpets.

(i) Install the side seatback assembly. (See page BO-210)

(j) Install the rear seat belt assembly outer with the bolt.

(k) Install the tonneau cover assembly.

(l) Install the rear seat cushion. (See page BO-210)

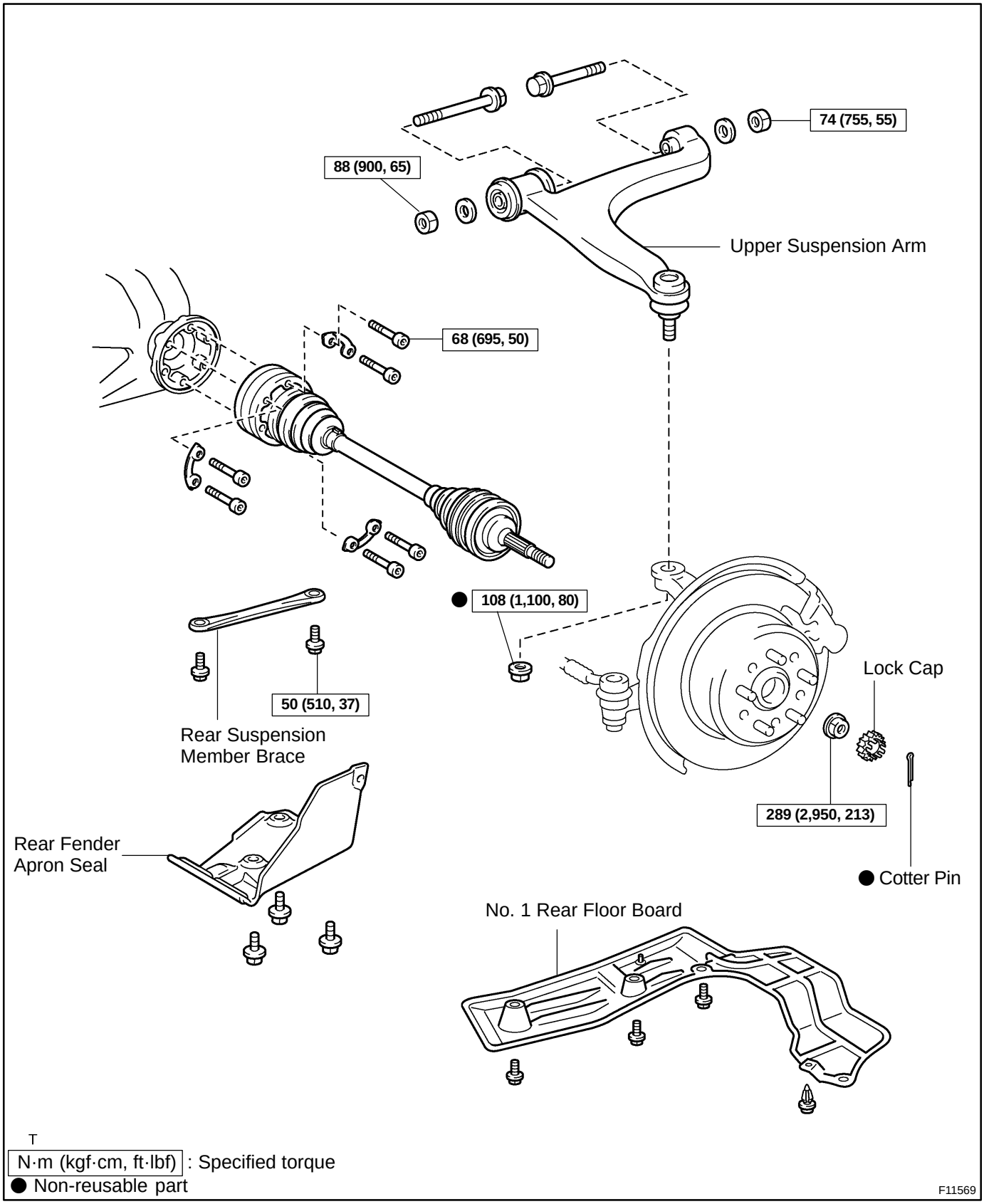
5. INSTALL REAR WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

6. CHECK REAR WHEEL ALIGNMENT (See page SA-9)

REAR UPPER SUSPENSION ARM

COMPONENTS

SA0SP-08



SA0SQ-08

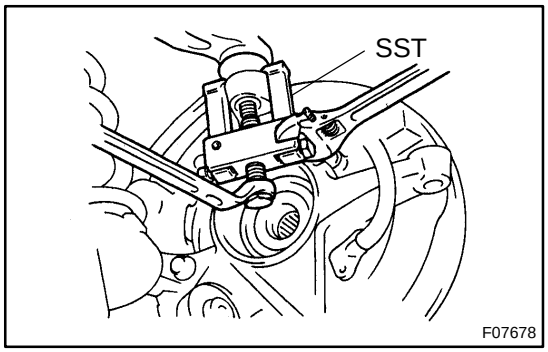
REMOVAL

1. REMOVE REAR WHEEL

2. REMOVE DRIVE SHAFT (See page SA-59)

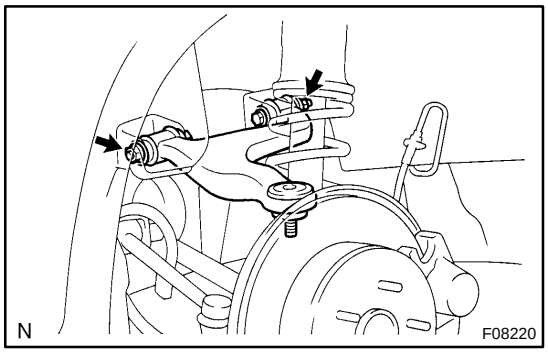
3. REMOVE UPPER SUSPENSION ARM

(a) Remove the nut.



(b) Using SST, disconnect the upper suspension arm from the axle carrier.
SST 09628-6201 1

(c) Support the axle carrier securely.

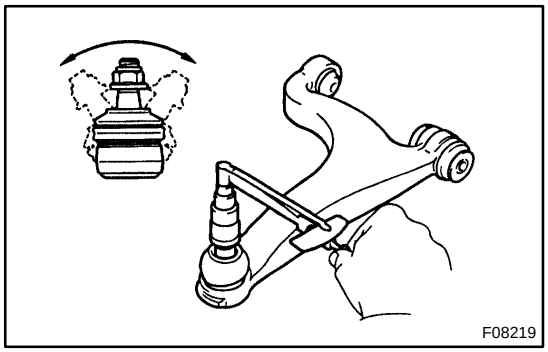


(d) Remove the 2 nuts, washers, bolts and upper suspension arm from the body.

SA0SR-08

INSPECTION

1. INSPECT UPPER SUSPENSION ARM BALL JOINT BOOT FOR DAMAGE



2. INSPECT UPPER SUSPENSION ARM BALL JOINT FOR ROTATION CONDITION

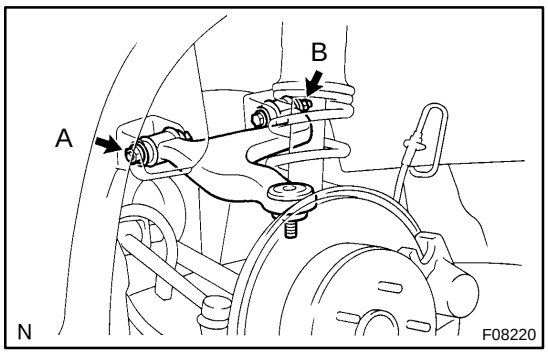
(a) As shown in the illustration, flip the ball joint stud back and forth 5 times, before installing the nut.

(b) Using torque wrench, turn the nut continuously 1 turn per 2 - 4 seconds and take the torque reading on the 5th turn.

Turning torque:

1.0 - 2.9 N·m (10 - 30 kgf·cm, 9 - 26 in.·lbf)

SA1JK-05



INSTALLATION

1. INSTALL UPPER SUSPENSION ARM

(a) Install the upper suspension arm to the body with the 2 bolts, washers and 2 nuts.

Torque:
Nut A: 88 N·m (900 kgf·cm, 65 ft·lbf)
Nut B: 74 N·m (755 kgf·cm, 55 ft·lbf)

HINT:

After stabilizing the suspension arm, torque the nut.

(b) Connect the upper suspension arm to the axle carrier with a new nut.

Torque: 108 N·m (1,100 kgf·cm, 80 ft·lbf)

2. INSTALL DRIVE SHAFT (See page SA-66)

3. INSTALL REAR WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

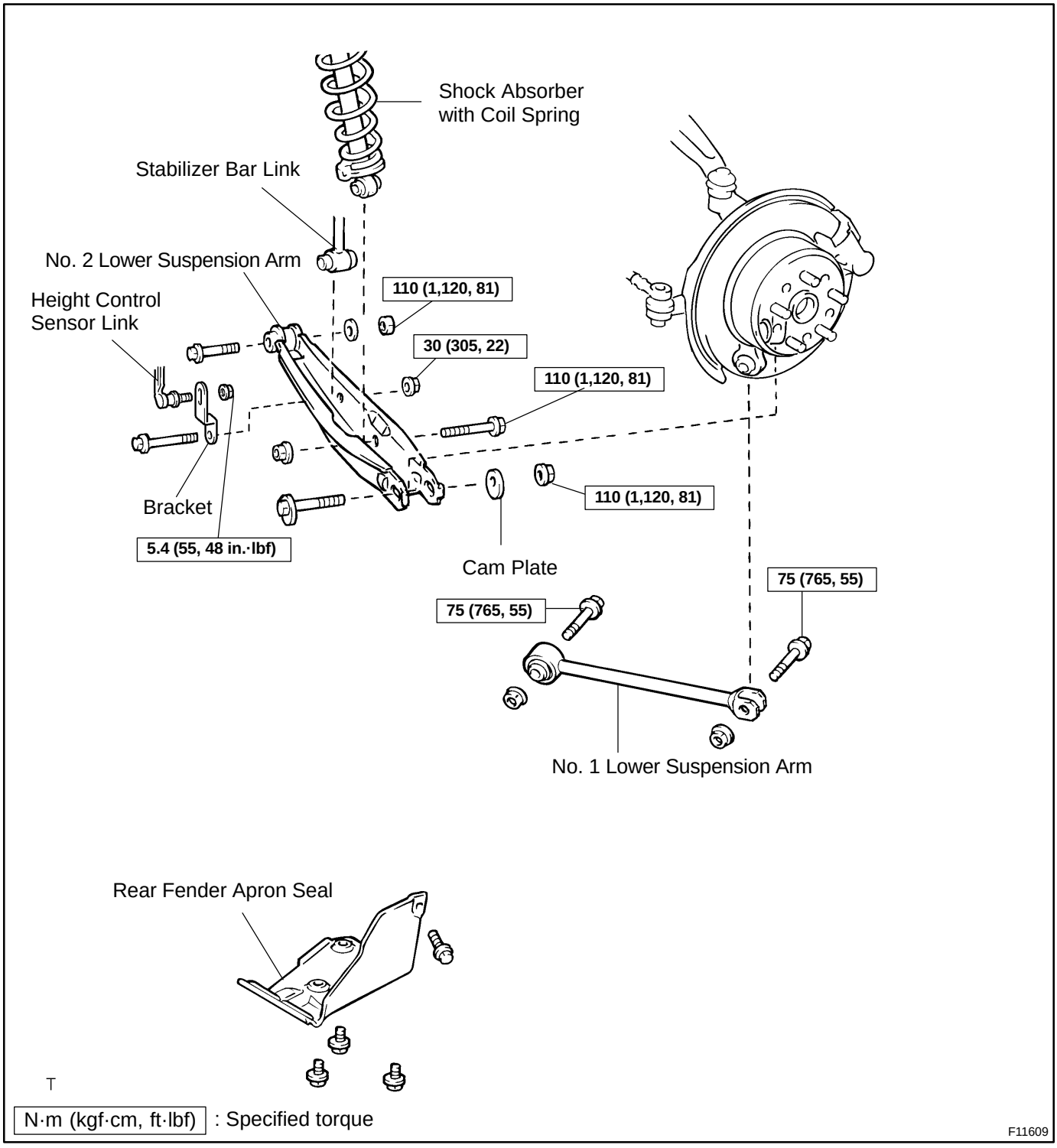
4. CHECK REAR WHEEL ALIGNMENT
(See page SA-9)

5. CHECK ABS SPEED SENSOR SIGNAL
w/ VSC (See page DI-507)
w/o VSC (See page DI-437)

REAR LOWER SUSPENSION ARM

SA0ST-08

COMPONENTS

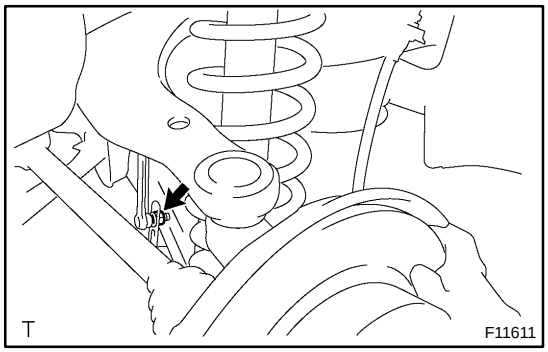


SA20N-03

REMOVAL

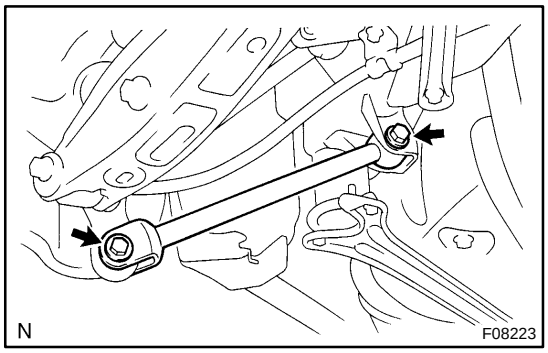
1. REMOVE REAR WHEEL

2. REMOVE REAR FENDER APRON SEAL



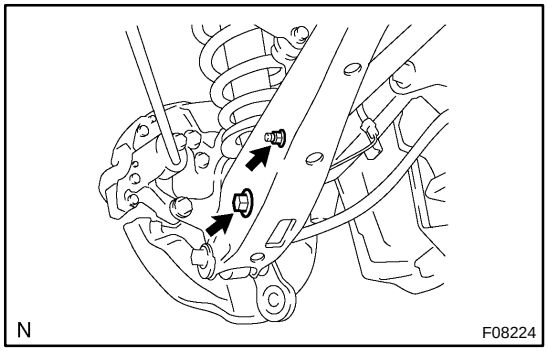
3. DISCONNECT HEIGHT CONTROL SENSOR LINK

Remove the nut and disconnect the height control sensor link from lower arm bracket.



4. REMOVE NO. 1 LOWER SUSPENSION ARM

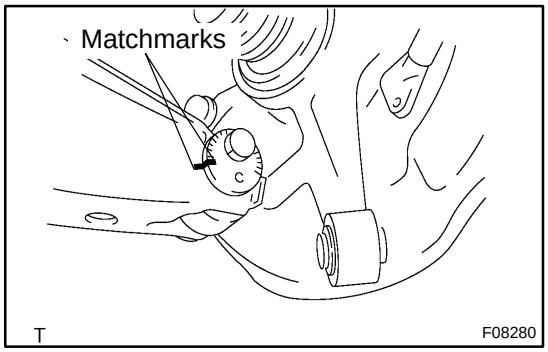
Remove the 2 bolts, nuts, and No. 1 lower suspension arm.



5. REMOVE NO. 2 LOWER SUSPENSION ARM

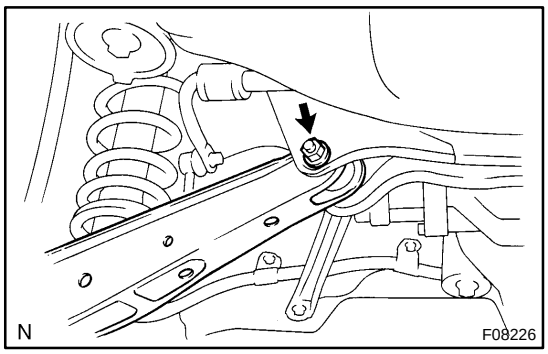
(a) Remove the nut, bolt and bracket, and disconnect the stabilizer bar link from the No. 2 lower suspension arm.

(b) Remove the bolt and nut, and disconnect the shock absorber from the No. 2 lower suspension arm.



(c) Place matchmarks on the cam bolt and No. 2 lower suspension arm.

(d) Remove the nut, cam plate and cam bolt, and disconnect the axle carrier.



(e) Remove the nut, washer, bolt and No. 2 lower suspension arm from the rear suspension member.

SA20O-03

INSTALLATION

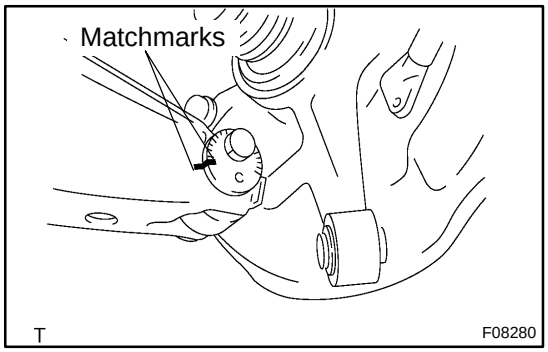
1. INSTALL NO. 2 LOWER SUSPENSION ARM

(a) Install the No. 2 lower suspension arm to the rear suspension member with bolt, washer and nut.

Torque: 110 N·m (1,120 kgf·cm, 81 ft·lbf)

HINT:

After stabilizing the suspension, torque the nut.



(b) Connect the No. 2 lower suspension arm to the axle carrier with the cam bolt, cam plate and nut.

Torque: 110 N·m (1,120 kgf·cm, 81 ft·lbf)

HINT:

After stabilizing the suspension, align the matchmarks on the cam bolt and No. 2 lower suspension arm, and torque the nut.

(c) Connect the shock absorber to the No. 2 lower suspension arm with the bolt and nut.

Torque: 110 N·m (1,120 kgf·cm, 81 ft·lbf)

HINT:

After stabilizing the suspension, torque the nut.

(d) Connect the stabilizer bar link to the No. 2 lower suspension arm with the bracket, bolt and nut.

Torque: 30 N·m (305 kgf·cm, 22 ft·lbf)

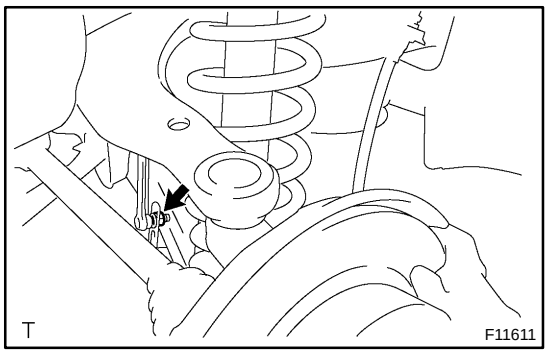
2. INSTALL NO. 1 LOWER SUSPENSION ARM

Install the No. 1 lower suspension arm with the 2 bolts and nuts.

Torque: 75 N·m (765 kgf·cm, 55 ft·lbf)

HINT:

After stabilizing the suspension, torque the bolt.



3. CONNECT HEIGHT CONTROL SENSOR LINK

(a) Set the lower arm to the vehicle height.

(b) Install the sensor link to the lower arm bracket with a nut.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

NOTICE:

- **Be careful not to brake the link fixing pin until the above operation is completed.**
- **The pin can be broken after completion of the above, however, the sensor arm rotation angle shall not exceed the range of ± 70° from the standard vehicle height.**

4. INSTALL REAR FENDER APRON SEAL

5. INSTALL REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

6. CHECK REAR WHEEL ALIGNMENT

(See page SA-9)

7. CHECK ABS SPEED SENSOR SIGNAL

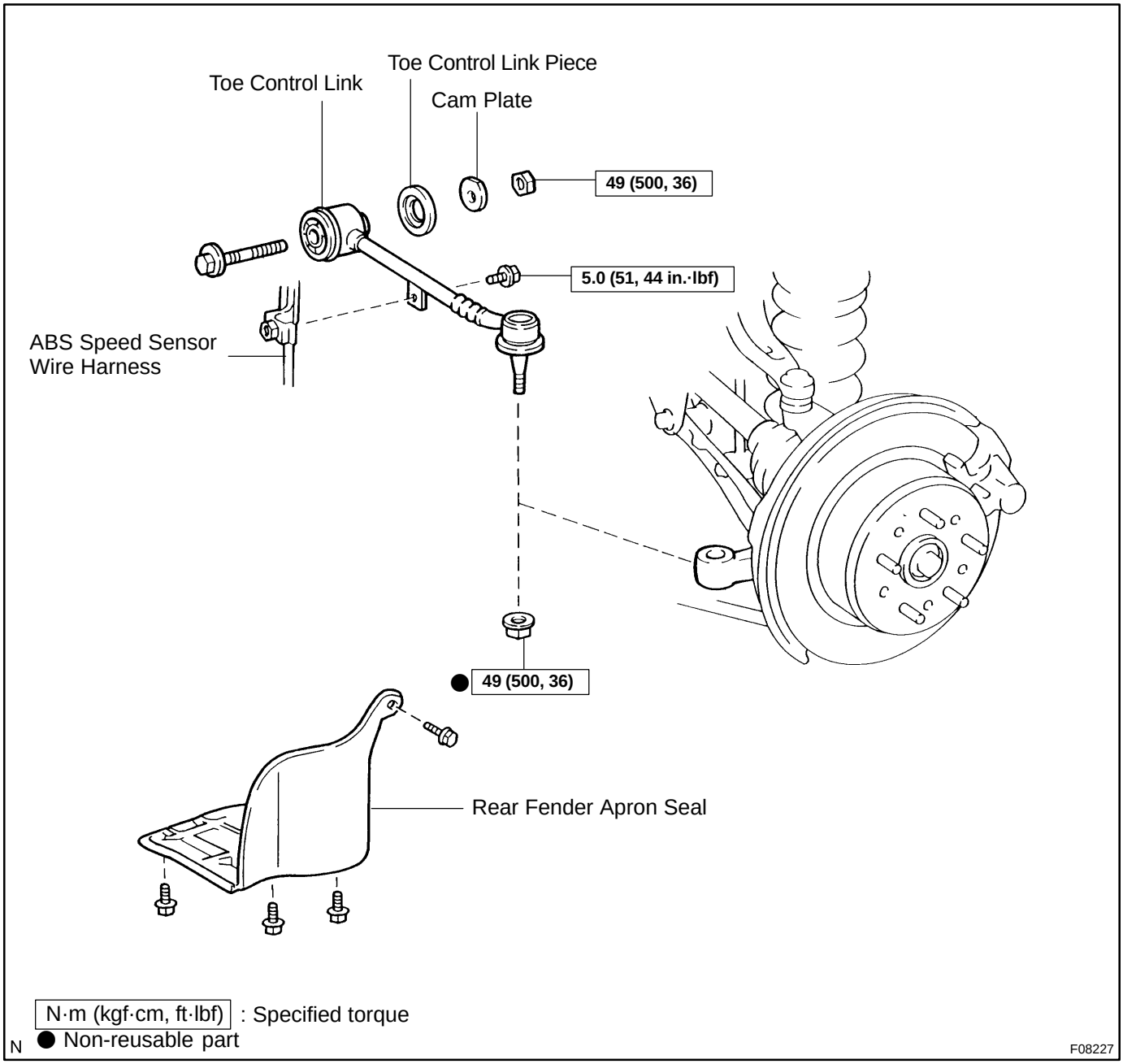
w/ VSC (See page DI-507)

w/o VSC (See page DI-437)

TOE CONTROL LINK

COMPONENTS

SA0SW-07



SA0SX-07

REMOVAL

1. REMOVE REAR WHEEL

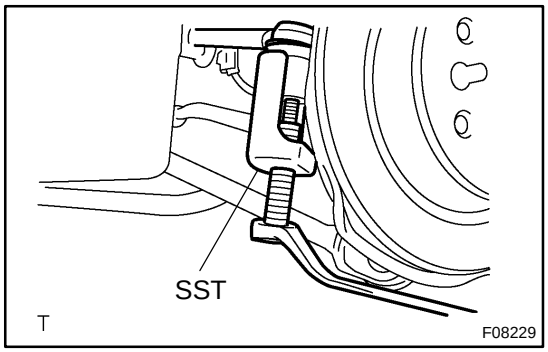
2. REMOVE REAR FENDER APRON SEAL

3. DISCONNECT ABS SPEED SENSOR WIRE HARNESS FROM TOE CONTROL LINK

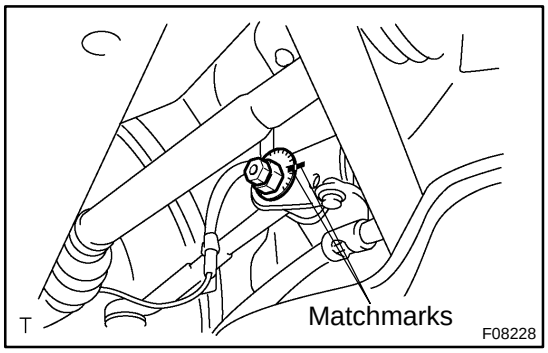
Remove the bolt and disconnect the ABS speed sensor wire harness.

4. REMOVE TOE CONTROL LINK

(a) Remove the nut.



(b) Using SST, disconnect the toe control link from the axle carrier.
SST 09610-20012



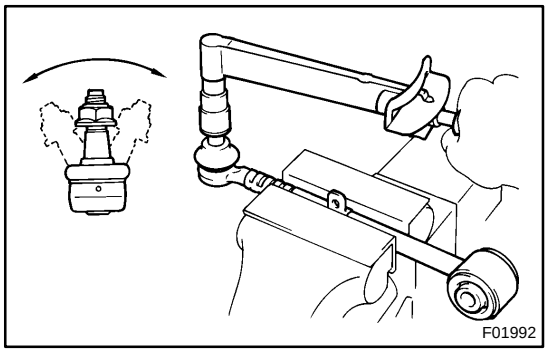
(c) Place matchmarks on the cam plate and rear suspension member.

(d) Remove the nut, cam plate, cam bolt, toe control link piece and toe control link from the axle carrier.

SA0SY-07

INSPECTION

1. INSPECT TOE CONTROL LINK BALL JOINT BOOT FOR DAMAGE



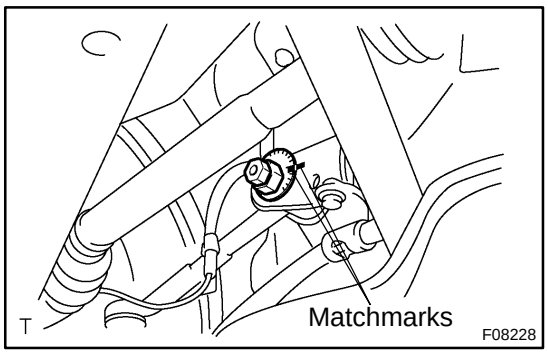
2. INSPECT TOE CONTROL LINK BALL JOINT FOR ROTATION CONDITION

(a) As shown in the illustration, flip the ball joint stud back and forth 5 times, before installing the nut.

(b) Using a torque wrench, turn the nut continuously 1 turn per 2 - 4 seconds and take the torque reading on the 5th turn.

Turning torque:
1.0 - 2.5 N·m (10 - 25 kgf·cm, 9 - 22 in.·lbf)

SA1JN-05



INSTALLATION

1. INSTALL TOE CONTROL LINK

(a) Install the toe control link, toe control link piece to the rear suspension member with the cam bolt, cam plate and nut.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

HINT:

After stabilizing the suspension arm, align the matchmarks on the cam plate and rear suspension member, and torque the nut.

(b) Connect the toe control link to the axle carrier with a new nut.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

2. CONNECT ABS SPEED SENSOR WIRE HARNESS TO TOE CONTROL LINK

Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

3. INSTALL REAR FENDER APRON SEAL

4. INSTALL REAR WHEEL

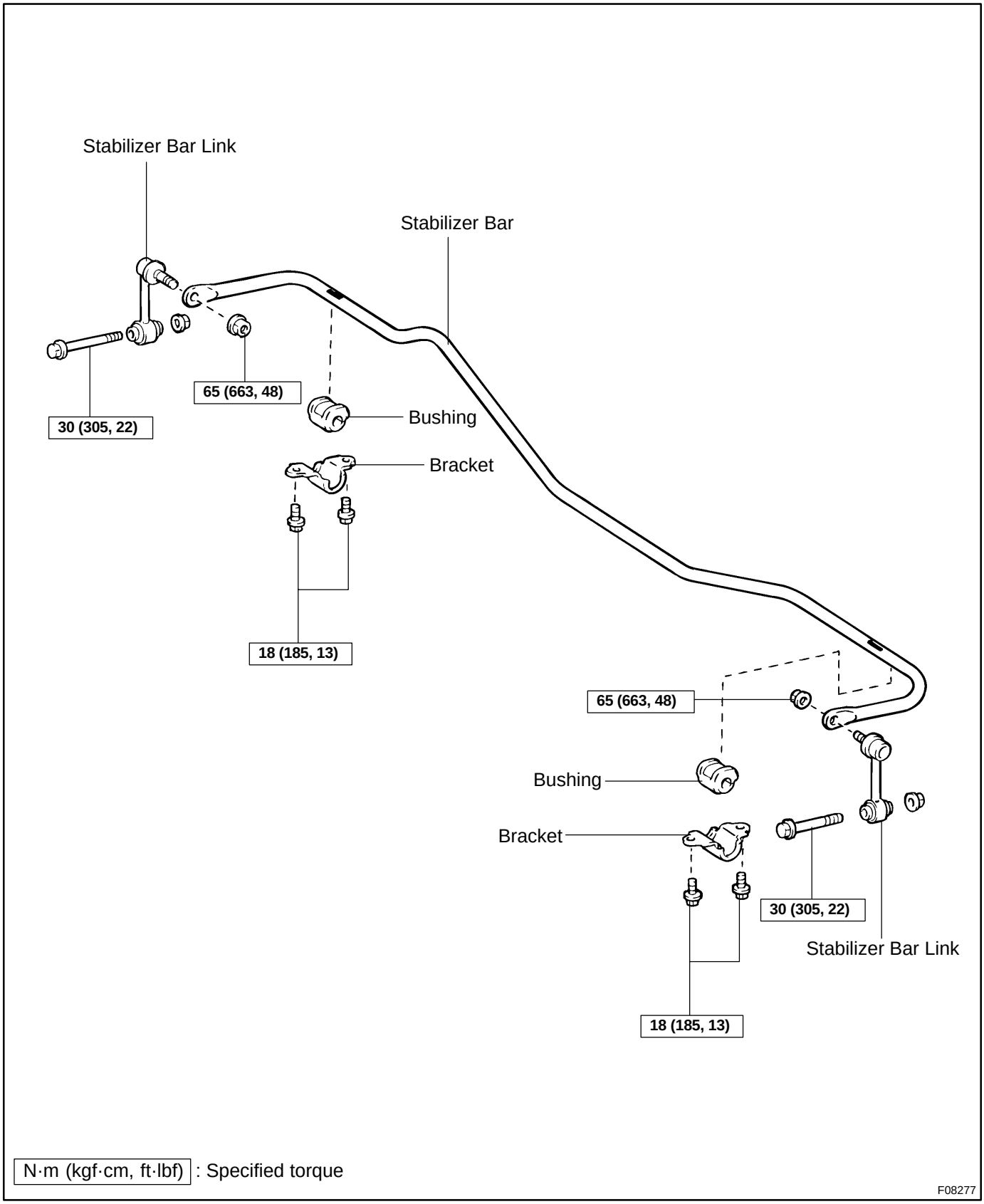
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

5. CHECK REAR WHEEL ALIGNMENT (See page SA-9)

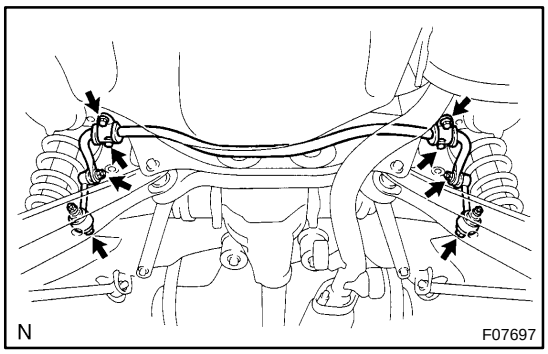
REAR STABILIZER BAR

SA0T0-08

COMPONENTS



SA1JO-04



REMOVAL

1. REMOVE STABILIZER BAR

(a) Remove the 4 nuts, 2 bolts and stabilizer bar links.

HINT:

If the ball joint turns together with the nut, use a hexagon wrench (5 mm) to hold the stud.

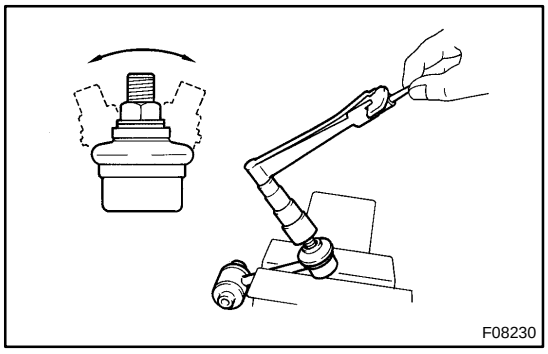
(b) Remove the 4 bolts and stabilizer bar.

2. REMOVE 2 BRACKETS AND BUSHINGS FROM STABILIZER BAR

SA0T2-07

INSPECTION

1. INSPECT STABILIZER BAR LINK BALL JOINT BOOT FOR DAMAGE



2. INSPECT STABILIZER BAR LINK BALL JOINT FOR ROTATION CONDITION

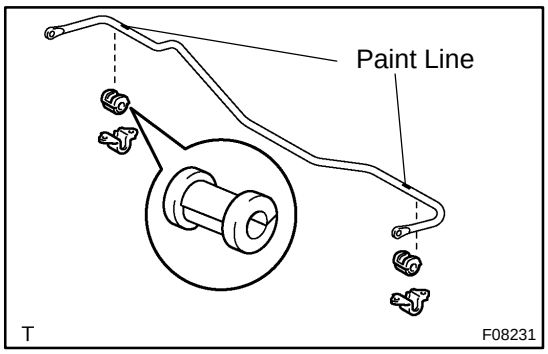
(a) As shown in the illustration, flip the ball joint stud back and forth 5 times, before installing the nut.

(b) Using a torque wrench, turn the nut continuously 1 turn per 2 - 4 seconds and take the torque reading on the 5th turn.

Turning torque:
0.05 - 1.0 N·m (0.5 - 10 kgf·cm, 0.4 - 9.0 in.·lbf)

SA1JP-05

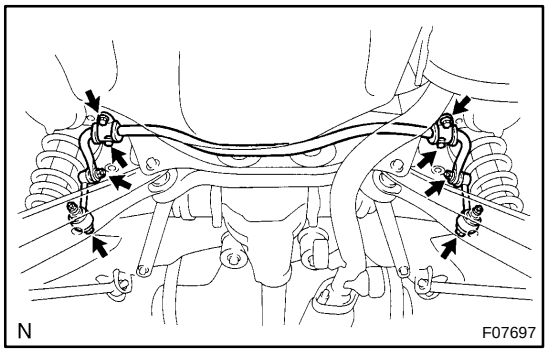
INSTALLATION



1. INSTALL 2 BUSHINGS AND BRACKETS TO STABILIZER BAR

HINT:

- Install the bushing to the outside of the paint line on the stabilizer bar.
- Install the bushing to the stabilizer bar so that the cutout of the bushing faces the rear of the vehicle, as shown in the illustration.



2. INSTALL STABILIZER BAR

(a) Install the stabilizer bar to the body with the 4 bolts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

(b) Install the 2 stabilizer bar links with the 2 bolts and 4 nuts.
Torque:
Bolt: 30 N·m (305 kgf·cm, 22 ft·lbf)
Nut: 65 N·m (663 kgf·cm, 48 ft·lbf)

HINT:

If the ball joint turns together with the nut, use a hexagon wrench (5 mm) to hold the stud.

BRAKE SYSTEM

BR0MH-01

PRECAUTION

- **Care must be taken to replace each part properly as it could affect the performance of the brake system and result in a driving hazard. Replace the parts with parts of the same part number or equivalent.**
- **It is very important to keep parts and the area clean when repairing the brake system.**
- **If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.**

TROUBLESHOOTING

BR0MI-08

PROBLEM SYMPTOMS TABLE

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

Symptom	Suspect Area	See page
Lower pedal or spongy pedal	6. Brake system (Fluid leaks)	DI-504 DI-604
	7. Brake system (Air in)	BR-4
	8. Piston seals (Worn or damaged)	BR-26 BR-35
	9. Master cylinder (Faulty)	BR-10
	10. Booster push rod (Out of adjustment)	BR-21
Brake drag	1. Brake pedal freeplay (Minimal)	BR-6
	2. Parking brake lever travel (Out of adjustment)	BR-9
	3. Parking brake wire (Sticking)	-
	4. Parking brake shoe clearance (Out of adjustment)	BR-45
	5. Pad (Cracked or distorted)	BR-23 BR-32
	6. Piston (Stuck)	BR-26 BR-35
	7. Piston (Frozen)	BR-26 BR-35
	8. Tension or return spring (Faulty)	BR-41
	9. Booster push rod (Out of adjustment)	BR-21
	10. Booster system (Vacuum leaks)	BR-18
	11. Master cylinder (Faulty)	BR-10
Brake pull	1. Piston (Stuck)	BR-26 BR-35
	2. Pad (Oily)	BR-23 BR-32
	3. Piston (Frozen)	BR-26 BR-35
	4. Disc (Scored)	BR-29 BR-38
	5. Pad (Cracked or distorted)	BR-23 BR-32
Hard pedal but brake inefficient	1. Brake system (Fluid leaks)	DI-504 DI-604
	2. Brake system (Air in)	BR-4
	3. Pad (Worn)	BR-23 BR-32
	4. Pad (Cracked or distorted)	BR-23 BR-32
	5. Pad (Oily)	BR-23 BR-32
	6. Pad (Glazed)	BR-23 BR-32
	7. Disc (Scored)	BR-29 BR-38
	8. Booster push rod (Out of adjustment)	BR-21
	9. Booster system (Vacuum leaks)	BR-18

Symptom	Suspect Area	See page
Noise from brake	1. Pad (Cracked or distorted)	BR-23 BR-32
	2. Installation bolt (Loose)	BR-26 BR-35
	3. Disc (Scored)	BR-29 BR-38
	4. Pad support plate (Loose)	BR-26
	5. Sliding pin (Worn)	BR-26
	6. Pad (Dirty)	BR-23 BR-32
	7. Pad (Glazed)	BR-23 BR-32
	8. Tension or return spring (Faulty)	BR-41
	9. Anti-squeal shim (Damaged)	BR-23 BR-32
	10.Shoe hold-down spring (Damaged)	BR-41

BRAKE FLUID

BR0MJ-08

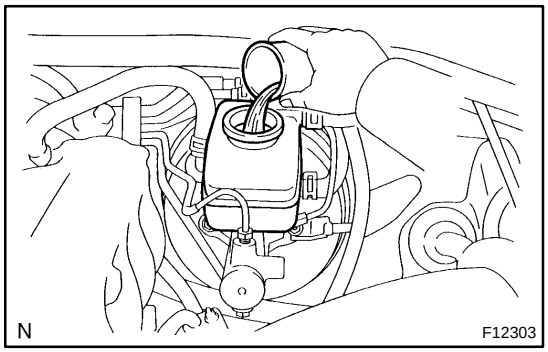
BLEEDING

HINT:

If any work is done on the brake system or if air in the brake lines is suspected, bleed the air from the system.

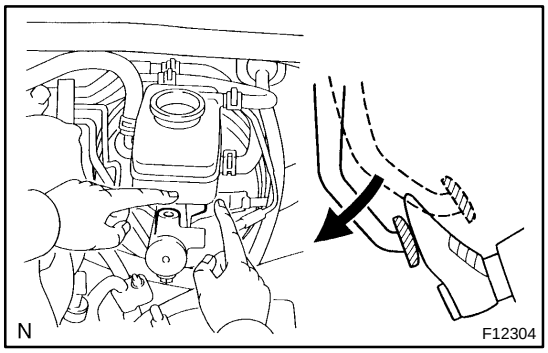
NOTICE:

Do not let brake fluid remain on painted surfaces. Wash it off immediately.



1. FILL RESERVOIR WITH BRAKE FLUID

Fluid: SAE J1703 or FMVSS NO. 116 DOT3



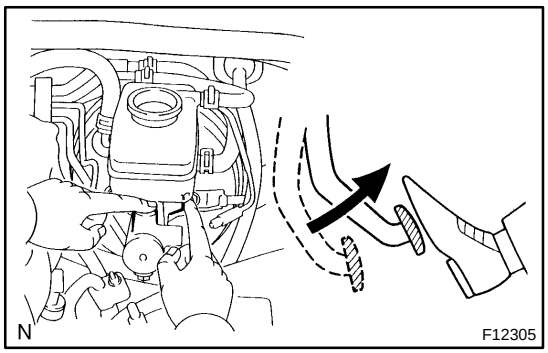
2. BLEED MASTER CYLINDER

HINT:

If the master cylinder has been disassembled or if the reservoir becomes empty, bleed the master cylinder of the air.

(a) Disconnect the brake lines from the master cylinder.
SST 09023-00100

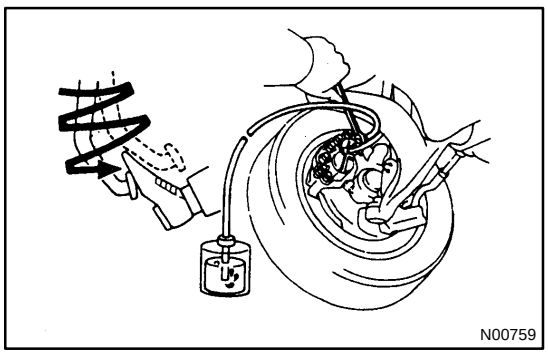
(b) Slowly depress the brake pedal and hold it.



(c) Block off the outer holes with your fingers, and release the brake pedal.

(d) Repeat (b) and (c) 3 or 4 times.

(e) Connect the brake lines to the master cylinder.
SST 09023-00100
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)



3. BLEED BRAKE LINE

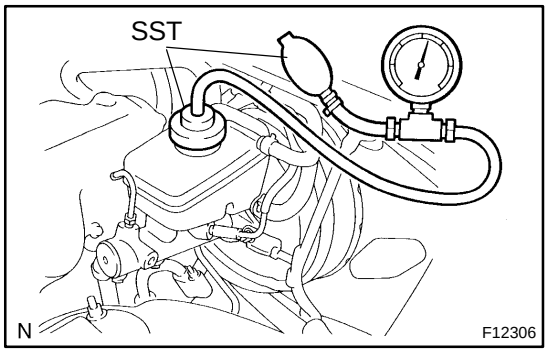
(a) Connect the vinyl tube to the caliper.

(b) Depress the brake pedal several times, then loosen the bleeder plug with the pedal held down.

(c) At the point when fluid stops coming out, tighten the bleeder plug, then release the brake pedal.

(d) Repeat (b) and (c) until all the air in the fluid has been bled out.

(e) Repeat the procedure on the previous page to bleed the brake line for each wheel.
Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

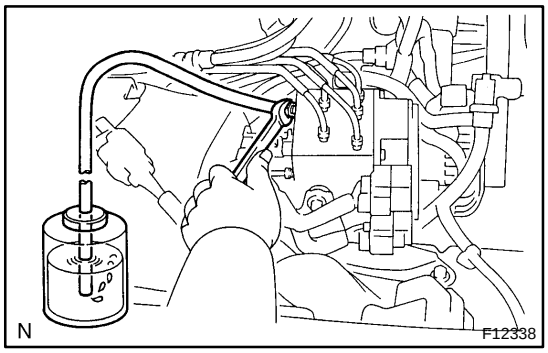


4. BLEED ABS & TRAC / VSC ACTUATOR

CAUTION:

When repairing the brake master cylinder or ABS & TRAC / VSC actuator, bleed the ABS & TRAC / VSC actuator of the air.

(a) Install the SST to the reservoir.
SST 09992-00242, 09992-00350



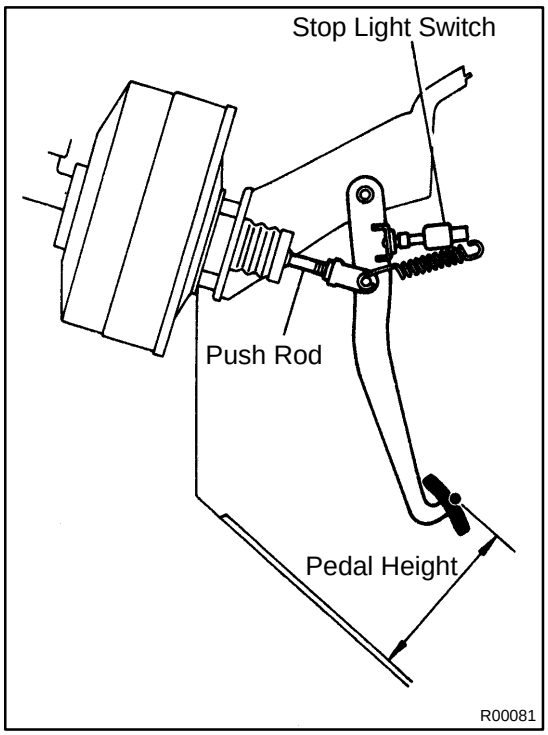
(b) Connect the vinyl tube to the ABS & TRAC / VSC actuator, and loosen the bleeder plug.

(c) Using SST, apply pressure to the reservoir.
Pressure: 98.1 kpa (1.0 kgf/cm^2, 14.2 psi)

(d) Bleed the ABS & TRAC / VSC actuator of the air, tighten the bleeder plug.
Torque: 8.3 N·m (85 kgf·cm, 74 in.·lbf)

5. CHECK FLUID LEVEL IN RESERVOIR

Check the fluid level and add fluid if necessary.
Fluid: SAE J1703 or FMVSS NO. 116 DOT3



BRAKE PEDAL

BR0MK-07

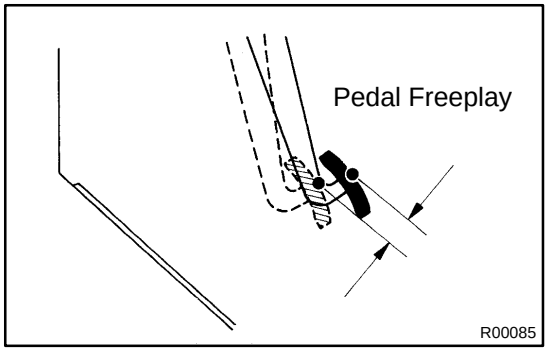
ON-VEHICLE INSPECTION

1. CHECK PEDAL HEIGHT

Pedal height from asphalt sheet:
154 - 164 mm (6.063 - 6.457 in.)

2. IF NECESSARY, ADJUST PEDAL HEIGHT

(a) Remove the lower finish panel (See page BO-135).
(b) Disconnect the connector from the stop light switch.
(c) Loosen the stop light switch lock nut and remove the stop light switch.
(d) Loosen the push rod lock nut.
(e) Adjust the pedal height by turning the pedal push rod.
(f) Tighten the push rod lock nut.
Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)
(g) Install the stop light switch and turn it until it slightly contacts the pedal stopper.
(h) Connect the connector to the stop light switch.
(i) Push in the brake pedal 5 - 10 mm (0.20 - 0.39 in.), turn the stop light switch to lock the nut in a position where the stop light goes off.
(j) After installation, push in the brake pedal 5 - 10 mm (0.20 - 0.39 in.), check that stop light lights up.
(k) After adjusting the pedal height, check the pedal free play.
(l) Install the lower finish panel (See page BO-135).

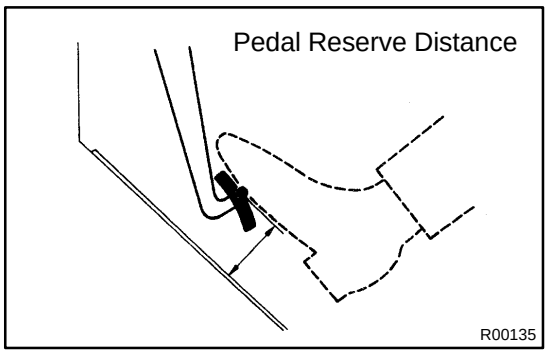


3. CHECK PEDAL FREE PLAY

(a) Stop the engine and depress the brake pedal several times until there is no more vacuum left in the booster.
(b) Push in the pedal by hand until the resistance begins to be felt, then measure the distance.
Pedal free play: 1 - 6 mm (0.04 - 0.24 in.)

HINT:
The freeplay to the 1st resistance is due to the play between the clevis and pin. This is magnified up to 2.0 - 4.5 mm (0.08 - 0.18 in.) at the pedal.
If incorrect, check the stop light switch clearance. If the clearance is OK, then troubleshoot the brake system.

Stop light switch clearance:
1.5 - 2.5 mm (0.059 - 0.098 in.)



4. CHECK PEDAL RESERVE DISTANCE

Release the parking brake lever.

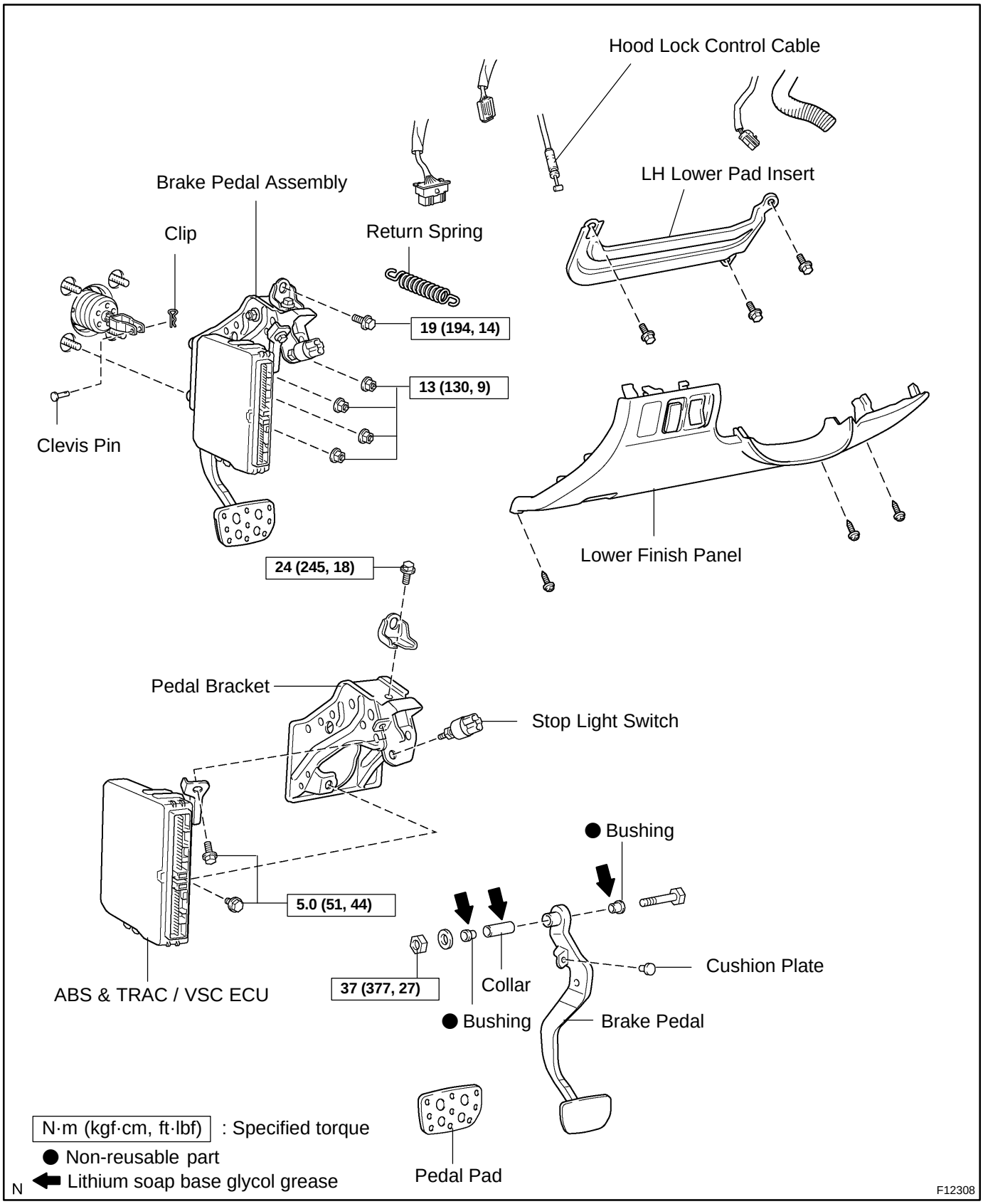
With the engine running, depress the pedal and measure the pedal reserve distance, as shown.

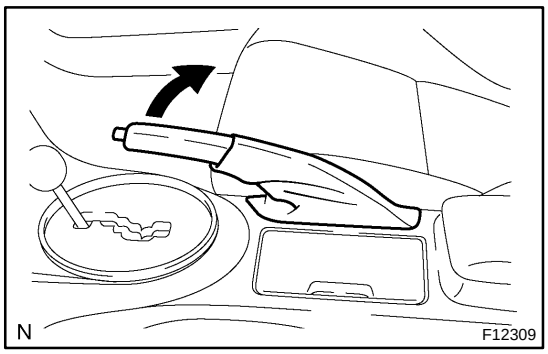
Pedal reserve distance from asphalt sheet at 490 N (50 Kgf, 110.2 lbf): More than 99 mm (3.90 in.)

If the reserve distance is incorrect, troubleshoot the brake system.

BR0YI-06

COMPONENTS





PARKING BRAKE LEVER

BR0ZV-02

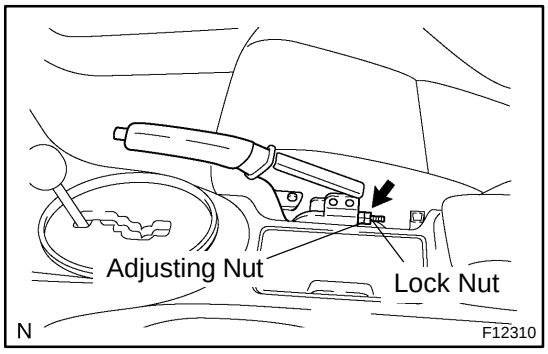
ON-VEHICLE INSPECTION

1. CHECK PARKING BRAKE LEVER TRAVEL

Pull the parking brake lever all the way up, and count the number of clicks.

Parking brake lever travel at 196 N (20 kgf, 44.1 lbf): 5 - 8 clicks

If incorrect, adjust the parking brake.



2. IF NECESSARY, ADJUST PARKING BRAKE

HINT:

Before adjusting the parking brake, make sure that the rear brake shoe clearance has been adjusted.

For shoe clearance adjustment (See page BR-45).

(a) Remove the parking brake lever hole cover.

(b) Loosen the lock nut and the turn adjusting nut until the lever travel is correct.

(c) Tighten the lock nut.

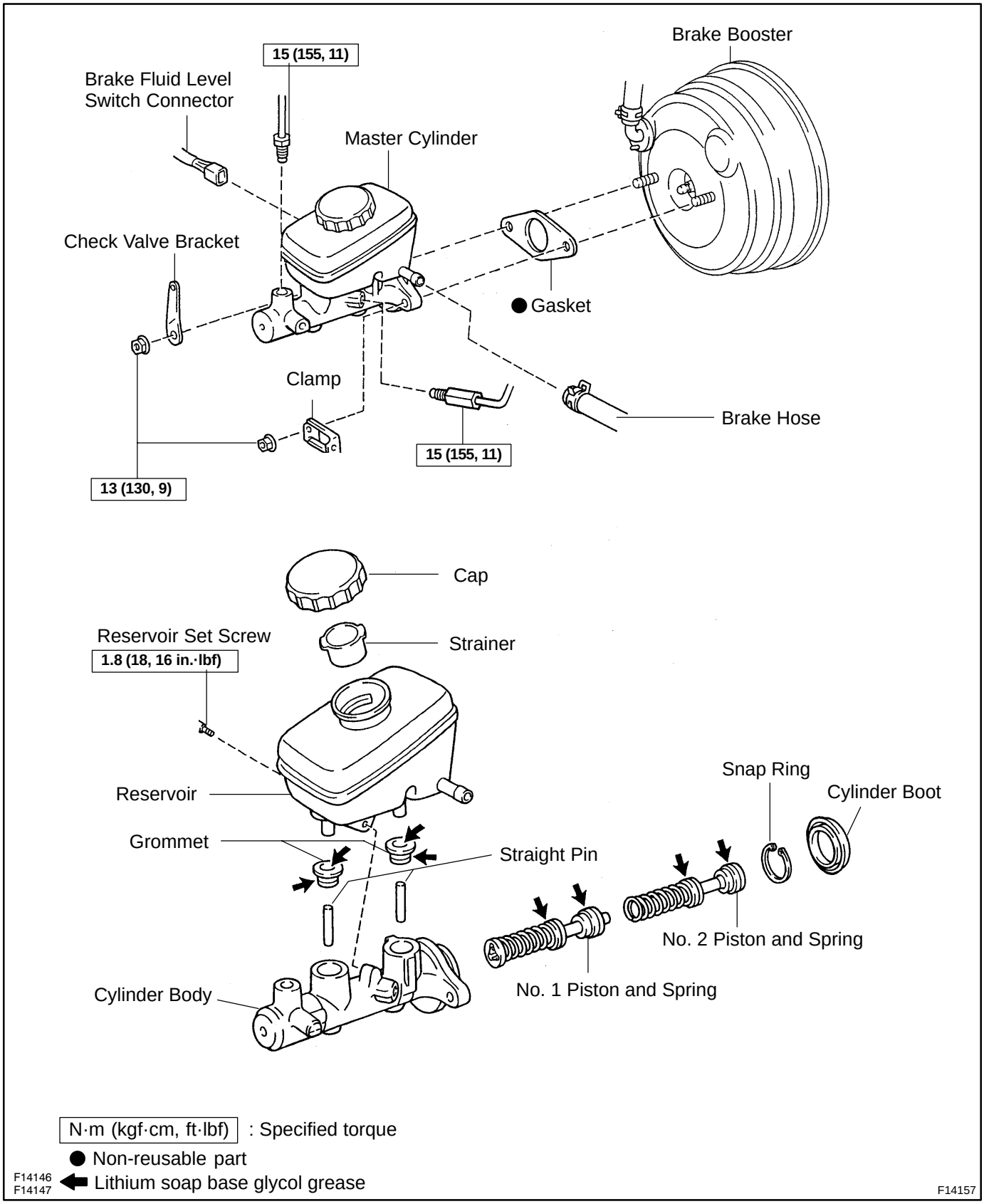
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(d) Install the parking brake lever hole cover.

BRAKE MASTER CYLINDER

COMPONENTS

BR1JU-02



BR0AF-12

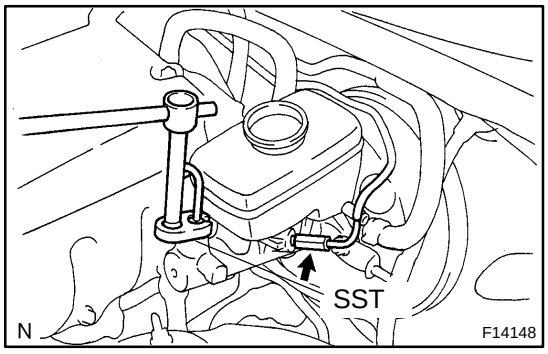
REMOVAL

1. TAKE OUT FLUID WITH SYRINGE

NOTICE:

Do not let brake fluid remain on a painted surface. Wash it off immediately.

2. DISCONNECT BRAKE FLUID LEVEL SWITCH CONNECTOR

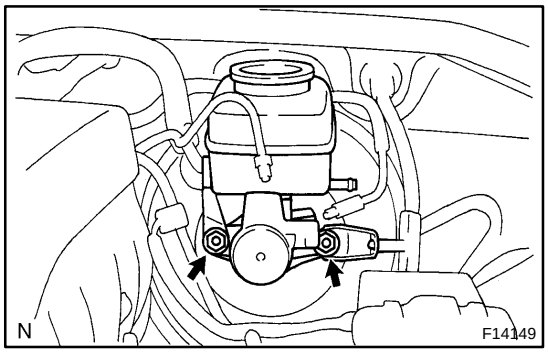


3. DISCONNECT BRAKE LINES

Using SST, disconnect the 2 brake lines.

SST 09023-00100

Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)



4. REMOVE MASTER CYLINDER

(a) Disconnect the 2 brake hoses.

(b) Remove the 2 nuts, and pull out the check valve bracket, brake hose clamp, master cylinder and gasket.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

BR1R6-01

DISASSEMBLY

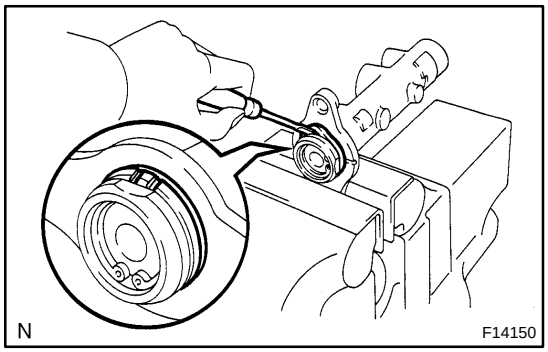
1. REMOVE RESERVOIR

Remove the set screw and pull out the reservoir.

Torque: 1.8 N·m (18 kgf·cm, 16 in.·lbf)

2. REMOVE 2 GROMMETS

3. PLACE CYLINDER IN VISE



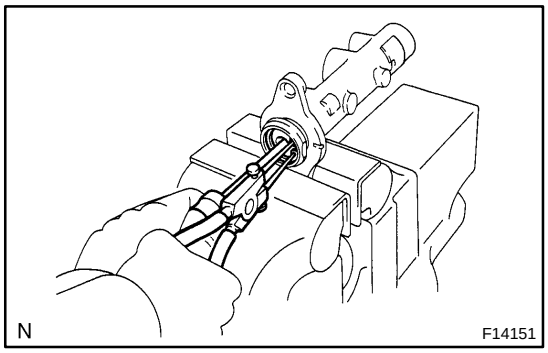
4. REMOVE MASTER CYLINDER BOOT

Using a screwdriver, remove the master cylinder boot.

HINT:

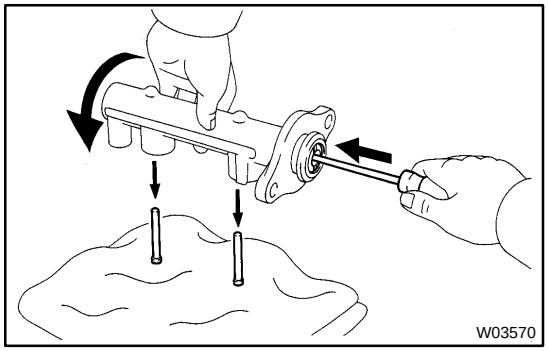
At the time of reassembly, please refer to the following item.

With the UP mark on the master cylinder boot facing upwards, install the cylinder boot on the master cylinder.



5. REMOVE 2 PISTONS AND SPRINGS

(a) Push in the piston with a screwdriver and remove the snap ring with snap ring pliers.

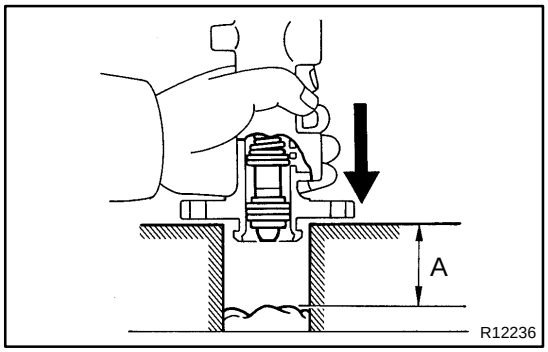


(b) Push in the piston with a screwdriver, and remove the 2 straight pins by turning over the cylinder body.

HINT:

Tape the screwdriver tip before use.

(c) Remove the 2 pistons and springs by hand, pulling straight out, not at angle.



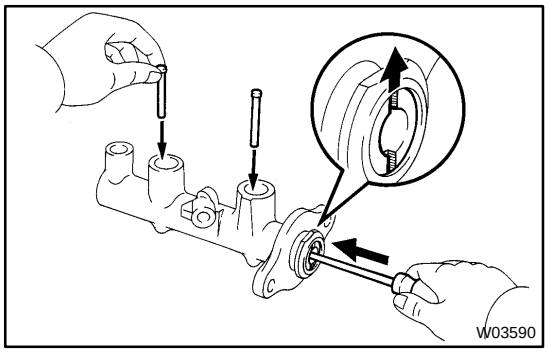
(d) Place a rag and 2 wooden blocks on the work table and lightly tap the cylinder flange against the block edges until the piston drops out of the cylinder.

HINT:

Make sure the distance (A) from the rag to the top of the blocks is at least 100 mm (3.94 in.).

NOTICE:

- **If pulled out and installed at an angle, there is a possibility that the cylinder bore could be damaged.**
- **At the time of reassembly, be careful not to damage the rubber lips on the pistons.**



HINT:
At the time of reassembly, insert the pistons with elliptic hole facing vertically.

BR0MP-01

INSPECTION

HINT:

Clean the disassembled parts with compressed air.

1. INSPECT CYLINDER BORE FOR RUST OR SCORING

2. INSPECT CYLINDER FOR WEAR OR DAMAGE

If necessary, clean or replace the cylinder.

BR0MQ-04

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR-12).

HINT:

Apply lithium soap base glycol grease to the rubber parts indicated by the arrows (See page BR-10).

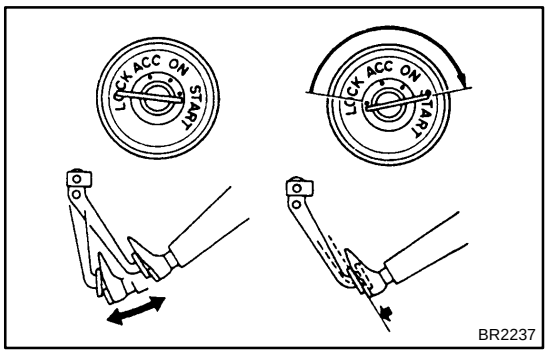
BR0MR-03

INSTALLATION

Installation is in the reverse order of removal (See page BR-11).

HINT:

- Before installation, adjust length of brake booster push rod (See page BR-21).
- After installation, fill the brake reservoir with brake fluid, bleed brake system (See page BR-4), and check for leaks.
- Check and adjust brake pedal (See page BR-6).



BRAKE BOOSTER ASSEMBLY

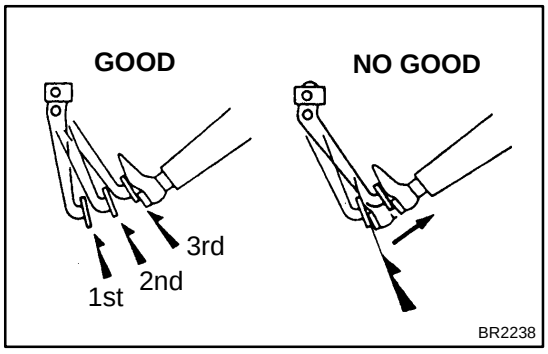
BR0NR-06

ON-VEHICLE INSPECTION

1. OPERATING CHECK

(a) Depress the bake pedal several times with the engine OFF and check that there is no change in the pedal reserve distance.

(b) Depress the brake pedal and start the engine. If the pedal goes down slightly, operation is normal.



2. AIR TIGHTNESS CHECK

(a) Start the engine and stop it after 1 or 2 minutes. Depress the brake pedal several times slowly.

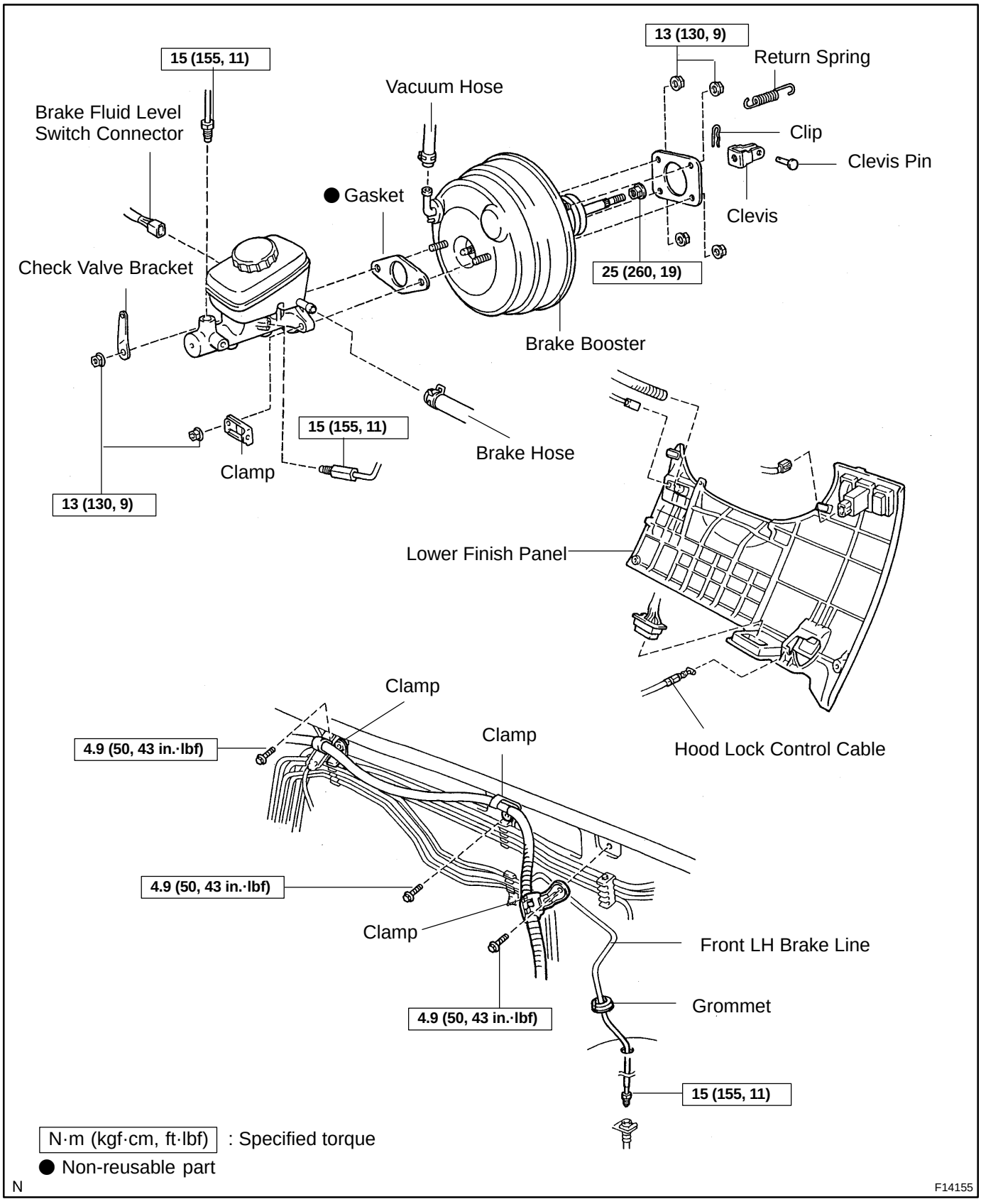
If the pedal goes down the farthest the 1st time, but gradually rises after the 2nd or 3rd time, the booster is air-tight.

(b) Depress the brake pedal while the engine is running, and stop the engine with the pedal depressed.

If there is no change in the pedal reserve travel after holding the pedal for 30 seconds, the booster is air-tight.

BR0NS-07

COMPONENTS



BR1JR-01

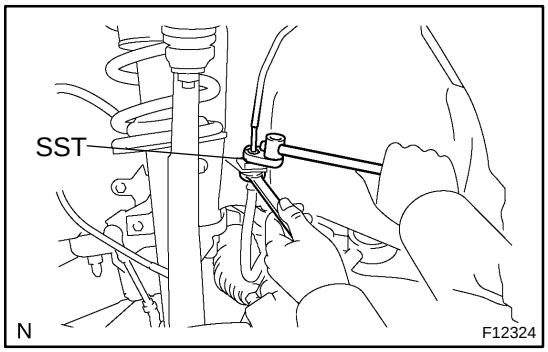
REMOVAL

1. REMOVE FRONT LH WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

2. REMOVE MASTER CYLINDER (See page BR-11)

3. DISCONNECT VACUUM HOSE FROM BRAKE BOOSTER

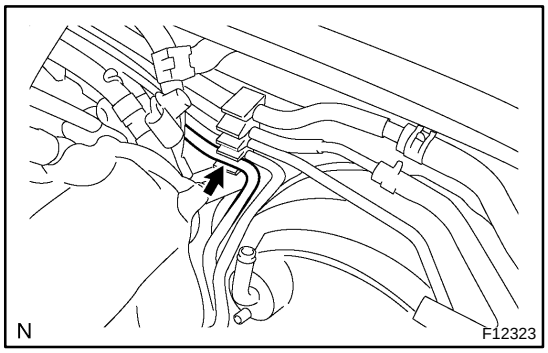


4. DISCONNECT FRONT LH BRAKE LINE

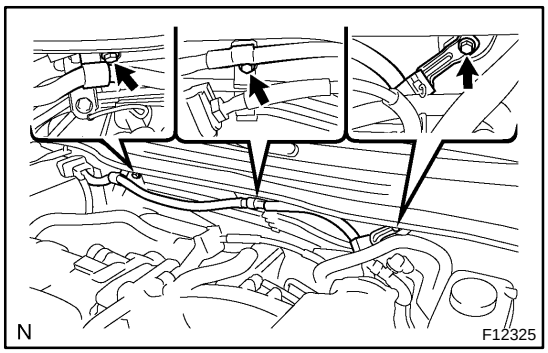
(a) Using SST and spanner, disconnect the brake line from the flexible hose of front LH brake.

SST 09023-00100

(b) Separate the grommet from body through the brake line.



(c) Disconnect the front LH brake line from the clamp.

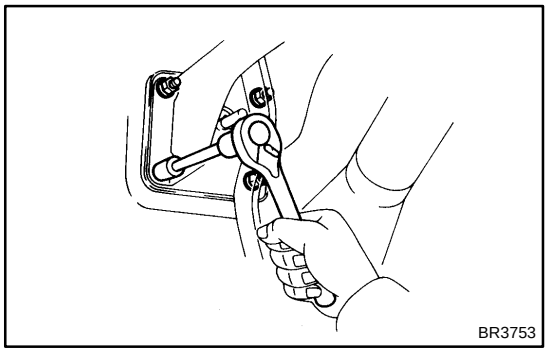


5. REMOVE BRAKE BOOSTER

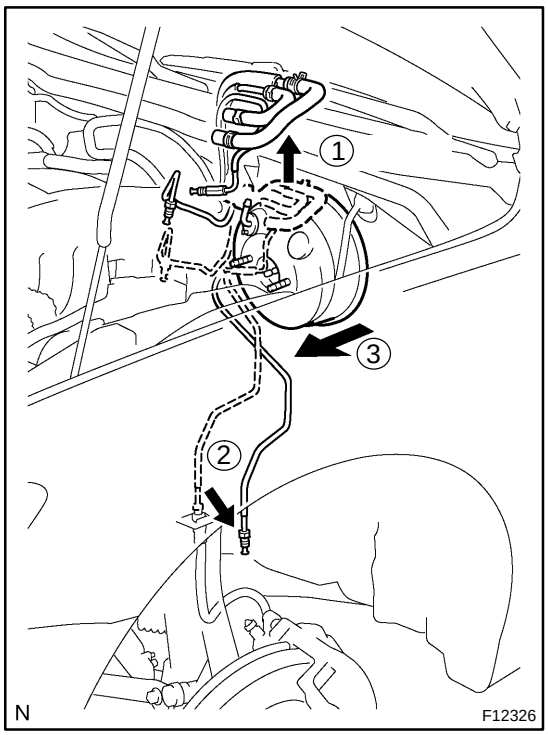
(a) Remove the 3 bolts and disconnect the 3 clamps.

(b) Remove the lower finish panel (See page BO-135).

(c) Remove the return spring, clip and clevis pin.



(d) Remove the clevis and 4 nuts.



(e) Move the brake line as illustrated and ensure sufficient space.

(f) Pull out the booster and gasket.

BR1JS-02

INSTALLATION

1. INSTALL BRAKE BOOSTER

(a) Install a new gasket to the booster.

(b) Install the booster.

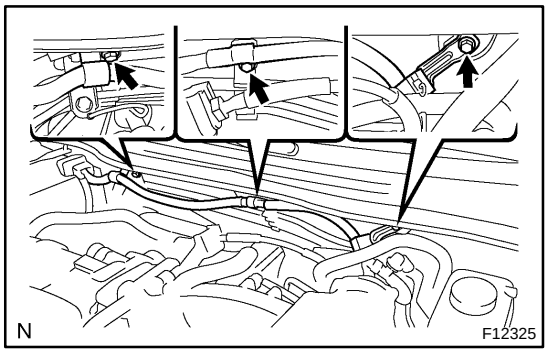
(c) Install and torque the booster installation nuts.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(d) Install the clevis to the operating rod.

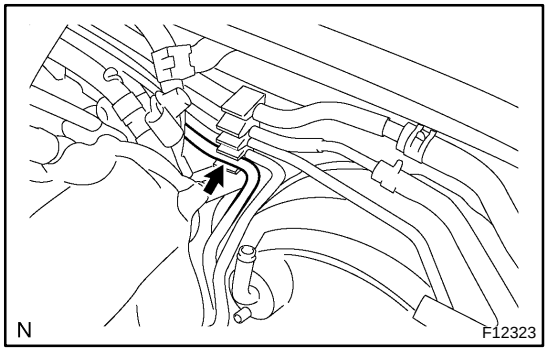
(e) Insert the clevis pin into the clevis and brake pedal, and install the clip to the clevis pin.

(f) Install the pedal return spring.

(g) Install the vacuum hose.



(h) Install the 3 clamps with 3 bolts.
Torque: 4.9 N·m (50 kgf·cm, 43 in.·lbf)

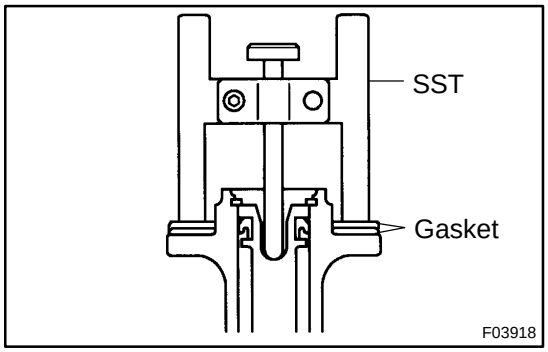


2. CONNECT FRONT LH BRAKE LINE

(a) Connect the front LH brake line to the clamp.

(b) Using SST and spanner, connect the brake line to the flexible hose of front LH brake.
SST 09023-00100
Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

(c) Attach the grommet to body through the brake line.



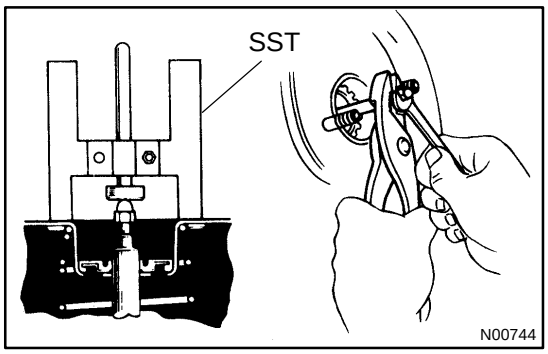
3. ADJUST LENGTH OF BOOSTER PUSH ROD

(a) Install 2 new gaskets on the master cylinder.

(b) Set the SST on the gasket, and lower the pin until its tip slightly touches the piston.
SST 09737-0001 1

(c) Turn the SST upside down, and set it on the booster.
SST 09737-0001 1

(d) Measure the clearance between the booster push rod and pin head (SST).
Clearance: 0 mm (0 in.)



(e) Adjust the booster push rod length until the push rod slightly touches the pin head.

HINT:

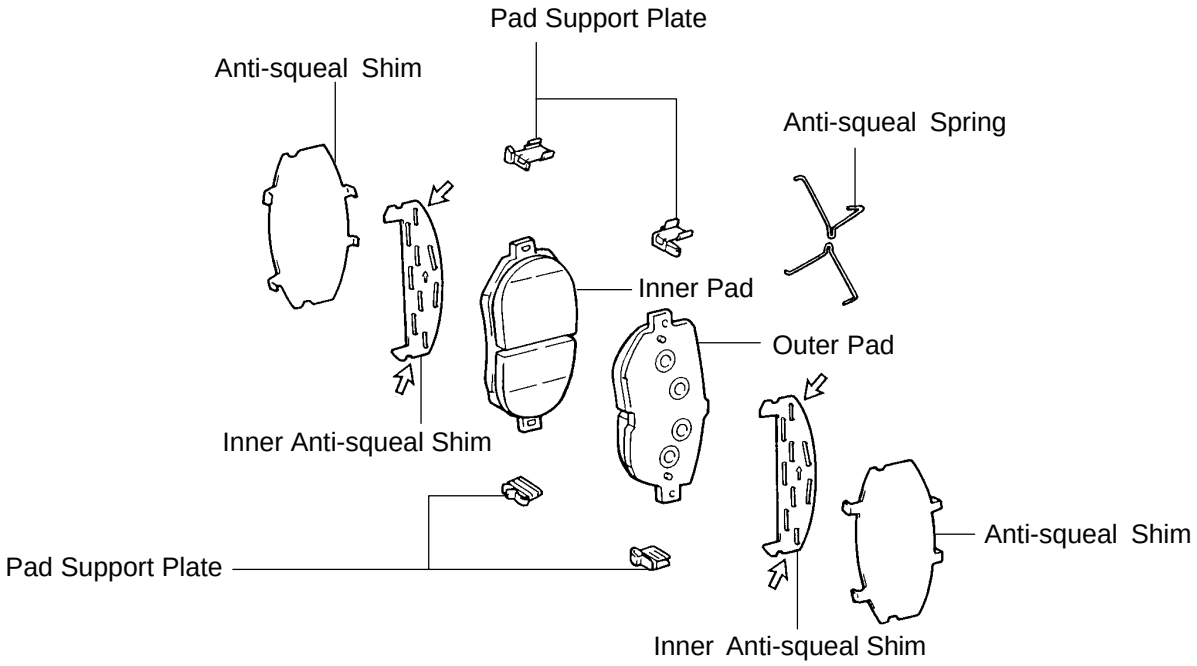
When adjusting the push rod, depress the brake pedal enough so that the push rod sticks out.

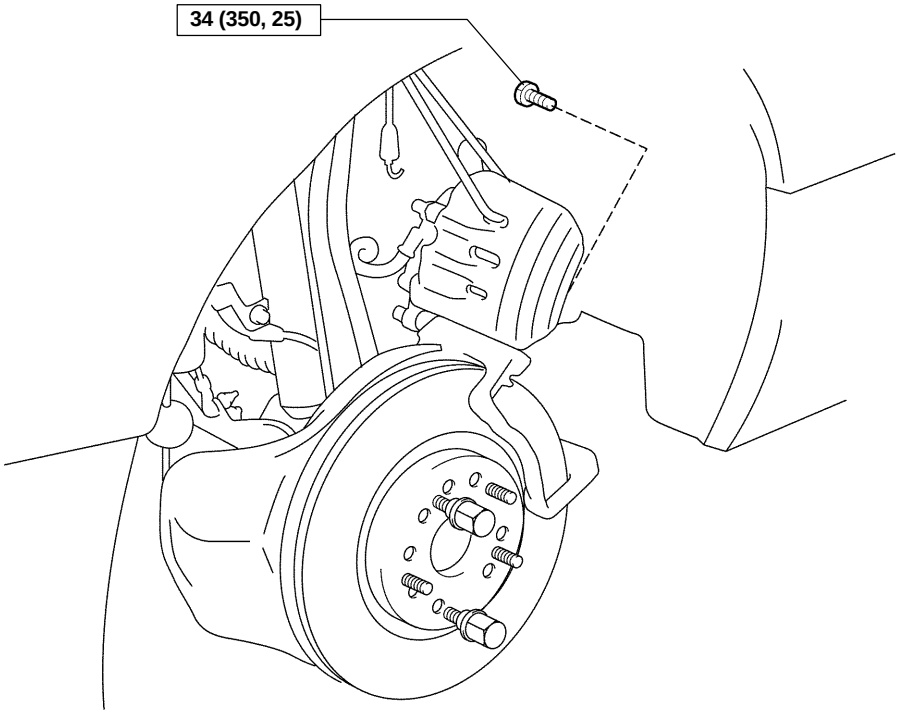
4. **INSTALL BRAKE MASTER CYLINDER (See page BR-16)**
5. **FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR-4)**
6. **CHECK FOR FLUID LEAKAGE**
7. **CHECK AND ADJUST BRAKE PEDAL (See page BR-6)**
8. **INSTALL LOWER FINISH PANEL (See page BO-135)**
9. **DO OPERATIONAL CHECK (See page BR-17)**

FRONT BRAKE PAD

COMPONENTS

BR0JH-08





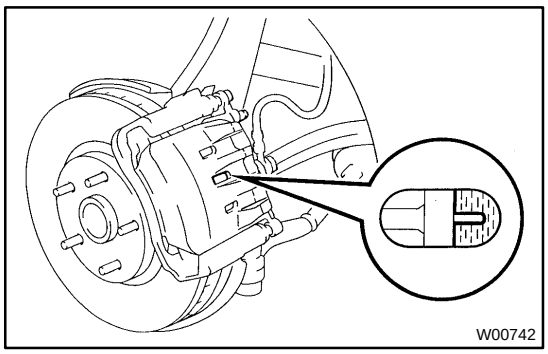
N·m (kgf·cm, ft·lbf) : Specified torque

⇨ Disc brake grease

F07909

BR1JT-01

REPLACEMENT

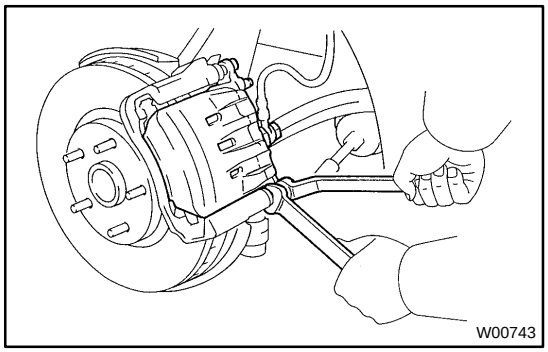


1. REMOVE FRONT WHEEL

2. INSPECT PAD LINING THICKNESS

Check the pad thickness through the caliper inspection hole and replace the pads if they are not within the specification.

Minimum thickness: 1.0 mm (0.039 in.)



3. LIFT UP CALIPER

(a) Hold the sliding pin on the bottom and loosen the installation bolt.

(b) Remove the installation bolt.

(c) Lift up the caliper and suspend it securely.

HINT:

Do not disconnect the flexible hose from the caliper.

4. REMOVE 2 ANTI- SQUEAL SPRINGS

5. REMOVE 2 BRAKE PADS WITH 4 ANTI- SQUEAL SHIMS

6. REMOVE 4 PAD SUPPORT PLATES

NOTICE:

The anti-squeal springs and support plates can be used again provided that they have sufficient rebound, no deformation, cracks or wear, and have had all rust, dirt and foreign particles cleaned off.

7. CHECK DISC THICKNESS AND RUNOUT

(See page BR-29)

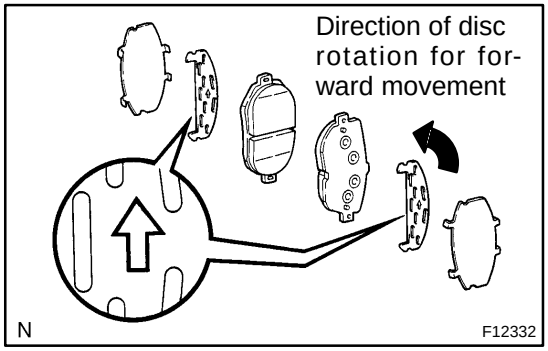
8. INSTALL 4 PAD SUPPORT PLATES

9. INSTALL NEW PADS

NOTICE:

When replacing worn pads, the anti-squeal shims must be replaced together with the pad.

(a) Apply disc brake grease to both sides of each inner anti-squeal shims (See page BR-23).



(b) Install the 2 anti-squeal shims to each pad.

HINT:

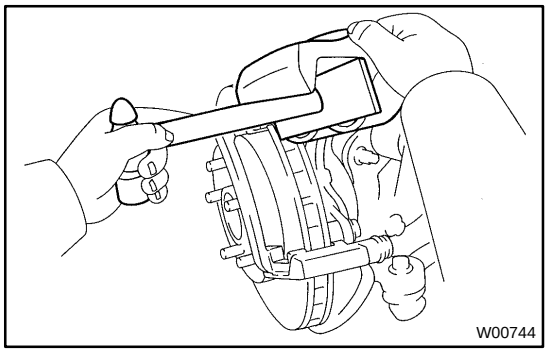
Make sure the arrows on the inner anti-squeal shims facing to the direction of disc rotation as shown in the illustration.

(c) Install the inner pad with the pad wear indicator plates facing downward.
(d) Install the outer pad.

NOTICE:

There should be no oil or grease adhering to the friction surfaces of the pads or the disc.

(e) Install the 2 anti-squeal springs.



10. INSTALL CALIPER

(a) Draw out a small amount of brake fluid from the reservoir.
(b) Press in the pistons with a hammer handle or similar implement.

HINT:

If the pistons are difficult to push in, loosen the bleeder plug and push in the pistons while letting some brake fluid escape.

(c) Install the caliper.
(d) Hold the sliding pin and torque the installation bolt.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

11. INSTALL FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

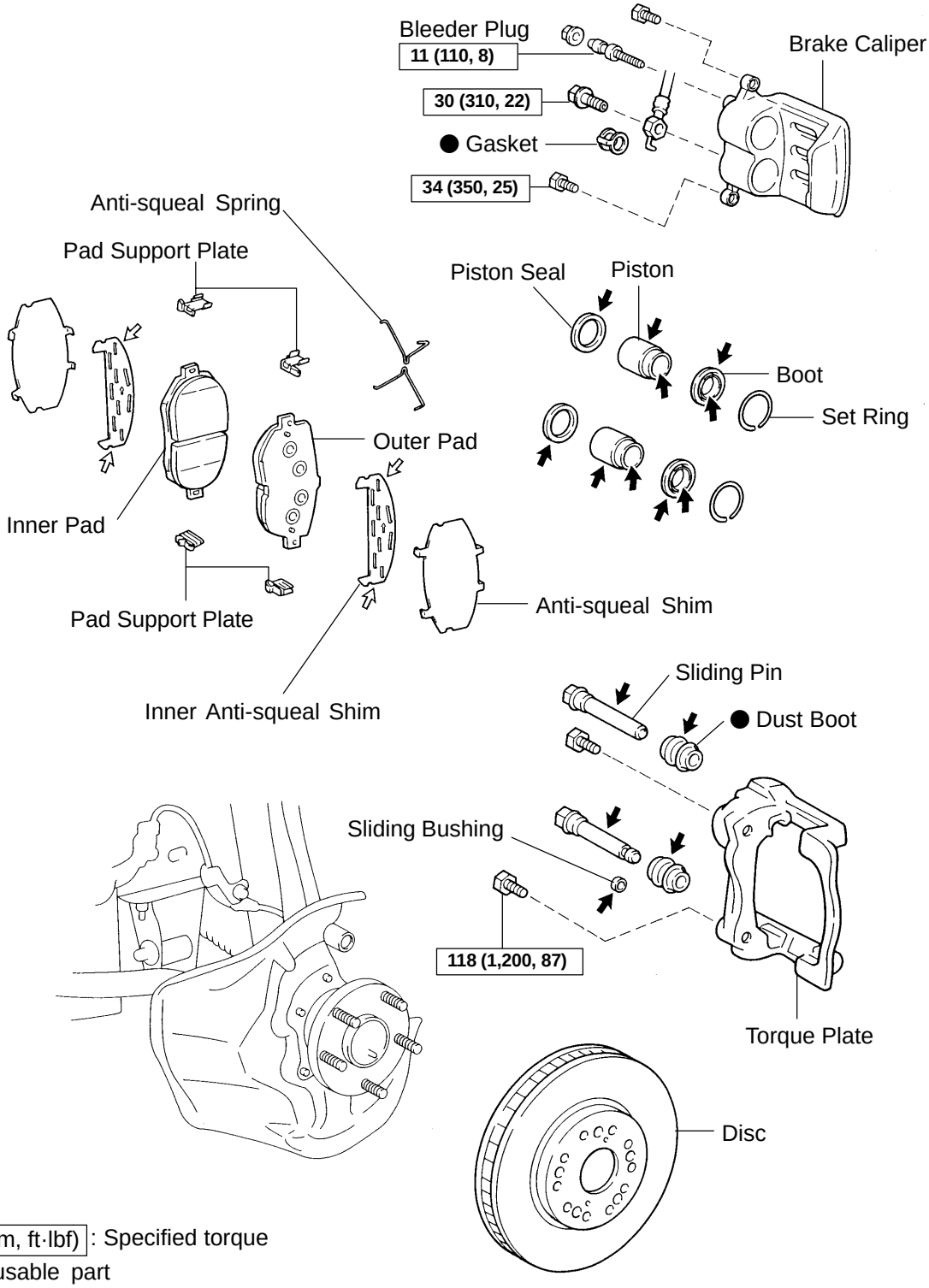
12. DEPRESS BRAKE PEDAL SEVERAL TIMES

13. CHECK THAT FLUID LEVEL IS AT MAX LINE

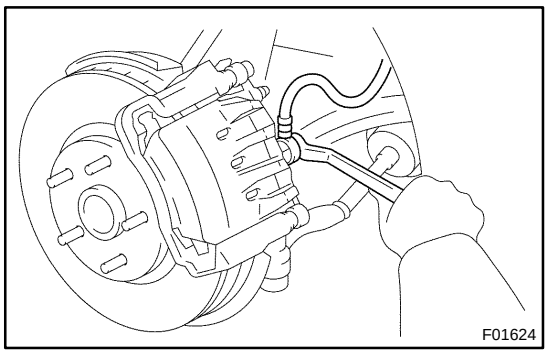
FRONT BRAKE CALIPER

COMPONENTS

BR0JJ-12



BR0JK-07



REMOVAL

1. DISCONNECT FLEXIBLE HOSE

Remove the union bolt and gasket from the caliper, then disconnect the flexible hose from the caliper. Use a container to catch brake fluid as it drains out.

Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

HINT:

At the time of installation, install the flexible hose lock securely in the lock hole in the caliper.

2. REMOVE CALIPER

(a) Hold the sliding pin and loosen the 2 installation bolts.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

(b) Remove the 2 installation bolts.

(c) Remove the caliper from the torque plate.

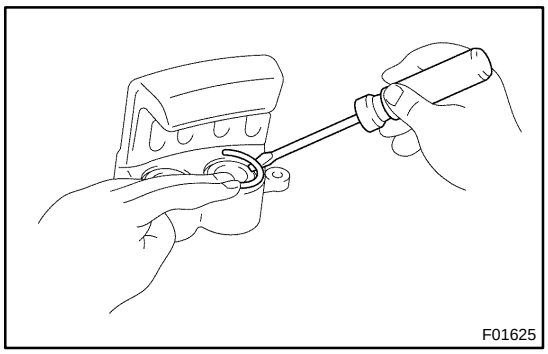
3. REMOVE 2 ANTI-SQUEAL SPRINGS

4. REMOVE 2 BRAKE PADS WITH 4 ANTI- SQUEAL SHIMS

5. REMOVE 4 PAD SUPPORT PLATES

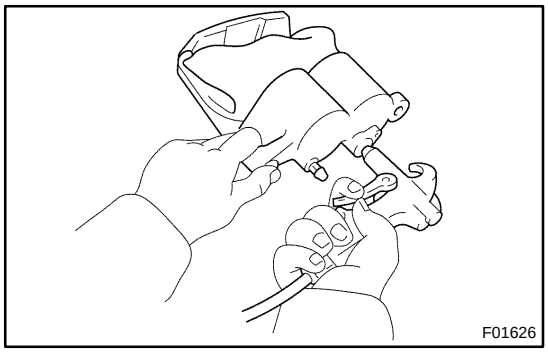
BR0JL-10

DISASSEMBLY



1. REMOVE SET RINGS AND CYLINDER BOOTS

Using a screwdriver, remove the 2 set rings and 2 cylinder boots.



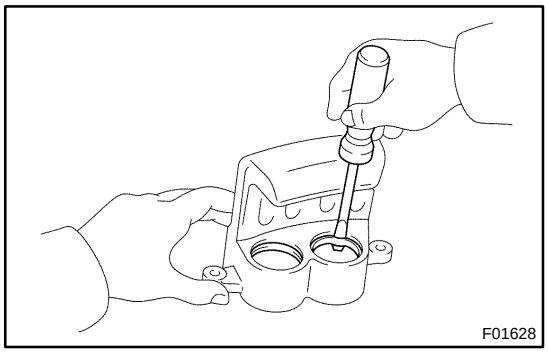
2. REMOVE PISTONS

(a) Put a piece of cloth or an equivalent between the piston and caliper.

(b) Use compressed air to remove the 2 pistons from the cylinder.

CAUTION:

Do not place your fingers in front of the piston when using compressed air.



3. REMOVE PISTON SEALS FROM BRAKE CYLINDER

Using a screwdriver, remove the 2 piston seals.

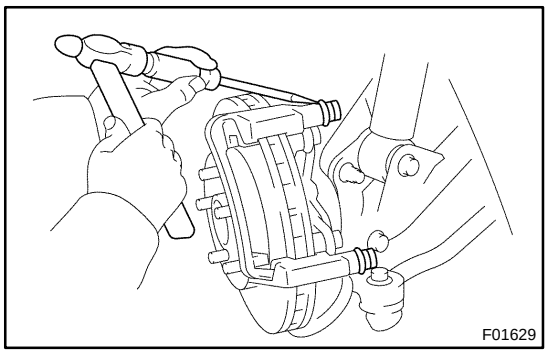
4. REMOVE SLIDING PINS AND DUST BOOTS

(a) Remove the 2 sliding pins from the torque plate.

NOTICE:

At the time of reassembly, please refer to the following item.

Insert the sliding pin with the sliding bushing into the bottom side.



(b) Using a screwdriver and hammer, tap out the 2 dust boots.

NOTICE:

At the time of reassembly, please refer to the following item.

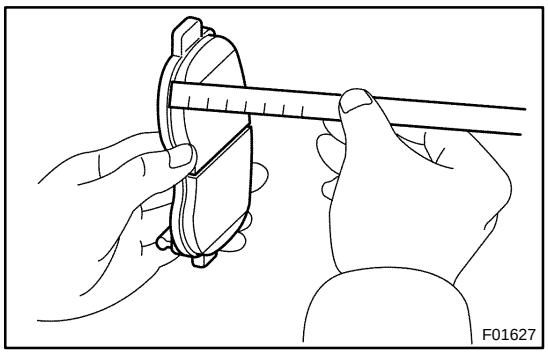
Confirm that the metal plate portion of the dust boot fits snugly in the torque plate.

HINT:

At the time of reassembly, use a 21 mm socket and tap in new dust boots into the torque plate.

BR0JM-11

INSPECTION



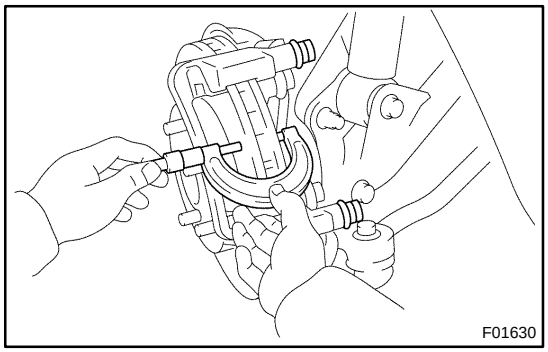
1. MEASURE PAD LINING THICKNESS

Using a ruler, measure the pad lining thickness.

Standard thickness: 11.0 mm (0.433 in.)

Minimum thickness: 1.0 mm (0.039 in.)

Replace the pad if the thickness is less than the minimum (the 1.0 mm slit is no longer visible), or if it shows signs of uneven wear.



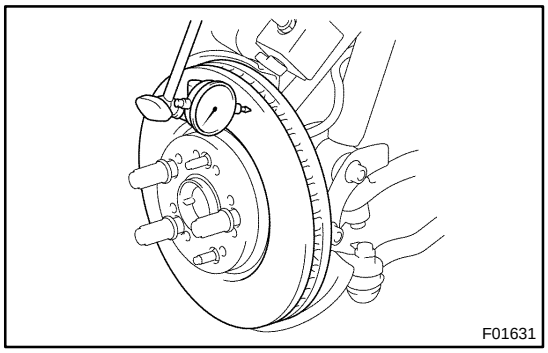
2. MEASURE DISC THICKNESS

Using a micrometer, measure the disc thickness.

Standard thickness: 32.0 mm (1.260 in.)

Minimum thickness: 30.0 mm (1.181 in.)

Replace the disc if the thickness of the disc is at the minimum thickness or less. Replace the disc or grind it on a lathe if it is scored or is worn unevenly.



3. MEASURE DISC RUNOUT

(a) Temporarily fasten the disc with the 3 hub nuts.

(b) Using a dial indicator, measure the disc runout at a position 10 mm (0.39 in.) away from the out side edge.

Maximum disc runout: 0.050 mm (0.0020 in.)

If the disc's runout is maximum value or greater, check the bearing play in the axial direction and check the axle hub runout (See page SA-12). If the bearing play and axle hub runout are not abnormal, adjust the disc runout or grind it on a "On-Car" brake lathe.

4. IF NECESSARY, ADJUST DISC RUNOUT

(a) Remove the 2 bolts and torque plate.

(b) Remove the 3 hub nuts and disc. Turn the disc 1/5 turn and reinstall the disc. Install and torque the 3 hub nuts.

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

(c) Remeasure the disc runout. Make a note of the runout and the disc's position on the hub.

(d) Repeat (b) until the disc has been installed on the 3 remaining hub positions.

- If the minimum runout recorded in (b) and (c) is less than 0.05 mm (0.0020 in.), install the disc in that position.
- If the minimum runout recorded in (b) and (c) is greater than 0.05 mm (0.0020 in.), replace the disc and repeat step 3.

(e) Install the torque plate and torque the 2 bolts.

Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

BR0JN-05

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR-28).

HINT:

Apply lithium soap base glycol grease to the parts indicated by the arrows (See page BR-26).

BR0JO-07

INSTALLATION

Installation is in the reverse order of removal (See page BR-27).

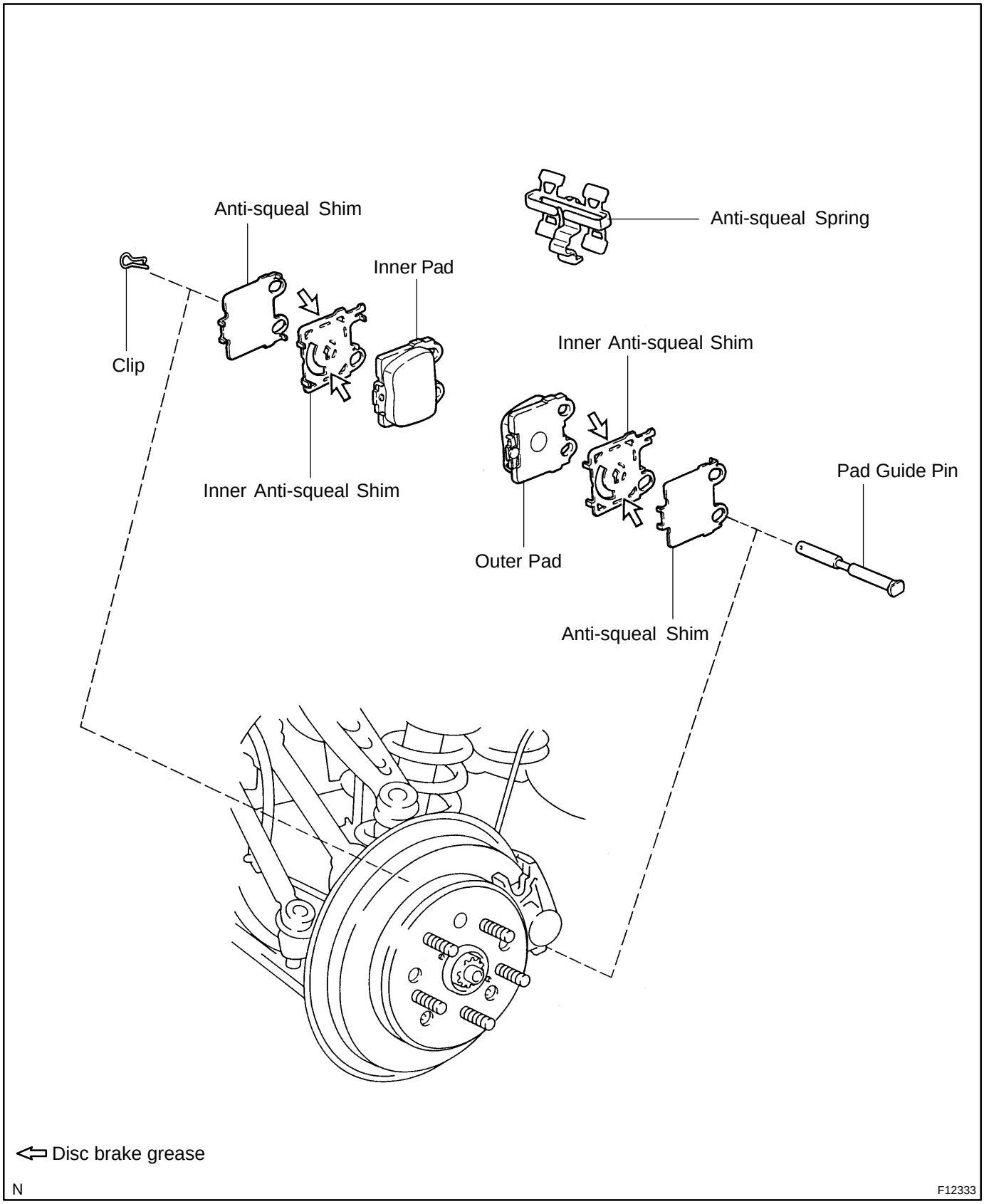
HINT:

- After installation, fill the brake reservoir with brake fluid and bleed brake system (See page BR-4).
- Check for leaks.

REAR BRAKE PAD

COMPONENTS

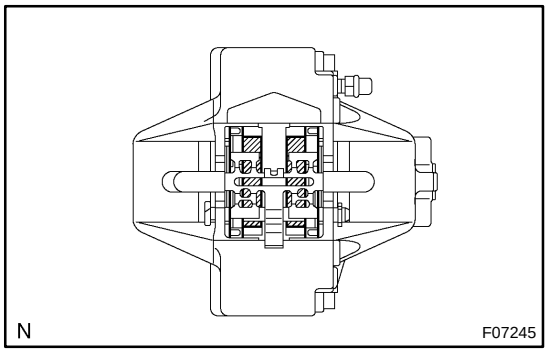
BR0JP-12



BR0ZX-03

REPLACEMENT

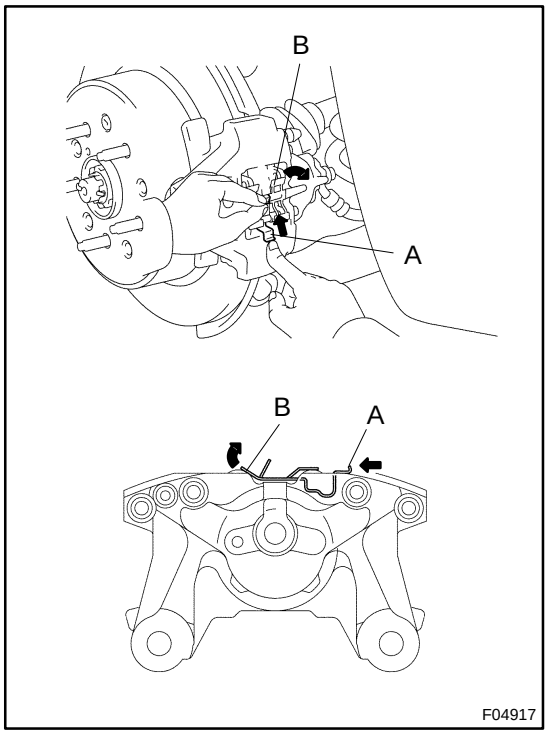
1. REMOVE REAR WHEEL



2. INSPECT PAD LINING THICKNESS

Check the pad thickness through the caliper inspection hole and replace pads if the thickness is not within the specification.

Minimum thickness: 1.0 mm (0.039 in.)



3. REMOVE ANTI-SQUEAL SPRING AND PAD GUIDE PIN

(a) Raise the "B" portion with hand, push up the "A" portion and unlatch the anti-squeal spring from brake caliper.

(b) Remove the anti-squeal spring.

NOTICE:

- **Do not deform the clip and anti-squeal spring.**
- **The clip and anti-squeal spring can be used again provided that they have sufficient rebound, no-deformation, cracks or wear, and have had all rust, dirt and foreign particles cleaned off.**

(c) Remove the clip and pad guide pin.

4. REMOVE PADS AND ANTI-SQUEAL SHIMS

(a) Remove the 2 pads.

(b) Remove the 4 anti-squeal shims from each pad.

5. CHECK DISC THICKNESS AND RUNOUT

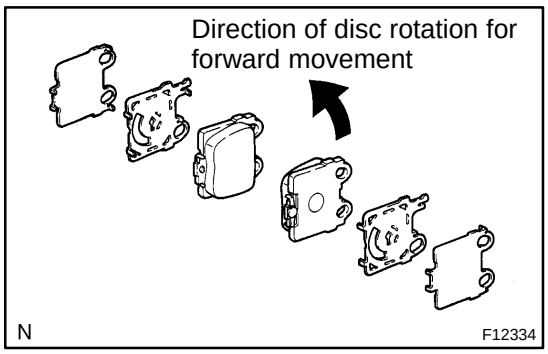
(See page BR-38)

6. INSTALL NEW PADS

NOTICE:

When replacing worn pads, the anti-squeal shims must be replaced together with the pads.

(a) Apply disc brake grease to both sides of inner anti-squeal shims (See page BR-32).

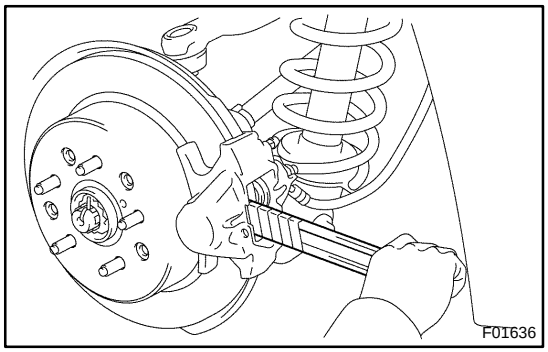


(b) Install the 2 anti-squeal shims on each pad.

HINT:

Make sure the arrows on the inner anti-squeal shims facing to the direction of disc rotation as shown in the illustration.

(c) Draw out a small amount of brake fluid from the reservoir.

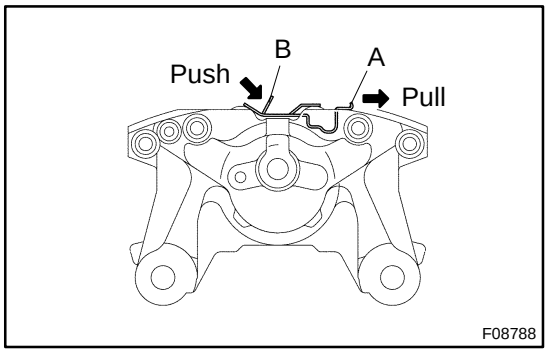


(d) Press in the pistons with a monkey wrench handle or equivalent.

HINT:

- Tape the monkey wrench handle before use.
- If the piston is difficult to push in, loosen the bleeder plug and push in the piston while letting some brake fluid escape.

(e) Install the 2 pads.

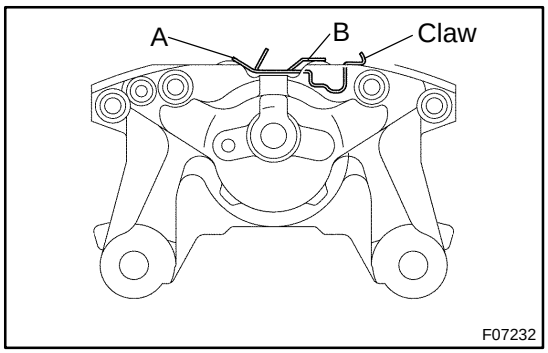


7. INSTALL PAD GUIDE PIN AND ANTI- SQUEAL SPRING

(a) Install the pad guide pin and clip.

(b) Install the anti-squeal spring.

(c) Push in the ”B” portion with hand, pull the ”A” portion and latch the anti-squeal spring to brake caliper.



HINT:

- Ensure that the claw of the anti-squeal spring is raised up on the caliper securely.
- Ensure that there is no gap between the pad guide pin and anti-squeal spring.
- Ensure that ”A” and ”B” portions of anti-squeal spring are attached to the pad.

8. INSTALL REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

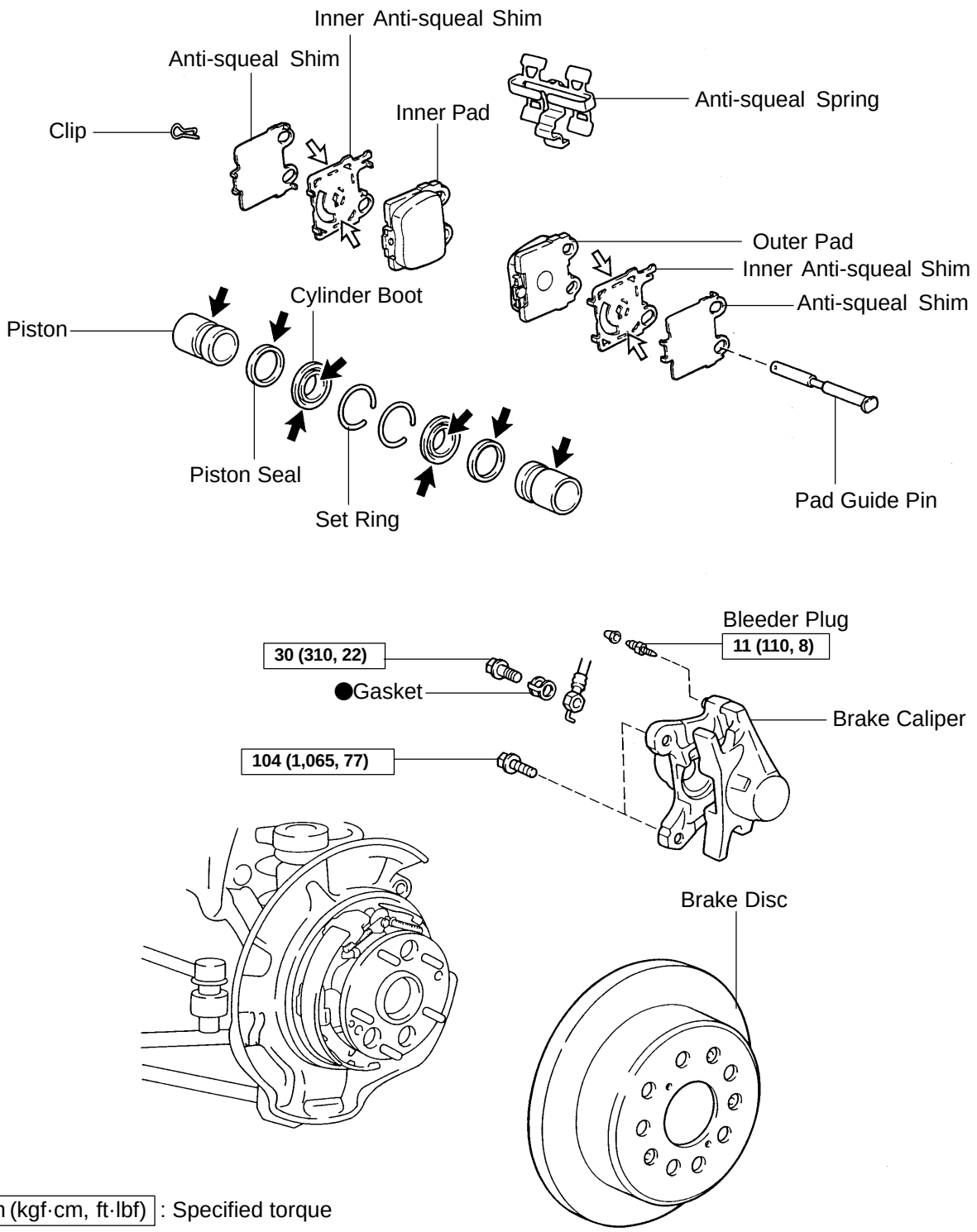
9. DEPRESS BRAKE PEDAL SEVERAL TIMES

10. CHECK THAT FLUID LEVEL IS AT MAX LINE

REAR BRAKE CALIPER

BR0JR-13

COMPONENTS



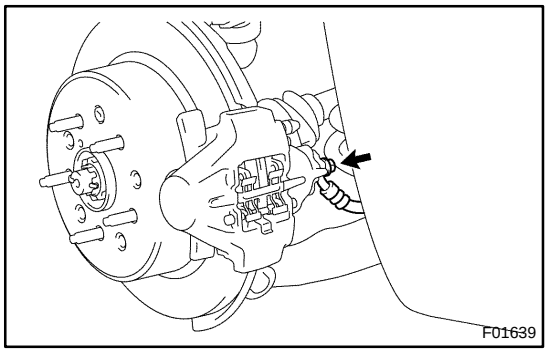
BR0JS-11

REMOVAL

1. REMOVE REAR WHEEL

Remove the rear wheel and temporarily fasten the disc with 3 hub nuts.

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)



2. DISCONNECT FLEXIBLE HOSE

Remove the union bolt and gasket from the caliper, then disconnect the flexible hose from the caliper. Use a container to catch brake fluid as it drains out.

Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

HINT:

At the time of installation, please refer to the following item.

Install the flexible hose lock securely in the lock hole in the caliper.

3. REMOVE CALIPER

(a) Remove the 2 installation bolts.

Torque: 104 N·m (1,065 kgf·cm, 77 ft·lbf)

(b) Remove the caliper.

4. REMOVE BRAKE PADS (See page BR-33)

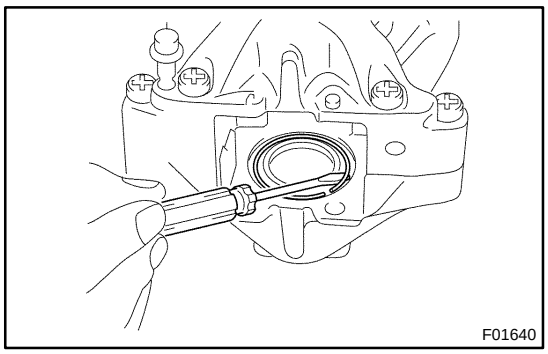
(a) Remove the anti-squeal spring.

(b) Remove the clip and pad guide pin.

(c) Remove the 2 pads with the 4 anti-squeal shims.

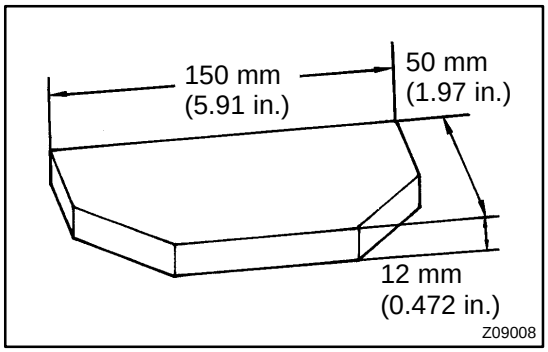
BR0JT-07

DISASSEMBLY



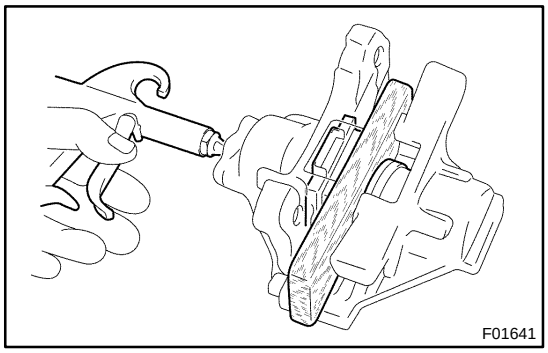
1. REMOVE SET RINGS AND BOOTS

Using a screwdriver, remove the 2 set rings and 2 boots.



2. REMOVE PISTONS FROM CYLINDER

(a) Prepare a wooden plate to hold the pistons.

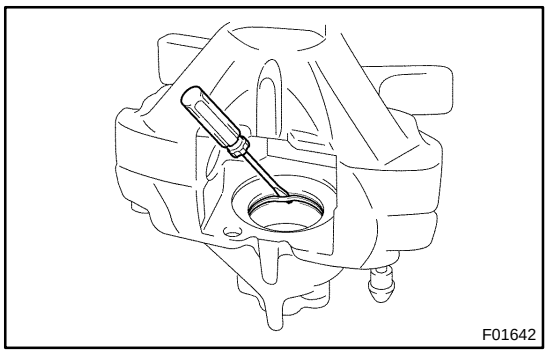


(b) Place the plate between the pistons and insert a pad on one side.

(c) Use compressed air to remove the pistons alternately from the caliper.

CAUTION:

Do not place your fingers in front of the piston when using compressed air.

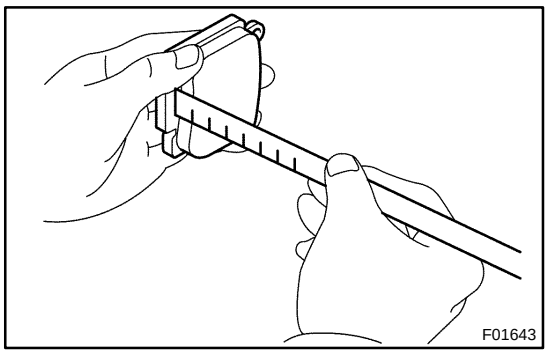


3. REMOVE PISTON SEALS

Using a screwdriver, remove the 2 piston seals from the caliper.

BR0JU-11

INSPECTION



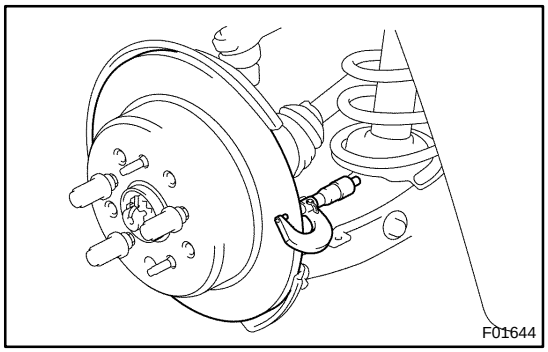
1. MEASURE PAD LINING THICKNESS

Using a ruler, measure the pad lining thickness.

Standard thickness: 10.5 mm (0.413 in.)

Minimum thickness: 1.0 mm (0.039 in.)

Replace the pads if the thickness is less than the minimum or if it shows signs of uneven wear.



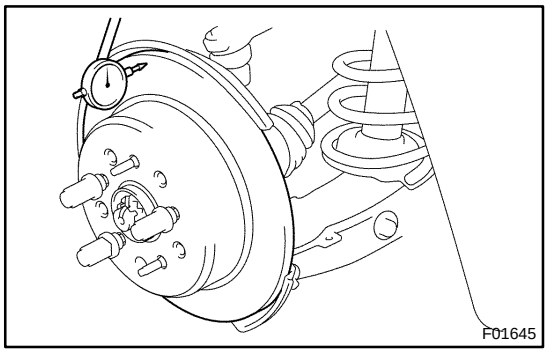
2. MEASURE DISC THICKNESS

Using a micrometer, measure the disc thickness.

Standard thickness: 12.0 mm (0.472 in.)

Minimum thickness: 10.5 mm (0.413 in.)

Replace the disc if the thickness of the disc is at the minimum thickness or less. Replace the disc or grind it on a lathe if it is badly scored or worn unevenly.



3. MEASURE DISC RUNOUT

Using a dial indicator, measure the disc runout at a position 10 mm (0.394 in.) away from the out side edge.

Maximum disc runout: 0.05 mm (0.0020 in.)

If the disc's runout is maximum value or greater, check the bearing play in the axial direction and check the axle hub runout (See page SA-50). If the bearing play and axle hub runout are not abnormal, adjust the disc runout or grind it on a "On-Car" brake lathe.

4. IF NECESSARY, ADJUST DISC RUNOUT

(a) Remove the 3 hub nuts and disc. Turn the disc 1/5 and reinstall the disc. Install and torque the 3 hub nuts.

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

(b) Remeasure the disc runout. Make a note of the runout and the disc's position on the hub.

(c) Repeat (b) until the disc has been installed on the 3 remaining hub positions.

- If the minimum runout recorded in (b) and (c) is less than 0.05 mm (0.0020 in.), install the disc in that position.
- If the minimum runout recorded in (b) and (c) is greater than 0.05 mm (0.0020 in.), replace the disc and repeat step 3.

BR0JV-04

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR-37).

HINT:

Apply lithium soap base glycol grease to the parts indicated by the arrows (See page BR-35).

BR0JW-04

INSTALLATION

Installation is in the reverse order of removal (See page BR-36).

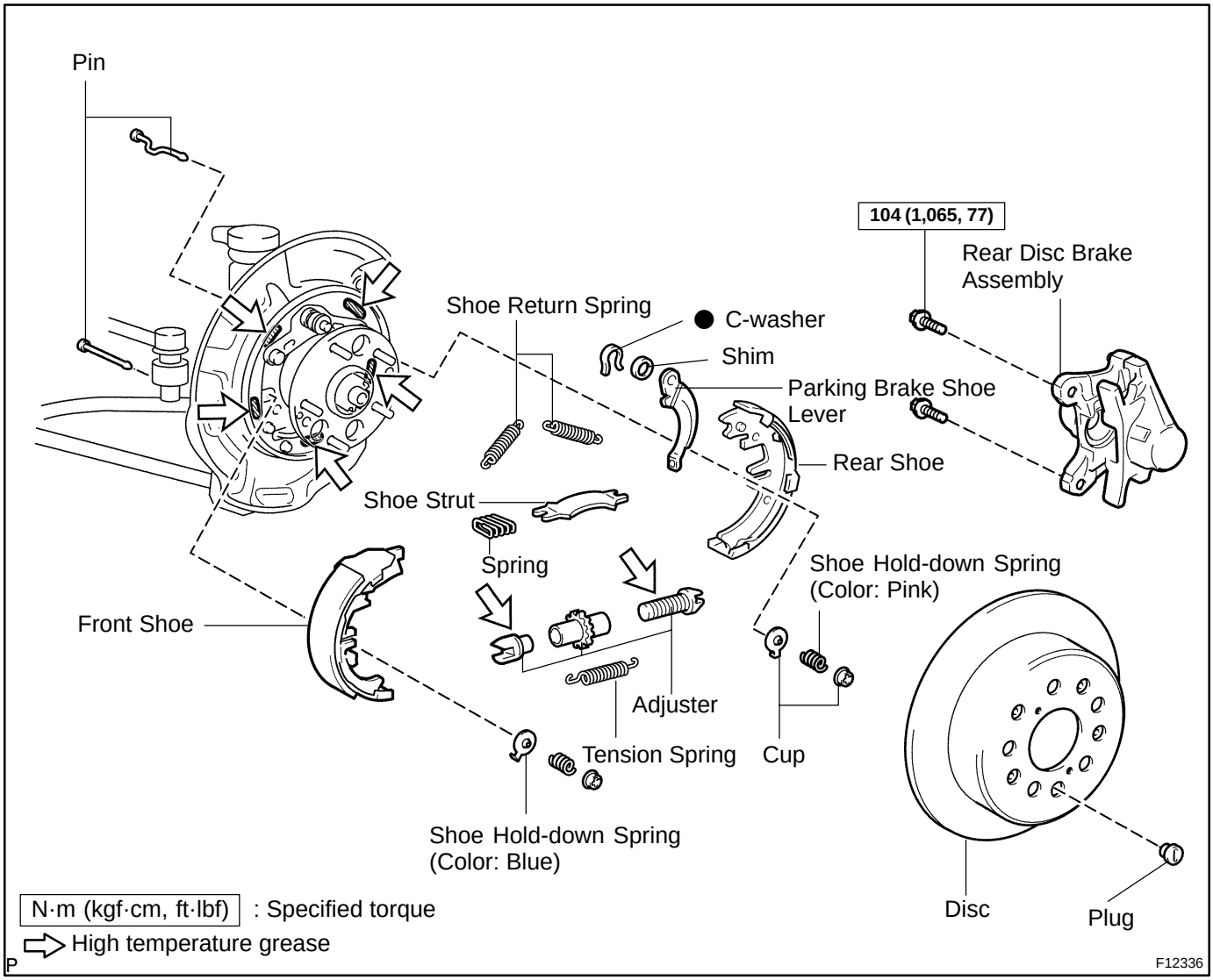
HINT:

- After installation, fill the brake reservoir with brake fluid and bleed brake system (See page BR-4).
- Check for leaks.

PARKING BRAKE

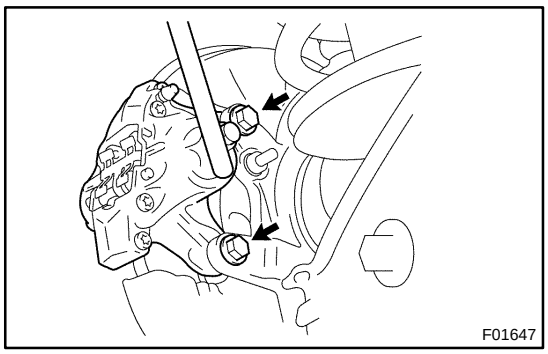
BR0JX-10

COMPONENTS



BR0JY-08

DISASSEMBLY


F01647

1. REMOVE REAR WHEEL

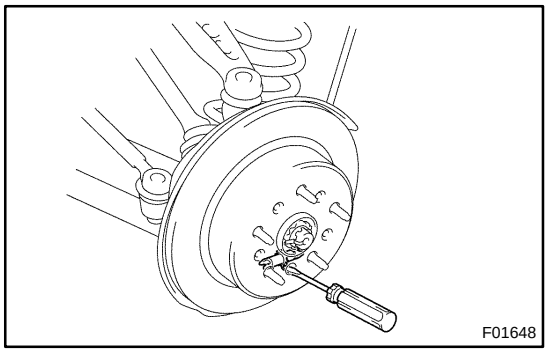
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

2. REMOVE REAR DISC BRAKE ASSEMBLY

(a) Remove the 2 mounting bolts and remove the disc brake assembly.

Torque: 104 N·m (1,065 kgf·cm, 77 ft·lbf)

(b) Suspend the disc brake securely and so the hose is not stretched.


F01648

3. REMOVE DISC

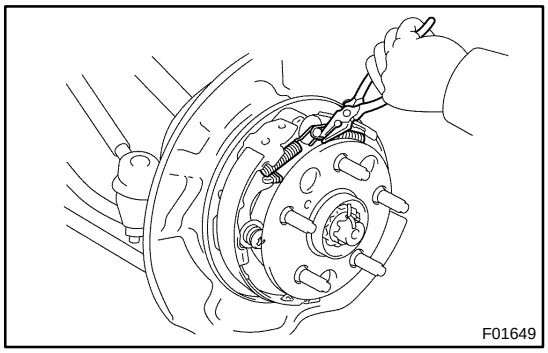
(a) Release the parking brake lever.

(b) Place matchmarks on the disc and rear axle hub.

(c) Remove the disc.

HINT:

- If the disc cannot be removed easily, turn the shoe adjuster until the wheel turns freely.
- If there are no matchmarks, temporarily install the disc, then measure the disc runout and install the disc in position (See page BR-38).


F01649

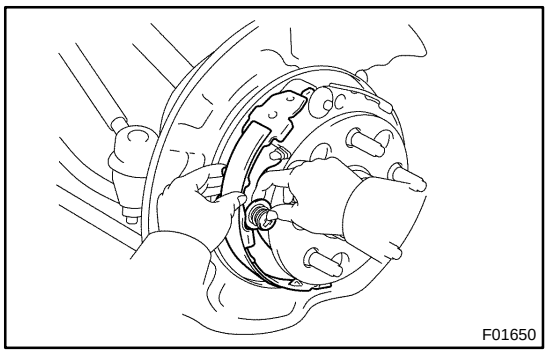
4. REMOVE SHOE RETURN SPRINGS

Using needle-nose pliers, remove the 2 shoe return springs.

5. REMOVE SHOE STRUT WITH SPRING

HINT:

At the time of reassembly, install the strut with the spring facing forward.


F01650

6. REMOVE FRONT SHOE AND ADJUSTER

(a) Slide out the front shoe and remove the shoe adjuster.

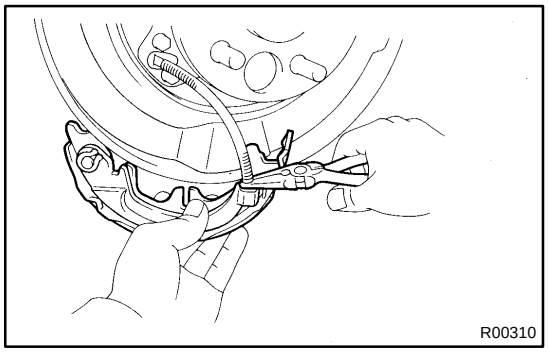
(b) Disconnect the tension spring and remove the front shoe.

(c) Remove the 2 cups and shoe hold-down spring.

7. REMOVE REAR SHOE AND TENSION SPRING

(a) Slide out the rear shoe.

(b) Remove the tension spring from the rear shoe.


R00310

(c) Disconnect the parking brake cable from the parking brake shoe lever.

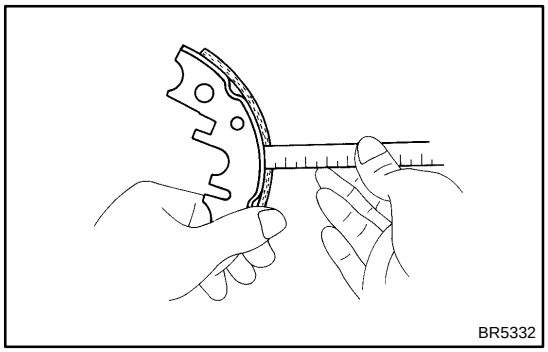
(d) Remove the 2 cups, shoe hold-down spring and pin.

BR0ZY-03

INSPECTION

1. INSPECT DISASSEMBLED PARTS

Inspect the disassembled parts for wear, rust or damage.



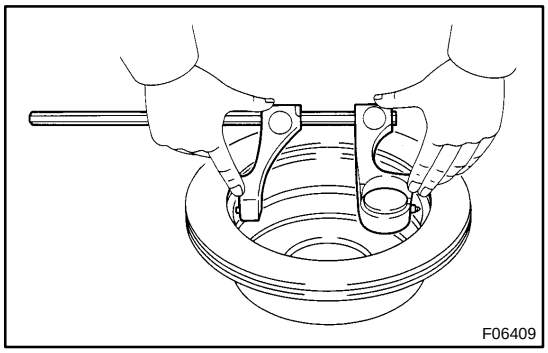
2. MEASURE BRAKE SHOE LINING THICKNESS

Using a ruler, measure the thickness of the shoe lining.

Standard thickness: 2.5 mm (0.098 in.)

Minimum thickness: 1.0 mm (0.039 in.)

If the lining thickness is at the minimum thickness or less, or if there is severe and uneven wear, replace the brake shoe.



3. MEASURE BRAKE DISC INSIDE DIAMETER

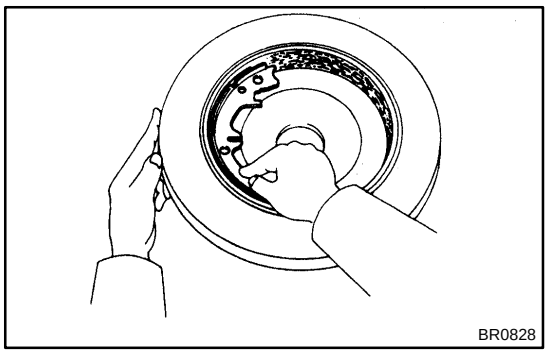
Using a brake drum gauge or equivalent, measure the inside diameter of the disc.

Standard inside diameter: 190 mm (7.48 in.)

Maximum inside diameter: 191 mm (7.52 in.)

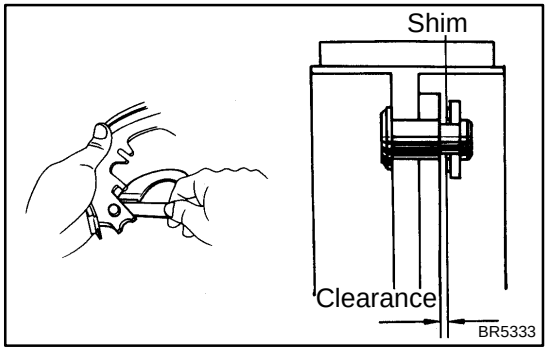
Replace the disc if the inside diameter is at the maximum value or more.

Replace the disc or grind it with a lathe if the disc is scored or worn unevenly.



4. INSPECT PARKING BRAKE SHOE LINING AND DISC FOR PROPER CONTACT

Apply chalk to the inside surface of the disc, then grind down the brake shoe lining to fit. If the contact between the disc and the brake shoe lining is improper, repair it using a brake shoe grinder or replace the brake shoe assembly.



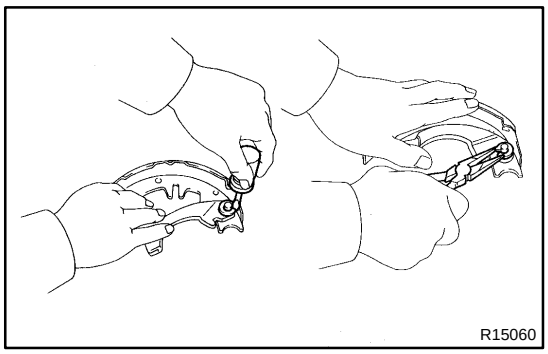
5. MEASURE CLEARANCE BETWEEN PARKING BRAKE SHOE AND LEVER

Using a feeler gauge, measure the clearance.

Standard clearance: Less than 0.35 mm (0.0138 in.)

If the clearance is not within the specification, replace the shim with one of the correct size.

Thickness mm (in.)	Thickness mm (in.)
0.3 (0.012)	0.9 (0.035)
0.6 (0.024)	-



6. IF NECESSARY, REPLACE SHIM

(a) Using a screwdriver, remove the C-washer and shim.

(b) Install the correct size shim with a new C-washer.

(c) Remeasure the clearance.

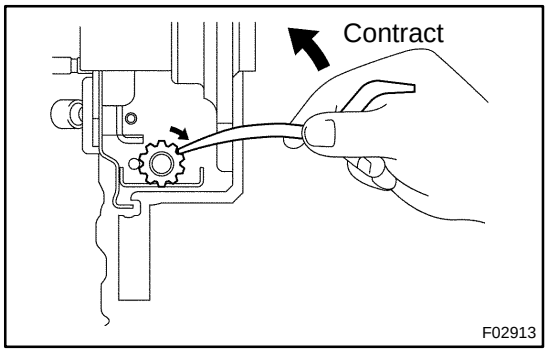
BR0K0-07

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BR-42).

HINT:

Apply high temperature grease to the parts indicated by the arrows (See page BR-41).



1. ADJUST PARKING BRAKE SHOE CLEARANCE

(a) Temporarily install the 3 hub nuts.

(b) Remove the hole plug.

(c) Turn the adjuster and expand the shoes until the disc locks.

(d) Return the adjuster 8 notches.

(e) Install the hole plug.

2. SETTLING PARKING BRAKE SHOES AND DISC

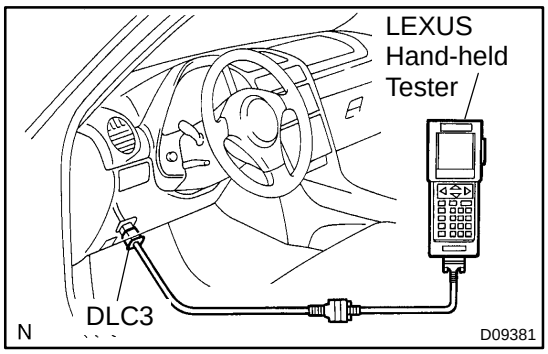
(a) Drive the vehicle at about 50 km/h (31 mph) on a safe, level and dry road.

(b) With the parking brake release button pushed in, pull on the parking brake lever with 88 N (9 kgf, 20 lbf) of force.

(c) Drive the vehicle for about 400 meters (0.25 mile) in this condition.

(d) Repeat this procedure 2 or 3 times.

3. CHECK AND ADJUST PARKING BRAKE LEVER TRAVEL (See page BR-9)



BRAKE ACTUATOR

BR1R7-01

ON-VEHICLE INSPECTION

1. INSPECT ABS & TRAC / VSC ACTUATOR OPERATION

(a) Connect the LEXUS hand-held tester.

(1) Connect the LEXUS hand-held tester to the DLC3.

(2) Start the engine and run it at idle.

(3) Select the ACTIVE TEST mode on the LEXUS hand-held tester.

HINT:

Please refer to the LEXUS hand-held tester operator's manual for further details.

(b) Inspect the actuator motor operation.

(1) With the motor relay ON, check the actuator motor operation noise.

(2) Turn the motor relay OFF.

(3) Depress the brake pedal and hold it for about 15 seconds. Check that the brake pedal cannot be depressed.

(4) With the motor relay ON, check that the pedal does not pulsate.

NOTICE:

Do not keep motor relay ON for more than 5 seconds continuously. When operating it continuously, set the interval of more than 20 seconds.

(5) Turn the motor relay OFF and release the brake pedal.

(c) Inspect the right front wheel operation.

NOTICE:

Never turn ON the solenoid which is not described below.

(1) With the brake pedal depressed, perform the following operations.

(2) Turn the SFRH and SFRR solenoid ON simultaneously, and check that the pedal cannot be depressed.

NOTICE:

Do not keep solenoid ON for more than 10 seconds continuously. When operating it continuously, set the interval of more than 20 seconds.

(3) Turn the SFRH and SFRR solenoid OFF simultaneously, and check that the pedal can be depressed.

(4) Turn the motor relay ON, and check that the pedal returns.

NOTICE:

Do not keep motor relay ON for more than 5 seconds continuously. When operating it continuously, set the interval of more than 20 seconds.

(5) Turn the motor relay OFF and release the brake pedal.

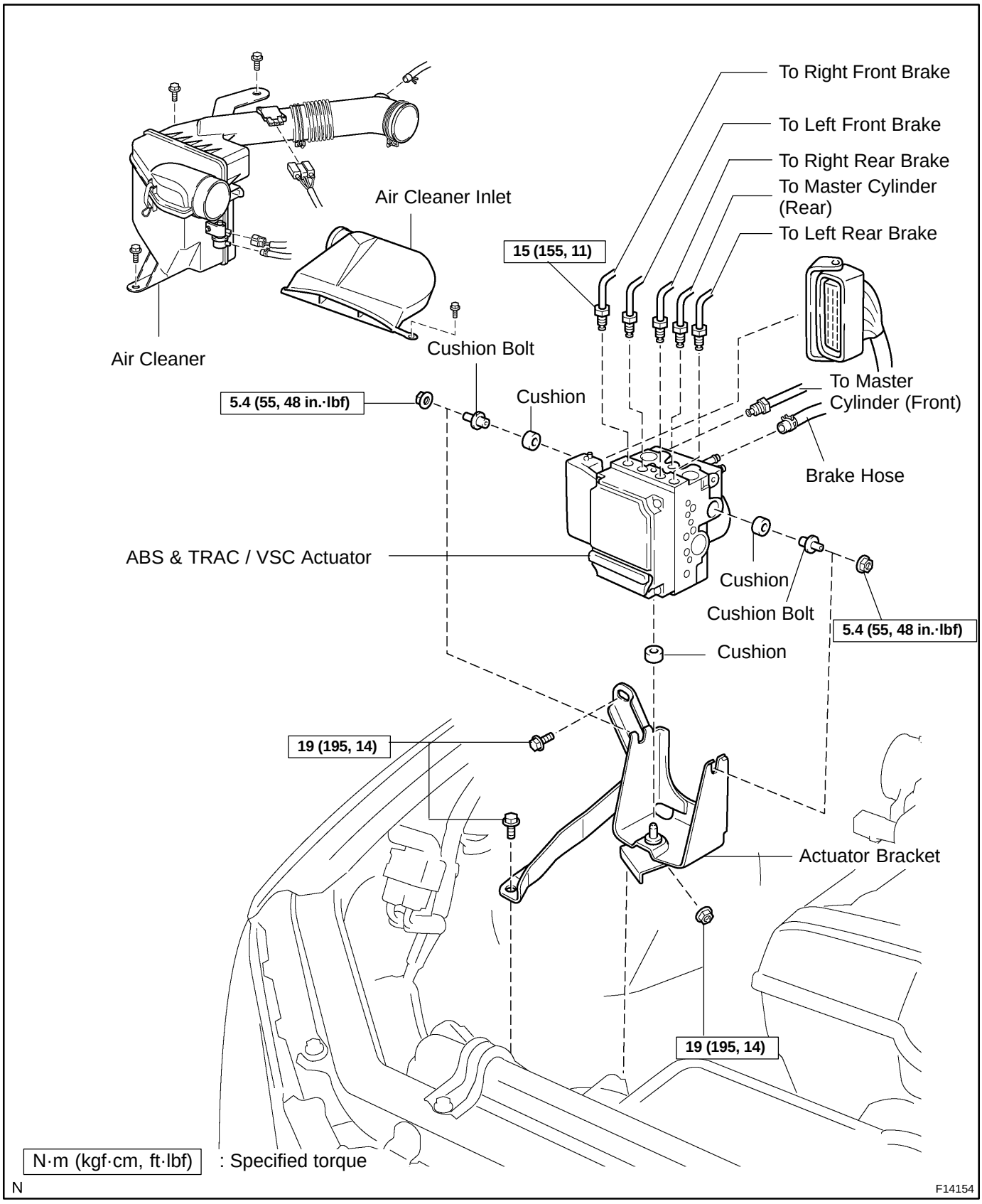
(d) Inspect other wheel operation.
As in the same procedure, check the solenoids of other wheels.

HINT:
Left front wheel: SFLH, SFLR
Right rear wheel: SRRH, SRRR
Left rear wheel: SRLH, SRLR

(e) Clear the DTC (See page DI-437 or DI-505).

BR1R8-01

COMPONENTS



BR1R9-01

REMOVAL

1. REMOVE AIR CLEANER INLET AND AIR CLEANER (See page EM-30)

2. DISCONNECT BRAKE LINES

Using SST, disconnect the 6 brake lines from the ABS & TRAC / VSC actuator.

SST 09023-00100

Torque: 15 N·m (155 kgf·cm, 11 ft·lbf)

3. DISCONNECT BRAKE HOSE AND CONNECTOR

4. REMOVE ABS & TRAC / VSC ACTUATOR ASSEMBLY

Remove the nut, 2 bolts and ABS & TRAC / VSC actuator assembly.

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

5. REMOVE ABS & TRAC & VSC ACTUATOR

(a) Remove the 2 nuts and ABS & TRAC / VSC actuator from the bracket.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(b) Remove the 2 cushion bolts and 3 cushions.

BR1RA-01

INSTALLATION

Installation is in the reverse order of removal (See page BR-49).

HINT:

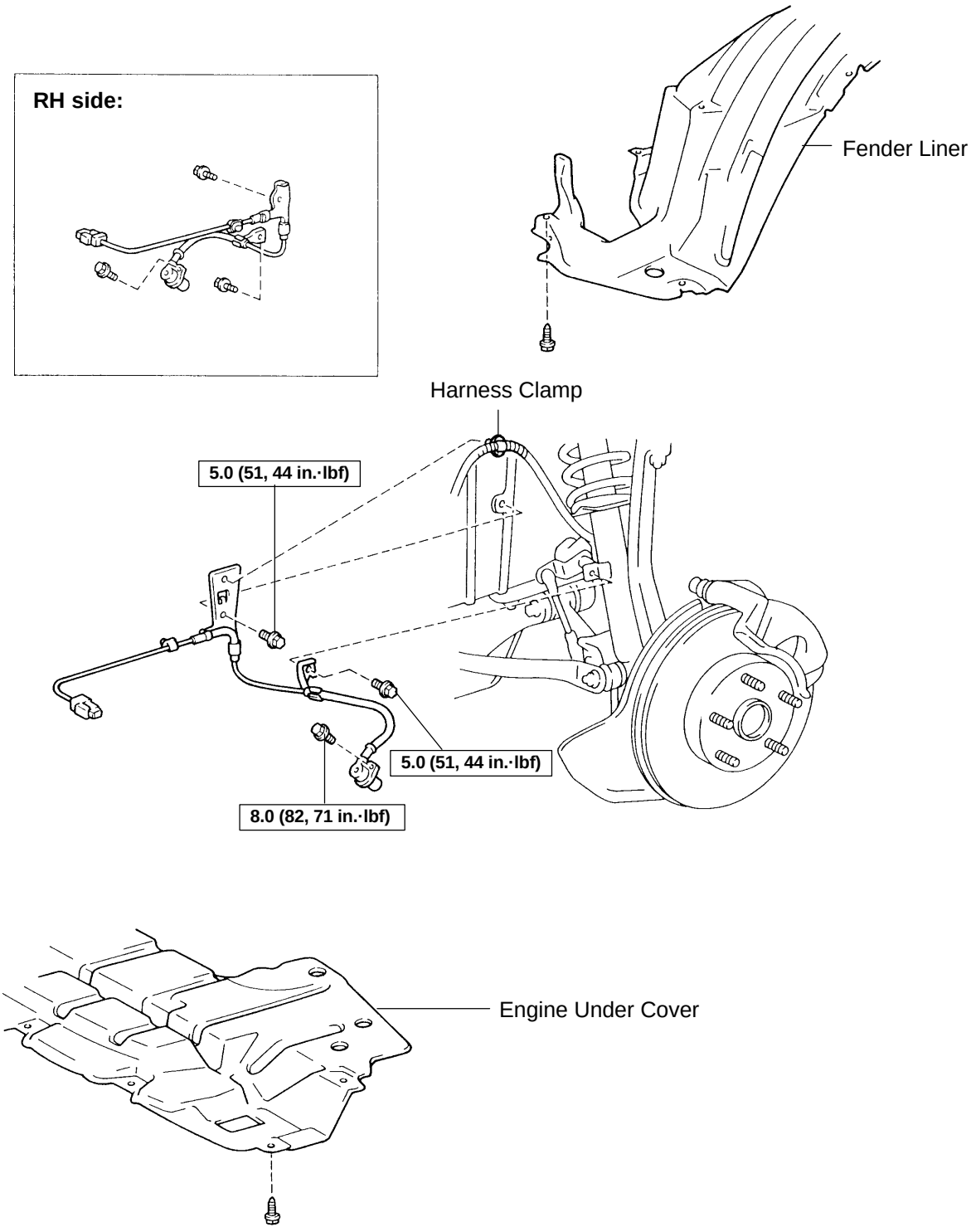
- After installation, fill the brake reservoir with brake fluid, bleed brake system (See page BR-4).
- Check for leaks.

FRONT SPEED SENSOR

COMPONENTS

BR0K1-11

LH side:



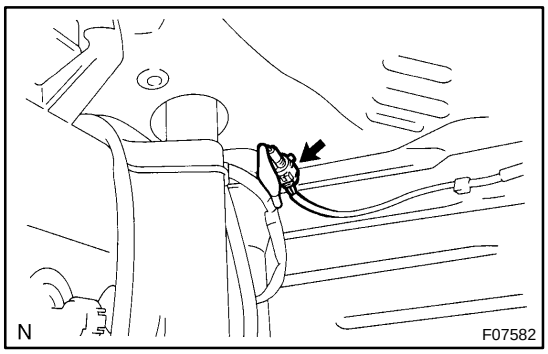
N·m (kgf·cm, ft·lbf) : Specified torque

N

F12321

BR0K2-10

REMOVAL



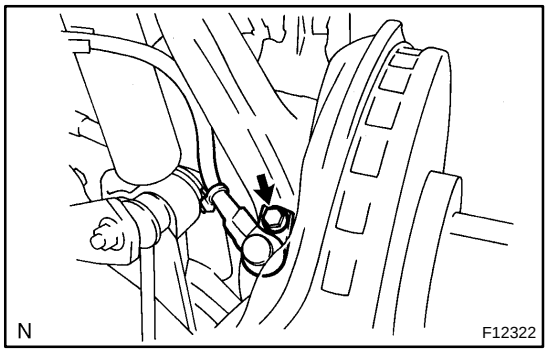
1. REMOVE FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

2. DISCONNECT SPEED SENSOR CONNECTOR

(a) Remove the engine under cover and fender liner.

(b) Disconnect the speed sensor connector.



3. REMOVE SPEED SENSOR

(a) LH side:
Disconnect the harness clamp.

(b) Remove the resin clip and 2 clamp bolts holding the sensor harness to the body.
Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

(c) Remove the bolt and speed sensor from the steering knuckle.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

BR0K3-11

INSTALLATION

Installation is in the reverse order of removal (See page BR-52).

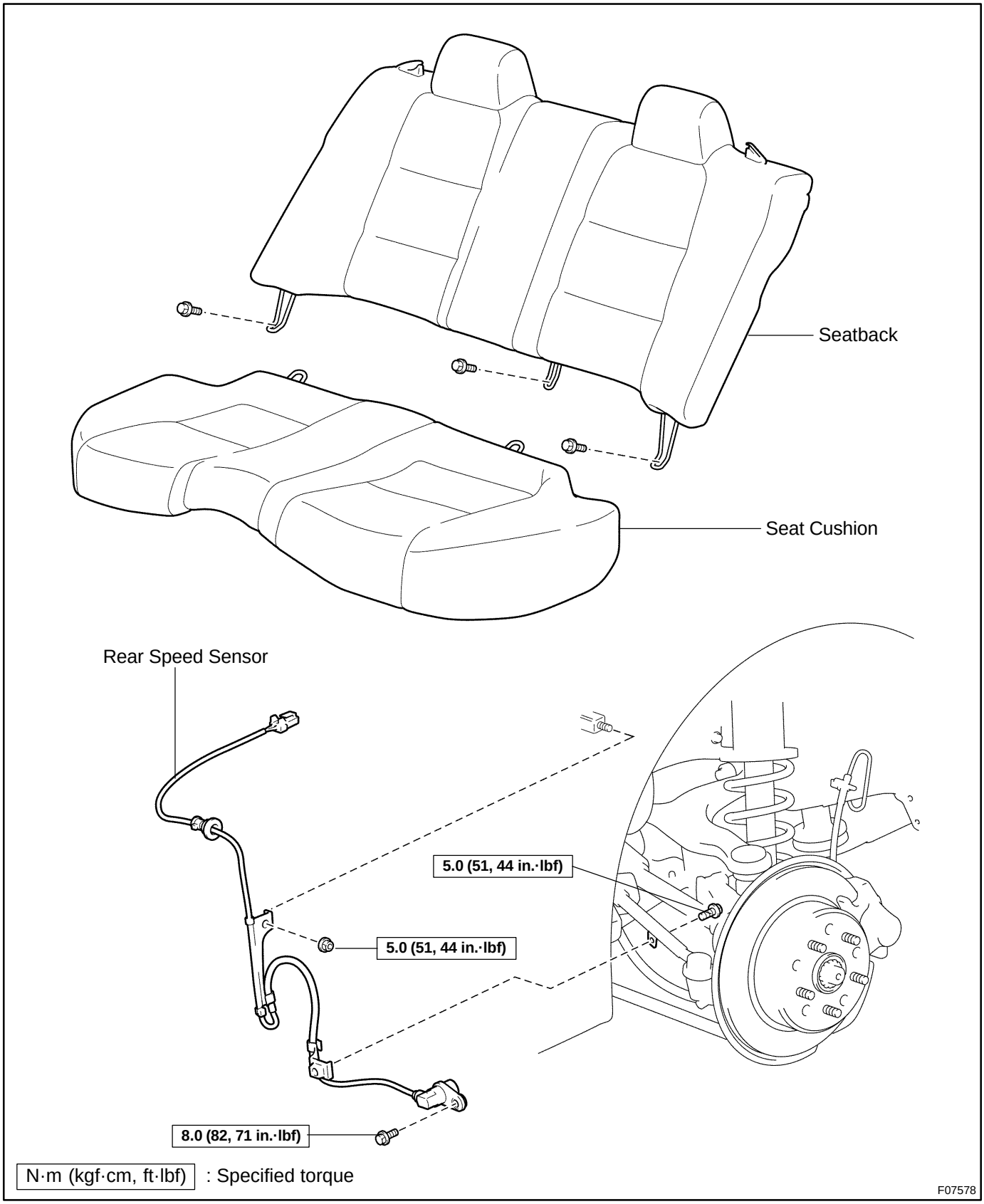
HINT:

After installation, check speed sensor signal (See page DI-437 or DI-507).

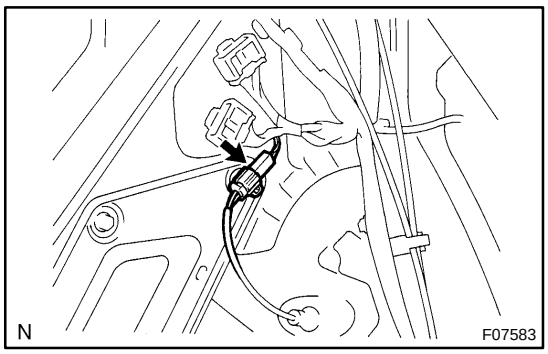
REAR SPEED SENSOR

COMPONENTS

BR0K4-11



BR0K5-11



REMOVAL

1. DISCONNECT SPEED SENSOR CONNECTOR

(a) Remove the seat cushion and seatback.

(b) Disconnect the speed sensor connector and pull out the sensor wire harness with the grommet.

2. REMOVE REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

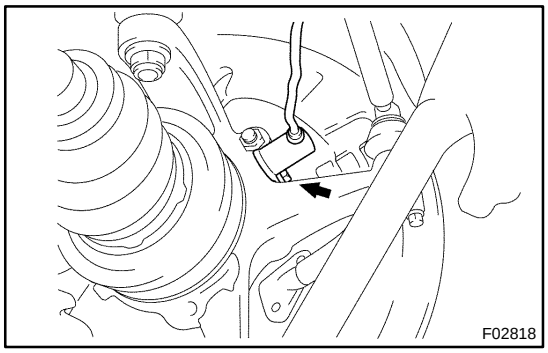
3. REMOVE SPEED SENSOR

(a) Remove the clamp bolt holding the sensor wire harness to the toe control link.

Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)

(b) Remove the clamp nut holding the sensor wire harness to the body.

Torque: 5.0 N·m (51 kgf·cm, 44 in.·lbf)



(c) Remove the sensor installation bolt and speed sensor from the axle carrier.

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

BR0K6-11

INSTALLATION

Installation is in the reverse order of removal (See page BR-55).

HINT:

After installation, check speed sensor signal (See page DI-437 or DI-507).

STEERING SYSTEM

SR0L4-09

PRECAUTION

- **Care must be taken to replace parts properly because they could affect the performance of the steering system and result in a driving hazard.**
- **The LEXUS IS300 is equipped with SRS (Supplemental Restraint System) such as the driver airbag and front passenger airbag. Failure to carry out service operation in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notices in the RS section.**

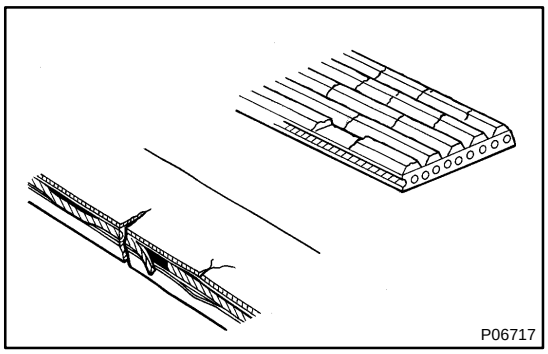
TROUBLESHOOTING

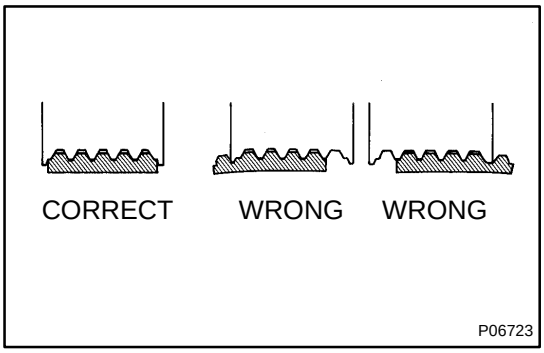
PROBLEM SYMPTOMS TABLE

SR0L5-15

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in the order shown. If necessary, repair or replace these parts.

Symptom	Suspect Area		See page
Hard steering	1. Tires (Improperly inflated)		SA-3
	2. Power steering fluid level (Low)		SR-5
	3. Drive belt (Loose)		-
	4. Front wheel alignment (Incorrect)		SA-5
	5. Steering system joints (Worn)		-
	6. Suspension arm ball joints (Worn)	Upper	SA-31
		Lower	SA-39
	7. Steering column (Binding)		-
	8. Power steering vane pump		SR-27
	9. Power steering gear		SR-38
Poor return	1. Tires (Improperly inflated)		SA-3
	2. Front wheel alignment (Incorrect)		SA-5
	3. Steering column (Binding)		-
	4. Power steering gear		SR-38
Excessive play	1. Steering system joints (Worn)		-
	2. Suspension arm ball joints (Worn)	Upper	SA-31
		Lower	SA-39
	3. Intermediate shaft (Worn)		-
	4. Front wheel bearing (Worn)		SA-12
	5. Power steering gear		SR-38
Abnormal noise	1. Power steering fluid level (Low)		SR-5
	2. Steering system joints (Worn)		-
	3. Power steering vane pump		SR-27
	4. Power steering gear		SR-38





DRIVE BELT

SR1BQ-02

INSPECTION

INSPECT DRIVE BELT

Visually check the belt for excessive wear, frayed cords etc.
If any defect has been found, replace the drive belt.
HINT:

- Cracks on the rib side of a belt are considered acceptable. If the missing chunks from the ribs are found on the belt, it should be replaced.
- After installing a belt, check that it fits properly in the ribbed grooves.
- Check with your hand to confirm that the belt has not slipped out of the groove on the bottom of the pulley.

POWER STEERING FLUID

SR05P-16

BLEEDING

1. CHECK FLUID LEVEL (See page SR-5)

2. JACK UP FRONT OF VEHICLE AND SUPPORT IT WITH STANDS

3. TURN STEERING WHEEL

With the engine stopped, turn the wheel slowly from lock to lock several times.

4. LOWER VEHICLE

5. START ENGINE

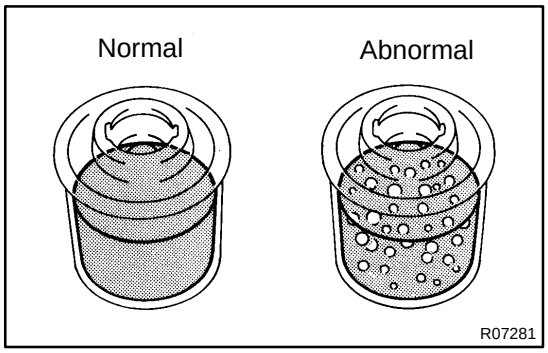
Run the engine at idle for a few minutes.

6. TURN STEERING WHEEL

(a) With the engine idling, turn the wheel to left or right full lock position and keep it there for 2 - 3 seconds, then turn the wheel to the opposite full lock position and keep it there for 2 - 3 seconds.

(b) Repeat (a) several times.

7. STOP ENGINE

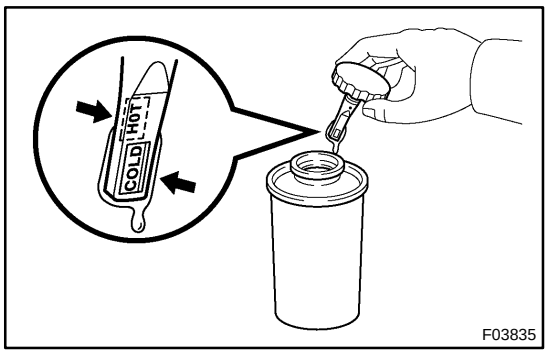


8. CHECK FOR FOAMING OR EMULSIFICATION

If the system has to be bled twice specifically because of foaming or emulsification, check for fluid leaks in the system.

9. CHECK FLUID LEVEL (See page SR-5)

SR05Q-18



INSPECTION

1. CHECK FLUID LEVEL

(a) Keep the vehicle level.

(b) With the engine stopped, check the fluid level in the oil reservoir.

If necessary, add fluid.

Fluid: ATF DEXRON® II or III

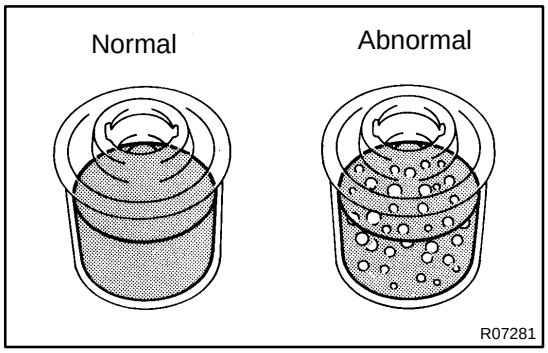
HINT:

Check that the fluid level is within the HOT LEVEL range on the reservoir. If the fluid is cold, check that it is within the COLD LEVEL range.

(c) Start the engine and run it at idle.

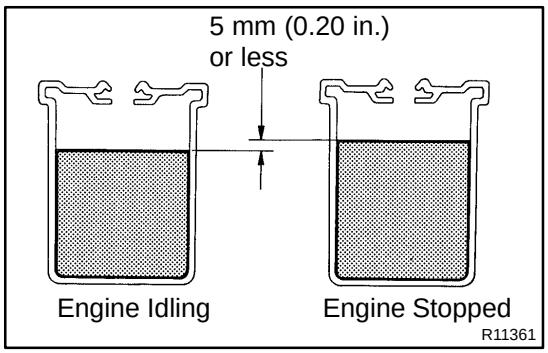
(d) Turn the steering wheel from lock to lock several times to boost fluid temperature.

Fluid temperature: 80˚C (176˚F)



(e) Check for foaming or emulsification.

If there is foaming or emulsification, bleed power steering system (See page SR-4).



(f) With the engine idling, measure the fluid level in the oil reservoir.

(g) Stop the engine.

(h) Wait a few minutes and remeasure the fluid level in the oil reservoir.

Maximum fluid level rise: 5 mm (0.20 in.)

If a problem is found, bleed power steering system (See page SR-4).

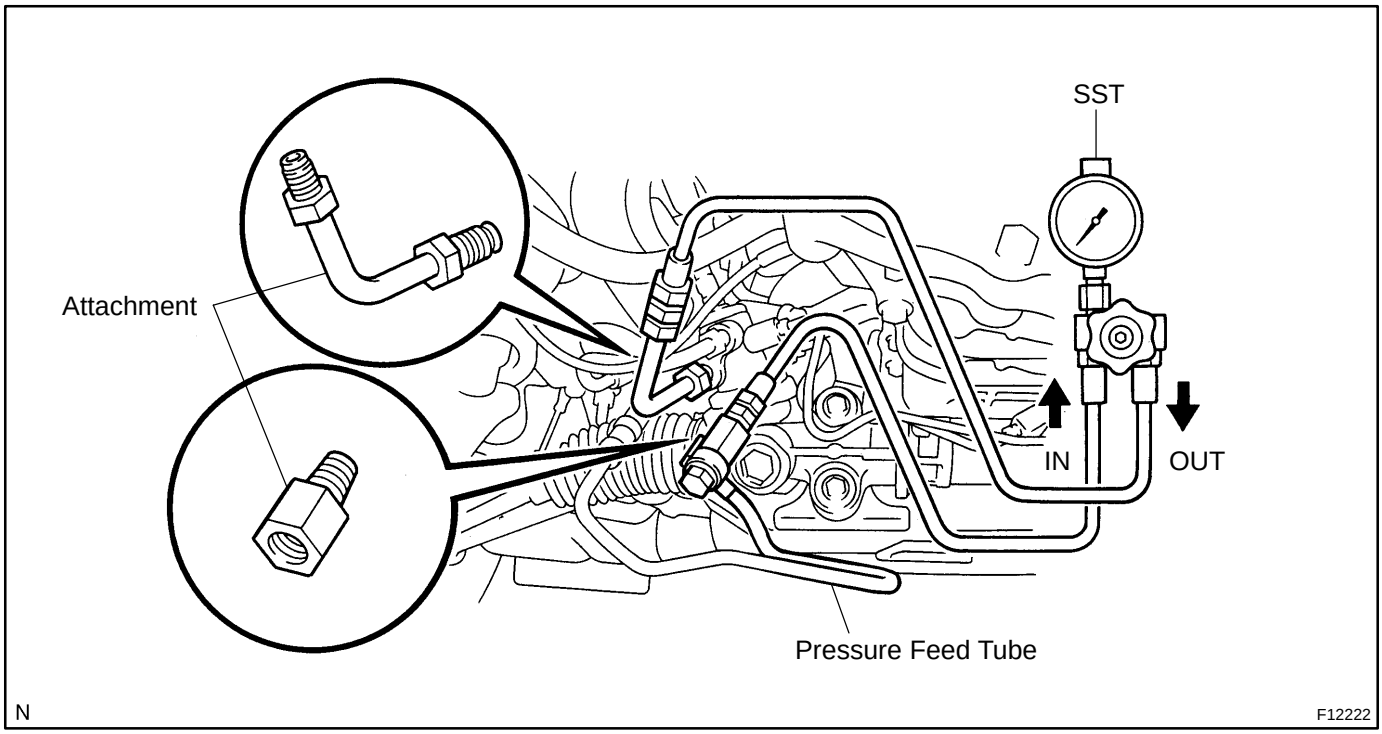
(i) Check the fluid level.

2. CHECK STEERING FLUID PRESSURE

(a) Disconnect the pressure feed tube from the PS gear (See page SR-41).

(b) Connect SST, as shown in the illustration below.
SST 09640-10010 (09641-01010, 09641-01030, 09641-01060)

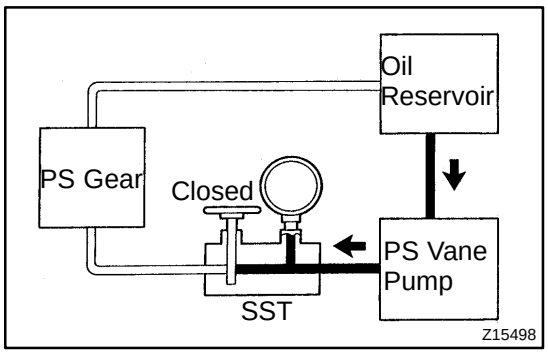
NOTICE:
Check that the valve of the SST is in the open position.



(c) Bleed the power steering system (See page SR-4).

(d) Start the engine and run it at idle.

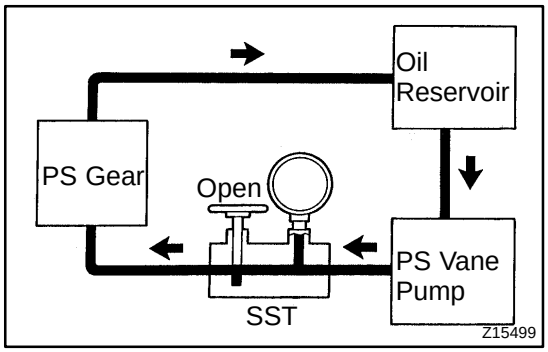
(e) Turn the steering wheel from lock to lock several times to boost fluid temperature.
Fluid temperature: 80 ˚C (176 ˚F)



(f) With the engine idling, close the valve of the SST and observe the reading on the SST.
Minimum fluid pressure:
6,900 kPa (70 kgf/cm^2, 996 psi)

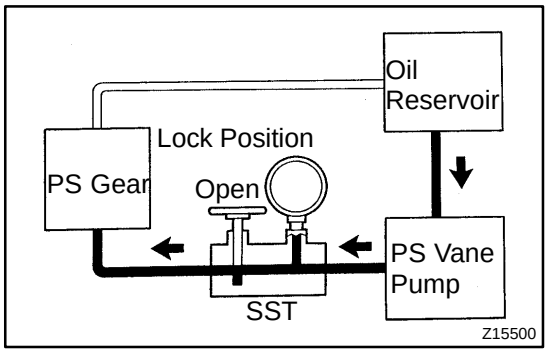
NOTICE:

- **Do not keep the valve closed for more than 10 seconds.**
- **Do not let the fluid temperature become too high.**



(g) With the engine idling, open the valve fully.
(h) Measure the fluid pressure at engine speeds of 1,000 rpm and 3,000 rpm.
Difference fluid pressure:
490 kPa (5 kgf/cm^2, 71 psi) or less

NOTICE:
Do not turn the steering wheel.

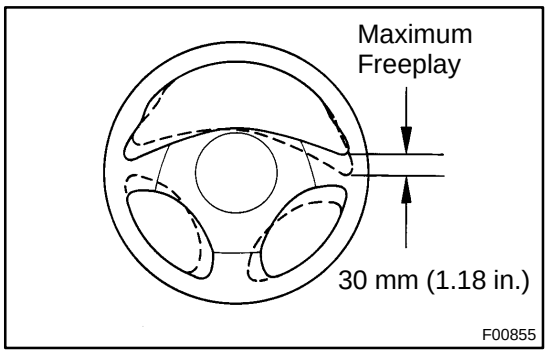


(i) With the engine idling and valve fully opened, turn the steering wheel to full lock position.
Minimum fluid pressure:
6,900 kPa (70 kgf/cm^2, 996 psi)

NOTICE:

- **Do not maintain lock position for more than 10 seconds.**
- **Do not let the fluid temperature become too high.**

(j) Disconnect the SST.
SST 09640- 10010 (09641- 01010, 09641- 01030, 09641-01060)
(k) Connect the pressure feed tube to the PS gear (See page SR-57).
(l) Bleed the power steering system (See page SR-4).



STEERING WHEEL

SR05R-20

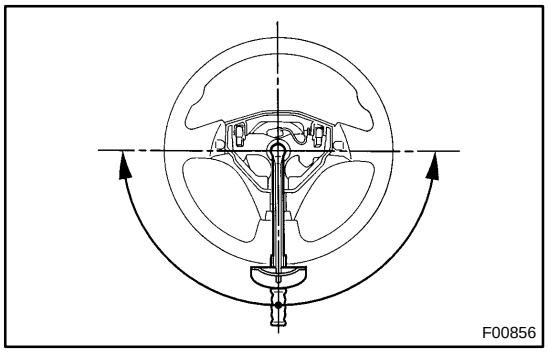
INSPECTION

1. CHECK STEERING WHEEL FREEPLAY

(a) Stop the vehicle and face the tires straight ahead.

(b) Rock the steering wheel gently up and down with a finger lightly, check the steering wheel freeplay.

Maximum freeplay: 30 mm (1.18 in.)



2. CHECK STEERING EFFORT

(a) Center the steering wheel.

(b) Remove the steering wheel pad (See page SR-13).

(c) Start the engine and run it at idle.

(d) Measure the steering effort in both directions.

Steering effort (Reference):

4.2 - 5.4 N·m (43 - 55 kgf·cm, 37 - 48 in.·lbf)

HINT:

Take the tire type, pressure and contact surface into consideration before making your diagnosis.

(e) Torque the steering wheel set nut.

Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

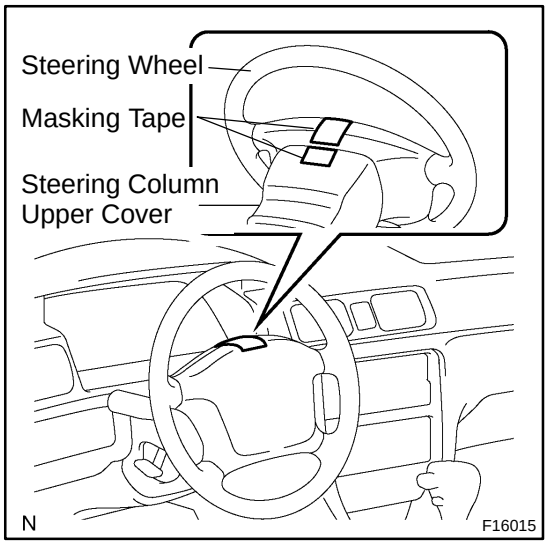
(f) Install the steering wheel pad (See page SR-25).

SR1HO-01

REPAIR PROCEDURES

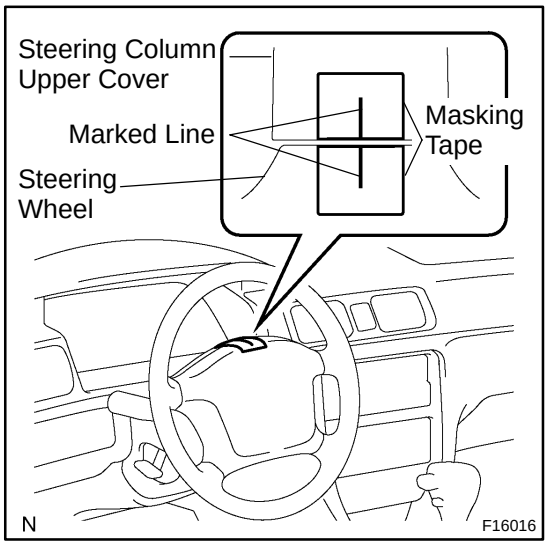
HINT:

This is the repair procedure for steering off center.



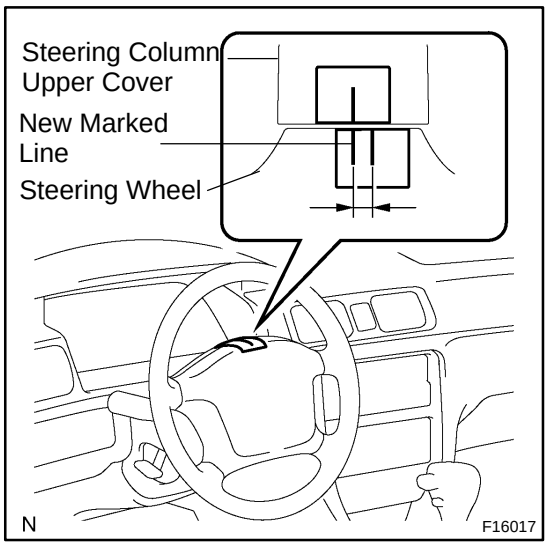
1. INSPECT STEERING WHEEL OFF CENTER

(a) Apply masking tape on the top center of the steering wheel and steering column upper cover.



(b) Drive the vehicle in a straight line for 100 meters at a constant speed of 35 mph (56 km/h), and hold the steering wheel to maintain the course.

(c) Draw a line on the masking tape as shown in the illustration.



(d) Turn the steering wheel to its straight position.

HINT:

Refer to the upper surface of the steering wheel, steering spoke and SRS airbag line for the straight position.

(e) Draw a new line on the masking tape of the steering wheel as shown in the illustration.

(f) Measure the distance between the 2 lines on the masking tape of the steering wheel.

(g) Convert the measured distance to steering angle.
Measured distance 1 mm (0.04 in.) = Steering angle approximately 1 deg.

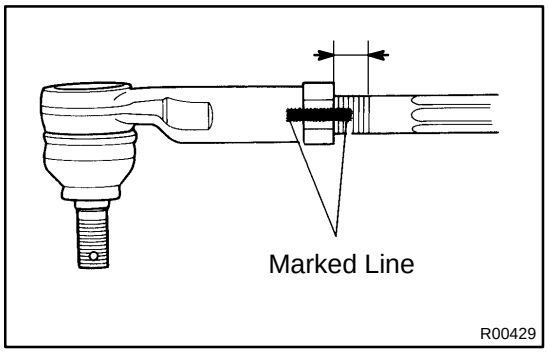
HINT:

Make a note of the steering angle.

2. ADJUST STEERING ANGLE

NOTICE:

The adjustment method for steering angle is different depending on the models. Check whether it is type A or B.

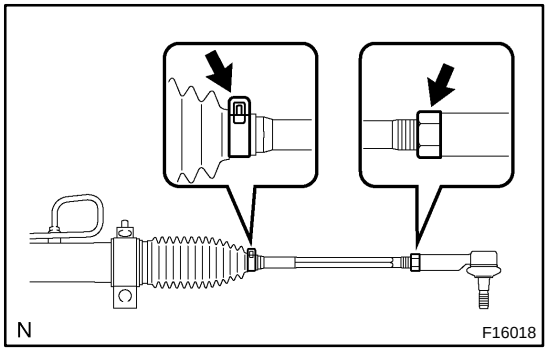


(a) Draw a line on the RH and LH tie rod and rack ends where it can easily be seen.

(b) Using a paper gauge, measure the distance from RH and LH tie rod ends to the rack end screws.

HINT:

- Measure the RH side and LH side.
- Make a note of the measured values.



(c) Remove the RH and LH boot clips from the rack boots.

(d) Loosen the RH and LH lock nuts.

(e) Turn the RH and LH rack end by the same amount (but in different directions) according to the steering angle.
1 turn 360 deg. of rack end (1.5 mm (0.059 in.) horizontal movement) = 12 deg. of steering angle

(f) Tighten the RH and LH lock nuts.
Torque: 56 N·m (570 kgf·cm, 41 ft·lbf)

NOTICE:

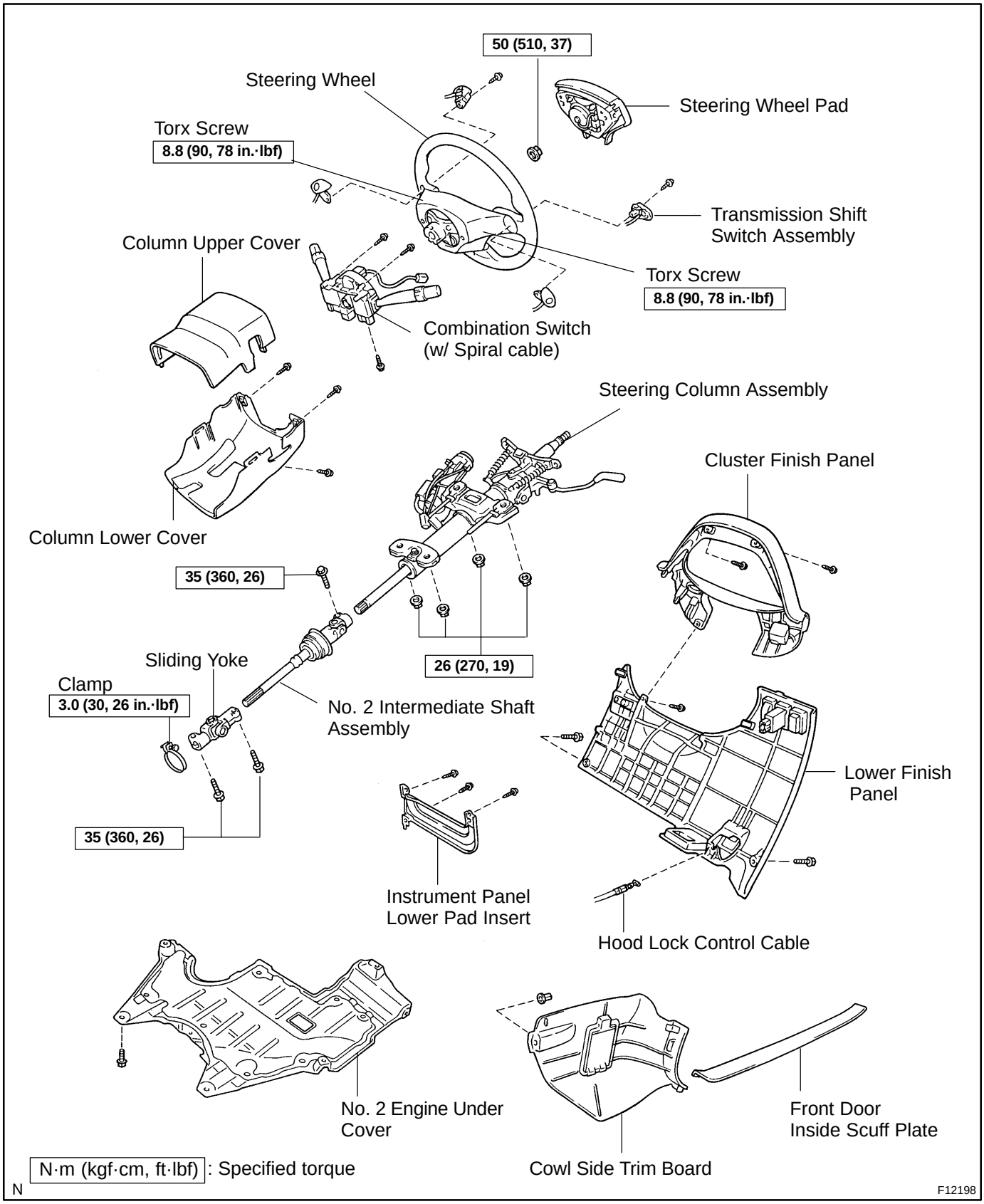
Make sure that the difference in length between RH and LH tie rod ends and rack end screws are within 1.5 mm (0.059 in.).

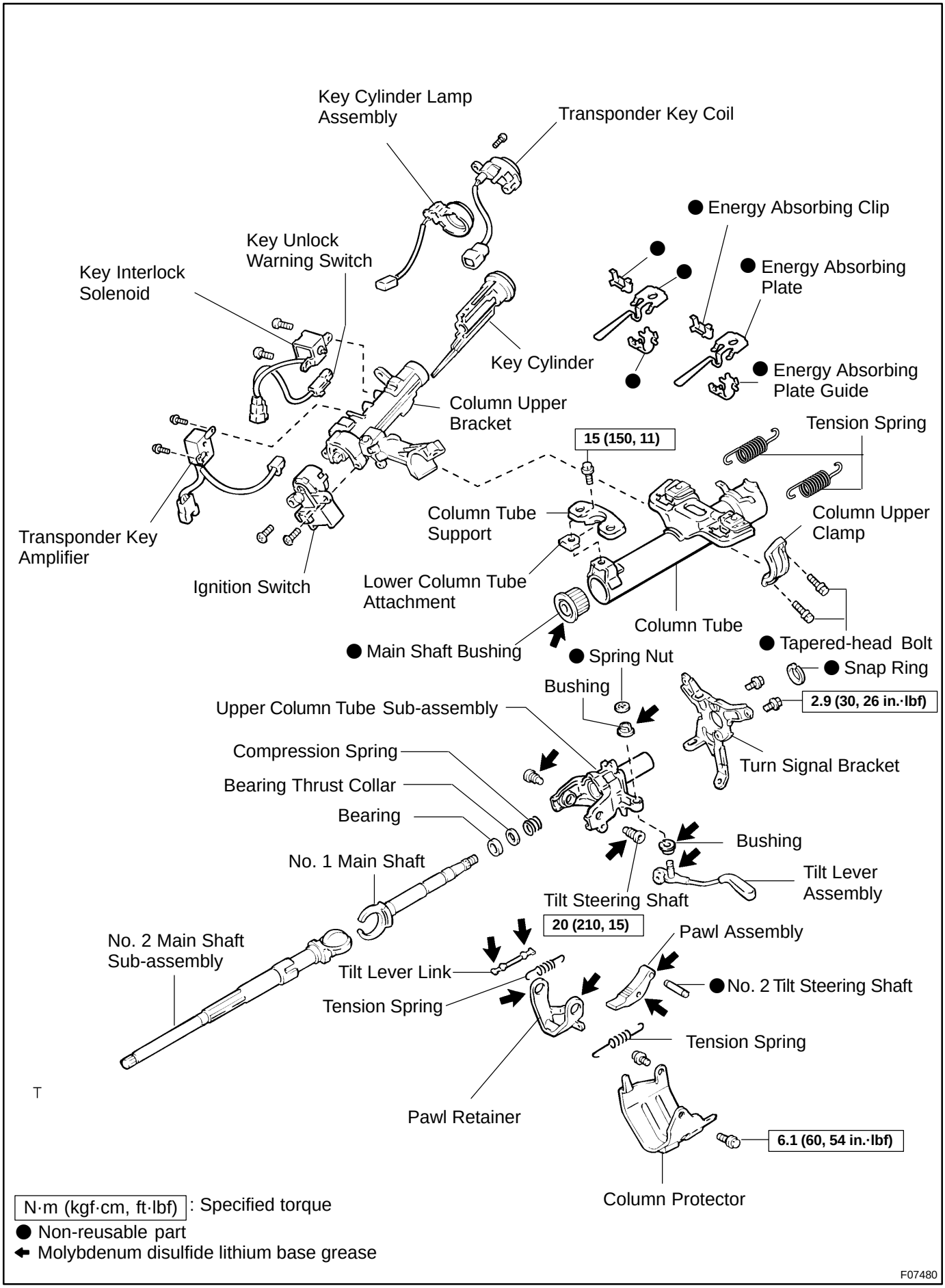
(g) Install the RH and LH boot clips.

TILT STEERING COLUMN

COMPONENTS

SR1BR-02




Key Cylinder Lamp Assembly
Transponder Key Coil
Energy Absorbing Clip
Key Unlock Warning Switch
Energy Absorbing Plate
Key Interlock Solenoid
Key Cylinder
Energy Absorbing Plate Guide
Column Upper Bracket
15 (150, 11)
Tension Spring
Column Tube Support
Column Upper Clamp
Transponder Key Amplifier
Ignition Switch
Lower Column Tube Attachment
Column Tube
Main Shaft Bushing
Spring Nut
Tapered-head Bolt
Snap Ring
Bushing
2.9 (30, 26 in.·lbf)
Upper Column Tube Sub-assembly
Turn Signal Bracket
Compression Spring
Bearing Thrust Collar
Bearing
Bushing
No. 1 Main Shaft
Tilt Lever Assembly
Tilt Steering Shaft
20 (210, 15)
Pawl Assembly
No. 2 Main Shaft Sub-assembly
Tilt Lever Link
No. 2 Tilt Steering Shaft
Tension Spring
Tension Spring
Pawl Retainer
6.1 (60, 54 in.·lbf)
Column Protector
N·m (kgf·cm, ft·lbf) : Specified torque
Non-reusable part
Molybdenum disulfide lithium base grease
F07480

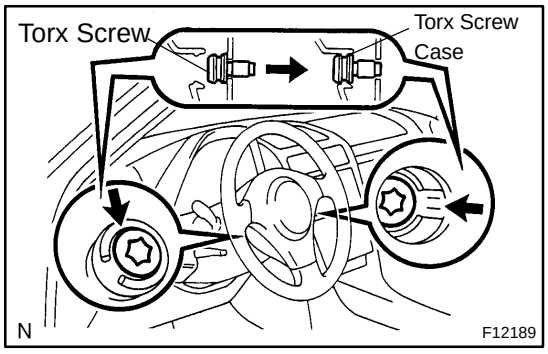
SR1BS-02

REMOVAL

1. REMOVE STEERING WHEEL PAD

NOTICE:

If the airbag connector is disconnected with the ignition switch at ON or ACC, DTCs will be recorded.



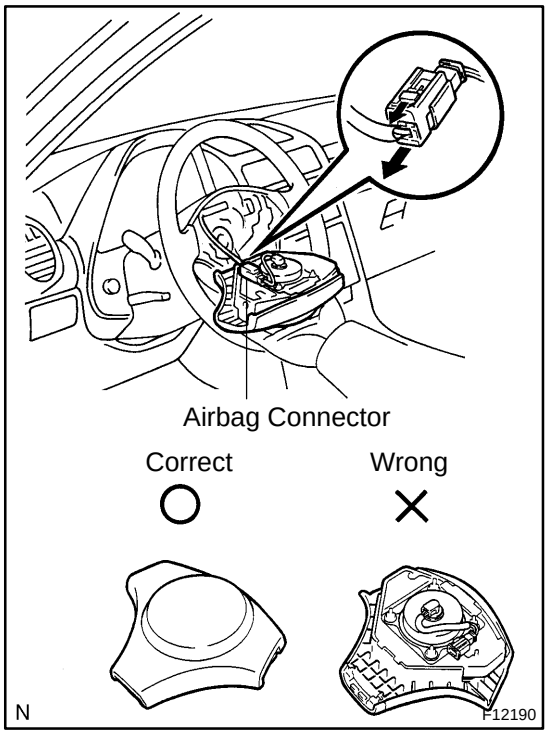
(a) Place the front wheels facing straight ahead.

(b) Remove the 2 steering wheel lower No. 2 covers.

(c) Using a torx socket wrench, loosen the 2 torx screws.

HINT:

Loosen the 2 screws until the groove along the screw circumference catches on the screw case.



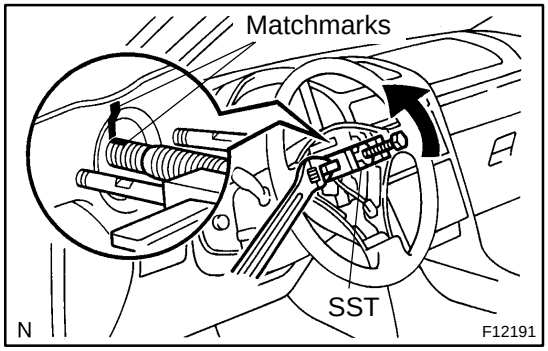
(d) Pull out the wheel pad from the steering wheel and disconnect the airbag connector.

CAUTION:

- **When storing the wheel pad, keep the upper surface of the pad facing upward.**
- **Never disassemble the wheel pad.**

NOTICE:

When removing the wheel pad, take care not to pull the airbag wire harness.



2. REMOVE STEERING WHEEL

(a) Disconnect the connector.

(b) Remove the steering wheel set nut.

(c) Place matchmarks on the steering wheel and main shaft assembly.

(d) Using SST, remove the wheel.

SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)

3. REMOVE FRONT DOOR INSIDE SCUFF PLATE AND COWL SIDE TRIM BOARD

(a) Remove the front door inside scuff plate.

(b) Remove the clip and cowl side trim board.

4. REMOVE LOWER FINISH PANEL

(a) Remove the 3 screws.

(b) Disconnect the connectors and remove the lower finish panel.

(c) Disconnect the hood lock control cable.

5. REMOVE CLUSTER FINISH PANEL

(a) Remove the 2 screws.

(b) Disconnect the connector and remove the cluster finish panel.

6. REMOVE COLUMN UPPER AND LOWER COVERS

(a) Remove the 3 screws and column lower cover.

(b) Remove the column upper cover.

7. REMOVE COMBINATION SWITCH WITH SPIRAL CABLE

(a) Disconnect the connectors.

(b) Disconnect the airbag connector.

(c) Remove the 3 screws and combination switch.

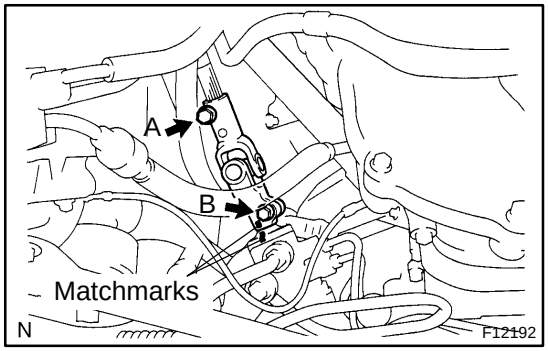
8. REMOVE SPIRAL CABLE

NOTICE:

Do not disassemble the cable or apply oil to it.

9. REMOVE UNDER COVER

Remove the 5 screws, 2 nuts and under cover.



10. DISCONNECT SLIDING YOKE

(a) Place matchmarks on the sliding yoke and control valve shaft.

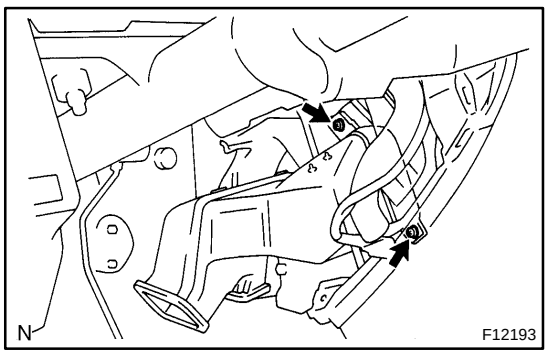
(b) Loosen the bolt ”A” and remove the bolt ”B”.

(c) Disconnect the sliding yoke.

11. DISCONNECT BRAKE PEDAL RETURN SPRING

12. REMOVE INSTRUMENT PANEL LOWER PAD INSERT

Remove the 3 bolts and instrument panel lower pad insert.



13. DISCONNECT HEATER TO REGISTER DUCT

Remove the 2 screws and disconnect heater to register duct.

14. REMOVE STEERING COLUMN ASSEMBLY

(a) Loosen the clamp.

(b) Disconnect the connectors.

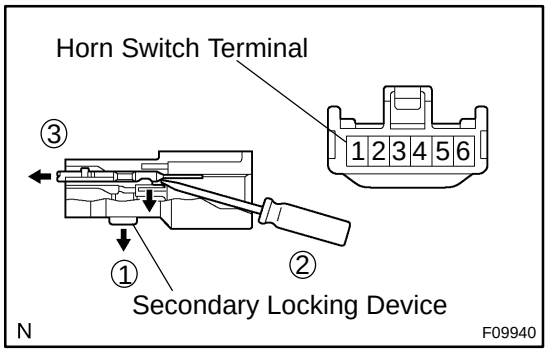
(c) Remove the 4 nuts and steering column assembly.

15. REMOVE SLIDING YOKE

Remove the bolt "A" and sliding yoke.

16. REMOVE NO. 2 INTERMEDIATE SHAFT ASSEMBLY

Remove the bolt and No. 2 intermediate shaft assembly.



17. REMOVE TRANSMISSION SHIFT SWITCH ASSEMBLY FROM STEERING WHEEL

(a) Remove the 2 screws.

(b) Disengage the secondary locking device of the connector.

(c) Release the locking lug of the terminal 1 (horn switch terminal), and pull the terminal out of the rear.

(d) Remove the transmission shift switch assembly.

SR0U8-03

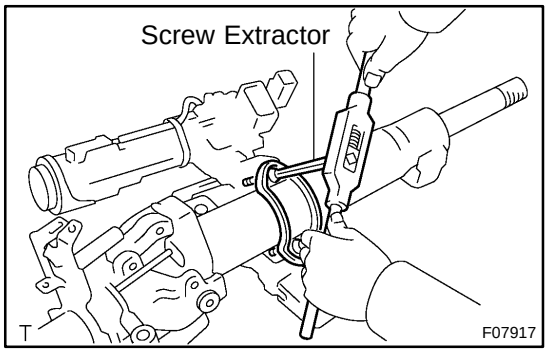
DISASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. REMOVE TRANSPONDER KEY COIL AND KEY CYLINDER LAMP ASSEMBLY

Remove the screw, transponder key coil and key cylinder lamp assembly.



2. REMOVE COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP

(a) Using a centering punch, mark the center of the 2 tapered-head bolts.

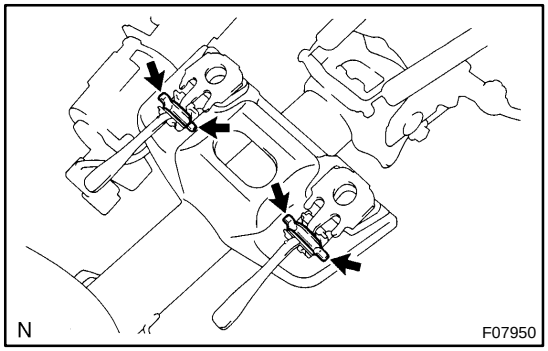
(b) Using a 3 - 4 mm (0.12 - 0.16 in.) drill, drill into the 2 bolts.

(c) Using a screw extractor, remove the 2 bolts, column upper bracket and column upper clamp.

3. REMOVE COLUMN TUBE SUPPORT

(a) Remove the bolt and column tube support with the lower column tube attachment.

(b) Remove the lower column tube attachment from the column tube support.



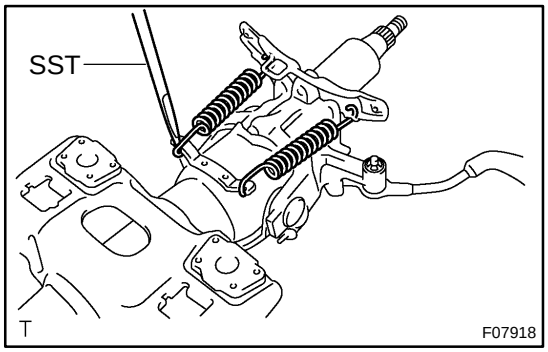
4. REMOVE 2 ENERGY ABSORBING PLATES

(a) Using pliers, remove the 2 energy absorbing clips.

(b) Remove the 2 energy absorbing plates and 2 energy absorbing plate guides.

5. REMOVE COLUMN PROTECTOR

Remove the 2 bolts and column protector.



6. REMOVE 2 TENSION SPRINGS

Using SST, remove the 2 tension springs.

SST 09703-30010

7. REMOVE TURN SIGNAL BRACKET

(a) Using pliers, remove the tension spring.

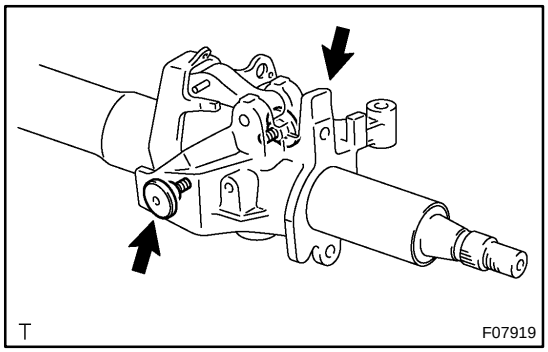
(b) Remove the 2 bolts and turn signal bracket.

8. REMOVE TILT LEVER ASSEMBLY

(a) Remove the tension spring.

(b) Remove the spring nut, tilt lever assembly and tilt lever link.

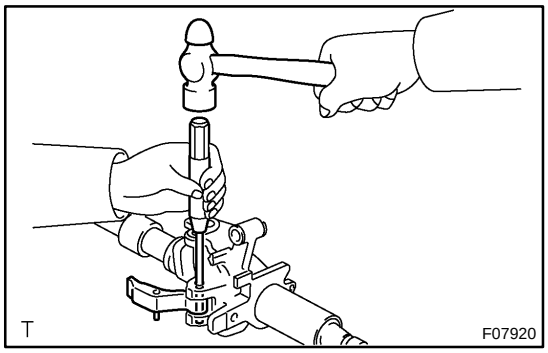
(c) Remove the 2 bushings from the upper column tube sub-assembly.



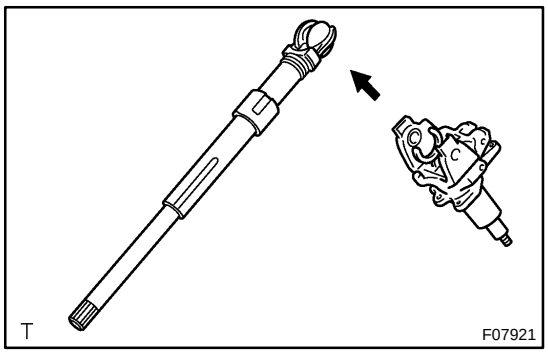
9. REMOVE MAIN SHAFT ASSEMBLY WITH UPPER COLUMN TUBE SUB-ASSEMBLY

(a) Using a hexagon wrench (6 mm), remove the 2 tilt steering shafts.

(b) Remove the pawl retainer and main shaft assembly with the upper column tube sub-assembly.

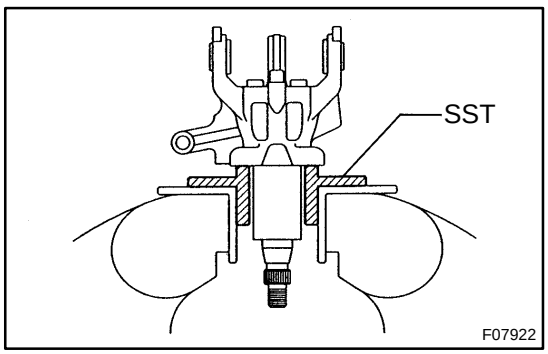


(c) Using a pin punch (5 mm) and a hammer, remove the No. 2 tilt steering shaft and pawl assembly.

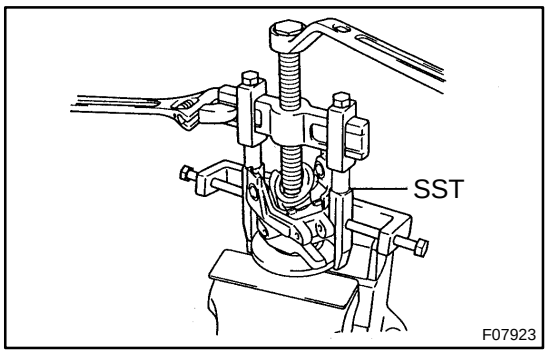


10. REMOVE UPPER COLUMN TUBE SUB-ASSEMBLY FROM MAIN SHAFT ASSEMBLY

(a) Bent the joint of the main shaft at right angles, leaving the cross ball in the No. 2 main shaft sub-assembly, separate the main shaft into the No. 1 main shaft with upper column tube sub-assembly and No. 2 main shaft sub-assembly.



(b) Secure the No. 1 main shaft with upper column tube sub-assembly and SST in a vise.
SST 09316-6001 1 (09316-00051)



(c) Using SST, compress the spring of the upper column tube sub-assembly .

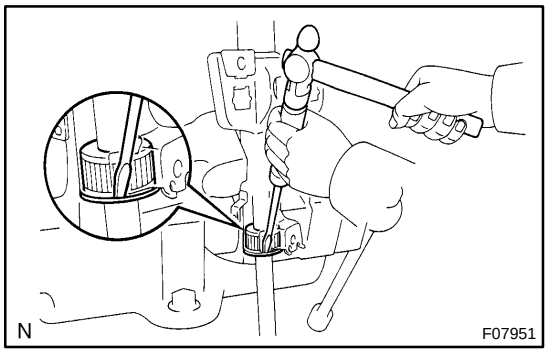
SST 09950-4001 1 (09951-04010, 09952-04010, 09953-04020, 09954-04010, 09955-04061, 09958-0401 1)

NOTICE:

Do not overtighten the SST.

(d) Using snap ring expander, remove the snap ring and No. 1 main shaft.

11. REMOVE COMPRESSION SPRING, BEARING THRUST COLLAR AND BEARING

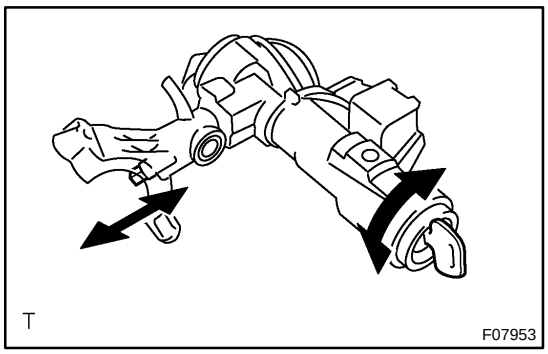


12. REMOVE MAIN SHAFT BUSHING

Using a screwdriver, tap out the main shaft bushing.

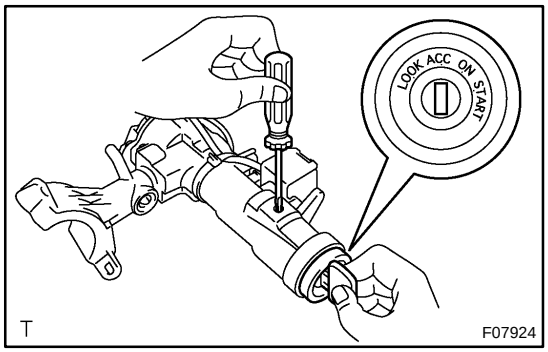
SR0LE-07

INSPECTION



1. INSPECT STEERING LOCK OPERATION

Check that the steering lock mechanism operates properly.



2. IF NECESSARY, REPLACE KEY CYLINDER

(a) Place the ignition key at the ACC position.

(b) Push down the stop pin with a screwdriver, and pull out the cylinder.

(c) Install a new cylinder.

HINT:

Make sure the key is at the ACC position.

3. INSPECT IGNITION SWITCH (See page BE-21)

4. IF NECESSARY, REPLACE IGNITION SWITCH

(a) Remove the 2 screws and ignition switch from the column upper bracket.

(b) Install a new ignition switch with the 2 screws.

5. INSPECT KEY UNLOCK WARNING SWITCH (See page BE-21)

6. IF NECESSARY, REPLACE KEY UNLOCK WARNING SWITCH

(a) Slide the key unlock waring switch out of the column upper bracket.

(b) Slide a new key unlock waring switch in the column upper bracket.

7. INSPECT KEY INTERLOCK SOLENOID (See page AT-18)

8. IF NECESSARY, REPLACE KEY INTERLOCK SOLENOID

(a) Remove the 2 screws and key interlock solenoid.

(b) Install a new key interlock solenoid with the 2 screws.

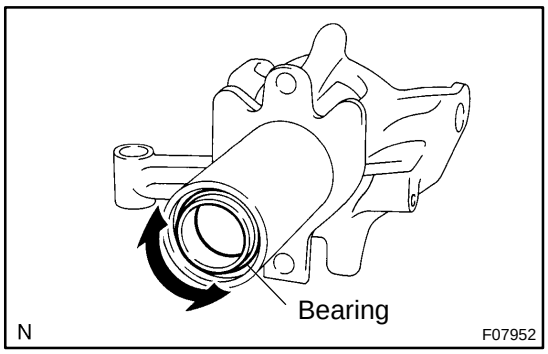
9. INSPECT TRANSPONDER KEY COIL (See page BE-230)

10. IF NECESSARY, REPLACE TRANSPONDER KEY COIL

11. IF NECESSARY, REPLACE TRANSPONDER KEY AMPLIFIER

(a) Remove the 2 screws and transponder key amplifier.

(b) Install a new transponder key amplifier with the 2 screws.



12. INSPECT BEARING

Check the bearing rotation condition and check for abnormal noise.

If the bearing is worn or damaged, replace the upper column tube sub-assembly.

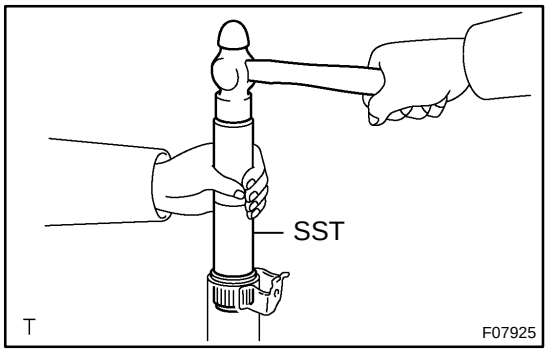
SR0U9-03

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. COAT PARTS INDICATED BY ARROWS WITH MOLYBDENUM DISULFIDE LITHIUM BASE GREASE
(See page SR-1 1)



2. INSTALL MAIN SHAFT BUSHING

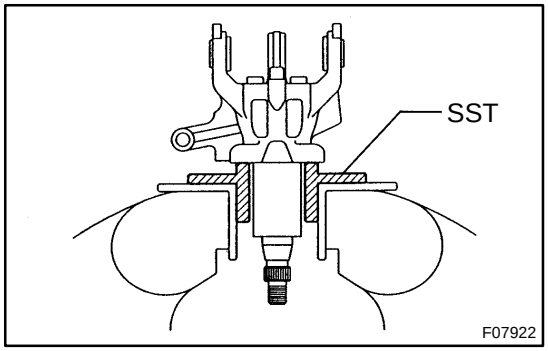
(a) Coat a new main shaft bushing with molybdenum disulfide lithium base grease.

(b) Using SST and a hammer, tap in the main shaft bushing.
SST 09612-2201 1

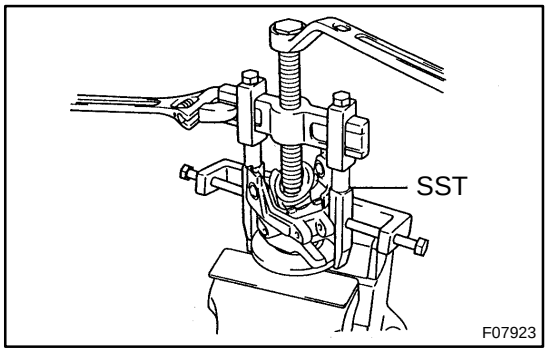
3. INSTALL COMPRESSION SPRING, BEARING THRUST COLLAR AND BEARING

4. INSTALL UPPER COLUMN TUBE SUB-ASSEMBLY TO MAIN SHAFT ASSEMBLY

(a) Temporarily install the upper column tube sub-assembly to the No. 1 main shaft.



(b) Secure the No. 1 main shaft with upper column tube sub-assembly and SST in a vise.
SST 09316-6001 1 (09316-00051)

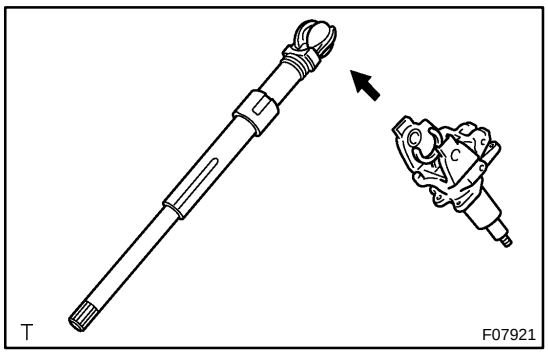


(c) Using SST, compress the spring of the upper column tube sub-assembly .
SST 09950-4001 1 (09951-04010, 09952-04010, 09953-04020, 09954-04010, 09955-04061, 09958-0401 1)

NOTICE:

Do not overtighten the SST.

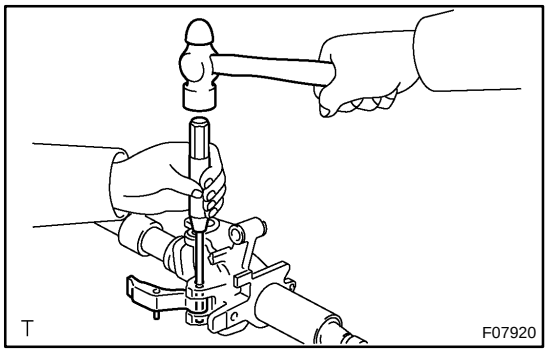
(d) Using a snap ring expander, install a new snap ring and No. 1 main shaft.



(e) Assemble the No. 1 main shaft with upper column tube sub-assembly and No. 2 main shaft sub-assembly.

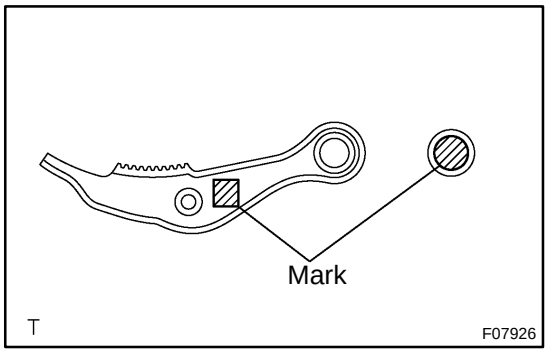
NOTICE:

Do not bend the universal joint of the shaft more than 20˚.



5. INSTALL MAIN SHAFT ASSEMBLY WITH UPPER COLUMN TUBE SUB-ASSEMBLY

(a) Using a pin punch (5 mm) and a hammer, install the pawl assembly with a new No. 2 tilt steering shaft.

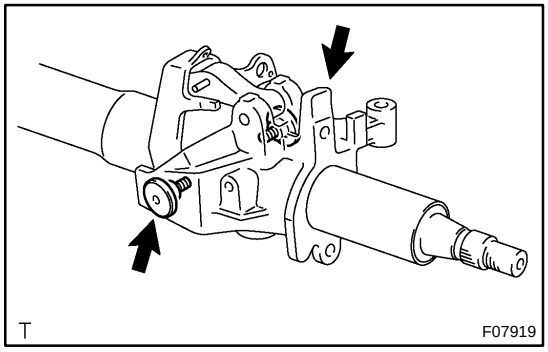


HINT:

Install a new No. 2 tilt steering shaft with the one having the mark corresponding to the mark stamped on the pawl assembly.

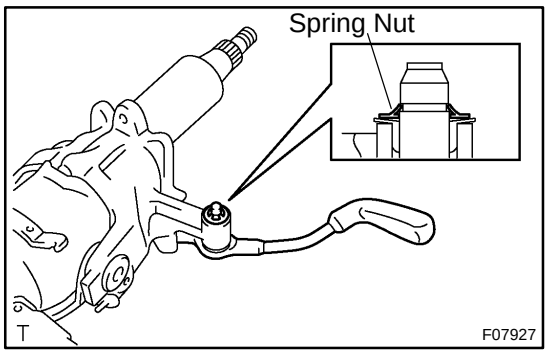
Pawl assembly mark	No. 2 tilt steering shaft color	No. 2 tilt steering shaft part number
1	White	45856-26010
2	Yellow	45856-26020
3	Black	45856-26030

(b) Install the main shaft assembly with the upper column tube sub-assembly and pawl retainer.



(c) Using a hexagon wrench (6 mm), install the 2 tilt steering shafts.

Torque: 20 N·m (210 kgf·cm, 15 ft·lbf)



6. INSTALL TILT LEVER ASSEMBLY

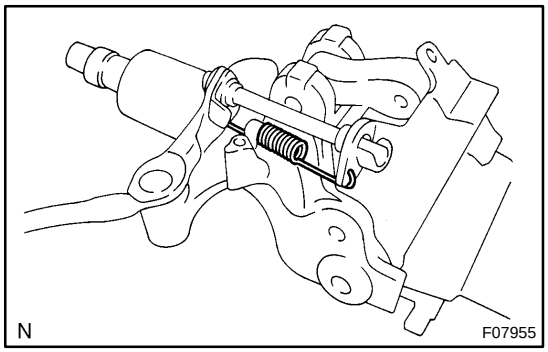
(a) Install the 2 bushings to the upper column tube sub-assembly.

(b) Install the tilt lever assembly with a new spring nut.

NOTICE:

Make sure that the spring nut is installed facing in the correct direction.

(c) Install the tilt lever link.



(d) Install the tension spring.

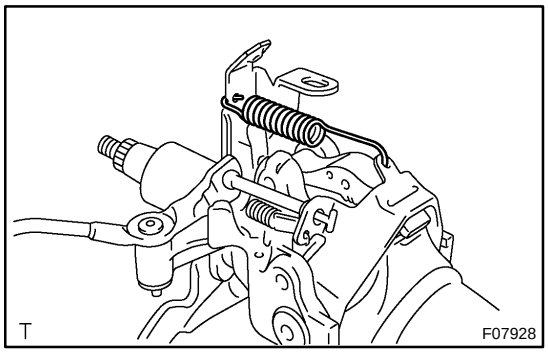
NOTICE:

Make sure that the tension spring is installed facing in the correct direction.

7. INSTALL TURN SIGNAL BRACKET

(a) Install the turn signal bracket with the 2 bolts.

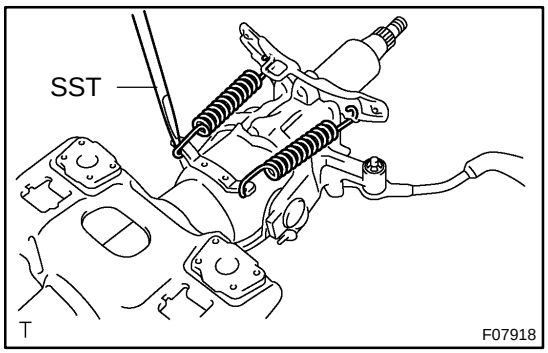
Torque: 2.9 N·m (30 kgf·cm, 26 in.·lbf)



(b) Using pliers, install the tension spring.

NOTICE:

Make sure that the tension spring is installed facing in the correct direction.



8. INSTALL 2 TENSION SPRINGS

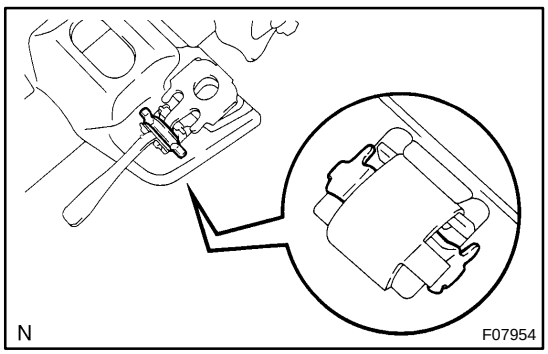
Using SST, install the 2 tension springs.

SST 09703-30010

9. INSTALL COLUMN PROTECTOR

Install the column protector with the 2 bolts.

Torque: 6.1 N·m (60 kgf·cm, 52 in.·lbf)



10. INSTALL 2 ENERGY ABSORBING PLATES

(a) Install the 2 new energy absorbing plate guides and energy absorbing plates.

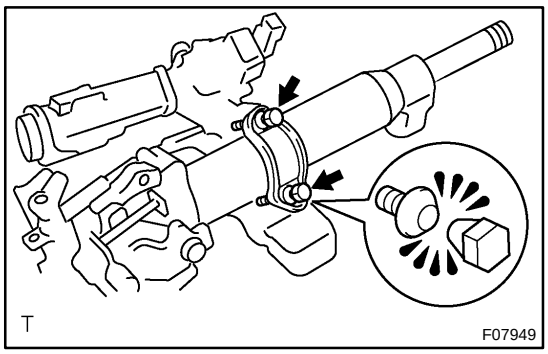
(b) Install the 2 new energy absorbing clips.

11. INSTALL COLUMN TUBE SUPPORT

(a) Install the lower column tube attachment to the column tube support.

(b) Install the column tube support with the lower column tube attachment with the bolt.

Torque: 15 N·m (150 kgf·cm, 11 ft·lbf)



12. INSTALL COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP

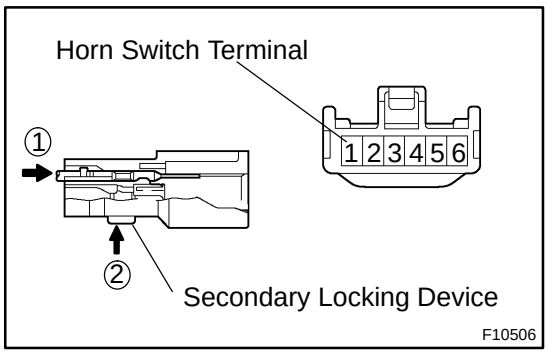
(a) Install the column upper bracket and column upper clamp with 2 new tapered-head bolts.

(b) Tighten the 2 tapered-head bolts until the bolt heads break off.

13. INSTALL TRANSPONDER KEY COIL AND KEY CYLINDER LAMP ASSEMBLY

Install the key cylinder lamp assembly and transponder key coil with the screw.

SR1BT-02



INSTALLATION

1. INSTALL TRANSMISSION SHIFT SWITCH ASSEMBLY TO STEERING WHEEL

(a) Install the transmission shift switch assembly.
(b) Push the terminal 1 (horn switch terminal) into the connector.
(c) Engage the secondary locking device of the connector.
(d) Install the 2 screws.

2. INSTALL NO. 2 INTERMEDIATE SHAFT ASSEMBLY

Install the No. 2 intermediate shaft assembly with the bolt.

Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

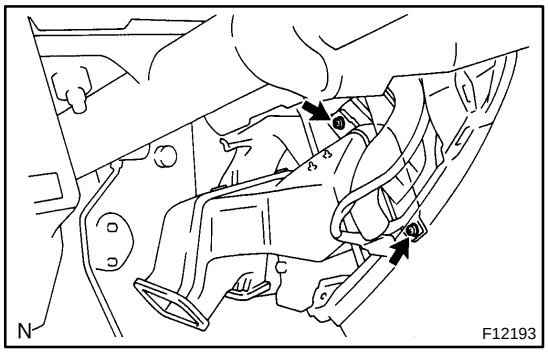
3. INSTALL SLIDING YOKE

Temporarily install sliding yoke with the bolt ”A”.

4. INSTALL STEERING COLUMN ASSEMBLY

Install the steering column assembly with the 4 nuts.

Torque: 26 N·m (270 kgf·cm, 19 ft·lbf)



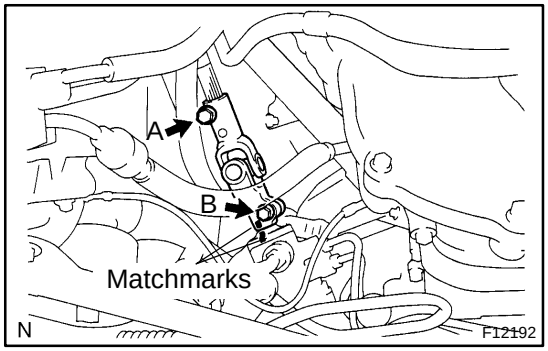
5. CONNECT HEATER TO REGISTER DUCT

Connect the heater to register duct with the 2 screws.

6. INSTALL INSTRUMENT PANEL LOWER PAD INSERT

Install the instrument panel lower pad insert with the 3 bolts.

7. CONNECT BRAKE PEDAL RETURN SPRING



8. CONNECT SLIDING YOKE

(a) Align the matchmarks on the sliding yoke and control valve shaft.
(b) Install the bolt ”A” and ”B”.

Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

9. INSTALL NO. 2 ENGINE UNDER COVER

Install the No. 2 engine under cover with the 5 screws.

10. INSTALL SPIRAL CABLE

11. INSTALL COMBINATION SWITCH WITH SPIRAL CABLE

(a) Install the combination switch with the 3 screws.
(b) Connect the airbag connector.
(c) Connect the connectors.

12. INSTALL COLUMN UPPER AND LOWER COVERS

(a) Install the column upper cover.
(b) Install the column lower cover with the 3 screws.

13. INSTALL CLUSTER FINISH PANEL

(a) Connect the connector and install the cluster finish panel.
(b) Install the 2 screws.

14. INSTALL LOWER FINISH PANEL

(a) Connect the hood lock control cable to the lower finish panel.

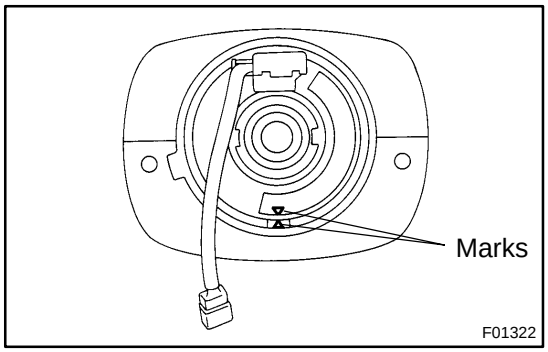
(b) Connect the connectors and install the lower finish panel.

(c) Install the 3 screws.

15. INSTALL FRONT DOOR INSIDE SCUFF PLATE AND COWL SIDE TRIM BOARD

(a) Install the cowl side trim board with the clip.

(b) Install the front door inside scuff plate.



16. CENTER SPIRAL CABLE

(a) Check that the front wheels are facing straight ahead.

(b) Turn the cable counterclockwise by hand until it becomes harder to turn.

(c) Then rotate the cable clockwise about 2.5 turns to align the marks.

HINT:

The cable will rotate about 2.5 turns to either left or right of the center.

17. INSTALL STEERING WHEEL

(a) Align the matchmarks on the steering wheel and main shaft assembly.

(b) Install the steering wheel set nut.

Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

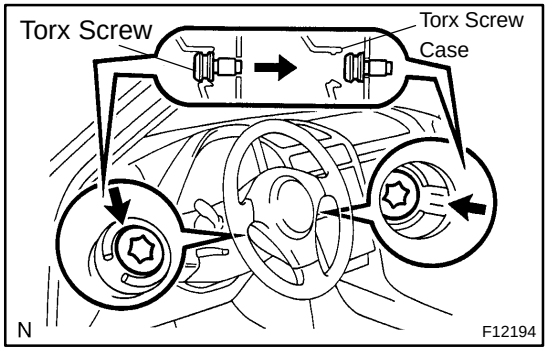
(c) Connect the connector.

18. INSTALL STEERING WHEEL PAD

NOTICE:

- **Never use airbag parts from another vehicle. When replacing parts, replace with new ones.**
- **Make sure the wheel pad is installed with the specified torque.**
- **If the wheel pad has been dropped, or there are cracks, dents or other defects on the case or connector, replace the wheel pad with a new one.**
- **When installing the wheel pad, take care that the wirings do not interfere with other parts and that they are not pinched between other parts.**

(a) Connect the airbag connector.



(b) Install the steering wheel pad after confirming that the circumference groove of the torx screws is caught on the screw case.

(c) Using a torx socket wrench, torque the 2 screws.

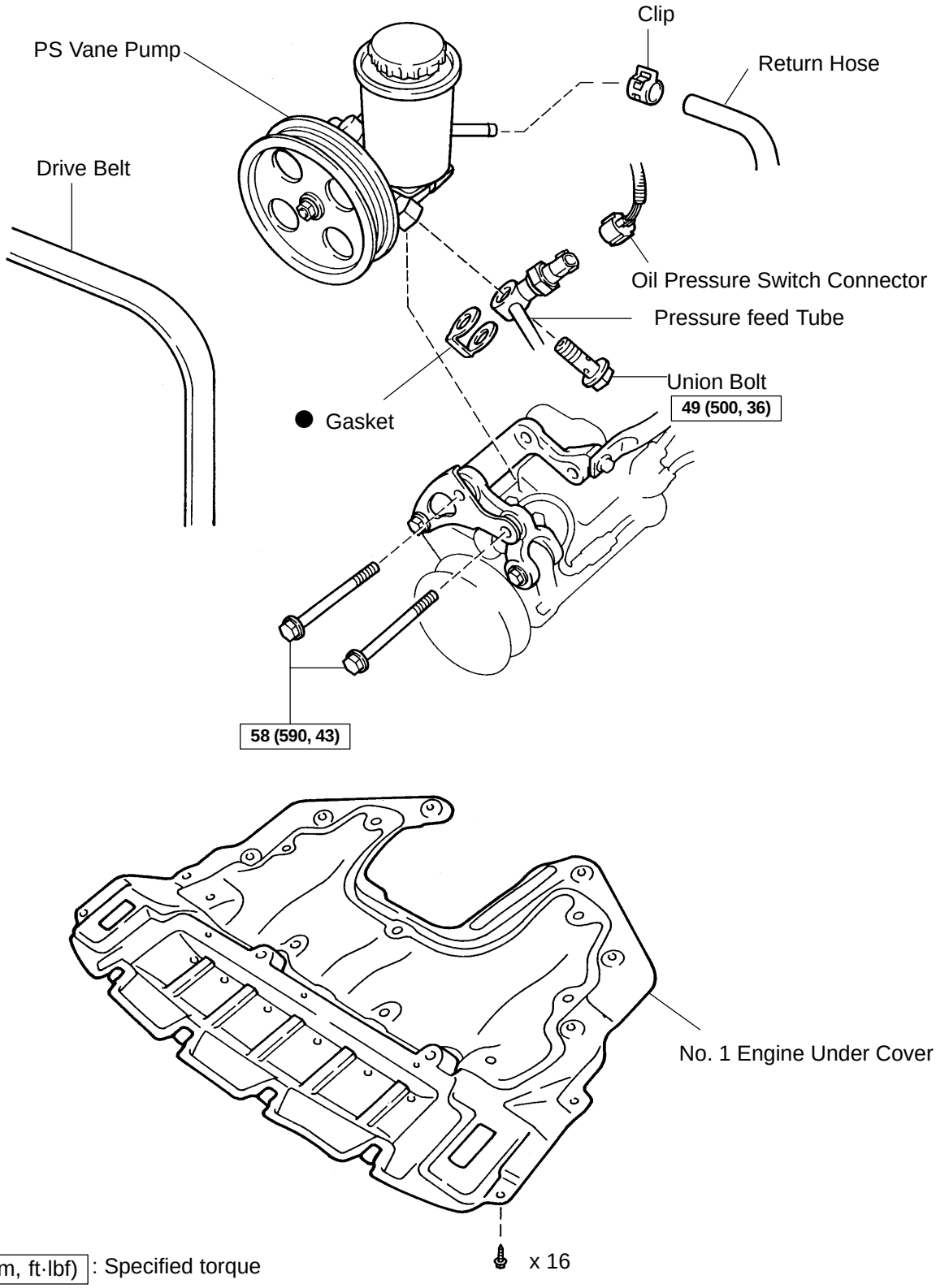
Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)

19. CHECK STEERING WHEEL CENTER POINT

POWER STEERING VANE PUMP

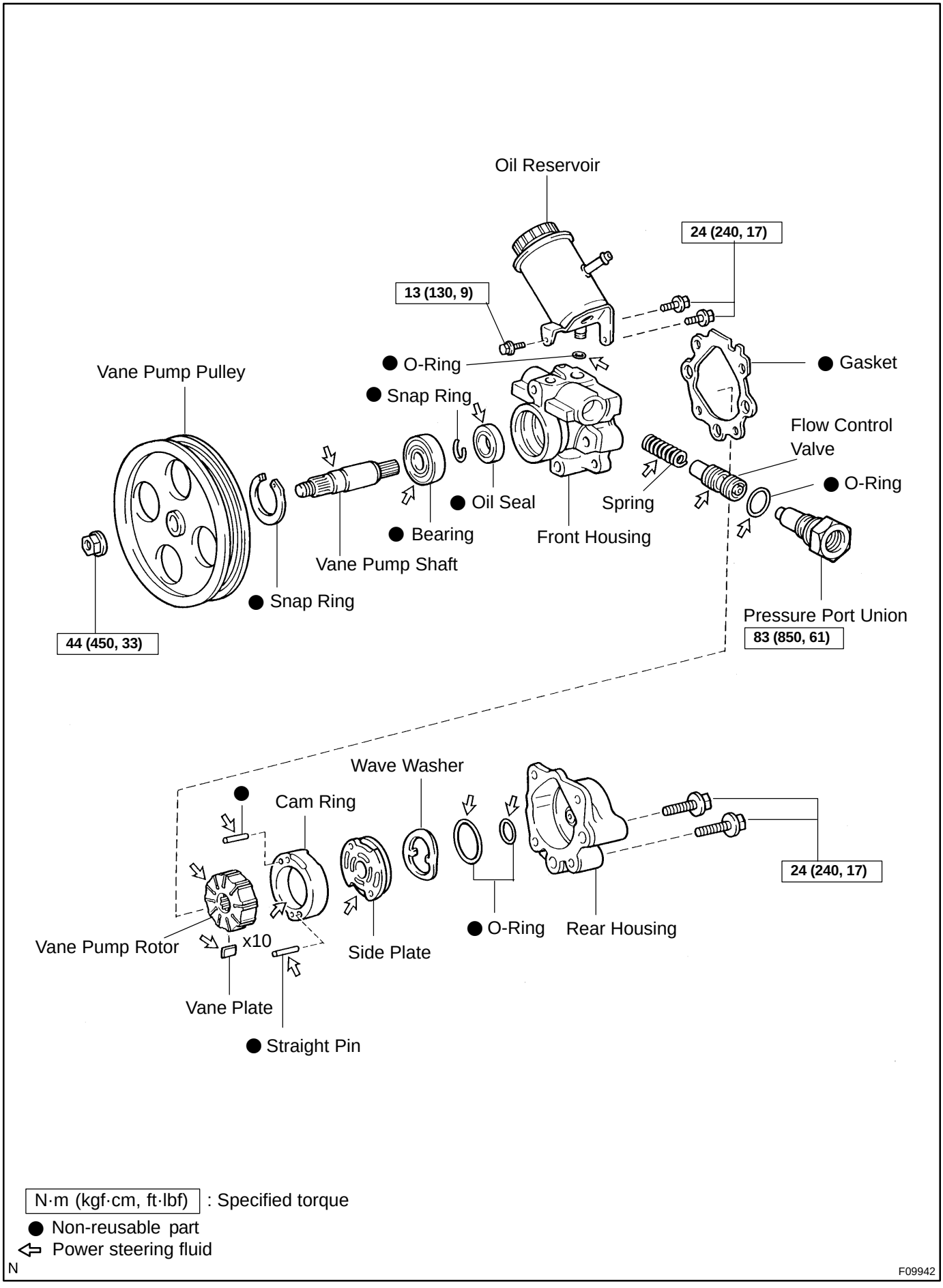
SR1BU-02

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque
● Non-reusable part

F12207

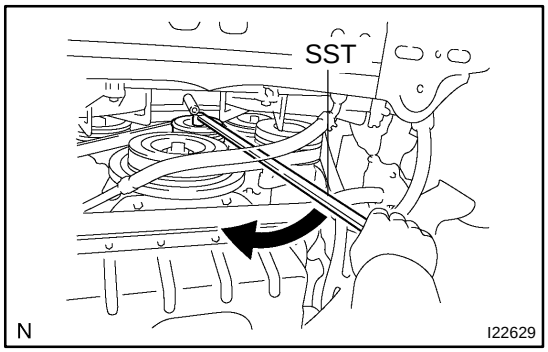

Oil Reservoir
24 (240, 17)
13 (130, 9)
● O-Ring
● Gasket
Vane Pump Pulley
● Snap Ring
Flow Control Valve
● O-Ring
● Oil Seal
Spring
● Bearing
Front Housing
Vane Pump Shaft
● Snap Ring
Pressure Port Union
83 (850, 61)
44 (450, 33)
Wave Washer
Cam Ring
24 (240, 17)
● O-Ring
Rear Housing
Vane Pump Rotor
x10
Side Plate
Vane Plate
● Straight Pin
N·m (kgf·cm, ft·lbf) : Specified torque
● Non-reusable part
⇦ Power steering fluid
N
F09942

SR1BV-03

REMOVAL

1. REMOVE NO. 1 ENGINE UNDER COVER

Remove the 16 screws, clip and No. 1 engine under cover.



2. REMOVE DRIVE BELT

Using SST, loosen the drive belt tension by turning the drive belt tensioner clockwise from the bottom side, and remove the drive belt.

SST 09216-00041

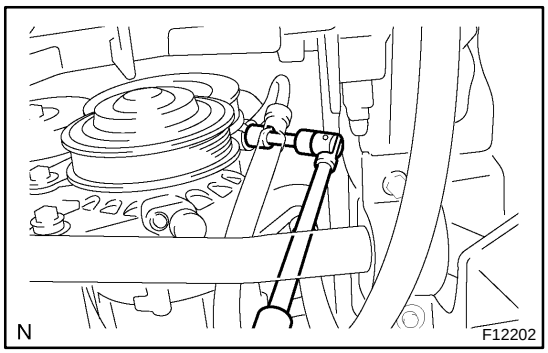
3. DISCONNECT OIL PRESSURE SWITCH CONNECTOR

4. DISCONNECT RETURN HOSE

Remove the clip and disconnect the return hose.

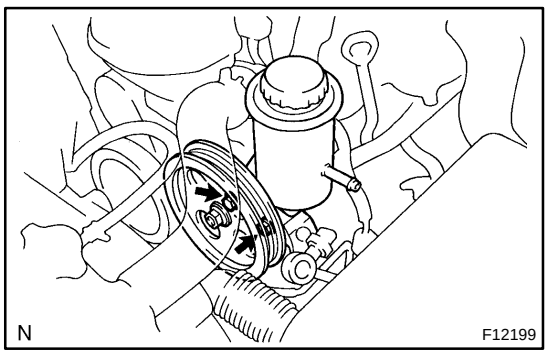
NOTICE:

Take care not to spill fluid on the drive belt and oil pressure switch connector.



5. DISCONNECT PRESSURE FEED TUBE

Remove the union bolt and gasket and disconnect the pressure feed tube.

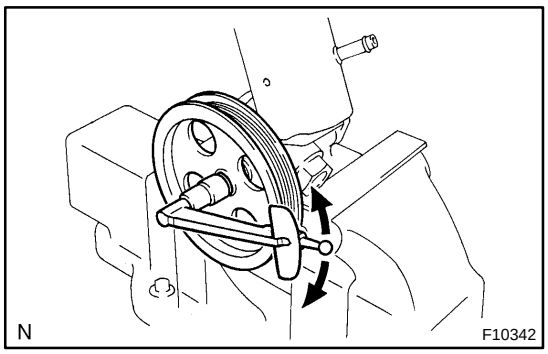


6. REMOVE PS VANE PUMP ASSEMBLY

Remove the 2 bolts and PS vane pump assembly.

SR1BW-02

DISASSEMBLY



NOTICE:

When using a vise, do not overtighten it.

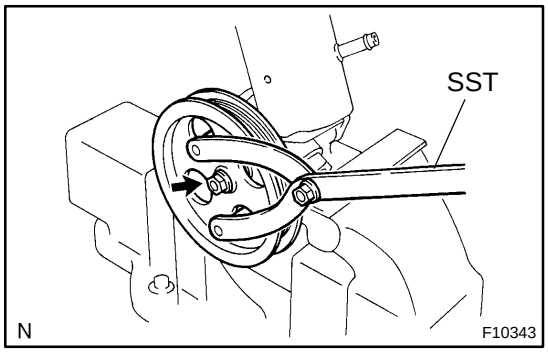
1. MEASURE PS VANE PUMP ROTATING TORQUE

(a) Check that the pump rotates smoothly without abnormal noise.

(b) Using a torque wrench, check the pump rotating torque.

Rotating torque:

0.25 N·m (2.5 kgf·cm, 2.2 in.·lbf) or less



2. REMOVE VANE PUMP PULLEY

Using SST, stop the pulley rotating and remove the pulley set nut.

SST 09960-10010 (09962-01000, 09963-01000)

3. REMOVE OIL RESERVOIR

(a) Remove the 3 bolts and oil reservoir.

(b) Remove the O-ring from the oil reservoir.

4. REMOVE PRESSURE PORT UNION, FLOW CONTROL VALVE AND SPRING

(a) Remove the pressure port union, flow control valve and spring.

(b) Remove the O-ring from the pressure port union.

5. REMOVE REAR HOUSING

(a) Remove the 2 bolts and rear housing.

(b) Remove the 2 O-rings from the rear housing.

6. REMOVE WAVE WASHER

7. REMOVE SIDE PLATE

8. REMOVE CAM RING, 10 VANE PLATES AND VANE PUMP ROTOR

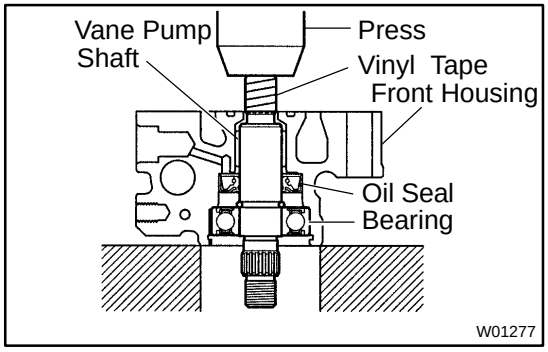
NOTICE:

Be careful not to drop the vane plate.

9. REMOVE 2 STRAIGHT PINS

Remove the 2 straight pins from the front housing.

10. REMOVE GASKET



11. REMOVE VANE PUMP SHAFT WITH BEARING

(a) Using snap ring pliers, remove the snap ring from the front housing.

(b) To prevent oil seal lip damage, wind vinyl tape on the serrated part of the vane pump shaft.

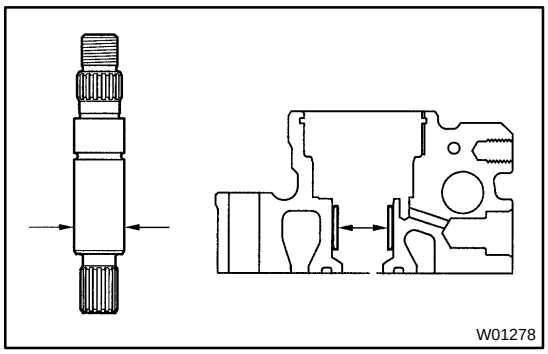
(c) Press out the vane pump shaft with the bearing.

NOTICE:

Be careful not to damage the oil seal lip.

SR1BX-02

INSPECTION



NOTICE:

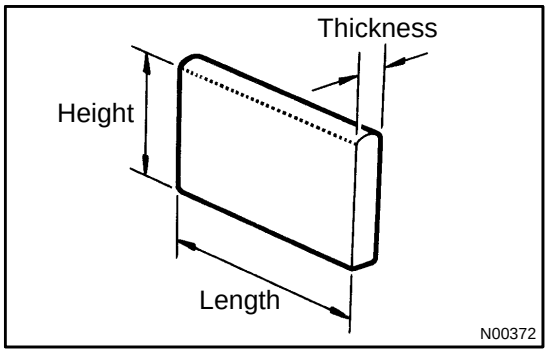
When using a vise, do not overtighten it.

1. CHECK OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING

Using a micrometer and caliper gauge, measure the oil clearance.

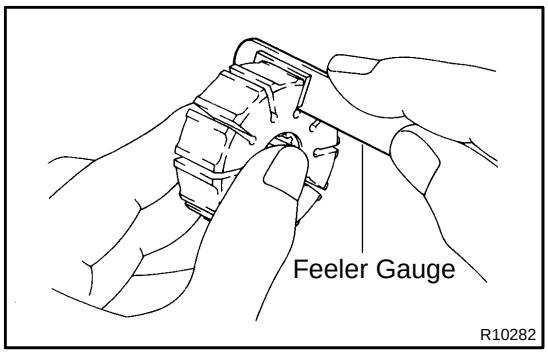
Standard clearance:
0.03 - 0.05 mm (0.0012 - 0.0020 in.)
Maximum clearance: 0.07 mm (0.0028 in.)

If it is more than the maximum, replace the vane pump shaft and front housing.

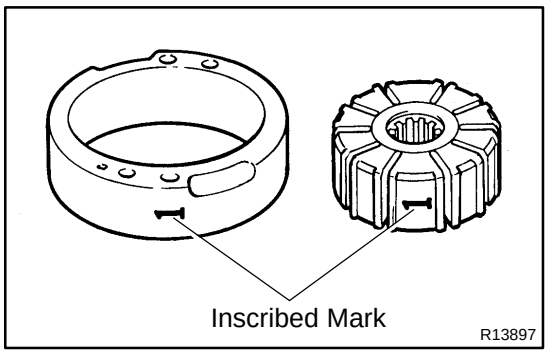


2. INSPECT VANE PUMP ROTOR AND VANE PLATES

(a) Using a micrometer, measure the height, thickness and length of the 10 vane plates.
Minimum height: 8.6 mm (0.339 in.)
Minimum thickness: 1.40 mm (0.0551 in.)
Minimum length: 14.99 mm (0.5902 in.)



(b) Using a feeler gauge, measure the clearance between the vane pump rotor groove and vane plate.
Maximum clearance: 0.033 mm (0.0013 in.)



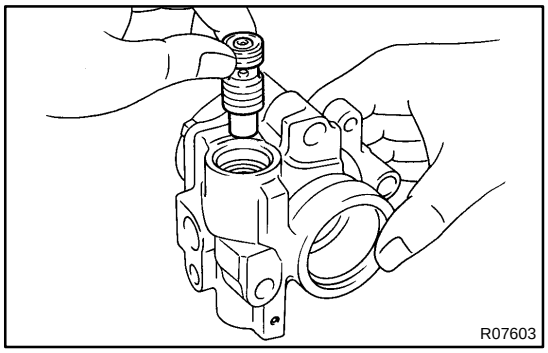
If it is more than the maximum, replace the vane plate and/or vane pump rotor with one having the same mark stamped on the cam ring.

Inscribed mark: 1, 2, 3, 4 or None

HINT:

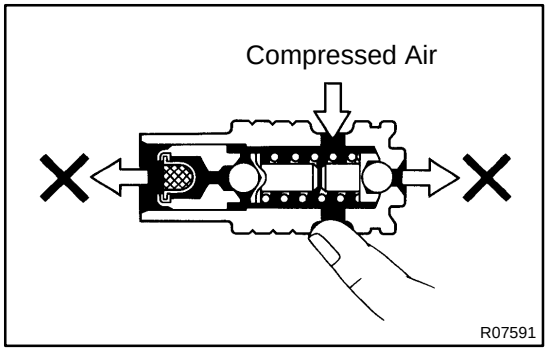
There are 5 vane plate lengths with the following rotor and cam ring marks:

Rotor and cam ring mark	Vane plate part number	Vane plate length mm (in.)
None	44345-26010	14.999-15.001 (0.59051-0.59059)
1	44345-26020	14.997-14.999 (0.59043-0.59051)
2	44345-26030	14.995-14.997 (0.59035-0.59043)
3	44345-26040	14.993-14.995 (0.59027-0.59035)
4	44345-26050	14.991-14.993 (0.59020-0.59027)

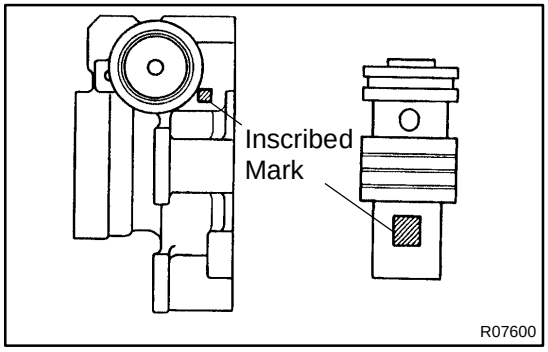


3. INSPECT FLOW CONTROL VALVE

(a) Coat the flow control valve with power steering fluid and check that it falls smoothly into the valve hole by its own weight.

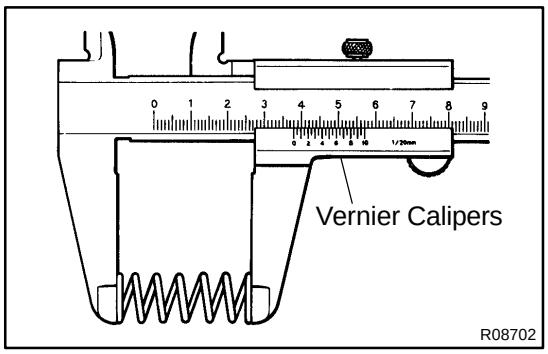


(b) Check the flow control valve for leakage.
Close one of the holes and apply compressed air 392 - 490 kPa (4 - 5 kgf/cm^2, 57 - 71 psi) into the opposite side, and confirm that air does not come out from the end holes.



If necessary, replace the flow control valve with one having the same letter as inscribed on the front housing.

Inscribed mark: A, B, C, D, E or F



4. INSPECT SPRING

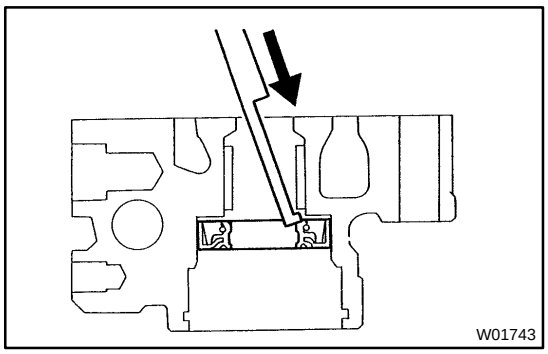
Using vernier calipers, measure the free length of the spring.

Minimum free length: 33.2 mm (1.307 in.)

If it is not within the specification, replace the spring.

SR1BY-02

REPLACEMENT



NOTICE:

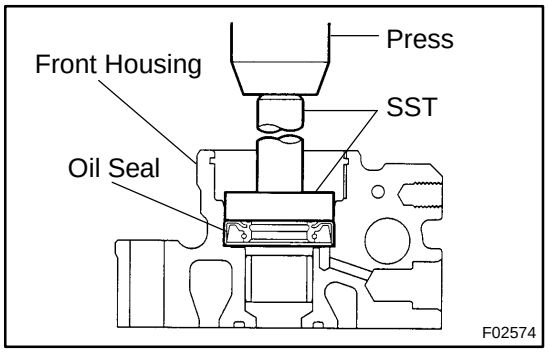
When using a vise, do not overtighten it.

1. IF NECESSARY, REPLACE OIL SEAL

(a) Using SST, tap out the oil seal from the front housing.
SST 09631-10030

NOTICE:

Be careful not to damage the bushing of the front housing.

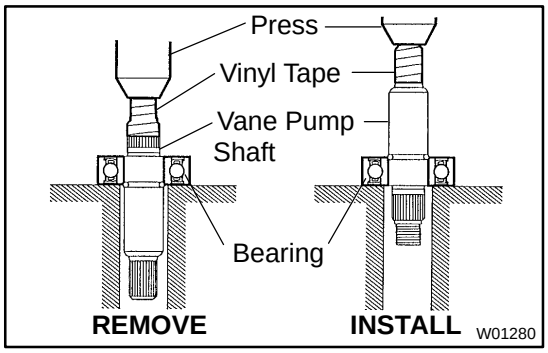


(b) Coat a new oil seal lip with power steering fluid.

(c) Using SST, press in the oil seal.
SST 09950-60010 (09951-00330),
09950-70010 (09951-07100)

NOTICE:

Make sure that the oil seal is installed facing in the correct direction.



2. IF NECESSARY, REPLACE BEARING

(a) Press out the bearing from the vane pump shaft.

(b) Using snap ring expander, replace the snap ring with new one.

NOTICE:

Be careful not to damage the shaft.

(c) Coat a new bearing with power steering fluid.

(d) Press in the bearing to the shaft.

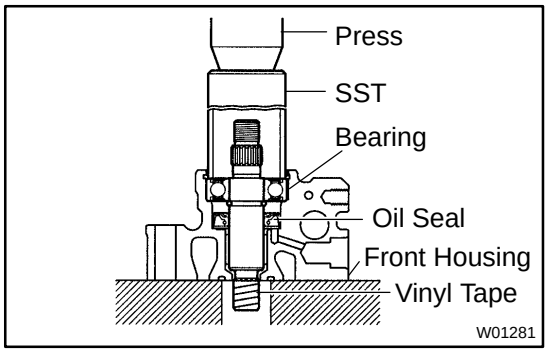
SR1BZ-02

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. COAT PARTS INDICATED BY ARROWS WITH POWER STEERING FLUID (See page SR-27)



2. INSTALL VANE PUMP SHAFT WITH BEARING

(a) To prevent oil seal lip damage, wind vinyl tape on the serrated part of the vane pump shaft.

(b) Using SST, press in the vane pump shaft with the bearing.
SST 09608-04031

NOTICE:

Be careful not to damage the oil seal.

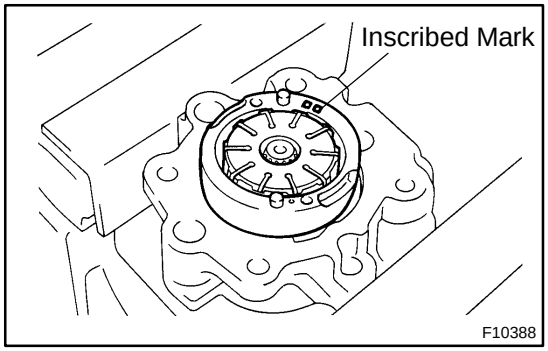
(c) Using snap ring pliers, install a new snap ring to the front housing.

3. INSTALL 2 STRAIGHT PINS

Using a plastic hammer, tap in 2 new straight pins to the front housing.

NOTICE:

Be careful not to damage the straight pins.



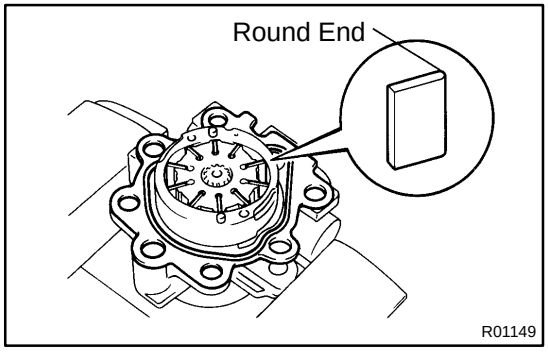
4. INSTALL CAM RING

Install the cam ring with the inscribed mark facing outward.

HINT:

Align the holes of the cam ring with the 2 straight pins.

5. INSTALL VANE PUMP ROTOR



6. INSTALL 10 VANE PLATES AND GASKET

(a) Install the 10 vane plates with the round end facing outward.

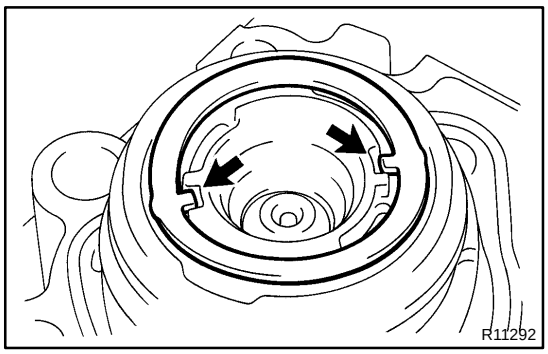
(b) Install a new gasket on the front housing.

NOTICE:

Be careful the direction of the gasket.

7. INSTALL SIDE PLATE

Align the holes of the side plate and 2 straight pins.



8. INSTALL WAVE WASHER

Install the wave washer so that its protrusions fit into the slots in the side plate.

9. INSTALL REAR HOUSING

(a) Coat 2 new O-rings with power steering fluid and install them to the rear housing.

(b) Install the rear housing with the 2 bolts.

Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)

10. INSTALL SPRING, FLOW CONTROL VALVE AND PRESSURE PORT UNION

(a) Install the spring.

(b) Install the flow control valve facing in the correct direction (See page SR-27).

(c) Coat a new O-ring with power steering fluid, and install it to the pressure port union.

(d) Install the pressure port union.

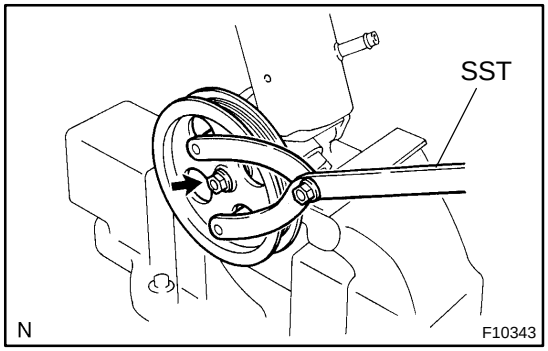
Torque: 83 N·m (850 kgf·cm, 61 ft·lbf)

11. INSTALL OIL RESERVOIR

(a) Coat a new O-ring with power steering fluid and install it to the oil reservoir.

(b) Install the oil reservoir with the 3 bolts.

Torque:
Front side bolt: 13 N·m (130 kgf·cm, 9 ft·lbf)
Rear side bolts: 24 N·m (240 kgf·cm, 17 ft·lbf)



12. INSTALL VANE PUMP PULLEY

(a) Install the vane pump pulley and nut to the vane pump shaft.

(b) Using SST, stop the pulley rotating and torque the pulley set nut.

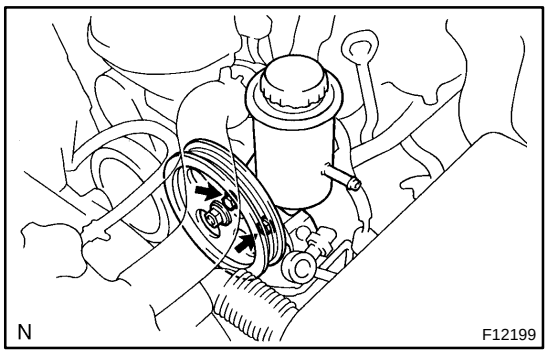
SST 09960-10010 (09962-01000, 09963-01000)

Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

13. MEASURE PS VANE PUMP ROTATING TORQUE (See page SR-30)

SR1C0-03

INSTALLATION



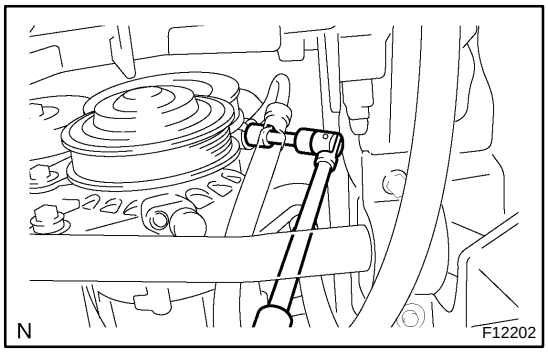
1. INSTALL PS VANE PUMP ASSEMBLY

Install the PS vane pump assembly with the 2 bolts.

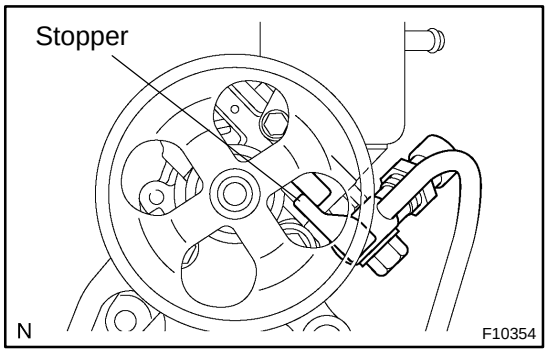
Torque: 58 N·m (590 kgf·cm, 43 ft·lbf)

2. CONNECT PRESSURE FEED TUBE

(a) Install a new gasket to the pressure feed tube.



(b) Connect the pressure feed tube with the union bolt.



HINT:

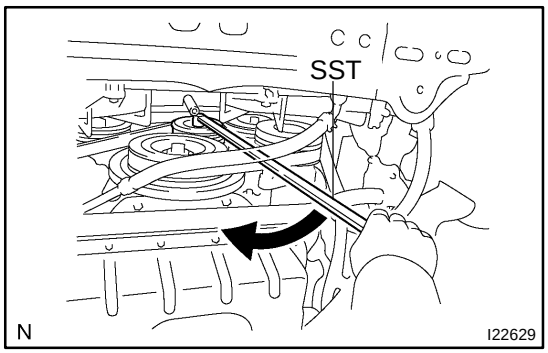
Make sure the stopper of the pressure feed tube touches the PS vane pump body as shown in the illustration, then install the union bolt.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

3. CONNECT RETURN HOSE

Connect the return hose with the clip.

4. CONNECT OIL PRESSURE SWITCH CONNECTOR



5. INSTALL DRIVE BELT

Using SST, loosen the drive belt tension by tuning the drive belt tensioner clockwise from the bottom side, and install the drive belt.

SST 09216-00041

6. INSTALL NO. 1 ENGINE UNDER COVER

Install the No. 1 engine under cover with the 16 screws and clip.

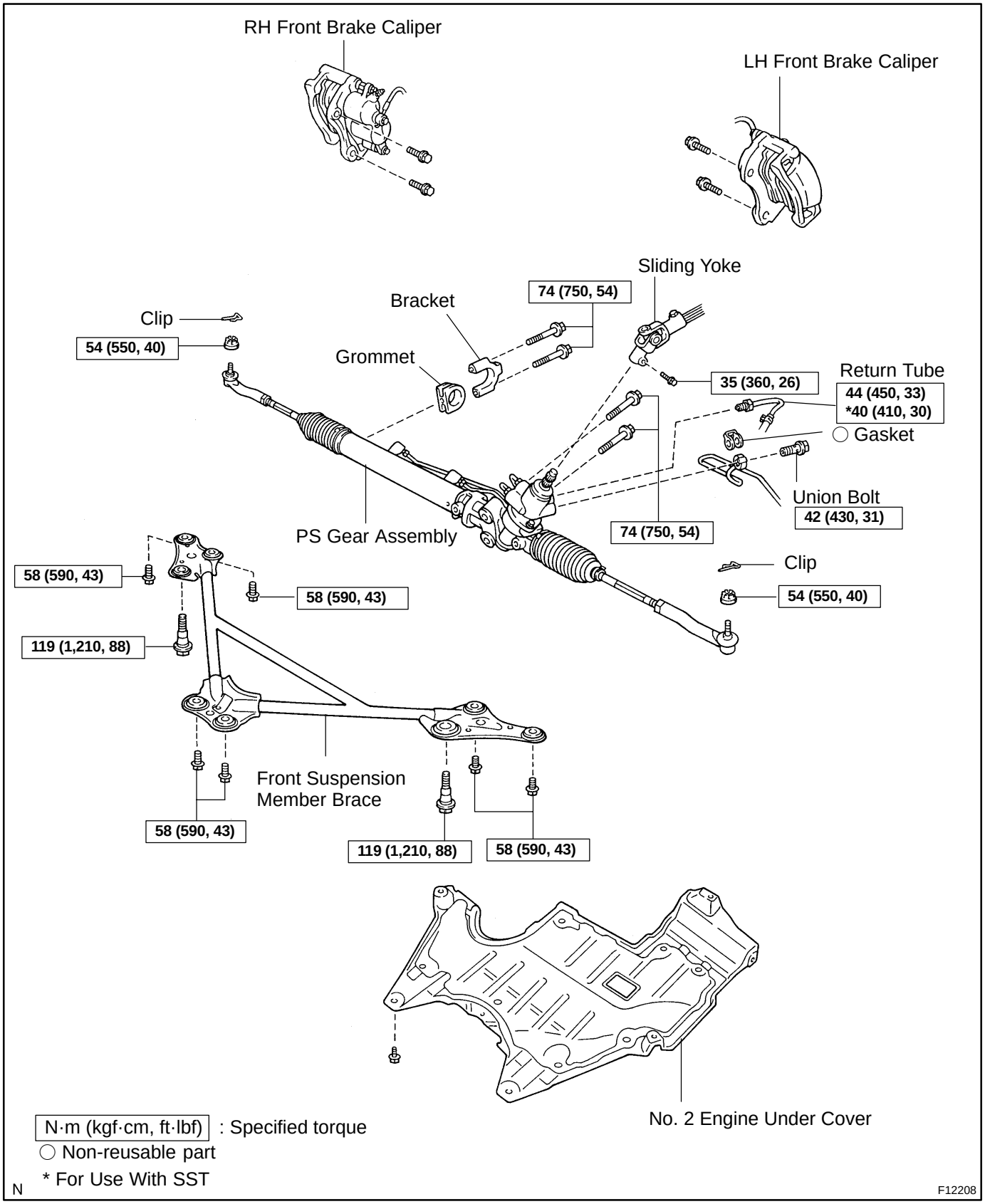
7. BLEED POWER STEERING SYSTEM

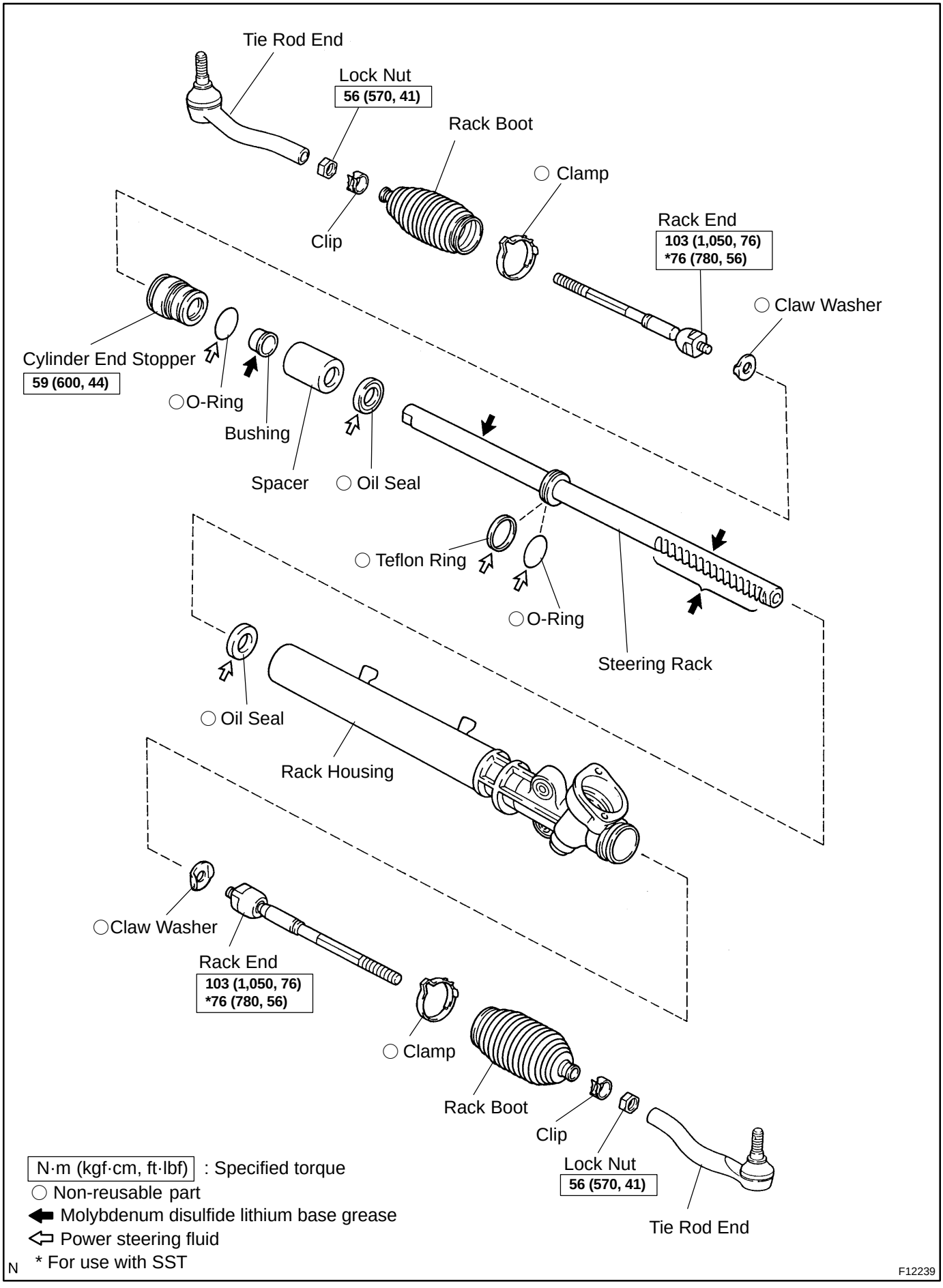
(See page SR-4)

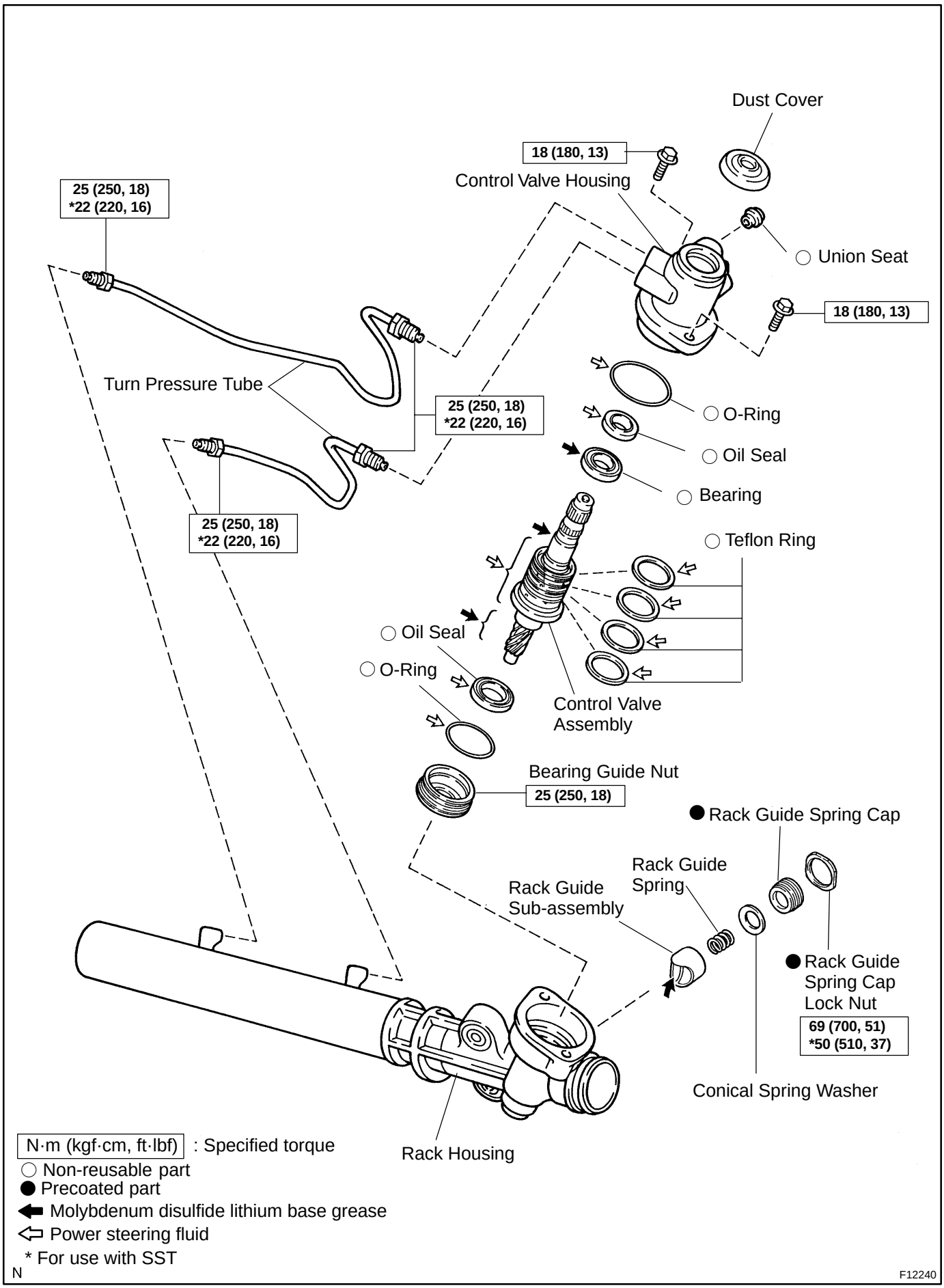
POWER STEERING GEAR

SR1C1-02

COMPONENTS



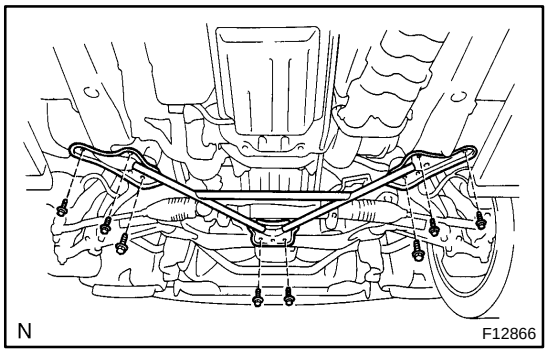

Tie Rod End
Lock Nut
56 (570, 41)
Rack Boot
Clamp
Clip
Rack End
103 (1,050, 76)
*76 (780, 56)
Claw Washer
Cylinder End Stopper
59 (600, 44)
O-Ring
Bushing
Spacer
Oil Seal
Teflon Ring
O-Ring
Steering Rack
Oil Seal
Rack Housing
Claw Washer
Rack End
103 (1,050, 76)
*76 (780, 56)
Clamp
Rack Boot
Clip
Lock Nut
56 (570, 41)
Tie Rod End
N·m (kgf·cm, ft·lbf) : Specified torque
Non-reusable part
Molybdenum disulfide lithium base grease
Power steering fluid
* For use with SST
N
F12239


Dust Cover
18 (180, 13)
Control Valve Housing
25 (250, 18)
*22 (220, 16)
○ Union Seat
18 (180, 13)
Turn Pressure Tube
25 (250, 18)
*22 (220, 16)
○ O-Ring
○ Oil Seal
○ Bearing
25 (250, 18)
*22 (220, 16)
○ Teflon Ring
○ Oil Seal
○ O-Ring
Control Valve
Assembly
Bearing Guide Nut
25 (250, 18)
● Rack Guide Spring Cap
Rack Guide
Spring
Rack Guide
Sub-assembly
● Rack Guide
Spring Cap
Lock Nut
69 (700, 51)
*50 (510, 37)
Conical Spring Washer
Rack Housing
N·m (kgf·cm, ft·lbf) : Specified torque
○ Non-reusable part
● Precoated part
Molybdenum disulfide lithium base grease
Power steering fluid
* For use with SST
N
F12240

SR1C2-02

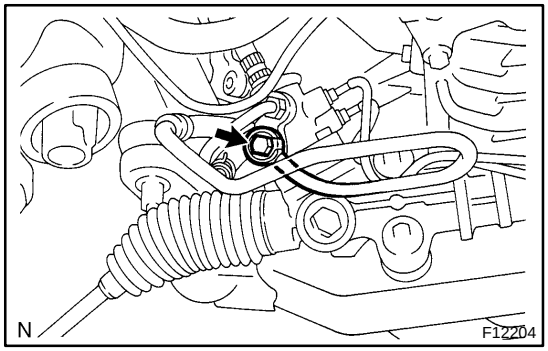
REMOVAL

1. PLACE FRONT WHEELS FACING STRAIGHT AHEAD
2. REMOVE STEERING WHEEL PAD (See page SR-13)
3. REMOVE STEERING WHEEL (See page SR-13)
4. REMOVE RH AND LH FRONT BRAKE CALIPERS (See page BR-27)
5. DISCONNECT RH AND LH TIE ROD ENDS (See page SA-34)
6. REMOVE NO. 2 ENGINE UNDER COVER
7. DISCONNECT SLIDING YOKE (See page SR-13)



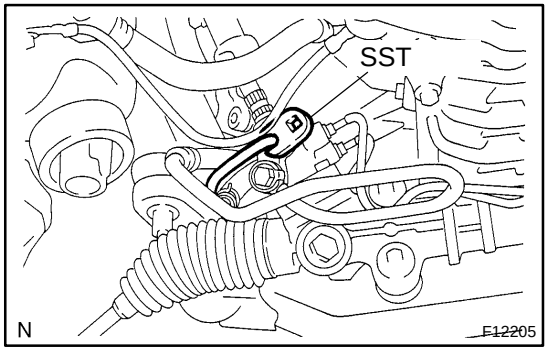
8. REMOVE FRONT SUSPENSION MEMBER BRACE

Remove the 8 bolts and front suspension member brace.



9. DISCONNECT PRESSURE FEED TUBE

Remove the union bolt and gasket, and disconnect the pressure feed tube.



10. DISCONNECT RETURN TUBE

Using SST, disconnect the return tube.

SST 09023-38400

11. REMOVE PS GEAR ASSEMBLY, BRACKET AND GROMMET

Remove the 4 bolts, PS gear assembly, bracket and grommet.

SR0UH-03

DISASSEMBLY

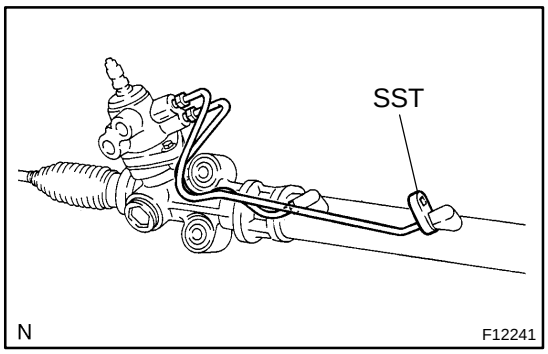
NOTICE:

When using a vise, do not overtighten it.

1. REMOVE 2 TURN PRESSURE TUBES

Using SST, remove the 2 turn pressure tubes.

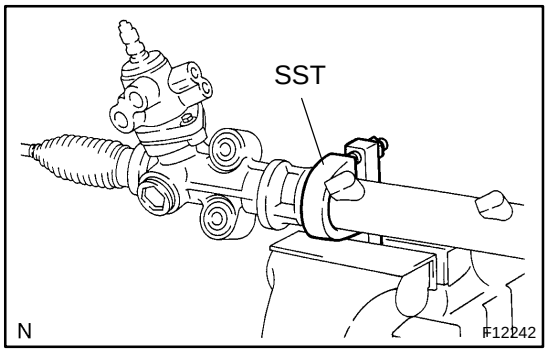
SST 09023-38200



2. SECURE PS GEAR ASSEMBLY IN VISE

Using SST, secure the PS gear assembly in a vise.

SST 09612-00012

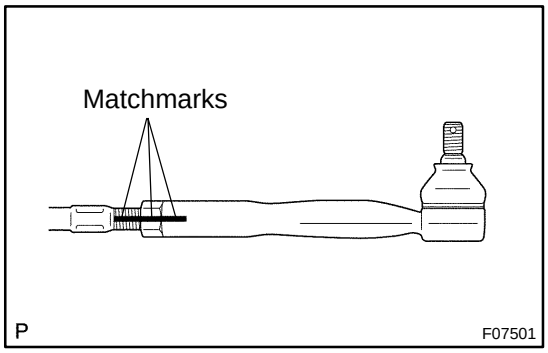


3. REMOVE RH AND LH TIE ROD ENDS AND LOCK NUTS

(a) Place matchmarks on the tie rod end, lock nut and rack end.

(b) Loosen the lock nut, and remove the tie rod end and lock nut.

(c) Employ the same manner described above to the other side.



4. REMOVE RH AND LH CLIPS, RACK BOOTS AND CLAMPS

(a) Using pliers, loosen the clamp as shown in the illustration.

(b) Remove the clamp, clip and rack boot.

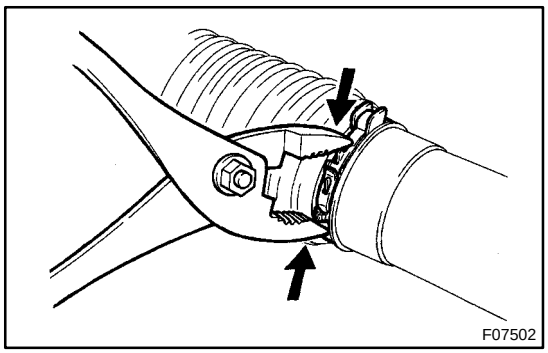
NOTICE:

Be careful not to damage the boot.

HINT:

Mark the RH and LH rack boots.

(c) Employ the same manner described above to the other side.

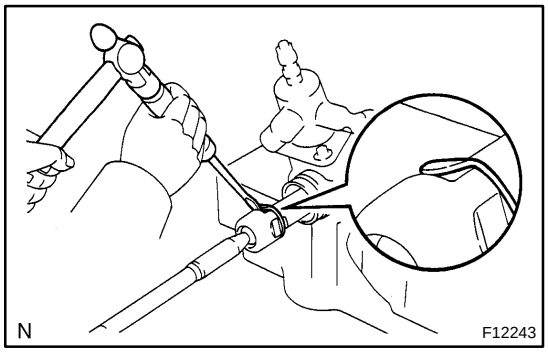


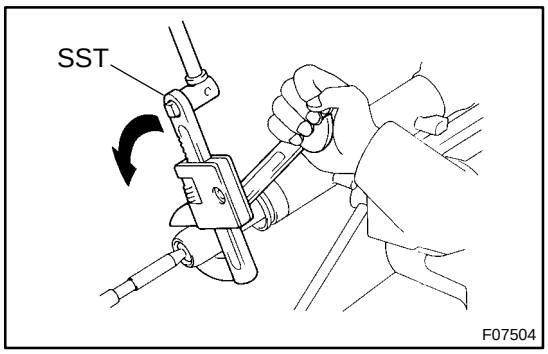
5. REMOVE RH AND LH RACK ENDS AND CLAW WASHERS

(a) Using a screwdriver and a hammer, unstake the washer.

NOTICE:

Avoid any impact on the steering rack.





(b) Using a spanner, hold the steering rack steadily and using SST, remove the rack end.
SST 09922-10010

NOTICE:

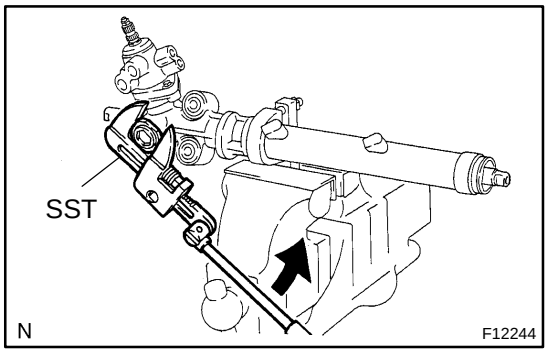
Use SST 09922-10010 in the direction shown in the illustration.

HINT:

Mark the RH and LH rack ends.

(c) Remove the claw washer.

(d) Employ the same manner described above to the other side.



6. REMOVE RACK GUIDE SPRING CAP LOCK NUT

Using SST, remove the rack guide spring cap lock nut.
SST 09922-10010

NOTICE:

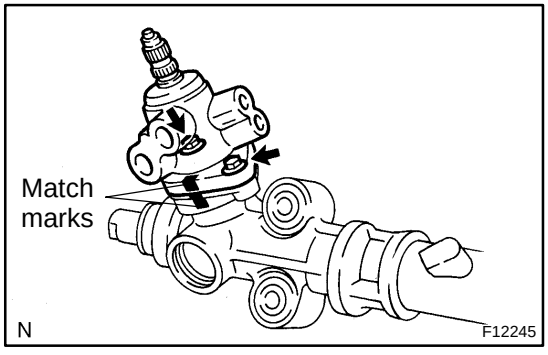
Use SST 09922-10010 in the direction shown in the illustration.

7. REMOVE RACK GUIDE SPRING CAP, CONICAL SPRING, RACK GUIDE SPRING AND RACK GUIDE SUB-ASSEMBL Y

(a) Using a hexagon wrench (24 mm), remove the rack guide spring cap.

(b) Remove the conical spring, rack guide spring and rack guide sub-assembly.

8. REMOVE DUST COVER

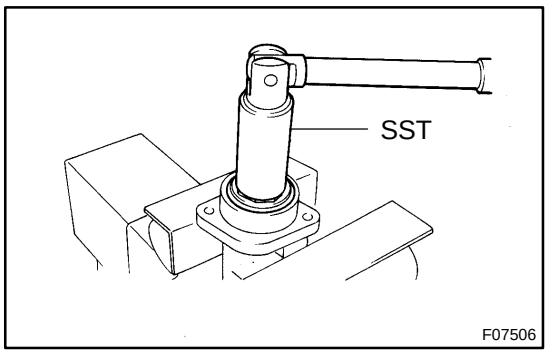


9. REMOVE CONTROL VALVE HOUSING WITH CONTROL VALVE ASSEMBLY

(a) Place matchmarks on the control valve housing and rack housing.

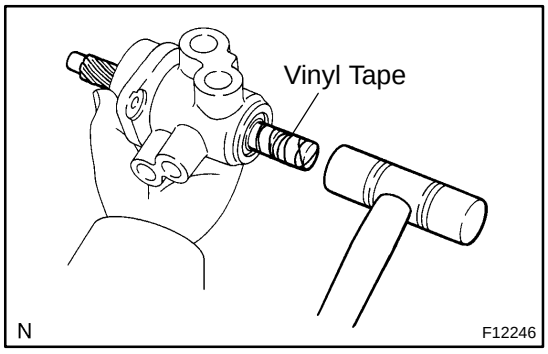
(b) Remove the 2 bolts and pull out the control valve housing with control valve assembly.

(c) Remove the O-ring from the control valve housing.



10. REMOVE BEARING GUIDE NUT AND CONTROL VALVE ASSEMBLY

(a) Using SST, loosen the bearing guide nut.
SST 09631-20060



(b) To prevent oil seal lip damage, wind vinyl tape on the serrated part of the control valve shaft.

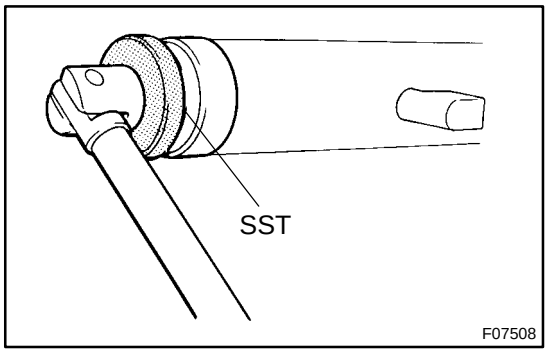
(c) Using a plastic hammer, tap out the control valve assembly with the bearing guide nut from the control valve housing.

NOTICE:

Be careful not to damage the oil seal lip

(d) Remove the bearing guide nut from the control valve assembly.

(e) Remove the O-ring from the bearing guide nut.

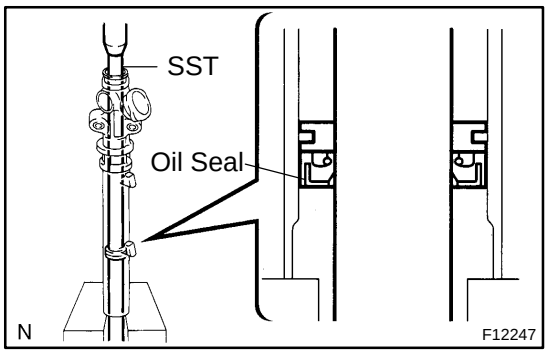


11. REMOVE CYLINDER END STOPPER AND SPACER

(a) Using SST, remove the cylinder end stopper.
SST 09631-20090

(b) Remove the O-ring from the cylinder end stopper.

(c) Remove the spacer.



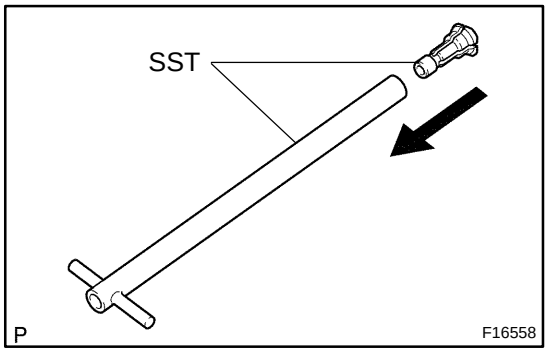
12. REMOVE STEERING RACK WITH OIL SEAL

(a) Using SST, press out the steering rack with the oil seal.
SST 09950-70010 (09951-07200)

NOTICE:

Take care not to drop the steering rack.

(b) Remove the oil seal from the steering rack.

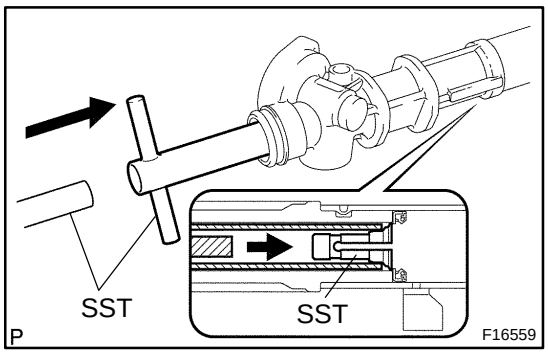


13. REMOVE OIL SEAL

(a) Install SST (09612-07130) on SST (09612-07210).
SST 09612-70100 (09612-07130, 09612-07210)

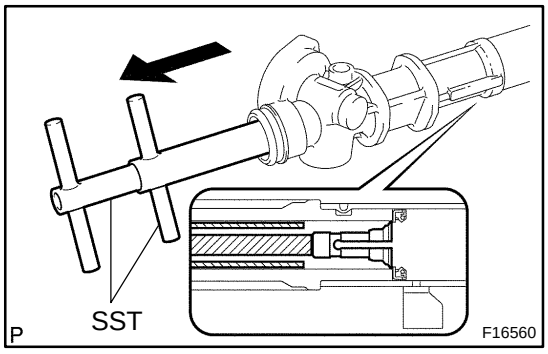
NOTICE:

- **Before using them, apply a small dab of grease to the inside wall of SST (09612-07210, 09612-07130).**
- **To prevent the inside of the housing from being damaged securely install SST 09612- 07130) on SST (09612-07210).**



(b) Diagonally insert SST (09612-07210) into the housing until it contacts with the oil seal, and then further insert the SST (09612-07210) until the tip of SST (09612-07220) contacts with SST (09612-07130).
SST 09612- 70100 (09612- 07130, 09612- 07210, 09612-07220)

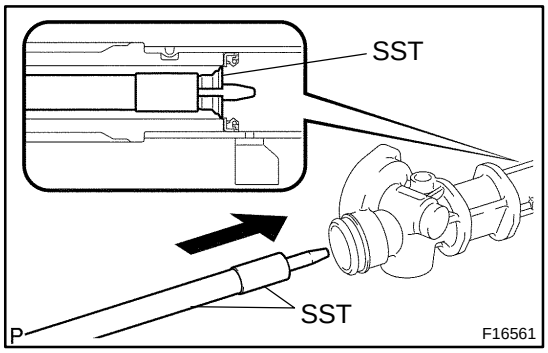
NOTICE:
Do not damage the inside of the housing.



(c) Secure SST (09612- 07220), and pull SST (09612-07210) to place SST (09612-07130) in the housing.
SST 09612- 70100 (09612- 07130, 09612- 07210, 09612-07220)

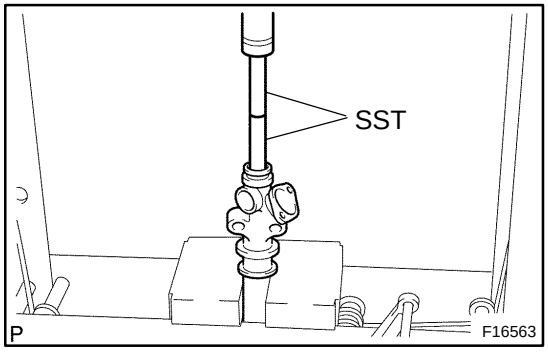
HINT:
Place SST on the chamfering position between the oil seal and rack housing.

(d) Remove the SST (09612-07210, 09612-07220).
SST 09612-70100 (09612-07210, 09612-07220)



(e) After installing SST (09612- 07240) on SST (09612-07210), insert the tip of SST (09612-07230) in the service hole of SST (09612-07130).
SST 09612- 70100 (09612- 07130, 09612- 07230, 09612-07240)

NOTICE:
- **Before using them, apply a small dab of grease to the tip of SST (09612-07230).**
- **To prevent SST (09612-07130) from being damaged, be sure to install SST (09612-07240).**
- **Do not damage the inside of the rack housing.**



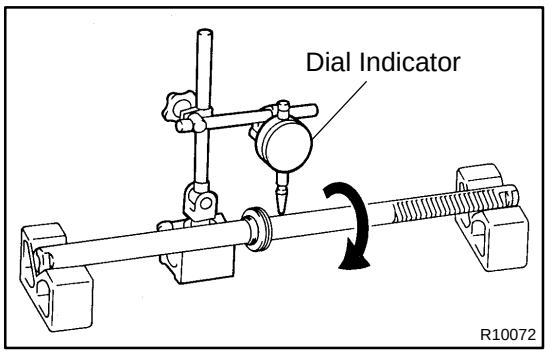
(f) Install SST (09951-07100) on SST (09612-07230) and remove the oil seal using a press.
SST 09612- 70100 (09612- 07130, 09612- 07230, 09612-07240), 09950-70010 (09951-07100)

NOTICE:
Do not damage the rack housing.

HINT:
Replace SST (09951-07100) with SST that is different in length in the set, if necessary.

SR0UI-03

INSPECTION

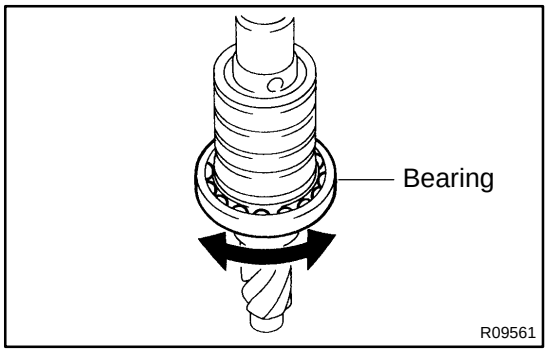


1. INSPECT STEERING RACK

(a) Using a dial indicator, check the steering rack for runout and for teeth wear and damage.

Maximum runout: 0.15 mm (0.0059 in.)

(b) Check the back surface for wear and damage.



2. INSPECT BEARING

(a) Check the bearing rotation condition and check for abnormal noise.

If the bearing is worn or damaged, replace the control valve assembly.

(b) Coat the bearing with molybdenum disulfide lithium base grease.

SR0UJ-03

REPLACEMENT

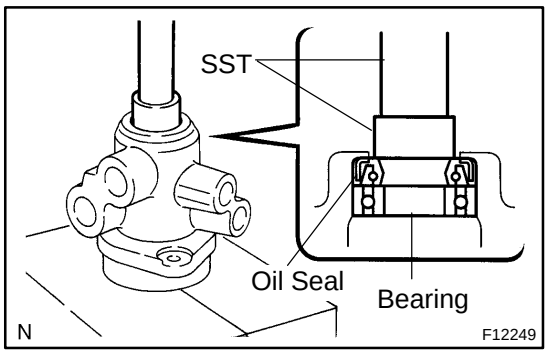
NOTICE:

When using a vise, do not overtighten it.

1. IF NECESSARY, REPLACE OIL SEAL AND BEARING

(a) Using SST, press out the bearing and oil seal from the control valve housing.

SST 09950-60010 (09951-00240), 09950-70010 (09951-07100)



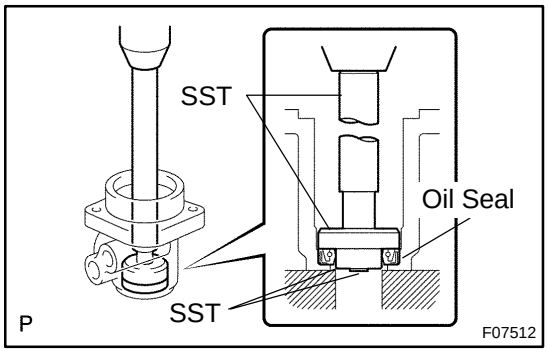
(b) Coat a new oil seal lip with power steering fluid.

(c) Using SST, press in the oil seal.

SST 09950- 60010 (09951- 00180, 09951- 00320, 09952-06010), 09950-70010 (09951-07150)

NOTICE:

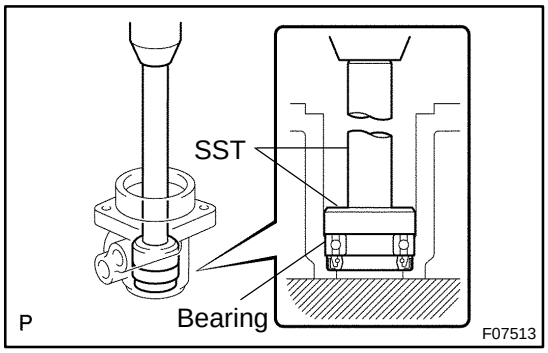
Make sure that the oil seal is installed facing in the correct direction.



(d) Coat a new bearing with molybdenum disulfide lithium base grease.

(e) Using SST, press in the bearing.

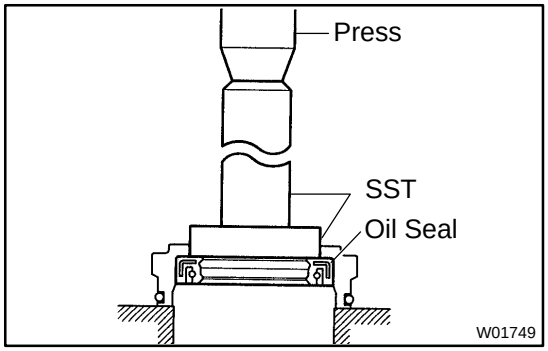
SST 09950-60010 (09951-00340), 09950-70010 (09951-07150)



2. IF NECESSARY, REPLACE OIL SEAL

(a) Using SST, press out the oil seal from the bearing guide nut.

SST 09950-60010 (09951-00310), 09950-70010 (09951-07100)



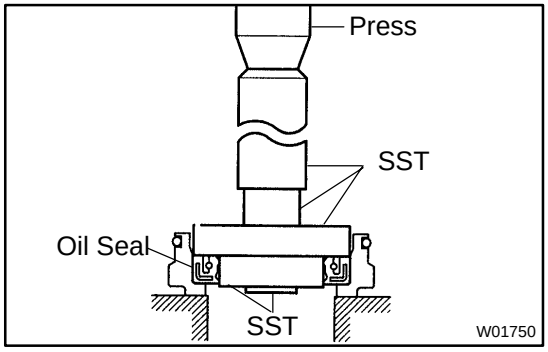
(b) Coat a new oil seal lip with power steering fluid.

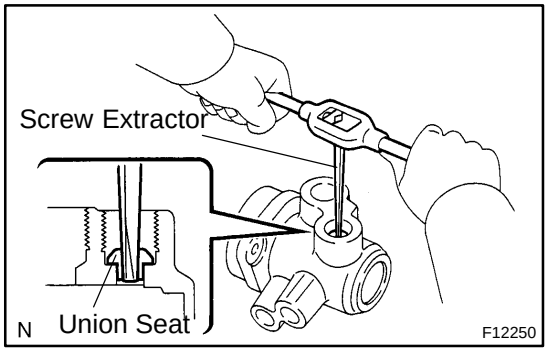
(c) Using SST, press in the oil seal.

SST 09950- 60010 (09951- 00250, 09951- 00360, 09952-06010), 09950-70010 (09951-07100)

NOTICE:

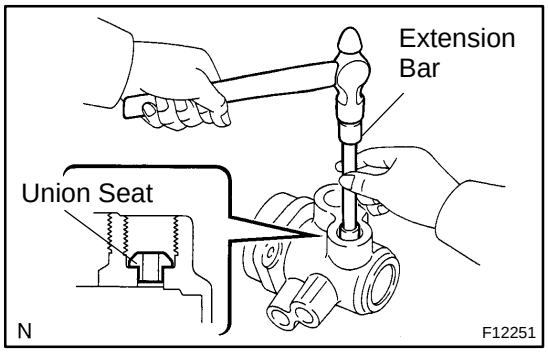
Make sure that the oil seal is installed facing in the correct direction.



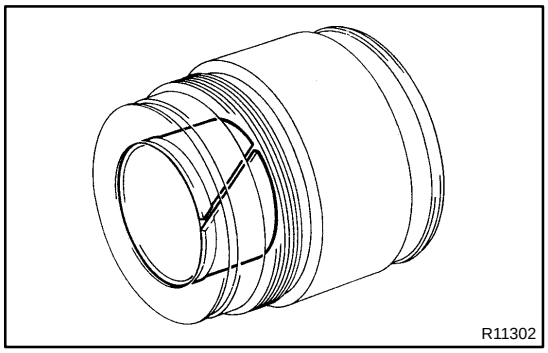


3. IF NECESSARY, REPLACE UNION SEAT

(a) Using a screw extractor, remove the union seat from the control valve housing.



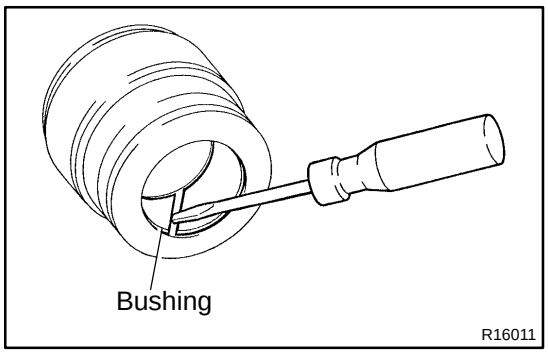
(b) Using a plastic hammer and extension bar, lightly tap in a new union seat.



4. INSPECT BUSHING

(a) Check the inside of the bushing of the cylinder end stopper for cracks. If faulty, replace the bushing.

(b) Apply molybdenum disulfide lithium base grease to the inside of the bushing.



5. IF NECESSARY, REPLACE BUSHING

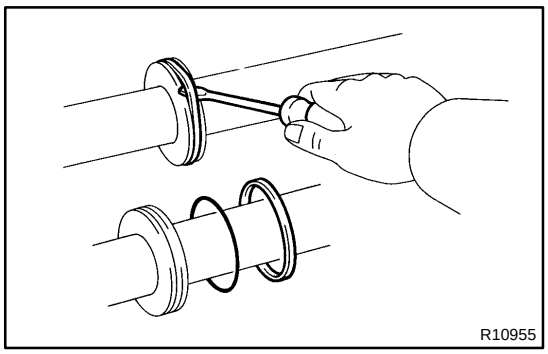
(a) Using a screwdriver, remove the bushing from the cylinder end stopper.

NOTICE:

Be careful not to damage the cylinder end stopper.

(b) Coat the inside of a new bushing with molybdenum disulfide lithium base grease.

(c) Install the bushing.



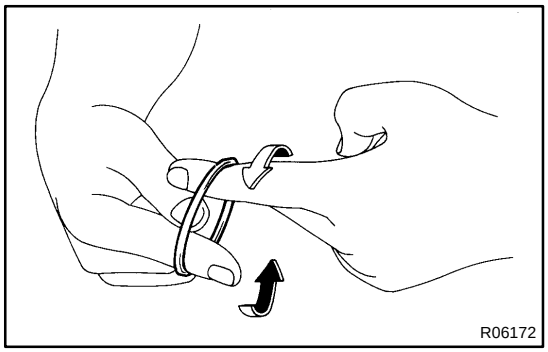
6. IF NECESSARY, REPLACE TEFLON RING AND O-RING

(a) Using a screwdriver, remove the teflon ring and O-ring from the steering rack.

NOTICE:

Be careful not to damage the groove for the teflon ring.

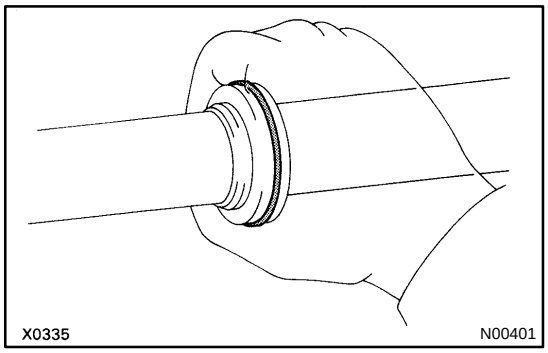
(b) Coat a new O-ring with power steering fluid and install it to the steering rack.



(c) Expand a new teflon ring with your fingers.

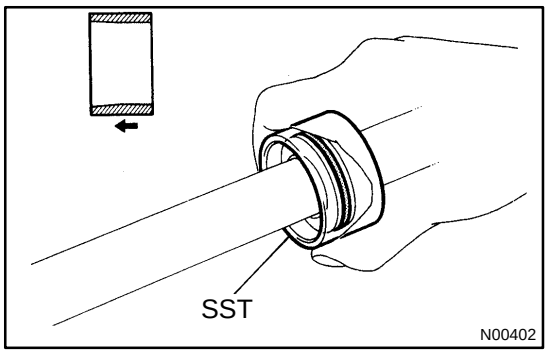
NOTICE:

Be careful not to overexpand the teflon ring.



(d) Coat the teflon ring with power steering fluid.

(e) Install the teflon ring to the steering rack and settle it down with your fingers.

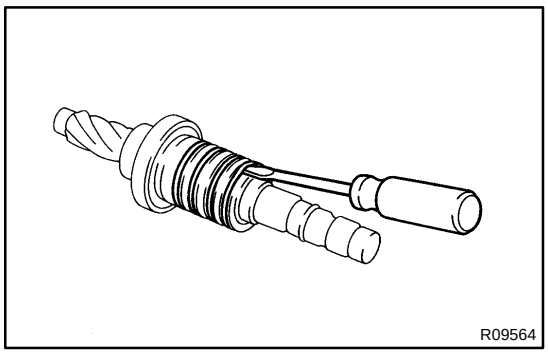


(f) Carefully slide the tapered end of SST over the teflon ring until it fits to the steering rack.

SST 09630-24014 (09620-24051)

NOTICE:

Be careful not to damage the teflon ring.



7. IF NECESSARY, REPLACE 4 TEFLON RINGS

(a) Using a screwdriver, remove the 4 teflon rings from the control valve assembly.

NOTICE:

Be careful not to damage the grooves for the teflon ring.

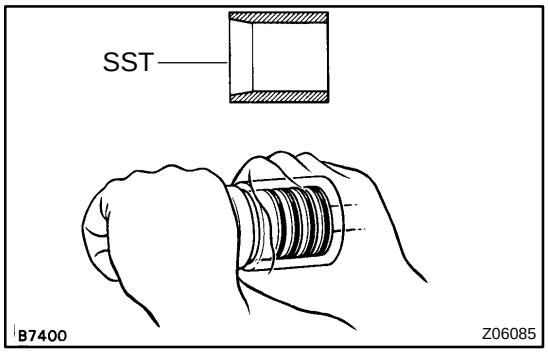
(b) Expand 4 new teflon rings with your fingers.

NOTICE:

Be careful not to overexpand the teflon ring.

(c) Coat the teflon rings with power steering fluid.

(d) Install the teflon rings to the control valve assembly, and settle them down with your fingers.



(e) Carefully slide the tapered end of SST over the teflon rings until they fit to the control valve assembly.

SST 09631-20081

NOTICE:

Be careful not to damage the teflon rings.

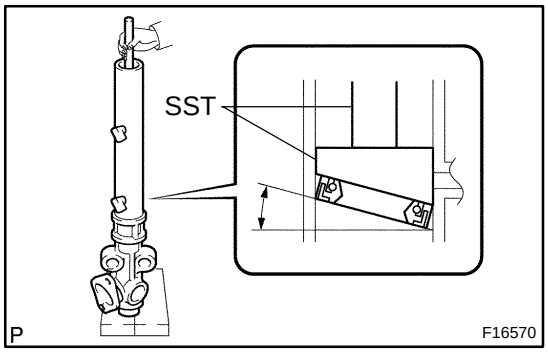
SR0UK-03

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. COAT PARTS INDICATED BY ARROWS WITH POWER STEERING FLUID OR MOLYBDENUM DISULFIDE LITHIUM BASE GREASE (See page SR-38)



2. INSTALL OIL SEAL

(a) Apply power steering fluid to a new oil seal, and install the oil seal on the rack housing at an angle.

NOTICE:

Install the oil seal in the correct direction.

HINT:

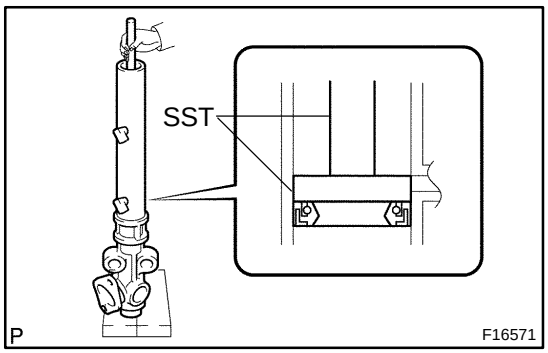
Install the oil seal so that the port faces downward with approx. 15 degrees.

(b) Using SST, push in the oil seal by hand until it passes through the 2 ports.

SST 09631-00180, 09950-70010 (09951-07360)

NOTICE:

Do not turn SST when inserting the oil seal.

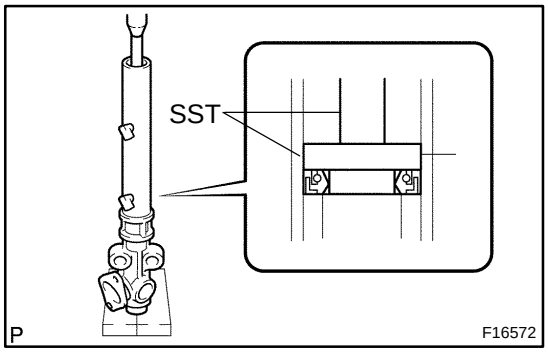


(c) After the oil seal has passed through the ports, push in the oil seal by hand until it becomes level, using SST.

SST 09950- 60010 (09951- 00430), 09950- 70010 (09951-07360)

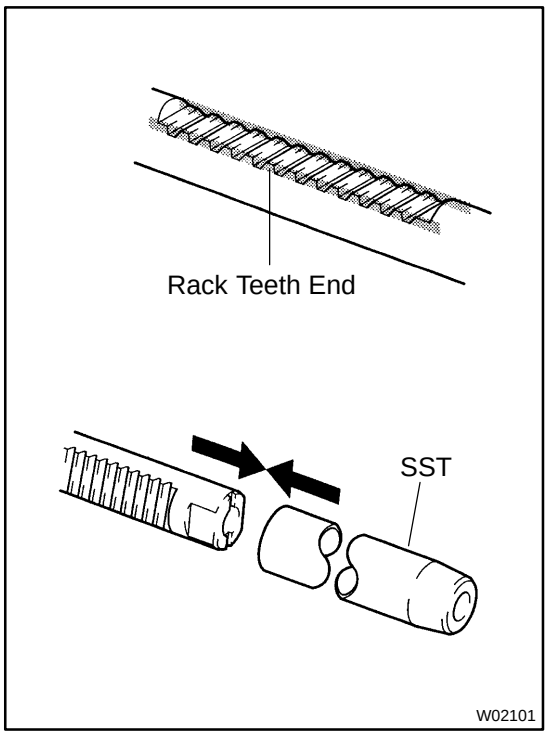
NOTICE:

When SST is set, do not damage the inside surface of the rack housing.



(d) After the oil seal has become level, using SST and press, install the oil seal.

SST 09950- 60010 (09951- 00430), 09950- 70010 (09951-07360)



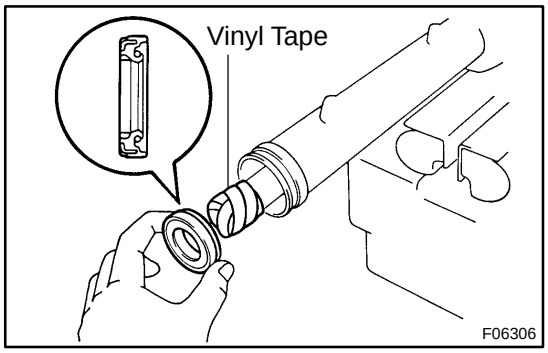
3. INSTALL STEERING RACK

(a) Install SST to the rack.
SST 09631-33010

HINT:

If necessary, scrape the burrs off the rack teeth end and burnish.

(b) Coat SST with power steering fluid.
(c) Install the steering rack into the rack housing.
(d) Remove the SST.
SST 09631-33010

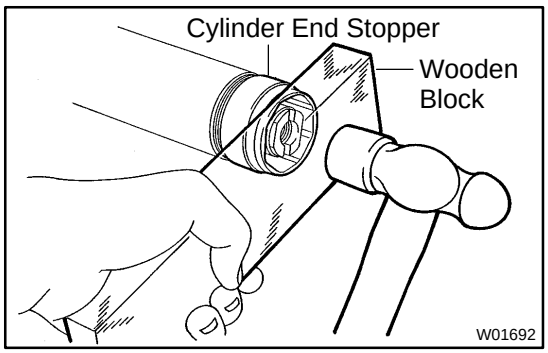


4. INSTALL OIL SEAL

(a) Coat a new oil seal lip with power steering fluid.
(b) To prevent oil seal lip damage, wind vinyl tape on the steering rack end, and apply power steering fluid.
(c) Install the oil seal by pushing it into the rack housing without tilting.

NOTICE:

Make sure that the oil seal is installed facing in the correct direction.

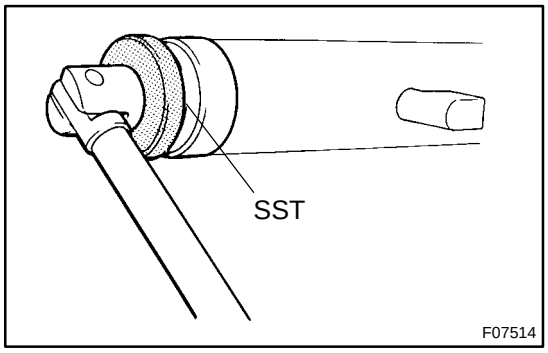


5. INSTALL CYLINDER END STOPPER AND SPACER

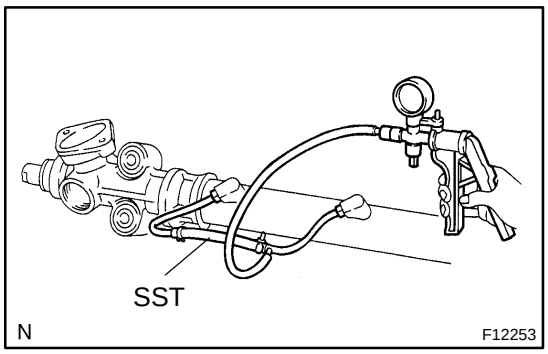
(a) Install the spacer.
(b) Coat a new O-ring with power steering fluid and install it to the cylinder end stopper.
(c) Using a wooden block and hammer, drive in the cylinder end stopper until it is tightly installed.

NOTICE:

Be careful not to damage the O-ring.



(d) Using SST, torque the cylinder end stopper.
SST 09631-20090
Torque: 59 N·m (600 kgf·cm, 44 ft·lbf)



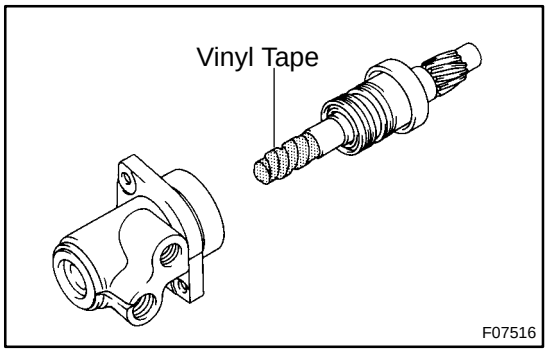
6. AIR TIGHTNESS TEST

(a) Install SST to the rack housing.
SST 09631-12071

(b) Apply 53 kPa (400 mmHg, 15.75 in.Hg) of vacuum for about 30 seconds.

(c) Check that there is no change in the vacuum.

If there is a change in the vacuum, check the installation of the oil seals.



7. INSTALL CONTROL VALVE ASSEMBLY

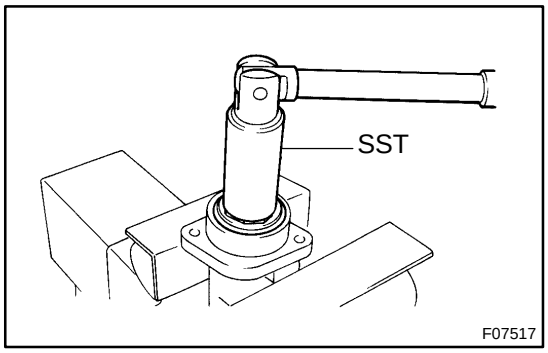
(a) Coat the teflon rings with power steering fluid.

(b) To prevent oil seal lip damage, wind vinyl tape on the serrated part of the control valve shaft.

(c) Push the control valve assembly into the control valve housing.

NOTICE:

Be careful not to damage the teflon rings and oil seal lip.



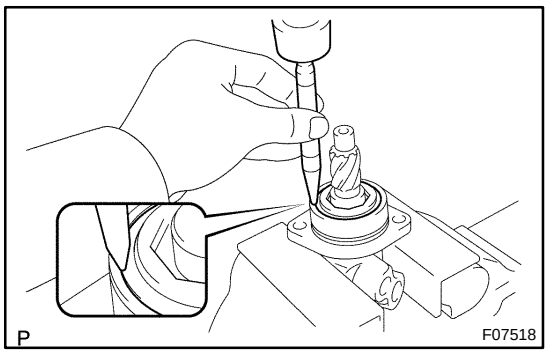
8. INSTALL BEARING GUIDE NUT

(a) Coat a new O-ring with power steering fluid, and install it to the bearing guide nut.

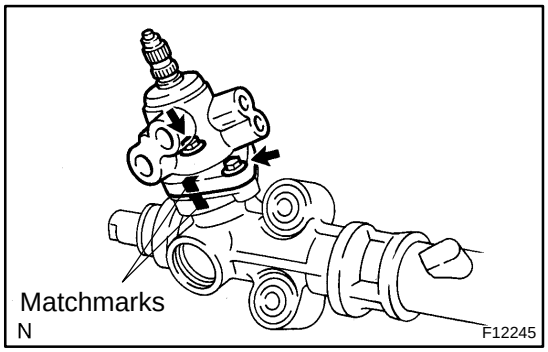
(b) Using SST, install the bearing guide nut.
SST 09631-20060
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

NOTICE:

Be careful not to damage the oil seal lip.



(c) Using a punch, stake the bearing guide nut.



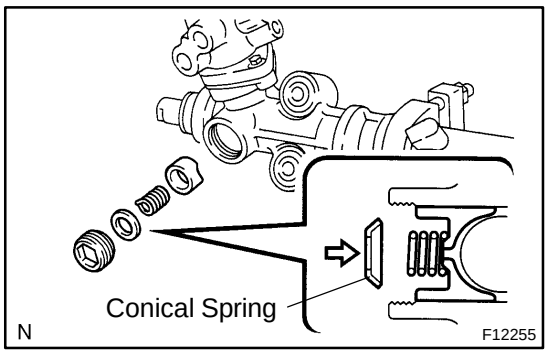
9. INSTALL CONTROL VALVE HOUSING WITH CONTROL VALVE ASSEMBLY

(a) Coat a new O-ring with power steering fluid, and install it to the control valve housing.

(b) Align the matchmarks on the valve housing and rack housing.

(c) Install the 2 bolts.
Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)

10. INSTALL DUST COVER



11. INSTALL RACK GUIDE SUB- ASSEMBLY, RACK GUIDE SPRING, CONICAL SPRING AND RACK GUIDE SPRING CAP

(a) Install the rack guide sub-assembly, rack guide spring and conical spring.

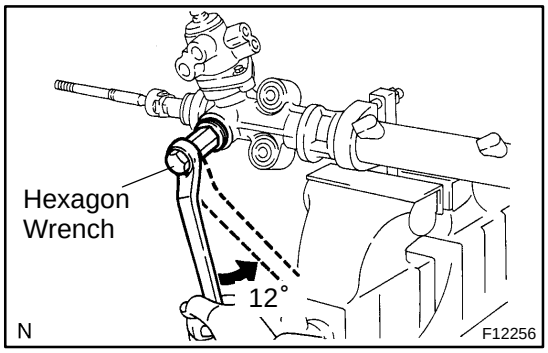
NOTICE:

Make sure that the conical spring is installed facing in the correct direction.

(b) Apply sealant to 2 or 3 threads of the rack guide spring cap.

Sealant:
Part No.08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(c) Temporarily install the rack guide spring cap.



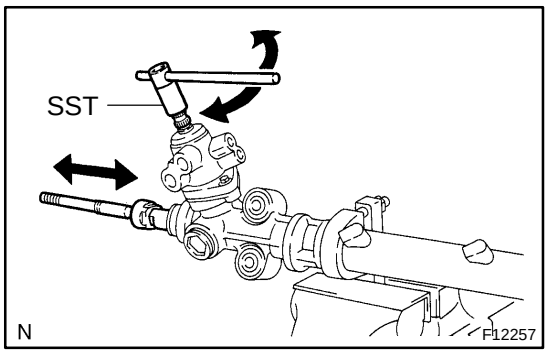
12. ADJUST TOTAL PRELOAD

(a) To prevent the steering rack teeth from damaging the oil seal lip, temporarily install the RH and LH rack ends.

(b) Using a hexagon wrench (24 mm), torque the rack guide spring cap.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

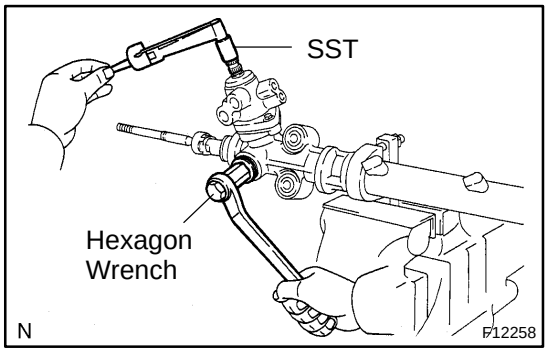
(c) Using a hexagon wrench (24 mm), return the rack guide spring cap 12°.



(d) Using SST, turn the control valve shaft right and left 1 or 2 times.

SST 09616-0001 1

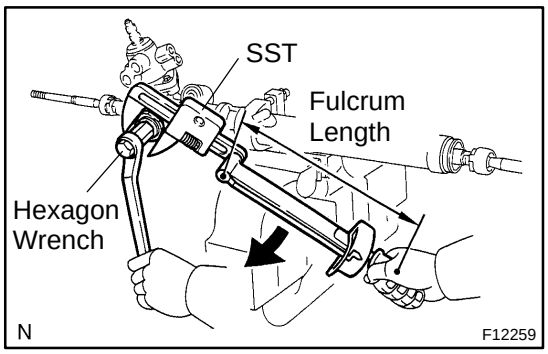
(e) Using a hexagon wrench (24 mm), loosen the rack guide spring cap until the rack guide spring is not functioning.



(f) Using SST, a torque wrench and hexagon wrench (24 mm), tighten the rack guide spring cap until the preload is within the specification.

SST 09616-0001 1

Preload (turning):
1.2 - 1.7 N·m (12.2 - 17.3 kgf·cm, 10.6 - 15.0 in.·lbf)



13. INSTALL RACK GUIDE SPRING CAP LOCK NUT

(a) Apply sealant to 2 or 3 threads of the rack guide spring cap lock nut.
Sealant:
Part No.08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(b) Temporarily install the rack guide spring cap lock nut.

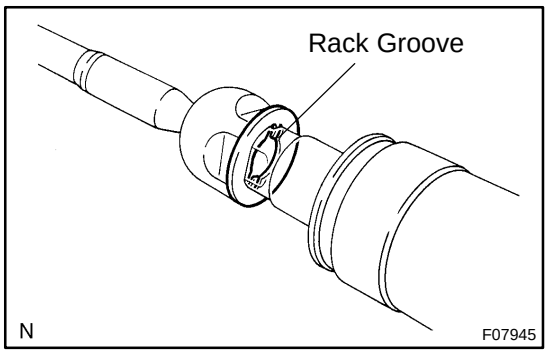
(c) Using a hexagon wrench (24 mm), hold the rack guide spring cap and using SST, torque the rack guide spring cap lock nut.
SST 09922-10010
Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

NOTICE:
Use SST 09922-10010 in the direction shown in the illustration.

HINT:
Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).

(d) Recheck the total preload.
Preload (turning):
1.2 - 1.7 N·m (12.2 - 17.3 kgf·cm, 10.6 - 15.0 in.·lbf)

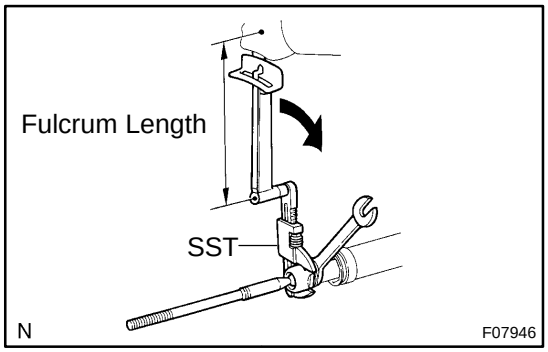
(e) Remove the RH and LH rack ends.



14. INSTALL RH AND LH CLAW WASHERS AND RACK ENDS

(a) Install a new claw washer, and temporarily install the rack end.

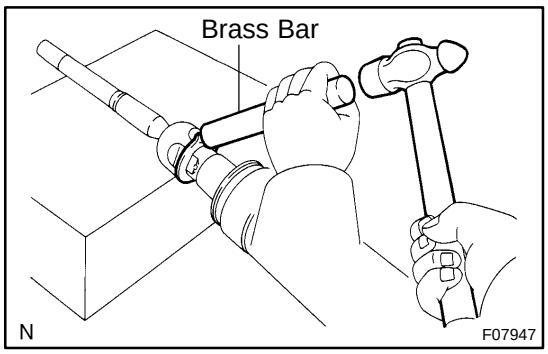
HINT:
Align the claws of the claw washer with the steering rack grooves.



(b) Using a spanner, hold the steering rack steadily and using SST, torque the rack end.
SST 09922-10010
Torque: 76 N·m (780 kgf·cm, 56 ft·lbf)

NOTICE:
Use SST 09922-10010 in the direction shown in the illustration.

HINT:
Use a torque wrench with a fulcrum length of 380 mm (14.96 in.).

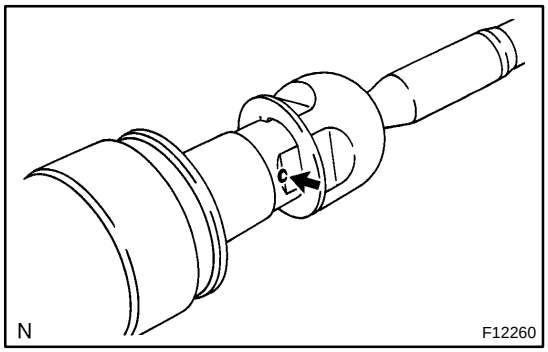


(c) Using a brass bar and a hammer, stake the washer.

NOTICE:

Avoid any impact on the steering rack.

(d) Employ the same manner described above to the other side.



15. INSTALL RH AND LH RACK BOOTS, CLAMPS AND CLIPS

(a) Ensure that the steering rack hole is not clogged with grease.

HINT:

If the hole is clogged, the pressure inside the boot will change after it is assembled and the steering wheel is turned.

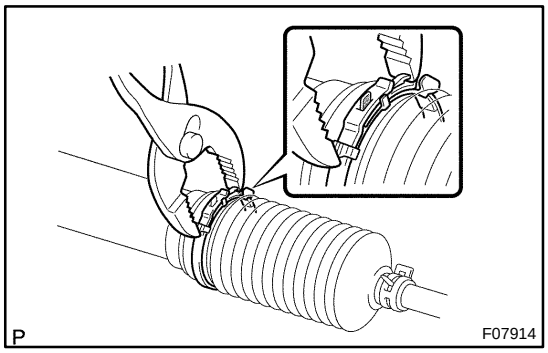
(b) Install the boot, clip and a new clamp.

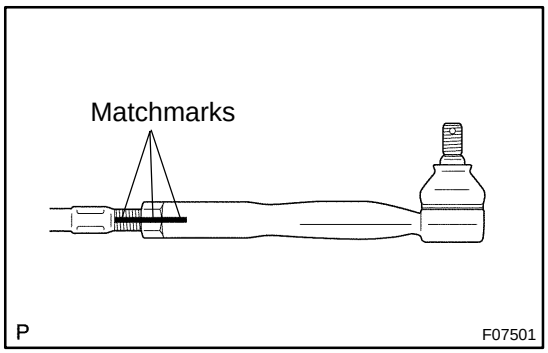
NOTICE:

Be careful not to damage or twist the boot.

(c) Tighten the clamp as shown in the illustration.

(d) Employ the same manner described above to the other side.



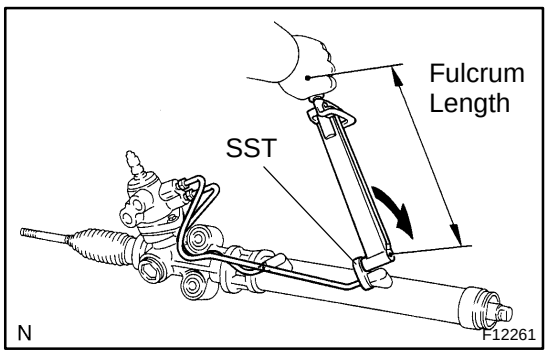


16. INSTALL RH AND LH TIE ROD ENDS AND LOCK NUTS

(a) Screw the lock nut and tie rod end onto the rack end until the matchmarks are aligned.

(b) After adjusting toe-in, torque the nut
(See page SA-5).
Torque: 56 N·m (570 kgf·cm, 41 ft·lbf)

(c) Employ the same manner described above to the other side.



17. INSTALL 2 TURN PRESSURE TUBES

Using SST, install the 2 turn pressure tubes.

SST 09023-38200

Torque: 22 N·m (220 kgf·cm, 16 ft·lbf)

HINT:

- Use a torque wrench with a fulcrum length of 300 mm (11.81 in.).
- This torque value is effective in case that SST is parallel to a torque wrench.

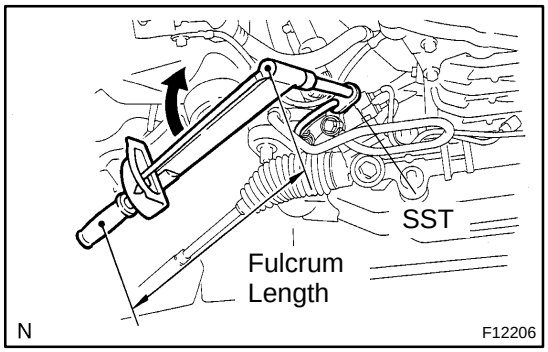
SR1C3-02

INSTALLATION

1. INSTALL GROMMET, BRACKET AND PS GEAR ASSEMBLY

Install the grommet, bracket and PS gear assembly with the 4 bolts.

Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)



2. CONNECT RETURN TUBE

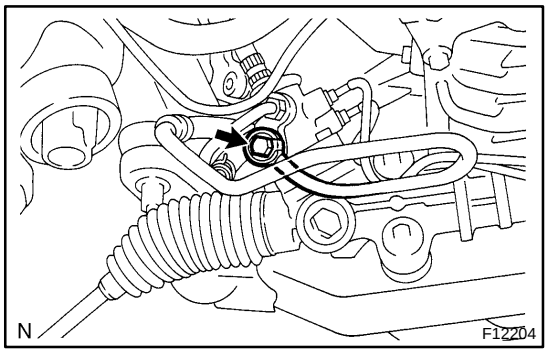
Using SST, connect the return tube.

SST 09023-38400

Torque: 40 N·m (410 kgf·cm, 30 ft·lbf)

HINT:

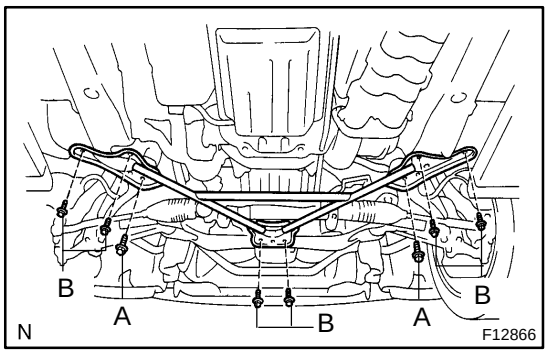
- Use a torque wrench with a fulcrum length of 345 mm (13.58 in).
- This torque value is effective in case that SST is parallel to a torque wrench.



3. CONNECT PRESSURE FEED TUBE

Install a new gasket, then connect the pressure feed tube with the union bolt.

Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)



4. INSTALL FRONT SUSPENSION MEMBER BRACE

Install the front suspension member brace with the 8 bolts.

Torque:
Bolt A: 119 N·m (1,210 kgf·cm, 88 ft·lbf)
Bolt B: 58 N·m (590 kgf·cm, 43 ft·lbf)

5. CONNECT SLIDING YOKE (See page SR-25)

6. INSTALL NO. 2 ENGINE UNDER COVER

7. CONNECT RH AND LH TIE ROD ENDS (See page SA-37)

8. INSTALL RH AND LH FRONT BRAKE CALIPERS (See page BR-26)

9. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

HINT:

Do it with the front of the vehicle jacked up.

10. CENTER SPIRAL CABLE (See page SR-25)

11. INSTALL STEERING WHEEL

(a) Align the matchmarks on the steering wheel and steering column main shaft.

(b) Temporarily tighten the steering wheel set nut.

(c) Connect the connector.

12. **BLEED POWER STEERING SYSTEM**
    (See page SR-4)
13. **CHECK STEERING WHEEL CENTER POINT**
14. **TORQUE STEERING WHEEL SET NUT**
    Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)
15. **INSTALL STEERING WHEEL PAD (See page SR-25)**
16. **CHECK FRONT WHEEL ALIGNMENT**
    (See page SA-5)

SRS AIRBAG

RS01Y-54

PRECAUTION

CAUTION:

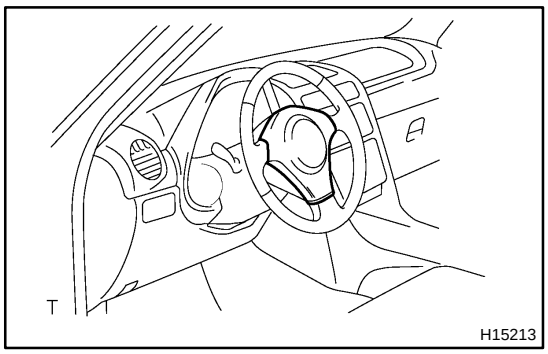
- **The LEXUS IS 300 is equipped with SRS, which comprises a driver airbag, front passenger airbag, side airbag and curtain shield airbag. Failure to carry out service operations in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Further, if a mistake is made in servicing the SRS, it is possible that the SRS may fail to operate when required. Before performing servicing (including removal or installation of parts, inspection or replacement), be sure to read the following items carefully, then follow the correct procedures described in the repair manual.**
- **Work must be started 90 seconds after the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.**
  (The SRS is equipped with a back-up power source so that if work is started within 90 seconds from disconnecting the negative (-) terminal cable of the battery, the SRS may be deployed.)
- **Do not expose the steering wheel pad, front passenger airbag assembly, side airbag assembly, curtain shield airbag assembly, airbag sensor assembly, front airbag sensor or side and curtain shield airbag sensor assembly directly to hot air or flames.**

NOTICE:

- **Malfunction symptoms of the SRS are difficult to confirm, so the DTCs become the most important source of information when troubleshooting. When troubleshooting the SRS, always inspect the DTCs before disconnecting the battery.**
- **Even in cases of a minor collision where the SRS does not deploy, the steering wheel pad, front passenger airbag assembly, side airbag assembly, airbag sensor assembly, front airbag sensor, curtain shield airbag assembly and side and curtain shield airbag sensor assembly should be inspected (See page RS-15 , RS-29 , RS-43 , RS-43 , RS-58 , RS-69 , RS-74 and RS-79).**
- **Before repairs, remove the airbag sensor if shocks are likely to be applied to the sensor during repairs.**
- **Never use SRS parts from another vehicle. When replacing parts, replace them with new parts.**
- **Never disassemble and repair the steering wheel pad, front passenger airbag assembly, side airbag assembly, curtain shield airbag assembly, airbag sensor assembly, front airbag sensor or side and curtain shield airbag sensor assembly in order to reuse it.**
- **If the steering wheel pad, front passenger airbag assembly, side airbag assembly, curtain shield airbag assembly, airbag sensor assembly, front airbag sensor or side and curtain shield airbag sensor assembly has been dropped, or if there are cracks, dents or other defects in the case, bracket or connector, replace it with new one.**
- **Use a volt/ohmmeter with high impedance (10 kΩ/V minimum) for troubleshooting the system's electrical circuits.**
- **Information labels are attached to the periphery of the SRS components. Follow the instructions on the notices.**
- **After work on the SRS is completed, perform the SRS warning light check (See page DI-607).**
- **When the negative (-) terminal cable is disconnected from the battery, the memory of the clock and audio system will be canceled. So before starting work, make a record of the contents memorized in the audio memory system. When work is finished, reset the audio systems as they were before and adjust the clock. To avoid erasing the memory in each memory system, never use a back- up power supply from outside the vehicle.**
- **If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.**

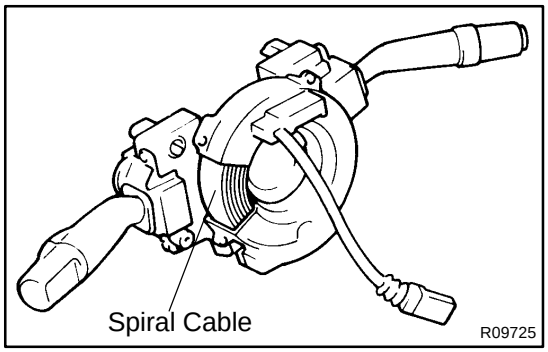
RS0UB-02

OPERATION



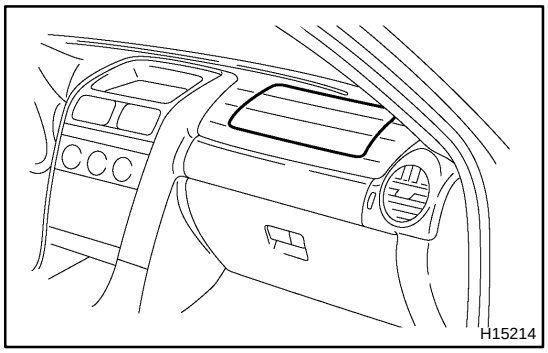
1. STEERING WHEEL PAD (with AIRBAG)

The inflater and bag of the SRS are stored in the steering wheel pad and cannot be disassembled. The inflater contains a squib, igniter charge, gas generator, etc., and inflates the bag when instructed by the airbag sensor assembly.



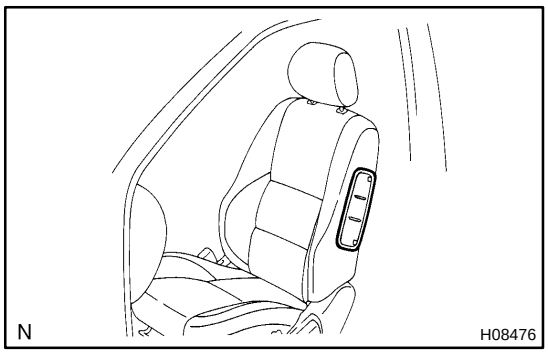
2. SPIRAL CABLE (in COMBINATION SWITCH)

A spiral cable is used as an electrical joint from the vehicle body side to the steering wheel.



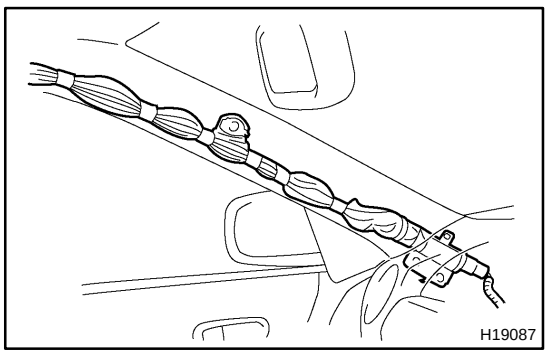
3. FRONT PASSENGER AIRBAG ASSEMBLY

The inflater and bag of the SRS are stored in the front passenger airbag assembly and cannot be disassembled. The inflater contains a squib, igniter charge, gas generator, etc., and inflates the bag when instructed by the airbag sensor assembly.



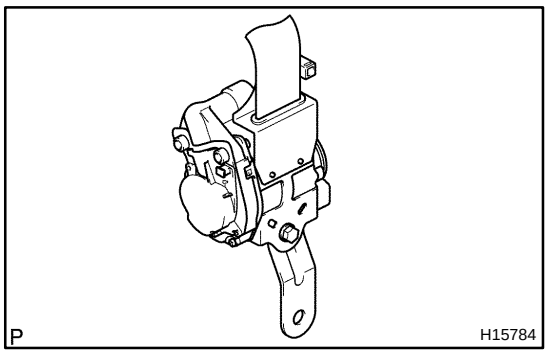
4. SIDE AIRBAG ASSEMBLY

The inflater and bag of the SRS side airbag are stored in the side airbag assembly and cannot be disassembled. The inflater contains a squib, igniter charge, gas generator, etc., and inflates the bag when instructed by the side and curtain shield airbag sensor assembly.



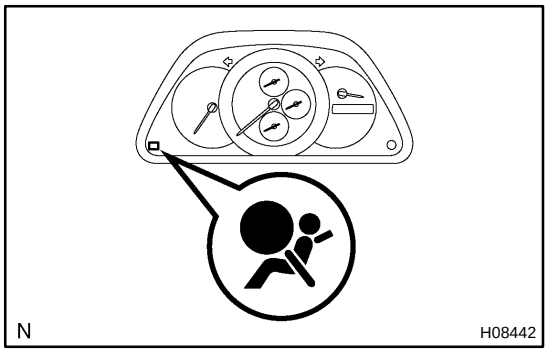
5. CURTAIN SHIELD AIRBAG ASSEMBLY

The inflater and bag of the SRS are stored in the curtain shield airbag assembly and cannot be disassembled. The inflater contains a squib, igniter charge, gas generator, etc., and inflates the bag when instructed by the airbag sensor assembly.



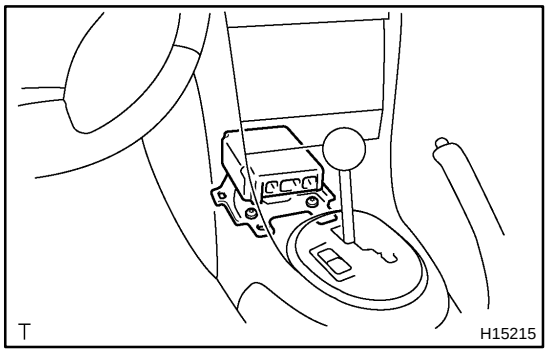
6. SEAT BELT PRETENSIONER

The seat belt pretensioner system is a component of the front seat outer belt. The pretensioner contains a squib, gas generator, wire, piston, etc., and operates in the event of a frontal collision. The seat belt pretensioner cannot be disassembled.



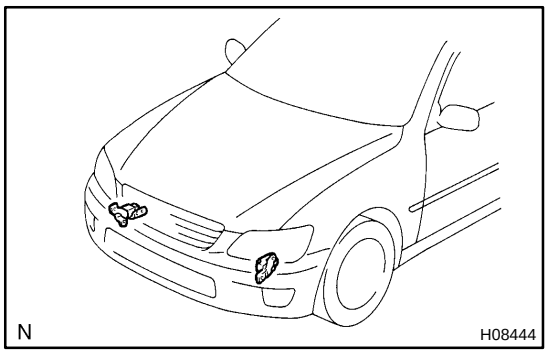
7. SRS WARNING LIGHT

The SRS warning light is located on the combination meter. It goes on to alert the driver of trouble in the system when a malfunction is detected in the airbag sensor assembly self-diagnosis. In normal operation conditions when the ignition switch is turned to the ON position, the light goes on for about 6 seconds and then goes off.



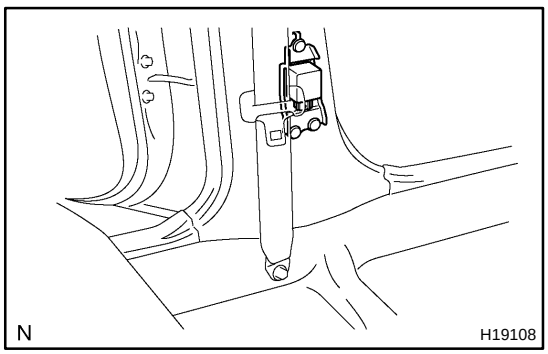
8. AIRBAG SENSOR ASSEMBLY

The airbag sensor assembly is mounted on the floor inside the console box. The airbag sensor assembly consists of an airbag sensor, safing sensor, diagnosis circuit, ignition control, drive circuit, etc. It receives signals from the airbag sensor, front airbag sensor, side and curtain shield airbag sensor assembly and door side airbag assembly and judges whether the SRS must be activated or not. The airbag sensor assembly cannot be disassembled.



9. FRONT AIRBAG SENSOR

The front airbag sensor is mounted inside each of the side members. The sensor unit is a mechanical type. When the sensor detects deceleration force above a predetermined limit, contact is made in the sensor, sending a signal to the airbag sensor assembly. The front airbag sensor cannot be disassembled.



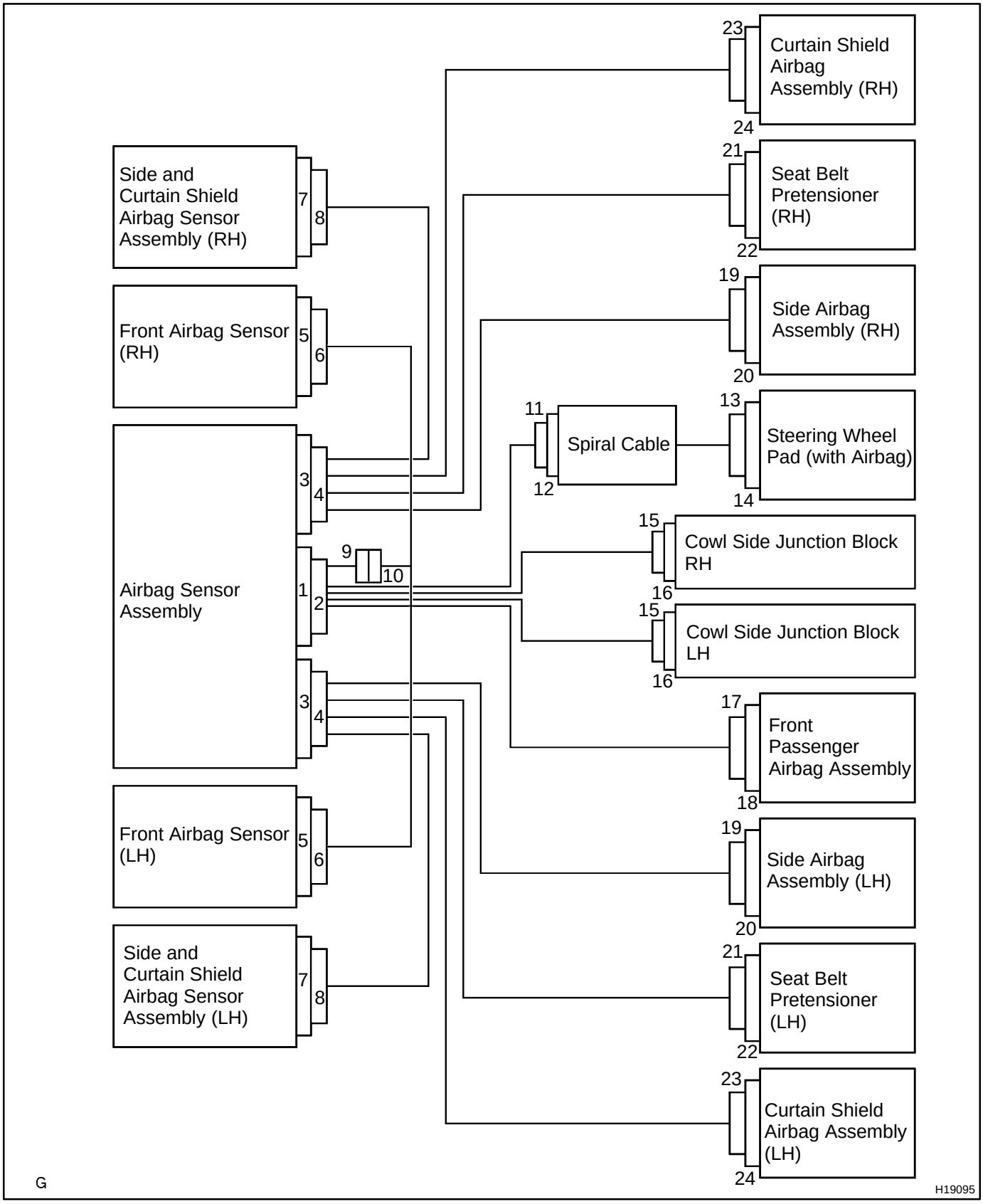
10. SIDE AND CURTAIN SHIELD AIRBAG SENSOR ASSEMBLY

The side and curtain shield airbag sensor assembly is mounted in the LH and RH center pillars. The side and curtain shield airbag sensor assembly consists of a lateral deceleration sensor, safing sensor, diagnosis circuit, etc. It sends signals to the airbag sensor assembly to judge whether the SRS side and curtain shield airbag must be activated or not. The side and curtain shield airbag sensor assembly cannot be disassembled.

11. SRS CONNECTORS

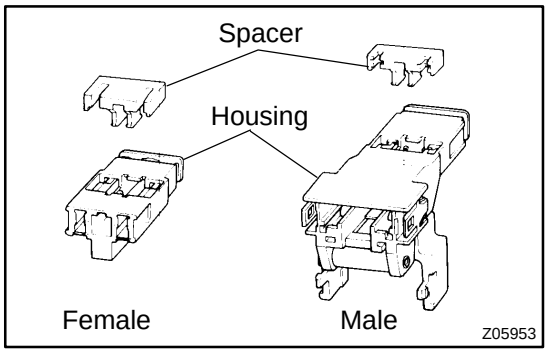
HINT:

SRS connectors are located as shown in the following illustration.



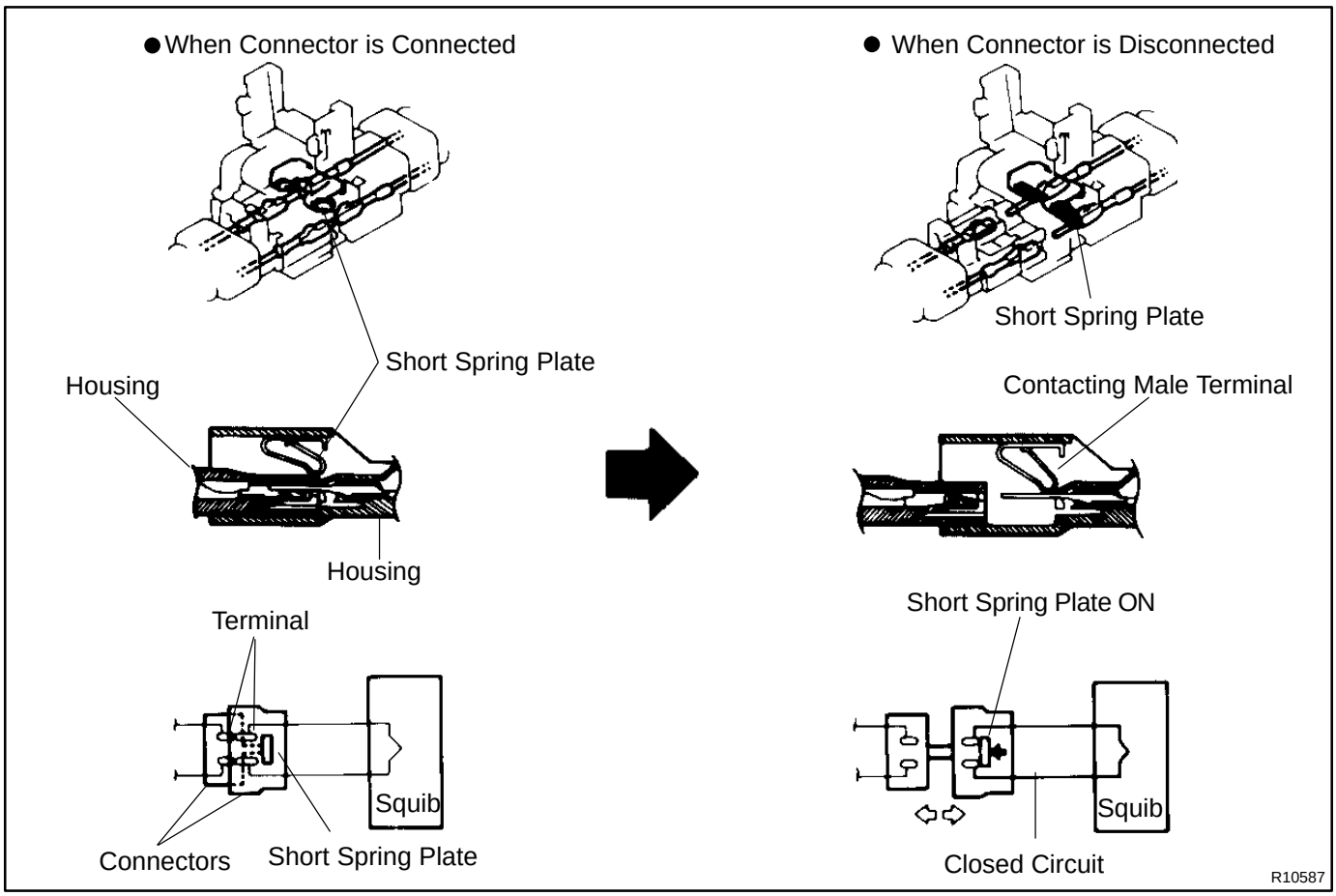
No.	Item	Application
(1)	Terminal Twin-Lock Mechanism	Connectors 2, 4, 6, 8, 9, 10, 11, 12, 13, 15, 16, 17, 19, 21, 23
(2)	Airbag Activation Prevention Mechanism	Connectors 2, 4, 12, 14, 18, 20, 22, 24
(3)	Electrical Connection Check Mechanism	Connectors 1, 2, 3, 4
(4)	Half Connection Prevention Mechanism	Connectors 6, 8, 9, 11, 13, 17, 19, 21, 23
(5)	Connector Twin-Lock Mechanism	Connectors 16

(a) All connectors in the SRS are colored in yellow to distinguish them from other connectors. Connectors having special functions and specifically designed for the SRS are used in the locations shown on the previous page to ensure high reliability. These connectors use durable gold-plated terminals.

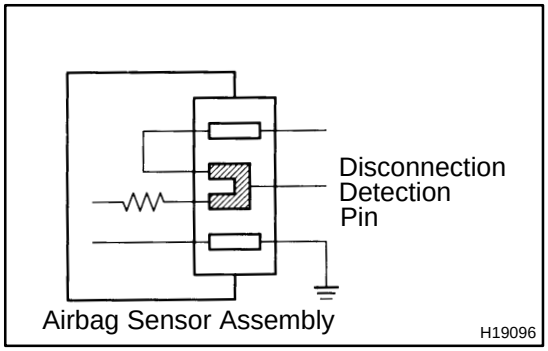


(1) Terminal twin-lock mechanism:
Each connector has a two-piece component consisting of a housing and a spacer. This design enables the terminal to be locked securely by two locking devices (the retainer and the lance) to prevent terminals from coming out.

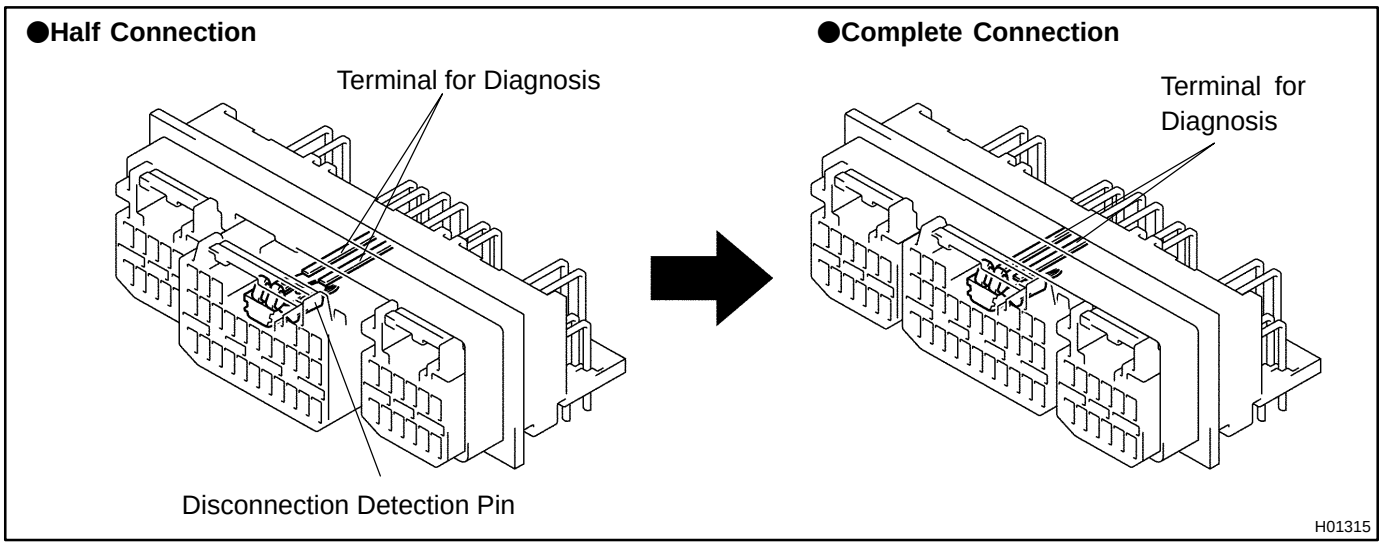
(2) Airbag activation prevention mechanism:
Each connector contains a short spring plate. When the connector is disconnected, the short spring plate automatically connects positive (+) terminal and negative (-) terminal of the squib.



HINT:
The type of connector is shown in the diagram on the previous page.

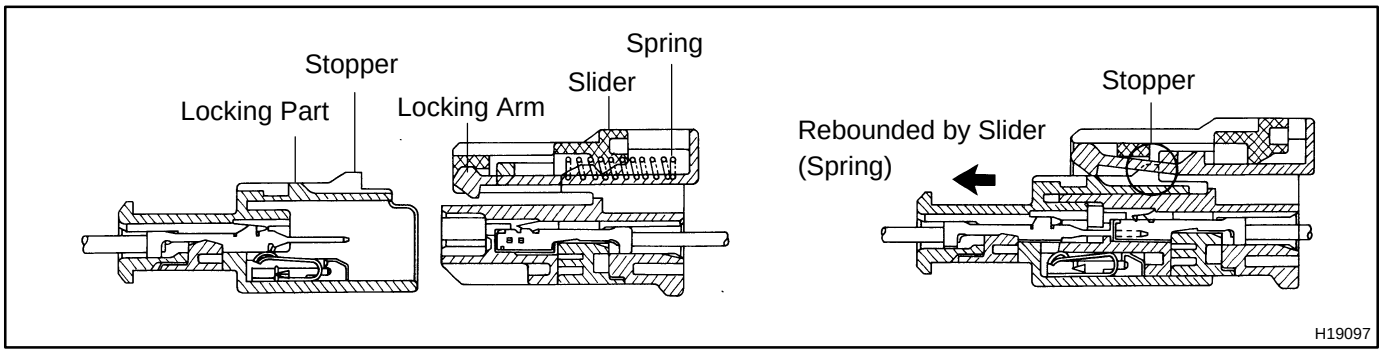


(3) Electrical connection check mechanism:
This mechanism electrically checks that connectors are connected correctly and completely. The electrical connection check mechanism is designed so that the disconnection detection pin connects with the diagnosis terminals when the connector housing lock is locked.

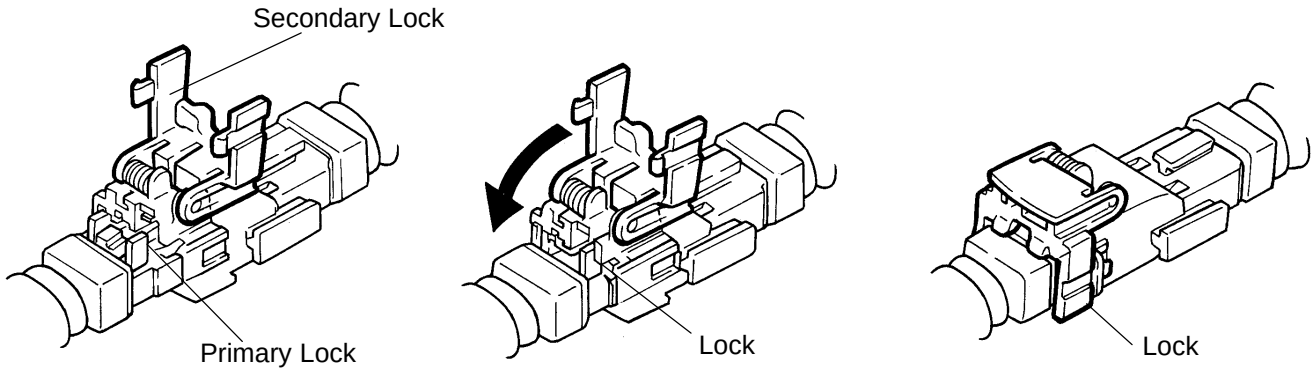


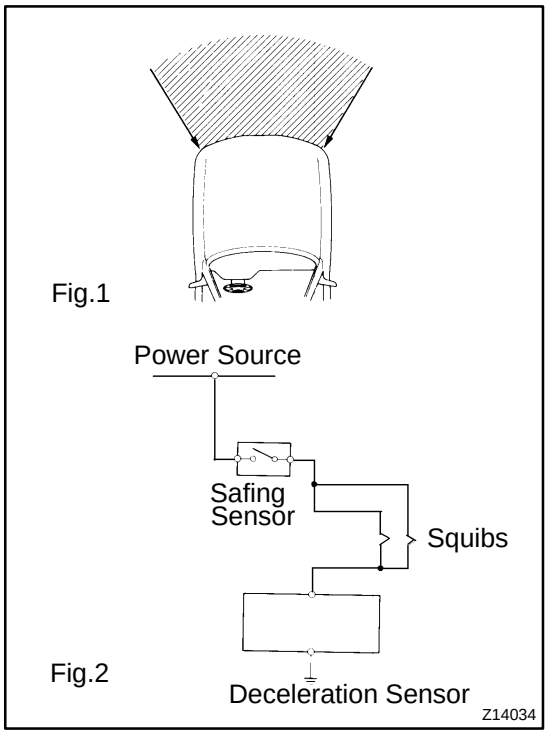
HINT:
The connectors shown in this illustration are connectors, "1", "2" and "3" in step 8.

(4) Half connection prevention mechanism:
If the connector is not completely connected, the connector is disconnected due to the spring operation to the extent that no continuity exists.

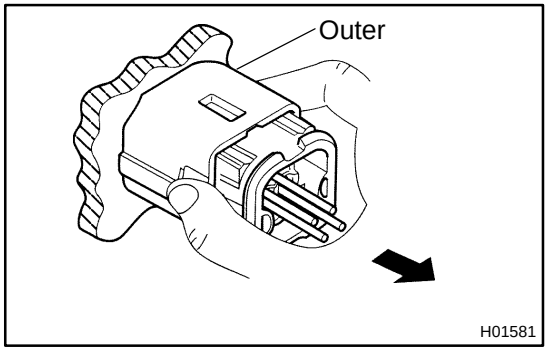


(5) Connector twin-lock mechanism:
With this mechanism connectors (male and female connectors) are locked by 2 locking devices to increase the connection reliability. If the primary lock is incomplete, ribs interfere and prevent the secondary lock.





(b) When the vehicle is involved in a frontal collision in the hatched area (Fig. 1) and the shock is larger than the predetermined level, the SRS is activated automatically. A safing sensor is designed to go on at a smaller deceleration rate than the airbag sensor. As illustrated in Fig. 2, ignition is caused when current flows to the squib, which happens when a safing sensor and the deceleration sensor go on simultaneously. When a deceleration force acts on the sensors, 2 squibs in the driver airbag and front passenger airbag ignite and generate gas. The gas discharging into the driver airbag and front passenger airbag rapidly increases the pressure inside the bags, breaking open the steering wheel pad and instrument panel.
Bag inflation then ends, and the bags deflate as the gas is discharged through discharge holes at the bag's rear or side.



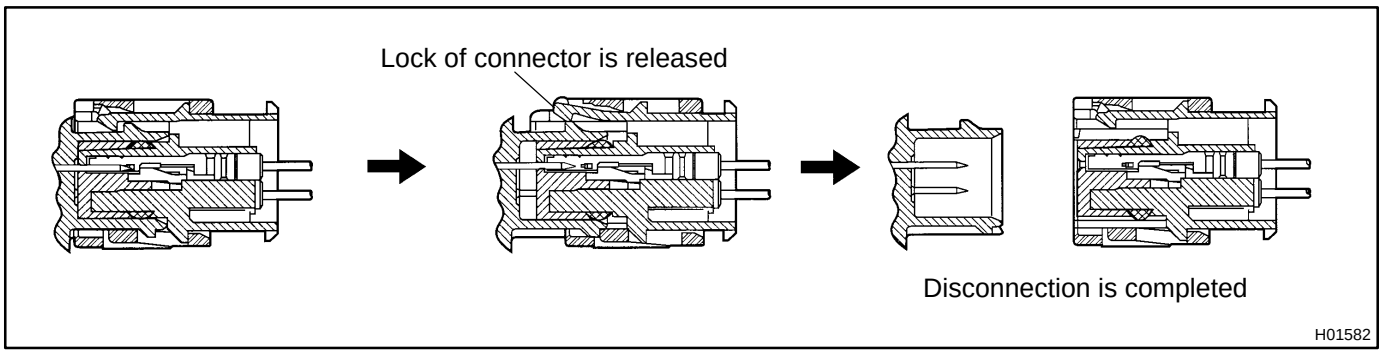
12. DISCONNECTION OF CONNECTORS FOR FRONT AIRBAG SENSOR AND SIDE AND CURTAIN SHIELD AIRBAG SENSOR

(a) While holding both flank sides of the outer, slide the outer to the direction shown by an arrow.

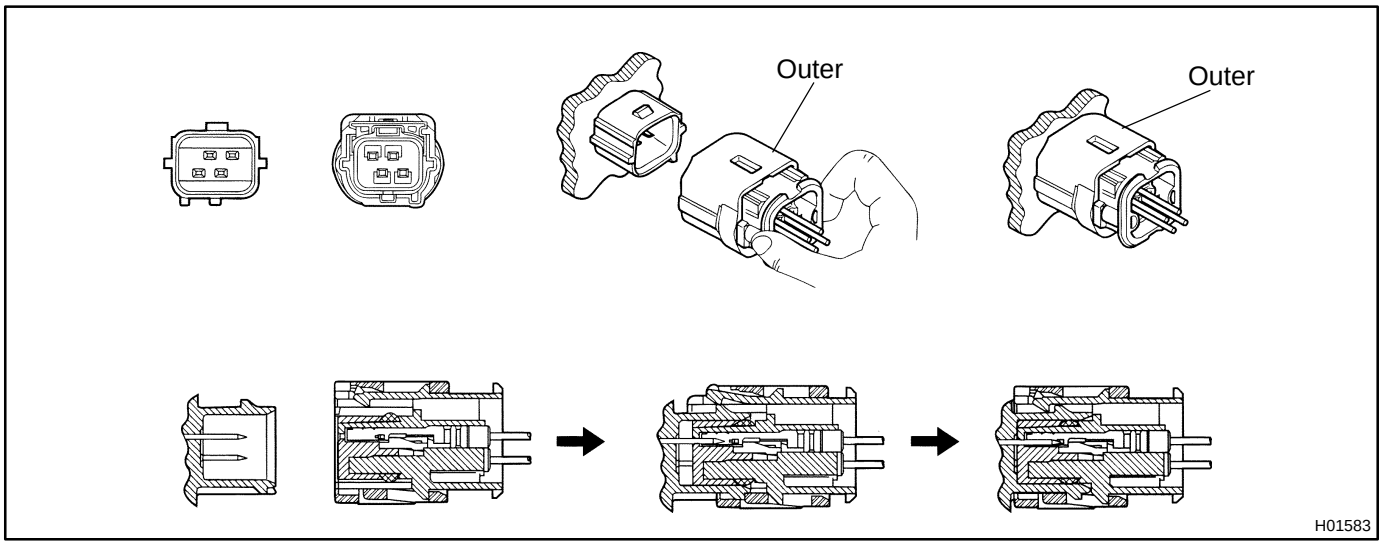
(b) Lock of the connectors is released, then disconnect the connectors.

HINT:

Be sure to hold both flank sides of the outer. If holding the top and bottom sides, it will obstruct disconnection.



13. CONNECTION OF CONNECTORS FOR FRONT AIRBAG SENSOR AND SIDE AND CURTAIN SHIELD AIRBAG SENSOR



(a) Align the male connector (of the side of sensor) and female connector in the same direction as shown in the illustration and fit in them without rubbing.

(b) As they are fitted in, the outer slides rearward. Press it until the outer returns to its original position again.

If fitting stops half way, connectors will separate.

(c) Be sure to insert until they are locked. After fitting in, pull them slightly to check that they are locked. (When locked, make sure that the outer returns to its original position and sound at the time of fitting in can be heard.)

HINT:

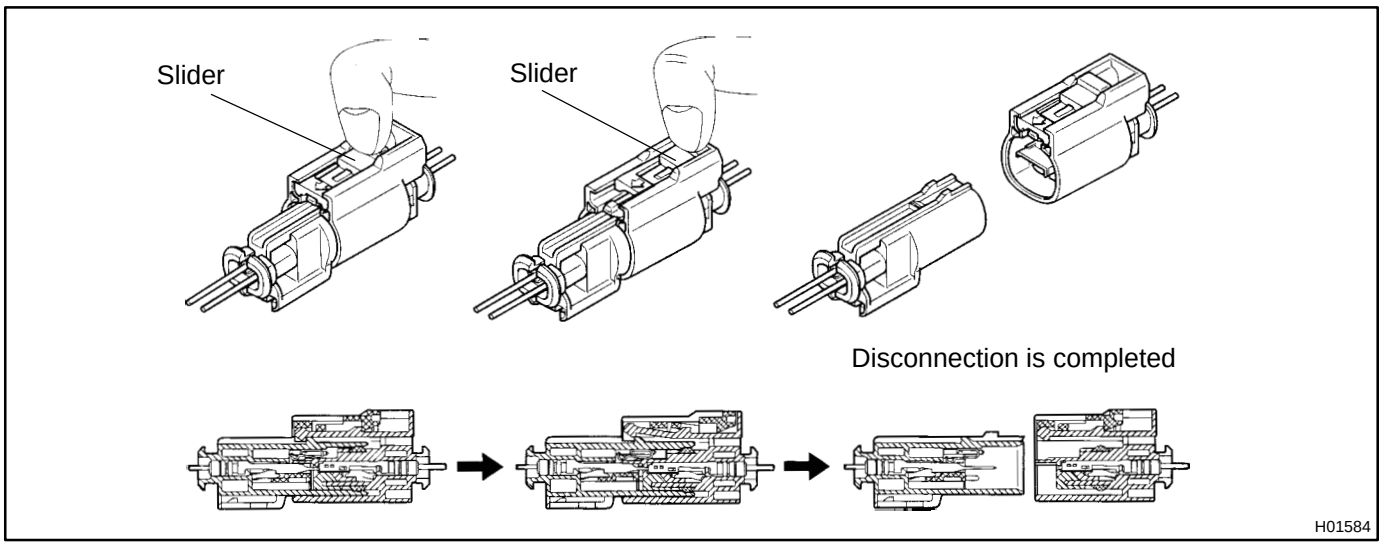
- ○ Do not fit in while holding the outer.
- ○ When fitting in, the outer slides. Do not touch it.

14. DISCONNECTION OF SIDE AIRBAG CONNECTOR

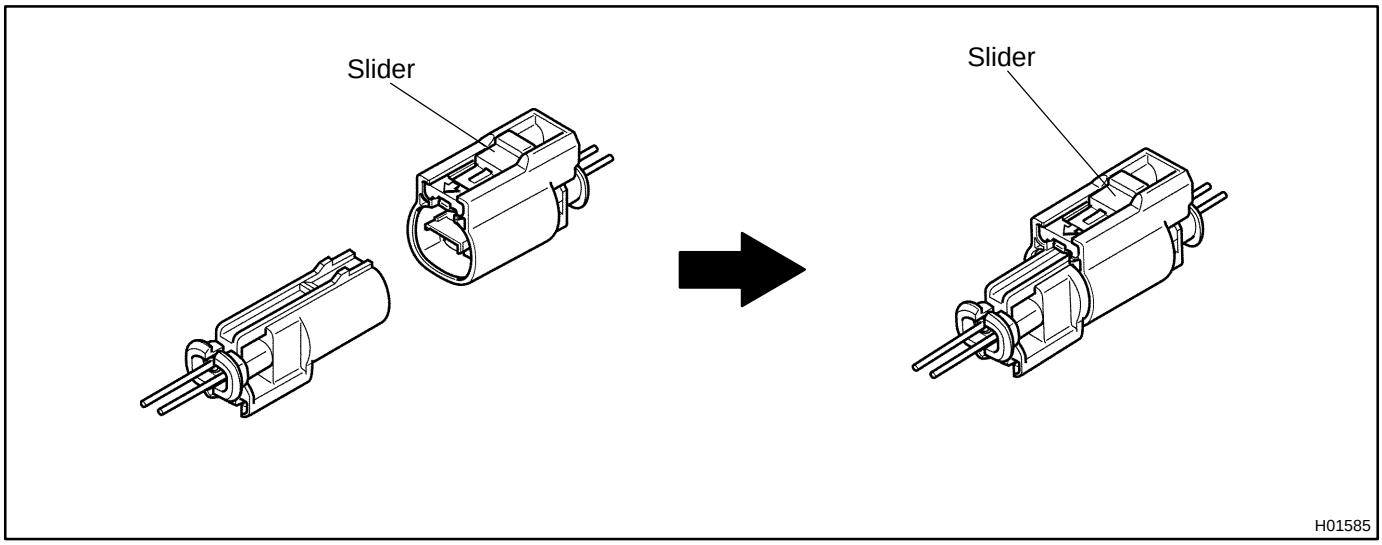
(a) Place a finger on the slider.

(b) Slide the slider to release lock.

(c) Disconnect the connector.



15. CONNECTION OF SIDE AIRBAG CONNECTOR



(a) Align a lock part of male connector and a slider of female connector in the same direction as shown in the illustration, fit in them without rubbing.

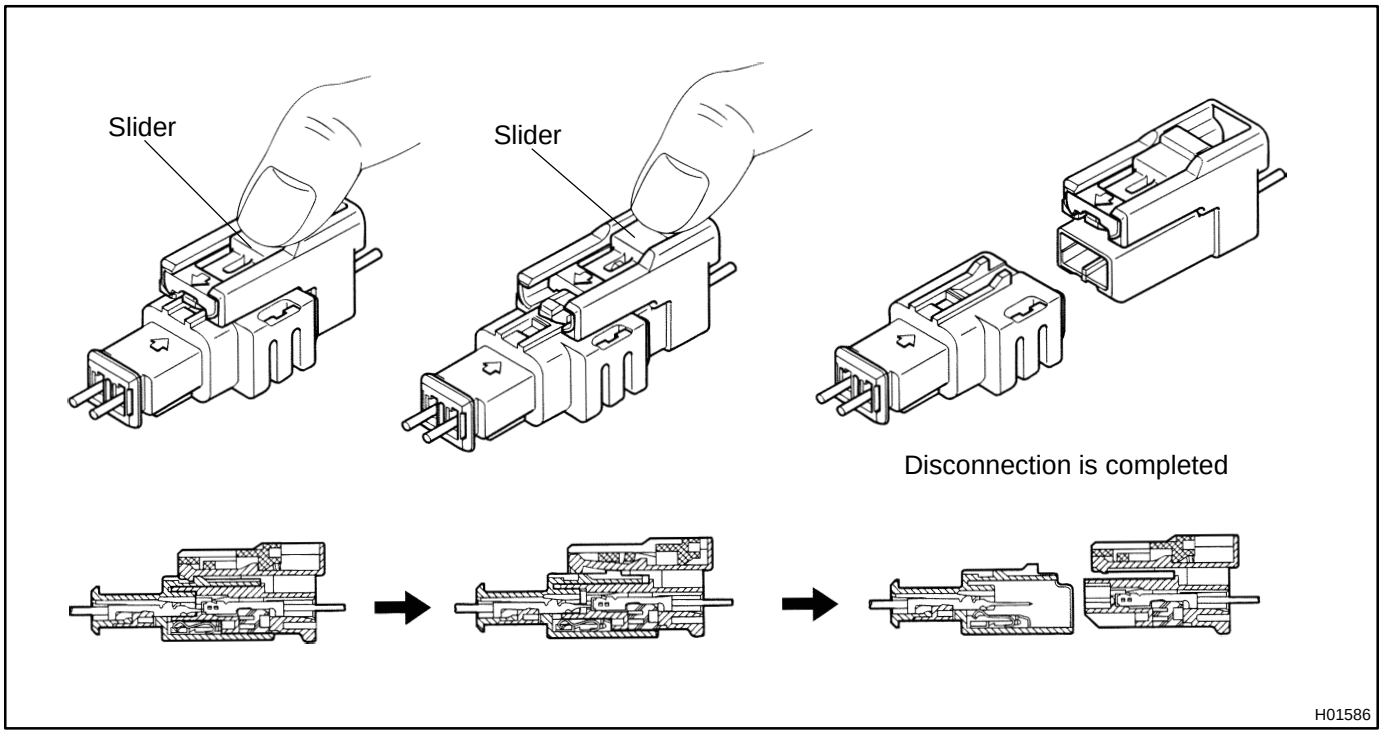
(b) Be sure to insert until they are locked. After fitting in pull them slightly to check that they are locked. (When locked, make sure that the outer returns to its original position and sound at the time of fitting in can be heard.)

HINT:

- ○ As the slider slides, do not touch it.
- ○ Be careful not to deform the release board. If the release board is deformed, replace it with a new one.

16. DISCONNECTION OF CONNECTORS FOR STEERING WHEEL PAD (with AIRBAG), CURTAIN SHIELD AIRBAG ASSEMBLY AND FRONT PASSENGER AIRBAG ASSEMBLY

(a) Place a finger on the slider.
(b) Slide the slider to release lock.
(c) Disconnect the connector.



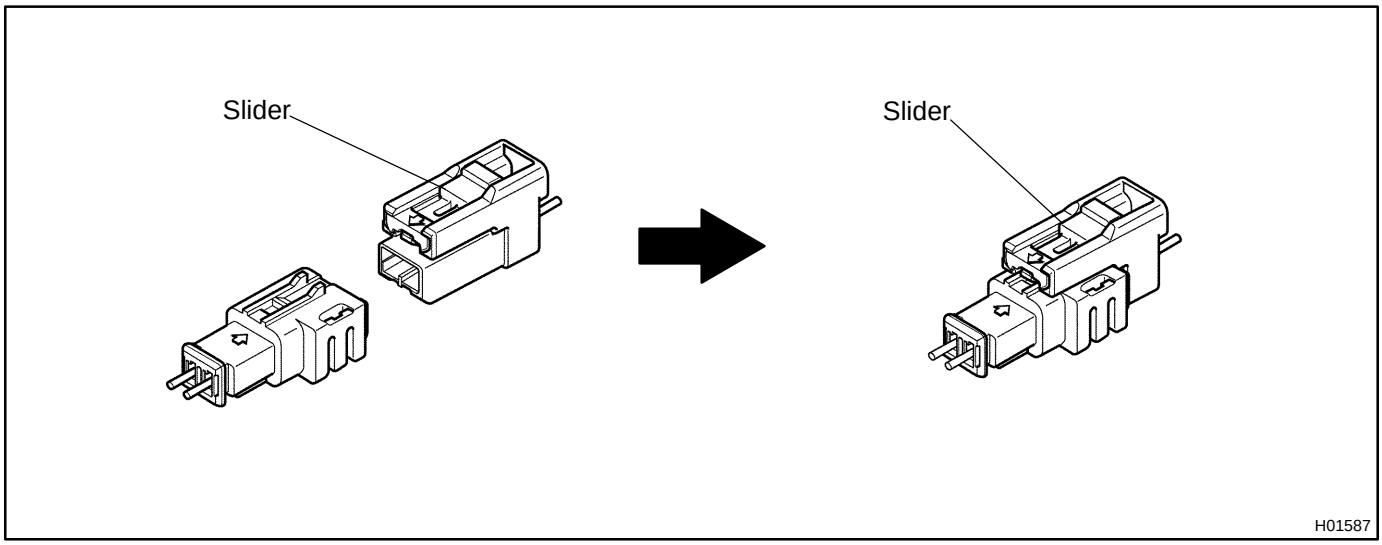
17. CONNECTION OF CONNECTORS FOR STEERING WHEEL PAD (with AIRBAG), CURTAIN SHIELD AIRBAG ASSEMBLY AND FRONT PASSENGER AIRBAG ASSEMBLY

(a) Align a lock part of male connector and a slider of female connector in the same direction as shown in the illustration, fit in them without rubbing.

(b) Be sure to insert until they are locked. After fitting in pull them slightly to check that they are locked. (When locked, make sure that the outer returns to its original position and sound at the time of fitting in can be heard.)

HINT:

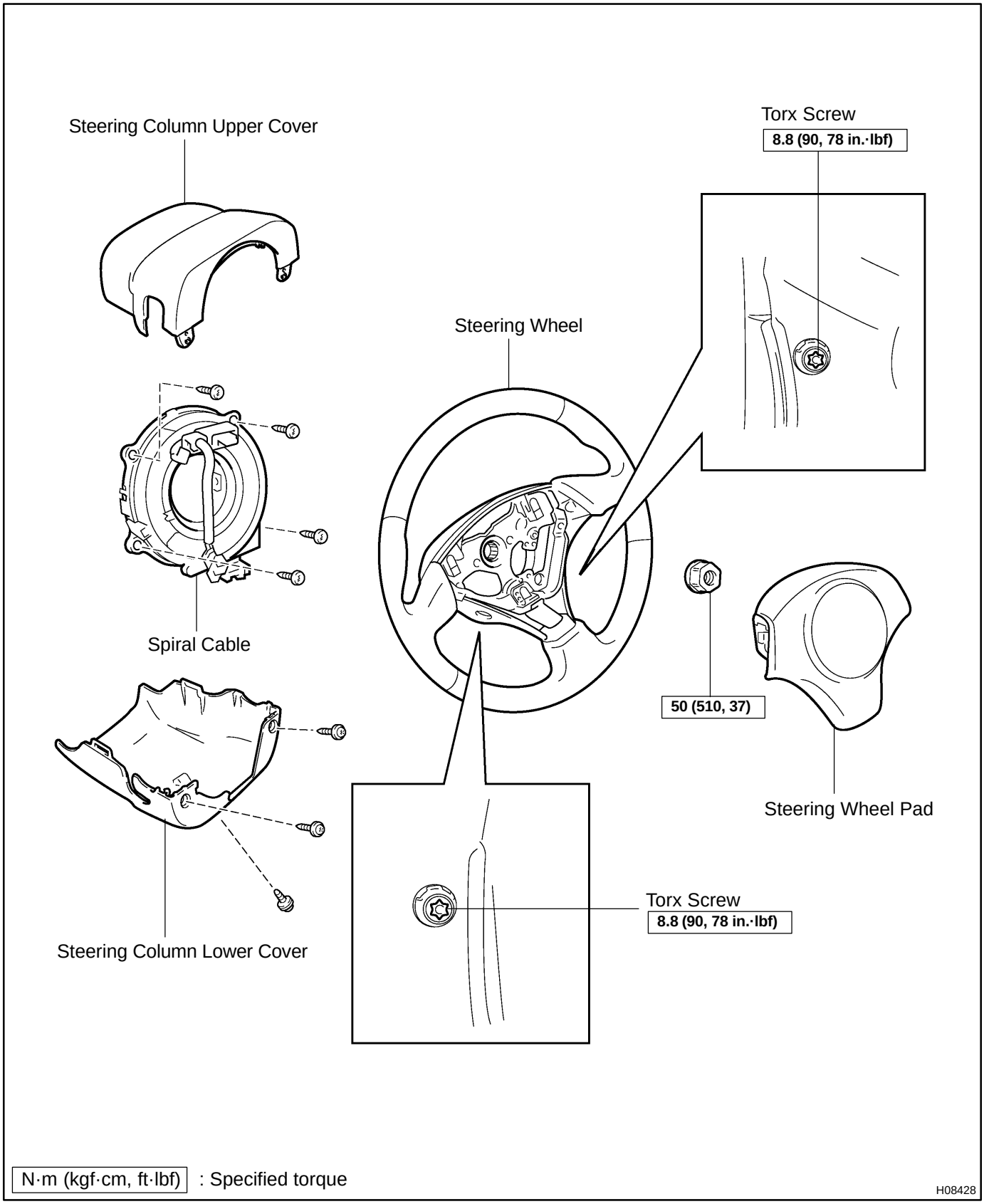
- ○ As the slider slides, do not touch it.
- ○ Be careful not to deform the release board. If the release board is deformed, replace it with a new one.



STEERING WHEEL PAD AND SPIRAL CABLE

COMPONENTS

RS00Y-52



RS00Z-18

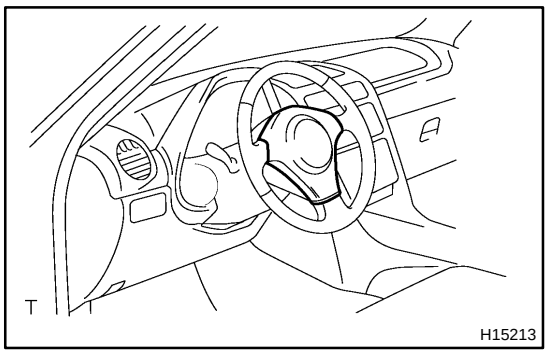
REMOVAL

HINT:

For step 1 to 4, refer to page SR-13 .

1. **REMOVE STEERING WHEEL PAD**
2. **REMOVE STEERING WHEEL**
3. **REMOVE STEERING COLUMN UPPER AND LOWER COVERS**
4. **REMOVE SPIRAL CABLE**

RS0RF-02



INSPECTION

1. Vehicle not involved in collision:

INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

(a) Do a diagnostic system check (See page DI-607).

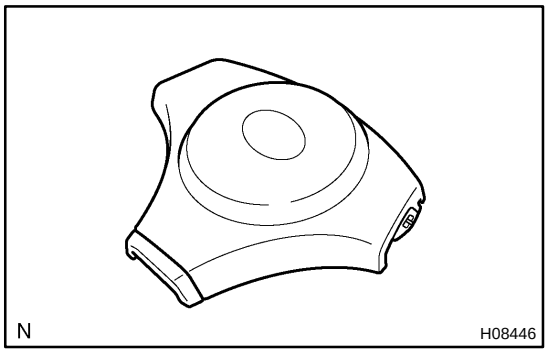
(b) Do a visual check which includes the following items with the steering wheel pad (with airbag) installed in the vehicle.

Check cuts, minute cracks or marked discoloration on the steering wheel pad top surface and in the grooved portion.

2. Vehicle involved in collision and airbag is not deployed:

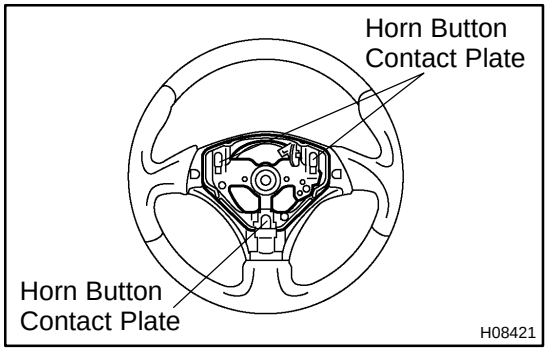
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

(a) Do a diagnostic system check (See page DI-607).



(b) Do a visual check which includes the following items with the steering wheel pad (with airbag) removed from the vehicle.

- Check cuts, minute cracks or marked discoloration on the steering wheel pad top surface and in the grooved portion.
- Check cuts and cracks in the wire harness, and chipping in the connectors.



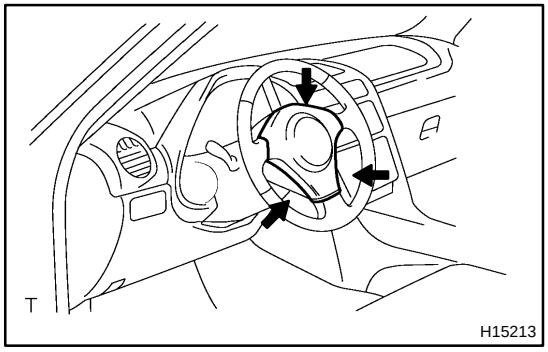
- Check the deformation of the horn button contact plate on the steering wheel.

CAUTION:

For removal and installation of the steering wheel pad, see page SR-13 and SR-25 , and be sure to follow the correct procedure.

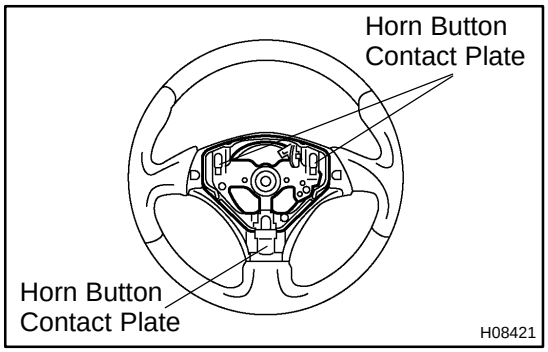
HINT:

- If the horn button contact plate of the steering wheel is deformed, never repair it. Always replace the steering wheel assembly with a new one.
- There should be no interference between the steering wheel pad and steering wheel, and the clearance should be uniform all the way around when a new steering wheel pad is installed on the steering wheel.



3. Vehicle involved in collision and airbag is deployed: INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

(a) Do a diagnostic system check (See page DI-607).

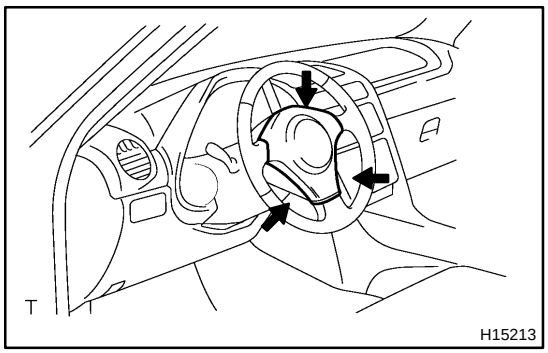


(b) Do a visual check which includes the following items with the steering wheel pad (with airbag) removed from the vehicle.

- Check the deformation on the horn button contact plate of the steering wheel.
- Check the damage on the spiral cable connector and wire harness.

HINT:

- If the horn button contact plate of the steering wheel is deformed, never repair it. Always replace the steering wheel assembly with a new one.



- There should be no interference between the steering wheel pad and steering wheel, and the clearance should be uniform all the way around when a new steering wheel pad is installed on the steering wheel.

RS0RG-03

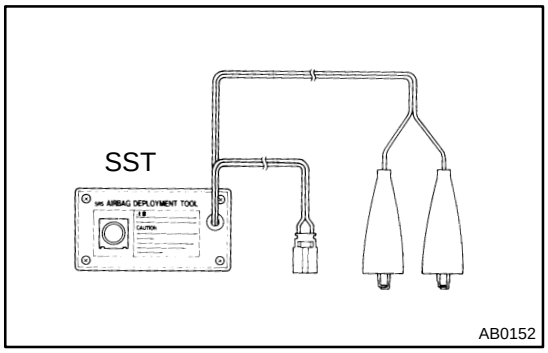
DISPOSAL

HINT:

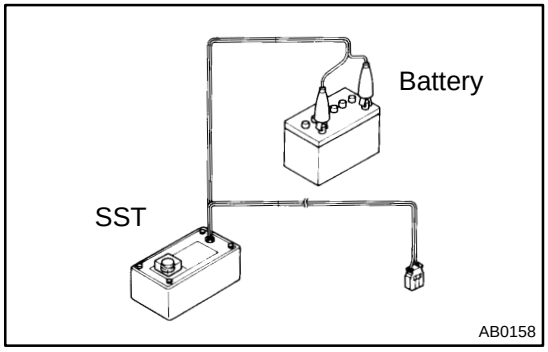
When scrapping vehicle equipped with an SRS or disposing of a steering wheel pad (with airbag), always first deploy the airbag in accordance with the procedure described below. If any abnormality occurs with the airbag deployment, contact the SERVICE DEPT. of TOYOTA MOTOR SALES, U.S.A., INC.

CAUTION:

- **Never dispose of a steering wheel pad which has an undeployed airbag.**
- **The airbag produces a sizeable exploding sound when it deploys, so perform the operation out-of-doors and where it will not create a nuisance to nearby residents.**



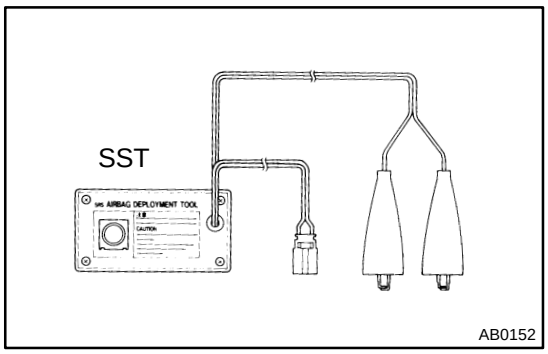
- **When deploying the airbag, always use the specified SST (SRS Airbag Deployment Tool). Perform the operation in a place away from electrical noise.**
  SST 09082-00700
- **When deploying an airbag, perform the operation at least 10 m (33 ft) away from the steering wheel pad.**
- **The steering wheel pad is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a steering wheel pad with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a steering wheel pad with the deployed airbag.**



1. AIRBAG DEPLOYMENT WHEN SCRAPPING VEHICLE

HINT:

Have a battery ready as the power source to deploy the airbag.

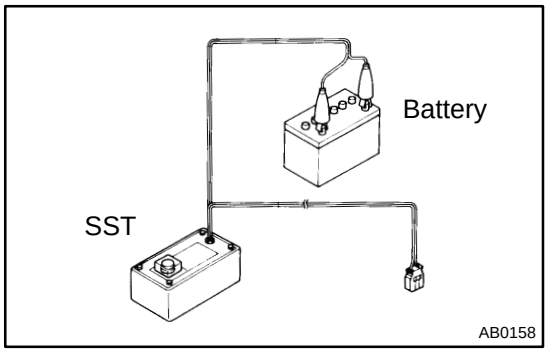


(a) Check functioning of the SST.

CAUTION:

When deploying the airbag, always use the specified SST: SRS Airbag Deployment Tool.

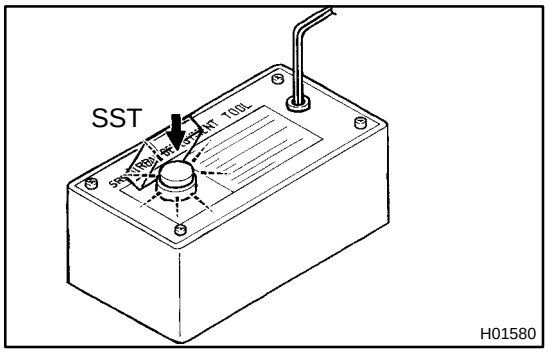
SST 09082-00700



(1) Connect the SST to the battery.
Connect the red clip of the SST to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.

HINT:

Do not connect the yellow connector which will be connected with the supplemental restraint system.

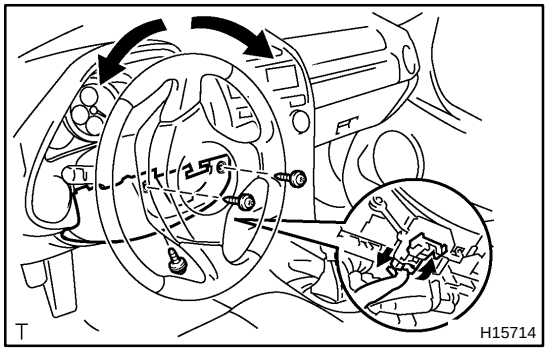


(2) Check functioning of the SST.
Press the SST activation switch, and check that the LED of the SST activation switch lights up.

CAUTION:

If the LED lights up when the activation switch is not being pressed, SST malfunction is probable, so definitely do not use the SST.

(3) Disconnect the SST from the battery.



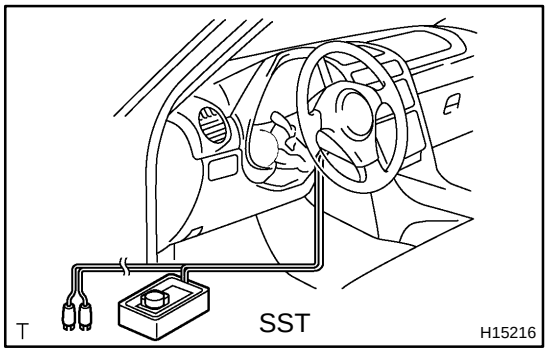
(b) Install the SST.

CAUTION:

Check that there is no looseness in the steering wheel and steering wheel pad.

(1) While turning the steering wheel right/left, remove the 3 screws and column lower cover.

(2) Disconnect the airbag connector of the spiral cable.

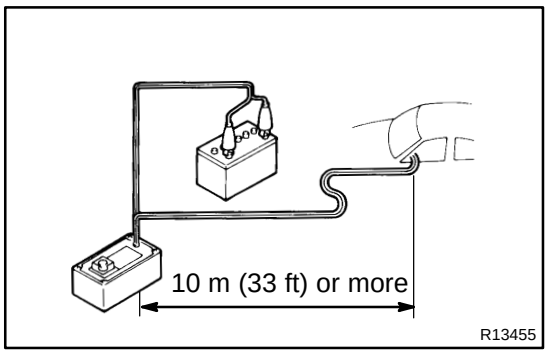


(3) Connect the SST connector to the airbag connector of the spiral cable.

SST 09082-00700

NOTICE:

To avoid damaging the connector of the SST and wire harness, do not lock the secondary lock of the twin lock.



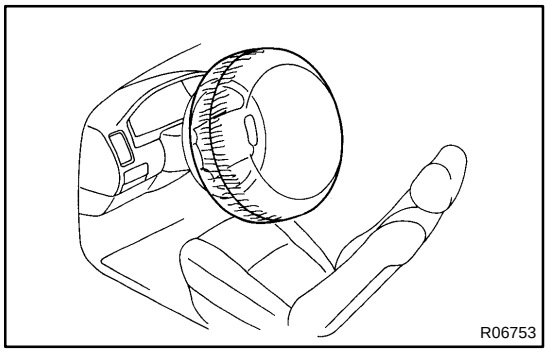
(4) Move the SST at least 10 m (33 ft) away from the front of the vehicle.

(5) Close all the doors and windows of the vehicle.

NOTICE:

Take care not to damage the SST wire harness.

(6) Connect the SST red clip to the battery positive (+) terminal and the black clip to the negative (-) terminal.



(c) Deploy the airbag.

(1) Confirm that no one is inside the vehicle or within 10 m (33 ft) area around the vehicle.

(2) Press the SST activation switch and deploy the airbag.

CAUTION:

- **The steering wheel pad is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a steering wheel pad with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a steering wheel pad with the deployed airbag.**
- **When scrapping a vehicle, deploy the airbag and scrap the vehicle with the steering wheel pad still installed.**
- **When moving a vehicle for scrapping which has a steering wheel pad with deployed airbag, use gloves and safety glasses.**

HINT:

The airbag deploys simultaneously as the LED of the SST activation switch lights up.

2. DEPLOYMENT WHEN DISPOSING OF STEERING WHEEL PAD ONLY

NOTICE:

- **When disposing of the steering wheel pad (with airbag) only, never use the customers vehicle to deploy the airbag.**
- **Be sure to follow the procedure given below when deploying the airbag.**

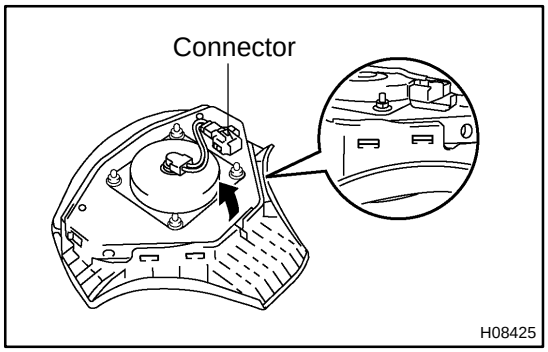
HINT:

Have a battery ready as the power source to deploy the airbag.

(a) Remove the steering wheel pad (See page SR-13).

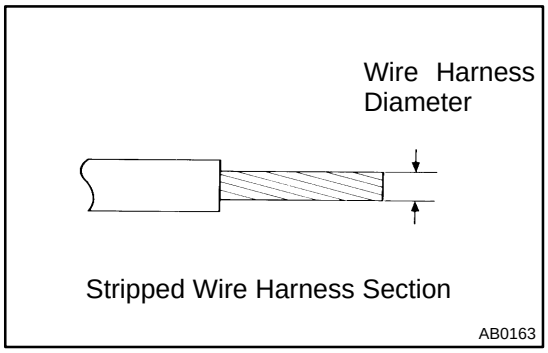
CAUTION:

- **When removing the steering wheel pad, work must be started 90 seconds after the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.**
- **When storing the steering wheel pad, keep the upper surface of the pad facing upward.**



(b) Remove the connector on the rear surface of the steering wheel pad from the bracket.

(c) Disconnect the engagement of the claw and remove the steering wheel pad cover.



(d) Using a service-purpose wire harness, tie down the steering wheel pad to the disc wheel.

Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 in^2. or more).

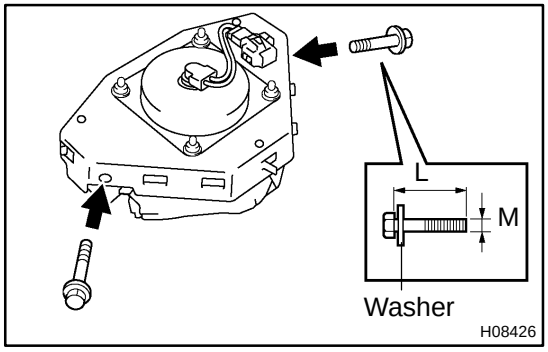
CAUTION:

If a wire harness which is too thin or some other thing is used to tie down the steering wheel pad, it may be snapped by the shock when the airbag is deployed. This is highly dangerous. Always use a wire harness for vehicle use which is at least 1.25 mm^2 (0.0019 in^2).

HINT:

To calculate the square of the stripped wire harness section:

Square = 3.14 x (Diameter)^2 divided by 4



(1) Install the 2 bolts with the washers in the 2 bolt holes in the steering wheel pad.

Bolt:

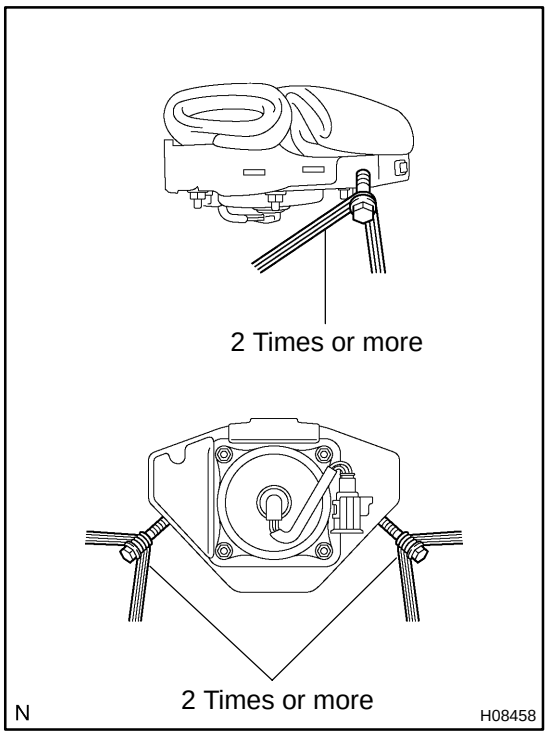
L: 35.0 mm (1.387 in.)

M: 6.0 mm (0.236 in.)

Pitch: 1.0 mm (0.039 in.)

NOTICE:

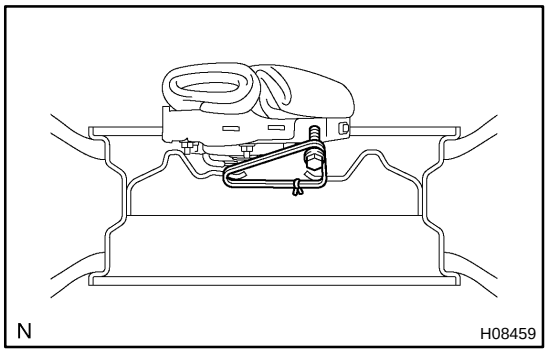
- **Tighten the bolts by hand until the bolts become difficult to turn.**
- **Do not tighten the bolts too much.**



(2) Using 3 wire harness, wind the wire harness at least 2 times each around the bolts installed on the left and right sides of the steering wheel pad.

CAUTION:

- **Tightly wind the wire harness around the bolts so that there is no slack.**
- **If there is slack in the wire harness, the steering wheel pad may come loose due to the shock when the airbag is deployed. This is highly dangerous.**



(3) Face the upper surface of the steering wheel pad upward. Separately tie the left and right sides of the steering wheel pad to the disc wheel through the hub nut holes. Position the steering wheel pad connector so that it hangs downward through a hub hole in the disc wheel.

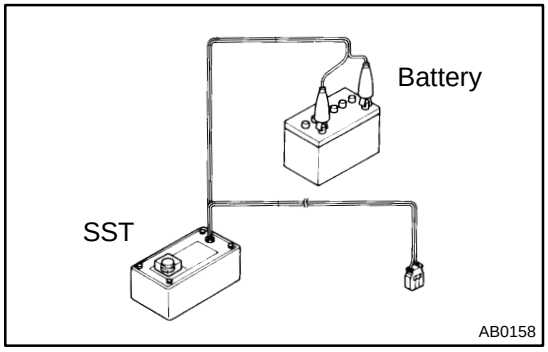
CAUTION:

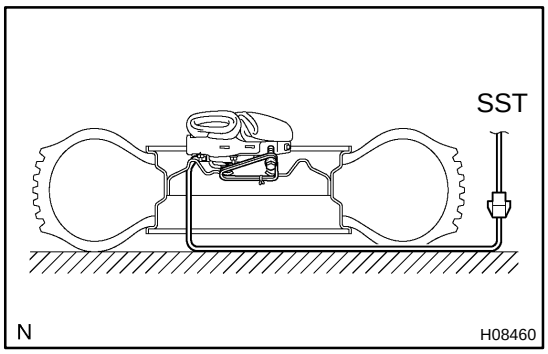
- **Make sure that the wire harness is tight. It is very dangerous when looseness in the wire harness results in the steering wheel pad coming free through the shock from the airbag deploying.**
- **Always tie down the steering wheel pad with the pad side facing upward. It is very dangerous if the steering wheel pad is tied down with the metal surface facing upward as the wire harness will be cut by the shock from the airbag deploying and the steering wheel pad will be thrown into the air.**

NOTICE:

The disc wheel will be marked by airbag deployment, so when disposing of the airbag use a redundant disc wheel.

(e) Check functioning of the SST (See step 1-(a)).
SST 09082-00700





(f) Install the SST.

CAUTION:

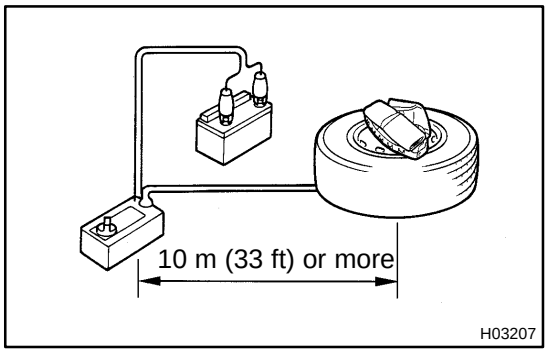
Place the disc wheel on the level ground.

(1) Connect the connector of 2 SST to the steering wheel pad connector.

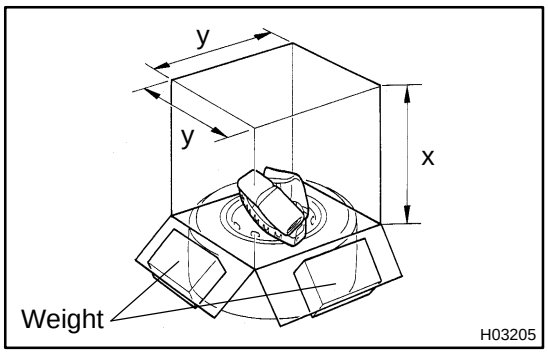
SST 09082-00700, 09082-00760

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock. Also, secure some slack for the SST wire harness inside the disc wheel.



(2) Move the SST to at least 10 m (33 ft) away from the steering wheel pad tied down on the disc wheel.



(g) Cover the steering wheel pad with a cardboard box or tires.

- Covering method using a cardboard box:
  Cover the steering wheel pad with the cardboard box and weight the cardboard box down in 4 places with at least 190 N (20 kg, 44 lb).

Size of cardboard box:

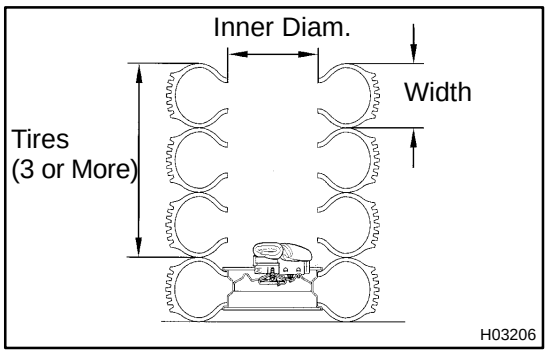
Must exceed the following dimensions:

X = 460 mm (18.11 in.)

Y = 650 mm (25.59 in.)

NOTICE:

- **When dimension Y of the cardboard box exceeds the diameter of the disc wheel with tire to which the steering wheel pad is tied, X should be the following size.**
  X = 460 mm (18.11 in.) + width of tire
- **If a cardboard box smaller than the specified size is used, the cardboard box will be broken by the shock from the airbag deployment.**



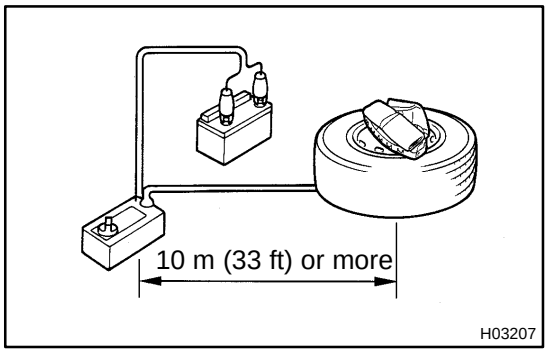
- Covering method using tires:
  Place at least 3 tires without disc wheel on top of the disc wheel with tire to which the steering wheel pad is tied.

Tire size: Must exceed the following dimensions-
Width: 185 mm (7.87 in.)
Inner diameter: 360 mm (14.17 in.)

CAUTION:
Do not use tires with disc wheels.

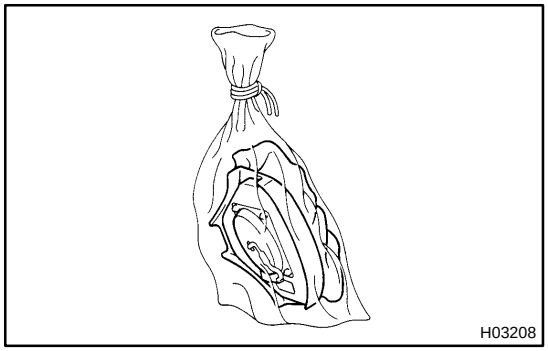
NOTICE:
The tires may be marked by the airbag deployment, so use the redundant tires.

(h) Deploy the airbag.
  (1) Connect the SST red clip to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.



  (2) Check that no one is within 10 m (33 ft) area around the disc wheel which the steering wheel pad is tied to.
  (3) Press the SST activation switch and deploy the airbag.

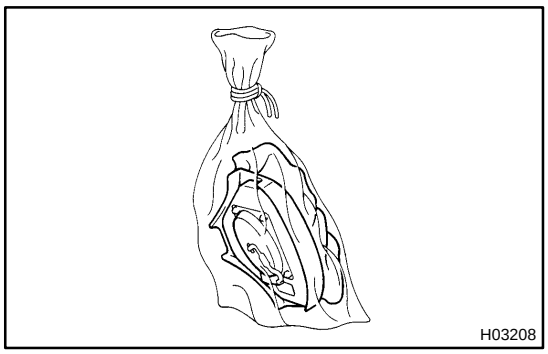
HINT:
The airbag deploys simultaneously as the LED of the SST activation switch lights up.



(i) Dispose of the steering wheel pad (with airbag).

CAUTION:
- **The steering wheel pad is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a steering wheel pad with deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a steering wheel pad with deployed airbag.**

  (1) Remove the steering wheel pad from the disc wheel.
  (2) Place the steering wheel pad in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts disposal.



3. DEPLOYMENT WHEN DISPOSING OF STEERING WHEEL PAD WITH AIRBAG DEPLOYED IN COLLISION

Dispose of the steering wheel pad (with airbag).

CAUTION:

- **The steering wheel pad is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **When moving a vehicle for scrapping which has a steering wheel pad with the deployed airbag, use gloves and safety glasses.**
- **Use gloves and safety glasses when handling a steering wheel pad with deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a steering wheel pad with the deployed airbag.**

(1) Remove the steering wheel pad from the steering wheel (See page SR-13).

(2) Place the steering wheel pad in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts disposal.

RS012-38

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the steering wheel pad, steering wheel or spiral cable.

Case	Replacing part
If the airbag has been deployed.	Steering wheel pad
If the steering wheel pad has been found to be faulty in troubleshooting.	Steering wheel pad
If the spiral cable has been found to be faulty in troubleshooting.	Spiral cable
If the steering wheel pad has been found to be faulty during checking items (See page RS-15).	Steering wheel pad
If the steering wheel has been found to be faulty during checking items (See page RS-15).	Steering wheel
If the spiral cable has been found to be faulty during checking items (See page RS-15).	Spiral cable
If the steering wheel pad has been dropped.	Steering wheel pad

CAUTION:

For removal and installation of the steering wheel pad, see page SR-13 and SR-25 . Be sure to follow the correct procedure.

RS013-19

INSTALLATION

HINT:

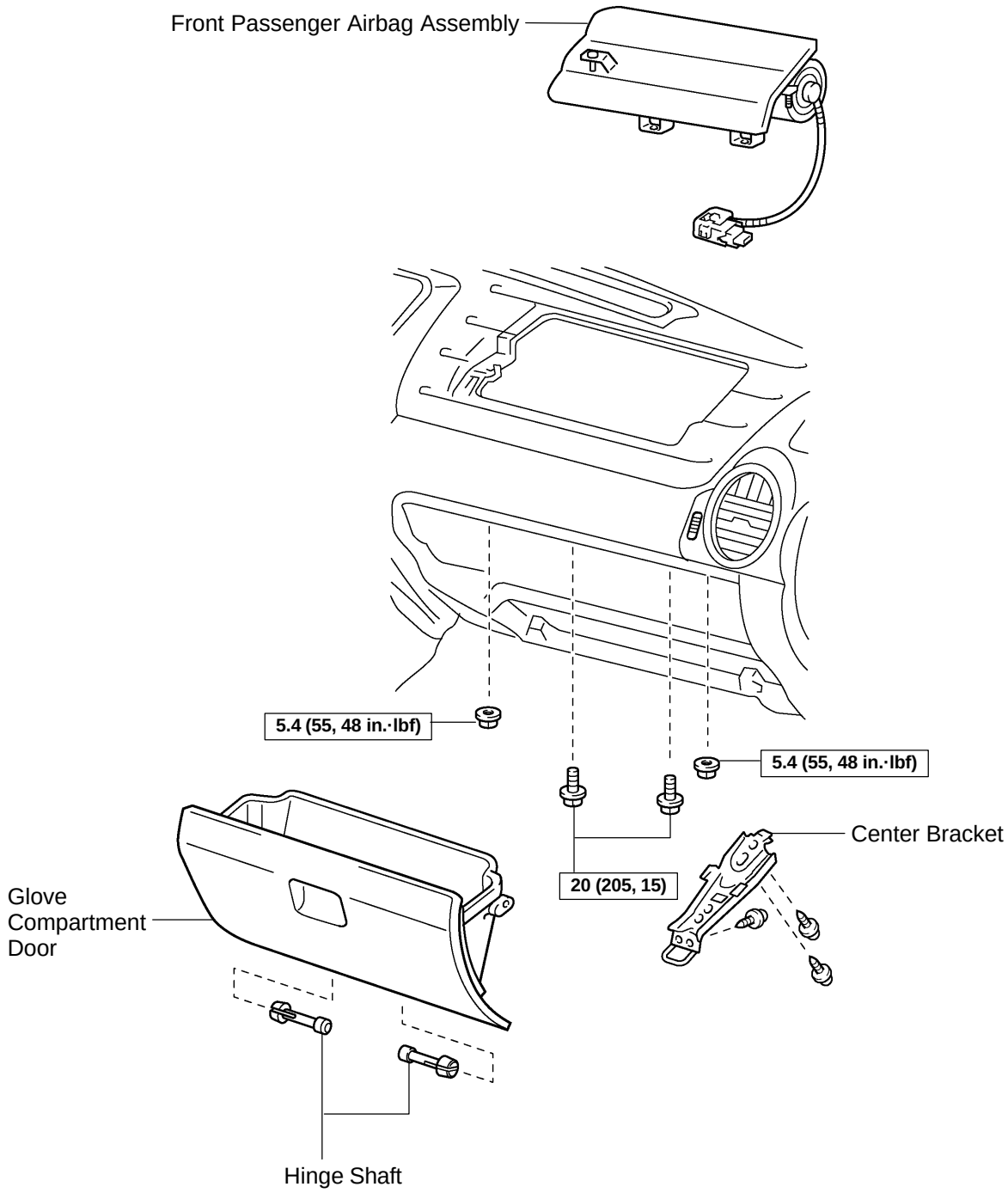
For step 1 to 4, refer to page SR-25 .

1. **INSTALL SPIRAL CABLE**
2. **INSTALL STEERING COLUMN UPPER AND LOWER COVERS**
3. **INSTALL STEERING WHEEL**
4. **INSTALL STEERING WHEEL PAD**

FRONT PASSENGER AIRBAG ASSEMBLY

RS014-40

COMPONENTS



T N·m (kgf·cm, ft·lbf) : Specified torque

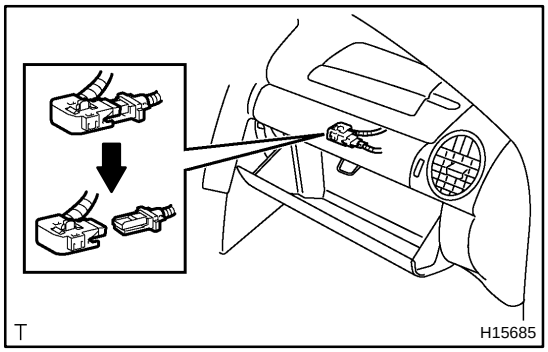
H15527

RS02P-08

REMOVAL

NOTICE:

- **If the wiring connector of the SRS is disconnected and the ignition switch is in ON or ACC position, DTCs will be recorded.**
- **Never use the airbag parts from another vehicle. When replacing parts, replace them with new parts.**



1. DISCONNECT FRONT PASSENGER AIRBAG ASSEMBLY CONNECTOR

Open the glove compartment door and disconnect the front passenger airbag assembly connector.

NOTICE:

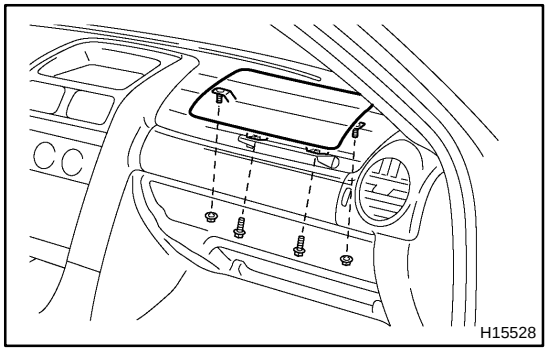
When handling the airbag connector, take care not to damage the airbag wire harness.

2. REMOVE GLOVE COMPARTMENT DOOR

(See page BO-135)

3. REMOVE CENTER BRACKET

Remove the 3 screws and center bracket.



4. REMOVE FRONT PASSENGER AIRBAG ASSEMBLY

(a) Remove the 2 bolts and nuts from the front passenger airbag assembly.

(b) Disconnect the engagement of the claw at 10 positions and remove the front passenger airbag assembly from the instrument panel.

CAUTION:

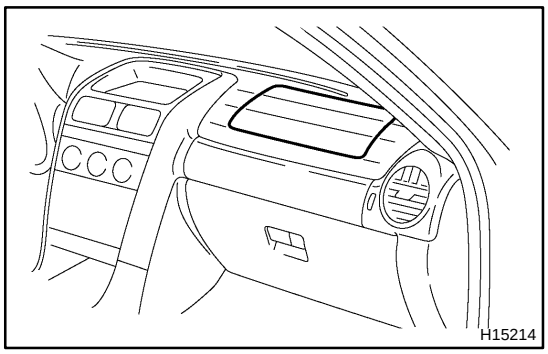
- **Do not store the front passenger airbag assembly with the airbag deployment side facing downward.**
- **Never disassemble the front passenger airbag assembly.**

NOTICE:

When removing the front passenger airbag assembly, take care not to damage the wire harness.

RS02Q-14

INSPECTION



1. Vehicle not involved in collision :

INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

(a) Do a diagnostic system check (See page DI-607).

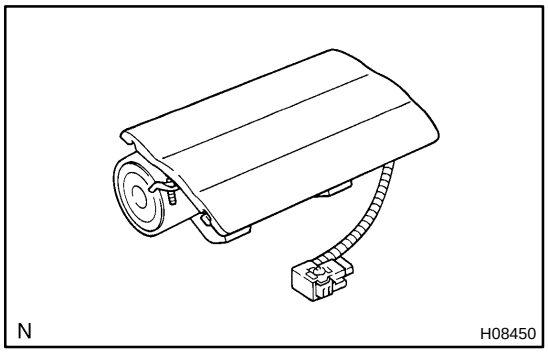
(b) Do a visual check which includes the following item with the front passenger airbag assembly installed in the vehicle.

Check cuts, minute cracks or marked discoloration on the front passenger airbag assembly and instrument panel.

2. Vehicle involved in collision and airbag is not deployed:

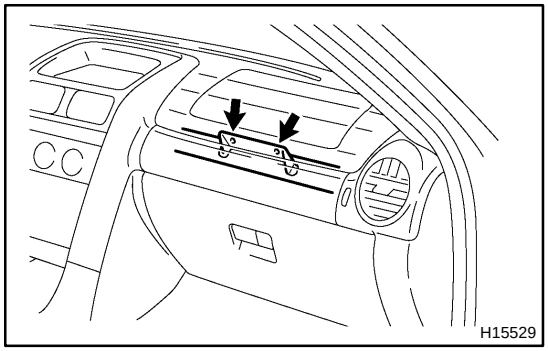
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

(a) Do a diagnostic system check (See page DI-607).



(b) Do a visual check which includes the following items with the front passenger airbag assembly removed from the vehicle.

- Check cuts, minute cracks or marked discoloration on the front passenger airbag assembly.
- Check cuts and cracks in the wire harness, and for chipping in the connectors.



- Check the deformation or cracks on the instrument panel and instrument panel reinforcement.

CAUTION:

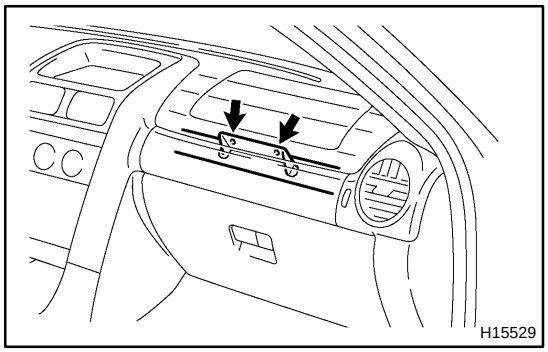
For removal and installation of the front passenger airbag assembly, see page RS-28 and RS-38 , and be sure to follow the correct procedure.

HINT:

If the instrument panel or instrument panel reinforcement is deformed or cracked, never repair it. Always replace it with a new one.

3. Vehicle involved in collision and airbag is deployed: INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

(a) Do a diagnostic system check (See page DI-607).



(b) Do a visual check which includes the following items with the front passenger airbag assembly removed from the vehicle.

- Check the deformation or cracks on the instrument panel and instrument panel reinforcement.
- Check the damage on the connector and wire harness.

CAUTION:

For removal and installation of the front passenger airbag assembly, see page RS-28 and RS-38 , and be sure to follow the correct procedure.

HINT:

If the instrument panel or instrument panel reinforcement is deformed or cracked, never repair it. Always replace it with a new one.

RS0RH-01

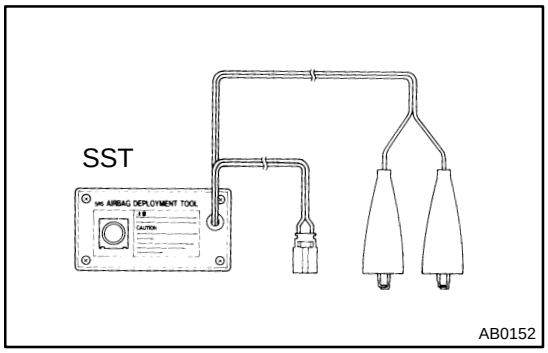
DISPOSAL

HINT:

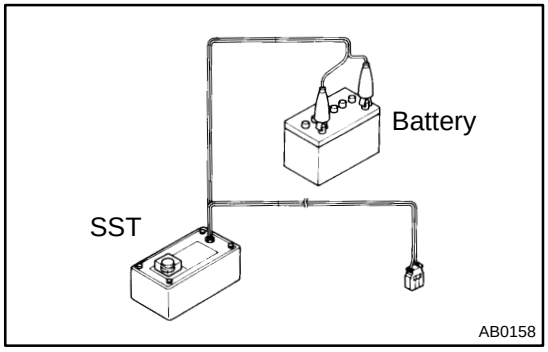
When scrapping vehicle equipped with an SRS or disposing of a front passenger airbag assembly, always first deploy the airbag in accordance with the procedure described below. If any abnormality occurs with the airbag deployment, contact the SERVICE DEPT. of TOYOTA MOTOR SALES, U.S.A., INC.

CAUTION:

- **Never dispose of a front passenger airbag assembly which has an undeployed airbag.**
- **The airbag produces a sizeable exploding sound when it deploys, so perform the operation out-of-doors and where it will not create a nuisance to nearby residents.**



- **When deploying the airbag, always use the specified SST (SRS Airbag Deployment Tool). Perform the operation in a place away from electrical noise.**
  SST 09082-00700
- **When deploying an airbag, perform the operation at least 10 m (33 ft) away from the front passenger airbag assembly.**
- **The front passenger airbag assembly is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a front passenger airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front passenger airbag assembly with the deployed airbag.**

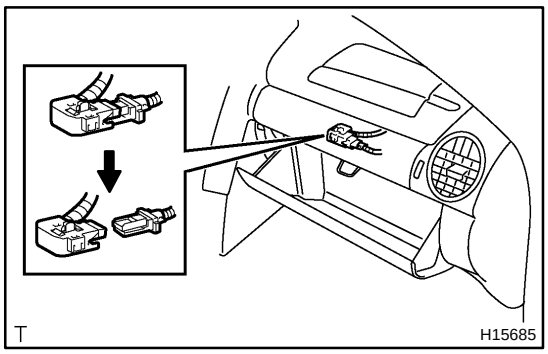


1. AIRBAG DEPLOYMENT WHEN SCRAPPING VEHICLE

HINT:

Have a battery ready as the power source to deploy the airbag.

(a) Check functioning of the SST (See page RS-17).
SST 09082-00700

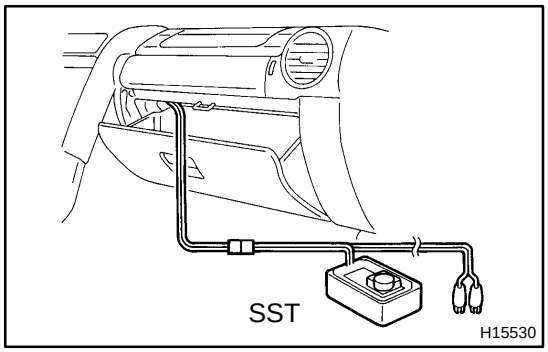


(b) Disconnect the front passenger airbag assembly connector.

Open the glove compartment door and disconnect the front passenger airbag assembly connector.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.



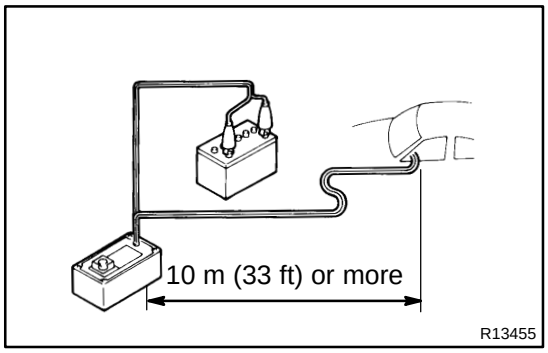
(c) Install the SST.

(1) Connect the connector of 2 SST to the front passenger airbag assembly connector.

SST 09082-00700, 09082-00760

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock.



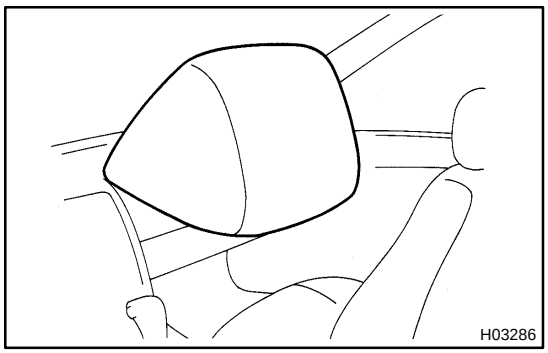
(2) Move the SST to at least 10 m (33 ft) away from the front of the vehicle.

(3) Close all the doors and windows of the vehicle.

NOTICE:

Take care not to damage the SST wire harness.

(4) Connect the SST red clip to the battery positive (+) terminal and the black clip to the negative (-) terminal.



(d) Deploy the airbag.

(1) Check that no one is inside the vehicle or within 10 m (33 ft) area around the vehicle.

(2) Press the SST activation switch and deploy the airbag.

CAUTION:

- **The front passenger airbag assembly is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a front passenger airbag assembly with deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front passenger airbag assembly with deployed airbag.**
- **When moving a vehicle for scrapping which has a front passenger airbag assembly with deployed airbag, use gloves and safety glasses.**

HINT:

The airbag deploys simultaneously as the LED of the SST activation switch light up.

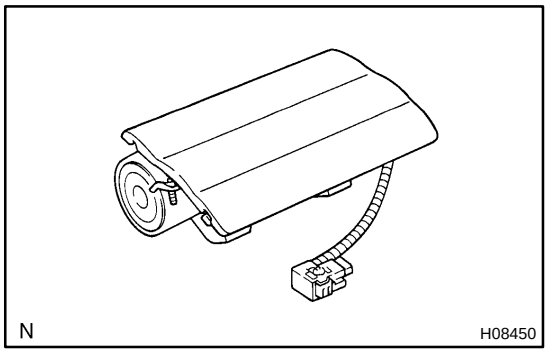
2. DEPLOYMENT WHEN DISPOSING OF FRONT PASSENGER AIRBAG ASSEMBLY ONLY

NOTICE:

- **When disposing of the front passenger airbag assembly only, never use the customer's vehicle to deploy the airbag.**
- **Be sure to follow the procedure given below when deploying the airbag.**

HINT:

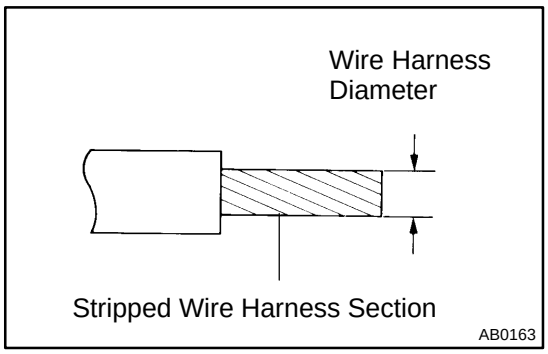
Have a battery ready as the power source to deploy the airbag.



(a) Remove the front passenger airbag assembly (See page RS-28).

CAUTION:

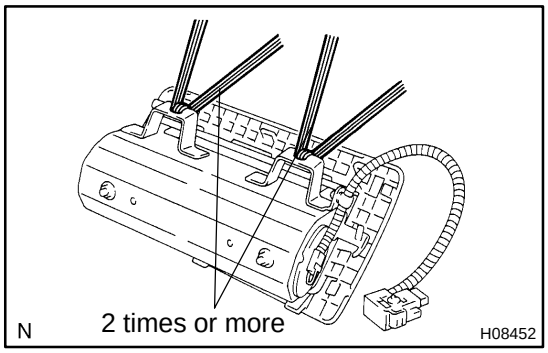
- **When removing the front passenger airbag assembly, work must be started 90 seconds after the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.**
- **When storing the front passenger airbag assembly, keep the upper surface of the airbag deployment side facing upward.**



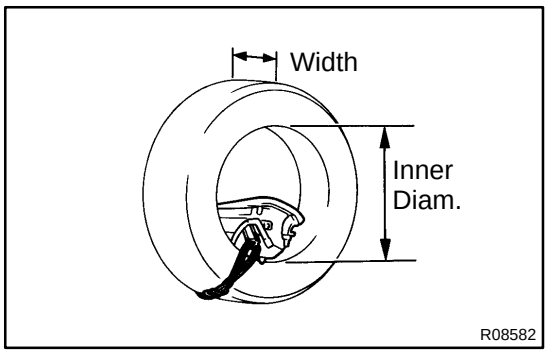
(b) Using a service-purpose wire harness for the vehicle, tie down the front passenger airbag assembly to the tire.
Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 in.^{2} or more)

CAUTION:
If the front passenger airbag assembly is tied down with too thin wire harness, it may snap. This is highly dangerous. Always use a wire harness which is at least 1.25 mm^2 (0.0019 in.^{2}).

HINT:
To calculate the square of the stripped wire harness section:
Square = 3.14 X (Diameter)^2 divided by 4



(1) Pass the wire harness through the installation holes, as shown in the illustration.

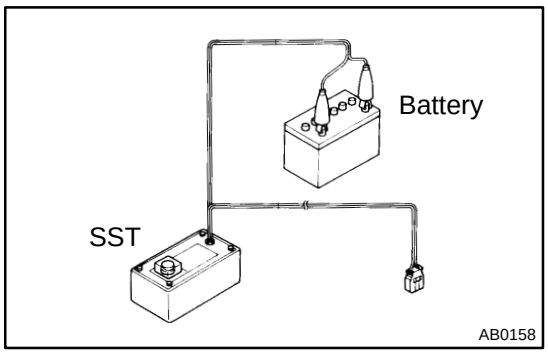


(2) Position the front passenger airbag assembly inside the tire with the airbag deployment side facing inside. Tie the front passenger airbag assembly to the tire, as shown in the illustration.

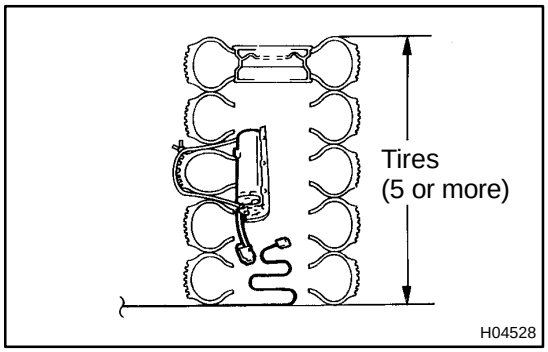
Tire size: Must exceed the following dimensions-
Width: 185 mm (7.28 in.)
Inner diameter: 360 mm (14.17 in.)

CAUTION:
- **Make sure that the wire harness is tight. It is very dangerous if looseness in the wire harness results in the front passenger airbag assembly coming free due to the shock from the airbag deploying.**
- **Always tie down the front passenger airbag assembly with the airbag deployment side facing inside.**

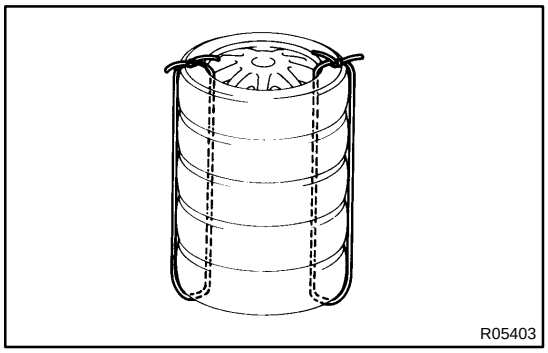
NOTICE:
The tire will be marked by the airbag deployment, so use a redundant tire.



(c) Check functioning of the SST (See step 1-(a) on page RS-14).
SST 09082-00700



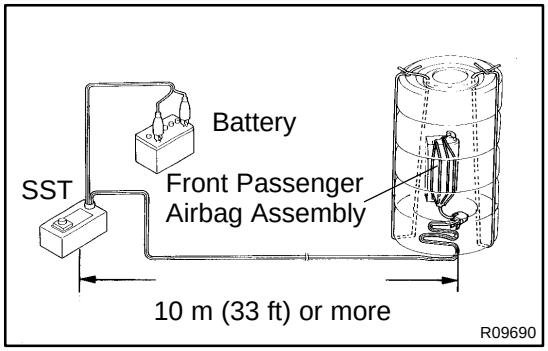
(d) Place the tires.
(1) Place at least 2 tires under the tire to which the front passenger airbag assembly is tied.
(2) Place at least 2 tires over the tire to which the front passenger airbag assembly is tied. The top tire should have the wheel installed.



(3) Tie the tires together with the 2 wire harness.

CAUTION:
Make sure that the wire harness is tight. It is very dangerous if loose wire harness result in the tires coming free due to the shock from the airbag deploying.

HINT:
Place the SST connector and wire harness inside tires. Provide at least 1 m (3 ft) of slack for the wire harness.

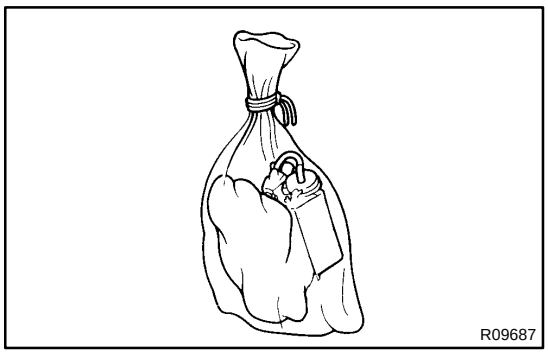


(e) Install the SST.
Connect the connector of 2 SST to the front passenger airbag assembly connector.
SST 09082-00700, 09082-00760

NOTICE:
To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock.

(f) Deploy the airbag.
(1) Connect the SST red clip to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.
(2) Check that no one is within 10 m (33 ft) area around the tire which the front passenger airbag assembly is tied to.
(3) Press the SST activation switch and deploy the airbag.

HINT:
The airbag deploys simultaneously as the LED of the SST activation switch lights up.



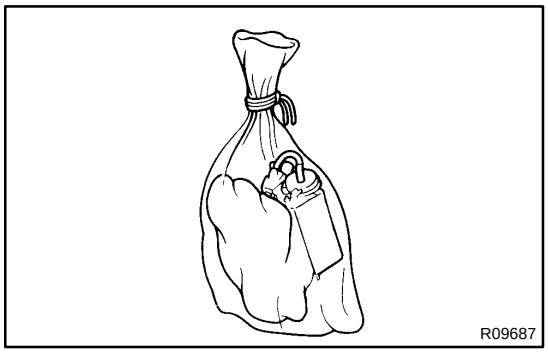
(g) Dispose of the front passenger airbag assembly.

CAUTION:

- **The front passenger airbag assembly is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a front passenger airbag assembly with deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front passenger airbag assembly with deployed airbag.**

(1) Remove the front passenger airbag assembly from the tire.

(2) Place the front passenger airbag assembly in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts.



3. DEPLOYMENT WHEN DISPOSING OF FRONT PASSENGER AIRBAG ASSEMBLY WITH AIRBAG DEPLOYED IN COLLISION

Dispose of the front passenger airbag assembly.

CAUTION:

- **The front passenger airbag assembly is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Using gloves and safety glasses when handling a front passenger airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front passenger airbag assembly with the deployed airbag.**

(1) Remove the front passenger airbag assembly from the instrument panel (See page BO-139).

(2) Place the front passenger airbag assembly in a vinyl bag, tie the end tightly and dispose of it in the same way so as other general parts disposal.

RS018-30

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the front passenger airbag assembly, instrument panel or instrument panel reinforcement.

Case	Replacing part
If the airbag has been deployed.	Front passenger airbag assembly
If the front passenger airbag assembly has been found to be faulty in trouble-shooting.	Front passenger airbag assembly
If the front passenger airbag assembly has been found to be faulty during checking items (See page RS-29).	Front passenger airbag assembly
If the instrument panel has been found to be faulty during checking items (See page RS-29).	Instrument panel
If the instrument panel reinforcement has been found to be faulty during checking items (See page RS-29).	Instrument panel reinforcement
If the front passenger airbag assembly has been dropped.	Front passenger airbag assembly

CAUTION:

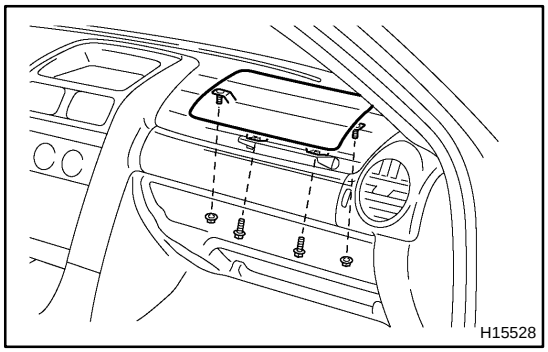
For replacement of the front passenger airbag assembly, see page RS-28 and RS-38 . Be sure to follow the correct procedure.

RS019-11

INSTALLATION

NOTICE:

Never use airbag parts from another vehicle. When replacing parts, replace them with new parts.



1. INSTALL FRONT PASSENGER AIRBAG ASSEMBLY

Connect the engagement of the claw at 10 positions and install the front passenger airbag assembly to the instrument panel with the 2 bolts and nuts.

Torque:
Bolt: 20 N·m (205 kgf·cm, 15 ft·lbf)
Nut: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

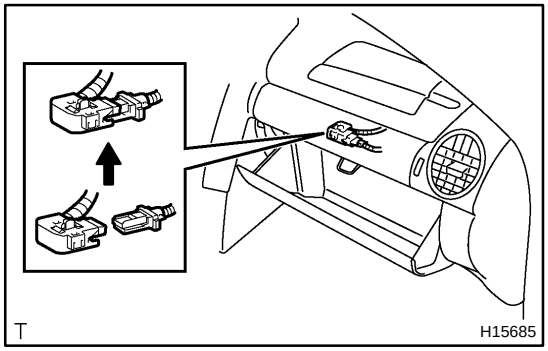
NOTICE:

- **Make sure that the front passenger airbag assembly is installed with the specified torque.**
- **When installing the front passenger airbag assembly, take care that the wiring does not interfere with other parts and is not pinched between other parts.**
- **If the front passenger airbag assembly has been dropped, or there are cracks, dents or other defects in the case or connector, replace the front passenger airbag assembly with a new one.**

2. INSTALL CENTER BRACKET

Install the center bracket with the 3 screws.

3. INSTALL GLOVE COMPARTMENT DOOR
(See page BO-149)

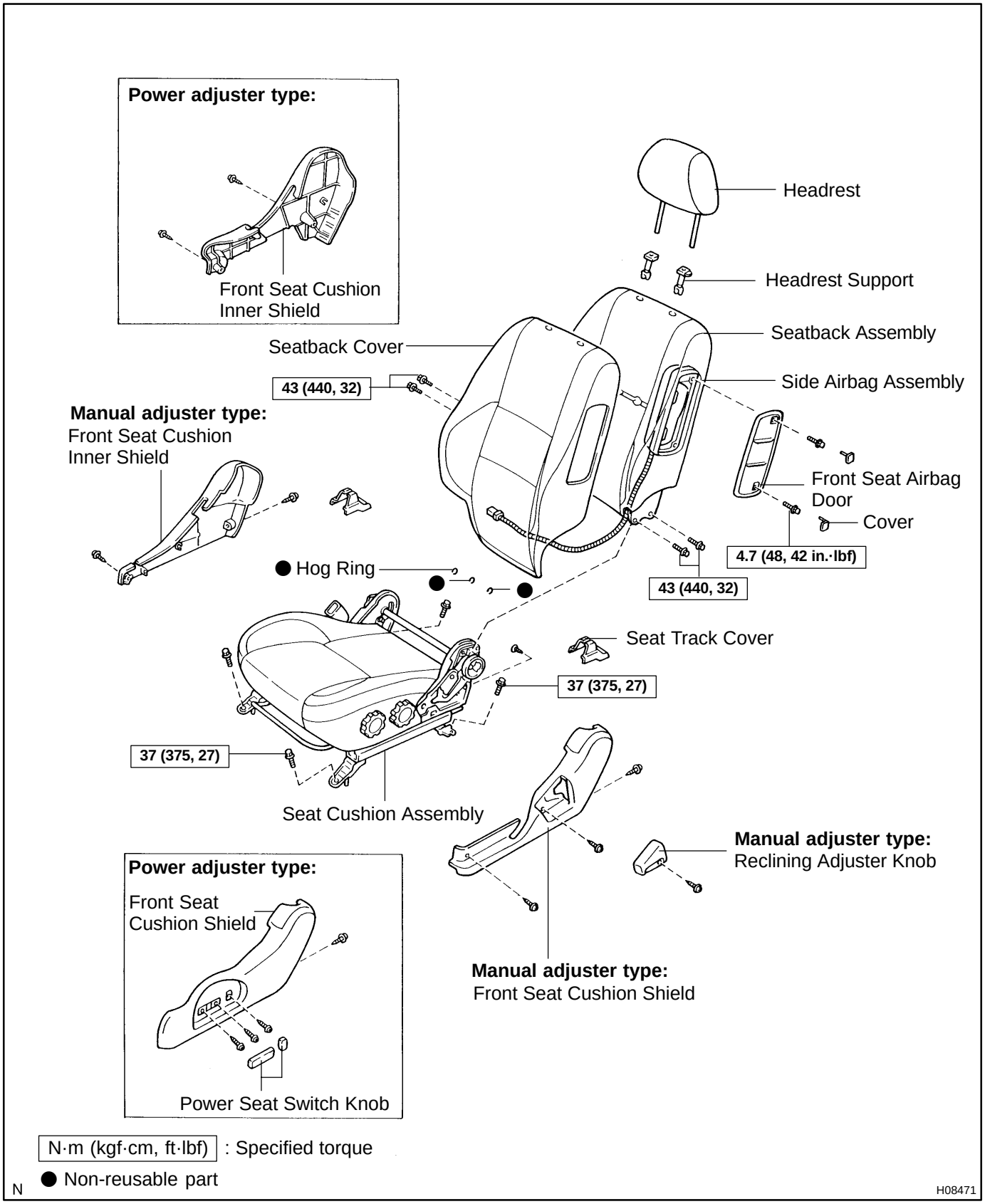


4. CONNECT FRONT PASSENGER AIRBAG ASSEMBLY CONNECTOR

SIDE AIRBAG ASSEMBLY

COMPONENTS

RS0HK-02

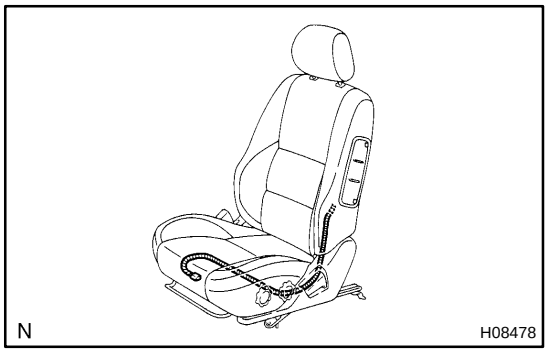


RS0HL-01

REMOVAL

NOTICE:

- **If the wiring connector of the SRS is disconnected and the ignition switch is at ON or ACC position, DTCs will be recorded.**
- **Never use the airbag parts from another vehicle. When replacing parts, replace them with new parts.**



1. REMOVE FRONT SEAT

(a) Remove the 2 seat track covers and 4 bolts.

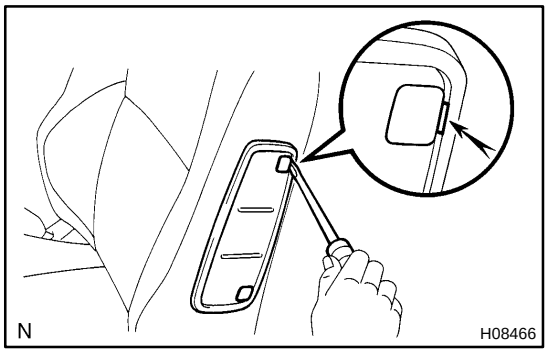
(b) Disconnect the connectors under the front seat.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.

(c) Remove the front seat.

2. REMOVE HEADREST

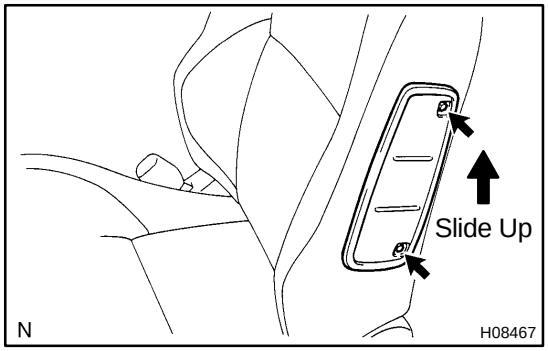


3. REMOVE FRONT SEAT AIRBAG DOOR

(a) Using a screwdriver, remove the 2 covers.

HINT:

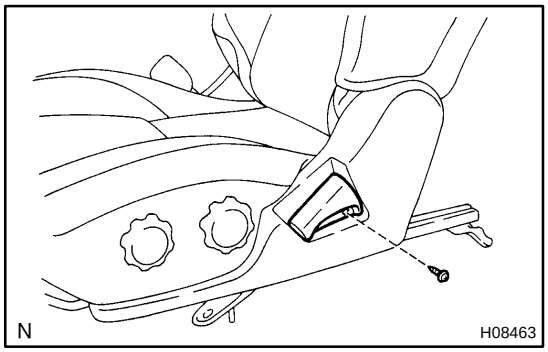
Tape the screwdriver tip before use.



(b) Remove the 2 bolts.

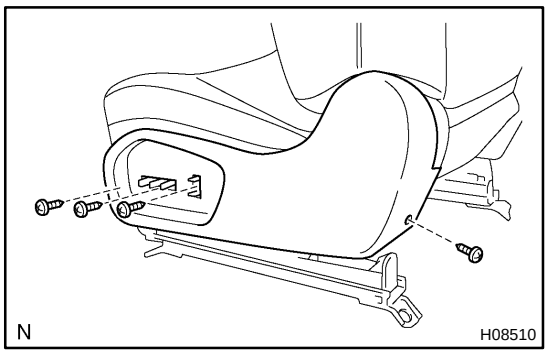
(c) Slide up the front seat airbag door and remove it.

4. Power adjuster type:
REMOVE POWER SEAT SWITCH KNOBS



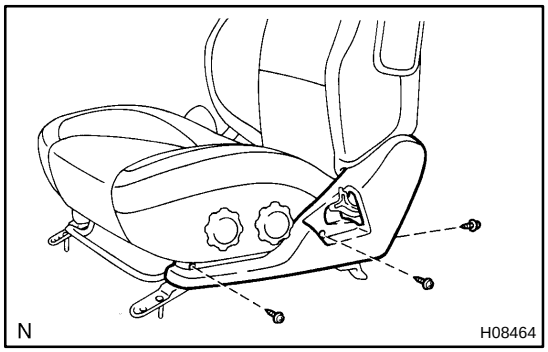
5. Manual adjuster type:
REMOVE RECLINING ADJUSTER KNOB

Remove the screw and reclining adjuster knob.



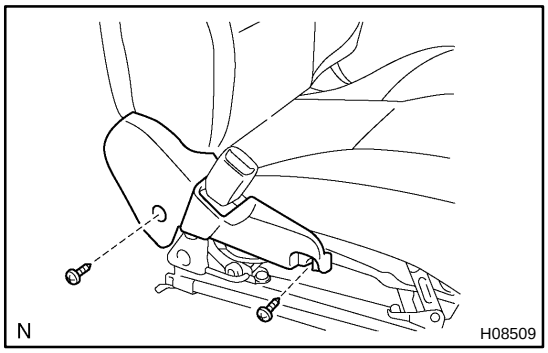
6. Power adjuster type:
REMOVE FRONT SEAT CUSHION SHIELD

Remove the 4 screws and front seat cushion shield.



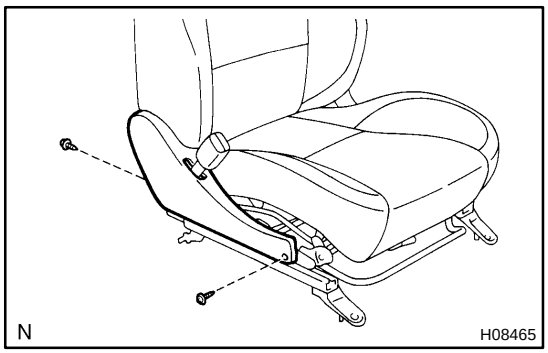
7. Manual adjuster type:
REMOVE FRONT SEAT CUSHION SHIELD

Remove the 3 screws and front seat cushion shield.



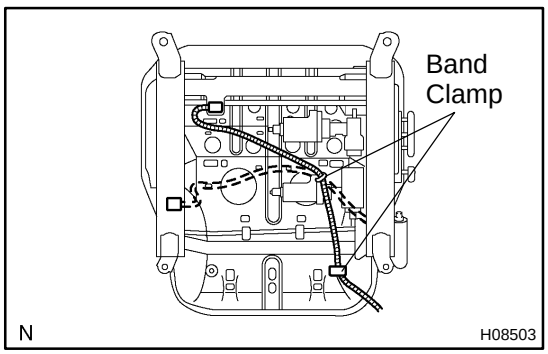
8. Power adjuster type:
REMOVE FRONT SEAT CUSHION INNER SHIELD

Remove the 2 screws and front seat cushion inner shield.



9. Manual adjuster type:
REMOVE FRONT SEAT CUSHION INNER SHIELD

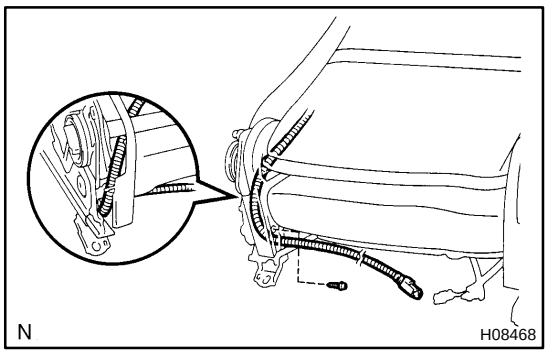
Remove the 2 screws and front seat cushion inner shield.



10. DISCONNECT WIRE HARNESS FOR SIDE AIRBAG ASSEMBLY FROM SEAT CUSHION ASSEMBLY

(a) Remove the band clamps.

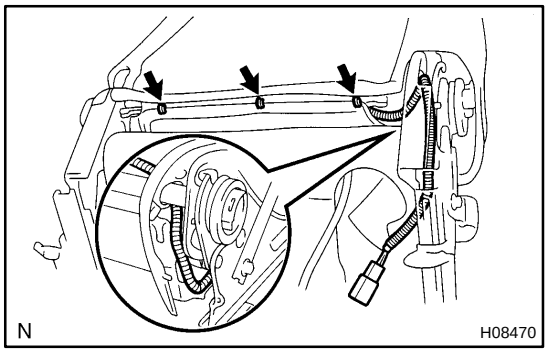
(b) Pull out the wire harness of the side airbag assembly and seat heater (w/ seat heater).



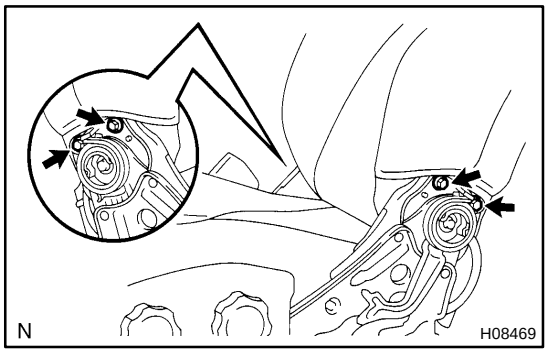
11. REMOVE SEATBACK ASSEMBLY

(a) Remove the LH reclining adjuster inside cover set screw.

(b) Disconnect the wire harness of the side airbag assembly from the LH reclining adjuster inside cover.



(c) Remove the 3 hog rings.



(d) Remove the 4 bolts and move the seatback assembly a little upward.

NOTICE:

Do not apply unnatural force to the airbag wire harness.

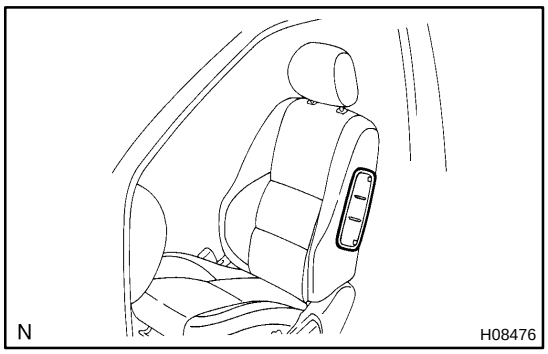
(e) Remove the seatback assembly.

NOTICE:

Take care not to let the airbag wire harness catch on the seat adjuster assembly, as this can damage the airbag wire harness.

RS05I-07

INSPECTION



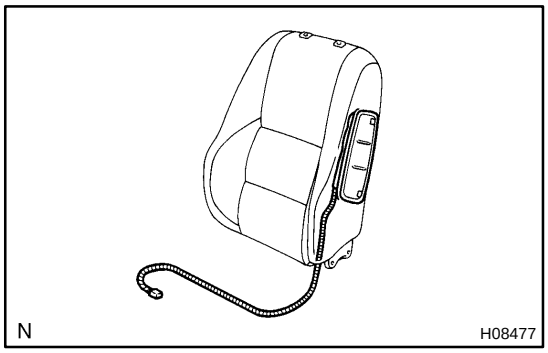
1. Vehicle not involved in collision:
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

(a) Do a diagnostic system check (See page DI-607).

(b) Do a visual check which includes the following item with the seatback assembly installed in the vehicle.
Check for cuts, minute cracks or marked discoloration of the front seat airbag door.

2. Vehicle involved in collision and airbag is not deployed:
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

(a) Do a diagnostic system check (See page DI-607).



(b) Do a visual check which includes the following items with the seatback assembly removed from the vehicle.
- Check cuts and cracks of the side airbag assembly.
- Check for cuts, minute cracks or marked discoloration of the front seat airbag door.
- Check cuts and cracks in the wire harness, and chipping in the connectors.

CAUTION:
For removal and installation of the seatback assembly, see page RS-40 and RS-52 . Be sure to follow the correct procedure.

3. Vehicle involved in collision and airbag is deployed:
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

(a) Do a diagnostic system check (See page DI-607).

(b) Do a visual check which includes the following items with the seatback assembly removed from the vehicle.
- Check the seatback installation part of the seat adjuster.
- Check the damage to the connector and wire harness.

CAUTION:
For removal and installation of the seatback assembly, see page RS-40 and RS-52 . Be sure to follow the correct procedure.

HINT:
If the seat adjuster is deformed, never repair it. Always replace it with a new one.

RS0RI-01

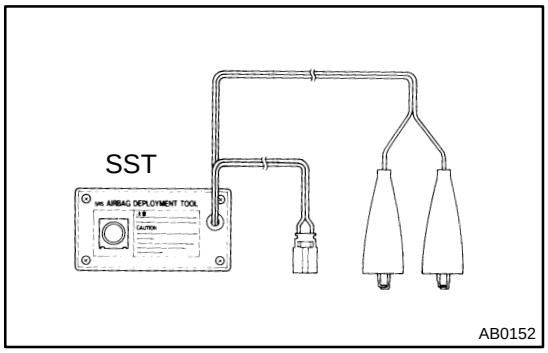
DISPOSAL

HINT:

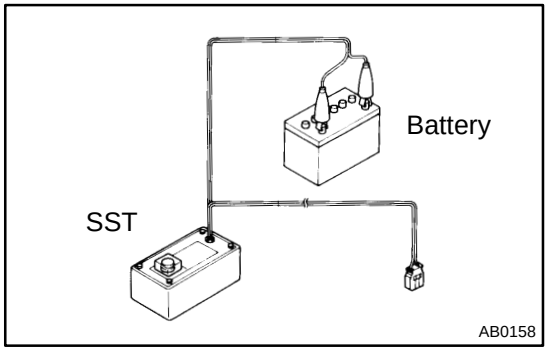
When scrapping vehicles equipped with an SRS or disposing of the side airbag assembly always first deploy the airbag in accordance with the procedure described below. If any abnormality occurs with the airbag deployment, contact the SERVICE DEPT. of TOYOTA MOTOR SALES, U.S.A., INC.

CAUTION:

- **Never dispose of a side airbag assembly which has an undeployed airbag.**
- **The airbag produces a sizeable exploding sound when it deploys, so perform the operation out of doors and where it will not create a nuisance to nearby residents.**



- **When deploying the airbag, always use the specified SST (SRS Airbag Deployment Tool), perform the operation in a place away from electrical noise.**
  SST 09082-00700
- **When deploying an airbag, perform the operation at least 10 m (33 ft) away from the airbag assembly.**
- **The side airbag assembly is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling side airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a side airbag assembly with the deployed airbag.**

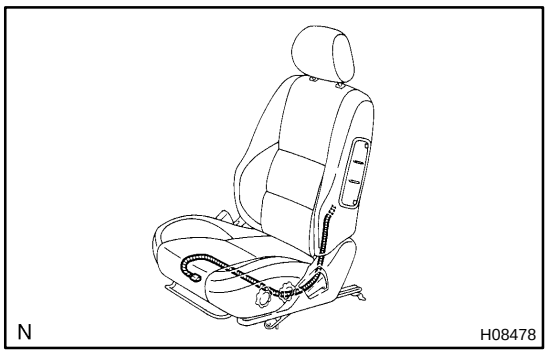


1. AIRBAG DEPLOYMENT WHEN SCRAPPING VEHICLE

HINT:

Have a battery ready as the power source to deploy the airbag.

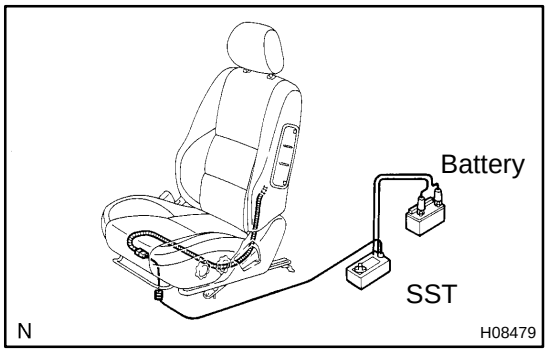
(a) Check functioning of the SST (See step 1 - (a) on page RS-17).
SST 09082-00700



(b) Disconnect the side airbag assembly connector.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.



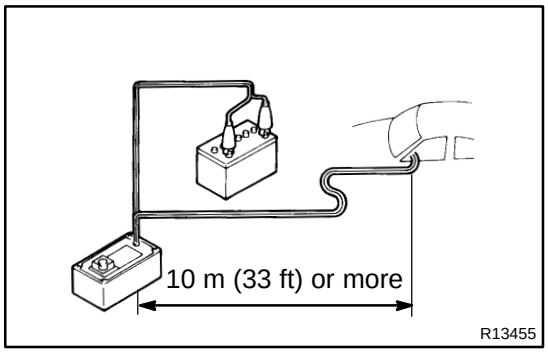
(c) Install the SST.

(1) Connect the connector of 2 SST to the side airbag assembly connector.

SST 09082-00700, 09082-00750

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock.



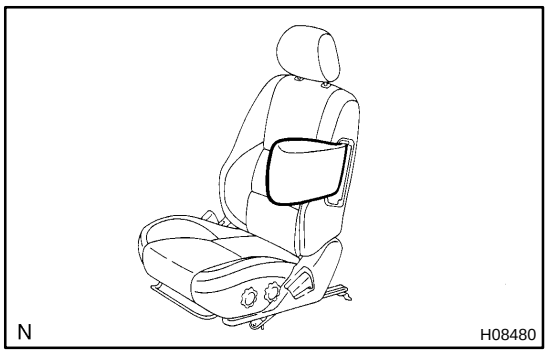
(2) Move the SST at least 10 m (33 ft) away from the front of the vehicle.

(3) Close all the doors and windows of the vehicle.

NOTICE:

Take care not to damage the SST wire harness.

(4) Connect the SST red clip to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.



(d) Deploy the airbag.

(1) Check that no one is inside the vehicle or within 10 m (33 ft) area around the vehicle.

(2) Press the SST activation switch and deploy the airbag.

CAUTION:

- **The side airbag assembly is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a side airbag assembly with the deployed airbag.**
- **Do not apply water, etc. to a side airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **When scrapping a vehicle, deploy the airbag and scrap the vehicle with the side airbag assembly still installed.**

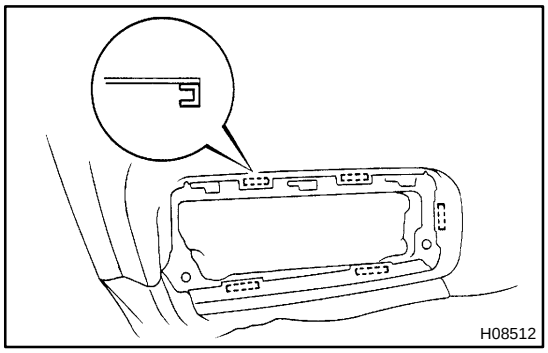
HINT:
The airbag deploys simultaneously as the LED of SST activation switch lights up.

2. DEPLOYMENT WHEN DISPOSING OF SIDE AIRBAG ASSEMBLY

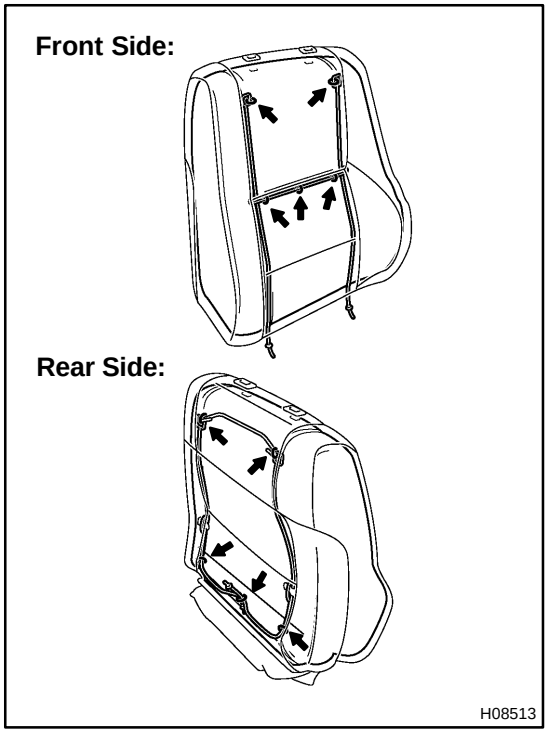
NOTICE:

- **When disposing of the side airbag assembly only, never use the customer's vehicle to deploy the airbag.**
- **Be sure to follow the procedure given below when deploying the airbag.**

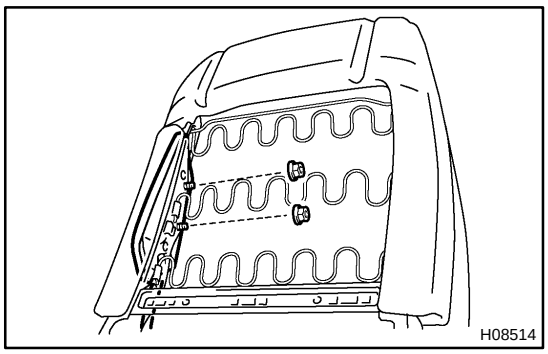
HINT:
Have a battery ready as the power source to deploy the airbag.



(a) Remove the side airbag assembly.
(1) Disengage the seatback cover hooks circumference of the side airbag assembly.



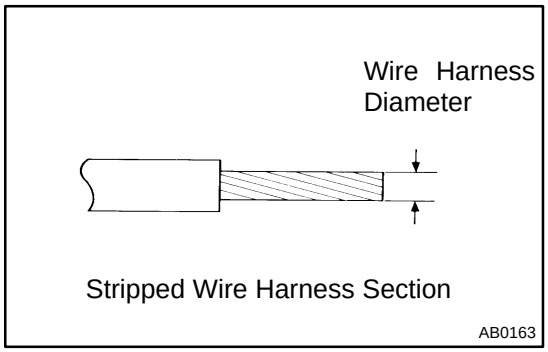
(2) Remove the 10 hog rings, headrest supports and seat back cover, as shown in the illustration.



(3) Remove the 2 nuts and side airbag assembly.

CAUTION:

When storing the side airbag assembly, keep the upper surface of the airbag deployment side facing upward.



(b) Using a service-purpose wire harness, tie down the side airbag assembly.

Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 in^2 or more)

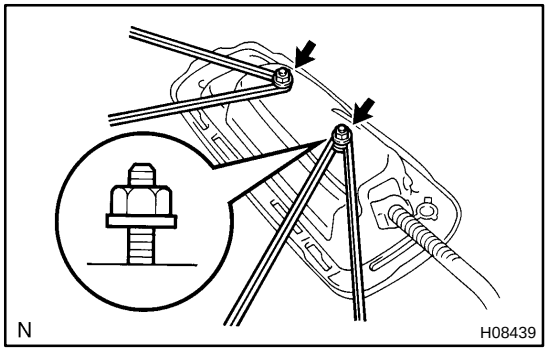
CAUTION:

If a wire harness which is too thin or some other thing is used to tie down the side airbag assembly, it may be snapped by the shock when the airbag is deployed. This is highly dangerous. Always use a wire harness for vehicle use which is at least 1.25 mm^2 (0.0019 in^2).

HINT:

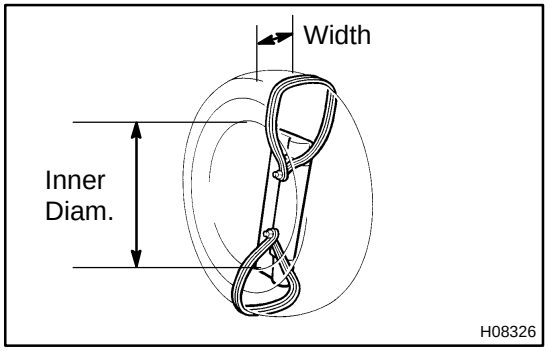
To calculate the square of the stripped wire harness section:

Square = 3.14 x (Diameter)^2 divided by 4



(1) Install the 2 nuts to the side airbag assembly.

(2) Wind the wire harness around the stud bolts of the side airbag assembly, as shown in the illustration.



(3) Position the side airbag assembly inside the tire with the airbag deployment direction facing inside. Tie the side airbag assembly to the tire, as shown in the illustration.

Tire size: Must exceed the following dimensions:-

Width: 185 mm (7.28 in.)

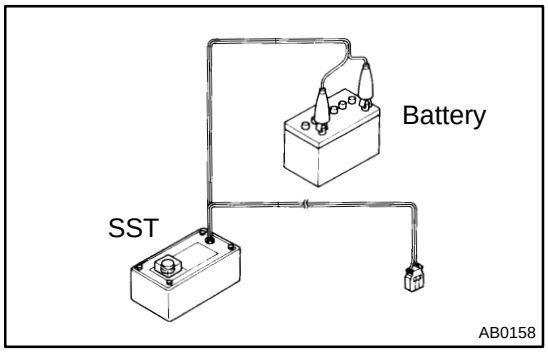
Inner diameter: 360 mm (14.17 in.)

CAUTION:

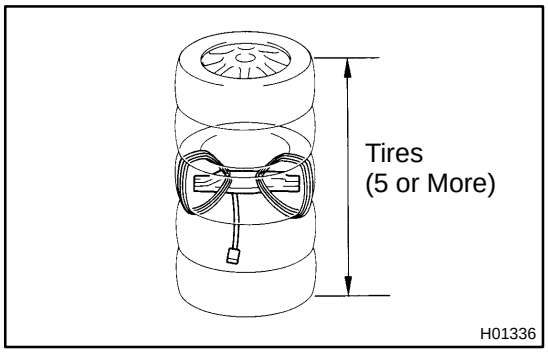
- **Make sure the wire harness is tight. It is very dangerous when a loose wire harness results in the side airbag assembly coming free due to the shock from the airbag deploying.**
- **Always tie down the side airbag assembly with the airbag deployment side facing inside.**

NOTICE:

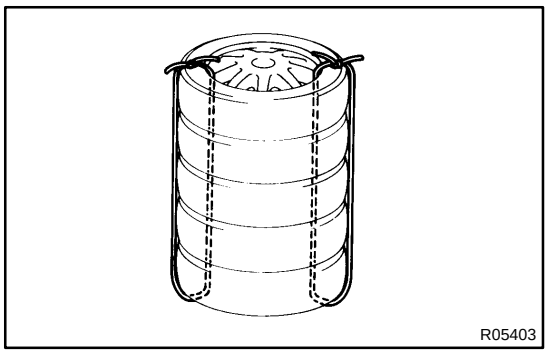
The tire will be marked by the airbag deployment, so when disposing of the airbag use a redundant tire.



(c) Check functioning of the SST
(See step 1 - (a) on page RS-17).
SST 09082-00700



(d) Place the tires.
(1) Place at least 2 tires under the tire to which the side airbag assembly is tied.
(2) Place at least 2 tires over the tire to which the side airbag assembly is tied. The top tire should have the wheel installed.



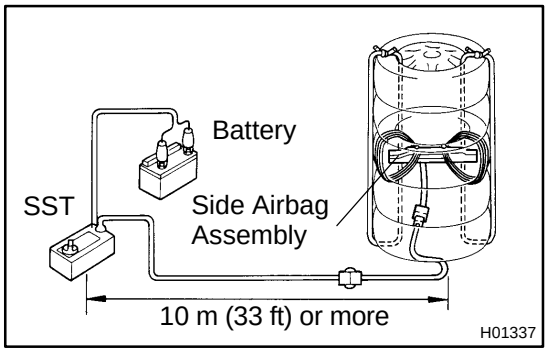
(3) Tie the tires together with the 2 wire harness.

CAUTION:

Make sure that the wire harness is tight. It is very dangerous when loose wire harness results in the tires coming free due to the shock from the airbag deploying.

HINT:

Place the SST connector and wire harness inside tires. Secure at least 1 m (3 ft) of slack for the wire harness.



(e) Install the SST.
Connect the connector of 2 SST to the side airbag assembly connector.
SST 09082-00700, 09082-00750

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock. Also, secure some slack for the SST wire harness inside the tire.

(f) Deploy the airbag.

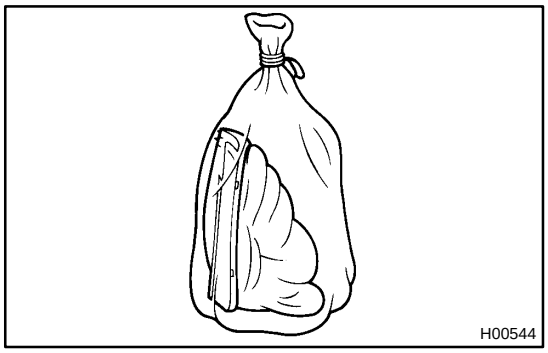
(1) Connect the SST red clip to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.

(2) Check that no one is within 10 m (33 ft) area around the tire which the side airbag assembly is tied to.

(3) Press the SST activation switch and deploy the airbag.

HINT:

The airbag deploys simultaneously as the LED of the SST activation switch lights up.



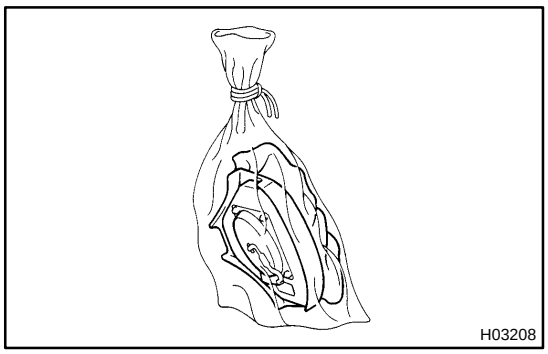
(g) Dispose of the side airbag assembly.

CAUTION:

- **The side airbag assembly is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a side airbag assembly with the deployed airbag.**
- **Do not apply water etc. to a side airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**

(1) Remove the side airbag assembly from the tire.

(2) Place the side airbag assembly in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts disposal.


H03208

3. DEPLOYMENT WHEN DISPOSING OF SIDE AIRBAG ASSEMBLY WITH AIRBAG DEPLOYED IN COLLISION

Dispose of the side airbag assembly.

CAUTION:

- **The side airbag assembly is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a side airbag assembly with deployed airbag.**
- **Do not apply water, etc. to a side airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**

(1) Remove the side airbag assembly from the seat (See step 2).

(2) Place the side airbag assembly in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts disposal.

RS05K-07

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the seatback assembly or front seat airbag door.

Case	Replacing part
If the side airbag has been deployed.	Seatback assembly
If the side airbag assembly has been found to be faulty in troubleshooting.	Seatback assembly
If the side airbag assembly has been found to be faulty during checking items (See page RS-43).	Seatback assembly
If the front seat airbag door has been found to be faulty during checking items (See page RS-43).	Front seat airbag door
If the seatback assembly has been dropped.	Seatback assembly

CAUTION:

For removal and installation of the seatback assembly, see page RS-40 and RS-52 . Be sure to follow the correct procedure.

RS0E5-03

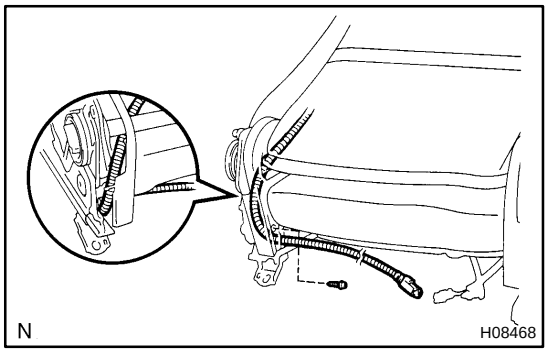
INSTALLATION

NOTICE:

Never use airbag parts from another vehicle. When replacing parts, replace them with new parts.

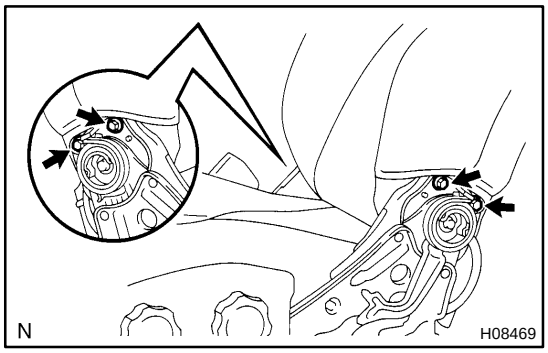
1. INSTALL SEATBACK ASSEMBLY

(a) Temporarily install the seatback assembly.



(b) Set the wire harness of the side airbag assembly to the LH reclining adjuster inside cover, as shown.

(c) Install the LH reclining adjuster inside cover set screw.

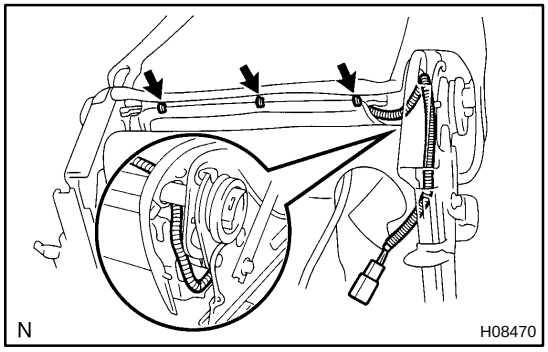


(d) Install the 4 bolts.

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

NOTICE:

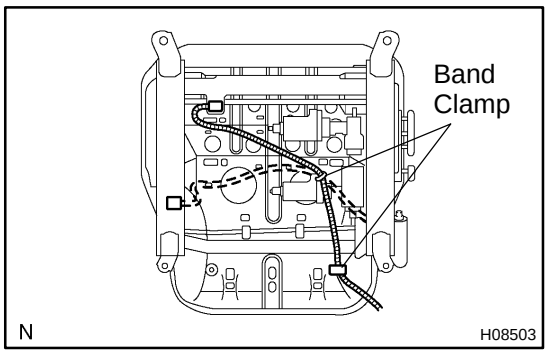
- **Make sure that the seatback assembly is installed with the specified torque.**
- **If the seatback assembly has been dropped, or there are cracks, dents or other defects in the case or connector, replace the seatback assembly with a new one.**
- **When installing the seatback assembly, take care it is not pinched between other parts.**



(e) Install 3 new hog rings, as shown in the illustration.

HINT:

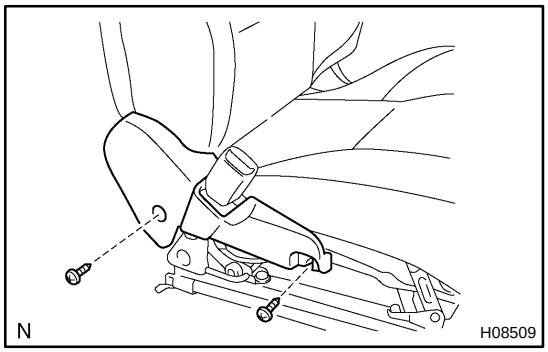
When installing the hog rings, take care to prevent wrinkles as much as possible.



2. SET WIRE HARNESS FOR SIDE AIRBAG ASSEMBLY TO SEAT CUSHION ASSEMBLY

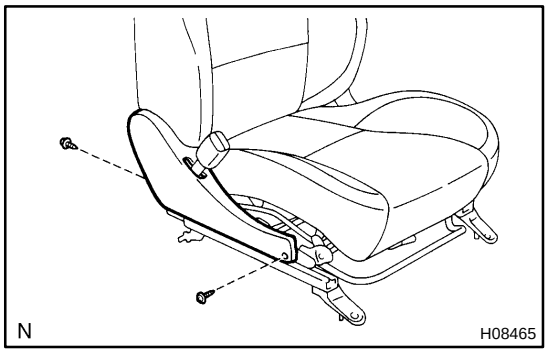
(a) Set the wire harness of the side airbag assembly and seat heater (w/ seat heater).

(b) Install the band clamps, as shown in the illustration.



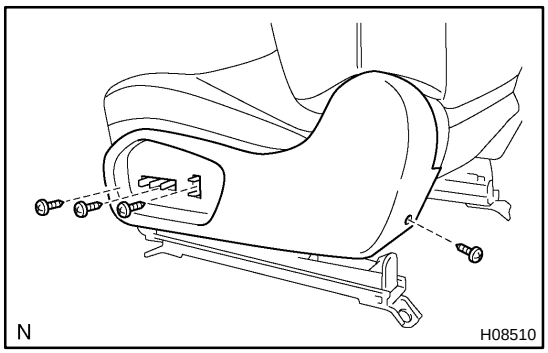
3. Power adjuster type:
INSTALL FRONT SEAT CUSHION INNER SHIELD

Install the front seat cushion inner shield with the 2 screws.



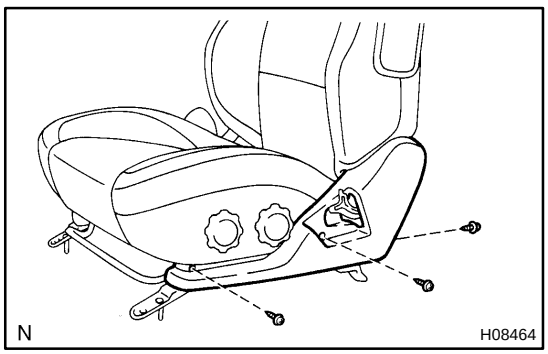
4. Manual adjuster type:
INSTALL FRONT SEAT CUSHION INNER SHIELD

Install the front seat cushion inner shield with the 2 screws.



5. Power adjuster type:
INSTALL FRONT SEAT CUSHION SHIELD

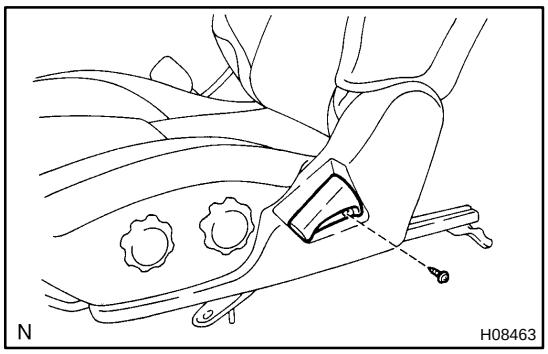
Install the front seat cushion shield with the 4 screws.



6. Manual adjuster type:
INSTALL FRONT SEAT CUSHION SHIELD

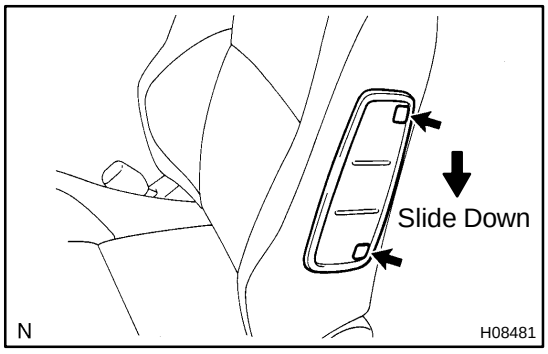
Install the front seat cushion shield with the 3 screws.

7. Power adjuster type:
INSTALL POWER SEAT SWITCH KNOBS



8. Manual adjuster type:
INSTALL RECLINING ADJUSTER KNOB

Install the reclining adjuster knob with the screw.



9. INSTALL FRONT SEAT AIRBAG DOOR

(a) Slide down the front seat airbag door and install it.

(b) Install the front seat airbag door with the 2 screws.
Torque: 4.7 N·m (48 kgf·cm, 42 in.·lbf)

10. INSTALL HEADREST

11. INSTALL FRONT SEAT

(a) Mount the front seat to the vehicle.

NOTICE:

When mounting the seat to the vehicle, take care not to damage the airbag wire harness.

(b) Connect the connectors under the front seat.

(c) Slide the front seat to the front most position.

NOTICE:

Make sure that seat adjuster locks.

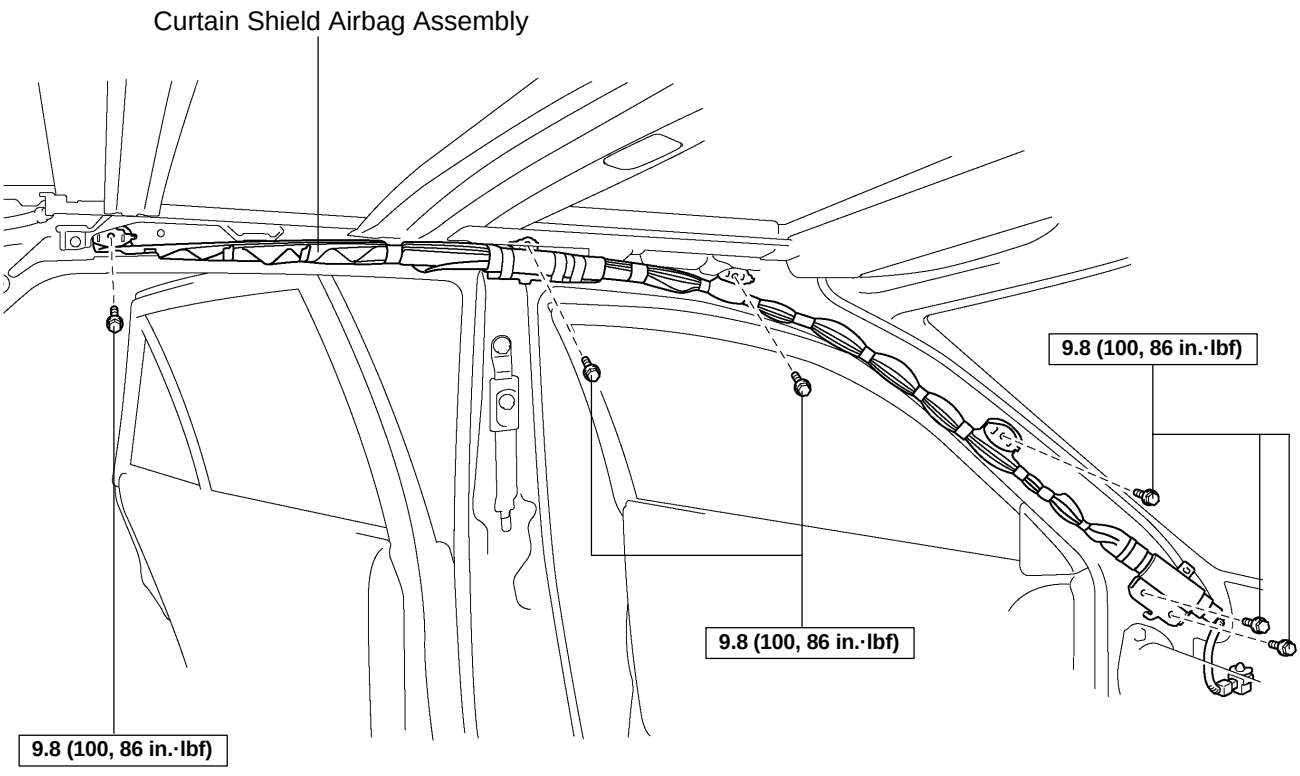
(d) Tighten the bolts on the rear side temporarily, starting from the bolt on the inner side tighten them completely.
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)

(e) Slide the seat to the rearmost position to install the bolts on the front side.
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)

CURTAIN SHIELD AIRBAG ASSEMBLY

RS0N2-07

COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

H19085

RS0UC-02

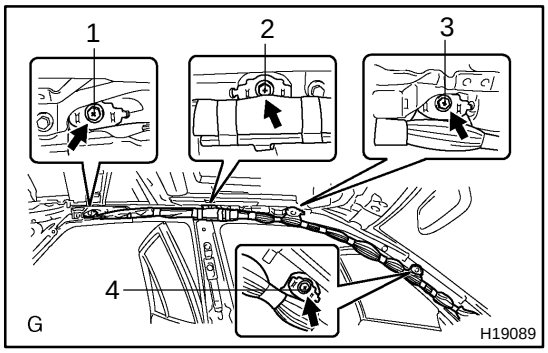
REMOVAL

NOTICE:

- **If the wiring connector of the SRS is disconnected and the ignition switch is at ON position, DTCs will be recorded.**
- **Never use any airbag parts removed from another vehicle. When replacing parts, replace them with new ones.**

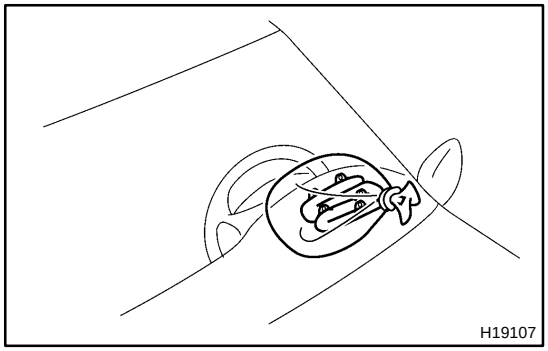
1. REMOVE ROOF HEADLINING

Pages for reference	See page
Sedan	BO-156
Wagon	BO-164



2. In case without removing inflater:
REMOVE CURTAIN SHIELD AIRBAG ASSEMBLY

(a) In the order shown in the illustration, remove the bolts and deployment section of the curtain shield airbag assembly.



(b) Put the removed curtain shield airbag assembly into a clear plastic bag and put it on the instrument panel.

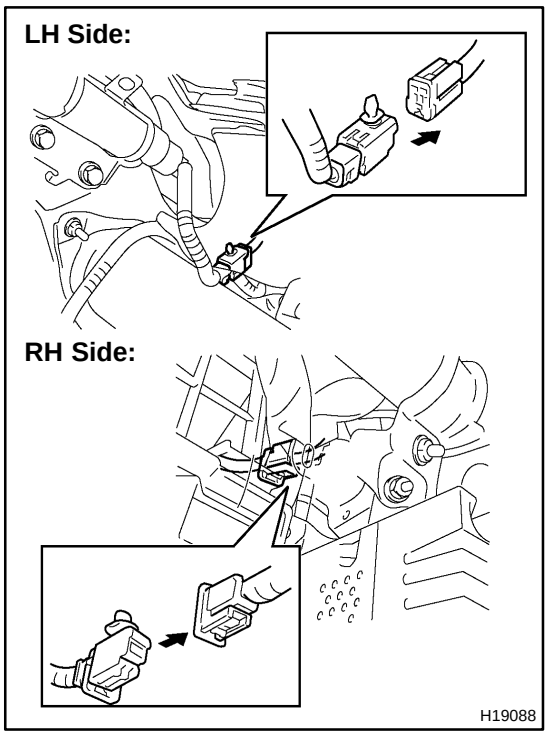
CAUTION:

Never disassemble the curtain shield airbag assembly.

NOTICE:

The clear plastic bag is not reusable.

3. REMOVE INSTRUMENT PANEL (See page BO-139)

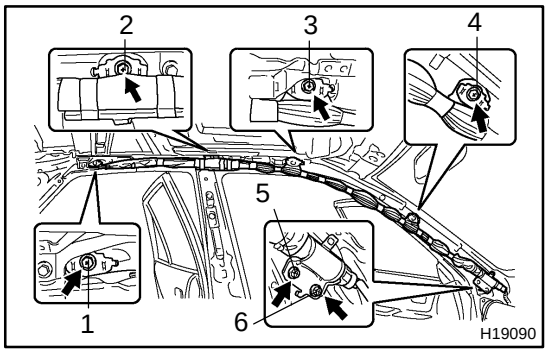


4. REMOVE CURTAIN SHIELD AIRBAG ASSEMBLY

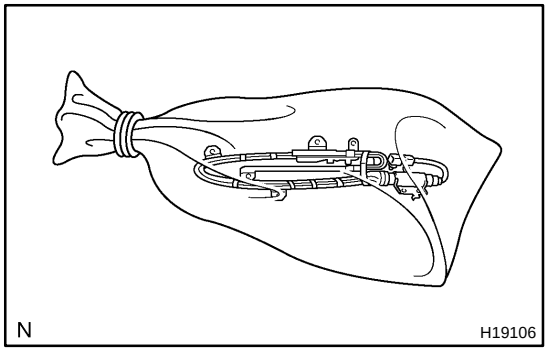
(a) Disengage the clamp and remove the curtain shield airbag assembly connector.

(b) Disconnect the connector for curtain sealed airbag assembly.

(c) Disengage the claw and disconnect the vehicle wire harness from the bracket of the curtain shield airbag assembly.



(d) In the order shown in the illustration, remove the bolts and curtain shield airbag assembly.



(e) Put the removed curtain shield airbag assembly into a clear plastic bag and keep it in a safe place.

CAUTION:

Never disassemble the curtain shield airbag assembly.

NOTICE:

The protection bag is not reusable.

RS0UD-02

INSPECTION

1. Vehicles not involved in collision:
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

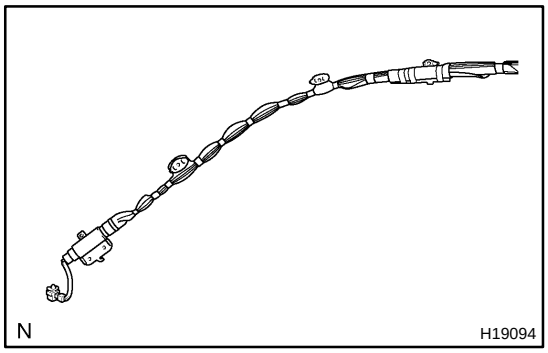
(a) Perform a diagnostic system check (See page DI-607).

(b) Perform a visual check which includes the following item with the curtain shield airbag assembly installed in the vehicle.

Check for cuts, minute cracks or marked discoloration on the front pillar garnish and roof headlining.

2. Vehicle involved in a collision and airbag is not deployed:
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

(a) Perform a diagnostic system check (See page DI-607).



(b) Perform a visual check which includes the following items with the curtain shield airbag assembly removed from the vehicle.

- Check for cuts, tears and cracks, or marked discoloration of the curtain shield airbag assembly.
- Check for cuts and cracks in wire harness, and chipping in connectors.

CAUTION:
For removal and installation of the curtain shield airbag assembly, see page RS-56 and RS-66 . Be sure to follow the correct procedure.

3. Vehicle involved in a collision and airbag is deployed:
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

(a) Perform a diagnostic system check (See page DI-607).

(b) Perform a visual check which includes the following items with the curtain shield airbag assembly removed from the vehicle.

- Check for deformation or cracks on the body part to where the curtain shield airbag installed.
- Check for damage of the connector and wire harness.

HINT:
If the body part is deformed or cracked, replace it.

RS0N5-08

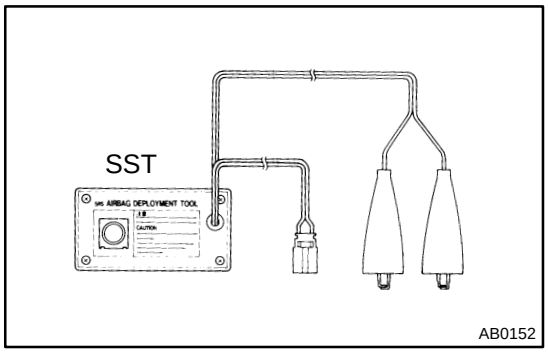
DISPOSAL

HINT:

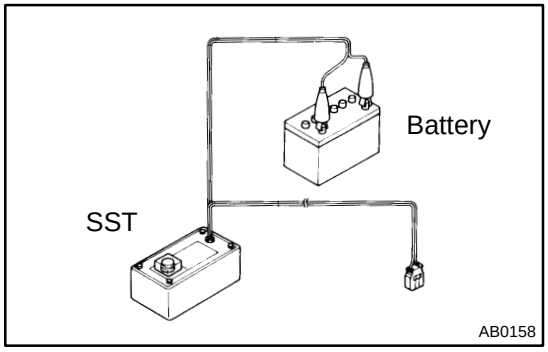
When scrapping vehicles equipped with an SRS or disposing of the curtain shield airbag assembly always first deploy the airbag in accordance with the procedure described below. If any abnormality occurs with the airbag deployment, contact the SERVICE DEPT. of TOYOTA MOTOR SALES, U.S.A., INC.

CAUTION:

- **Never dispose of a curtain shield airbag assembly which has an undeployed airbag.**
- **The airbag produces a sizeable exploding sound when it deploys, so perform the operation out-of-doors and where it will not create a nuisance to nearby residents.**



- **When deploying the airbag, always use the specified SST (SRS Airbag Deployment Tool), perform the operation in a place away from electrical noise.**
  SST 09082-00700
- **When deploying an airbag, perform the operation at least 10 m (33 ft) away from the airbag assembly.**
- **The side airbag assembly is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling side airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a side airbag assembly with the deployed airbag.**



1. AIRBAG DEPLOYMENT WHEN SCRAPPING VEHICLE

HINT:

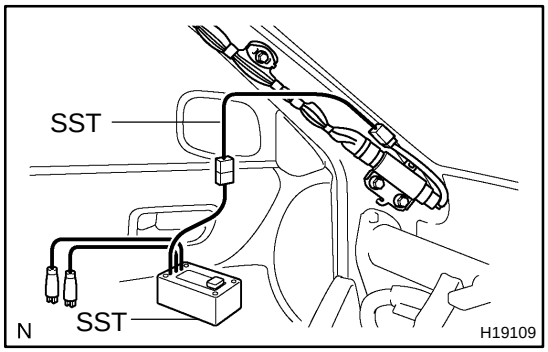
Have a battery ready as the power source to deploy the airbag.

(a) Check functioning of the SST (See step 1-(a) on page RS-17).
SST 09082-00700

(b) Disconnect the curtain shield airbag connector.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.



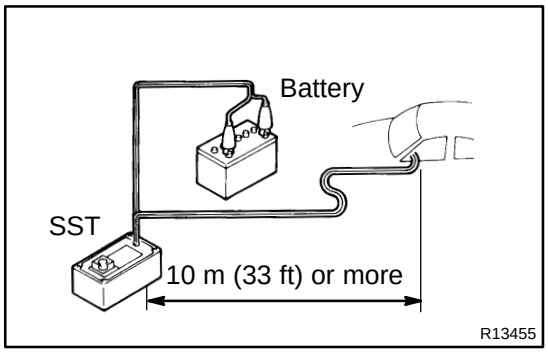
(c) Install the SST.

(1) Connect the connectors of the 2 SST to the airbag connector.

SST 09082-00700, 09082-00760

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock.



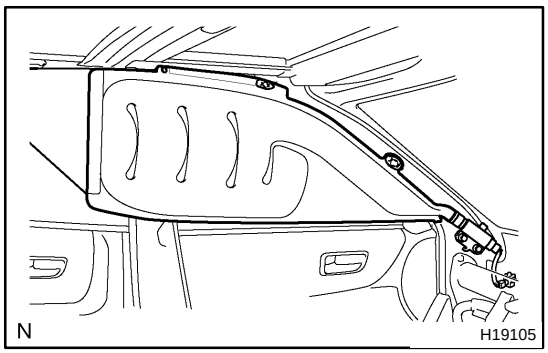
(2) Move the SST at least 10 m (33 ft) away from the front of the vehicle.

(3) Close all the doors and windows of the vehicle.

NOTICE:

Take care not to damage the SST wire harness.

(4) Connect the SST red clip to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.



(d) Deploy the airbag.

(1) Check that no one is inside the vehicle or within 10 m (33 ft) area around the vehicle.

(2) Press the SST activation switch and deploy the airbag.

CAUTION:

- **The curtain shield airbag assembly is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling the curtain shield airbag assembly with the deployed airbag.**
- **Do not apply water, etc. to the curtain shield airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**
- **When scrapping a vehicle, deploy the airbag and scrap the vehicle with the curtain shield airbag assembly still installed.**

2. DEPLOYMENT WHEN DISPOSING OF CURTAIN SHIELD AIRBAG ASSEMBLY

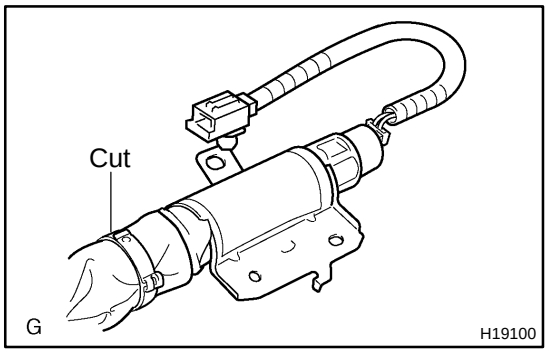
NOTICE:

- **When disposing of the curtain shield airbag assembly only, never use the customer's vehicle to deploy the airbag.**
- **Be sure to follow the procedure given below when deploying the airbag.**

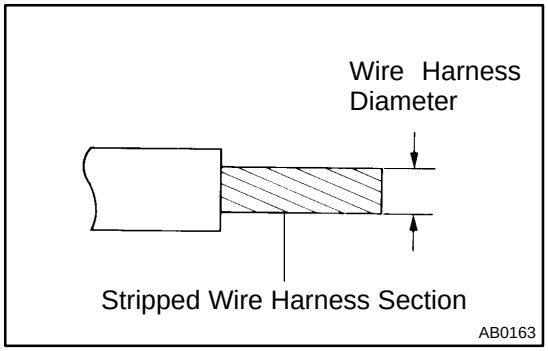
HINT:

Have a battery ready as the power source to deploy the airbag.

(a) Remove the curtain shield airbag assembly (See page RS-56).



(b) Cut off the deployment section in airbag from inflator.



(c) Using a service-purpose wire harness, tie down the curtain shield airbag assembly to the tire.

Wire harness: Stripped wire harness section 1.25 mm^2 or more (0.0019 in^2. or more)

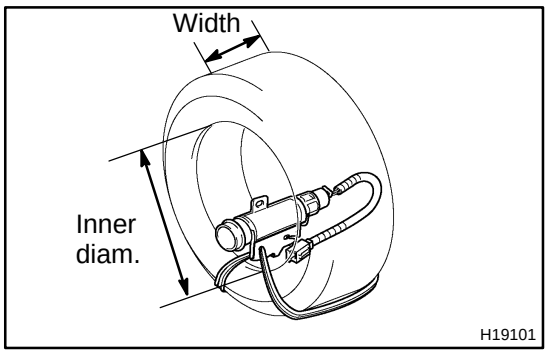
CAUTION:

If a wire harness which is too thin or some other thing is used to tie down the side airbag assembly, it may be snapped by the shock when the airbag is deployed. This is highly dangerous. Always use a wire harness for vehicle use which is at least 1.25 mm^2 (0.0019 in^2.).

HINT:

To calculate the square of the stripped wire harness section-

Square = 3.14 x $(Diameter)^2$ divided by 4

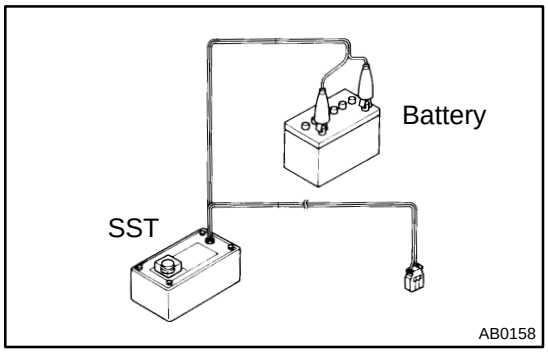


Position the curtain shield airbag assembly inside the tire with the airbag deployment direction facing inside.

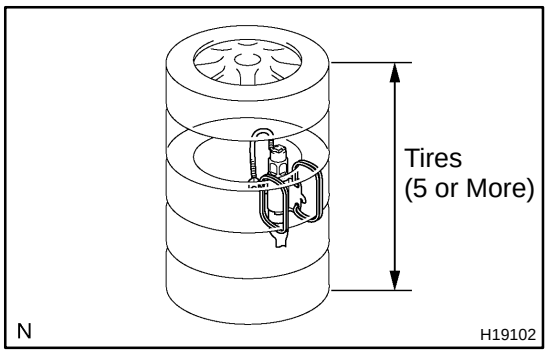
Tire size: Must exceed the following dimensions-
Width: 185 mm (7.28 in.)
Inner diameter: 360 mm (14.17 in.)

CAUTION:
Make sure the wire harness is tight. It is very dangerous when a loose wire harness results in the curtain shield airbag assembly coming free due to the shock from the airbag deploying.

NOTICE:
The tire will be marked by the airbag deployment, so when disposing of the airbag use a redundant tire.



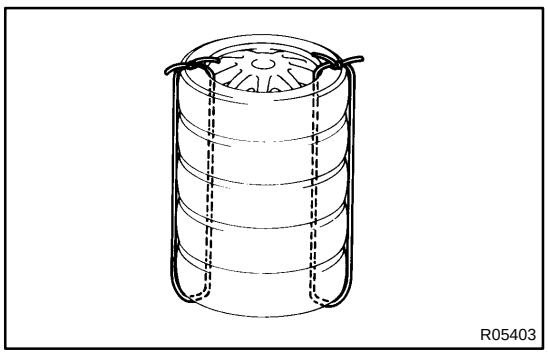
(d) Check functioning of the SST (See step 1-(a) on page RS-17).
SST 09082-00700



(e) Place the tires.

CAUTION:
Place the tire so that the deployment direction of the curtain shield airbag will be downward.

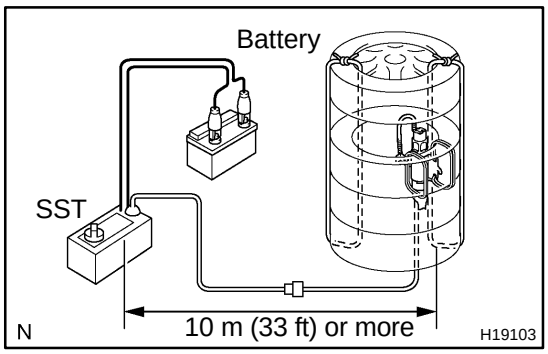
(1) Place at least 2 tires under the tire to which the side airbag assembly is tied.
(2) Place at least 2 tires over the tire to which the side airbag assembly is tied. The top tire should have the wheel installed.



(3) Tie the tires together with 2 wire harness.

CAUTION:
Make sure that the wire harness are tight. It is very dangerous when loose wire harness results in the tires coming free due to the shock from the airbag deploying.

HINT:
Place the SST connector and wire harness inside tires. Secure at least 1 m (3 ft) of slack for the wire harness.



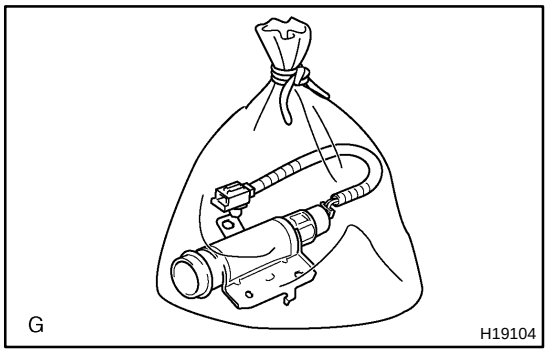
(f) Install the SST.
Connect the connectors of the 2 SST to the curtain shield airbag assembly connector.
SST 09082-00700, 09082-00760

NOTICE:

To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock. Also, secure some slack for the SST wire harness inside the tire.

(g) Deploy the airbag.
(1) Connect the SST red clip to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.
(2) Check that no one is within 10 m (33 ft) area around the tire which the side airbag assembly is tied to.
(3) Press the SST activation switch and deploy the airbag.

HINT:
The airbag deploys simultaneously as the LED of the SST activation switch lights up.

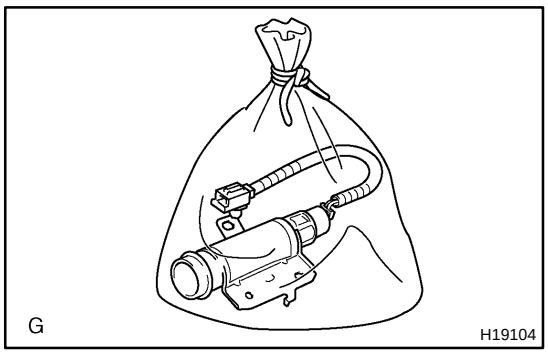


(h) Dispose of the curtain shield airbag assembly.

CAUTION:

- **The curtain shield airbag assembly is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a curtain shield airbag assembly with the deployed airbag.**
- **Do not apply water etc. to a curtain shield airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**

(1) Remove the curtain shield airbag assembly from the tire.
(2) Place the curtain shield airbag assembly in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts disposal.



3. DEPLOYMENT WHEN DISPOSING OF SIDE AIRBAG ASSEMBLY WITH AIRBAG DEPLOYED IN COLLISION

Dispose of the curtain shield airbag assembly.

CAUTION:

- **The curtain shield airbag assembly is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.**
- **Use gloves and safety glasses when handling a curtain shield airbag assembly with the deployed airbag.**
- **Do not apply water etc. to a curtain shield airbag assembly with the deployed airbag.**
- **Always wash your hands with water after completing the operation.**

(1) Remove the curtain shield airbag assembly (See page RS-56).

(2) Place the curtain shield airbag assembly in a vinyl bag, tie the end tightly and dispose of it in the same way as other general parts disposal.

RS0N6-04

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the curtain shield airbag assembly, front pillar garnish and/or roof headlining.

Case	Part to be replaced
If the curtain shield airbag has been deployed.	Curtain shield airbag assembly
If the curtain shield airbag assembly has been found to be faulty in trouble-shooting.	Curtain shield airbag assembly
If the curtain shield airbag assembly has been found to be faulty during checking items (See page RS-58).	Curtain shield airbag assembly
If the front pillar garnish has been found to be faulty during the check (See page RS-58).	Front pillar garnish
If the roof headlining has been found to be faulty during the check (See page RS-58).	Roof headlining
If the curtain shield airbag assembly has been dropped.	Curtain shield airbag assembly

CAUTION:

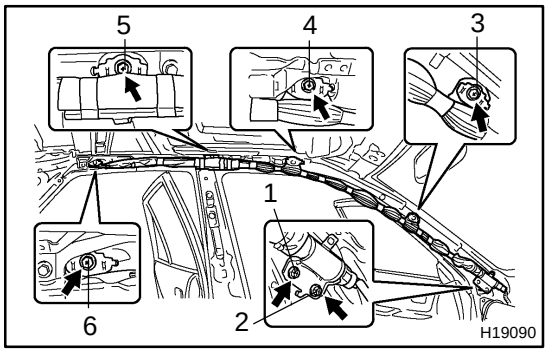
For removal and installation of the curtain shield airbag assembly, see page RS-56 and RS-66 . Be sure to follow the correct procedure.

RS0N7-05

INSTALLATION

NOTICE:

Never use airbag parts removed from another vehicle. When replacing parts, replace them with new parts.



1. INSTALL CURTAIN SHIELD AIRBAG ASSEMBLY

(a) In order shown in the illustration, install the curtain shield airbag assembly with the 6 bolts.

Torque: 9.8 N·m (100 kgf·cm, 86 in.·lbf)

CAUTION:

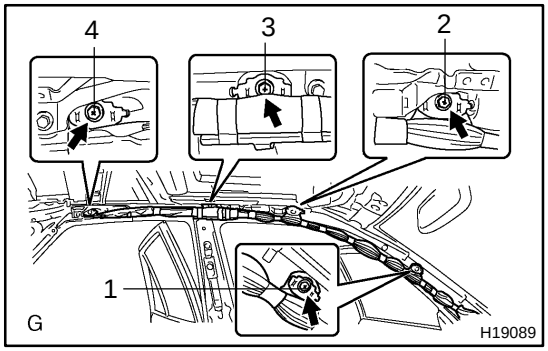
Pay attention not to twist the deployment section of the curtain shield airbag assembly.

NOTICE:

- **Make sure that the curtain shield airbag assembly is installed with the specified torque.**
- **If the curtain shield airbag assembly has been dropped, or any cracks, dents or other defects in the case or connector, replace the curtain shield airbag assembly with a new one.**
- **When installing the curtain shield airbag assembly, be careful to prevent it from being pinched between other parts.**

(b) Connect the connector of the curtain shield airbag assembly.

2. INSTALL INSTRUMENT PANEL (See page BO-149)



3. When inflator is installed:

INSTALL CURTAIN SHIELD AIRBAG ASSEMBLY

In order shown in the illustration, install the deployment section of the curtain shield airbag assembly with the 4 bolts.

Torque: 9.8 N·m (100 kgf·cm, 86 in.·lbf)

CAUTION:

Pay attention not to twist it.

NOTICE:

- **Make sure that the curtain shield airbag assembly is installed with the specified torque.**
- **When installing the curtain shield airbag assembly, be careful to prevent it from being pinched between other parts.**

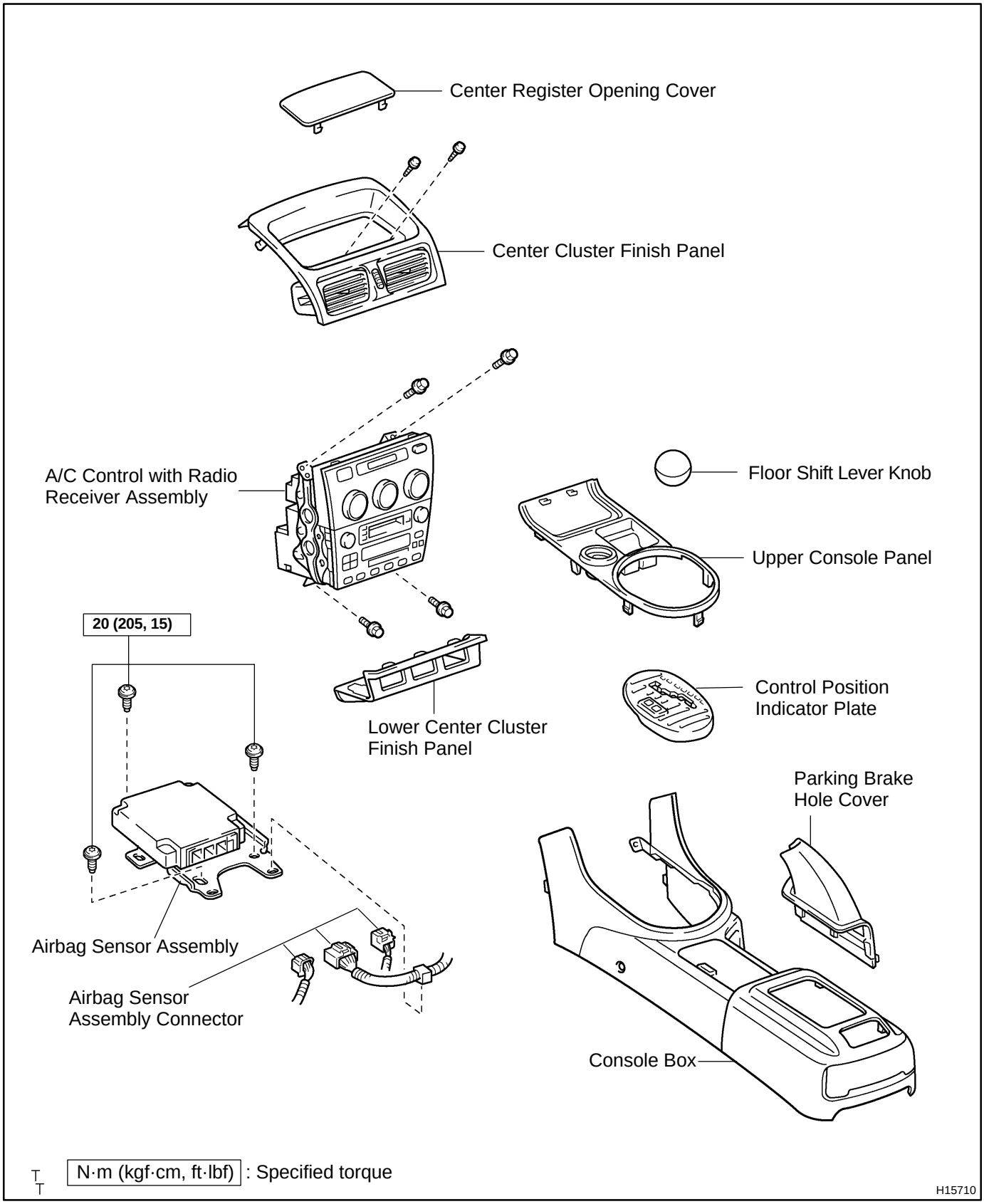
4. INSTALL ROOF HEADLINING

Pages for reference	See page
Sedan	BO-160
Wagon	BO-169

AIRBAG SENSOR ASSEMBLY

RS01G-31

COMPONENTS



RS0EY-13

REMOVAL

NOTICE:

Do not open the cover or the case of the ECU and various electrical devices unless absolutely necessary.

(If the IC terminals are touched, the IC may be destroyed by static electricity.)

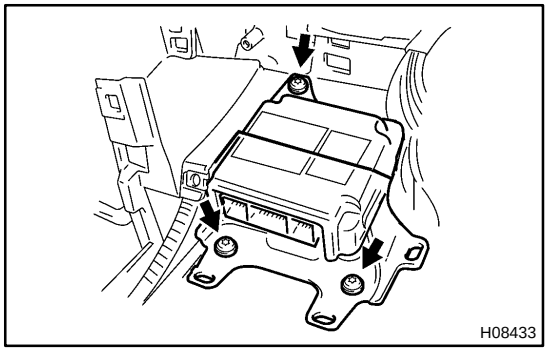
HINT:

For step 1 to 8, refer to page BO-139 .

1. **REMOVE FLOOR SHIFT LEVER KNOB**
2. **REMOVE UPPER CONSOLE PANEL**
3. **REMOVE CENTER REGISTER OPENING COVER**
4. **REMOVE CENTER CLUSTER FINISH PANEL**
5. **REMOVE LOWER CENTER CLUSTER FINISH PANEL**
6. **REMOVE A/C CONTROL WITH RADIO RECEIVER ASSEMBLY**
7. **REMOVE PARKING BRAKE HOLE COVER**
8. **REMOVE CONSOLE BOX**
9. **REMOVE CONTROL POSITION INDICATOR PLATE**

(a) Disconnect the connector.

(b) Disconnect the engagement of the claw at 4 positions and remove the control position indicator plate.



10. **REMOVE AIRBAG SENSOR ASSEMBLY**

(a) Disconnect the 3 airbag sensor assembly connectors.

NOTICE:

Disconnect the connectors with the sensor assembly installed.

(b) Using a torx wrench, remove the 3 screws and airbag sensor assembly.

Torx wrench: T40 (Part No.09042-00020 or locally manufactured tool)

RS05T-04

INSPECTION

1. Vehicle not involved in collision:
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

Do a diagnostic system check (See page DI-607).

2. Vehicle involved in collision and airbag is not deployed:
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

Do a diagnostic system check (See page DI-607).

3. Vehicle involved in collision and airbag is deployed:
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

Replace the airbag sensor assembly (See page RS-68).

RS01J-13

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the airbag sensor assembly.

- If the SRS has been deployed in a collision.
- If the airbag sensor assembly has been found to be faulty in troubleshooting.
- If the airbag sensor assembly has been dropped.

CAUTION:

For removal and installation of the airbag sensor assembly, see page RS-68 and RS-71 . Be sure to follow the correct procedure.

RS0EZ-13

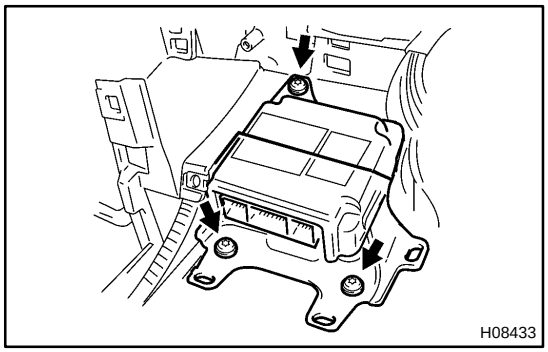
INSTALLATION

NOTICE:

- **Never use SRS parts from another vehicle. When replacing parts, replace them with new parts.**
- **Never reuse the airbag sensor assembly involved in a collision when the airbag has deployed.**
- **Never repair a sensor in order to reuse it.**

HINT:

For step 3 to 10, refer to page BO-149 .



1. INSTALL AIRBAG SENSOR ASSEMBLY

(a) Using a torx wrench, install the airbag sensor assembly with the 3 screws.

Torx wrench: T40 (Part No.09042-00020 or locally manufactured tool)

Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)

(b) Connect the 3 airbag sensor assembly connectors.

NOTICE:

- **Connection of the connector is done after the sensor assembly has been installed.**
- **Make sure the sensor assembly is installed with the specified torque.**
- **If the sensor assembly has been dropped, or there are cracks, dents or other defects in the case, bracket or connector, replace the sensor assembly with a new one.**
- **When installing the sensor assembly, take care that the SRS wiring does not interfere with other parts and is not pinched between other parts.**
- **After installing, shake the sensor assembly to check that there is no looseness.**

2. INSTALL CONTROL POSITION INDICATOR PLATE

(a) Connect the engagement of the claw at 4 positions and install the control position indicator plate.

(b) Connect the connector.

3. INSTALL CONSOLE BOX

4. INSTALL PARKING BRAKE HOLE COVER

5. INSTALL A/C CONTROL WITH RADIO RECEIVER ASSEMBLY

6. INSTALL LOWER CENTER CLUSTER FINISH PANEL

7. INSTALL CENTER CLUSTER FINISH PANEL

8. INSTALL CENTER REGISTER OPENING COVER

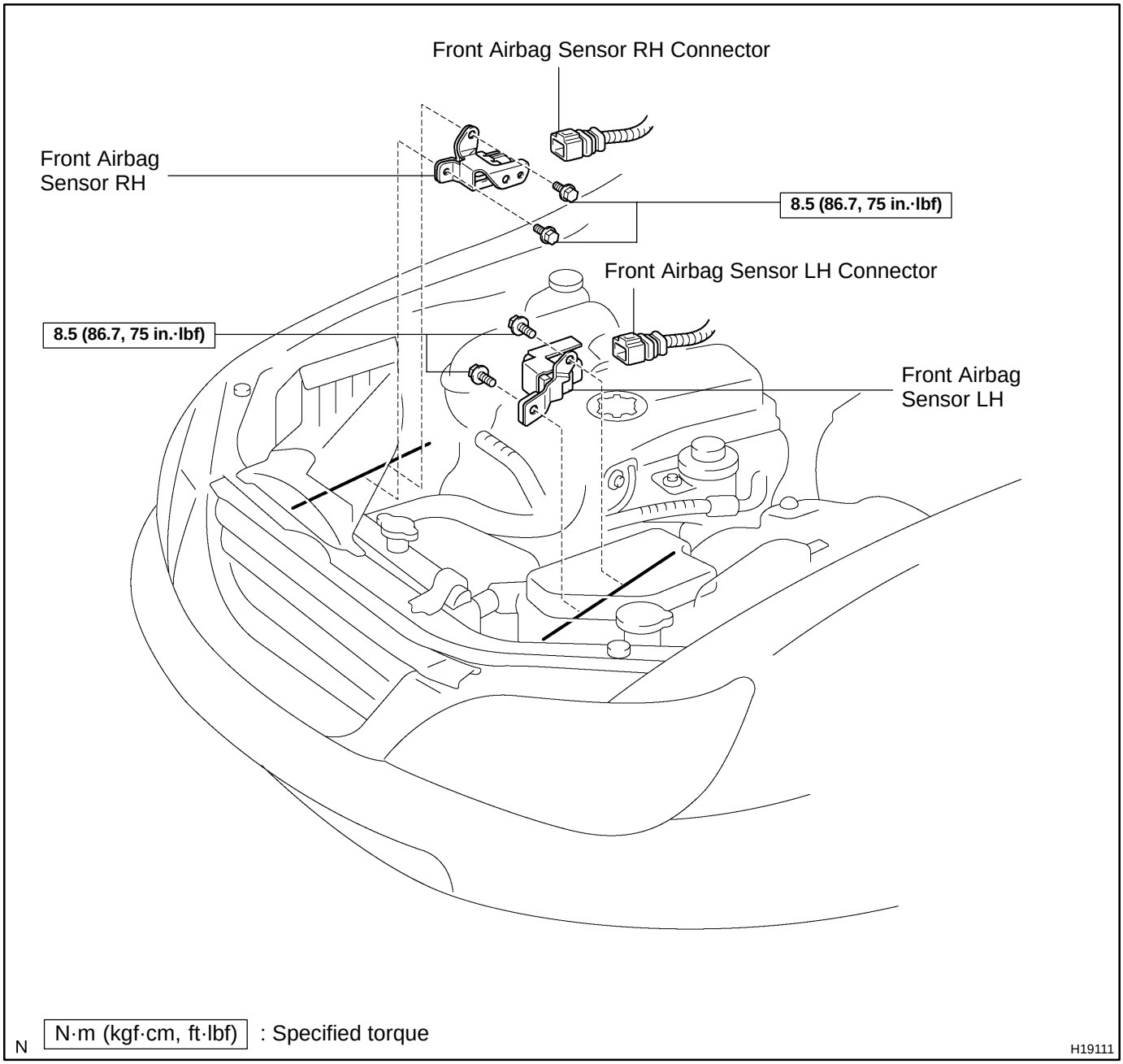
9. INSTALL UPPER CONSOLE PANEL

10. INSTALL FLOOR SHIFT LEVER KNOB

FRONT AIRBAG SENSOR

RS07U-06

COMPONENTS

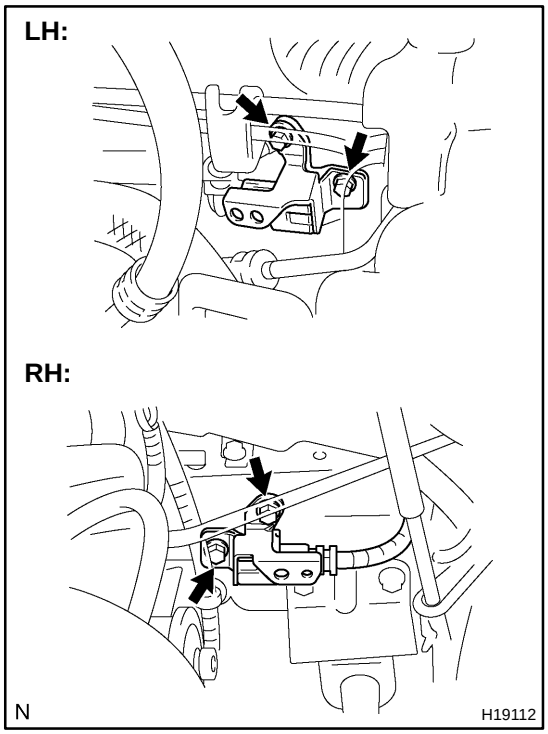


RS0UJ-02

REMOVAL

NOTICE:

- **If the wiring connector of the SRS is disconnected with the ignition switch in ON or ACC position, DTCs will be recorded.**
- **Never use any SRS parts removed from another vehicle. When replacing parts, replace them with new one.**
- **Never reuse the sensor involved in a collision when the SRS has deployed.**
- **Never repair a sensor in order to reuse it.**



REMOVE FRONT AIRBAG SENSOR

(a) Disconnect the front airbag sensor connector.

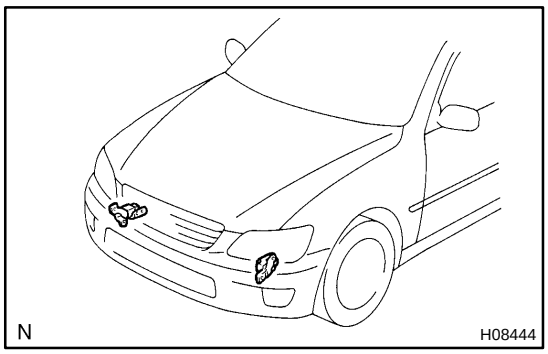
NOTICE:

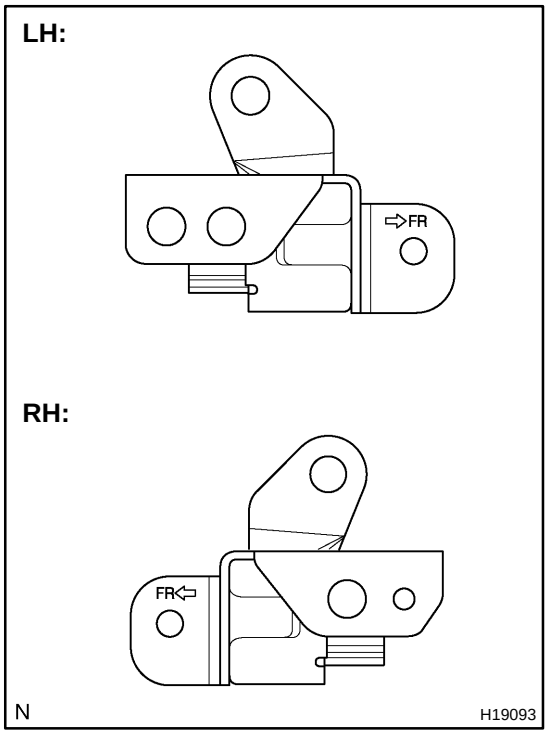
Disconnect the connector with the sensor assembly installed.

(b) Remove the 2 bolts and front airbag sensor.

(c) Employ the same manner described above to the other side.

RS07W-05





INSPECTION

1. VEHICLES NOT INVOLVED IN COLLISION

Perform a diagnostic system check (See page DI-607).

2. VEHICLES INVOLVED IN COLLISION

(a) Perform a diagnostic system check (See page DI-607).

(b) If the front fender of the car or its periphery is damaged, do a visual check for damage to the front airbag sensor, which includes the following items even if the airbag was not deployed:

- Bracket deformation
- Paint peeling off the bracket
- Cracks, dents or chips in the case
- Cracks, dents, chipping and scratches in the connector
- Peeling of the label or damage to the serial number

RS07X-04

REPLACEMENT

REPLACEMENT REQUIREMENTS

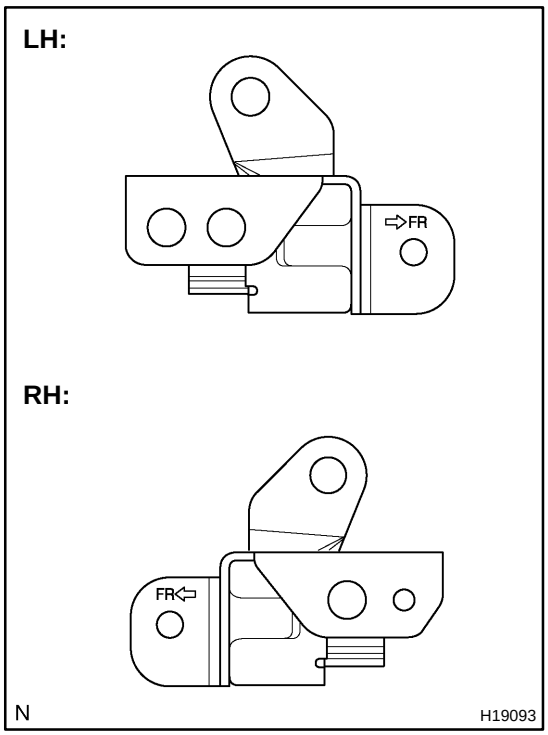
In the following cases, replace the front airbag sensor.

- If the SRS has been deployed in a collision (Replace both the left and right airbag sensors.).
- If the front airbag sensor has been found to be faulty in troubleshooting.
- If the front airbag sensor has been found to be faulty during the check in item (See page RS-74).
- If the front airbag sensor has been dropped.

CAUTION:

For removal and installation of the front airbag sensor, see page RS-73 and RS-76 . Be sure to follow the correct procedure.

RS0UK-02



INSTALLATION

INSTALL FRONT AIRBAG SENSOR

(a) Install the front airbag sensor with the arrow on the sensor facing toward the front of the vehicle.

Torque: 8.5 N·m (86.7 kgf·cm, 75 in.·lbf)

NOTICE:

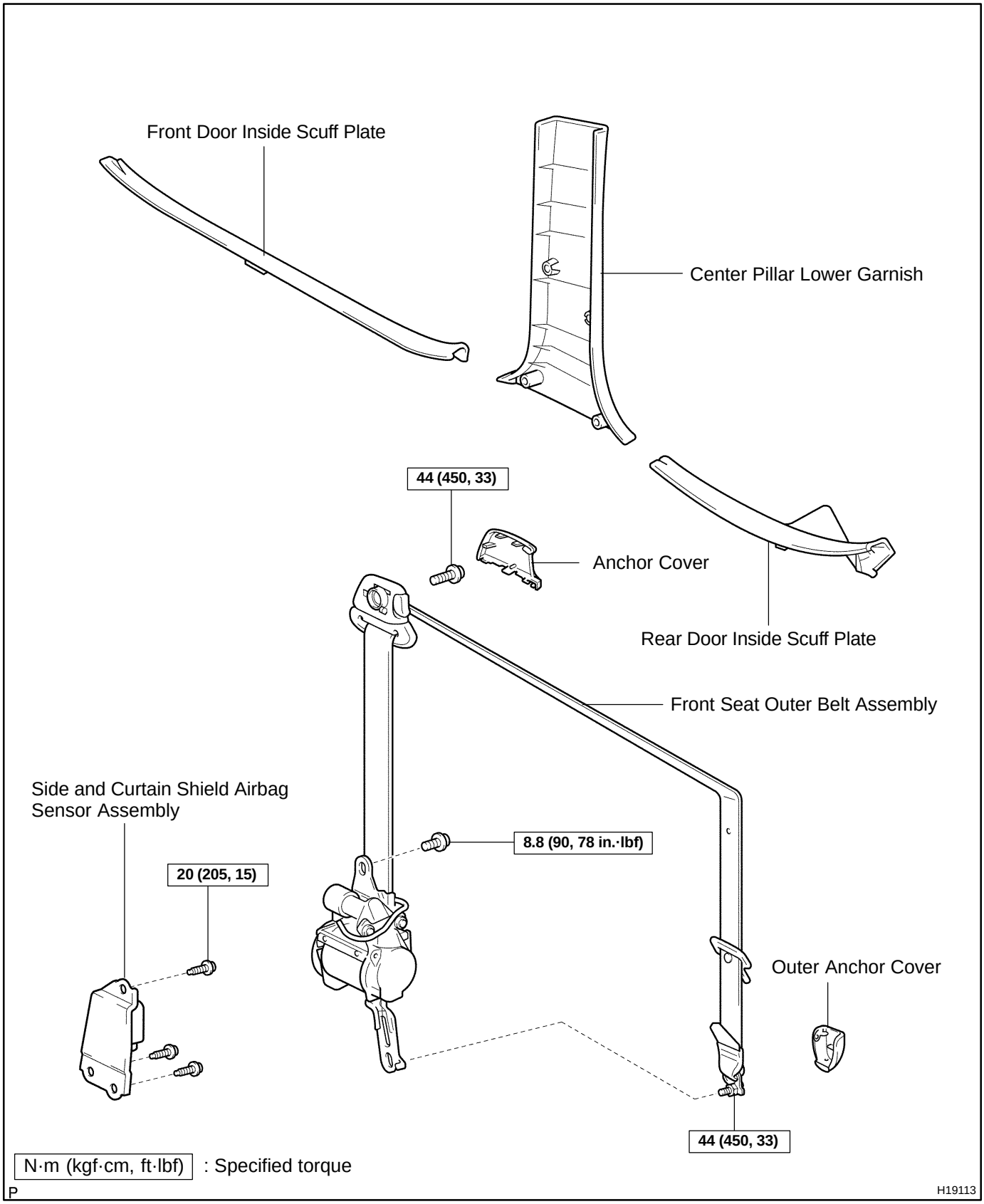
- **Connection of the connector is done after the sensor has been installed.**
- **Make sure the sensor is installed with the specified torque.**
- **If the sensor has been dropped, or there are cracks, dents or other defects in the case, brackets or connector, replace the removed sensor with a new one.**
- **The front sensor is equipped with an electrical connection check mechanism. Be sure to lock this mechanism securely when connecting the connector. If the connector is not securely locked, a malfunction code will be detected by the diagnostic system.**

(b) Connect the front airbag sensor connector.

SIDE AND CURTAIN SHIELD AIRBAG SENSOR ASSEMBLY

RS0UE-03

COMPONENTS



RS0UF-03

REMOVAL

NOTICE:

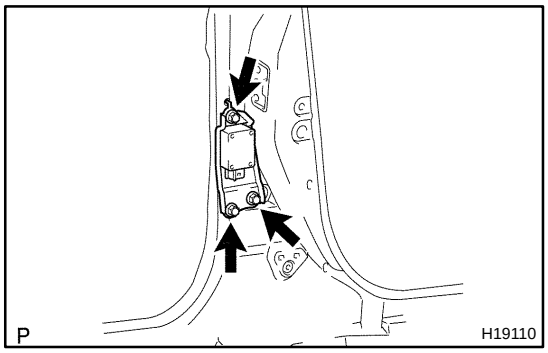
- **If the wiring connector of the SRS is disconnected with the ignition switch at ON position, DTC will be recorded.**
- **Do not open the cover or the case of the ECU and various electrical devices unless absolutely necessary. (If the IC terminals are touched, the IC may be destroyed by static electricity.)**

1. REMOVE FRONT AND REAR DOOR INSIDE SCUFF PLATES

2. REMOVE CENTER PILLAR LOWER GARNISH

3. REMOVE FRONT SEAT OUTER BELT ASSEMBLY

Pages for reference	See page
Sedan	BO-211
Wagon	BO-214



4. REMOVE SIDE AND CURTAIN SHIELD AIRBAG SENSOR ASSEMBLY

(a) Disconnect the side and curtain shield airbag sensor assembly connector.

NOTICE:

Disconnect the connector with the sensor assembly installed.

(b) Remove the 3 bolts and side and curtain shield airbag sensor assembly.

RS0UG-01

INSPECTION

1. Vehicle not involved in collision:
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

Do a diagnostic system check (See page DI-607).

2. Vehicle involved in collision and airbag is not deployed:
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

Do a diagnostic system check (See page DI-607).

3. Vehicle involved in collision and airbag is deployed:
INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

Replace the side airbag sensor assembly (See page RS-78).

RS0UH-01

REPLACEMENT

REPLACEMENT REQUIREMENTS

In the following cases, replace the side and curtain shield airbag sensor assembly.

- If the side and curtain shield airbag sensor assembly has been deployed in a collision.
- If the side and curtain shield airbag sensor assembly has been found to be faulty in troubleshooting.
- If the side and curtain shield airbag sensor assembly has been dropped.

CAUTION:

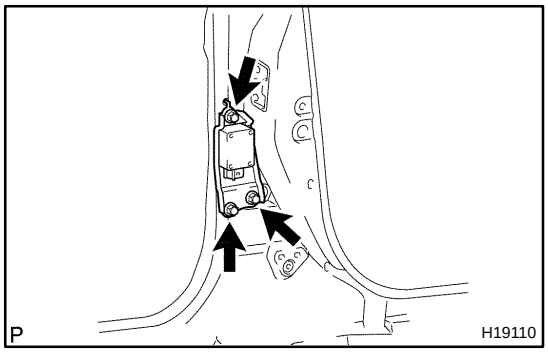
For removal and installation of the side and curtain shield airbag sensor assembly, see page RS-78 and RS-81 . Be sure to follow the correct procedure.

RS0UI-02

INSTALLATION

NOTICE:

- **Never use SRS parts from another vehicle. When replacing parts, replace them with new ones.**
- **Never reuse the side and curtain shield airbag sensor assembly involved in a collision when the airbag has deployed.**
- **Never repair a sensor in order to reuse it.**



1. INSTALL SIDE AND CURTAIN SHIELD AIRBAG SENSOR ASSEMBLY

(a) Install the side and curtain shield airbag sensor assembly with the 3 bolts.

Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)

(b) Connect the side and curtain shield airbag sensor assembly connector.

NOTICE:

- **Connection of the connector is done after the sensor assembly has been installed. Make sure the sensor assembly is installed with the specified torque.**
- **If the sensor assembly has been dropped, or there are cracks, dents or other defects in the case, bracket or connector, replace the sensor assembly with a new one.**
- **When installing the sensor assembly, take care that the SRS wiring does not interfere with other parts and is not pinched between other parts.**
- **After installation, shake the sensor assembly to check that there is no looseness.**

2. INSTALL FRONT SEAT OUTER BELT ASSEMBLY

Pages for reference	See page
Sedan	BO-211
Wagon	BO-214

3. INSTALL CENTER PILLAR LOWER GARNISH

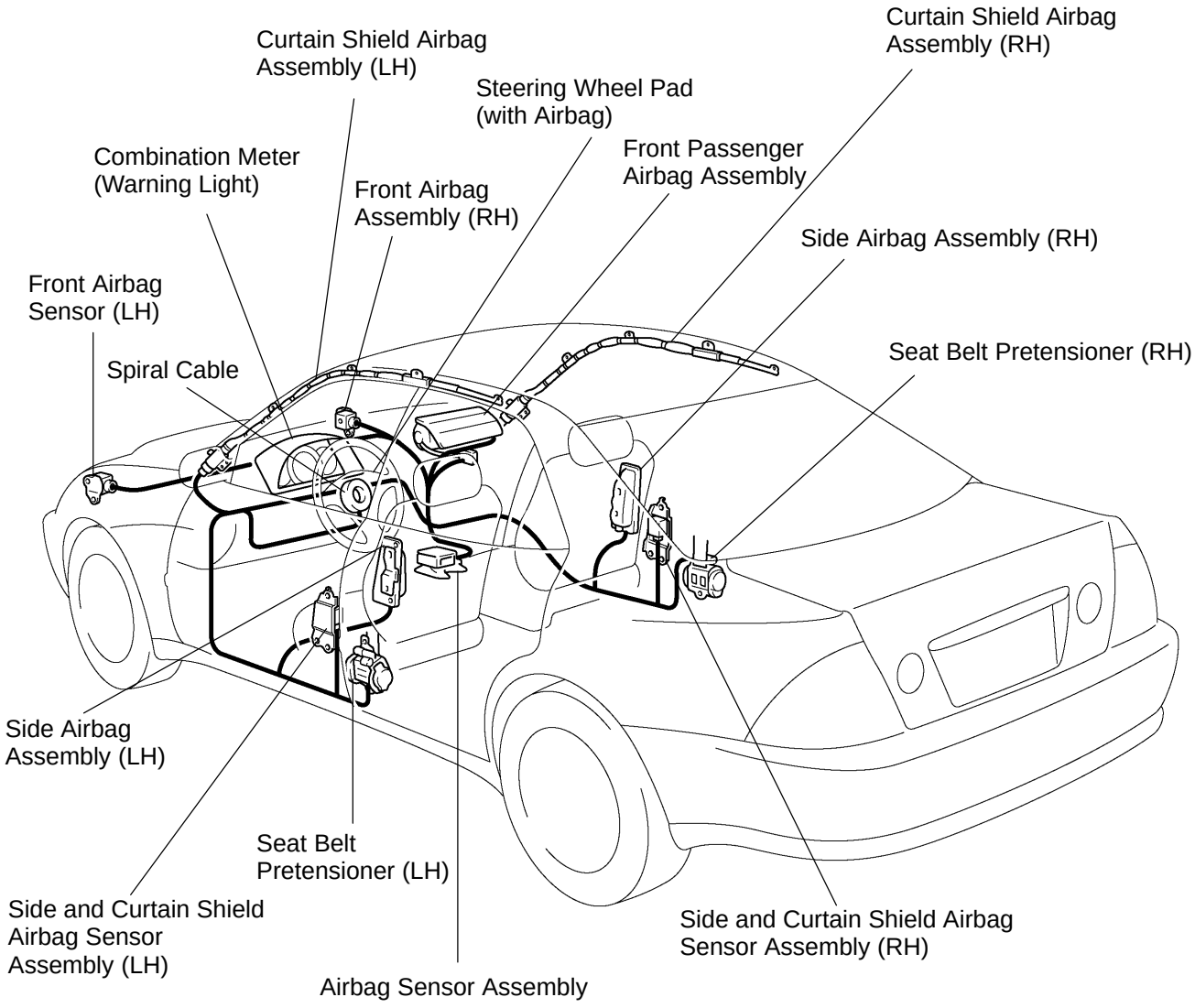
4. INSTALL FRONT AND REAR DOOR INSIDE SCUFF PLATES

WIRE HARNESS AND CONNECTOR

RS0UL-02

LOCATION

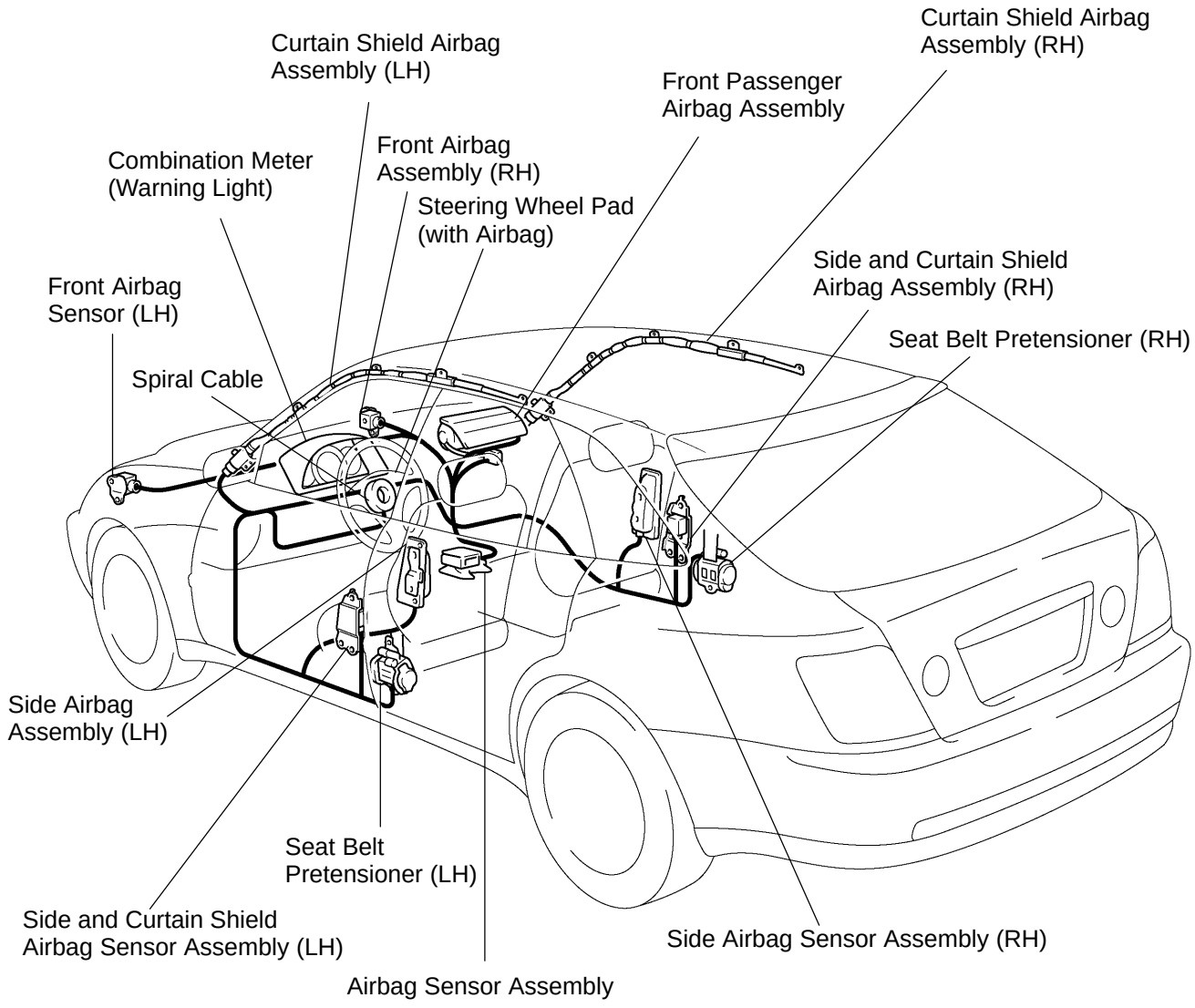
Sedan:



N

H19272

Wagon:



N

H19086

RS085-04

INSPECTION

HINT:

The SRS wire harness is integrated with the instrument panel wire harness assembly. All the connectors in the system are a standard yellow color.

1. Vehicles not involved in collision:

INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

Perform a diagnostic system check (See page DI-607).

2. Vehicles involved in collision:

INSPECT SUPPLEMENTAL RESTRAINT SYSTEM

(a) Perform a diagnostic system check (See page DI-607).

(b) Check breaks in all wires of the SRS wire harness, and exposed conductors.

(c) Check to see if the SRS wire harness connectors are cracked or chipped.

RS086-04

REPLACEMENT

In the following cases,replace the wire harness or connector.

- If any part of the SRS wire harness or any connector has been found to be faulty in troubleshooting.
- If any part of the SRS wire harness or any connector has been found to be faulty during checking items (See page RS-84).

CAUTION:

If the wire harness used in the SRS is damaged, replace the whole wire harness assembly.

BODY ELECTRICAL SYSTEM

BE01I-15

PRECAUTION

HINT:

Take care to observe the following precautions when performing inspections or removal and replacement of body electrical related parts.

1. HEADLIGHT SYSTEM

- Halogen bulbs have pressurized gas inside and require special handling. They can burst if scratched or dropped. Hold a bulb only by its plastic or metal case. Don't touch the glass part of a bulb with bare hands.
- When high voltage socket of discharge headlight is touched with the light control switch HEAD, high voltage of 20,000 V is momentarily generated. This might lead to a serious accident.
- Never connect the tester to the high voltage socket of discharge headlight for measurement, as this leads to a serious accident because of high voltage.
- When performing operation related to the discharge headlight, make sure to do it in the place with no water of rain to prevent electric shock, with light control switch OFF, battery terminal removed, connector of light control ECU disconnected.
- When performing operation related to the discharge headlight, make sure to do it after assembling has been completely over and never light up without a bulb installed.
- Do not light up the discharge headlight using another power source except vehicle's.
- When there is a defect on the discharge headlight or any shock has been applied to it, replace the light with a new one.

  Even if the light operates normally, there is a possibility that the fail-safe function works.

2. SRS (SUPPLEMENTAL RESTRAINT SYSTEM)

The LEXUS IS300 is equipped with an SRS (Supplemental Restraint System) such as the driver airbag, front passenger airbag, side airbag, curtain shield airbag. Failure to carry out service operation in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notices in the RS section.

3. AUDIO SYSTEM

If the negative (-) terminal cable is disconnected from the battery, the preset AM, FM 1 and FM 2 stations stored in memory are erased, so make sure to note the stations and reset them after the negative (-) terminal cable is reconnected to the battery.

4. MOBILE COMMUNICATION SYSTEM

If the vehicle is equipped with a mobile communication system, refer to precautions in the IN section.

TROUBLESHOOTING

BE16S-06

PROBLEM SYMPTOMS TABLE

IGNITION SWITCH AND

This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.

Symptom	Suspect Area	See page
Ignition switch is not set to each position.	11. Ignition switch 12. Power source circuit	BE-21 -

KEY UNLOCK WARNING SWITCH

This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.

Symptom	Suspect Area	See page
Key unlock warning system does not operate. (The buzzer sounds when the ignition key is ACC or ON)	1. Ignition Switch 2. Key Unlock Warning Switch 3. Body ECU 4. Combination Meter 5. Wire Harness	BE-21 BE-21 DI-893 BE-90 -

w/o Daytime running light system:

HEADLIGHT AND TAILLIGHT SYSTEM

This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.

HINT:

To inspect the bulb and light control ECU, replace them with the ones working normally and judge whether they work normally or not.

Symptom	Suspect Area	See page
”Automatic light control system” does not operate.	1. Automatic Light Control Sensor 2. Light Control Switch 3. Door Courtesy Switch 4. Wire Harness 5. Theft Deterrent ECU 6. Body ECU	BE-31 BE-31 BE-58 - DI-776 DI-893
Auto turn-off system does not operate when the driver’s door is opened.	1. Drivers Door Courtesy Switch 2. Body ECU	BE-58 DI-893
Auto turn-off system: Headlight and taillight do not come on.	1. Body ECU 2. Wire Harness	DI-893 -
Auto turn-off system: Headlight and taillight stay on.	1. Body ECU 2. Wire Harness	DI-893 -
Only one headlight comes on.	1. Bulb 2. Light Control Sensor 3. Wire Harness	- BE-31 -
”LO-Beam” does not light (All).	1. Headlight Control Relay 2. Light Control Sensor 3. Wire Harness	BE-31 BE-31 -
”LO-Beam” does not light (One side).	1. Bulb 2. H-LP L-LWR Fuse 3. H-LP R-LWR Fuse 4. Wire Harness	- BE-15 BE-15 -
”HI-Beam” does not light (All).	1. Headlight Dimmer Switch 2. Wire Harness	BE-31 -

”HI-Beam” does not light (One side).	1. Bulb 2. H-LP L-UPR Fuse 3. H-LP R-UPR Fuse 4. Wire Harness	- BE-15 BE-15 -
”Flash” does not light.	1. H-LP L-UPR Fuse 2. H-LP R-UPR Fuse 3. Headlight Dimmer Switch 4. Light Control ECU 5. Wire Harness	BE-15 BE-15 BE-31 - -
”Flash” does not light.	1. Bulb 2. Light Control ECU 3. Wire Harness	- - -
Headlight does not come on.	1. Headlight Control Relay 2. Light Control Switch 3. Light Control ECU 4. Wire Harness	BE-31 BE-31 - -
Headlight does not come on.	1. Bulb 2. Light Control ECU 3. Wire Harness	- - -
Headlight flickers.	1. Bulb 2. Light Control ECU 3. Wire Harness	- - -
Headlight is dark.	1. Bulb 2. Light Control ECU 3. Wire Harness	- - -
Only one taillight comes on.	1. Bulb 2. Wire Harness	- -
Taillight does not come on. (Headlight is normal)	1. TAIL Fuse 2. GAUGE Fuse 3. Taillight Control Relay 4. Light Failure Relay 5. Light Control Switch 6. Wire Harness	BE-15 BE-15 BE-31 BE-31 BE-31 -
Taillight does not come on. (Headlight does not light)	1. Light Control Switch 2. Wire Harness	BE-31 -
Rear combination light does not come on.	1. Light Failure Relay 2. Wire Harness 3. Bulb	BE-31 - -

w/ Daytime running light system:

HEADLIGHT AND TAILLIGHT SYSTEM

This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.

HINT:

To inspect the bulb and light control ECU, replace them with the ones working normally and judge whether they work normally or not.

Symptom	Suspect Area	See page
”Automatic light control system” does not operate.	1. Automatic Light Control Sensor 2. Light Control Switch 3. Door Courtesy Switch 4. Wire Harness 5. Theft Deterrent ECU 6. Body ECU	BE-31 BE-31 BE-58 - DI-776 DI-893
Auto turn-off system does not operate when the driver’s door is opened.	1. Drivers Door Courtesy Switch 2. Body ECU	BE-58 DI-893
Auto turn-off system: Headlight and taillight do not come on.	1. Body ECU 2. Wire Harness	DI-893 -
Auto turn-off system: Headlight and taillight stay on.	1. Body ECU 2. Wire Harness	DI-893 -
Only one headlight comes on.	1. Daytime Running Light No. 2 Relay 2. Daytime Running Light Main Relay 3. Bulb 4. Light Control ECU 5. Wire Harness 6. Combination Meter	BE-31 BE-31 - - - BE-90
”LO-Beam” does not light (All).	1. Headlight Control Relay 2. Light Control ECU 3. Wire Harness	BE-31 - -
”LO-Beam” does not light (One side).	1. Bulb 2. H-LP L-LWR Fuse 3. H-LP R-LWR Fuse 4. Light Control ECU 5. Wire Harness	- BE-15 BE-15 - -
”HI-Beam” does not light (All).	1. Headlight Dimmer Switch 2. Daytime Running Light Main Relay 3. Wire Harness 4. Combination Meter	BE-31 BE-31 - BE-90
”HI-Beam” does not light (One side).	1. Bulb 2. H-LP L-UPR Fuse 3. H-LP R-UPR Fuse 4. Daytime Running Light No. 2 Relay 5. Wire Harness	- BE-15 BE-15 BE-31 -
”Flash” does not light.	1. Headlight Dimmer Switch 2. Daytime Running Light Main Relay 3. Wire Harness 4. Combination Meter	BE-31 BE-31 - BE-90

Headlight does not come on.	1. Headlight Control Relay 2. Daytime Running Light Main Relay 3. Daytime Running Light No.2 Relay 4. Headlight Dimmer Switch 5. Light Control Switch 6. Wire Harness 7. Light Control ECU 8. Bulb 9. Combination Meter	BE-31 BE-31 BE-31 BE-31 BE-31 - - - BE-90
Headlight does not come on with light control switch in HEAD.	1. Light Control Switch 2. Light Control ECU 3. Wire Harness	BE-31 - -
Headlight does not go out with light control switch in OFF.	1. Headlight Control Relay 2. Light Control ECU 3. Wire Harness	BE-31 - -
Headlight flickers.	1. Bulb 2. Light Control ECU 3. Wire Harness	- - -
Headlight is dark.	1. Bulb 2. Light Control ECU 3. Wire Harness	- - -
Taillight does not come on with light control switch in TAIL.	1. Taillight Control Relay 2. Light Control Switch 3. Wire Harness	BE-31 BE-31 -
Taillight does not go out with light control switch in OFF.	1. Taillight Control Relay 2. Light Control Switch 3. Wire Harness	BE-31 BE-31 -
Headlight does not come on with engine running and light control switch in OFF.	1. ECU-B Fuse 2. GAUGE Fuse 3. Daytime Running Light Main Relay 4. Daytime Running Light No.2 Relay 5. Generator L Terminal 6. Parking Brake Switch 7. Wire Harness 8. Combination Meter	BE-15 BE-15 BE-31 BE-31 BE-90 BE-90 - -

HID type headlight:
HEADLIGHT BEAM LEVEL CONTROL SYSTEM

Symptom	Suspect Area	See page
Beam axis is not controlled. (It is not initialized.) Headlight Beam Level Control System does not operate.	1. ECU-IG Fuse 2. Headlight Beam Level Control Actuator 3. Headlight Beam Level Control ECU 4. Wire Harness Side	BE-15 BE-31 BE-31 -
Beam axis is not controlled. (It is initialized.) Headlight Beam Level Control System does not operate.	1. Height Control Sensor 2. Headlight Beam Level Control ECU 3. Wire Harness Side	- BE-31 -
Controlled angle of head light is unusual. (The angle is controlled.)	1. Height Control Sensor 2. Headlight Beam Level Control ECU 3. Headlights 4. Wire Harness Side	- BE-31 BE-31 -
Beam axis position is not stable during driving.	1. ABS System 2. Headlights 3. Wire Harness	- BE-31 -

FOG LIGHT SYSTEM

This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.

Symptom	Suspect Area	See page
Front fog light does not light up with light control SW TAIL or HEAD (LO-beam only). (Headlight is normal.)	1. Bulbs 2. FR FOG Fuse 3. Front Fog Light Relay 4. Front Fog Light Switch 5. Wire Harness	- BE-15 BE-48 BE-48 -
Only one light does not light.	1. Bulbs 2. Wire Harness	- -
Rear fog light does not light with light control SW HEAD. (Headlight is normal.)	1. Bulbs 2. ECU-B2 Fuse 3. Rear Fog Light Switch 4. Wire Harness	- BE-15 BE-48 -
Rear fog light does not light with light control SW HEAD. (Headlight does not light.)	1. Inspect Headlight and Taillight System 2. Wire Harness	BE-2 -
Only one light does not light.	1. Bulbs 2. Wire Harness	- -

TURN SIGNAL AND HAZARD WARNING SYSTEM

This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.

Symptom	Suspect Area	See page
”Hazard” and ”Turn” do not light up.	1. GAUGE Fuse 2. TURN HAZ Fuse 3. Ignition Switch 4. Turn Signal Flasher Relay 5. Wire Harness	BE-15 BE-15 BE-21 BE-53 -
Hazard warning light does not light up. (Turn is normal)	1. A/C Control Panel 2. Wire Harness	AC-79 -
Turn signal does not light up. (Hazard is normal)	1. Turn Signal Switch 2. Wire Harness	BE-53 -
Turn signal does not light up in one direction.	1. Turn Signal Switch 2. Wire Harness	BE-53 -
Only one bulb does not light up.	1. Bulb 2. Wire Harness	- -

INTERIOR LIGHT SYSTEM

This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.

Symptom	Suspect Area	See page
All the lights do not come ON.	DOME Fuse	BE-15
The driver door courtesy light does not come ON when the driver's door is opened.	1. Driver's Door Courtesy Switch 2. Wire Harness 3. Body ECU	BE-58 - DI-893
The passenger door courtesy light does not come ON when the passenger's door is opened.	1. Passenger's Door Courtesy Switch 2. Wire Harness 3. Body ECU	BE-58 - DI-893
The room light does not come on when the rear-right door is opened.	1. Rear-Right Door Courtesy Switch 2. Wire Harness 3. Body ECU 4. Room Light	BE-58 - DI-893 BE-58

The room light does not come on when the rear-left door is opened.	1. Rear-Left Door Courtesy Switch 2. Wire Harness 3. Body ECU 4. Room Light	BE-58 - DI-893 BE-58
Only one of the bulbs comes ON.	Bulb	-
The illumination does not fade out when all the doors are closed.	1. Courtesy Switch 2. Wire Harness 3. Body ECU	BE-58 - DI-893
The illumination does not fade out immediately when the ignition switch is turned to ACC or ON within 15 seconds after all the doors are closed.	1. Ignition Switch 2. RADIO NO.2 Fuse 3. GAUGE Fuse 4. Wire Harness 5. Body ECU	BE-21 BE-15 BE-15 - DI-893
The illumination does not fade out immediately when all the doors are locked within 15 seconds after they are closed.	1. Door Unlock Detection Switch 2. Wire Harness 3. Body ECU	BE-121 - DI-893
Interior light does not light up. (in front personal light)	1. Bulb 2. Front Personal Light 3. Wire Harness	- BE-58 -
Front personal light does not light up.	1. Bulb 2. Front Personal Light 3. Wire Harness	- BE-58 -
Rear personal light does not light up.	1. Bulb 2. Rear Personal Light 3. Wire Harness	- BE-58 -
Vanity light does not light up.	1. Bulb 2. Vanity Light 3. Wire Harness	- BE-58 -
Luggage compartment light does not light up.	1. Bulb 2. Luggage Compartment Door Courtesy Switch 3. Wire Harness	- BE-58 -
Courtesy light does not light up.	1. Bulb 2. Door Courtesy Switch 3. Wire Harness 4. Body ECU	- BE-58 - DI-893

BACK-UP LIGHT SYSTEM

Symptom	Suspect Area	See page
Back-Up Light does not light up.	1. GAUGE Fuse 2. Ignition Switch 3. Wire Harness 4. Bulb	BE-15 BE-21 - -
Back-Up Light remains always on.	1. Park/Neutral Position Switch (A/T) Back-up Light Switch (M/T) 2. Wire Harness	DI-371 BE-65 -
Only one light does not light up.	1. Bulb 2. Wire Harness	- -

STOP LIGHT SYSTEM

Symptom	Suspect Area	See page
Stop light does not light up.	1. STOP Fuse 2. Stop Light Switch 3. Light Failure Relay 4. Wire Harness	BE-15 BE-68 BE-31 -
Stop light always lights up.	1. Stop Light Switch 2. Wire Harness	BE-68 -
Only one light always lights up.	Wire Harness	-
Only one light does not light up.	1. Bulb 2. Wire Harness	- -

HEADLIGHT CLEANER SYSTEM

Symptom	Suspect Area	See page
”Headlight Cleaner System” does not operate (All)	1. H-LP CLN Fuse 2. WASHER Fuse 3. Ignition Switch 4. Headlight Cleaner Switch 5. Headlight Cleaner Relay 6. Headlight Cleaner Motor 7. Headlight Cleaner Nozzle and Hose 8. Wire Harness	BE-15 BE-15 BE-21 BE-70 BE-70 BE-70 - -
Washer fluid does not spray.	Headlight Cleaner Nozzle and Hose	-

WIPER AND WASHER SYSTEM

Symptom	Suspect Area	See page
Wipers and washer do not operate.	1. WIP Fuse 2. Wiper Switch 3. Wiper Motor 4. Wire Harness	BE-15 BE-75 BE-75 -
Wipers do not operate in LO, HI or MIST.	1. Wiper Switch 2. Wiper Motor 3. Wire Harness	BE-75 BE-75 -
Wipers do not operate in INT.	1. Wiper Switch 2. Wiper Motor 3. Wire Harness	BE-75 BE-75 -
Washer motor does not operate.	1. WASHER Fuse 2. Washer Switch 3. Washer Motor 4. Wire Harness	BE-15 BE-75 BE-75 -
Wipers do not operate when washer switch ON.	1. WASHER Fuse 2. Washer Switch 3. Wiper Motor 4. Wire Harness	BE-15 BE-75 BE-75 -
Washer fluid does not operate.	Washer Hose and Nozzle	-
●When wiper switch is in HI position, the wiper blade is in contact with the body. ●When the wiper switch is OFF, the wiper blade does not retract or the retract position is wrong.	1. Wiper Motor *1 2. Wire harness *1	BE-75 -
Rear wiper does not operate.	1. WIPER Fuse 2. Rear Wiper Motor 3. Rear Wiper Switch 4. Wire Harness	- BE-75 BE-75 -

Rear wiper does not operate in INT or ON position.	1. Rear Wiper Switch 2. Wire Harness	BE-75 -
Rear wiper does not return to OFF position.	1. Rear Wiper Motor 2. Wire Harness	BE-75 -
Rear Washer Motor does not operate.	1. Rear Washer Motor 2. Rear Washer Switch 3. Wire Harness	BE-75 BE-75 -

*1: Inspect wiper arm and blade set positions.

COMBINATION METER

○ This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.

○ Refer to DI section for warning light or indicator light not described in the table below.

Symptom	Suspect Area	See page
Driver seat belt warning light does not light up.	1. Bulb 2. Driver Buckle Switch CIrcuit 3. Meter Circuit Plate 4. Wire Harness 5. Body ECU	- BE-90 BE-90 - DI-893
Passenger seat belt warning light does not light up. (in A/C control panel)	1. Passenger Buckle Switch CIrcuit 2. Occupant Detection Sensor 3. A/C Control Panel 4. Wire Harness 5. A/C ECU	BE-90 BE-90 DI-1009 - DI-1009
SRS warning light does not light up.	1. MPX-B Fuse 2. SRS-B Fuse 3. Bulb 4. Meter Circuit Plate 5. Wire Harness 6. Airbag Sensor Assembly	BE-15 BE-15 - BE-90 - DI-605
Hi-beam indicator light does not light up.	1. Bulb 2. Meter Circuit Plate 3. Wire Harness 4. Headlight System	- BE-90 - BE-31
Turn indicator light does not light up.	1. Bulb 2. Meter Circuit Plate 3. Wire Harness 4. Turn Signal and Hazard Warning System	- BE-90 - BE-53
ABS warning light does not light up.	1. GAUGE Fuse 2. Bulb 3. Meter Circuit Plate 4. Wire Harness 5. ABS ECU	BE-15 - BE-90 - DI-435
TRAC warning light does not light up.	1. GAUGE Fuse 2. Bulb 3. Meter Circuit Plate 4. Wire Harness 5. ABS ECU	BE-15 - BE-90 - DI-435

Check engine warning light does not light up.	1. Bulb 2. Meter Circuit Plate 3. Wire Harness 4. ECM	- BE-90 - DI-1
Fuel level warning light does not light up.	1. Bulb 2. Fuel Level Warning Switch 3. Meter Circuit Plate 4. Wire Harness	- BE-90 BE-90 -

DEFOGGER SYSTEM

This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.

Symptom	Suspect Area	See page
Rear window defogger does not operate.	1. HTR Fuse 2. DEF M-Fuse 3. Defogger Relay Circuit 4. Defogger Switch (in A/C Panel Switch) 5. Defogger Wire 6. Wire Harness 7. Body ECU 8. Noise Filter 9. A/C ECU	BE-15 BE-15 DI-940 DI-1009 BE-102 - DI-893 - DI-1009
Mirror heater does not operate.	1. MIR-HTR Fuse (Passenger Side J/B) 2. Mirror Heater Relay 3. Mirror Heater 4. Wire Harness	BE-15 BE-102 BE-102 -

POWER WINDOW CONTROL SYSTEM

This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.

Symptom	Suspect Area	See page
All the power windows do not operate. (Power Door Lock System is normal.)	1. Power Window Master Switch 2. Wire Harness 3. Body ECU	BE-115 - DI-893
Only the driver's window does not operate.	1. Power Window Master Switch 2. Power Window Switch 3. Power Window Motor 4. Wire Harness	BE-115 BE-115 BE-115 -
"Window lock function" does not operate.	Power Window Master Switch	BE-115
Power window control system abnormal operation.	TROUBLESHOOTING	BE-104

POWER DOOR LOCK CONTROL SYSTEM

This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.

Symptom	Suspect Area	See page
All the doors cannot be locked or unlocked. (Power Window Control System is normal.)	1. Door Lock Control Switch 2. Wire Harness 3. Body ECU	BE-121 - DI-893
Only one side door lock control does not operate.	1. Door Lock Motor 2. Wire Harness	BE-121 -
Door key related function does not operate.	1. Door Key Lock and Unlock Switch 2. Wire Harness 3. Body ECU	BE-121 - DI-893

Key confinement prevention function does not operate.	1. Key Unlock Warning Switch 2. Door Courtesy Switch 3. Wire Harness 4. Body ECU	BE-21 BE-58 - DI-893
Luggage compartment door opener function does not operate.	1. Luggage Compartment Door Opener Switch 2. Luggage Compartment Door Opener Motor 3. Wire Harness 4. Body ECU	BE-121 BE-121 - DI-893

THEFT DETERRENT SYSTEM

- ○ This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.
- ○ Refer to DI section for warning light or indicator light not described in the table below.

Symptom	Suspect Area	See page
The system cannot be set.	1. Indicator Light 2. Key Unlock Warning Switch 3. Door Unlock Detection Switch 4. Engine Hood Courtesy Switch 5. Luggage Compartment Door Courtesy Switch 6. Wire Harness 7. Theft Deterrent ECU	BE-127 BE-21 BE-121 BE-58 BE-58 - DI-776
The system cannot be canceled when the ignition switch is turned to ON with key.	1. Key Unlock Warning Switch 2. Ignition Switch 3. RAD NO. 2 Fuse 4. Wire Harness 5. Theft Deterrent ECU	BE-21 BE-21 BE-15 - DI-776
The system cannot be canceled when the luggage compartment door is unlocked with key.	1. Luggage Compartment Door Courtesy Switch 2. Wire Harness 3. Theft Deterrent ECU	BE-58 - DI-776
The system does not operate when the engine hood is opened.	1. Engine Hood Courtesy Switch 2. Wire Harness 3. Theft Deterrent ECU	BE-58 - DI-776
The system does not operate when the ignition switch is turned to ACC without using a key or transmitter.	1. Ignition Switch 2. Key Unlock Warning Switch 3. Transmitter 4. Wire Harness 5. Theft Deterrent ECU	BE-21 BE-21 BE-136 - DI-776
Some of the system does not operate. (Headlight does not light up.)	1. Headlight System 2. Wire Harness 3. Theft Deterrent ECU	BE-31 - DI-776
Some of the system does not operate. (Taillight does not light up.)	1. Taillight System 2. Wire Harness 3. Theft Deterrent ECU	BE-31 - DI-776
Some of the system does not operate. (Self power siren or Horn does not sound.)	1. HORN Fuse 2. Self Power Siren 3. Horn 4. Horn Relay 5. Wire Harness 6. Theft Deterrent ECU	BE-15 BE-127 BE-233 BE-233 - DI-776
While the warning is given, the system cannot be canceled by unlocking the door with key or transmitter.	1. Door Key Lock and Unlock Switch 2. Wire Harness 3. Theft Deterrent ECU	BE-121 - DI-776

While the warning is given, the system cannot be canceled by turning the ignition switch to ACC or ON with key.	1. Ignition Switch 2. Key Unlock Warning Switch 3. RAD NO. 2 Fuse 4. ECU-IG Fuse 5. Wire Harness 6. Theft Deterrent ECU	BE-21 BE-21 BE-15 BE-15 - DI-776
The system operates for more than 30 seconds.	Theft Deterrent ECU	DI-776

WIRELESS DOOR LOCK CONTROL SYSTEM

This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.

HINT:

- ○ Troubleshooting of the wireless door lock control system is based on the premise that the door lock control system is operating normally. Accordingly, before troubleshooting the wireless door lock control system, first make certain that the door lock control system is operating normally.
- ○ If the trouble still reappears even though there are no abnormalities in any of the other circuits, then check and replace the Wireless Door Lock Control Receiver as the last step.

Symptom	Suspect Area	See page
All functions of wireless door lock control system do not operate.	1. Transmitter 2. Wireless Door Lock Control Receiver 3. Wire Harness 4. Body ECU	BE-136 BE-136 - DI-893

SLIDING ROOF SYSTEM:

HINT:

The sliding roof system must be initialized after any of the following is done:

- ○ The battery is disconnected.
- ○ The S/ROOF fuse is replaced.
- ○ The sliding roof assembly (sliding roof ECU) is replaced.
- ○ The sliding roof is removed and reinstalled or replaced.

Initialize the sliding roof system as follows:

- ○ Using the tilt switch, tilt the roof fully upward, and then fully downward.
- ○ Using the slide switch, fully open the roof, and then fully close it.

Symptom	Suspect Area	See page
Sliding roof system does not operate.	1. S/ROOF Fuse 2. ECU-IG Fuse 3. Front Personal Light (Sliding Roof Switch) 4. Sliding Roof Control Assembly 5. Wire Harness	BE-15 BE-15 BE-145 BE-145 -
Sliding roof system stops operation halfway. (Sliding roof reverses during close (down) operation.)	1. Foreign object between sliding roof rail and glass 2. Incorrect sliding roof adjustment 3. Sliding Roof Control Assembly	- BO-126 BE-145
Only "Key-off Sliding Roof Operation*" does not operate.	1. Drivers Door Courtesy Switch 2. Sliding Roof Control Assembly 3. Body ECU 4. Wire Harness	BE-58 BE-145 DI-893 -

*: The sliding roof can be operated for approximately 45 seconds, after the ignition switch is turned from ON to OFF with all doors closed. However, if the driver side door is opened during this time, the operation is canceled.

POWER SEAT CONTROL SYSTEM

Symptom	Suspect Area	See page
Driver's seat does not operate.	1. P/SEAT Fuse 2. Power Seat Switch 3. Wire Harness	BE-15 BE-151 -
"Slide operation" does not operate.	1. Power Seat Switch 2. Wire Harness 3. Slide Motor	BE-151 - BE-151
"Front Vertical Operation" does not operate.	1. Power Seat Switch 2. Wire Harness 3. Front Vertical Motor	BE-151 - BE-151
"Lifter Operation" does not operate.	1. Power Seat Switch 2. Wire Harness 3. Lifter Motor	BE-151 - BE-151
"Reclining Operation" does not operate.	1. Power Seat Switch 2. Wire Harness 3. Reclining Motor	BE-151 - BE-151

(D): Driver's Seat
(P): Passenger's Seat

POWER MIRROR CONTROL SYSTEM

This system uses the multiplex communication system, so check diagnosis system of the multiplex communication system before you proceed with troubleshooting.

Symptom	Suspect Area	See page
Both right and left mirrors do not operate.	1. Mirror Switch 2. Wire Harness	BE-159 -
Only one side of mirror does not operate.	1. Mirror Motor 2. Wire Harness	BE-159 -

SEAT HEATER SYSTEM

Symptom	Suspect Area	See page
Driver's seat heater does not operate.	1. SEAT HTR Fuse 2. Seat Heater Switch (D, P) 3. Seat Heater 4. Wire Harness	BE-15 BE-165 BE-165 -
Passenger's seat heater does not operate.	1. SEAT HTR Fuse 2. Seat Heater Switch (D, P) 3. Seat Heater 4. Wire Harness	BE-15 BE-165 BE-165 -
Seat heater temperature is too hot.	Seat Heater	BE-165

AUDIO SYSTEM

Symptom	Suspect Area	See page
Audio system abnormal operation.	TROUBLESHOOTING	BE-179

CLOCK SYSTEM (in A/C Control Panel)

Symptom	Suspect Area	See page
Passenger seat belt warning system does not light up.	TROUBLESHOOTING NO. 1	BE-210
Clock will not operate.	TROUBLESHOOTING NO. 1	BE-210
Clock loses or gains time.	TROUBLESHOOTING NO. 2	BE-210

ENGINE IMMOBILIZER SYSTEM

Symptom	Suspect Area	See page
Engine immobilizer system does not operate.	See DIAGNOSIS SYSTEM	DI-849

HORN SYSTEM

Symptom	Suspect Area	See page
Horn system does not operate.	1. HORN Fuse 2. Horn Relay 3. Horn Switch 4. Horn 5. Wire Harness	BE-15 BE-233 BE-233 BE-233 -
Horns blow all the time.	1. Horn Relay 2. Horn Switch 3. Wire Harness	BE-233 BE-233 -
One horn operates but the other horn does not operate.	1. Horn 2. Wire Harness	BE-233 -
Horns operate abnormally.	1. Horn Relay 2. Horn 3. Wire Harness	BE-233 BE-233 -

GARAGE DOOR OPENER SYSTEM

Symptom	Suspect Area	See page
The equipment of which code has been registered does not operate.	1. Garage Door Opener 2. Wire Harness 3. *	BE-219 - -
LED does not light up. (Even though either switch is pressed.)	1. Garage Door Opener 2. Wire Harness	BE-219 -
LED does not light up. (Only one switch is pressed.)	Garage Door Opener	BE-219

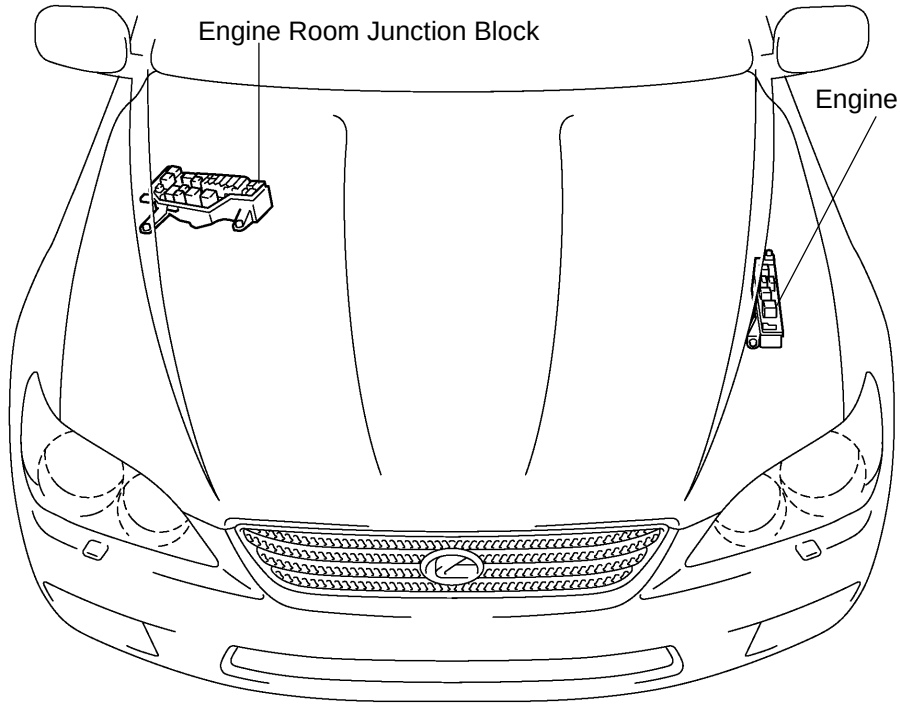
* As the GARAGE DOOR OPENER on the vehicle side seems to be normal, check the OPENER on the equipment side, of which code has been registered.

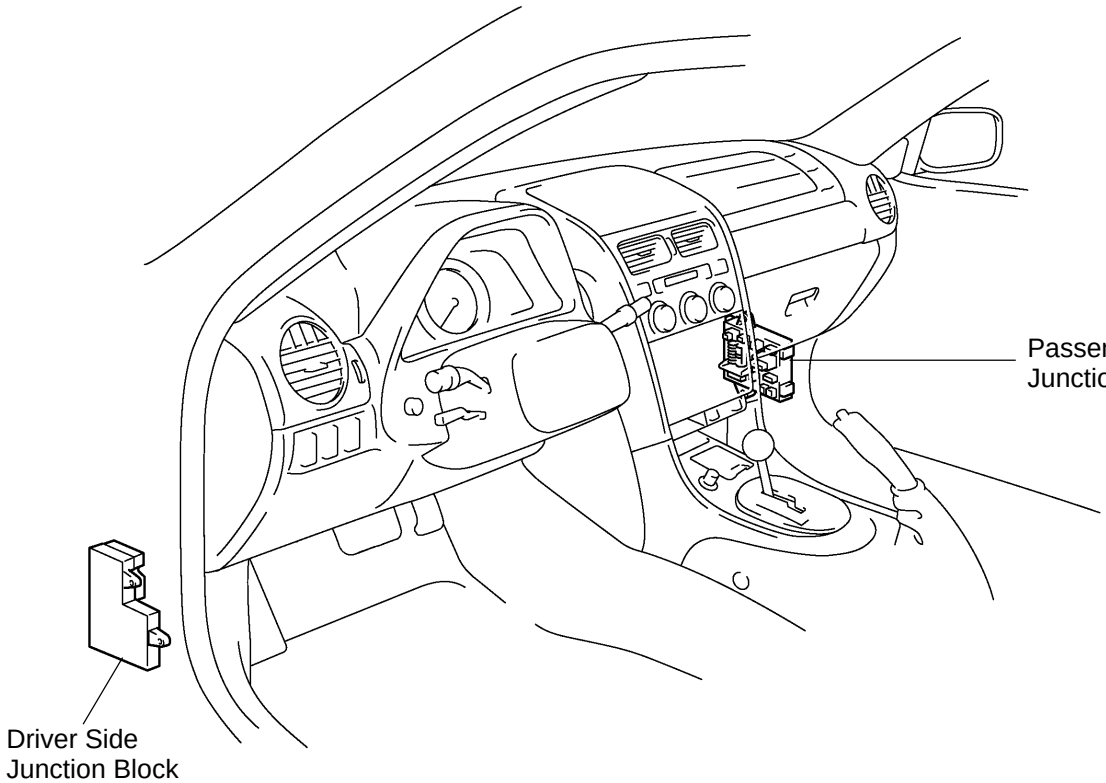
POWER SOURCE

LOCATION

BE1WP-04

Power Source

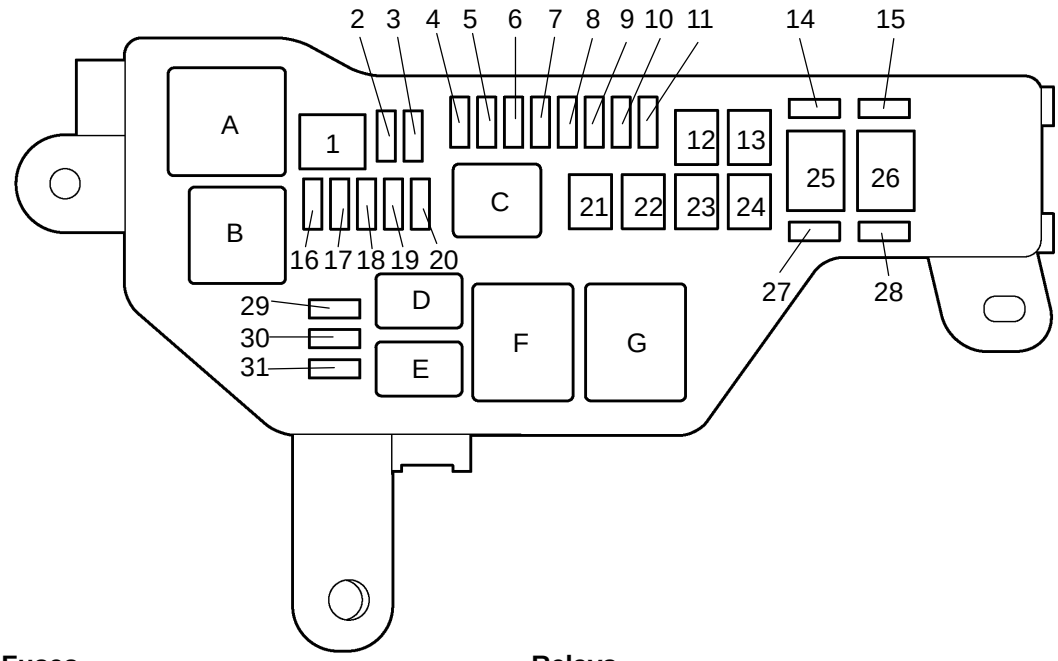




C

I27323

●Engine Room Junction Block



Fuses

1. MAIN FL 40A
2. ECU-B1 20A
3. -
4. ALT-S 7.5A
5. ETCS 15A
6. AM2 20A
7. HORN 10A
8. -
9. RADIO NO. 1 20A
10. TURN-HAZ 15A
11. EFI 25A
12. P/SEAT 30A
13. H-LP CLN 30A
14. SPARE
15. SPARE
16. DRL NO. 2 7.5A
17. DRL NO. 1 7.5A
18. H-LP L LWR 15A
19. H-LP R LWR 15A
20. ABS2 7.5A
21. -
22. -
23. CDS FAN 30A
24. RDI FAN 30A
25. ALT 120A
26. ABS1 60A
27. SPARE
28. SPARE
29. H-LP L UPR 10A
30. H-LP R UPR 10A
31. -

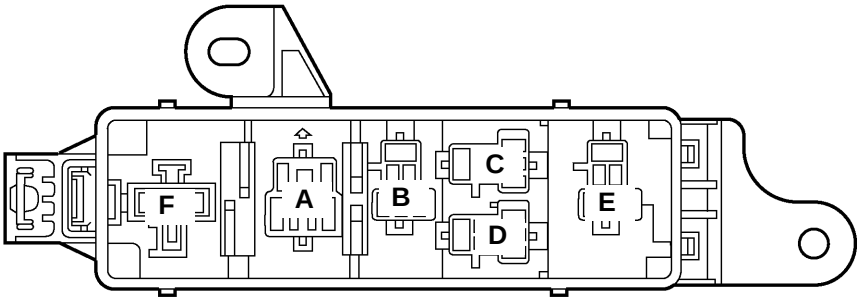
Relays

A. HEAD LP Relay
B. Starter relay
C. Circuit Opening Relay
D. Horn Relay
E. EFI Relay
F. ABS MTR Relay
G. ABS SOL Relay

N

I11570

●Engine Room Relay Block



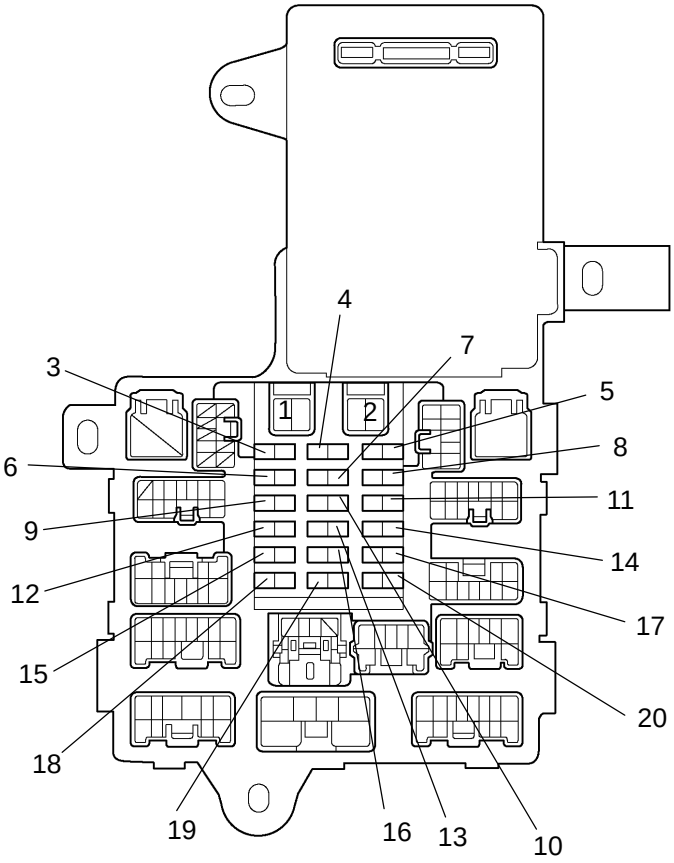
Relays

A. DIMMER Relay
B. A/C COMP Relay
C. FAN NO.3 Relay
D. FAN NO.2 Relay
E. FAN NO.1 Relay
F. FUEL PMP Relay

C

I23236

●Driver Side Junction Block

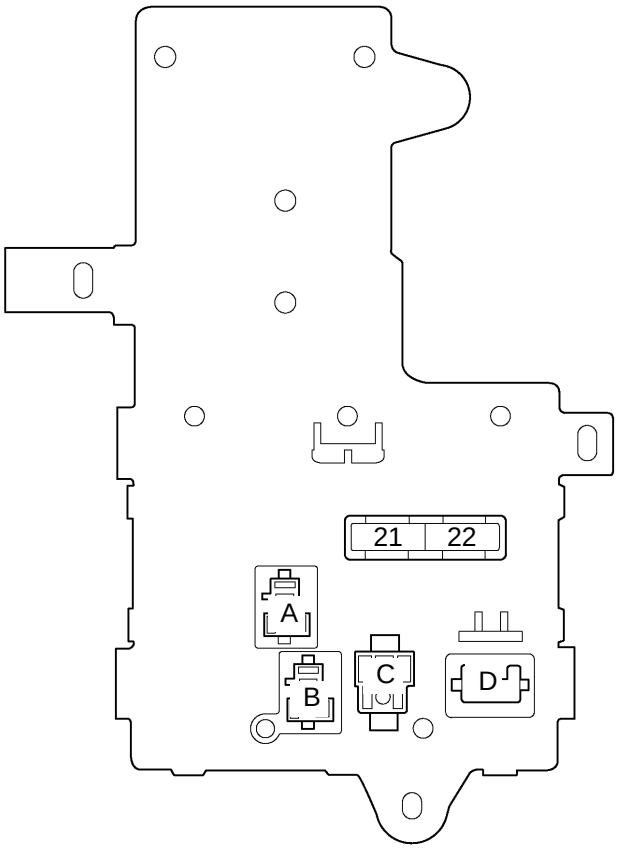


Fuses

1. RR DEF 40A
2. AM1 40A
3. D FR P/W 20A
4. TAIL 10A
5. GAUGE 10A
6. DOOR 20A
7. PANEL 7.5A
8. WASHER 15A
9. STARTER 7.5A
10. FR DEF 20A
11. A/C 10A
12. SEAT HTR 15A
13. CIG 15A
14. S/ROOF 30A
15. ECU-IG 10A
16. SRS-ACC 10A
17. STOP 15A
18. WIPER 25A
19. RADIO NO.2 10A
20. -

Condenser

21. DEF CDS
22. DEF CDS



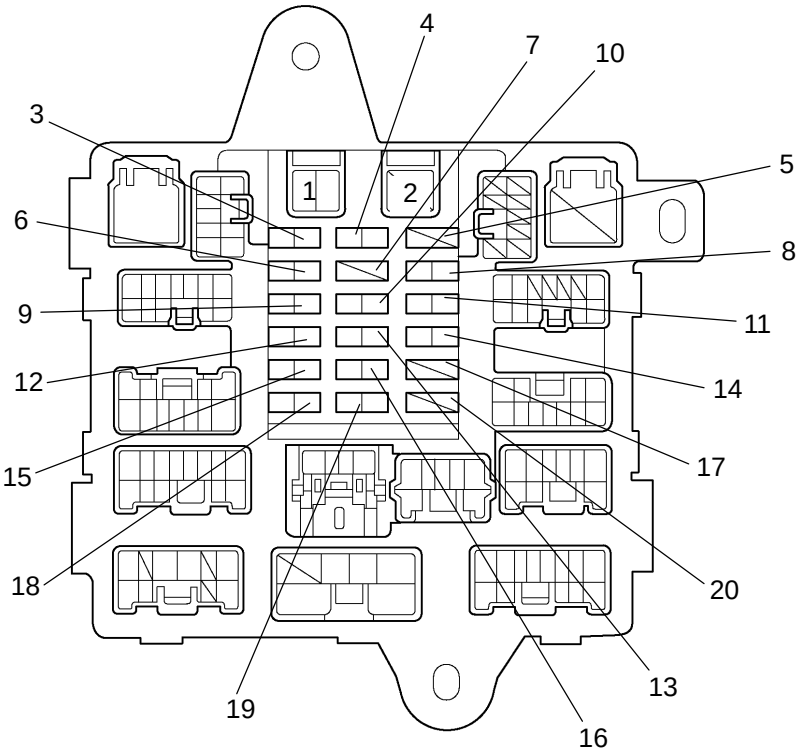
Relays

A. Deicer Relay
B. TAIL Relay
C. RR DEF Relay
D. FLSH Relay

N

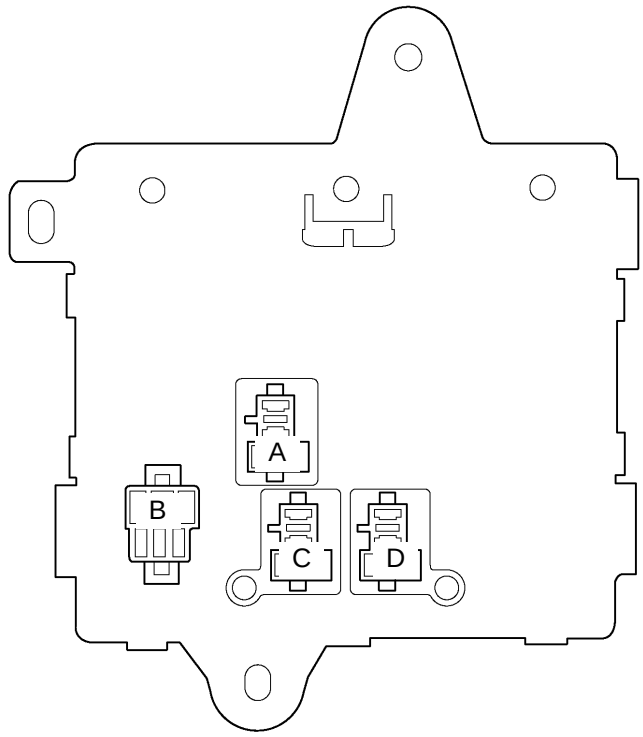
I11547

●Passenger Side Junction Block



Fuses

1. HEATER 40A
2. -
3. DOOR DL 15A
4. DOME 7.5A
5. -
6. FR FOG 15A
7. -
8. P FR P/W 20A
9. PWR OUTLET 15A
10. ECU-B2 7.5A
11. D RR P/W 20A
12. MIR HIR 15A
13. MPX-B 10A
14. P RR P/W 20A
15. SRS-B 7.5A
16. TV 7.5A
17. -
18. OBD 7.5A
19. IGN 7.5A
20.-



Relays

A. FR FOG Relay
B. HTR Relay
C. MIR HTR Relay
D. P/W Relay

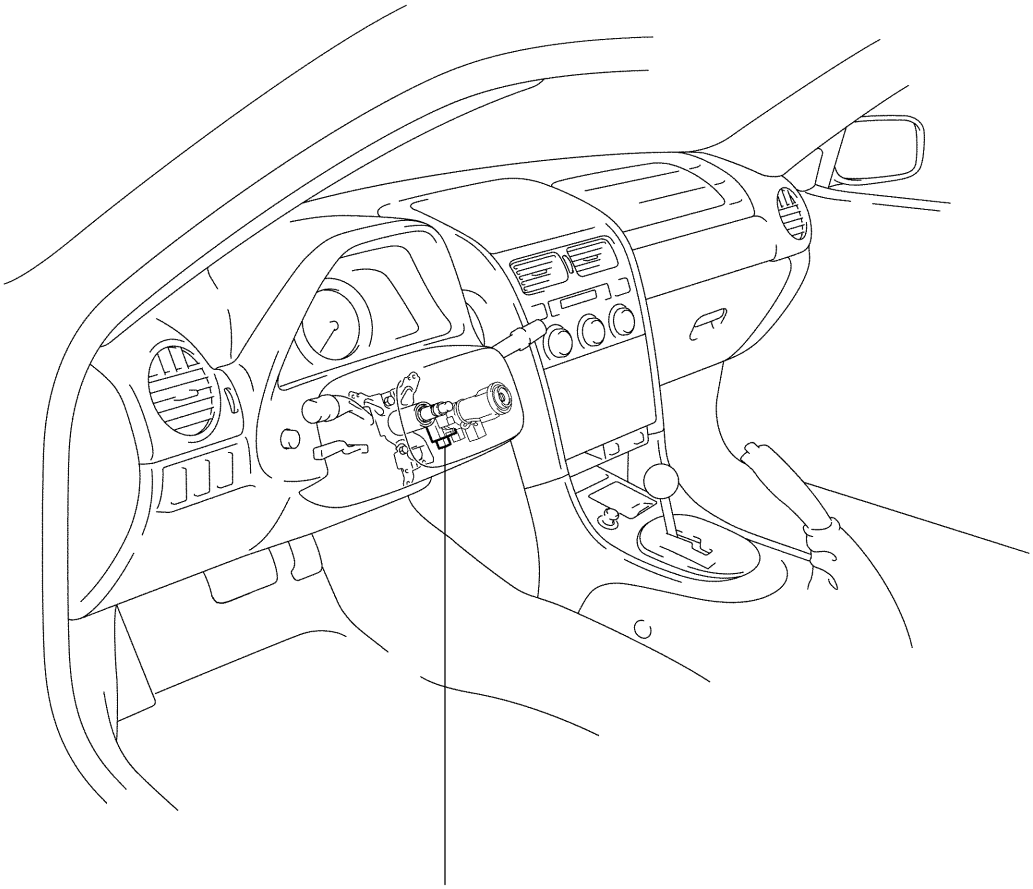
N

I11548

IGNITION SWITCH AND KEY UNLOCK WARNING SWITCH

BE01L-18

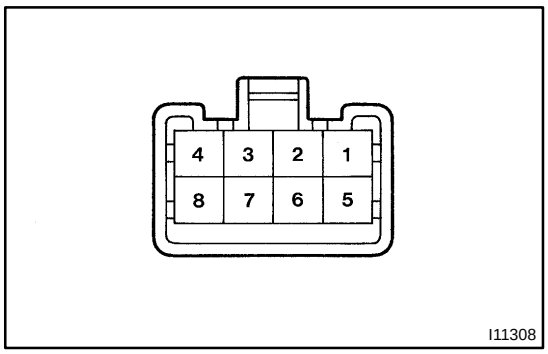
LOCATION



Ignition Switch and
Key Unlock Warning Switch

I27324

BE15W-04

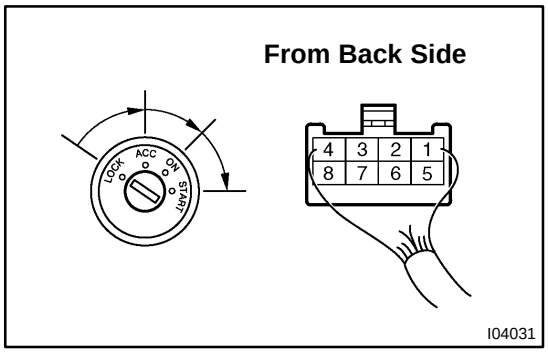


INSPECTION

1. INSPECT IGNITION SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
LOCK	-	No continuity
ACC	2 - 3	Continuity
ON	2 - 3 - 4 6 - 7	Continuity
START	1 - 2 - 4 6 - 7 - 8	Continuity

If continuity is not as specified, replace the switch.

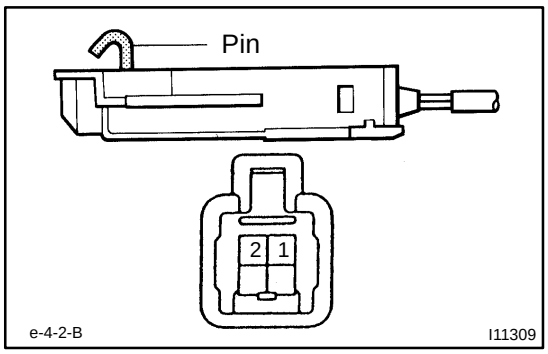


2. INSPECT IGNITION SWITCH CIRCUIT

Connect the switch connector and inspect the connector on wire harness side from the back side, as shown.

Tester connection	Condition	Specified condition
2 - Ground	Always	Battery Positive Voltage
3 - Ground	Ignition switch ACC or ON	Battery Positive Voltage
4 - Ground	Ignition switch ON	Battery Positive Voltage
6 - Ground	Ignition switch ON or START	Battery Positive Voltage
7 - Ground	Always	Battery Positive Voltage
8 - Ground	Ignition switch START	Battery Positive Voltage

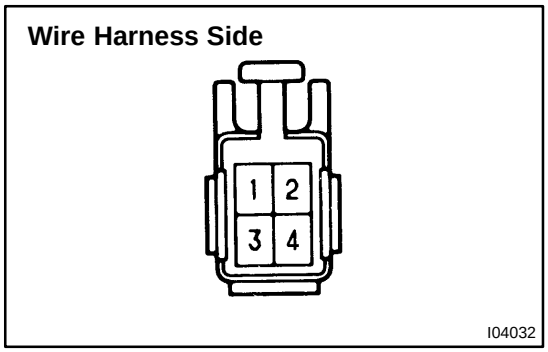
If circuit is not as specified, inspect the circuits connected to other parts.



3. INSPECT KEY UNLOCK WARNING SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF (Key removed)	1 - 2	No continuity
ON (Key set)	1 - 2	Continuity

If continuity is not as specified, replace the switch.



4. INSPECT KEY UNLOCK WARNING SWITCH CIRCUIT (See page DI-915)

Connect the switch connector and inspect the connector on wire harness side from the back side, as shown.

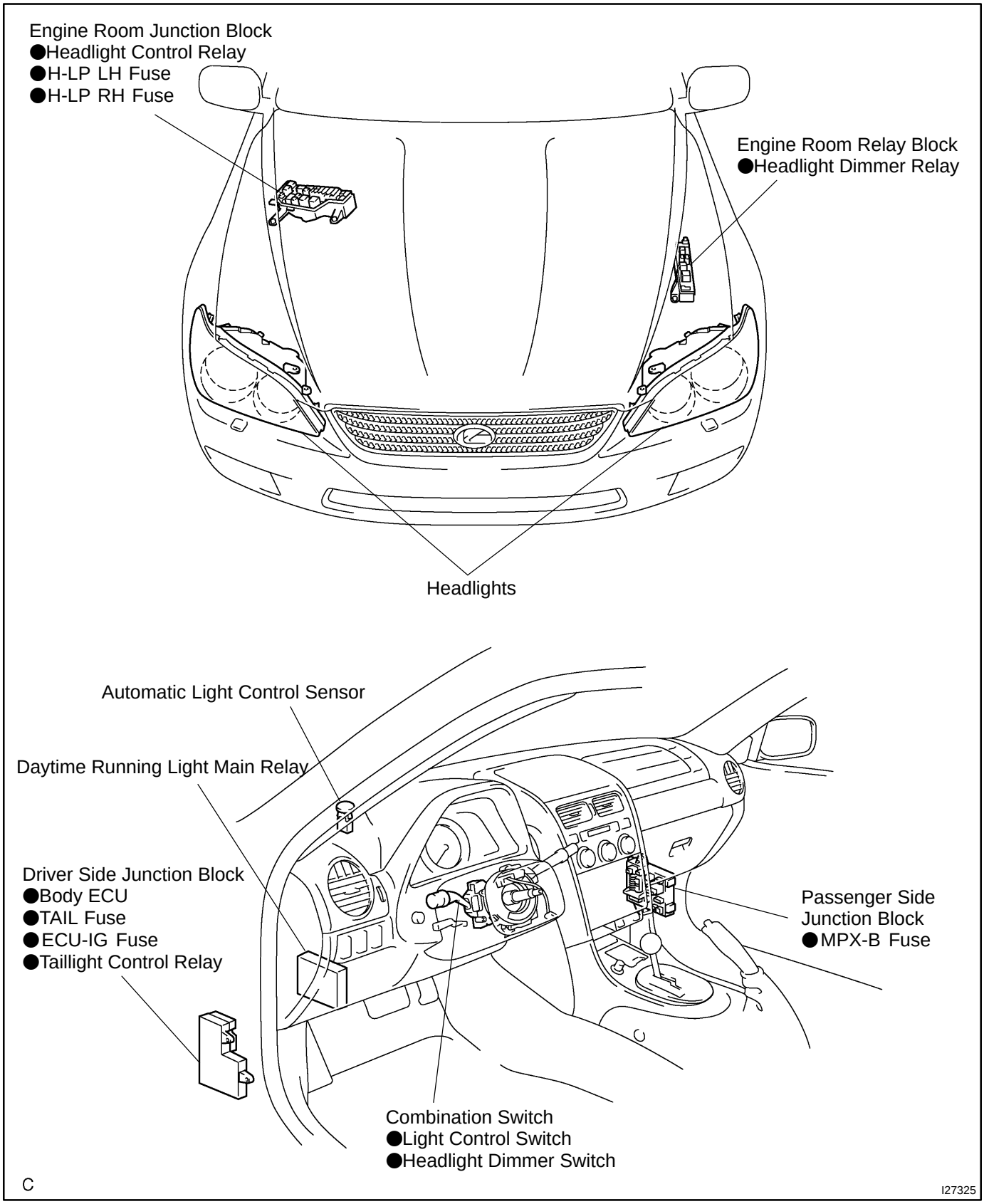
Tester connection	Condition	Specified condition
1 - Ground	Always	Continuity

If circuit is not as specified, inspect the circuits connected to other parts.

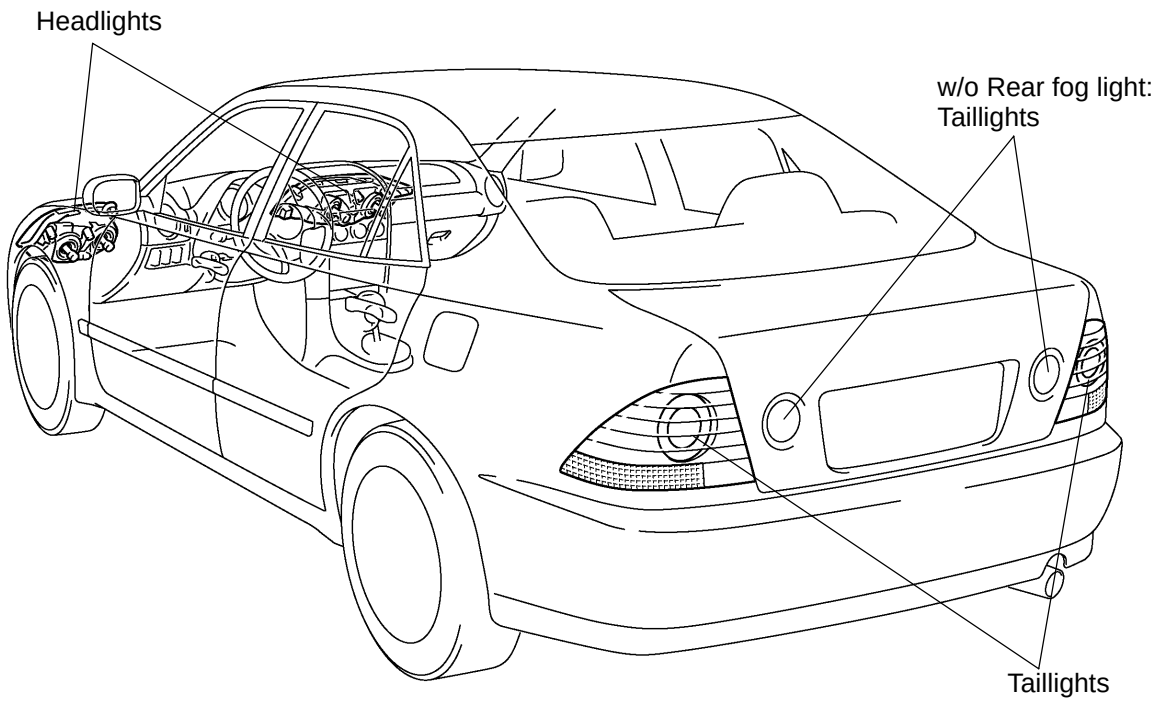
HEADLIGHT AND TAILLIGHT SYSTEM

BE29M-02

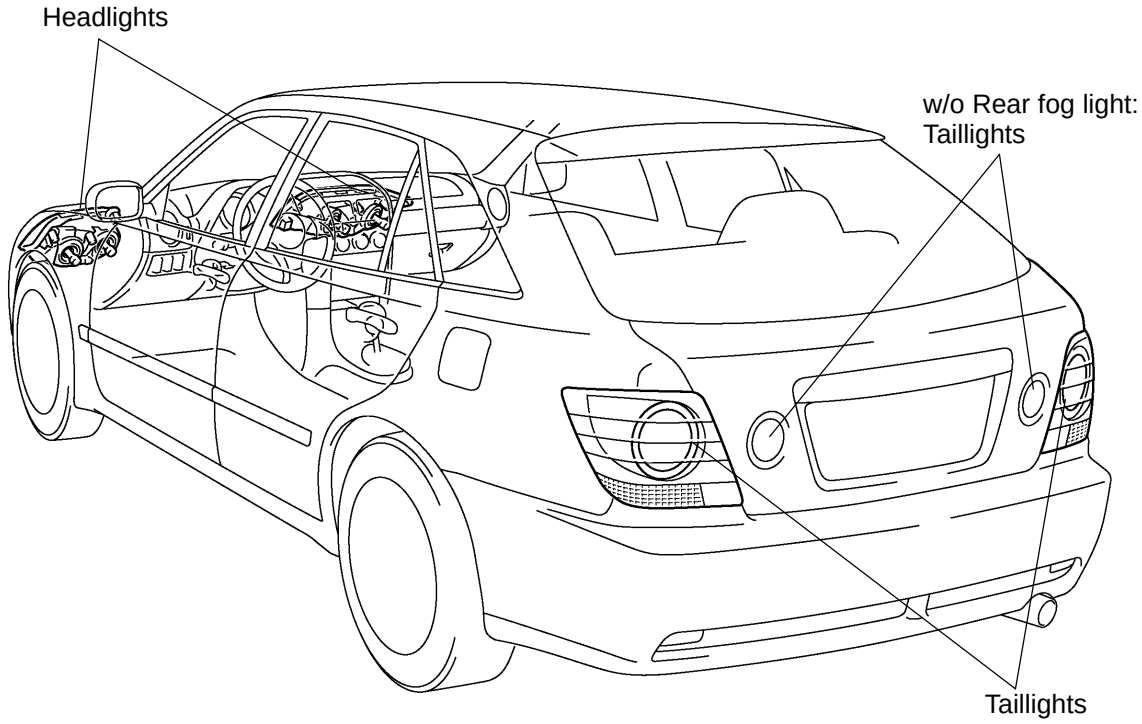
LOCATION



Sedan:



Wagon:

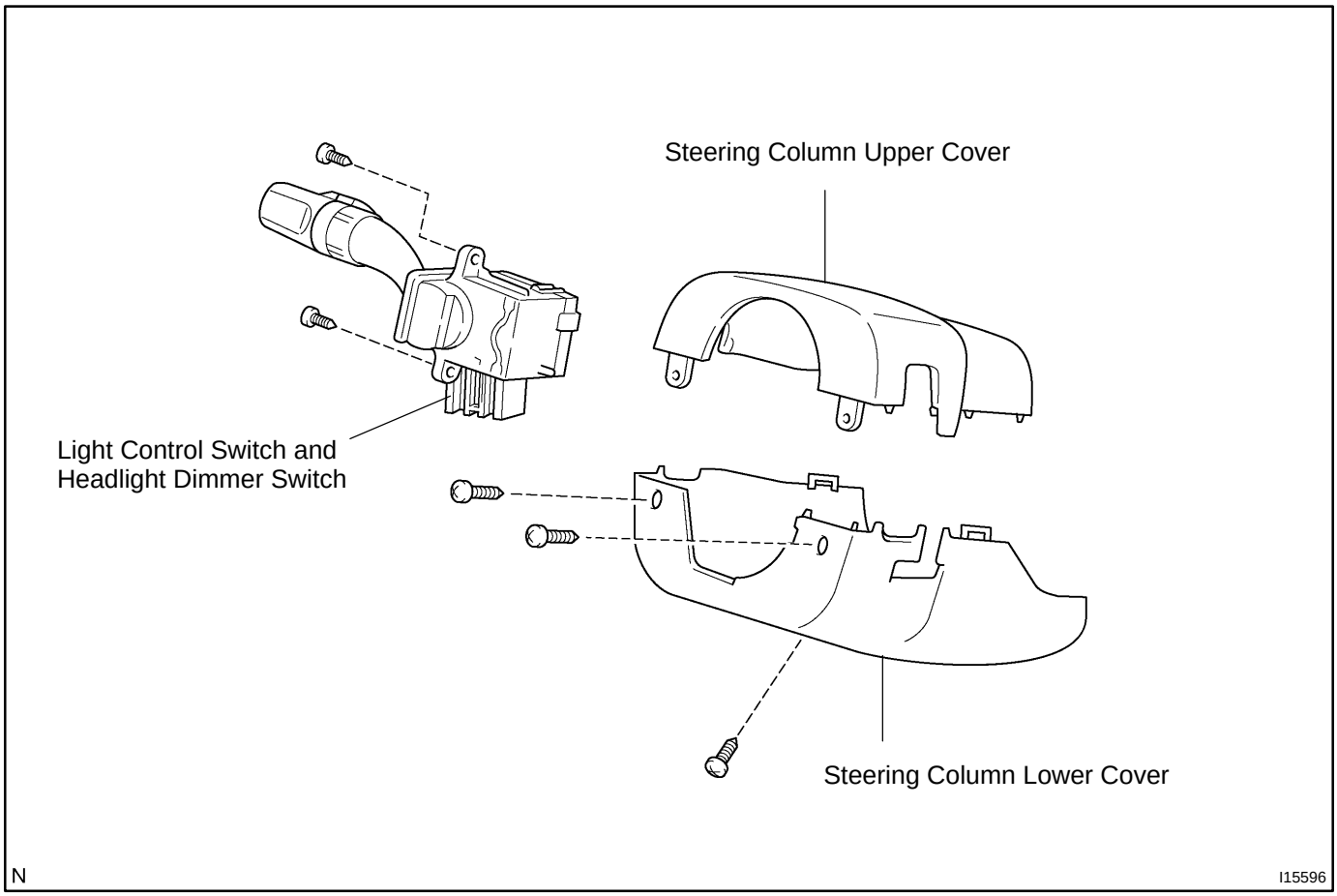


C

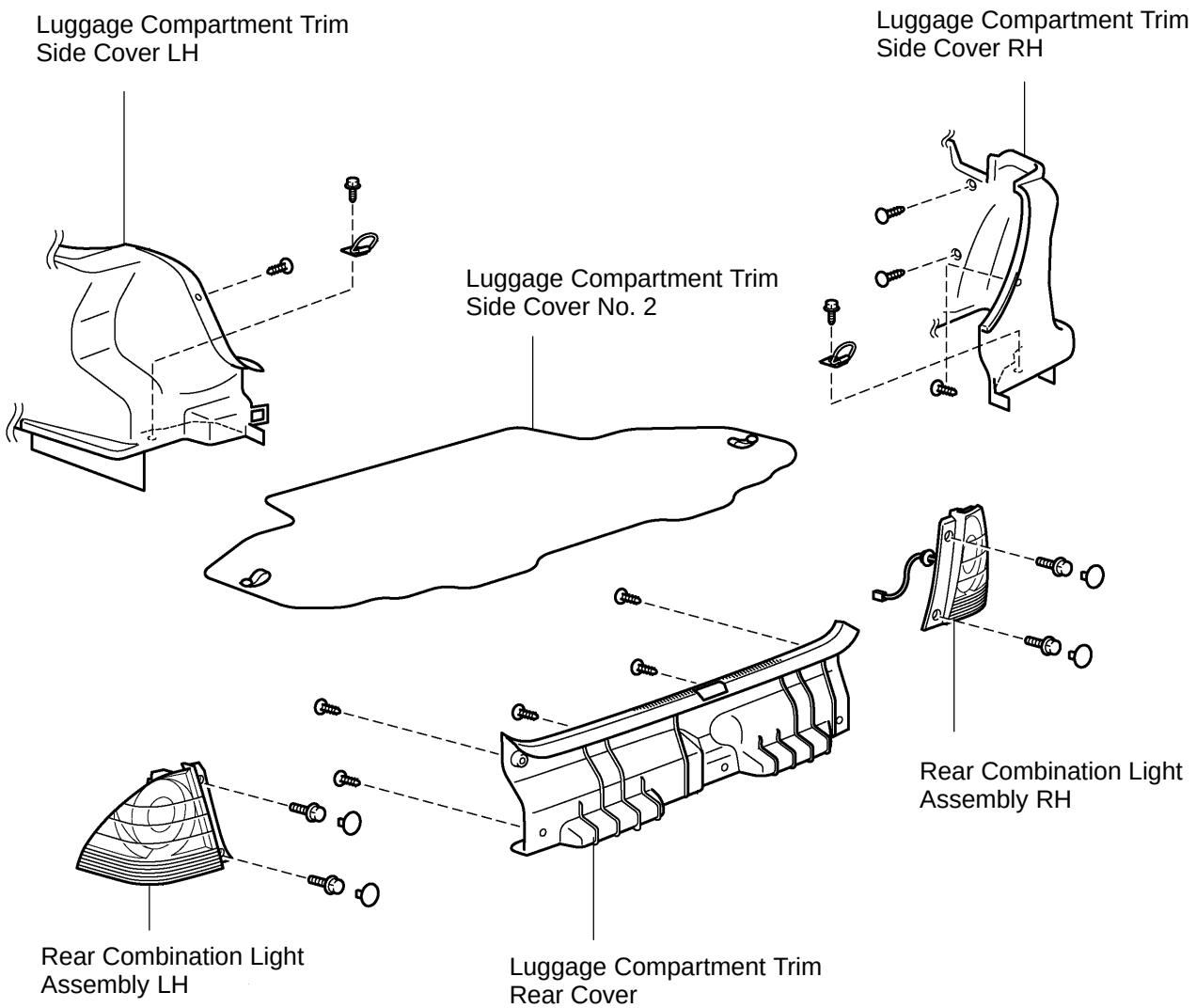
I23132

BE29N-02

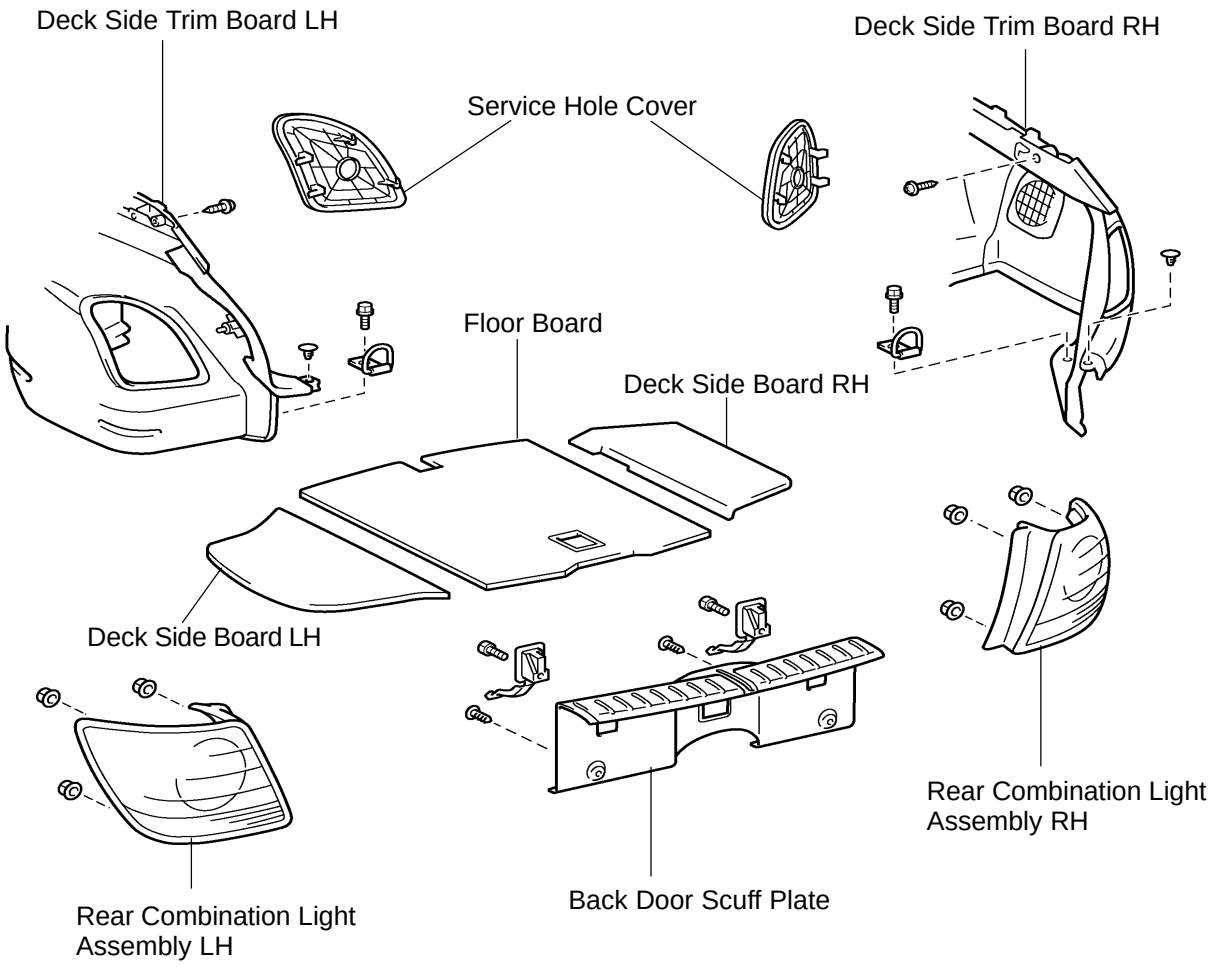
COMPONENTS



Sedan:


Luggage Compartment Trim Side Cover LH
Luggage Compartment Trim Side Cover RH
Luggage Compartment Trim Side Cover No. 2
Rear Combination Light Assembly RH
Rear Combination Light Assembly LH
Luggage Compartment Trim Rear Cover
H
I11324

Wagon:

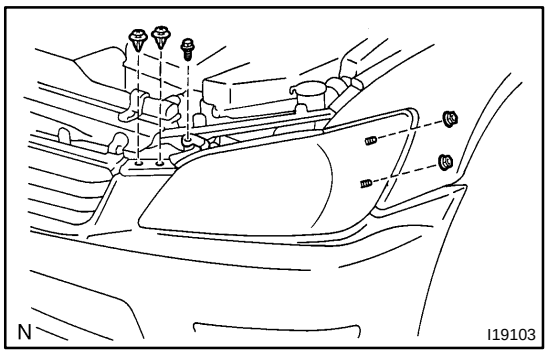


C

I23133

BE29O-02

REMOVAL

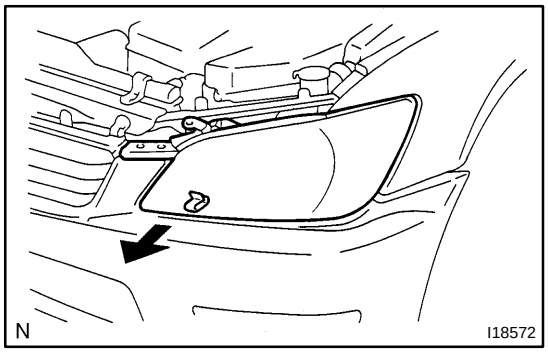


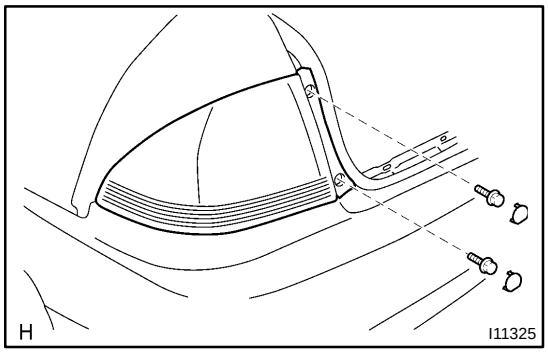
1. REMOVE HEADLIGHT

HINT:

Follow the same procedure for RH as for LH.

(a) Remove a part of LH front fender liner.
(b) Remove a part of front bumper cover.
(c) Remove the bolt, 2 nuts and 2 clips.
(d) Lift up the front bumper and pull the headlight assembly towards the front of the vehicle, and disconnect the engagement of the headlight assembly.
(e) Install LH headlight assembly.
(f) Install a part of front bumper cover.
(g) Install a part of front fender liner.
(h) Inspect and adjust optical axis of headlight (See page BE-38).



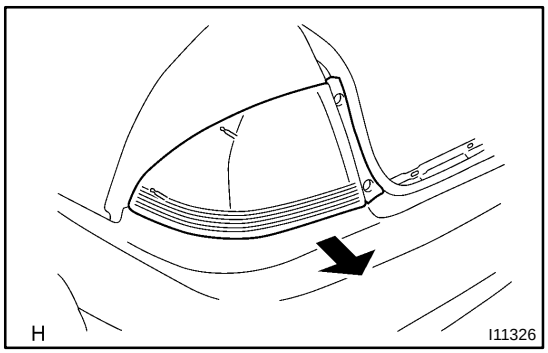


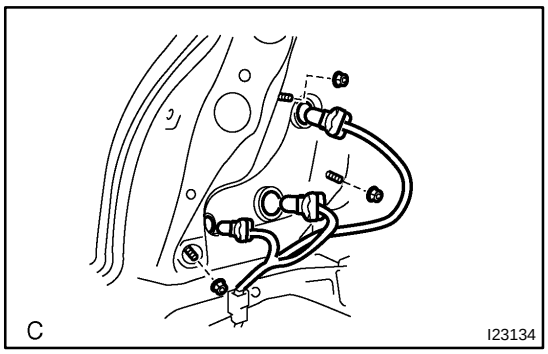
2. Sedan: REMOVE REAR COMBINATION LIGHT

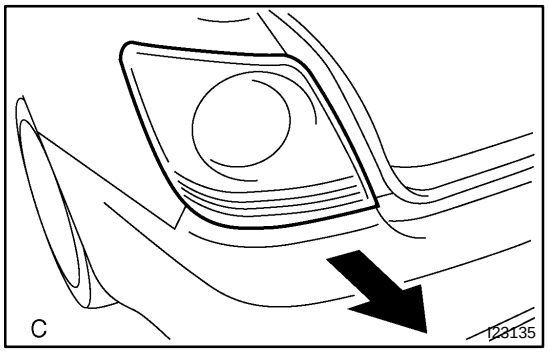
HINT:

- Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.
- Follow the same procedure for RH as for LH.

(a) Remove luggage compartment trim side cover No. 2.
(b) Remove luggage compartment trim rear cover.
(c) Remove a part of LH luggage compartment trim side cover.
(d) Remove the 2 rear light covers and 2 bolts.
(e) Pull the pin toward the rear of the vehicle, and disconnect the engagement of 2 pins.
(f) From the inside of the luggage room, separate the connector and disconnect the LH rear combination light assembly.





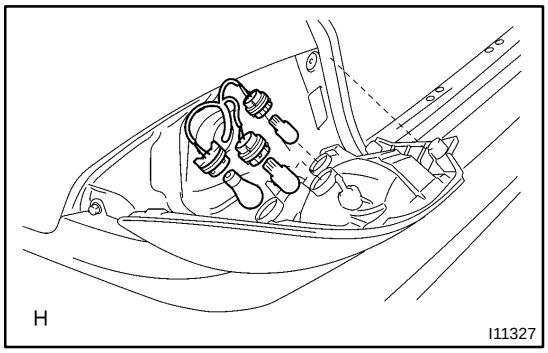


3. Wagon:
REMOVE REAR COMBINATION LIGHT

HINT:

- Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.
- Follow the same procedure for RH as for LH.

(a) Remove floor board and deck side board LH.
(b) Remove back door scuff plate.
(c) Remove a part of deck side trim board LH.
(d) Disconnect the bulb sockets and 3 nuts.
(e) Remove the combination light assembly.



4. Sedan:
REMOVE REAR COMBINATION BULB

HINT:

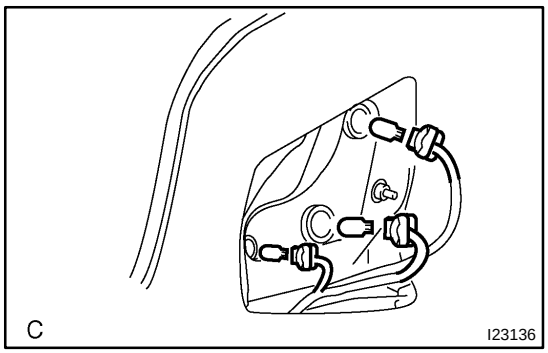
- Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.
- Follow the same procedure for RH as for LH.

(a) Remove a part of LH combination light assembly.

HINT:

Remove the light unit from only the outside of the vehicle.

(b) Remove the bulb sockets and remove the bulbs.

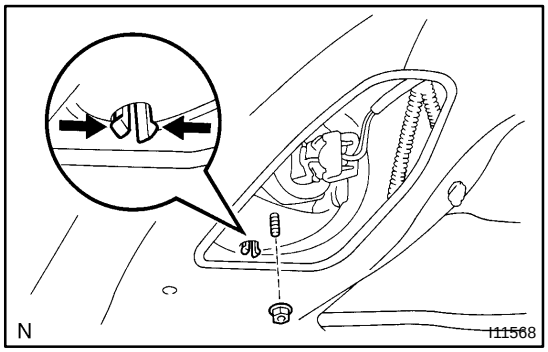


5. Wagon:
REMOVE REAR COMBINATION BULB

HINT:

- Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.
- Follow the same procedure for RH as for LH.

(a) Remove a service hole cover.
(b) Remove the bulb sockets and remove the bulbs.



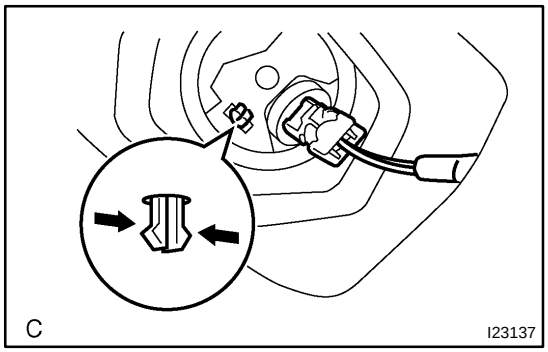
6. Sedan:
REMOVE REAR LAMP ASSEMBLY

HINT:

- Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.
- Follow the same procedure for RH as for LH.

(a) Remove a part of luggage compartment door trim.
(b) Remove the nut.
(c) Compress the claw to disconnect the engagement as shown in the illustration.

(d) Separate the connector and remove the rear light assembly.

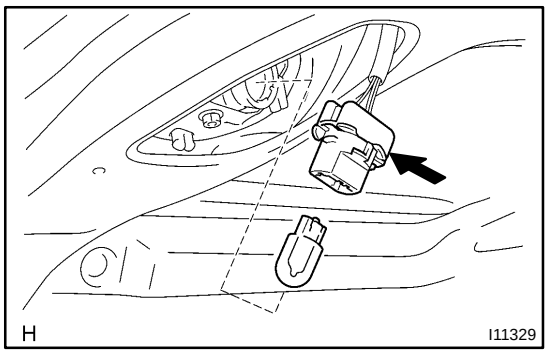


7. Wagon:
REMOVE REAR LAMP ASSEMBLY

HINT:

- Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.
- Follow the same procedure for RH as for LH.

(a) Remove the back door trim service hole cover.
(b) Compress the claw to disconnect the engagement as shown in the illustration.
(c) Separate the connector and remove the rear light assembly.

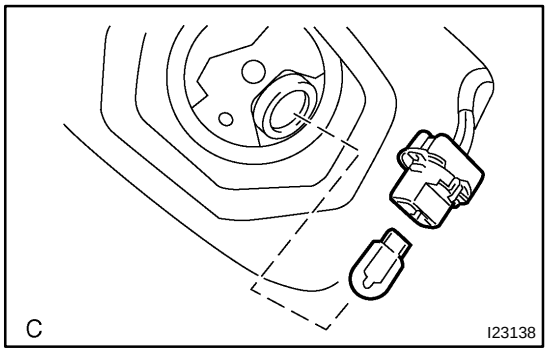


8. Sedan:
REMOVE REAR LAMP BULB

HINT:

Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.

(a) Remove a part of luggage compartment door trim.
(b) Remove the bulb socket and bulb.



9. Wagon:
REMOVE REAR LAMP BULB

HINT:

Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.

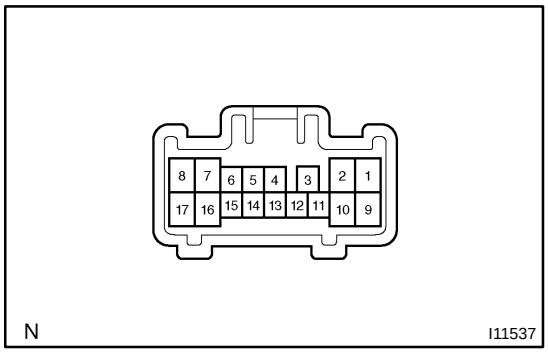
(a) Remove the back door trim service hole cover.
(b) Remove the bulb socket and bulb.

BE1WQ-04

INSPECTION

1. FAIL-SAFE FUNCTION (Light Control ECU)

When input error is inspected.	When input voltage is not within the range of operation voltage (9 to 16 V), lighting of the headlight stops. As soon as the voltage comes within the range, it lights up again. However if the input voltage becomes low after lighting up, sufficient voltage is maintained until light of bulb completely goes off.
When output error is inspected (Open or short). When light flushing is inspected.	When an error occurs in the output voltage (open or short) or flushing symptom occurs on the bulb, lighting of the headlight stops, the condition is maintained until power is turned ON again (headlight dimmer switch OFF → ON). In this case, it can not be judged whether lighting malfunction is caused by an output error or other reasons (fuse blown out, etc.). Check that there is no error in fuse and wiring (including power source) and replace the bulb in the first place, when the error still appears, replace the light control ECU.



2. INSPECT LIGHT CONTROL SWITCH CONTINUITY

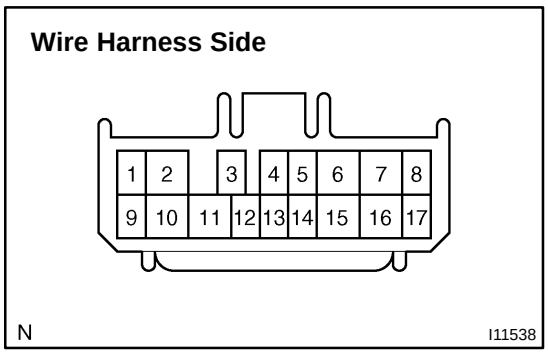
Switch position	Tester connection	Specified condition
OFF	-	No continuity
TAIL	14 - 16	Continuity
HEAD	13 - 14 - 16	Continuity
AUTO	13 - 16	Continuity

If continuity is not as specified, replace the switch.

3. INSPECT HEADLIGHT DIMMER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Low beam	16 - 17	Continuity
High beam	7 - 16	Continuity
Flash	7 - 8 - 16	Continuity

If continuity is not as specified, replace the switch.

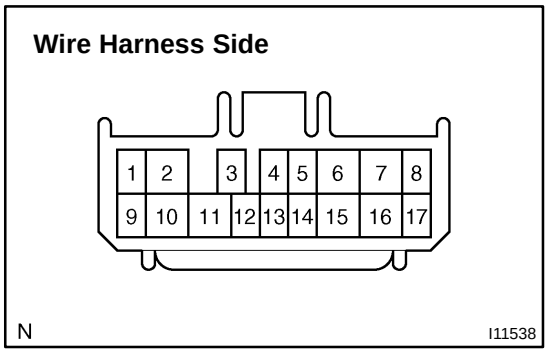


4. Connector disconnected:
INSPECT LIGHT CONTROL SWITCH CIRCUIT(See page DI-802)

Disconnect the connector from the switch and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
16 - Ground	Always	Continuity

If circuit is not as specified, inspect the wire harness.

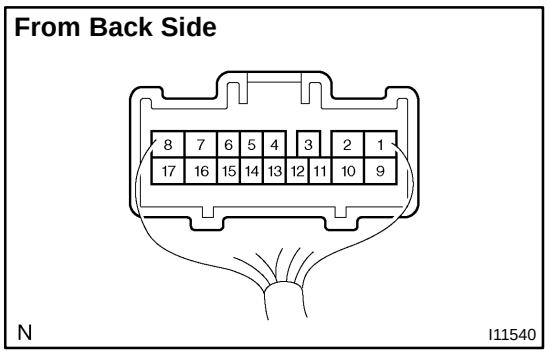


5. Connector disconnected:
INSPECT HEADLIGHT DIMMER SWITCH CIRCUIT (See page DI-802)

Disconnect the connector from the switch and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
16 - Ground	Always	Continuity
13 - Ground	Light control switch HEAD	Battery Positive Voltage

If circuit is not as specified, inspect the wire harness.

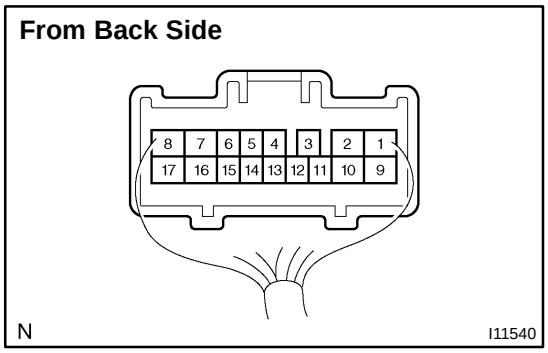


6. Connector connected:
INSPECT LIGHT CONTROL SWITCH CIRCUIT

Connect the wire harness side connector to the light control and dimmer switch and inspect the connector from the back side, as shown.

Tester connection	Condition	Specified condition
12 - Ground	Light control switch OFF, TAIL or HEAD	Battery Positive Voltage
12 - Ground	Light control switch AUTO	No voltage
13 - Ground	Light control switch OFF or TAIL	Battery Positive Voltage
13 - Ground	Light control switch HEAD	No voltage
14 - Ground	Light control switch OFF	Battery Positive Voltage
14 - Ground	Light control switch TAIL or HEAD	No voltage

If circuit is not as specified, inspect the wire harness.

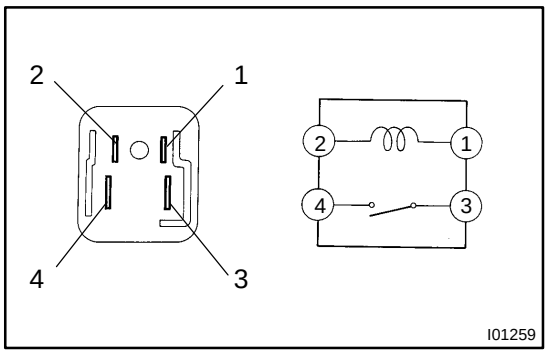


7. Connector connected:
INSPECT HEADLIGHT DIMMER SWITCH CIRCUIT

Connect the wire harness side connector to the light control and dimmer switch and inspect the connector from the back side, as shown.

Tester connection	Condition	Specified condition
7 - Ground	Headlight dimmer switch FLASH Light control switch HEAD and dimmer switch HIGH	No voltage
7 - Ground	Light control switch HEAD and dimmer switch LOW	Battery Positive Voltage
17 - Ground	Light control switch HEAD and dimmer switch LOW and fog light switch ON	No voltage
17 - Ground	Light control switch HEAD and dimmer switch HIGH or FLASH and fog light switch ON	Battery Positive Voltage

If circuit is not as specified, inspect the wire harness.

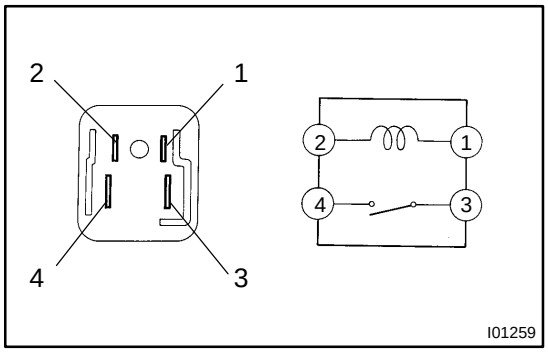


8. INSPECT HEADLIGHT CONTROL RELAY CONTINUITY

Condition	Tester connection	Specified condition
Always	1 - 2	Continuity
Apply B+ between terminals 1 and 2.	3 - 4	Continuity

If continuity is not as specified, replace the relay.

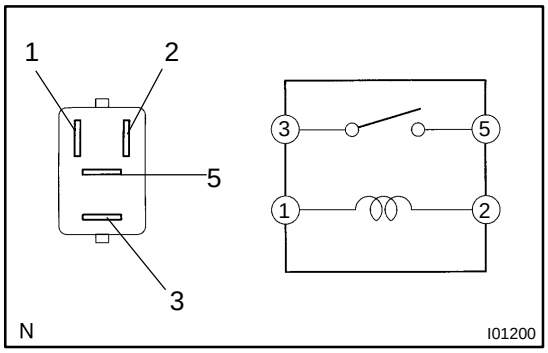
9. INSPECT HEADLIGHT CONTROL RELAY CIRCUIT (See page DI-805)



10. INSPECT HEADLIGHT DIMMER (DAYTIME RUNNING LIGHT NO. 2) RELAY CONTINUITY

Condition	Tester connection	Specified condition
Always	1 - 2	Continuity
Apply B+ between terminals 1 and 2.	3 - 4	Continuity

If continuity is not as specified, replace the relay.

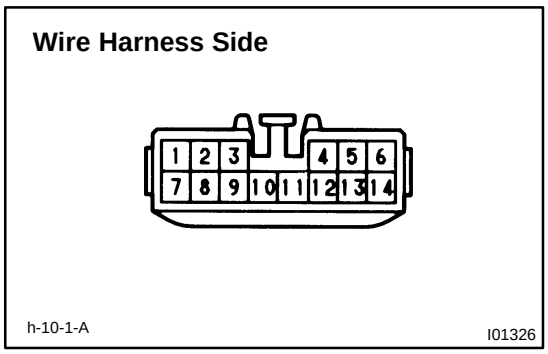


11. INSPECT TAILLIGHT CONTROL RELAY CONTINUITY

Condition	Tester connection	Specified condition
Always	1 - 2	Continuity
Apply B+ between terminals 1 and 2.	3 - 5	Continuity

If continuity is not as specified, replace the relay.

12. INSPECT TAILLIGHT CONTROL RELAY CIRCUIT (See page DI-913)

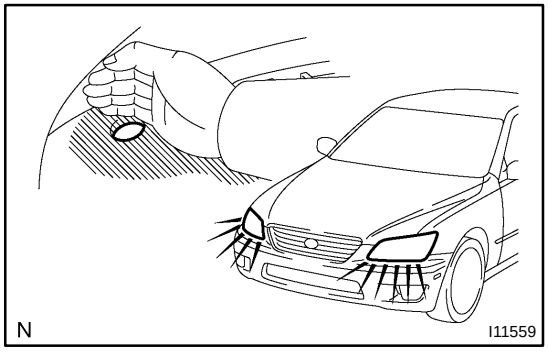


13. INSPECT DAYTIME RUNNING LIGHT MAIN RELAY CIRCUIT

Disconnect the connector from the relay and inspect the connector on the wire harness side.

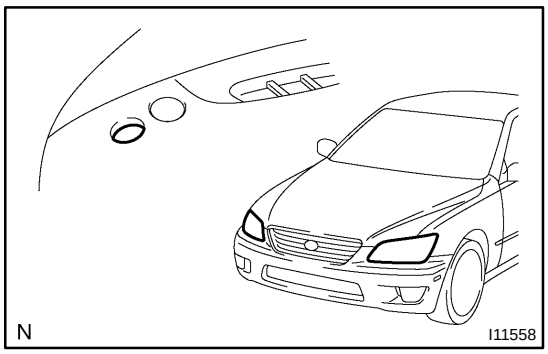
Tester connection	Condition	Specified condition
2 - Ground	Light control switch OFF	No continuity
2 - Ground	Light control switch TAIL or HEAD	Continuity
4 - Ground	Light control switch OFF or TAIL	No continuity
4 - Ground	Light control switch HEAD	Continuity
6 - Ground	Headlight dimmer switch FLASH	Continuity
8 - Ground	Engine running	Battery Positive Voltage
7 - Ground	Always	Continuity
10 - Ground	Always	Continuity
13 - Ground	Headlight dimmer switch FLASH or HI	Continuity
12 - Ground	Always	Battery Positive Voltage
1 - Ground	Ignition switch OFF	No voltage
1 - Ground	Ignition switch ON	Battery Positive Voltage
9 - Ground	Terminal 3 ground	Battery Positive Voltage
11 - Ground	Rear fog light switch ON, terminal 3 ground	Battery Positive Voltage
5 - Ground	Always	Battery Positive Voltage
14 - Ground	Terminal 5 ground	Battery Positive Voltage

If circuit is specified, try replacing the relay with a new one.
If circuit is not as specified, inspect the circuits connected to other parts.



14. Auto on function:
INSPECT AUTOMATIC LIGHT CONTROL SYSTEM

(a) Turn the ignition switch ON.
(b) Turn the light control switch to AUTO.
(c) Gradually cover the top of the sensor.
(d) Check the accessory lights and the headlights should turn ON.



15. Auto off function:
INSPECT AUTOMATIC LIGHT CONTROL SYSTEM

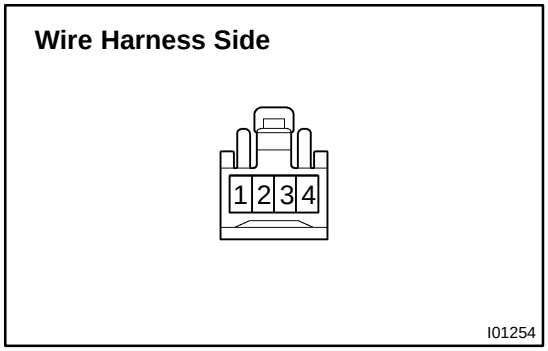
(a) Gradually expose the sensor.
(b) Check the headlights and the accessory lights should turn OFF.

16. INSPECT LIGHT-OFF CONDITION

(a) Turn the ignition switch ON.
(b) Gradually cover the top of the sensor.
Lights auto ON:
(c) Check that the lights go off under the following conditions.
(1) Light control switch is OFF.
(2) The area surrounding the sensor gets bright.
(3) The driver's door is opened with the ignition switch OFF.

17. INSPECT LIGHTS-ON CONDITION

(a) Open the driver's door while the ignition switch is OFF.
(b) Turn the light control switch to AUTO leaving the door open and cover the top of the sensor, and verify that the lights go on when the ignition switch is turned ON.



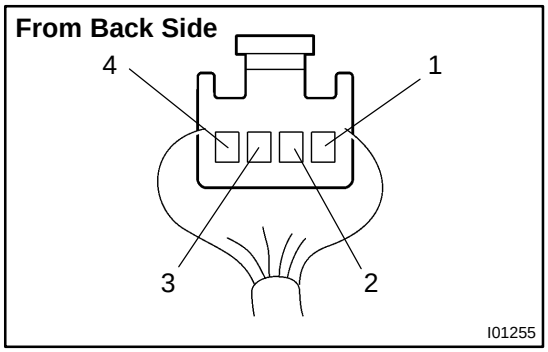
18. Connector disconnected:
INSPECT AUTOMATIC LIGHT CONTROL SENSOR CIRCUIT

Disconnect the connector from the sensor and inspect the connector on the wire harness side, as shown in the table.

Tester connection	Condition	Specified condition
3 - Ground	Always	Continuity
1 - Ground	Ignition switch LOCK or ACC	No voltage
1 - Ground	Ignition switch ON	Battery Positive Voltage
4 - Ground	Ignition switch LOCK or ACC	No voltage
4 - Ground	Ignition switch ON	5.2 - 9.0 V

If circuit is as specified, perform the inspection on the following page.

If the circuit is not as specified, inspect the circuit connected to other parts.



19. Connector connected:
INSPECT AUTOMATIC LIGHT CONTROL SENSOR CIRCUIT

Connect the wire harness side connector to the sensor and inspect wire harness side connector from the back side, as shown.

HINT:

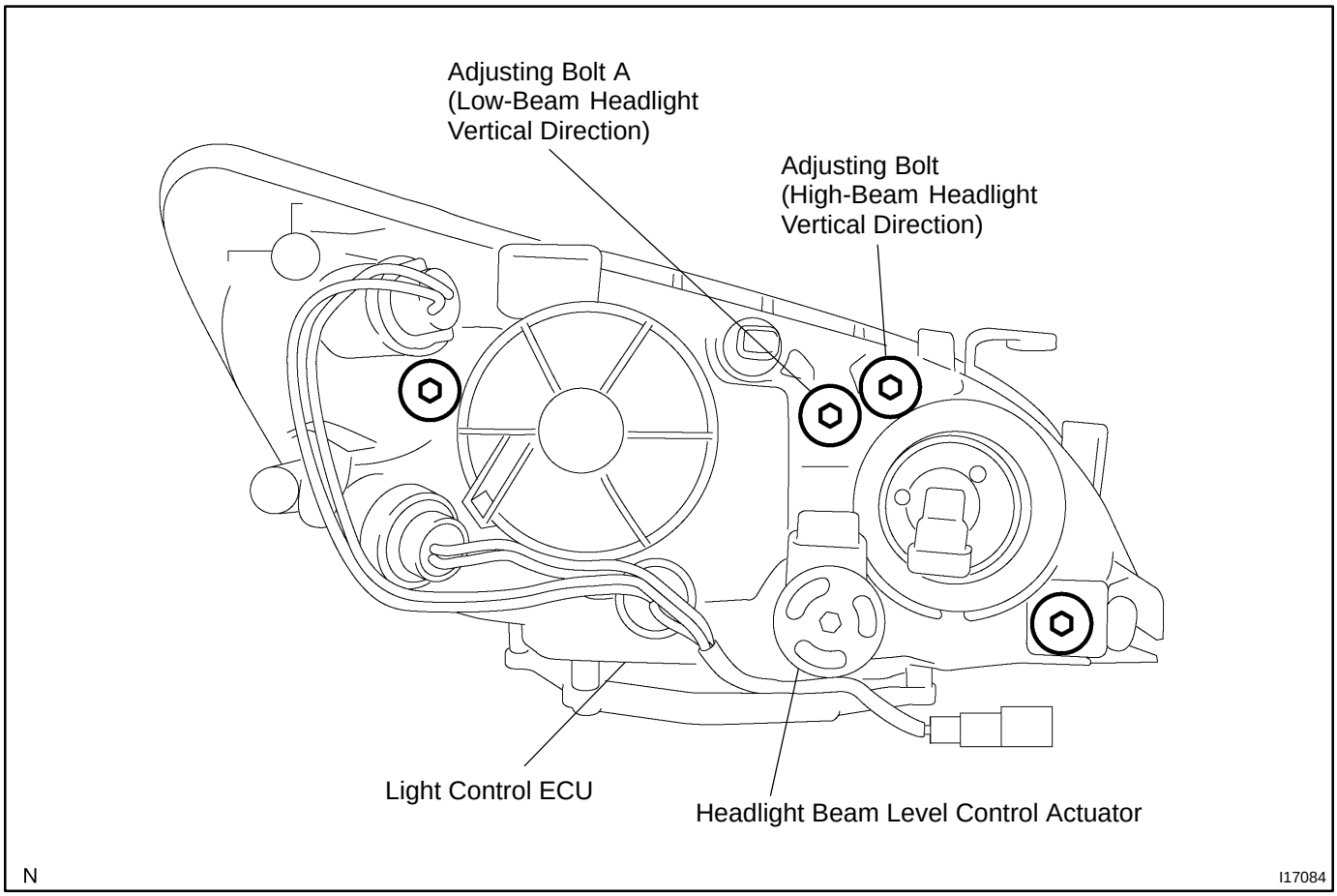
- Ignition switch ON.
- Light control switch AUTO.
- Vehicle's surroundings are bright.

Tester connection	Condition	Specified condition
3 - Ground	Always	Continuity
1 - Ground	Ignition switch LOCK or ACC	No voltage
1 - Ground	Ignition switch ON	9.5 V or more
Vehicle is under the direct sun light. (Sensor is not covered)		Taillight and Headlight are ON.

If circuit is as specified, try replacing the sensor with a new one.
If the circuit is not as specified, inspect the circuit connected to other parts.

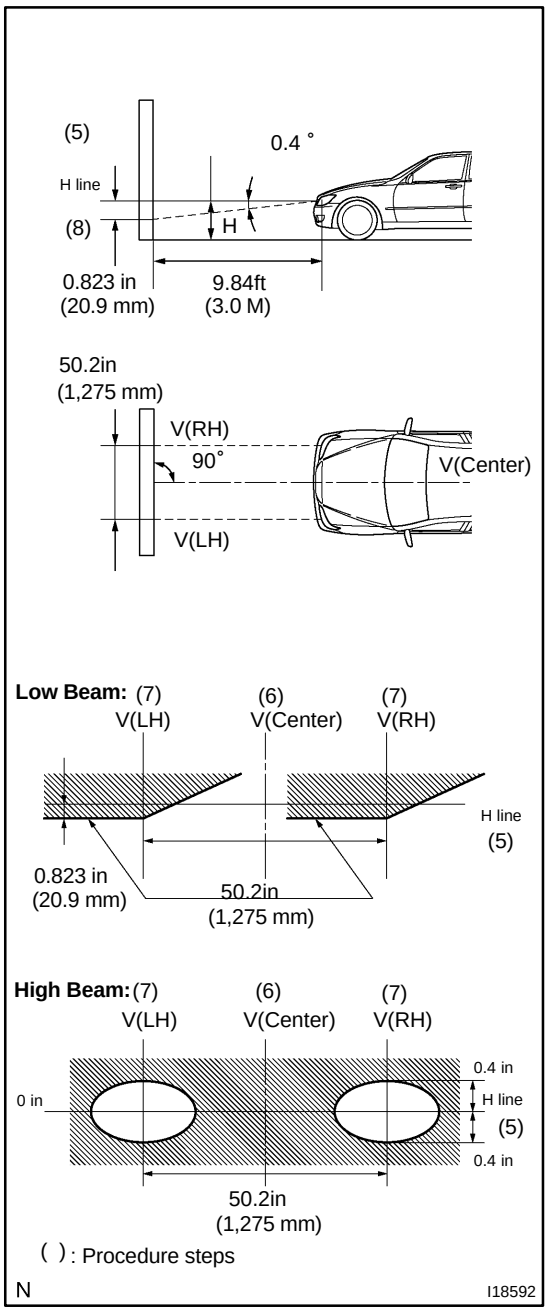
BE160-04

ADJUSTMENT



NOTICE:

- **Disconnect the connector of the other light to avoid heat affection from the light because the outer lens of the head light assembly is made of synthetic resin. When connecting the connector again take care not to wake the aiming out of adjustment.**
- **When covering the headlight, finish it within 3 minutes.**



ADJUSTING HEADLIGHT AIM

(a) Put the vehicle in below conditions.

- Make sure the body around the headlight is not deformed.
- Park the vehicle on a level spot.
- Tire inflation pressure is the specified value.
- Height control operation completes.
- Tire inflation pressure is the specified value.
- The driver gets into the driver's seat and puts the vehicle in a state ready for driving (with a full tank).
- Bounce the vehicle several times.

(b) Check the headlight aiming.

(1) Prepare the thick white colored paper.

(2) Stand the paper perpendicularly and ensure the distance from it to the head lights is 9.84 ft.

(3) Ensure that the center line of vehicle and the paper are at a 90 degree angle as shown in the illustration.

(4) Engine running.

(5) Draw a horizontal line (H line) on the paper where the head lights of the vehicle are to be.

(6) Draw a vertical line on the paper where the center line of the vehicle is to be. (V line)

(7) Draw the vertical lines on the paper where the headlights (low-beam and high-beam center marks) of the vehicle are to be (V RH and V LH lines).

(8) Draw the vertical lines on the paper where the headlights (low beam center marks) of the vehicle are to be. (V RH and LH lines)

(9) Turn the head lights ON.

(10) Check that the head lights light up the paper as shown in the illustration.

(11) When the paper is not lighted up properly, adjust the lights in the vertical direction.

HINT:

As shown in the illustration, adjust aiming of the LH and RH lights respectively.

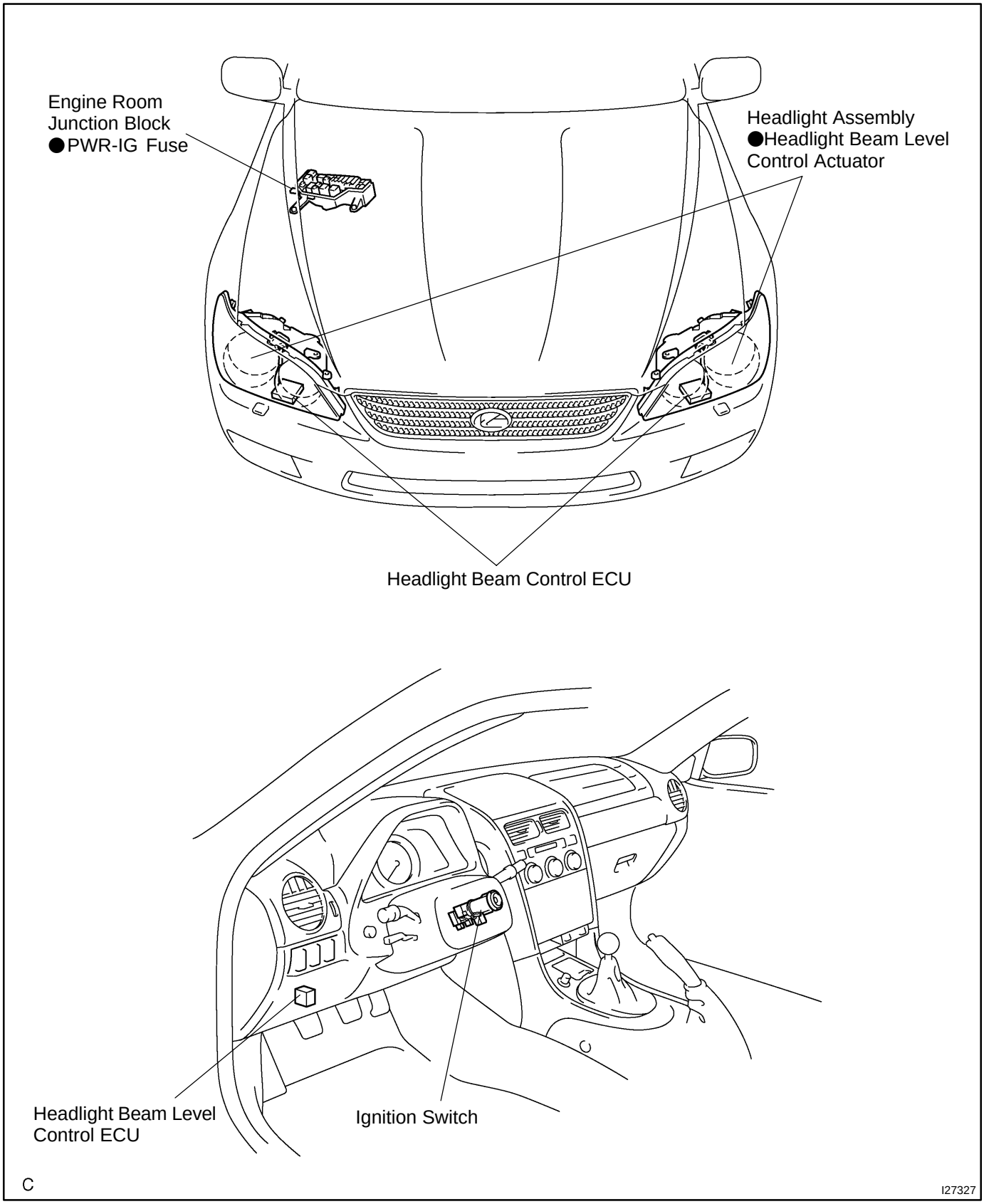
(c) Adjust the headlight in vertical direction.

Using adjusting bolt A, adjust the headlight aim to within the specifications.

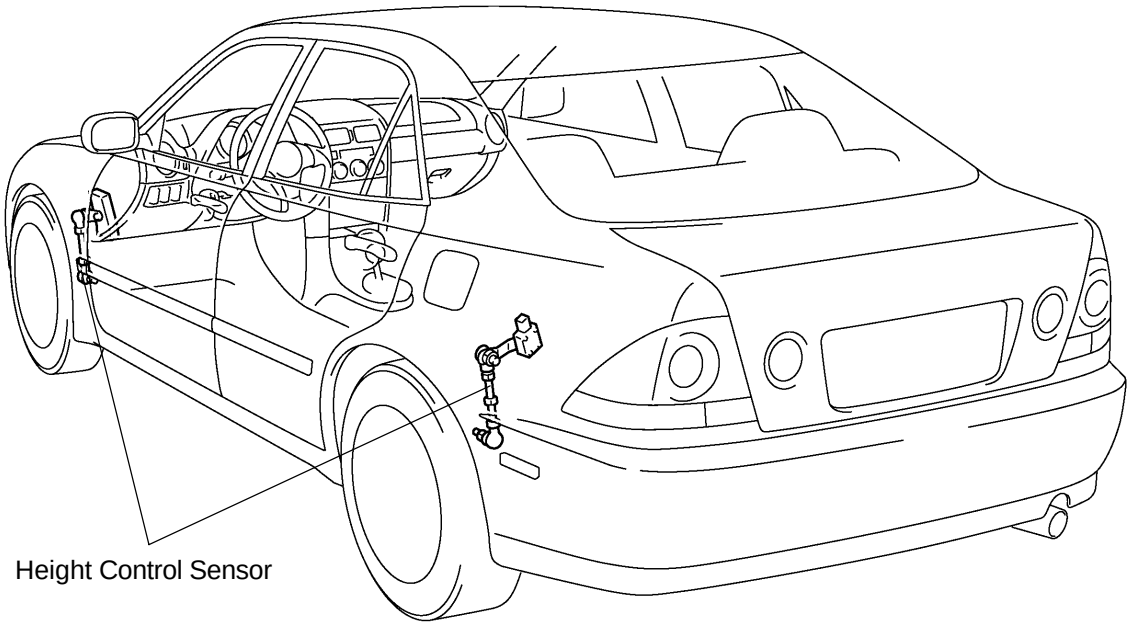
HEADLIGHT BEAM LEVEL CONTROL SYSTEM

LOCATION

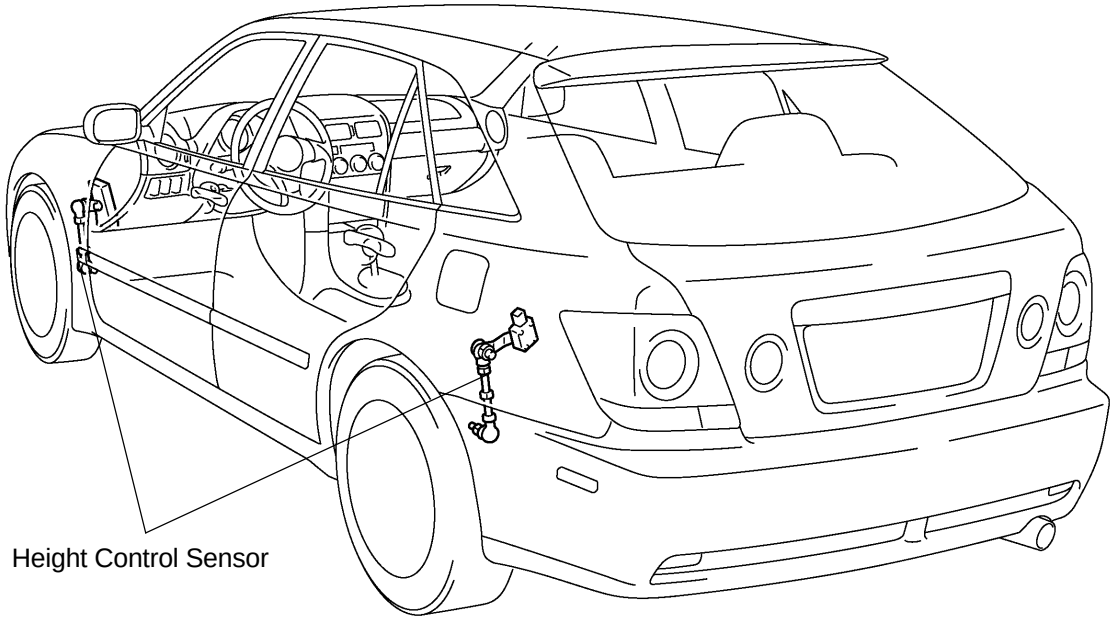
BE29P-02



Sedan:



Wagon:

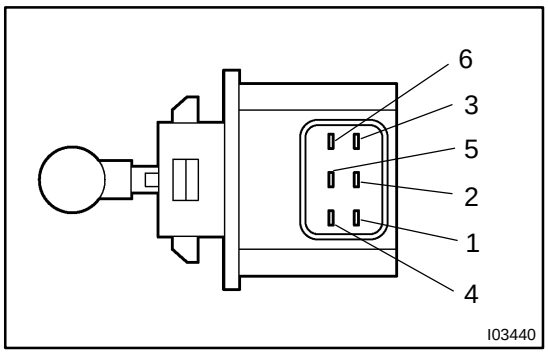


C

I27326

BE0BI-04

INSPECTION



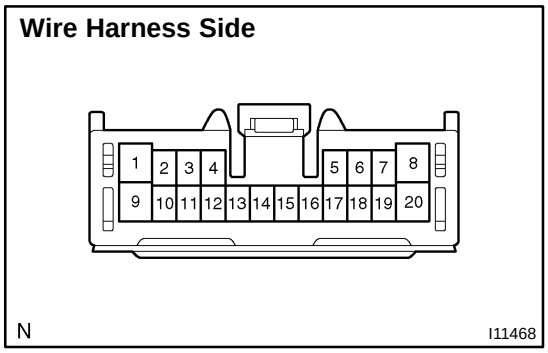
1. INSPECT HEADLIGHT BEAM LEVEL CONTROL ACTUATOR RESISTANCE

(a) Check that continuity exists between terminal 2 and 5.

(b) Check that resistance exists between terminal, as shown in the chart.

Terminal	Resistance (Ω)
2 - 1	26 - 30
2 - 3	26 - 30
2 - 4	26 - 30
2 - 6	26 - 30
5 - 1	26 - 30
5 - 3	26 - 30
5 - 4	26 - 30
5 - 6	26 - 30

If resistance value is not as specified, replace the actuator.

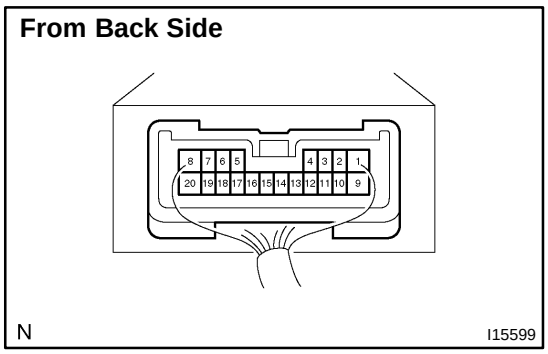


2. Connector disconnected:
INSPECT HEADLIGHT BEAM LEVEL CONTROL ECU CIRCUIT

Disconnect the connector from the ECU and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
1 - 13	Ignition switch OFF	26 - 30 Ω
1 - 15	Ignition switch OFF	26 - 30 Ω
1 - 14	Ignition switch OFF	26 - 30 Ω
1 - 16	Ignition switch OFF	26 - 30 Ω
1 - 4	Ignition switch OFF	26 - 30 Ω
1 - 2	Ignition switch OFF	26 - 30 Ω
1 - 12	Ignition switch OFF	26 - 30 Ω
1 - 3	Ignition switch OFF	26 - 30 Ω
6 - 10	Ignition switch OFF	Continuity
7 - 11	Ignition switch OFF	Continuity
10 - 17	Ignition switch OFF	Continuity
5 - 11	Ignition switch OFF	Continuity
20 - Ground	Ignition switch OFF	Continuity

If circuit is not as specified, perform the inspection on the following page.



3. Connector connected:
INSPECT HEADLIGHT BEAM LEVEL CONTROL ECU CIRCUIT

Connect the connector from the ECU and inspect the connector on the back side, as shown in the chart.

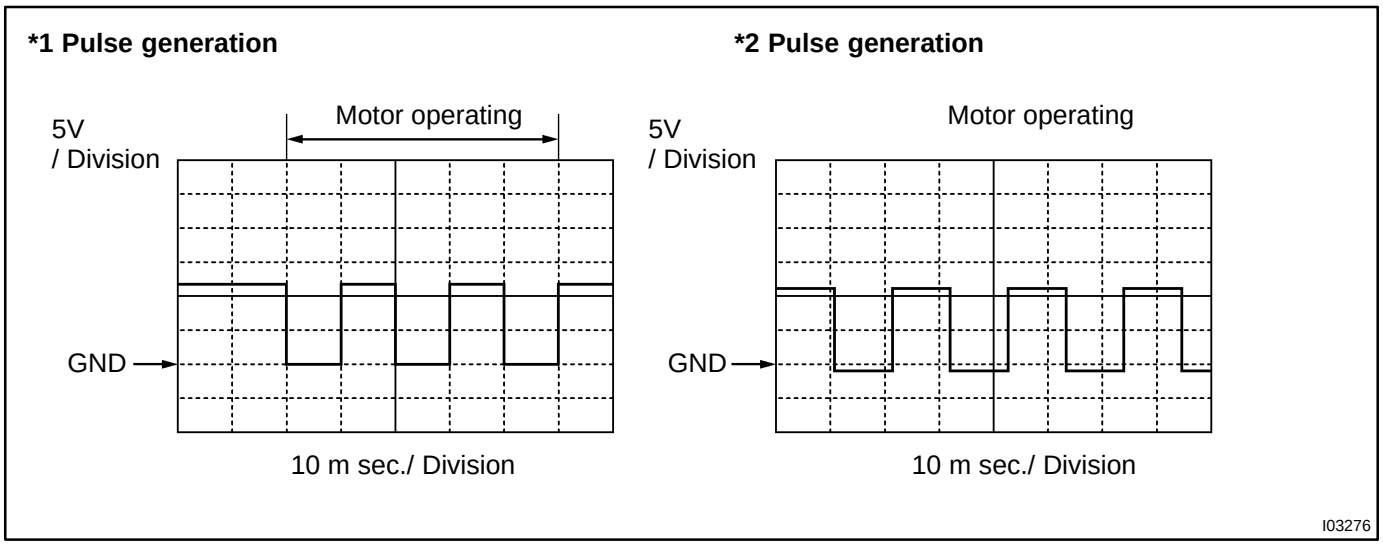
Tester connection	Condition	Specified condition
1 - 20	Ignition switch ON	Battery positive voltage
13 - 20	Ignition switch ON, when keep and bounce the vehicle	*1 Pulse generation
15 - 20	Ignition switch ON, when keep and bounce the vehicle	*1 Pulse generation
14 - 20	Ignition switch ON, when keep and bounce the vehicle	*1 Pulse generation
16 - 20	Ignition switch ON, when keep and bounce the vehicle	*1 Pulse generation
10 - 17	Ignition switch ON	Approx. 2.5 V
18 - 20	Ignition switch ON	No continuity
4 - 20	Ignition switch ON, when keep and bounce the vehicle	*1 Pulse generation
2 - 20	Ignition switch ON, when keep and bounce the vehicle	*1 Pulse generation
12 - 20	Ignition switch ON, when keep and bounce the vehicle	*1 Pulse generation
3 - 20	Ignition switch ON, when keep and bounce the vehicle	*1 Pulse generation
5 - 11	Ignition switch ON	Approx. 2.5 V
11 - 20	Ignition switch OFF	Continuity
10 - 17	Ignition switch OFF	Continuity
6 - 10	Ignition switch ON	5 V
7 - 11	Ignition switch ON	5 V
10 - 20	Ignition switch OFF	Continuity
20 - Body ground	Ignition switch OFF	Continuity

If the circuit is not as specified, replace the ECU.

Reference INSPECTION USING OSCILLOSCOPE

HINT:

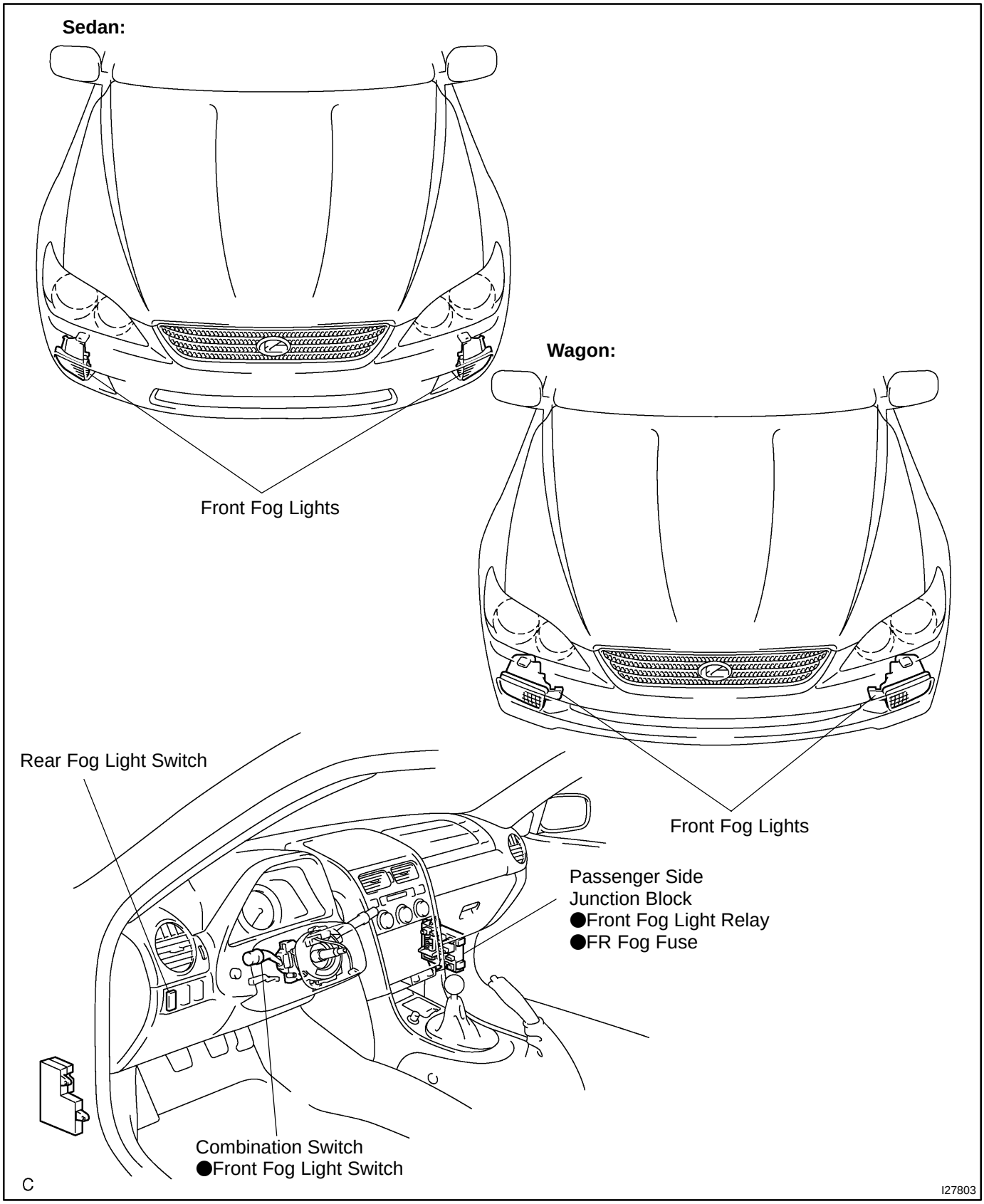
The correct waveform is as shown in the illustration.



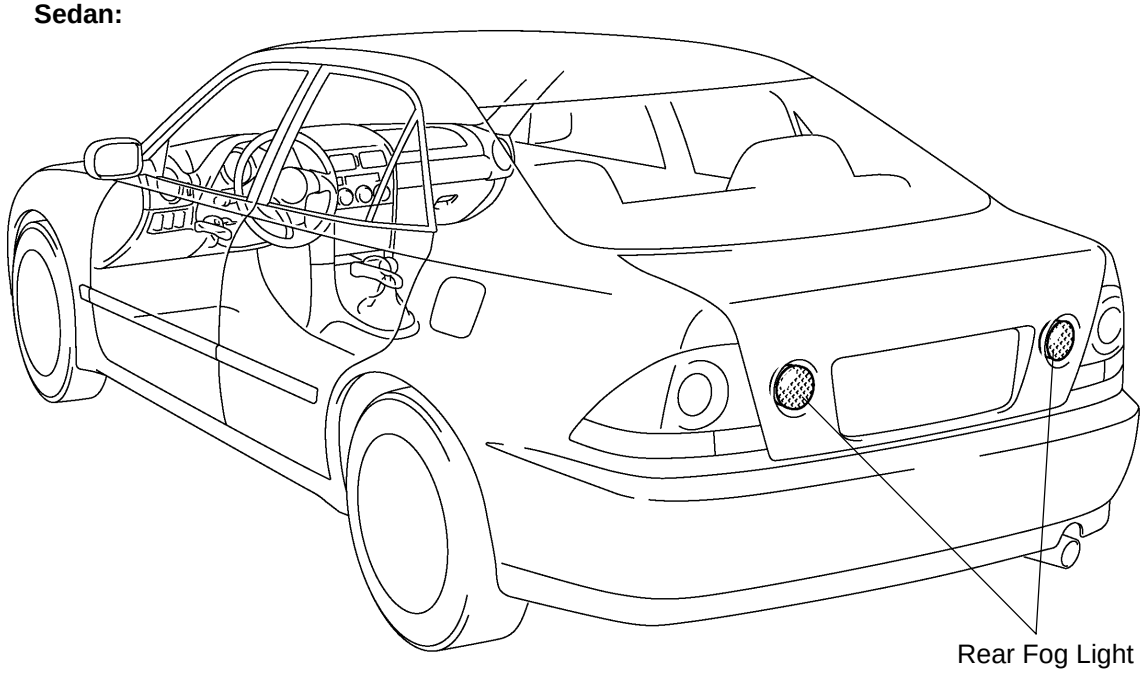
FOG LIGHT SYSTEM

LOCATION

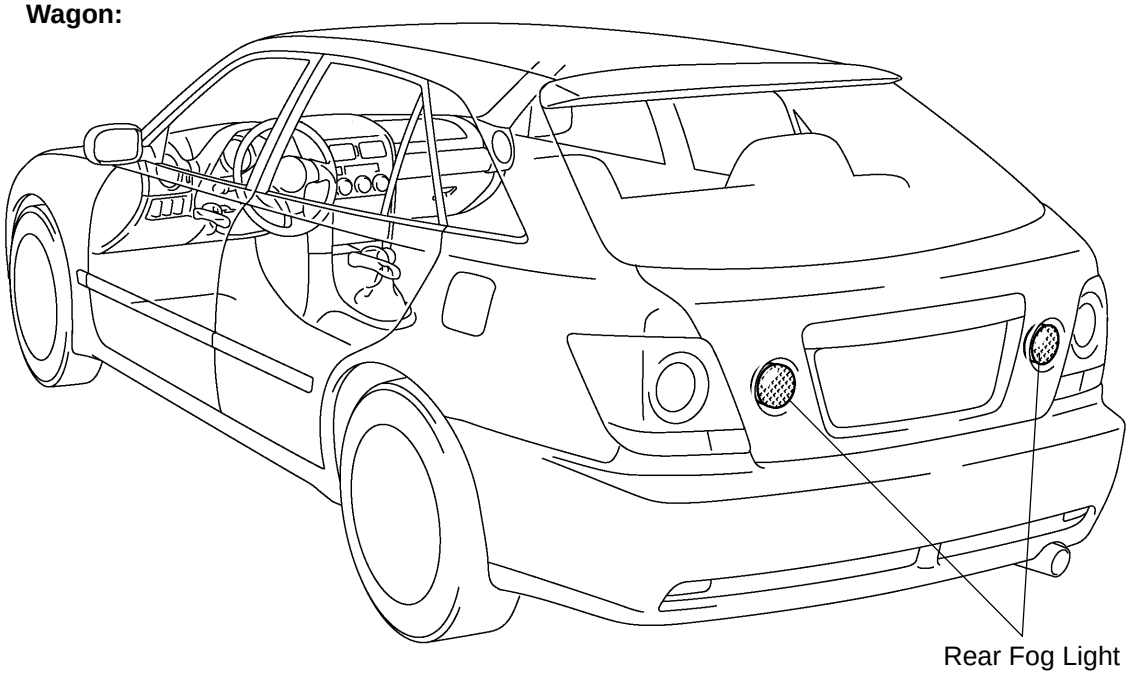
BE29Q-02



Sedan:



Wagon:

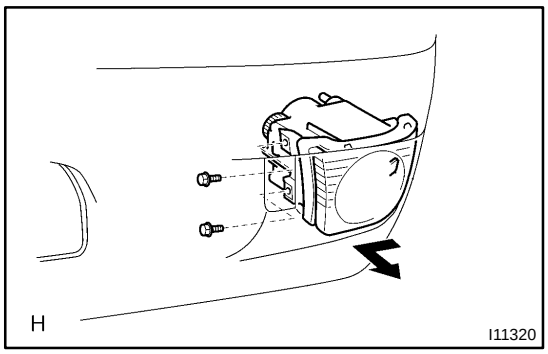


C

I27804

BE29R-02

REMOVAL

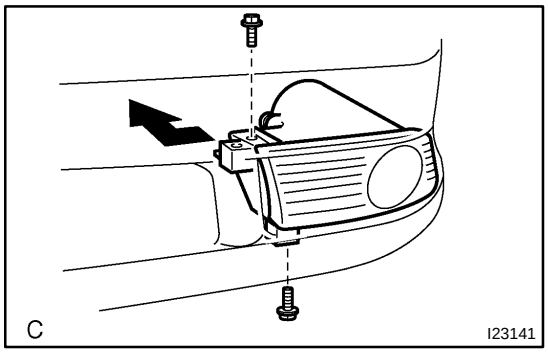


1. Sedan:
REMOVE FRONT FOG LIGHT ASSEMBLY

HINT:

- Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.
- Follow the same procedure for RH as for LH.

(a) Remove the front portion of fender liner.
(b) Disconnect the connecter.
(c) Remove the 2 bolts.
(d) Remove the front fog light assembly, as shown in the illustration.
(e) Install front fog light assembly.
(f) Adjust optical axis of fog light (See page BE-50).

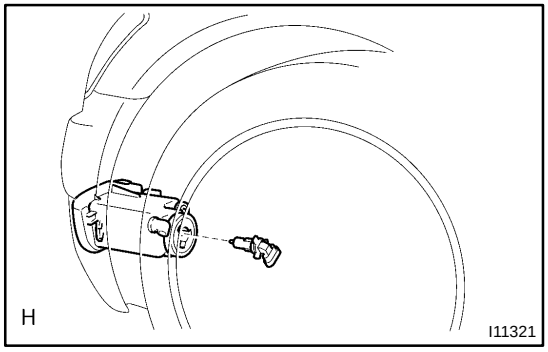


2. Wagon:
REMOVE FRONT FOG LIGHT ASSEMBLY

HINT:

- Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.
- Follow the same procedure for RH as for LH.

(a) Remove the front portion of fender liner.
(b) Disconnect the connecter.
(c) Remove the 2 bolts.
(d) Remove the front fog light assembly, as shown in the illustration.
(e) Install front fog light assembly.
(f) Adjust optical axis of fog light (See page BE-50).



3. REMOVE FRONT FOG LIGHT BULB

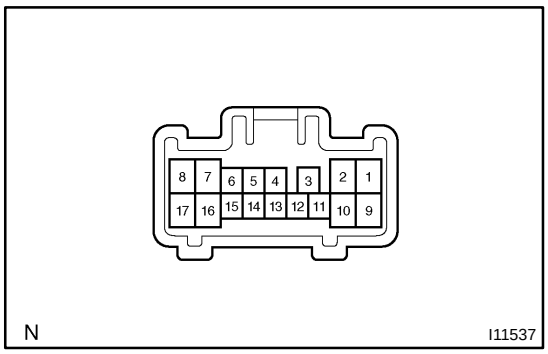
HINT:

Follow the same procedure for RH as for LH.

(a) Remove a part of LH front fender liner.
(b) Separate the connector and remove the bulb.

BE29S-03

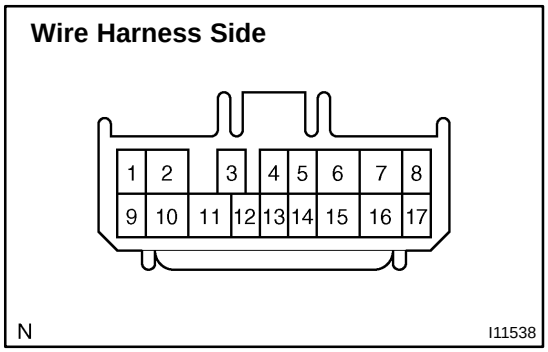
INSPECTION



1. INSPECT FRONT FOG LIGHT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	-	No continuity
ON	10 - 11	Continuity

If continuity is not as specified, replace the switch.

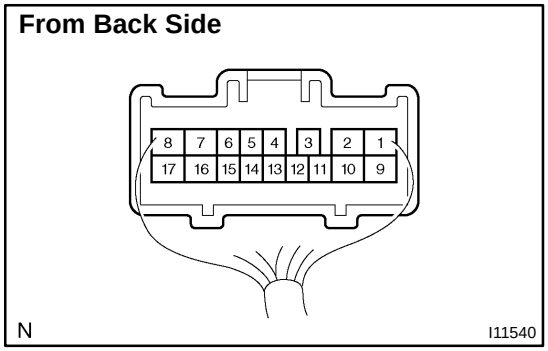


2. Connector disconnected: INSPECT FRONT FOG LIGHT SWITCH CIRCUIT

Disconnect the connector from the switch and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
10 - 17	Always	Continuity

If circuit is not as specified, inspect the wire harness.



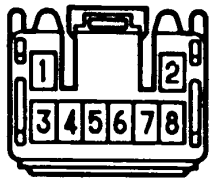
3. Connector connected: INSPECT FRONT FOG LIGHT SWITCH CIRCUIT

Connect the wire harness side connector to the light control and dimmer switch and inspect the connector from the back side, as shown.

Tester connection	Condition	Specified condition
11 - Ground	Light control switch HEAD and headlight dimmer switch LO and fog light switch ON	No voltage
11 - Ground	Light control switch HEAD and headlight dimmer switch LO and fog light switch OFF	Battery Positive Voltage

If circuit is not as specified, inspect the wire harness.

Wire Harness Side



I11315

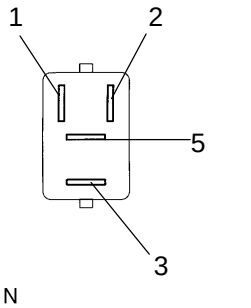
4. INSPECT REAR FOG LIGHT SWITCH CIRCUIT

Disconnect the connector from the switch and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
1 - Ground	Always	* Continuity
2 - Ground	Light control switch TAIL or HEAD	Continuity
3 - Ground	Always	Battery voltage
5 - Ground	Light control switch HEAD	Continuity
7 - Ground	Always	Continuity
8 - Ground	Always	Continuity

*: There is resistance because this circuit is ground through the bulb.

If the circuit is not as specified, replace the wire harness.



N

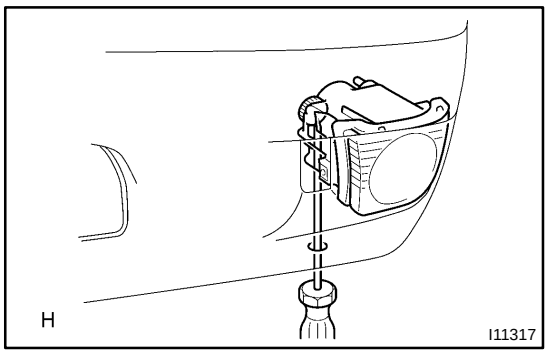
I01200

5. INSPECT FRONT FOG LIGHT RELAY CONTINUITY

Condition	Tester connection	Specified condition
Always	1 - 2	Continuity
Apply B+ between terminals 1 and 2.	3 - 5	Continuity

If continuity is not as specified, replace the relay.

BE164-05



ADJUSTMENT

ADJUST FRONT FOG LIGHT AIM

A-bolt: Vertical Direction

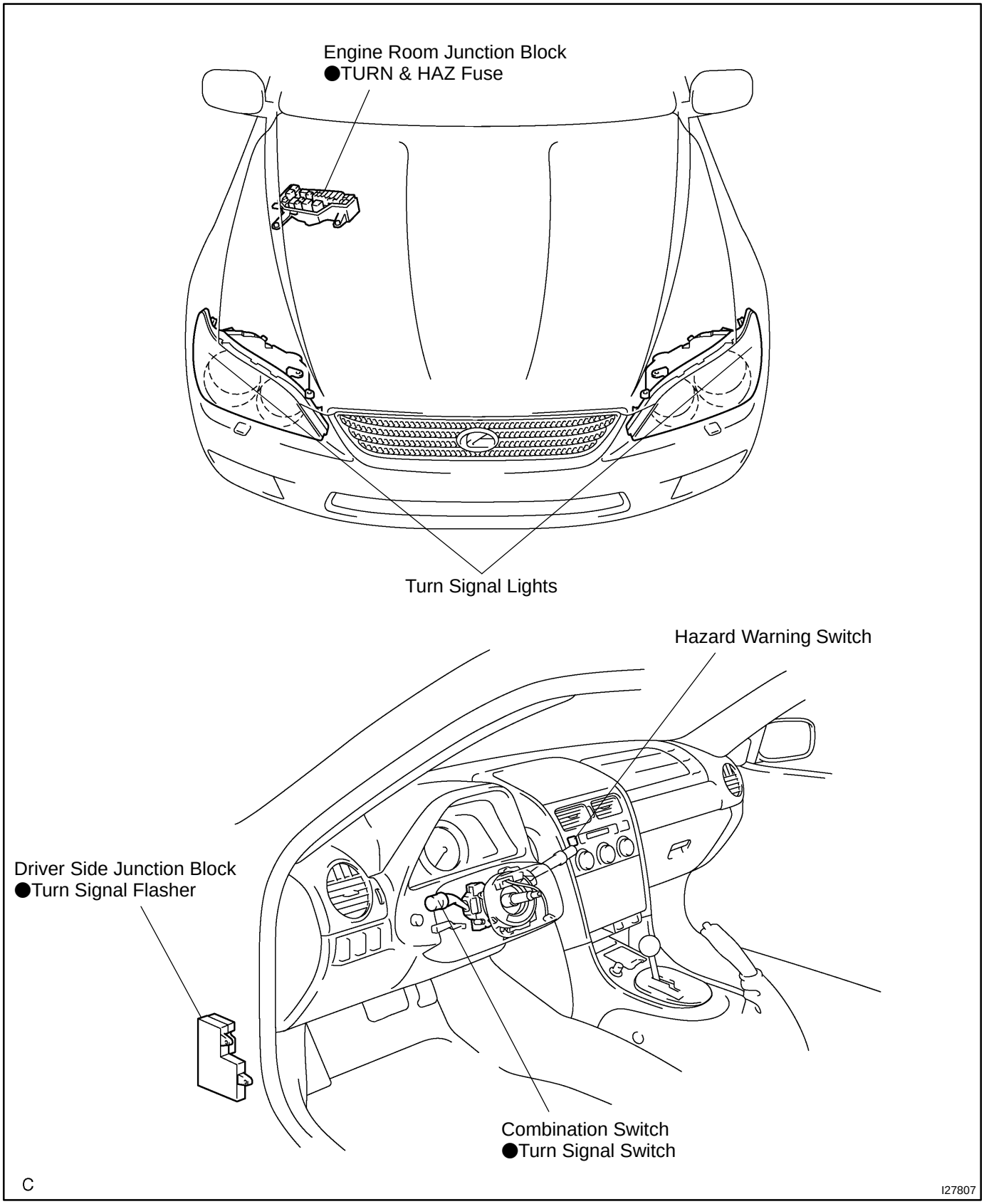
HINT:

Insert a driver into the hole for aiming in the fender liner to perform aiming.

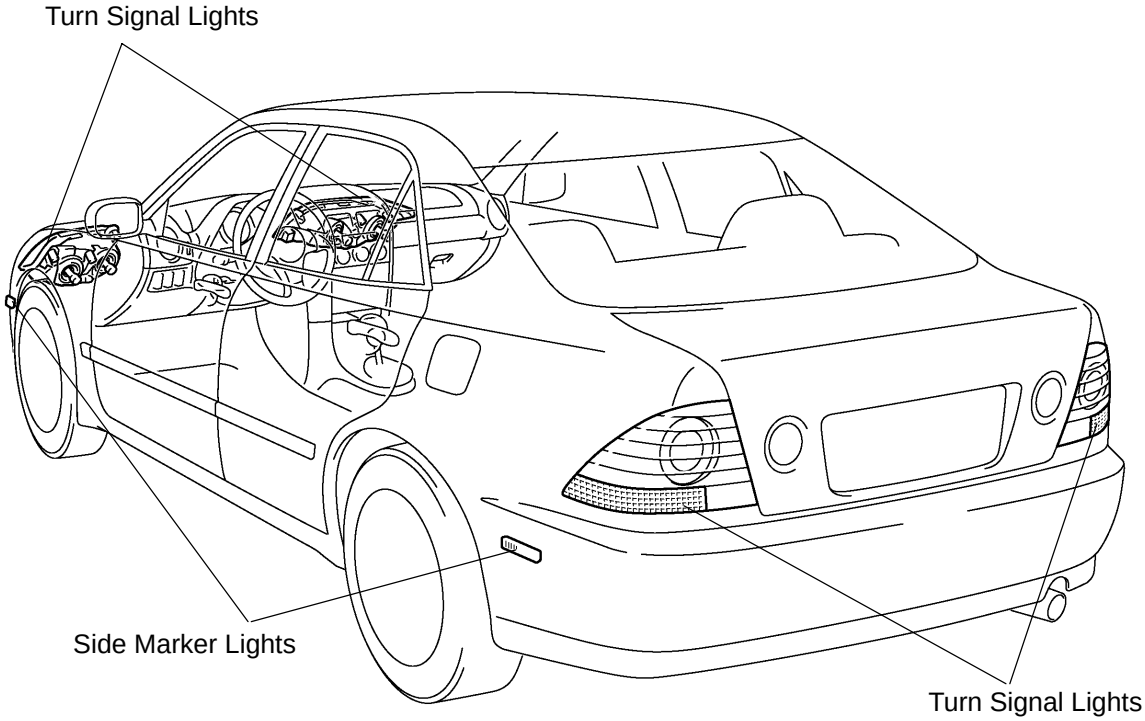
TURN SIGNAL AND HAZARD WARNING SYSTEM

BE29T-02

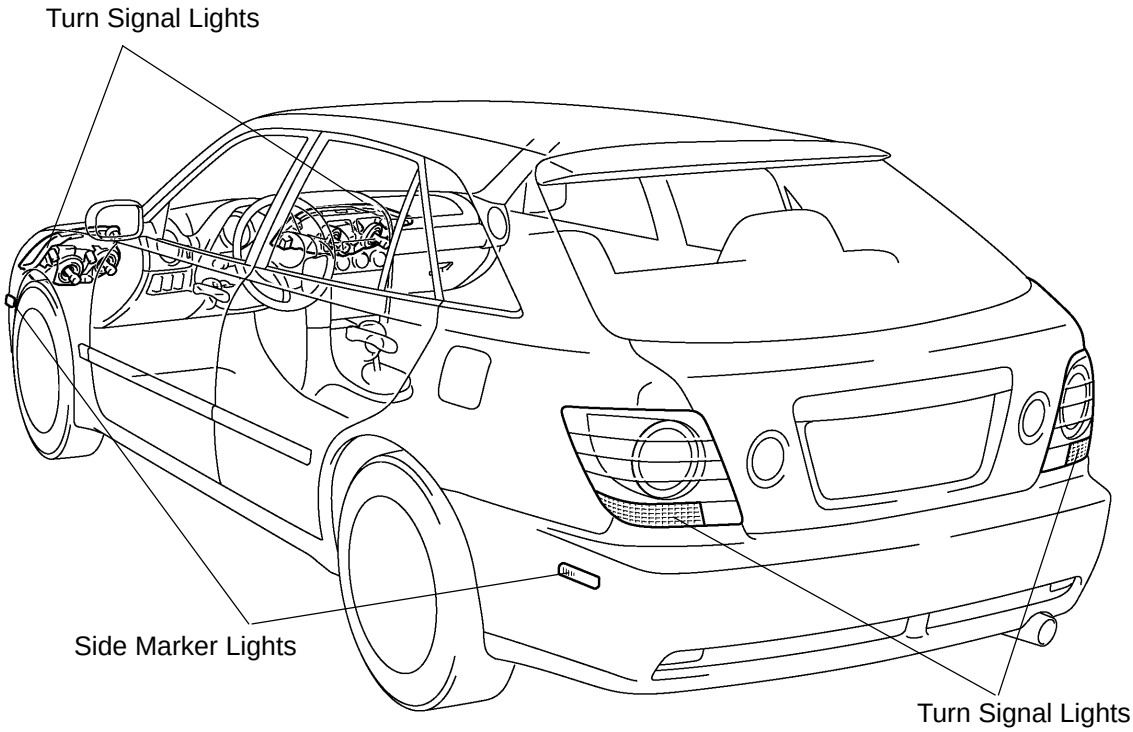
LOCATION



Sedan:



Wagon:

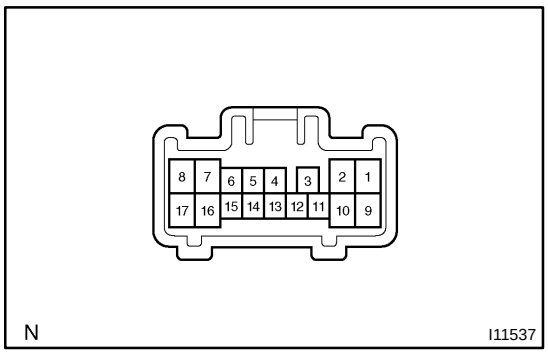


C

I27808

BE1WS-03

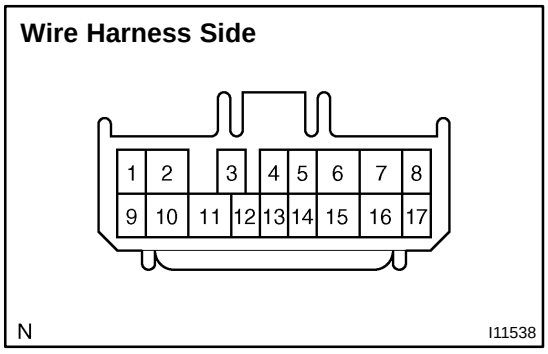
INSPECTION



1. INSPECT TURN SIGNAL SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Left turn	1 - 2	Continuity
Neutral	-	No continuity
Right turn	2 - 3	Continuity

If continuity is not as specified, replace the switch.

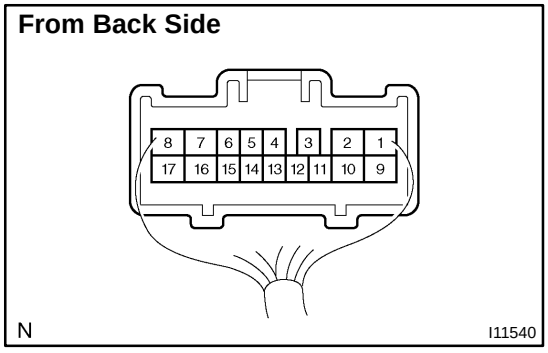


2. Connector disconnected: INSPECT TURN SIGNAL SWITCH CIRCUIT

Disconnect the connector from the combination switch and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
2 - Ground	Always	Continuity

If circuit is not as specified, inspect the wire harness.



3. Connector connected: INSPECT TURN SIGNAL SWITCH CIRCUIT

Connect the wire harness side connector to the combination switch and inspect the connector form the back side, as shown.

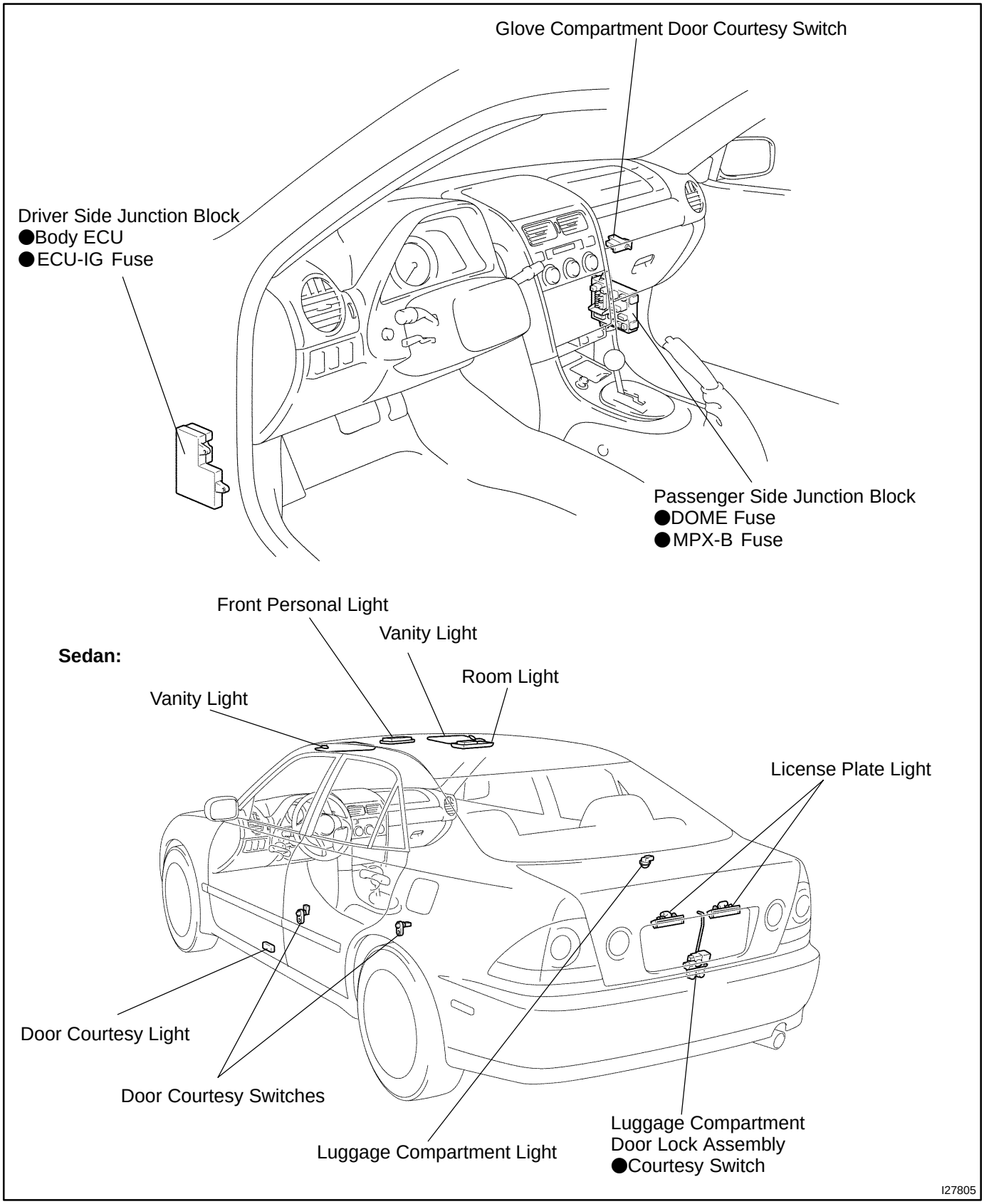
Tester connection	Condition	Specified condition
2 - Ground	Ignition switch ON and turn signal switch Neutral	No voltage
1 - Ground	Ignition switch ON and turn signal switch Left	Battery Positive Voltage ↔ 0 V
3 - Ground	Ignition switch ON and turn signal switch Right	Battery Positive Voltage ↔ 0 V

If circuit is not as specified, inspect the circuits connected to other parts.

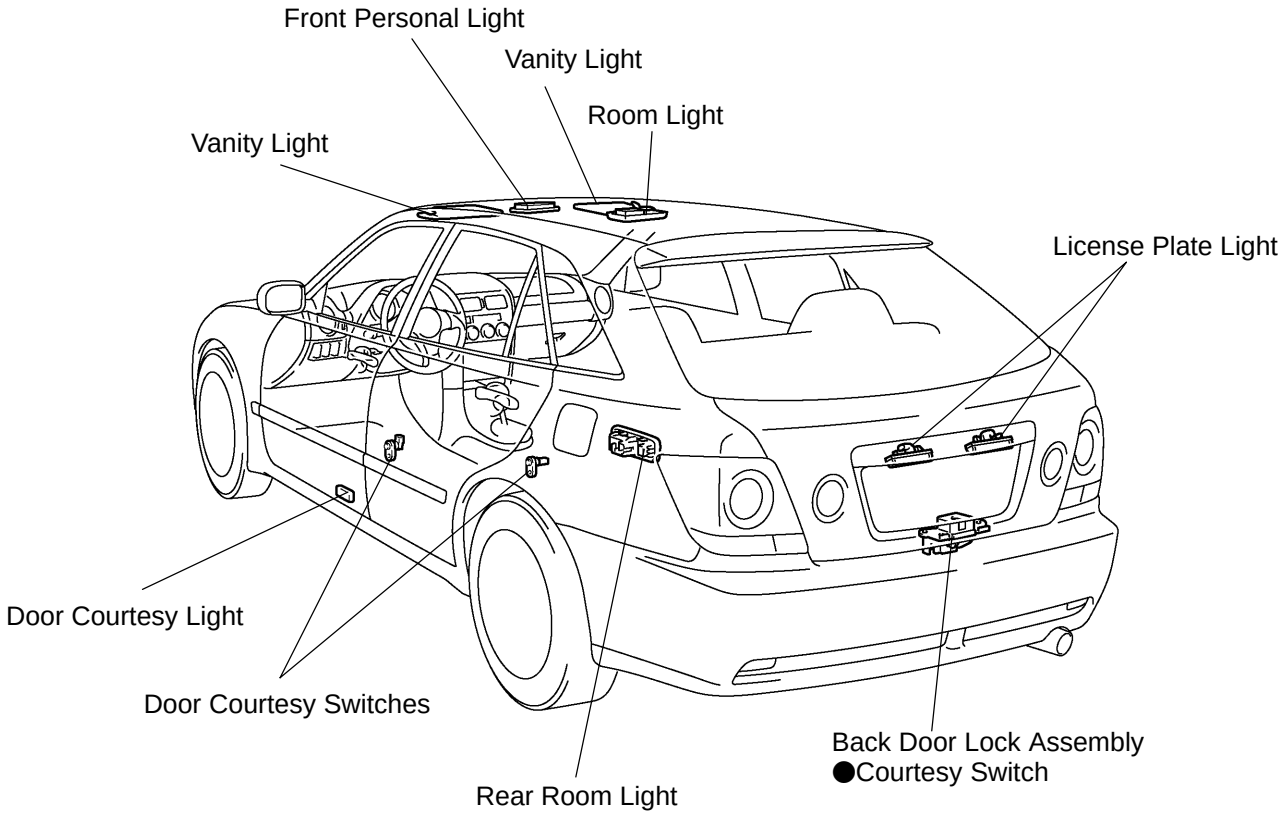
INTERIOR LIGHT SYSTEM

LOCATION

BE29U-02



Wagon:

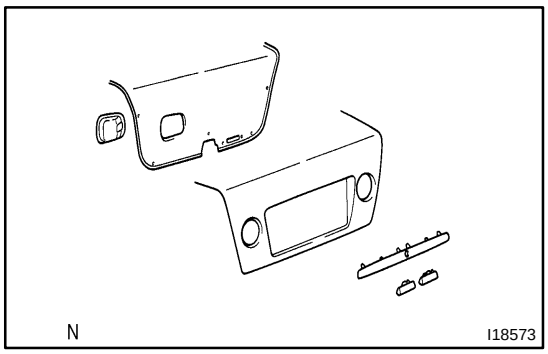


C

I27806

BE29V-02

REMOVAL

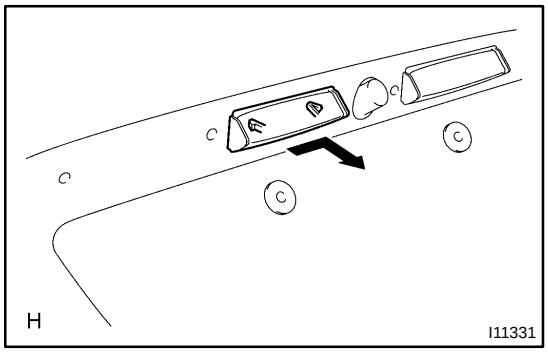


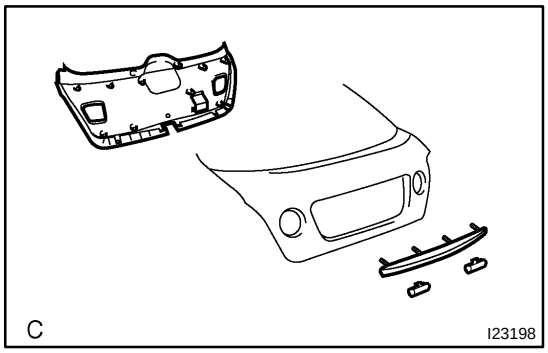
1. Sedan:
REMOVE LICENSE PLATE LIGHT

HINT:

- Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.
- Follow the same procedure for RH as for LH.

(a) Remove the Internal Trunk Release Handle.
(b) Remove a part of luggage compartment door trim.
(c) Remove the 4 nuts.
(d) Remove luggage compartment door outer garnish.
(e) Disconnect the connector.
(f) Pull the claw towards the inside of the vehicle as shown in the illustration, disconnect the engagement of 2 claws, and remove the license plate light assembly.



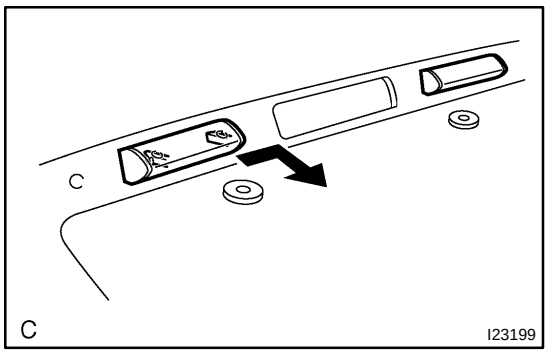


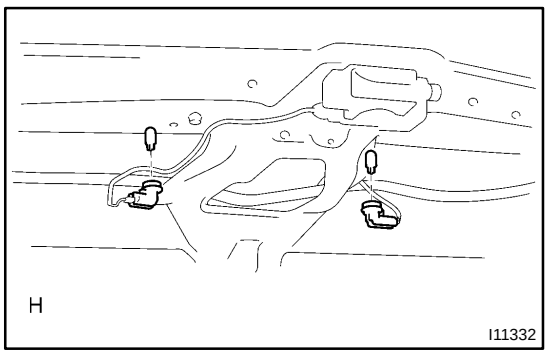
2. Wagon:
REMOVE LICENSE PLATE LIGHT

HINT:

- Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.
- Follow the same procedure for RH as for LH.

(a) Remove the back door trim.
(b) Remove the 4 nuts.
(c) Remove back door outer garnish.
(d) Disconnect the connector.
(e) Pull the claw towards the inside of the vehicle as shown in the illustration, disconnect the engagement of 2 claws, and remove the license plate light assembly.



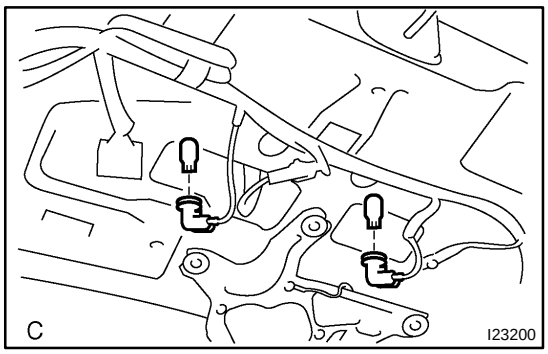


3. Sedan:
REMOVE LICENSE PLATE BULB

HINT:

Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.

(a) Remove a part of luggage compartment door trim.
(b) Disconnect the bulb sockets and remove the bulbs.



4. Wagon:
REMOVE LICENSE PLATE BULB

HINT:

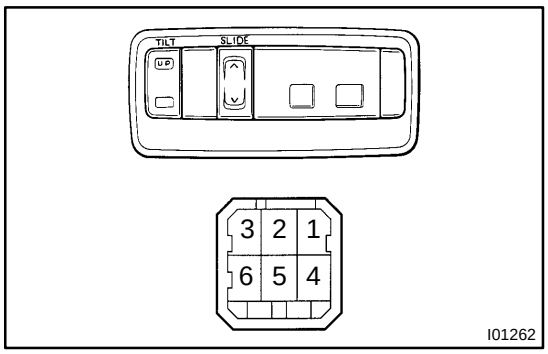
Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.

(a) Remove the back door trim.

(b) Disconnect the bulb sockets and remove the bulbs.

BE29W-03

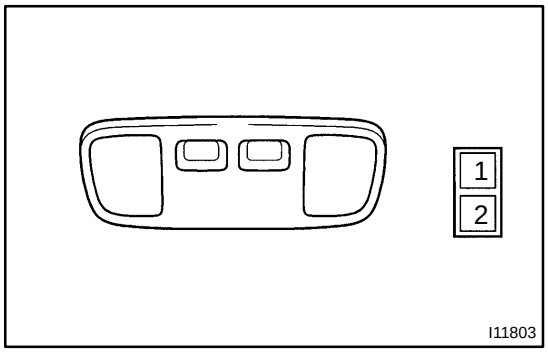
INSPECTION



1. w/ Sliding Roof:
INSPECT FRONT PERSONAL LIGHT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	-	No continuity
ON	1 - 4	Continuity

If continuity is not as specified, replace the light assembly or bulb.

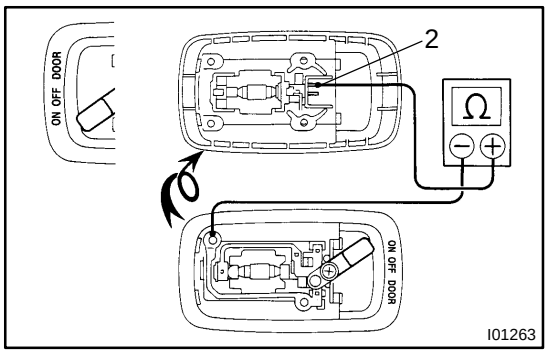


2. w/o Sliding Roof:
INSPECT FRONT PERSONAL LIGHT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	-	No continuity
ON	1 - 2	Continuity

If continuity is not as specified, replace the light assembly or bulb.

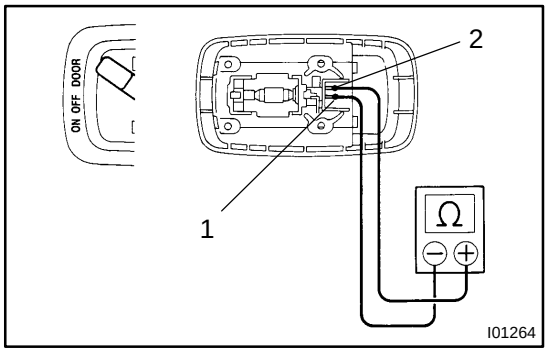
3. INSPECT FRONT PERSONAL LIGHT SWITCH CIRCUIT (See page DI-907)



4. w/o Reader sensor:
INSPECT ROOM LIGHT CONTINUITY

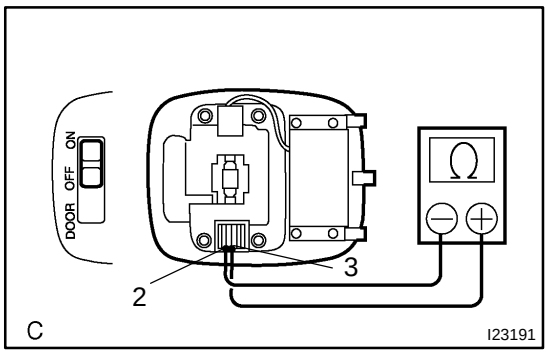
(a) Disconnect the connector from the room light.

(b) Turn the room light switch ON, check that continuity exists between terminal 2 and body ground.



(c) Turn the room light switch DOOR, check that continuity exists between terminals 1 and 2.

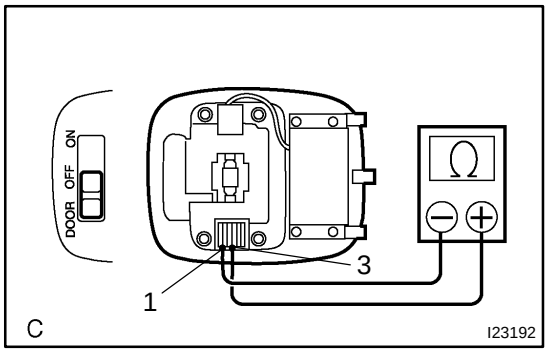
If continuity is not as specified, replace the light assembly or bulb.



5. w/ Reader sensor:
INSPECT ROOM LIGHT CONTINUITY

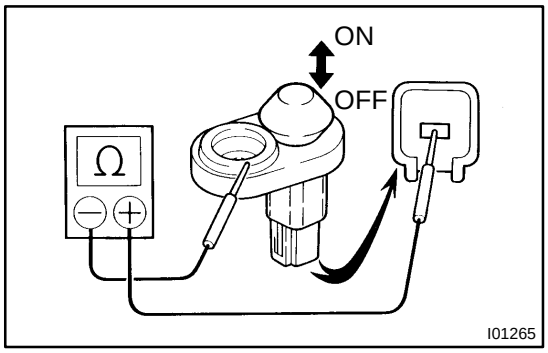
(a) Disconnect the connector from the room light.

(b) Turn the room light switch ON, check that continuity exists between terminal 2 and 3.



(c) Turn the room light switch DOOR, check that continuity exists between terminals 1 and 3.

If continuity is not as specified, replace the light assembly or bulb.

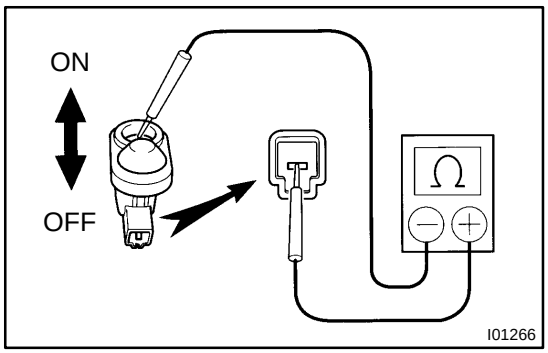


6. INSPECT FRONT DOOR COURTESY SWITCH CONTINUITY

(a) Check that continuity exists between terminals and the switch body with the switch ON (switch pin released: opened door).

(b) Check that no continuity exists between terminals and the switch body with the switch OFF (switch pin pushed in: closed door).

If operation is not as specified, replace the switch.

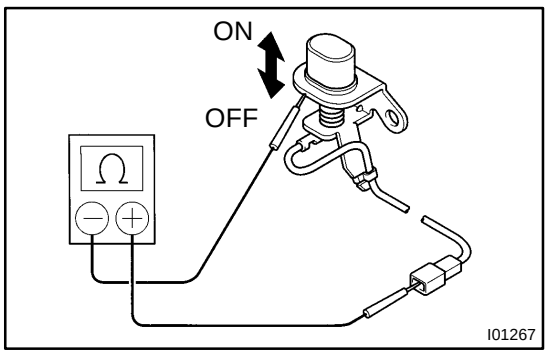


7. INSPECT REAR DOOR COURTESY SWITCH CONTINUITY

(a) Check that continuity exists between terminals and the switch body with the switch ON (switch pin released: opened door).

(b) Check that no continuity exists between terminals and the switch body with the switch OFF (switch pin pushed in: closed door).

If operation is not as specified, replace the switch.

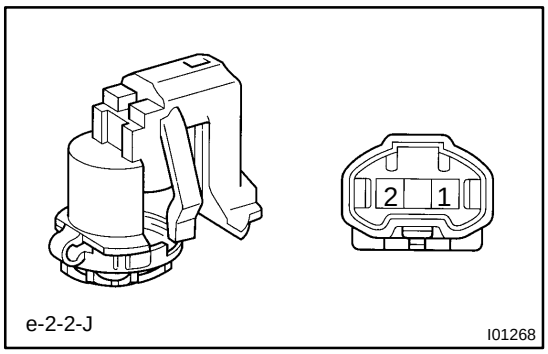


8. INSPECT LUGGAGE COMPARTMENT DOOR COURTESY SWITCH CONTINUITY

(a) Check that continuity exists between terminals and the switch body with the switch ON (switch pin released: opened door).

(b) Check that no continuity exists between terminals and the switch body with the switch OFF (switch pin pushed in: closed door).

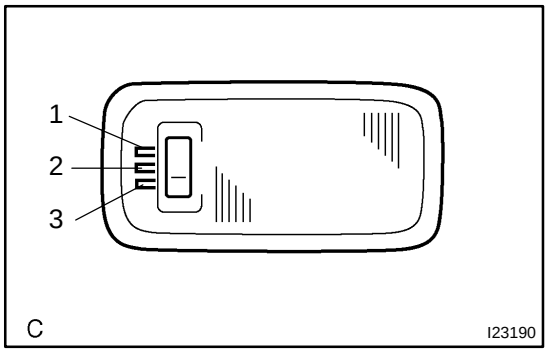
If operation is not as specified, replace the switch.



9. INSPECT LUGGAGE COMPARTMENT LIGHT CONTINUITY

Using the ohmmeter, check that continuity exists between terminals.

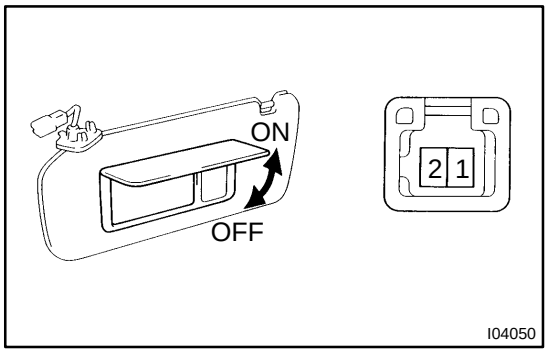
If continuity is not as specified, replace the light assembly or bulb.



10. REAR ROOM LIGHT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	1 - 2	No continuity
ON	2 - 3	Continuity

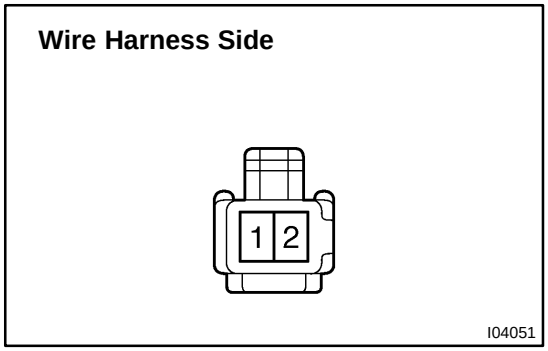
If continuity is not as specified, replace the light assembly or bulb.



11. INSPECT VANITY LIGHT CONTINUITY

Switch position	Tester connection	Specified condition
OFF (closed)	-	No continuity
ON (opened)	1 - 2	Continuity

If continuity is not as specified, replace the vanity light assembly or bulb.



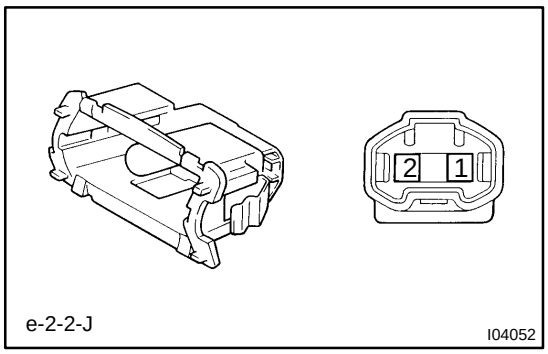
12. INSPECT VANITY LIGHT CIRCUIT

(See page DI-907)

Disconnect the connector from the light and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
2 - Ground	Always	Continuity
1 - Ground	Always	Battery Positive Voltage

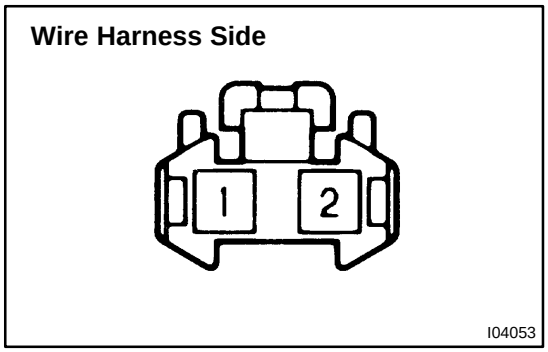
If circuit is not as specified, inspect power source or wire harness.



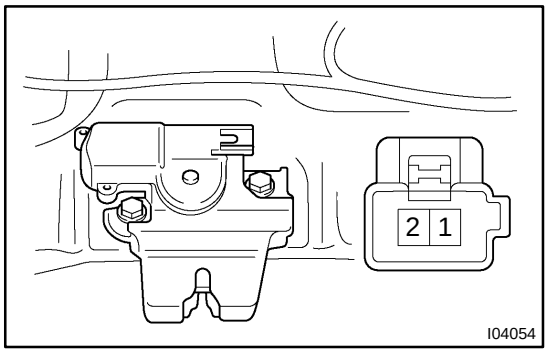
13. INSPECT DOOR COURTESY LIGHT CONTINUITY

Using an ohmmeter, check that continuity exists between terminals.

If continuity is not as specified, replace the light assembly or bulb.



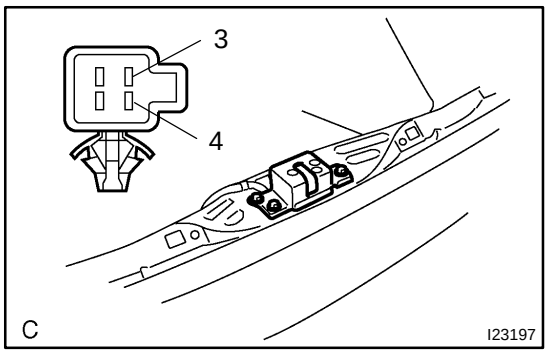
14. INSPECT DOOR COURTESY LIGHT CIRCUIT
(See page DI-907)



15. INSPECT LUGGAGE COMPARTMENT DOOR COURTESY SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF (closed)	-	No continuity
ON (opened)	2 - Switch body	Continuity

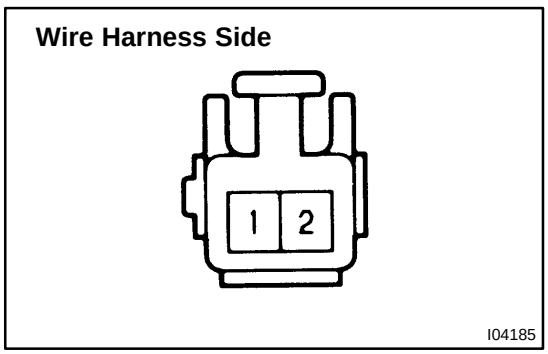
If continuity is not as specified, replace the switch.



16. BACK DOOR COURTESY SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF (closed)	-	No continuity
ON (opened)	3 - 4	Continuity

If continuity is not as specified, replace the switch.

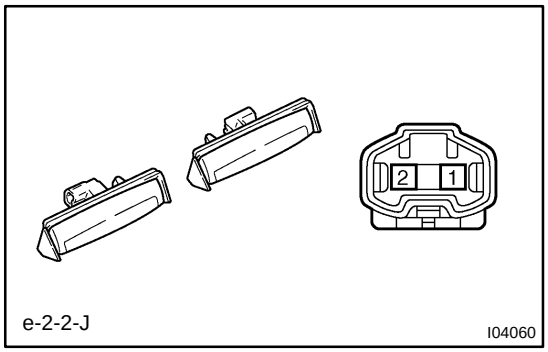


17. INSPECT LUGGAGE COMPARTMENT DOOR COURTESY SWITCH CIRCUIT
(See page DI-923)

Disconnect the connector from the switch and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
2 - Body ground	Luggage compartment door courtesy switch ON (door opened)	Continuity

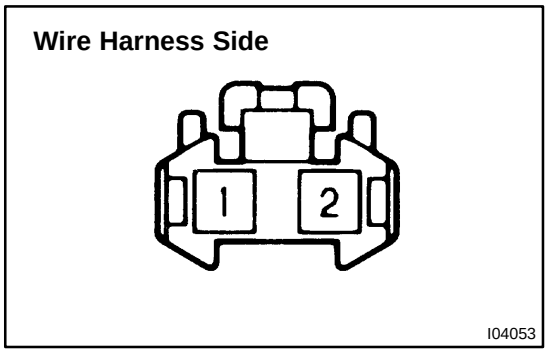
If circuit is not as specified, inspect power source or wire harness.



18. INSPECT LICENSE PLATE LIGHT CONTINUITY

Using an ohmmeter, check that continuity exists between terminals.

If continuity is not as specified, replace the light assembly or bulb.



19. INSPECT LICENSE PLATE LIGHT CIRCUIT

Disconnect the connector from the light and inspect the connector on the wire harness side, as shown.

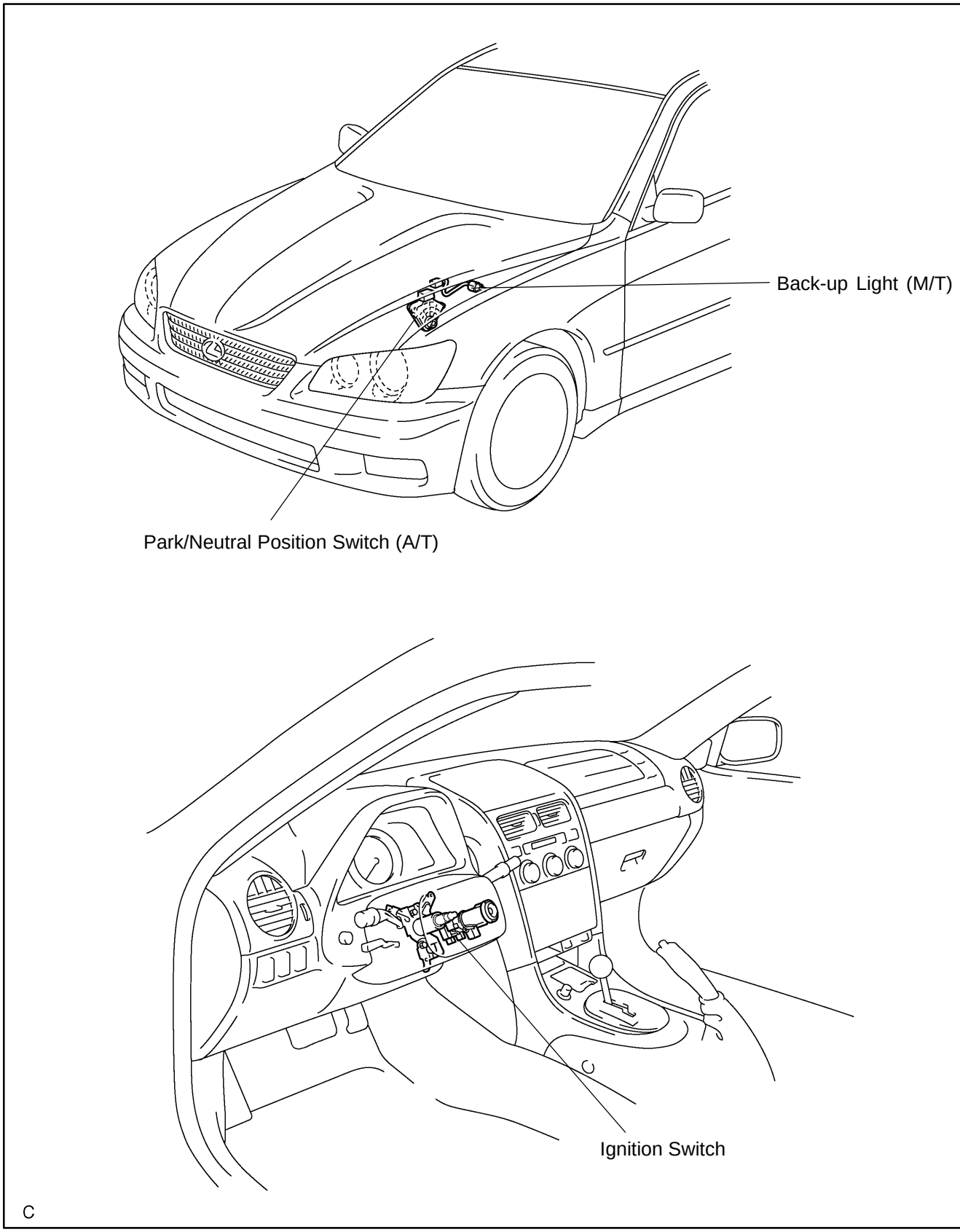
Tester connection	Condition	Specified condition
1 - Ground	Always	Continuity
2 - Ground	Light control switch TAIL or HEAD	Battery Positive Voltage

If circuit is not as specified, inspect power source or wire harness.

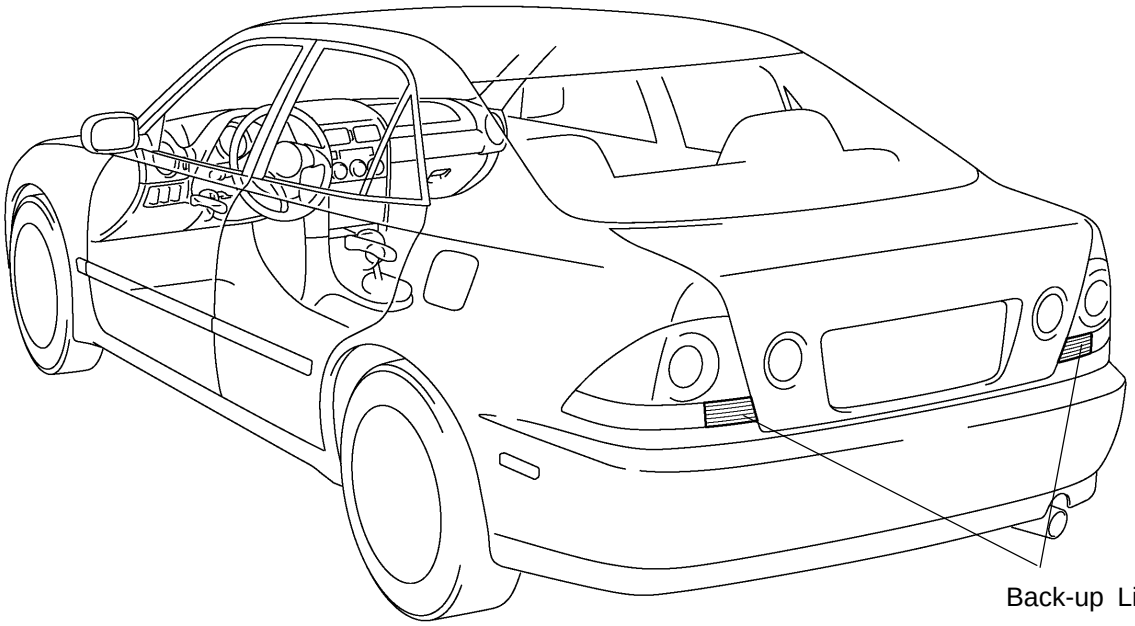
BACK-UP LIGHT SYSTEM

LOCATION

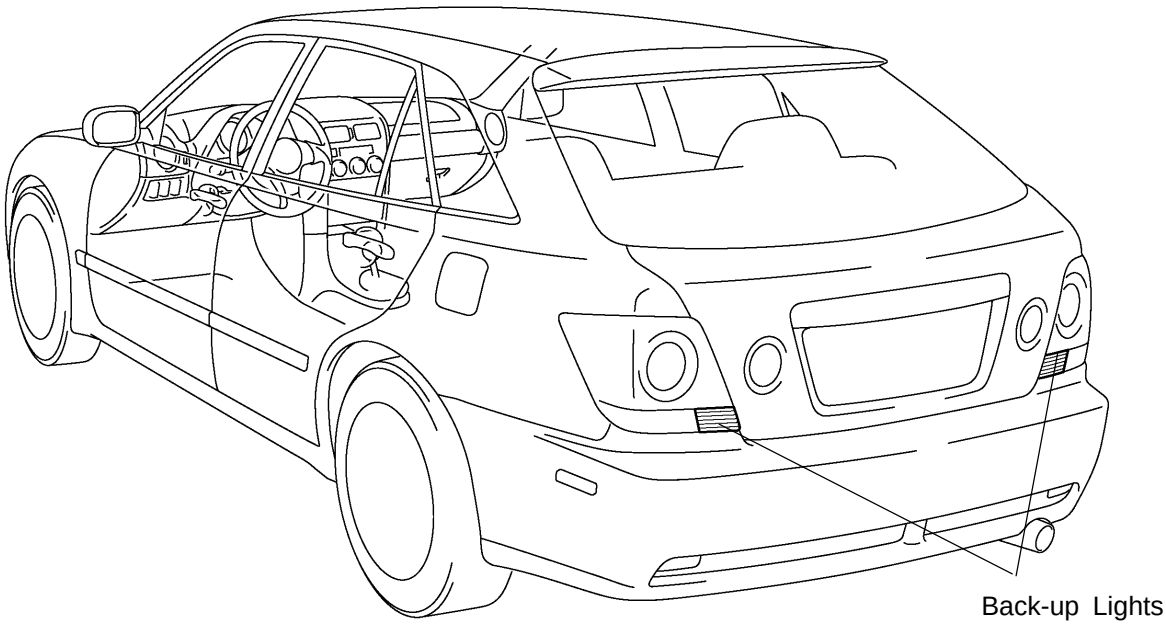
BE29X-03



Sedan:



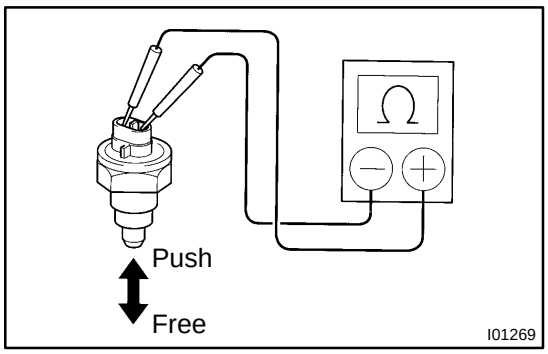
Wagon:



C

I27810

BE169-05



INSPECTION

1. INSPECT BACK- UP LIGHT SWITCH CONTINUITY (M/T)

Switch position	Specified condition
Push	Continuity
Free	No continuity

If continuity is not as specified, replace the switch.

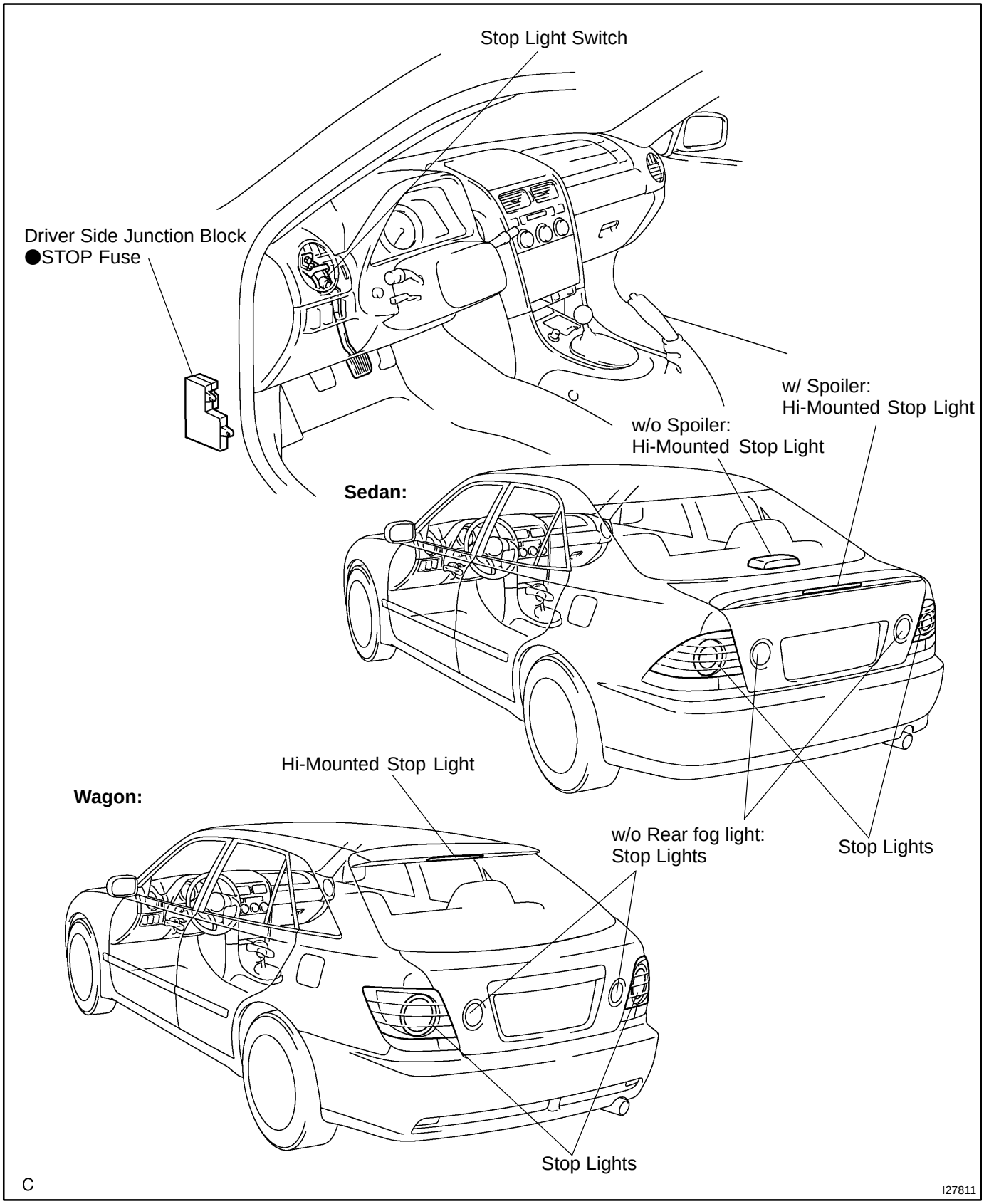
2. INSPECT PARK/NEUTRAL POSITION SWITCH CONTINUITY (A/T)

(See page DI-371)

STOP LIGHT SYSTEM

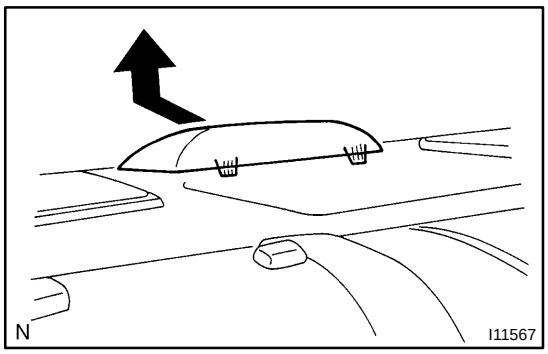
LOCATION

BE0H6-14



BE16A-04

REMOVAL



1. w/o Spoiler:
REMOVE HI-MOUNTED STOP LIGHT ASSEMBLY

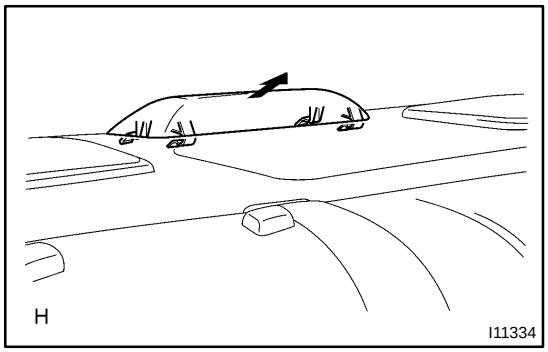
HINT:

Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.

(a) Insert the clip remover in the position as shown in the illustration, pull it upwards, and disconnect the engagement of the 2 front claws.

(b) Pull the center stop light assembly in the direction as shown in the illustration, and disconnect the engagement of 4 claws.

(c) Separate the connector, and remove the center stop light assembly.



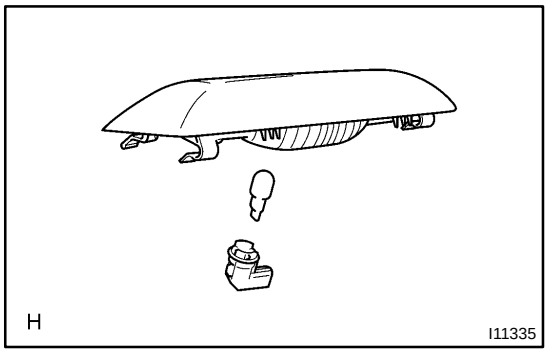
2. w/o Spoiler:
REMOVE HI-MOUNTED STOP LIGHT BULB

HINT:

Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.

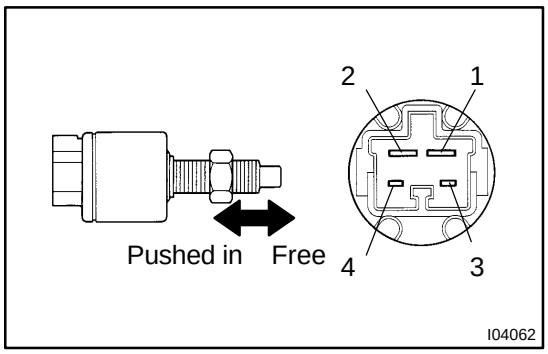
(a) Remove center stop light assembly.

(b) Remove the bulb sockets and bulbs.



BE29Y-03

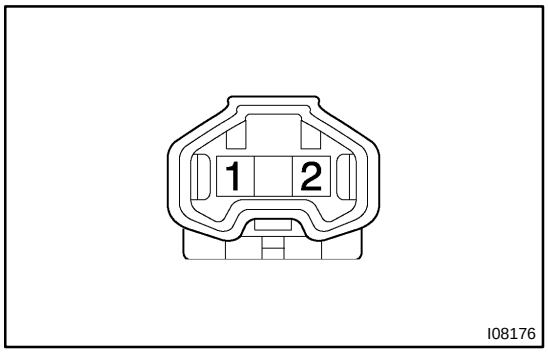
INSPECTION



1. INSPECT STOP LIGHT SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
Switch pin pushed in (Pedal released)	1 - 2	Continuity
Switch pin free (Pedal depressed)	1 - 2	No continuity
Switch pin free (Pedal depressed)	3 - 4	Continuity
Switch pin pushed in (Pedal released)	3 - 4	No continuity

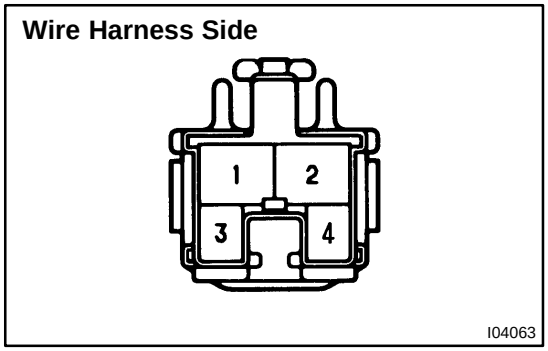
If continuity is not as specified, replace the switch.



2. w/ Spoiler: INSPECT HI- MOUNTED STOP LIGHT ASSEMBLY CONTINUITY

Using the ohmmeter, check that continuity exists between terminals.

If continuity is not as specified, replace the bulb or light assembly.



3. INSPECT STOP LIGHT SWITCH CIRCUIT

(See page DI-830)

Disconnect the connector from the switch and inspect the connector on the wire harness side, as shown.

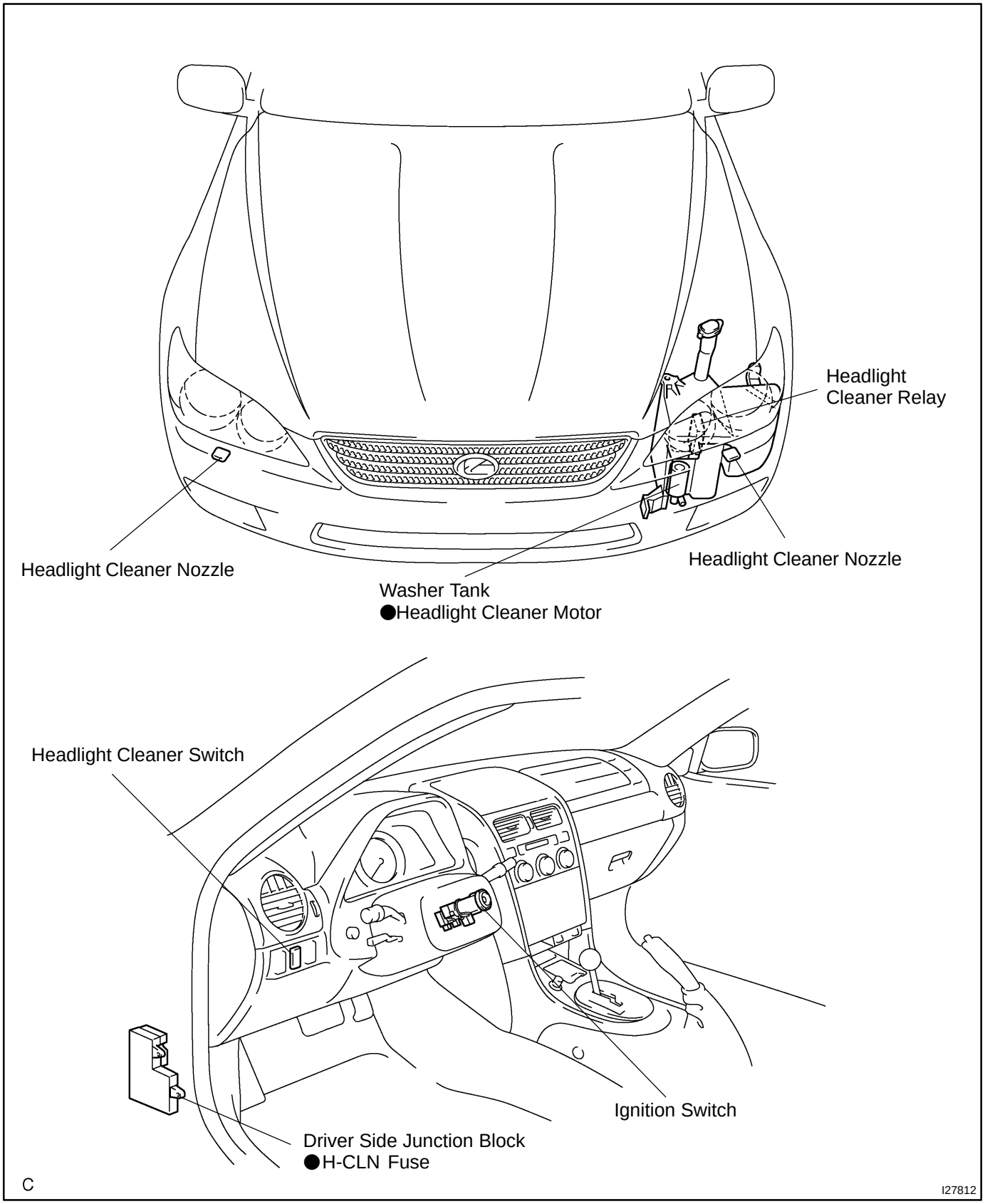
Tester connection	Condition	Specified condition
2 - Ground	Always	Battery Positive Voltage

If circuit is not as specified, inspect the power source or wire harness.

HEADLIGHT CLEANER SYSTEM

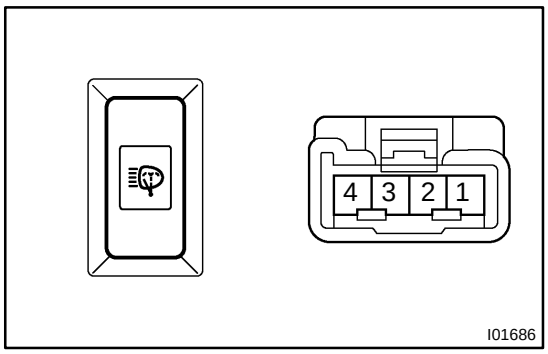
LOCATION

BE023-13



BE0HM-07

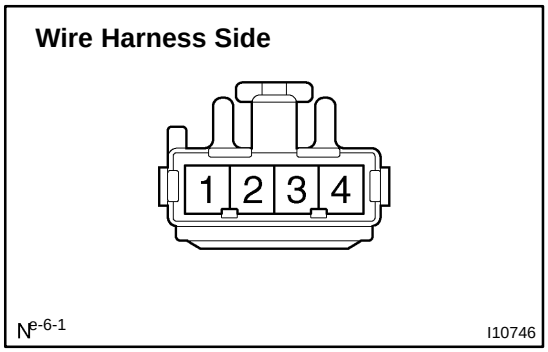
INSPECTION



1. INSPECT HEADLIGHT CLEANER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	-	No continuity
ON	1 - 4	Continuity
Illumination circuit	2 - 3	Continuity

If continuity is not as specified, replace the switch.

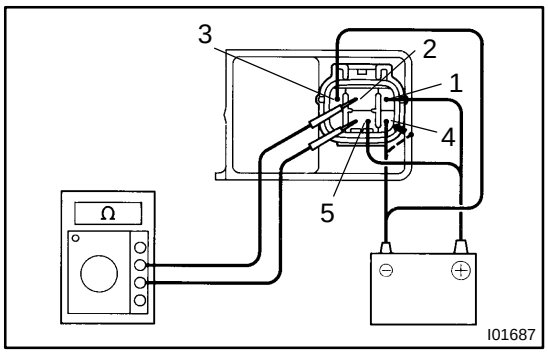


2. INSPECT HEADLIGHT CLEANER SWITCH CIRCUIT

Disconnect the switch connector and inspect the connector on wire harness side, as shown.

Tester connection	Condition	Specified condition
1 - Ground	Headlight ON	Continuity
1 - Ground	Headlight OFF	No continuity

If circuit is not as specified, inspect the circuits connected to other parts.



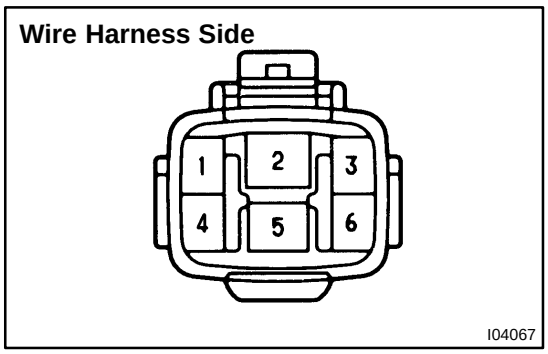
3. INSPECT HEADLIGHT CLEANER RELAY OPERATION

(a) Check that no continuity exists between terminals 2 and 5.

(b) Connect the positive (+) lead from the battery to terminals 1 and 5, and the negative (-) lead to terminal 3.

(c) Connect the negative (-) lead from the battery to terminal 4, and check that continuity exists between terminals 2 and 5 for 0.9 - 1.1 seconds, then no continuity exists.

If operation is not as specified, replace the motor.

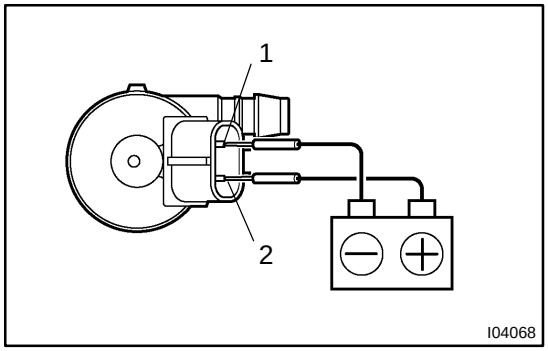


4. INSPECT HEADLIGHT CLEANER RELAY CIRCUIT

Disconnect the connector from the relay and inspect the connector on wire harness side, as shown.

Tester connection	Condition	Specified condition
2 - Ground 3 - Ground	Always	Continuity
4 - Ground	Ignition switch ON, light control switch in HEAD and cleaner switch OFF	No continuity
4 - Ground	Ignition switch ON, light control switch in HEAD and cleaner switch ON or daytime running light system operating	Continuity
1 - Ground	Ignition switch OFF or ACC	No voltage
1 - Ground	Ignition switch ON	Battery voltage
5 - Ground	Always	Battery voltage

If circuit is not as specified, inspect the circuits connected to other parts.



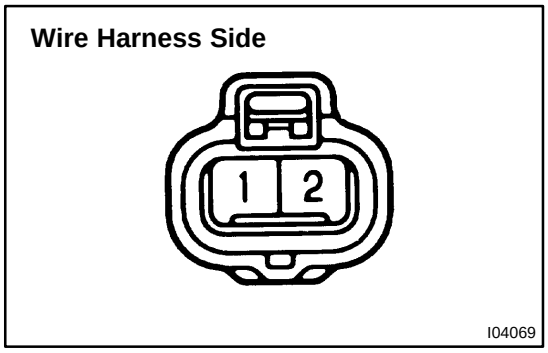
5. INSPECT HEADLIGHT CLEANER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 1, check that the motor operates.

NOTICE:

These tests must be performed quickly (within 20 seconds) to prevent the coil from burning out.

If operation is not as specified, replace the motor.



6. INSPECT HEADLIGHT CLEANER MOTOR CIRCUIT

Disconnect the connector from the cleaner motor and inspect the connector on wire harness side, as shown.

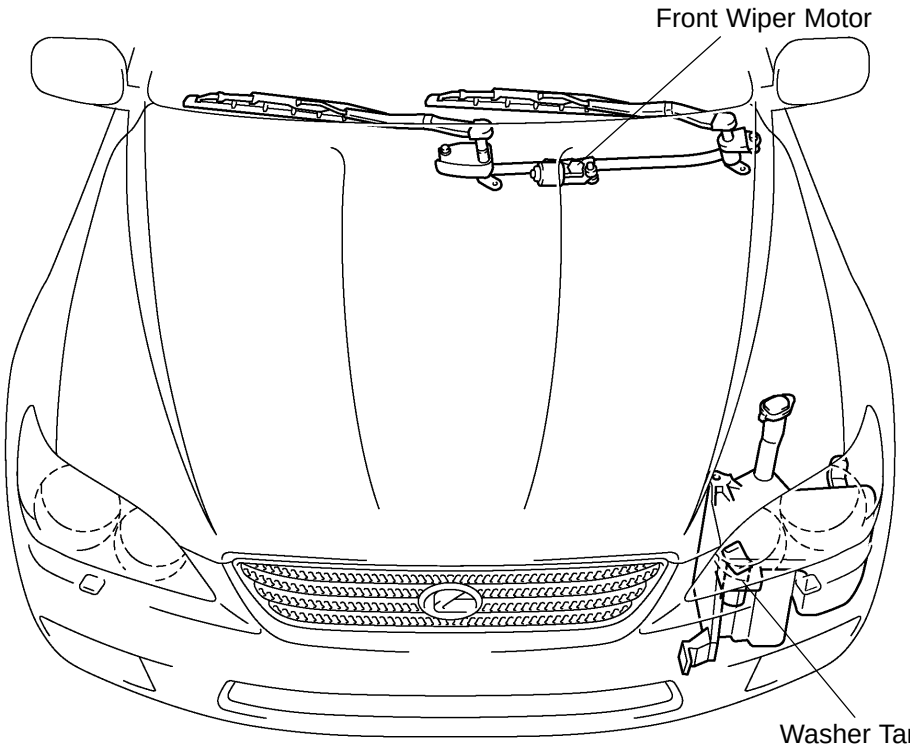
Tester connection	Condition	Specified condition
2 - Ground	Always	Continuity

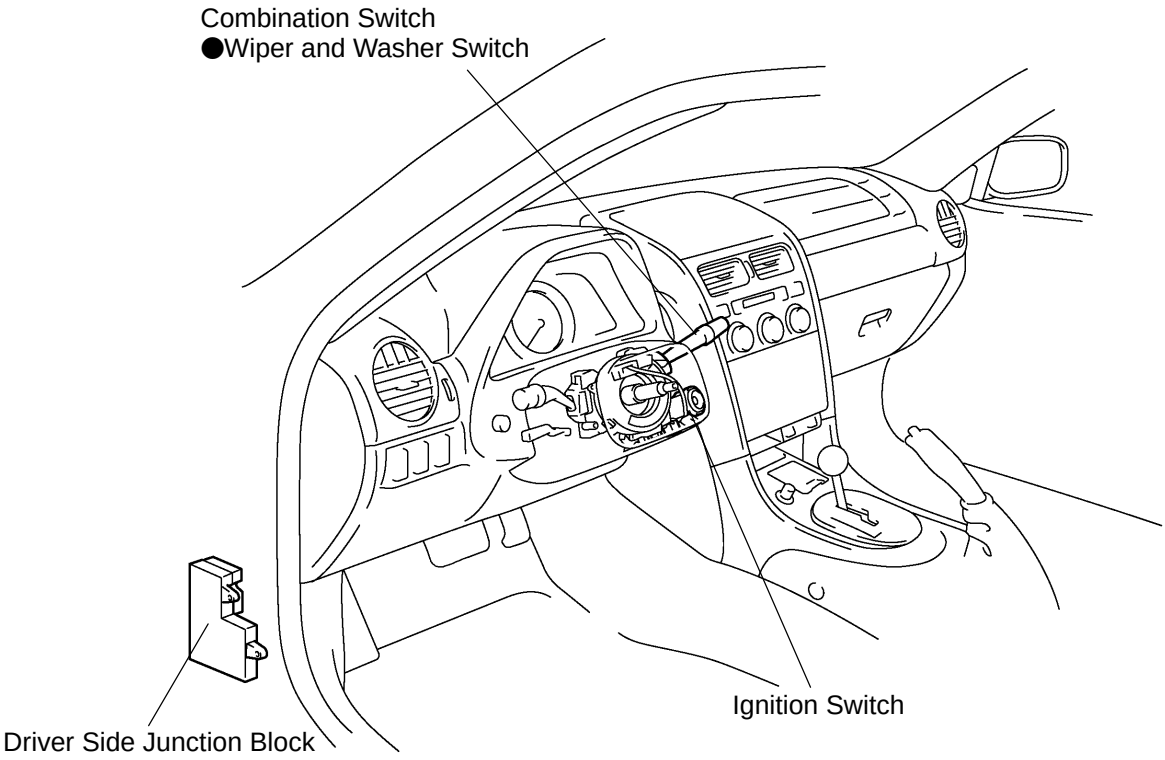
If circuit is not as specified, inspect the circuits connected to other parts.

WIPER AND WASHER SYSTEM

BE29Z-04

LOCATION

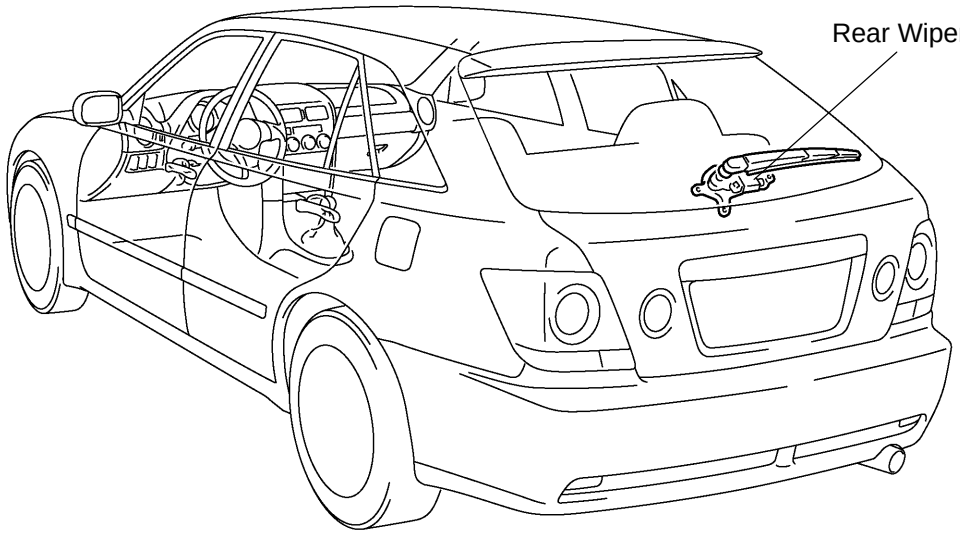




C

I27813

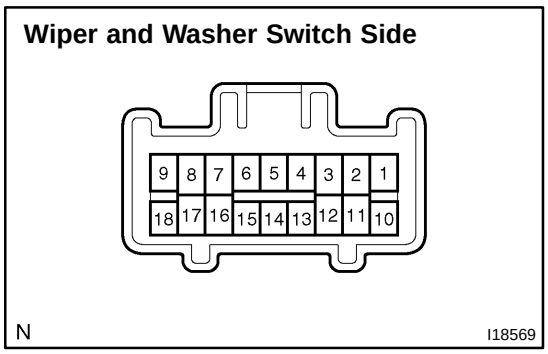
Wagon:



C

I27814

BE2MV-02



INSPECTION

1. INSPECT FRONT WIPER AND WASHER SWITCH CONTINUITY

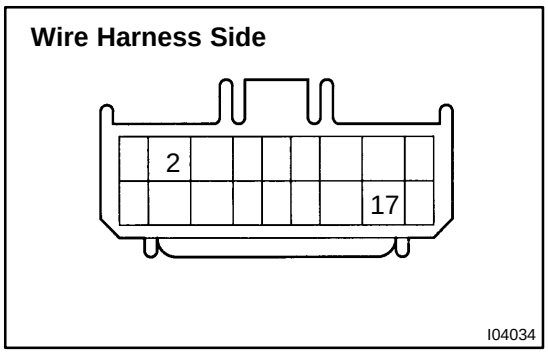
Switch position	Tester connection	Specified condition
OFF	7 - 16	Continuity
INT	7 - 16	Continuity
LO	7 - 17	Continuity
HI	8 - 17	Continuity
Washer OFF	-	No continuity
Washer ON	2 - 11	Continuity

If continuity is not as specified, replace the switch.

2. INSPECT REAR WIPER AND WASHER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	-	Continuity
INT	2 - 13	Continuity
ON	2 - 10	Continuity
Washer OFF	-	No continuity
Washer ON	2 - 12	Continuity

If continuity is not as specified, replace the switch.

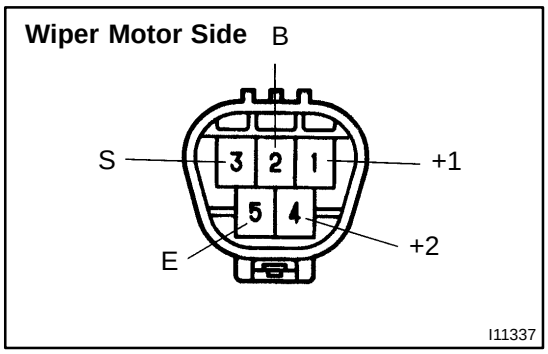


3. Connector disconnected: INSPECT WIPER AND WASHER SWITCH CIRCUIT

Disconnect the connector from the motor and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
2 - Ground	Always	Continuity
17 - Ground	Ignition switch LOCK or ACC	No voltage
17 - Ground	Ignition switch ON	Battery Positive Voltage

If circuit is not as specified, inspect the circuits connected to other parts.



4. Low speed:
INSPECT FRONT WIPER MOTOR OPERATION

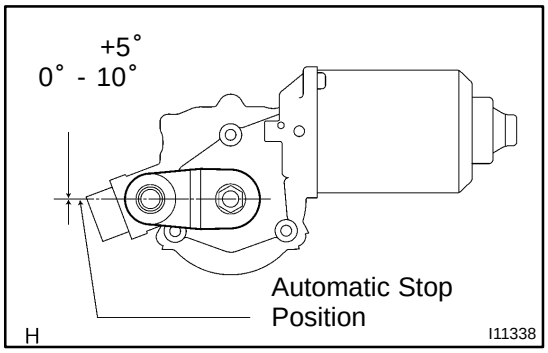
Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 5, check that the motor operates at low speed.

If operation is not as specified, replace the motor.

5. High speed:
INSPECT FRONT WIPER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 4 and the negative (-) lead to terminal 5, check that the motor operates at high speed.

If operation is not as specified, replace the motor.



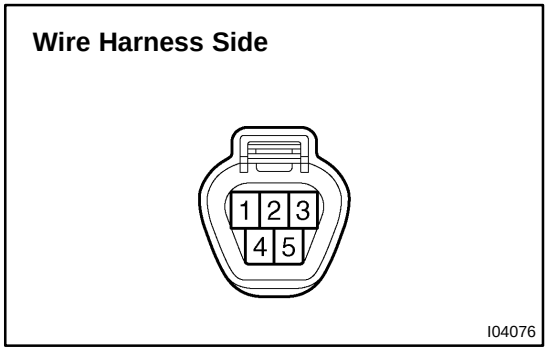
6. Stopping at stop position:
INSPECT FRONT WIPER MOTOR OPERATION

(a) Operate the motor at low speed and stop the motor operation anywhere except at the stop position by disconnecting positive (+) lead from terminal 1.

(b) Connect terminals 1 and 3.

(c) Connect the positive (+) lead from the battery to terminal 2 and negative (-) lead to terminal 5, check that the motor stops running at the stop position after the motor operates again.

If operation is not as specified, replace the motor.

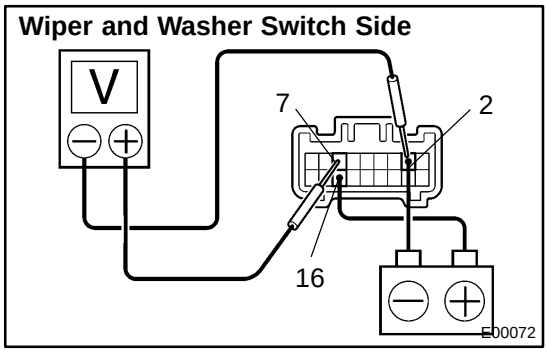


7. Connector disconnected:
INSPECT FRONT WIPER MOTOR CIRCUIT

Disconnect the connector from the motor and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
4 - Ground	Always	Continuity
2 - Ground	Ignition switch LOCK or ACC	No voltage
2 - Ground	Ignition switch ON	Battery Positive Voltage

If circuit is not as specified, inspect the circuits connected to other parts.

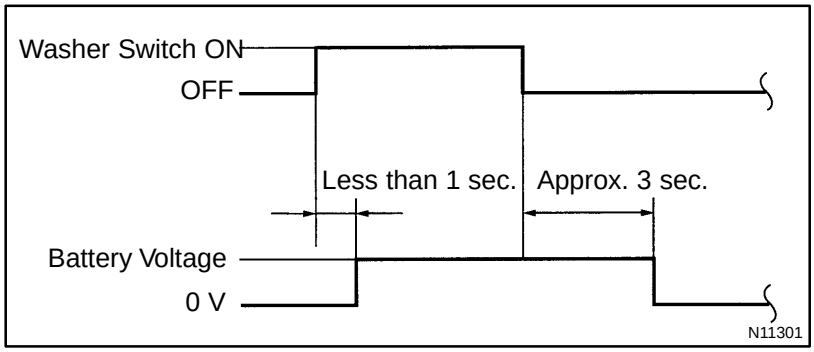


8. INSPECT FRONT WASHER LINKED OPERATION

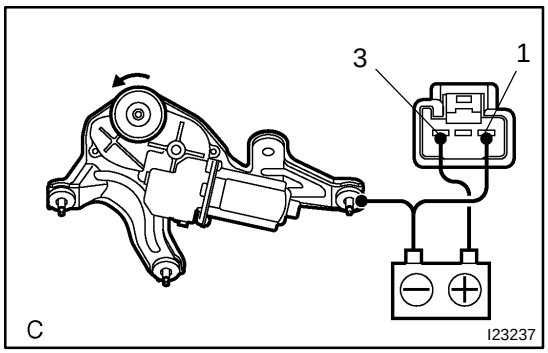
(a) Connect the positive (+) lead from the battery to terminal 16 and the negative (-) lead to terminal 2.

(b) Connect the positive (+) lead from the voltmeter to terminal 7 and the negative (-) lead to terminal 2.

(c) Push in the washer switch, and check that the voltage changes as shown in the table.

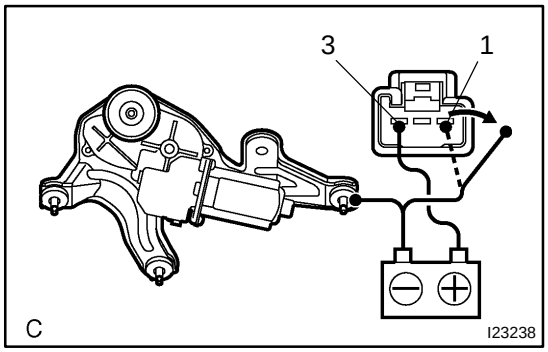


If operation is not as specified, replace the wiper and washer switch.



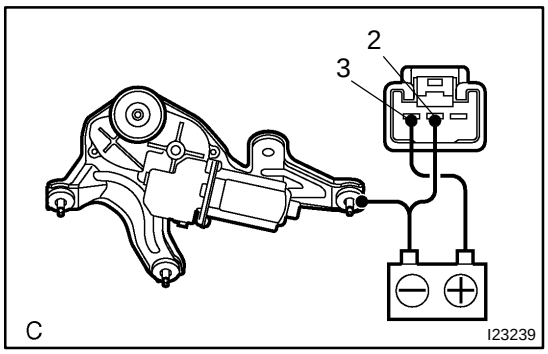
9. INSPECT REAR WIPER MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 3 and negative (-) lead to terminal 1 and the motor body, check that the motor operates.



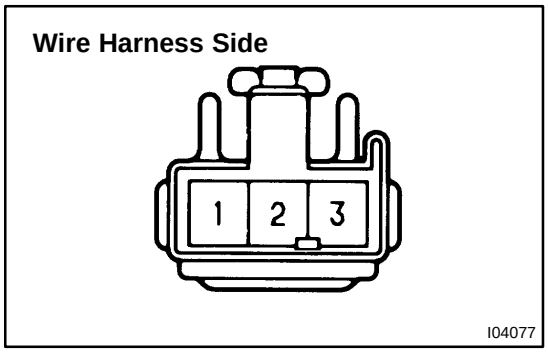
(b) Disconnect the negative (-) lead from terminal 1, check that the motor stops running at the stop position.

If operation is not as specified, replace the motor.



10. Intermittent:
INSPECT REAR WIPER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 3 and the negative (-) lead to terminal 2 and the motor body, check that the motor operates intermittently for 9-15 seconds.
If operation is not as specified, replace the motor.



11. Connector disconnected:
INSPECT REAR WIPER MOTOR CIRCUIT

Disconnect the connector from the motor and inspect the connector on the wire harness side, as shown.

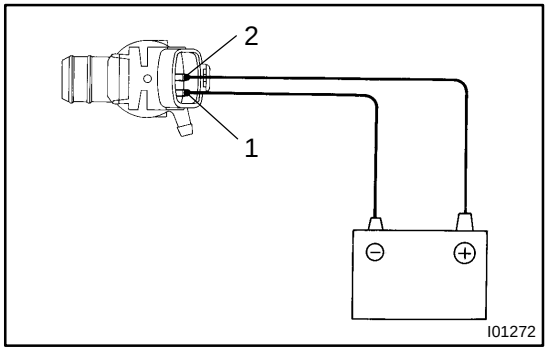
Tester connection	Condition	Specified condition
1 - Ground	Always	Continuity
2 - Ground	Always	Continuity
3 - Ground	Ignition switch OFF or ACC	No voltage
3 - Ground	Ignition switch ON	Battery positive voltage

If circuit is not as specified, inspect the circuits connected to other parts.

12. Wagon:
INSPECT REAR WASHER LINKED OPERATION

Make sure that the rear wiper operates simultaneously with the washer when the rear washer switch is turned ON.

- If the rear wiper does not operates, inspect the rear wiper motor.
- If washer fluid dose not come out, inspect the washer motor.
- If necessary, replace the wiper and washer switch.



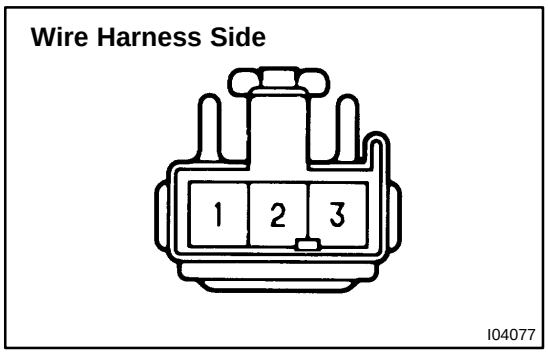
13. Sedan:
INSPECT WASHER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 1, check that the motor operates.

NOTICE:

These tests must be performed quickly (within 20 seconds) to prevent the coil from burning out.

If operation is not as specified, replace the motor.

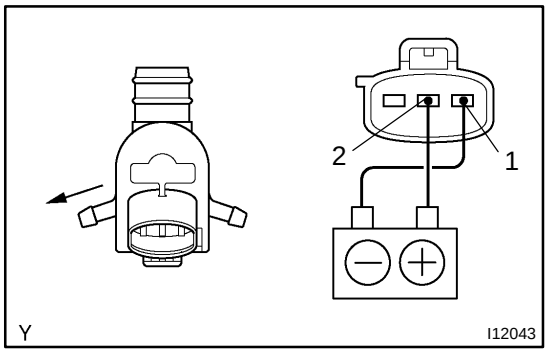


14. Sedan, Connector disconnected:
INSPECT FRONT WASHER MOTOR CIRCUIT

Disconnect the connector from the motor and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
2 - Ground	Ignition switch ON	Battery Positive Voltage

If circuit is not as specified, inspect the power source, wire harness and wiper switch.



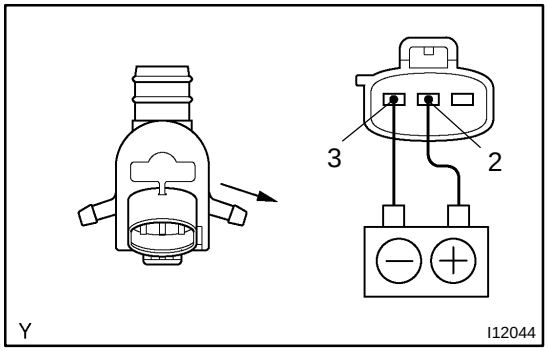
15. Wagon:
INSPECT FRONT WASHER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 1, check that the motor operates.

NOTICE:

These tests must be performed quickly (within 20 seconds) to prevent the coil from burning out.

If operation is not as specified, replace the motor.



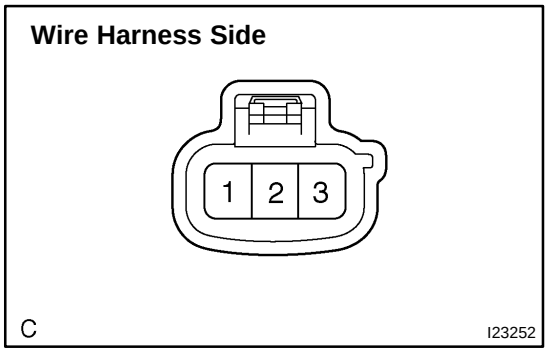
16. INSPECT REAR WASHER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 3, check that the motor operates.

NOTICE:

These tests must be performed quickly (within 20 seconds) to prevent the coil from burning out.

If operation is not as specified, replace the motor.



17. Wagon, Connector disconnected:
INSPECT WASHER MOTOR CIRCUIT

Disconnect the connector from the motor and inspect the connector on the wire harness side, as shown.

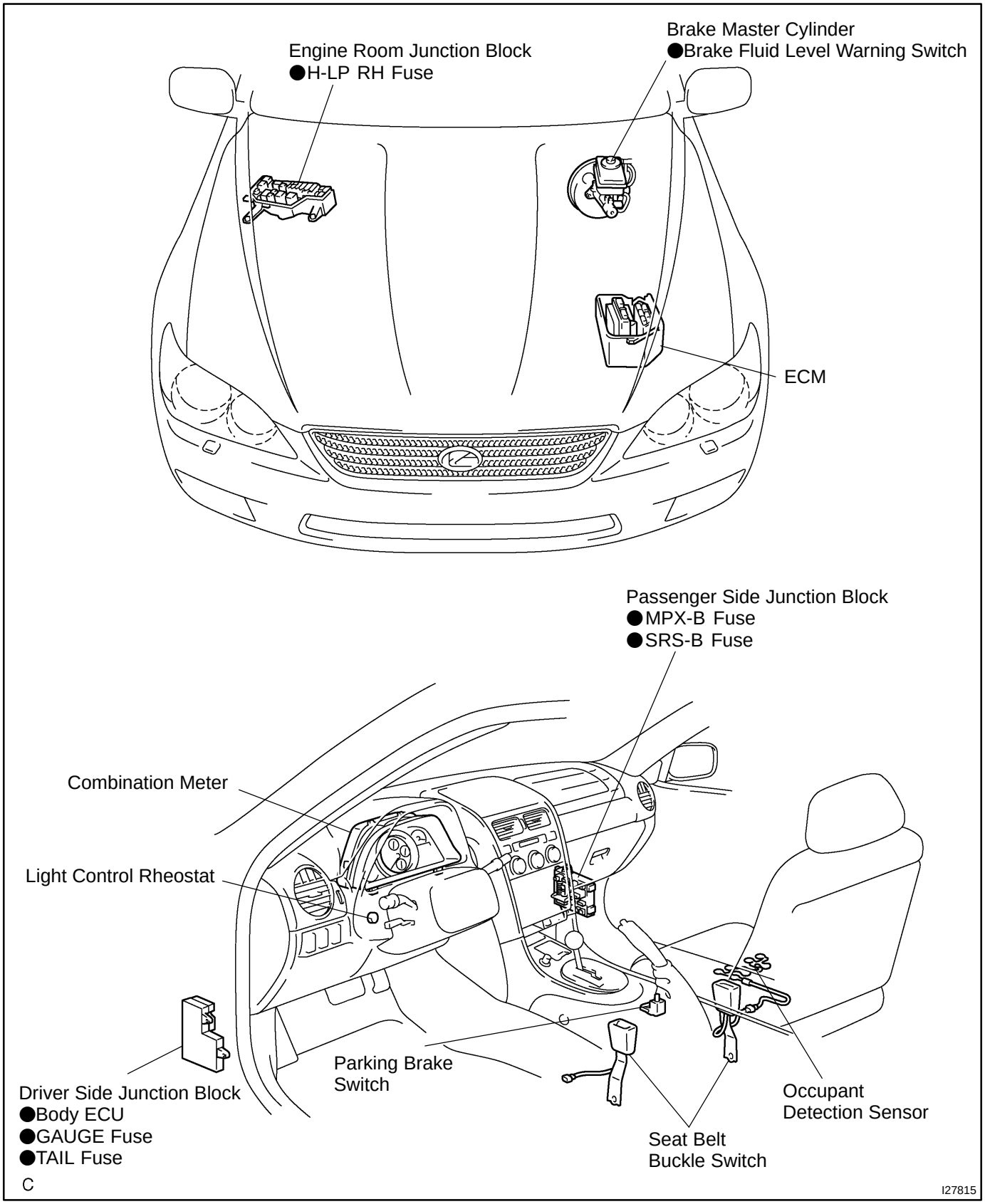
Tester connection	Condition	Specified condition
2 - Ground	Ignition switch ON	Battery positive voltage

If circuit is not as specified, inspect the power source, wire harness and wiper switch.

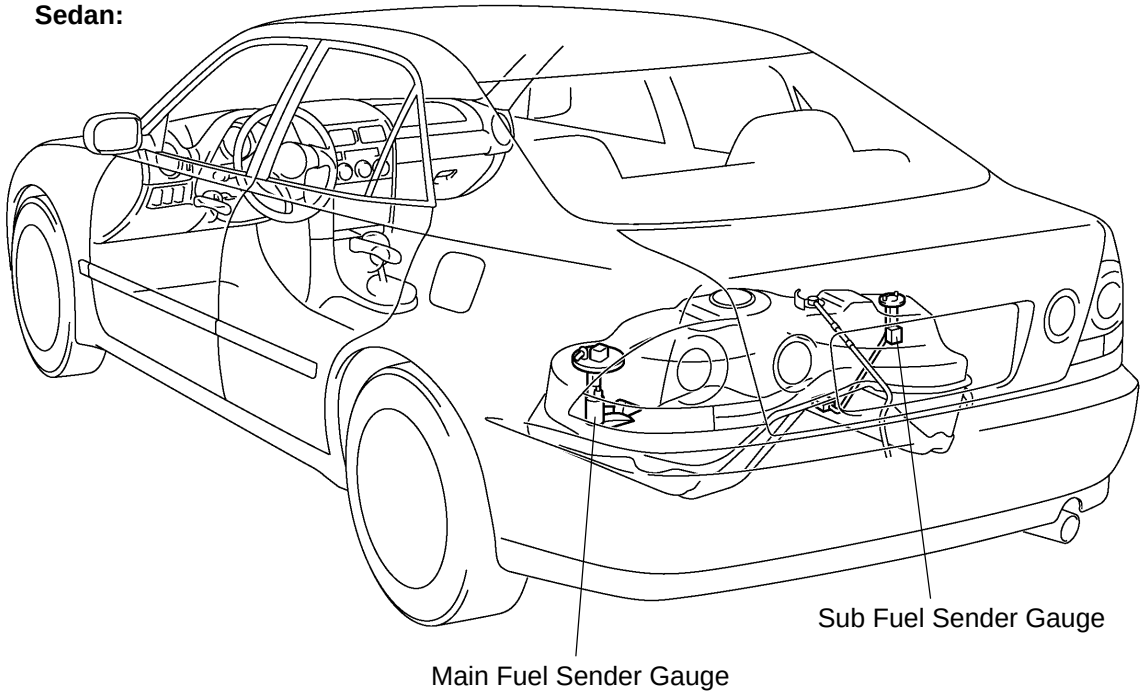
COMBINATION METER

LOCATION

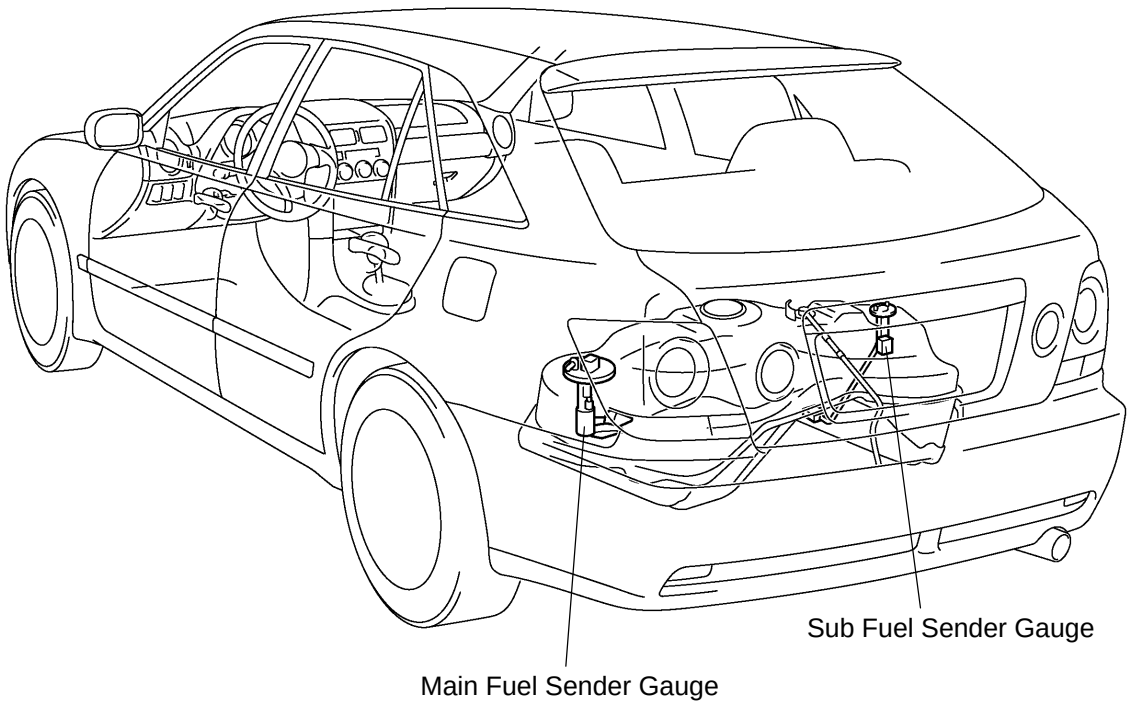
BE2A1-03



Sedan:

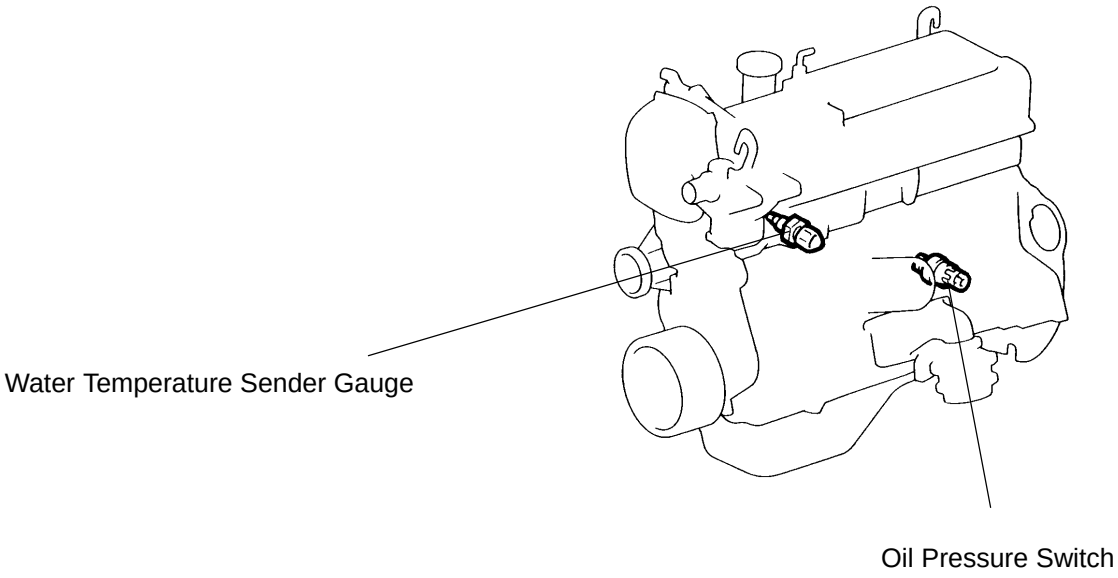


Wagon:

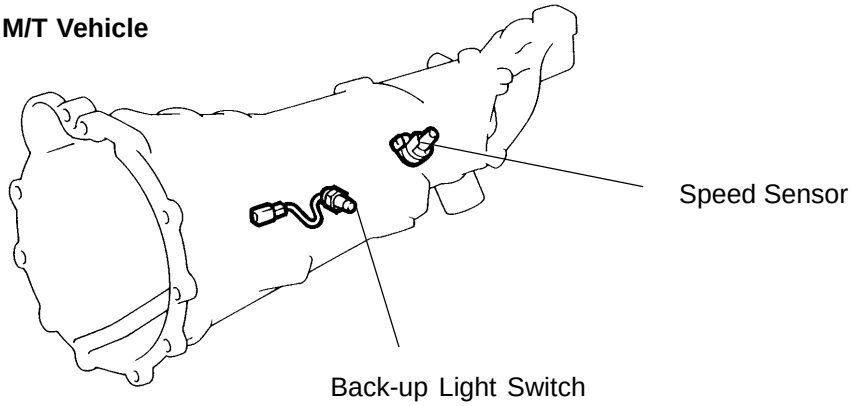


C

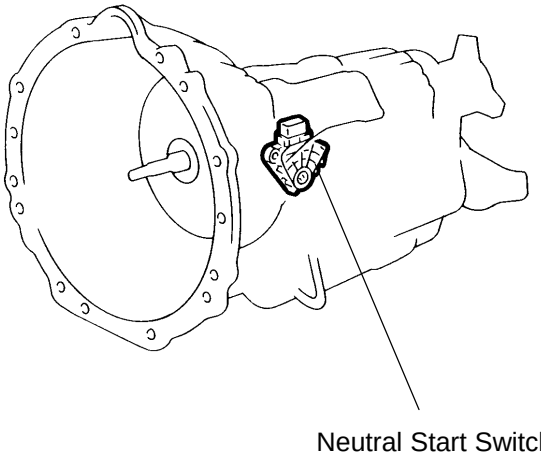
I27816



M/T Vehicle



A/T Vehicle

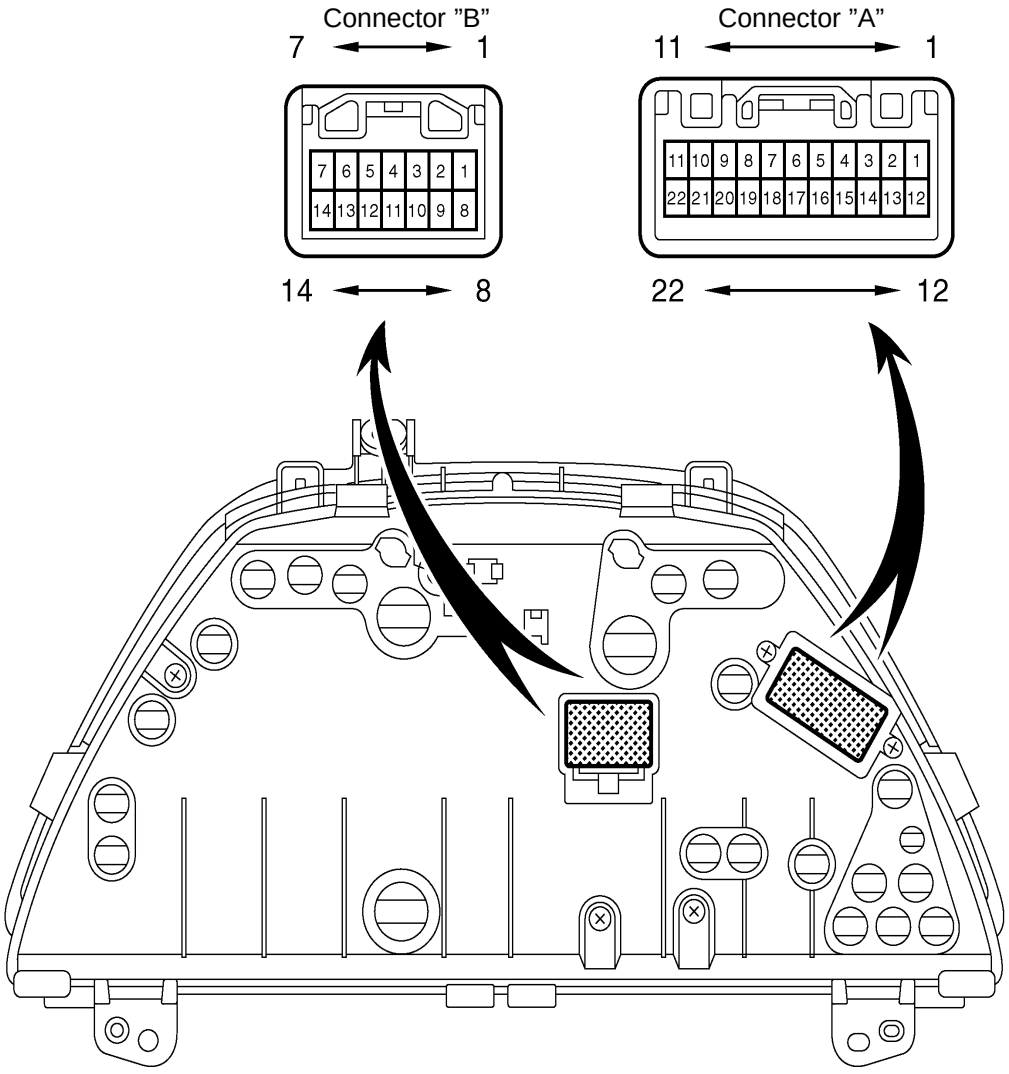


N

I11340

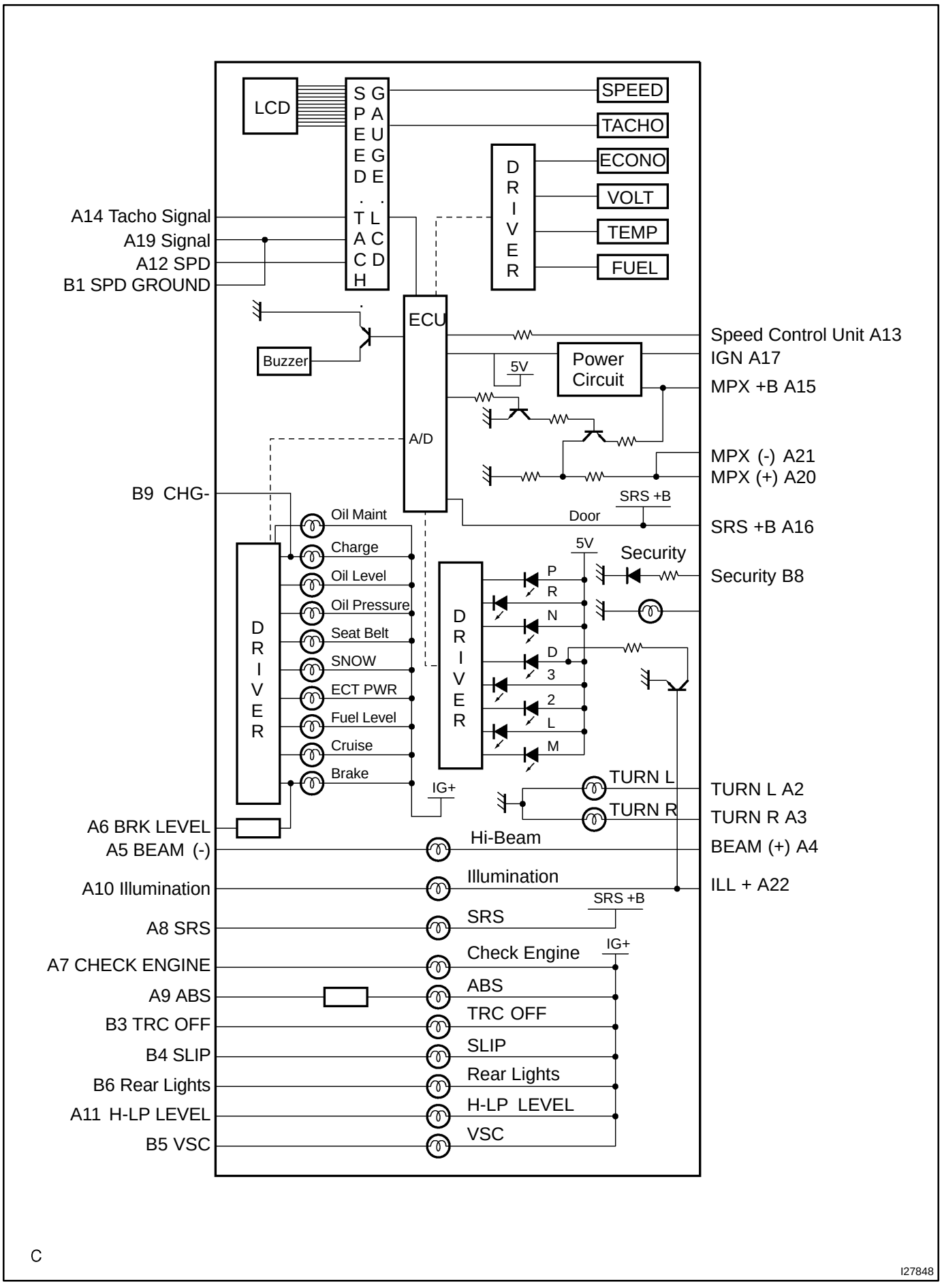
BE16C-04

CIRCUIT



N

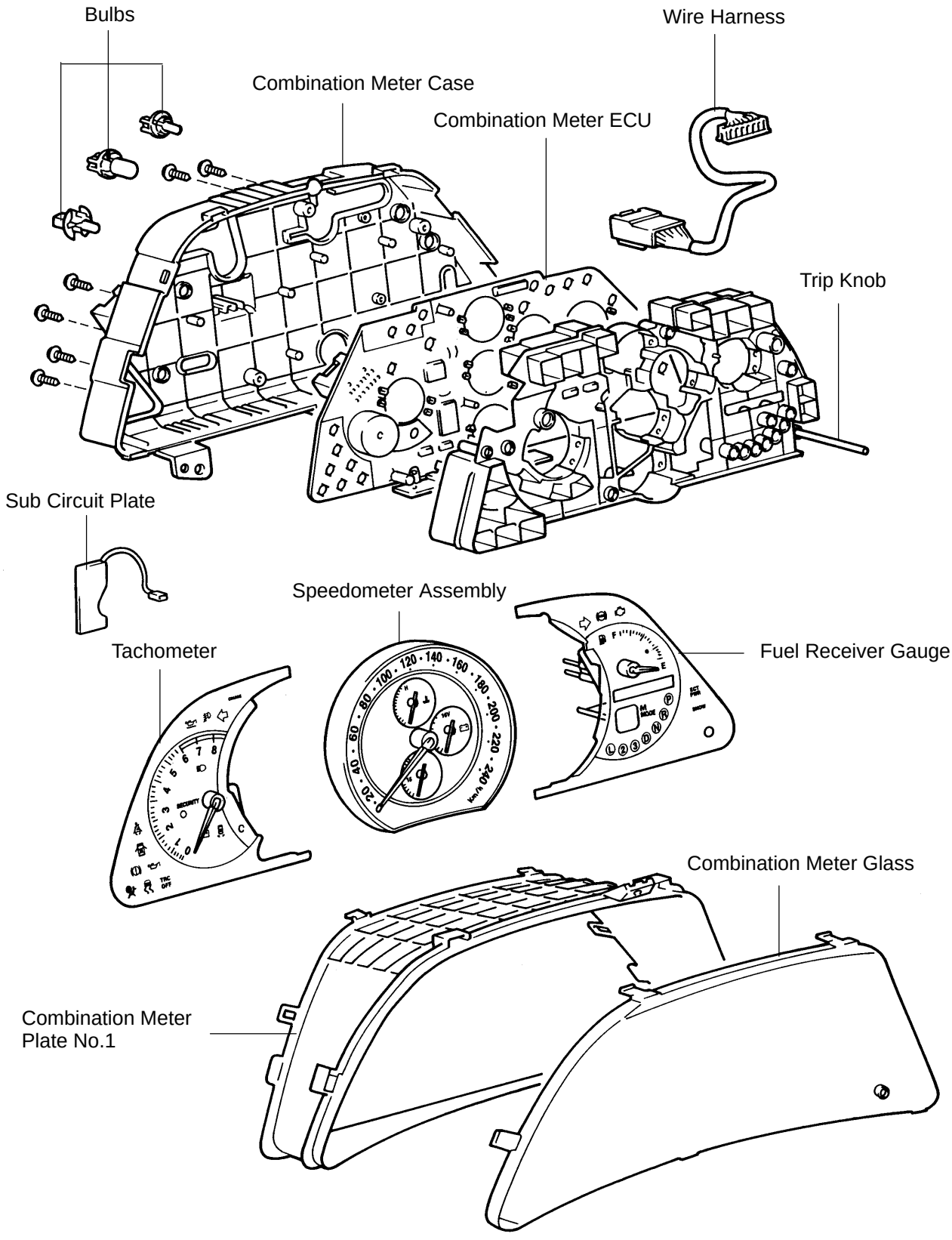
I18580


LCD
SPEED. TACH
GAUGE. LCD
SPEED
TACHO
ECONO
VOLT
TEMP
FUEL
DRIVER
A14 Tacho Signal
A19 Signal
A12 SPD
B1 SPD GROUND
ECU
A/D
Buzzer
5V
Power Circuit
Speed Control Unit A13
IGN A17
MPX +B A15
MPX (-) A21
MPX (+) A20
B9 CHG-
SRS +B
Door
SRS +B A16
Oil Maint
Charge
Oil Level
Oil Pressure
Seat Belt
SNOW
ECT PWR
Fuel Level
Cruise
Brake
DRIVER
DRIVER
5V
Security
Security B8
P
R
N
D
3
2
L
M
IG+
TURN L
TURN R
TURN L A2
TURN R A3
A6 BRK LEVEL
A5 BEAM (-)
Hi-Beam
BEAM (+) A4
A10 Illumination
Illumination
ILL + A22
SRS +B
A8 SRS
SRS
IG+
A7 CHECK ENGINE
Check Engine
A9 ABS
ABS
B3 TRC OFF
TRC OFF
B4 SLIP
SLIP
B6 Rear Lights
Rear Lights
A11 H-LP LEVEL
H-LP LEVEL
B5 VSC
VSC
C
I27848

No.		Wiring connector side
A	2	Turn signal light switch (Left)
	3	Turn signal light switch (Right)
	4	HEAD Fuse
	5	Headlight dimmer switch
	6	Brake fluid level warning switch
	7	ECM
	8	Airbag sensor assembly
	9	ABS ECU
	10	Rheostat light control volume
	11	Headlight beam level control ECU
	12	Speed sensor (M/T) or ABS ECU (A/T)
	13	Speed control unit
	14	ECM
	15	MPX+B Fuse
	16	SRS+B Fuse
	17	GAUGE Fuse
	18	Power ground
	19	Signal ground
	20	Multiplex communication circuit (MPX+)
	21	Multiplex communication circuit (MPX-)
	22	TAIL Fuse
B	1	Speed signal ground (M/T vehicle only)
	3	ABS and TRC ECU
	4	ABS and TRC ECU
	5	ABS and TRC ECU (w/ VSC)
	6	Light failure sensor
	8	Theft deterrent ECU
	9	Daytime running light ECU

BE0HJ-13

COMPONENTS



N

I18579

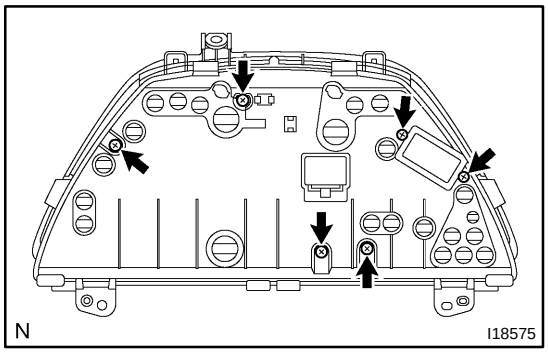
BE16D-04

DISASSEMBLY

HINT:

Installation is in the reverse order of removal. Only if there is a specified procedure for installation it is shown.

1. **REMOVE INSTRUMENT PANEL LWR**
   (See page BO-135)
2. **REMOVE INSTRUMENT CLUSTER FINISH PANEL**
3. **REMOVE COMBINATION METER ASSEMBLY**
4. **REMOVE COMBINATION METER GLASS**
5. **REMOVE COMBINATION METER PLATE NO. 1**

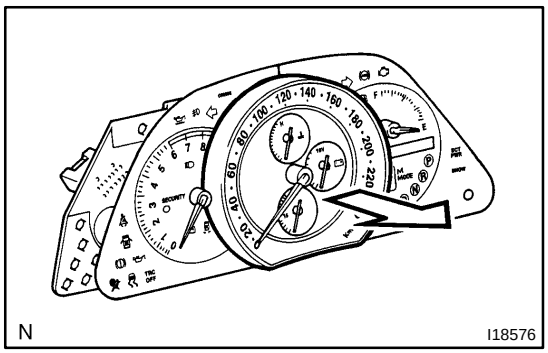


6. **REMOVE COMBINATION METER CASE**

(a) Separate the wire harness connector at the upper side of the combination meter assembly from the combination meter computer.

(b) Remove the 6 screws as shown in the illustration, and remove the combination meter.

7. **REMOVE THE WIRE HARNESS**



8. **REMOVE SPEEDOMETER ASSEMBLY**

Pull the speed meter assembly in the direction indicated by the arrow in the illustration and disconnect the engagement of the combination meter computer assembly to remove the speed meter assembly.

NOTICE:

Use gloves so as not to scratch or stain the panel surface.
Do not apply unnatural force.

9. **REMOVE ENGINE TACHO METER ASSEMBLY**

HINT:

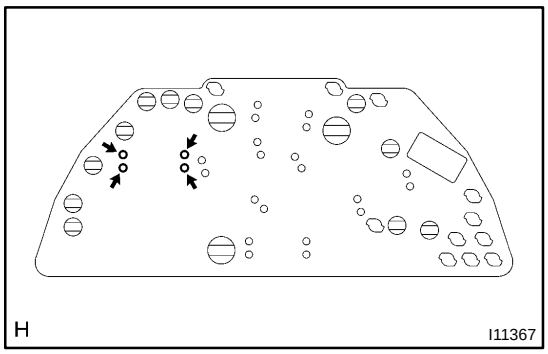
Remove it in the same procedure as for the speed meter assembly.

10. **REMOVE FUEL RECEIVER GAUGE.**

HINT:

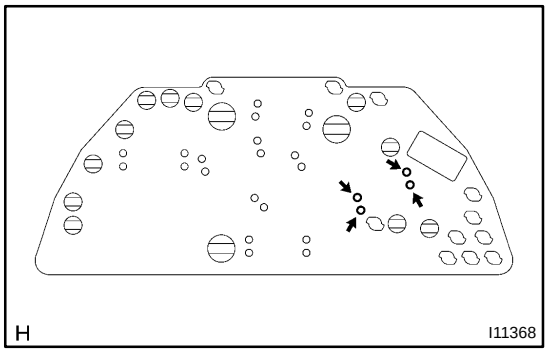
Remove it in the same procedure as for the speed meter assembly.

11. **REMOVE TRIP KNOB**
12. **REMOVE COMBINATION METER COMPUTER ASSEMBLY**



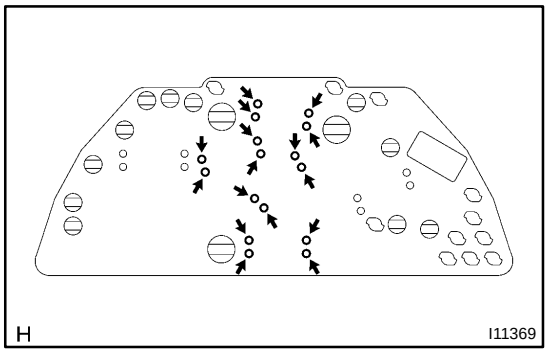
13. INSTALL FUEL RECEIVER GAUGE

Install the fuel receiver gauge to the combination meter computer assembly, and check that the gauge terminal shown in the illustration are fitted in securely.



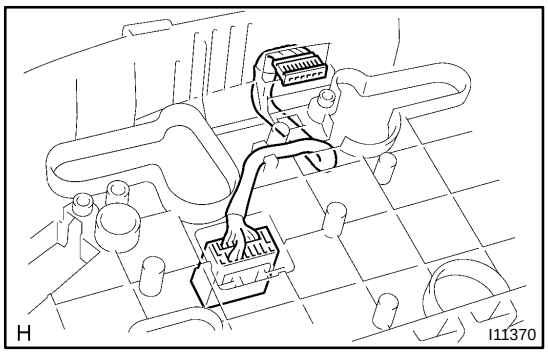
14. INSTALL ENGINE TACHO METER ASSEMBLY

Install the engine tacho meter assembly to the combination meter computer assembly, and check that the gauge terminals shown in the illustration are fitted in securely.



15. INSTALL SPEEDOMETER ASSEMBLY

Install the speedometer assembly to the combination meter computer assembly, and check that the gauge terminals shown in the illustration are fitted in securely.



16. INSTALL WIRE HARNESS

Route the wire harness as shown in the illustration and install it to the combination meter case.

BE1WU-04

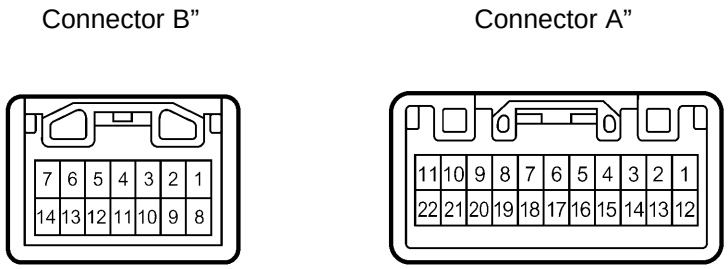
INSPECTION

1. INSPECT COMBINATION METER CIRCUIT

Connector connected:

Connect connector ”A” and ”B” from the combination meter and inspect the connectors on the wire harness side as shown in the table.

Connector connected



I11995

Tester connection	Condition	Specified condition
A2 - Ground (Turn L)	Ignition switch ON and turn signal switch Left	Battery voltage
A3 - Ground (Turn R)	Ignition switch ON and turn signal switch Right	Battery voltage
A4 - Ground (Beam +)	Always	Battery voltage
A5 - Ground (Beam -)	Headlight dimmer switch HI	Battery voltage
A6 - Ground (BRK level)	Ignition switch ON and Brake fluid level warning switch LO	Battery voltage
A7 - Ground (Check engine)	Ignition switch ON and engine running	Battery voltage
A8 - Ground (SRS)	SRS warning light does not light up	Battery voltage
A9 - Ground (ABS)	Ignition switch ON and ABS warning does not lights up	Battery voltage
A10 - Ground (ILL-)	Light control switch TAIL or HEAD	Continuity
A11 - Ground (Headlight beam level)	Headlight beam level control system is operation	Battery voltage
A12 - Ground (Speed signal input)	Ignition switch ON and turn propeller shaft slowly	Battery voltage
A13 - Ground (Speed signal output)	Ignition switch ON and turn propeller shaft slowly	1 V to 4.5 - 5.5 V
A14 - Ground (Tachometer signal)	Engine running	Pulse generation *1
A15 - Ground (MPX +B)	Always	Battery voltage

A16 - Ground (DOME +B)	Always	Battery voltage
A17 - Ground (IGN)	Ignition switch ON	Battery voltage
A18 - Ground (Power ground)	Always	Continuity
A19 - Ground (Signal ground)	Always	Continuity
A20 - Ground (MPX+)	Ignition switch ON	Pulse generation
A21 - Ground (MPX-)	Ignition switch ON	Pulse generation
A22 - Ground (ILL+)	Light control switch TAIL or HEAD	Battery voltage
B1 - Ground (SP ground)	Always	Continuity
B3 - Ground (TRC OFF)	Ignition switch ON and TRC OFF indicator does not light up	Battery voltage
B4 - Ground (SLIP)	Ignition switch ON and SLIP indicator does not light up	Battery voltage
B5 - Ground (VSC)	Ignition switch ON and VSC indicator does not light up	Battery voltage
B6 - Ground (Rear Lights)	Ignition Switch ON and rear lights bulb is blown	Battery voltage
B8 - Ground (Security)	Theft deterrent system is operating	Battery voltage
B9 - Ground (Alternator L terminal)	Engine running	Battery voltage

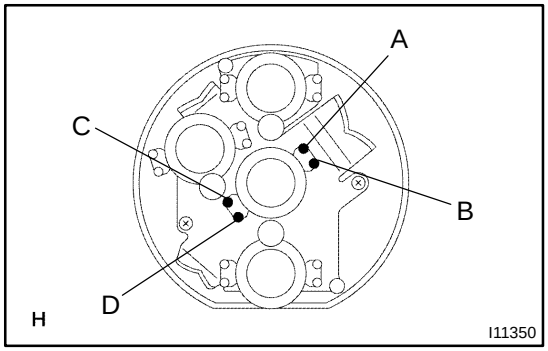
If circuit is not as specified, wiring diagram and inspect the circuits connected to other parts.

2. INSPECT SPEEDOMETER/ON-VEHICLE

Using a speedometer tester, inspect the speedometer for allowable indication error and check the operation of the odometer.
HINT:
Tire wear and tire over or under inflation will increase the indication error.

USA (mph)		CANADA (km/h)	
Standard indication	Allowable range	Standard indication	Allowable range
20	18.5 - 21.5	20	18 - 23
40	38 - 41.5	40	40 - 44
60	58 - 62	60	60 - 64.5
80	77.5 - 82	80	80 - 85
100	97 - 102	100	100 - 105
120	116.5 - 122	120	120 - 125.5
140	136 - 142	140	140 - 146
		160	160 - 167
		180	180 - 188
		200	200 - 209
		220	220 - 230
		240	240 - 251

If error is excessive, replace the speedometer.



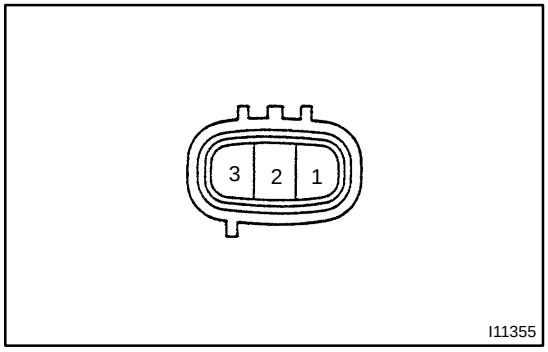
3. INSPECT SPEEDOMETER RESISTANCE

(See page DI-877)

Measure the resistance between terminals with fixing pointer to the stopper.

Tester connection	Resistance (Ω)
A - D	160
B - C	160

If resistance value is not as the specified, replace the meter.



4. INSPECT VEHICLE SPEED SENSOR OPERATION

(See page DI-885)

(a) Connect the positive (+) lead from battery to terminal 1 and negative (-) lead to terminal 2.
(b) Connect the positive (+) lead from tester to terminal 3 and negative (-) lead to terminal 2.
(c) Rotate shaft.
(d) Check that there is a voltage change from approx. 0 V to 11 V or more between terminals 2 and 3.

HINT:
The voltage change should be 4 times for every revolution of the speed sensor shaft.
If operation is not as specified, replace the sensor.

5. INSPECT TACHOMETER/ON-VEHICLE

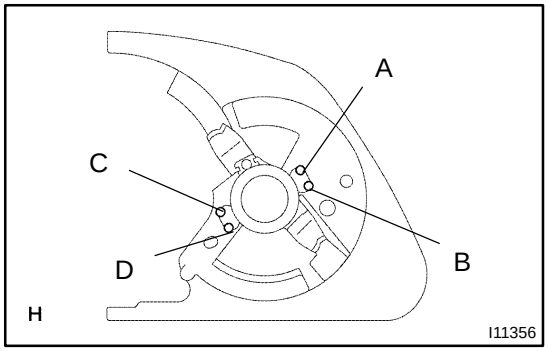
(a) Connect a tune-up test tachometer, and start the engine.

NOTICE:

- **Reversing the connection of the tachometer will damage the transistors and diodes inside.**
- **When removing or installing the tachometer, be careful not to drop or subject it to heavy shocks.**

(b) Compare the tester and tachometer indications.
DC 13.5 V 25 ˚C at (77˚F)

Standard indication	Allowable range
700	630 - 770
1,000	(900 - 1,100)
2,000	(1,850 - 2,150)
3,000	2,850 - 3,150
4,000	(3,800 - 4,200)
5,000	4,800 - 5,200
6,000	(5,750 - 6,250)
7,000	6,700 - 7,300
8,000	7,700 - 8,300

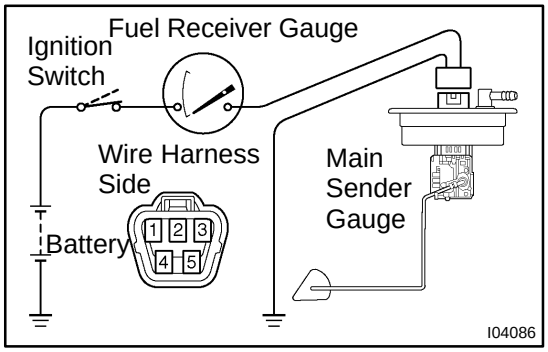


6. INSPECT TACHOMETER RESISTANCE
(See page DI-878)

Measure the resistance between terminals with fixing pointer to the stopper.

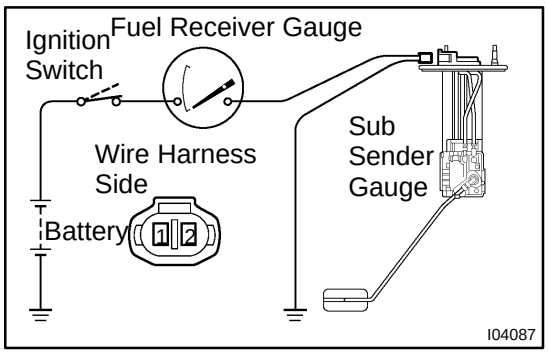
Tester connection	Resistance (Ω)
A - D	160
B - C	160

If resistance value is not as specified, replace the meter.



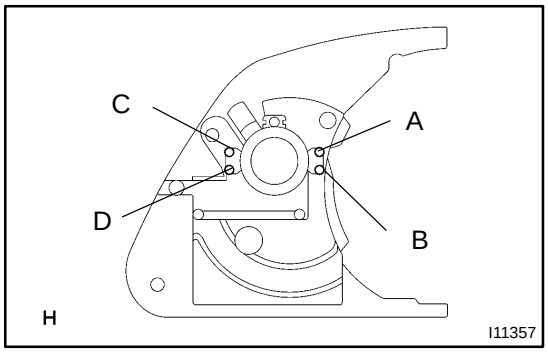
7. INSPECT FUEL RECEIVER GAUGE OPERATION (See page DI-879)

(a) Disconnect the connector from the main sender gauge.
(b) Turn the ignition switch ON, check that the receiver gauge needle indicates EMPTY.



(c) Connect the main sender gauge.
(d) Disconnect the connector from the sub sender gauge.
(e) Turn the ignition switch ON, check that the receiver gauge needle indicates EMPTY.

HINT:
Because of the silicon oil in the gauge, it will take a short time for needle to stabilize.
If operation is not as specified, inspect the receiver gauge resistance.

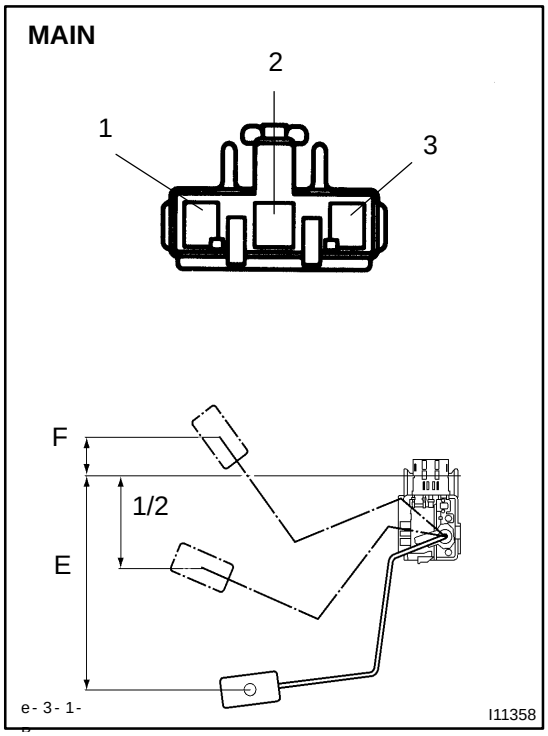


8. INSPECT FUEL RECEIVER GAUGE RESISTANCE (See page DI-919)

Measure the resistance between terminals with fixing pointer to the stopper.

Tester connection	Resistance (Ω)
A - D	160
B - C	160

If resistance value is not as specified, replace the receiver gauge.

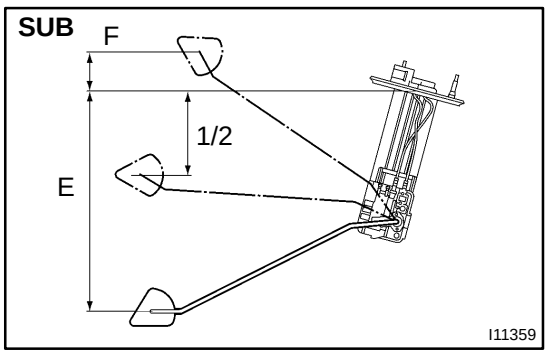


9. INSPECT FUEL MAIN SENDER GAUGE RESISTANCE

Measure the resistance between terminals 1 and 2 for each float position.

Float position mm (in.)	Resistance (Ω)
F: Approx. 22.9 (0.90) ± 3 (0.12)	Approx. 2.0 ± 1.0
1/2: Approx. 58.3 (2.30) ± 3 (0.12)	Approx. 30.3 ± 3.0
E: Approx. 133.6 (5.26) ± 3 (0.12)	Approx. 55.0 ± 1.0

If resistance value is not as specified, replace the main sender gauge.



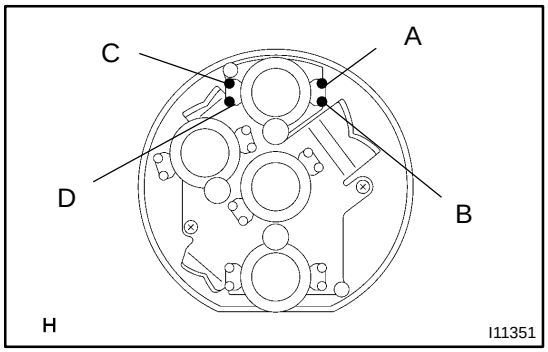
10. INSPECT FUEL SUB SENDER GAUGE RESISTANCE

Measure the resistance between terminals 1 and 2 for each float position.

Float position mm (in.)	Resistance (Ω)
F: Approx. 29.1 (1.15) ± 3 (0.12)	Approx. 2.0 ± 1.0
1/2: Approx. 65.8 (2.59) ± 3 (0.12)	Approx. 29.7 ± 3.0
E: Approx. 169.5 (6.67) ± 3 (0.12)	Approx. 55 ± 1.0

If resistance value is not as specified, replace the sub sender gauge.

11. INSPECT WATER TEMPERATURE RECEIVER GAUGE OPERATION (See page DI-881)



12. INSPECT WATER TEMPERATURE RECEIVER GAUGE RESISTANCE

Measure the resistance between terminals with fixing pointer to the stopper.

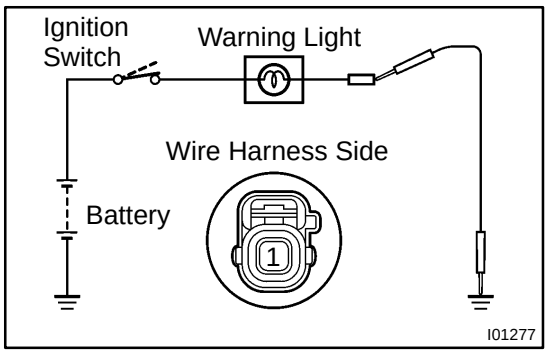
Tester connection	Resistance (Ω)
A - D	160
B - C	160

If resistance value is not as specified, replace the receiver gauge.

HINT:

This circuit includes the diode.

If resistance value is not as specified, replace the receiver gauge.

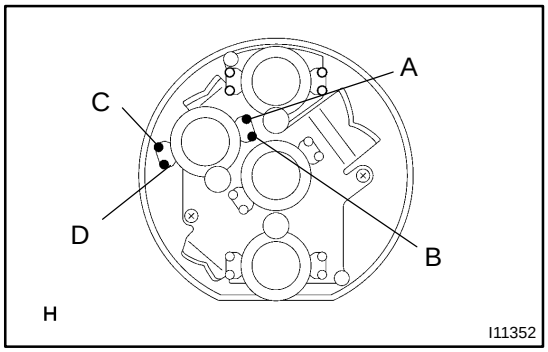


13. INSPECT LOW OIL PRESSURE WARNING LIGHT

(a) Disconnect the connector from the warning switch and ground terminal on the wire harness side connector.

(b) Turn the ignition switch ON and check that the warning light lights up.

If the warning light does not light up, test the bulb.

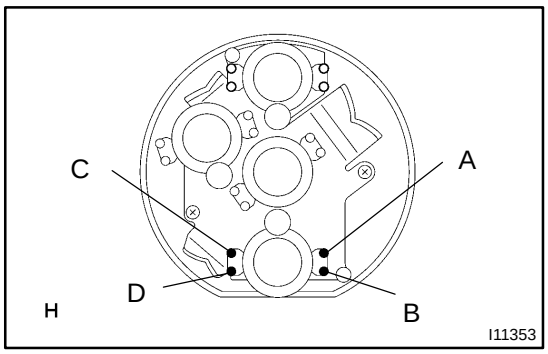


14. INSPECT VOLTAGE GAUGE RESISTANCE (See page DI-883)

Measure the resistance between terminals with fixing pointer to the stopper.

Tester connection	Resistance (Ω)
A - D	160
B - C	160

If resistance value is not as specified, replace the receiver gauge.

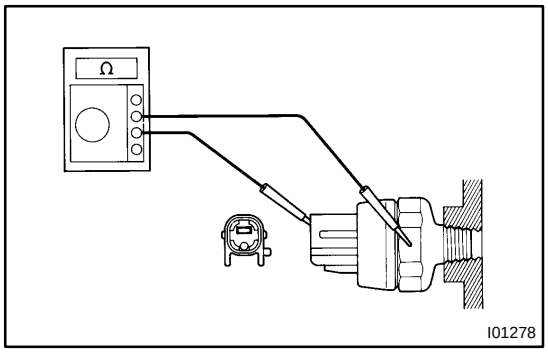


15. INSPECT SPECIFIC FUEL CONSUMPTION GAUGE RESISTANCE (See page DI-884)

Measure the resistance between terminals with fixing pointer to the stopper.

Tester connection	Resistance (Ω)
A - D	160
B - C	160

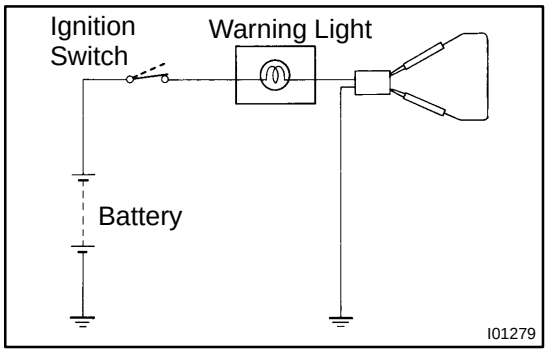
If resistance value is not as specified, replace the meter.



16. INSPECT OIL PRESSURE SENDER CONTINUITY

(a) Disconnect the connector from the oil presser sender.
(b) Check that no continuity exists between terminal and ground with the engine stopped.
(c) Check that continuity exists between terminal and ground with the engine running.

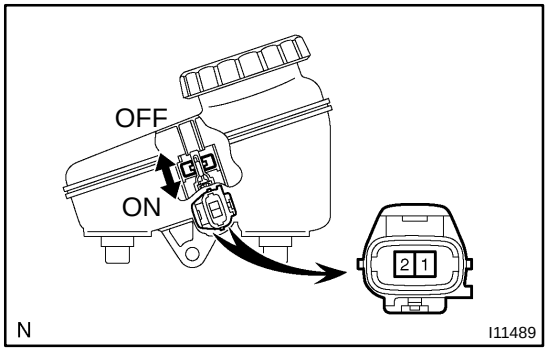
HINT:
Oil pressure should be over 24.5 kPa (0.25 kgf/cm^2, 3.55 psi).
If operation is not as specified, replace the oil pressure sender.



17. INSPECT BRAKE WARNING LIGHT

(a) Disconnect the connector from the brake fluid warning switch.
(b) Release the parking brake pedal.
(c) Connect the terminals on the wire harness side of the level warning switch connector.
(d) Start the engine, check that the warning light lights up.

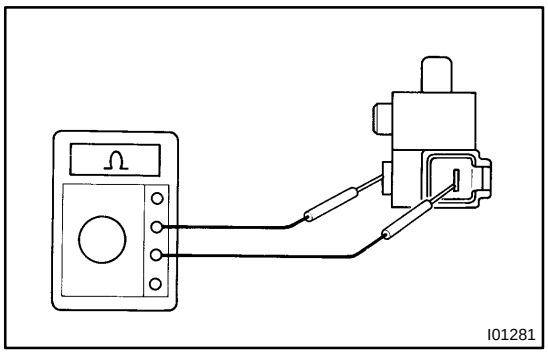
If the warning light does not light up, test the bulb or wire harness.



18. INSPECT BRAKE FLUID LEVEL WARNING SWITCH CONTINUITY

(a) Remove the reservoir tank cap and strainer.
(b) Disconnect the connector.
(c) Check that no continuity exists between the terminals with the switch OFF (float up).
(d) Use siphon, etc. to take fluid out of the reservoir tank.
(e) Check that continuity exists between the terminals with the switch ON (float down).
(f) Pour the fluid back in the reservoir tank.

If operation is not as specified, replace the switch.

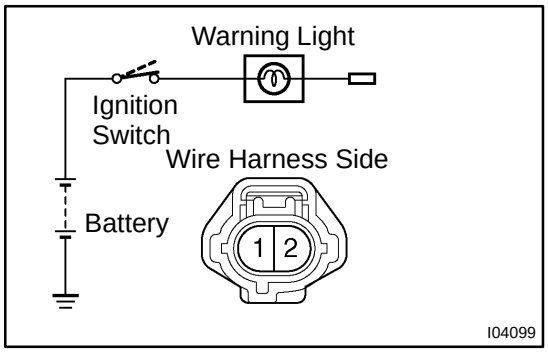


19. INSPECT PARKING BRAKE SWITCH CONTINUITY

(a) Check that continuity exists between the terminal and switch body with the switch ON (switch pin released).

(b) Check that no continuity exists between the terminal and switch body with the switch OFF (switch pin pushed in).

If operation is not as specified, replace the switch or inspect ground point.



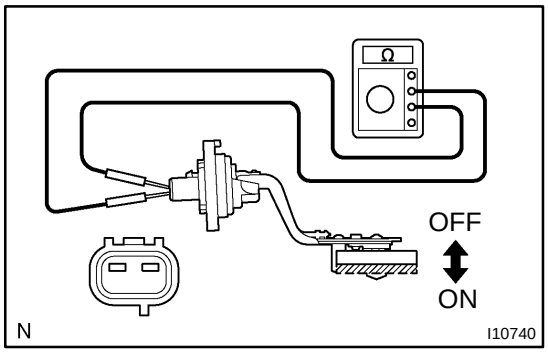
20. INSPECT ENGINE OIL LEVEL WARNING LIGHT

(a) Disconnect the connector from the switch.

(b) Run the engine.

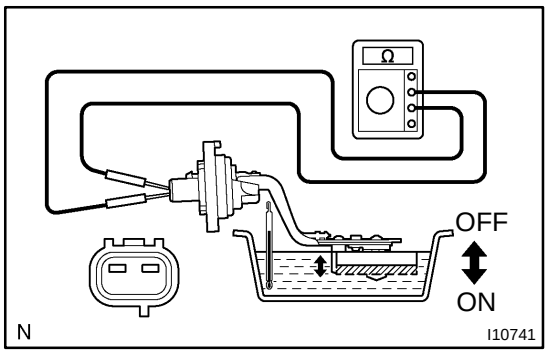
(c) Turn the ignition switch ON, check that the warning light lights up approximately 40 seconds later.

If the warning light does not light up, inspect bulb or wire harness.



21. INSPECT ENGINE OIL LEVEL WARNING SENSOR

(a) Check that continuity exists between terminals when the sensor-sensed temperature drops to 40 °C or less with the float down.

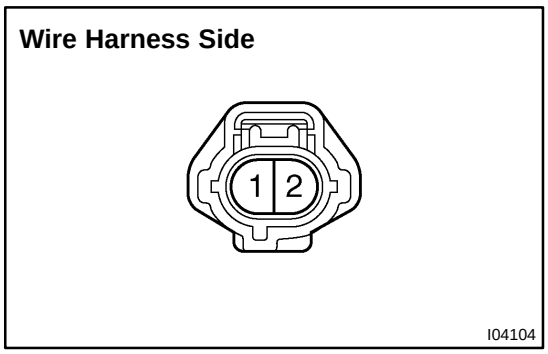


(b) Heat the switch to above 60 °C (140 °F) in an oil bath.

(c) Check that there is continuity between terminals with the switch ON (float down).

(d) Check that there is no continuity between terminals with the switch OFF (float up).

If operation is not as specified, replace the sensor.

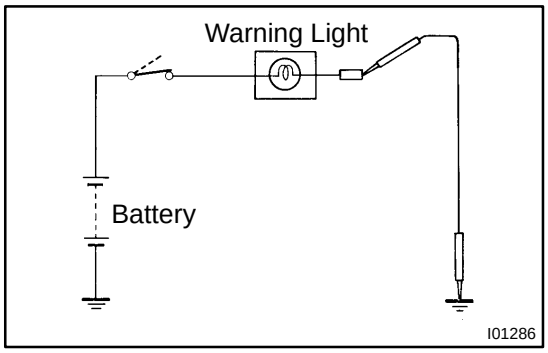


22. INSPECT ENGINE OIL LEVEL WARNING SENSOR CIRCUIT

Disconnect the switch connector and inspect the connector on wire harness side, as shown.

Tester connection	Condition	Specified condition
2 - Ground	Always	Continuity

If continuity is not as specified, inspect the wire harness or ground point.

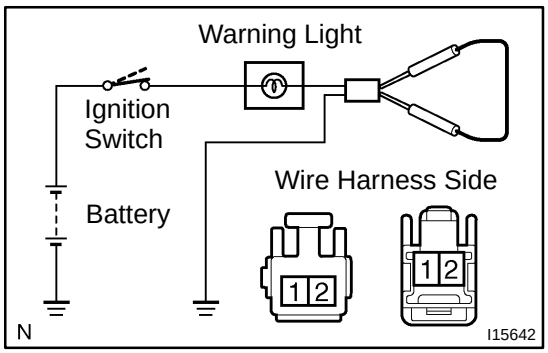


23. INSPECT OPEN DOOR WARNING LIGHT

Disconnect the connector from the door courtesy switch and ground terminal 1 on the wire harness side, and check that the warning light lights up.

If the warning light does not light up, inspect the bulb or wire harness.

24. INSPECT DOOR COURTESY SWITCH CONTINUITY AND CIRCUIT (See page DI-921)



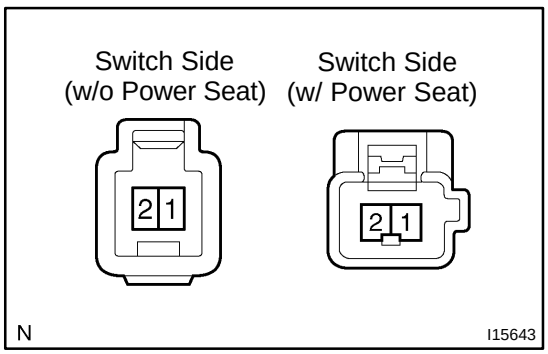
25. INSPECT SEAT BELT WARNING LIGHT

(a) Disconnect the connector from the buckle switch.

(b) Connect terminal on the wire harness side of the buckle switch connector.

(c) Turn the ignition switch ON and check that the warning light lights up.

If the warning light does not light up, inspect the bulb or wire harness.



26. INSPECT SEAT BELT BUCKLE SWITCH CONTINUITY

(a) Check that continuity exists between the terminals 1 and 2 on the switch side connector with the switch ON (belt fastened).

(b) Check that continuity exists between the terminals 1 and 2 on the switch side connector with the switch OFF (belt unfastened).

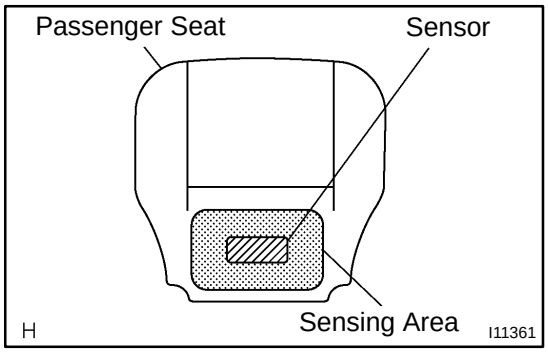
If operation is not as specified, replace the switch.

27. INSPECT SEAT BELT BUCKLE SWITCH CIRCUIT (See page DI-917)

Disconnect the switch connector and inspect the connector on wire harness side, as shown.

Tester connection	Condition	Specified condition
2 - Ground	Always	Continuity

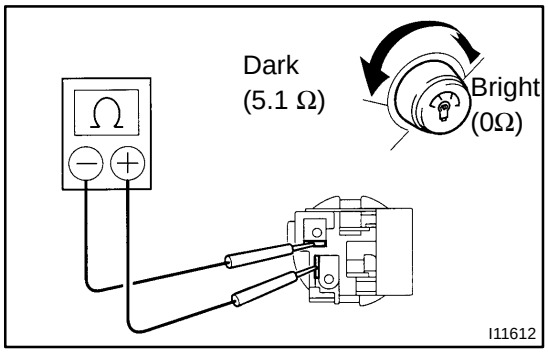
If continuity is not as specified, inspect the circuits connected to other parts.



28. Passenger seat only: INSPECT SEAT BELT WARNING OCCUPANT DETECTION SENSOR CONTINUITY

Check that continuity exists between the terminals 1 and 2 when pressing the sensing part.

If operation is not as specified, replace the sensor.

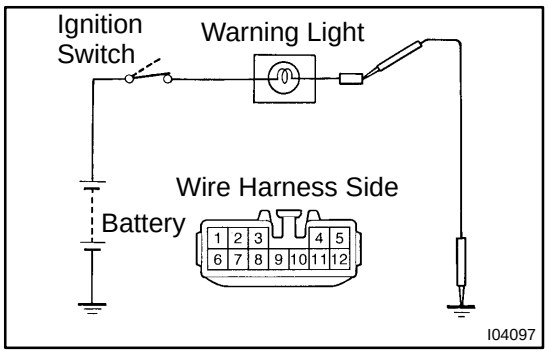


29. INSPECT LIGHT CONTROL RHEOSTAT OPERATION

(a) Turn the rheostat knob max. dark side and check that the resistance 5.1 Ω. (Rheostat knob turned to fully counterclockwise)

(b) Gradually, turn the rheostat knob from the dark side to bright side and check that the resistance decreases from 5.1 to 0 Ω. (Rheostat knob turned to clockwise)

If operation is not as specified, replace the rheostat light control.

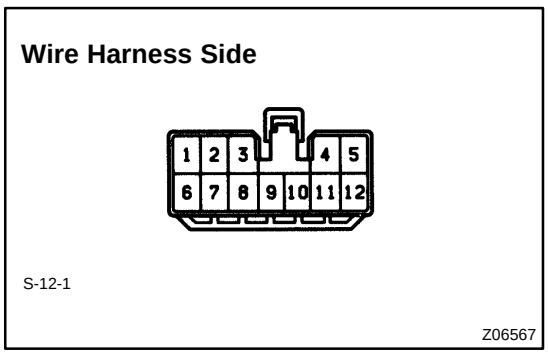


30. INSPECT REAR LIGHTS WARNING LIGHT

(a) Disconnect the connector from the light failure sensor and ground terminal 4, 5 or 9 on the wire harness side connector.

(b) Start the engine, check that the warning light lights up.

If the warning light does not light up, inspect the bulb or wire harness.



31. INSPECT LIGHT FAILURE SENSOR CIRCUIT

Disconnect the connector from the sensor and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
1 - Ground	Always	* Continuity
2 - Ground	Always	* Continuity
3 - Ground	Taillight ON	Battery Positive Voltage
9 - Ground	Always	* Continuity
11 - Ground	Always	Continuity
3 - Ground	Taillight or Headlight OFF	No voltage
3 - Ground	Taillight or Headlight ON	Battery Positive Voltage
4 - Ground	Ignition switch LOCK or ACC	No voltage
4 - Ground	Ignition switch ON	Battery Positive Voltage
7 - Ground	Stop light switch OFF	No voltage
7 - Ground	Stop light switch ON	Battery Positive Voltage
8 - Ground	Ignition switch LOCK or ACC	No voltage
8 - Ground	Ignition switch ON	Battery Positive Voltage

*: There is resistance because this circuit is grounded through the bulb.

If the circuit is not as specified, inspect the circuits connected to other parts.

32. MAINTENANCE LIQUID RESETTING PROCEDURE

Indicator Condition:

State	Condition	Specified condition
Blinking	The vehicle runs 4,500 miles after the previous setting.	The indicator blinks for 15 seconds after the ignition switch is turned on (Incluing 3 seconds for a valve check)
Continuously illuminated	The vehicle runs 5,000 miles after the previous setting.	The indicator is continuously illuminated after the ignition switch is turned on.

(a) Set the display window to ODO.

(b) Turn the ignition switch off.

(c) Pressing the reset switch, turn the ignition switch (Keep pressing for at least 5 seconds).

(d) The reset procedure is completed.

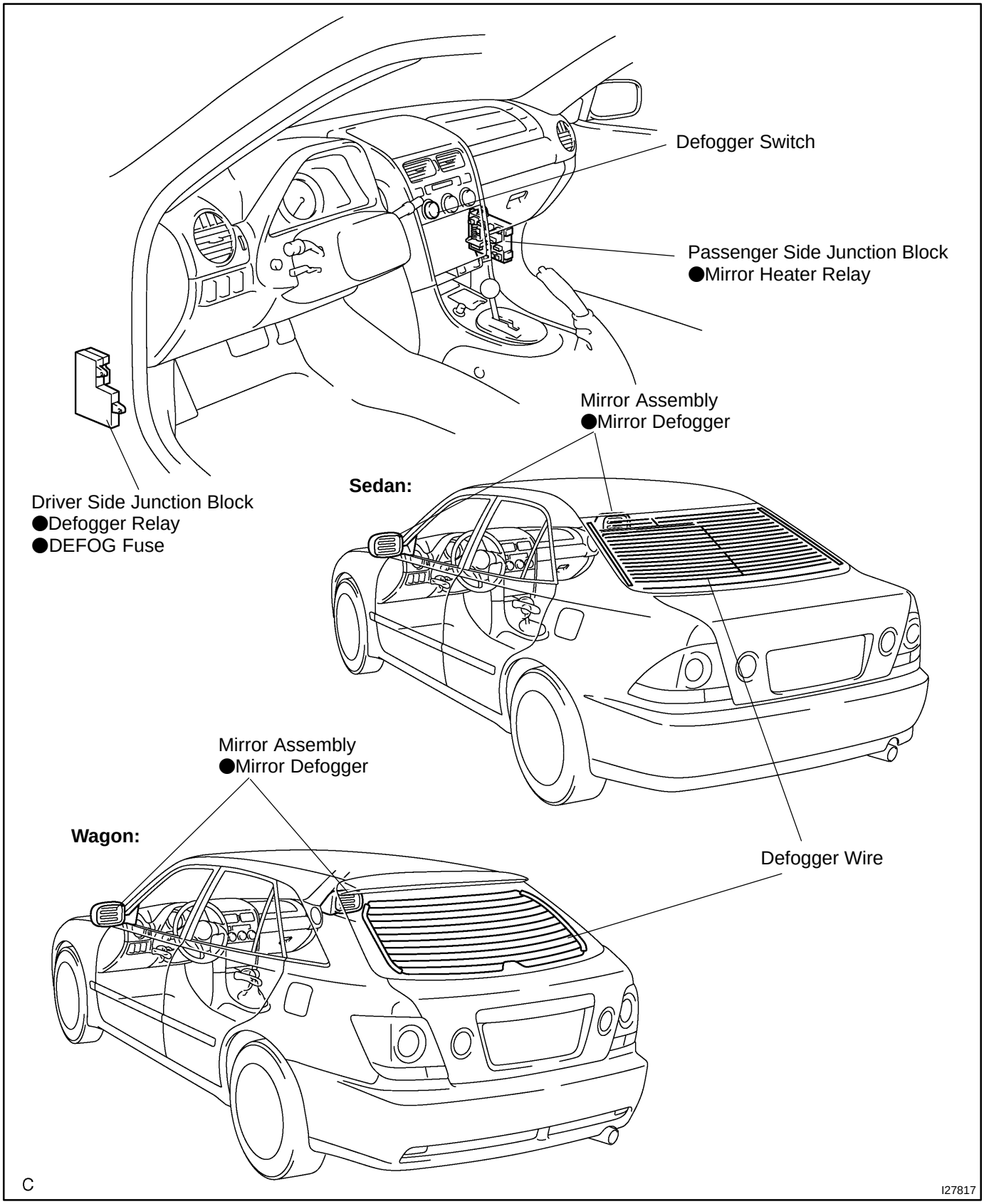
HINT:

- If the ignition switch is turned off during the reset procedure, reset mode is canceled.
- If the reset switch is turned off during the reset procedure, reset mode is canceled.

DEFOGGER SYSTEM

LOCATION

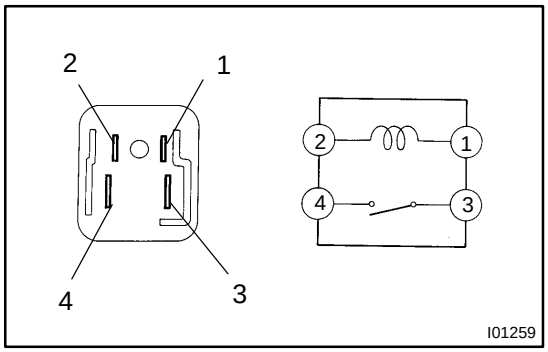
BE0GS-21



BE1WV-03

INSPECTION

1. INSPECT DEFOGGER SWITCH (See page AC-88)

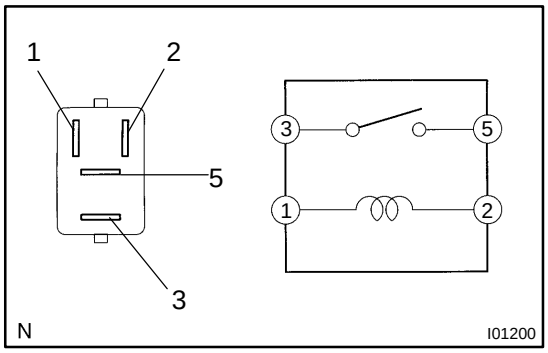


2. INSPECT DEFOGGER RELAY CONTINUITY

Condition	Tester connection	Specified condition
Always	1 - 2	Continuity
Apply B+ between terminals 1 and 2.	3 - 4	Continuity

If continuity is not as specified, replace the relay.

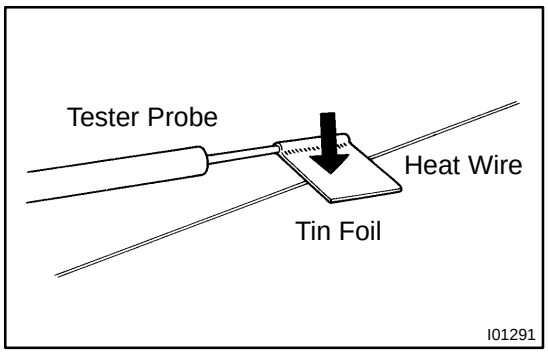
3. INSPECT DEFOGGER RELAY CIRCUIT (See page DI-940)



4. INSPECT MIRROR DEFOGGER RELAY CONTINUITY

Condition	Tester connection	Specified condition
Always	1 - 2	Continuity
Apply B+ between terminals 1 and 2.	3 - 5	Continuity

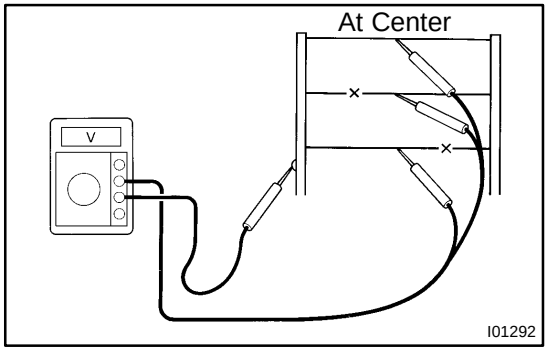
If continuity is not as specified, replace the relay.



5. INSPECT DEFOGGER WIRE

NOTICE:

- **When cleaning the glass, use a soft, dry cloth, and wipe the glass in the direction of the wire. Take care not to damage the wires.**
- **Do not use detergents or glass cleaners with abrasive ingredients.**
- **When measuring voltage, wrap a piece of tin foil around the tip of the negative probe and press the foil against the wire with your finger, as shown.**

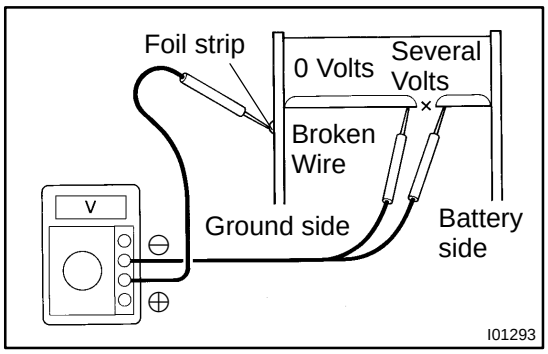


(a) Turn the ignition switch ON.

(b) Turn the defogger switch ON.

(c) Inspect the voltage at the center of each heat wire, as shown.

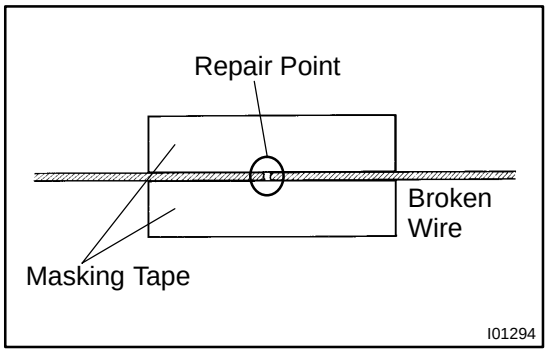
Voltage	Criteria
Approx. 5V	Okay (No break in wire)
Approx. 10V or 0V	Broken wire



HINT:
If there is approximately 10 V, the wire is broken between the center of the wire and the positive (+) end. If there is no voltage, the wire is broken between the center of the wire and ground.

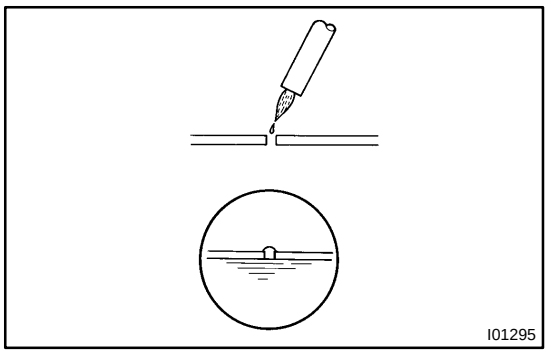
(d) Place the voltmeter positive (+) lead against the defogger wire on the battery side.
(e) Place the voltmeter negative (-) lead with the foil strip against the wire on the ground side.
(f) Slide the positive (+) lead from battery to ground side.
(g) The point where the voltmeter deflects from several V to zero V is the place where the defogger wire is broken.

HINT:
If the heat wire is not broken, the voltmeter indicates 0 V at the positive (+) end of the heat wire but gradually increases to about 12 V as the meter probe moves to the other end.

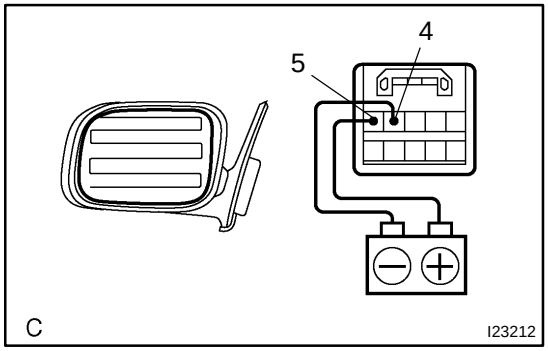


6. IF NECESSARY, REPAIR DEFOGGER WIRE

(a) Clean the broken wire tips with grease, wax and silicone remover.
(b) Place the masking tape along both sides of the wire for repair.
(c) Thoroughly mix the repair agent (Dupont paste No. 4817).



(d) Using a fine tip brush, apply a small amount of the agent to the wire.
(e) After a few minutes, remove the masking tape.
(f) Do not repair the defogger wire for at least 24 hours.



7. w/ Mirror heater:
INSPECT MIRROR DEFOGGER OPERATION

(a) Connect the positive (+) lead from the battery to terminal 5 and the negative (-) lead to terminal 4.
(b) Check that the mirror becomes warm.

HINT:
It will take a short time for the mirror to become warm.

POWER WINDOW CONTROL SYSTEM

BE02C-15

TROUBLESHOOTING

Malfunction symptoms	Applicable chart
Driver's door does not operate.	1
Passenger's and all rear doors do not operate by using the switches at each seat.	2
Any of passenger's and rear doors does not operate by using the switches of each seat.	3
Passenger's and all rear doors are not controlled remotely by using the master switch. (Switches of each door can be operated.)	4
AUTO UP and AUTO DOWN does not operate. (Prepare a normal master switch.)	5
DOWN operation operates during door glass AUTO UP operation.	6
Even though a foreign object is caught, DOWN operation does not function.	7
After ignition switch has been turned to OFF by using a key, power window function does not operate.	8

1	**Driver's door does not operate.**

Remove the power window regulator master switch and disconnect the connector.

Check there is voltage of 10 of 14 V between terminal 1 of vehicle side connector of master switch and body ground.

No → Wire harness defective (between power fuse terminal 1 of master switch.)

Yes

With ignition switch ON, is there voltage of 10 to 14 V between the terminal 2 and 4 of vehicle side connector of the master switch and body ground.

Yes → Wire harness (between terminal of the power main relay and 2 or 4 terminal of the master switch.)

No

Does continuity exist between 9 terminal of vehicle side connector of the master switch and body ground?

No → Wire harness defective (between 9 terminal of the master switch and body ground.)

Yes

When battery voltage is supplied to the vehicle side connector of the master switch, check if the door glass operate.

Yes → Power window regulator master switch defective.

Connection	Glass operation
Battery positive - 8 terminal Battery negative - 20 terminal	UP
Battery positive - 20 terminal Battery negative - 8 terminal	DOWN

No

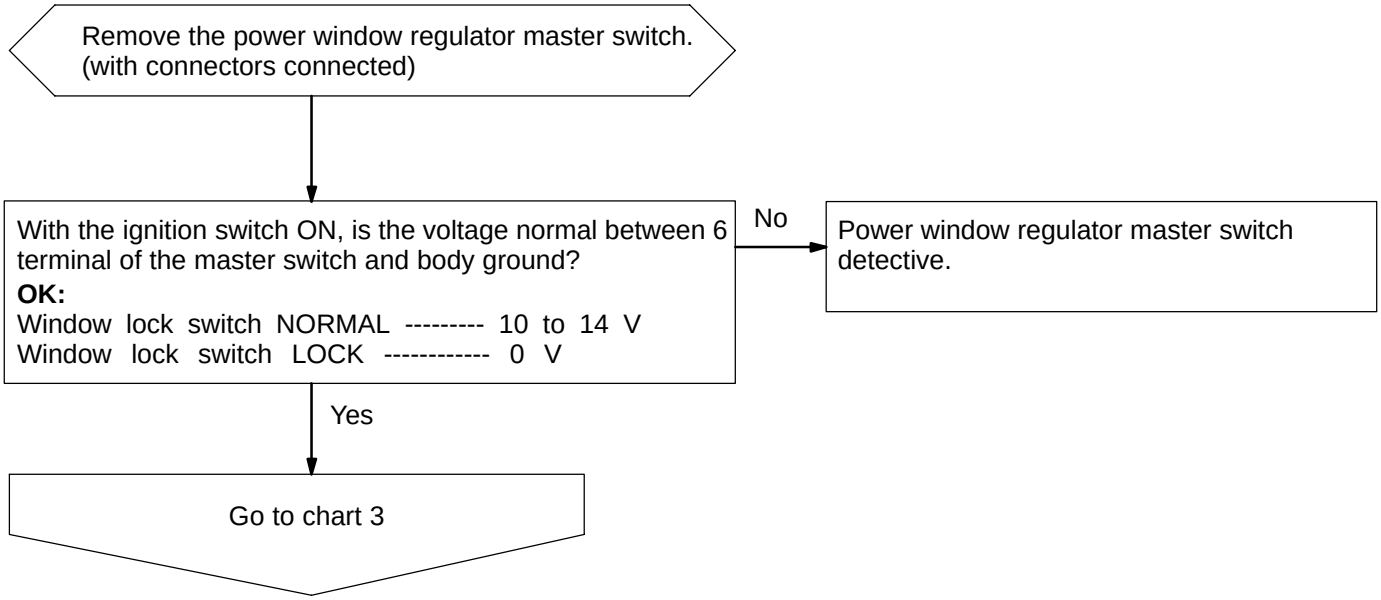
Is the power motor normal?

No → Power window motor defective.

Yes

Wire harness (between 20 terminal of the master switch and 2 terminal of the power window motor or 8 terminal of the master switch and 1 terminal of the power window).

2	**Passenger's and all rear doors do not operate by using the switches of each seat.**



3	**Any of passenger's and all rear doors does not operate by using the switches at each seat.**

Remove the power window regulator switch at the seat where the operation is unavailable and disconnect the connector.

With the ignition switch ON and window lock switch NORMAL, is there voltage of 10 to 14 V between 11 terminal of the vehicle side connector of the regulator switch and body ground?

- No → Wire harness defective (between 6 terminal of master switch and 11 terminal of regulator.)
- Yes ↓

Is there the voltage of 10 to 14 V between 7 terminal of vehicle side connector of the regulator switch and body ground?

- Yes → Wire harness defective (between POWER fuse and 7 terminal of the regulator.)
- No ↓

Is there continuity between 7 terminal of the vehicle side connector of the regulator switch and body ground.

- No → Wire harness defective (between 12 terminal of the regulator and body ground.)
- Yes ↓

When battery voltage is supplied to the vehicle side connector of the regulator switch, check if the door glass operate.

- Yes → Power window regulator master switch defective.

Connection	Glass operation
Battery positive - 6 terminal Battery negative - 1 terminal	UP
Battery positive - 1 terminal Battery negative - 6 terminal	DOWN

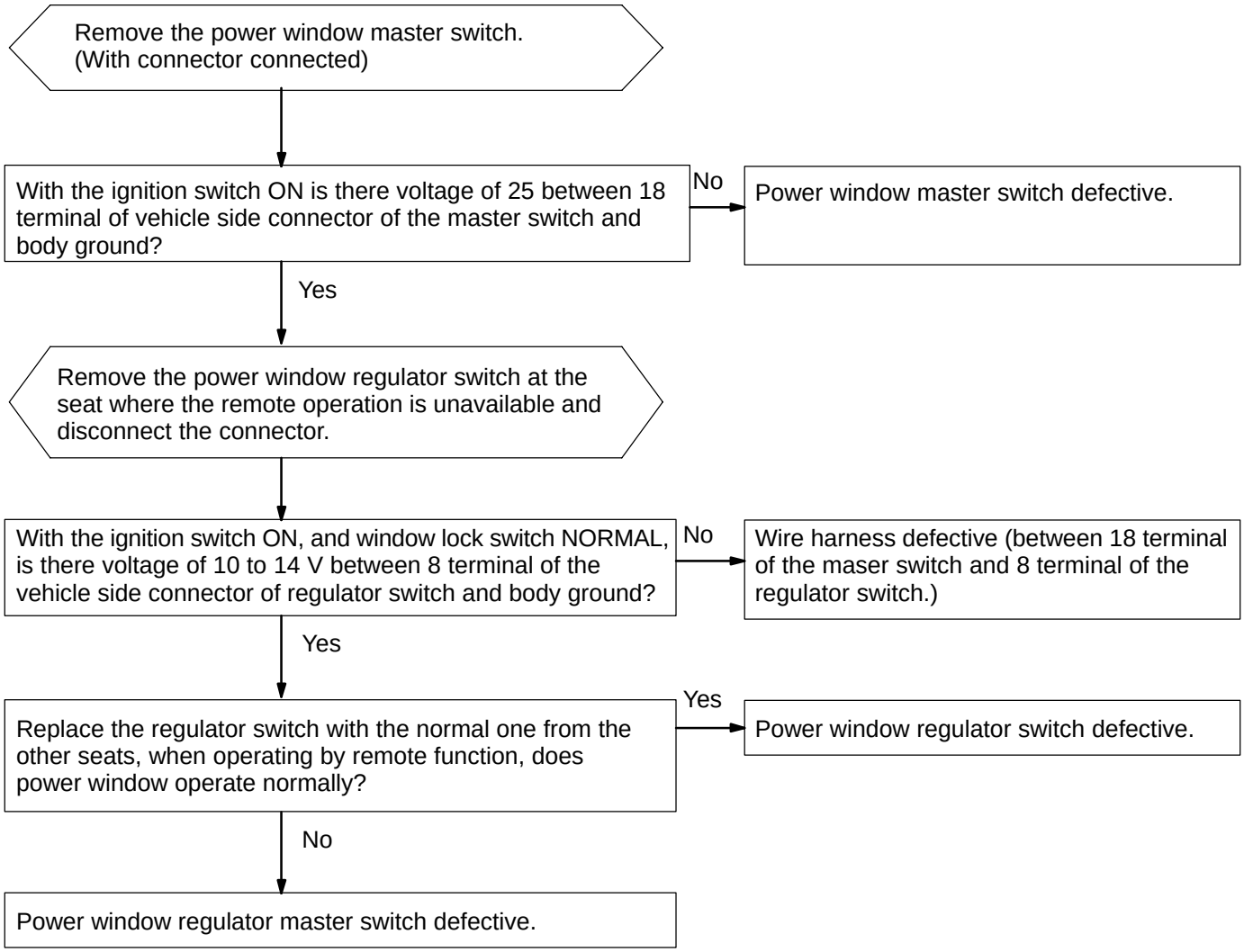
- No ↓

Is the power motor normal?

- No → Power window motor defective.
- Yes ↓

Wire harness (between 6 terminal of the regulator switch and 4 terminal of the power window motor or 1 terminal of the regulator switch and 1 terminal of the power window motor).

4	**Passenger's and all rear doors are not controlled remotely by using the master switch. (Switches at each door can be operated.)**



5	**AUTO UP and AUTO DOWN do not operate. (Prepare a normal master switch.)**

Remove the master switch or regulator switch at the seat where AUTO UP and AUTO DOWN is unavailable. (With connectors connected)

Master of regulator switch inspection:
Are the voltage and continuity of the connectors connected to the master switch or regulator switch normal?

OK:

Terminal No.		Item	Inspection condition	Standard
13	3	Voltage	Fully open by manual operation → fully close → switch OFF	Less than 1 → 10 V to 14 → 0 V
12	4	Voltage	During power window operation	Approx. 5.5 V
10	2	Continuity	Constant	Continuity

No

Yes → Master or regulator switch defective.

Disconnect the connectors of the master switch or regulator switch and power window motor.

Does continuity exist between connectors of the following vehicle side connectors?
Switch side ↔ Motor side
13 (3) terminal ↔ 3 terminal
12 (4) terminal ↔ 4 terminal
10 (2) terminal ↔ 2 terminal
The number in parenthesis shows the terminal No.

No → Wire harness defective (Open circuit in each terminal)

Yes

Does continuity exist between 13 (3), 12 (4) and 10 (2) terminals on the switch side or 3, 4, 2 terminals and body ground?

No → Wire harness defective (Short circuit).

Yes

Connect the connector of power window motor.

Connect the normal master switch or regulator switch and check if AUTO UP and DOWN operates.

Yes → Master switch or regulator switch.

No

Power window motor defective.

6	DOWN operates during door glass AUTO UP operation.

When UP operates by AUTO UP operation or starting up by key OFF operation, is there any factor to increase the sliding resistance of door glass around the reverse position?

Yes → Disassemble the door and repair or replace the malfunction part.

No ↓

Remove the window regulator assembly.

↓

After assembling and raising the door glass manually, does it slide smoothly without being caught?

No → Inspect and replace the door glass run and window guide.

Yes ↓

Remove the power window motor from the power window regulator assembly?

↓

When the power window regulator is slide manually, does it slide smoothly without being caught or is there any damage to the gear parts?

No → Power window regulator defective.

Yes ↓

Does the power window motor rotate smoothly?

No → Power window motor defective.

Yes ↓

Reset the power window motor (Initial position setting of limit switch), assemble the power window regulator to the vehicle.

↓

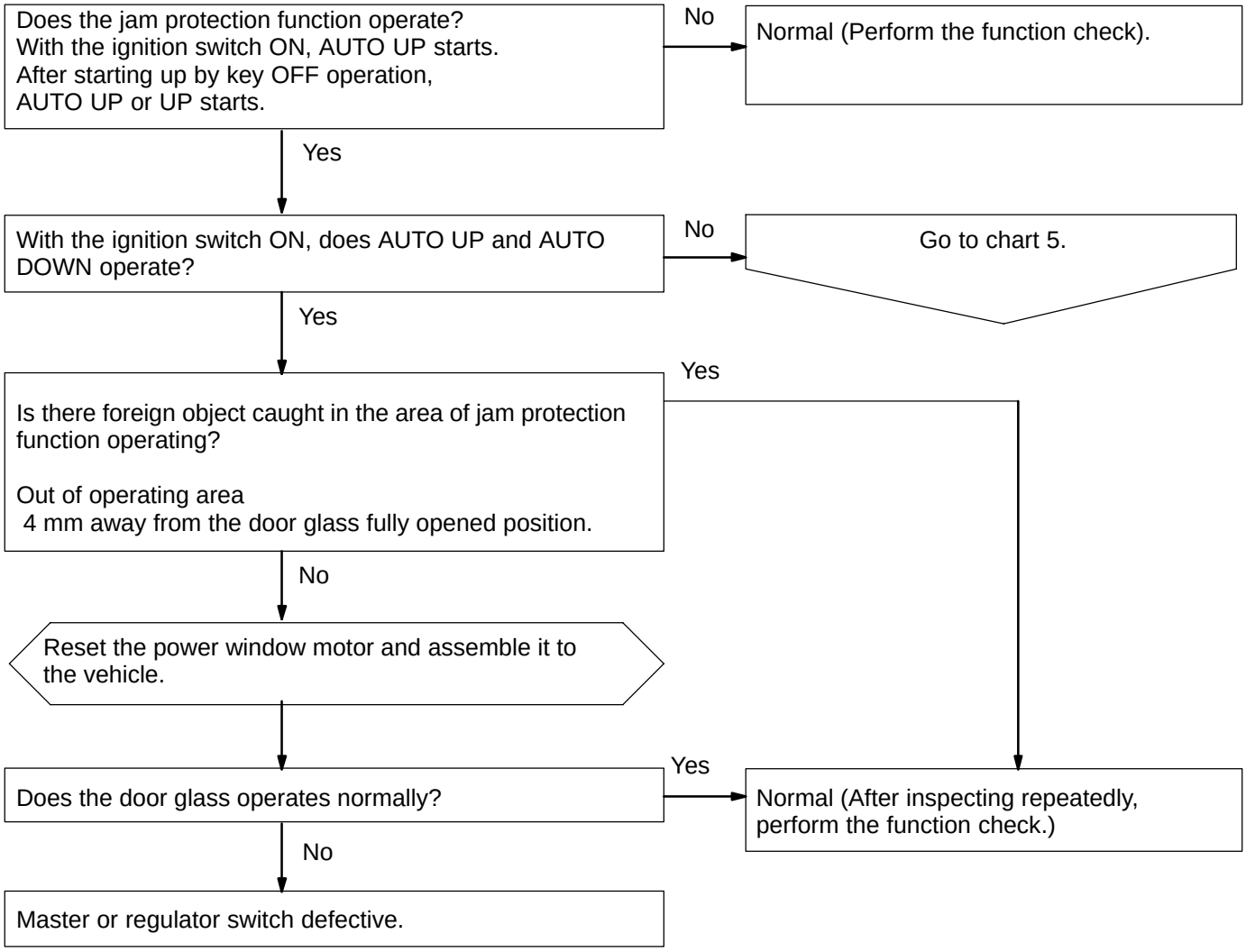
Does the door glass operates normally?

Yes → Normal (Perform the function check.)

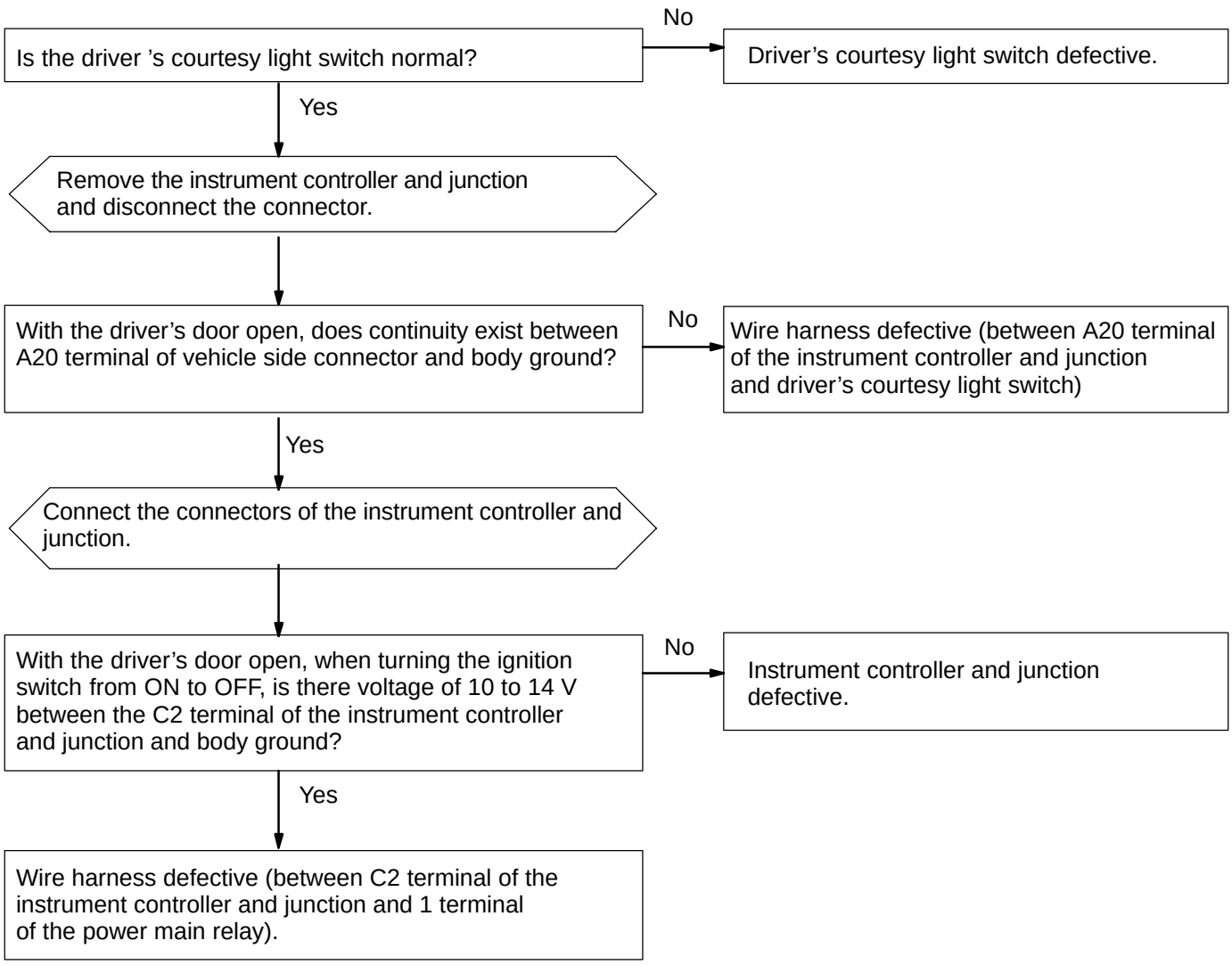
No ↓

Master or regulator switch defective.

7	**Even through a foreign object is caught, DOWN operation does not function.**

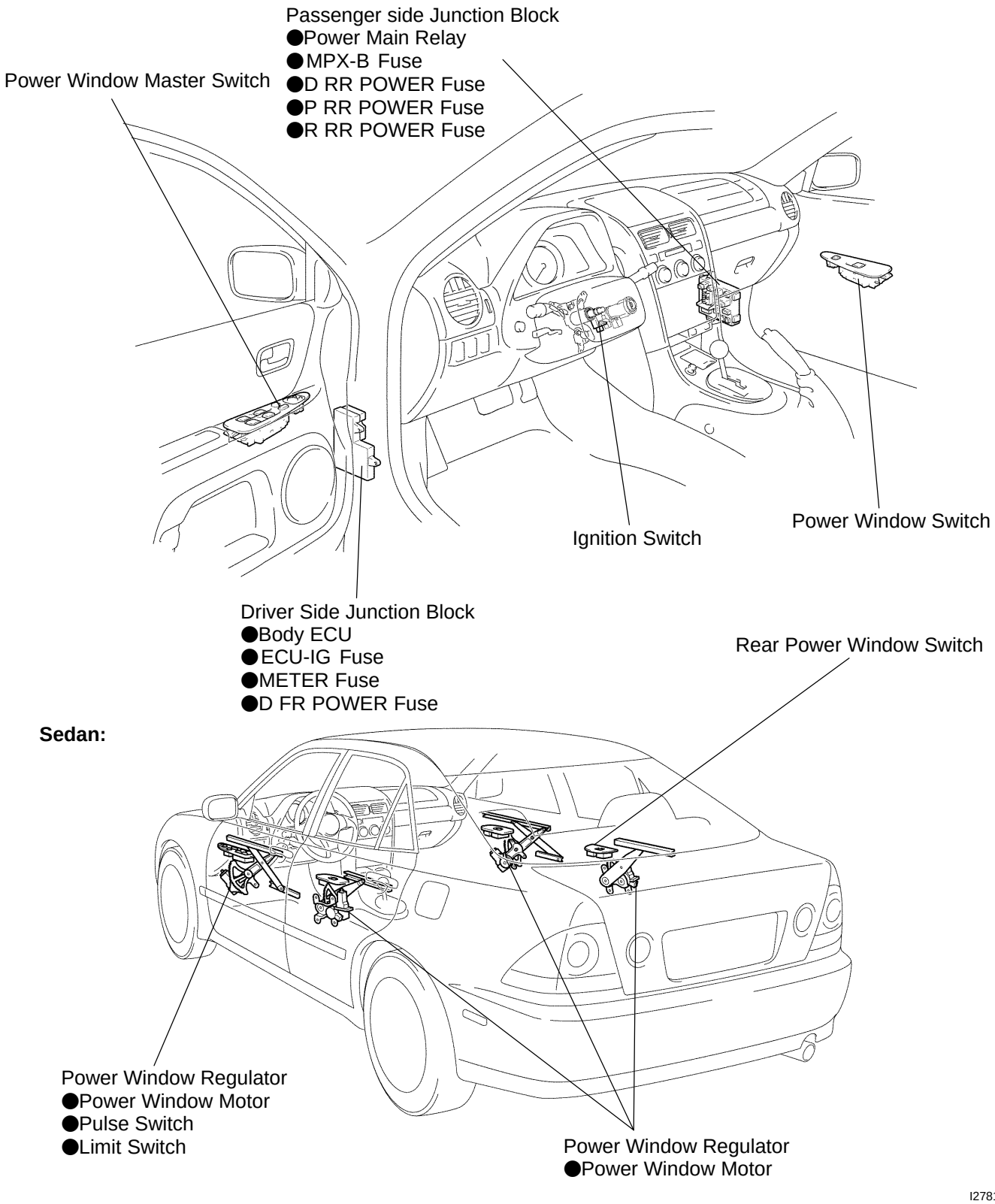


8	**After ignition switch has been turned OFF by using a key, power window function does not operate.**

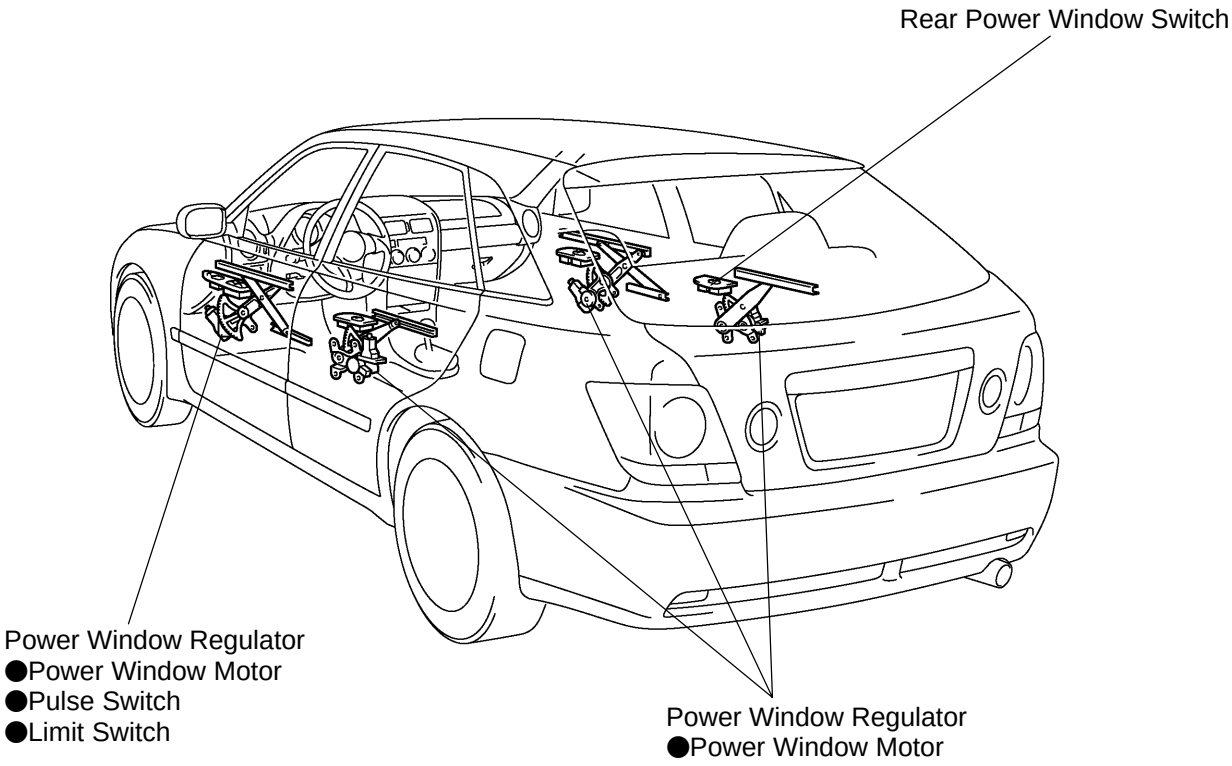


BE2A2-02

LOCATION



Wagon:



C

I27819

BE16F-04

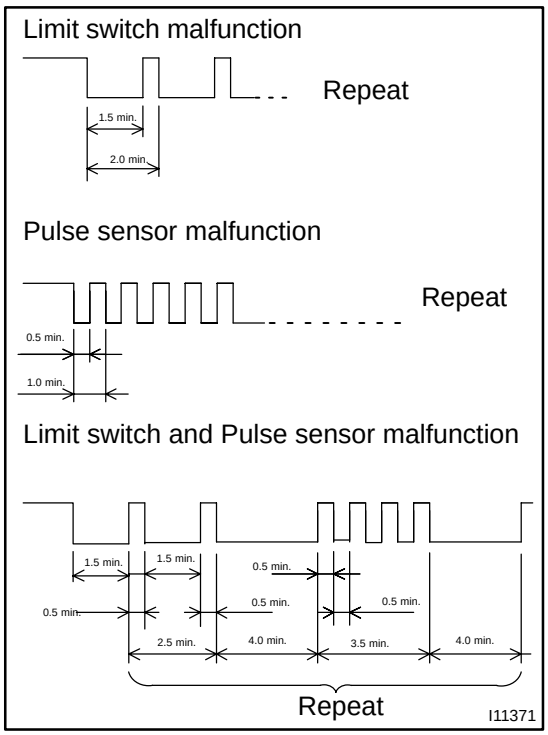
INSPECTION

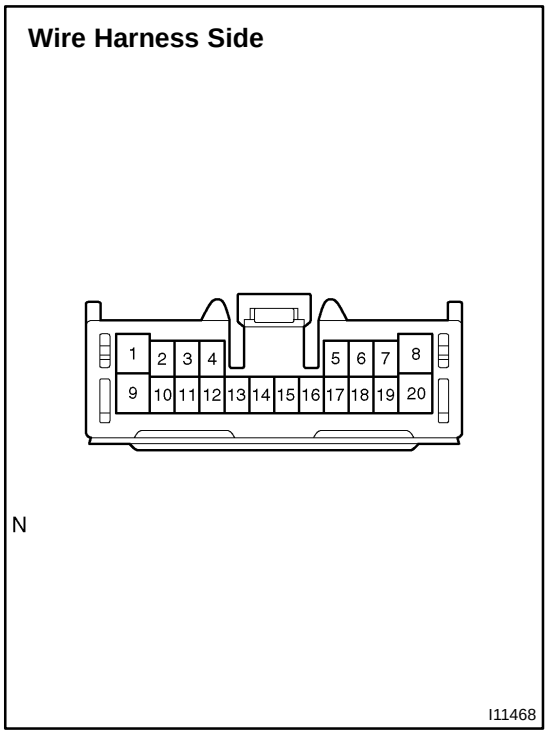
1. INSPECT DIAGNOSIS CODE IS OUTPUT

Check that the master switch assembly automatic light flash under the condition of KEY off operation (for 45 secs. after the starter switch has been turned from ON to OFF with the driver's door open.)

HINT:

- Limit switch malfunction:
  Even though the glass goes down from the fully closed position, the power window regulator switch assembly does not detect a change in limit switch signal within 2.0 secs. after the operation has started.
- Pulse sensor malfunction:
  Even though the glass goes down from the fully closed position, the power window regulator switch assembly does not detect a change in pulse switch signal within 2.0 secs. after the operation has started.





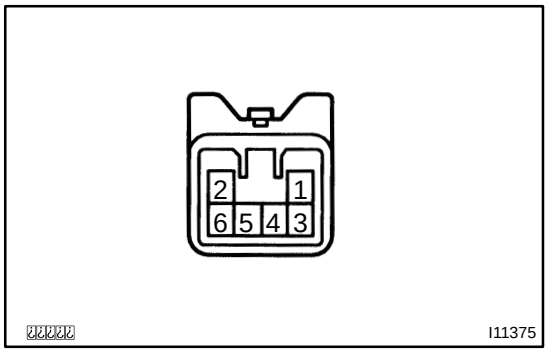
2. Connector disconnected: INSPECT POWER WINDOW MASTER SWITCH CIRCUIT

Disconnect the connectors from the switch and inspect connector on the wire harness side.

Tester connection	Condition	Specified condition
9 - Ground	Always	Continuity
1, 5 - Ground	Always	Battery Positive Voltage
2, 4 - Ground	Ignition switch LOCK	No voltage
2, 4 - Ground	Ignition switch ACC or ON	Battery Positive Voltage

If circuit is not as specified, replace the switch.

3. INSPECT POWER WINDOW MASTER SWITCH CIRCUIT (See page DI-935)



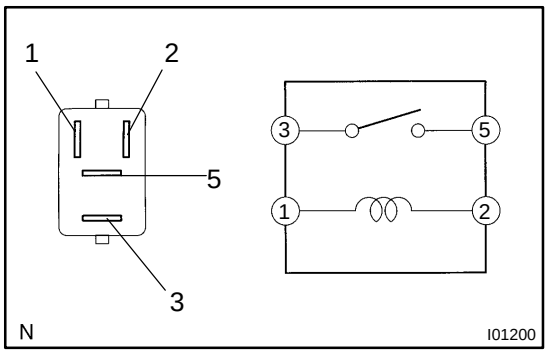
4. INSPECT POWER WINDOW SWITCH CONTINUITY

Connect the positive (+) lead from the battery to terminal 3 and the negative (-) lead to terminal 6.

Switch position	Tester connection	Specified condition
UP	2 - 3 4 - 5	Continuity
OFF	-	No continuity
DOWN	2 - 4 3 - 5	Continuity

If continuity is not as specified, replace the switch.

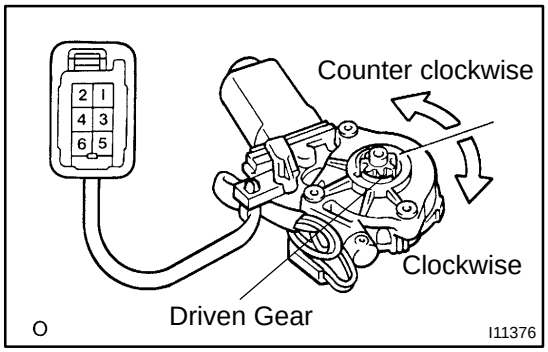
5. INSPECT POWER WINDOW SWITCH CIRCUIT (See page DI-938)



6. INSPECT POWER MAIN RELAY CONTINUITY

Condition	Tester connection	Specified condition
Always	1 - 2	Continuity
Apply B+ between terminals 1 and 2.	3 - 5	Continuity

If continuity is not as specified, replace the relay.

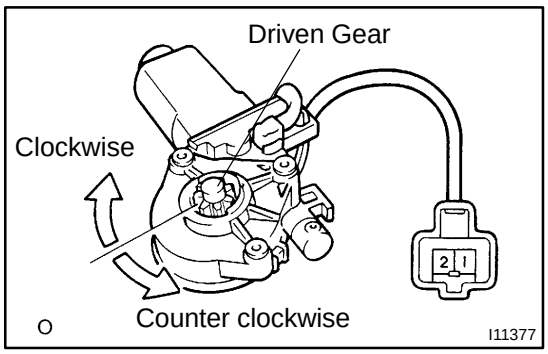


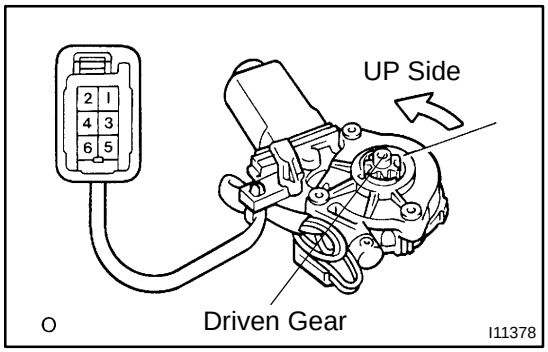
7. Driver's door:
INSPECT POWER WINDOW MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2, and check that the motor turns clockwise.

(b) Reverse the polarity, check that the motor turns counter-clockwise.

If operation is not as specified, replace the motor.





8. Front passenger's door and rear door:
INSPECT POWER WINDOW MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2, and check that the motor turns clockwise.

(b) Reverse the polarity, check that the motor turns counter-clockwise.

If operation is not as specified, replace the motor.

9. INSPECT POWER WINDOW MOTOR CIRCUIT (See page DI-935)

10. INSPECT POWER WINDOW MOTOR PTC OPERATION

(a) Disconnect the connector from the master switch.

(b) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2 on the wire harness side connector and raise the window to full closed position.

(c) Continue to apply voltage, check that there is a PTC operation noise within approximately 4 to 90 seconds.

(d) Reverse the polarity, check that the window begins to descend within approximately 60 seconds.

If operation is not as specified, replace the motor.

11. INSPECT JAM PROTECTION FUNCTION

NOTICE:

Never, ever be caught any part of your body when checking.

HINT:

In case of performing resetting of the limit switch, do checking after repeating up and down of the glass with automatic operation.

(a) Confirmation of AUTO up operation:
Confirm that the window will be fully close with AUTO up operation.

(b) Checking of the operation of the jam protection function:
(1) Move up the window with AUTO up operation and check that the window will go down when it touches the handle of the hammer stetted.
(2) Confirm that the window will then stop going down about 200 mm.

HINT:

In case of removing the glass, glass guide, regulator and etc. be sure to perform checking of the jam protection function.

If the jam protection is not functioned properly, adjust power window motor reset switch and pulse switch.

BE0HG-21

ADJUSTMENT

HOW TO RESET POWER WINDOW MOTOR (RESET SWITCH AND PULSE SWITCH)

If the jam protection is not functioned properly, perform the following procedure.

HINT:

It is necessary to reset the power window motor (in initial position for the limit switch) when separating the window regulator from the power window motor or operating the window regulator with the door glass not installed.

(a) Remove the power window motor (See page BO-17 , BO-28).

HINT:

Place the matchmarks on the power window motor and window regulator gear.

(b) Connect the power window motor and power window switch to wire harness of the vehicle.

(c) Turn the ignition switch ON and operate the power window switch to idle the power window motor in UP side direction for more than 6 rotations or less than 10 rotates (4 seconds or more).

(d) Assemble the power window motor and regulator.

HINT:

- Install the motor when the regulator arm is below the middle point.
- Align the matchmarks on the power window motor and window regulator gear.

(e) Assemble the power window regulator and door glass.

HINT:

Never rotate the motor to the down direction until the completion of the window glass installation.

(f) Connect power window switch to wire harness and turn the ignition switch ON.

(g) Repeat UP and DOWN operation several times manually.

(h) Check if AUTO UP → AUTO DOWN operates in automatic operation.

HINT:

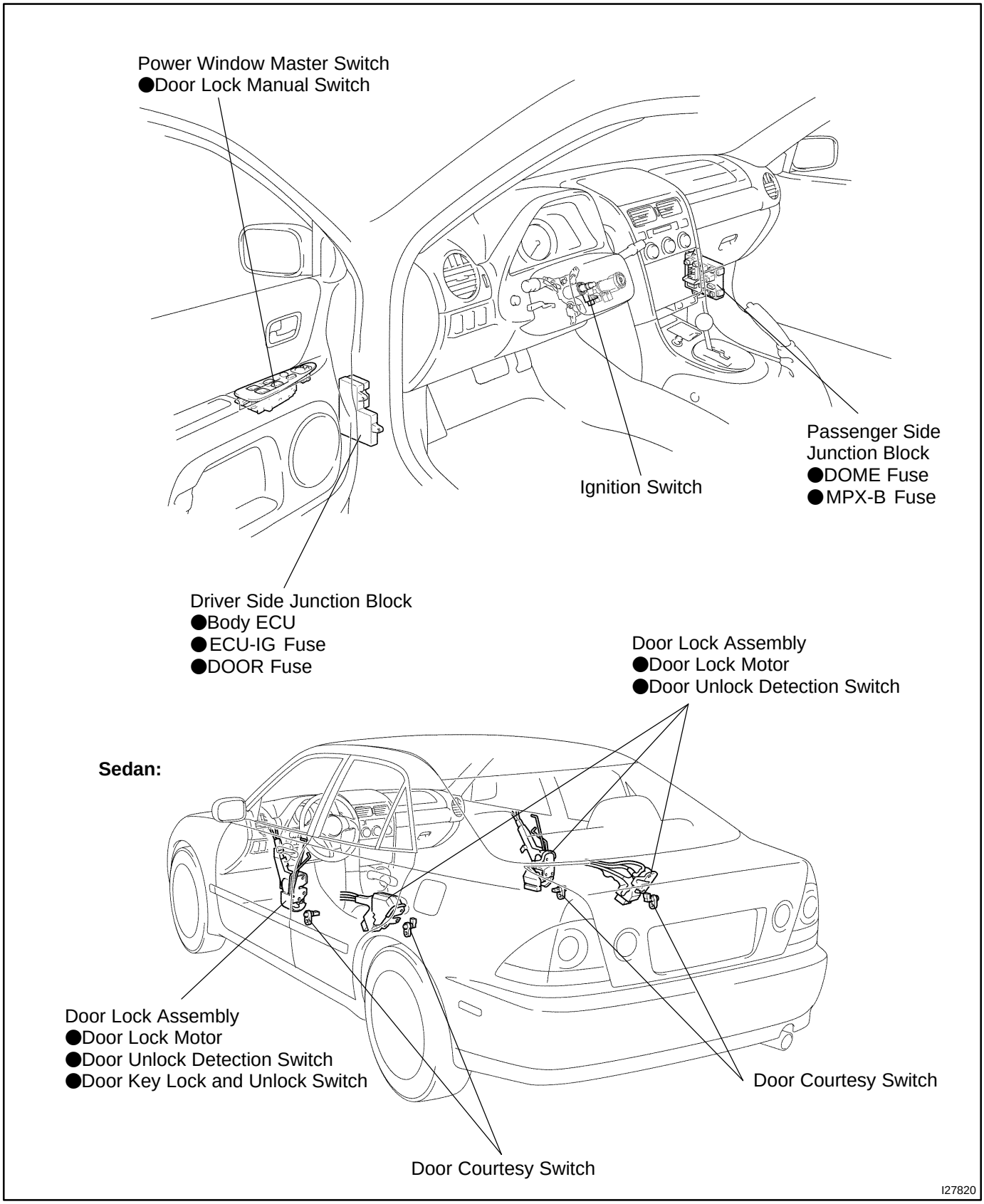
- Take care that the jam protection function does not operate just after resetting.
- Reset the regulator again when performing the reverse operating after closing the window fully by AUTO UP operation.

(i) Check the power window function.

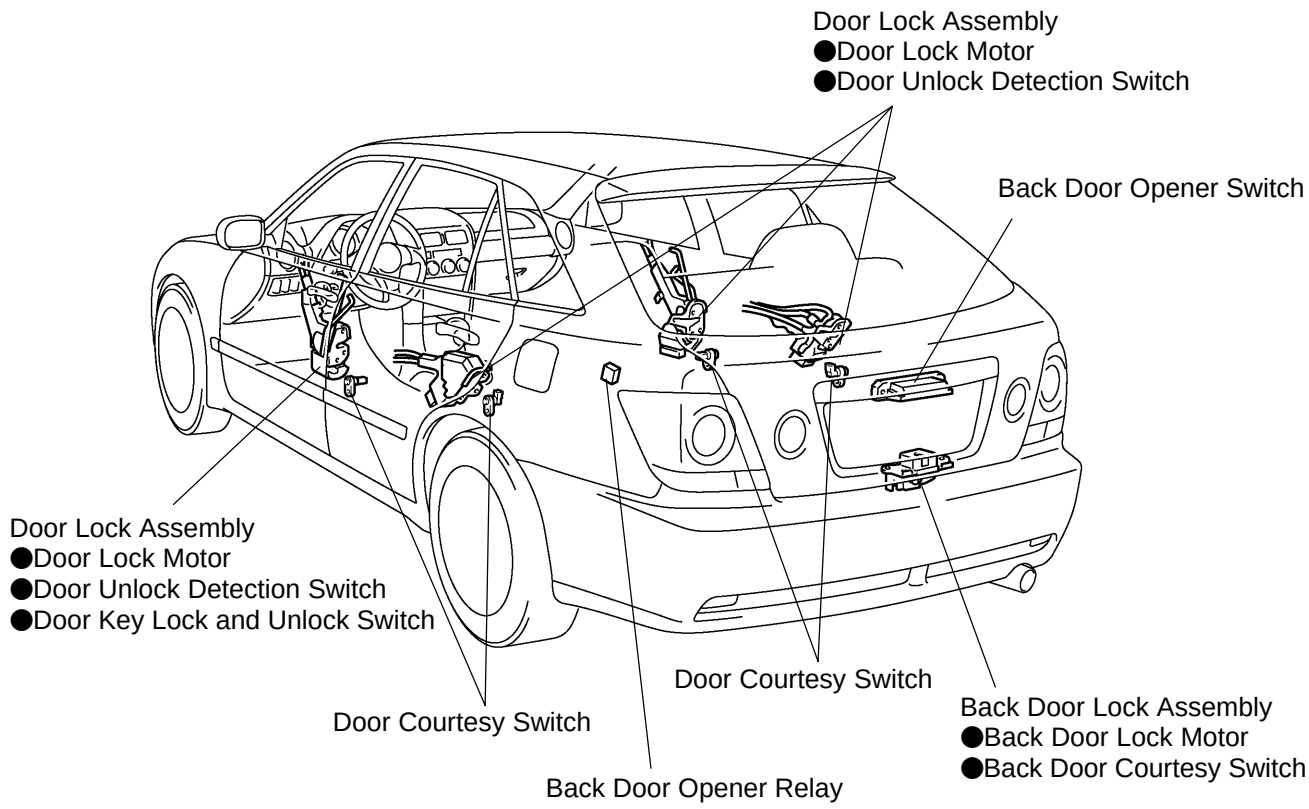
POWER DOOR LOCK CONTROL SYSTEM

BE2A3-02

LOCATION



Wagon:



C

I27821

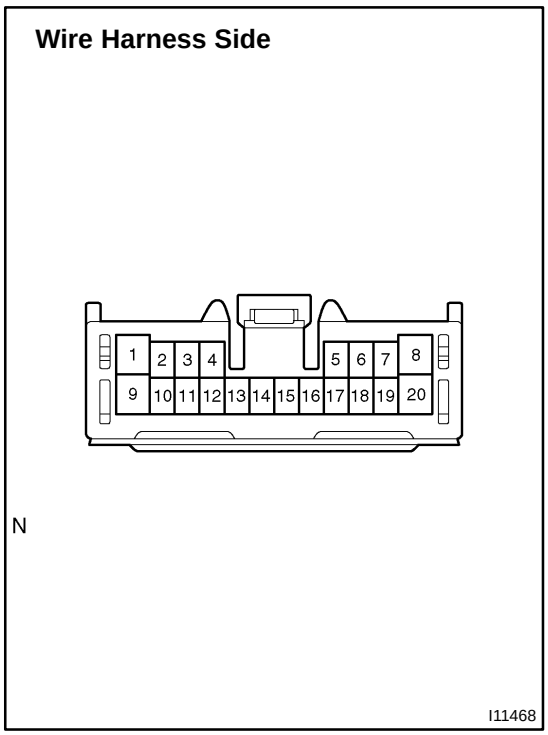
BE2A4-02

INSPECTION

1. Connector disconnected:

INSPECT POWER WINDOW MASTER SWITCH CIRCUIT

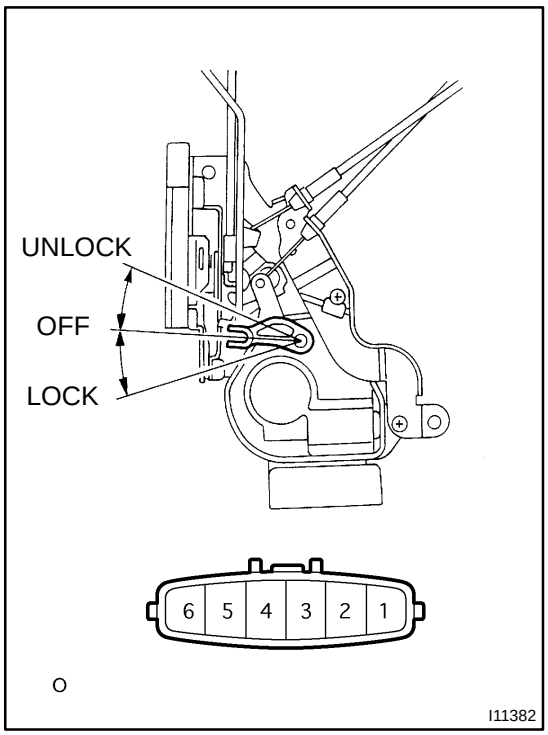
Disconnect the connectors from the switch and inspect connector on the wire harness side.



Tester connection	Condition	Specified condition
9 - Ground	Always	Continuity
1, 5 - Ground	Always	Battery Positive Voltage
2, 4 - Ground	Ignition switch LOCK	No voltage
2, 4 - Ground	Ignition switch ACC or ON	Battery Positive Voltage
15 - Ground (LHD)	Driver's door key lock and unlock switch LOCK	No Continuity
15 - Ground (LHD)	Driver's door key lock and unlock UNLOCK	Continuity
16 - Ground	Each door courtesy switch ON (door opened)	No Continuity
16 - Ground	Each door courtesy switch OFF (door closed)	Continuity
6 - Ground (RHD)	Driver's door key lock and unlock switch LOCK	No Continuity
6 - Ground (RHD)	Driver's door lock and unlock switch UNLOCK	Continuity

If circuit is not as specified, inspect power source or wire harness.

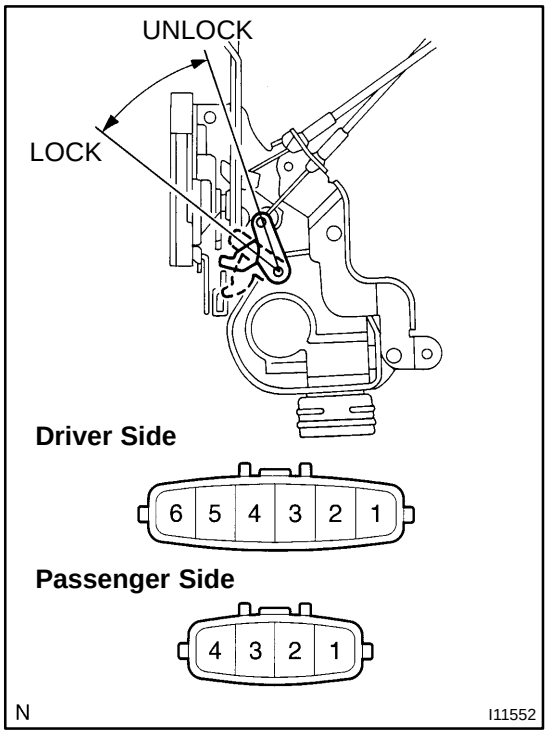
2. INSPECT POWER WINDOW MASTER SWITCH CIRCUIT (See page DI-935)



3. INSPECT DOOR KEY LOCK AND UNLOCK SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
LOCK	2 - 4	Continuity
OFF	-	No continuity
UNLOCK	2 - 3	Continuity

If continuity is not as specified, replace the door lock assembly.



4. INSPECT DRIVER SIDE DOOR UNLOCK DETECTION SWITCH CONTINUITY

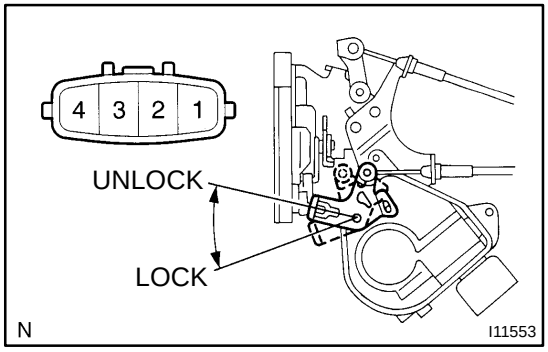
Switch position	Tester connection	Specified condition
OFF (Door Lock set to LOCK)	-	No continuity
ON (Door Lock set to UNLOCK)	1 - 2	Continuity

If continuity is not as specified, replace the door lock assembly.

5. INSPECT PASSENGER DOOR UNLOCK DETECTION SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF (Door Lock set to LOCK)	-	No continuity
ON (Door Lock set to UNLOCK)	3 - 4	Continuity

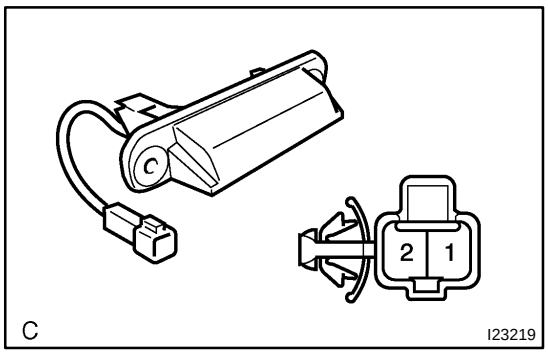
If continuity is not as specified, replace the door lock assembly.



6. INSPECT REAR DOOR UNLOCK DETECTION SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF (Door Lock set to LOCK)	-	No continuity
ON (Door Lock set to UNLOCK)	1 - 2 (LH side) 3 - 4 (RH side)	Continuity

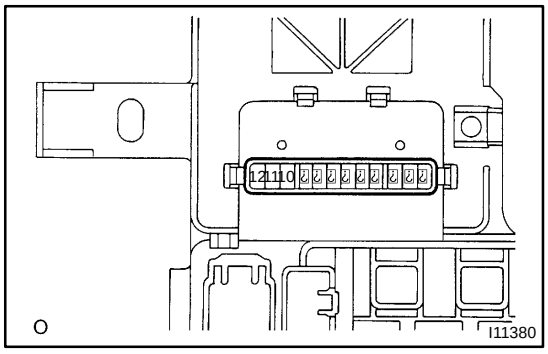
If continuity is not as specified, replace the door lock assembly.



7. INSPECT BACK DOOR OPENER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF	-	No continuity
ON	1 - 2	Continuity

If continuity is not as specified, replace the switch.



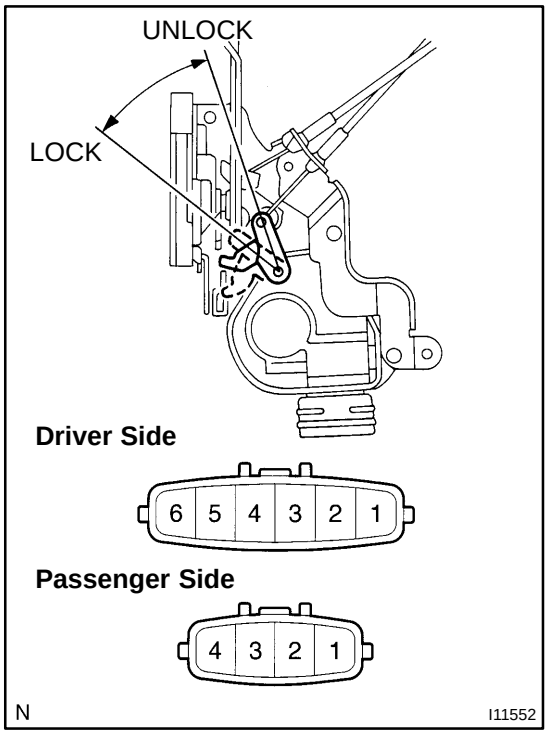
8. INSPECT DOOR LOCK MOTOR AND J/B CIRCUIT

(a) Remove the body ECU from the driver's side junction block.

(b) Connect the positive (+) lead from the battery to J/B terminal 9 and the negative (-) lead to J/B terminal 10, and check that the door lock link moves to LOCK position.

(c) Reverse the polarity and check that the door link moves to UNLOCK position.

If operation is not as specified, inspect door lock motor.



9. INSPECT DRIVER SIDE DOOR LOCK MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 5 and the negative (-) lead to terminal 6, and check that the door lock link moves to LOCK position.

(b) Reverse the polarity and check that the door lock link moves to UNLOCK position.

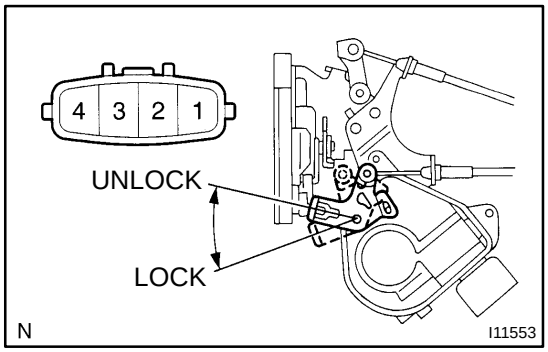
If operation is not as specified, replace the door lock assembly.

10. INSPECT PASSENGER SIDE DOOR LOCK MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2, and check that the door lock link moves to LOCK position.

(b) Reverse the polarity and check that the door lock link moves to UNLOCK position.

If operation is not as specified, replace the door lock assembly.



11. INSPECT REAR DOOR LOCK MOTOR OPERATION ( ): RH side

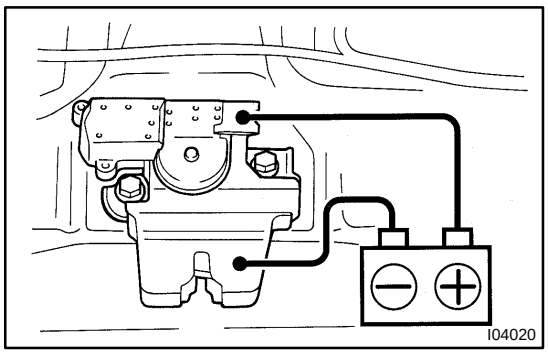
(a) Connect the positive (+) lead from the battery to terminal 3 (1) and the negative (-) lead to terminal 4 (2), and check that the door lock link moves to LOCK position.

(b) Reverse the polarity and check that the door lock link moves to UNLOCK position.

If operation is not as specified, replace the door lock assembly.

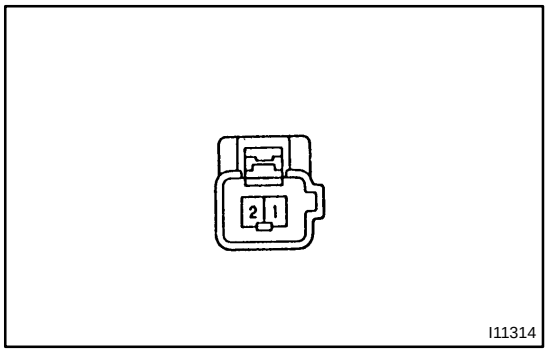
12. INSPECT DOOR LOCK MOTOR CIRCUIT

(See page DI-931)

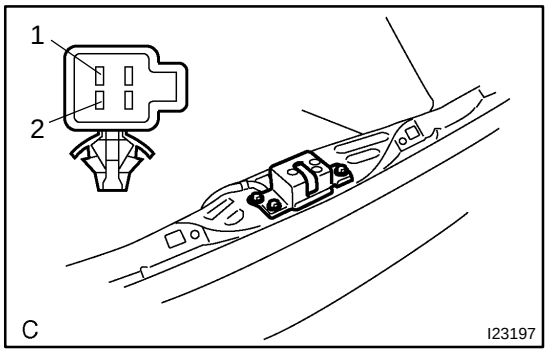


13. INSPECT LUGGAGE COMPARTMENT DOOR OPENER MOTOR OPERATION

Connect positive (+) lead to the terminal 1 and negative (-) lead to the opener motor body, and check that the motor operates.
If operation is not as specified, replace the motor assembly.



14. INSPECT LUGGAGE COMPARTMENT DOOR OPENER MOTOR CIRCUIT (See page DI-927)



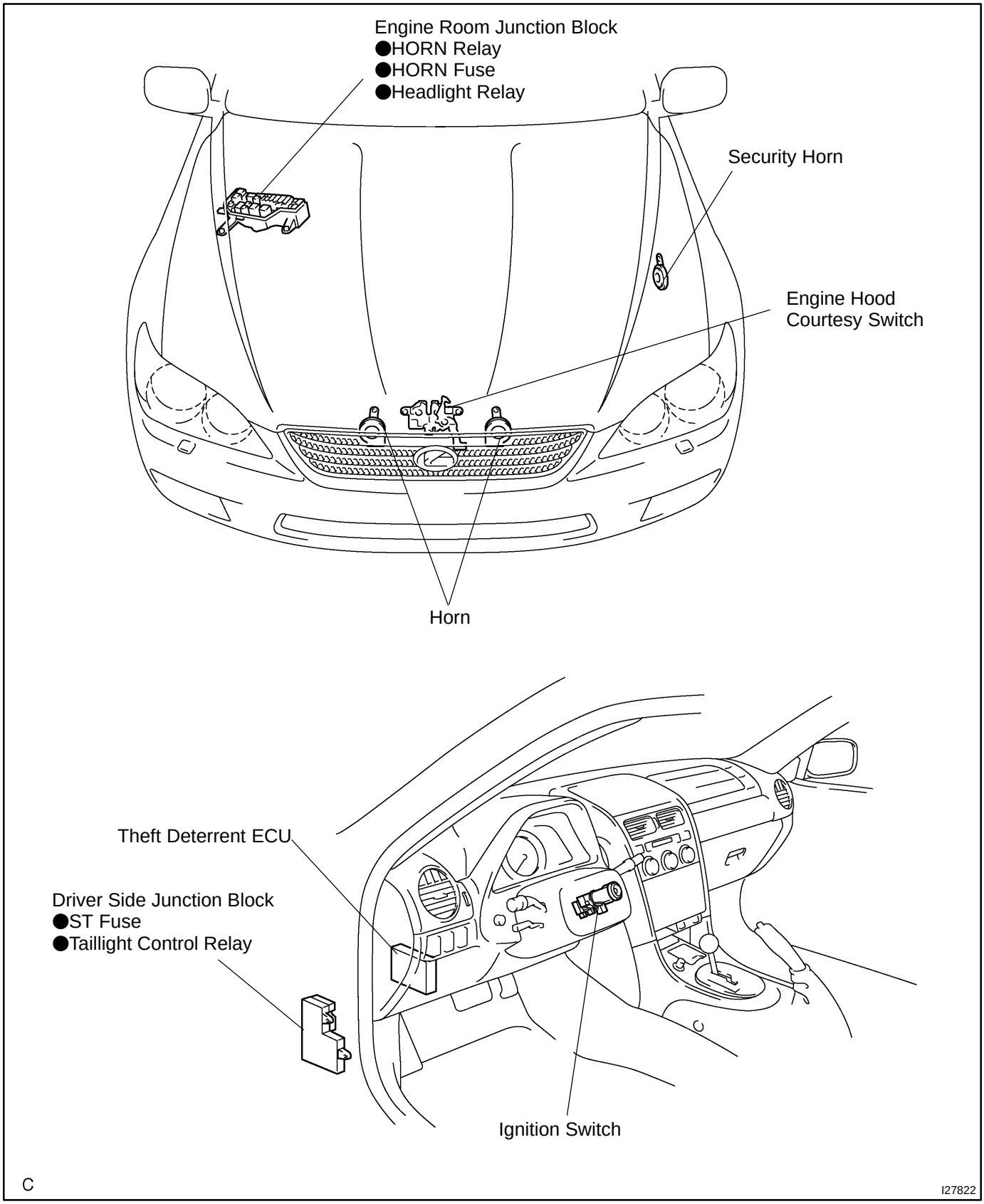
15. INSPECT BACK DOOR OPENER MOTOR OPERATION

Connect positive (+) lead to the terminal 1 and negative (-) lead to the terminal 2, and check that the motor operates.
If operation is not as specified, replace the motor assembly.

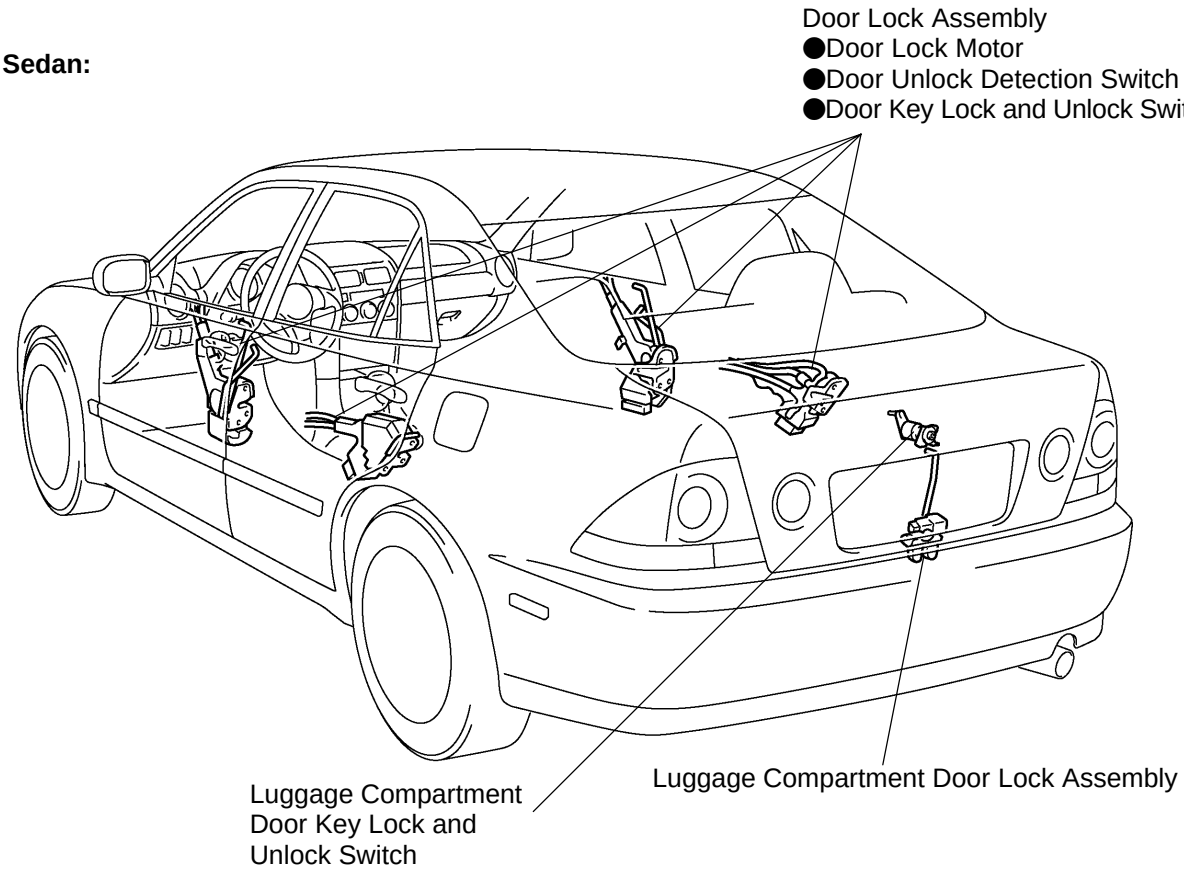
THEFT DETERRENT SYSTEM

BE2A5-02

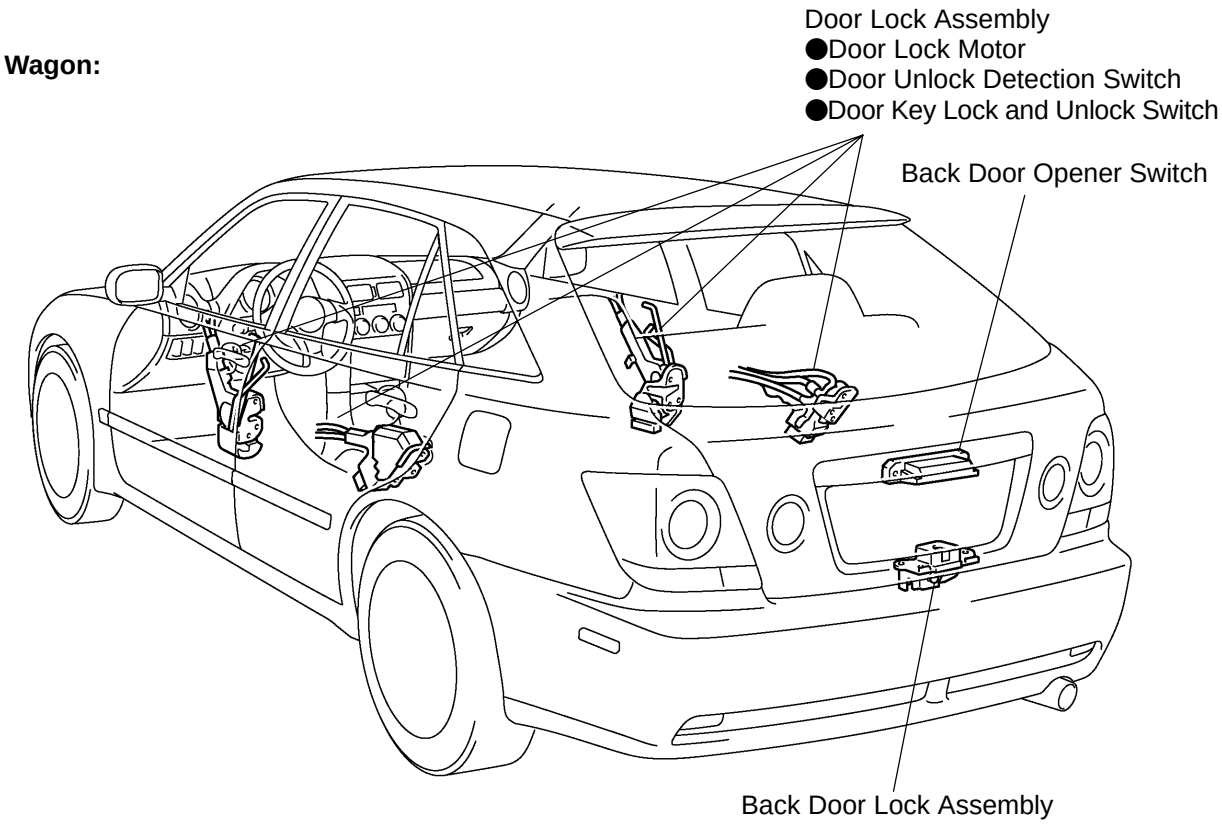
LOCATION



Sedan:



Wagon:

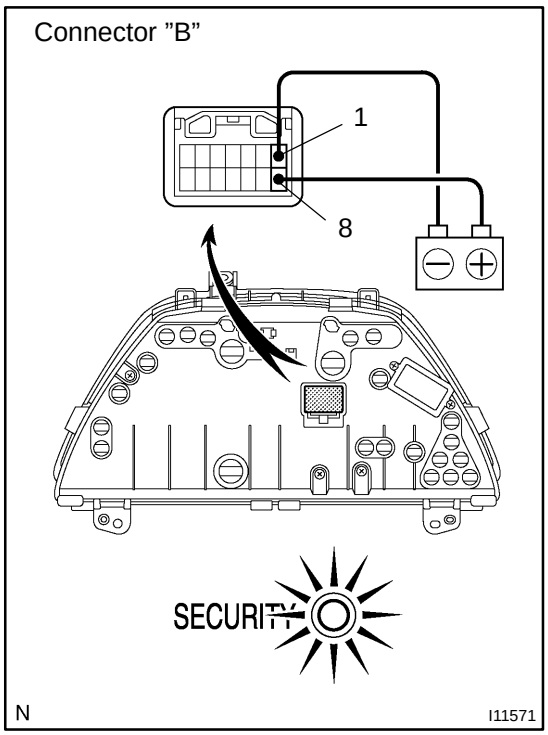


C

I27823

BE16R-03

INSPECTION



1. INSPECT THEFT DETERRENT INDICATOR LIGHT OPERATION

(a) Remove the combination meter.

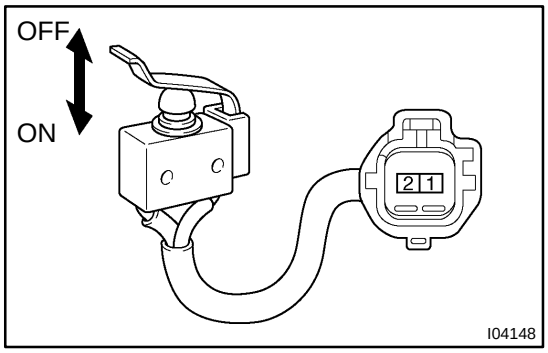
(b) Disconnect the combination meter connector.

(c) Check indicator light lights up when connect the positive (+) lead from the battery to terminal B8 and the negative (-) lead to terminal B1 of combination meter connector.

If operation is not as specified, replace the indicator light.

2. INSPECT THEFT DETERRENT INDICATOR LIGHT CIRCUIT

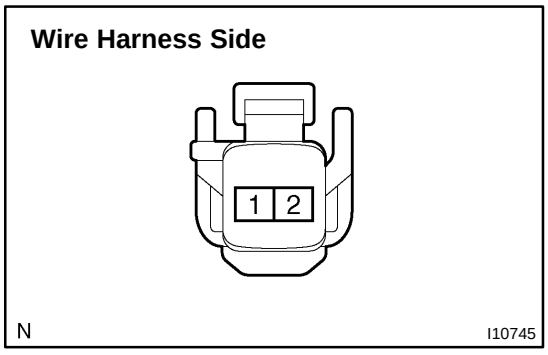
(See page DI-790)



3. INSPECT ENGINE HOOD COURTESY SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
OFF (closed)	-	No continuity
ON (opened)	1 - 2	Continuity

If continuity is not as specified, replace the switch.



4. INSPECT ENGINE HOOD COURTESY SWITCH CIRCUIT

(See page DI-816)

Disconnect the connector from the switch and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
2 - Ground	Always	Continuity

If circuit is not as specified, inspect power source or wire harness.

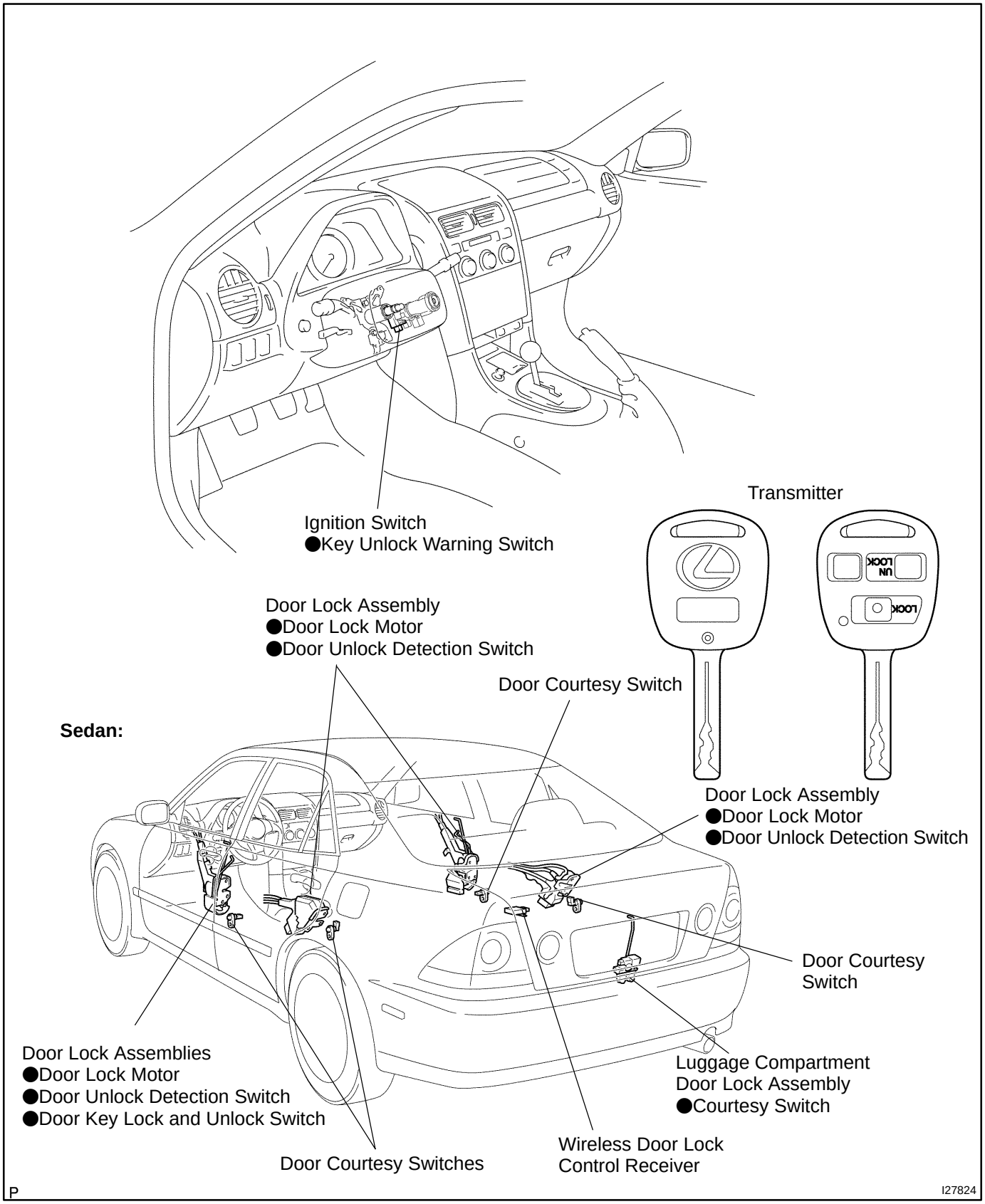
5. INSPECT THEFT DETERRENT SIREN BATTERY

(a) The internal battery is fully discharged.
(b) Set the system inside the vehicle.
(c) Disconnect the connector of theft deterrent ECU in this condition, and sounds the siren for open detection.
(d) The siren battery is normal when the siren sounds for 30 seconds, stops, then after 5 seconds, seconds again.
(e) Replace the siren battery when the siren stops sounding before 30 seconds elapse the battery because the battery life has run out.

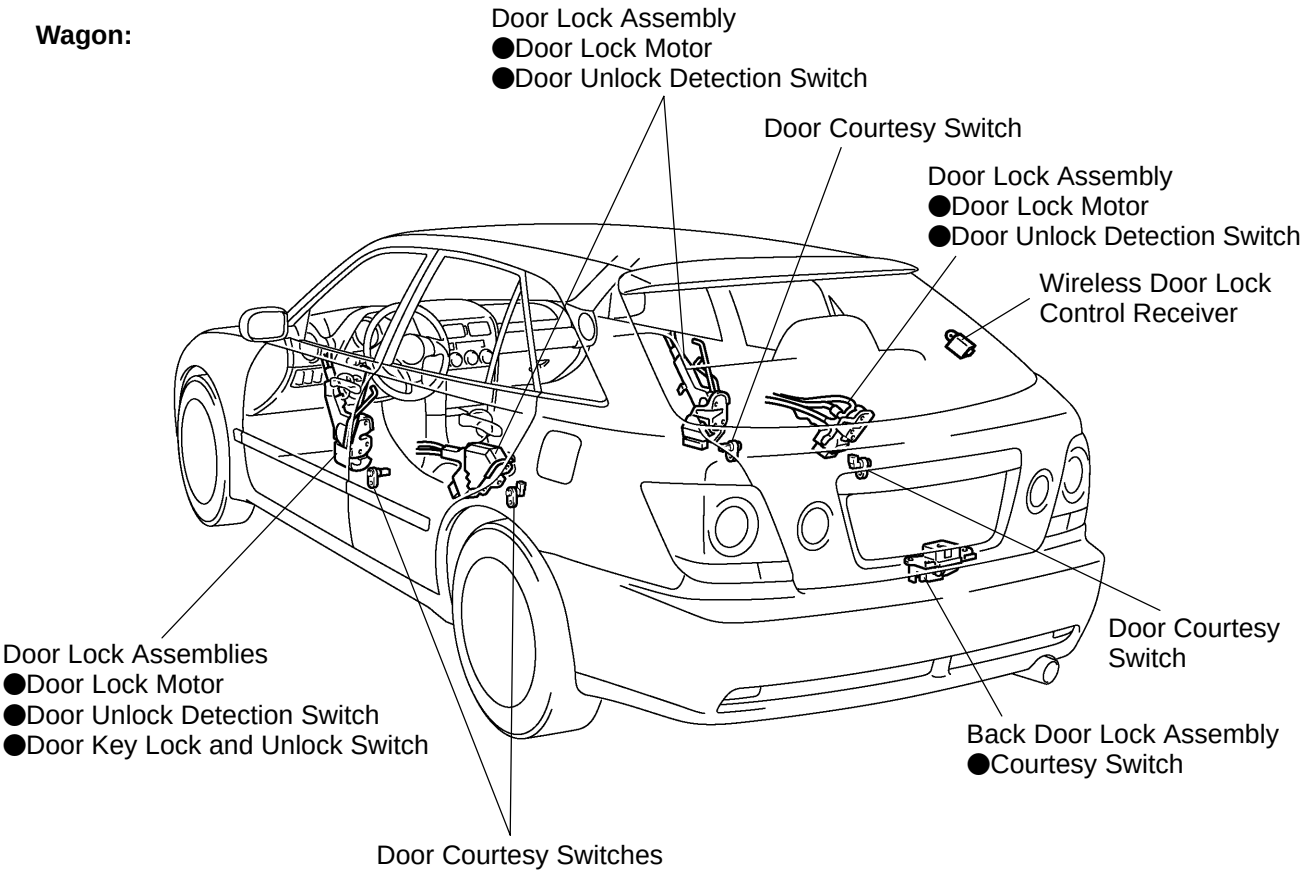
WIRELESS DOOR LOCK CONTROL SYSTEM

LOCATION

BE2A6-03



Wagon:



C

I27825

BE0GN-11

PRE-CHECK

Only wireless function (Remote control) will not operate.
(If a new transmitter or a transmitter of the same type that works properly with the vehicle is not available.)

Make the vehicle in the initialized condition:
The initialized condition is the condition when the following conditions are satisfied.
(1) Key plate has not been inserted in the ignition key cylinder.
(2) All the doors are closed. (Door warning light is OFF.)
(3) All the doors are locked.

Basic function check:

Under the standard operation, when repeating UNLOCK and LOCK switch 3 times or more alternately, check the UNLOCK-LOCK operation from 3rd time onward.
●Following procedures are standard operation.
(1) Keep about 1 M away to the right direction from the outside handle of a driver's seat.
(2) Face the transmitter toward the vehicle and press one of transmitter switches for about 1 sec.
<Reference>
●As of the security function, even the wireless function is normal, there may be the case that only UNLOCK operation will not work.

No

Yes

Transmitter LED inspection:

Check when pressing UNLOCK switch and LOCK switch under standard operation, that the transmitter LED lights up once more.

No

Yes

Normal
<Reference>
●Operative distance may differ according to an operator, the way of holding the transmitter or position.
●Because weak electric wave is used, when there is strong wave or noise in the used frequency ,operation distance might be shortened.

Transmitter battery check:

Replace the transmitter battery with a new or normal one and check UNLOCK-LOCK function works under the standard operation.
<Reference>
●The battery should be replaced by only the shops with sufficient skill as new or normal battery is necessary.
●Battery quality can be judged by checking the remnant volume of the battery.

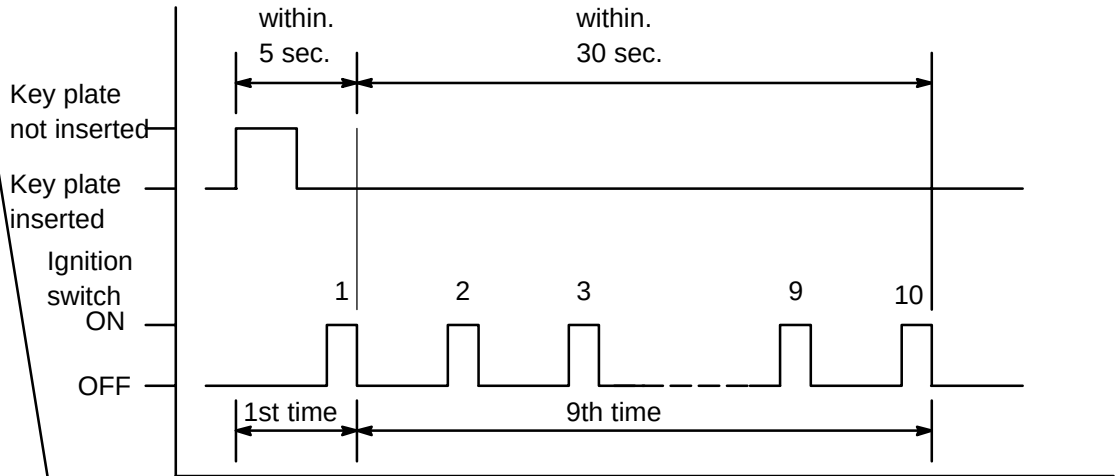
Yes → Battery faulty.

No

Make the vehicle be in the initialized condition.

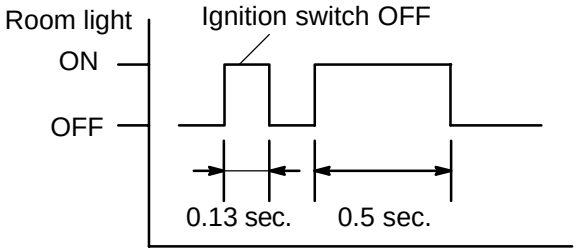
Inspection start by using self diagnostic mode:

Enter into the self diagnostic mode.
If operating door control receiver in the order of 1 through 2, the mode turns to diagnostic mode.
(1) Insert the key plate in the ignition key cylinder and pull out, then insert it again and turn ignition switch OFF → ON → OFF once within 5 seconds after pulling out.
(2) After completing the procedure within 30 seconds, turn the ignition switch OFF → ON → OFF 9 times.
HINT:
In the case that either (1) or (2) condition is not satisfied, transfer to normal mode.
<Reference>
When completing self diagnostic mode, turn the ignition switch ON.
LOCK and UNLOCK operation and output of luggage door opener signal are not performed under the self diagnostic mode.



Self diagnostic mode operation check:

After the self diagnostic mode input operation has been performed, check that the room light



No
(Not entered in self diagnostic mode)

Is the method to enter into the diagnostic mode correct?

No

Yes

Is the chirping function of operation confirmation room light normal?

No

Check door control room light

Yes

Yes
(Entered in self diagnostic mode)

Key unlock warning switch inspection:

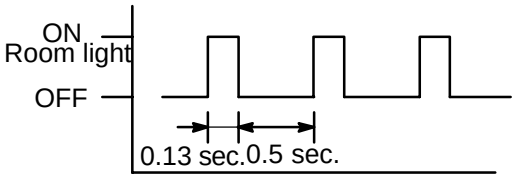
Check that continuity exists between connector terminal A3 of MPX body ECU on the vehicle side and ground by inserting the key plate into the ignition key cylinder.

Check key unlock warning switch.

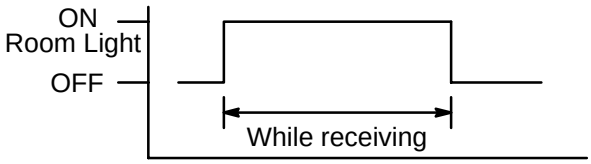
Self diagnostic mode check:

Check that how the room light when pressing each transmitter switch.

(1) Receiver normal wave of LOCK, UNLOCK or TRUCK switch.



(2) Incompatibility of the recognition code or out from synchronization of rolling code.



<Reference>:
While turning the ignition switch ON in the self diagnostic mode, the mode returns to normal mode.

(2) is output.
(All room light response is same.)

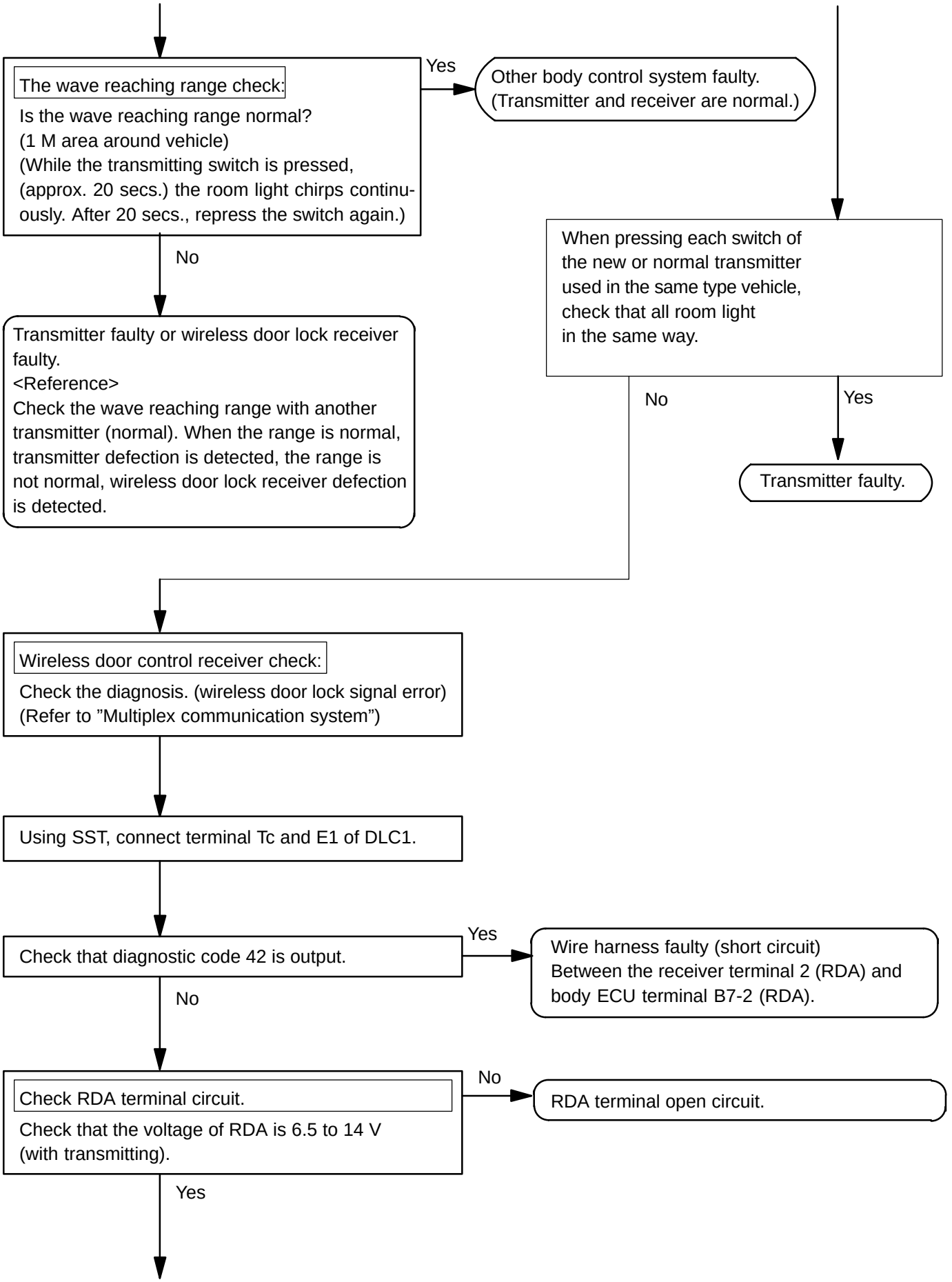
Recognition code registration function check:

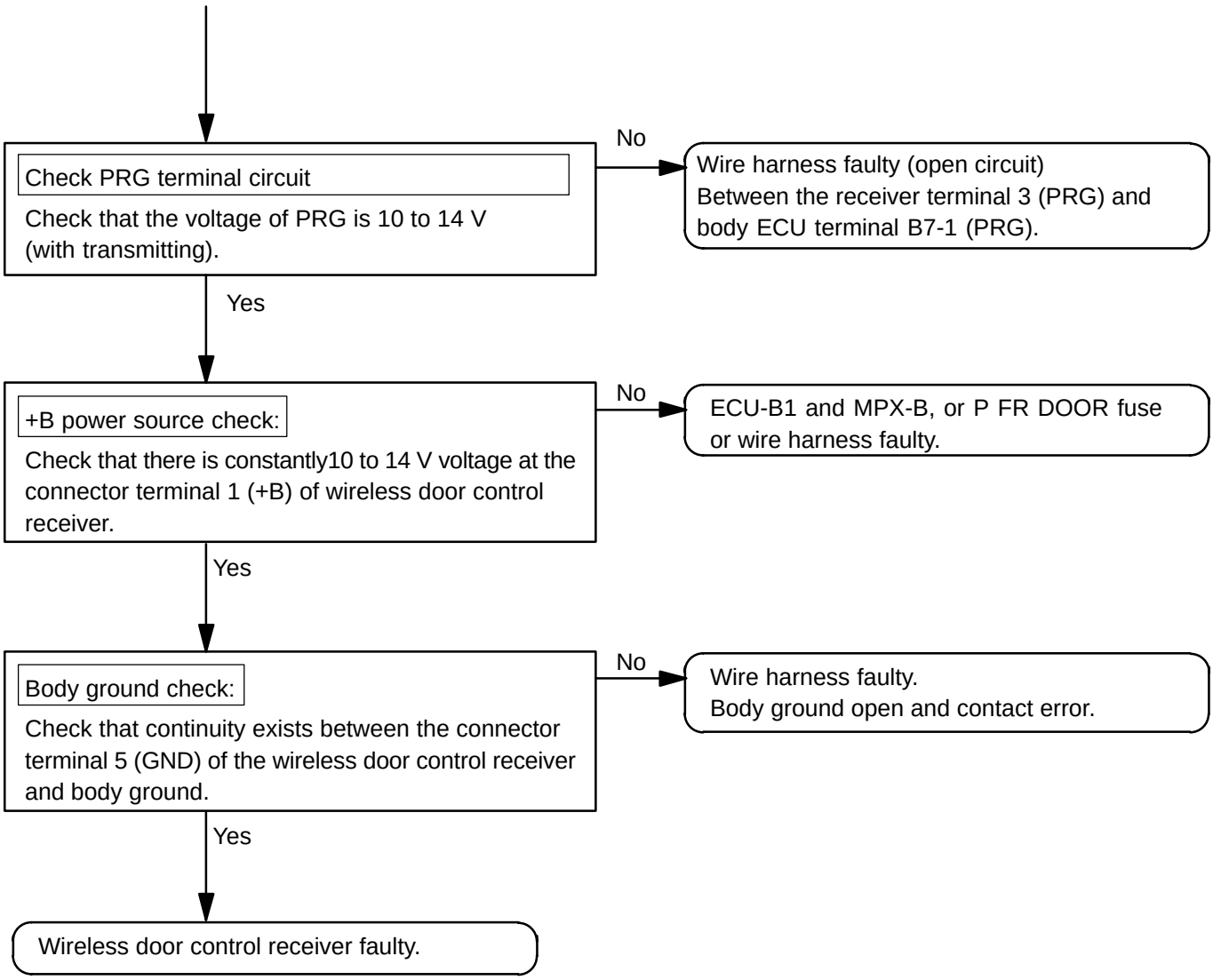
Check that it is possible to enter into rewrite mode or add mode.
(Refer to "Wireless door lock receiver and transmitter" - "Recognition code registration".)

Wireless door lock operates normally when recognition code is registered.

No response from room light

(1) is output.


The wave reaching range check:
Is the wave reaching range normal?
(1 M area around vehicle)
(While the transmitting switch is pressed, (approx. 20 secs.) the room light chirps continuously. After 20 secs., repress the switch again.)
Yes
Other body control system faulty.
(Transmitter and receiver are normal.)
No
Transmitter faulty or wireless door lock receiver faulty.
<Reference>
Check the wave reaching range with another transmitter (normal). When the range is normal, transmitter defection is detected, the range is not normal, wireless door lock receiver defection is detected.
When pressing each switch of the new or normal transmitter used in the same type vehicle, check that all room light in the same way.
No
Yes
Transmitter faulty.
Wireless door control receiver check:
Check the diagnosis. (wireless door lock signal error)
(Refer to ”Multiplex communication system”)
Using SST, connect terminal Tc and E1 of DLC1.
Check that diagnostic code 42 is output.
Yes
Wire harness faulty (short circuit)
Between the receiver terminal 2 (RDA) and body ECU terminal B7-2 (RDA).
No
Check RDA terminal circuit.
Check that the voltage of RDA is 6.5 to 14 V (with transmitting).
No
RDA terminal open circuit.
Yes


Check PRG terminal circuit
Check that the voltage of PRG is 10 to 14 V (with transmitting).
No
Wire harness faulty (open circuit)
Between the receiver terminal 3 (PRG) and body ECU terminal B7-1 (PRG).
Yes
+B power source check:
Check that there is constantly10 to 14 V voltage at the connector terminal 1 (+B) of wireless door control receiver.
No
ECU-B1 and MPX-B, or P FR DOOR fuse or wire harness faulty.
Yes
Body ground check:
Check that continuity exists between the connector terminal 5 (GND) of the wireless door control receiver and body ground.
No
Wire harness faulty.
Body ground open and contact error.
Yes
Wireless door control receiver faulty.

BE1WW-02

INSPECTION

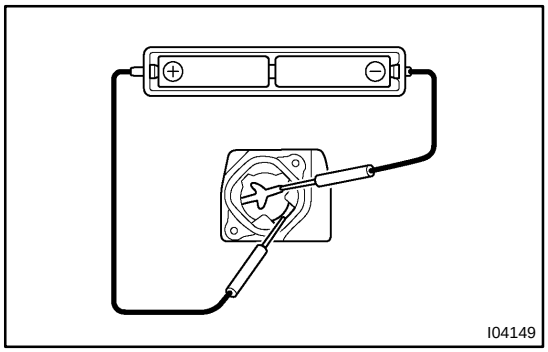
1. INSPECT WIRELESS DOOR LOCK TRANSMITTER OPERATION

HINT:

Refer to "Wireless door lock control transmitter battery replacement" on page BE-140 .

(a) Using a screwdriver, remove the screw and cover.

(b) Remove the battery (lithium battery).



(c) Install a new or normal battery (lithium battery).

HINT:

When a new or normal battery can not be obtained, connect 2 new 1.5 V batteries in series, connect the battery (+) to the battery receptacle side terminal and battery (-) to the bottom terminal, then apply 3 V voltage to the transmitter.

(d) In the location where is approx. 1 M away from driver's outside handle in the right direction, face the key plate of the transmitter to the vehicle, and check the transmitter operation when pressing transmission switch on the side of the transmitter body.

Standard:

- **Remote control of vehicle door lock can be operated.**
- **LED lights up more than once.**

HINT:

- The minimum operation distance differs according to operator, the way of holding the transmitter, and location.
- As weak wave is used, operation distance might be shortened when noise is detected in strong wave or used frequency.

(e) Install the battery (lithium battery).

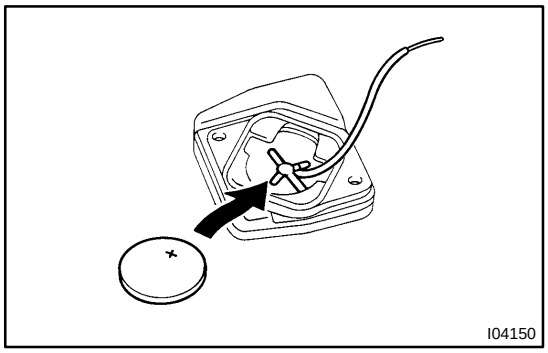
(f) Install a cover so that O-ring is not distorted or slipped off.

(g) Using a screwdriver, tighten the screw.

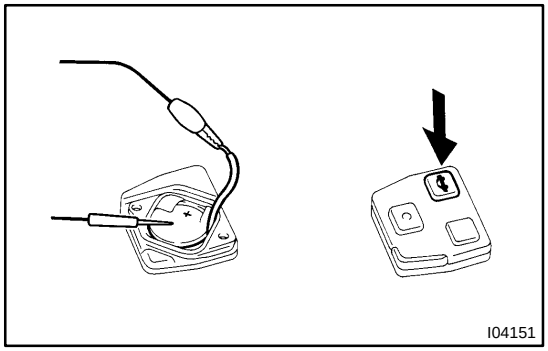
2. CHECK BATTERY CAPACITY

HINT:

- Make sure to use the LEXUS electrical tester.
- With the battery unloaded, judge can not be made whether the battery is available or not on the test.
- When the transmitter is faulty, the energy amount left in the battery might not be checked correctly.
- On the lithium battery used for the transmitter, the voltage more than 2.5 V with the battery unloaded is shown on the tester until the energy is completely consumed.
  Accordingly when inspecting the energy amount left in the battery, it is necessary to measure the voltage when the battery is loaded. (1.2 kΩ).



(a) Remove the screws and cover using a (-) driver.
(b) Remove the battery (lithium battery) from the transmitter.
(c) Connect the lead to the (-) terminal of the transmitter and install the battery.

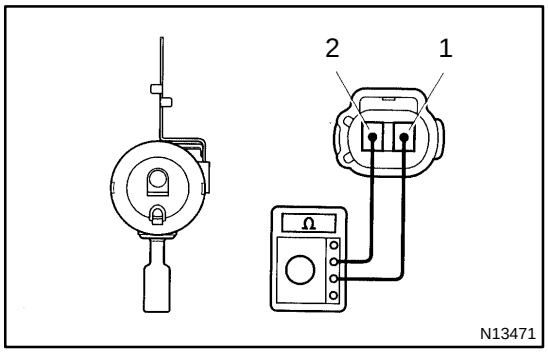


(d) Connect the (+) tester to the (+) battery (lithium battery), and (-) tester to the lead respectively.
(e) Press one of the transmitting switches on the transmitter for approx. 1 second.
(f) Press the transmitting switch on the transmitter again to check the voltage.
Standard: 2.1 V or more

HINT:

- When the temperature of the battery is low, the judge can not be made correctly.
  When the outcome of the test is less than 2.1 V, conduct the test again after leaving the battery in the place at 18 ˚C for more than 30 minutes.
- By auto power off function, the voltage becomes no load voltage (more than 2.5 V) condition 0.8 seconds after the switch was pressed.
  Make sure to read the voltage before of it.
- High voltage might be shown 1 to 2 times after leaving the battery, judge should be made with the voltage shown at the 3rd time or later.

(g) Disconnect the lead.
(h) Set the battery (lithium battery) in the transmitter.
(i) Install the cover, so that the O-ring is not distorted or slipped off.
(j) Using a screwdriver, tighten the screws.

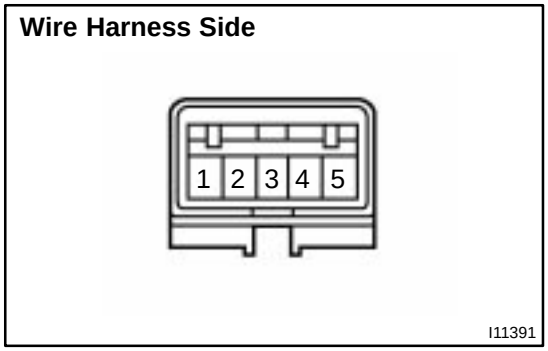


3. INSPECT WIRELESS DOOR LOCK BUZZER OPERATION

Connect the positive (+) lead from the ohmmeter to terminal 1 and the negative (-) lead to terminal 2, and measure resistance of approx. 1 kΩ.

If resistance is not as specified, replace the buzzer.

4. INSPECT WIRELESS DOOR LOCK BUZZER CIRCUIT (See page DI-945)



5. Connector disconnected:
INSPECT WIRELESS DOOR LOCK CONTROL RECEIVER CIRCUIT (See page DI-905)

Disconnect the connector from the receiver and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
1 - Ground	Always	Continuity
5 - Ground	Always	Battery Positive Voltage

If the circuit is not as specified, inspect the circuits connected to other parts.

6. Connector connected:
INSPECT WIRELESS DOOR LOCK CONTROL RECEIVER CIRCUIT

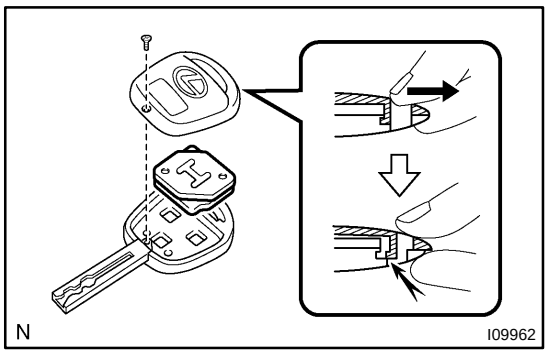
Connect the wire harness side connector to the receiver and inspect the wire harness side connector from the back side, as shown.

Tester connection	Condition	Specified condition
3 - Ground	Always	Battery Positive Voltage
2 - Ground	All door closed Transmitter OFF → ON	0 V - 6 V → 0 V

If circuit is as specified, replace the receiver.
If the circuit is not as specified, inspect the circuits connected to other parts.

BE0GP-17

REPLACEMENT



1. REPLACE TRANSMITTER (LITHIUM) BATTERY

NOTICE:

Special caution should be taken for handling each component as they are precision electronic components.

(a) Using a screwdriver, remove the screw and cover.

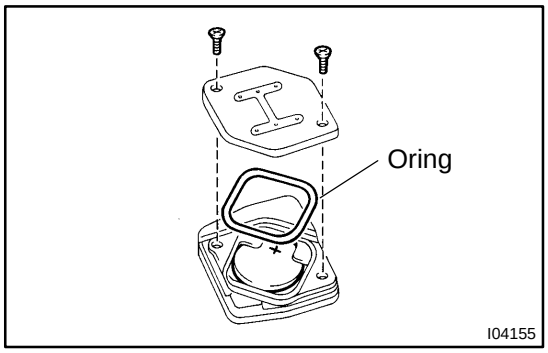
NOTICE:

Do not pry out the cover forcibly.

HINT:

Push the cover with a finger as shown in the illustration, so that there becomes clearance, then pry out the cover from that clearance.

(b) Remove the transmitter.

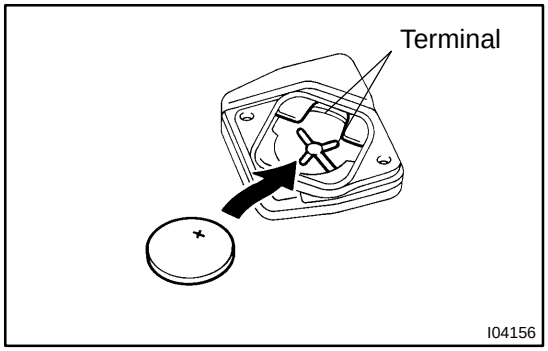


(c) Using a screwdriver, remove the 2 screws and cover.

(d) Remove the battery (lithium battery).

NOTICE:

- **Do not push the terminals with a finger.**
- **If prying up the battery (lithium battery) forcibly to remove, the terminals are deformed.**



(e) Install a battery (lithium battery) as shown in the illustration.

NOTICE:

Face the battery upward. Take care not to deform the terminals.

(f) Check that O-ring is not distorted or slipped off, and install the cover.

(g) Using a screwdriver, tighten the 2 screws.

NOTICE:

When the shrews are tightened loosely, it might cause faulty contact of battery (lithium battery) and terminals.

(h) Assemble the transmitter to the key plate and the cover.

(i) Using a screwdriver, tighten the screw.

2. REPLACE DOOR CONTROL RECEIVER AND TRANSMITTER

NOTICE:

When replacing the door control receiver and transmitter, registration of recognition code is necessary because they are provided as single components.

(a) Select which operation mode should be performed from the following modes.
- ○ Add mode
- ○ Rewrite mode
- ○ Prohibition mode
- ○ Confirmation mode

HINT:
- ○ The add mode is used to retain codes already registered while you register new recognition codes. This mode is used when adding a transmitter. However, if the number of registered codes exceeds 4 codes, previously registered codes are correspondingly erased in order, starting from the first registered code.
- ○ The rewrite mode is used to erase all previously registered codes and register only new recognition codes.
- ○ The prohibition mode is used to erase all registered codes and cancels the wireless door lock function. Use this mode when the transmitter is lost.
- ○ The confirmation mode is for confirming how many recognition codes are already registered before you register additional recognition codes.

(b) Follow the chart on the following pages to register the transmitter recognition code at the wireless door lock control receiver.

HINT:
- ○ When procedure is out of the specified, the operation returns to normal operation.
- ○ Maximum 4 recognition codes can be registered.

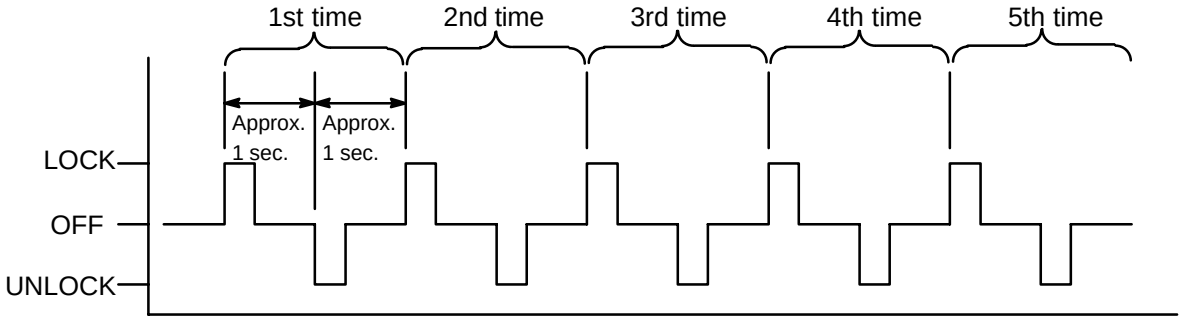
Start registration of recognition code

The vehicle should be in the following conditions.
- ●The key is not inserted in the ignition key cylinder.
- ●Driver's door is OPEN. (Other doors are CLOSED)
- ●Driver's door is UNLOCKED.

Insert the key into the ignition key cylinder, then pull it out.

Within 40 secs.

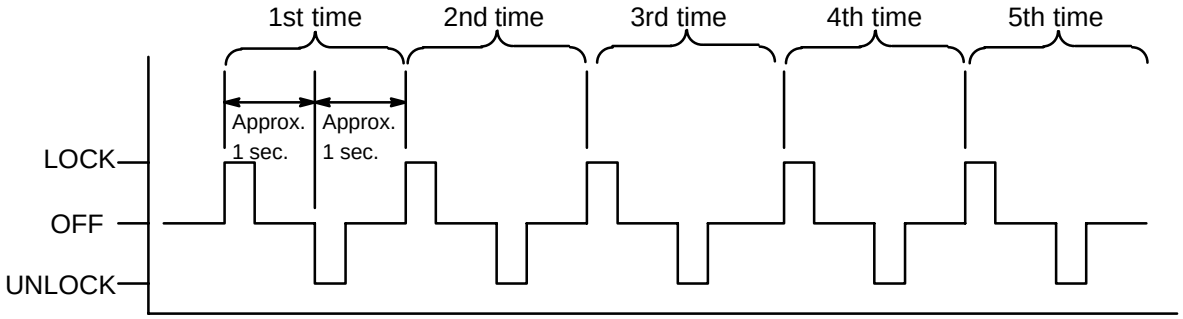
Press the door lock control switch (for manual operation) 5 times to LOCK/UNLOCK at approx. 1 sec. interval.



Close the driver's door, then open it.

Within 40 secs.

Again press the door lock control switch (for manual operation) 5 times to LOCK/UNLOCK at approx. 1 sec. interval.

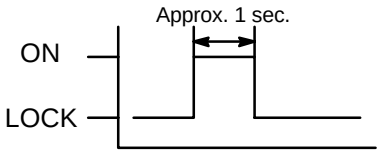


Insert the key into the ignition key cylinder.

Turn the ignition switch from ON to LOCK at approx. 1 sec. interval 1 to 5 times to select the mode.

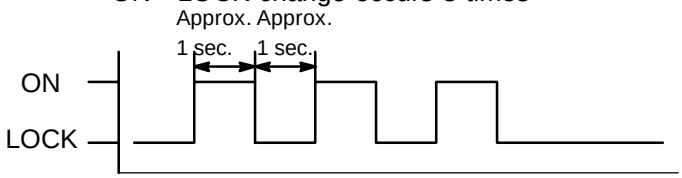
Add mode

ON - LOCK change occurs 1 time



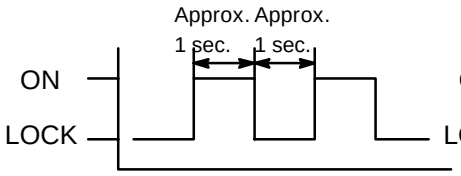
Confirmation mode

ON - LOCK change occurs 3 times



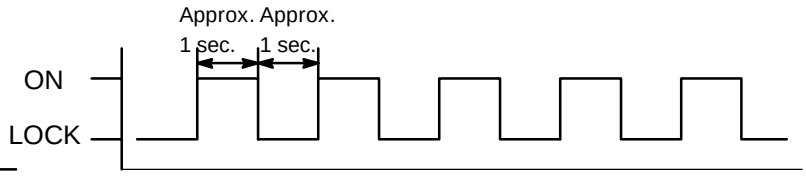
Rewrite mode

ON - LOCK change occurs 2 times



Prohibition mode

ON - LOCK change occurs 5 times



Pull out the key plate from the ignition key cylinder.

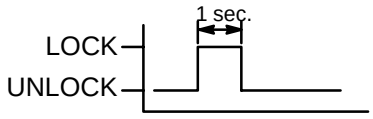
When add mode or rewrite mode is selected.

MPX body ECU automatically performs the LOCK-UNLOCK operation once or twice at 1 sec. interval to inform the operator that either the add mode or rewrite mode has been selected.

Within 3 secs.

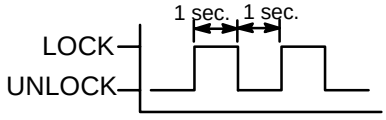
LOCK-UNLOCK occurs once

Indicates that add mode has been selected.



LOCK-UNLOCK occurs twice

Indicates that rewrite mode has been selected.

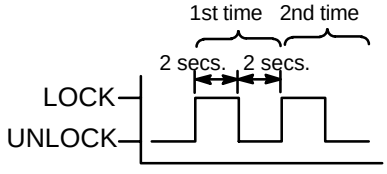


When prohibition mode is selected.

When confirmation mode is selected.

MPX body ECU automatically performs the LOCK-UNLOCK operation 1 to 4 times at 2 sec. interval to inform the operator of the number of the registered codes.
HINT:
When the number of the registered code is 0, the operation is automatically performed 5 times.

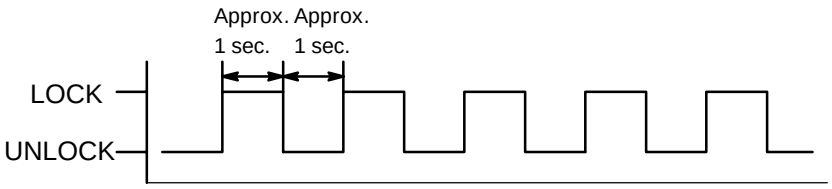
Example:
When the operation is performed twice, it directs that 2 types of recognition code have been registered.



Registration of recognition code (Confirmation mode and prohibition mode) is completed.

When prohibition mode is selected.

MPX body performs LOCK-UNLOCK operation 5 times at a 1 sec. interval to inform the operator that prohibition mode has been selected.



Within 40 secs.

Press the lock and unlock switches on the transmitter simultaneously within. 1.5 sec.

Within 3 secs.

Press again either one of 3 switches on the transmitter for more than 1 sec.

Within 3 secs.

MPX body ECU automatically performs LOCK-UNLOCK operation once or twice at a 1 sec. interval to inform the operator that the receiver has received the signal from the transmitter.

LOCK-UNLOCK occurs once

Registration of recognition code is completed

LOCK-UNLOCK occurs twice

Registration of recognition code has not been completed.
- Recognition code received first time and second time did not match.

If LOCK-UNLOCK operation can not be performed at all, the mode returns to the normal mode, then start with "Start registration of recognition code".

Proceed to finish registration

Proceed to continue registration

Within 40 secs.

If even one of the following conditions is satisfied, registration of recognition codes is completed.
- 40 secs. elapses since the MPX body ECU response.
- The driver's door is closed.
- The key plate is inserted in the ignition key cylinder.
- 4 type recognition codes are registration at one time.

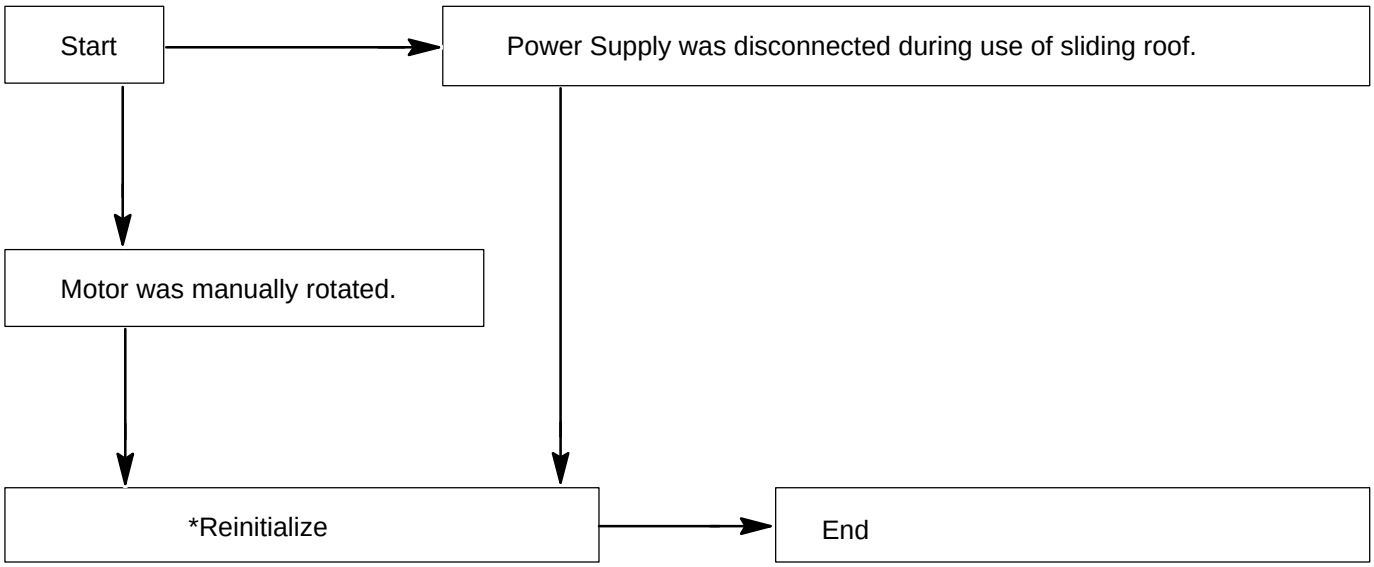
Registration of recognition codes (add mode or rewrite mode) is completed.

SLIDING ROOF SYSTEM

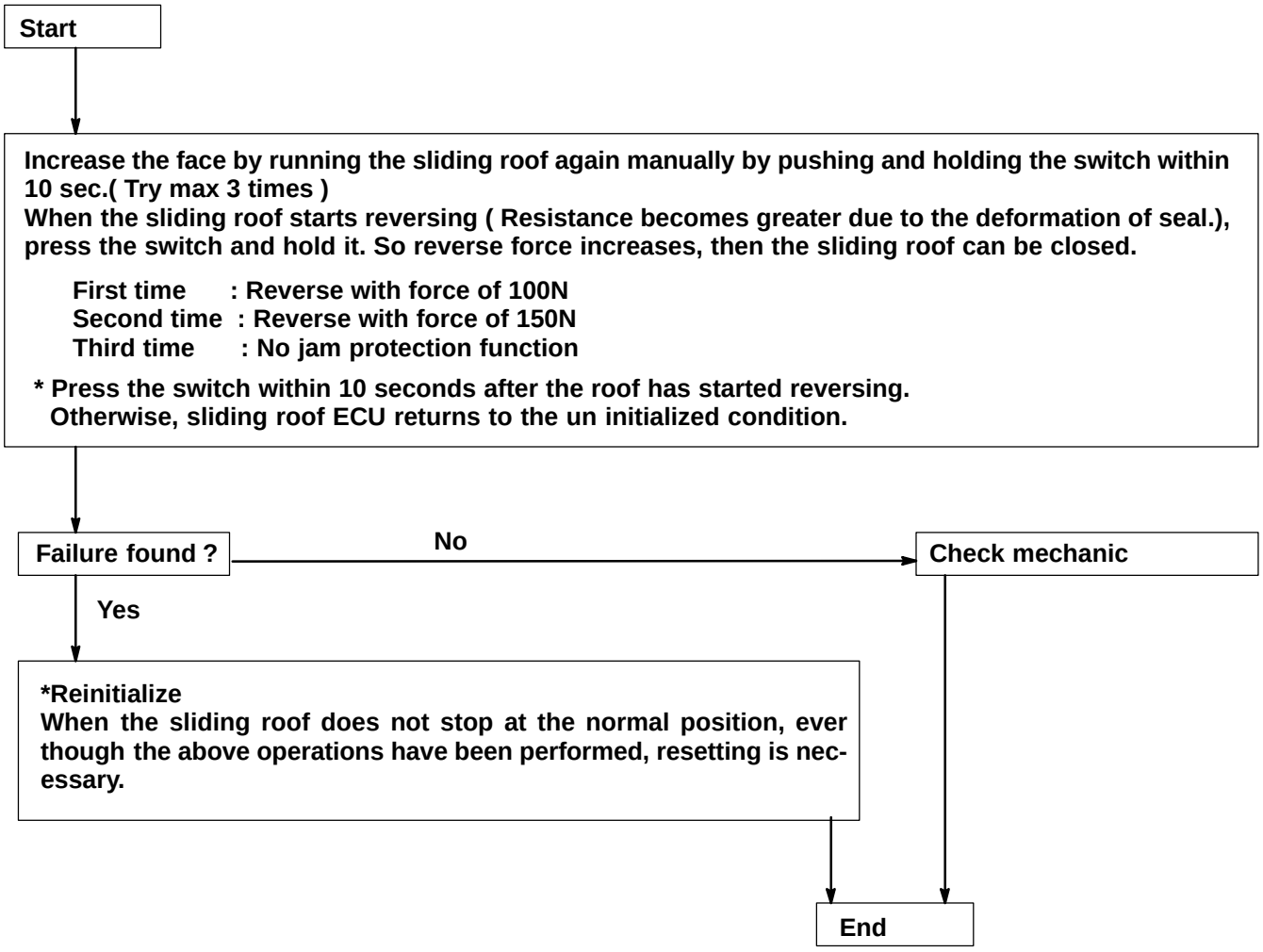
TROUBLESHOOTING

BE0O9-08

1	**Sliding Roof does not stop at correct position.**



2	**Sliding Roof always reopens (anti trap function).**

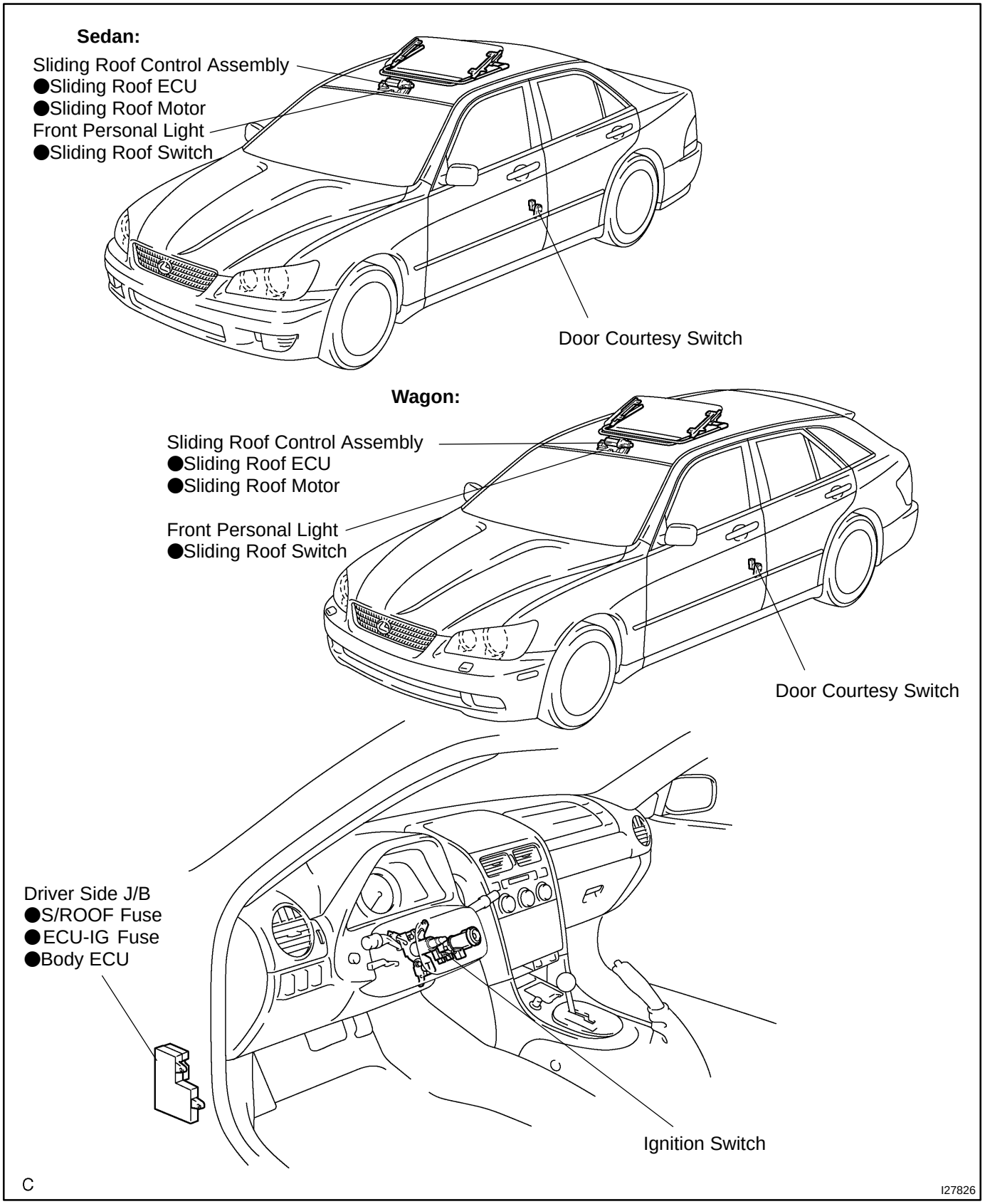


*Reinitializing method
(a) Move the sliding roof to the maximum tilted position.
(b) Release the switch, press the switch again and hold it for 10 secs.
(c) The sliding roof operates in a cycle of TILT DOWN → SLIDE OPEN → SLIDE CLOSE → TILT UP.
THis completes reinitializing.

SLIDING ROOF SYSTEM

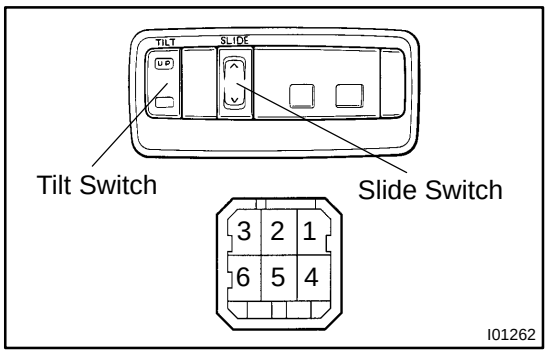
LOCATION

BE05Q-07



BE10K-05

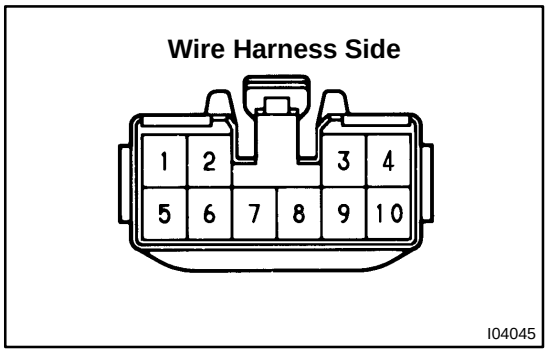
INSPECTION



1. INSPECT SLIDING ROOF SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
SLIDE OPEN	3 - 4	Below 10 Ω
SLIDE OFF	3 - 4, 4 - 6	10k Ω or higher
SLIDE CLOSE	4 - 6	Below 10 Ω
TILT DOWN	2 - 4	Below 10 Ω
TILT OFF	2 - 4, 4 - 5	10k Ω or higher
TILT UP	4 - 5	Below 10 Ω

If continuity is not as specified, replace the front personal light (sliding roof switch).



2. INSPECT SLIDING ROOF CONTROL ASSEMBLY CIRCUIT

Disconnect the connector from the sliding roof control assembly and inspect the connector on the wire harness side, as shown in the chart below.

Tester connection	Condition	Specified condition
5 - Ground	Sliding roof control switch (TILT) UP	Below 100 Ω
6 - Ground	Sliding roof control switch (TILT) DOWN	Below 100 Ω
1 - Ground	Sliding roof control switch (SLIDE) CLOSE	Below 100 Ω
2 - Ground	Sliding roof control switch (SLIDE) OPEN	Below 100 Ω
8, 7 - Ground	Always	Below 1 V
10 - Ground	Front door is opened	Below 1 Ω
3 - Ground	Ignition switch LOCK or ACC	Below 2 V
3 - Ground	Ignition switch ON	10 to 14 V
4 - Ground	Always	10 to 14 V

If the circuit condition is as specified, replace the sliding roof control assembly.

3. CHECK AUTO SLIDE-OPEN/CLOSE OPERATION

NOTICE:

If the sliding roof system has not been initialized, then AUTO slide open/close operation does not work.

HINT:

Initialize the sliding roof system after any of the following is done:

- The battery is disconnected.
- The S/ROOF fuse is replaced.
- The sliding roof assembly (sliding roof ECU) is replaced.
- The sliding roof is removed and then reinstalled or replaced.

(a) Initialize the sliding roof system.
  (1) Turn the ignition switch to the ON position.
  (2) Using the tilt switch, tilt the roof fully upward, and then fully downward.
  (3) Using the slide switch, fully open the roof, and then fully close it.

(b) Check AUTO slide-open operation.
  (1) Turn the ignition switch to the ON position.
  (2) If the roof glass is not fully closed, slide or tilt it so that it is fully closed.
  (3) Press the sliding roof OPEN switch for 0.3 seconds or more. The roof glass should automatically slide open and stop slightly before the fully open position.

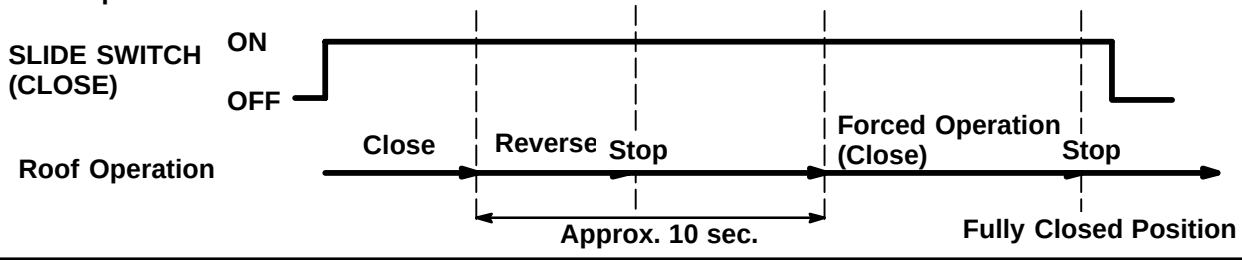
(c) Check the AUTO slide-close operation.
  (1) Turn ignition switch to the ON position.
  (2) Press the sliding roof CLOSE switch for 0.3 seconds or more. The roof glass should automatically close.
  (3) If the CLOSE, OPEN, UP, or DOWN switch is pressed while the roof glass is in motion, the roof glass will stop moving.
  (4) If the roof glass cannot be fully closed using AUTO operation (opens due to the jam protection function):
  - Visually check if there is any foreign object between the sliding roof rail and the sliding roof glass.
  - Check if the alignment of the sliding roof glass is within the specified range (see page BO-126).

  If no problems are found with the above checks, then perform the following operation to fully close the roof glass forcibly and check if AUTO operation return to normal. (Forced operation)

Perform forced operation.*

Caution:
The jam protection function does not operate during forced operation.
Be careful not to get any part of your body caught between the vehicle body and the roof glass.

***: Pressing and holding the CLOSE switch inhibits the jam protection function approx.10 sec. after starting the reverse operation.**
If the switch is kept pressed, the sliding roof starts close operation and stops when detecting the fully closed position.



If the roof glass does not operate normally even after performing above procedures, then replace the sliding roof control assembly.

4. CHECK AUTO TILT-UP/DOWN OPERATION

NOTICE:

If the sliding roof system has not been initialized, then AUTO slide tilt-up/down operation does not work.

HINT:

Initialize the sliding roof system after any of the following is done:

- The battery is disconnected.
- The S/ROOF fuse is replaced.
- The sliding roof assembly (sliding roof ECU) is replaced.
- The sliding roof is removed and then reinstalled or replaced.

(a) Initialize the sliding roof system.
  (1) Turn the ignition switch to the ON position.
  (2) Using the tilt switch, tilt the roof fully upward, and then fully downward.
  (3) Using the slide switch, fully open the roof, and then fully close it.

(b) Check AUTO tilt-up operation.
  (1) Turn the ignition switch to the ON position.
  (2) If the roof glass is not fully closed, slide or tilt it so that it is fully closed.
  (3) Press the sliding roof UP switch for 0.3 seconds or more. The roof glass should automatically tilt upward until it is fully open.

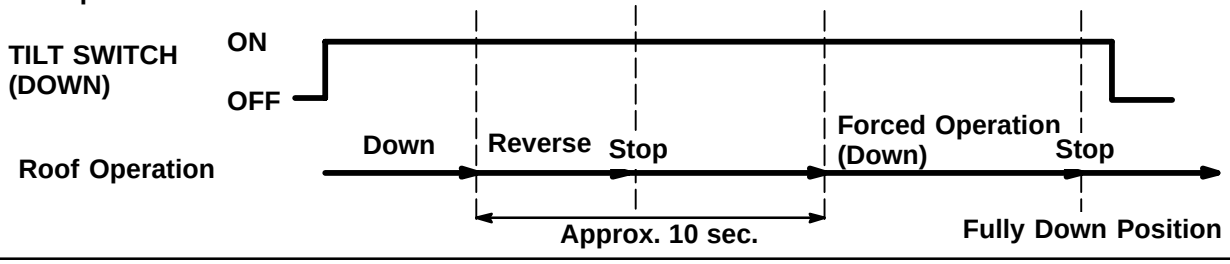
(c) Check the AUTO tilt-down operation.
  (1) Turn the ignition switch to the ON position.
  (2) When the roof glass is fully tilted upward, press the sliding roof DOWN switch for 0.3 seconds or more. The roof glass should automatically tilt downward until it is fully closed.
  (3) If the CLOSE, OPEN, UP, or DOWN switch is pressed while the roof glass is in motion, the roof glass will stop moving.
  (4) If the roof glass cannot be fully tilted using AUTO operation (opens due to the jam protection function):
  - Visually check if there is any foreign object between the sliding roof rail and the sliding roof glass.
  - Check if the alignment of the sliding roof glass is within the specified range (see page BO-126).

  If no problems are found with the above checks, then perform the following operation to fully down the roof glass forcibly and check if AUTO operation return to normal. (Forced operation)

Perform forced operation.*

Caution:
The jam protection function does not operate during forced operation.
Be careful not to get any part of your body caught between the vehicle body and the roof glass.

***: Pressing and holding the DOWN switch inhibits the jam protection function approx.10 sec. after starting the reverse operation.**
If the switch is kept pressed, the sliding roof starts down operation and stops when detecting the fully down position.



If the roof glass does not operate normally even after performing above procedures, then replace the sliding roof control assembly.

5. CHECK KEY-OFF SLIDING ROOF OPERATION

HINT:

The sliding roof can be operated for approximately 45 seconds after the ignition switch is turned from ON to OFF with all doors closed. However, if the driver side door is opened during this time, the operation is canceled.

(a) Check the sliding roof operation function after the ignition switch is turned from ON to OFF.

(1) Turn the ignition switch from ON to OFF. Sliding roof AUTO operation should be possible. However, opening either of the front doors should disable AUTO operation.

(2) Turn the ignition switch from ON to OFF. Wait approximately 45 seconds. AUTO operation should be prohibited.

(3) Turn the ignition switch from ON to OFF with either of the front doors open. AUTO operation should immediately stop functioning.

If operation is not as specified, then inspect each part following the problem symptom table (see page BE-2).

6. CHECK JAM PROTECTION FUNCTION

HINT:

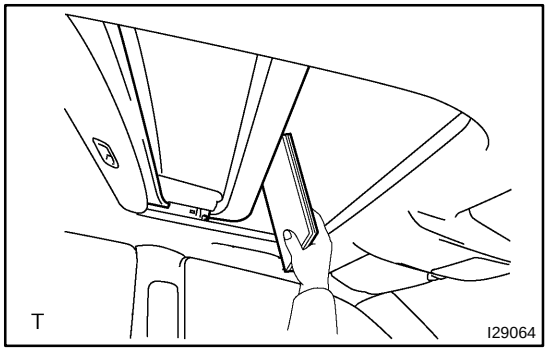
When sliding roof AUTO operation is being used, the jam protection function prevents objects from being caught between the vehicle body and the roof glass.

Operative condition:

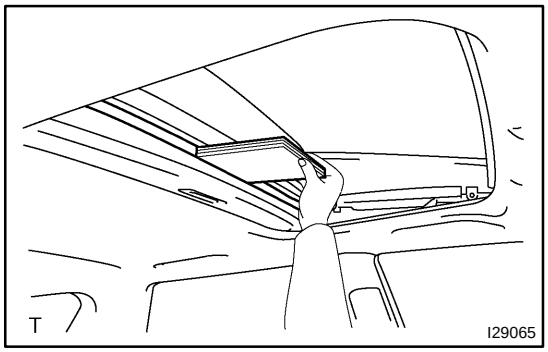
- AUTO CLOSE with ignition switch ON.
- AUTO CLOSE during sliding operation after the ignition switch is turned OFF.
- AUTO TILT-DOWN with ignition switch ON.
- AUTO TILT-DOWN during sliding operation after the ignition switch is turned OFF.

CAUTION:

- **Do not use any part of your body such as your hand, or any object to check the jam protection function. Do not allow anything to become caught in the sliding roof by accident during this procedure.**
- **The jam protection function may not work against an object less than 5 mm (0.20 in.) in width.**



(a) When sliding roof AUTO operation is being used:
check that the roof glass should open a distance of 200 mm (7.87 in.) from the point of contact with the object, or fully open if 200 mm (7.87 in.) of opening distance is not available when an object is caught between the vehicle body and the roof glass.



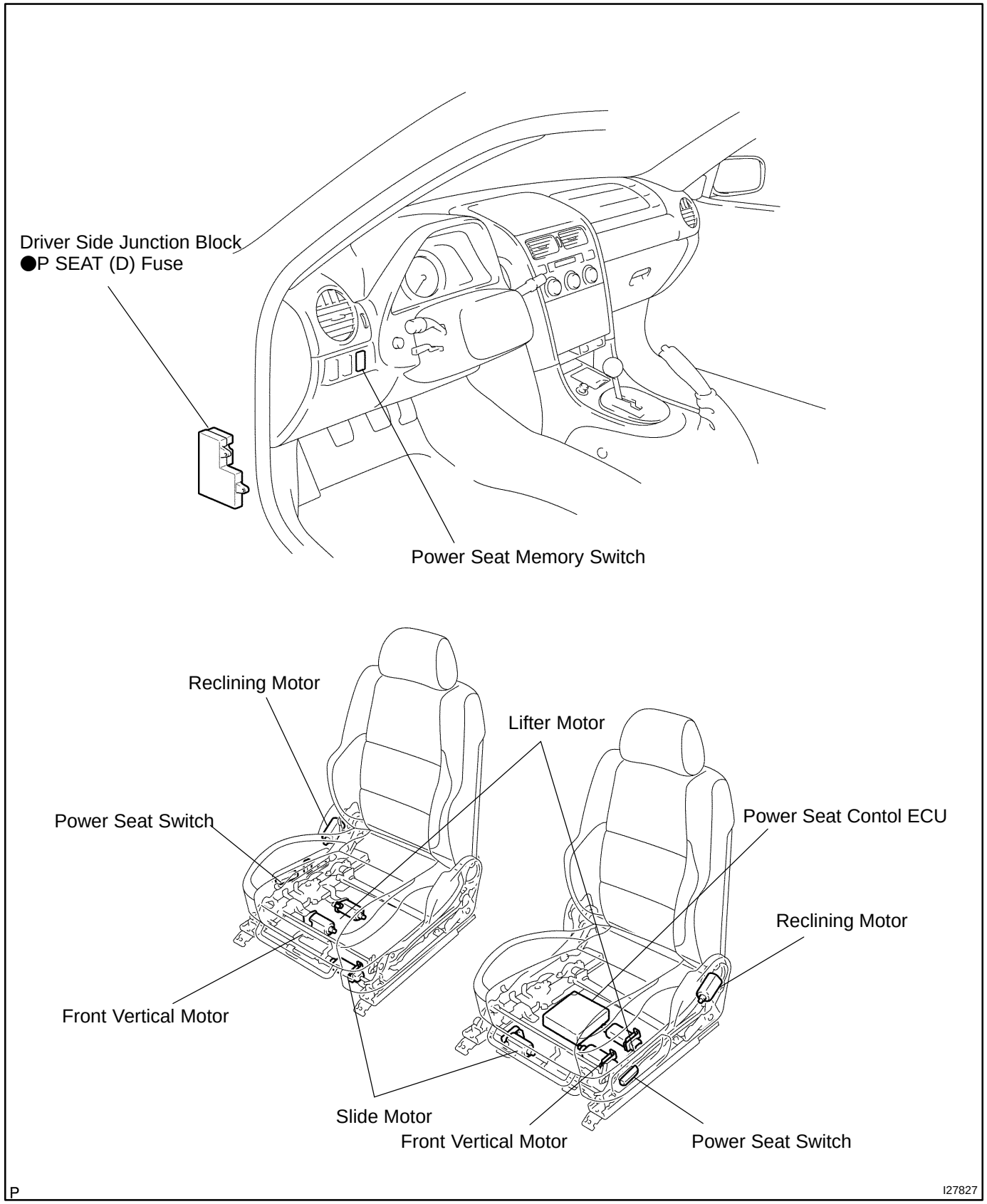
(b) When the tilt-down operation is being used:
Check that the sliding roof fully tilts up when an object is caught between the vehicle body and the roof glass.

If operation is not as specified, then replace the sliding roof control assembly.

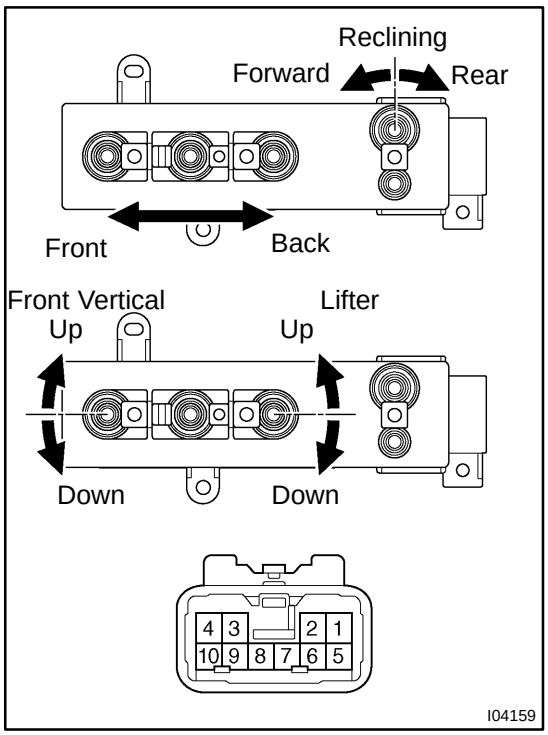
POWER SEAT CONTROL SYSTEM

LOCATION

BE0GK-11



BE2JV-01



INSPECTION

1. INSPECT DRIVER'S POWER SEAT SWITCH CONTINUITY

Slide switch:

Switch position	Tester connection	Specified condition
FRONT	1 - 9 4 - 6	Continuity
OFF	4 - 6 4 - 9	Continuity
BACK	1 - 6 4 - 9	Continuity

Front vertical switch:

Switch position	Tester connection	Specified condition
UP	1 - 10 4 - 5 (*1)	Continuity
OFF	4 - 5 (*1) 4 - 10 (*1)	Continuity
DOWN	1 - 5 4 - 10 (*1)	Continuity

Lifter switch:

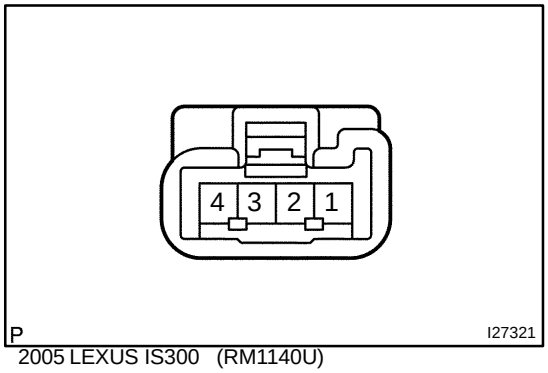
Switch position	Tester connection	Specified condition
UP	1 - 7 4 - 8 (*1)	Continuity
OFF	4 - 7 (*1) 4 - 8 (*1)	Continuity
DOWN	1 - 8 4 - 7 (*1)	Continuity

Reclining switch:

Switch position	Tester connection	Specified condition
FORWARD	1 - 3 2 - 4	Continuity
OFF	2 - 4 3 - 4	Continuity
REAR	1 - 2 3 - 4	Continuity

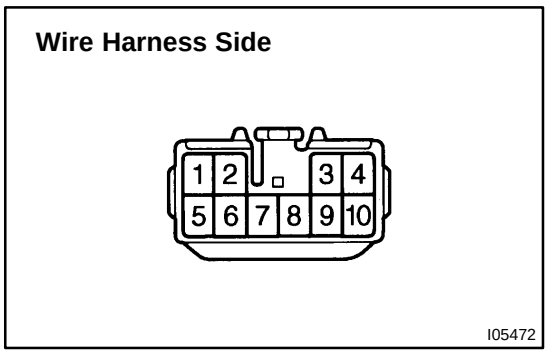
*1: w/ power seat memory switch

If continuity is not as specified, replace the switch.



2. INSPECT POWER SEAT MEMORY SWITCH

Switch position	Tester connection	Specified condition
SET	1 - 4	Continuity
SW1	2 - 4	Continuity
SW2	3 - 4	Continuity



3. INSPECT DRIVER'S POWER SEAT SWITCH CIRCUIT

(a) Disconnect the switch connector and connect the seat wire harness to the floor wire harness.

(b) Inspect the connector on the wire harness side.

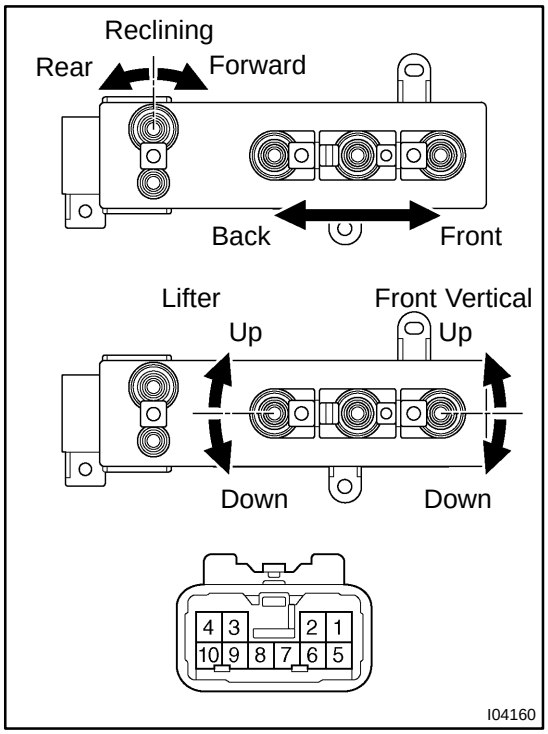
w/o Power seat memory switch:

Tester connection	Condition	Specified condition
4 - Ground	Always	Continuity
1 - Ground	Always	Battery Positive Voltage

w/ Power seat memory switch:

Tester connection	Condition	Specified condition
1 - Ground	Always	Continuity

If circuit is not as specified, inspect the circuits connected to other parts.



4. INSPECT PASSENGER'S POWER SEAT SWITCH CONTINUITY

Slide switch:

Switch position	Tester connection	Specified condition
FRONT	1 - 9 4 - 6	Continuity
OFF	4 - 6 4 - 9	Continuity
BACK	1 - 6 4 - 9	Continuity

Front vertical switch:

Switch position	Tester connection	Specified condition
UP	1 - 5 4 - 10	Continuity
OFF	4 - 5 4 - 10	Continuity
DOWN	1 - 10 4 - 5	Continuity

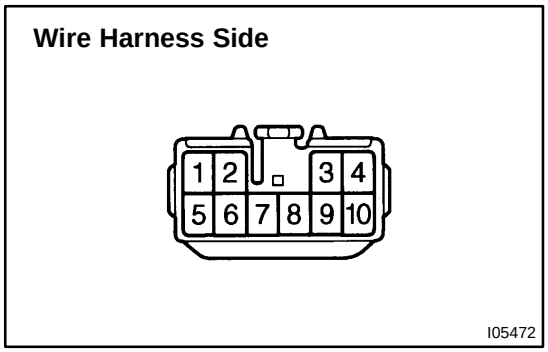
Lifter switch:

Switch position	Tester connection	Specified condition
UP	1 - 8 4 - 7	Continuity
OFF	4 - 7 4 - 8	Continuity
DOWN	1 - 7 4 - 8	Continuity

Reclining switch:

Switch position	Tester connection	Specified condition
FORWARD	1 - 3 2 - 4	Continuity
OFF	2 - 4 3 - 4	Continuity
REAR	1 - 2 3 - 4	Continuity

If continuity is not as specified, replace the switch.



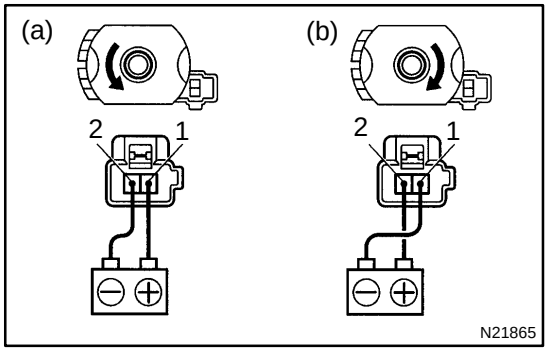
5. INSPECT PASSENGER'S POWER SEAT SWITCH CIRCUIT

(a) Disconnect the switch connector and connect the seat wire harness to the floor wire harness.

(b) Inspect the connector on the wire harness side.

Tester connection	Condition	Specified condition
4 - Ground	Always	Continuity
1 - Ground	Always	Battery positive voltage

If circuit is not as specified, inspect the circuits connected to other parts.

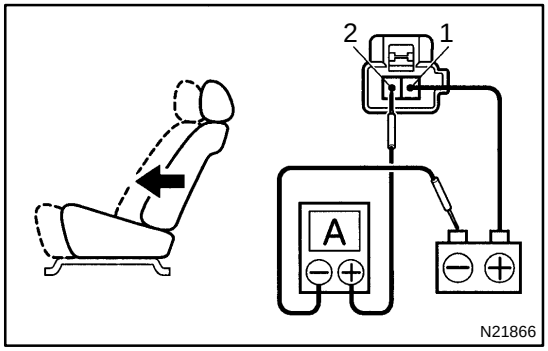


6. INSPECT SLIDE MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2, check that the motor turns counterclockwise.

(b) Reverse the polarity, check that the motor turns clockwise.

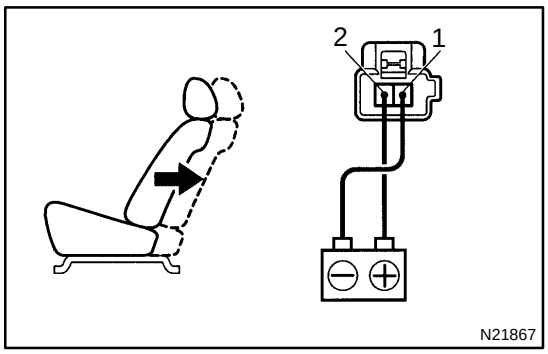
If operation is not as specified, replace the seat adjuster.



7. INSPECT SLIDE MOTOR PTC THERMISTOR OPERATION

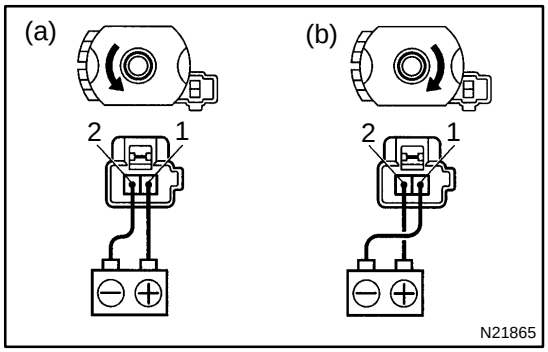
(a) ( ): Passenger side
Connect the positive (+) lead from the battery to terminal 1 (2), the positive (+) lead from the ammeter to terminal 2 (1) and the negative (-) lead to the battery negative (-) terminal, then move the seat cushion to the front position.

(b) Continue to apply voltage, check that current changes to less than 1 ampere within 4 to 90 seconds.



(c) Disconnect the leads from terminals.
(d) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 2 (1) and the negative (-) lead to terminal 1 (2), check that the seat cushion begins to move backwards.

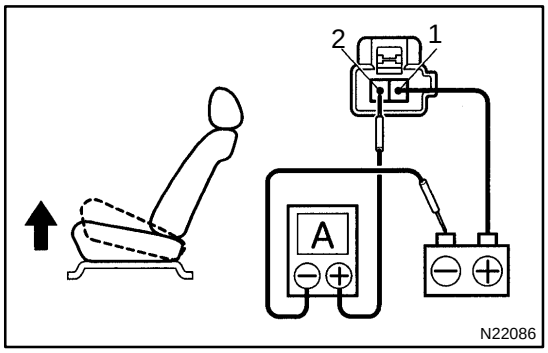
If operation is not as specified, replace the seat adjuster.



8. INSPECT FRONT VERTICAL MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2, check that the motor turns counterclockwise.
(b) Reverse the polarity, check that the motor turns clockwise.

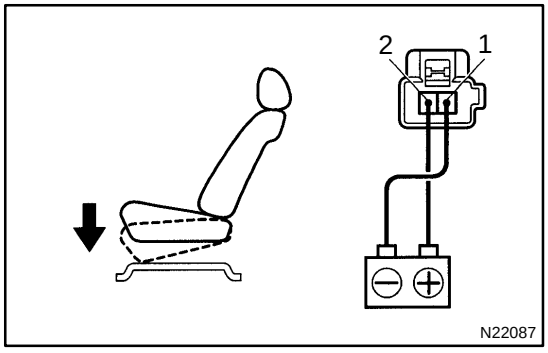
If operation is not as specified, replace the seat adjuster.

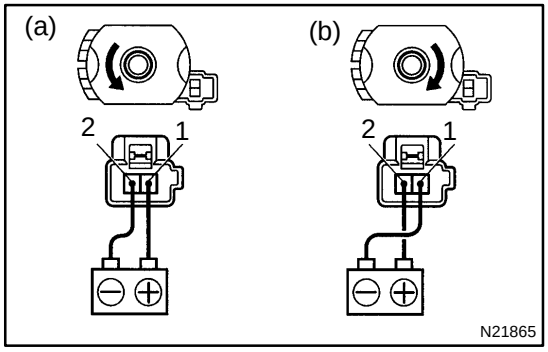


9. INSPECT FRONT VERTICAL MOTOR PTC THERMISTOR OPERATION

(a) ( ): Passenger side
Connect the positive (+) lead from the battery to terminal 1 (2), the positive (+) lead from the ammeter to terminal 2 (1) and the negative (-) lead to the battery negative (-) terminal, then move the seat cushion to the highest position.
(b) Continue to apply voltage, check that the current changes to less than 1 ampere within 4 to 90 seconds.
(c) Disconnect the leads from the terminals.
(d) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 2 (1) and the negative (-) lead to terminal 1 (2), check that the seat cushion begins to descend.

If operation is not as specified, replace the seat adjuster.

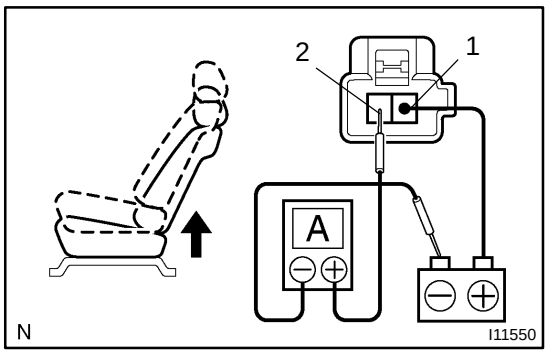




10. INSPECT LIFTER MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2, check that the motor turns counterclockwise.
(b) Reverse the polarity, check that the motor turns clockwise.

If operation is not as specified, replace the seat adjuster.



11. INSPECT LIFTER MOTOR PTC THERMISTOR OPERATION

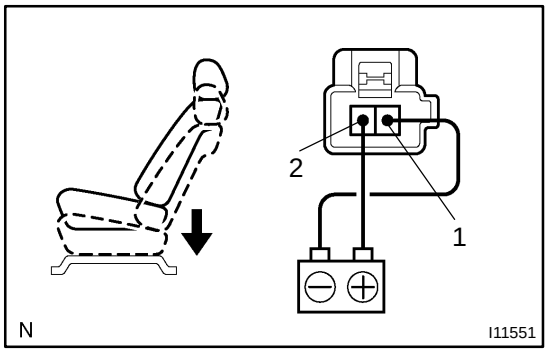
(a) ( ): Passenger side
Connect the positive (+) lead from the battery to terminal 1 (2), the positive (+) lead from the ammeter to terminal 2 (1) and the negative (-) lead to the battery negative (-) terminal, then move the seat cushion to the highest position.

(b) Continue to apply voltage, check that the current changes to less than 1 ampere within 4 to 90 seconds.

(c) Disconnect the leads from the terminals.

(d) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 2 (1) and the negative (-) lead to terminal 1 (2), check that the seat cushion begins to descend.

If operation is not as specified, replace the seat adjuster.

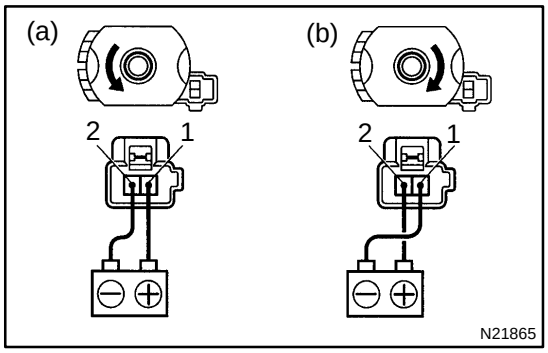


12. INSPECT RECLINING MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2, check that the motor turns counterclockwise.

(b) Reverse the polarity, check that the motor turns clockwise.

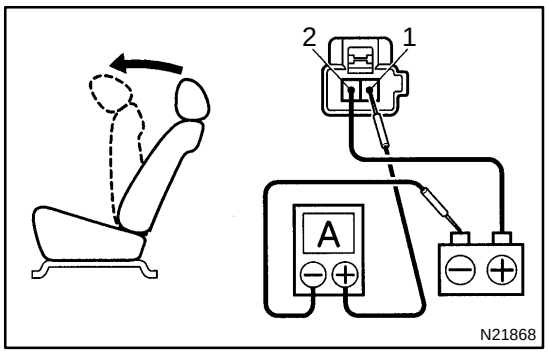
If operation is not as specified, replace the seat adjuster.



13. INSPECT RECLINING MOTOR PTC THERMISTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 2, the positive (+) lead from the ammeter to terminal 1 and the negative (-) lead to the battery negative (-) terminal, then recline the seat back to the most forward position.

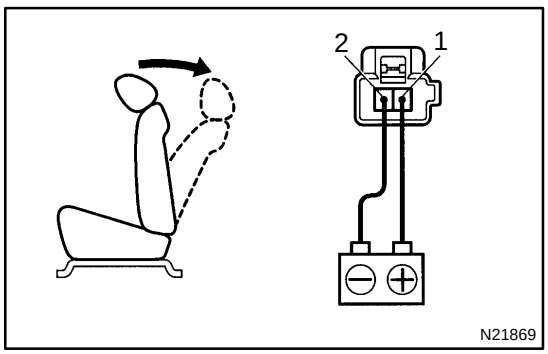
(b) Continue to apply voltage, check that the current changes to less than 1 ampere within 4 to 90 seconds.



(c) Disconnect the leads from the terminals.

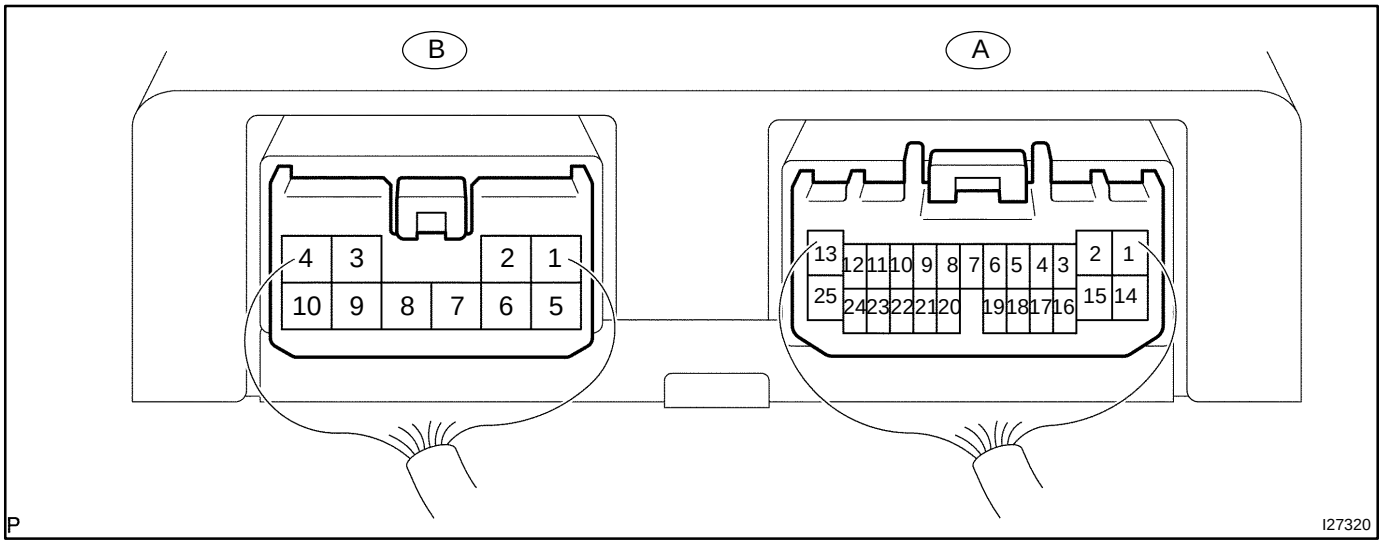
(d) Approximately 60 seconds later, connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2, check that the seat back begins to fall backward.

If operation is not as specified, replace the seat adjuster.



14. INSPECT POWER SEAT CONTROL ECU

(a) Check power seat control ECU with connector A and B still connected.



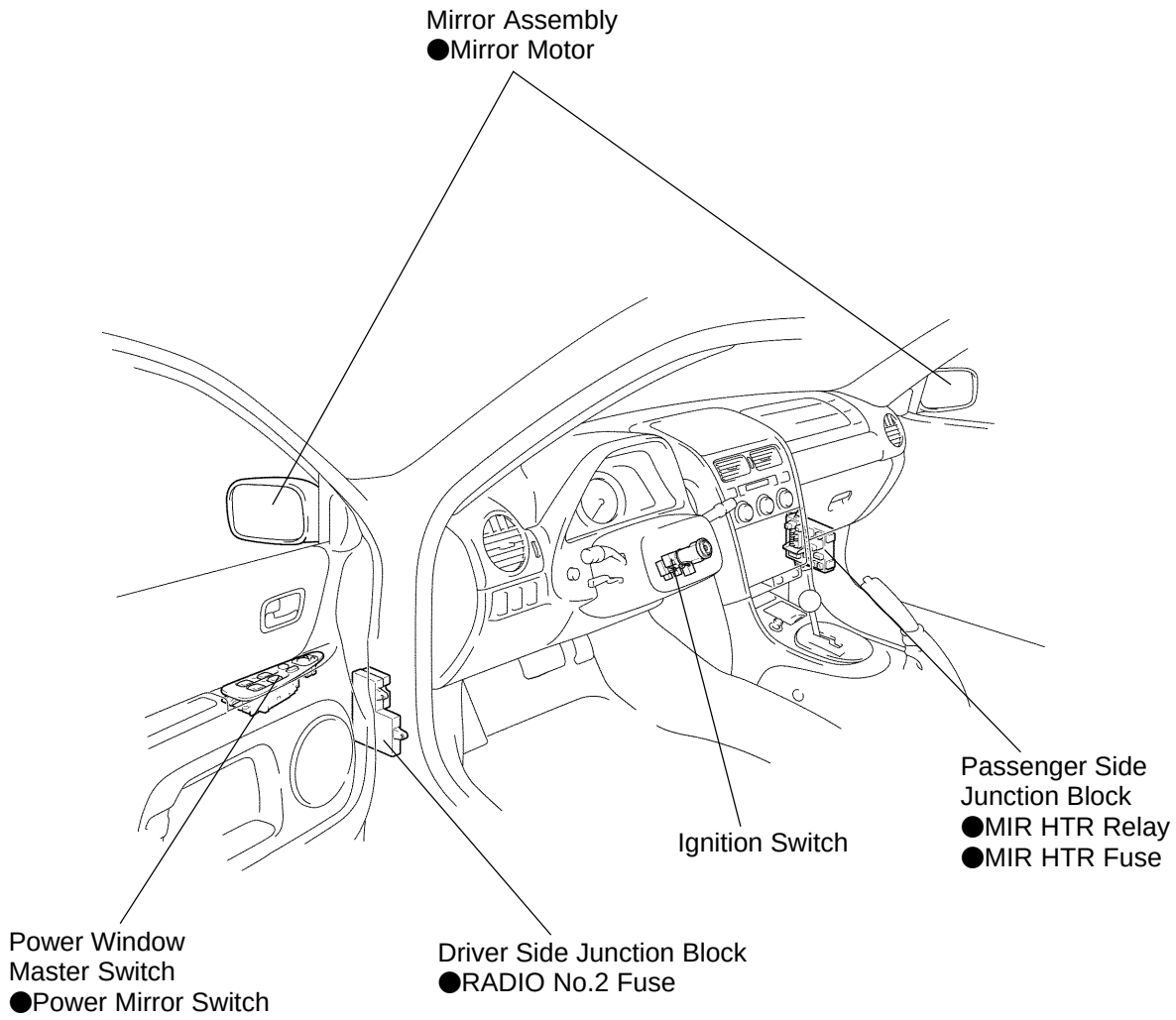
Symbols (Terminal No.)	Condition	Specified condition
PKB (A-1) - Body ground	Parking brake switch ON	Blow 2 V
P (A-2) - Body ground	Neutral position switch is P	10-14 V
SSRS (A-3) - Body ground	Slide position sensor OFF → ON	Blow 2 V → 6.6 V or higher
SSFV (A-4) - Body ground	Front vertical sensor OFF → ON	Blow 2 V → 6.6 V or higher
PCVV (A-5) - Body ground	Ignition switch ON	Blow 8 V
SLDF (A-6) - Body ground	Manual switch (Front slide) OFF → ON	1 kΩ or higher → Below 10 Ω
SLDR (A-8) - Body ground	Manual switch (Rear slide) OFF → ON	1 kΩ or higher → Below 10 Ω
MMRY (A-9) - Body ground	Memory switch OFF → ON	10 kΩ or higher → Below 100 Ω
RCLF (A-10) - Body ground	Manual switch (Rear reclining) OFF → ON	1 kΩ or higher → Below 10 Ω
RDWN (A-11) - Body ground	Manual switch (Rear vertical down) OFF → ON	1 kΩ or higher → Below 10 Ω
RCLR (A-12) - Body ground	Manual switch (Front reclining) OFF → ON	1 kΩ or higher → Below 10 Ω
IG (A-13) - Body ground	Ignition switch ON	10-14 V
SI (A-14)	Communication line	-
DCTY (A-15) - Body ground	Door courtesy switch OFF → ON	10 kΩ or higher → Below 100 Ω
SSRR (A-16) - Body ground	Reclining position sensor OFF → ON	Blow 1 V → Blow 2 V
SSRV (A-17) - Body ground	Rear vertical sensor OFF → ON	Blow 2 V → 6.6 V or higher
SGND (A-19) - Body ground	Always	Blow 1 Ω
SW2 (A-20) - Body ground	Memory switch OFF → ON	10 kΩ or higher → Below 100 Ω
SW1 (A-21) - Body ground	Memory switch OFF → ON	10 kΩ or higher → Below 100 Ω
RUP (A-22) - Body ground	Manual switch (Rear vertical up) OFF → ON	1 kΩ or higher → Below 10 Ω
FUP (A-23) - Body ground	Manual switch (Front vertical up) OFF → ON	1 kΩ or higher → Below 10 Ω
FDWN (A-24) - Body ground	Manual switch (Front vertical down) OFF → ON	1 kΩ or higher → Below 10 Ω
RCL- (B-1) - Body ground	Manual switch (Rear reclining) OFF → ON	Blow 1 V → 10-14 V
RCL+ (B-2) - Body ground	Manual switch (Front reclining) OFF → ON	Blow 1 V → 10-14 V
SLD- (B-3) - Body ground	Manual switch (Rear slide) OFF → ON	Blow 1 V → 10-14 V
SLD+ (B-4) - Body ground	Manual switch (Front slide) OFF → ON	Blow 1 V → 10-14 V
RRV- (B-5) - Body ground	Manual switch (Rear vertical down) OFF → ON	Blow 1 V → 10-14 V
RRV+ (B-6) - Body ground	Manual switch (Rear vertical up) OFF → ON	Blow 1 V → 10-14 V

GND (B-7) - Body ground	Always	Blow 1 Ω
+B (B-8) - Body ground	Always	10-14 V
FRV- (B-9) - Body ground	Manual switch (Front vertical down) OFF → ON	Blow 1 V → 10-14 V
FRV+ (B-10) - Body ground	Manual switch (Front vertical up) OFF → ON	Blow 1 V → 10-14 V

POWER MIRROR CONTROL SYSTEM

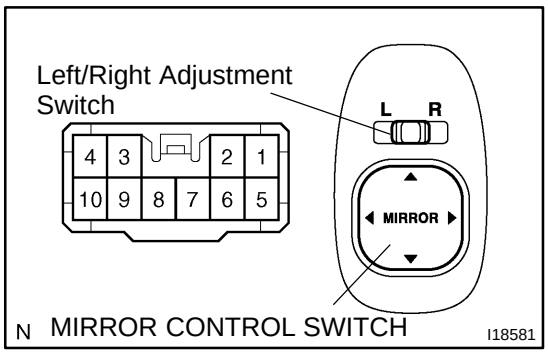
BE02J-17

LOCATION



I27828

BE1X6-01



INSPECTION

1. Left/right adjustment switch (Left side): INSPECT MIRROR SWITCH CONTINUITY

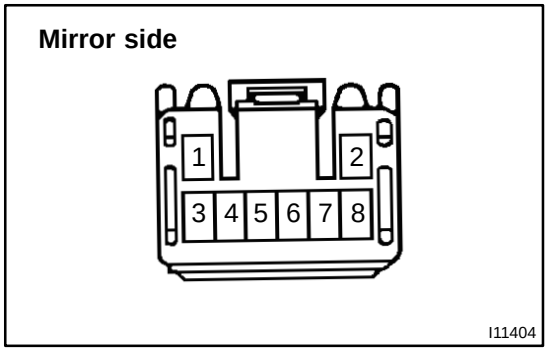
Switch position	Specified condition
UP	1 - 10 3 - 4
RIGHT	1 - 3 9 - 4
DOWN	1 - 3 10 - 4
LEFT	1 - 9 3 - 4

If continuity is not as specified, replace the switch.

2. Left/right adjustment switch (Right side): INSPECT MIRROR SWITCH CONTINUITY

Switch position	Specified condition
UP	1 - 6 3 - 4
RIGHT	1 - 3 2 - 4
DOWN	1 - 3 6 - 4
LEFT	1 - 2 3 - 4

If continuity is not as specified, replace the switch.



3. INSPECT MIRROR MOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 8 and the negative (-) lead to terminal 7, and check that the mirror turns to the upward.

(b) Reverse the polarity, and check that the mirror turns to the downward.

(c) Connect the positive (+) lead from the battery to terminal 6 and the negative (-) lead to terminal 7, and check that the mirror turns to the inside.

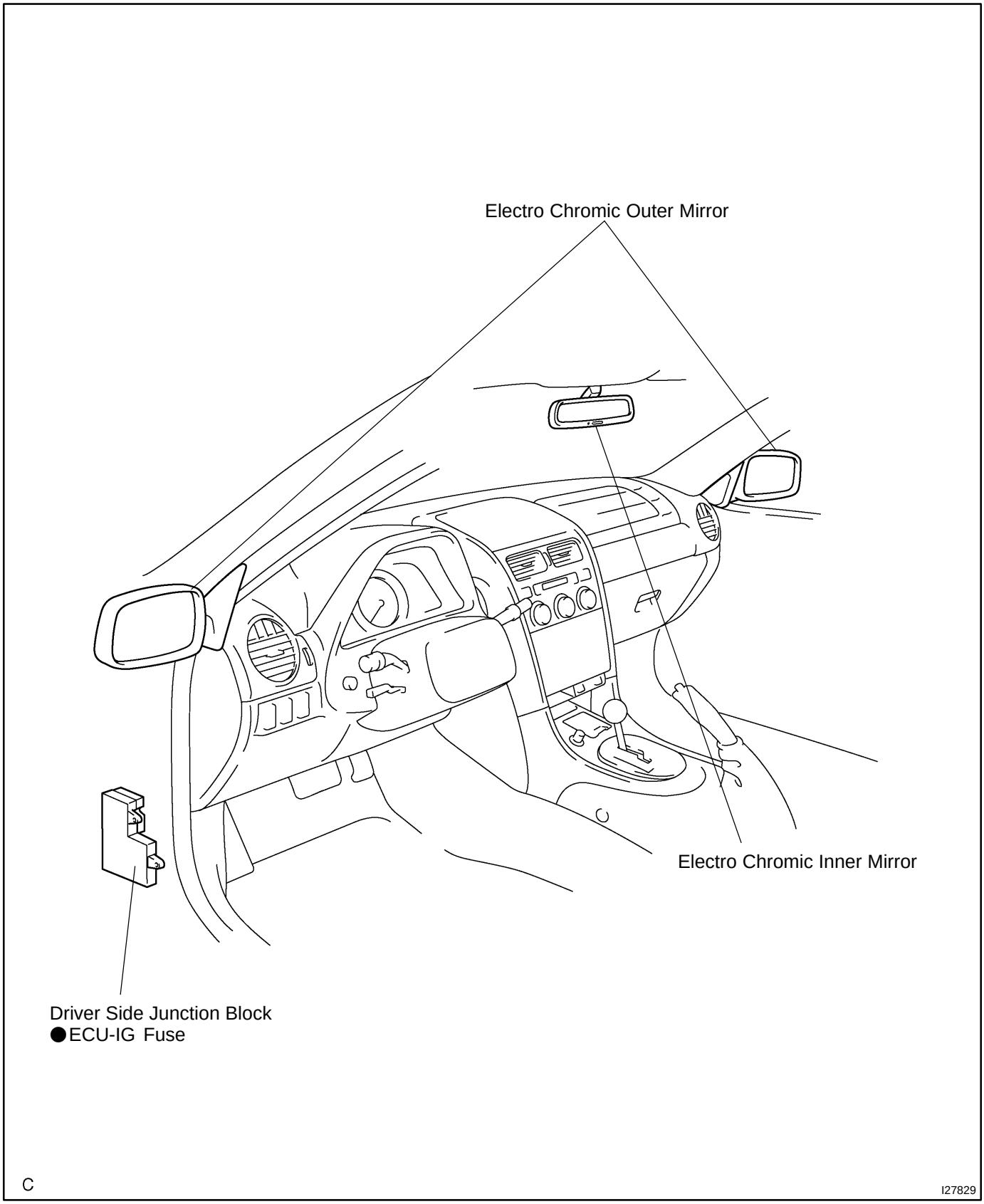
(d) Reverse the polarity, and check that the mirror turns outside.

If operation is not as specified, replace the mirror assembly.

ELECTRO CHROMIC MIRROR SYSTEM

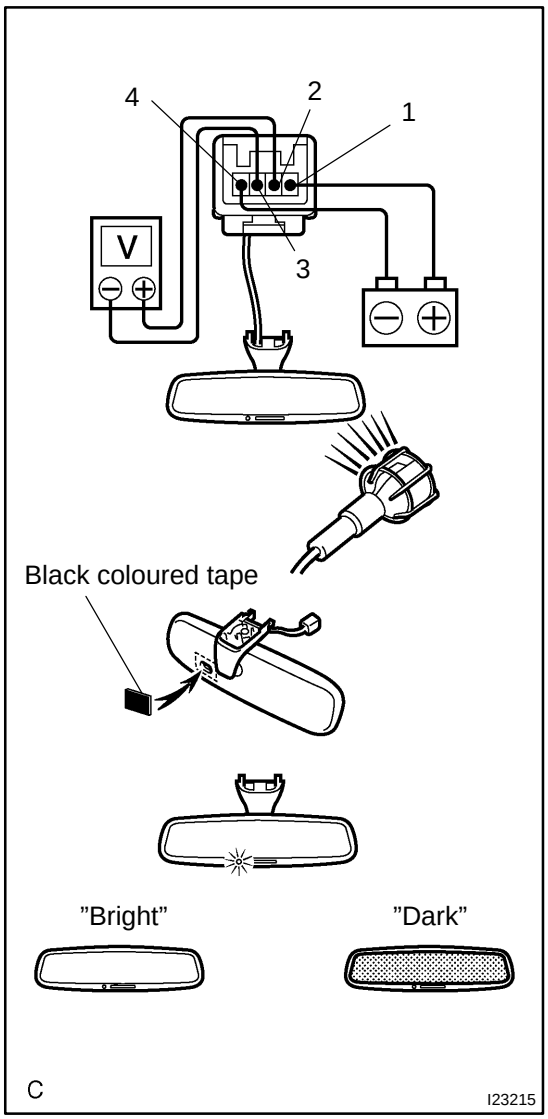
LOCATION

BE0HC-13



BE2A7-02

INSPECTION



1. INSPECT ELECTRO CHROMIC INNER MIRROR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 4.

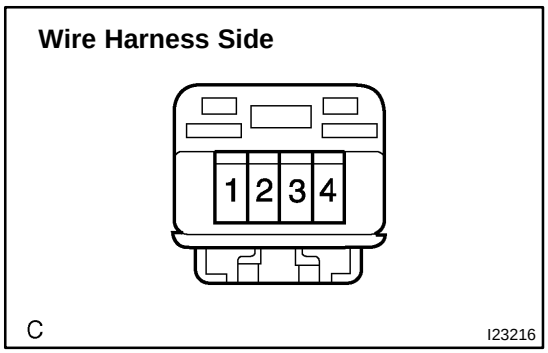
(b) Connect the positive (+) lead from the voltmeter to terminal 2 and the negative (-) lead to terminal 3.

(c) Attach a black coloured tape to forward sensor to prevent it from sensing.

(d) When the mode is turned to AUTO, check that indicator light lights up.

(e) Light up the mirror with an electric light, and check that there is battery positive voltage and mirror surface changes ”bright” to ”dark”.

If operation is not as specified, replace the inner mirror.

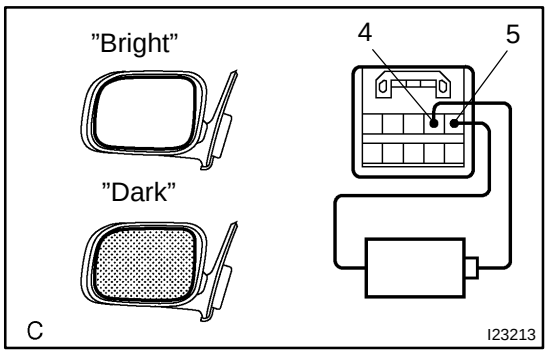


2. INSPECT ELECTRO CHROMIC INNER MIRROR CIRCUIT

Disconnect the connector from the mirror and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
4 - Ground	Always	Continuity
1 - Ground	Ignition switch LOCK or ACC	No voltage
1 - Ground	Ignition switch ON	Battery positive voltage

If circuit is not as specified, inspect the circuits connected to other parts.



3. INSPECT ELECTRO CHROMIC OUTER MIRROR OPERATION

(a) Disconnect the outer mirror connector.

(b) Connect the positive (+) lead from the dry cell battery to terminal 4 and the negative (-) lead to terminal 5, then check that the mirror surface changes to ”dark”.

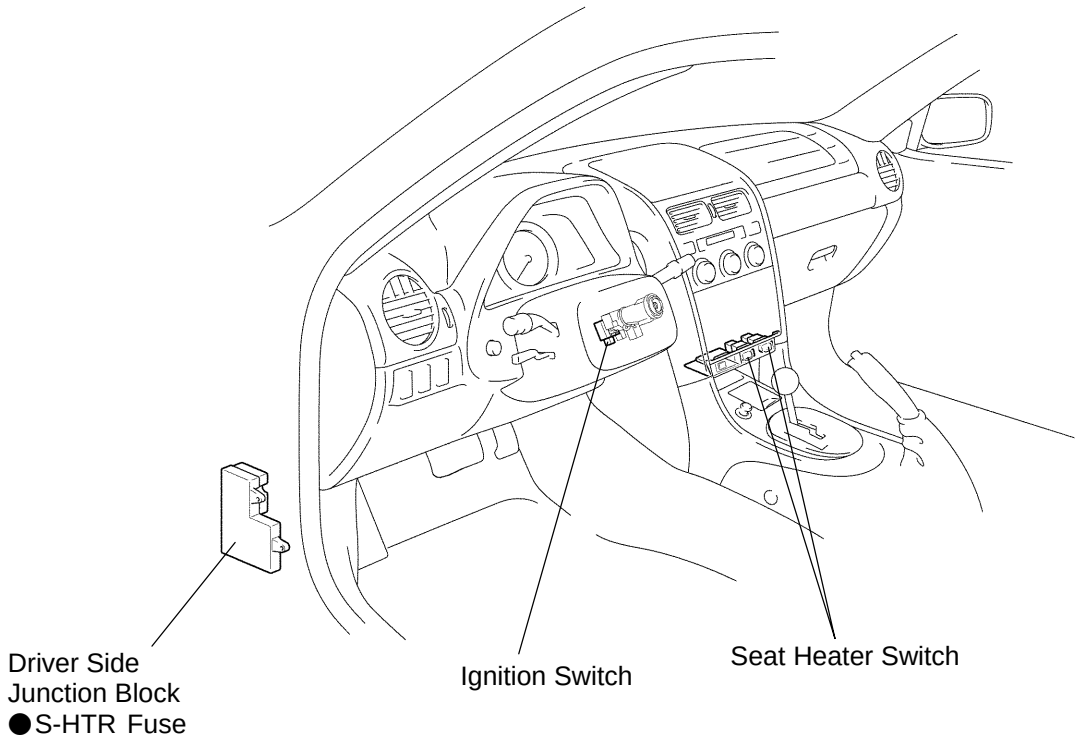
(c) Check the mirror turns to ”bright” after disconnecting the battery.

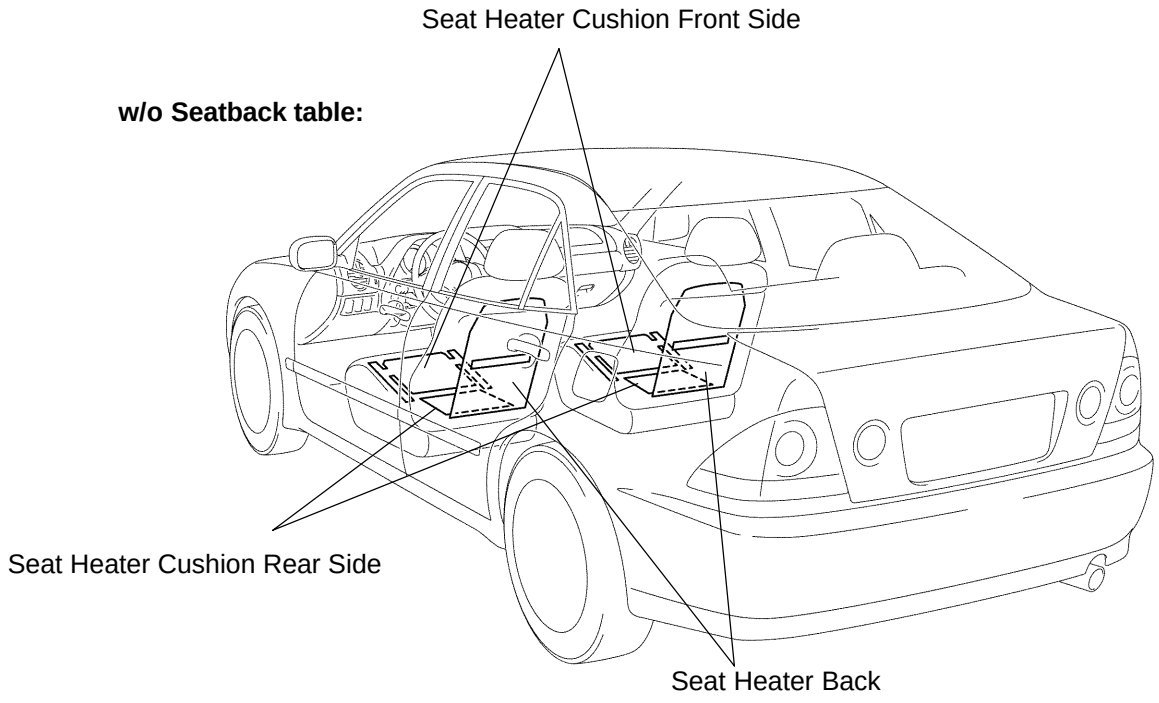
If operation is not as specified, replace the mirror assembly.

SEAT HEATER SYSTEM

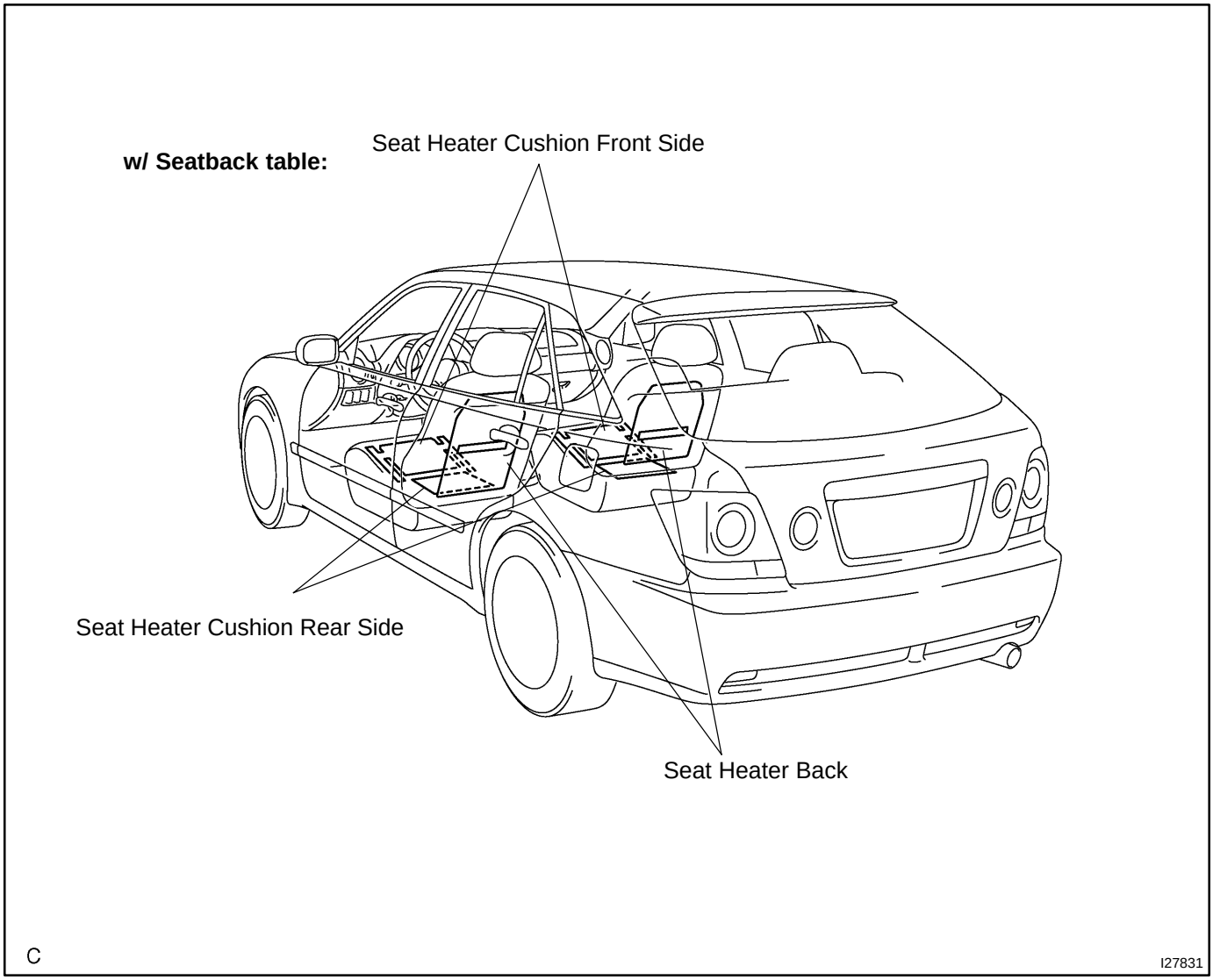
BE2A8-03

LOCATION



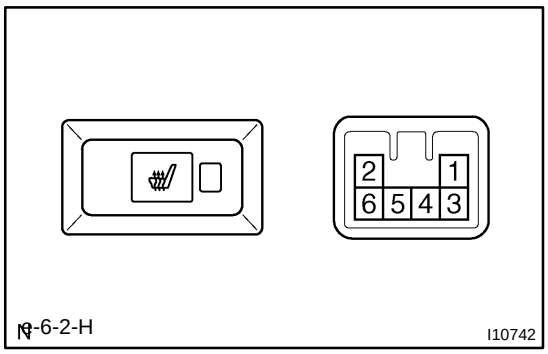


I27830


w/ Seatback table:
Seat Heater Cushion Front Side
Seat Heater Cushion Rear Side
Seat Heater Back
C
I27831

BE2F1-01

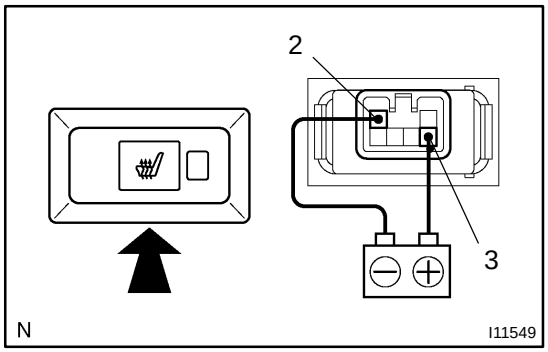
INSPECTION



1. INSPECT SEAT HEATER SWITCH CONTINUITY

Switch position	Tester connection	Specified condition
ON	2 - 3 - 6	Continuity
OFF	-	No continuity
Illumination circuit	1 - 4	Continuity

If continuity is not as specified, replace the switch.

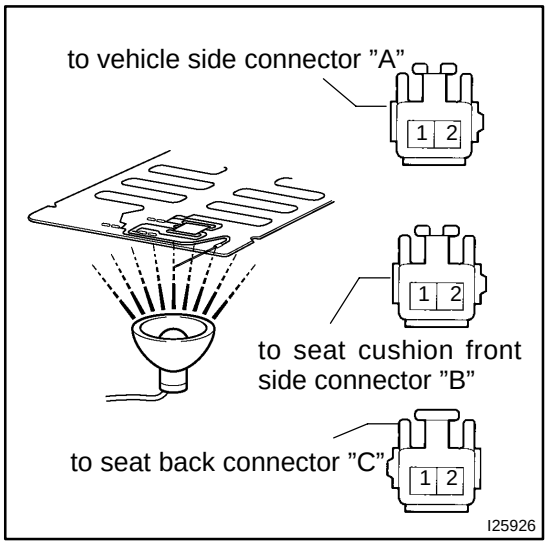


2. INSPECT SEAT HEATER INDICATOR LIGHT OPERATION

(a) Connect the positive (+) lead from the battery to terminal 3 and the negative (-) lead to terminal 2.

(b) Push the seat heater switch ON that the indicator light lights up.

If operation is not as specified, replace the switch and inspect the circuits connected to other parts.



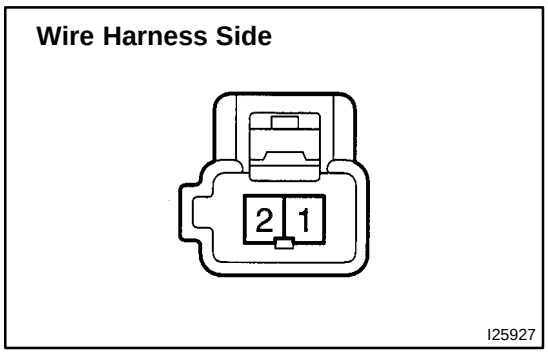
3. INSPECT SEAT HEATER CUSHION REAR SIDE CONTINUITY

(a) Heat the thermostat with a light.

(b) Inspect the seat heater cushion continuity between terminals, as shown.

Tester connection	Condition	Specified condition
A1 - B2	Seat heater temperature below 25 °C (77 °F)	Continuity
A1 - B2	Seat heater temperature above 45 °C (113 °F)	No continuity
A2 - B1	Always	Continuity
A2 - C1	Always	Continuity
B2 - C2	Always	Continuity

If continuity is not as specified, replace the seat cushion pad.

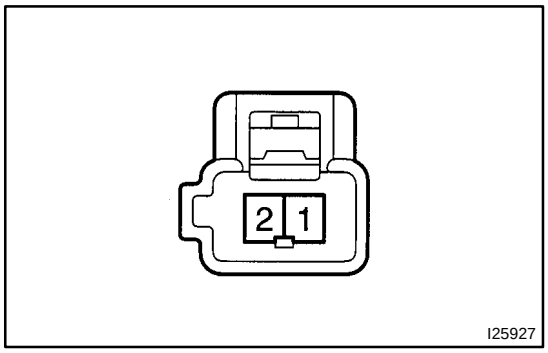


4. INSPECT SEAT HEATER CUSHION CIRCUIT

Disconnect the connector from the seat heater cushion and inspect the connector on wire harness side, as shown.

Tester connection	Condition	Specified condition
2 - Body ground	Seat heater switch ON	Battery Positive Voltage

If circuit is not as specified, inspect the wire harness.

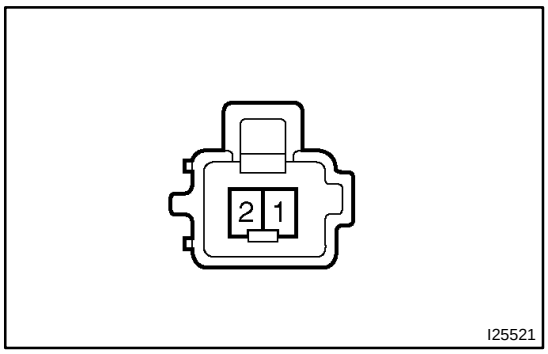


5. INSPECT SEAT CUSHION FRONT SIDE CONTINUITY

Inspect the seat cushion front side continuity between terminals, as shown.

Tester connection	Condition	Specified condition
1 - 2	Always	Continuity

If continuity is not as specified, replace the seat cushion pad.



6. INSPECT SEAT BACK CONTINUITY

Inspect the seat back continuity between terminals, as shown.

Tester connection	Condition	Specified condition
1 - 2	Always	Continuity

If continuity is not as specified, replace the seat back pad.

AUDIO SYSTEM

DESCRIPTION

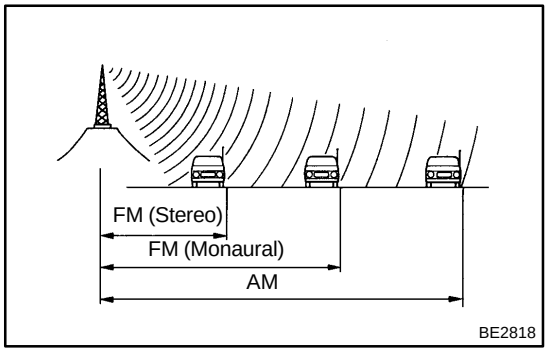
BE1X4-03

1. RADIO WAVE BAND

The radio wave bands used in radio broadcasting are as follows:

Frequency	30 kHz	300 kHz	3 MHz	30 MHz	300 MHz
Designation	LF	MF	HF	VHF	
Radio wave	LW ⟷	AM (MW) ⟷	SW ⟷	FM (UKW) ⟷	
Modulation	Amplitude modulation			Frequency modulation	

LF: Low Frequency
MF: Medium Frequency
HF: High Frequency
VHF: Very High Frequency

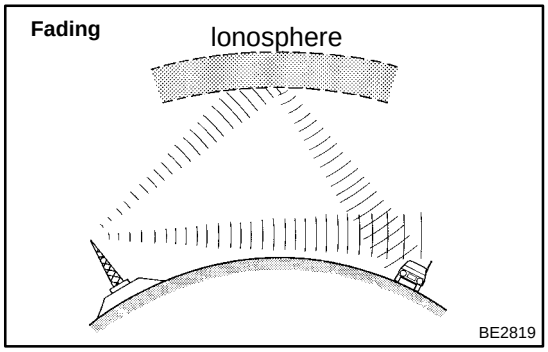


2. SERVICE AREA

There are great differences in the size of the service area for AM and FM monaural. Sometimes FM stereo broadcasts cannot be received even through AM can be received in very clearly.
Not only does FM stereo have the smallest service area, but it also picks up static and other types of interference (”noise”) easily.

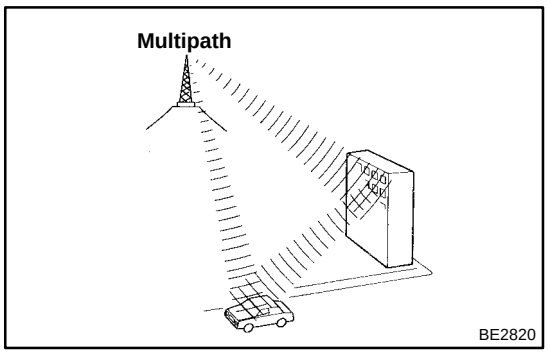
3. RECEPTION PROBLEMS

Besides the problem of static, there are also the problems called ”fading”, ”multipath” and ”fade out”. These problems are caused not by electrical noise but by the nature of the radio waves themselves.

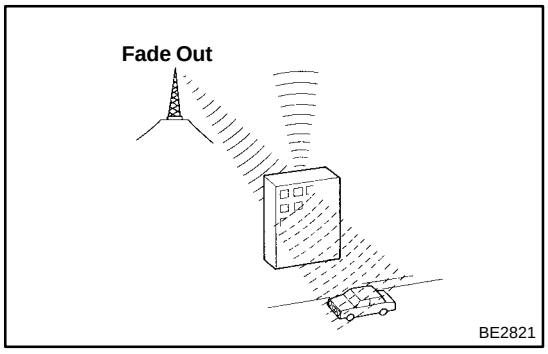


○ Fading

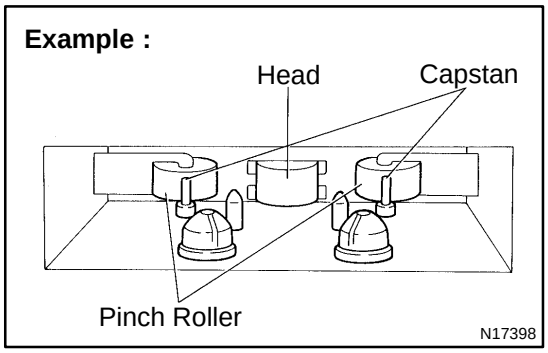
Besides electrical interference, AM broadcasts are also susceptible to other types of interference, especially at night. This is because AM radio waves bounce off the ionosphere at night. These radio waves then interfere with the signals from the same transmitter that reach the vehicle’s antenna directly. This type of interference is called ”fading”.



○ Multipath
One type of interference caused by the bounce of radio waves off of obstructions is called ”multipath”. Multipath occurs when a signal from the broadcast transmitter antenna bounces off buildings and mountains and interferes with the signal that is received directly.



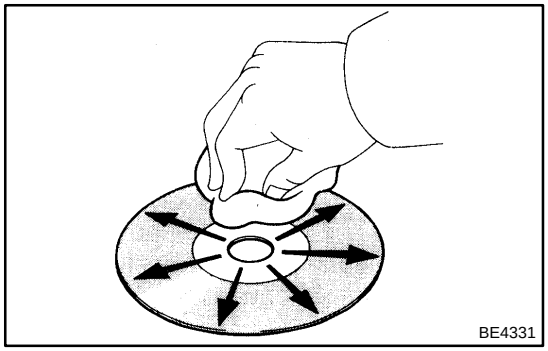
○ Fade Out
Because FM radio waves are of higher frequencies than AM radio waves, they bounce off buildings, mountains, and other obstructions. For this reason, FM signals often seem to gradually disappear or fade away as the vehicle goes behind a building or other obstruction. This is called ”fade out”.



4. Tape Player/Head Cleaning:
MAINTENANCE

(a) Raise the cassette door with your finger.
Next, using a pencil or similar object, push in the guide.

(b) Using a cleaning pen or cotton applicator soaked in cleaner, clean the head surface, pinch rollers and capstans.



5. CD Player/Disc Cleaning:
MAINTENANCE

If the disc gets dirty, clean the disc by wiping the surface from the center to outside in the radial directions with a soft cloth.

NOTICE:

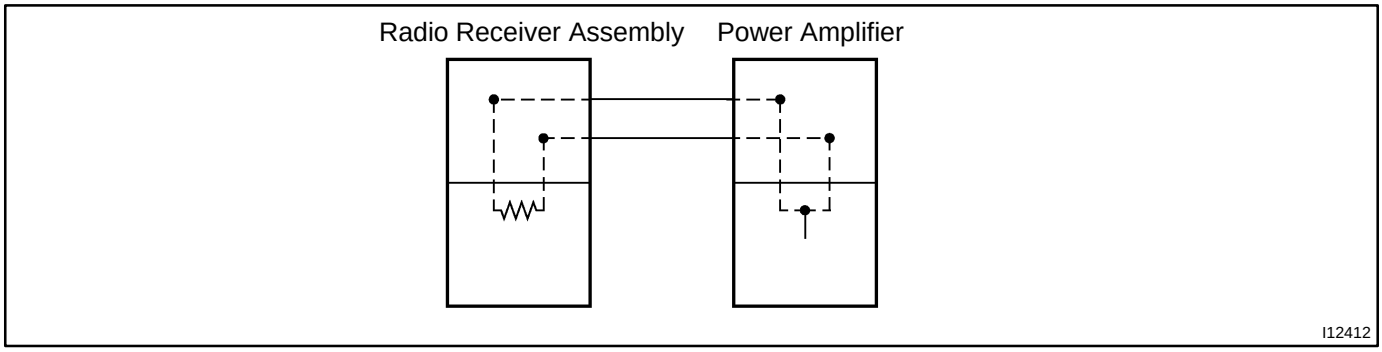
Do not use a conventional record cleaner or anti-static preservative.

6. OUTLINE OF AVC-LAN

(a) What is AVC-LAN?

AVC-LAN is the abbreviation, which stands for Audio Visual Communication-Local Area Network. This is a unified standard co-developed by 6 audio manufactures associated with Toyota Motor Corporation.

The Unified standard covers signals, such as audio signal, visual signal, signal for switch indication and communication signal.



(b) Objectives

Recently the car audio system has been rapidly developed and functions have been changed drastically. The conventional system has been switched to the multi-media type such as a navigation system. At the same time the level of customers needs to audio system has been upgraded. This lies behind this standardization.

The concrete objectives are explained below.

(1) When products by different manufactures were combined together, there used to be a case that malfunction occurred such as sound did not come out. This problem has been resolved by standardization of signals.

(2) Various types of after market products have been able to add or replace freely.

(3) Because of the above (2), each manufacture has become able to concentrate on developing products in their strongest field. This has enabled many types of products provided inexpensively.

(4) Conventionally, a new product developed by a manufacture could not be used due to a lack of compatibility with other manufactures products. Because of this new standard, users can enjoy compatible products provided for them timely.

The above descriptions are the objectives to introduce AVC-LAN. By this standardization, development of new products will no longer cause systematic errors. Thus, this is very effective standard for a product in the future.

HINT:

- ○ When +B short or GND short is detected in AVC-LAN circuit, communication stops. Accordingly the audio system does not function normally.
- ○ When audio system is not equipped with a navigation system, audio head unit is the master unit. (When audio system is equipped with a navigation system, navigation ECU is the master unit.)
- ○ The car audio system using AVC-LAN circuit has a diagnosis function.
- ○ Each product has its own specified numbers called physical address. Numbers are also allotted to each function in one product, which are called logical address.

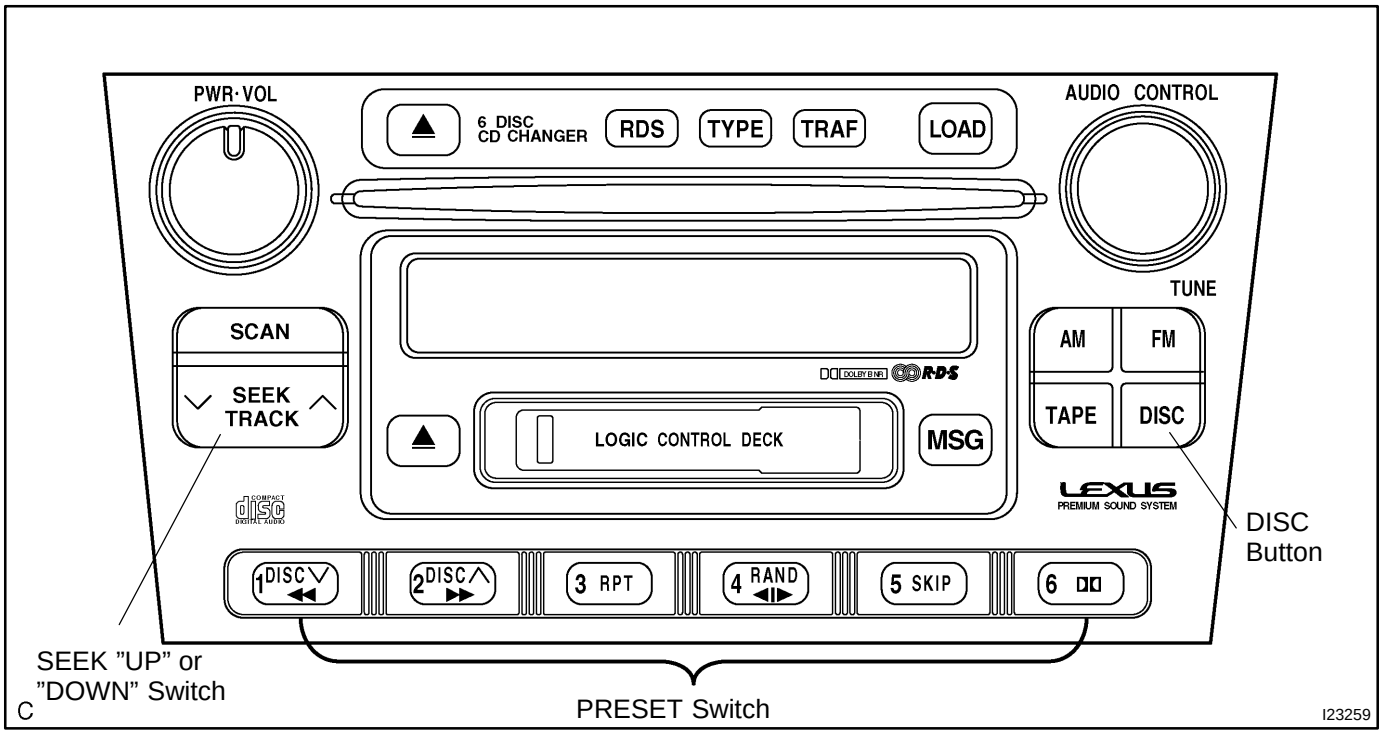
7. DIAGNOSIS FUNCTION

Error codes over tuner and connected equipment are displayed on the screen of tuner.

(a) Starting and Finishing Diagnosis Mode
With the audio system OFF and the ignition switch in ACC, while simultaneously pressing the preset buttons ”1” and ”6”, push ”DISC” or ”CD” 3 times.

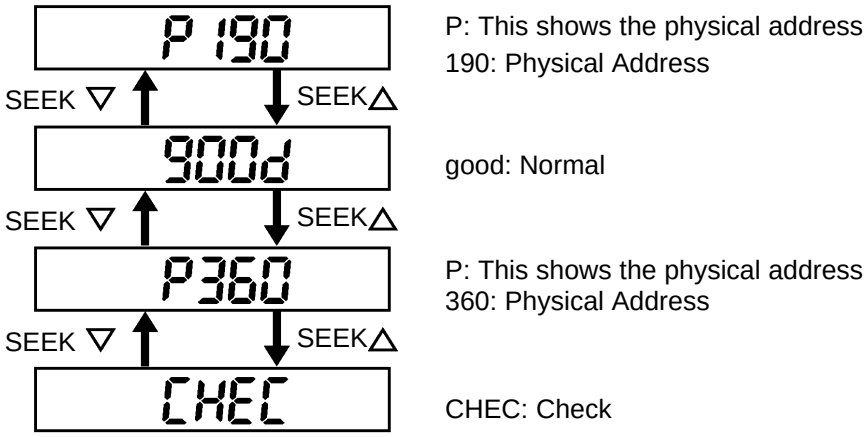
HINT:

- ○ A beep sound 3 times and the system goes on to the Service Check Mode.
- ○ System check and diagnosis memory check is performed in the Service Check Mode and the check result is displayed in ascending order of the component codes.
- ○ It may take about 40 sec. to complete these checks.



(b) Displaying Result in Service Check Mode (For checking the system condition at present and in the past)

(1) By the ”SEEK” switch operation, confirm the check result of each component.



- This illustration shows an example that the system has components of code 190 and 360 and an error occurs in the physical address 360.
- Component codes are displayed in ascending order, and each of them is followed by its check result.

N I18570

Code No. (physical address) List

Code No. (physical address)	Equipment name
190	Radio receiver assembly (Audio head unit)
440	Power amplifier

(2) If ”CHEC” or ”ECHm” is detected in a component, activate the Detail Display mode and check its DTC.

(3) To restart the Service Check, press the preset button ”1”.

(4) To exit the diagnosis mode, press ”DISC” or ”CD” for 2 sec. or more, or turn the ignition switch OFF.

(c) DISPLAYING RESULTS

Results for each check are displayed as follows:

( ): Meaning

- ○ good (Normal)
  No DTC is detected for both ”System Check Confirmation” and ”Diagnosis Memory Response”.
- ○ nCon(No connection)
  Although identified by the system at the time of registration, it has transmitted no response when the diagnosis mode is started.
- ○ CHEC(Check)
  If this is displayed, activate the Detail Display Mode and Check the DTC.
- ○ ECHn(Exchange)
  -ditto-
- ○ OLd (Old Version)
  An old version diagnosis system applies to this component.
- ○ nrES (No Response)
  In spite of response identified when the diagnosis mode is started, no diagnostic information has been responded.

(d) Detail Display Mode (For displaying DTC of erratic components)

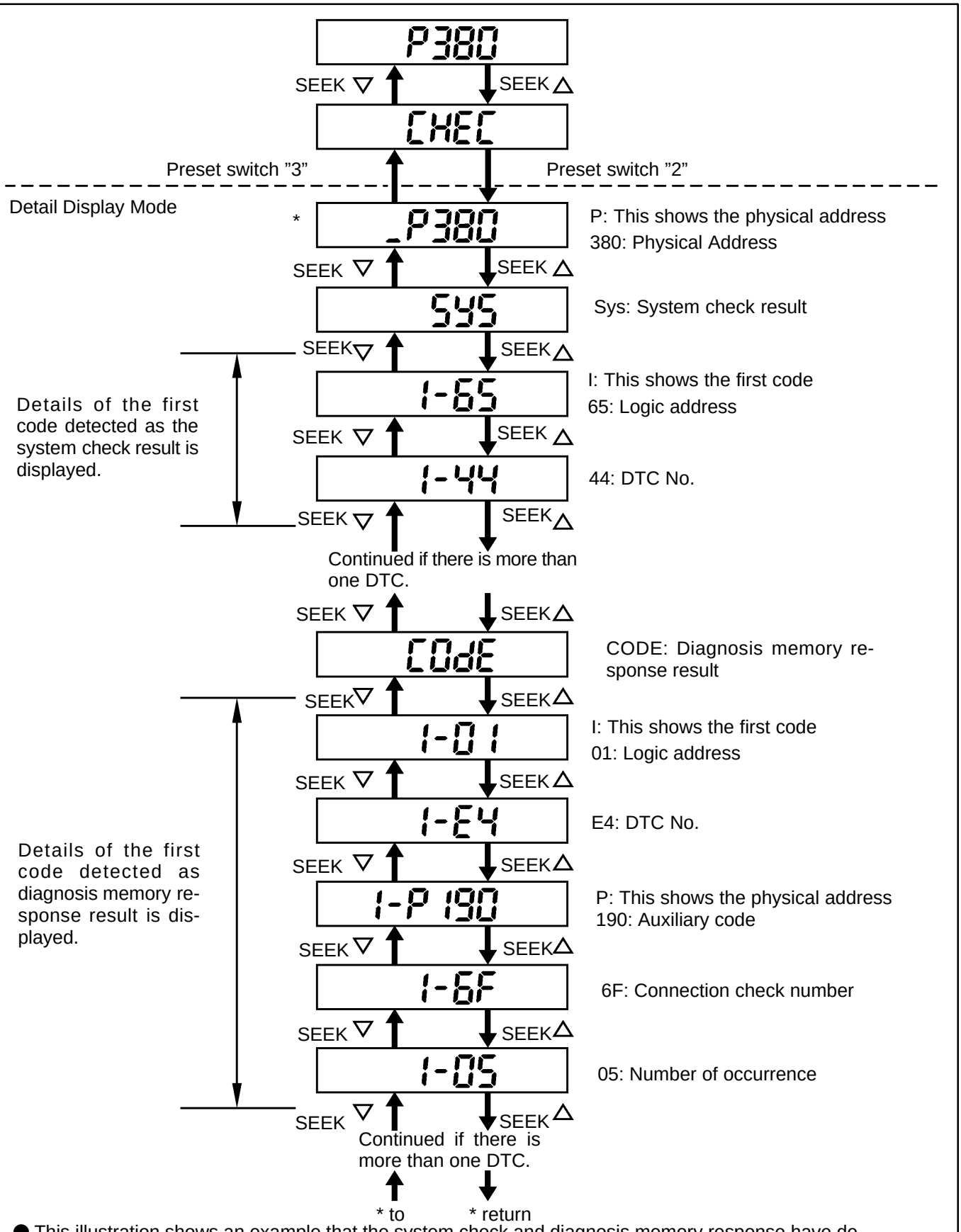
(1) While ”CHEC” or ECHn” is displayed, press the preset button ”2” to go on to the Detail Display Mode.

(2) By the ”SEEK” switch operation, ”the system check result (SYS)” and ”the diagnosis memory response result (COdE)” can be displayed.

(3) Refer to the diagnosis code list and inspect the defective part(s).

(4) Press the preset button ”3” to return to the Service Check Mode.

(e) Service Check Mode



- This illustration shows an example that the system check and diagnosis memory response have detected DTC "44" and "E4" in the component code 380.
- In the Detail Display Mode, a system check result is displayed before the diagnosis memory response result.
- If a DTC does not have any auxiliary code, no auxiliary code is displayed.

N

I18571

(f) DISPLAY IN DETAIL DISPLAY MODE

Segment for DTC	Meaning	Display Order by "SEEK UP" button operation (Reverse order when operating "SEEK DOWN" button)
Sys	System check result	Physical address → DTC
COdE	Diagnosis memory response result	Physical address → DTC → Auxiliary code → Connection check number → Number of occurrence

(g) Deleting DTC memory (Deleting DTC stored in the past)

(1) After repairing defective part(s), start the diagnosis mode.

(2) Press the preset button "5" for 2 sec. or more. (Display: "CLr")

HINT:

When DTC memory is completely deleted, a beep sounds once.

(3) Pressing the preset button "1", perform the Service Check again and confirm that no error is displayed for all component codes.

8. DIAGNOSTIC TROUBLE CODE CHART

Terms	Meaning
Physical address	Three-digit code (shown in hexadecimal) which is given to each component comprising the AVC - LAN Corresponding to the function, individual symbols are specified..
Logical address	Two-digit code (shown in hexadecimal) which is given to each function comprising the inner system of the AVC - LAN.

Physical address: 440 Power amplifier

Logical address	DTC	Diagnosis item	Diagnosis content	Countermeasure and inspected parts
01 (Communication control)	21	ROM Error	Abnormal condition of ROM is detected.	Replace power amplifier.
01 (Communication control)	22	RAM Error	Abnormal condition of RAM is detected.	Replace power amplifier.
01 (Communication Control)	D6	Absence of Master	Component in which this code is recorded has been disconnected from system with ignition in ACC or ON. Or, when this code was recorded, power amplifier was disconnected.	●Check harness for power supply system of radio receiver assembly. ●Check harness for communication system of radio receiver assembly. ●Check harness for power supply system of power amplifier. ●Check harness for communication system of power amplifier.
01 *6 (Communication Control)	D7	Connection Check Error	Component in which this code is recorded has been disconnected from system after engine start. Or, when this code was recorded, power amplifier was disconnected.	●Check harness for power supply system of radio receiver assembly. ●Check harness for communication system of radio receiver assembly. ●Check harness for power supply system of power amplifier. ●Check harness for communication system of power amplifier.
01 (Communication Control)	DC	Transmission Error	Transmission to component shown by auxiliary code has been failed. (This code does not necessarily mean actual failure.)	If same auxiliary code is recorded in other component(s), check harness for power supply and communication system of components shown sub code.
01 (Communication Control)	DD	Master Reset (Momentary Interruption)	After engine is started, power amplifier was disconnected from system.	●Check harness for power supply system of power amplifier. ●Check harness for communication system of power amplifier. ●If error occurs frequently, replace power amplifier.
01 (Communication Control)	DF	Master Error	Due to defective condition of component with a display, master function is switched to audio equipment . Error occurs in communication between sub-master (audio) and master component.	●Check harness for power supply of power amplifier. ●Check harness for communication system of power amplifier. ●Check harness for communication system between power amplifier and sub-master component.

01 (Communication Control)	E2	ON/OFF Instruction Parameter Error	Error is detected in ON/OFF control command from power amplifier.	Replace power amplifier.
01 (Communication Control)	E4	Plural Frame Abort	Plural frame transmission is aborted.	●Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.

*6: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.

Physical address: 190 Radio receiver assembly

Logical address	DTC	Diagnosis item	Diagnosis content	Countermeasure and inspected parts
01 (Communication Control)	21	ROM Error	Error is detected in internal ROM.	Replace radio receiver assembly.
01 (Communication Control)	22	RAM Error	Error is detected in internal RAM.	Replace radio receiver assembly.
01 *3 (Communication Control)	D8	No Response to Connection Check	Component shown by auxiliary code is or had been disconnected from system after engine start.	●Check harness for power supply system of component shown by auxiliary code. ●Check harness for communication system of component shown by auxiliary code.
01 *2 (Communication Control)	D9	Last Mode Error	Component operated (sounds and/or images were provided) before engine stop is or has been disconnected with ignition switch in ACC or ON.	Check harness for power supply system of component shown by auxiliary code. Check harness for communication system of component shown by auxiliary code.
01 (Communication Control)	DA	No Response to ON/OFF Instruction	No response is identified when changing mode (audio and visual mode change). Detected when sound and picture does not change by button operation.	●Check harness for power supply of component shown by auxiliary code. ●Check harness for communication system of component shown by auxiliary code. ● If error occurs again, replace component shown by auxiliary code.
01 *2 (Communication Control)	DB	Mode Status Error	Dual alarm is detected.	●Check harness for power supply of component shown by auxiliary code. ●Check harness for communication system of component shown by auxiliary code.
01 *4 (Communication Control)	DC	Transmission Error	Transmission to component shown by auxiliary code has been failed. (Detecting this DTC does not necessary mean actual failure.)	●If same auxiliary code is recorded in other component, check harness for power supply and communication system of components shown sub code.

01 *5 (Communication Control)	DD	Master Reset (Momentary Interruption)	After engine is started, multi-display assembly was disconnected from system.	●If this error occurs frequently, replace multi-display assembly.
01 *5 (Communication Control)	DE	Slave Reset (Momentary Interruption)	After engine is started, slave component was disconnected from system.	●Check harness for power supply of component shown by auxiliary code. ●Check harness for communication system of component shown by auxiliary code.
01 *6 (Communication Control)	DF	Master Error	Due to defective condition of radio receiver assembly, master function is switched to audio equipment. Error occurs in communication between sub-master (audio) and radio receiver assembly.	●Check harness for power supply of multi-display assembly. ●Check harness for communication system of radio receiver assembly. ●Check harness for communication system between radio receiver assembly and sub-master component.
01 *2 (Communication Control)	E1	Audio processor ON error	While source equipment is operating, AMP output is stopped.	●Check harness for power supply of multi-display assembly. ●Check harness for communication system of radio receiver assembly.
01 (Communication Control)	E2	ON/OFF Instruction Parameter Error	Error occurs in ON/OFF controlling command from radio receiver assembly.	●Replace radio receiver assembly.
01 (Communication Control)	E4	Plural Frame Abort	Plural frame transmission is aborted.	●Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.
60 (Radio receiver assembly)	43	AM Tuner Error	Abnormal condition is detected in AM tuner. Inspect radio receiver assembly.	Replace radio receiver assembly.
60 (Radio receiver assembly)	44	FM Tuner Error	Abnormal condition is detected in FM tuner.	Replace radio receiver assembly.
61 (Cassette switch)	40	Mechanical or Media Error	Malfunction due to mechanical failure is identified. Or, cassette tape is cut or entangled.	Inspect cassette tape.
63 (In-dash CD changer)	47	CD High Temp	High temperature is detected in CD changer.	Replace radio receiver assembly.
63 (In-dash CD changer)	48	CD Excess Current	Excess current is applied to CD changer.	Replace radio receiver assembly.

*2: Even if no failure is detected, it may be stored depending on the battery condition or voltage for starting an engine.

*3: It is stored when 180 sec. has passed after the power supply connector is pulled out after engine start.

*4: It may be stored when the engine key is turned again 1 min. after engine start.

*5: It may be stored when the engine key is turned again after engine start.

*6: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.

BE1X5-03

TROUBLESHOOTING

NOTICE:

When replacing the internal mechanism (computer part) of the audio system, be careful that no part of your body or clothing comes in contact with the terminals of the leads from the IC, etc. of the replacement part (spare part).

HINT:

This inspection procedure is a simple troubleshooting which should be carried out on the vehicle during system operation and was prepared on the assumption of system component troubles (except for the wires and connectors, etc.).

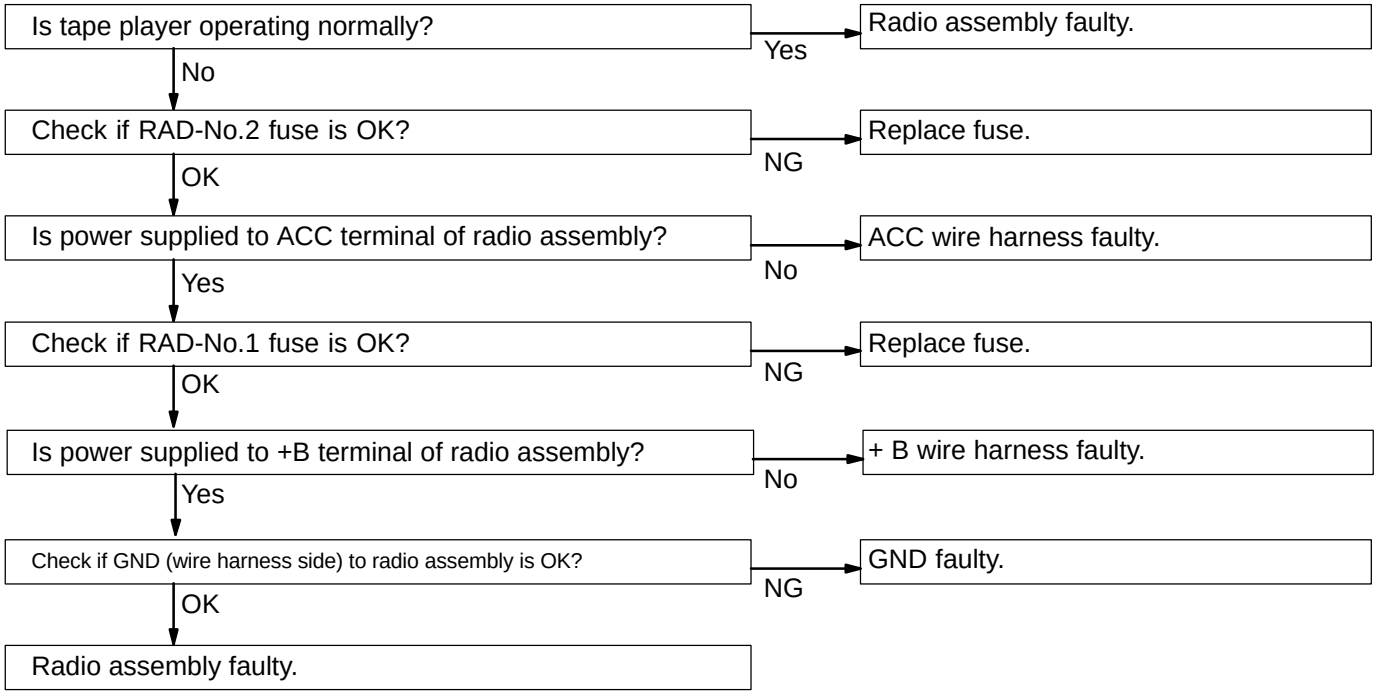
Always inspect the trouble taking the following items into consideration.

- Open or short circuit of the wire harness
- Connector or terminal connection fault

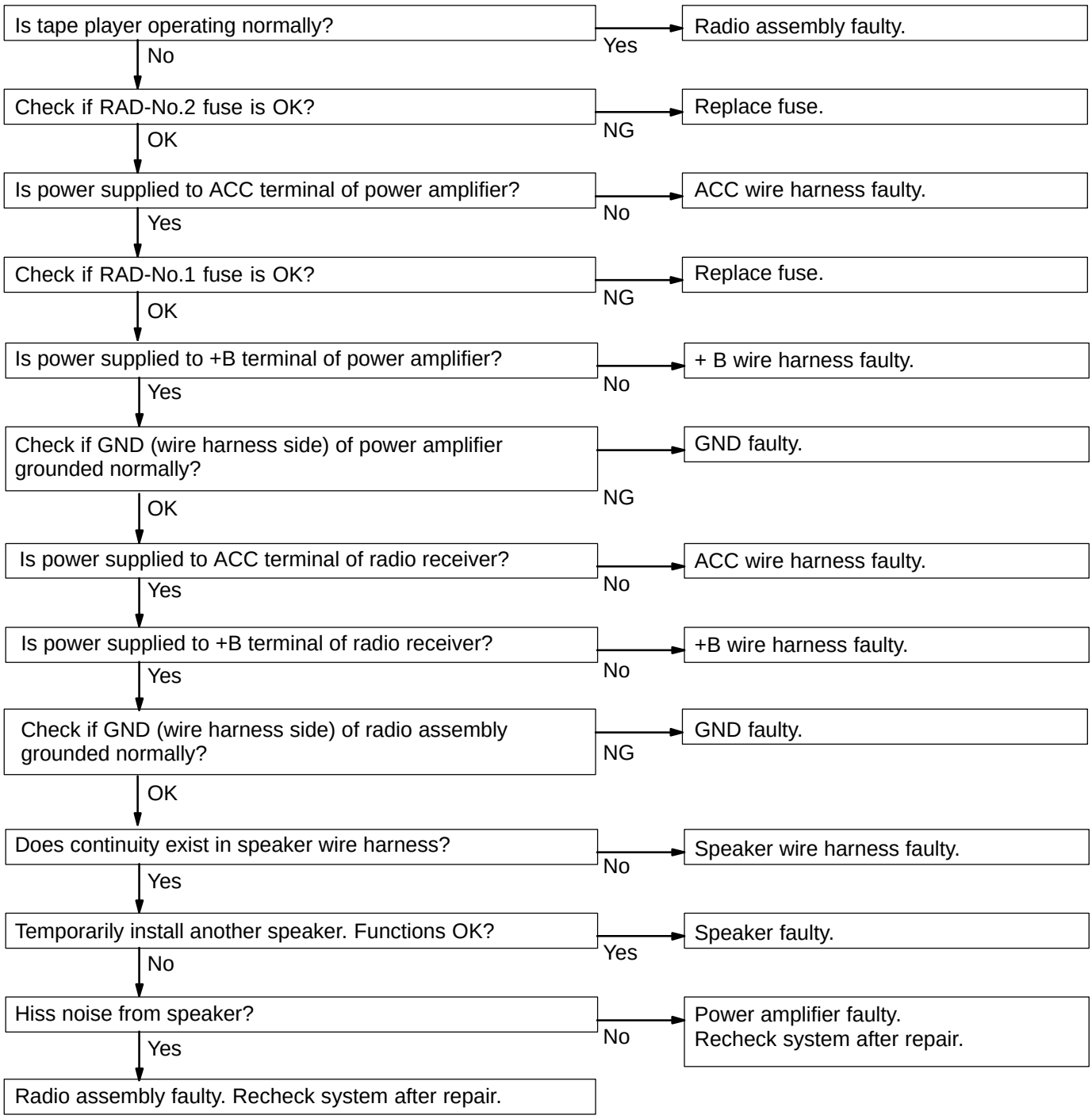
	Problem	No.
Radio	Radio not operating when power switch turned to 'ON'.	1
	Display indicates when power switch turned to 'ON', but no sound (including 'noise') is produced.	2
	Noise present, but AM - FM not operating.	3
	Any speaker does not work.	4
	Any AM or FM does not work.	5
	Few preset turning bands.	5
	Reception poor.	6
	Sound quality poor.	7
	Preset memory disappears.	8
Tape Player	Cassette tape cannot be inserted.	9
	Cassette tape inserted, but no power.	10
	Power coming in, but tape player not operating.	11
	Any speaker does not work.	12
	Sound quality poor.	13
	Tape jammed, malfunction with tape speed or auto-reverse.	14
	Cassette tape will not eject.	15
CD Player	CD cannot be inserted.	16
	CD inserted, but no power.	17
	Power coming in, but CD player not operating.	18
	Sound jumps.	19
	Sound quality poor (Volume faint).	20
	Any speaker does not work.	21
	CD will not be ejected.	22
Power Amplifier	No power coming in.	23
	Power coming in, but power amplifier not operating.	24
	Any speaker does not work.	25
Noise	Noise occurs	26
	Noise produced by vibration or shock while driving.	27
	Noise produced when engine starts.	28

The term "AM" includes LW, MW and SW, and the term "FW" includes UKW.

1	Radio	RADIO NOT OPERATING WHEN POWER SWITCH TURNED TO ”ON”



2	Radio	DISPLAY INDICATES WHEN POWER SWITCH TURNED TO ”ON”, BUT NO SOUND (INCLUDING ”NOISE”) IS PRODUCED

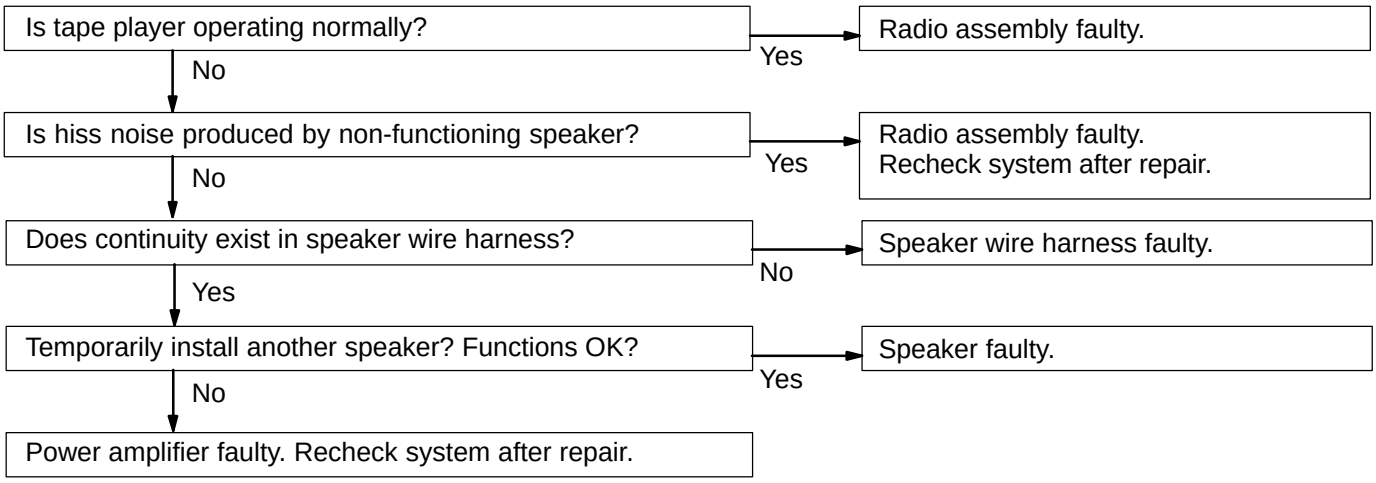


3	Radio	NOISE PRESENT, BUT AM-FM NOT OPERATING

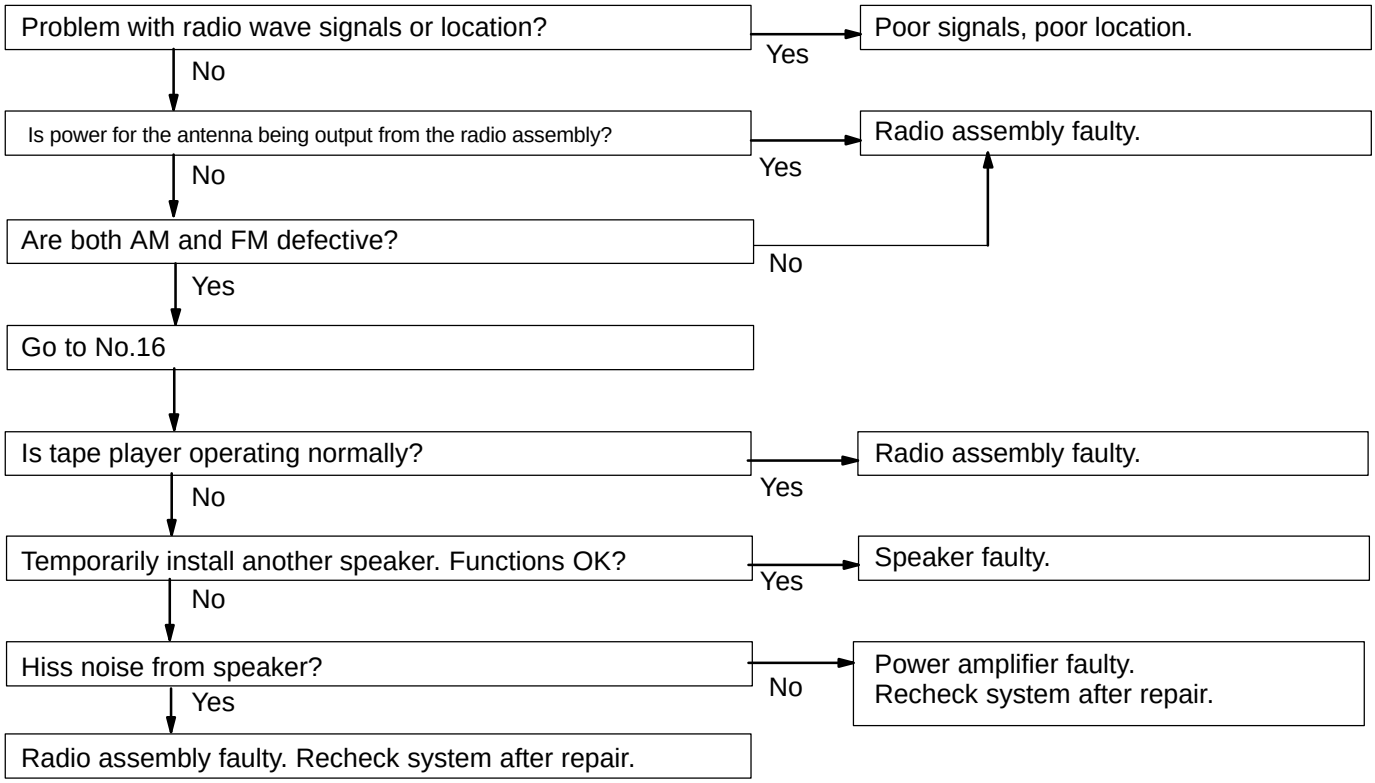
Go to No.25

If radio side faulty. → Radio faulty.

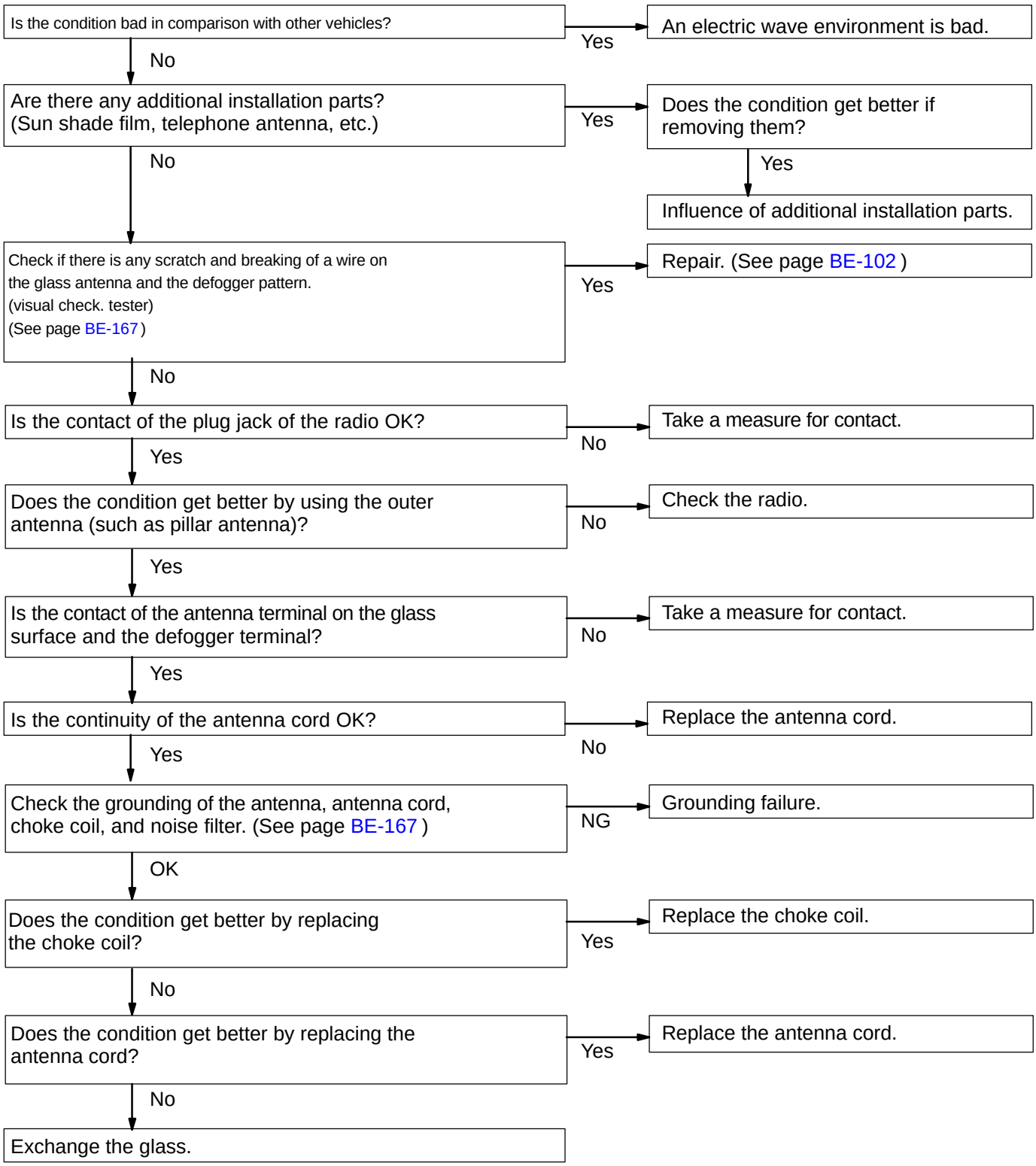
4	Radio	ANY SPEAKER DOSE NOT WORK



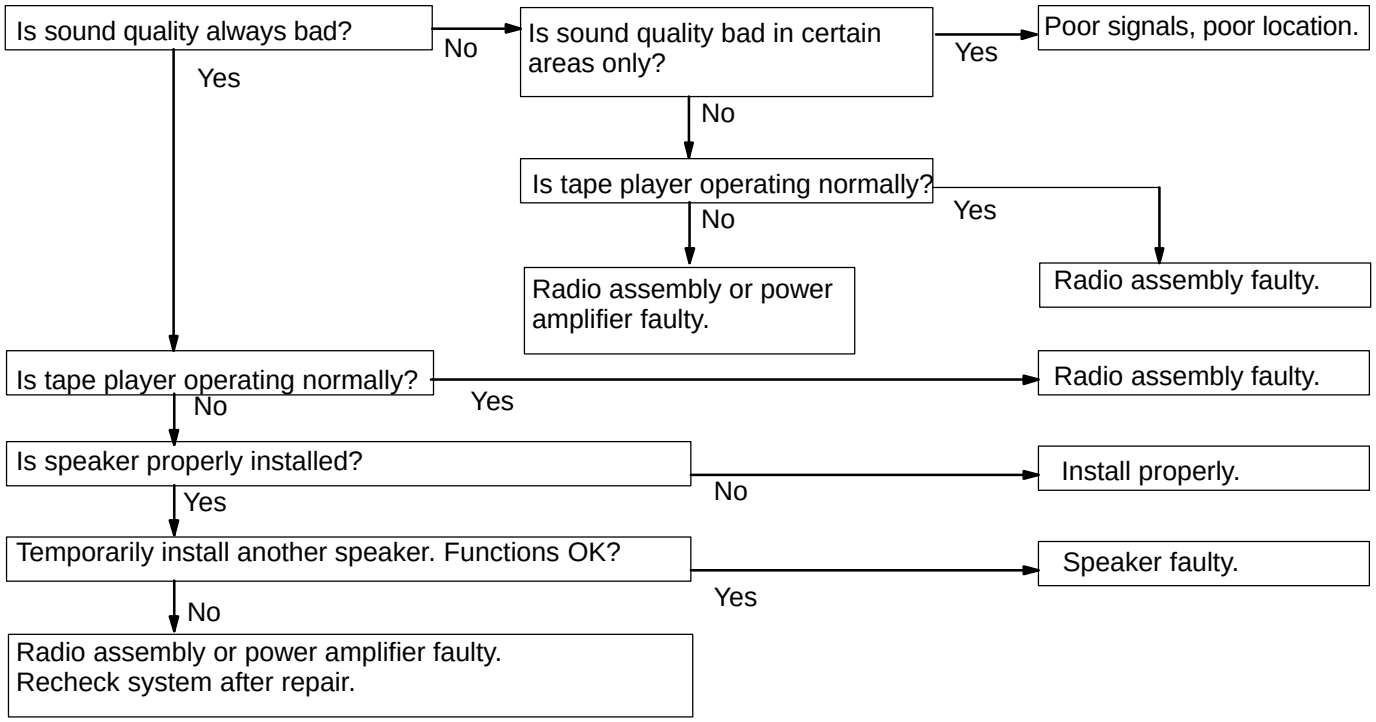
5	Radio	ANY AM OR FM DOES NOR WORK FEW PRESET TUNING BANDS



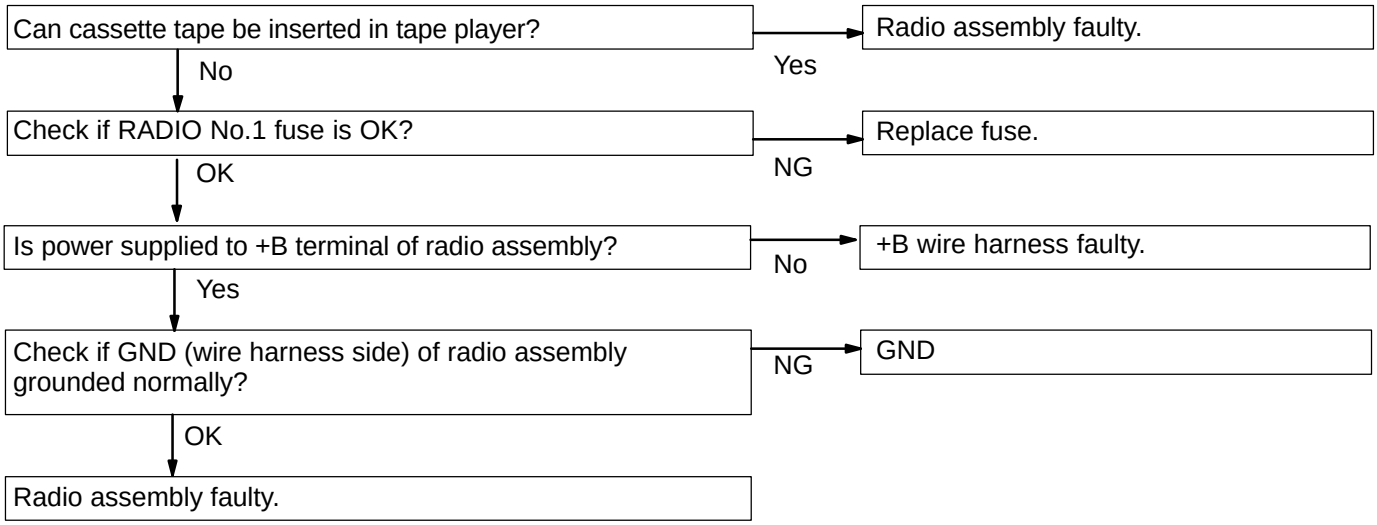
6	Radio	POOR RECEPTION



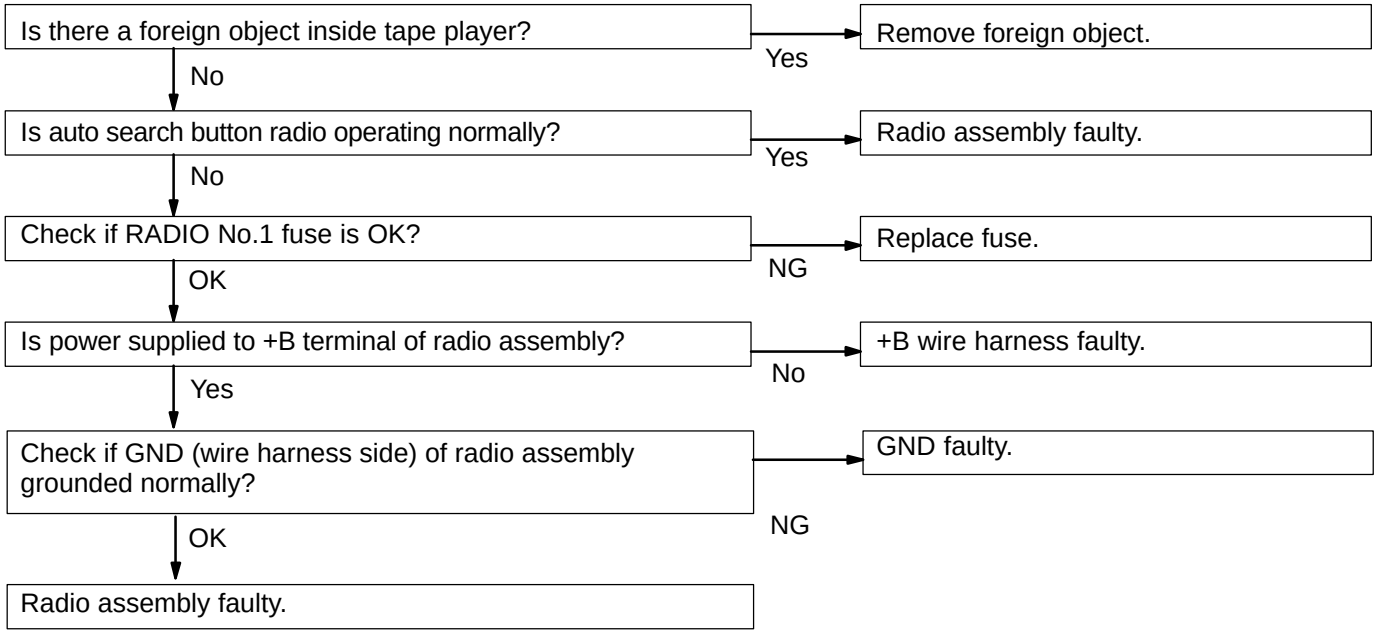
7	Radio	SOUND QUALITY POOR



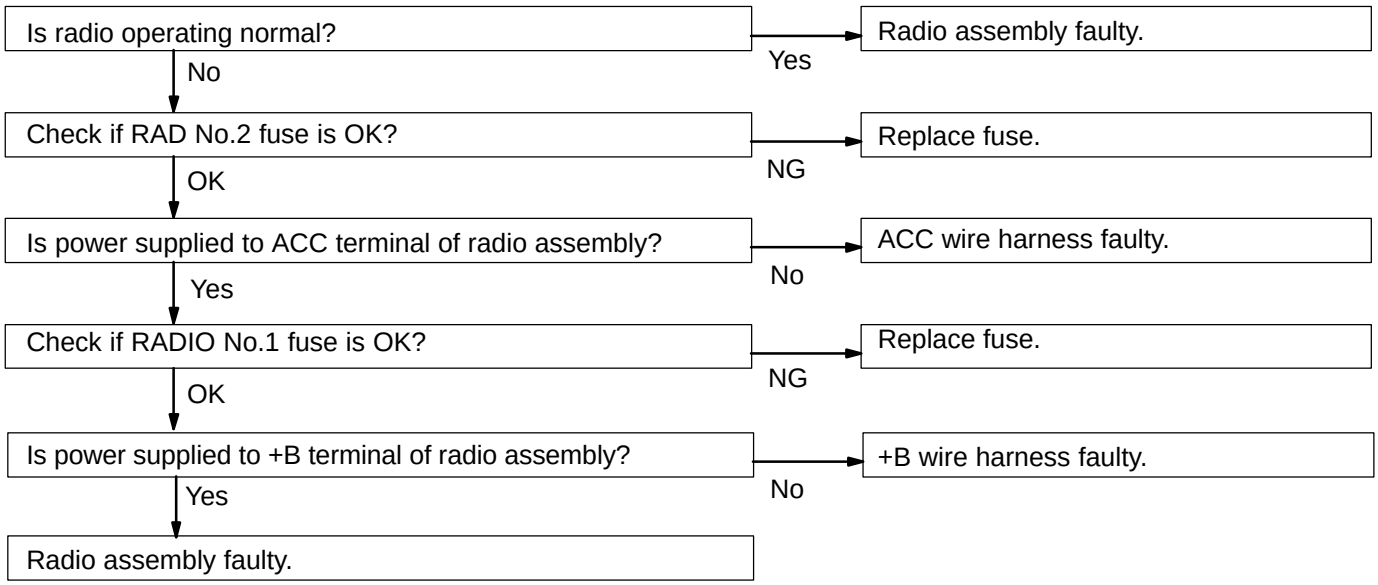
8	Radio	PRESET MEMORY DISAPPEARS



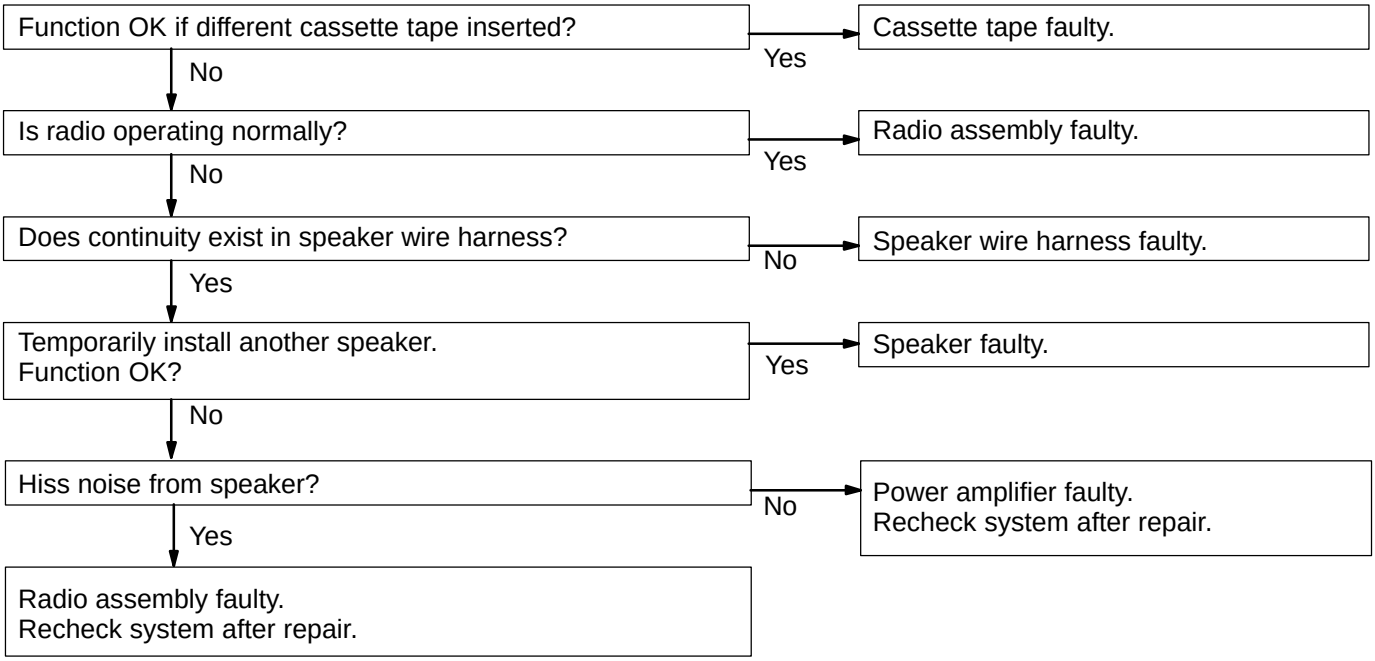
9	Tape Player	CASSETTE TAPE CANNOT BE INSERTED



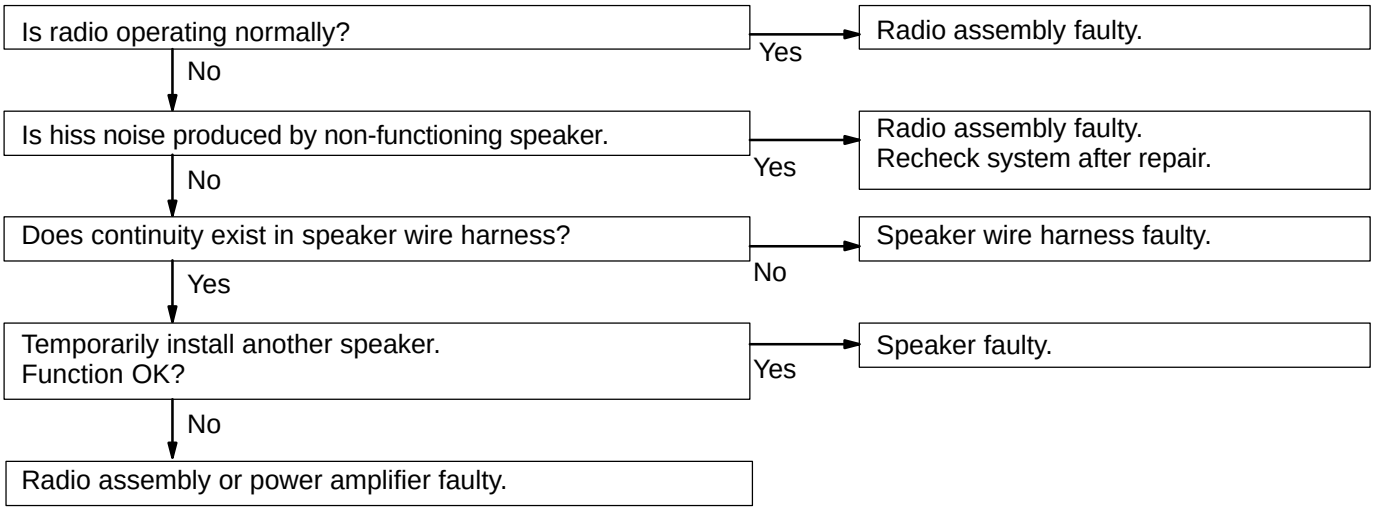
10	Tape Player	CASSETTE TAPE INSERTED, BUT NO POWER



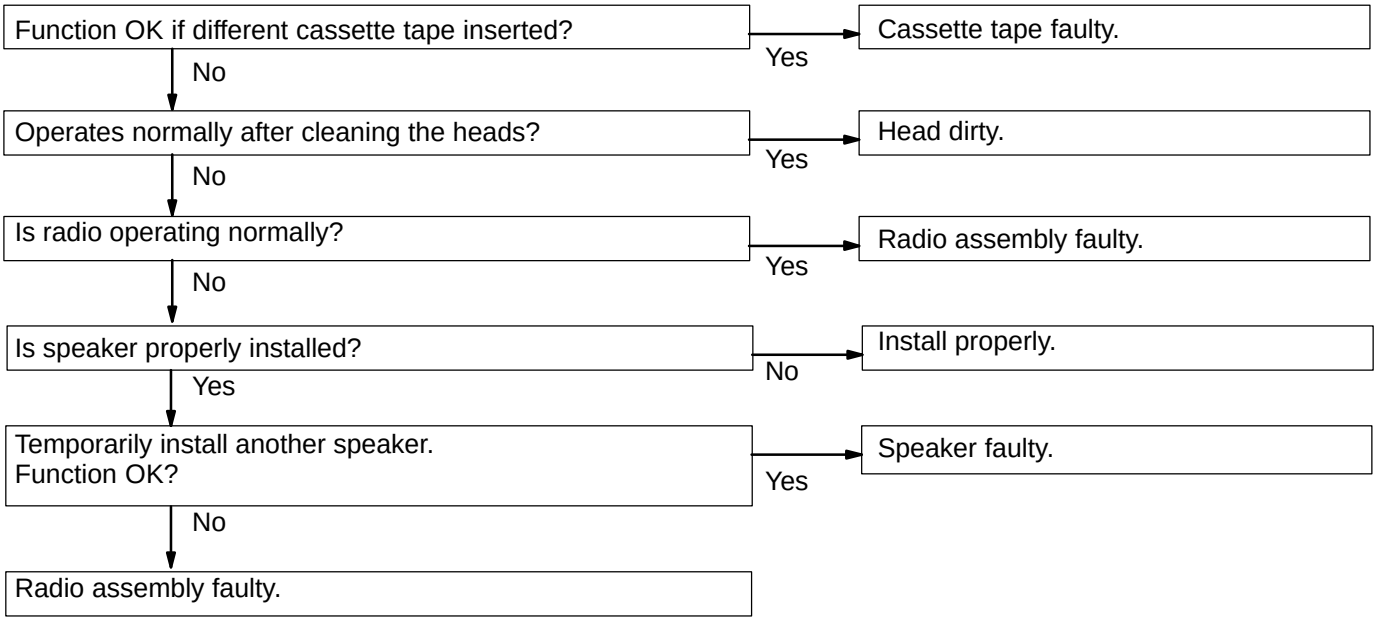
11	Tape Player	POWER COMING IN, BUT TAPE PLAYER NOT OPERATING



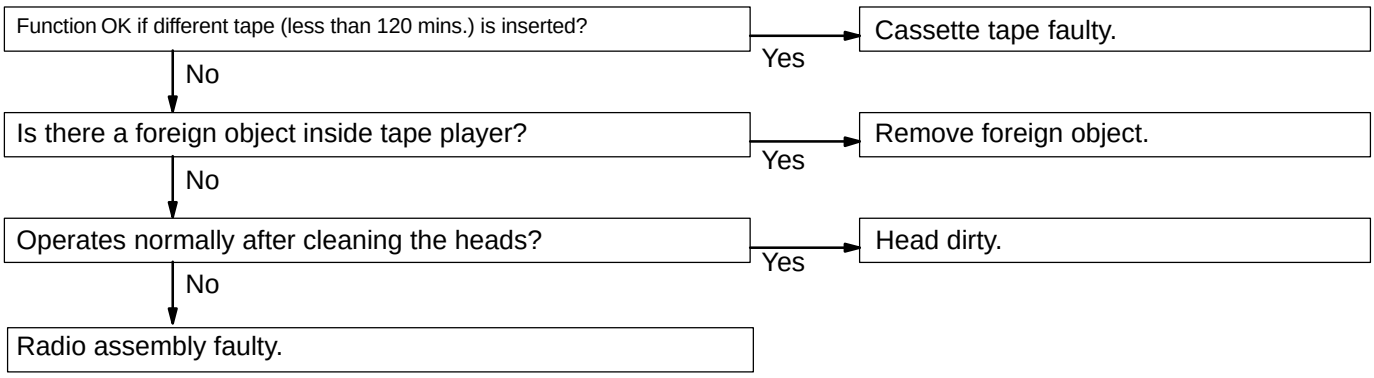
12	Tape Player	ANY SPEAKER DOES NOT WORK



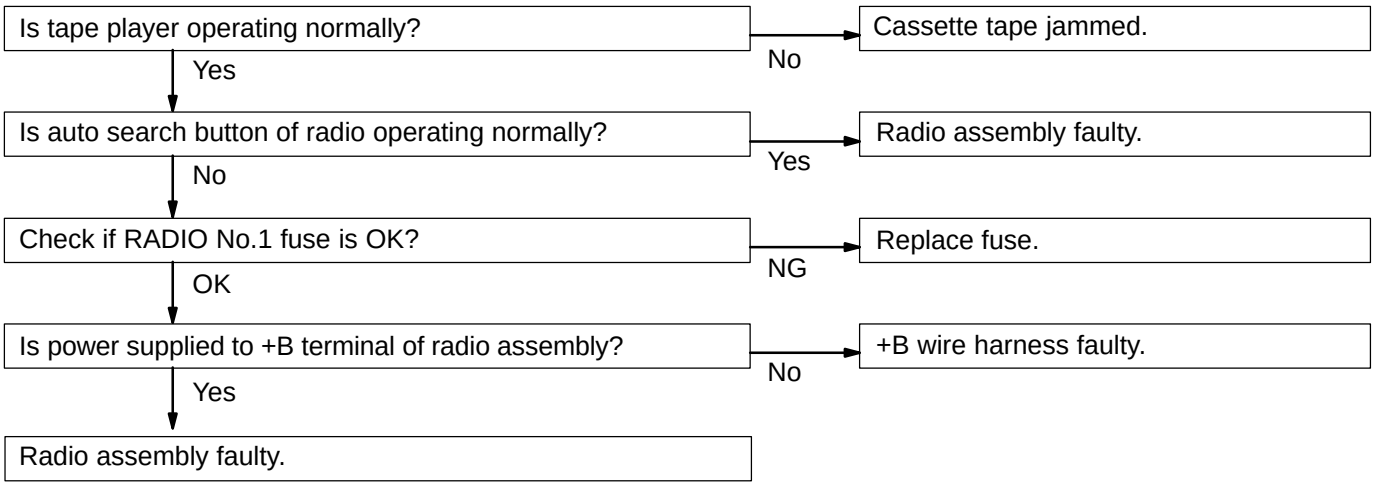
13	Tape Player	SOUND QUALITY POOR (VOLUME FAINT)



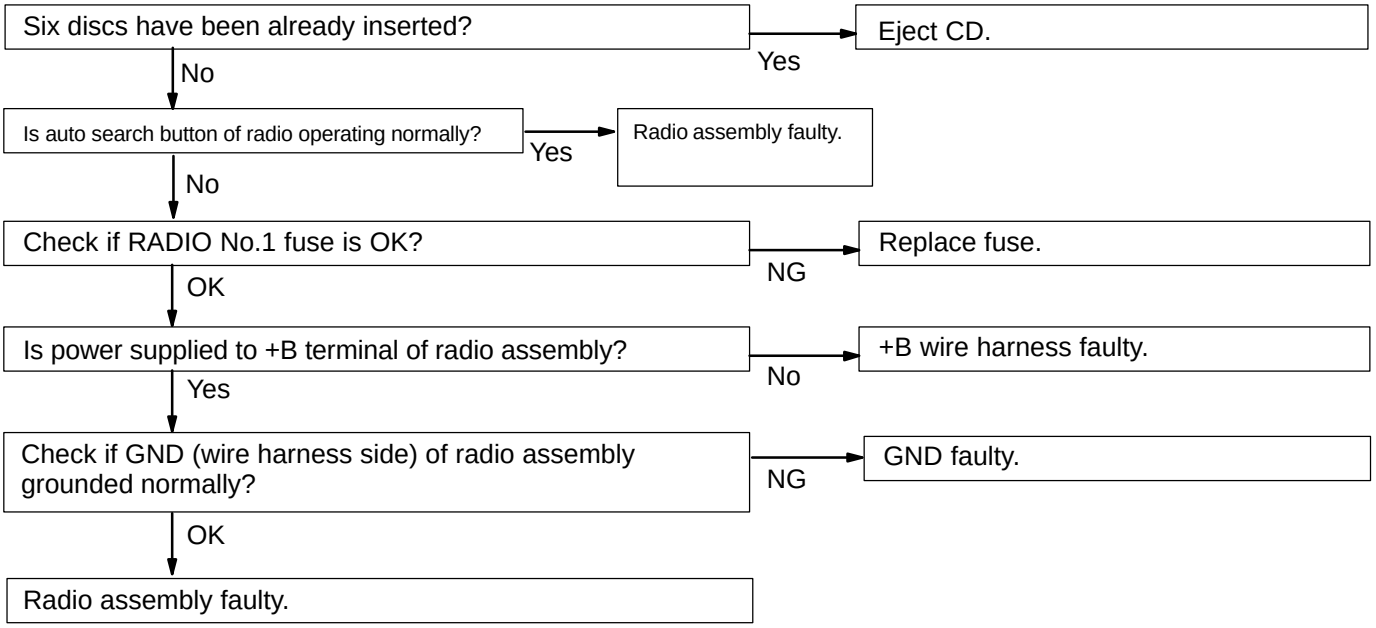
14	Tape Player	TAPE JAMMED MALFUNCTION WITH TAPE SPEED OR AUTO-REVERSE



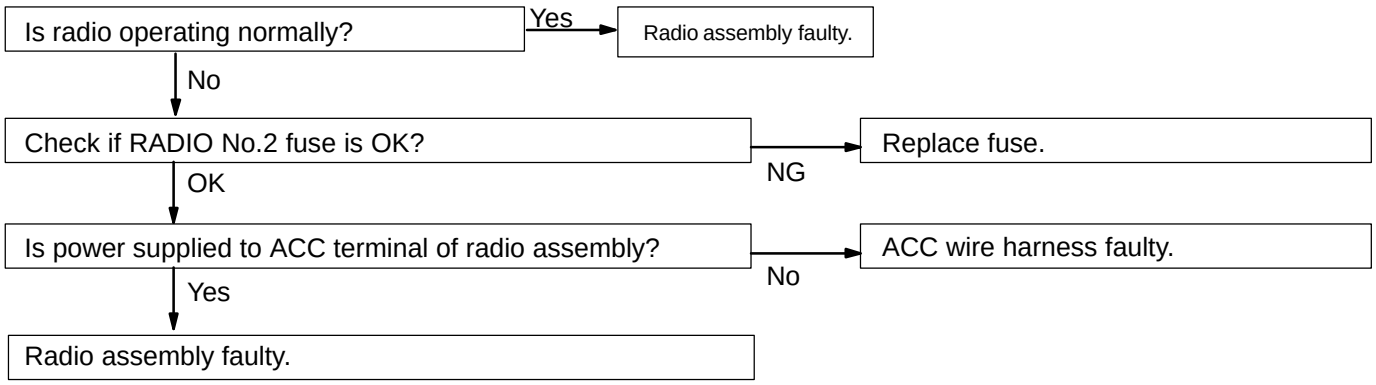
15	Tape Player	CASSETTE TAPE WILL NOT BE EJECTED



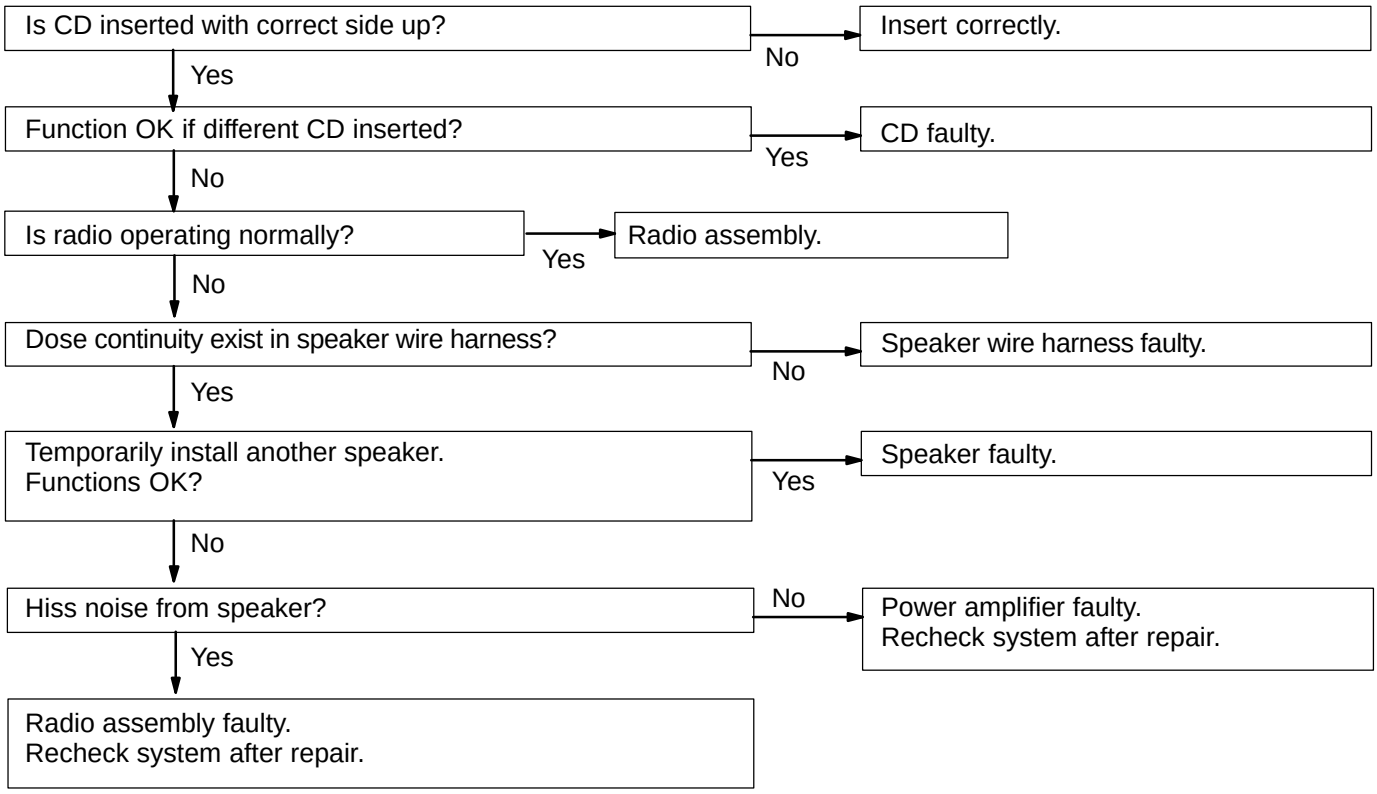
16	CD Player	CD CANNOT BE INSERTED



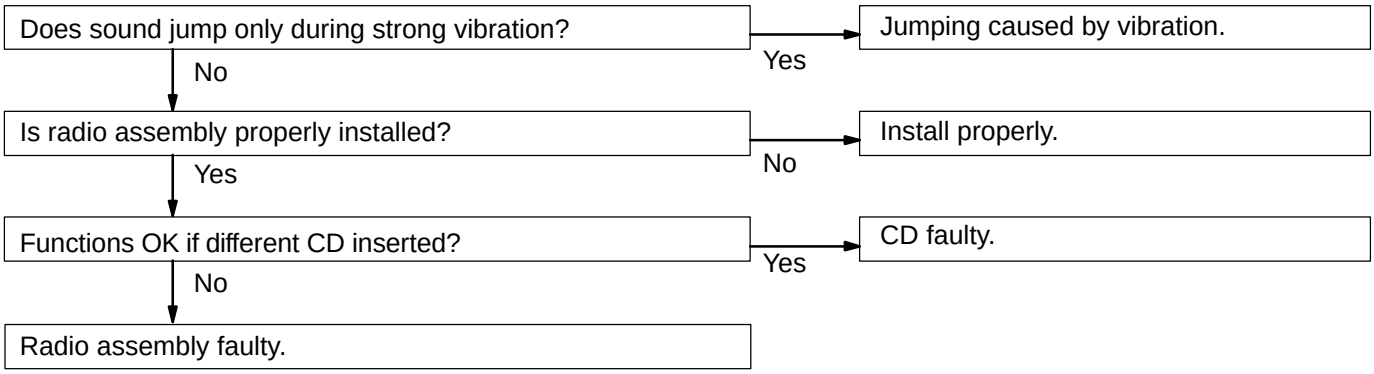
17	CD Player	CD INSERTED, BUT NO POWER



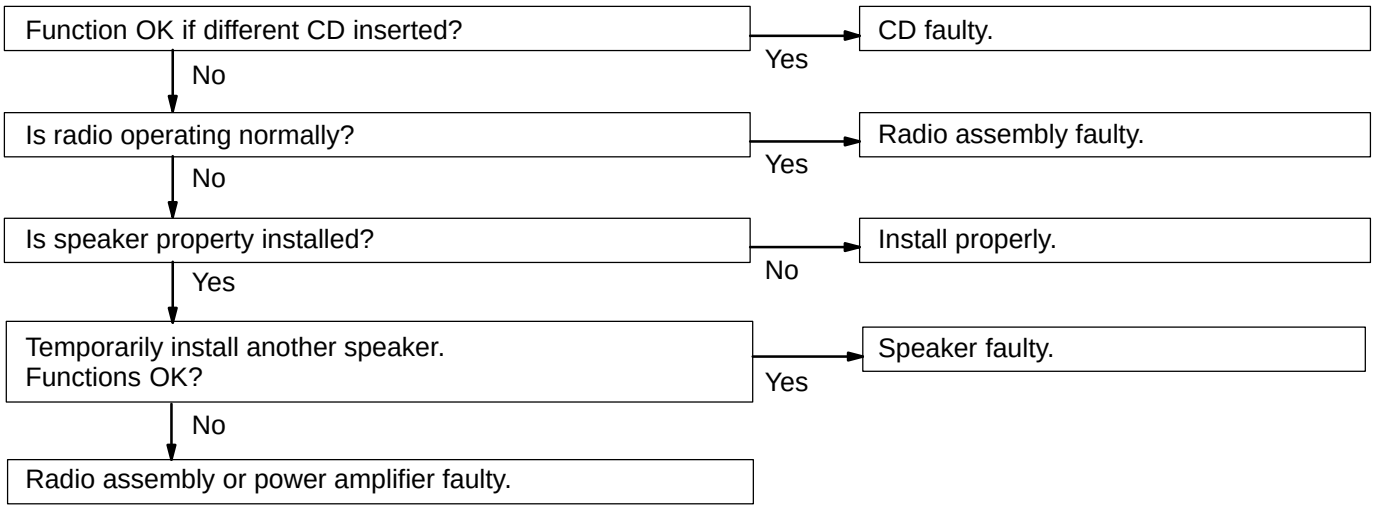
18	CD Player	POWER COMING IN, BUT CD PLAYER NOT OPERATING



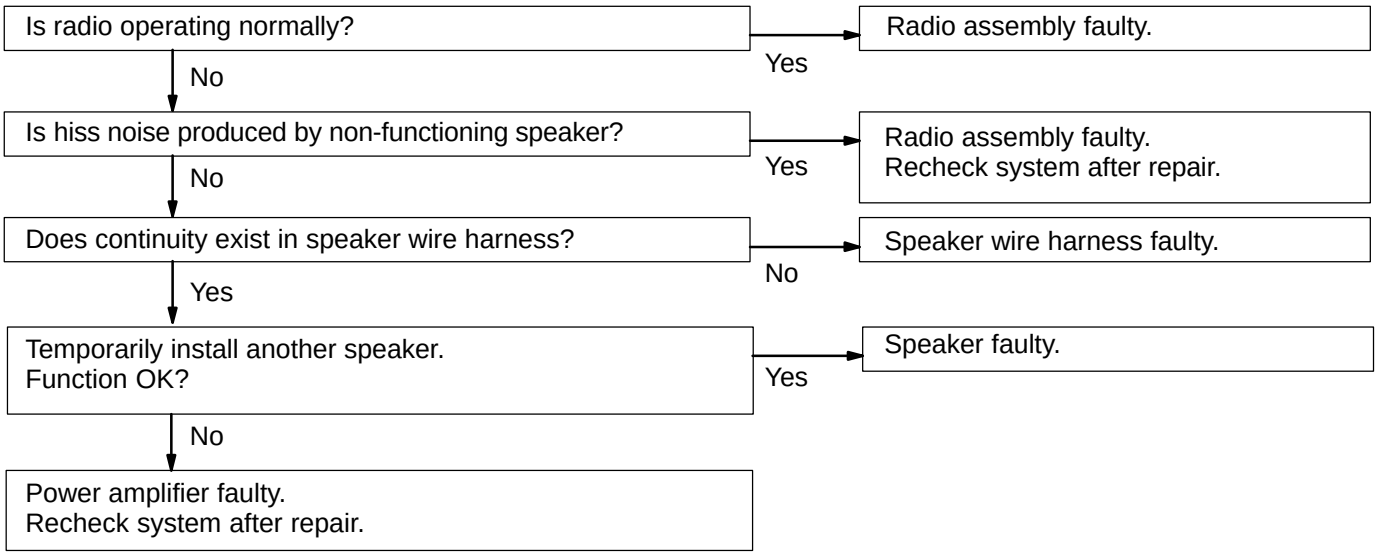
19	CD Player	SOUND JUMPS



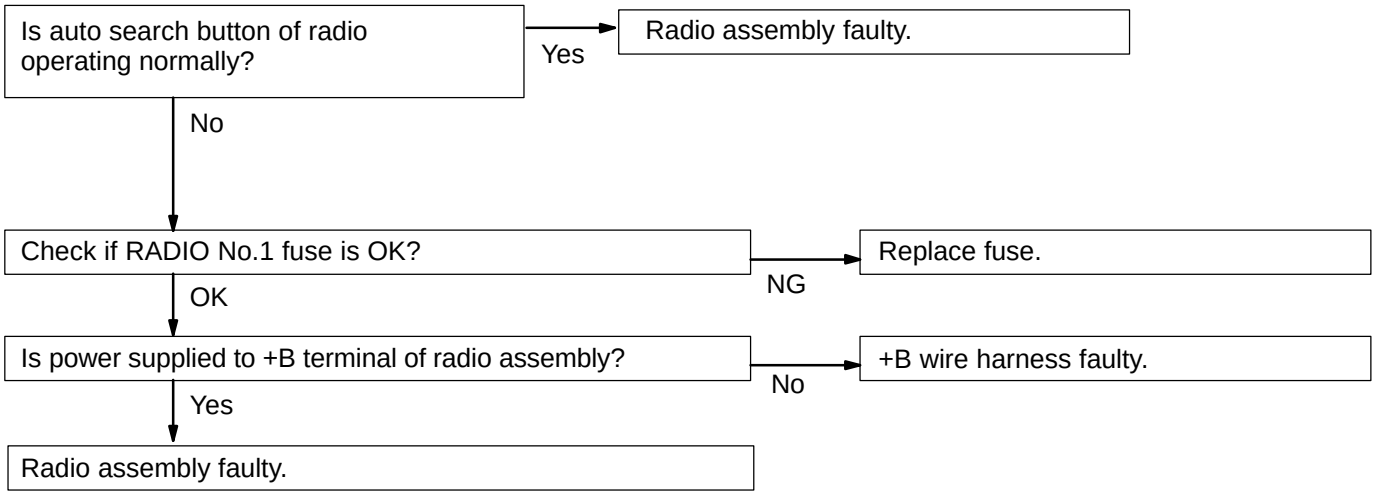
20	CD Player	SOUND QUALITY POOR (VOLUME FAINT)



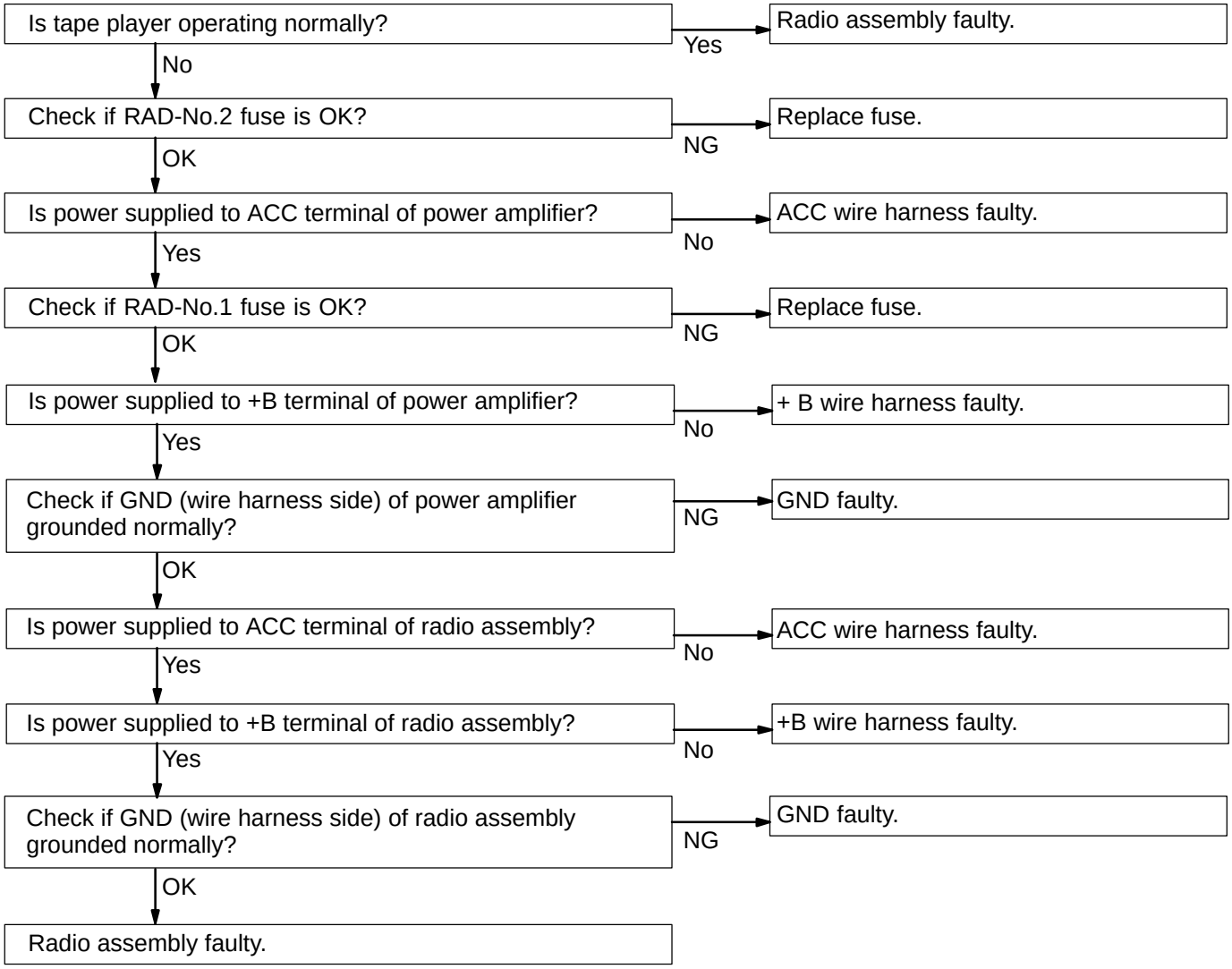
21	CD Player	ANY SPEAKER DOES NOT WORK



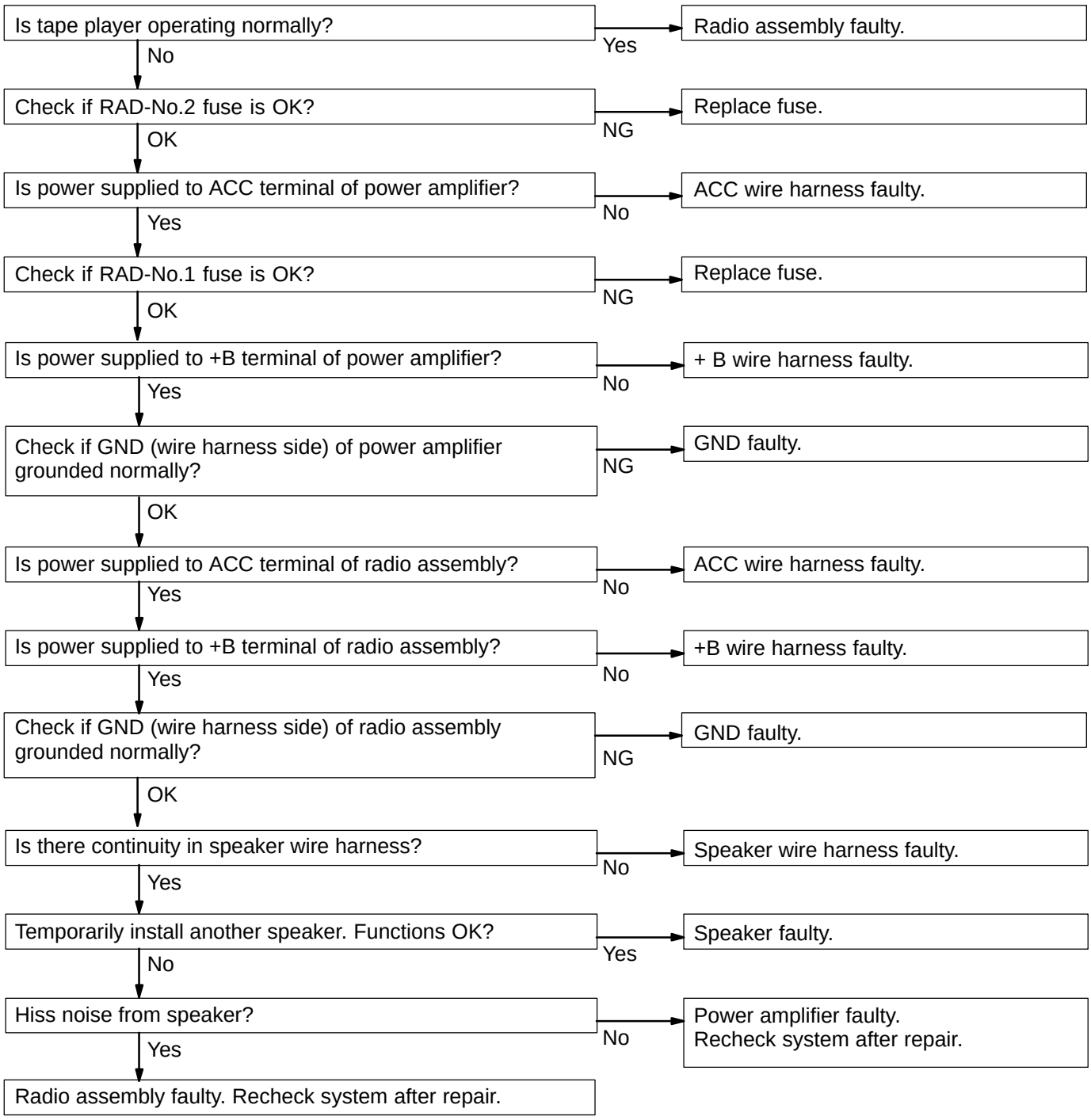
22	CD Player	CD WILL NOT BE EJECTED



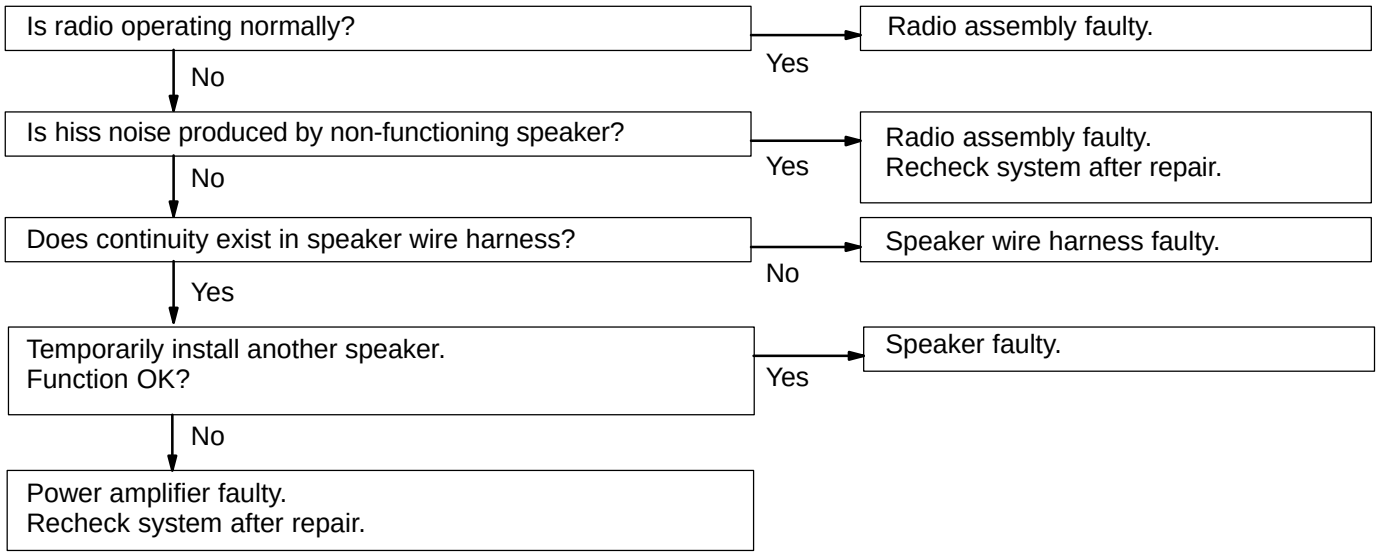
23	Power Amplifier	NO POWER COMING IN



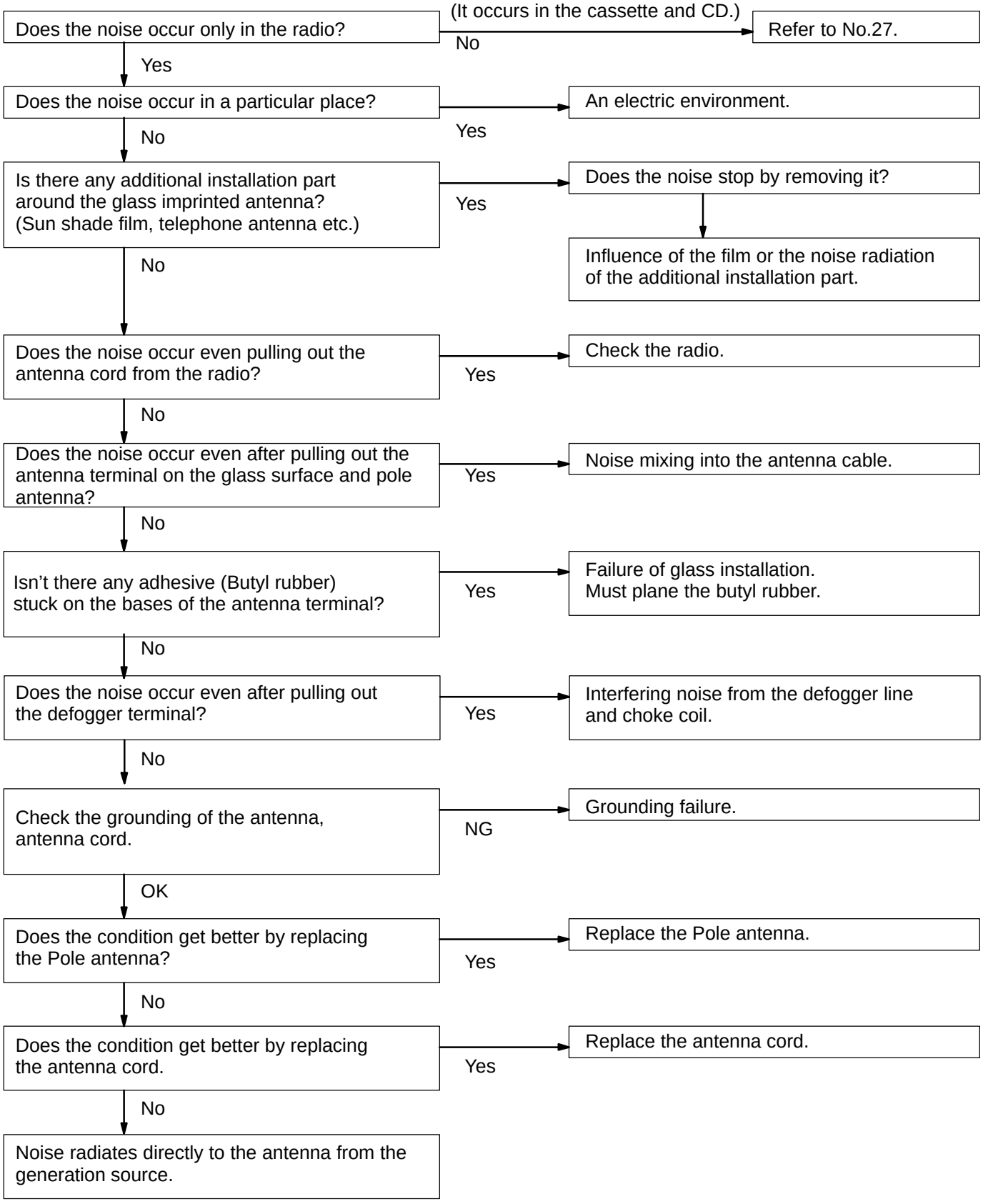
24	Power Amplifier	POWER COMING IN, BUT WOOFER (POWER) AMPLIFIER NOT OPERATING



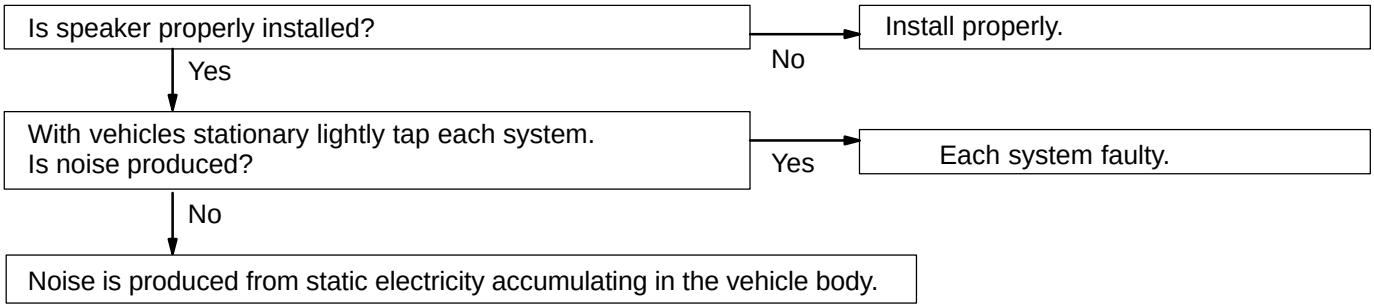
25	Power Amplifier	ANY SPEAKER DOES NOT WORK



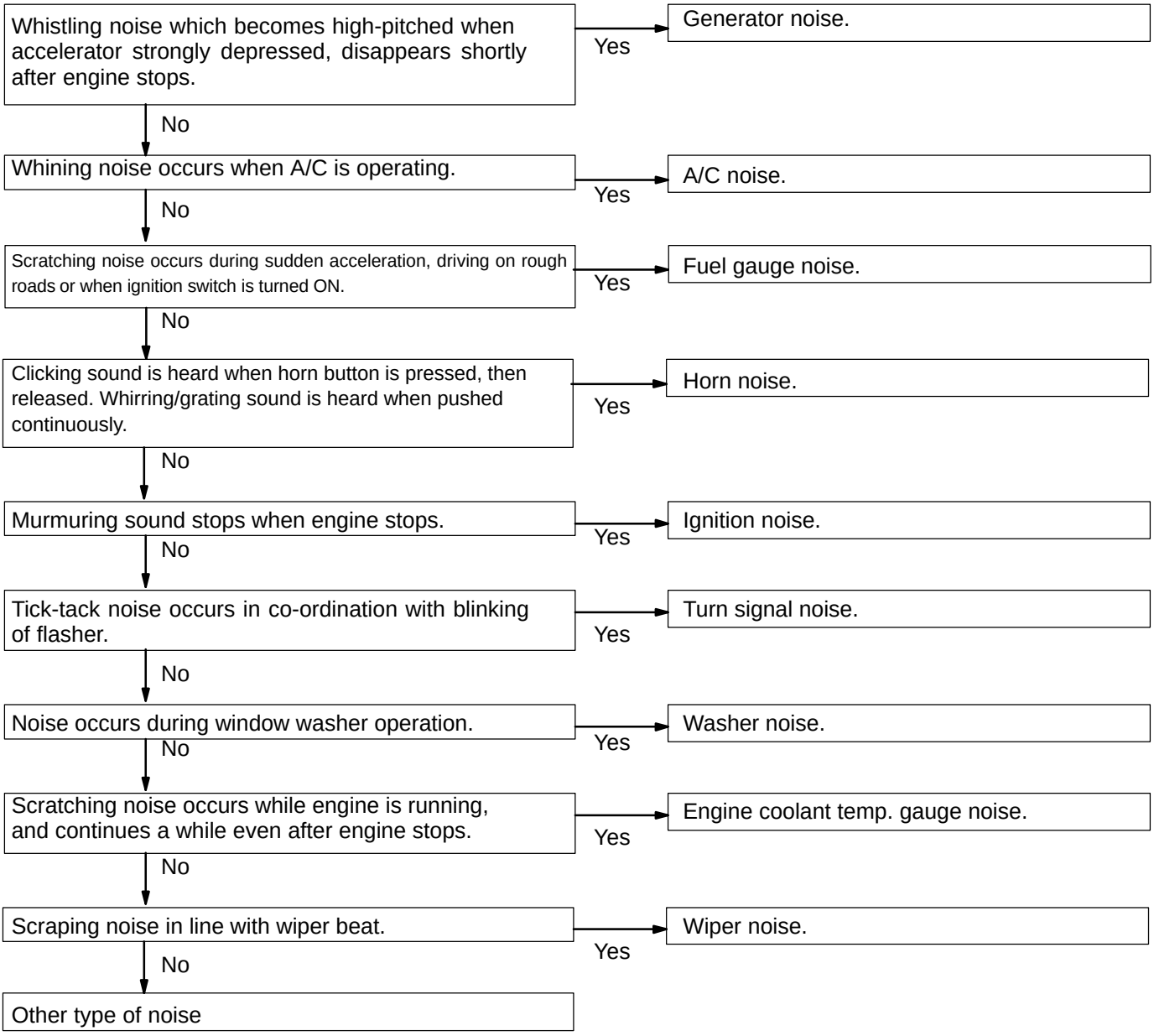
26	Noise	NOISE OCCURS



27	Noise	NOISE PRODUCED BY VIBRATION OR SHOCK WHILE DRIVING

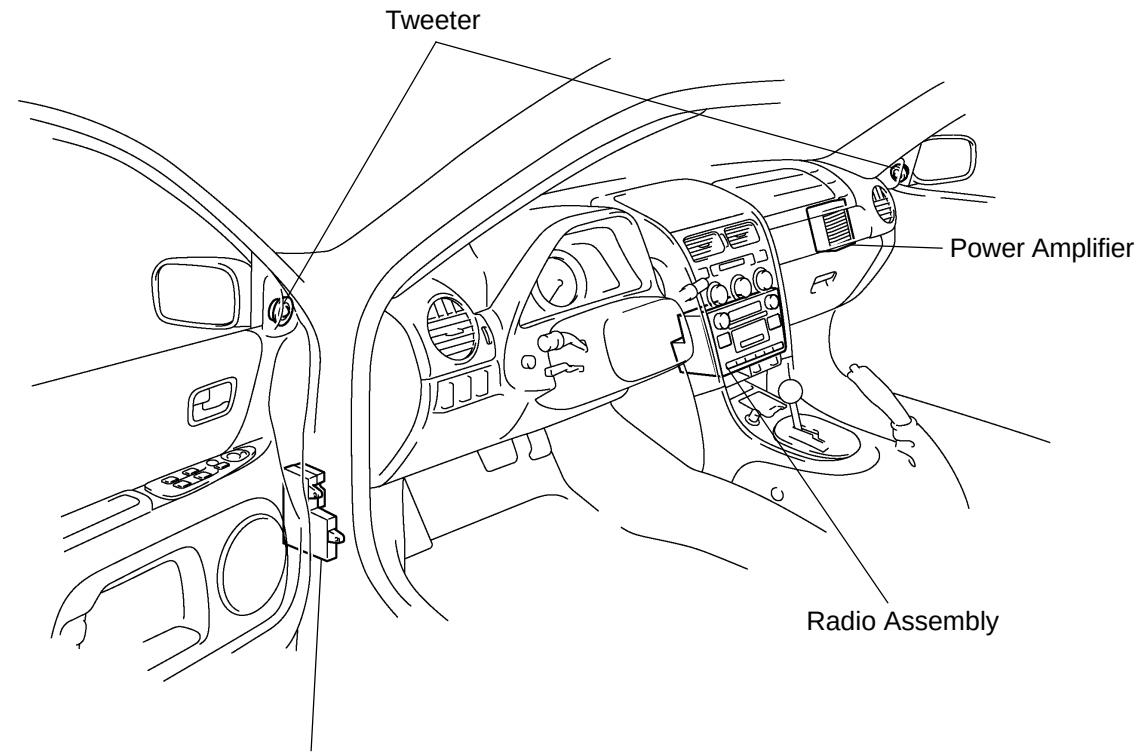


28	Noise	NOISE PRODUCED WHEN ENGINE STARTS

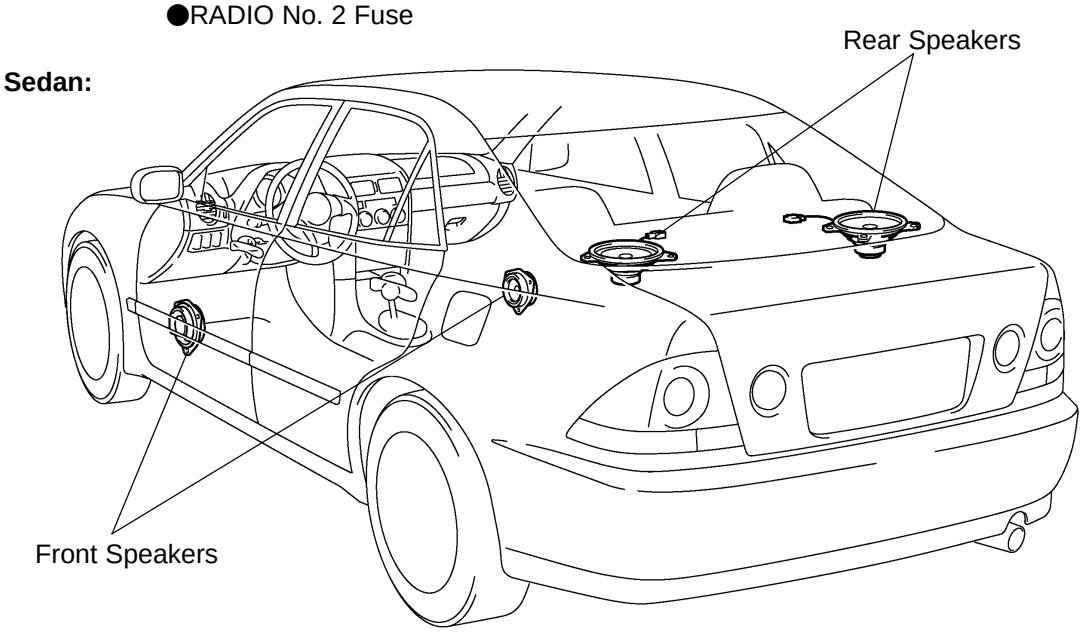


BE2A9-02

LOCATION



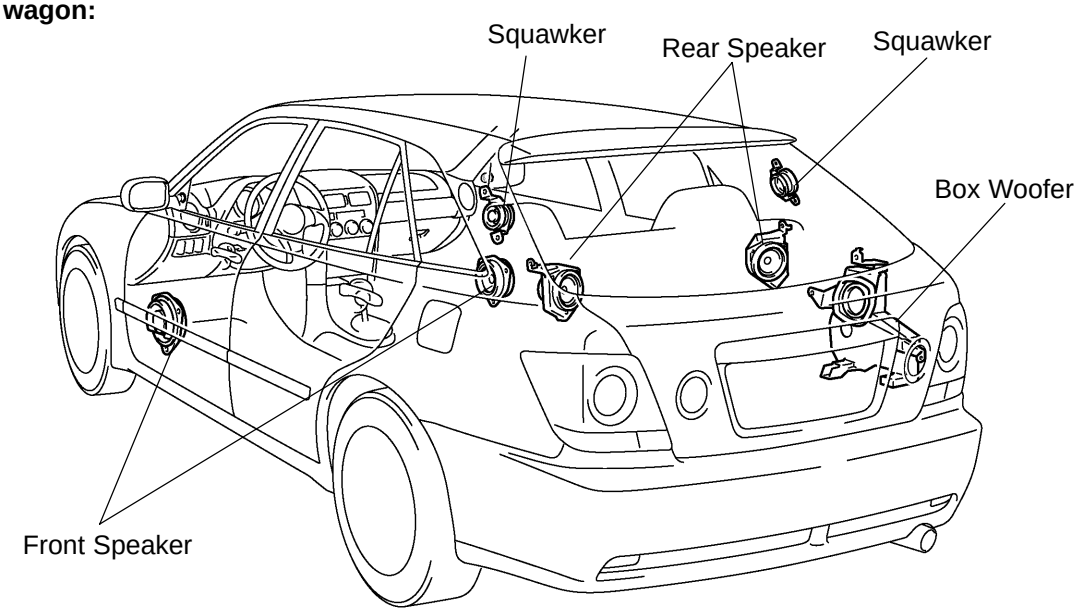
Sedan:



C

I27832

wagon:



C

I27833

BE16M-07

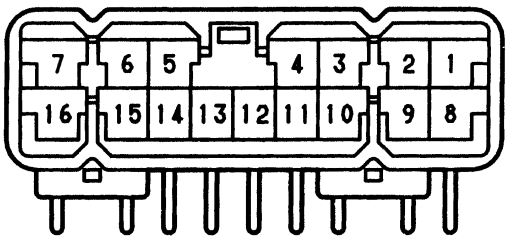
INSPECTION

1. INSPECT POWER AMPLIFIER CIRCUIT

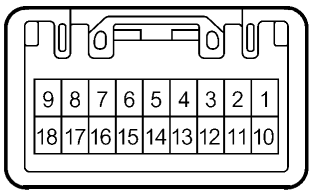
Connect the connector from power amplifier and inspect the connector on the wire harness side.

Power amplifier side

Connector "A"



Connector "B"



e16220A

I11410

Tester connection	Condition	Specified condition
A1 - Ground (FL+)	Audio sounding	5 - 7 V
A2 - Ground (FR+)	Audio sounding	5 - 7 V
A3 - Ground (RL+)	Audio sounding	5 - 7 V
A4 - Ground (WL+)	Audio sounding	5 - 7 V
A5 - Ground (RR+)	Audio sounding	5 - 7 V
A6 - Ground (WR+)	Audio sounding	5 - 7 V
A7 - Ground (BU+)	Audio sounding	Battery voltage
A8 - Ground (FL-)	Audio sounding	5 - 7 V
A9 - Ground (FR-)	Audio sounding	5 - 7 V
A10 - Ground (RL-)	Audio sounding	5 - 7 V
A11 - Ground (WL-)	Audio sounding	5 - 7 V
A12 - Ground (GND)	Constant	Continuity
A14 - Ground (RR-)	Audio sounding	5 - 7 V
A15 - Ground (WR-)	Audio sounding	5 - 7 V
A16 - Ground (ACC)	Ignition switch ACC	Battery voltage
B1 - Ground (TX+)	Constant	Battery voltage
B2 - Ground (CTX+)	Radio power switch ON	Battery voltage

B5 - Ground (N-MUTE)	Audio sounding	Battery voltage
B6 - Ground (T-MUTE)	Audio sounding	Battery voltage
B7 - Ground (MUTE)	Audio sounding	1 V or below
B8 - Ground (L+)	Audio sounding	1 V or below
B9 - Ground (R+)	Audio sounding	1 V or below
B10 - Ground (TX-)	Constant	Continuity
B11 - Ground (CTX-)	Constant	Continuity
B14 - Ground (GND)	Constant	Continuity
B15 - Ground (GND)	Constant	Continuity
B17 - Ground (L-)	Audio sounding	1 V or below
B18 - Ground (R-)	Audio sounding	1 V or below

If the circuit is not as specified, inspect the circuits connected to other parts.

2. INSPECT RADIO RECEIVER ASSEMBLY CIRCUIT

Connect the connectors from the radio receiver assembly, and inspect the connector on the wire harness side.

Radio Receiver Side

N

I15534

Tester connection	Condition	Specified condition
A1 - Ground (B)	Constant	Battery Positive Voltage
A2 - Ground (ILL+)	Light switch ON	Battery Positive Voltage
A3 - Ground (AMP)	Ignition switch ACC	10 - 14 V
A7 - Ground (MUTE)	Ignition switch ACC and Audio OFF	1 V or below
A8 - Ground (CDR+)	Audio sounding	Approx. 0.7 V
A9 - Ground (CDL+)	Audio sounding	Approx. 0.7 V
A11 - Ground (ACC)	Ignition switch ACC	Battery Positive Voltage
A12 - Ground (ILL-)	Light switch ON	0 - 14 V (Variable)
A13 - Ground (ANT)	Radio power switch ON	Battery Positive Voltage
A16 - Ground (SGND)	Constant	Continuity
A18 - Ground (CDR-)	Audio sounding	Approx. 0.7 V
A19 - Ground (CDL-)	Audio sounding	Approx. 0.7 V
A20 - Ground (E)	Constant	Continuity
B9 - Ground (TX-)	System check mode	-
B10 - Ground (TX+)	System check mode	-

*: w/ LEXUS navigation system

If the circuit is not as specified, inspect the circuits connected to other parts.

HINT:
Check the wire harness between radio receiver assembly and power amplifier.

3. INSPECT GLASS IMPRINTED ANTENNA

Use same procedure as for ”INSPECT DEFOGGER WIRES” on page BE-102 .

4. REPAIR GLASS IMPRINTED ANTENNA

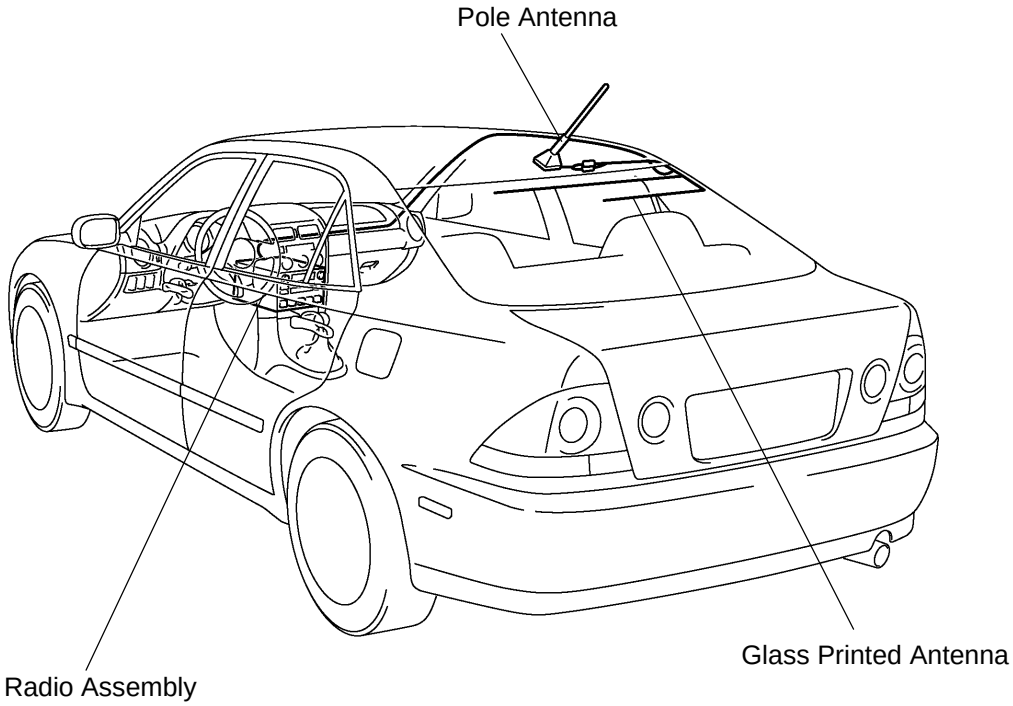
Use same procedure as for ”REPAIR DEFOGGER WIRES” on page BE-102 .

ANTENNA

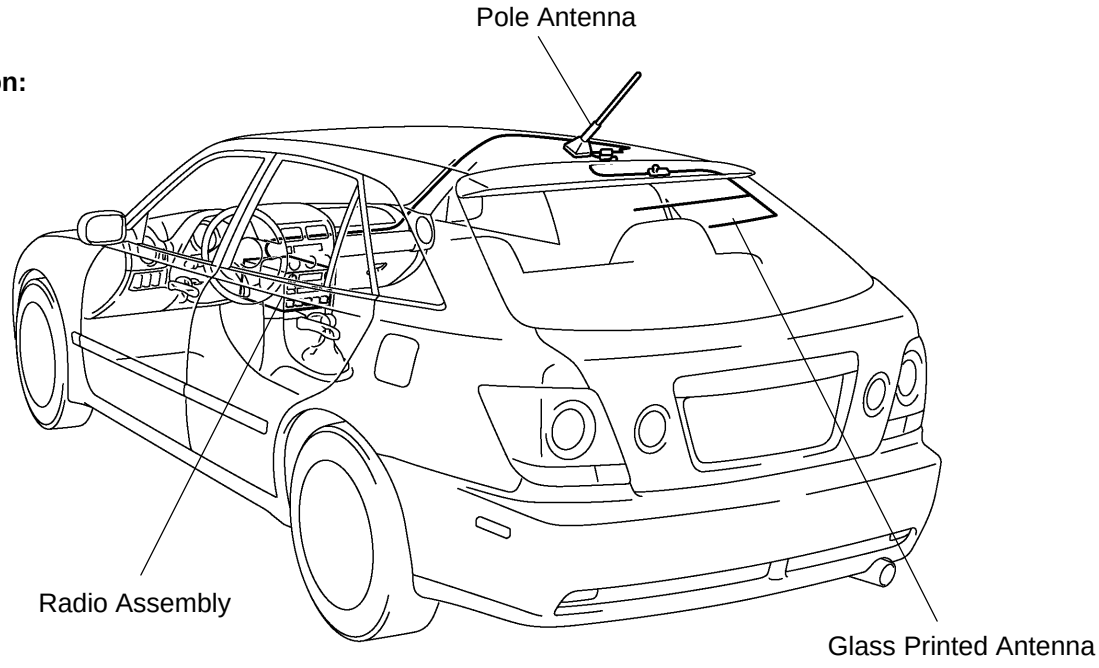
LOCATION

BE16N-04

Sedan:



Wagon:

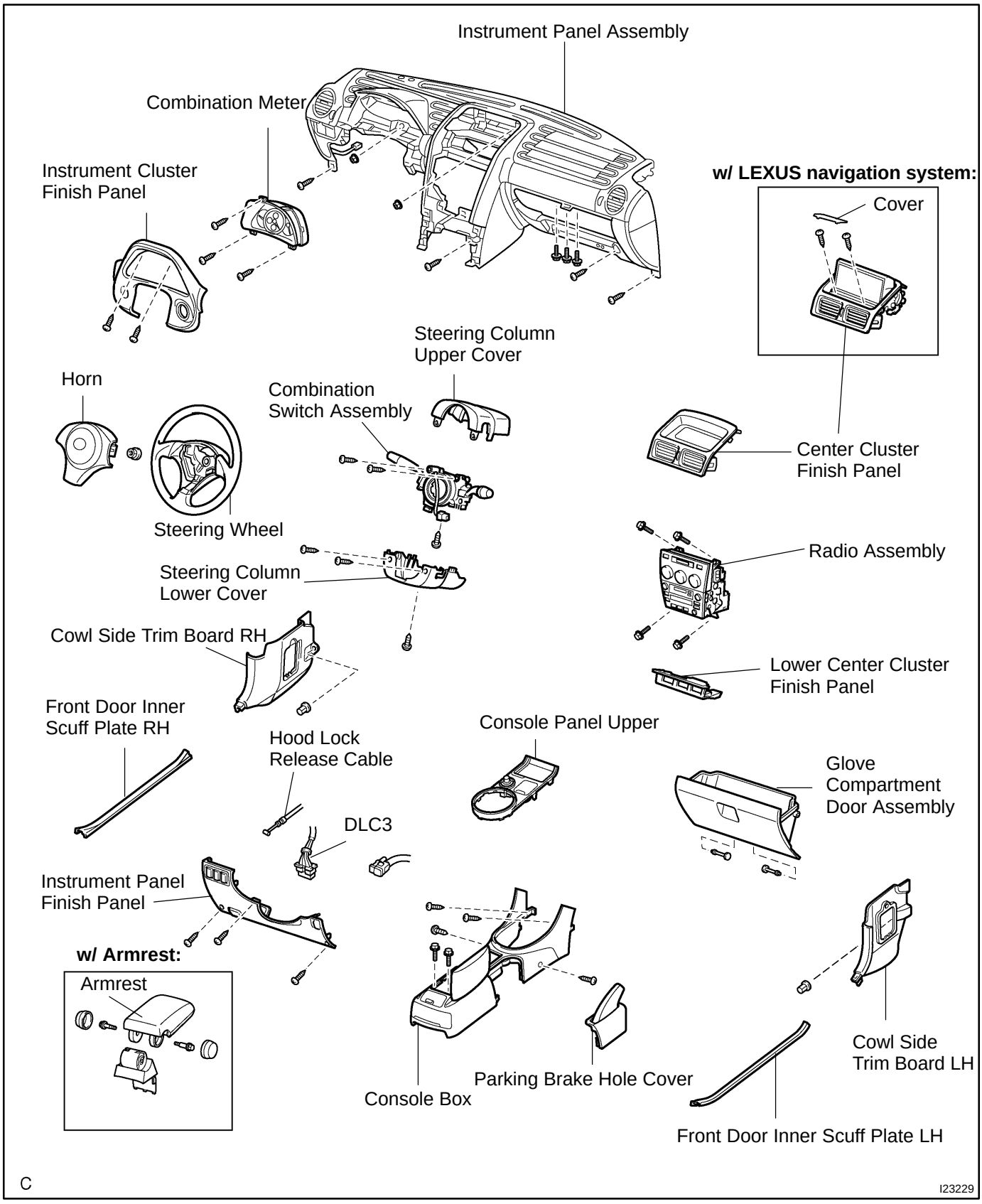


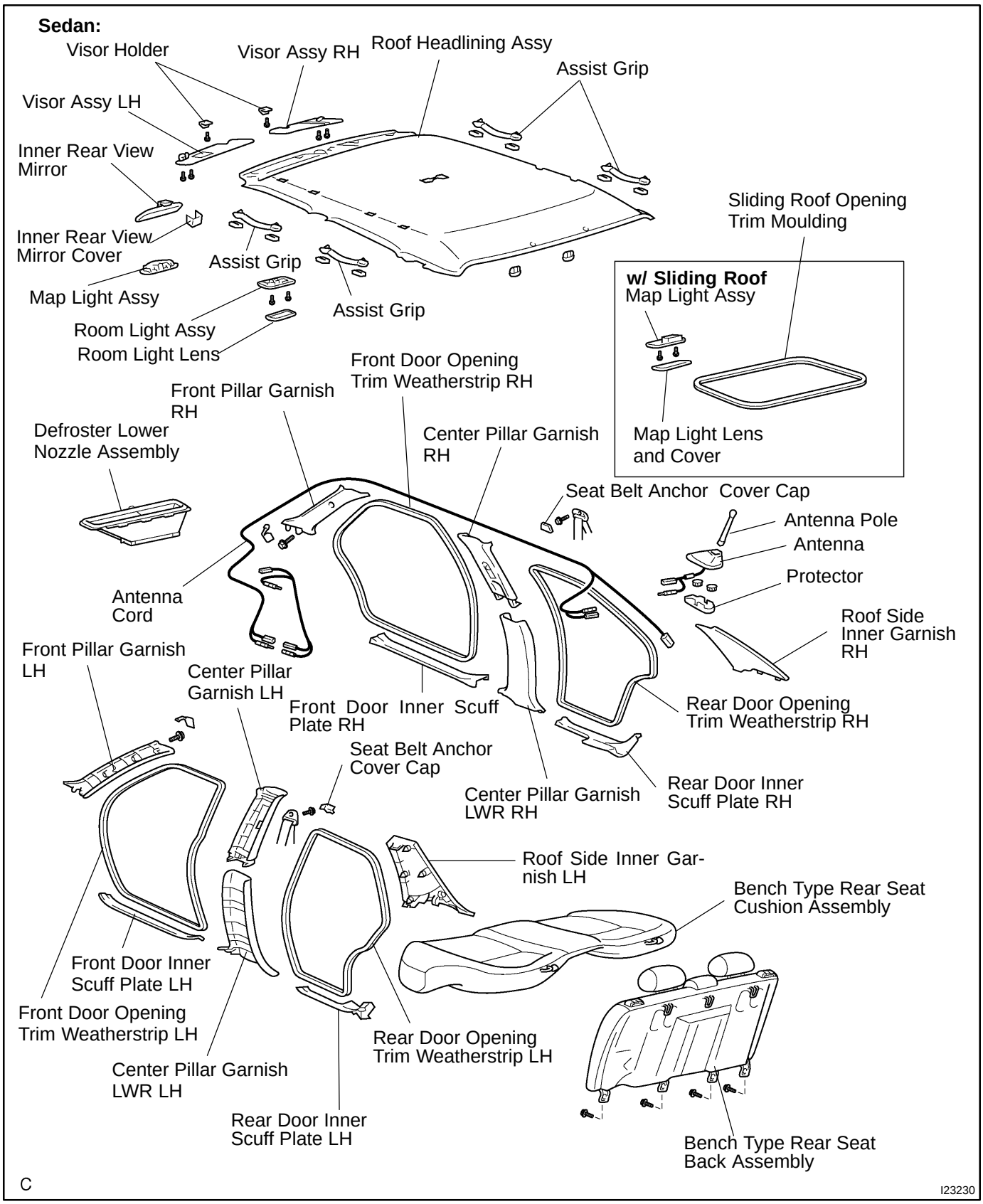
C

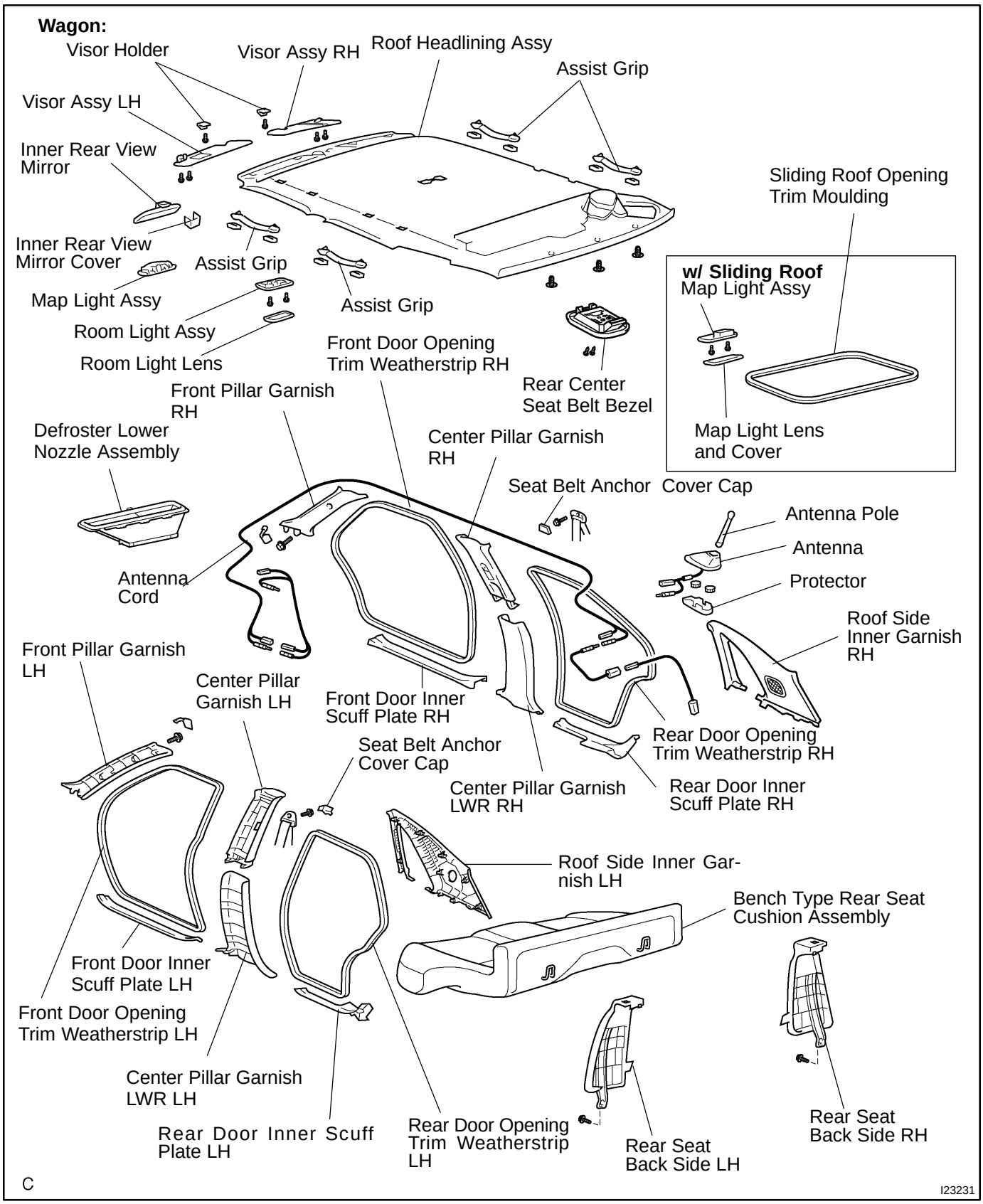
I27834

BE2AA-01

COMPONENTS




Sedan:
Visor Holder
Visor Assy RH
Roof Headlining Assy
Assist Grip
Visor Assy LH
Inner Rear View Mirror
Sliding Roof Opening Trim Moulding
Inner Rear View Mirror Cover
Assist Grip
w/ Sliding Roof
Map Light Assy
Map Light Assy
Assist Grip
Room Light Assy
Room Light Lens
Front Door Opening Trim Weatherstrip RH
Front Pillar Garnish RH
Defroster Lower Nozzle Assembly
Center Pillar Garnish RH
Map Light Lens and Cover
Seat Belt Anchor Cover Cap
Antenna Pole
Antenna
Protector
Antenna Cord
Roof Side Inner Garnish RH
Front Pillar Garnish LH
Center Pillar Garnish LH
Front Door Inner Scuff Plate RH
Rear Door Opening Trim Weatherstrip RH
Seat Belt Anchor Cover Cap
Center Pillar Garnish LWR RH
Rear Door Inner Scuff Plate RH
Roof Side Inner Garnish LH
Bench Type Rear Seat Cushion Assembly
Front Door Inner Scuff Plate LH
Front Door Opening Trim Weatherstrip LH
Rear Door Opening Trim Weatherstrip LH
Center Pillar Garnish LWR LH
Rear Door Inner Scuff Plate LH
Bench Type Rear Seat Back Assembly
C
I23230


Wagon:
Visor Holder
Visor Assy RH
Roof Headlining Assy
Assist Grip
Visor Assy LH
Inner Rear View Mirror
Sliding Roof Opening Trim Moulding
Inner Rear View Mirror Cover
Assist Grip
w/ Sliding Roof
Map Light Assy
Map Light Assy
Assist Grip
Room Light Assy
Room Light Lens
Front Door Opening Trim Weatherstrip RH
Rear Center Seat Belt Bezel
Front Pillar Garnish RH
Defroster Lower Nozzle Assembly
Center Pillar Garnish RH
Seat Belt Anchor Cover Cap
Map Light Lens and Cover
Antenna Pole
Antenna
Protector
Antenna Cord
Roof Side Inner Garnish RH
Front Pillar Garnish LH
Center Pillar Garnish LH
Front Door Inner Scuff Plate RH
Rear Door Opening Trim Weatherstrip RH
Seat Belt Anchor Cover Cap
Center Pillar Garnish LWR RH
Rear Door Inner Scuff Plate RH
Roof Side Inner Garnish LH
Bench Type Rear Seat Cushion Assembly
Front Door Inner Scuff Plate LH
Front Door Opening Trim Weatherstrip LH
Center Pillar Garnish LWR LH
Rear Door Inner Scuff Plate LH
Rear Door Opening Trim Weatherstrip LH
Rear Seat Back Side LH
Rear Seat Back Side RH
C
I23231

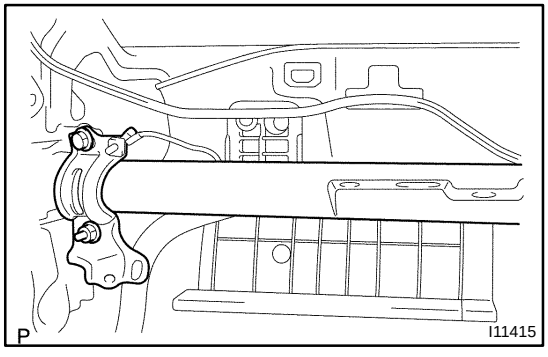
BE16P-02

REMOVAL

HINT:

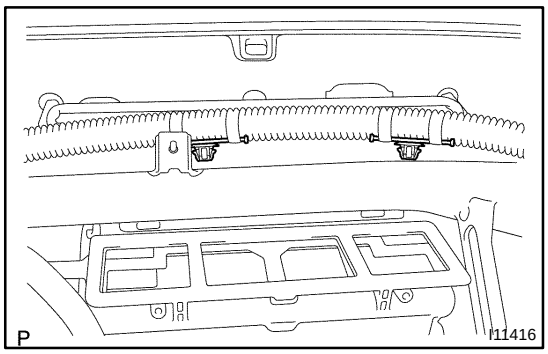
Installation is in the reverse order of removal.

1. **REMOVE INSTRUMENT CLUSTER FINISH PANEL CENTER**
2. **REMOVE INSTRUMENT CLUSTER FINISH PANEL CENTER LOWER**
3. **REMOVE AIR CONDITIONER ASSEMBLY**
4. **REMOVE CONSOLE PANEL UPPER**
5. **REMOVE PARKING BRAKE HOLE COVER**
6. **REMOVE CONSOLE BOX**
7. **REMOVE GLOVE COMPARTMENT DOOR ASSEMBLY**
8. **REMOVE HORN BUTTON**
9. **REMOVE STEERING WHEEL**
10. **REMOVE STEERING COLUMN LOWER COVER**
11. **REMOVE STEERING COLUMN UPPER COVER**
12. **REMOVE TURN SIGNAL SWITCH ASSEMBLY**
13. **REMOVE INSTRUMENT PANEL FINISH PANEL LOWER**
14. **REMOVE INSTRUMENT CLUSTER FINISH PANEL**
15. **REMOVE COMBINATION METER**
16. **REMOVE FRONT DOOR INNER SCUFF PLATE RH**
17. **REMOVE FRONT DOOR INNER SCUFF PLATE LH**
18. **REMOVE COWL SIDE TRIM BOARD RH**
19. **REMOVE COWL SIDE TRIM BOARD LH**
20. **REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP RH**
21. **REMOVE FRONT DOOR OPENING TRIM WEATHERSTRIP LH**
22. **REMOVE FRONT PILLAR GARNISH RH**
23. **REMOVE FRONT PILLAR GARNISH LH**
24. **DISCONNECT PASSENGER AIRBAG CONNECTOR**
25. **REMOVE INSTRUMENT PANEL ASSEMBLY**



26. **REMOVE INSTRUMENT PANEL REINFORCEMENT BRACKET**

Remove the bolt and nut and pull instrument panel reinforcement.



27. REMOVE A PART OF INSTRUMENT PANEL WIRE

Remove the 2 clips and a part of instrument panel wire.

28. REMOVE DEFROSTER LOWER NOZZLE

29. REMOVE BENCH TYPE REAR SEAT CUSHION ASSEMBLY

30. REMOVE BENCH TYPE REAR SEAT BACK ASSEMBLY

31. REMOVE REAR DOOR INNER SCUFF PLATE RH

32. REMOVE REAR DOOR INNER SCUFF PLATE LH

33. REMOVE REAR DOOR OPENING TRIM WEATHER STRIP RH

34. REMOVE REAR DOOR OPENING TRIM WEATHER STRIP LH

35. REMOVE CENTER PILLAR GARNISH LOWER RH

36. REMOVE CENTER PILLAR GARNISH LOWER LH

37. REMOVE SEAT BELT ANCHOR COVER CAP

38. REMOVE FRONT SEAT OUTER BELT ASSEMBLY RH

39. REMOVE FRONT SEAT OUTER BELT ASSEMBLY LH

40. REMOVE CENTER PILLAR GARNISH RH

41. REMOVE CENTER PILLAR GARNISH LH

42. REMOVE ROOF SIDE INNER GARNISH RH

43. REMOVE ROOF SIDE INNER GARNISH LH

44. REMOVE ASSIST GRIP COVER

45. REMOVE ASSIST GRIP

46. REMOVE VISOR ASSEMBLY RH

47. REMOVE VISOR ASSEMBLY LH

48. REMOVE INNER REAR VIEW MIRROR STAY HOLDER COVER

49. REMOVE INNER REAR VIEW MIRROR

50. REMOVE MAP LIGHT ASSEMBLY

51. REMOVE ROOM LIGHT ASSEMBLY

52. w/ Sliding Roof:
REMOVE SLIDING ROOF OPENING TRIM MOULDING

53. REMOVE VISOR HOLDER

54. REMOVE ROOF HEADLINING ASSEMBLY

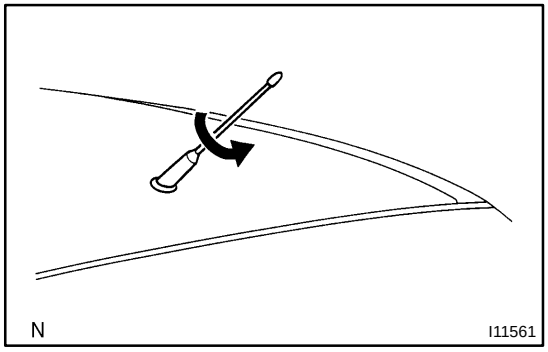
55. REMOVE ANTENNA ASSEMBLY

(a) Remove the 2 nuts and disconnect the connector.

(b) Remove the antenna assembly.

56. REMOVE ANTENNA COED

Remove the clamp and the antenna cord.



57. REMOVE ANTENNA POLE

Turn the antenna pole counterclockwise to remove.

CLOCK

TROUBLESHOOTING

BE0G0-13

HINT:

Troubleshoot the clock according to the table below.

Troubleshooting	No.
Passenger seat belt warning light does not light up.	1
Clock will not operate	1
Clock loses or gains time	2

± 1.5 seconds / day

1. INSPECT CLOCK CIRCUIT (See page DI-1009)

2. TROUBLESHOOTING NO. 1

1	**PASSENGER SEAT BELT WARNING LIGHT DOES NOT OPERATE**
	CLOCK WILL NOT OPERATE

(a) Check that the battery positive voltage is 10 - 16 V.

If voltage is not as specified, replace the battery.

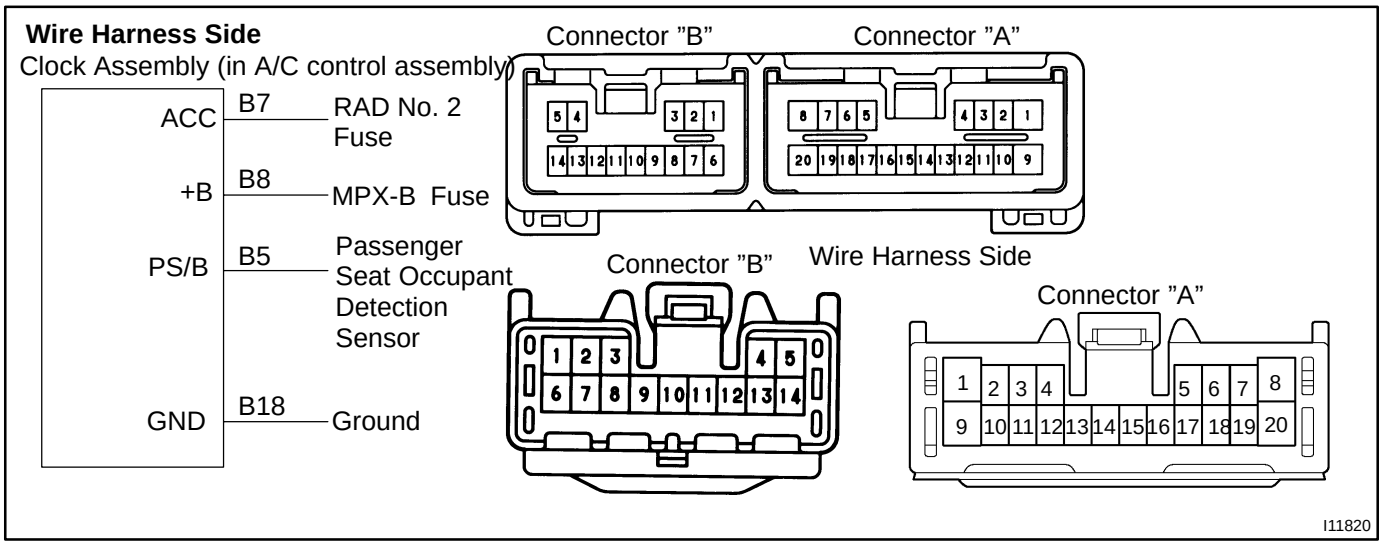
(b) Check that the MPX-B and RAD No. 2 fuses are not blown.

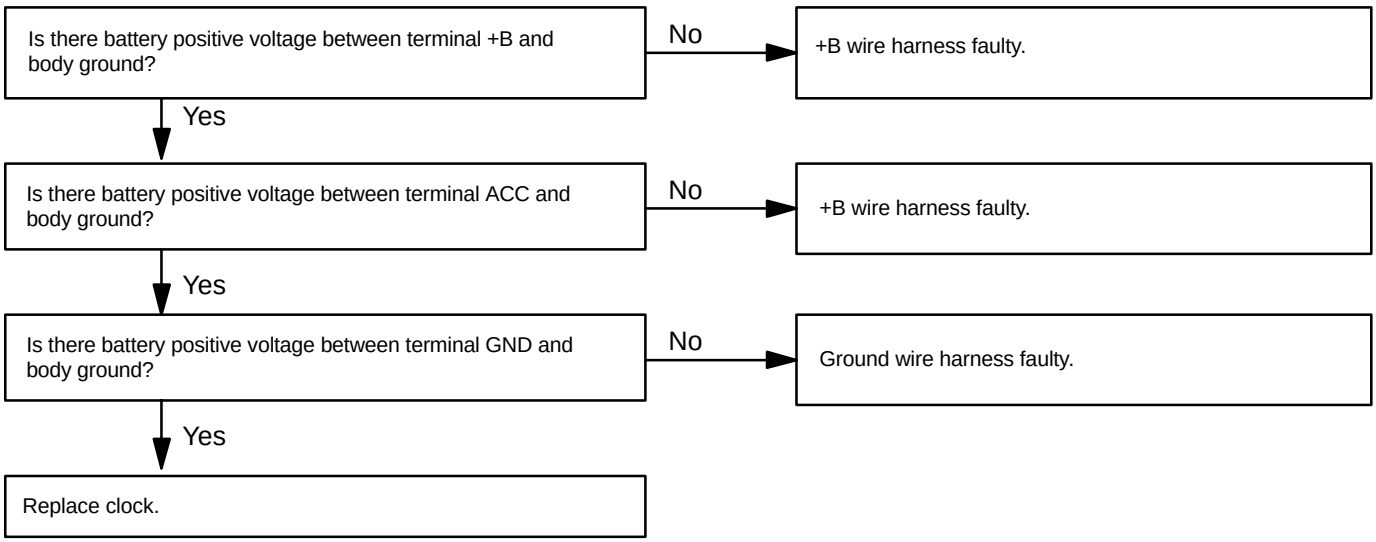
If the fuse is blown, replace the fuse and check for short.

(c) Troubleshoot the clock as follows.

HINT:

Inspect the connector on the wire harness side.





3. TROUBLESHOOTING NO. 2

2	**CLOCK LOSES OR GAINS TIME**

(a) Check that the battery positive voltage is 10 - 16 V.

If voltage is not as specified, replace the battery.

(b) Inspect the error of the clock.

Allowable error (per day): ± 1.5 seconds

If the error exceeds the allowable error, replace the clock.

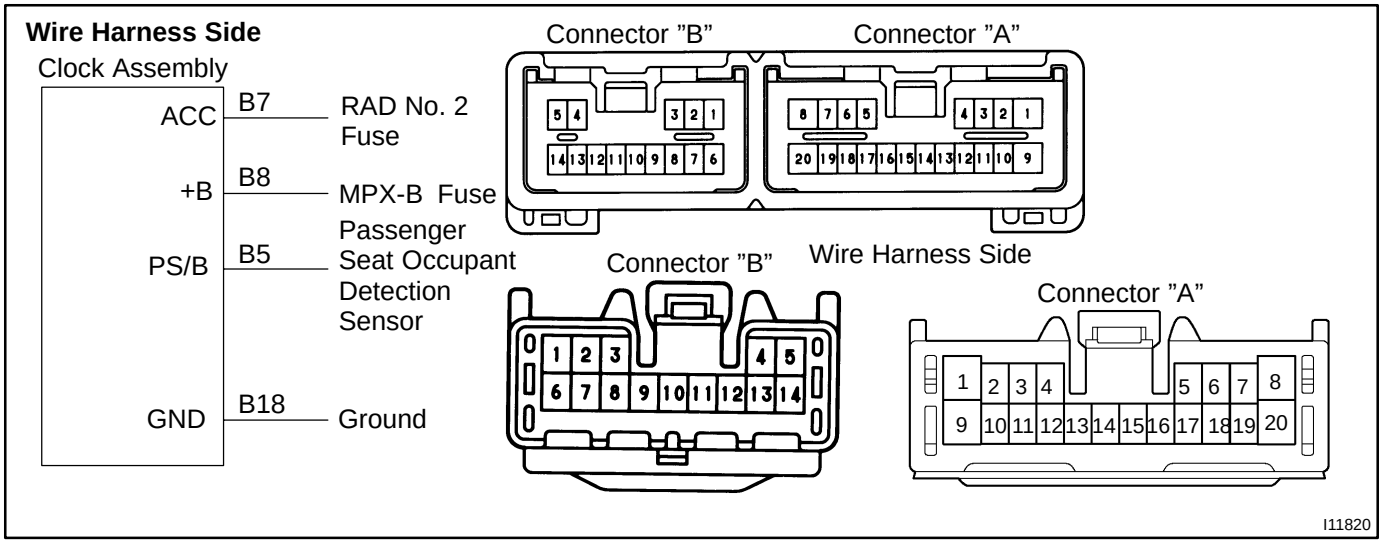
(c) Check that the clock adjusting button is sticking in position and has failed to return.

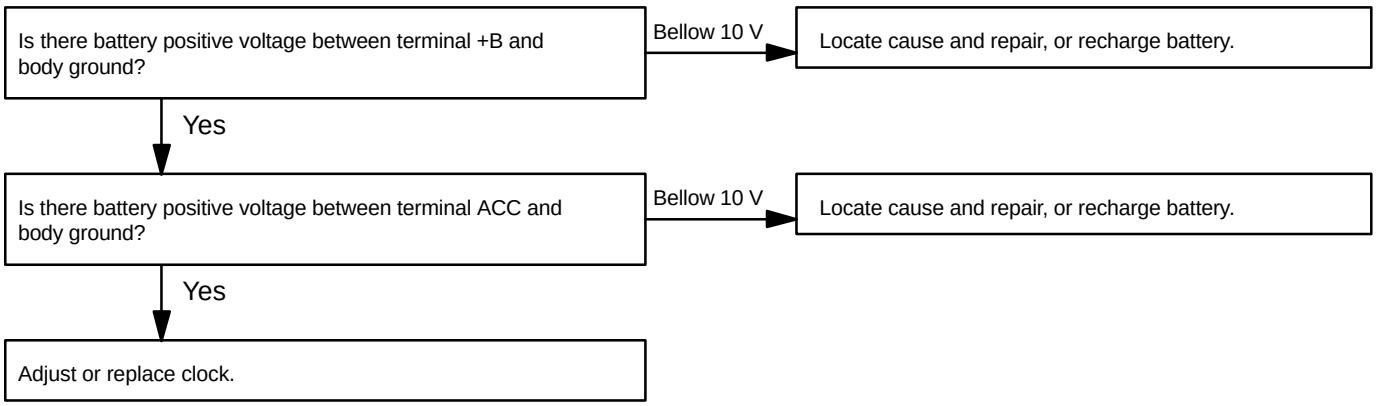
If the error exceeds the allowable error, replace the clock.

(d) Troubleshoot the clock as follows.

HINT:

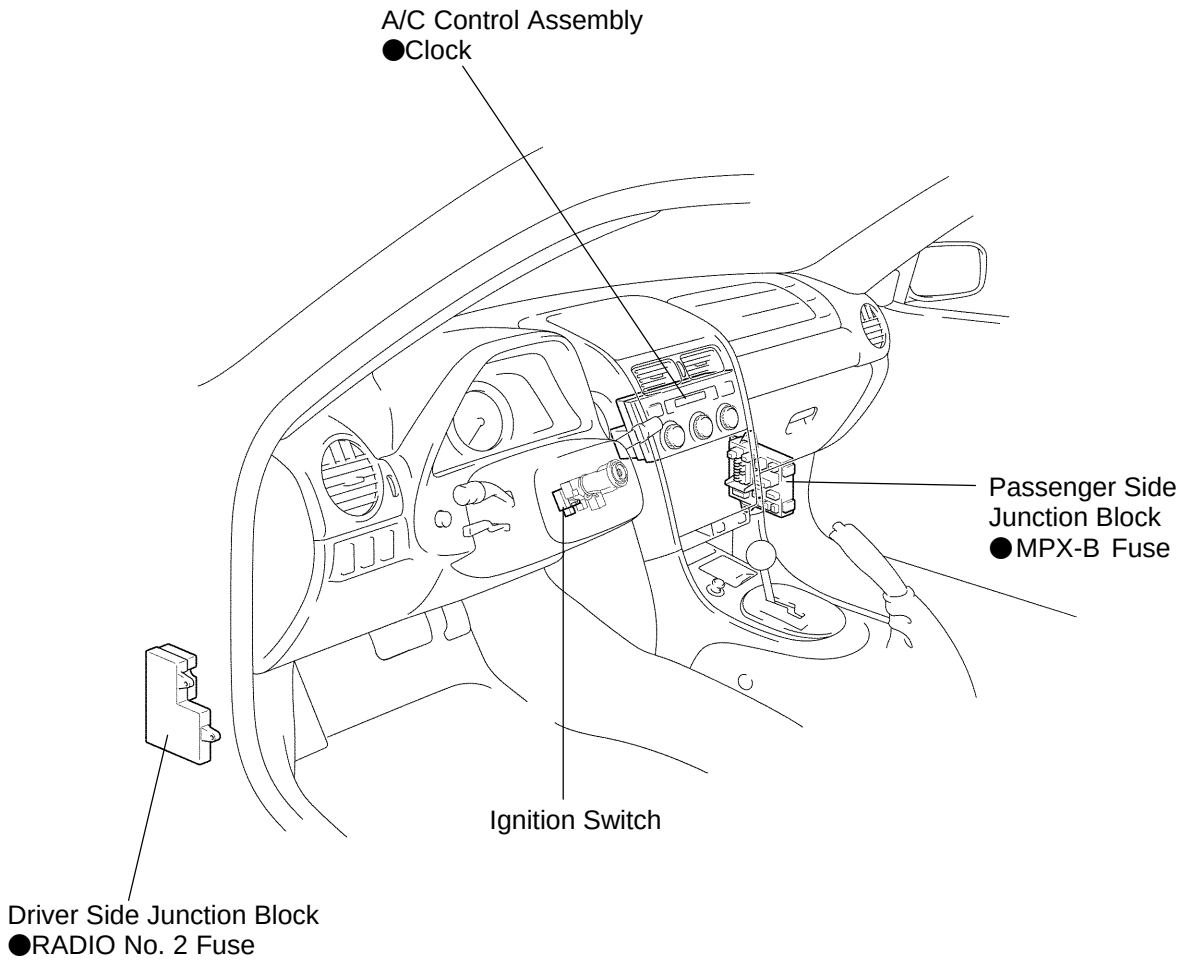
Inspect the connector on the wire harness side.




Is there battery positive voltage between terminal +B and body ground?
Bellow 10 V
Locate cause and repair, or recharge battery.
Yes
Is there battery positive voltage between terminal ACC and body ground?
Bellow 10 V
Locate cause and repair, or recharge battery.
Yes
Adjust or replace clock.

BE0G1-13

LOCATION



I27835

GARAGE DOOR OPENER SYSTEM

BE0L6-04

REGISTRATION PROCEDURE

1. NEW CODE REGISTRATION

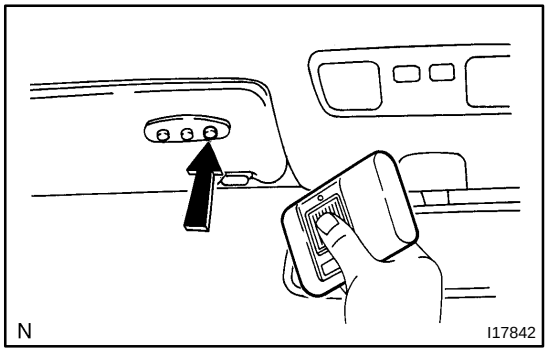
NOTICE:

- **If pressing the switch of the original transmitter to register the code, the system might operate.**
- **When registering the transmitter codes such as for garage or gate, check that there is nobody around those places then register.**

(a) Press the switch for the item to be registered for 20 seconds

HINT:

When transferring to registration mode, LED (red) blinks in 1 Hz cycle.

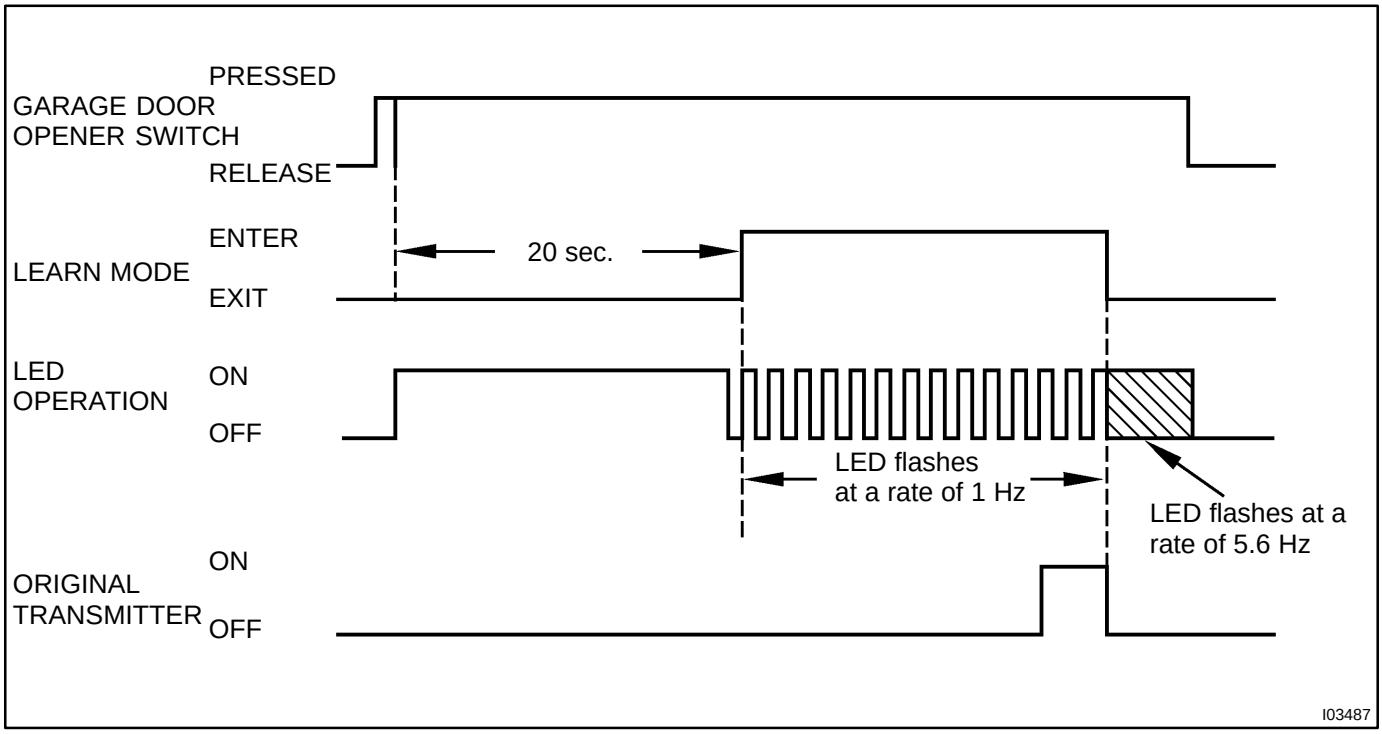


(b) In the condition of (a), bring the original transmitter to within 1-inch area around the garage door opener and press the switch. (code transmitting).

HINT:

When code registration completes correctly, LED (red) blinks in 5.6 Hz cycle.

New code registration timing chart



If a code can not be registered, observe the following conditions.

HINT:

- If the battery of original transmitter is consumed.
- Press the switch of the transmitter repeatedly in registration mode, as some transmitters stop transmitting for 1 to 2 seconds.
- This system is not applicable to the garage door opener which had been made before 1982.

2. CODE DELETION

(a) Press the switches at both ends of garage door opener simultaneously for 20 seconds.

HINT:

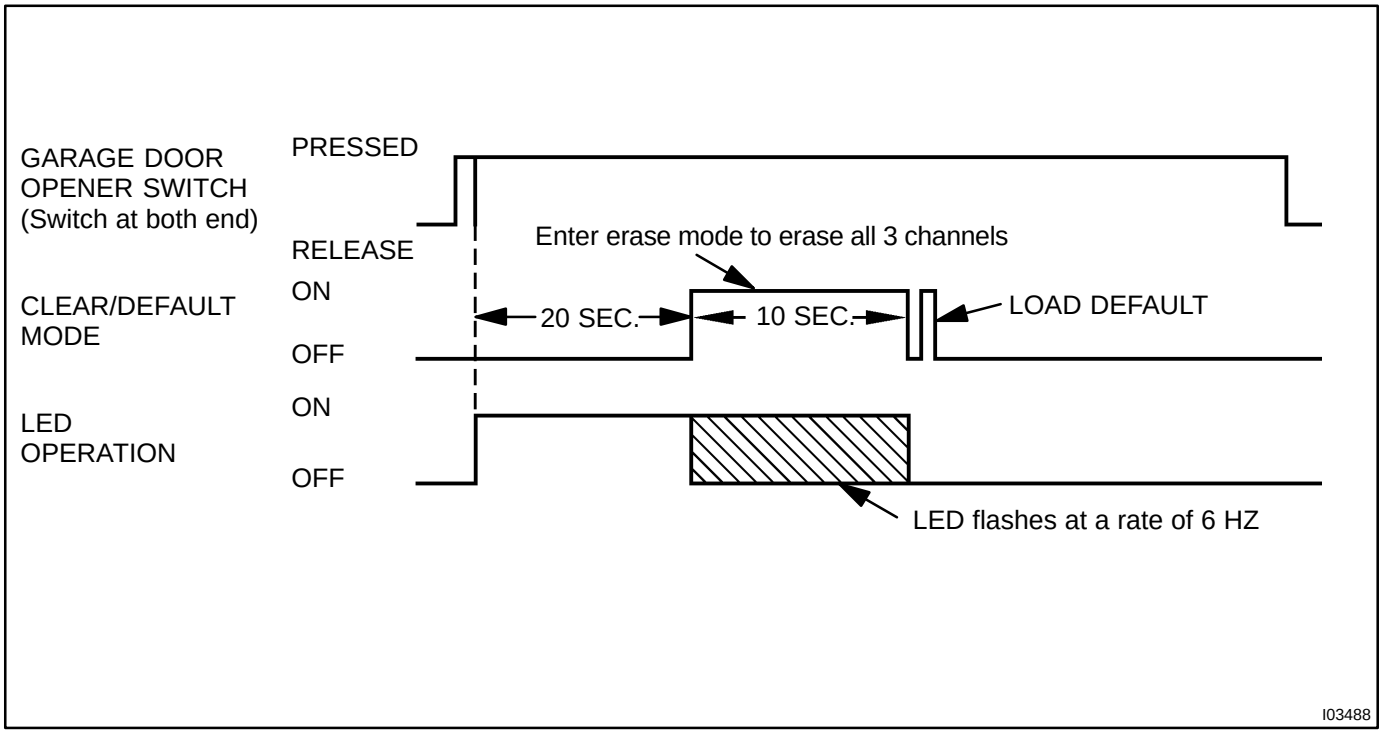
When transferring to deletion mode, LED (red) blinks in 6 Hz cycle.

(b) When releasing the switch within 10 seconds after transferring to deletion mode, all the registered codes will be erased.

HINT:

Press the switch until blinking in 6 Hz cycle stops, so that the default code for check is set.

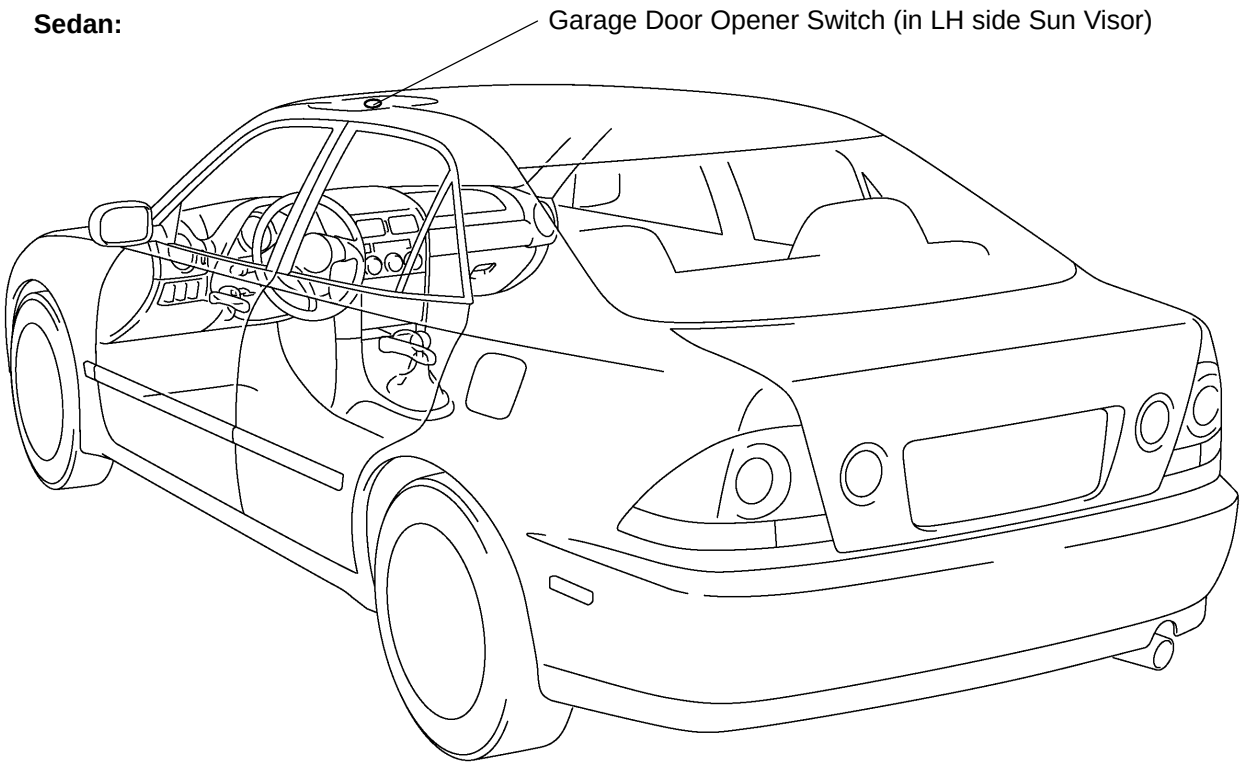
Code deletion timing chart



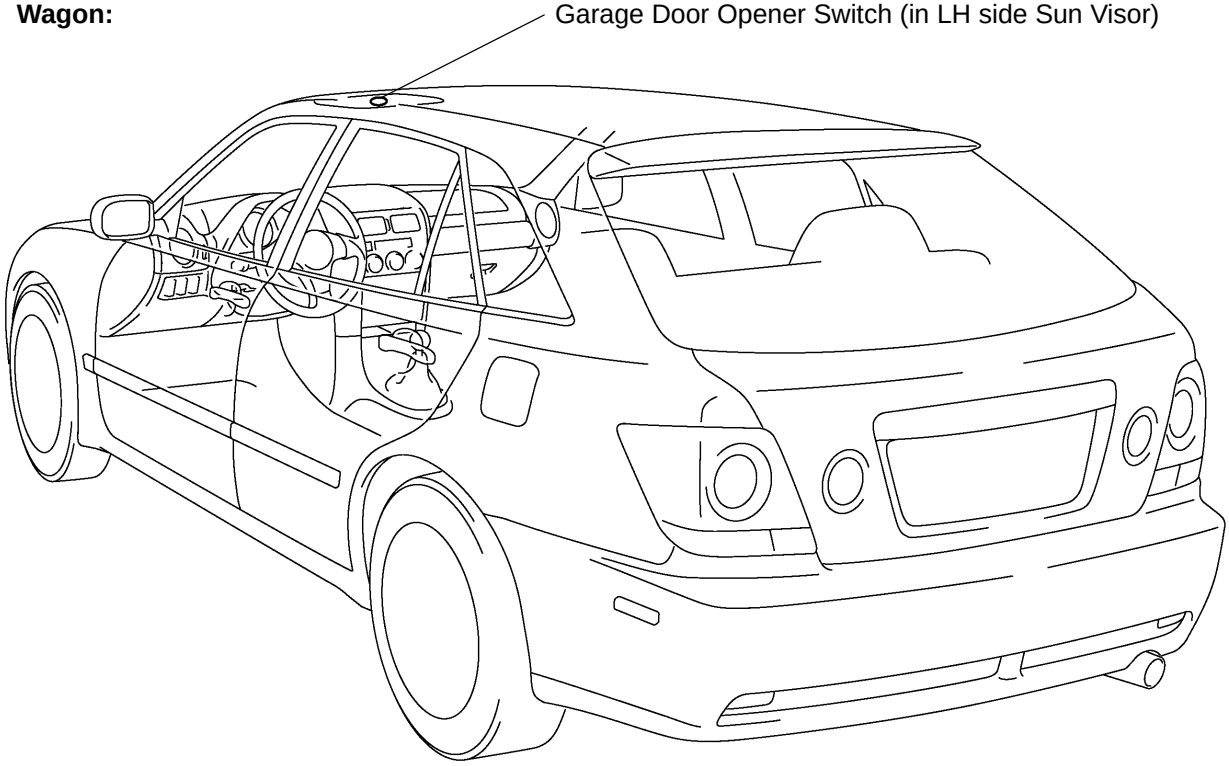
BE0L7-05

LOCATION

Sedan:



Wagon:



I27836

BE0L8-02

REMOVAL

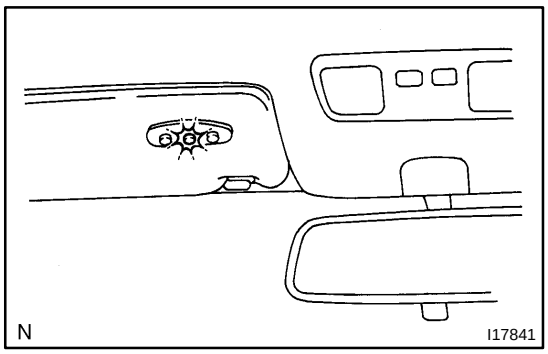
REMOVE LH SIDE SUN VISOR

(a) Remove the 2 screws.

(b) Disconnect the garage door opener switch connector.

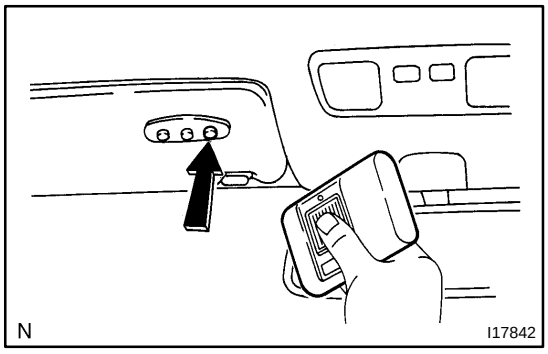
BE0L9-04

INSPECTION



1. INSPECT GARAGE DOOR OPENER

Press the switch and check that each LED (red) lights up.
Even if only one switch is found not to light up, replace it.

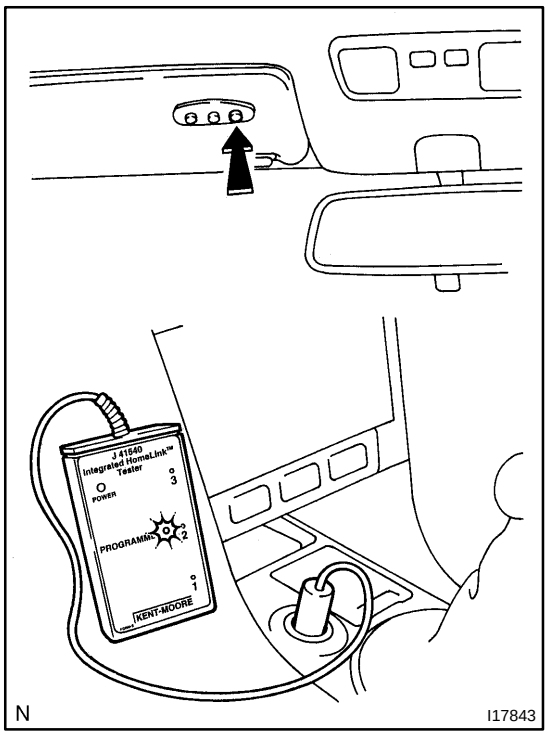


2. INSPECT GARAGE DOOR OPENER REGISTRATION AND TRANSMITTING

HINT:
Use the home link tester made by KENT MORE for this test.
As it is necessary to record the code of the hand held transmitter, customer's code will be erased. When the inspection completes, please register the customer's again.

(a) Check that the code of hand held transmitter for inspection can be recorded.
(See page BE-213)

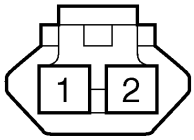
If the code can not be registered, replace garage door opener.



(b) Press the switch which an inspection code has been registered for and check that LED (green) of the home link tester lights up.

If the LED (green) does not light up, replace the garage door opener.

Wire Harness Side



I04287

3. INSPECT GARAGE DOOR OPENER CIRCUIT

Disconnect the connector from the switch and inspect the connector on the wire harness side, as shown.

Tester connection	Condition	Specified condition
2 - Ground	Always	Continuity
1 - Ground	Always	Battery positive voltage

If the circuit is not as specified, inspect the circuits connected to other parts.

BE0LA-02

INSTALLATION

INSTALL GARAGE DOOR OPENER SWITCH

(a) Connect the garage door opener switch connector.

(b) Install the 2 screws and the LH side sun visor.

ENGINE IMMOBILISER SYSTEM

BE27I-02

REGISTRATION PROCEDURE

HINT:

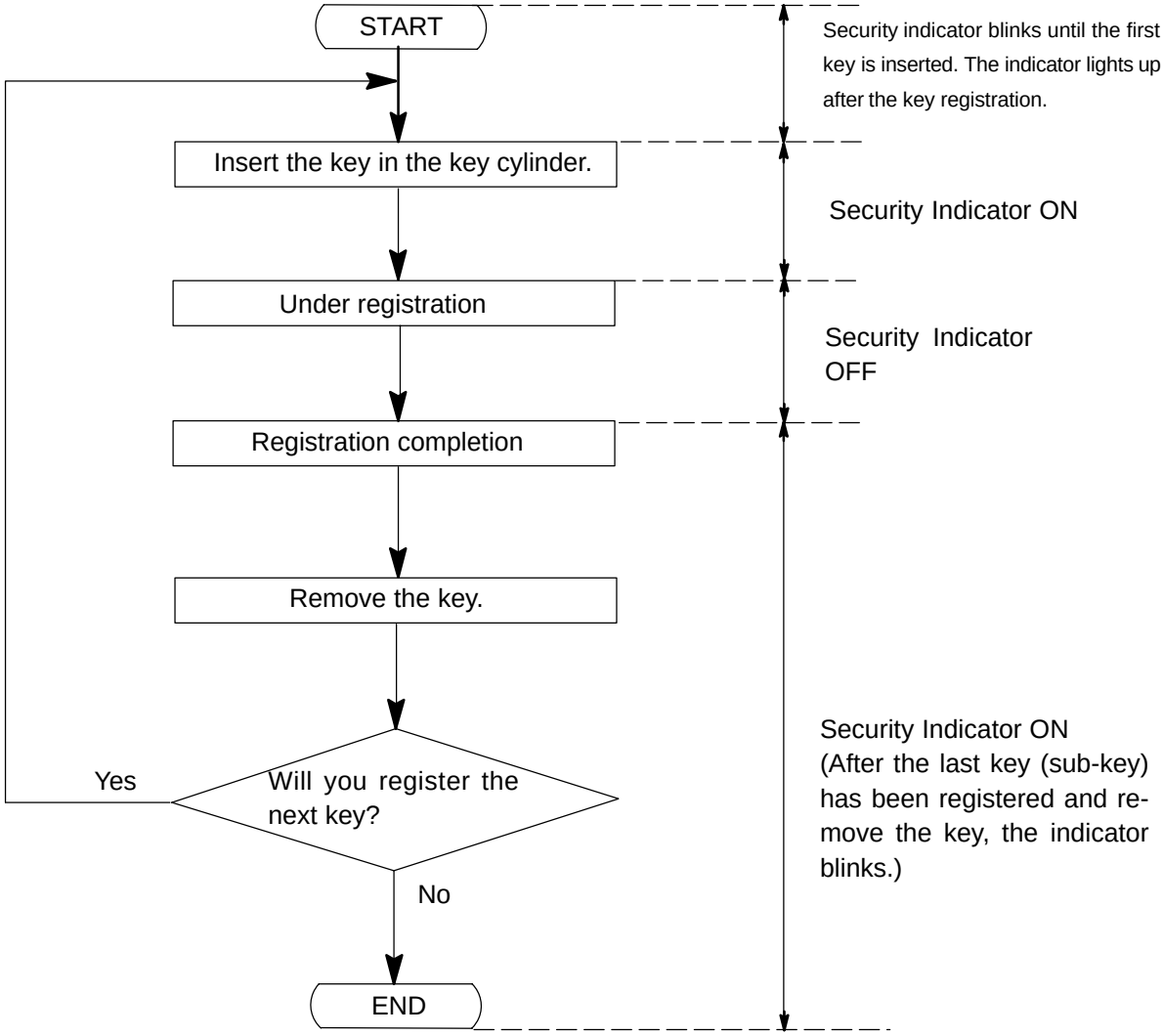
In case of having lost all the already registered master keys, you are not able to do additional registration or deletion. Change the ECM and then must register the new key codes according to the following registration procedure of the automatic registration mode.

1. KEY REGISTRATION IN AUTOMATIC REGISTRATION MODE

(a) Registration of a new transponder key.

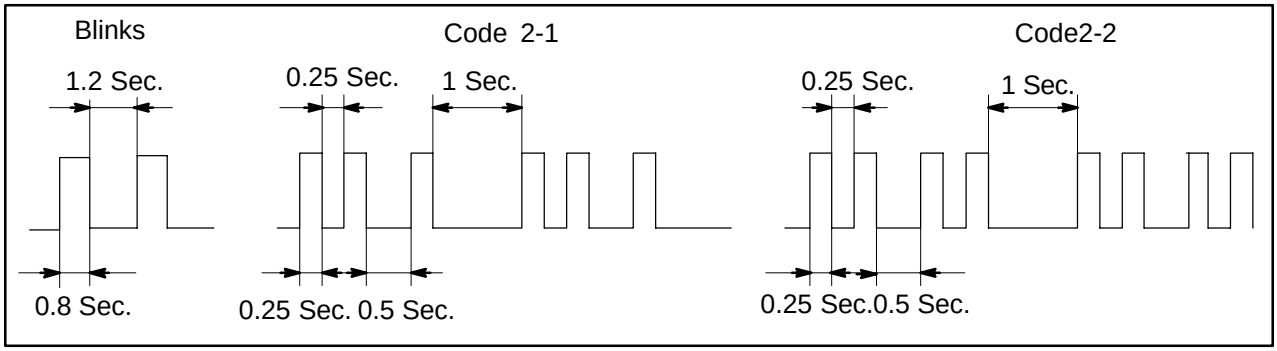
HINT:

- This must be done when you install a new ECM.
- The new ECM is on the automatic key code registration mode. The already fixed number of key codes for this ECM can be registered.
  On this type of vehicle, up to 3 key codes can be registered.
- In the automatic registration mode, the last key registered becomes sub-key.



HINT:

- When a key is not inserted in the key cylinder on the automatic registration mode, the security indicator always lights on.
- When the immobiliser system operates normally and the key is pull out, the security indicator blinks.
- When key code registration could not be performed on the automatic registration mode, code 2-1 is output from the security indicator and when inserting the already registered key, code 2-2 is output.



(b) Automatic registration mode completion

If completing the mode forcibly when more than 1 key code have been registered on the automatic registration mode, perform the following procedures.

After 1 more key code have been registered with master key, perform step (1) or (2) without pulling the key out or inserting the already registered key.

(1) Depress and release brake pedal 5 times or more within 15 sec.

(2) With the hand-held tester, require automatic registration mode completion.

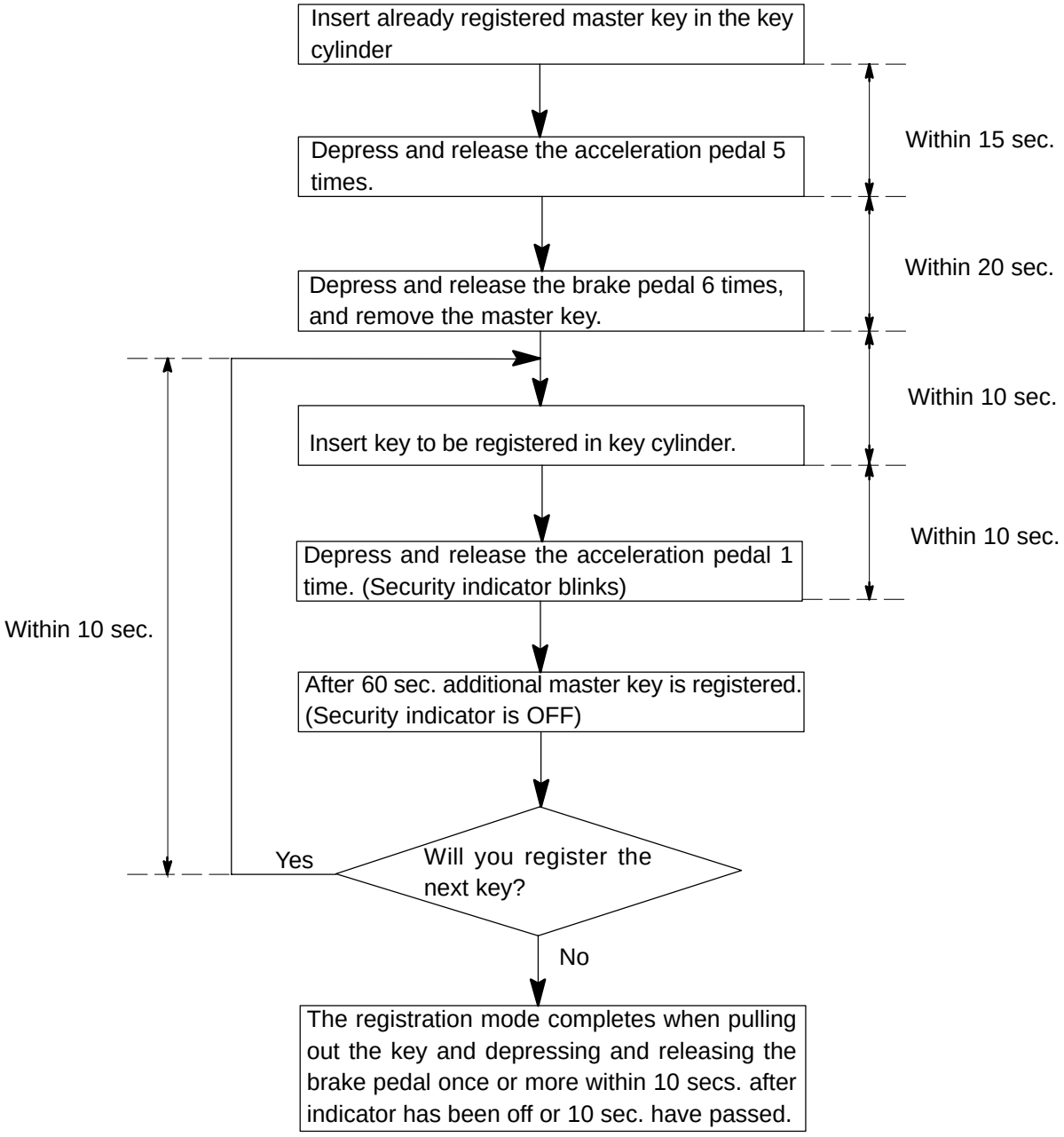
2. REGISTRATION OF ADDITIONAL MASTER KEY

There are 2 ways for registration of additional master key, one way is depressing brake pedal and acceleration pedal and the other way is using hand-held tester.

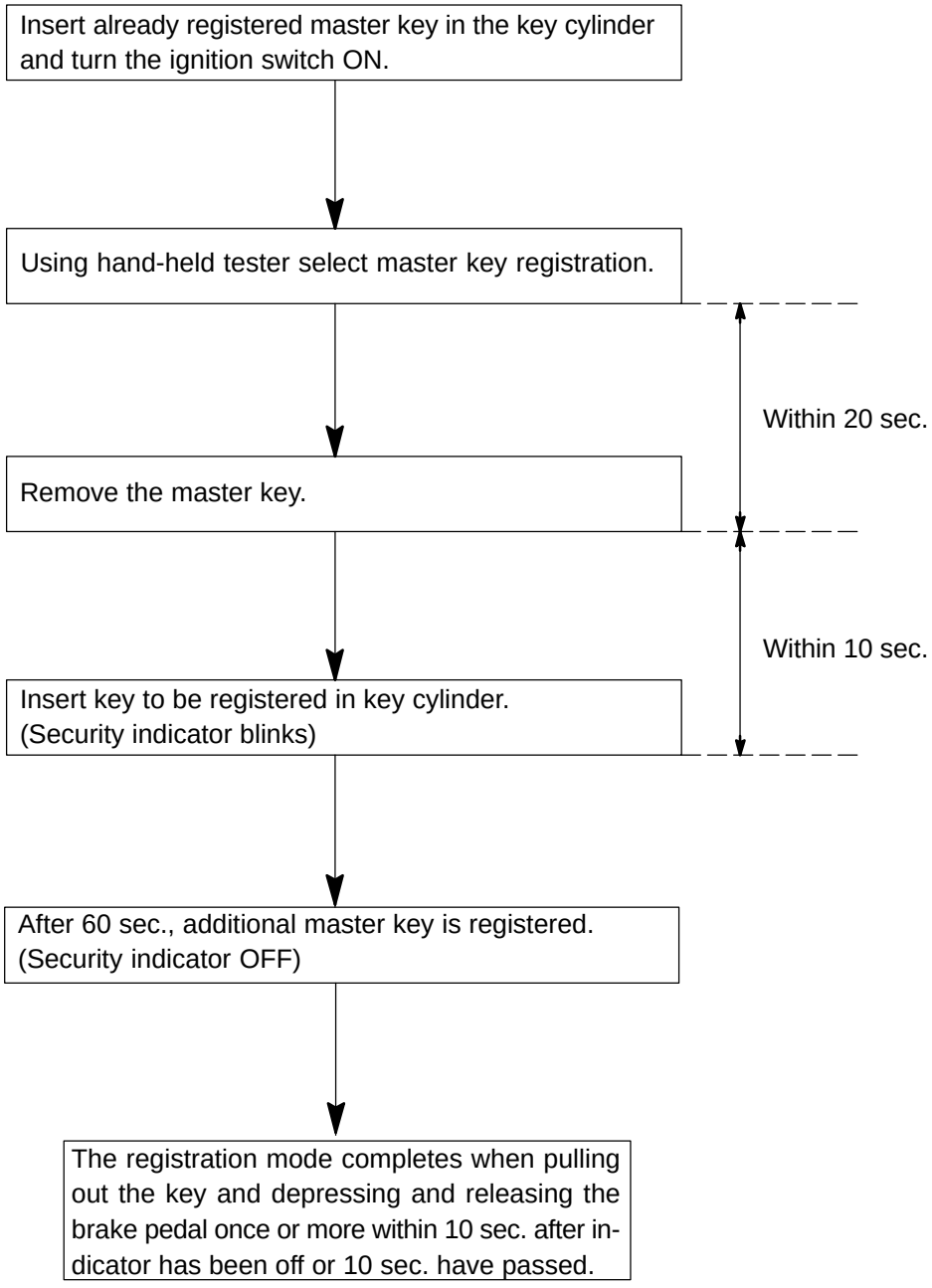
HINT:

- It is possible to register up to 7 master key codes including the already registered key code.
- When any operation time described below is over, registration mode completes.
- When the next procedure is performed while the timer is working, the timer completes counting time, then next timer starts.
- When replacing ”Ignition Cylinder Key Set” or ”Lock Cylinder Set” and register according to the following procedure using the original master key. However, after the registration of the additional master key, as the original master key and the original sub-key is not necessary any more, so erase registration of those key codes.

(1) Depressing brake pedal and acceleration pedal:



(2) Using hand-held tester:



HINT:
Please follow the screen of the hand-held tester for more detailed procedure.

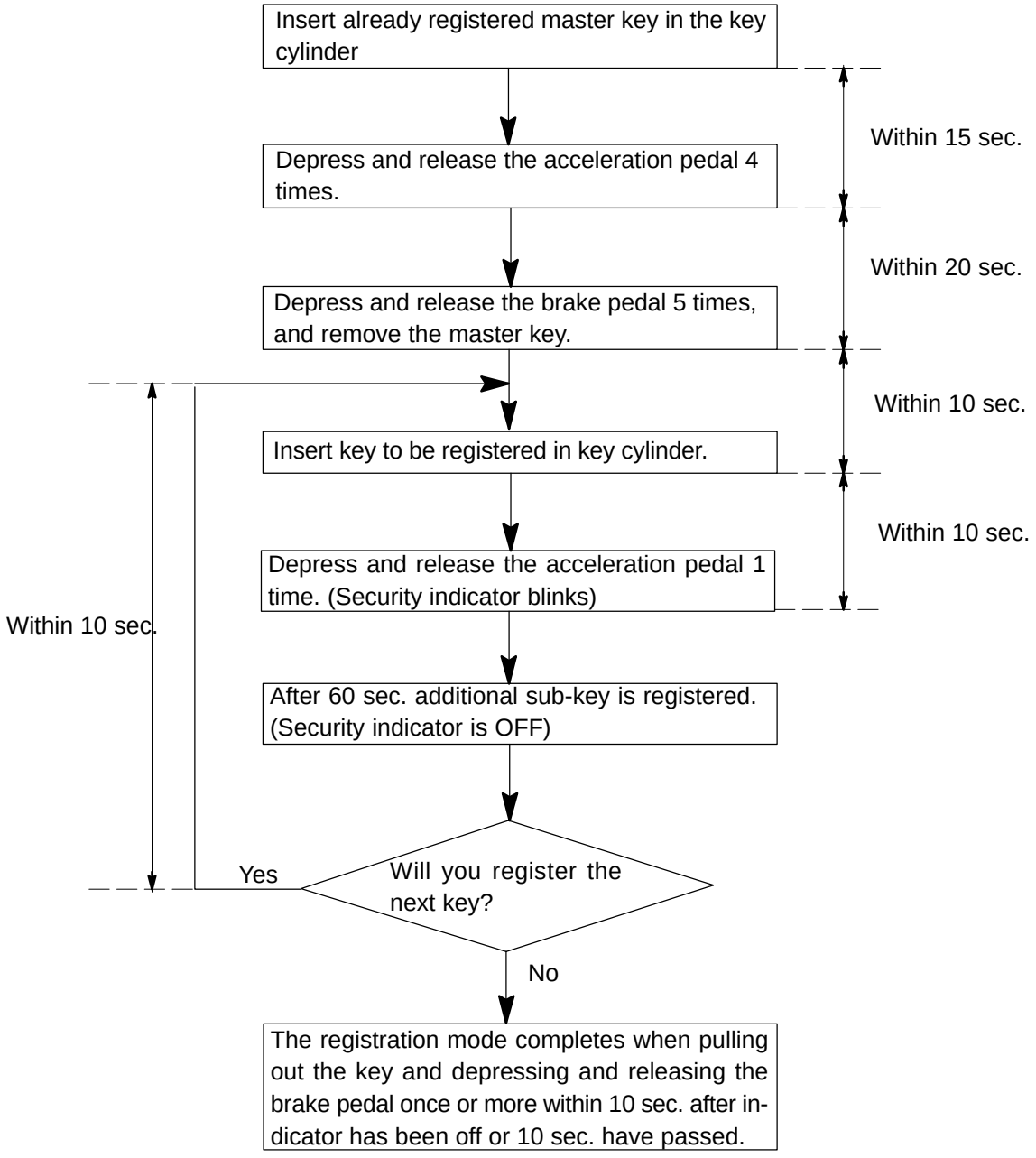
3. REGISTRATION OF ADDITIONAL SUB-KEY

There are 2 ways for registration of additional sub-key, one way is depressing brake pedal and acceleration pedal and the other way is using hand-held tester.

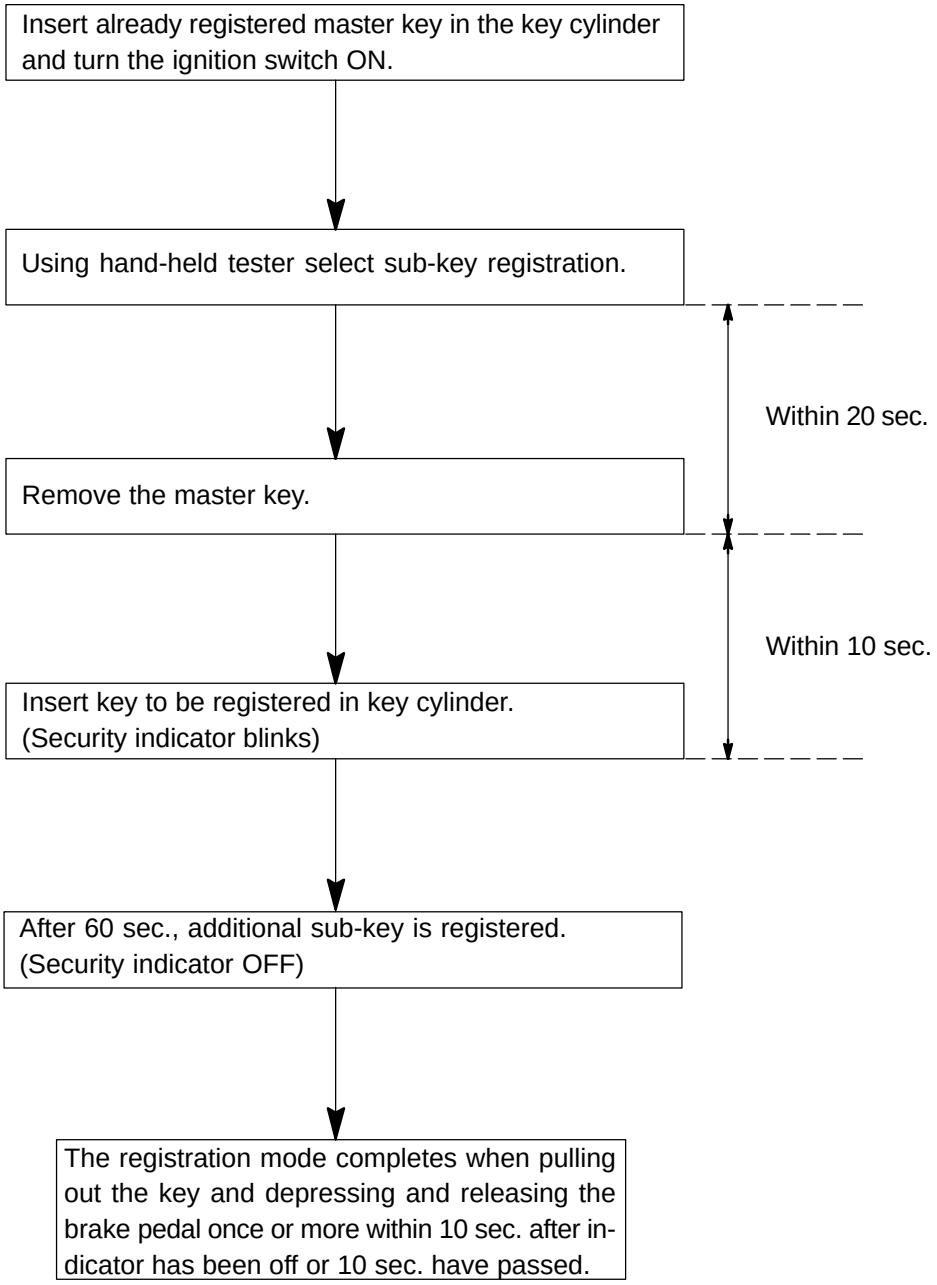
HINT:

- It is possible to register up to 3 sub-key codes including the already registered key code.
- When any operation time described below is over, registration mode completes.
- When the next procedure is performed while the timer is working, the timer completes counting time, then next timer starts.

(1) Depressing brake pedal and acceleration pedal:



(2) Using hand-held tester:



HINT:
Please follow the screen of the hand-held tester for more detailed procedure.

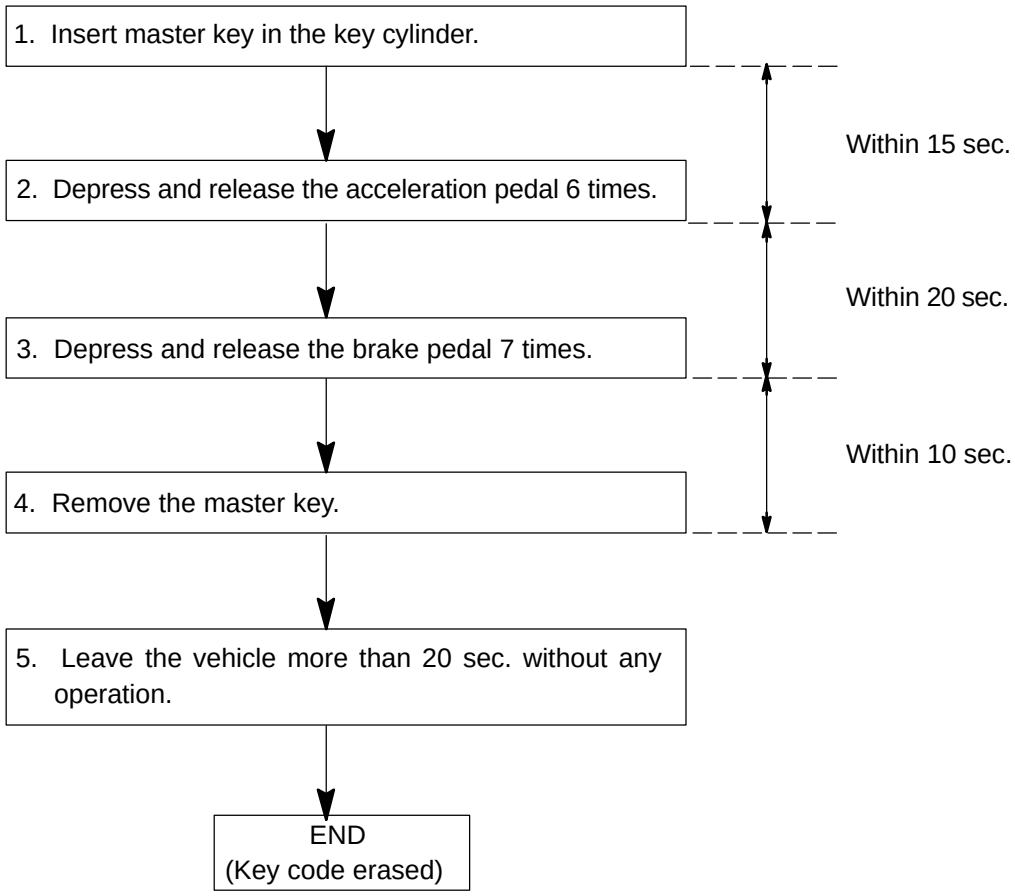
4. ERASURE OF TRANSPONDER KEY CODE

There are 2 ways for erasure of transponder key code, one way is depressing brake pedal and acceleration pedal and the other way is using hand-held tester.

HINT:

- Delete all other master and sub-key codes leaving the master key code to use the operation. When using the key which was used before deletion, it is necessary to register the code again.
- When any operation time described below is over, registration mode completes.
- When the next procedure is performed while the timer is working, the timer completes counting time, then next timer starts.

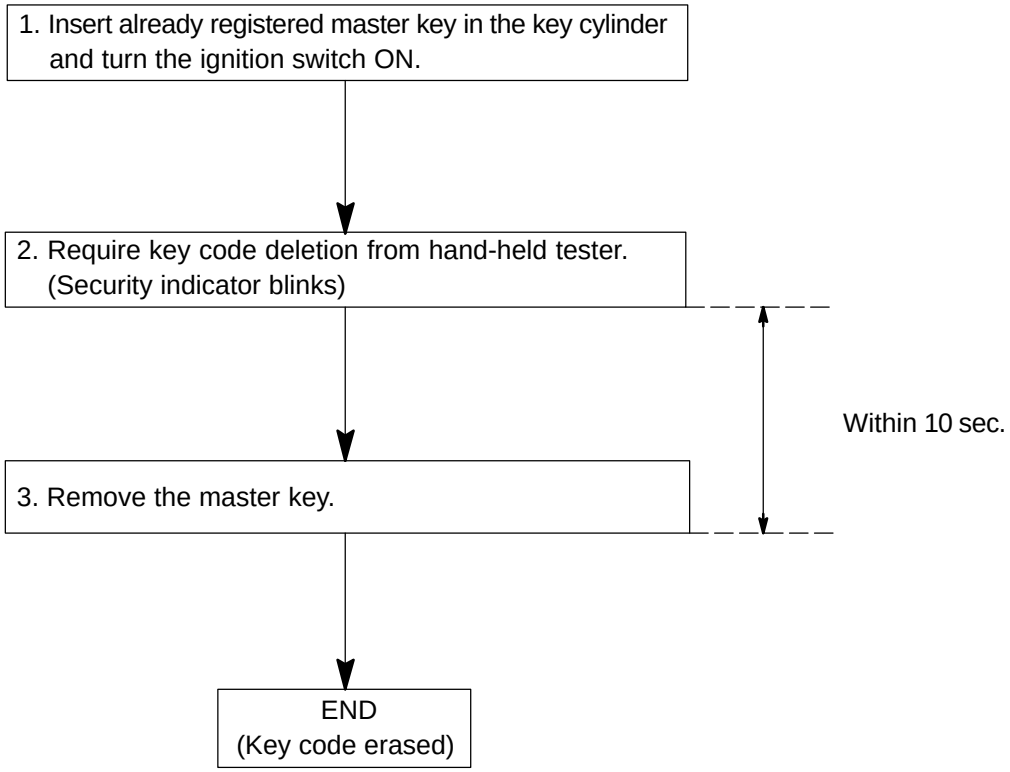
(1) Depressing brake pedal and acceleration pedal:



HINT:

If the key cannot be pulled out within 30 sec. from the first brake depression in the step 3, the key code deletion is canceled.

(2) Using hand-held tester:

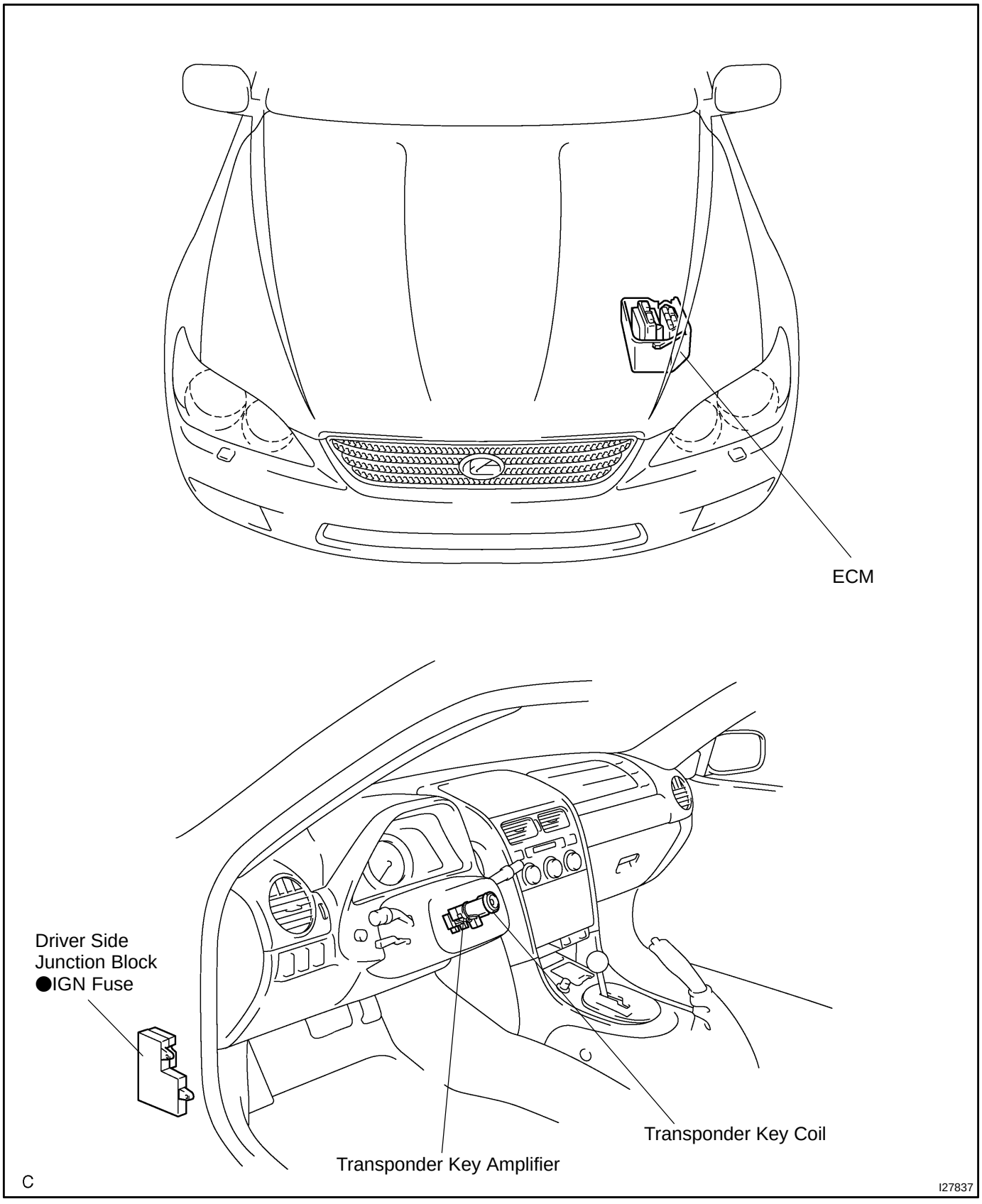


HINT:

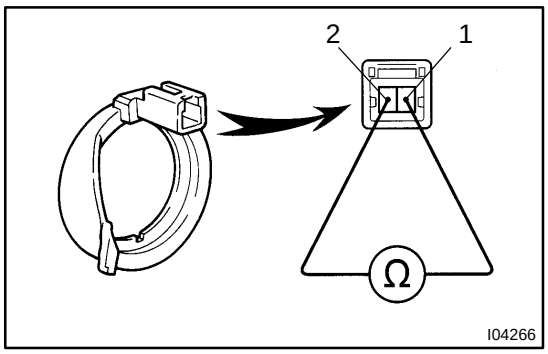
- When the key cannot be pulled out in the step 3, key code deletion is canceled. (Security indicator is OFF.)
- Please follow the screen of the hand-held tester for more detailed procedure.

BE02Q-26

LOCATION



BE0G8-10



INSPECTION

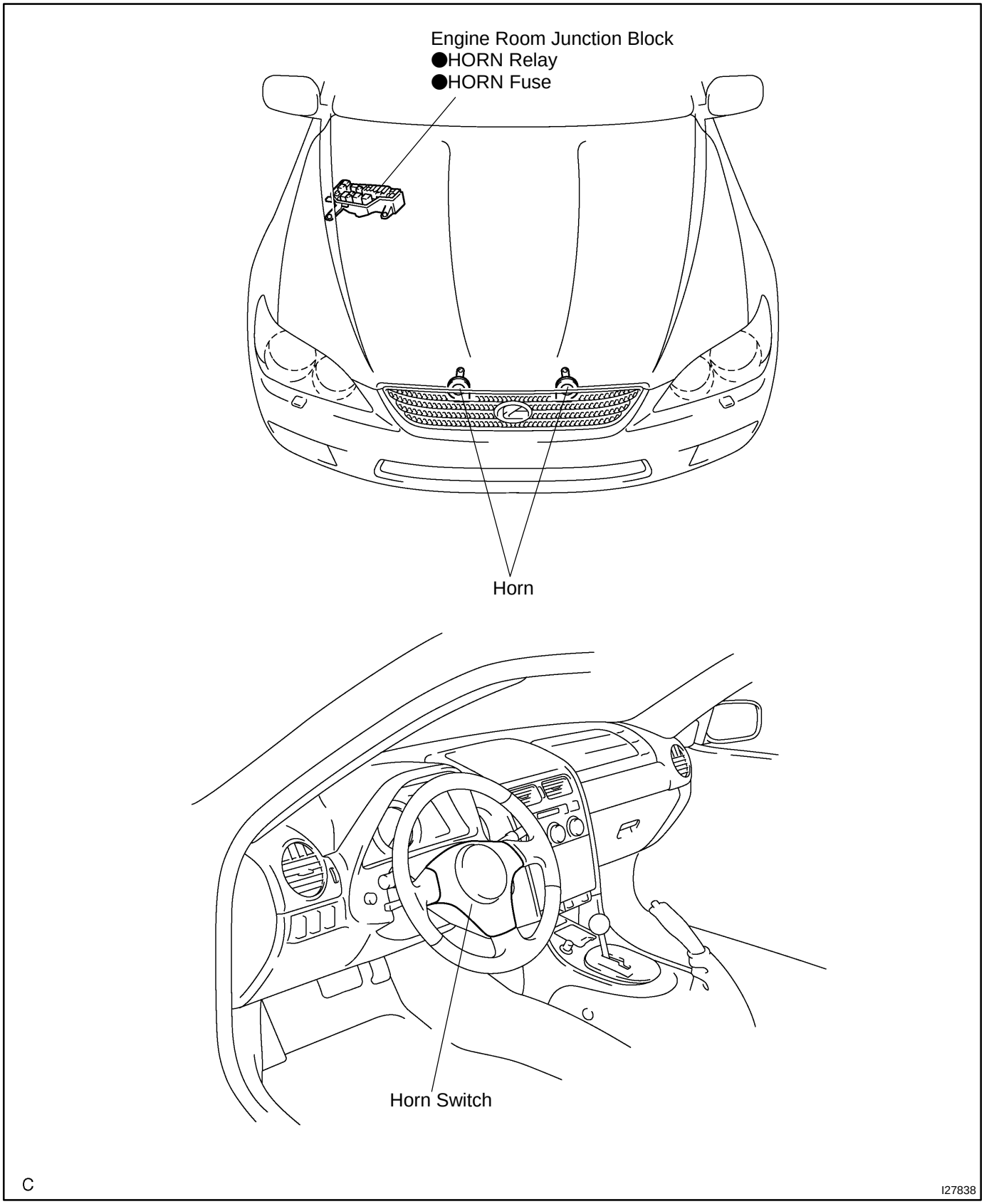
INSPECTION TRANSPONDER KEY COIL CONTINUITY

Check that continuity exists between terminals 1 and 2.
If continuity is not as specified, replace the coil.

HORN SYSTEM

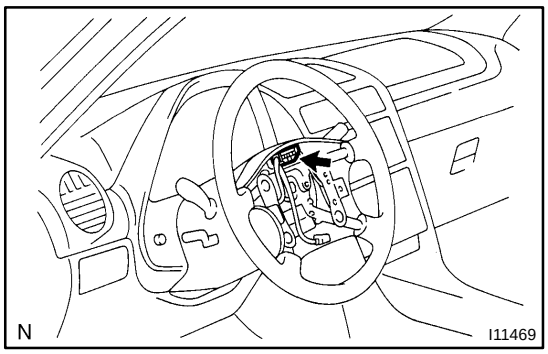
LOCATION

BE0FY-31



BE0FZ-20

INSPECTION

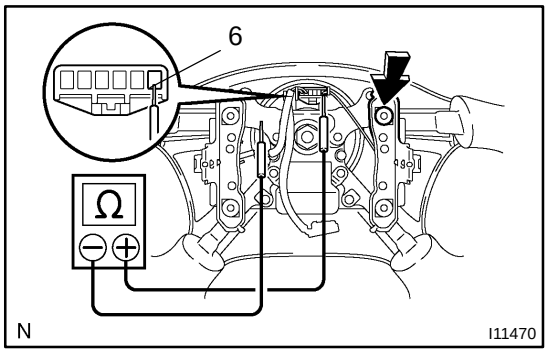


1. INSPECT HORN SWITCH

(a) Disconnect the negative (-) terminal from the battery.
(b) Remove the left and right covers from the steering wheel.
(c) Using a torx socket wrench, loosen the 2 bolts.
(d) Pull up the horn pad and place it on the steering column, as shown.

HINT:
Do not disconnect the connector from the horn pad.

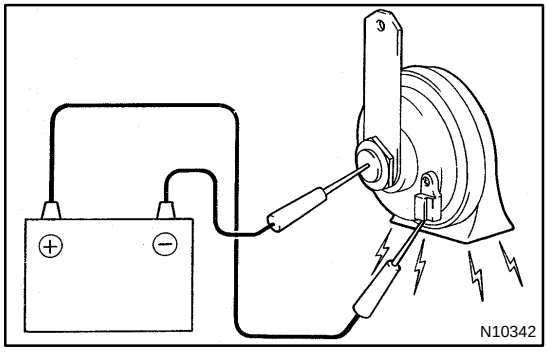
(e) Disconnect the connector from the slip ring.



(f) Check that no continuity exists between terminal 6 of the connector and body ground.
(g) Check that continuity exists between terminal 6 of the connector and body ground when the horn contact plate is pressed against the steering spoke assembly.

If continuity is not as specified, repair or replace the steering wheel or wire harness as necessary.

(h) Install the horn pad in place and using a torx socket wrench, torque the 2 bolts.
Torque: 7.1 N·m (72 kgf·cm, 62 in.·lbf)
(i) Install the left and right covers.
(j) Connect the negative (-) terminal to the battery.

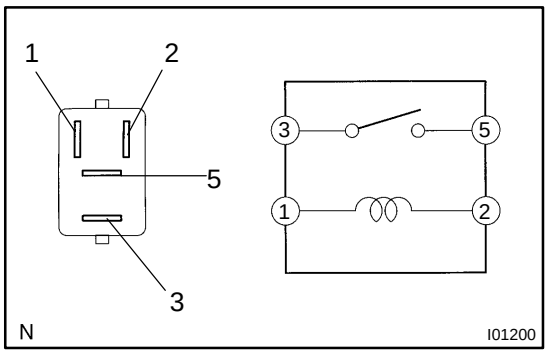


2. INSPECT HORN OPERATION

Connect the positive (+) lead from the battery to the terminal and negative (-) lead to the horn body and check that the horn blows.

If operation is not as specified, replace the horn.

3. INSPECT HORN SWITCH CIRCUIT
(See page DI-800)



4. INSPECT HORN RELAY CONTINUITY

Condition	Tester connection	Specified condition
Always	1 - 2	Continuity
Apply B+ between terminals 1 and 2.	3 - 5	Continuity

If continuity is not as specified, replace the relay.

5. INSPECT HORN RELAY CIRCUIT

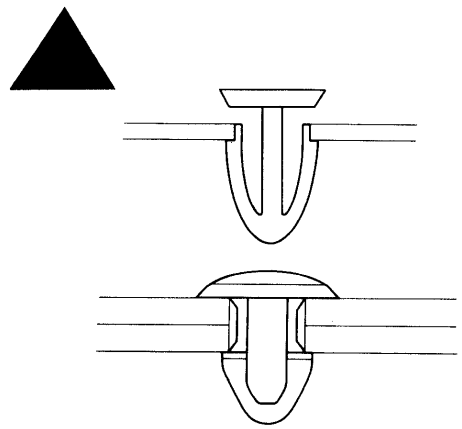
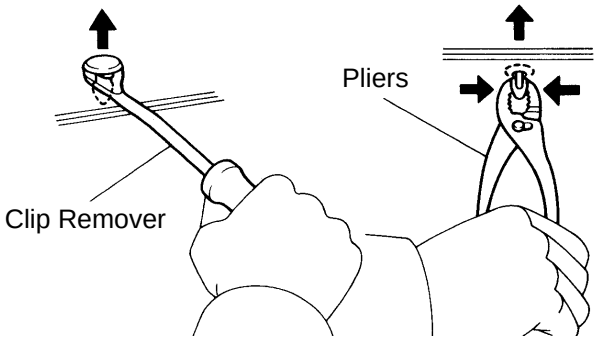
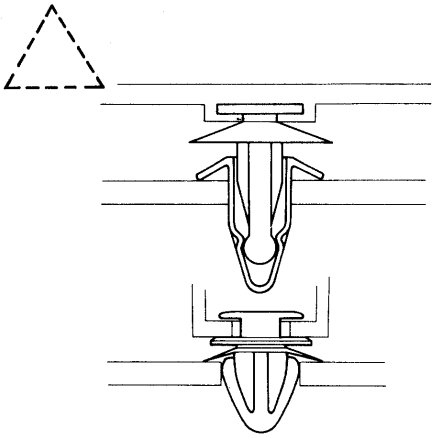
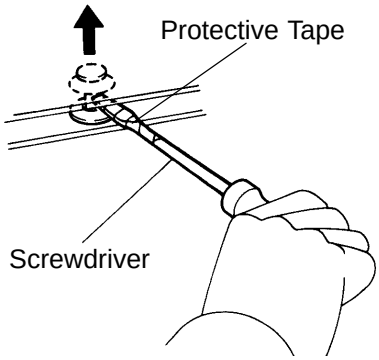
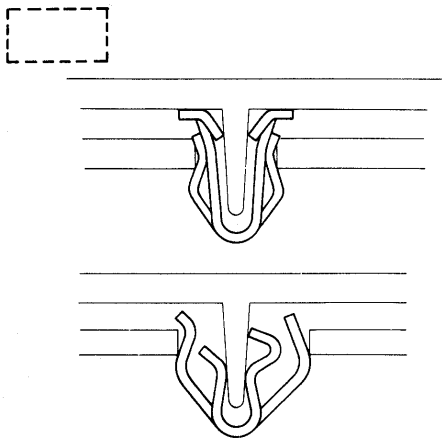
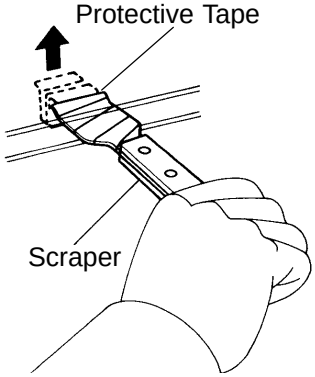
(See page DI-800)

CLIP

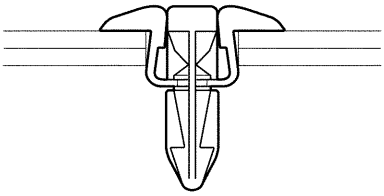
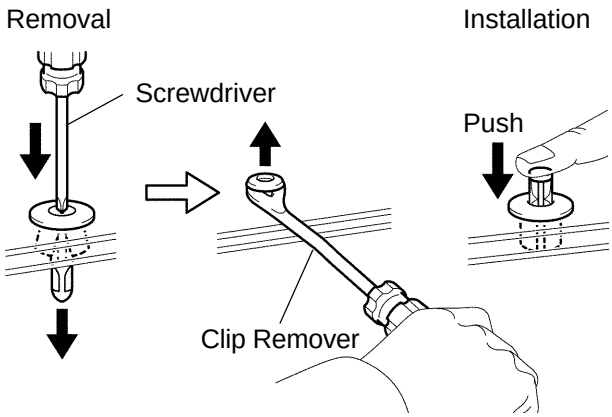
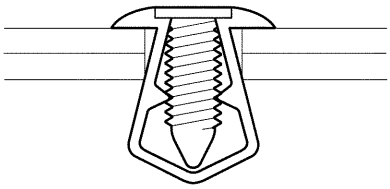
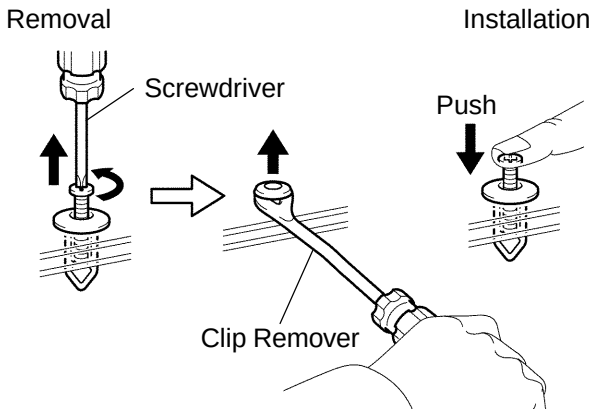
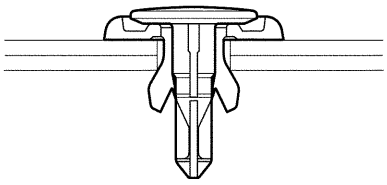
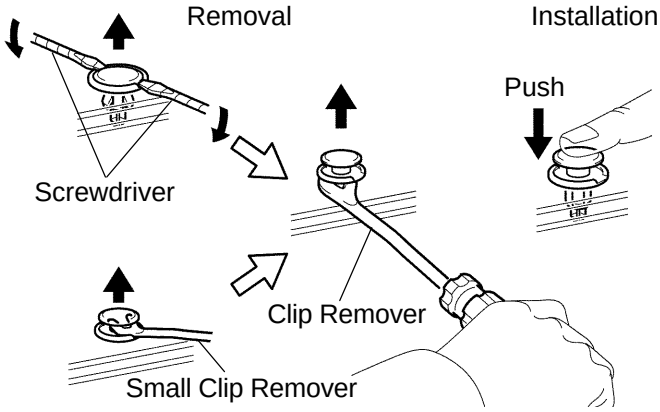
BO0VU-09

REPLACEMENT

The removal and installation methods of typical clips used in body parts are shown in the table below.
HINT:
If the clip is damaged during the operation, always replace it with a new clip.

Shape (Example)	Removal / Installation
	 Remove clips from front or rear using clip remover or pliers.
	 Remove clips from front or rear using clip remover or pliers.
	 Remove clips from front or rear using clip remover or pliers.

V00005

Shape (Example)	Removal/Installation
	 Remove rivet by pushing the center pin through and prying out the rivet shell.
	 Remove rivet by unscrewing the center pin and prying out the rivet shell.
	 Remove rivet by prying out the pin and then prying out the rivet shell.

P

V30002

SRS AIRBAG

BO0VV-13

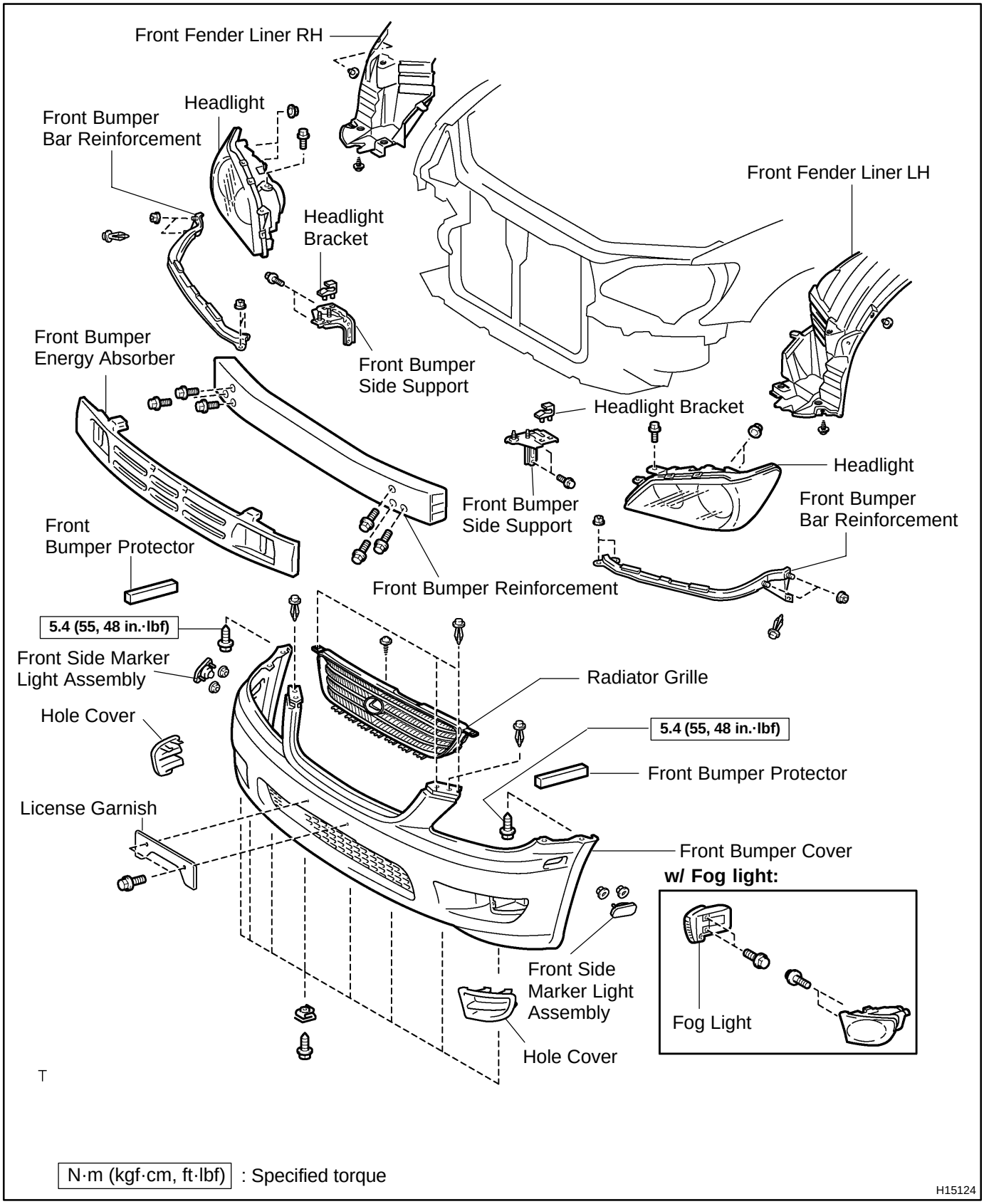
PRECAUTION

The LEXUS IS300 is equipped with an SRS (Supplemental Restraint System) such as the driver airbag, front passenger airbag and side airbag. Failure to carry out service operation in the correct sequence could cause the SRS to unexpectedly deploy during the servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notices in the RS section.

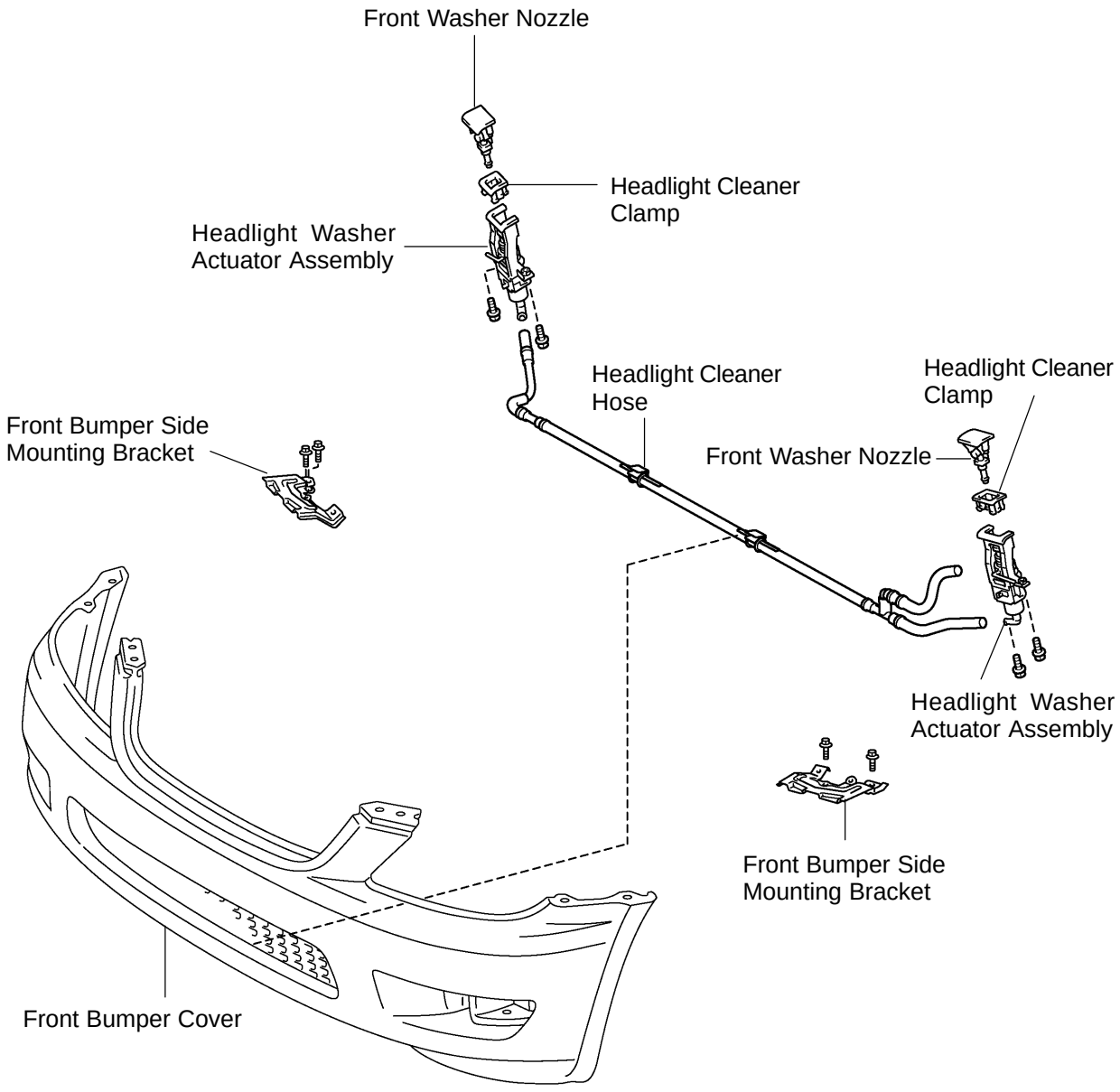
FRONT BUMPER

COMPONENTS

BO4CW-03

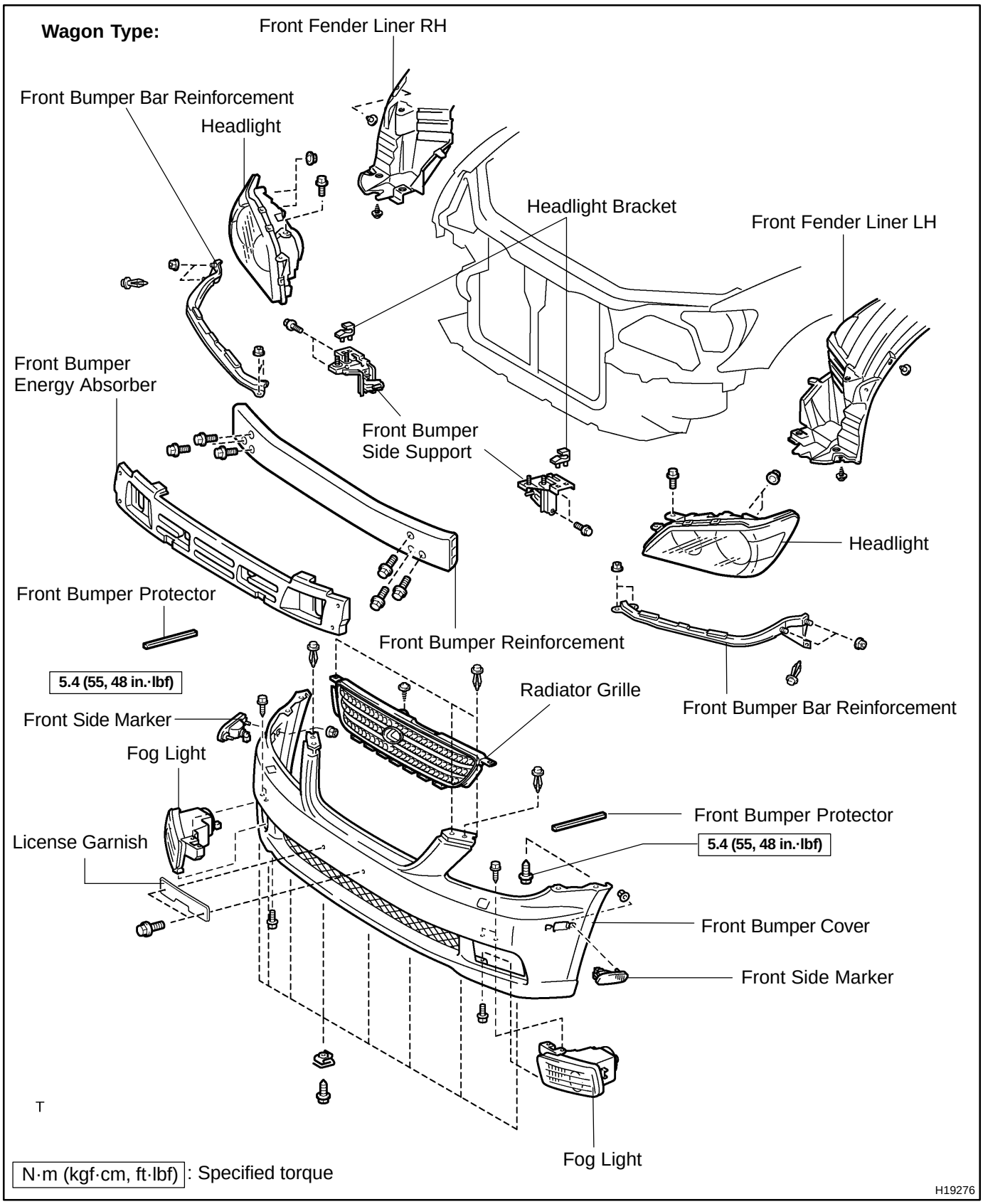


w/ Headlight washer:

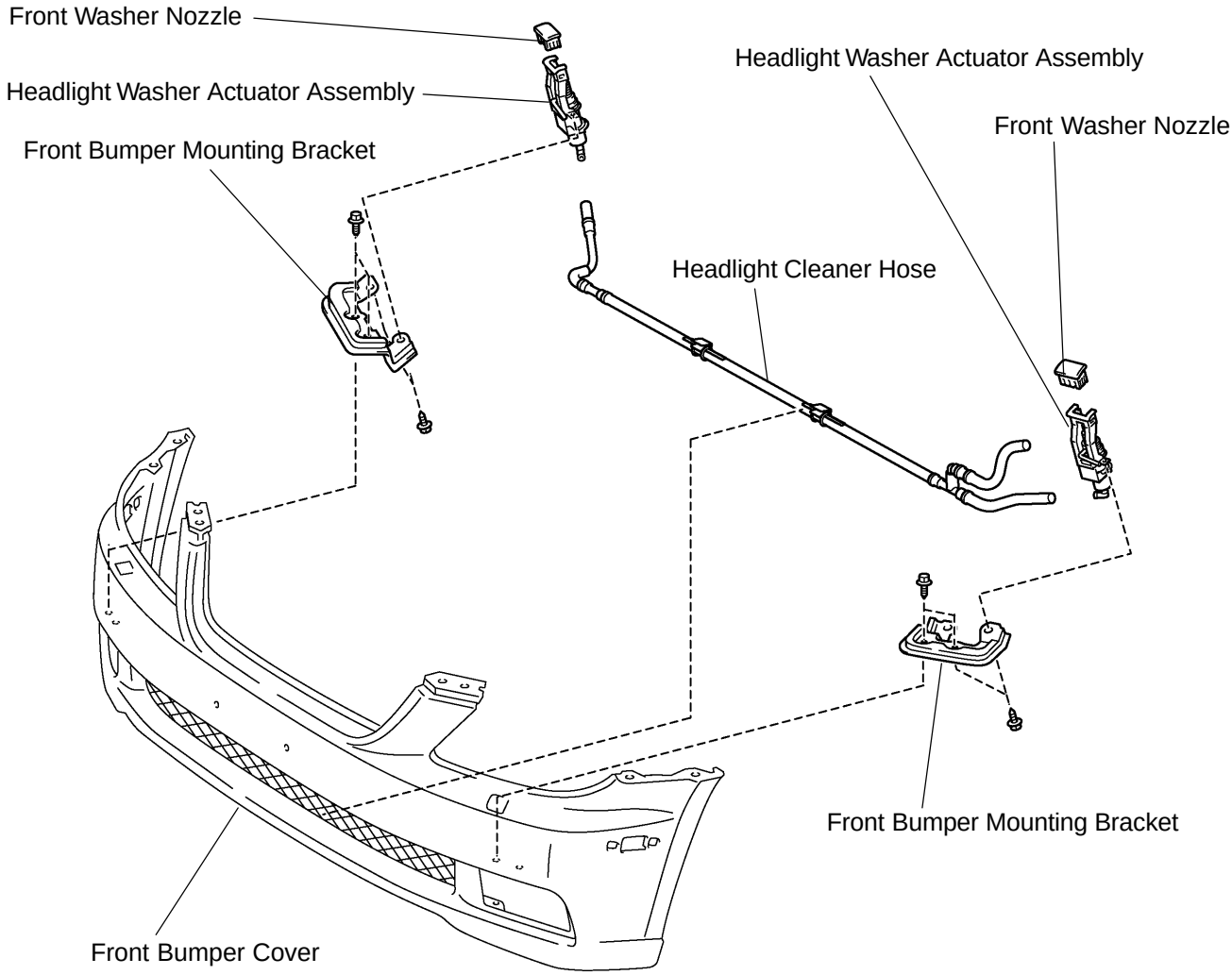


T

H15125


Wagon Type:
Front Fender Liner RH
Front Bumper Bar Reinforcement
Headlight
Headlight Bracket
Front Fender Liner LH
Front Bumper Energy Absorber
Front Bumper Side Support
Headlight
Front Bumper Protector
Front Bumper Reinforcement
5.4 (55, 48 in.·lbf)
Radiator Grille
Front Bumper Bar Reinforcement
Front Side Marker
Fog Light
Front Bumper Protector
License Garnish
5.4 (55, 48 in.·lbf)
Front Bumper Cover
Front Side Marker
T
Fog Light
N·m (kgf·cm, ft·lbf): Specified torque
H19276

w/ Headlight Washer:



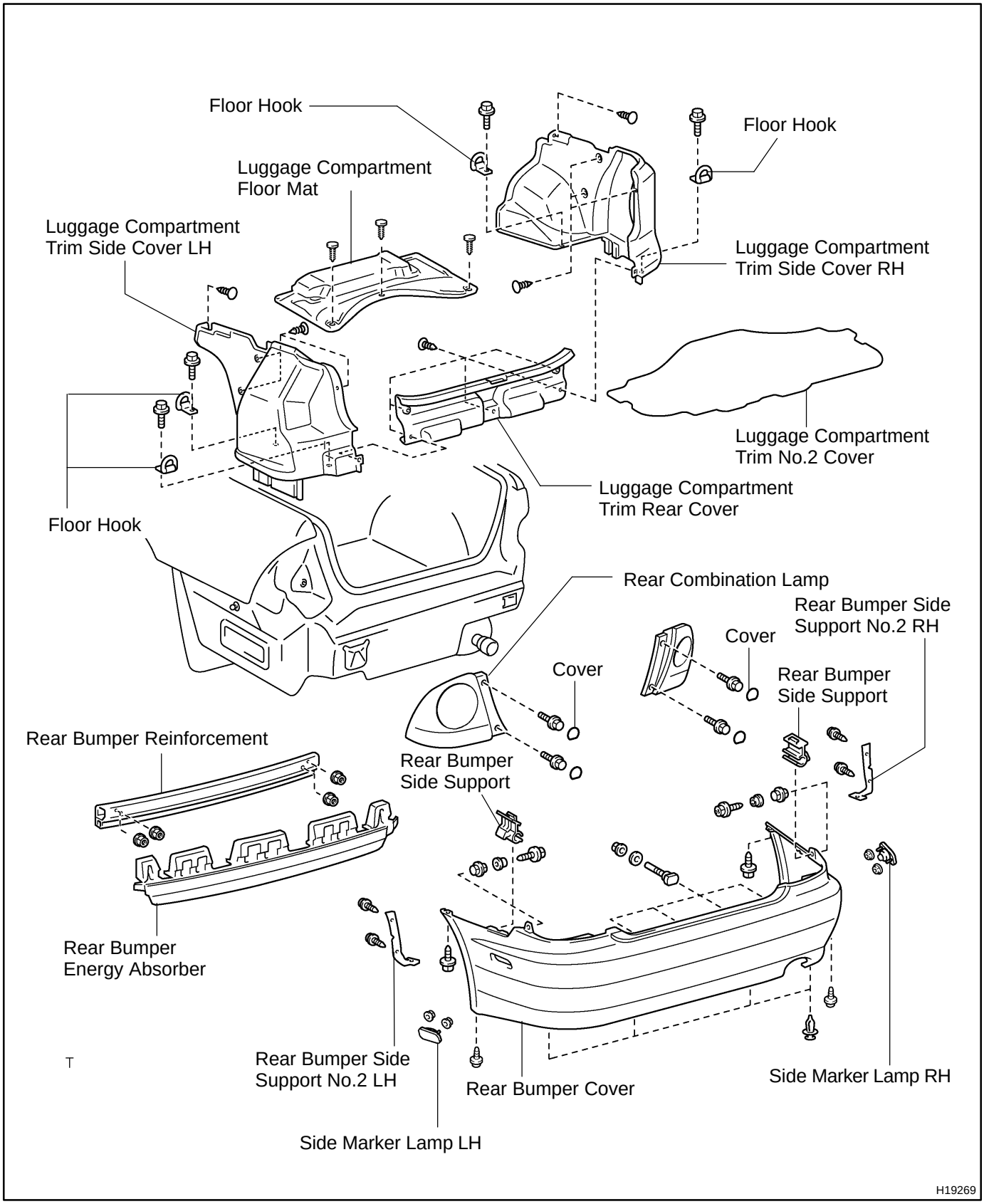
T

H19436

REAR BUMPER (Sedan)

COMPONENTS

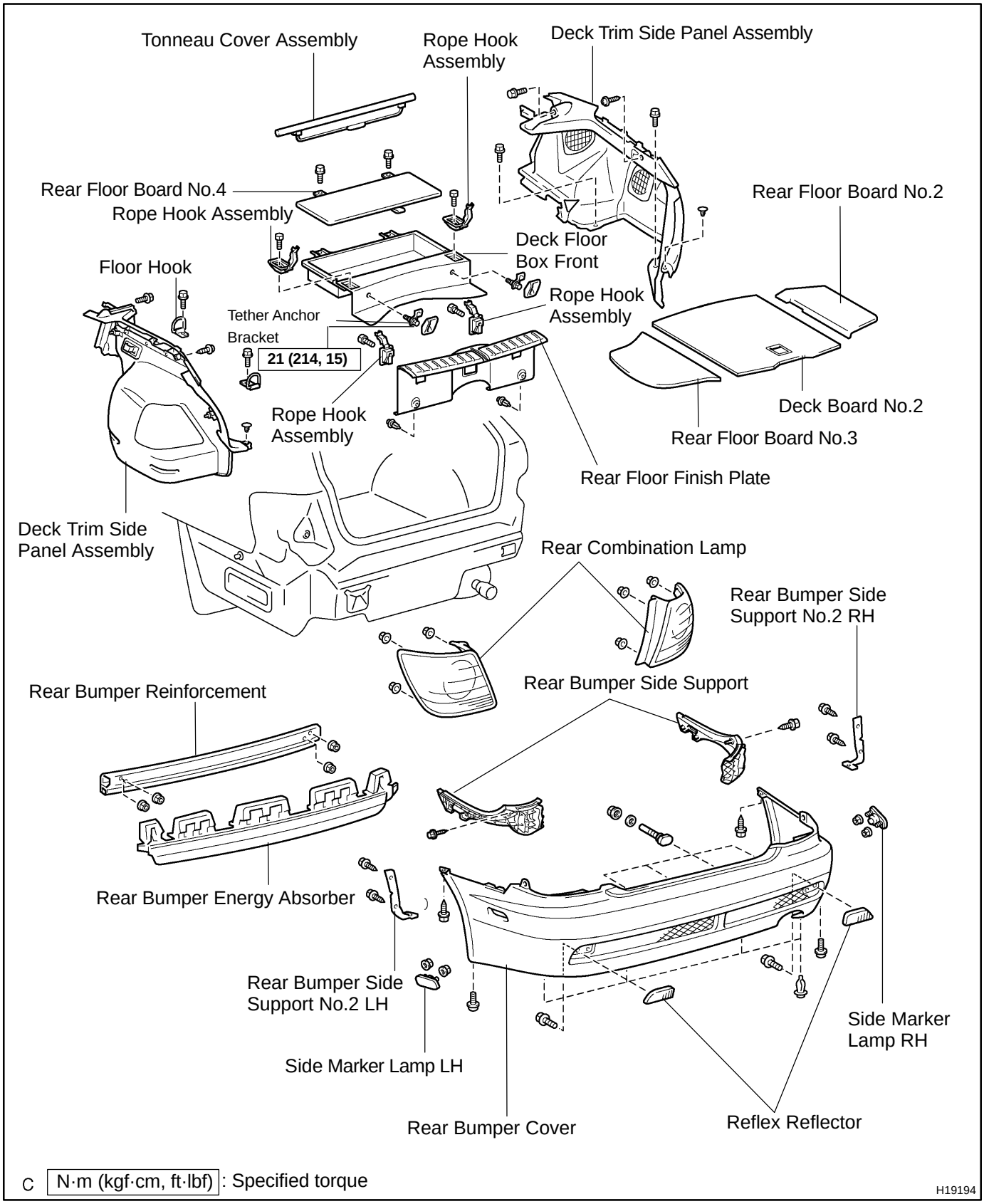
BO4CX-02



REAR BUMPER (Wagon)

BO4CY-02

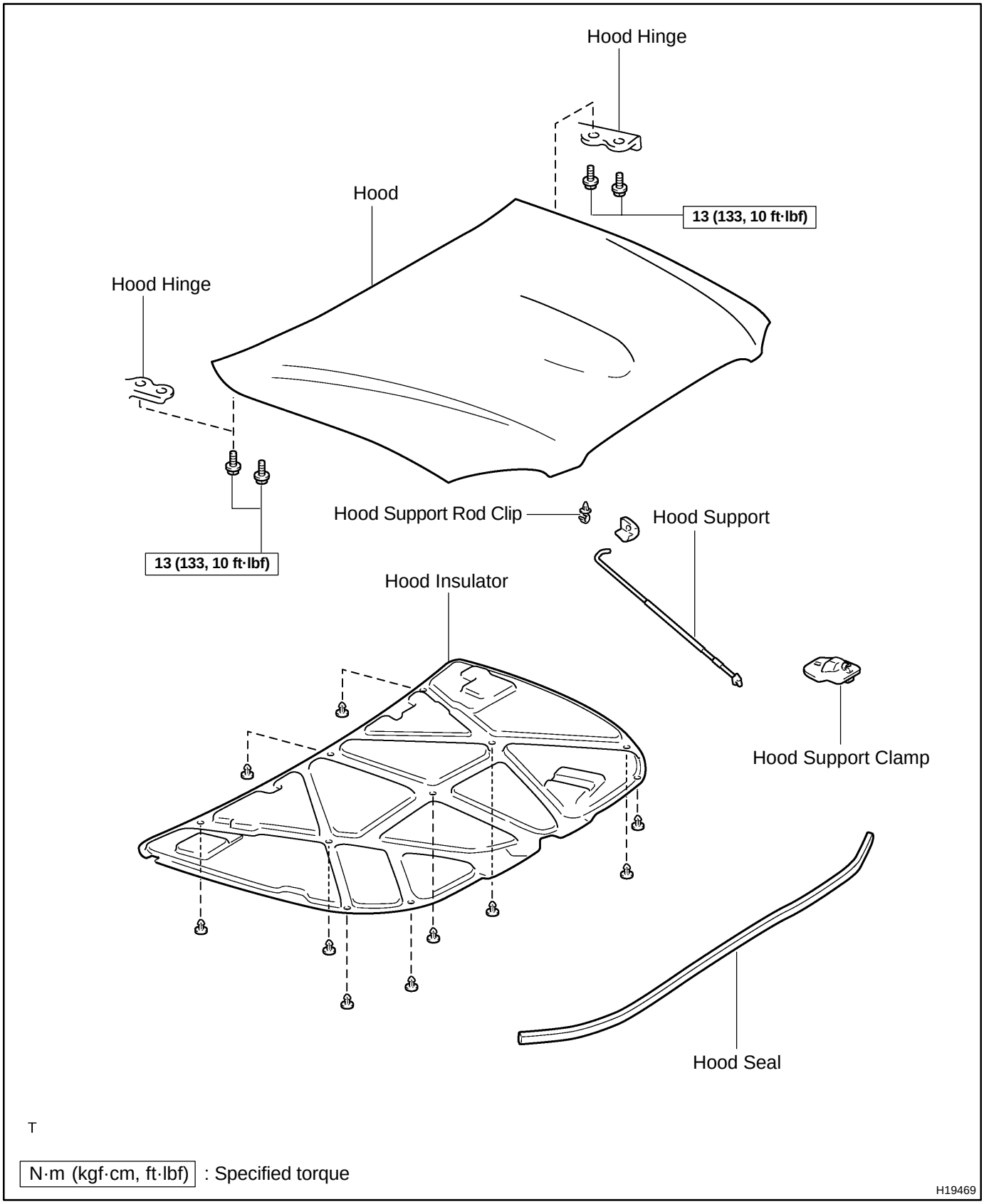
COMPONENTS



HOOD

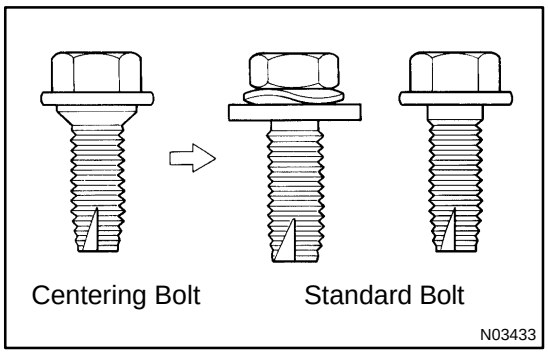
COMPONENTS

BO0VZ-09



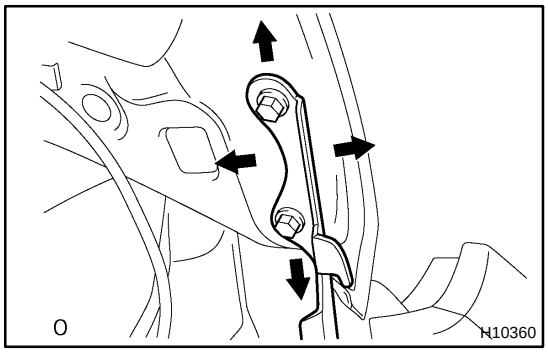
BO0W0-10

ADJUSTMENT



HINT:

Since the centering bolt is used as a hood hinge and hood lock set bolt, the hood and hood lock cannot be adjusted. Substitute the bolt with a washer for the centering bolt.



1. ADJUST HOOD IN FORWARD/REARWARD

Adjust the hood by loosening the hood side hinge bolts.

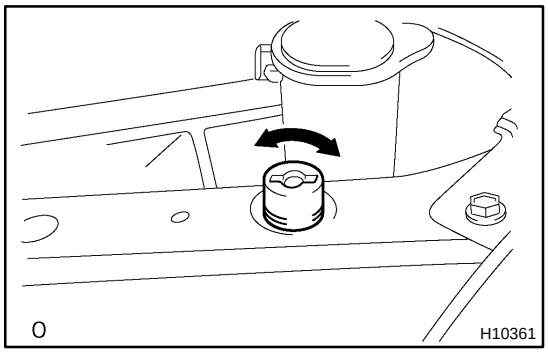
Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

2. ADJUST HOOD IN VERTICAL DIRECTIONS

(a) Remove the bolts and increase or decrease the number of washers between the hinge and the hood.

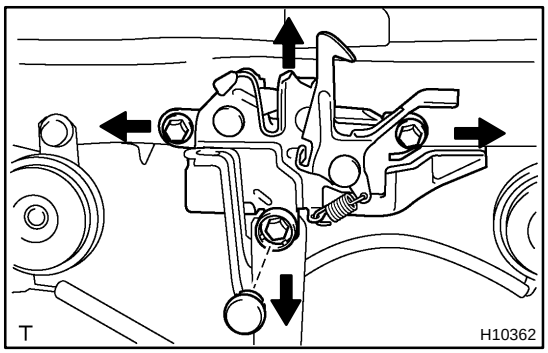
(b) Install the bolts again.

Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)



3. ADJUST FRONT EDGE OF HOOD IN VERTICAL DIRECTION

Adjust the hood by turning the cushions.



4. ADJUST HOOD LOCK

(a) Remove the screw, 2 clips and radiator grille.

(b) Using a screwdriver, remove the hood lock bolt cap.

HINT:

Tape the screwdriver tip before use.

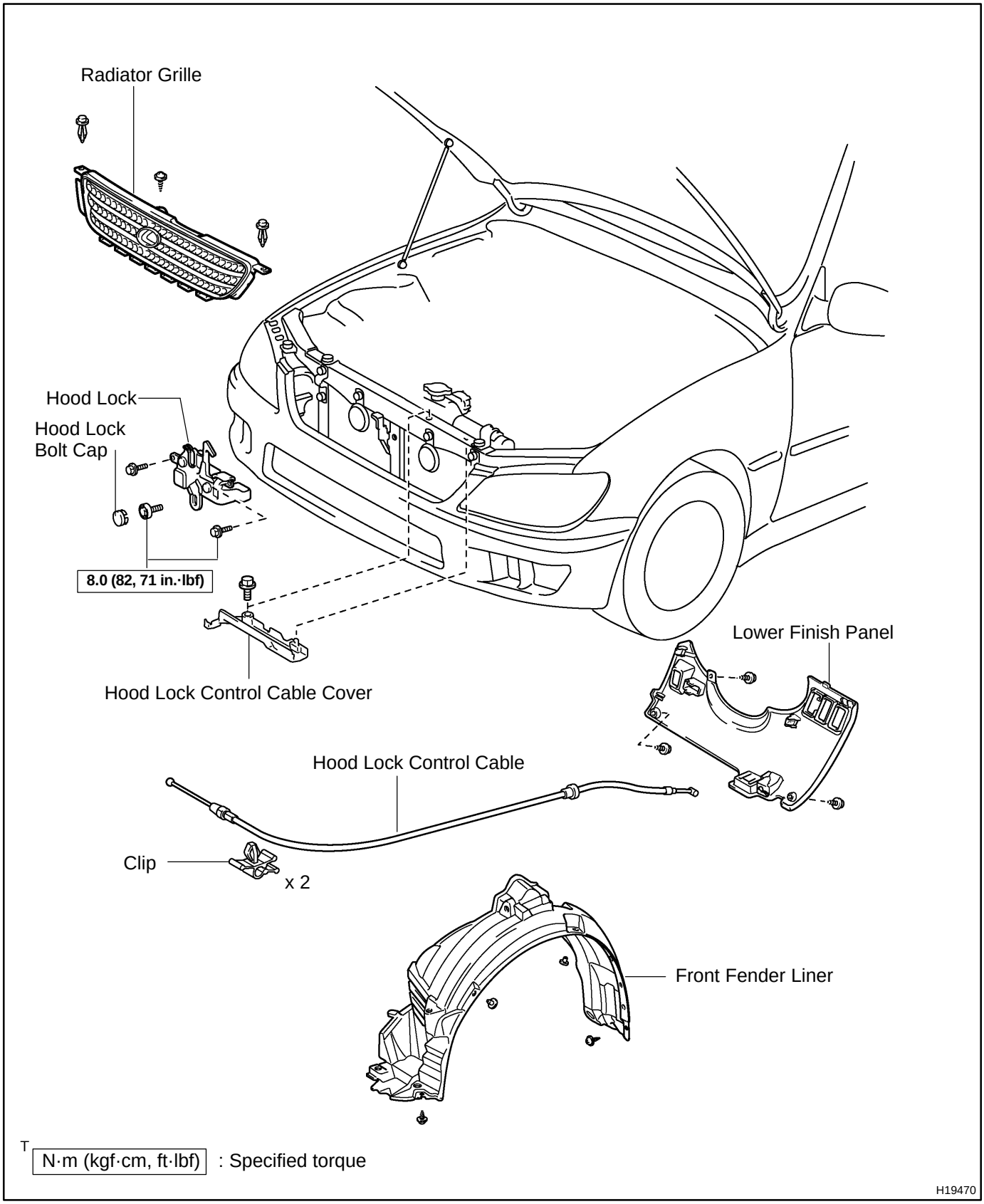
(c) Adjust the hood lock by loosening the bolts.

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

HOOD LOCK CONTROL

COMPONENTS

BO0VW-06



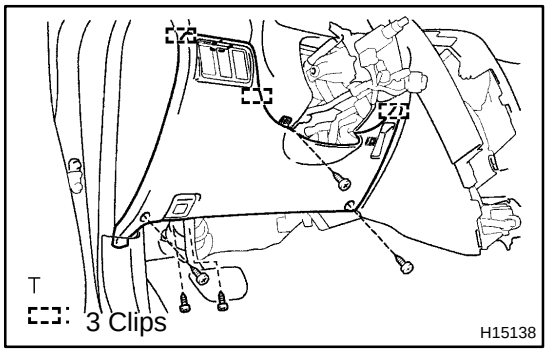
BO0VX-09

REMOVAL

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. REMOVE FRONT FENDER LINER



2. REMOVE LOWER FINISH PANEL

(a) Remove the 3 screws and lower finish panel.

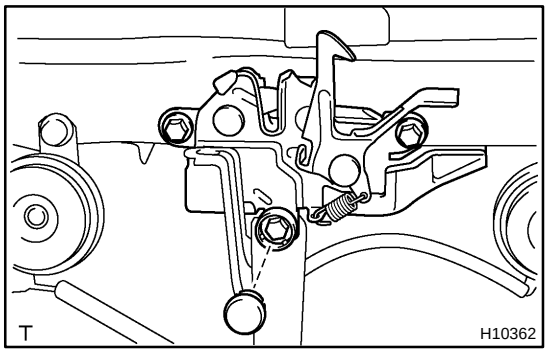
(b) Disconnect the connectors and hood lock control cable.

3. REMOVE RADIATOR GRILLE

Remove the screw, 2 clips and radiator grille.

4. REMOVE HOOD LOCK CONTROL CABLE COVER

Remove the bolt and hood lock control cable cover.



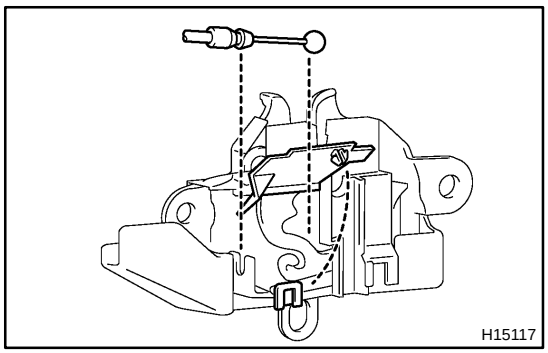
5. REMOVE HOOD LOCK

(a) Using a screwdriver, remove the hood lock bolt cap.

HINT:

Tape the screwdriver tip before use.

(b) Remove the 3 bolts and hood lock.



(c) Using a screwdriver, open the cover, then disconnect the hood lock control cable.

HINT:

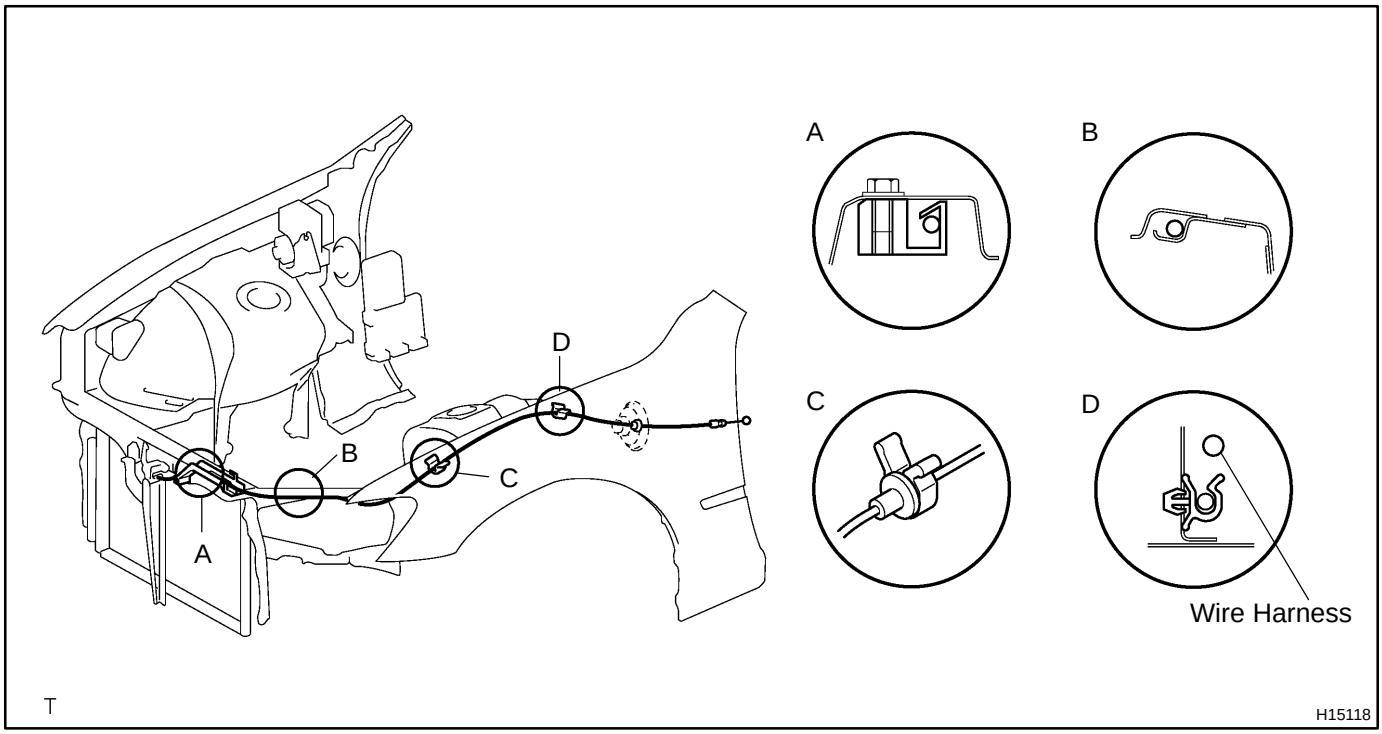
Tape the screwdriver tip before use.

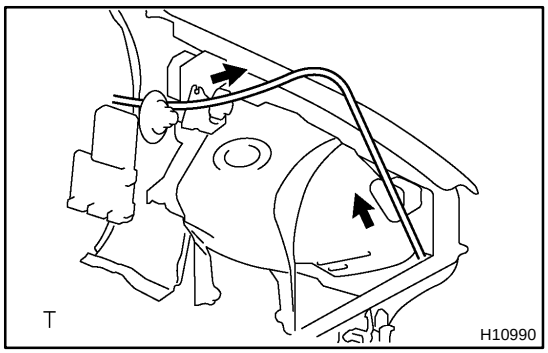
6. REMOVE HOOD LOCK CONTROL CABLE

(a) Using a screwdriver, disconnect the cable from the clamps.

HINT:

Tape the screwdriver tip before use.

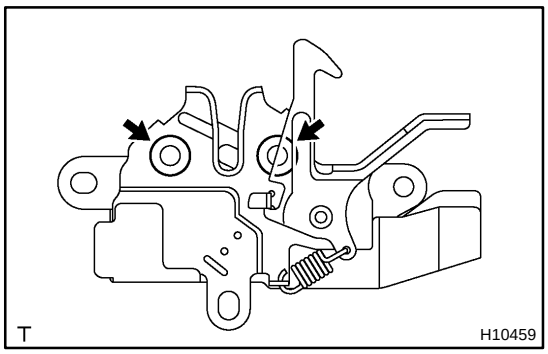




(b) Pull the cable from the engine room to remove it.

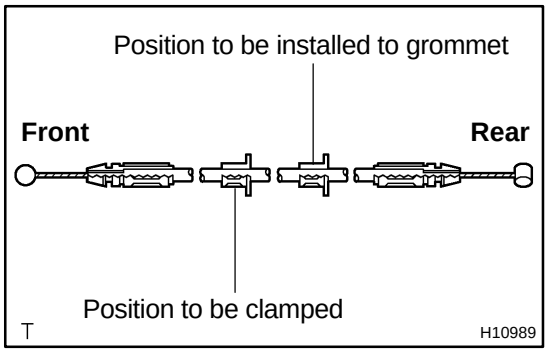
BO2C2-03

INSTALLATION



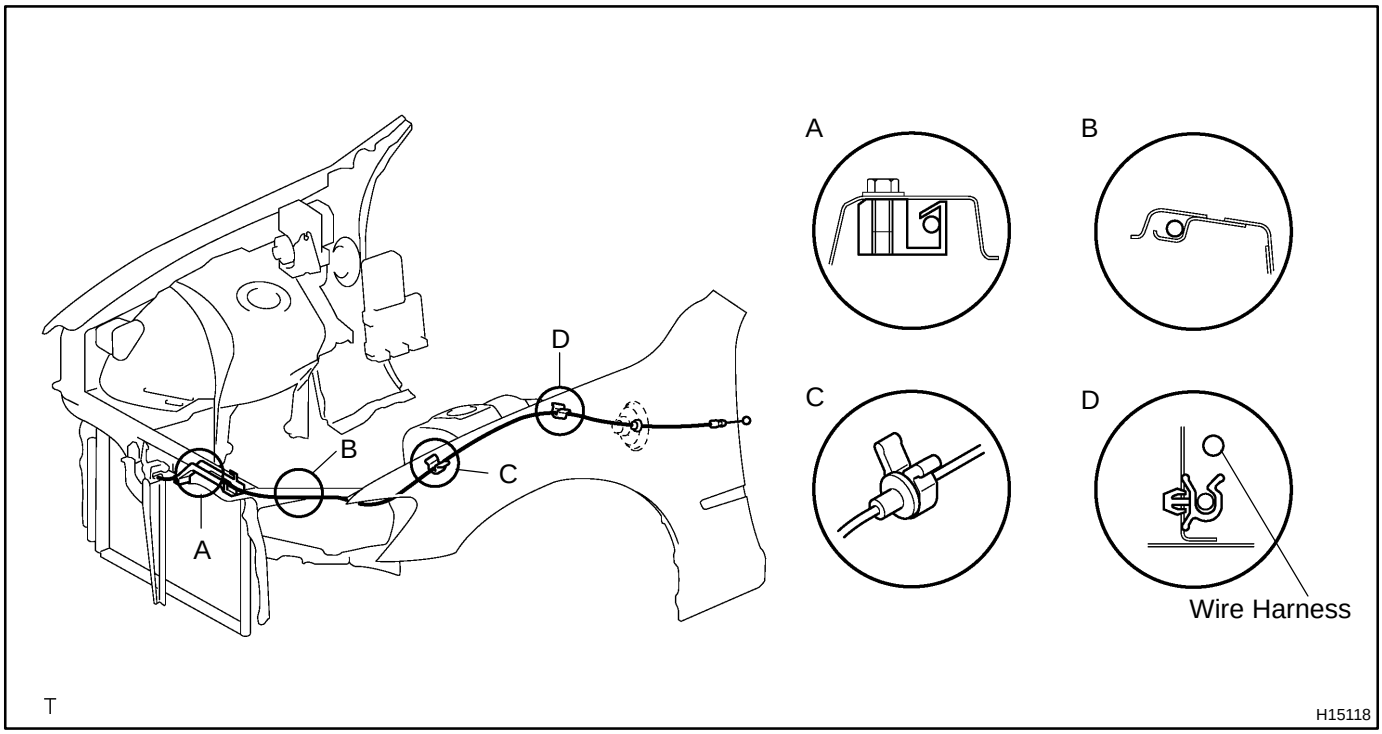
1. BEFORE INSTALLING PARTS, COAT LOCK WITH MP GREASE

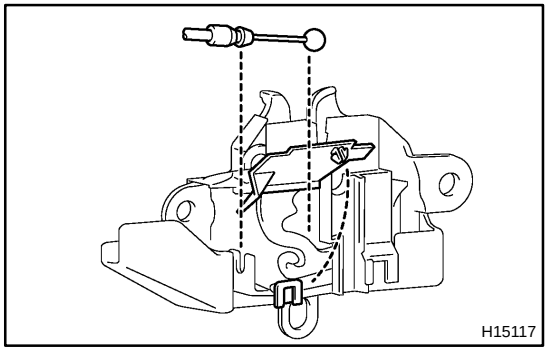
Apply MP grease to the sliding surface of the lock.



2. INSTALL HOOD LOCK CONTROL CABLE

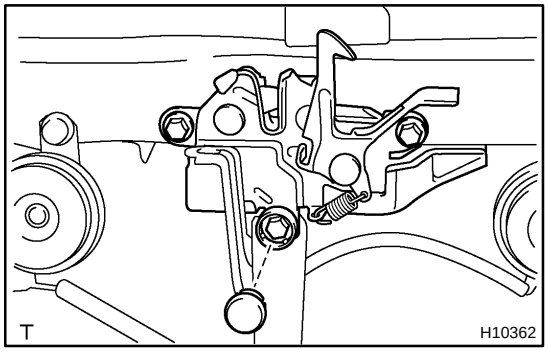
(a) Push the rear side cable through the grommet.
(b) Push the cable stopper to the grommet.
(c) Pass the front side cable through the upper radiator support.
(d) Install the cable with clamps.
(e) Push the cable stopper to the clamp.





3. INSTALL HOOD LOCK

(a) Connect the hood lock control cable to the hood lock, then close the cover.



(b) Install the hood lock with the 3 bolts.

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

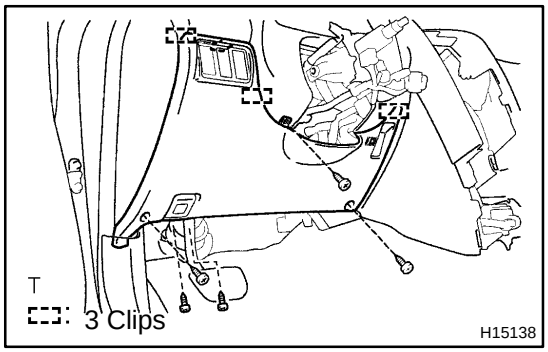
(c) Install the hood lock bolt cap.

4. INSTALL HOOD LOCK CONTROL CABLE COVER

Install the hood lock control cable cover with the bolt.

5. INSTALL RADIATOR GRILLE

Install the radiator grille with the screw and 2 clips.



6. INSTALL LOWER FINISH PANEL

(a) Connect the connectors and hood lock control cable to the lower finish panel.

(b) Install the lower finish panel with the 3 screws.

7. CHECK HOOD LOCK CONTROL FOR PROPER OPERATION

After checking for proper operation, tighten the 3 bolts to install the lock.

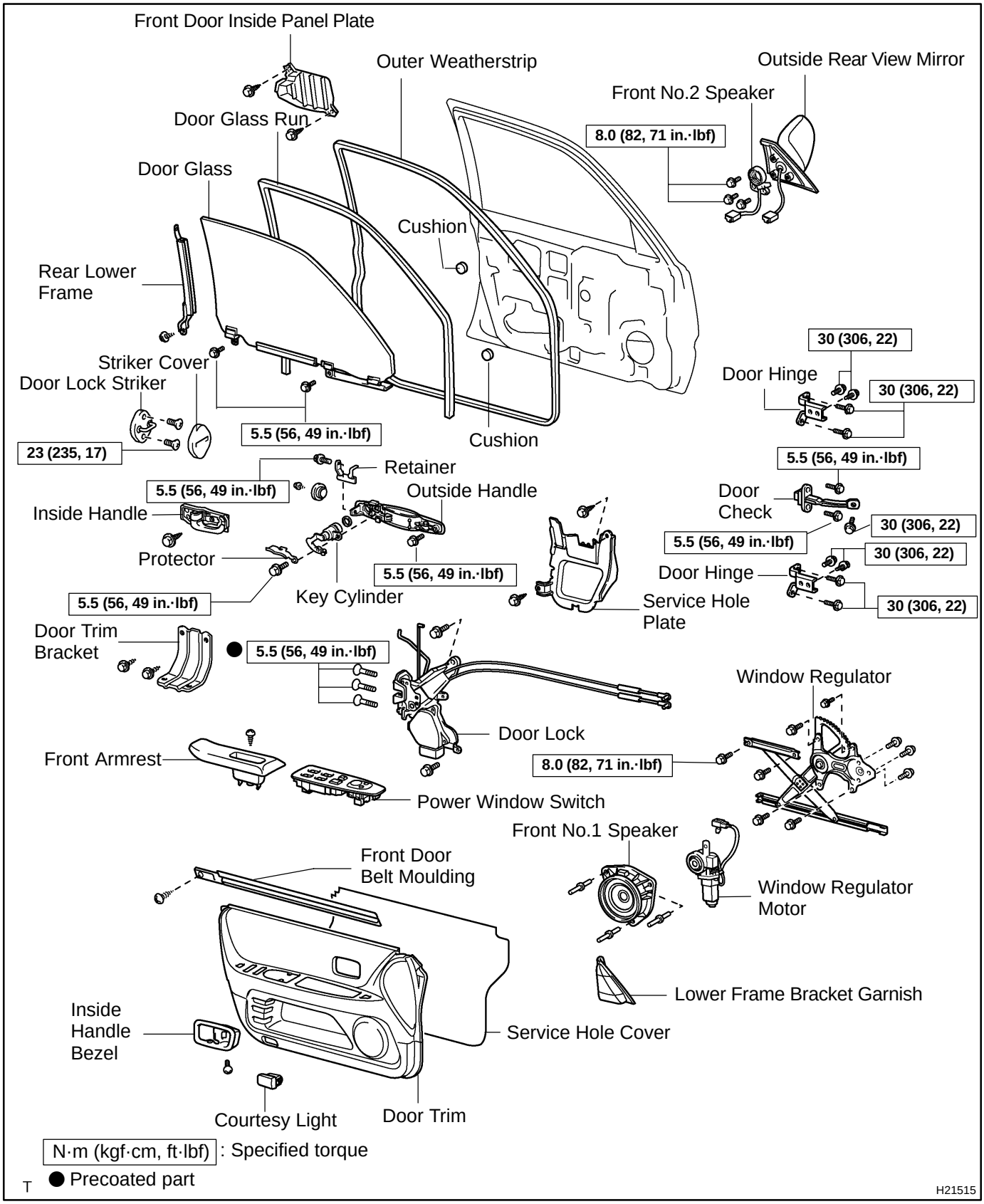
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

8. INSTALL FRONT FENDER LINER

FRONT DOOR

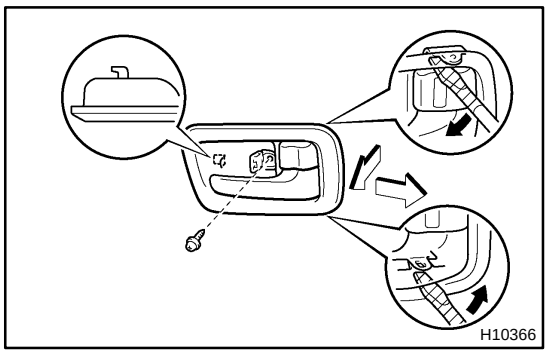
COMPONENTS

BO2C3-05



BO2C6-05

DISASSEMBLY



HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. REMOVE INSIDE HANDLE BEZEL

(a) Using a screwdriver, open the screw cap.

HINT:

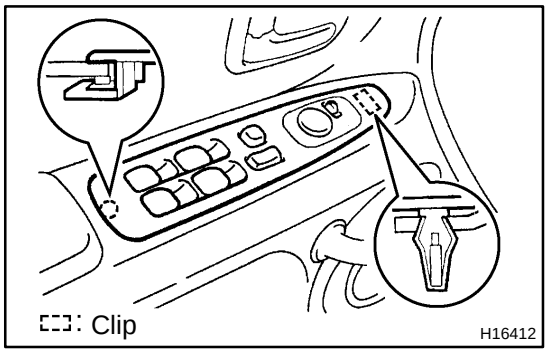
Tape the screwdriver tip before use.

(b) Remove the screw.

(c) Using a screwdriver, remove the inside handle bezel as shown in the illustration.

HINT:

Tape the screwdriver tip before use.



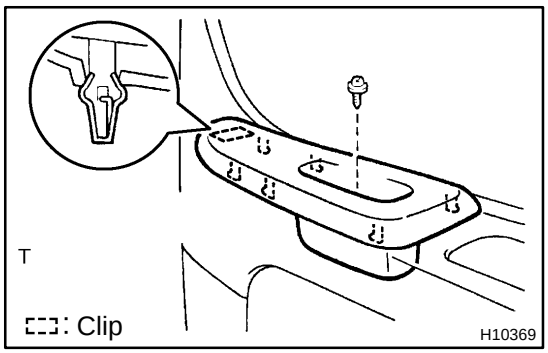
2. REMOVE POWER WINDOW SWITCH

(a) Using a screwdriver, remove the power window switch.

HINT:

Tape the screwdriver tip before use.

(b) Disconnect the connectors.



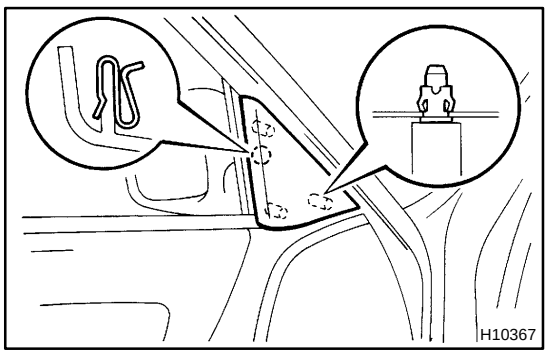
3. REMOVE FRONT ARMREST

(a) Remove the screw.

(b) Using a screwdriver, remove the front armrest as shown in the illustration.

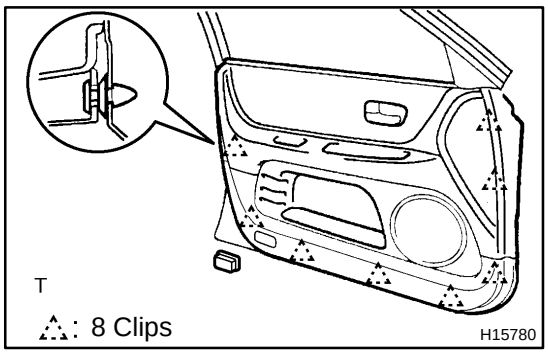
HINT:

Tape the screwdriver tip before use.



4. REMOVE LOWER FRAME BRACKET GARNISH

Remove the lower frame bracket garnish.



5. REMOVE DOOR TRIM

(a) Using a screwdriver, remove the courtesy light, then disconnect the connector.

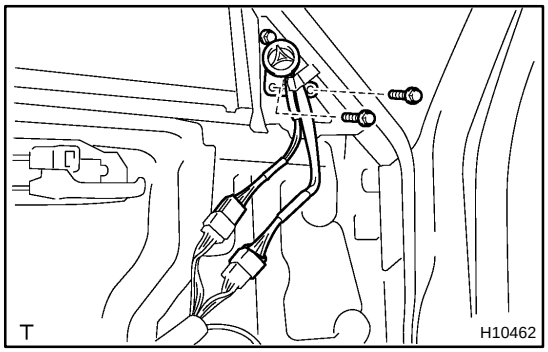
HINT:

Tape the screwdriver tip before use.

(b) Using a screwdriver, disengage the clips, then pull the trim upward to remove it.

HINT:

Tape the screwdriver tip before use.



6. REMOVE FRONT NO.2 SPEAKER

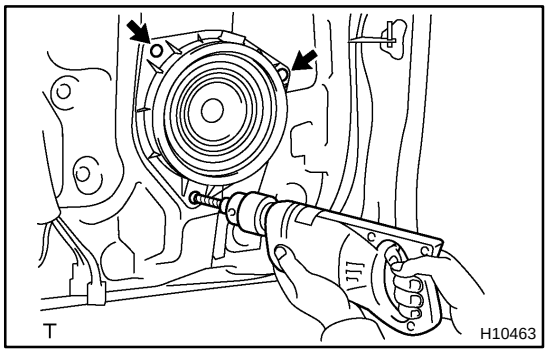
(a) Disconnect the 2 connectors.

(b) Remove the 2 bolts and front No.2 speaker.

7. REMOVE OUTSIDE REAR VIEW MIRROR

(a) Disconnect the connector.

(b) Remove the bolt and outside rear view mirror.



8. REMOVE FRONT NO.1 SPEAKER

(a) Disconnect the connector.

(b) Using a drill of less than ø 4 mm (0.16 in.), drill out the rivet heads and remove the speaker.

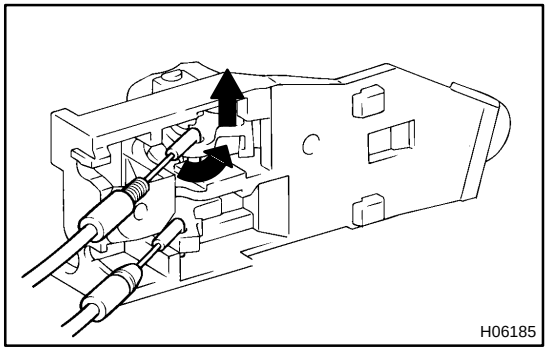
(c) Gently and vertically put the drill to the rivet, and cut the rivet flanges.

NOTICE:

- **Prizing the hole with a drill can lead to damage to the rivet hole or breaking the drill.**
- **Take care as the cut rivet is hot.**

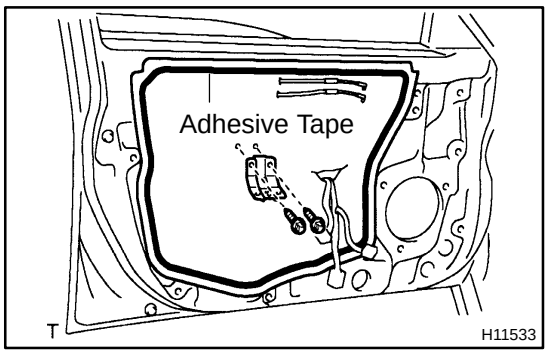
(d) Even if a flange is taken off, continue drilling and push out remaining fragments with the drill.

(e) Using a vacuum cleaner, remove the drilled rivet and their dust from the inside of the door.



9. REMOVE INSIDE HANDLE

Remove the screw and inside handle, disconnect the 2 cables from the inside handle.



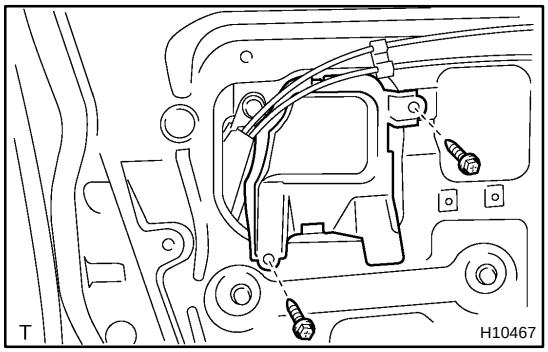
10. REMOVE SERVICE HOLE COVER

(a) Remove the 2 screws and door trim bracket.

(b) Remove the service hole cover.

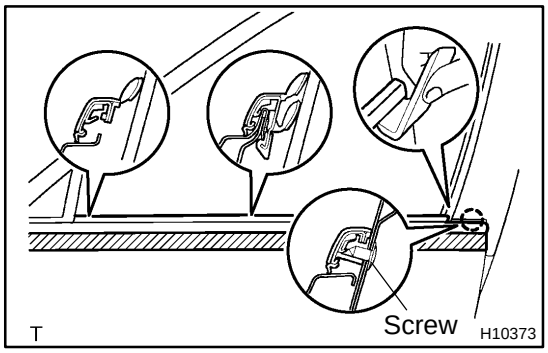
11. REMOVE FRONT DOOR INSIDE PANEL PLATE

Remove the 2 screws and front door inside panel plate.



12. REMOVE NO.2 SERVICE HOLE COVER

Remove the 2 screws and No.2 service hole cover.

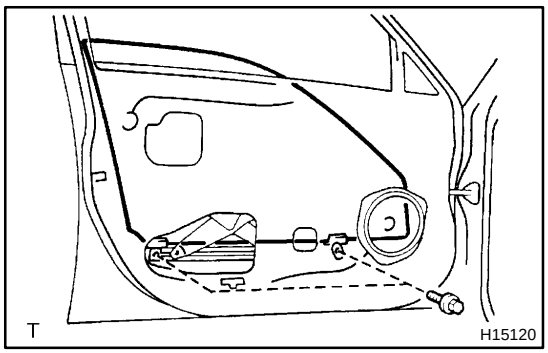


13. REMOVE FRONT DOOR BELT MOULDING

(a) Remove a screw.

(b) Apply protective tape to the outer surface as shown in the illustration, to keep the surface from being scratched.

(c) Using a moulding remover, remove the front door belt moulding as shown in the illustration.



14. REMOVE DOOR GLASS

HINT:

Insert a shop rag inside the door panel to prevent scratching the glass.

(a) Open the door glass until the bolts appear in the service hole.

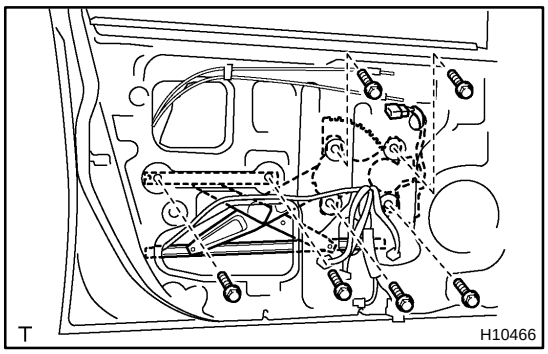
(b) Remove the 2 bolts and door glass.

NOTICE:

Do not damage the door glass.

HINT:

Pull the glass upward to remove it.



15. REMOVE WINDOW REGULATOR

(a) Disconnect the connector and disengage the clamps.

(b) Remove the 6 bolts and window regulator.

16. REMOVE WINDOW REGURATOR MOTOR

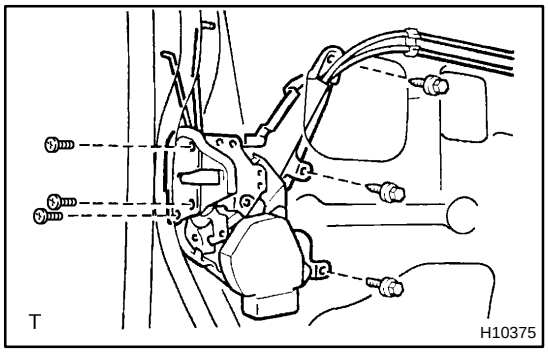
(a) Place matchmarks on the window regurator motor bracket and regurator gear.

(b) Remove the 3 screws and motor.

17. REMOVE DOOR GLASS RUN

18. REMOVE REAR LOWER FRAME

Remove the bolt and rear lower frame.



19. REMOVE DOOR LOCK

(a) Disconnect the 2 links from the outside handle and key cylinder.

(b) Remove the bolt and 2 screws.

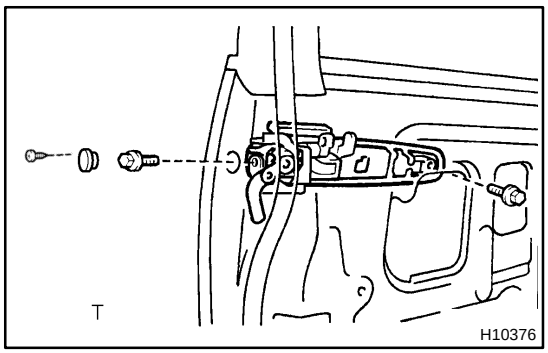
(c) Using a torx socket wrench, remove the 3 torx screws and door lock.

Torx socket wrench: T30 (Part No. 09042-00010 or locally manufactured tool)

(d) Disconnect the connector.

HINT:

Remove the door lock through the service hole.



20. REMOVE OUTSIDE HANDLE AND KEY CYLINDER

(a) Remove the screw and hole cover.

(b) Remove the 2 bolts and outside handle with the key cylinder.

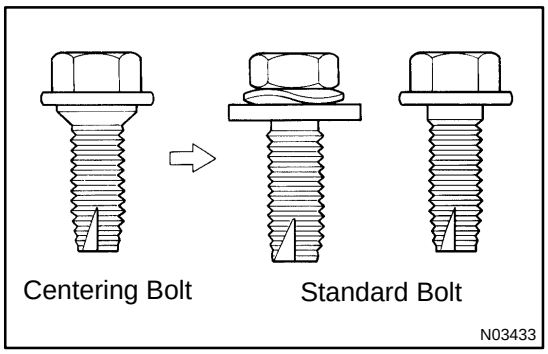
(c) Remove the retainer from the outside handle.

(d) Remove the bolt, key cylinder and protector from the outside handle.

21. REMOVE CUSHIONS

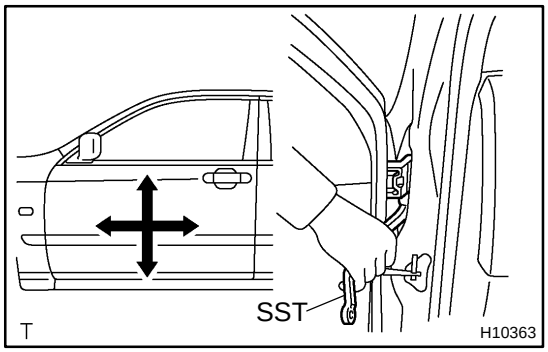
BO3TS-03

ADJUSTMENT



HINT:

Since the centering bolt is used as a door side hinge bolt, the door hinge cannot be adjusted. Substitute the bolt with a washer for the centering bolt.

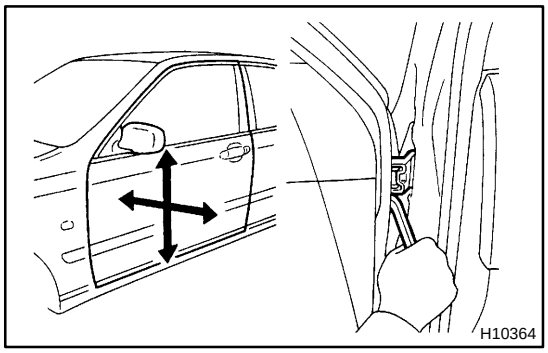


1. ADJUST FRONT DOOR IN FORWARD/REARWARD AND VERTICAL DIRECTIONS

Using SST, adjust the door by loosening the body side hinge bolts.

SST 09812-00010

Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)



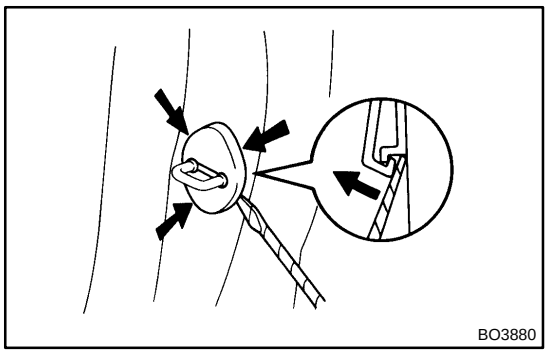
2. ADJUST FRONT DOOR IN LEFT/RIGHT AND VERTICAL DIRECTIONS

Adjust the door by loosening the door side hinge bolts.

Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)

3. ADJUST FRONT DOOR LOCK STRIKER

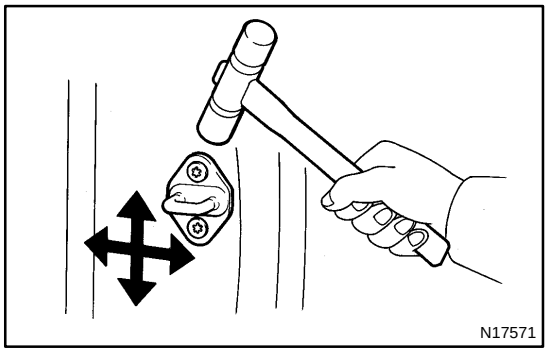
(a) Check that the door fit and door lock linkages are adjusted correctly.



(b) Using a screwdriver, remove the striker cover.

HINT:

Tape the screwdriver tip before use.



(c) Adjust the striker position by slightly loosening the striker mounting screws, and hitting the striker with a hammer.

(d) Tighten the striker mounting screws again.

Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)

(e) Install the striker cover.

BO2C5-04

REASSEMBLY

1. INSTALL OUTER WEATHERSTRIP

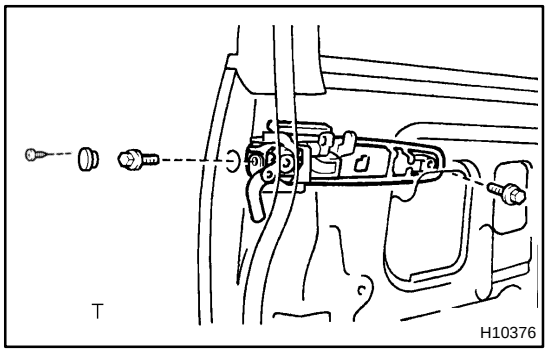
2. INSTALL CUSHIONS

3. INSTALL OUTSIDE HANDLE AND KEY CYLINDER

(a) Install the key cylinder and protector with the bolt to the outside handle.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

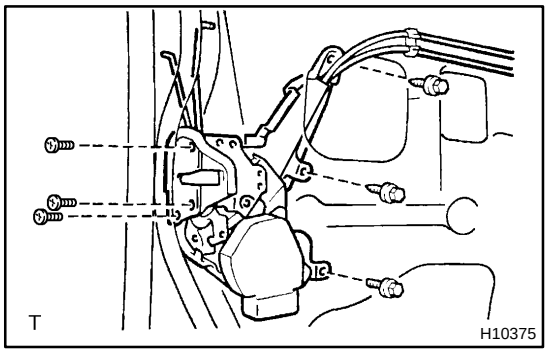
(b) Install the retainer to the outside handle.



(c) Install the outside handle with the key cylinder to the door panel with the 2 bolts.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

(d) Install the hole cover with the screw.



4. INSTALL DOOR LOCK

(a) Connect the connector.

(b) Using a torx socket wrench, install the door lock with the 3 torx screws.

Torx socket wrench: T30 (Part No. 09042-00010 or locally manufactured tool)

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

HINT:

Apply adhesive to the 3 torx screws.

Part No. 08833-00070, THREE BOND 1324 or equivalent

(c) Install the bolt and 2 screws.

(d) Connect the 2 links to the outside handle and key cylinder.

5. INSTALL REAR LOWER FRAME

Install the rear lower frame with the bolt.

6. INSTALL DOOR GLASS RUN

7. INSTALL WINDOW REGURATOR MOTOR

(a) Align the matchmarks on the regulator motor bracket and regulator gear.

(b) Install the 3 screws.

NOTICE:

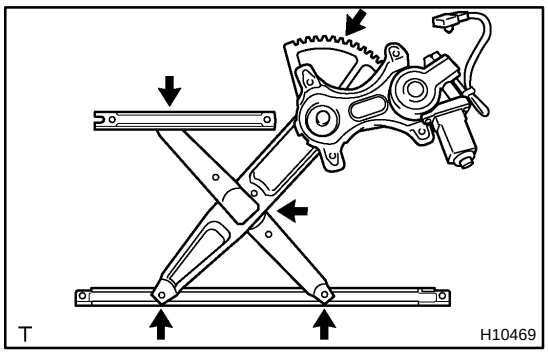
Driver's side:

If only the motor is rotated, reset the motor (See page BE-1 18).

HINT:

Driver's side:

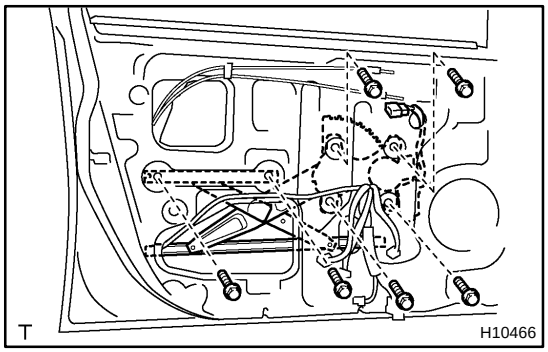
Never rotate the motor to the down direction mention of the window glass until completing the installation.



8. INSTALL WINDOW REGULATOR

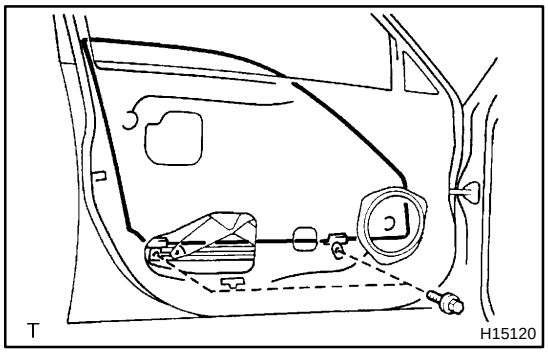
HINT:

Apply MP grease to the sliding and rotating parts of the window regulator.



(a) Install the window regulator with the 6 bolts.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

(b) Connect the connector and attach the clamps.



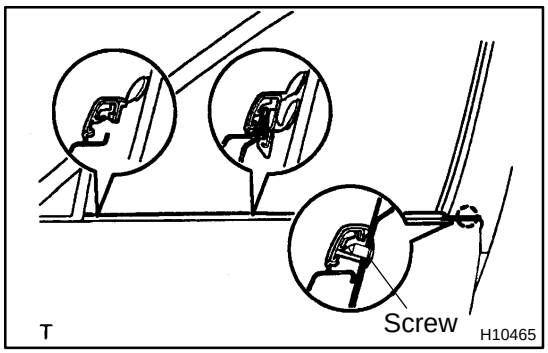
9. INSTALL DOOR GLASS

NOTICE:

Do not damage the door glass.

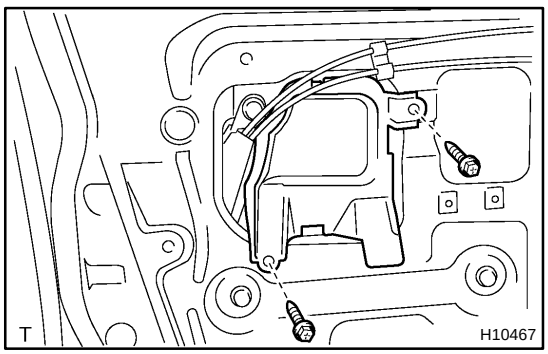
(a) Put the door glass in the door panel carefully.

(b) Install the door glass with the 2 bolts to the window regulator.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)



10. INSTALL FRONT DOOR BELT MOULDING

Install the front door belt moulding with the screw.

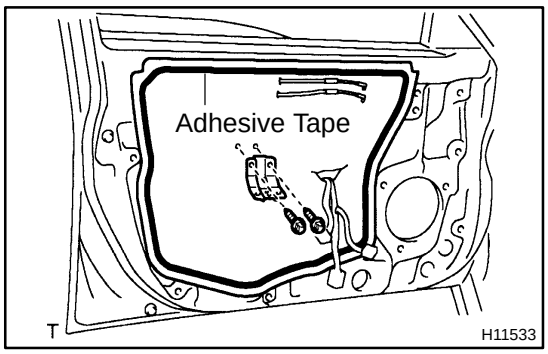


11. INSTALL NO.2 SERVICE HOLE COVER

Install the No.2 service hole cover with the 2 screws.

12. INSTALL FRONT DOOR INSIDE PANEL PLATE

Install the front door inside panel plate with the 2 screws.



13. INSTALL SERVICE HOLE COVER

(a) Install the service hole cover to the door panel.

HINT:

- When installing the service hole cover, pull out the links and the connectors through the service hole cover.
- There should be no wrinkles or folds after attaching the service hole cover.
- After attaching the service hole cover, sealing condition should be confirmed.

(b) Install the door trim bracket with the 2 screws.

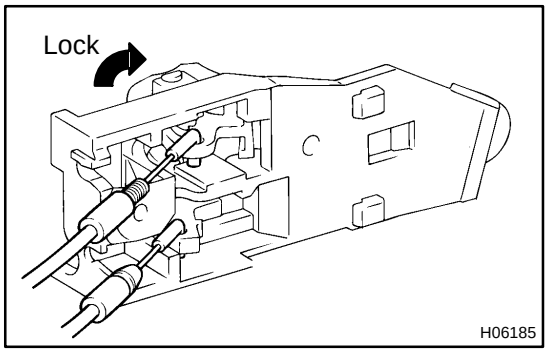
14. INSTALL INSIDE HANDLE

Connect the 2 cables to the inside handle, then install the inside handle with the screw.

NOTICE:

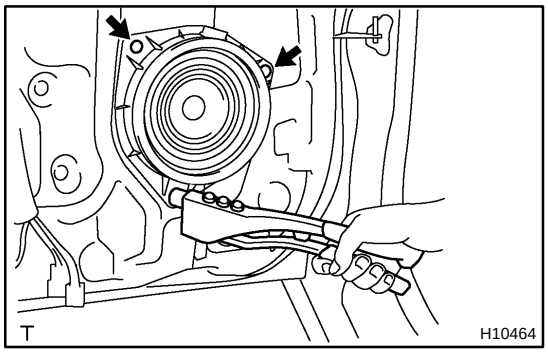
At the time of locking cable reassembly, please refer to the following items.

- **Set the door lock assembly to the LOCK position.**
- **Hold the lock knob to the LOCK position by hand, and do not pull the cable while connecting the locking cable.**



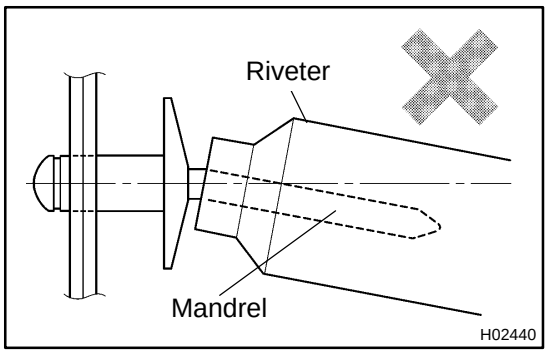
15. INSTALL FRONT NO.1 SPEAKER

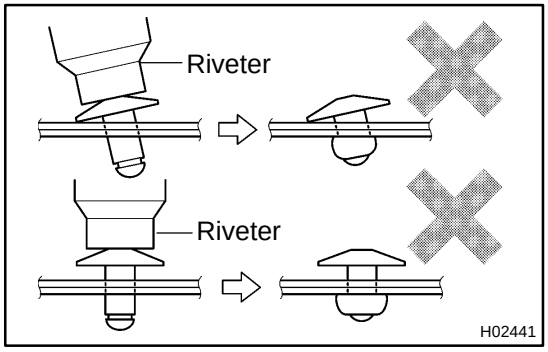
(a) Using an air riveter or hand riveter, install the front No.1 speaker.



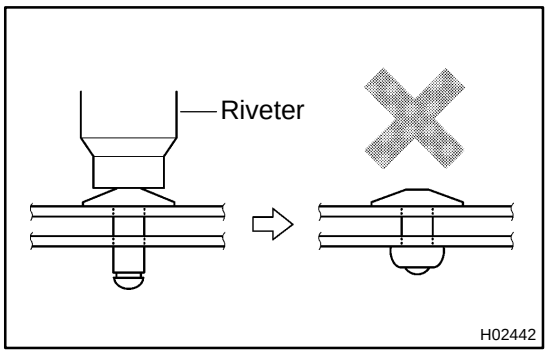
NOTICE:

- **Do not prize a riveter. It could damage the riveter and cause loose fitting and mandrel bend.**





- **Do not tilt the riveter when fastening the rivet to the material to avoid loose fitting.**
- **Do not allow gap spacing between the rivet head and the material.**



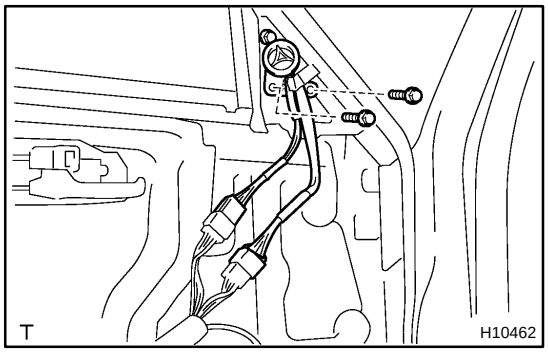
- **Do not allow gap spacing between the materials.**

(b) Connect the connector.

16. INSTALL OUTSIDE REAR VIEW MIRROR

(a) Install the outside rear view mirror with the bolt.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

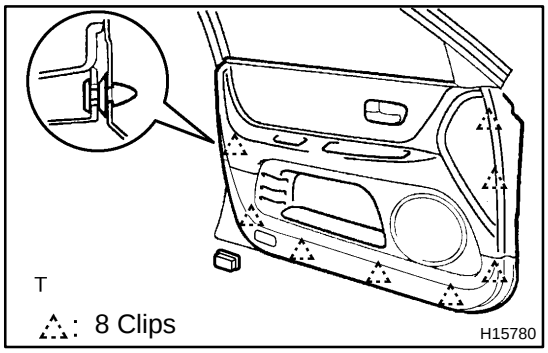
(b) Connect the connector.



17. INSTALL FRONT NO.2 SPEAKER

(a) Install the front No.2 speaker with the 2 bolts.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

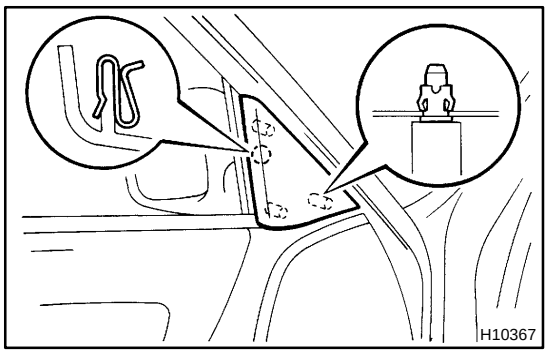
(b) Connect the 2 connectors.



18. INSTALL DOOR TRIM

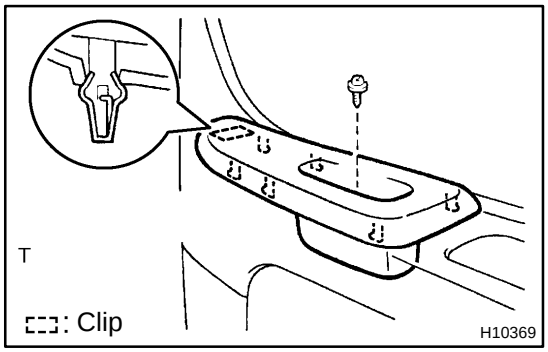
(a) Install the door trim to the door panel.

(b) Connect the connector, then install the courtesy light.



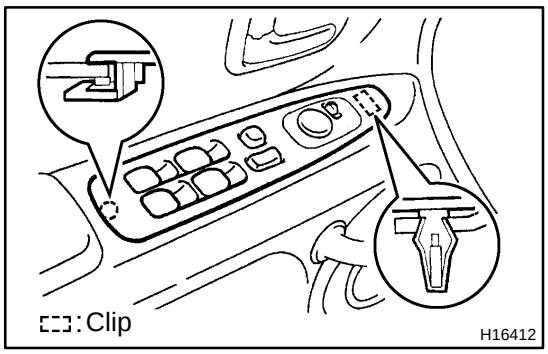
19. INSTALL LOWER FRAME BRACKET GARNISH

Install the lower frame bracket garnish to the door panel.



20. INSTALL FRONT ARMREST

Install the front armrest with the screw.



21. INSTALL POWER WINDOW SWITCH

(a) Connect the connectors.

(b) Install the power window switch.

22. INSTALL INSIDE HANDLE BEZEL

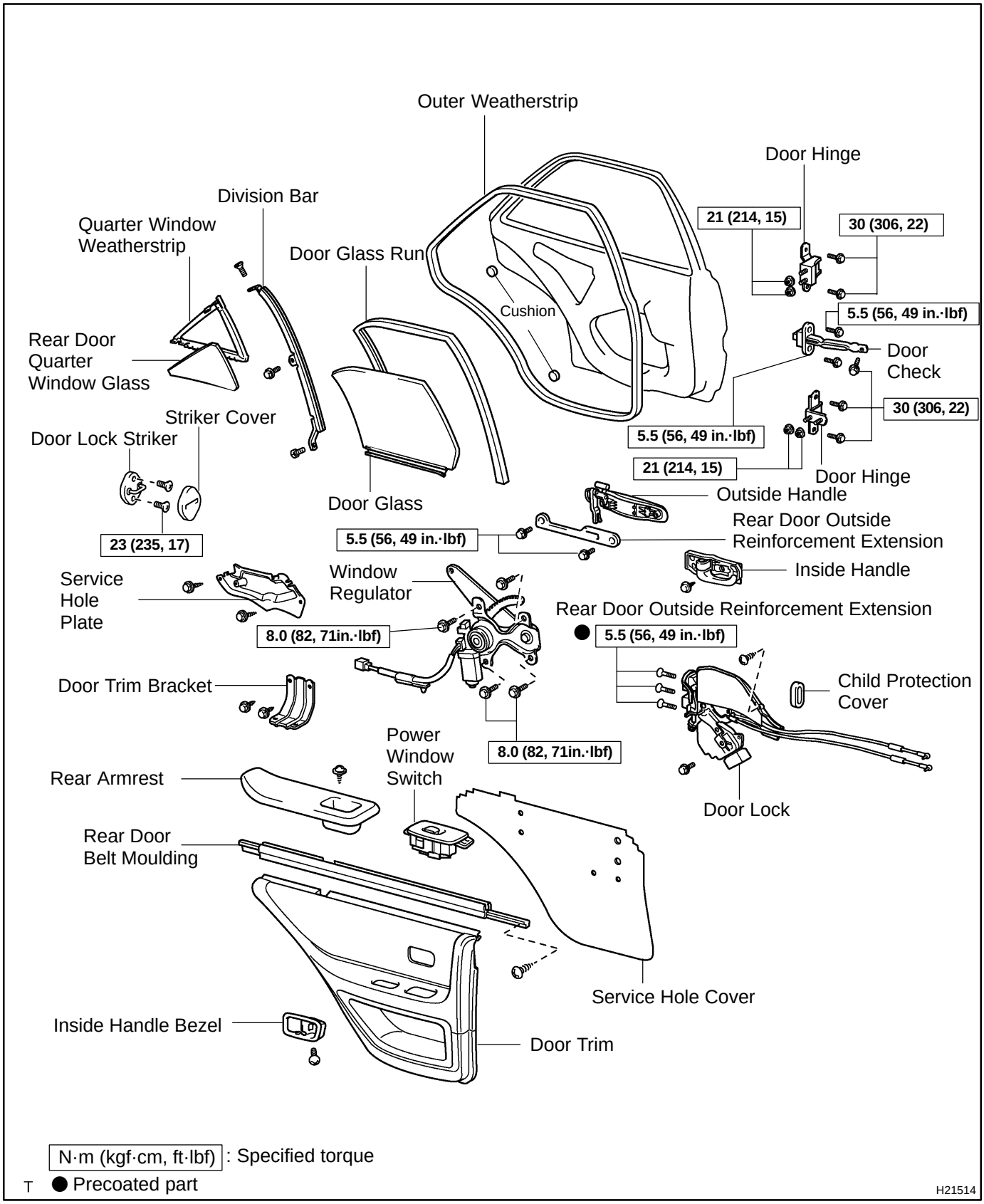
(a) Install the inside handle bezel with the screw.

(b) Close the screw cap.

REAR DOOR

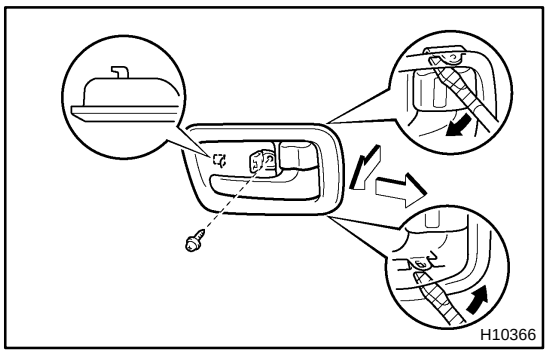
COMPONENTS

BO2C7-05



BO2C8-05

DISASSEMBLY



HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. REMOVE INSIDE HANDLE BEZEL

(a) Using a screwdriver, open the screw cap.

HINT:

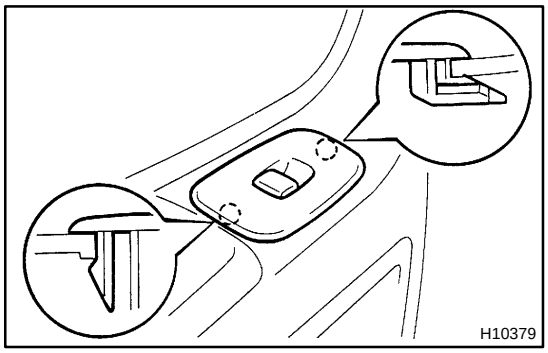
Tape the screwdriver tip before use.

(b) Remove the screw.

(c) Using a screwdriver, remove the inside handle bezel as shown in the illustration.

HINT:

Tape the screwdriver tip before use.



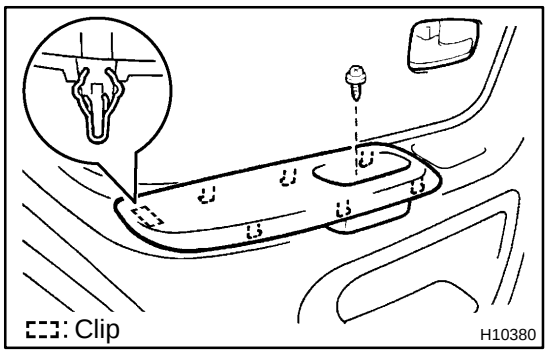
2. REMOVE POWER WINDOW SWITCH

(a) Using a screwdriver, remove the power window switch.

HINT:

Tape the screwdriver tip before use.

(b) Disconnect the connector.



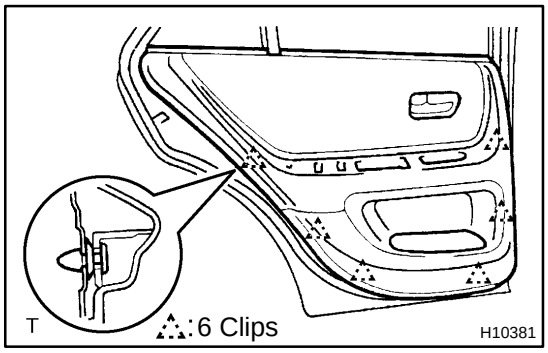
3. REMOVE REAR ARMREST

(a) Remove the screw.

(b) Using a screwdriver, remove the rear armrest.

HINT:

Tape the screwdriver tip before use.

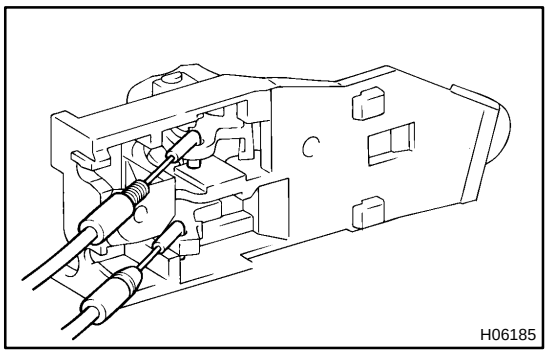


4. REMOVE DOOR TRIM

Using a screwdriver, disengage the clips, then pull the trim upward to remove it.

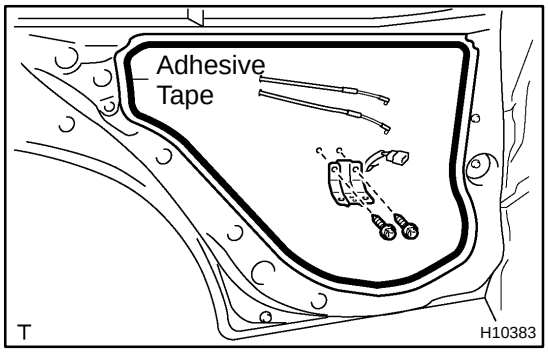
HINT:

Tape the screwdriver tip before use.



5. REMOVE INSIDE HANDLE

Remove the screw and inside handle, and disconnect the 2 cables from the inside handle.



6. REMOVE SERVICE HOLE COVER

(a) Disconnect the connector.

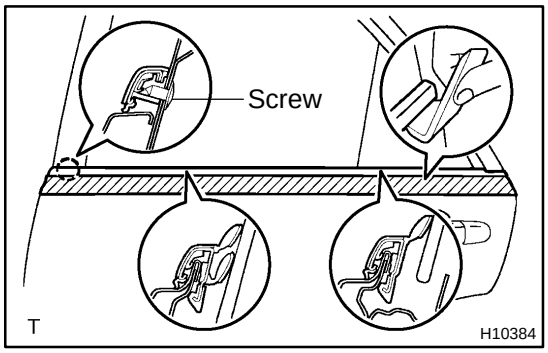
(b) Remove the 2 screws and door trim bracket.

(c) Remove the service hole cover.

7. REMOVE SERVICE HOLE PLATE

Remove the 2 screws and service hole plate.

8. REMOVE DOOR GLASS RUN

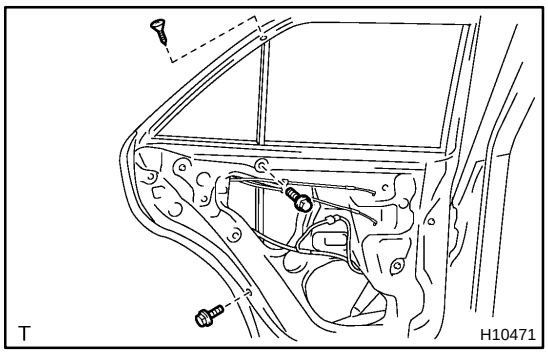


9. REMOVE REAR DOOR BELT MOULDING

(a) Remove the screw.

(b) Apply protective tape to the outer surface as shown in the illustration to keep the surface from being scratched.

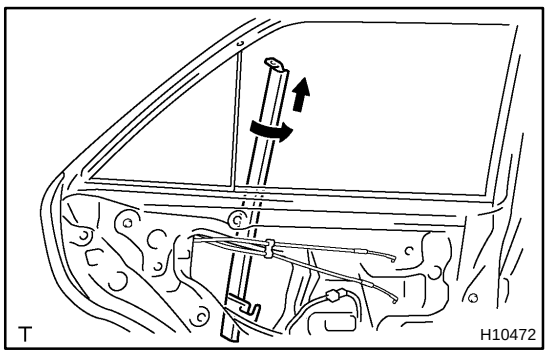
(c) Using a moulding remover, remove the rear door belt moulding as shown in the illustration.



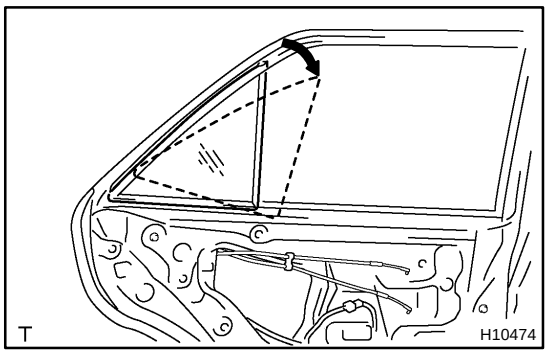
10. REMOVE DIVISION BAR

(a) Remove the 2 bolts and screw.

(b) Pull the division bar forward.



(c) Rotate the division bar 90° and pull it upward as shown in the illustration.



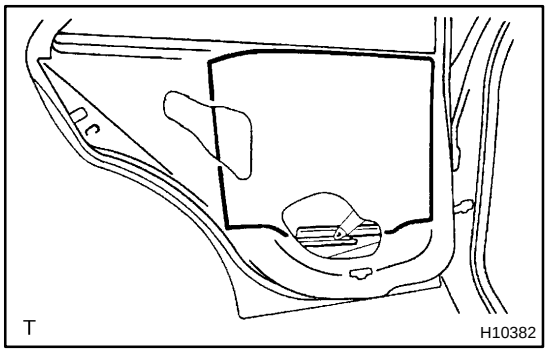
11. REMOVE REAR DOOR QUARTER WINDOW GLASS

(a) Remove the rear door quarter window glass as shown in the illustration.

NOTICE:

Do not damage the glass.

(b) Remove the quarter window weatherstrip from the glass.



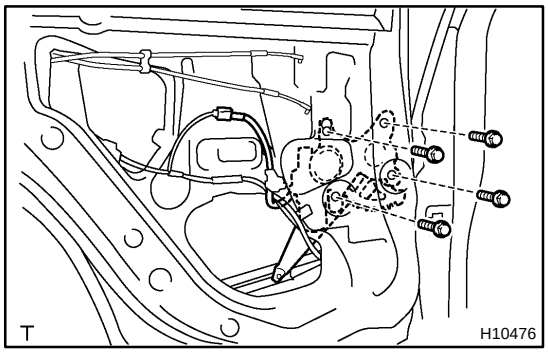
12. REMOVE DOOR GLASS

HINT:

Insert a shop rag inside the door panel to prevent scratching the glass.

(a) Open the door glass.

(b) Tilt the door glass and disconnect the roller of the regulator from the glass channel to remove the door glass.



13. REMOVE WINDOW REGULATOR

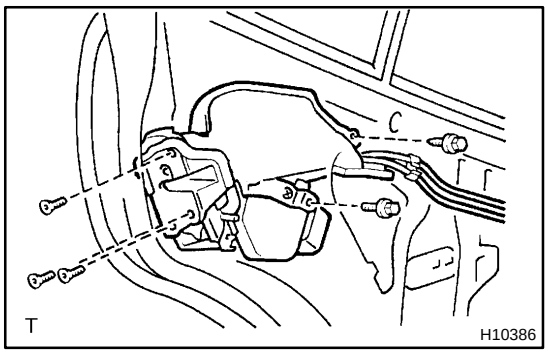
(a) Disconnect the connector.

(b) Remove the 4 bolts and window regulator.

14. REMOVE DOOR LOCK

(a) Remove the child protection cover.

(b) Disconnect the 2 links from the outside handle and key cylinder.



(c) Remove the bolt and screw.

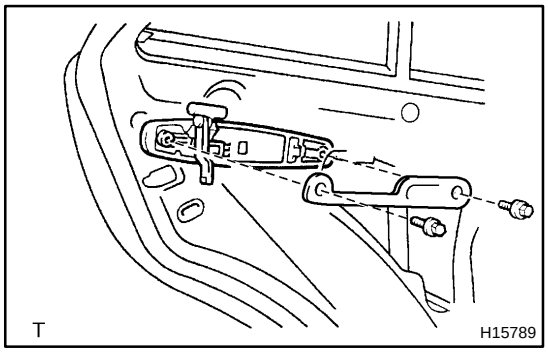
(d) Using a torx socket wrench, remove the 3 torx screws and door lock.

Torx socket wrench: T30 (Part No. 09042-00010 or locally manufactured tool)

HINT:

Remove the door lock through the service hole.

(e) Disconnect the connector.



15. REMOVE OUTSIDE HANDLE

Remove the 2 bolts, rear door outside reinforcement extension and outside handle.

16. REMOVE CUSHIONS

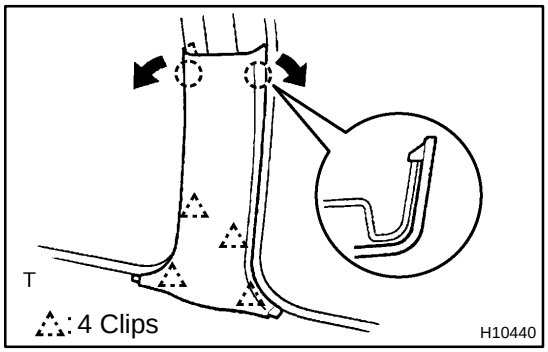
BO3TT-03

ADJUSTMENT

1. ADJUST DOOR IN FORWARD/REARWARD AND VERTICAL DIRECTIONS

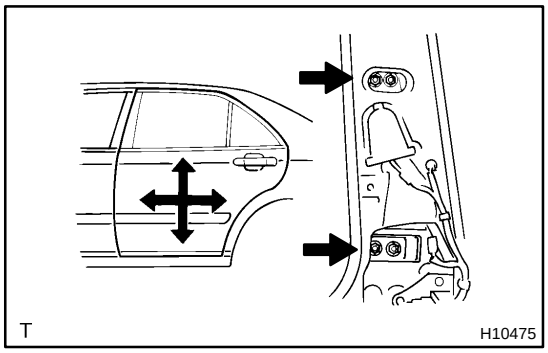
(a) Remove the front door inside scuff plate.

(b) Remove the rear door inside scuff plate.



(c) Remove the center pillar lower garnish.

(d) Remove the seat belt pretensioner (See page BO-217).



(e) Adjust the door by loosening the body side hinge nuts.

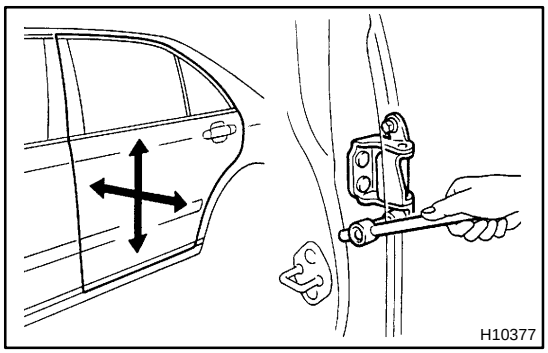
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

(f) Install the seat belt pretensioner (See page BO-226).

(g) Install the lower center pillar garnish.

(h) Install the rear door inside scuff plate.

(i) Install the front door inside scuff plate.



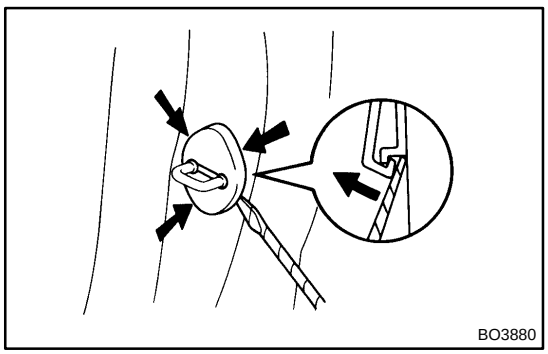
2. ADJUST DOOR IN LEFT/RIGHT AND VERTICAL DIRECTIONS

Adjust the door by loosening the door side hinge bolts.

Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)

3. ADJUST DOOR LOCK STRIKER

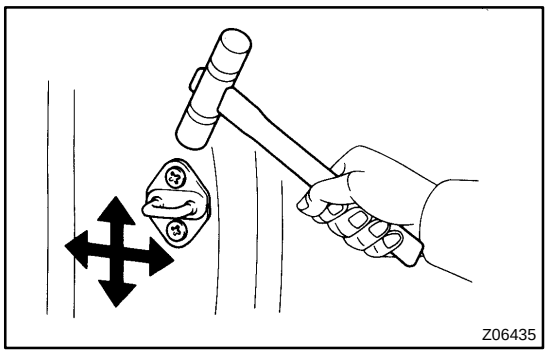
(a) Check that the door fit and door lock linkages are adjusted correctly.



(b) Using a screwdriver, remove the striker cover.

HINT:

Tape the screwdriver tip before use.



(c) Adjust the striker position by slightly loosening the striker mounting screws and hitting the striker with a hammer.

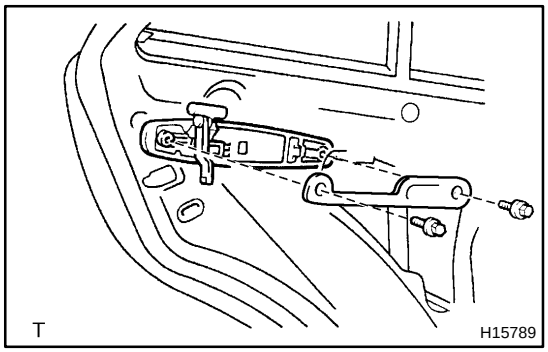
(d) Tighten the striker mounting screws again.
Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)

(e) Install the striker cover.

BO2CA-04

REASSEMBLY

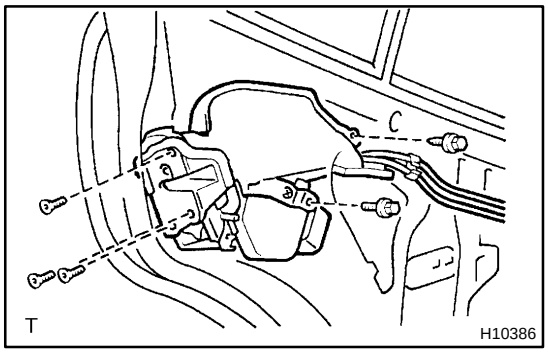
1. INSTALL CUSHIONS



2. INSTALL OUTSIDE HANDLE

Install the outside handle and rear door outside reinforcement extension with the 2 bolts.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)



3. INSTALL DOOR LOCK

(a) Connect the connector.

(b) Using a torx socket wrench, install the door lock with the 3 torx screws.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

Torx socket wrench: T30 (Part No. 09042-00010 or locally manufactured tool)

HINT:

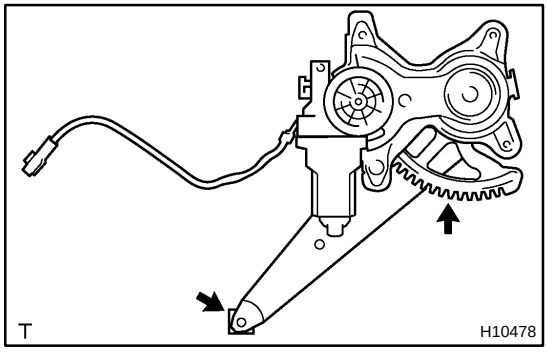
Apply adhesive to the 3 torx screws.

Part No. 08833-00070, THREE BOND 1324 or equivalent

(c) Install the bolt and screw.

(d) Connect the 2 links to the outside handle and key cylinder.

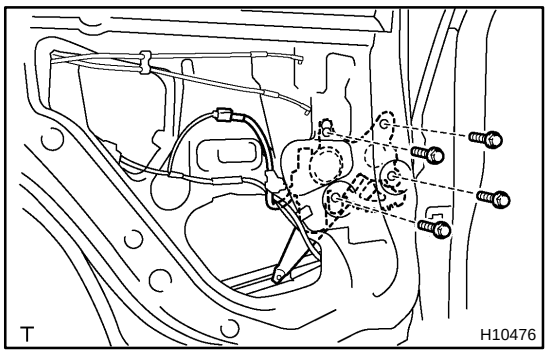
(e) Install the child protection cover.



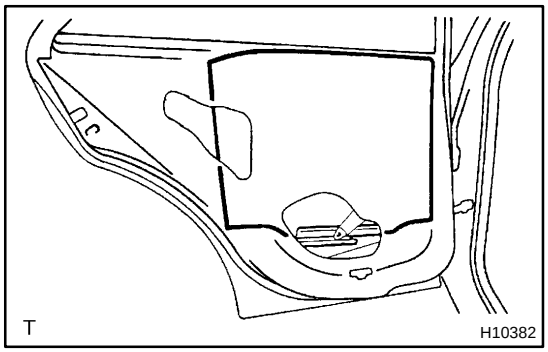
4. INSTALL WINDOW REGULATOR

HINT:

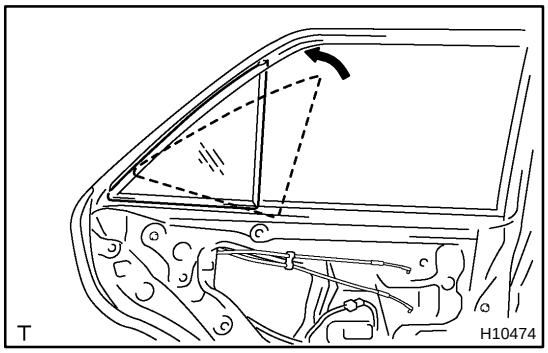
Apply MP grease to the sliding and rotating parts of the window regulator.



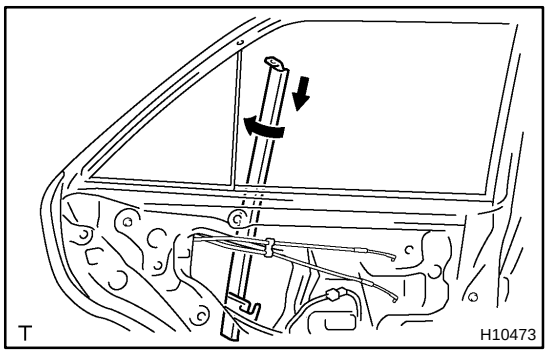
(a) Install the window regulator with the 4 bolts.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)
(b) Connect the connector.



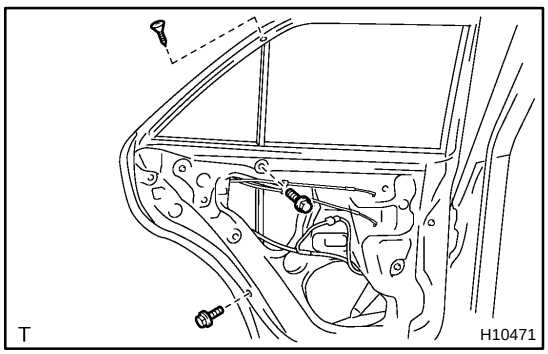
5. INSTALL DOOR GLASS
HINT:
Insert a shop rag inside the door panel to prevent scratching the glass.
Tilt the door glass and connect the roller of the regulator to the glass channel to install the door glass.



6. INSTALL QUARTER WINDOW GLASS
(a) Install the quarter window weatherstrip to the glass.
NOTICE:
Do not damage the glass.
(b) Install the rear door quarter window glass as shown in the illustration.

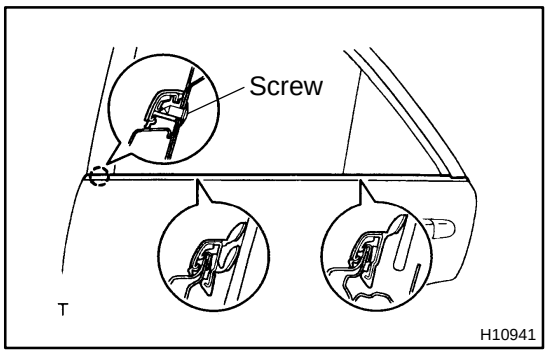


7. INSTALL DIVISION BAR
(a) Insert the division bar to the door panel, then rotate it 90°.



(b) Install the 2 bolts and screw.

8. INSTALL DOOR GLASS RUN

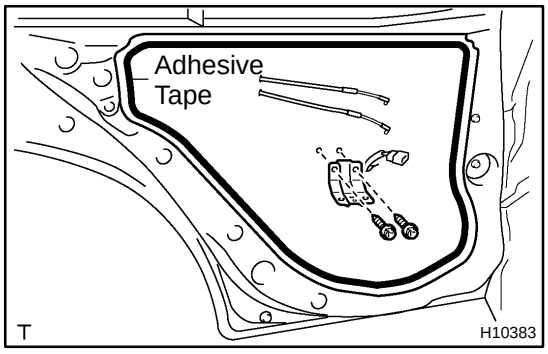


9. INSTALL REAR DOOR BELT MOULDING

Install the rear door belt moulding with the screw.

10. INSTALL SERVICE HOLE PLATE

Install the service hole plate with the 2 screws.



11. INSTALL SERVICE HOLE COVER

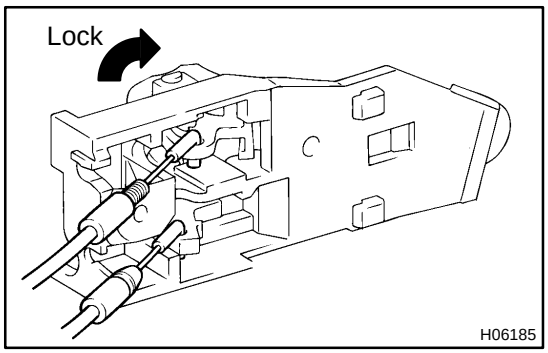
(a) Install the service hole cover to the door panel.

HINT:

- When installing the service hole cover, pull out the links and connectors through the service hole cover.
- There should be no wrinkles or folds after attaching the service hole cover.
- After attaching the service hole cover, sealing condition should be confirmed.

(b) Install the door trim bracket with the 2 screws.

(c) Connect the connector.



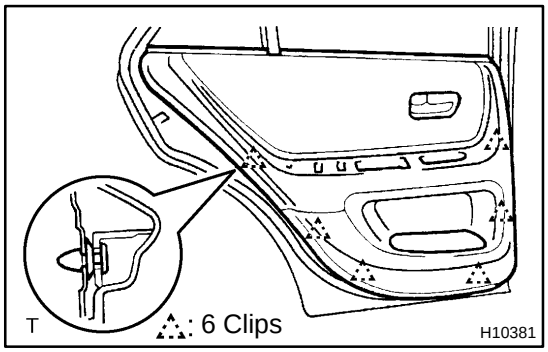
12. INSTALL INSIDE HANDLE

Connect the 2 cables to the inside handle, then install the inside handle with the screw.

NOTICE:

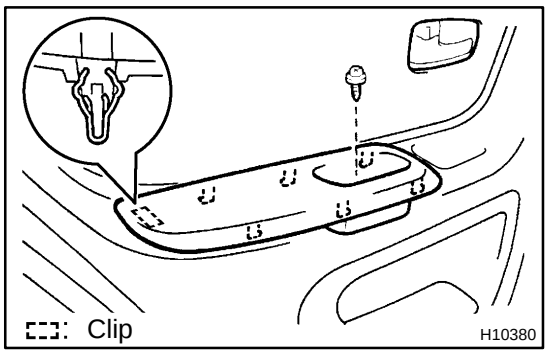
At the time of locking cable reassembly, please refer to the following items.

- **Set the door lock assembly to the LOCK position.**
- **Hold the lock knob to the LOCK position by hand, and do not pull the cable while connecting the locking cable.**



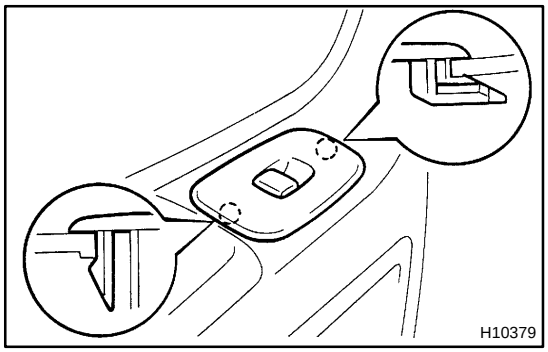
13. INSTALL DOOR TRIM

Install the door trim to the door panel.



14. INSTALL REAR ARMREST

Install the rear armrest with the screw.



15. INSTALL POWER WINDOW SWITCH

(a) Connect the connector.

(b) Install the power window switch to the door trim.

16. INSTALL DOOR INSIDE HANDLE BEZEL

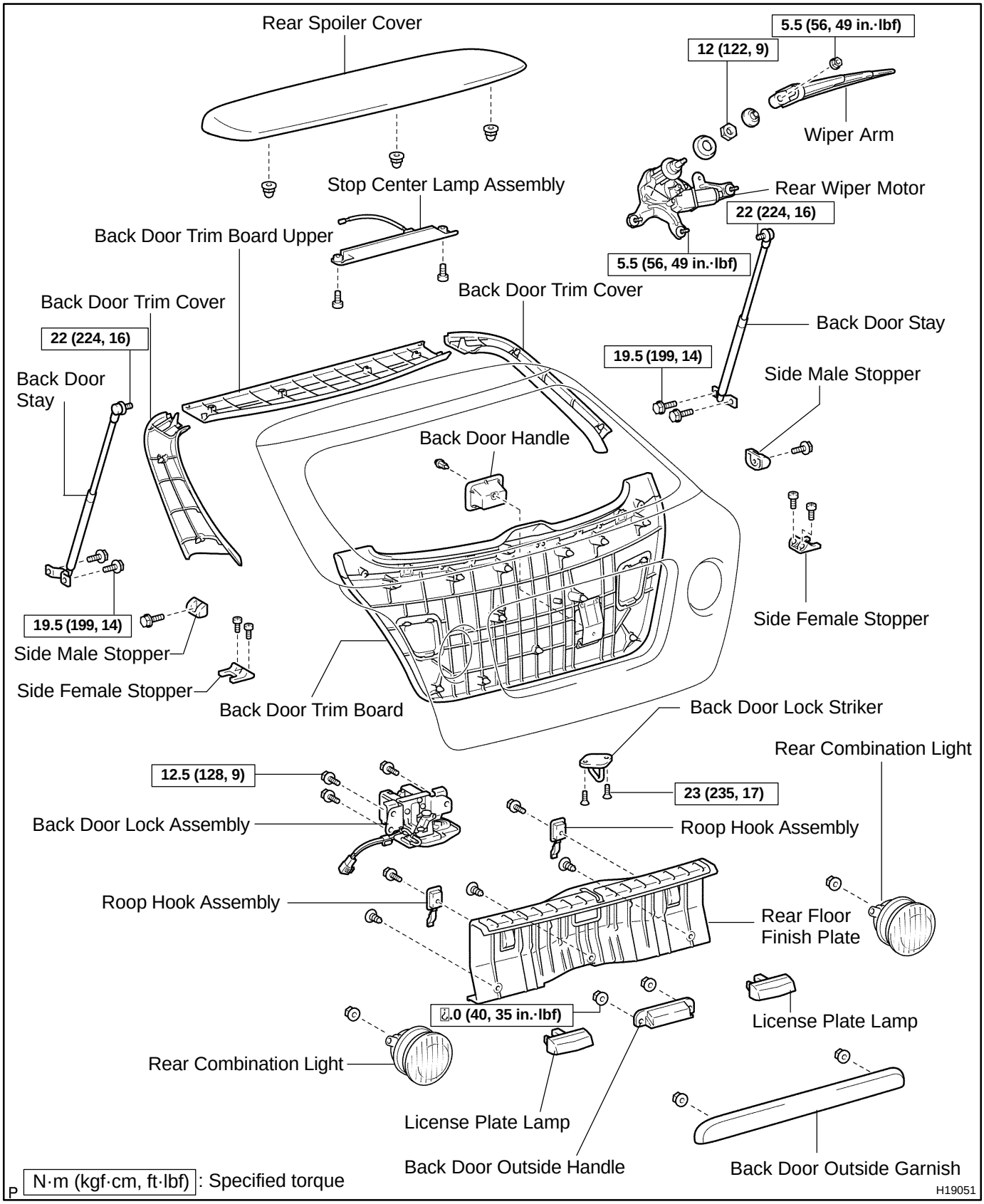
(a) Install the door inside handle bezel with the screw.

(b) Close the cap.

BACK DOOR

COMPONENTS

BO4CZ-02



BO4D0-03

DISASSEMBLY

HINT:

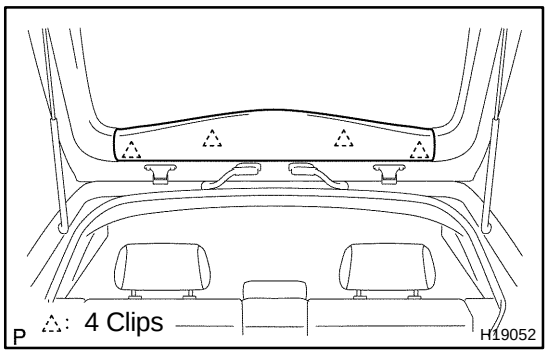
A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. REMOVE BACK DOOR TRIM BOARD UPPER

Using a screwdriver, remove the back door trim board upper.

HINT:

Tape the screwdriver tip before use.



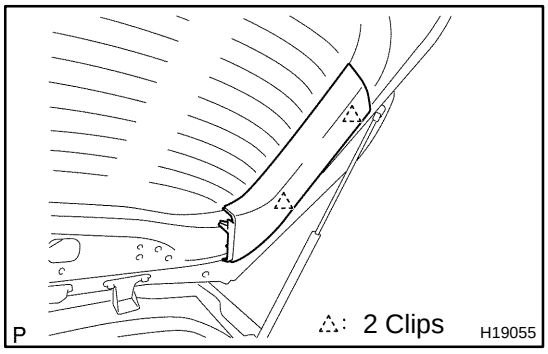
2. REMOVE BACK DOOR TRIM COVERS

(a) Insert a screwdriver between the back door panel and back door trim cover to pry the cover.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



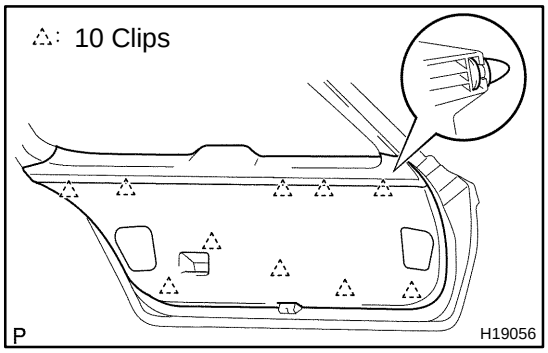
3. REMOVE BACK DOOR TRIM BOARD

(a) Remove the clip and back door handle.

(b) Using a screwdriver, remove the back door trim board.

HINT:

Tape the screwdriver tip before use.

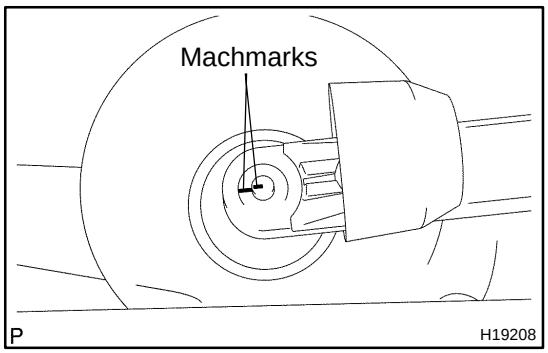


4. REMOVE REAR WIPER ARM

(a) Open the wiper arm cover.

(b) Place matchmarks on the wiper arm and wiper motor.

(c) Remove the nut and rear wiper arm.



5. REMOVE REAR WIPER MOTOR

(a) Remove the nut and washer on the outer side of the back door panel.

(b) Disconnect the connector.

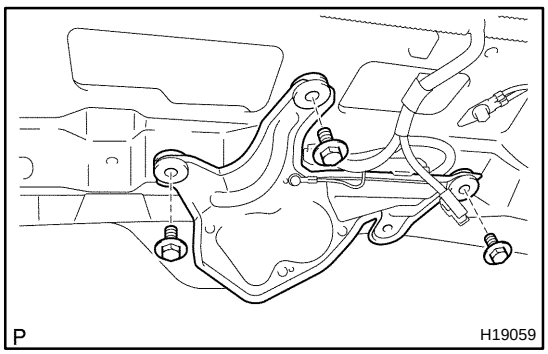
(c) Remove the 3 bolts and rear wiper motor.

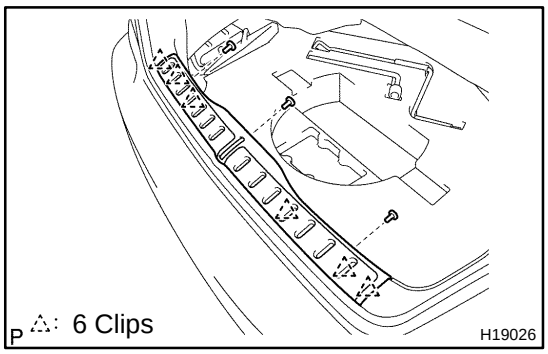
6. REMOVE REAR COMBINATION LIGHT

(a) Disconnect the connector.

(b) Remove the nut and rear combination light.

(c) Employ the same manner described above to the other side.





7. REMOVE REAR FLOOR FINISH PLATE

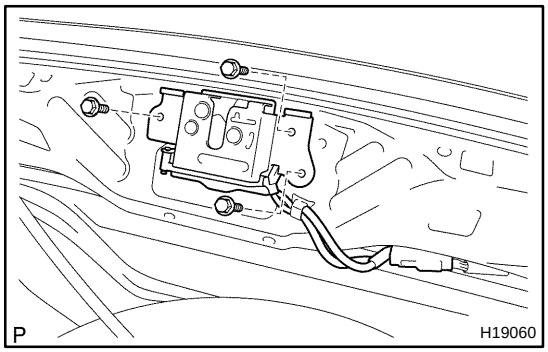
(a) Remove the 2 bolts and the 2 rope hook assemblies.

(b) Remove the 3 clips.

(c) Using a screwdriver, remove the rear floor finish plate.

HINT:

Tape the screwdriver tip before use.

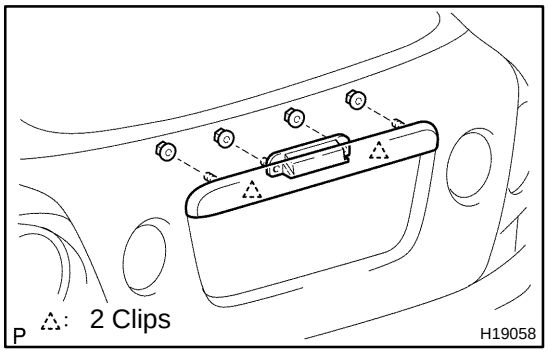


8. REMOVE BACK DOOR LOCK ASSEMBLY

Remove the 3 bolts and the back door lock assembly, then disconnect the connector.

9. REMOVE LICENSE PLATE LAMPS

Remove the license plate lamps, then disconnect the connectors.



10. REMOVE BACK DOOR OUTSIDE GARNISH

(a) Remove the 4 nuts and back door outside garnish.

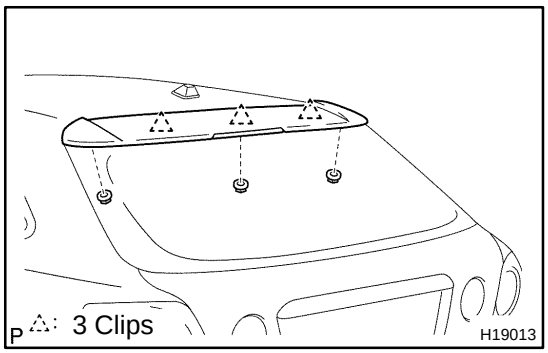
(b) Using a screwdriver, remove the back door outside garnish.

HINT:

Tape the screwdriver tip before use.

11. REMOVE BACK DOOR OUTSIDE HANDLE

Remove the 2 bolts and back door outside handle, then disconnect the connector.



12. REMOVE REAR SPOILER COVER

(a) Remove the 3 nuts.

(b) Using a screwdriver, remove the rear spoiler cover, then disconnect the connector.

HINT:

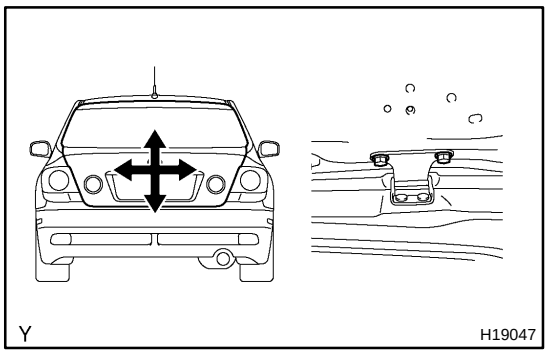
Tape the screwdriver tip before use.

13. REMOVE STOP CENTER LAMP ASSEMBLY

Remove the 2 screws and the stop center lamp assembly.

BO4D1-02

ADJUSTMENT

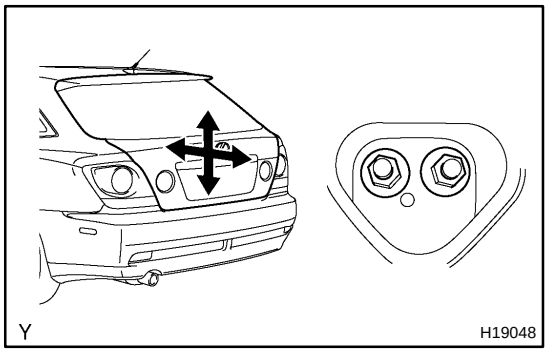


1. ADJUST DOOR IN LEFT/RIGHT AND VERTICAL DIRECTIONS

Adjust the door by loosening the door side hinge bolts.

Torque: 15 N·m (153 kgf·cm, 11 ft·lbf)

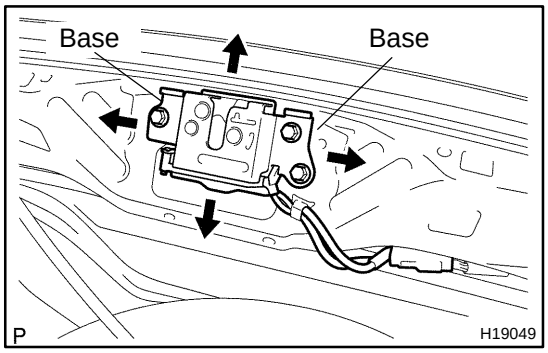
2. ADJUST DOOR IN FORWARD/ REARWARD AND VERTICAL DIRECTIONS



(a) Pull down rear part of roof headlining.
(See page BO-164)

(b) Adjust the door by loosening the body side hinge nuts.

Torque: 11.5 N·m (117 kgf·cm, 8 ft·lbf)



3. ADJUST BACK DOOR LOCK ASSEMBLY

(a) Check that the door fit and door linkage are adjusted correctly.

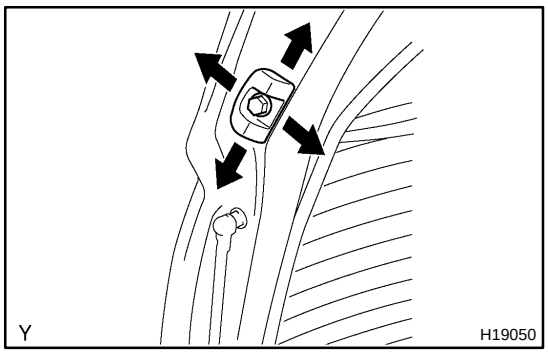
(b) Adjust the back door lock assembly by loosening the back door lock bolts.

Torque: 12.5 N·m (128 kgf·cm, 9 ft·lbf)

(c) Using a plastic hammer, tap the back door lock assembly to adjust.

NOTICE:

Tap the base for adjustment.



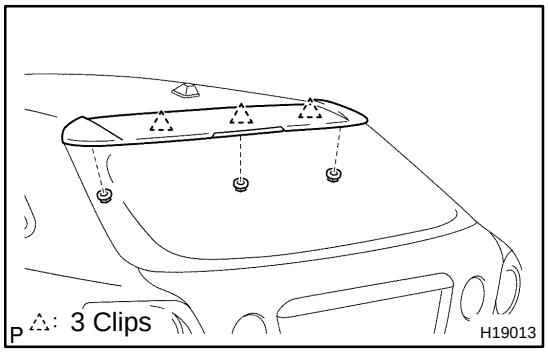
4. ADJUST SIDE MALE STOPPER

Adjust the side male stopper by loosening the stopper mounting bolt.

BO4D2-02

REASSEMBLY

1. INSTALL STOP CENTER LAMP ASSEMBLY



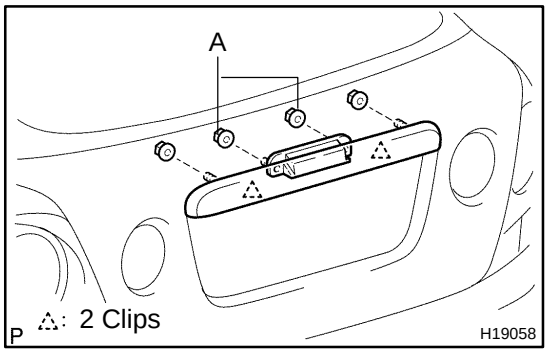
2. INSTALL REAR SPOILER COVER

Install the rear spoiler cover with the 3 nuts.

3. INSTALL BACK DOOR OUTSIDE HANDLE

(a) Connect the connector.

(b) Install the back door outside handle with the 2 bolts.

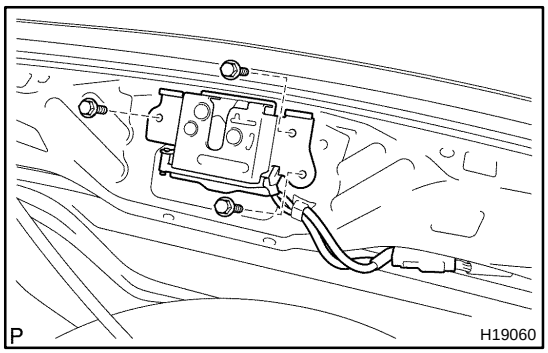


4. INSTALL BACK DOOR OUTSIDE GARNISH

Install the back door outside garnish with the 4 nuts.

Torque:
A: 4.0 N·m (40 kgf·cm, 35 in.·lbf)

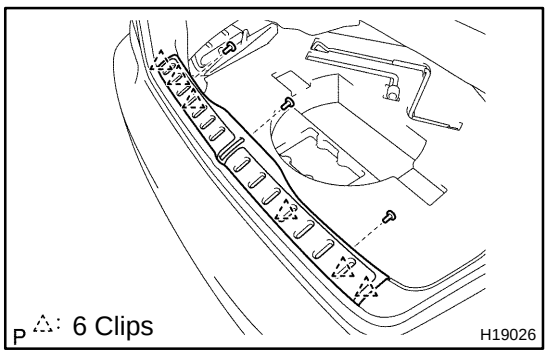
5. INSTALL LICENSE PLATE LAMPS



6. INSTALL BACK DOOR LOCK ASSEMBLY

(a) Install the back door lock assembly with the 3 bolts .
Torque: 12.5 N·m (128 kgf·cm, 9 ft·lbf)

(b) Connect the connector.

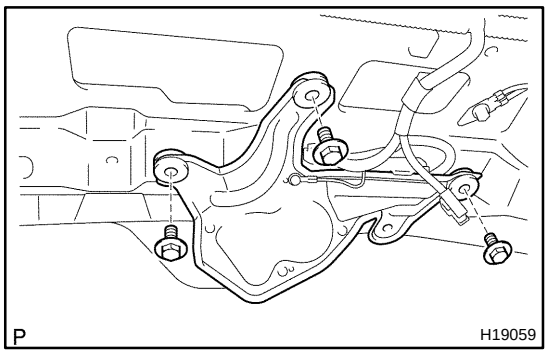


7. INSTALL REAR FLOOR FINISH PLATE

(a) Install the rear floor finish plate with the 3 clips.

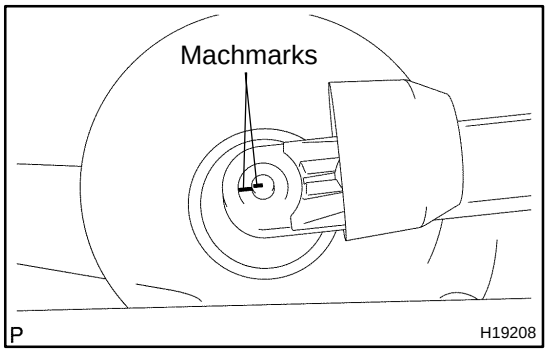
(b) Install the 2 rope hook assemblies with the 2 bolts.

8. INSTALL REAR COMBINATION LIGHTS



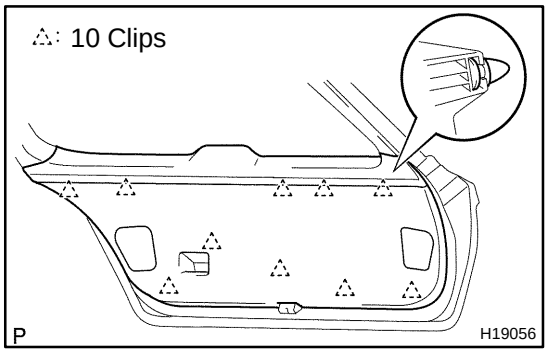
9. INSTALL REAR WIPER MOTOR

(a) Install the rear wiper motor with the 3 bolts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
(b) Connect the connector.
(c) Install the nut and washer on the outer side of the back door panel.
Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)



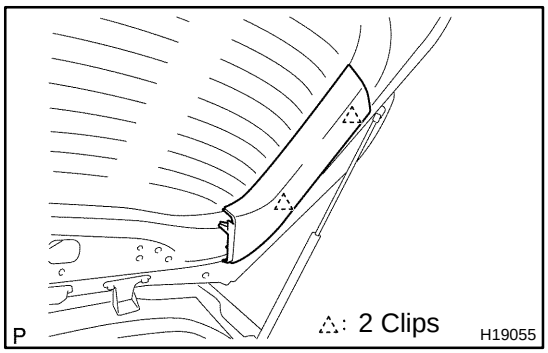
10. INSTALL REAR WIPER ARM

(a) Install the wiper arm and tighten the nut by hand. Operate the wiper once and turn the wiper switch OFF.
(b) Align the machmarks on the wiper arm and wiper motor.
(c) Install the rear wiper arm with the nut.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
(d) Close the wiper arm cover.



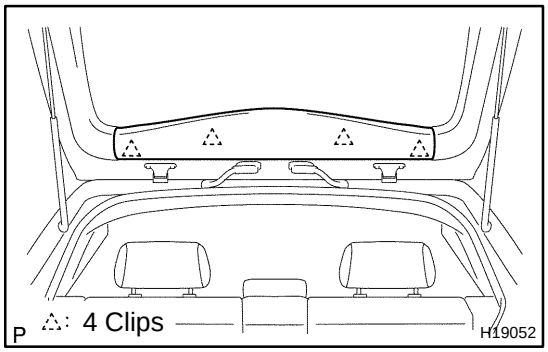
11. INSTALL BACK DOOR TRIM BOARD

(a) Install the back door trim board to the back door panel.
(b) Install the back door handle with the clip.



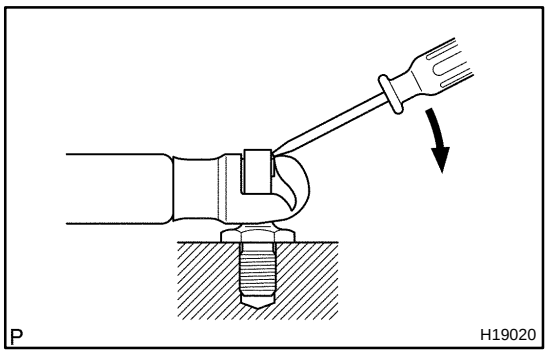
12. INSTALL BACK DOOR TRIM COVERS

Install the back door trim cover to the body.



13. INSTALL BACK DOOR TRIM BOARD UPPER

Install the back door trim board upper to the body.



BACK DOOR STAY

BO4D3-02

REPLACEMENT

1. REMOVE BACK DOOR STAY

(a) Using a screwdriver, remove the back door stay from the back door panel.

HINT:

While supporting the back door by hand, remove the back door stay.

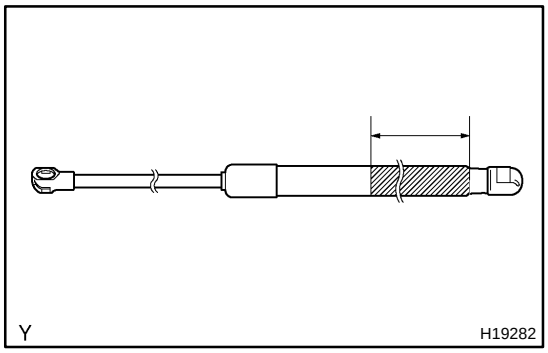
(b) Remove the bolt and back door stay from the body.

2. IF NECESSARY, REPLACE BACK DOOR STAY

NOTICE:

When handling the back door stay.

- **Do not disassemble the back door stay because the cylinder is filled with pressurized gas.**



- **When replacing the back door stay, drill a 2.0 - 3.0 mm (0.079 - 0.118 in.) hole in the lower half of the bottom of the back door stay as shown in the illustration to completely release the high-pressure gas before disposing of it.**
- **When drilling, chips may fly out, so work carefully.**
- **The gas is colorless, odorless and non-toxic.**
- **When working, handle the back door stay carefully. Never score or scratch the exposed part of the piston rod, and never allow paint or oil to get on it.**
- **Do not turn the piston rod and cylinder with the back door stay fully extended.**

3. INSTALL BACK DOOR STAY

(a) Install the back door stay to the body with the bolt.

Torque: 19.5 N·m (199 kgf·cm, 14 ft.·lbf)

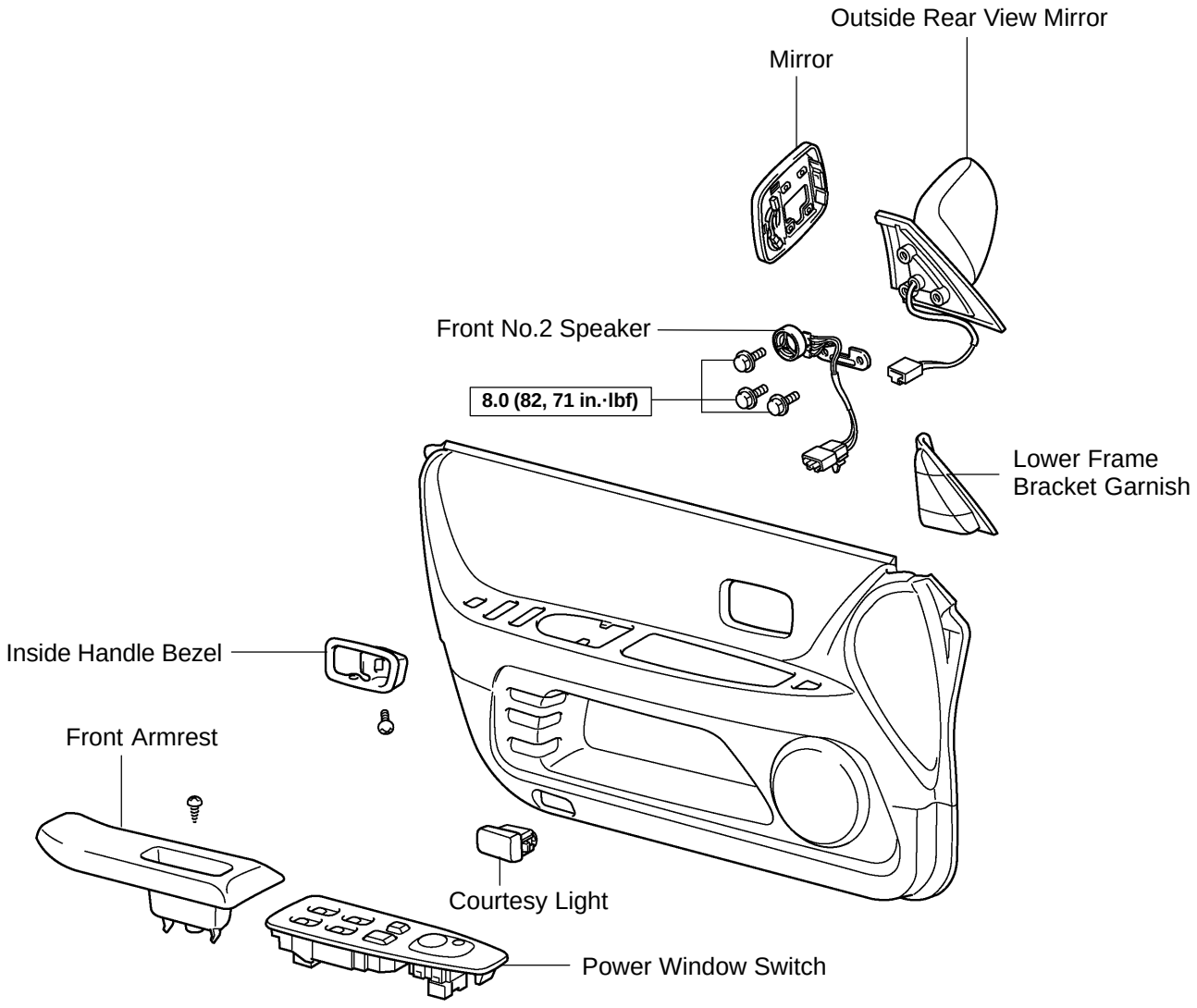
(b) Install the back door stay to the back door panel with the bolts.

Torque: 22 N·m (224 kgf·cm, 16 ft.·lbf)

OUTSIDE REAR VIEW MIRROR

COMPONENTS

BO0UO-08



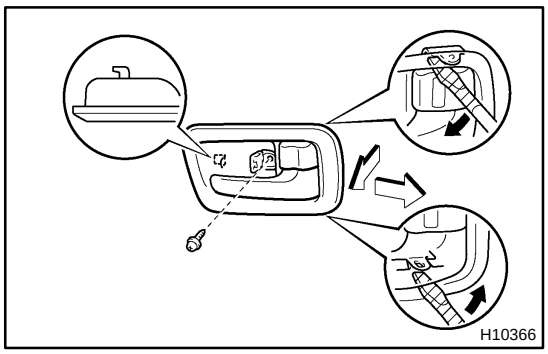
T

N·m (kgf·cm, ft·lbf) : Specified torque

H15122

BO2CB-05

REMOVAL



HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. REMOVE INSIDE HANDLE BEZEL

(a) Using a screwdriver, open the screw cap.

HINT:

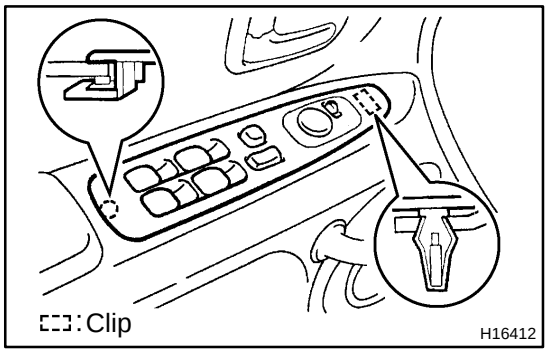
Tape the screwdriver tip before use.

(b) Remove the screw.

(c) Using a screwdriver, remove the inside handle bezel as shown in the illustration.

HINT:

Tape the screwdriver tip before use.



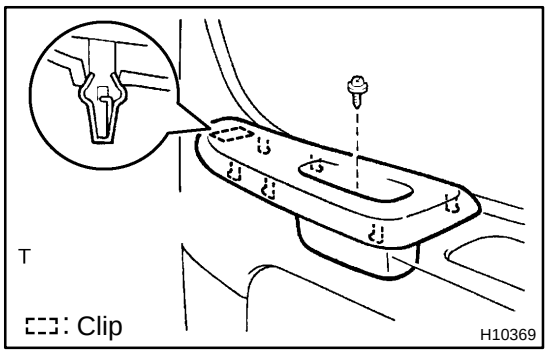
2. REMOVE POWER WINDOW SWITCH

(a) Using a screwdriver, remove the power window switch.

HINT:

Tape the screwdriver tip before use.

(b) Disconnect the connectors.



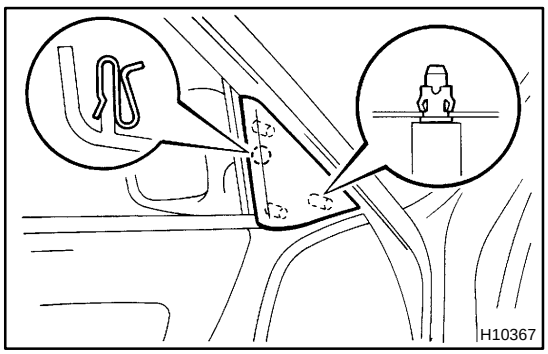
3. REMOVE FRONT ARMREST

(a) Remove the screw.

(b) Using a screwdriver, remove the front armrest as shown in the illustration.

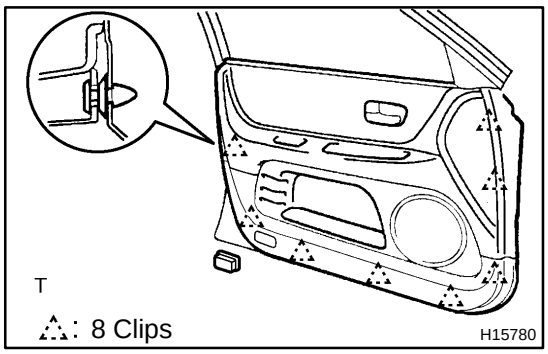
HINT:

Tape the screwdriver tip before use.



4. REMOVE LOWER FRAME BRACKET GARNISH

Remove the lower frame bracket garnish.



5. REMOVE DOOR TRIM

(a) Using a screwdriver, remove the courtesy light, then disconnect the connector.

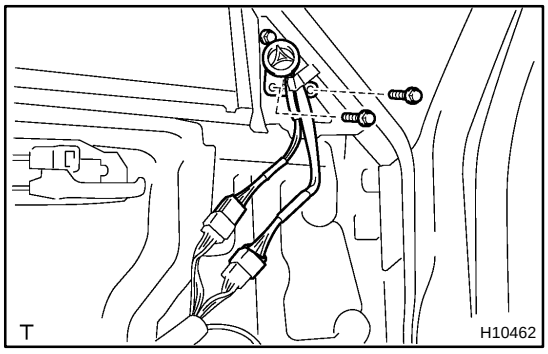
HINT:

Tape the screwdriver tip before use.

(b) Using a screwdriver, disengage the clips, then pull the trim upward to remove it.

HINT:

Tape the screwdriver tip before use.



6. REMOVE FRONT NO.2 SPEAKER

(a) Disconnect the connector.

(b) Remove the 2 bolts and front No.2 speaker.

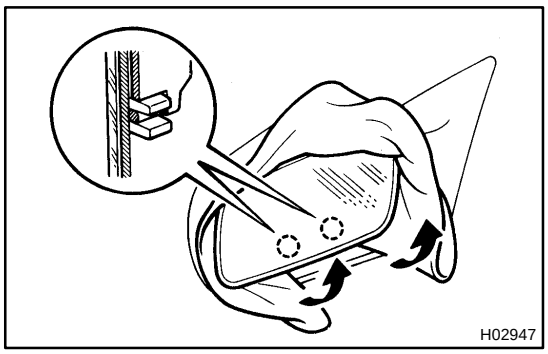
7. REMOVE OUTSIDE REAR VIEW MIRROR

(a) Disconnect the connector.

(b) Remove the bolt and outside rear view mirror.

BO0UQ-07

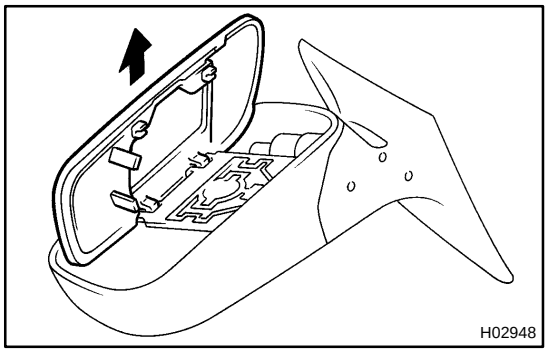
REPLACEMENT



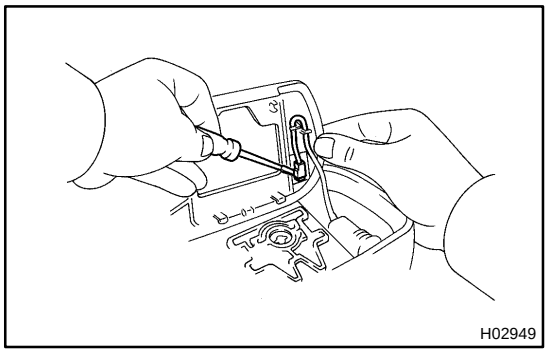
1. IF NECESSARY, DISCONNECT MIRROR

(a) Insert a shop rag between the mirror and the mirror body.

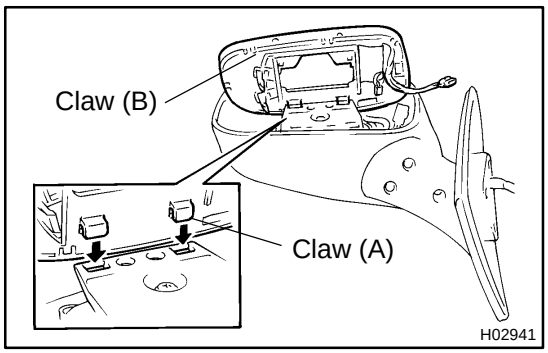
(b) Pull up the lower side of the shop rag to disconnect the mirror joint.



(c) Pull up the mirror and disconnect it.



(d) Disconnect the connectors.



2. CONNECT MIRROR

(a) Connect the connectors.

(b) Fit the claws (A) in the holes and set the mirror to the mirror body.

(c) Push the mirror to fix it by fitting the claws (B) in the holes.

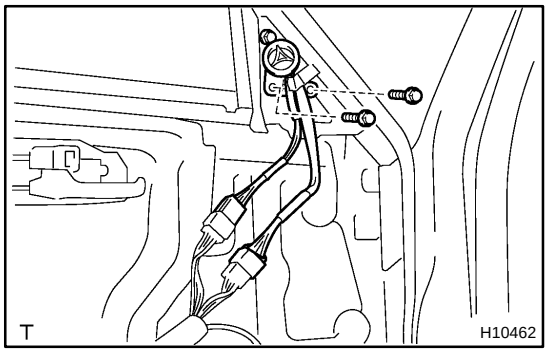
BO2CC-04

INSTALLATION

1. INSTALL OUTSIDE REAR VIEW MIRROR

(a) Install the outside rear view mirror with the bolt.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

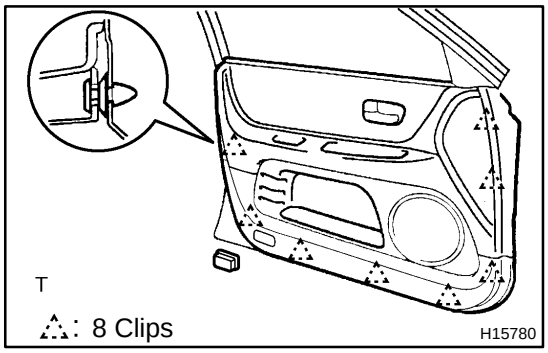
(b) Connect the connector.



2. INSTALL FRONT NO.2 SPEAKER

(a) Install the front No.2 speaker with the 2 bolts.
Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)

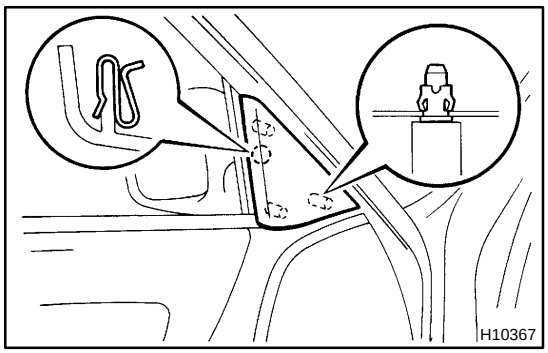
(b) Connect the connector.



3. INSTALL DOOR TRIM

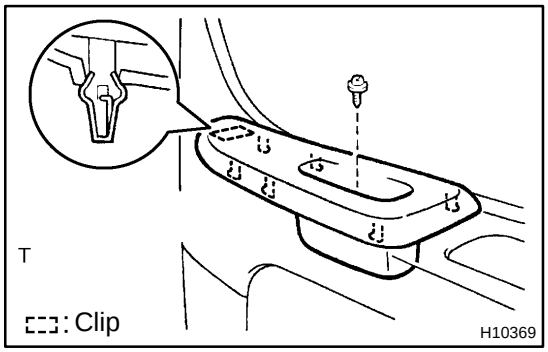
(a) Install the door trim to the door panel.

(b) Connect the connector, then install the courtesy light.



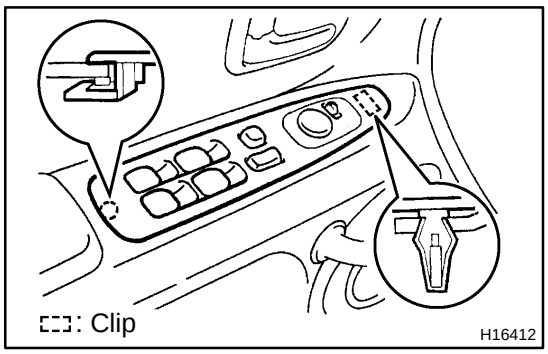
4. INSTALL LOWER FRAME BRACKET GARNISH

Install the lower frame bracket garnish to the door panel.



5. INSTALL FRONT ARMREST

Install the front armrest with the screw.



6. INSTALL POWER WINDOW SWITCH

(a) Connect the connectors.

(b) Install the power window switch.

7. INSTALL INSIDE HANDLE BEZEL

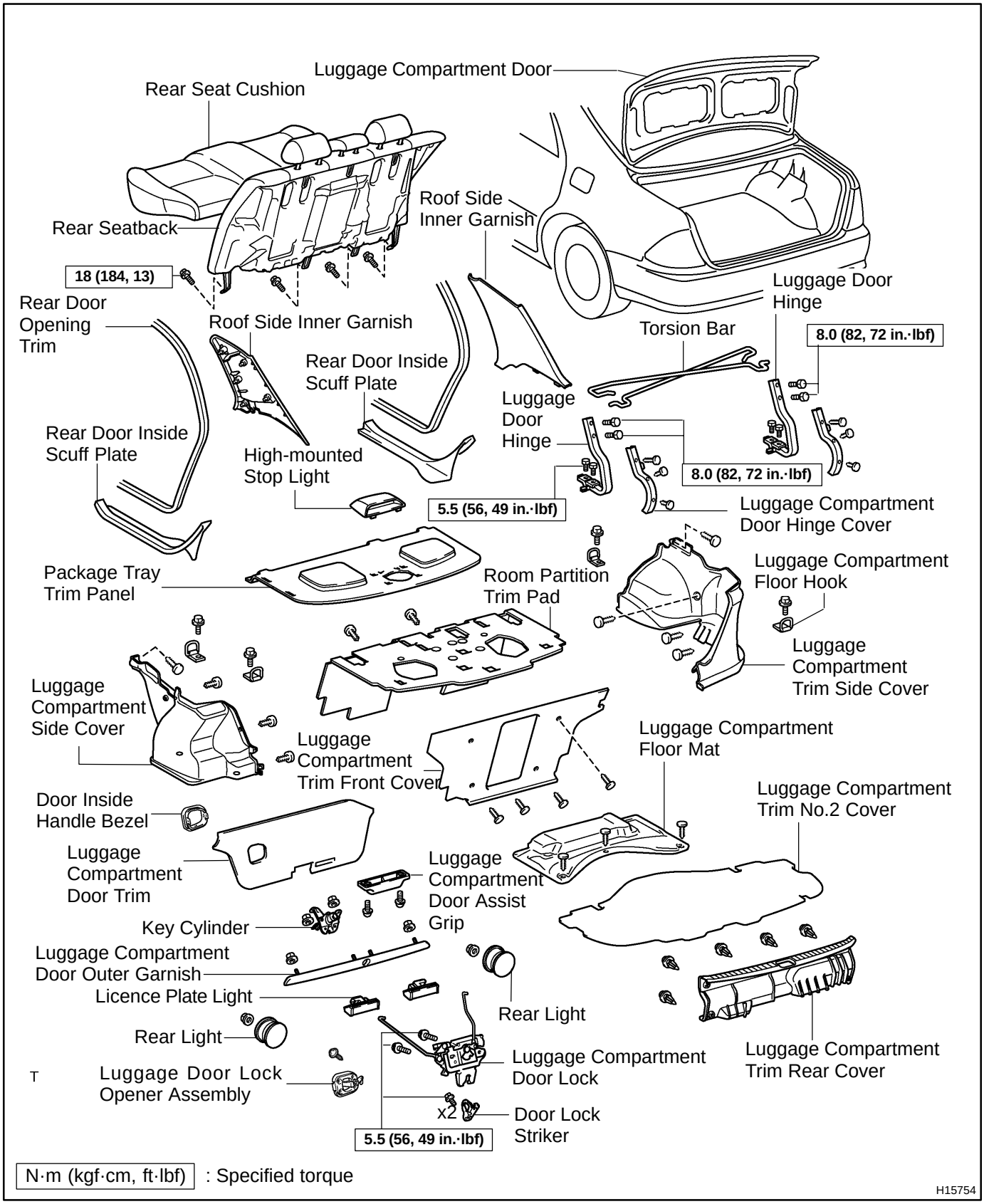
(a) Install the inside handle bezel with the screws.

(b) Close the screw cap.

LUGGAGE COMPARTMENT DOOR AND HINGE

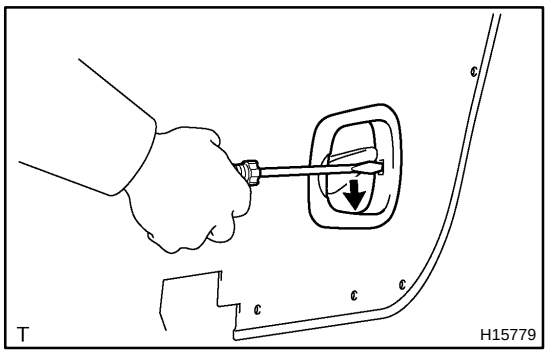
COMPONENTS

BO0XB-11



BO3TU-04

REMOVAL



1. REMOVE DOOR INSIDE HANDLE BEZEL

Using a screwdriver, remove the door inside handle bezel.

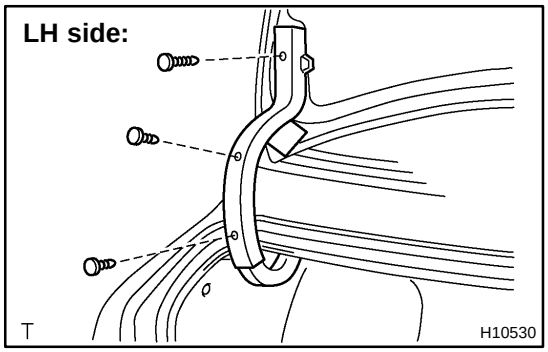
HINT:

Tape the screwdriver tip before use.

2. REMOVE LUGGAGE COMPARTMENT DOOR TRIM

(a) Remove the 2 screws and luggage compartment door assist grip.

(b) Remove the 14 clips and luggage compartment door trim.



3. REMOVE LUGGAGE COMPARTMENT DOOR HINGE COVERS

(a) Remove the 3 clips.

(b) Open the cover and remove the hinge cover.

(c) Employ the same manner described above to the other side.

4. REMOVE LUGGAGE COMPARTMENT DOOR

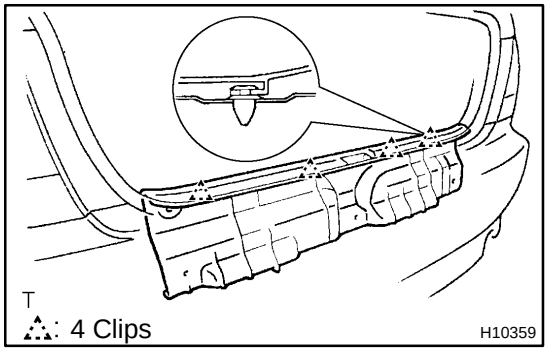
(a) Disconnect the connector.

(b) Disengage the clamps.

(c) Remove the 4 bolts and door.

Torque: 8.0 N·m (82 kgf·cm, 72 in.·lbf)

5. REMOVE LUGGAGE COMPARTMENT TRIM NO.2 COVER



6. REMOVE LUGGAGE COMPARTMENT TRIM REAR COVER

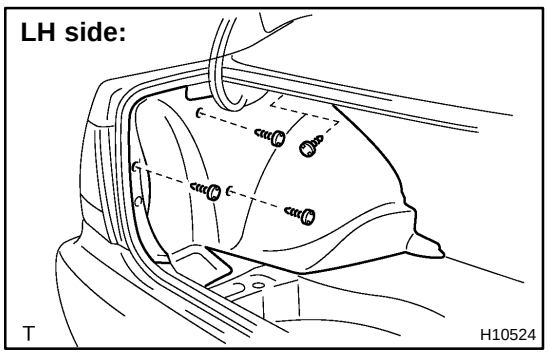
(a) Using a clip remover, remove the 5 clips.

(b) Using a screwdriver, remove the luggage compartment trim rear cover.

HINT:

Tape the screwdriver tip before use.

7. REMOVE LUGGAGE COMPARTMENT FLOOR HOOKS



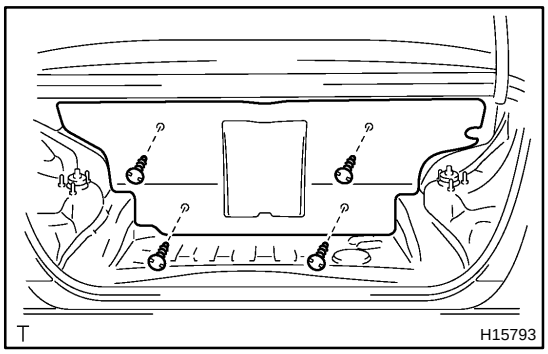
8. REMOVE LUGGAGE COMPARTMENT TRIM SIDE COVER LH AND RH

(a) Remove the 4 clips and luggage compartment trim side cover.

(b) Employ the same manner described above to the other side.

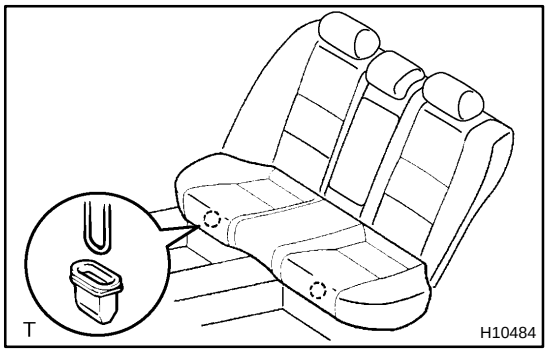
9. REMOVE LUGGAGE COMPARTMENT FLOOR MAT

Remove the 3 clips and luggage compartment floor mat.



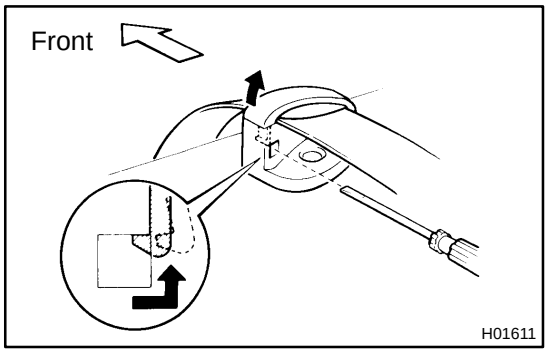
10. REMOVE LUGGAGE COMPARTMENT TRIM FRONT COVER

Remove the 4 clips and luggage compartment trim front cover.



11. REMOVE REAR SEAT CUSHION

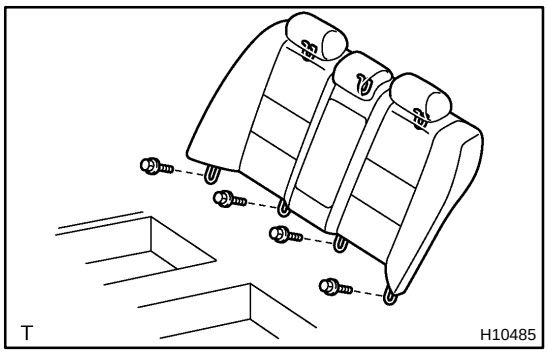
Pull up the front portion of the seat cushion, then remove it.



12. REMOVE REAR SEATBACK

(a) Using a screwdriver, remove the rear seat belt from the belt guide as shown in the illustration.

(b) Employ the same manner described above to the other side.

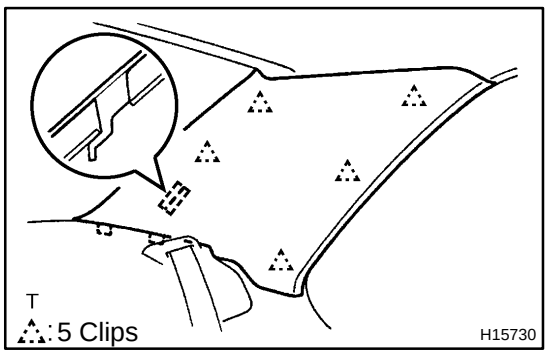


(c) Remove the 4 bolts.
Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

(d) Pull up the seatback to remove it.

NOTICE:

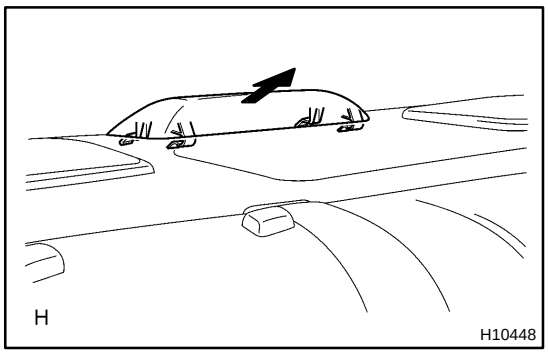
Be careful not to damage the body.



13. REMOVE ROOF SIDE INNER GARNISH

(a) Using a screwdriver, remove the roof side inner garnish.

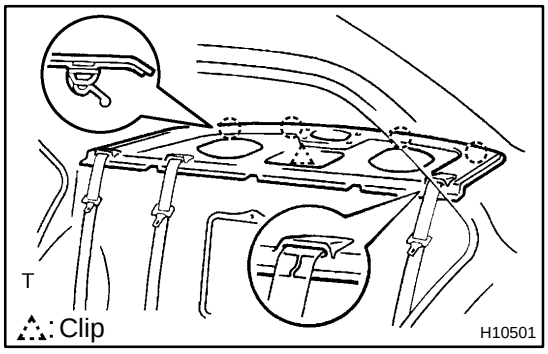
(b) Employ the same manner described above to the other side.



14. REMOVE HIGH-MOUNTED STOP LIGHT

(a) Remove the high-mounted stop light as shown in the illustration.

(b) Disconnect the connector.



15. REMOVE PACKAGE TRAY TRIM PANEL

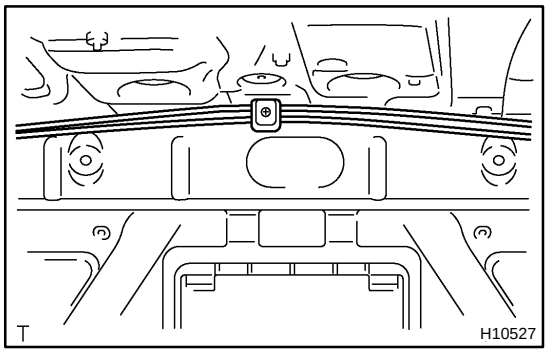
(a) Pull the package tray trim panel upward to disengage the clips.

(b) Remove the rear seat outer belts through the cutout on the package tray trim panel.

(c) Pull the package tray trim panel forward to remove it.

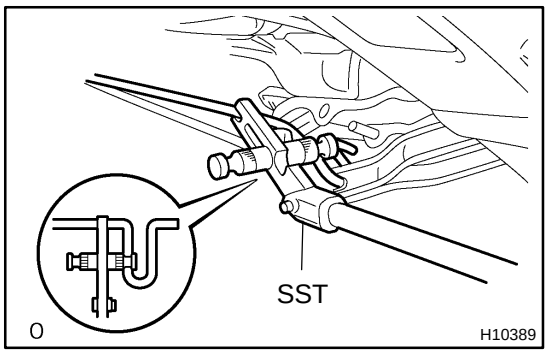
16. REMOVE ROOM PARTITION TRIM PAD

Remove the 2 clips and room partition trim pad.

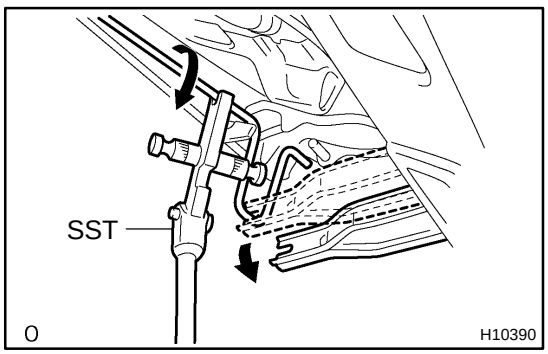


17. REMOVE TORSION BAR

(a) Remove the torsion bars from the center bracket.

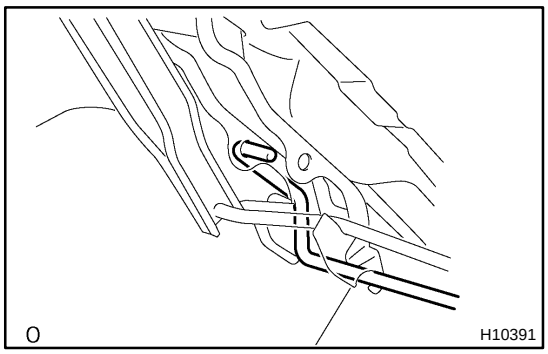


(b) Install SST to the torsion bar on the hinge side.
SST 09804-24010



(c) Push down SST to pull the luggage compartment door hinge from the torsion bar.

(d) Slowly lift SST, and remove the torsion bar from the torsion bar bracket with SST.



(e) Disconnect the torsion bar from the bracket.
(f) Employ the same manner described above to the other side.

HINT:

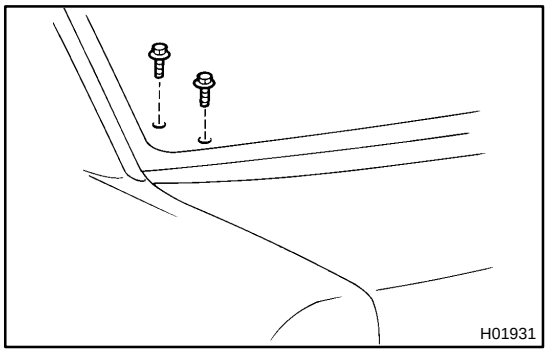
Check the color of marks on the torsion bar when replacing or installing the torsion bar.

w/o Rear spoiler:

Side	Color
RH	Yellow
LH	Pink

w/ Rear spoiler:

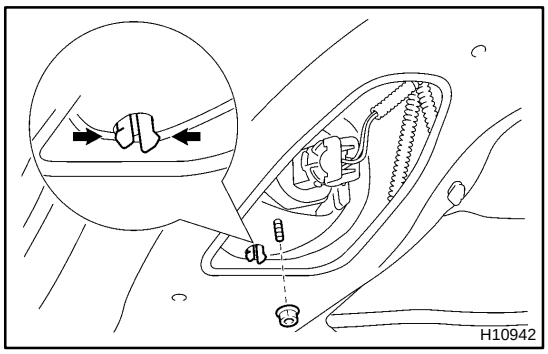
Side	Color
RH	Green
LH	Orange



18. REMOVE LUGGAGE COMPARTMENT DOOR HINGE

(a) Remove the 2 bolts.
(b) Remove the hinge.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)
(c) Employ the same manner described above to the other side.

BO2CE-05



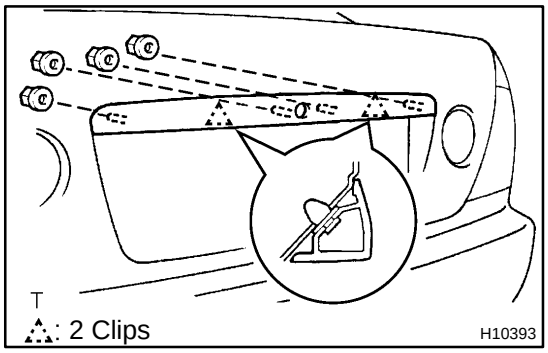
DISASSEMBLY

1. REMOVE REAR LIGHT

(a) Remove the nut.
(b) Disengage the clip.
(c) Disconnect the connector, then remove the rear light.
(d) Employ the same manner described above to the other side.

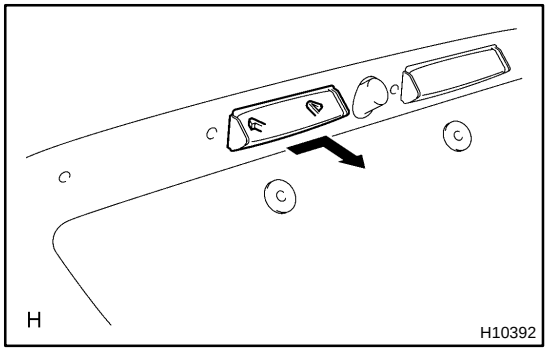
2. REMOVE LUGGAGE COMPARTMENT DOOR OUTER GARNISH

(a) Disconnect the cable and link from the key cylinder.



(b) Remove the 4 nuts and key cylinder.
(c) Using a screwdriver, remove the luggage compartment door outer garnish.

HINT:
Tape the screwdriver tip before use.

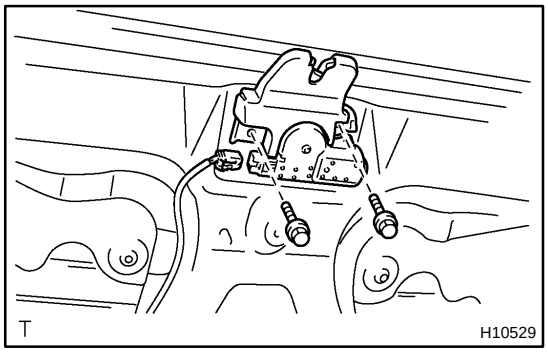


3. REMOVE LICENCE PLATE LIGHT

(a) Disconnect the connector.
(b) Remove the licence plate light as shown in the illustration.
(c) Employ the same manner described above to the other side.

4. REMOVE LUGGAGE DOOR LOCK OPENER ASSEMBLY

(a) Disconnect the link.
(b) Remove the screw and luggage door lock opener assembly.

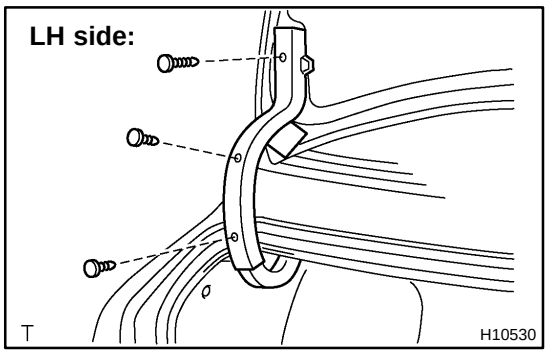


5. REMOVE LUGGAGE COMPARTMENT DOOR LOCK

(a) Disconnect the connector.
(b) Remove the 2 bolts and luggage compartment door lock.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

BO2CF-04

ADJUSTMENT

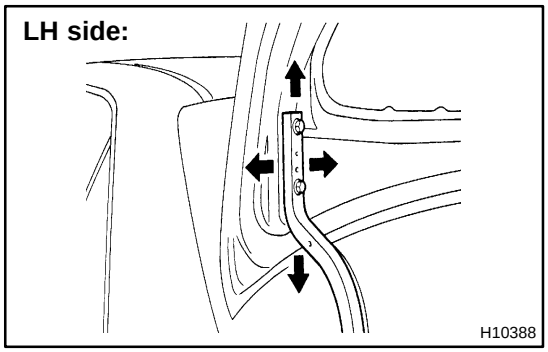


1. ADJUST LUGGAGE COMPARTMENT DOOR

(a) Remove the 3 clips.

(b) Open the cover and remove the hinge cover.

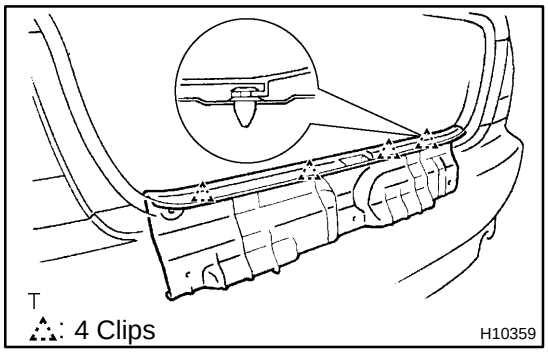
(c) Employ the same manner described above to the other side.



(d) For forward / rearward and left / right adjustments, loosen the bolts.

(e) For vertical adjustment of front end of the door, increase or decrease the number of washers between the hinge and the door.

Torque: 8.0 N·m (82 kgf·cm, 72 in.·lbf)



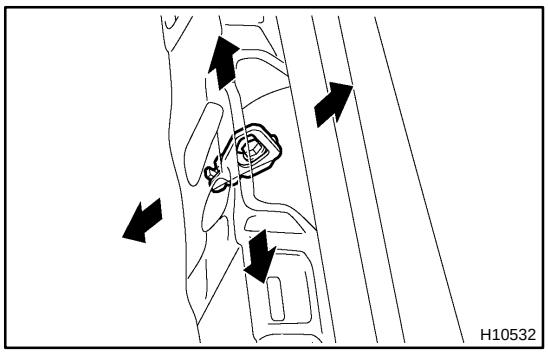
2. ADJUST DOOR LOCK STRIKER

(a) Using a clip remover, remove the 5 clips.

(b) Using a screwdriver, remove the rear floor finish plate.

HINT:

Tape the screwdriver tip before use.



(c) Using a hammer and brass bar, tap the striker to adjust it.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

BO0XF-02

REASSEMBLY

The reassembly procedures are the disassembly procedures in reverse order (See page BO-56).

BO0XG-04

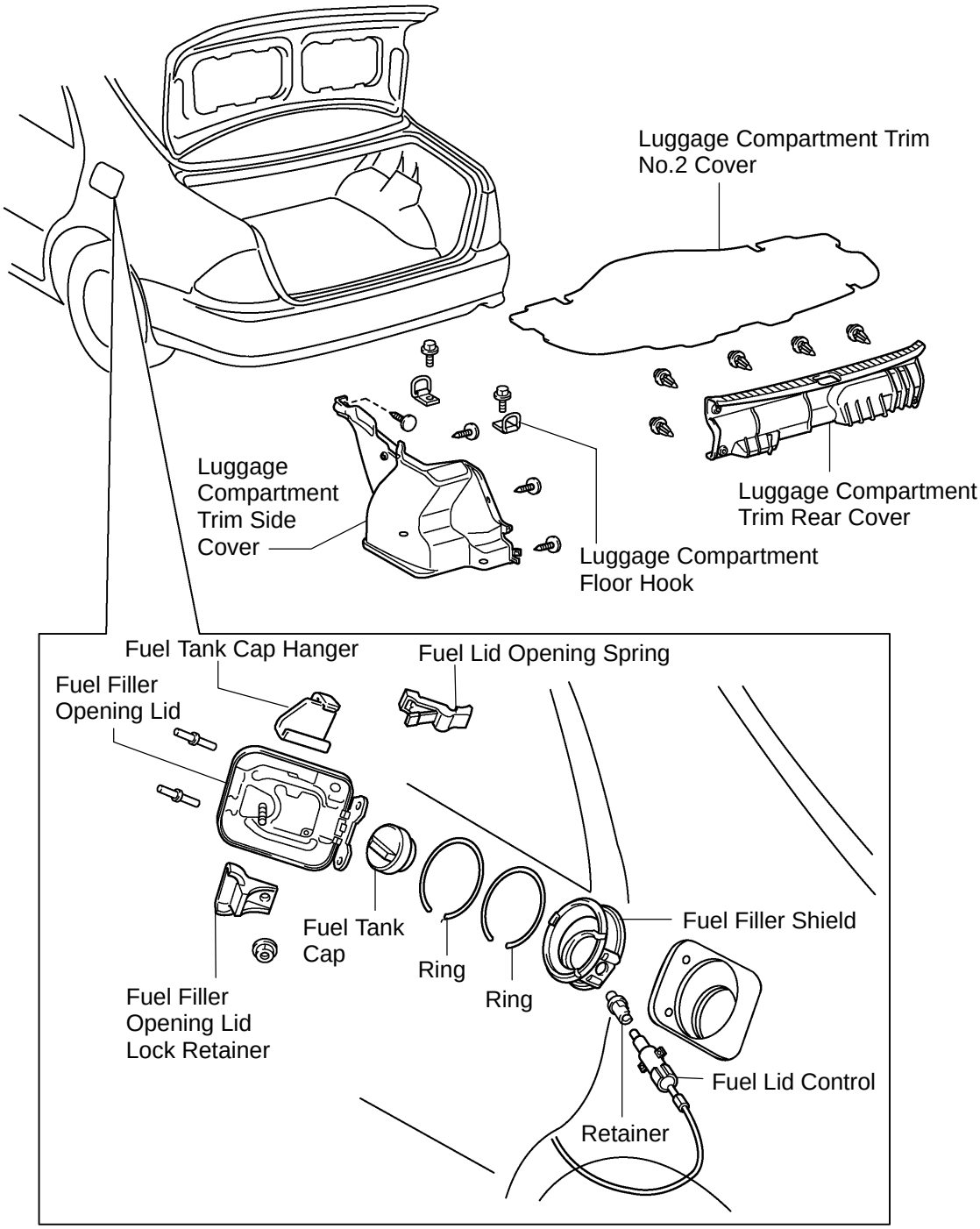
INSTALLATION

The installation procedures are the removal procedures in reverse order (See page BO-52).

FUEL LID (Sedan)

BO4D4-01

COMPONENTS



T

H15790

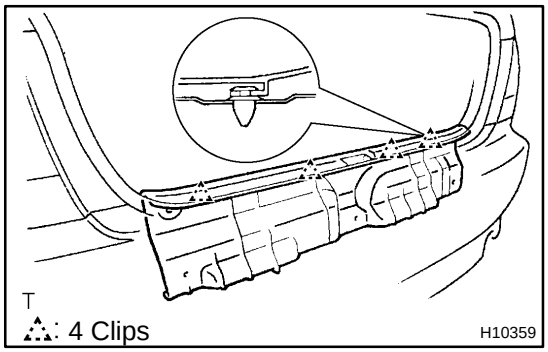
BO4D5-03

REMOVAL

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. REMOVE LUGGAGE COMPARTMENT TRIM NO.2 COVER



2. REMOVE LUGGAGE COMPARTMENT TRIM REAR COVER

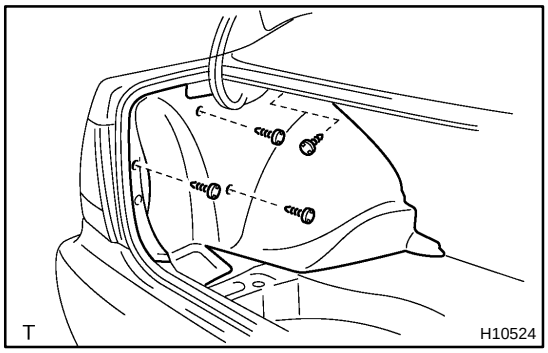
(a) Using a clip remover, remove the 5 clips.

(b) Using a screw driver, remove the luggage compartment trim rear cover.

HINT:

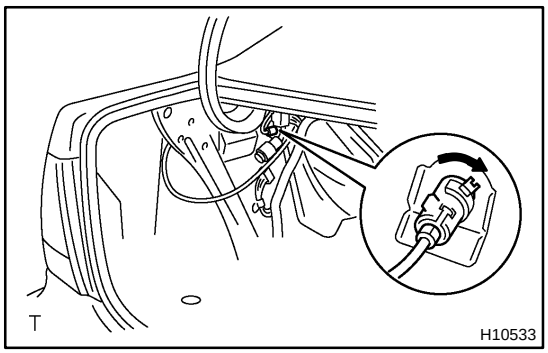
Tape the screwdriver tip before use.

3. REMOVE LUGGAGE COMPARTMENT FLOOR HOOKS



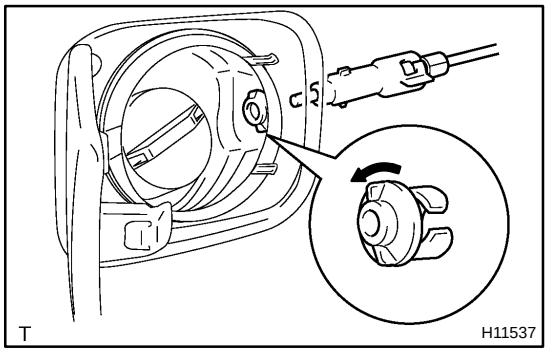
4. REMOVE LUGGAGE COMPARTMENT TRIM SIDE COVER LH

Remove the 4 clips and luggage compartment trim side cover LH.

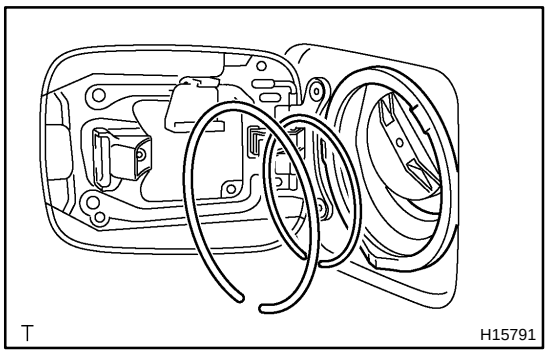


5. REMOVE FUEL LID LOCK CONTROL

(a) Rotate the fuel lid lock right to disengage the lock, then pull it out.



(b) Rotate the retainer left to disengage the lock, then pull it out.



6. REMOVE FUEL FILLER SHIELD

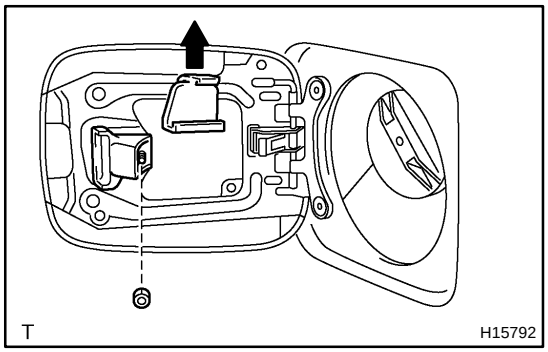
(a) Remove the 2 rings from the fuel filler shield.

(b) Remove the fuel tank cap and shield.

CAUTION:

Always keep the tank cap closed when it is not required to be open. Keep open fire away during the operation.

(c) Install the fuel tank cap quickly.

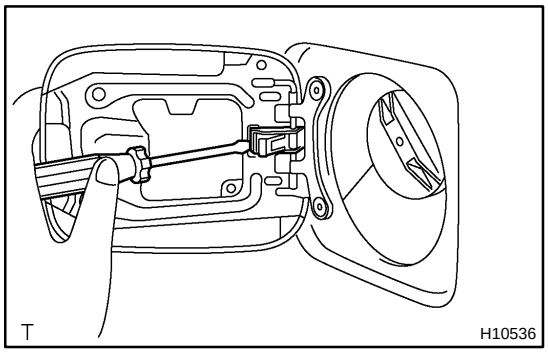


7. REMOVE FUEL TANK CAP HANGER

Pull up the fuel tank cap hanger to remove it.

8. REMOVE FUEL FILLER OPENING LID LOCK RETAINER

Remove the nut and fuel filler opening lid lock retainer.

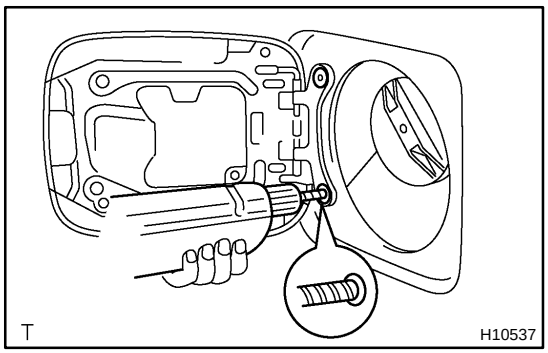


9. REMOVE FUEL LID OPENING SPRING

Insert a screwdriver between the spring and fuel filler opening lid to remove the spring as shown in the illustration.

HINT:

Tape the screwdriver tip before use.



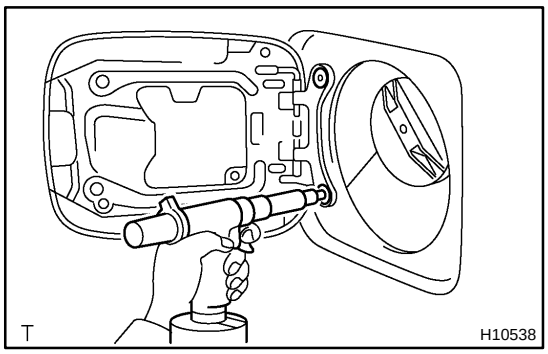
10. REMOVE FUEL FILLER OPENING LID

(a) Using a drill, drill out the rivet heads.

(b) Remove the fuel filler opening lid.

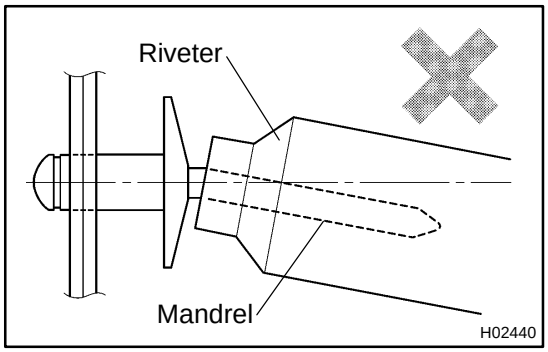
BO4D6-02

INSTALLATION



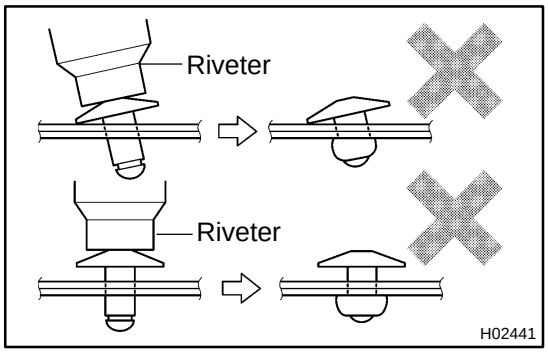
1. INSTALL FUEL FILLER OPENING LID

Using a riveter, install the fuel filler opening lid with the 2 rivets to the body.

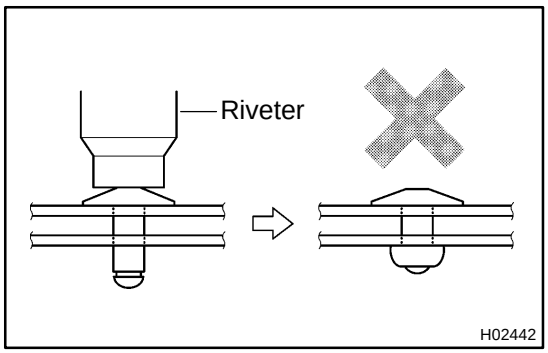


NOTICE:

- **Do not prize a riveter. It could damage the riveter and cause loose fitting and mandrel bend.**

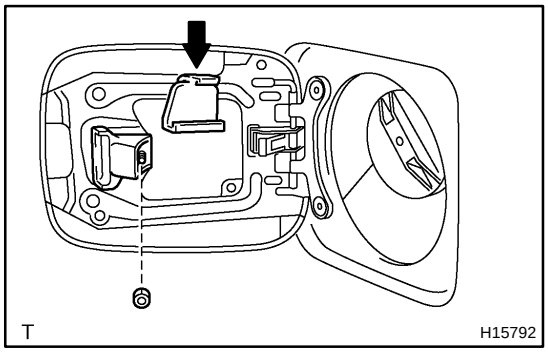


- **Do not tilt the riveter when fastening the rivet to the material to avoid loose fitting.**
- **Do not allow gap spacing between the rivet head and the material.**



- **Do not allow gap spacing between the materials.**

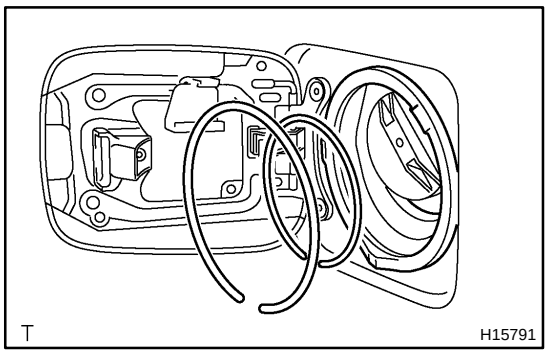
2. INSTALL FUEL FILLER OPENING SPRING



3. INSTALL FUEL FILLER OPENING LID LOCK RETAINER

Install the fuel filler opening lid lock retainer with the nut.

4. INSTALL FUEL TANK CAP HANGER



5. INSTALL FUEL FILLER SHIELD

(a) Remove the fuel tank cap.

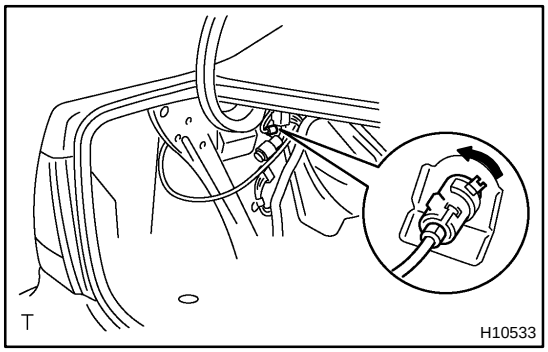
(b) Install the fuel filler shield to the body.

(c) Install the fuel tank cap quickly.

CAUTION:

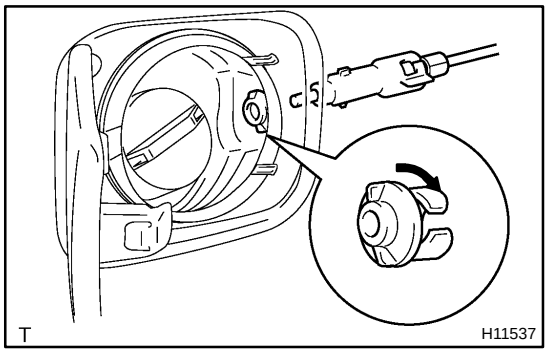
Always keep the tank cap closed when it is not required to be open. Keep open fire away during the operation.

(d) Install the 2 rings to the fuel filler shield as shown in the illustration.

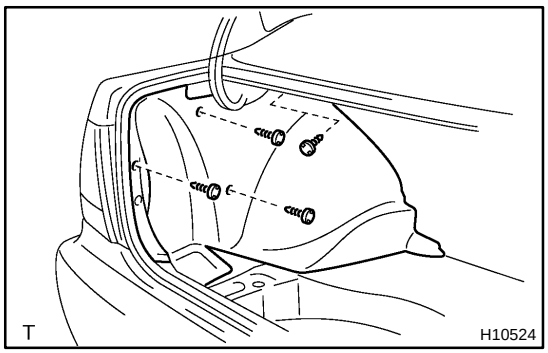


6. INSTALL FUEL LID LOCK CONTROL

(a) Install the retainer to the body from the outside of the vehicle and rotate it to the right to lock.



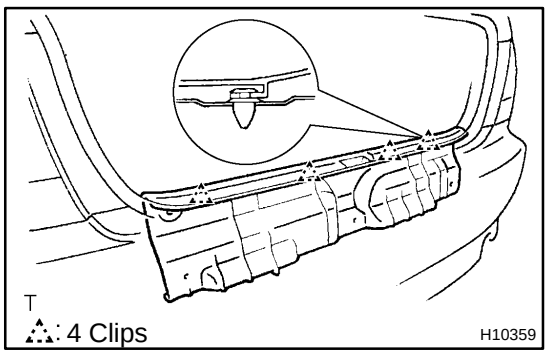
(b) Insert the fuel lid lock control to the retainer and rotate it to the left to lock.



7. INSTALL LUGGAGE COMPARTMENT TRIM SIDE COVER LH

Install the luggage compartment trim side cover LH with the 3 clips.

8. INSTALL LUGGAGE COMPARTMENT FLOOR HOOKS



9. INSTALL LUGGAGE COMPARTMENT TRIM REAR COVER

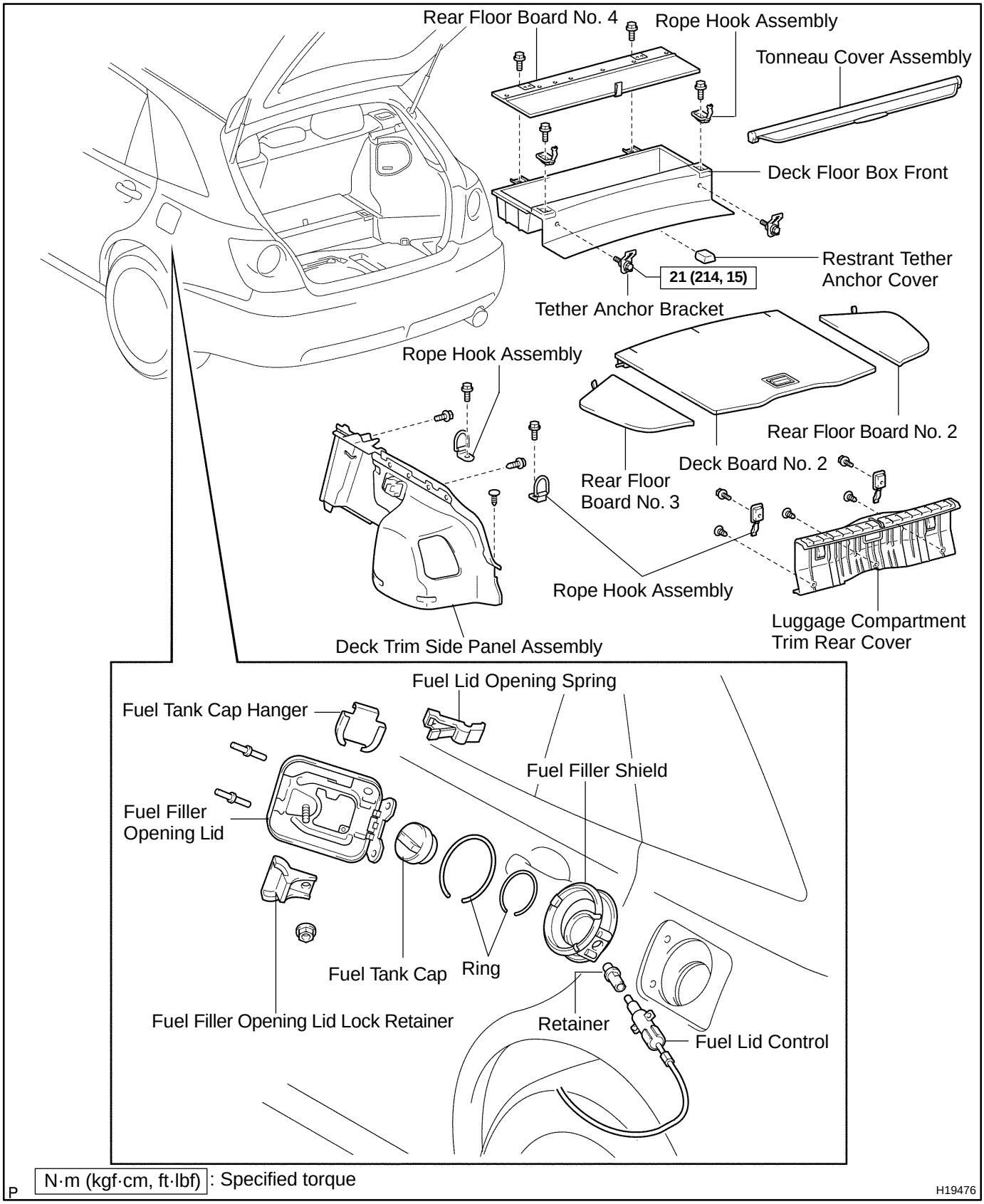
Install the luggage compartment trim rear cover with the 5 clips.

10. INSTALL LUGGAGE COMPARTMENT TRIM NO.2 COVER

FUEL LID (Wagon)

COMPONENTS

BO4D7-03



BO4D8-03

REMOVAL

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. REMOVE REAR SEAT CUSHION (See page BO-204)

2. REMOVE SIDE SEATBACK ASSEMBLY (See page BO-204)

3. REMOVE REAR SEAT FLOOR BOARD NO. 4

(a) Remove the seat back board carpets.

(b) Remove the 2 bolts and rear floor board.

4. REMOVE DECK FLOOR BOX FRONT

(a) Remove the 2 bolts and the 2 rope hook assemblies.

(b) Remove the 2 bolts and 2 tether anchor brackets.

(c) Remove the restraint seat tether anchor cover.

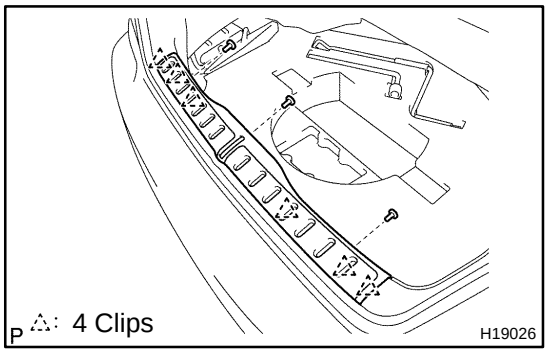
(d) Remove the deck floor box.

5. REMOVE DECK BOARD NO. 2

6. REMOVE REAR FLOOR BOARD NO. 2

7. REMOVE REAR FLOOR BOARD NO. 3

8. REMOVE TONNEAU COVER ASSEMBLY



9. REMOVE REAR FLOOR FINISH PLATE

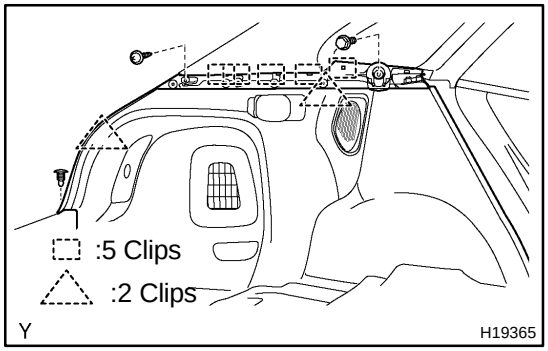
(a) Remove the 2 bolts and the 2 rope hook assemblies.

(b) Remove the 3 clips.

(c) Using a screwdriver, remove the rear floor finish plate.

HINT:

Tape the screwdriver tip before use.



10. REMOVE DECK TRIM SIDE PANEL ASSEMBLY

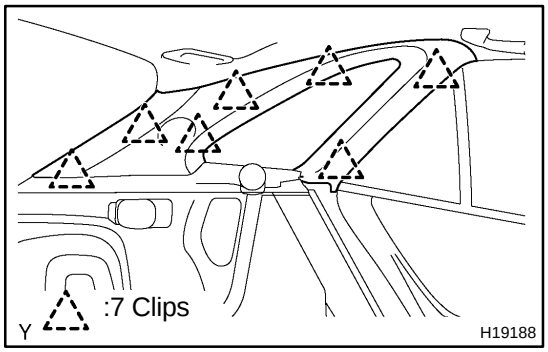
(a) Remove the 2 bolts and 2 floor hooks.

(b) Remove the screw, bolt and clip.

(c) Using a screwdriver, remove the deck trim side panel assembly, then disconnect the connector.

HINT:

Tape the screwdriver tip before use.

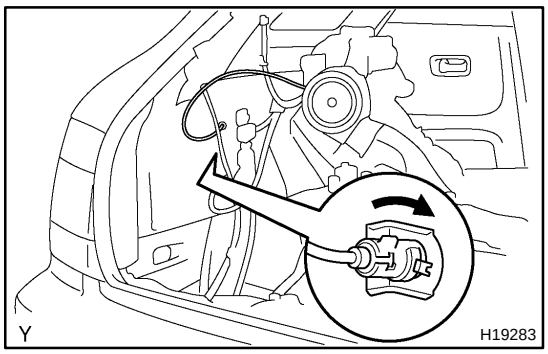


11. REMOVE ROOF SIDE INNER GARNISH

Using a screwdriver, remove the roof side inner garnish.

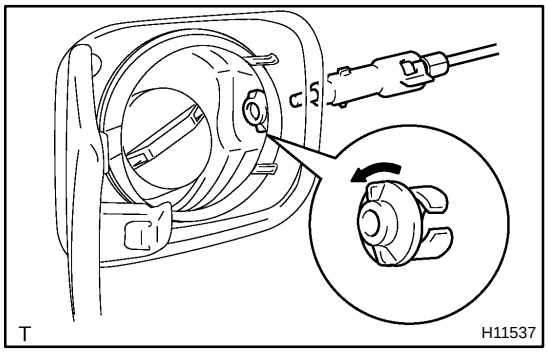
HINT:

Tape the screwdriver tip before use.

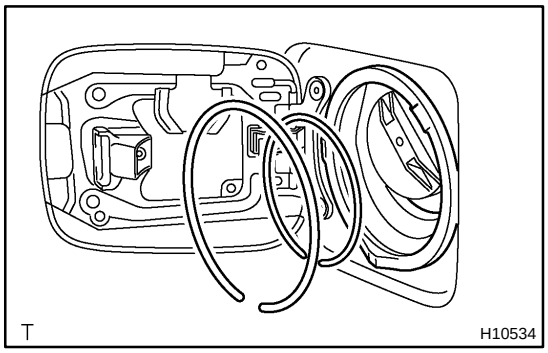


12. REMOVE FUEL LID LOCK CONTROL

(a) Rotate the fuel lid lock to the right to disengage the lock, then pull it out.



(b) Rotate the retainer to the left to disengage the lock, then pull it out.



13. REMOVE FUEL FILLER SHIELD

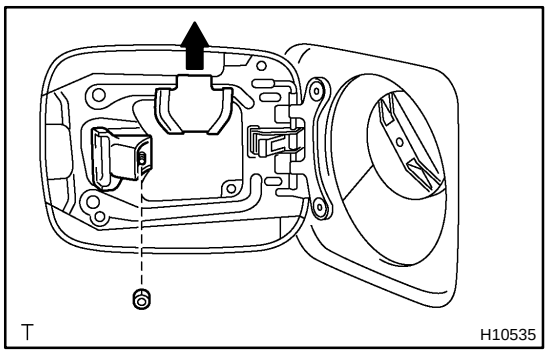
(a) Remove the 2 rings from the fuel filler shield.

(b) Remove the fuel tank cap and shield.

CAUTION:

Always keep the tank cap closed when it is not required to be open. Keep open fire away during the operation.

(c) Install the fuel tank cap quickly.

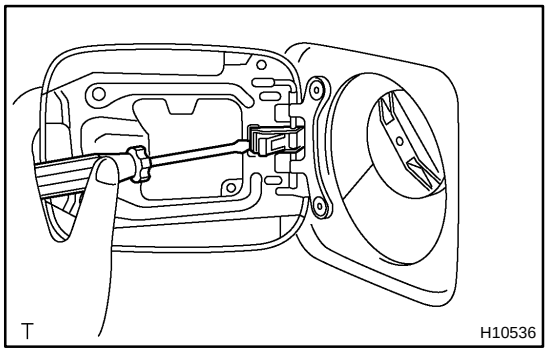


14. REMOVE FUEL TANK CAP HANGER

Pull up the fuel tank cap hanger to remove it.

15. REMOVE FUEL FILLER OPENING LID LOCK RETAINER

Remove the nut and fuel filler opening lid lock retainer.

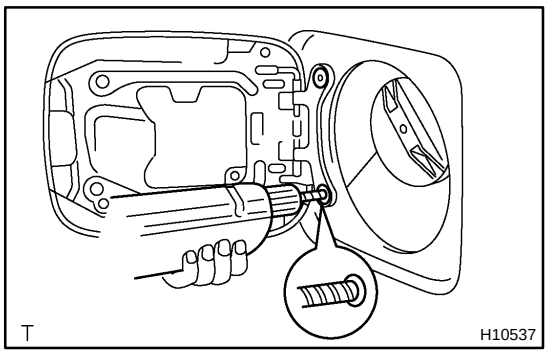


16. REMOVE FUEL LID OPENING SPRING

Insert a screwdriver between the spring and fuel filler opening lid to remove the spring as shown in the illustration.

HINT:

Tape the screwdriver tip before use.



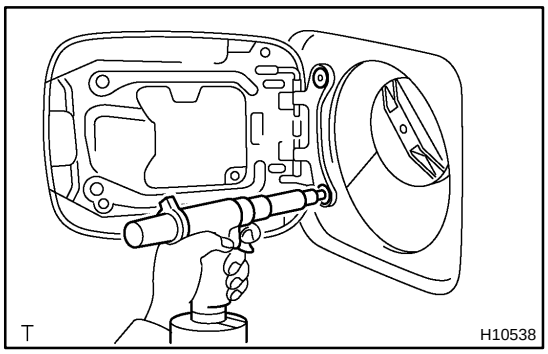
17. REMOVE FUEL FILLER OPENING LID

(a) Using a drill, drill out the rivet heads.

(b) Remove the fuel filler opening lid.

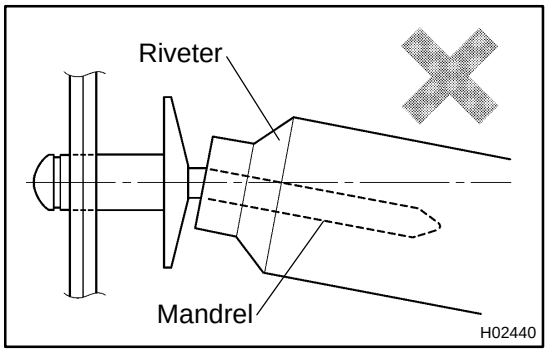
BO4D9-02

INSTALLATION



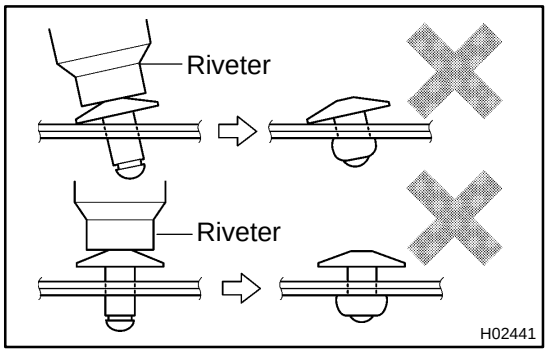
1. INSTALL FUEL FILLER OPENING LID

Using a riveter, install the fuel filler opening lid with the 2 rivets to the body.

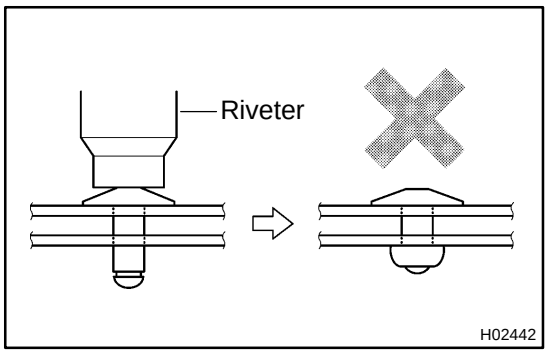


NOTICE:

- **Do not prize a riveter. It could damage the riveter and cause loose fitting and mandrel bend.**

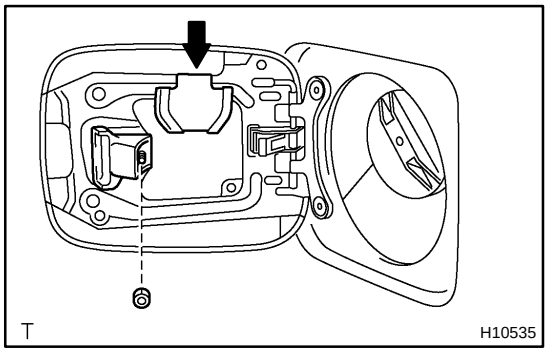


- **Do not tilt the riveter when fastening the rivet to the material to avoid loose fitting.**
- **Do not allow gap spacing between the rivet head and the material.**



- **Do not allow gap spacing between the materials.**

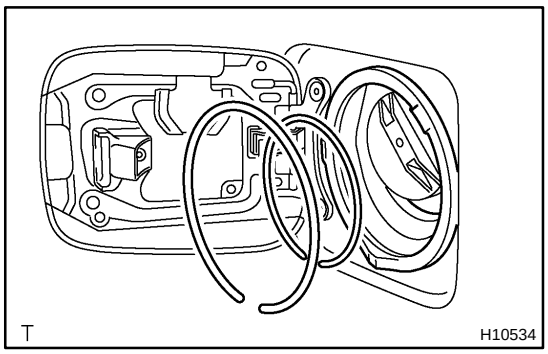
2. INSTALL FUEL FILLER OPENING SPRING



3. INSTALL FUEL FILLER OPENING LID LOCK RETAINER

Install the fuel filler opening lid lock retainer with the nut.

4. INSTALL FUEL TANK CAP HANGER



5. INSTALL FUEL FILLER SHIELD

(a) Remove the fuel tank cap.

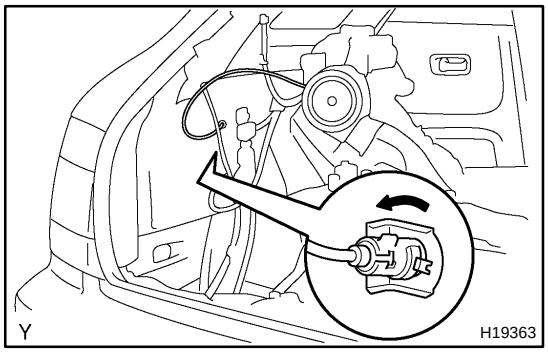
(b) Install the fuel filler shield to the body, and put the fuel tank cap back immediately.

(c) Install the fuel tank cap quickly.

CAUTION:

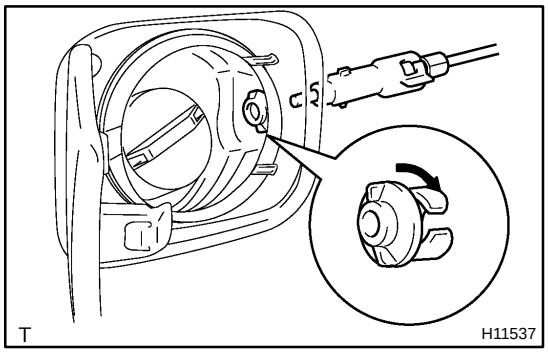
Always keep the tank cap closed when it is not required to be open. Keep open fire away during the operation.

(d) Install the 2 rings to the fuel filler shield as shown in the illustration.

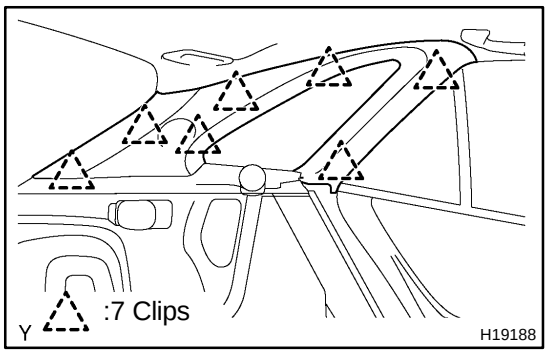


6. INSTALL FUEL LID LOCK CONTROL

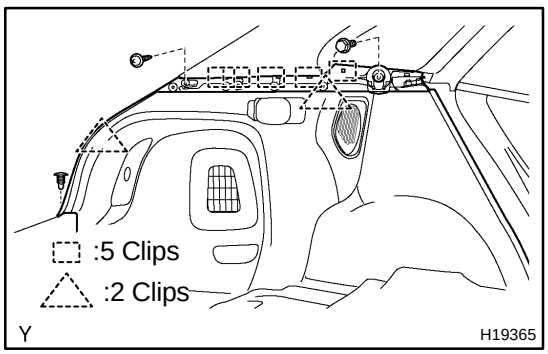
(a) Install the retainer to the body from the outside of the vehicle and rotate it right to lock.



(b) Insert the fuel lid lock control to the retainer and rotate it to the left to lock.



7. INSTALL ROOF SIDE INNER GARNISH

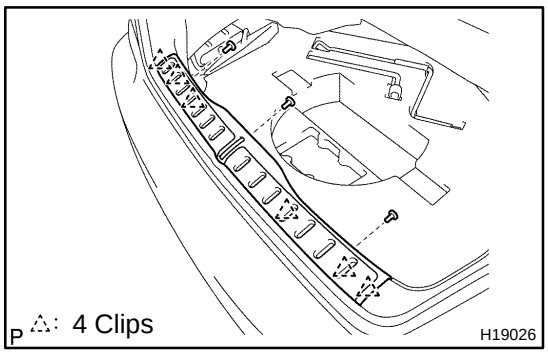


8. INSTALL DECK TRIM SIDE PANEL ASSEMBLY

(a) Install the deck trim side panel assembly then connect the connector.

(b) Install the screw, bolt and clip.

(c) Install the 2 floor hooks with the 2 bolts.



9. INSTALL REAR FLOOR FINISH PLATE

(a) Install the rear floor finish plate.

(b) Install the 3 clips.

(c) Install the 2 rope hook assemblies with the 2 bolts.

10. INSTALL TONNEAU COVER ASSEMBLY

11. INSTALL REAR FLOOR BOARD NO. 3

12. INSTALL REAR FLOOR BOARD NO. 2

13. INSTALL DECK BOARD NO. 2

14. INSTALL DECK FLOOR BOX FRONT

(a) Install the deck floor box.

(b) Install the 2 tether anchor brackets with the 2 bolts.

Torque: 21 N·m (214 kgf·cm, 15ft·lbf)

(c) Install the restraint seat tether anchor cover.

(d) Install the 2 rope hook assemblies with the 2 bolts.

15. INSTALL REAR SEAT FLOOR BOARD NO. 4

(a) Install the rear floor board with the 2 bolts.

(b) Install the seat back board carpets.

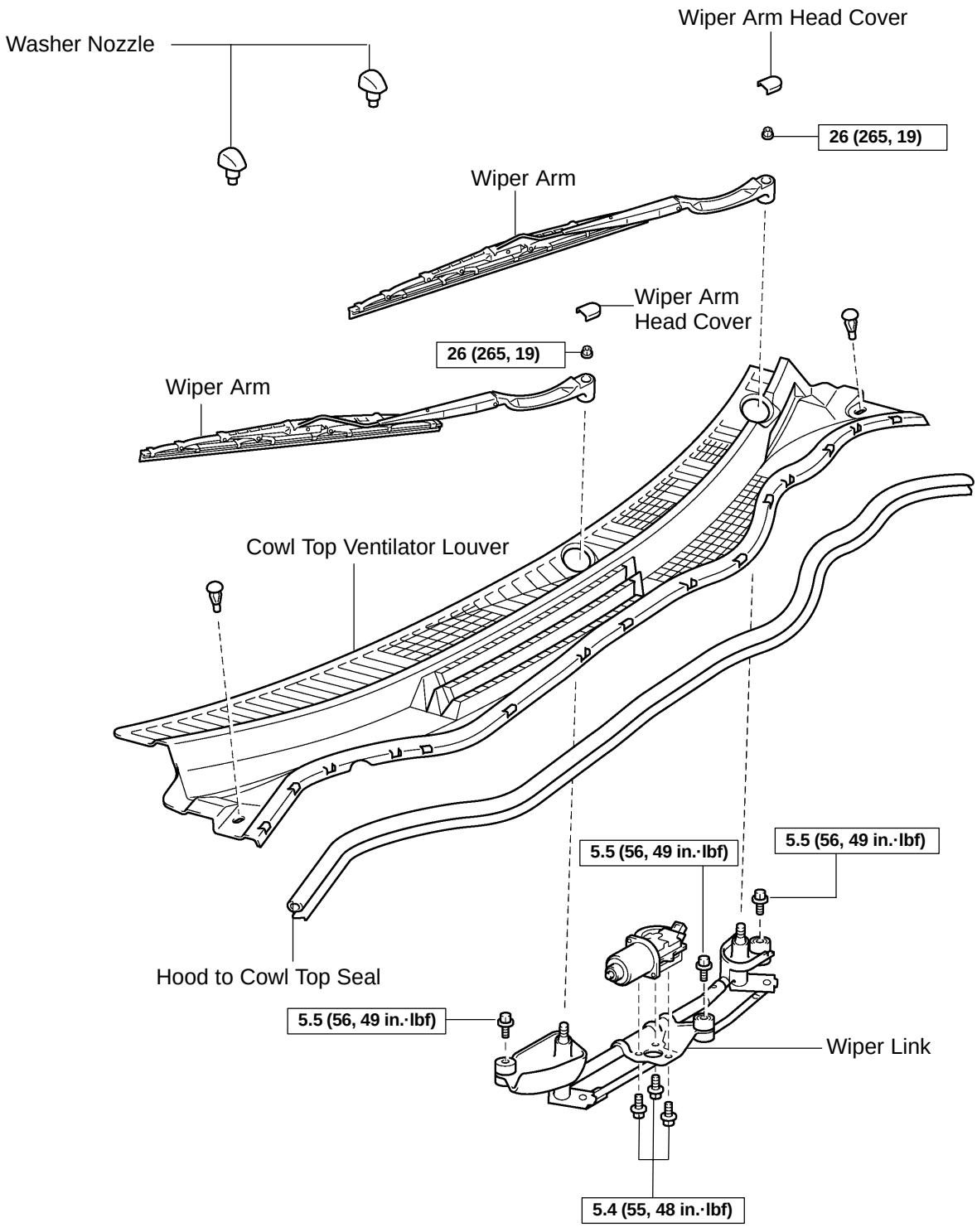
16. INSTALL SIDE SEAT BACK ASSEMBLY (See page BO-204)

17. INSTALL REAR SEAT CUSHION (See page BO-204)

FRONT WIPER AND WASHER

BO0UX-07

COMPONENTS



T N·m (kgf·cm, ft·lbf) : Specified torque

H15723

BO2CI-03

REMOVAL

1. REMOVE WIPER ARMS

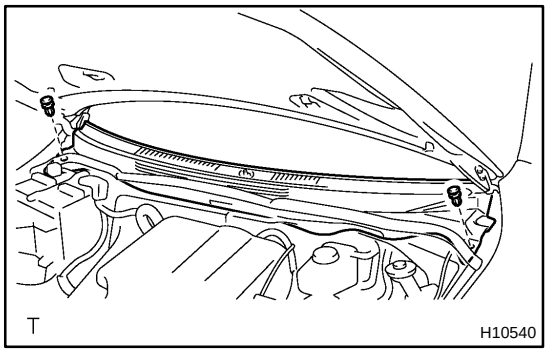
(a) Using a screwdriver, remove the wiper arm head covers.

HINT:

Tape the screwdriver tip before use.

(b) Remove the 2 nuts and 2 wiper arms.

2. REMOVE HOOD TO COWL TOP SEAL



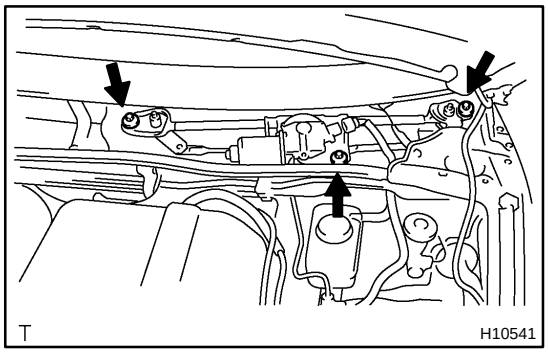
3. REMOVE COWL TOP VENTILATOR LOUVER

(a) Remove the 2 clips

(b) Using a screwdriver, remove the cowl top ventilator louver.

HINT:

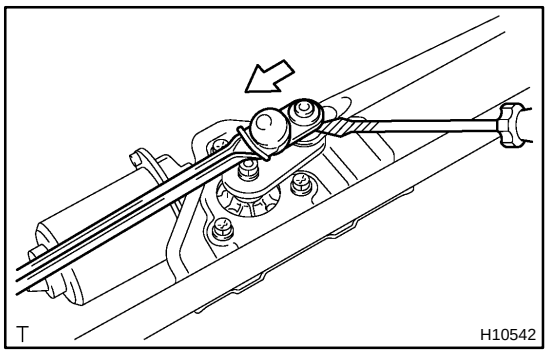
Tape the screwdriver tip before use.



4. REMOVE WIPER LINK ASSEMBLY

(a) Disconnect the connector.

(b) Remove the 3 bolts and wiper link assembly.

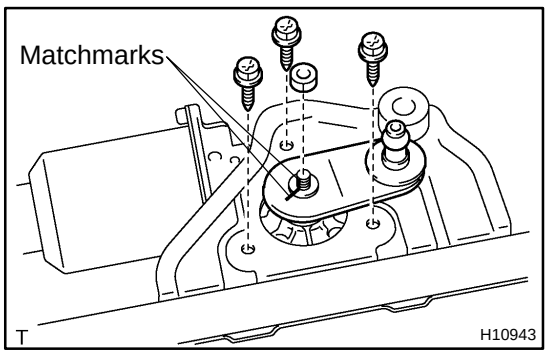


5. REMOVE WIPER MOTOR

(a) Using a screwdriver, disconnect the wiper link from the motor.

HINT:

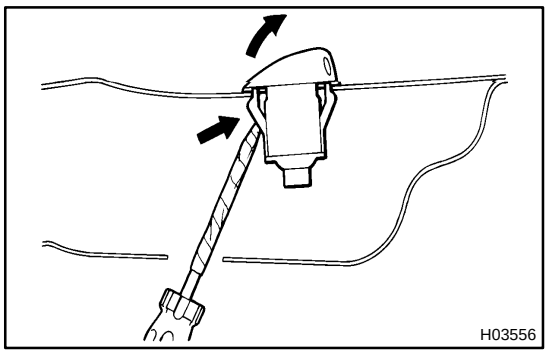
Tape the screwdriver tip before use.



(b) Remove the nut.

(c) Place the matchmarks on the wiper link and motor.

(d) Remove the 3 screws and wiper motor from the wiper link.



6. REMOVE WASHER NOZZLE

(a) Remove the hood insulator.

(b) Disconnect the washer hose.

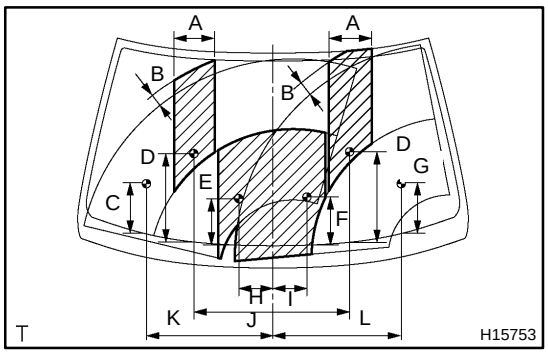
(c) Using a screwdriver, remove the washer nozzle.

HINT:

Tape the screwdriver tip before use.

(d) Employ the same manner described above to the other side.

BO0UZ-10



INSPECTION

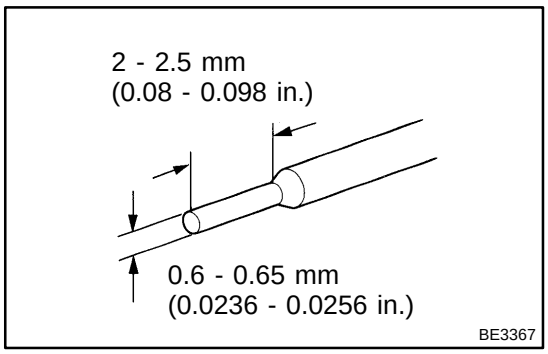
INSPECT WASHER NOZZLE

(a) While operating the washer, check whether the points where the washer fluid hits the windshield and the surge area are within the range indicated by the hatched line.

A: Approx. 150 mm (5.91 in.)
B: Approx. 50 mm (1.97 in.)
C: Approx. 181.4 mm (7.142 in.)
D: Approx. 320.6 mm (12.622 in.)
E: Approx. 175.9 mm (6.925 in.)
F: Approx. 176.5 mm (6.949 in.)
G: Approx. 181 mm (7.13 in.)
H: Approx. 117.8 mm (4.638 in.)
I: Approx. 120 mm (4.72 in.)
J: Approx. 546.6 mm (21.520 in.)
K: Approx. 443.7 mm (17.468 in.)
L: Approx. 447 mm (17.60 in.)

(b) Check if the outer point where the washer fluid hits the windshield is within the range of the wiping pattern (the area of the glass which is wiped by the wiper blades).

BO0V0-07



ADJUSTMENT

ADJUST WASHER NOZZLE

Using a tool like the one shown in the illustration, change the direction of the nozzle hole to adjust the point where washer fluid hits the windshield.

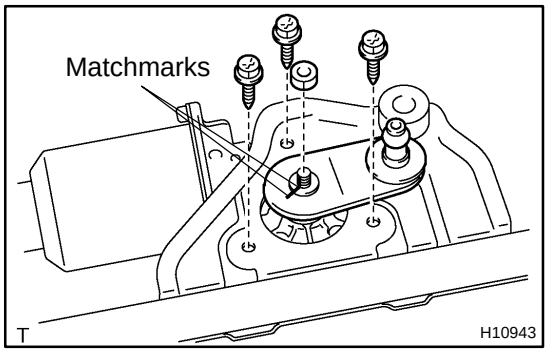
BO2CJ-04

INSTALLATION

1. INSTALL WASHER NOZZLES

(a) Install the washer nozzles, then connect the washer hoses.

(b) Install the hood insulator.

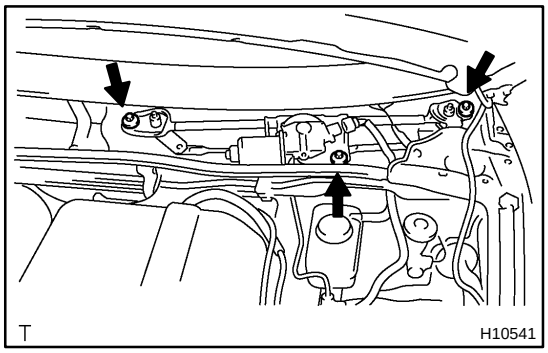


2. INSTALL WIPER MOTOR

(a) Install the wiper motor with the 3 bolts to the wiper link.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(b) Align the matchmakers on the wiper link and wiper motor, then install the nut.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

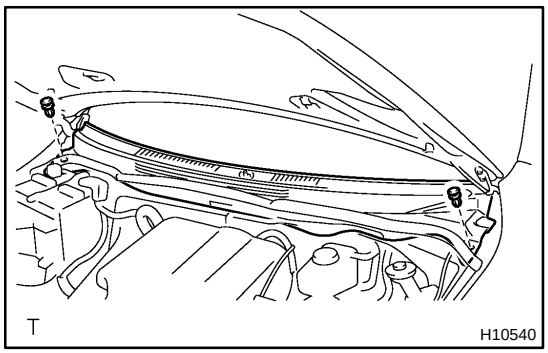
(c) Connect the wiper link to the wiper motor.



3. INSTALL WIPER LINK ASSEMBLY

(a) Install the wiper link assembly and fasten the 3 bolts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

(b) Connect the connector.



4. INSTALL COWL TOP VENTILATOR LOUVER

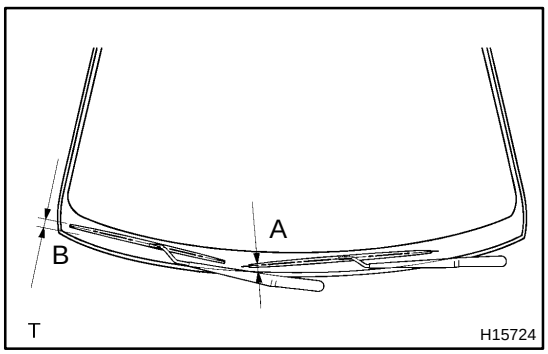
Install the cowl top ventilator louver with the 2 clips.

5. INSTALL HOOD TO COWL TOP SEAL

6. INSTALL WIPER ARMS

(a) Operate the wipers once and turn the wiper switch OFF.

(b) Install the wiper arms and tighten the nuts by hand.



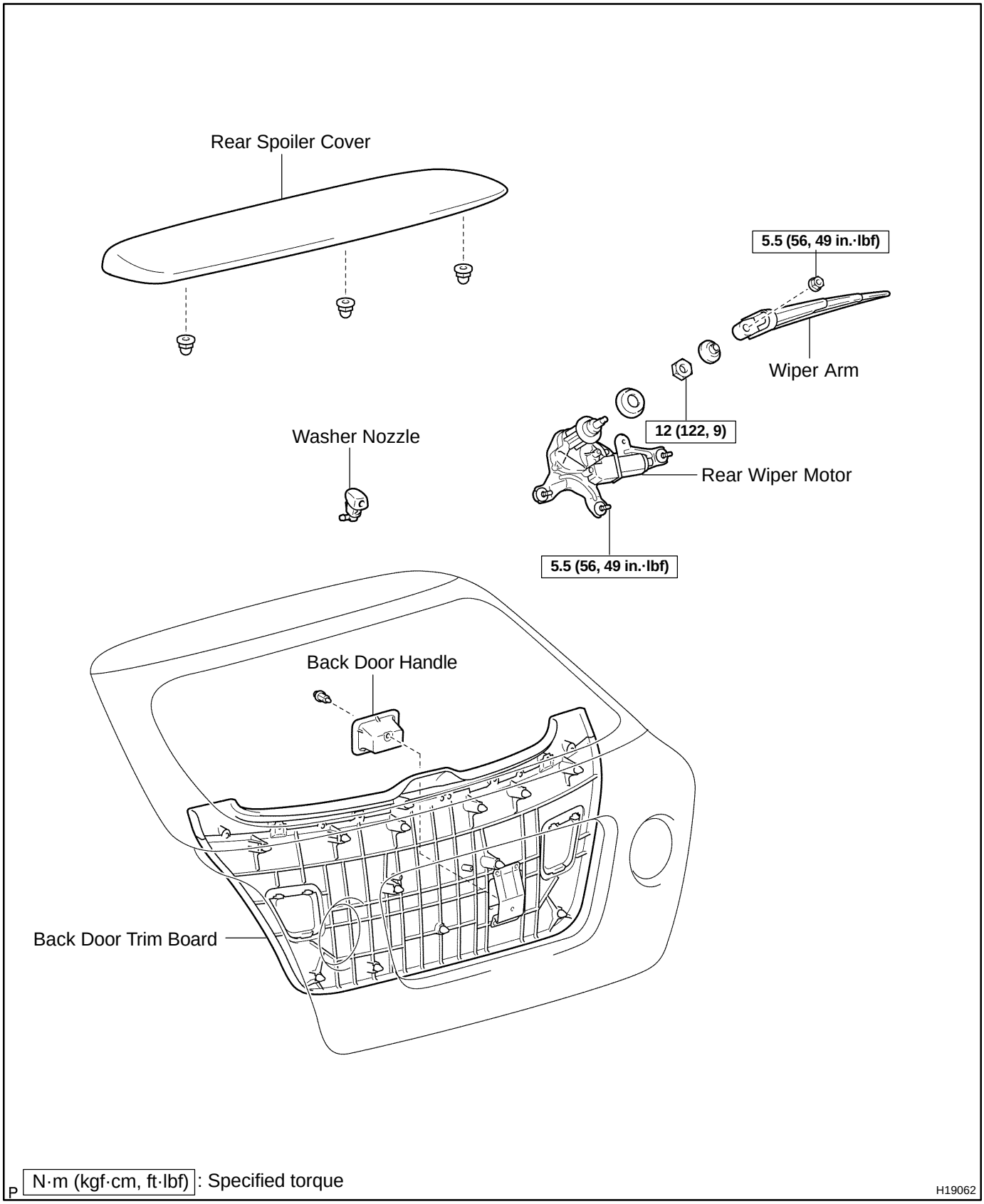
(c) Adjust the installation positions of the wiper arms to the positions as shown in the illustration.
A: 20.0 mm (0.787 in.)
B: 28.0 mm (1.102 in.)

(d) Torque the nuts.
Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)

REAR WIPER AND WASHER (Wagon)

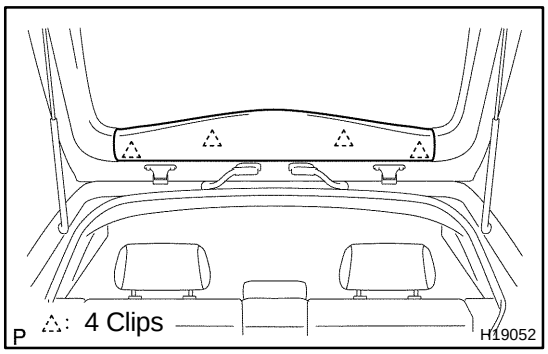
BO4DA-01

COMPONENTS



BO4DB-02

REMOVAL

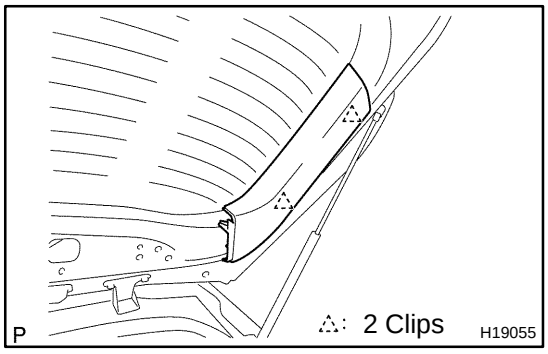


1. REMOVE BACK DOOR TRIM BOARD UPPER

Using a screwdriver, remove the back door trim board upper.

HINT:

Tape the screwdriver tip before use.



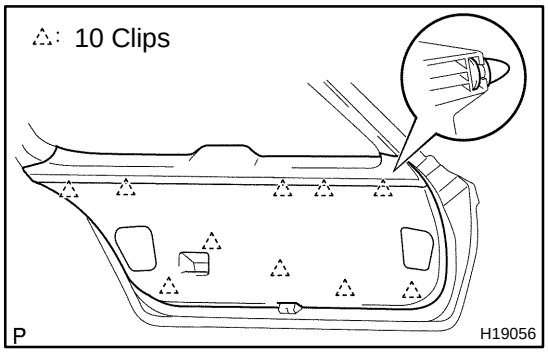
2. REMOVE BACK DOOR TRIM COVERS

(a) Insert a screwdriver between the back door panel and back door trim cover to pry the cover.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



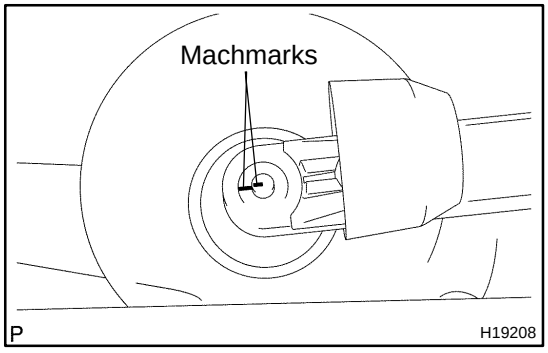
3. REMOVE BACK DOOR TRIM BOARD

(a) Remove the clip and back door handle.

(b) Using a screwdriver, remove the back door trim board.

HINT:

Tape the screwdriver tip before use.

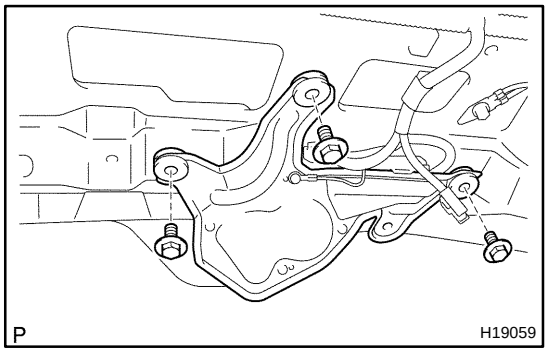


4. REMOVE REAR WIPER ARM

(a) Open the wiper arm cover.

(b) Place matchmarks on the wiper arm and wiper motor.

(c) Remove the nut and rear wiper arm.



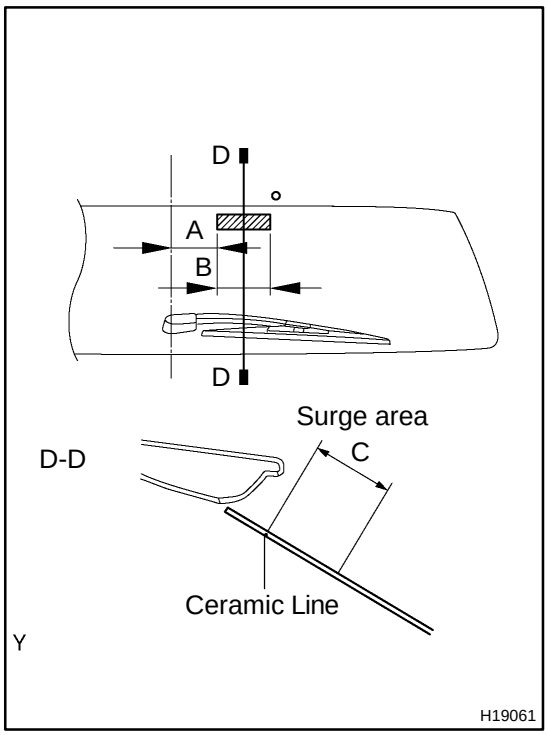
5. REMOVE REAR WIPER MOTOR

(a) Remove the nut and washer on the outer side of the back door panel.

(b) Disconnect the connector.

(c) Remove the 3 bolts and rear wiper motor.

BO4DC-01



INSPECTION

INSPECT WASHER NOZZLE

(a) While operating the washer, check whether the upper point where the washer fluid hits the back door glass and the surge area are within the range indicated by the hatched line.

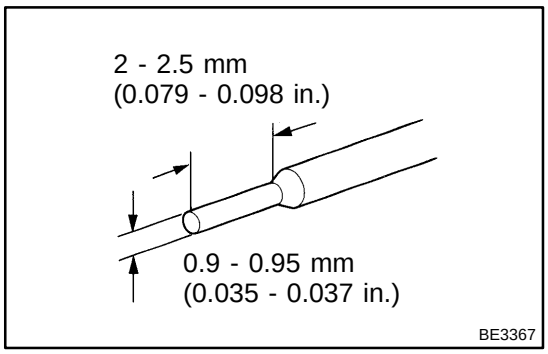
A: 88 mm (3.46 in.)

B: 100 mm (3.94 in.)

C: 55 mm (2.17 in.)

(b) Check if the lower point where the washer fluid hits the back door glass is within the range of the wiping pattern (the are of the glass which is wiped by the wiper blades).

BO4DD-01



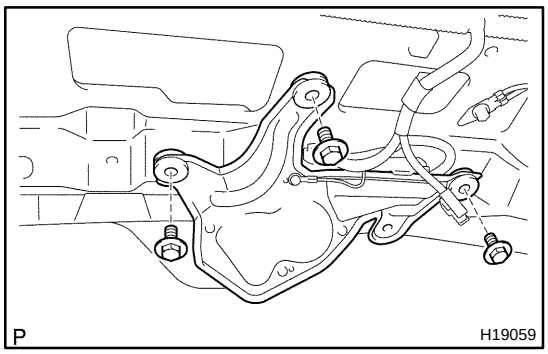
ADJUSTMENT

ADJUST WASHER NOZZLE

Using a tool like the one shown in the illustration, change the direction of the nozzle hole to adjust the point where washer fluid hits the back door glass.

BO4DE-01

INSTALLATION

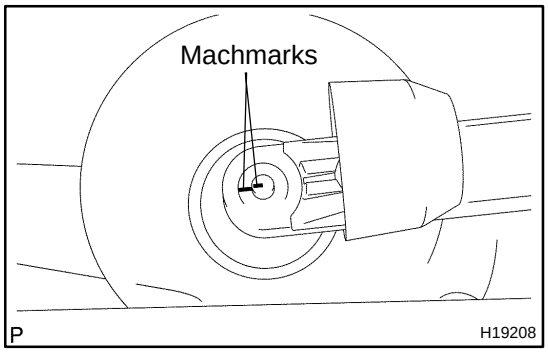


1. INSTALL REAR WIPER MOTOR

(a) Install the rear wiper motor with the 3 bolts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

(b) Connect the connector.

(c) Install the nut and washer on the outer side of the back door panel.
Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)



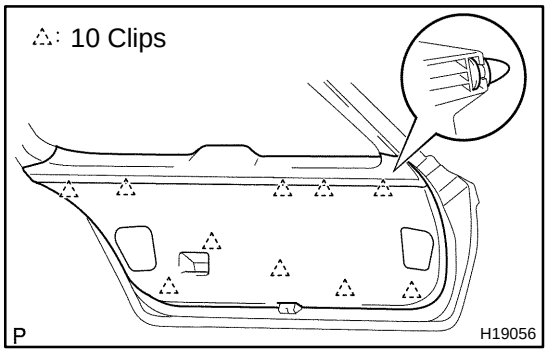
2. INSTALL REAR WIPER ARM

(a) Install the wiper arm and tighten the nut by hand. Operate the wiper once and turn the wiper switch OFF.

(b) Align the machmarks on the wiper arm and wiper motor.

(c) Install the rear wiper arm with the nut.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

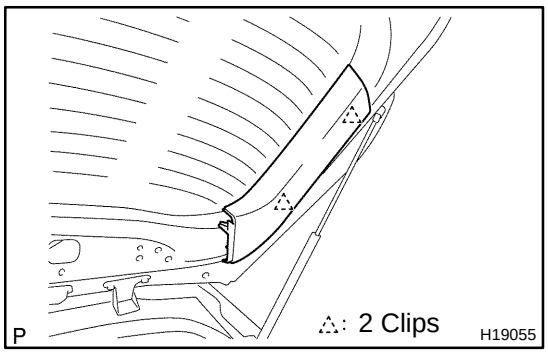
(d) Install the wiper arm cover.



3. INSTALL BACK DOOR TRIM BOARD

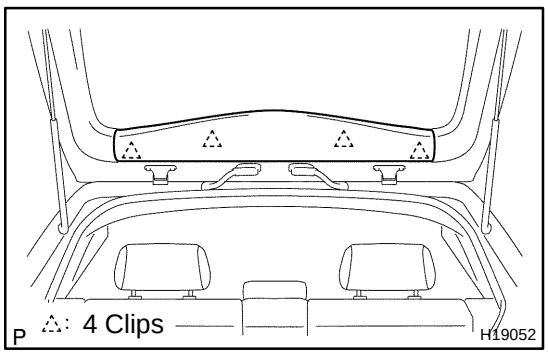
(a) Install the back door trim board to the back door panel.

(b) Install the back door handle with the clip.



4. INSTALL BACK DOOR TRIM COVERS

Install the trim covers to the body.



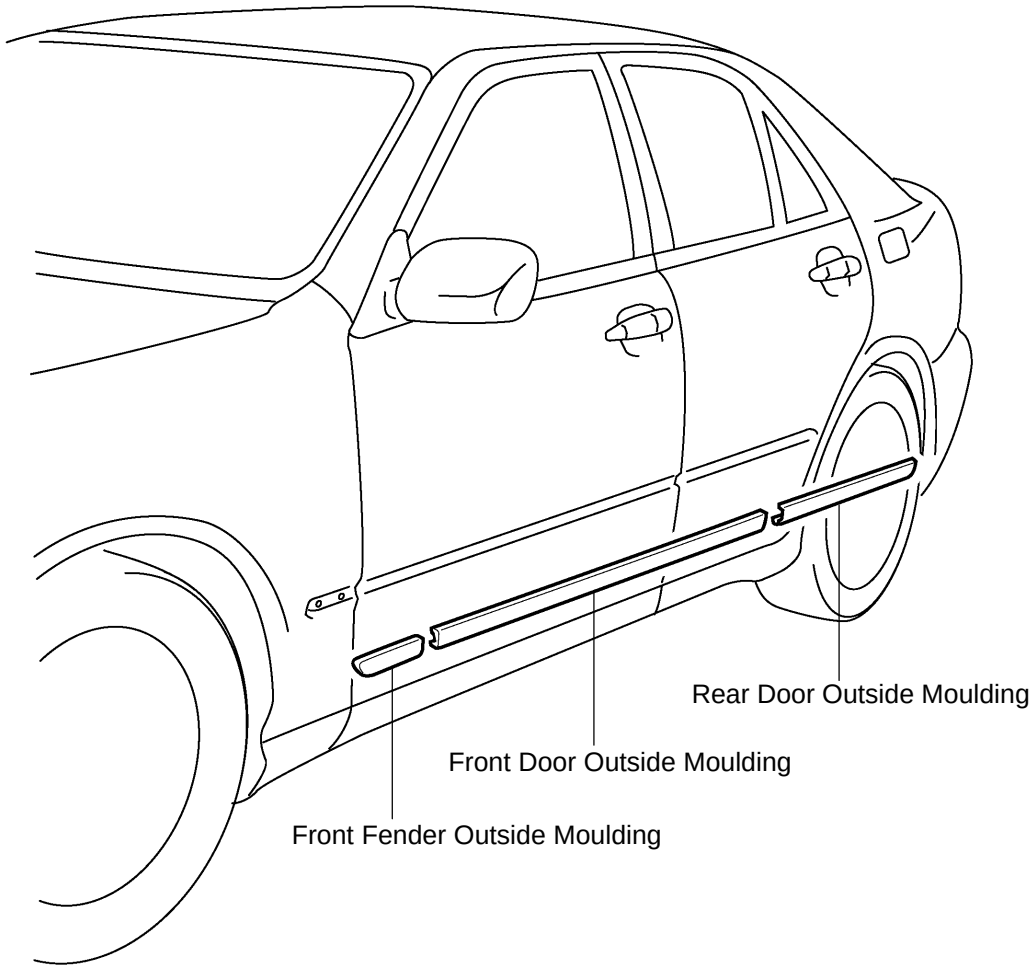
5. INSTALL BACK DOOR TRIM BOARD UPPER

Install the back door trim board upper to the body.

BODY OUTSIDE MOULDING

COMPONENTS

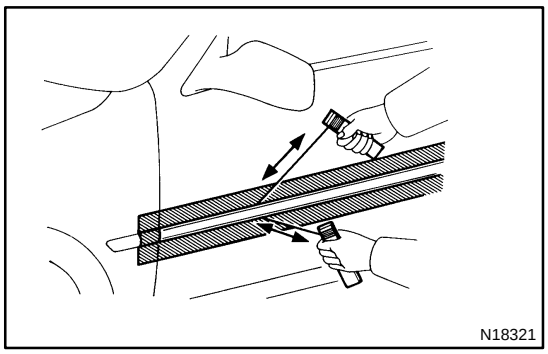
BO229-05



T

H15794

BO22A-04



REMOVAL

1. HEAT MOULDING

Using a heat light, heat the moulding to 20 - 30 ˚C (68 - 86 ˚F).

NOTICE:

Do not heat the moulding excessively.

2. REMOVE MOULDING

(a) Tie both piano wire ends to wooden blocks or similar objects.

(b) Cut the adhesive tape by pulling the piano wire as shown in the illustration.

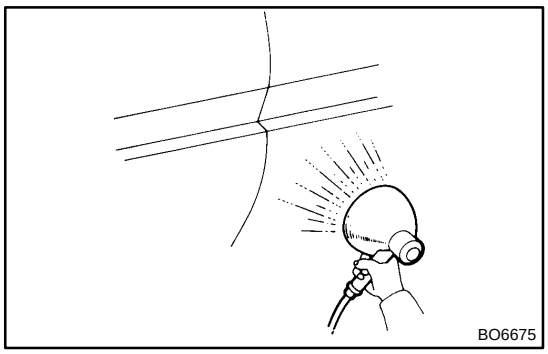
NOTICE:

- **If reusing the moulding, take care not to damage the moulding.**
- **Do not damage the body.**

(c) Remove the moulding.

BO2CK-04

INSTALLATION



1. CLEAN BODY MOUNTING SURFACE

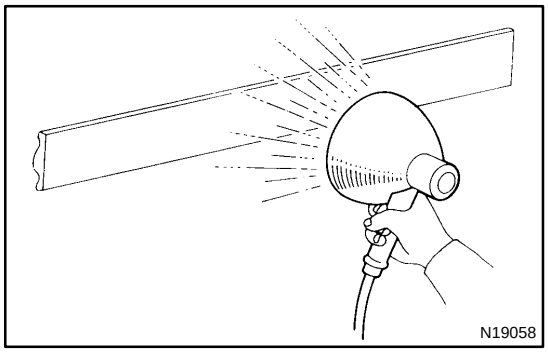
(a) Using a heat light, heat the body mounting surface to 40 - 60 ˚C (104 - 140 ˚F).

NOTICE:

Do not heat the body excessively.

(b) Remove the adhesive tape from the body.

(c) Wipe off stains with cleaner.



2. If reusing the moulding:
CLEAN MOULDING

(a) Using a heat light, heat the moulding to 20 - 30 ˚C (68 - 86 ˚F).

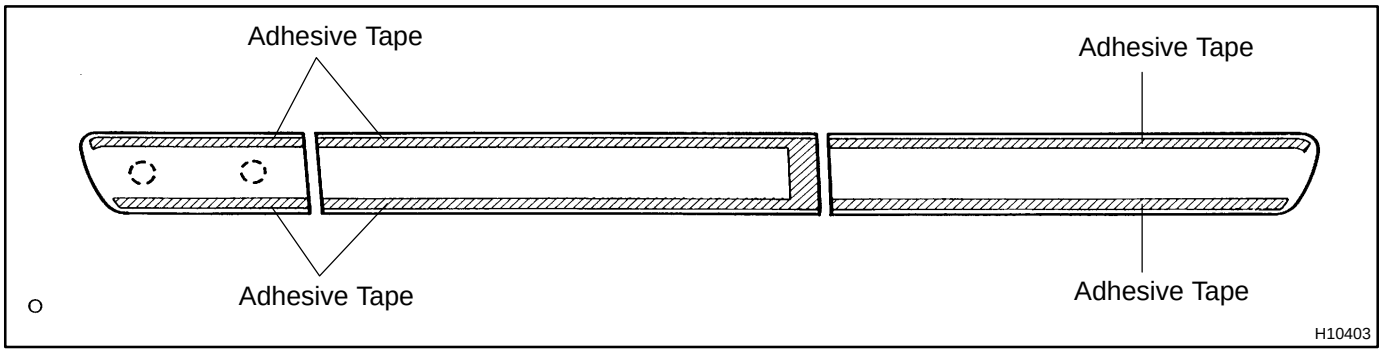
NOTICE:

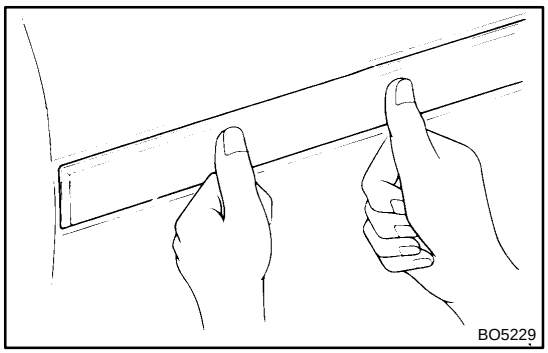
Do not heat the moulding excessively.

(b) Remove the adhesive tape from the moulding.

(c) Wipe off stains with cleaner.

(d) Apply a new adhesive tape to the moulding as shown in the illustration.





3. INSTALL MOULDING

(a) Using a heat light, heat the body and moulding.
Body: 40 - 60 ˚C (104 - 140 ˚F)
Moulding: 20 - 30 ˚C (68 - 86 ˚F)

NOTICE:

Do not heat the moulding excessively.

(b) Lift the moulding release sheet from face of the moulding.

NOTICE:

Before installing the moulding release sheet, make sure that there is no dirt or dust can get on the adhesive surface of the moulding.

(c) Front fender outside moulding:
Align the bosses with their corresponding holes in the body, and press firmly on the moulding.

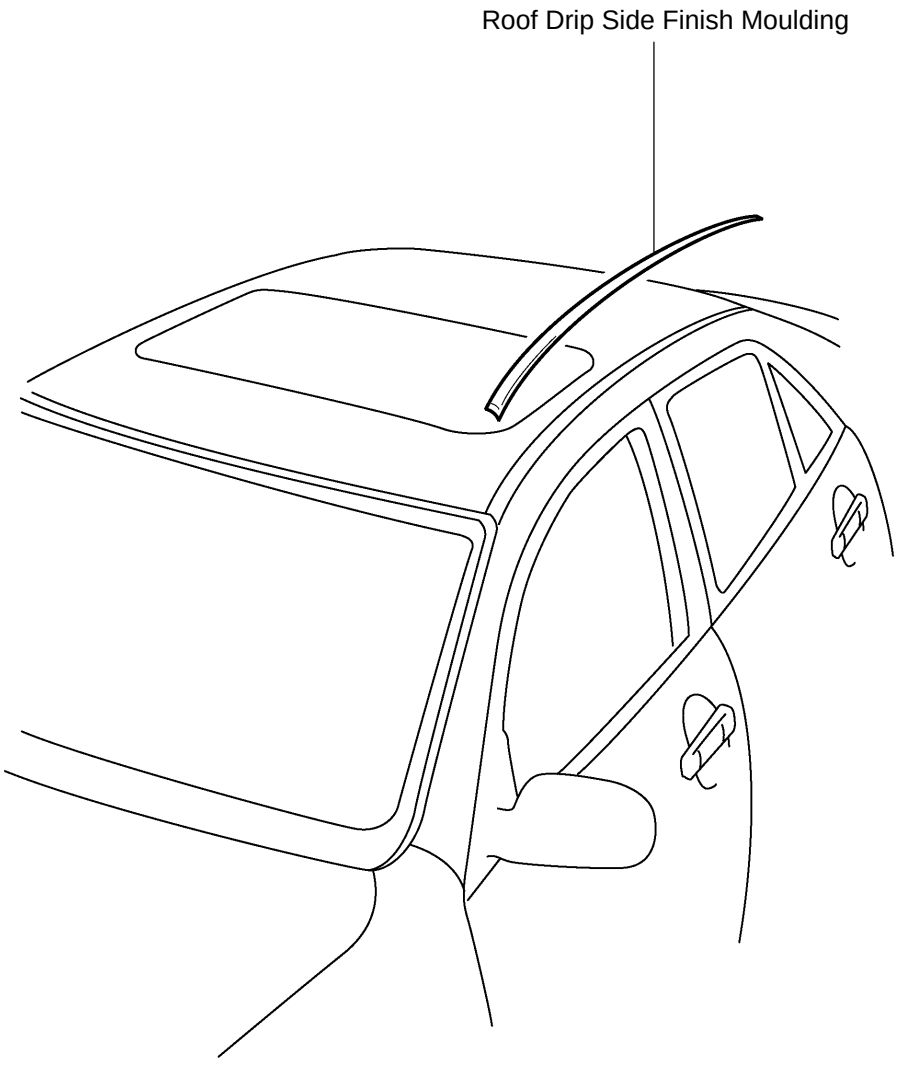
NOTICE:

Do not apply excessive force on to the moulding, but steady pressure with thumbs.

ROOF DRIP SIDE FINISH MOULDING (Sedan)

BO4DF-01

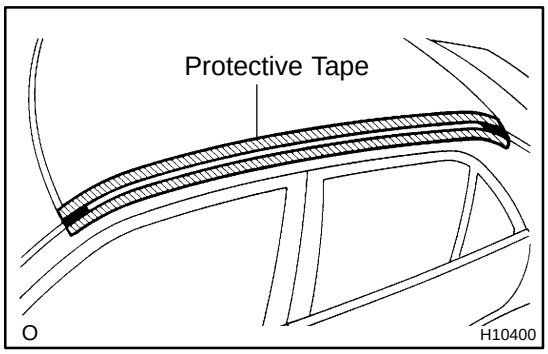
COMPONENTS



T

H10544

BO4DG-02



REMOVAL

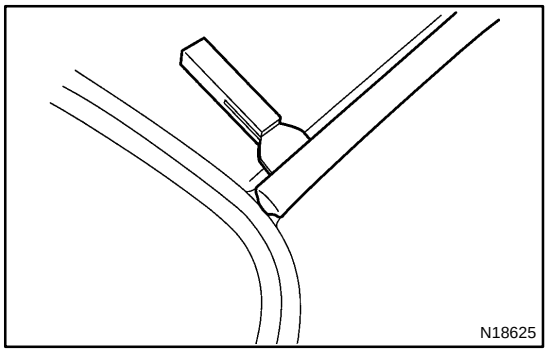
1. REMOVE ENDS OF MOULDING

(a) Apply protective tape to the outer surface as shown in the illustration to keep the surface from being scratched.

(b) Using a heat light, heat the moulding to 20 - 30 °C (68 - 86 °F).

NOTICE:

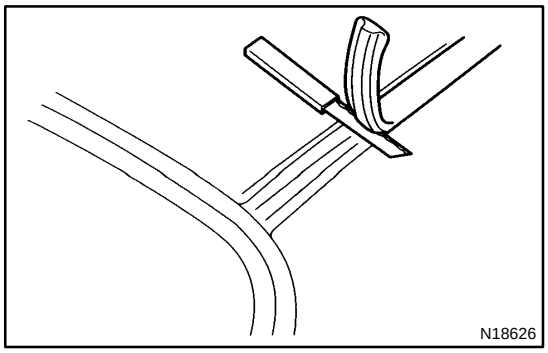
Do not heat the moulding excessively.



(c) Using a scraper, pull off the roof drip side finish moulding from the front end and rear end.

HINT:

Tape the scraper tip before use.



2. REMOVE MOULDING AND ADHESIVE

(a) Pull off the moulding by cutting the adhesive with a knife at the front and rear ends.

(b) Remove the moulding.

NOTICE:

Do not damage the body with the knife.

BO4DH-02

INSTALLATION

1. CLEAN CONTRACT SURFACE OF BODY

(a) Using a heat light, heat the moulding surface to 40 - 60 ˚C (104 - 140 ˚F).

NOTICE:

Do not heat the body excessively.

(b) Using a knife, cut away any rough areas on the body.

NOTICE:

Be careful not to damage the body.

(c) Wipe off stains with cleaner.

2. If reusing the moulding:
CLEAN MOULDING

(a) Using a heat light, heat the moulding surface to 20 - 30 ˚C (68 - 86 ˚F).

NOTICE:

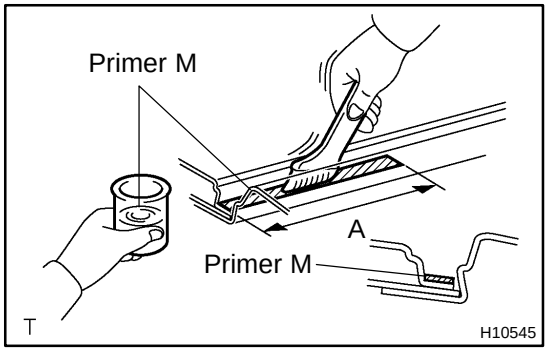
Do not heat the moulding excessively.

(b) Using a knife, cut the remaining adhesive from the moulding.

NOTICE:

Be careful not to damage the moulding.

(c) Wipe off stains with cleaner.



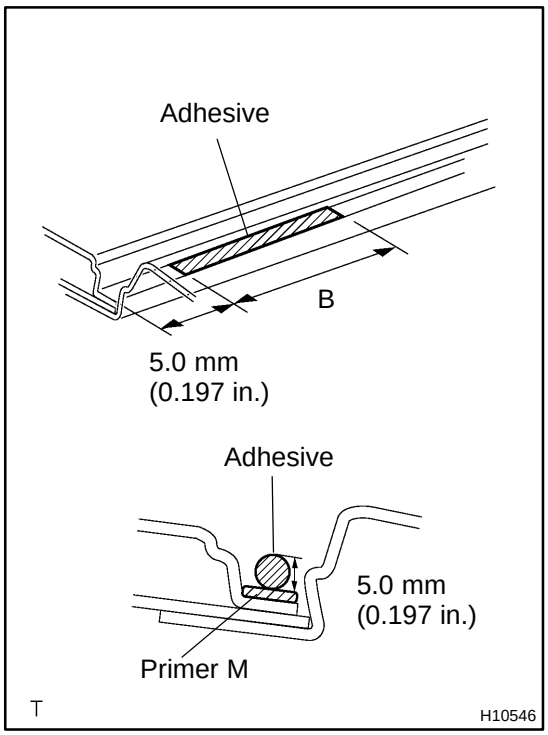
3. COAT CONTRACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat the contact surface on the body with Primer M as shown in the illustration.

Front end:
A: 40 mm (1.57 in.)
Rear end:
A: 35 mm (1.38 in.)

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not coat the adhesive.**
- **Do not keep any of the opened Primer M for later use.**



4. APPLY ADHESIVE

(a) Cut off the tip of the cartridge nozzle.

Part No. 08850-00801 or equivalent

HINT:

After cutting off the tip, finish off adhesive within the time described in the chart below.

Temperature	Tackfree time
35 ˚C (95 ˚F)	15 minutes
20 ˚C (68 ˚F)	100 minutes
5 ˚C (41 ˚F)	8 hours

(b) Load the cartridge into the sealer gun.

(c) Apply adhesive to the hatched area in the illustration for both front and rear of the vehicle.

Front end:

B: 30 mm (1.18 in.)

Rear end:

B: 25 mm (0.98 in.)

HINT:

When removing the moulding, apply adhesive throughly to the part where the body sealer is removed.

5. INSTALL MOULDING

Push the moulding to the body.

NOTICE:

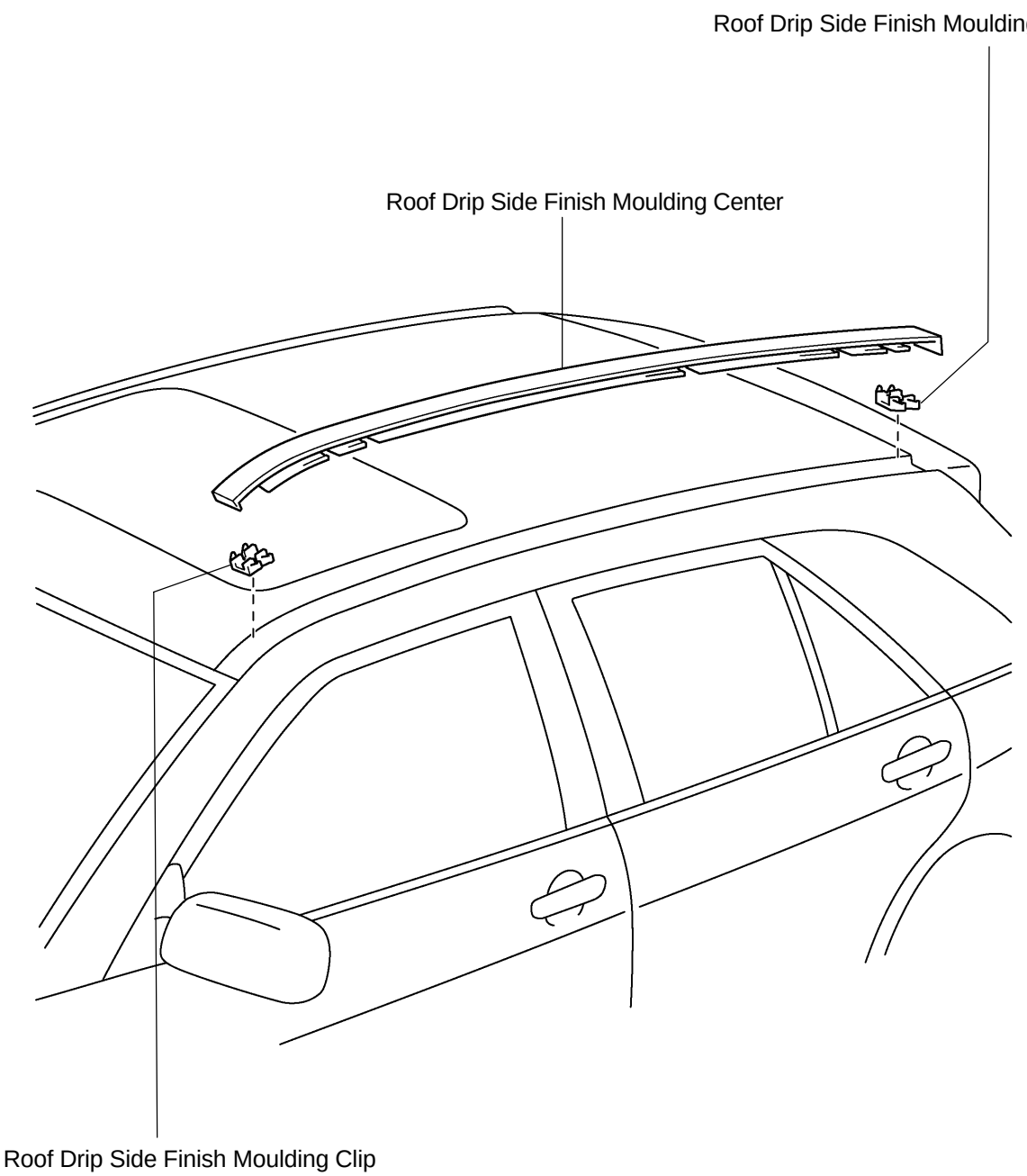
- **Make sure that the body and moulding are heated to the proper temperature.**
- **Do not depress the adhesive coated parts excessively but just hold them down with your thumb.**
- **Scrape off any overflowing adhesive with a plastic spatula and clean the surface with a dry rag.**
- **Take care not to drive the vehicle during the time described in the chart below.**

Temperature	Minimum time prior to driving the vehicle
35 ˚C (95 ˚F)	1.5 hours
20 ˚C (68 ˚F)	5 hours
5 ˚C (41 ˚F)	24 hours

ROOF DRIP SIDE FINISH CENTER MOULDING (Wagon)

BO4DI-01

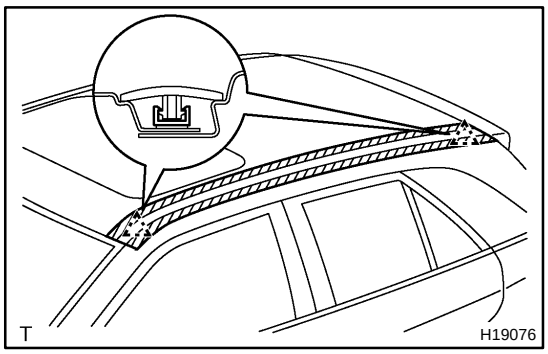
COMPONENTS



T

H19075

BO4DJ-02



REMOVAL

REMOVE ROOF DRIP SIDE FINISH MOULDING CENTER

(a) Tape around the moulding for protection.

(b) Using a remover for the roof moulding, release both clip engagements in the front end and the rear ends of the moulding, and then remove the roof drip side finish moulding.

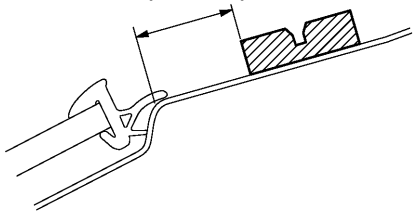
NOTICE:

- **Do not remove the clips.**
- **In case that the clips are damaged or removed accidentally, replace them with new ones.**

BO4DK-02

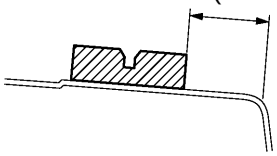
Front side

17 mm (0.67 in.)



Rear side

13 mm (0.51 in.)



T H19077

INSTALLATION

1. INSTALL ROOF DRIP SIDE FINISH MOULDING CLIP

NOTICE:

Only when exchanging the clips.

(a) Remove the adhesive tape that remains on the moulding surface of the body, and then clean the surface with white gasoline.

(b) Heat up the moulding and its installation surfaces on the body with a heat light.

Body: 40 - 60˚C (104 - 140˚F)

Moulding: 20 - 30˚C (68 - 86˚F)

NOTICE:

Do not heat the moulding excessively.

(c) Set the supplied clips into the positions as shown in the illustration, and press-fit those clips by hand to install them.

(d) The installation of the moulding should be carried out 30 minutes or more after press-fitting the clips.

HINT:

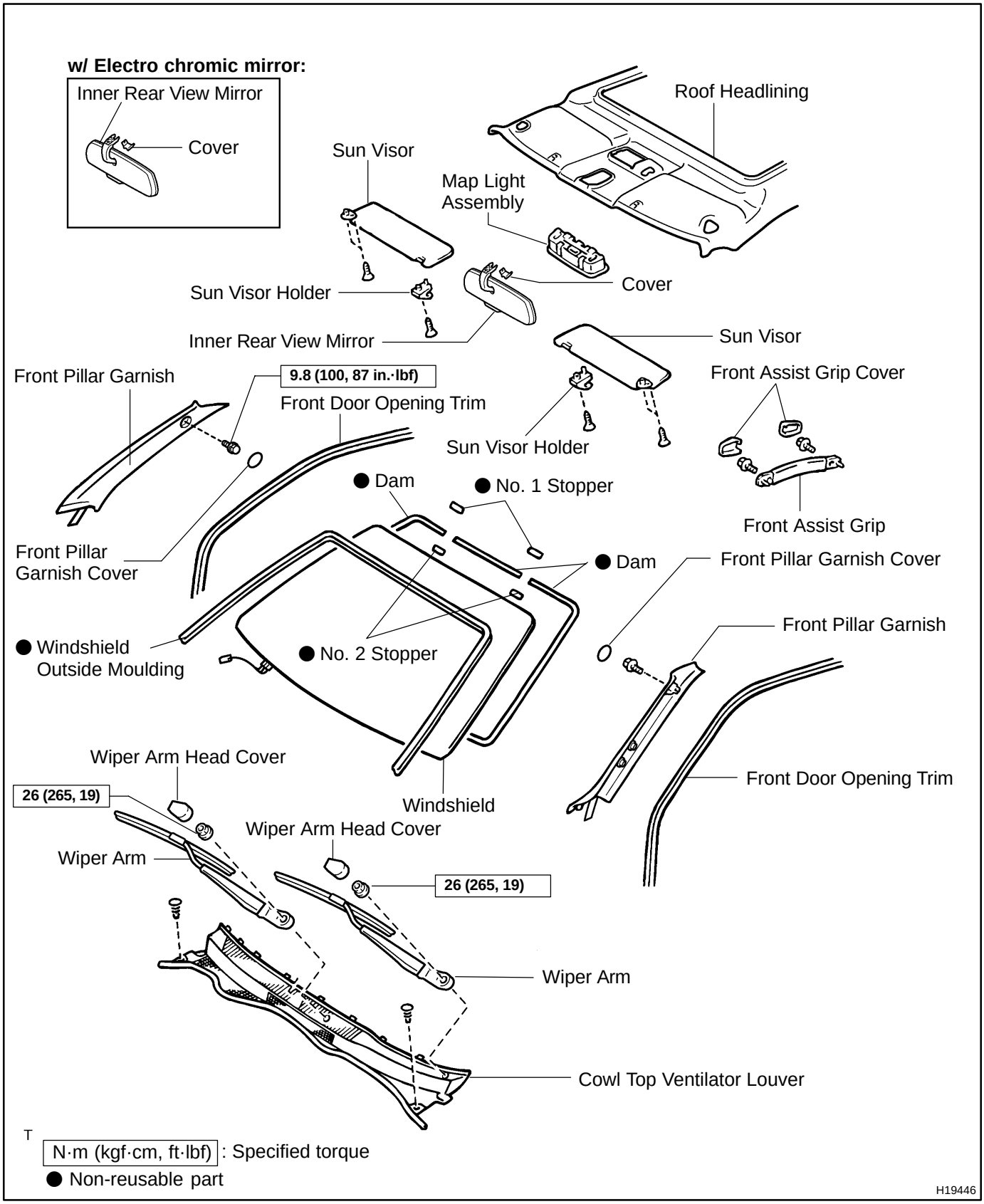
- Initial hardening time: 30 minutes
- Perfect hardening time: 24 hours

2. INSTALL MOULDING

WINDSHIELD

COMPONENTS

BO22F-08



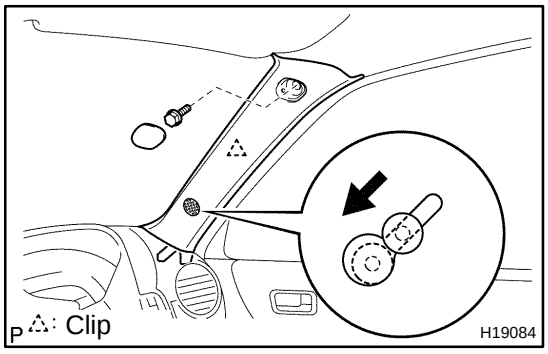
BO4DL-03

REMOVAL

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. REMOVE FRONT PART OF FRONT DOOR OPENING TRIMS



2. REMOVE FRONT PILLAR GARNISH

(a) Using a screwdriver, remove the front pillar garnish cover.

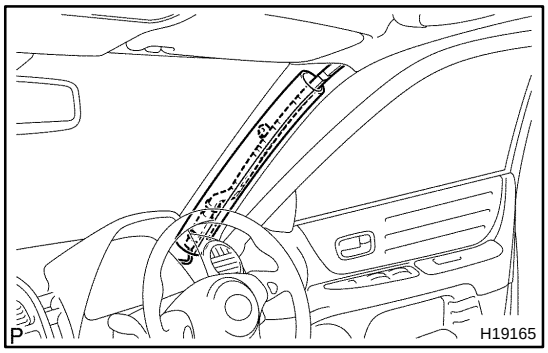
HINT:

Tape the screwdriver tip before use.

(b) Remove the bolt.

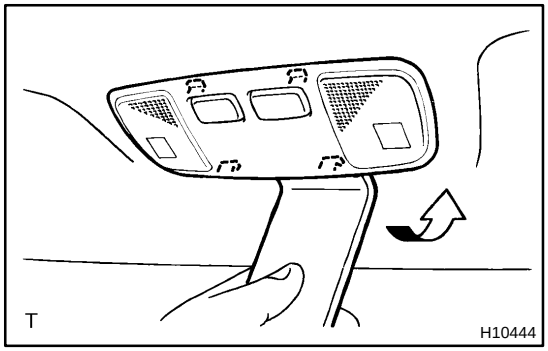
(c) Using a screwdriver, remove the front pillar garnish.

(d) Remove the bolt.



(e) Pack the airbag with protection cover.

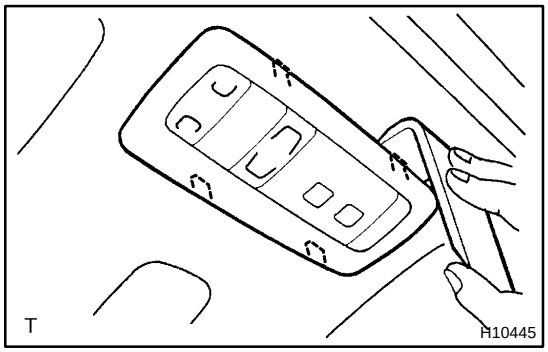
(f) Employ the same manner described above to the other side.



3. w/o Sliding roof:
REMOVE MAP LIGHT ASSEMBLY

(a) Using a moulding remover, remove the lens.

(b) Remove the 2 screws and the map light assembly, then disconnect the connectors.



4. w/ Sliding roof:
REMOVE MAP LIGHT ASSEMBLY

(a) Using a moulding remover, remove the cover.

(b) Remove the 2 screws and the map light assembly.

(c) Disconnect the connectors.

5. REMOVE SUN VISORS

(a) Remove the 2 screws and sun visor, then disconnect the connector.

(b) Employ the same manner described above to the other side.

6. REMOVE SUN VISOR HOLDERS

Remove the 2 screws and sun visor holders.

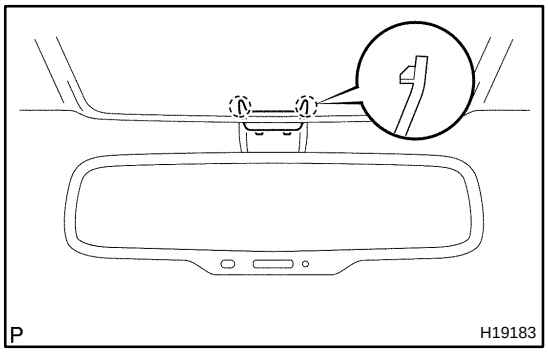
7. REMOVE FRONT ASSIST GRIP

(a) Using a screwdriver, remove the front assist grip covers.

HINT:

Tape the screwdriver tip before use.

(b) Remove the 2 bolts and assist grip.

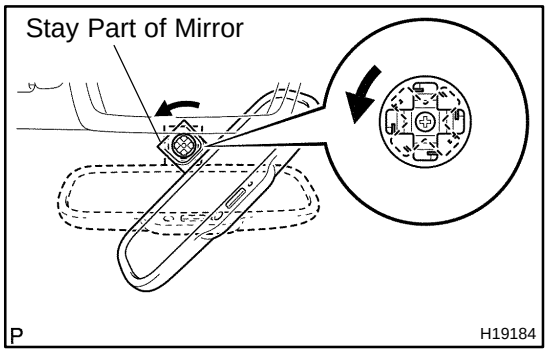


8. REMOVE INNER REAR VIEW MIRROR

(a) Using a screwdriver, remove the inner rear view mirror stay holder cover.

HINT:

Tape the screwdriver tip before use.



(b) w/ electro chromic inner mirror:
Disconnect the connector.

(c) Remove the mirror assembly by turning the stay part of the mirror counterclockwise.

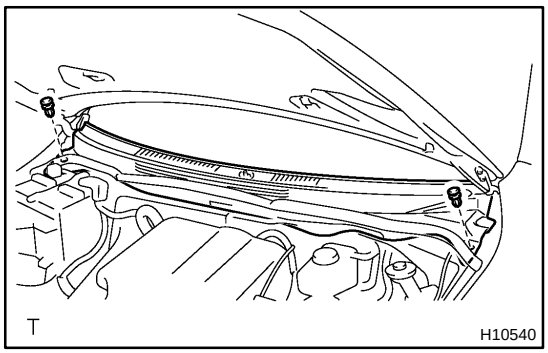
9. REMOVE WIPER ARMS

(a) Using a screwdriver, remove the 2 wiper arm head covers.

HINT:

Tape the screwdriver tip before use.

(b) Remove the 2 nuts and 2 wiper arms.

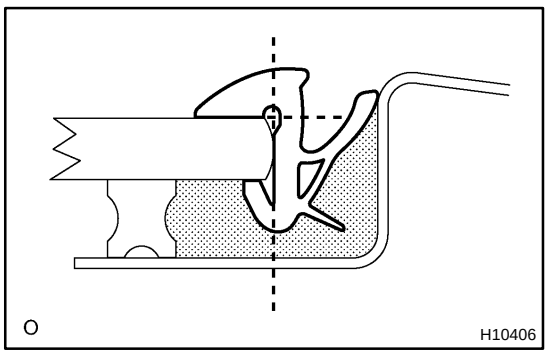


10. REMOVE COWL TOP VENTILATOR LOUVER

(a) Remove the hood to cowl top seal.

(b) Remove the 2 clips and cowl top ventilator louver.

11. PULL DOWN FRONT PART OF ROOF HEADLINING



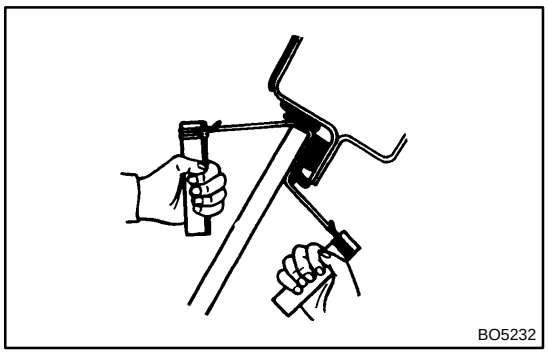
12. REMOVE WINDSHIELD OUTSIDE MOULDING

(a) Using a knife, cut off the moulding as shown in the illustration.

NOTICE:

Do not damage the body with the knife.

(b) Remove the remaining moulding.



13. REMOVE WINDSHIELD GLASS

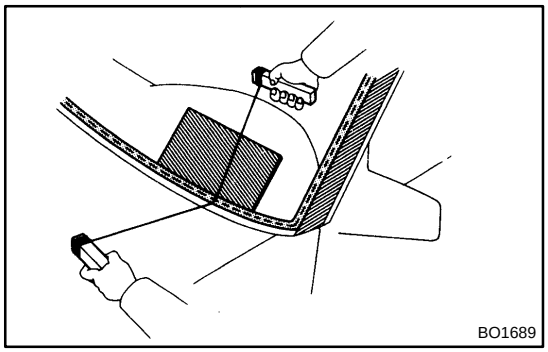
(a) Push piano wire through between the body and glass from the interior.

(b) Tie both wire ends to wooden blocks or similar objects.

(c) w/ Front window defogger:
Disconnect the connector.

NOTICE:

Be careful not to damage the wire harness.



(d) Cut the adhesive by pulling the piano wire around it.

NOTICE:

When separating the glass, take care not to damage the paint and exterior ornaments. To prevent scratching the safety pad when removing the windshield, place a plastic sheet between the piano wire and safety pad.

HINT:

Apply protective tape to the outer surface to keep the surface from being scratched.

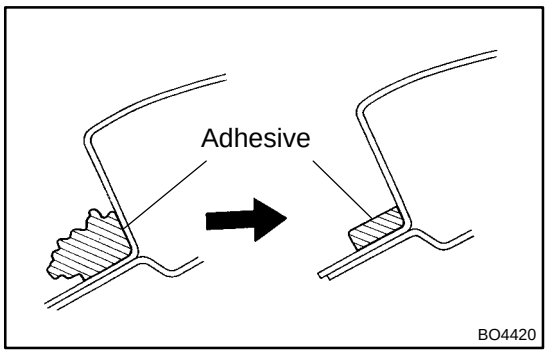
(e) Remove the glass.

NOTICE:

Leave as much of the adhesive on the body as possible when cutting off the glass.

BO2CP-04

INSTALLATION



1. CLEAN AND SHAPE CONTACT SURFACE OF BODY

(a) Using a knife, cut away any rough areas on the body.

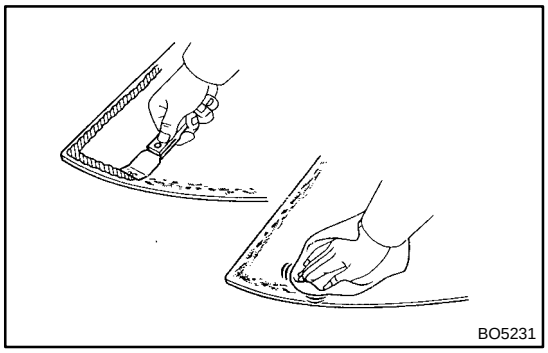
HINT:

Leave as much of the adhesive on the body as possible.

(b) Clean the cutting surface of the adhesive with a piece of shop rag soaked with cleaner.

HINT:

Even if all the adhesive has been removed with knife, clean the body with the shop rag.



2. CLEAN REMOVED GLASS

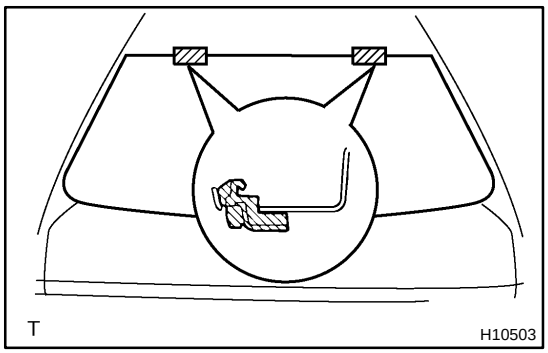
(a) Remove the damaged No. 2 stoppers and dams.

(b) Using a scraper, remove the adhesive sticking to the glass.

(c) Clean the glass with cleaner.

NOTICE:

- **Be careful not to damage the glass.**
- **Do not touch the glass face after cleaning it.**



3. REPLACE NO. 1 STOPPERS

(a) Remove the damaged stoppers.

(b) Cut off the old adhesive around the stoppers installation area.

NOTICE:

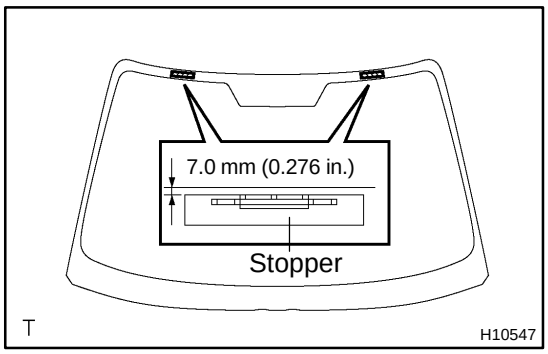
Be careful not to damage the body.

(c) Clean the installation area.

(d) Attach new stoppers to the body with the notches on the body aligned with the stoppers as shown in the illustration.

HINT:

Make sure that the stoppers are installed in the correct direction.

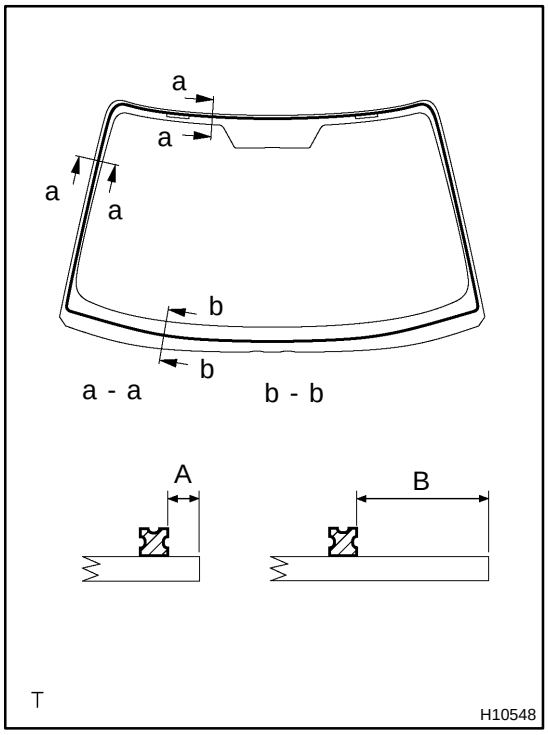


4. INSTALL NEW NO. 2 STOPPERS

Attach new stoppers to the glass with the ceramic notches on the glass aligned with the stoppers as shown in the illustration.

HINT:

Make sure that the stoppers are installed in the correct direction.

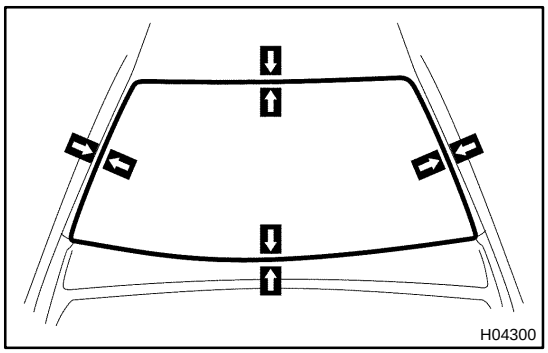


5. INSTALL NEW DAMS

Install new dams with double-stick tape as shown in the illustration.

A: 7.0 mm (0.276 in.)

B: 35.9 mm (1.413 in.)



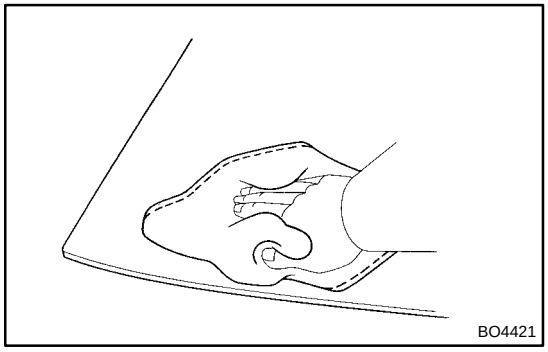
6. POSITION GLASS

(a) Place the glass in the correct position.

(b) Check that all contacting parts of the glass rim are perfectly even.

(c) Place reference marks between the glass and body.

(d) Remove the glass.

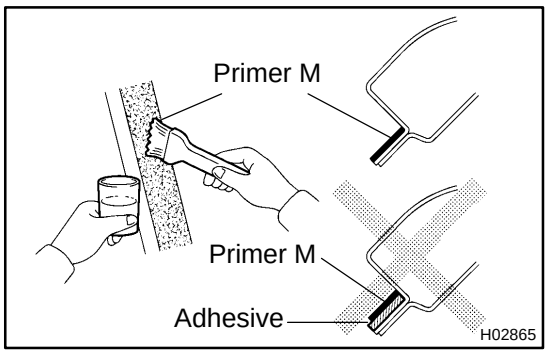


7. CLEAN CONTACT SURFACE OF GLASS

Using a cleaner, clean the contact surface which is black-colored area around the entire glass rim.

NOTICE:

Do not touch the glass face after cleaning it.

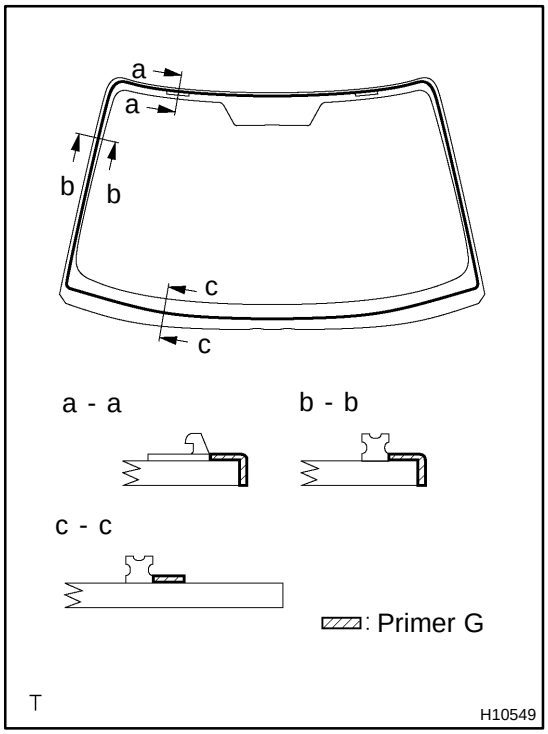


8. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat Primer M to the exposed part of body on the vehicle side.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not coat Primer M to the adhesive.**
- **Do not keep any of the opened Primer M for later use.**



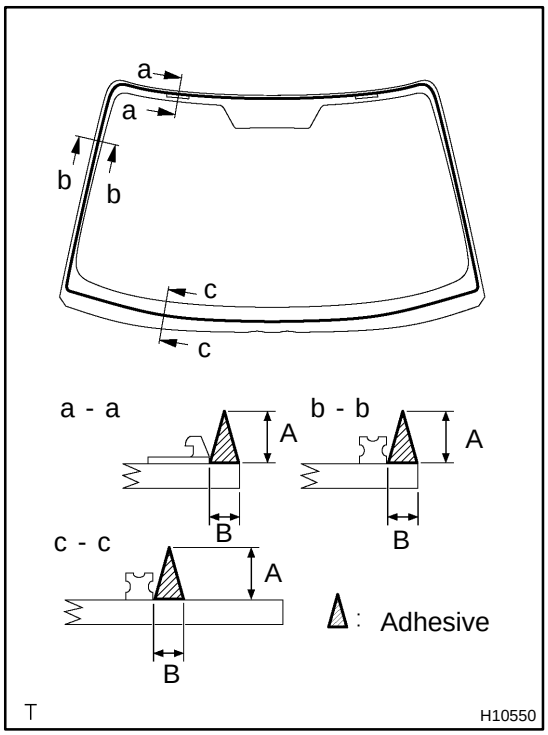
9. COAT CONTACT SURFACE OF GLASS WITH PRIMER "G"

(a) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G as shown in the illustration.

(b) When the primer is coated wrongly to the area other than the specified by accident, wipe it off with a clean shop rag before the primer dries.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not keep any of the opened Primer G for later use.**



10. APPLY ADHESIVE

(a) Cut off the tip of the cartridge nozzle.
Part No. 08850-00801 or equivalent

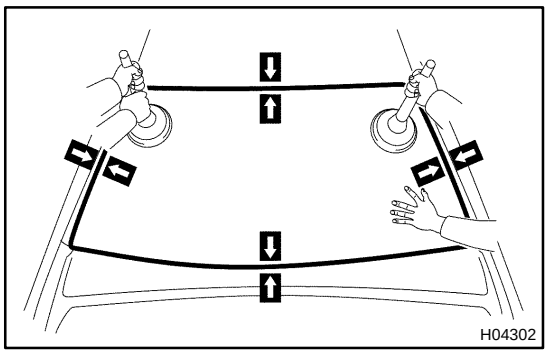
HINT:

After cutting off the tip, finish off the adhesive within the time described in the table below.

Temperature	Tackfree time
35˚C (95˚F)	15 minutes
20˚C (68˚F)	100 minutes
5˚C (41˚F)	8 hours

(b) Load the cartridge into the sealer gun.

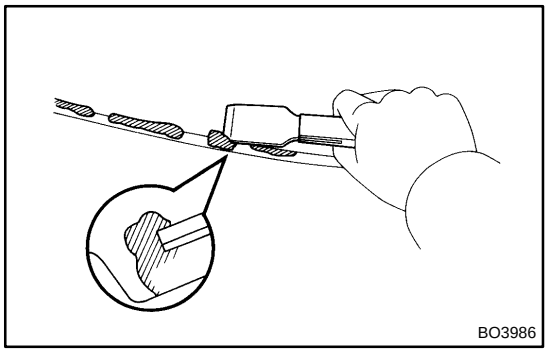
(c) Coat the glass with adhesive as shown in the illustration.
A: 12.5 mm (0.492 in.)
B: 8.0 mm (0.315 in.)



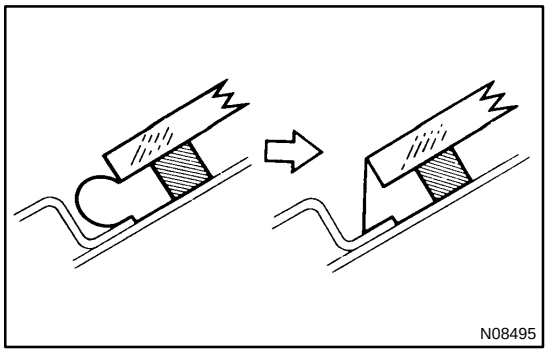
11. INSTALL GLASS

(a) Position the glass so that the reference marks are lined up, and press in gently along the rim.

(b) Using a spatula, apply adhesive on the glass rim.



(c) Use a scraper to remove any excess or protruding adhesive.



HINT:

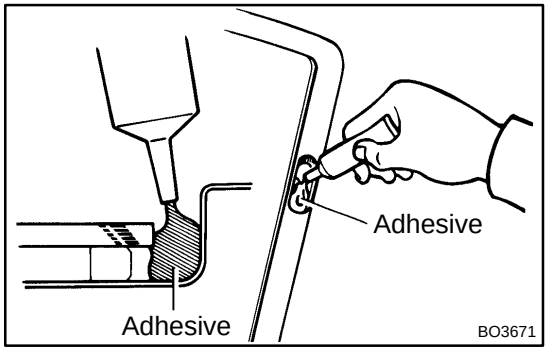
Confirm that the dam is attached to the body panel as shown in the illustration.

(d) Hold the windshield glass in place securely with a protective tape or equivalent until the adhesive hardens.

NOTICE:

Take care not to drive the vehicle during the time described in the table below.

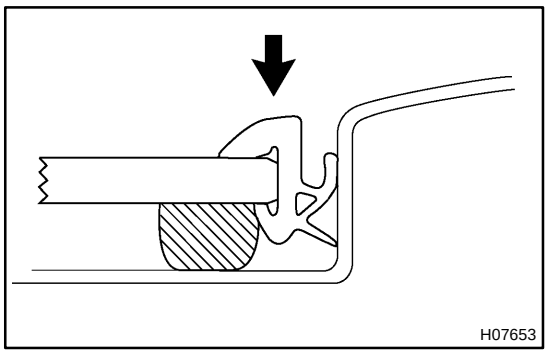
Temperature	Minimum time prior to driving the vehicle
35˚C (95˚F)	1.5 hours
20˚C (68˚F)	5 hours
5˚C (41˚F)	24 hours



12. APPLY ADHESIVE TO MOULDING INSTALLATION AREA

Apply adhesive to the moulding installation area between the glass and the body.

Part No. 08833-00030 or equivalent



13. INSTALL WINDSHIELD OUTSIDE MOULDING

Place new moulding onto the body and tap it by hand.

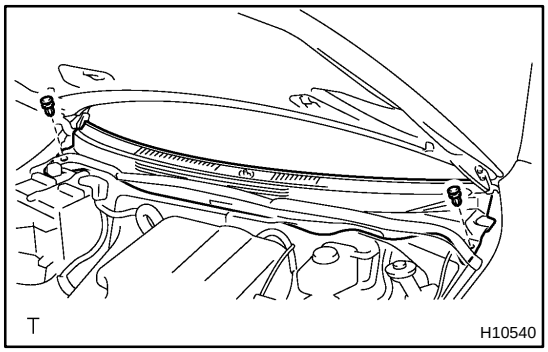
14. INSPECT FOR LEAK AND REPAIR

(a) Conduct a leak test after the hardening time has elapsed.

(b) Seal any leak with sealant.

Part No. 08833-00030 or equivalent

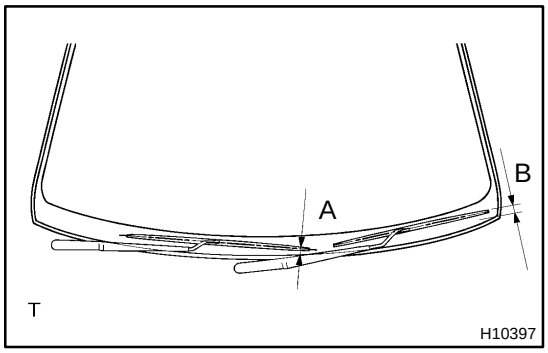
15. INSTALL FRONT PART OF ROOF HEADLINING



16. INSTALL COWL LOUVER

(a) Install the cowl louver with the 2 clips.

(b) Install the hood to cowl top seal.



17. INSTALL WIPER ARMS

(a) Operate the wipers once and turn the wiper switch OFF.

(b) Install the wiper arms and tighten the nuts by hand.

(c) Adjust the installation positions of the wiper arms to the positions as shown in the illustration.

A: 20.0 mm (0.787 in.)

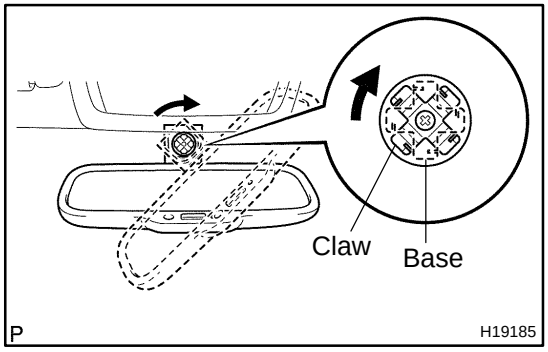
B (Europe models): 25.0 mm (0.984 in.)

B (Australia models): 28.0 mm (1.102 in.)

(d) Install the 2 wiper arms with the 2 nuts.

Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)

(e) Install the 2 wiper arm head covers.



18. REMOVE ELECTRO CHROMIC INNER MIRROR

(a) Match the claw part of the mirror with a cut part of the base.

(b) Turn the stay part of the mirror clockwise so that the stay comes to the original position, and then install the mirror assembly.

(c) w/ Electro chromic inner mirror:
Connect the inner rear view mirror connector.

19. INSTALL FRONT ASSIST GRIP

(a) Install the assist grip with the 2 screws.

(b) Install the caps.

20. INSTALL SUN VISOR HOLDERS

Install the sun visor holders with the 2 screws.

21. INSTALL SUN VISORS

Connect the connectors, then install the sun visors with the 4 screws.

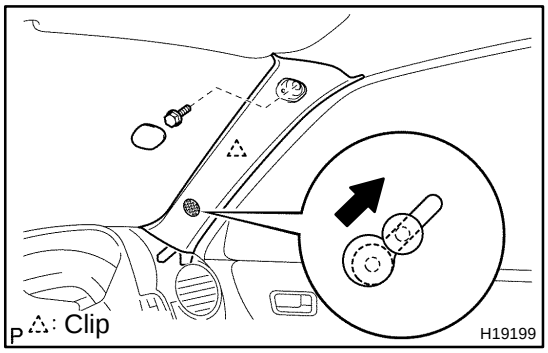
22. INSTALL MAP LIGHT ASSEMBLY

(a) Connect the connectors.

(b) Install the map light assembly with the 2 screws.

(c) w/o Sliding roof:
Install the lens.

(d) w/ Sliding roof:
Install the cover.



23. INSTALL FRONT PILLAR GARNISH

(a) Remove the protection cover.

(b) Install the bolt.
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)

(c) Install the front pillar garnish to the body.

(d) Install the bolt.

(e) Install the front pillar garnish cover.

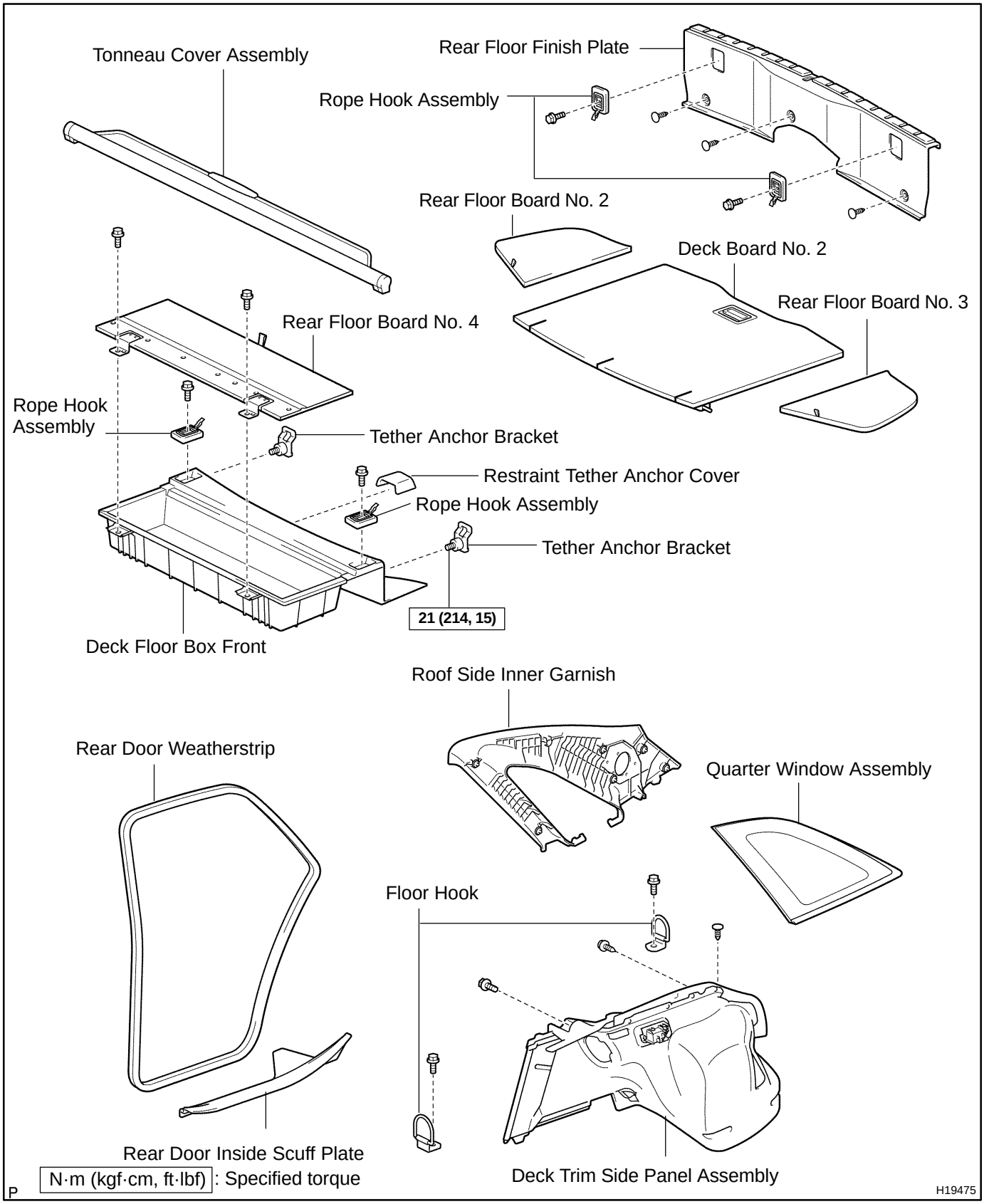
(f) Employ the same manner described above to the other side.

24. INSTALL FRONT PART OF FRONT DOOR OPENING TRIMS

QUARTER WINDOW GLASS

BO4DM-02

COMPONENTS



BO4DN-03

REMOVAL

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. REMOVE REAR SEAT CUSHION (See page BO-204)

2. REMOVE SIDE SEATBACK ASSEMBLY (See page BO-204)

3. REMOVE REAR SEAT FLOOR BOARD NO. 4

(a) Remove the seat back board carpets.

(b) Remove the 2 bolts and rear floor board.

4. REMOVE DECK FLOOR BOX FRONT

(a) Remove the 2 bolts and the 2 rope hook assemblies.

(b) Remove the 2 bolts and 2 tether anchor brackets.

(c) Remove the restraint seat tether anchor cover.

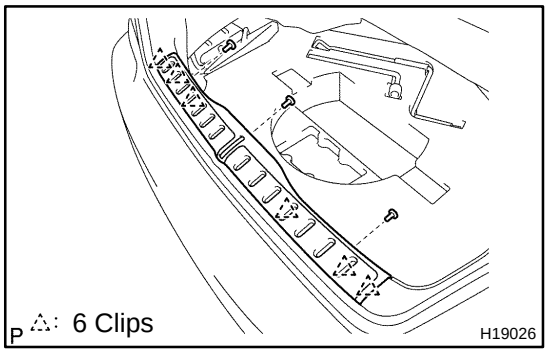
(d) Remove the deck floor box front.

5. REMOVE DECK BOARD NO. 2

6. REMOVE REAR FLOOR BOARD NO. 2

7. REMOVE REAR FLOOR BOARD NO. 3

8. REMOVE TONNEAU COVER ASSEMBLY



9. REMOVE REAR FLOOR FINISH PLATE

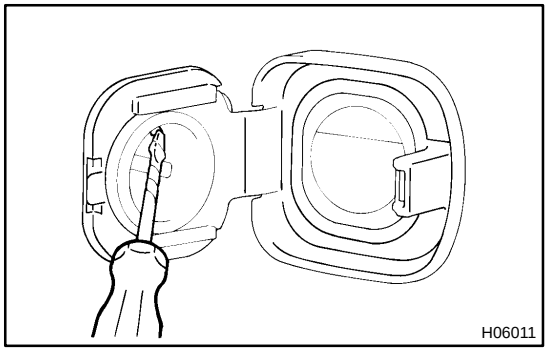
(a) Remove the 2 bolts and the 2 rope hook assemblies.

(b) Remove the 3 clips.

(c) Using a screwdriver, remove the rear floor finish plate.

HINT:

Tape the screwdriver tip before use.

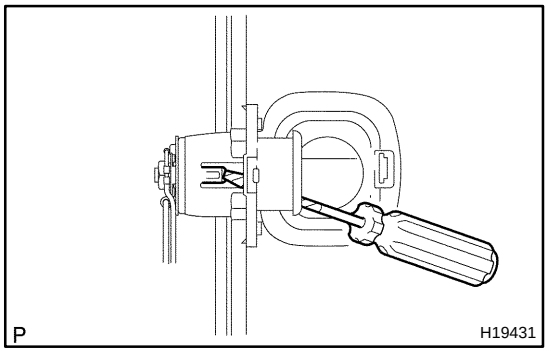


10. RH side:
REMOVE ACCESSORY SOCKET

(a) Using a screwdriver, disengage the claw on the accessory socket cover from the hole in the accessory socket, then pull out the accessory socket approx. 15 mm (0.59 in.).

HINT:

Tape the screwdriver tip before use.



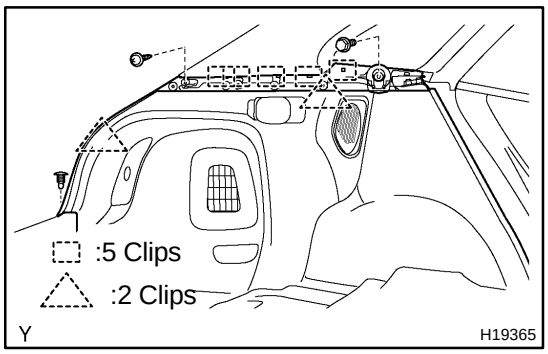
(b) Using a screwdriver, disengage the claw on the accessory socket cover from the body and remove the accessory socket and cover as a unit.

HINT:

Tape the screwdriver tip before use.

(c) Disconnect the connector.

(d) Disassemble the accessory socket from the socket cover.



11. REMOVE DECK TRIM SIDE PANEL ASSEMBLY

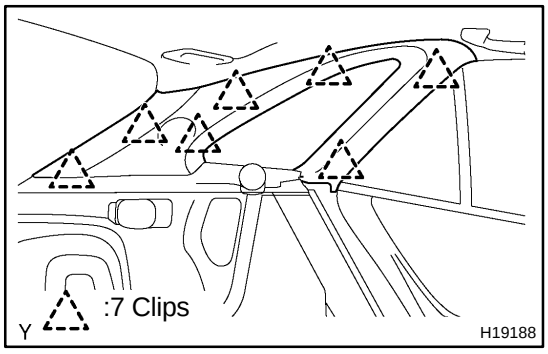
(a) Remove the 2 bolts and 2 floor hooks.

(b) Remove the screw, bolt and clip.

(c) Using a screwdriver, remove the deck trim side panel assembly, then disconnect the connector.

HINT:

Tape the screwdriver tip before use.



12. REMOVE ROOF SIDE INNER GARNISH

Using a screwdriver, remove the roof side inner garnish.

HINT:

Tape the screwdriver tip before use.

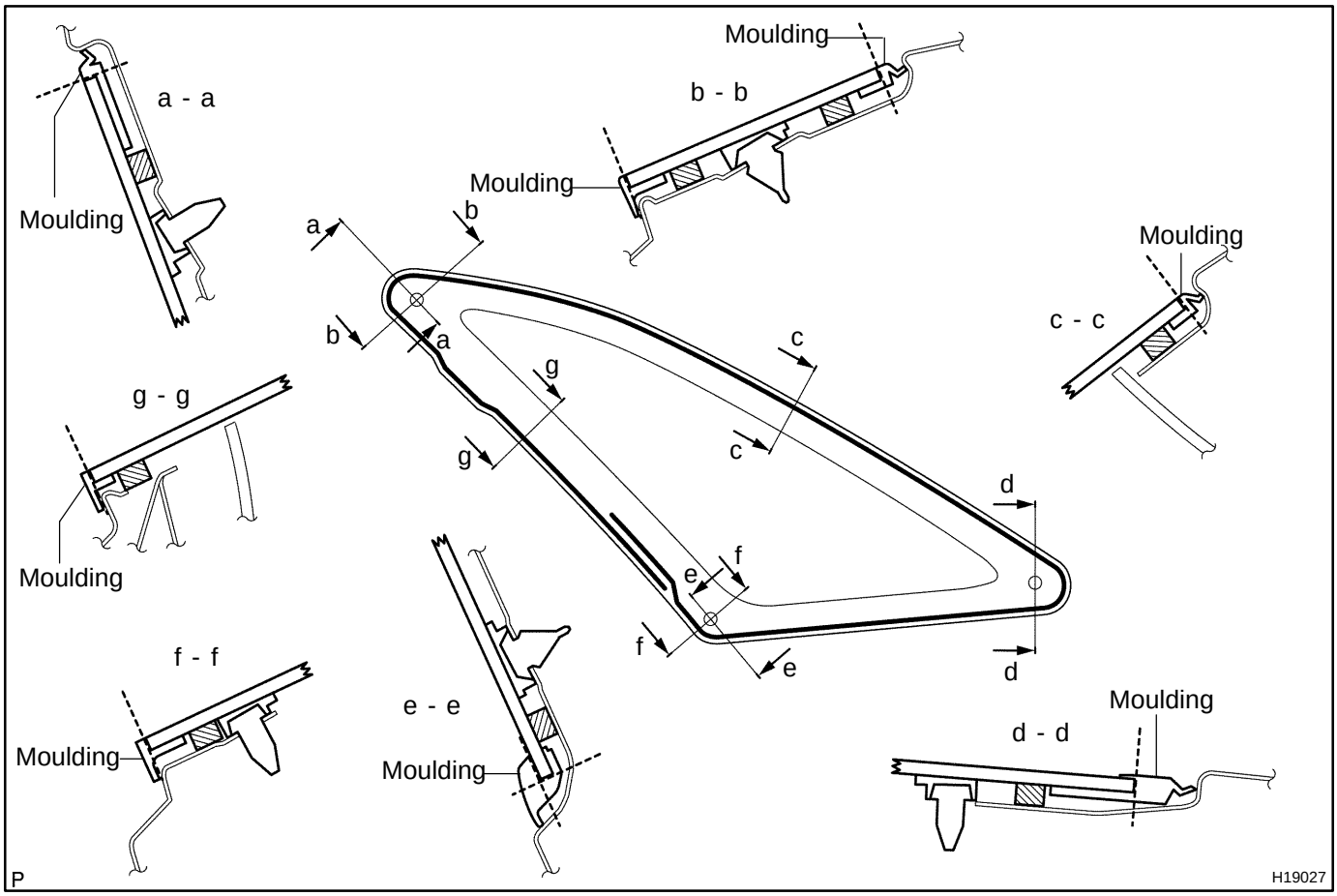
13. REMOVE QUARTER WINDOW GLASS

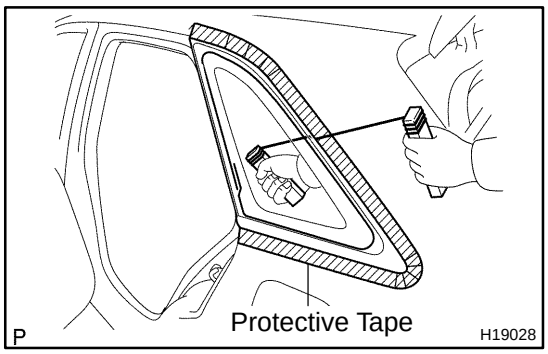
(a) Using a knife, cut off the moulding as shown in the illustration.

NOTICE:

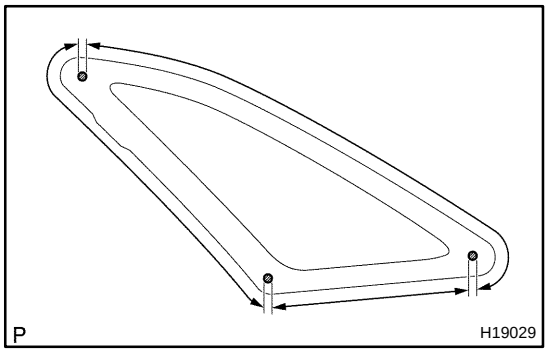
Do not damage the body with a knife.

(b) Disconnect the connector.

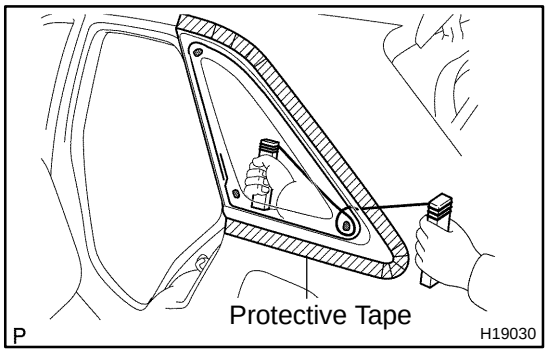




(c) Push a piano wire through from the interior.
(d) Tie both wire ends to wooden blocks or similar object.
HINT:
Apply protective tape to the outer surface to keep the surface from being scratched.
NOTICE:
When separating the glass, take care not to damage the paint and exterior.



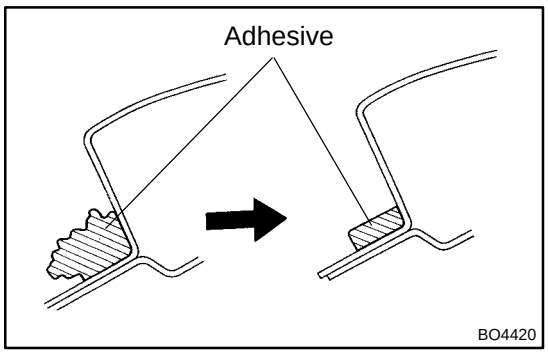
(e) Cut the adhesive by pulling the piano wire around it.
HINT:
Cut the adhesive areas as shown in the illustration, leaving the adhesive where the clips are.



(f) Push the piano wire through as shown in the illustration, and cut off the adhered part to the clips.
(g) Remove the glass.
NOTICE:
Leave as much of the adhesive on the body as possible when cutting off the glass.

BO4DO-02

INSTALLATION



1. CLEAN AND SHAPE CONTACT SURFACE OF BODY PANEL

(a) Using a knife, cut away any rough areas on the body.

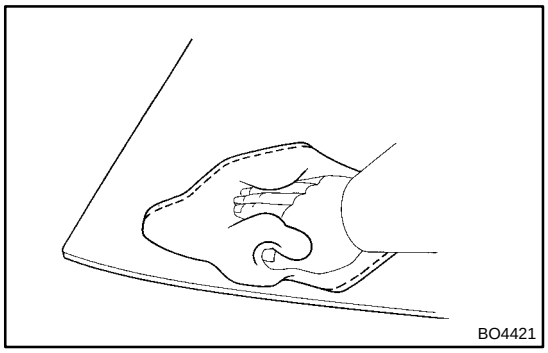
HINT:

Leave as much of the adhesive on the body as possible.

(b) Clean the cutting surface of the adhesive with a piece of shop rag soaked with cleaner.

HINT:

Even if all the adhesive has been removed with a knife, clean the body with the shop rag.

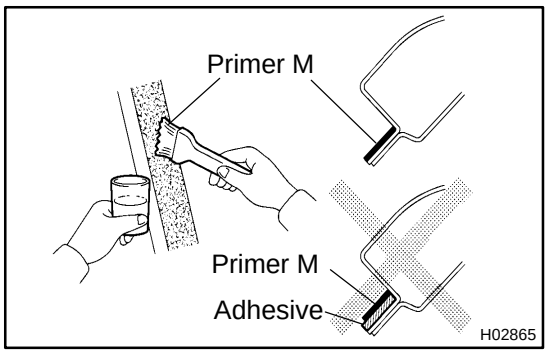


2. CLEAN CONTACT SURFACE OF GLASS

Using a cleaner, clean the contact surface which is black-colored area around the entire glass rim.

NOTICE:

Do not touch the glass face after cleaning it.



3. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat Primer M to the exposed part of body on the vehicle side.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not coat Primer M to the adhesive.**
- **Do not keep any of the opened Primer M for later use.**

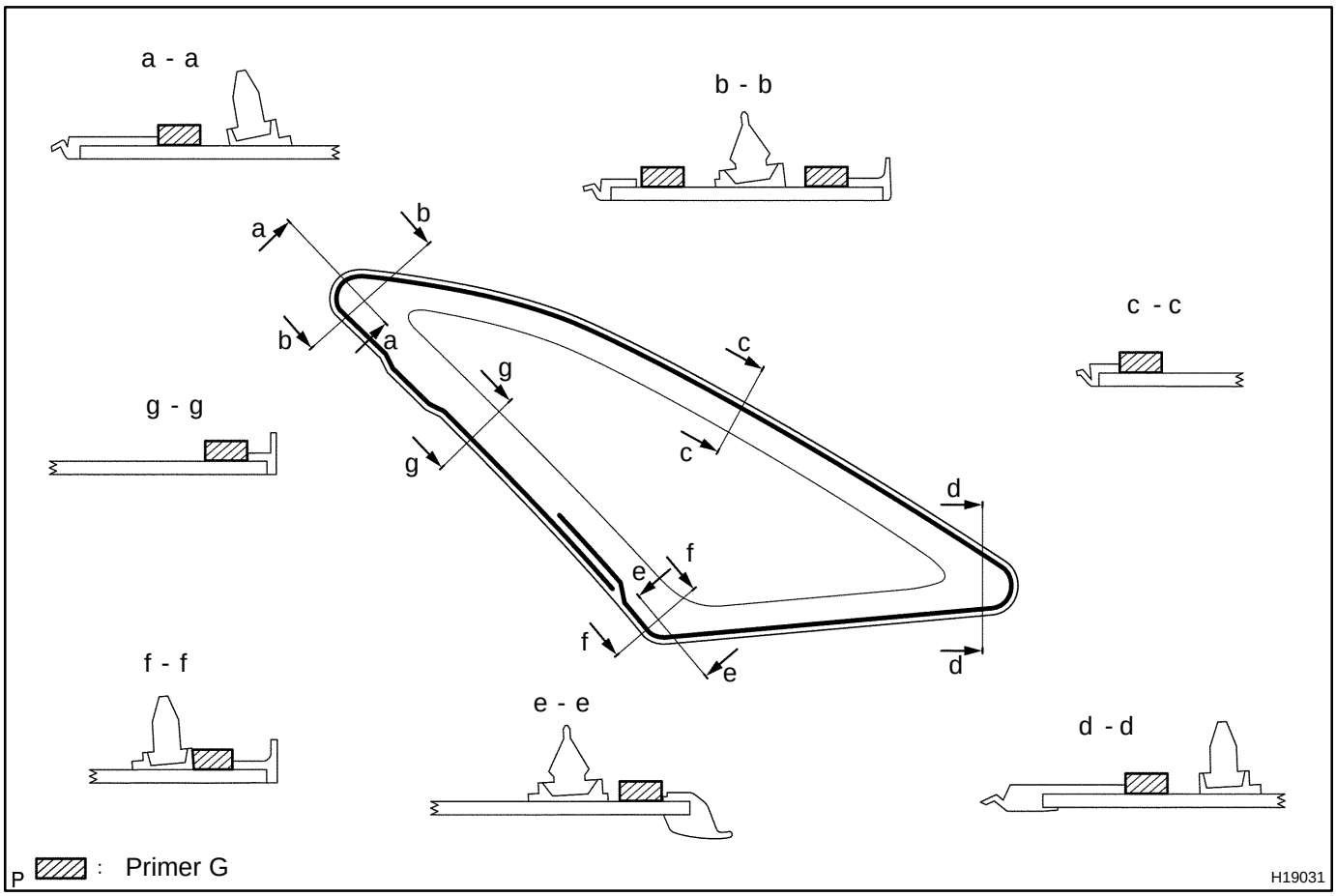
4. COAT CONTACT SURFACE OF GLASS WITH PRIMER "G"

(a) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G as shown in the illustration on the following page.

(b) When the primer is coated wrongly to the area other than the specified, wipe it off with a clean shop rag before the primer dries.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not keep any of the opened Primer G for later use.**



5. APPLY ADHESIVE

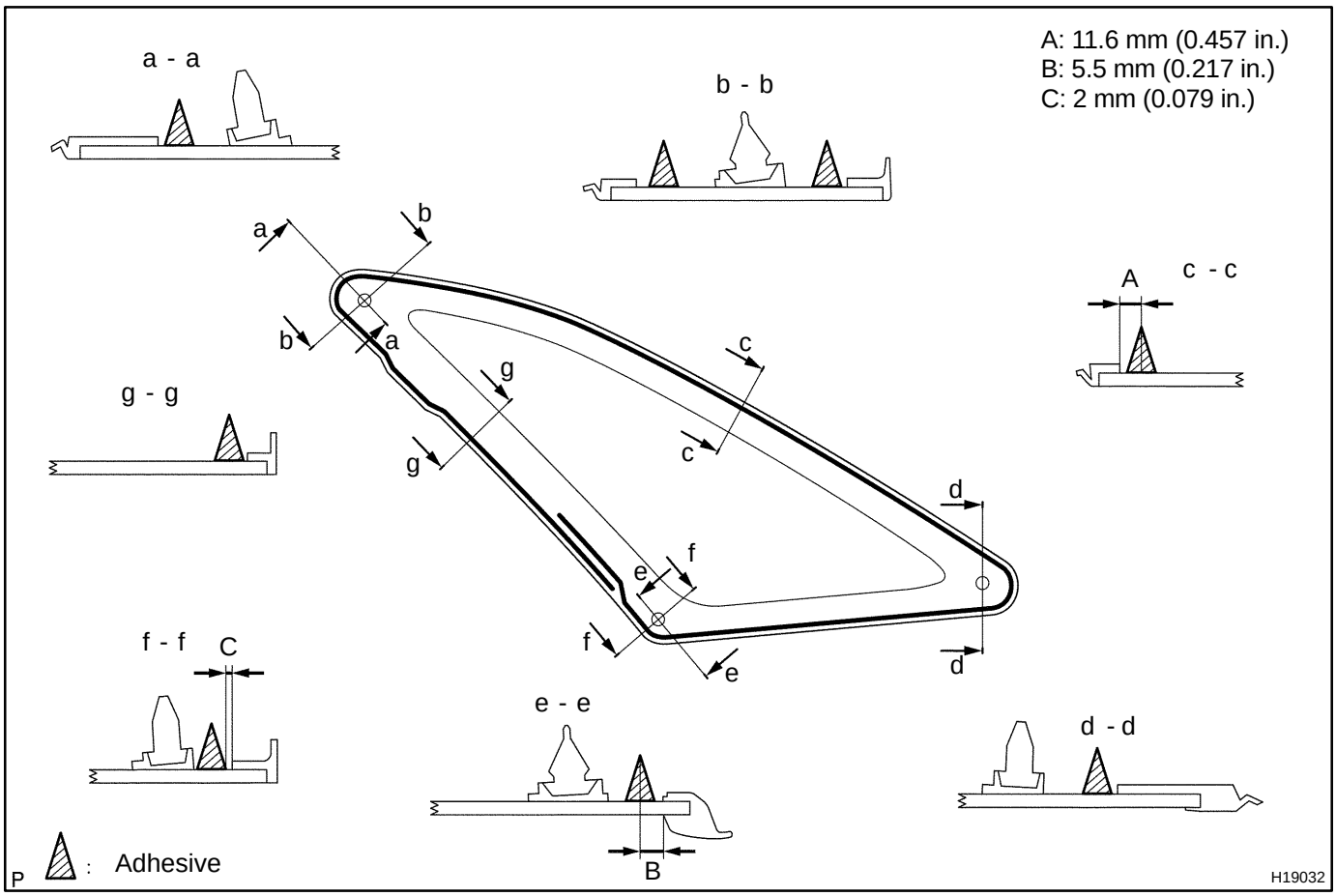
(a) Cut off the tip of the cartridge nozzle.
Part No. 08850-00801 or equivalent.

HINT:
After cutting off the tip, finish off the adhesive within the time described in the table below.

Temperature	Tackfree time
35˚C (95˚F)	15 minutes
20˚C (68˚F)	100 minutes
5˚C (41˚F)	8 hours

(b) Load the cartridge into the sealer gun.

(c) Coat the glass with adhesive as shown in the illustration on the following page.
Adhesive height: 12.5 mm (0.492 in.)
Adhesive width: 8.0 mm (0.315 in.)



6. INSTALL GLASS

(a) Install the glass to the body.

(b) Hold the glass in place securely with a protective tape or equivalent until the adhesive hardens.

NOTICE:

Take care not to drive the vehicle during the time described in the table below.

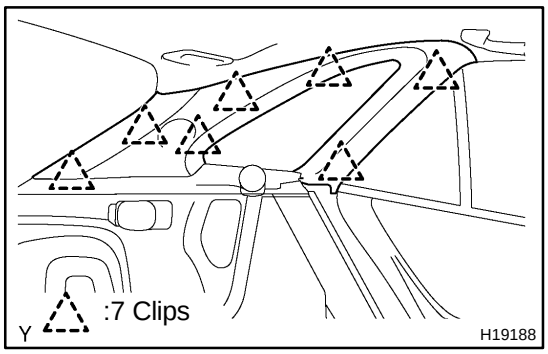
Temperature	Minimum time prior to driving the vehicle
35˚C (95˚F)	1.5 hours
20˚C (68˚F)	5 hours
5˚C (41˚F)	24 hours

7. INSPECT FOR LEAK AND REPAIR

(a) Conduct a leak test after the hardening time has elapsed.

(b) Seal any leak with sealant.

Part No. 08833-00030 or equivalent.

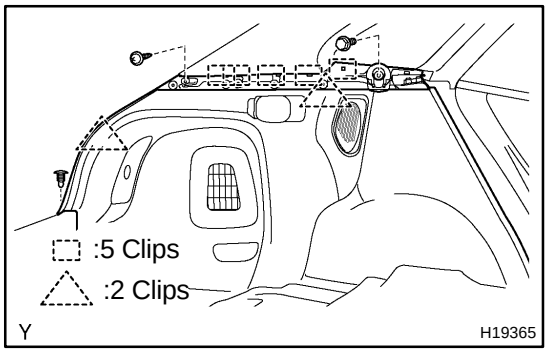


8. INSTALL ROOF SIDE INNER GARNISH

Install the roof side inner garnish to the body.

HINT:

After cutting off the tip, finish off the adhesive within the time described in the table below.



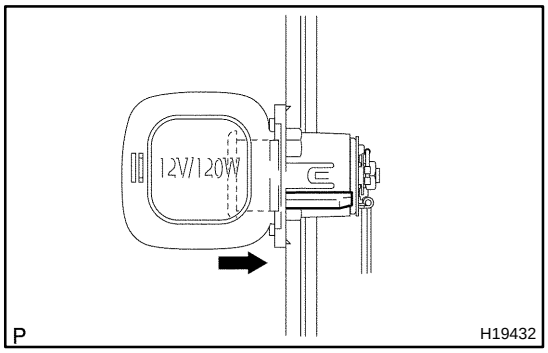
9. INSTALL DECK TRIM SIDE PANEL ASSEMBLY

(a) Install the deck trim side panel with the screw, bolt and clip.

(b) Install the 2 floor hooks with the 2 bolts.

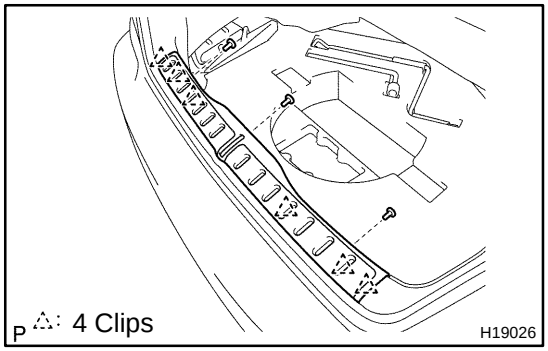
10. RH side:
INSTALL ACCESSORY SOCKET

(a) Assemble the accessory socket to the accessory socket cover at the position 15 mm (0.59 in.) away from full lock position and ensure that they are temporarily locked.



(b) Align the cut-out on the body with the claw on the accessory socket cover, and install the accessory socket and cover to the body.

(c) After installing them, push in the accessory socket approx. 15 mm (0.59 in.) to lock it.



11. INSTALL REAR FLOOR FINISH PLATE

(a) Install the rear floor finish plate with the 3 clips.

(b) Install the 2 rope hook assemblies with the 2 bolts.

12. INSTALL TONNEAU COVER

13. INSTALL REAR FLOOR BOARD NO. 3

14. INSTALL REAR FLOOR BOARD NO. 2

15. INSTALL DECK BOARD NO. 2

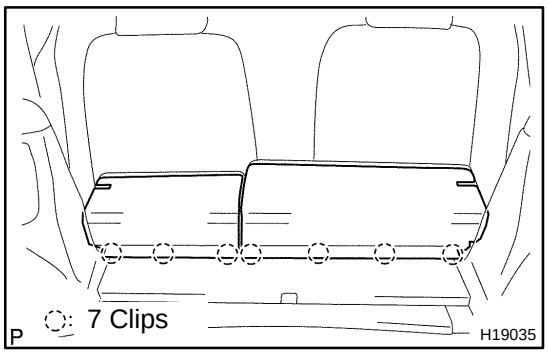
16. INSTALL DECK FLOOR BOX FRONT

(a) Install the deck floor box.

(b) Install the 2 tether anchor brackets with the 2 bolts.
Torque: 21 N·m (214 kgf·cm, 15ft·lbf)

(c) Install the restraint seat tether anchor cover.

(d) install the 2 rope hook assemblies with the 2 bolts.



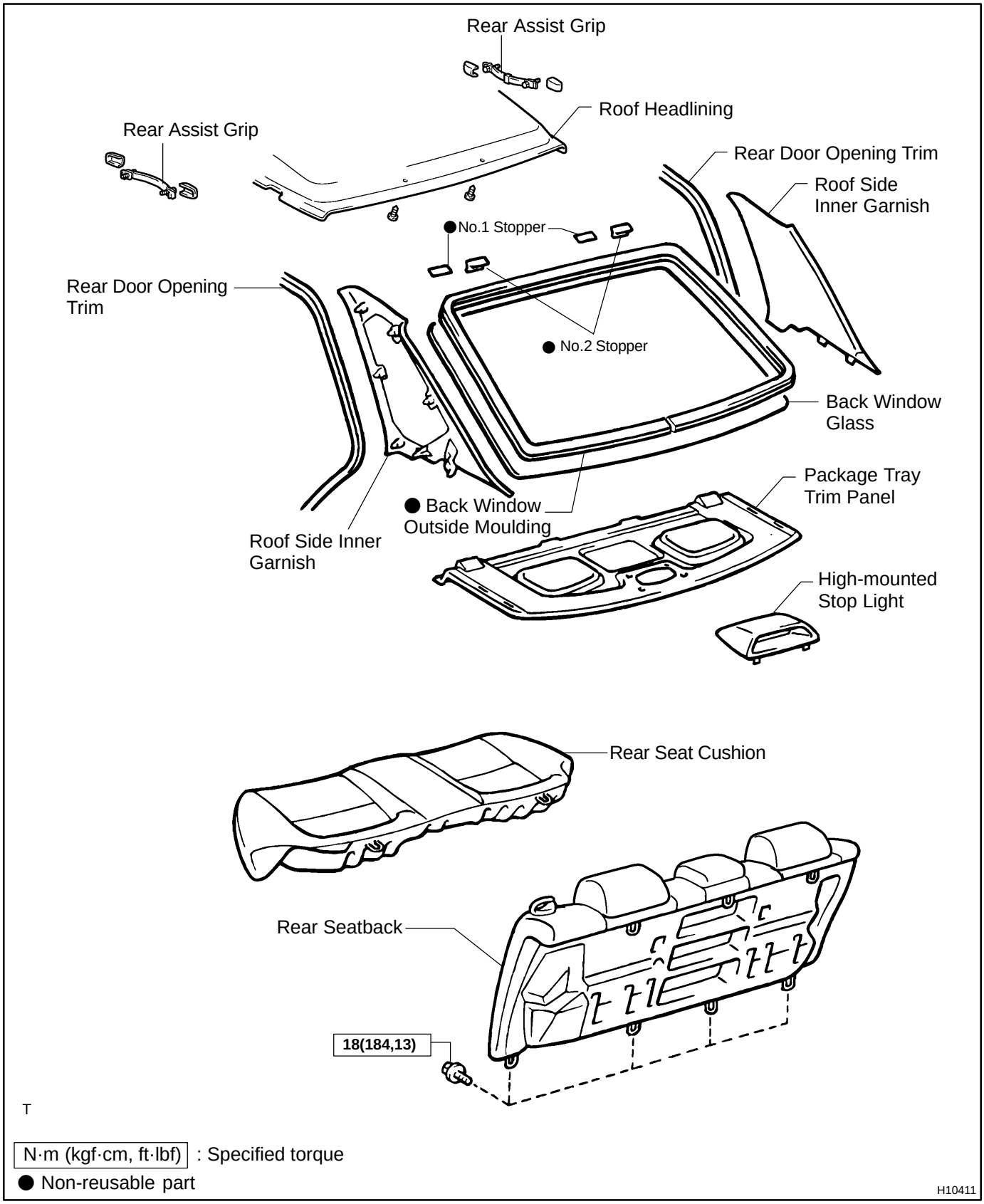
17. INSTALL REAR SEAT FLOOR BOARD NO. 4

Install the rear floor board with the 2 bolts.

BACK WINDOW GLASS

COMPONENTS

BO22L-09



N·m (kgf·cm, ft·lbf) : Specified torque

● Non-reusable part

H10411

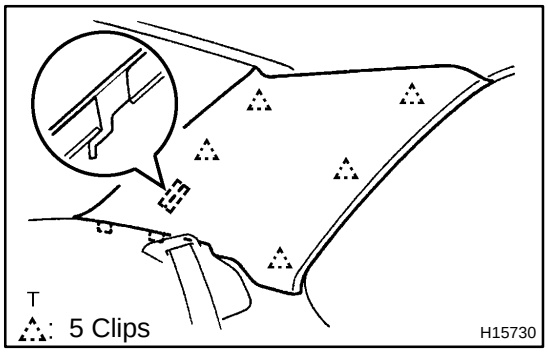
BO2CQ-04

REMOVAL

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. **REMOVE REAR SEAT CUSHION (See page BO-196)**
2. **REMOVE REAR SEATBACK (See page BO-196)**
3. **REMOVE UPPER PART OF REAR DOOR OPENING TRIMS**



4. **REMOVE ROOF SIDE INNER GARNISH**

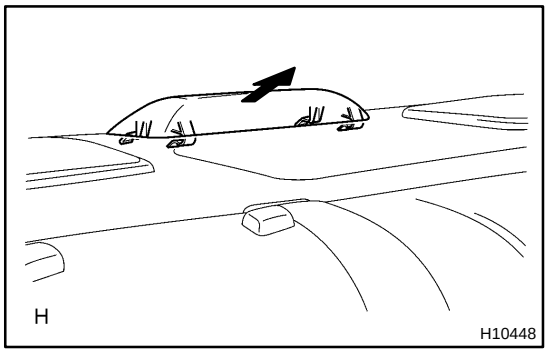
(a) Using a screwdriver, disengage the clips.

HINT:

Tape the screwdriver tip before use.

(b) Pull the garnish upward to remove it.

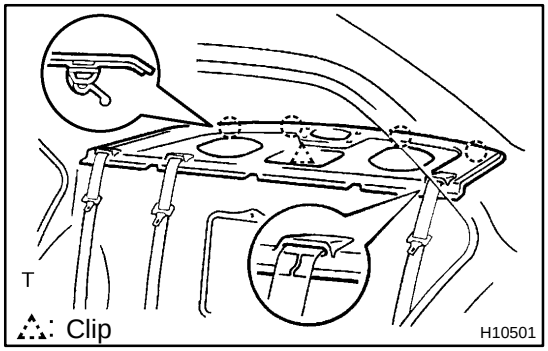
(c) Employ the same manner described above to the other side.



5. **REMOVE HIGH-MOUNTED STOP LIGHT**

(a) Remove the high-mounted stop light as shown in the illustration.

(b) Disconnect the connector.



6. **REMOVE PACKAGE TRAY TRIM PANEL**

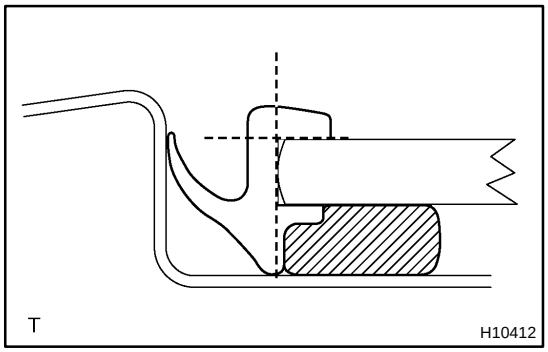
(a) Pull the package tray trim panel upward to disengage the clips.

(b) Remove the rear seat outer belts through the cutout on the package tray trim.

(c) Pull the package tray trim panel forward to remove it.

7. **REMOVE REAR ASSIST GRIPS**
8. **REMOVE REAR PART OF ROOF HEADLINING**

Remove the 2 clips.



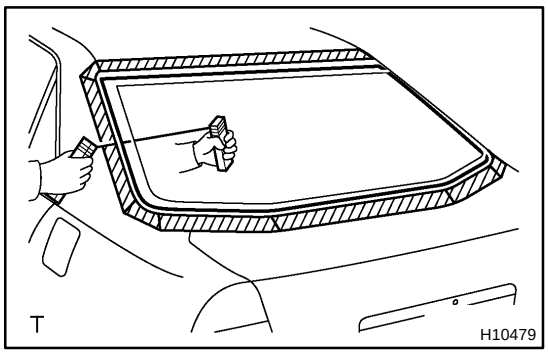
9. **REMOVE BACK WINDOW OUTSIDE MOULDING**

(a) Using a knife, cut off the moulding as shown in the illustration.

NOTICE:

Do not damage the body with the knife.

(b) Remove the remaining moulding.



10. REMOVE BACK WINDOW GLASS

(a) Disconnect the connector.

(b) Push piano wire through from the interior.

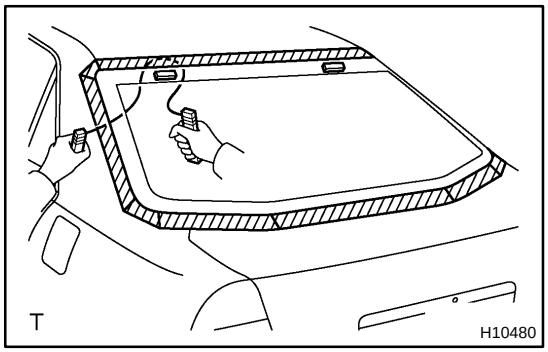
(c) Tie both wire ends to wooden blocks or similar objects.

HINT:

Apply protective tape to the outer surface to keep the surface from being scratched.

NOTICE:

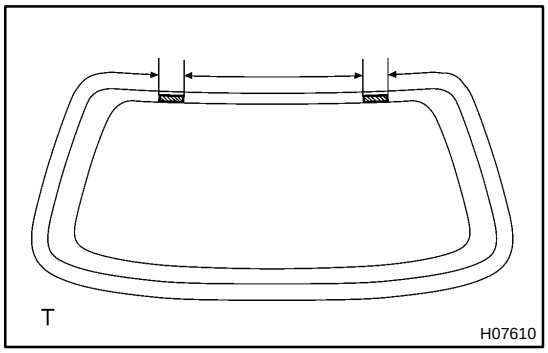
When separating the glass, take care not to damage the paint and exterior.



(d) Cut the adhesive by pulling the piano wire around it.

HINT:

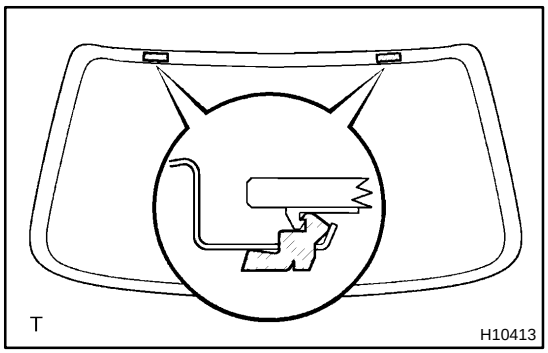
Cut the adhesive areas as shown in the illustration, leaving the adhesive where the stoppers are.



(e) Let the piano wire pass as shown in the illustration, cut off the adhesive sticking to the stoppers.

NOTICE:

Do not damage the glass stoppers.



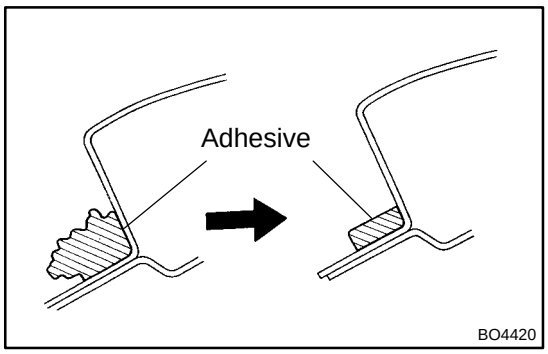
(f) Disengage the stoppers, then remove the glass.

NOTICE:

Leave as much of the adhesive on the body as possible when cutting off the glass.

BO2CR-04

INSTALLATION



1. CLEAN AND SHAPE CONTACT SURFACE OF BODY

(a) Using a knife, cut away any rough areas on the body.

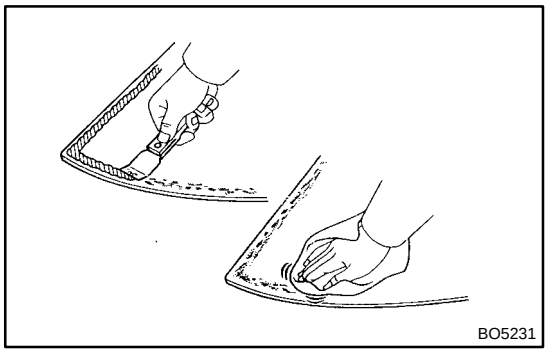
HINT:

Leave as much of the adhesive on the body as possible.

(b) Clean the cutting surface of the adhesive with a piece of shop rag saturated in cleaner.

HINT:

Even if all the adhesive has been removed with a knife, clean the body with the shop rag.



2. CLEAN REMOVED GLASS

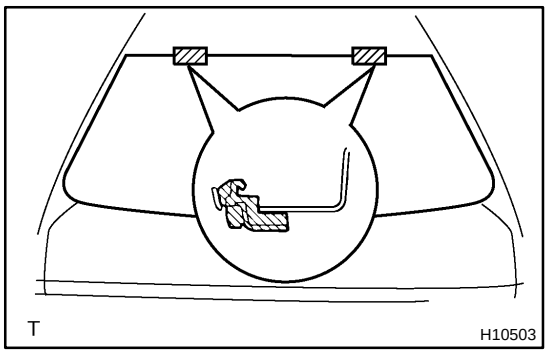
(a) Remove the damaged No.2 stoppers.

(b) Using a scraper, remove the adhesive sticking to the glass.

(c) Clean the glass with cleaner.

NOTICE:

- **Be careful not to damage the glass.**
- **Do not touch the glass face after cleaning it.**



3. REPLACE NO.1 STOPPERS

(a) Remove the damaged stoppers.

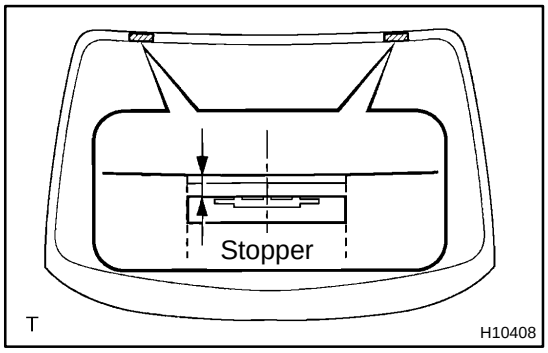
(b) Cut off the old adhesive around the stoppers installation area.

NOTICE:

Be careful not to damage the body.

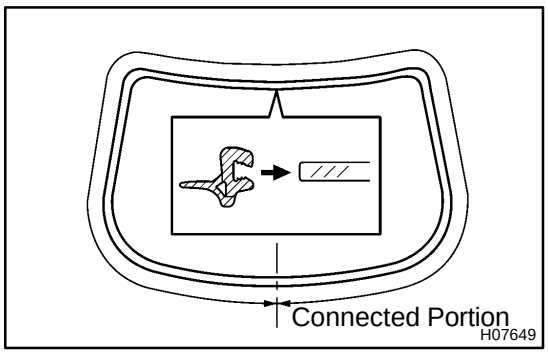
(c) Clean the installation area.

(d) Attach new stoppers to the body with the notches on the body aligned with the stoppers as shown in the illustration.



4. INSTALL NEW NO.2 STOPPERS

Attach new stoppers to the glass with the ceramic notches on the glass aligned with the stoppers as shown in the illustration.

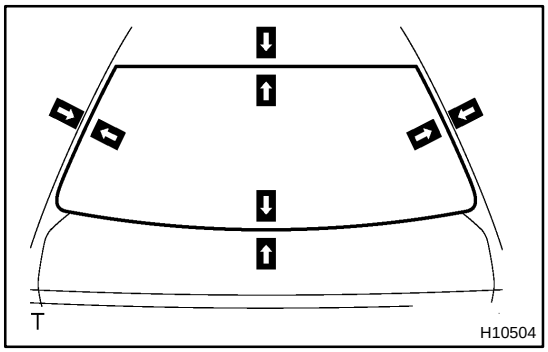


5. INSTALL NEW BACK WINDOW OUTSIDE MOULDING

Install new back window outside moulding to the back window glass as shown in the illustration.

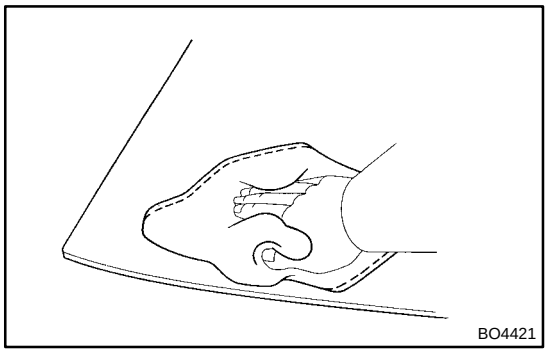
HINT:

- Install the back window outside moulding from the center of the glass on the lower side of the vehicle.
- When installing the back window outside moulding, do not stretch it.



6. POSITION GLASS

(a) Place the glass in the correct position.
(b) Check that all contacting parts of the glass rim are perfectly even.
(c) Place reference marks between the glass and body.
(d) Remove the glass.

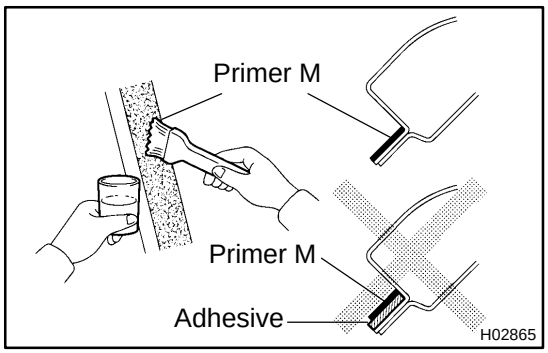


7. CLEAN CONTACT SURFACE OF GLASS

Using a cleaner, clean the contact surface which is black-colored area around the entire glass rim.

NOTICE:

Do not touch the glass face after cleaning it.

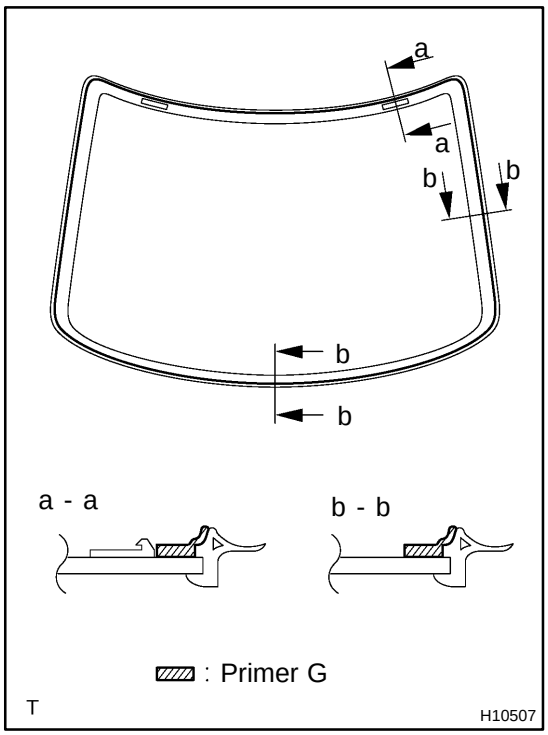


8. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat Primer M to the exposed part of body on the vehicle side.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not coat Primer M to the adhesive.**
- **Do not keep any of the opened Primer M for later use.**



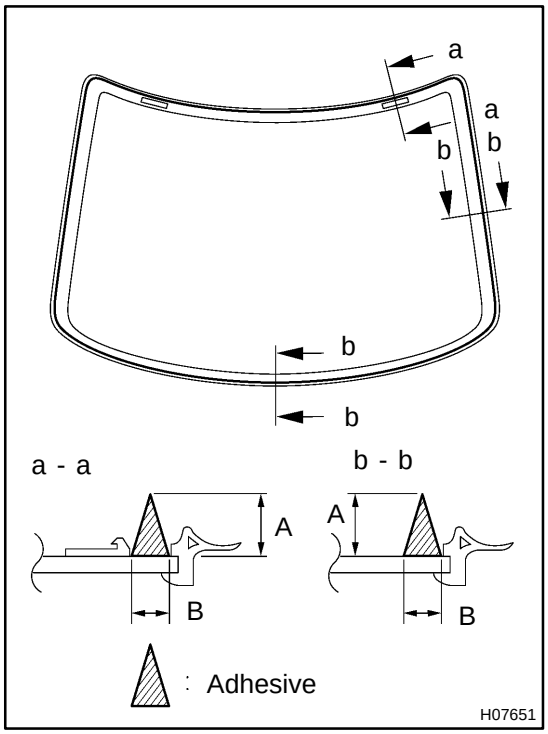
9. COAT CONTACT SURFACE OF GLASS WITH PRIMER "G"

(a) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G as shown in the illustration.

(b) When the primer is coated wrongly to the area other than the specified by accident, wipe it off with a clean shop rag before the primer dries.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not keep any of the opened Primer G for later use.**



10. APPLY ADHESIVE

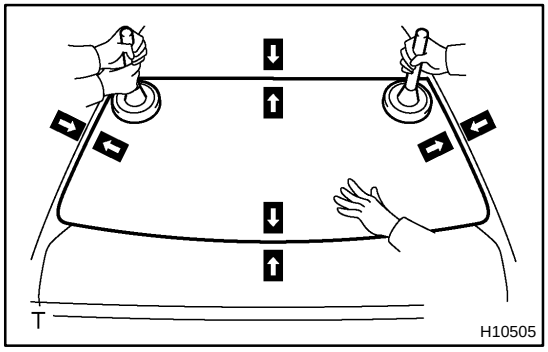
(a) Cut off the tip of the cartridge nozzle.
Part No. 08850-00801 or equivalent

HINT:
After cutting off the tip, finish off the adhesive within the time described in the table below.

Temperature	Tackfree time
35 ˚C (95 ˚F)	15 minutes
20 ˚C (68 ˚F)	100 minutes
5 ˚C (41 ˚F)	8 hours

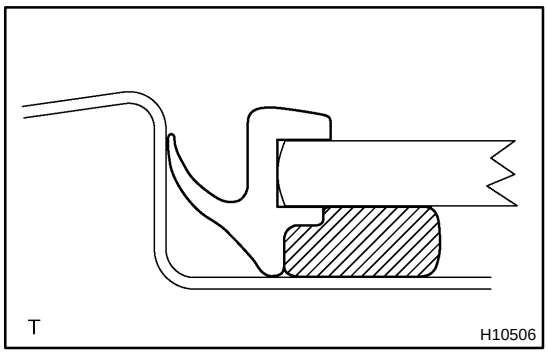
(b) Load the cartridge into the sealer gun.

(c) Coat the glass with adhesive as shown in the illustration.
A: 12.5 mm (0.492 in.)
B: 8.0 mm (0.315 in.)



11. INSTALL GLASS

(a) Position the glass so that the reference marks are lined up, and press in gently along the rim.



HINT:
Confirm that the moulding is attached to the body panel as shown in the illustration.

(b) Hold the back window glass in place securely with a protective tape or equivalent until the adhesive hardens.

NOTICE:

Take care not to drive the vehicle during the time described in the table below.

Temperature	Minimum time prior to driving the vehicle
35 ˚C (95 ˚F)	1.5 hours
20 ˚C (68 ˚F)	5 hours
5 ˚C (41 ˚F)	24 hours

12. INSPECT FOR LEAK AND REPAIR

(a) Conduct a leak test after the hardening time has elapsed.

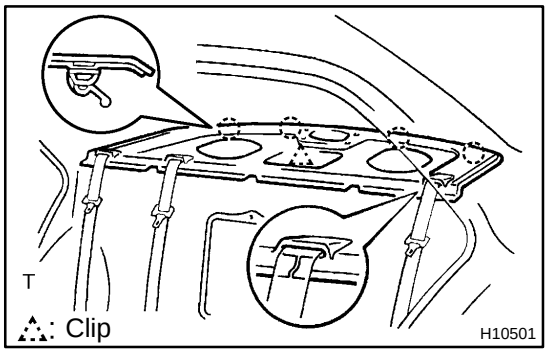
(b) Seal any leak with sealant.

Part No. 08833-00030 or equivalent

13. INSTALL REAR PART OF ROOF HEADLINING

Install the 2 clips.

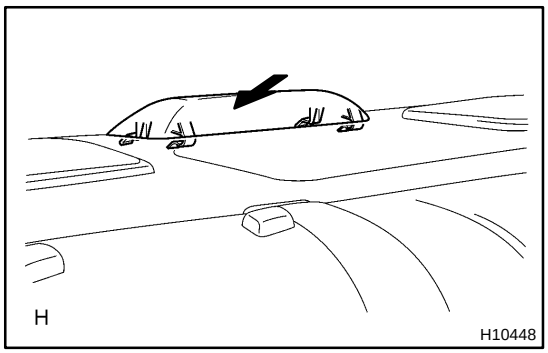
14. INSTALL REAR ASSIST GRIPS



15. INSTALL PACKAGE TRAY TRIM PANEL

(a) Install the seat belt through the cutout of the package tray trim.

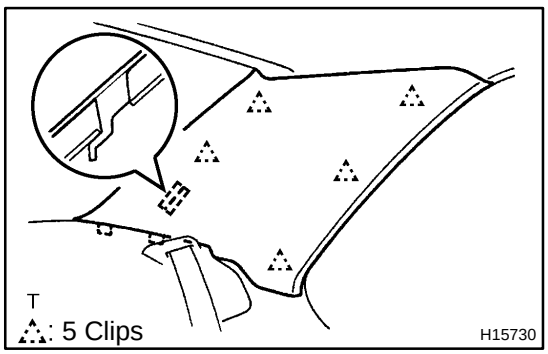
(b) Install the package tray trim as shown in the illustration.



16. INSTALL HIGH-MOUNTED STOP LIGHT

(a) Connect the connector.

(b) Install the high-mounted stop light as shown in the illustration.



17. INSTALL ROOF SIDE INNER GARNISH

(a) Install the roof side inner garnish as shown in the illustration.

(b) Employ the same manner described above to the other side.

18. INSTALL UPPER PART OF REAR DOOR OPENING TRIMS

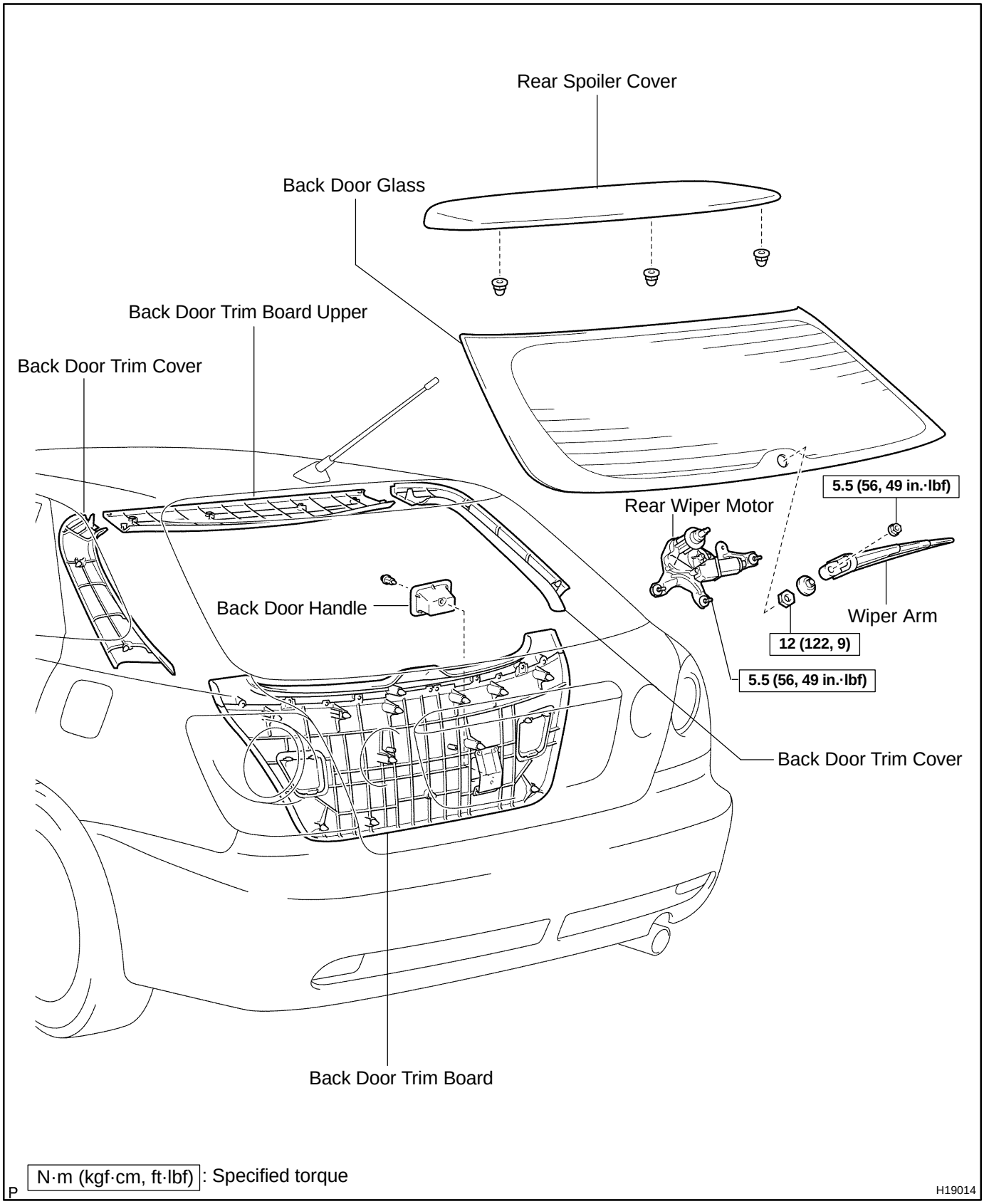
19. INSTALL REAR SEATBACK (See page BO-201)

20. INSTALL REAR SEAT CUSHION (See page BO-201)

BACK DOOR GLASS

COMPONENTS

BO4DP-02

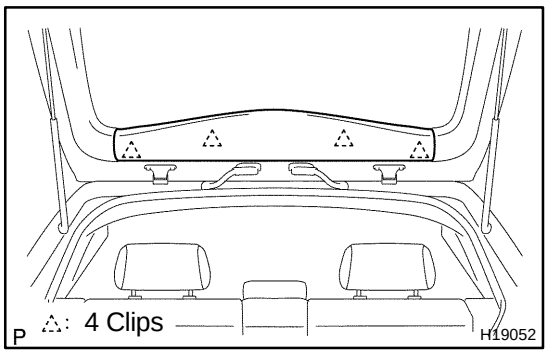


BO4DQ-03

REMOVAL

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

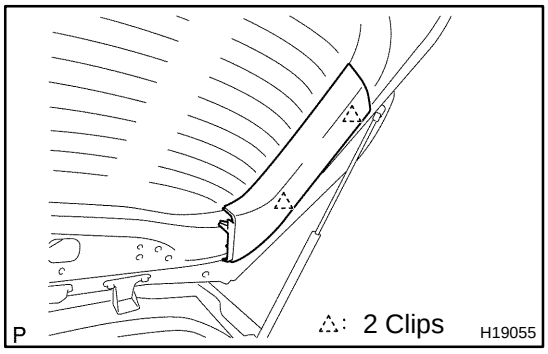


1. REMOVE BACK DOOR TRIM BOARD UPPER

Using a screwdriver, remove the back door trim board upper.

HINT:

Tape the screwdriver tip before use.



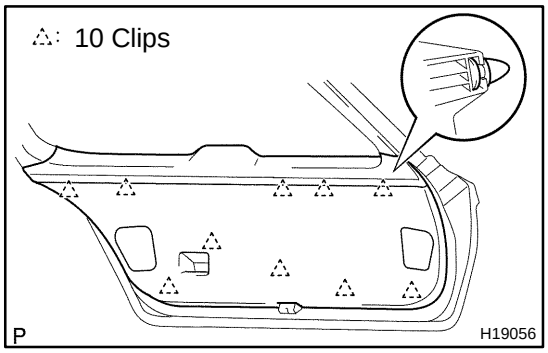
2. REMOVE BACK DOOR TRIM COVERS

(a) Insert a screwdriver between the back door panel and back door trim cover to pry the cover.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



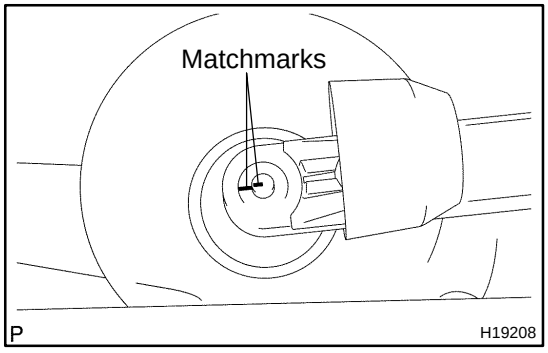
3. REMOVE BACK DOOR TRIM BOARD

(a) Remove the clip and back door handle.

(b) Using a screwdriver, remove the back door trim board.

HINT:

Tape the screwdriver tip before use.

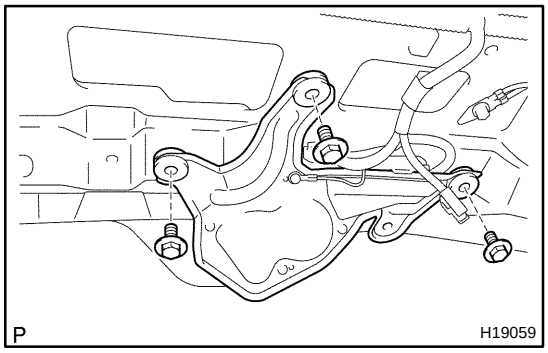


4. REMOVE REAR WIPER ARM

(a) Remove the wiper arm cover.

(b) Place matchmarks on the wiper arm and wiper motor.

(c) Remove the nut and rear wiper arm.

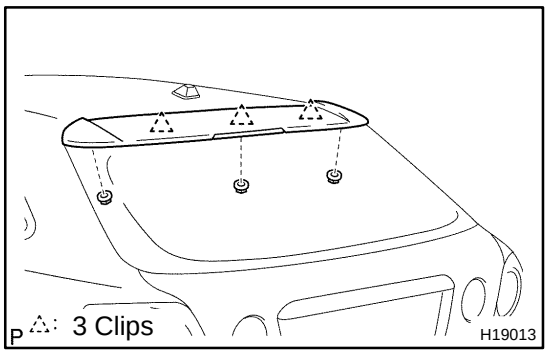


5. REMOVE REAR WIPER MOTOR

(a) Remove the nut and washer on the outer side of back door panel.

(b) Disconnect the connector.

(c) Remove the 3 bolts and rear wiper motor.



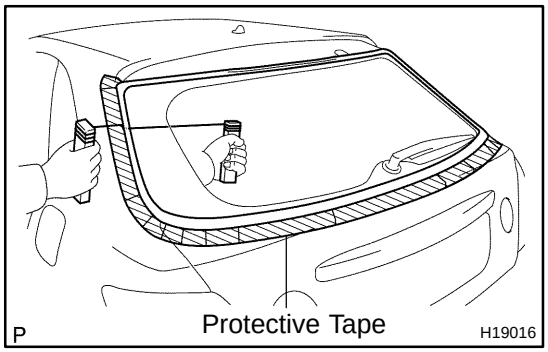
6. REMOVE REAR SPOILER COVER

(a) Remove the 3 nuts.

(b) Using a screwdriver, remove the rear spoiler cover then disconnect the connector.

HINT:

Tape the screwdriver tip before use.



7. REMOVE BACK DOOR GLASS

(a) Disconnect the connector.

(b) Push piano wire through from the interior.

(c) Tie both wire ends to wooden blocks or similar object.

HINT:

Apply protective tape to the outer surface to keep the surface from being scratched.

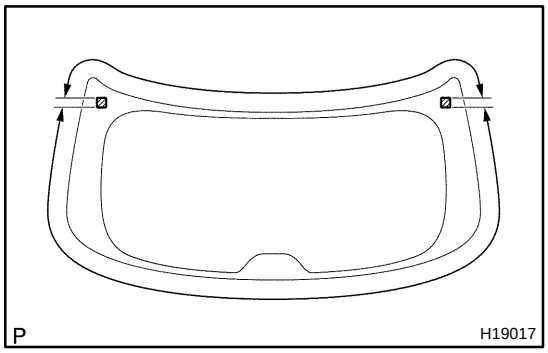
NOTICE:

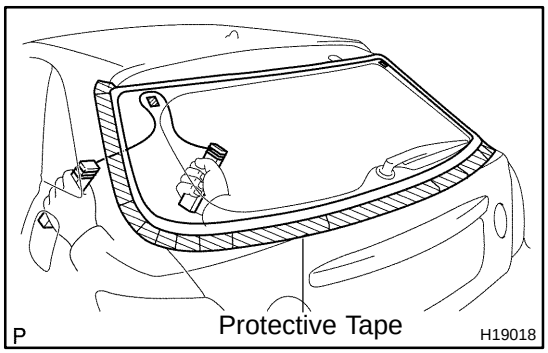
When separating the glass, take care not to damage the paint and exterior.

(d) Cut the adhesive by pulling the piano wire around it.

HINT:

Cut the adhesive areas as shown in the illustration, leaving the adhesive where the clips are.





(e) Let the piano wire pass as shown in the illustration, cut off the adhered part to the clips.

NOTICE:

Do not damage the glass retainers.

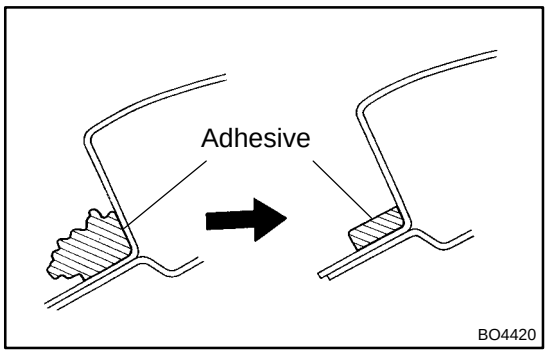
(f) Remove the glass.

NOTICE:

Leave as much of the adhesive on the body as possible when cutting off the glass.

BO4DR-02

INSTALLATION



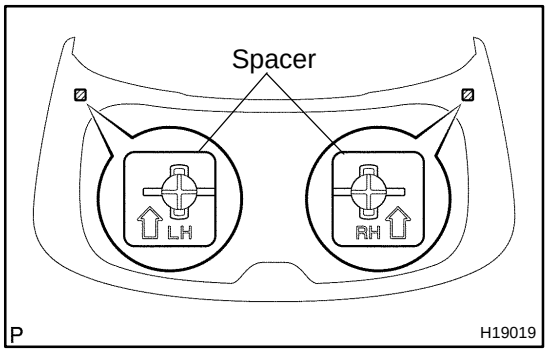
1. CLEAN AND SHAPE CONTACT SURFACE OF BODY

(a) Using a knife, cut away any rough areas on the body.

HINT:

Leave as much of the adhesive on the body as possible.

(b) Clean the cutting surface of the adhesive with a piece of shop rag soaked with cleaner.



2. REPLACE SPACER

(a) Remove the damaged spacers.

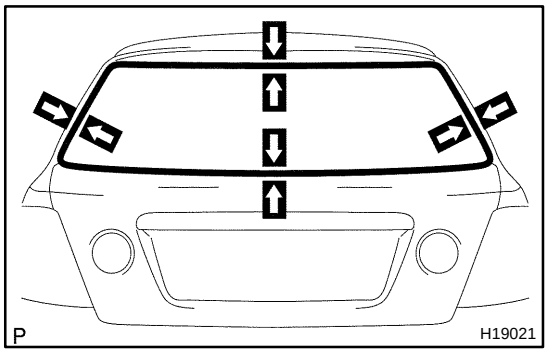
(b) Cut off the old adhesive around the spacers installation area.

NOTICE:

Be careful not to damage the body.

(c) Clean the installation area.

(d) Attach the new spacers to the glass with the ceramic notch on the glass aligned with the spacers as shown in the illustration.



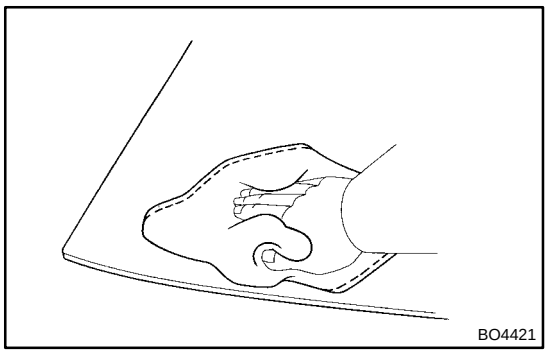
3. POSITION GLASS

(a) Place the glass in the correct position.

(b) Check that all contacting part of the glass rim are perfectly even.

(c) Place reference marks between the glass and body.

(d) Remove the glass.

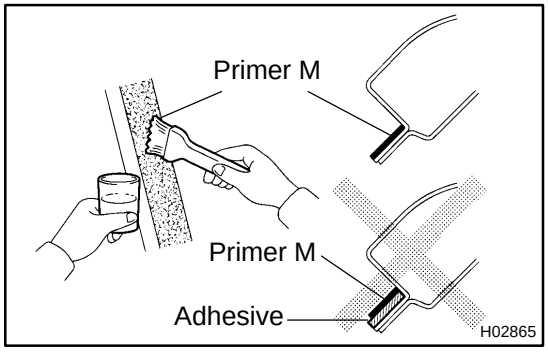


4. CLEAN CONTACT SURFACE OF GLASS

Using a cleaner, clean the contact surface which is black-colored area around the entire glass rim.

NOTICE:

Do not touch the glass face after cleaning it.

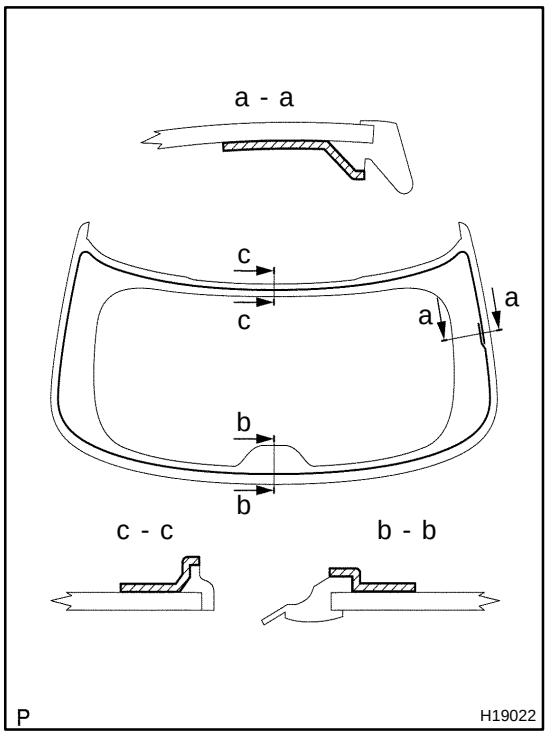


5. COAT CONTACT SURFACE OF BODY WITH PRIMER "M"

Using a brush, coat Primer M to the exposed part of body on the vehicle side.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not coat Primer M to the adhesive.**
- **Do not keep any of the opened Primer M for later use.**



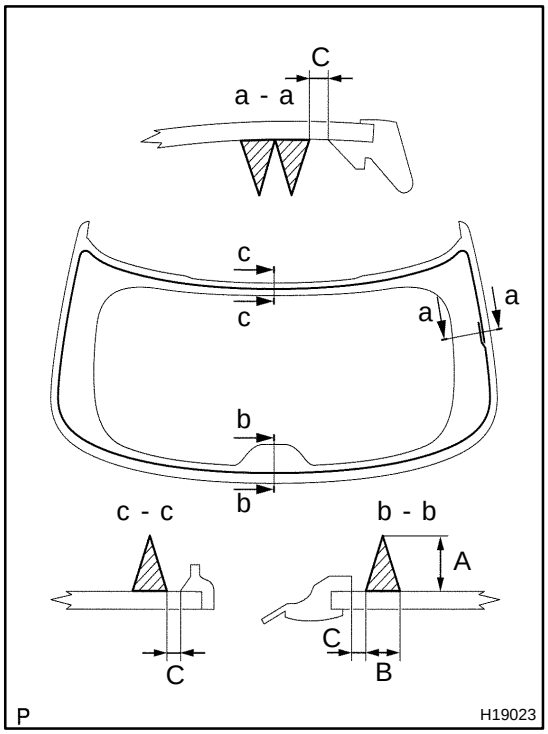
6. COAT CONTACT SURFACE OF GLASS WITH PRIMER "G"

(a) Using a brush or sponge, coat the edge of the glass and the contact surface with Primer G as shown in the illustration.

(b) When the primer is coated to the area other than the specified by accident, wipe it off with a clean shop rag before the primer dries.

NOTICE:

- **Let the primer coating dry for 3 minutes or more.**
- **Do not keep any of the opened Primer G for later use.**



7. APPLY ADHESIVE

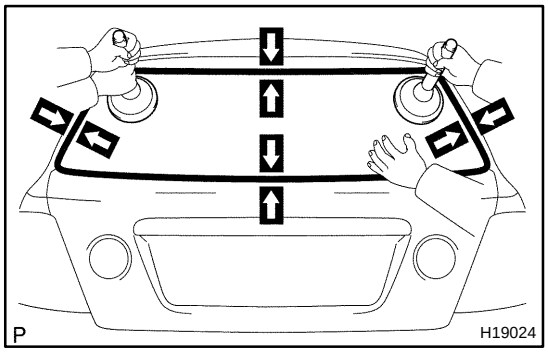
(a) Cut off the tip of the cartridge nozzle.
Part No. 08850-00801 or equivalent.

HINT:
After cutting off the tip, finish off the adhesive within the time described in the table below.

Temperature	Tackfree time
35˚C (95˚F)	15 minutes
20˚C (68˚F)	100 minutes
5˚C (41˚F)	8 hours

(b) Load the cartridge into the sealer gun.

(c) Coat the glass with adhesive as shown in the illustration.
A: 12.0 mm (0.472 in.)
B: 8.0 mm (0.315 in.)
C: 3.0 mm (0.118 in.)

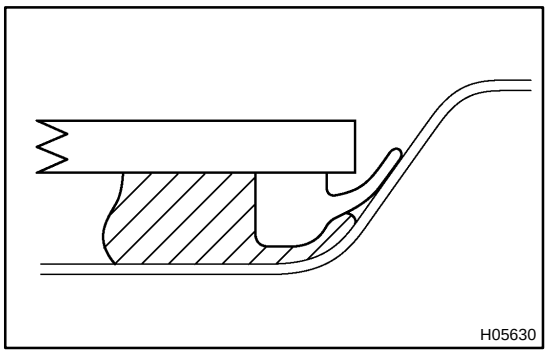


8. INSTALL GLASS

(a) Position the glass so that the reference marks are lined up, and press in gently along the rim.

(b) Using a spatula, apply adhesive on the glass rim.

(c) Use a scraper to remove any excess or protruding adhesive.



HINT:
Confirm that the moulding is attached to the body panel as shown in the illustration.

(d) Hold the back door glass in place securely with a protective tape or equivalent until the adhesive hardens.

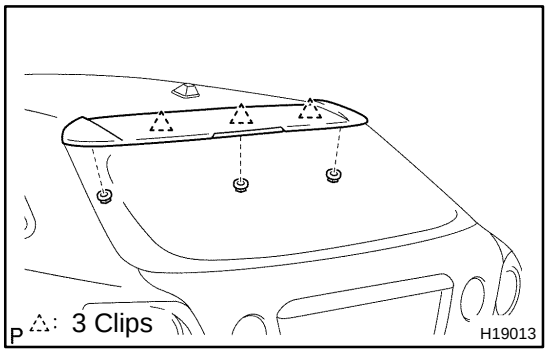
NOTICE:
Take care not to drive the vehicle during the time described in the table below.

Temperature	Minimum time prior to driving the vehicle
35˚C (95˚F)	1.5 hours
20˚C (68˚F)	5 hours
5˚C (41˚F)	24 hours

9. INSPECT FOR LEAK AND REPAIR

(a) Conduct a leak test after the hardening time has elapsed.

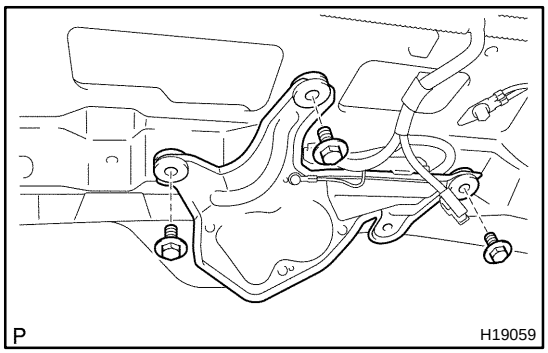
(b) Seal any leak with sealant.
Part No. 08833-00030 or equivalent.



10. INSTALL REAR SPOILER COVER

Install the rear spoiler cover with the 3 nuts.

11. INSTALL BACK DOOR OUTSIDE HANDLE

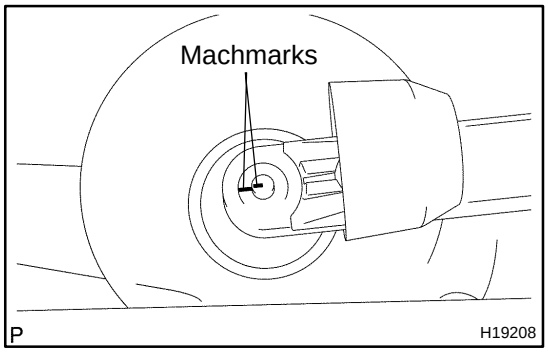


12. INSTALL REAR WIPER MOTOR

(a) Install the rear wiper motor with the 3 bolts.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

(b) Connect the connector.

(c) Install the nut and washer on the outer side of the back door panel.
Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)



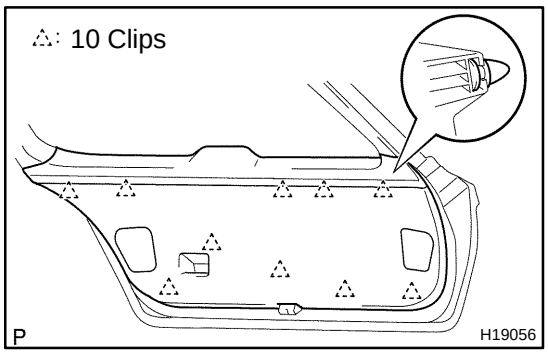
13. INSTALL REAR WIPER ARM

(a) Install the wiper arm and tighten the nut by hand. Operate the wiper once and turn the wiper switch OFF.

(b) Align the machmarks on the wiper arm and wiper motor.

(c) Install the rear wiper arm with the nut.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

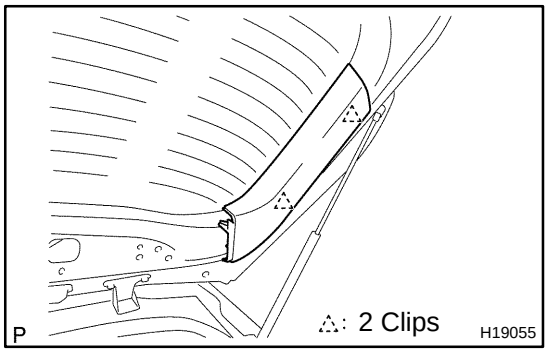
(d) Install the wiper arm cover.



14. INSTALL BACK DOOR TRIM BOARD

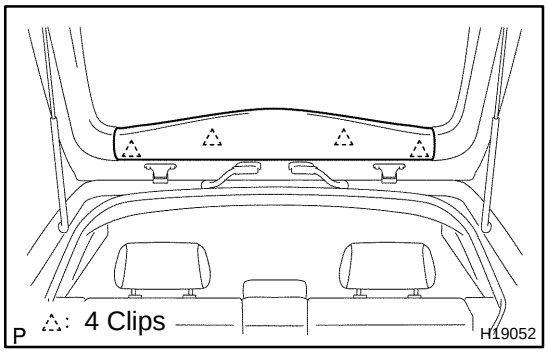
(a) Install the back door trim board to the back door panel.

(b) Install the back door handle with the clip.



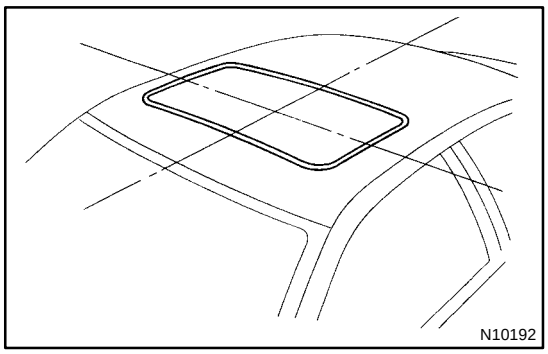
15. INSTALL BACK DOOR TRIM COVERS

Install the trim cover to the body.



16. INSTALL BACK DOOR TRIM BOARD UPPER

Install the back door trim board upper to the body.



SLIDING ROOF

BO0M1-07

ON-VEHICLE INSPECTION

INSPECT SLIDING ROOF GLASS ALIGNMENT

(a) Start the engine and check the operation time of the sliding roof.

Operation time:

Approx. 6 secs.

(b) Check for abnormal noise or closed condition during operation.

(c) With the sliding roof fully closed, check for water leakage.

(d) Check for a difference in level between the sliding roof weatherstrip and roof panel.

Front end:

0 – 2.0 mm (0 - 0.079 in.)

0 + 1.0 mm (0 + 0.039 in.)

Side end:

0 ± 1.5 mm (0 ± 0.059 in.)

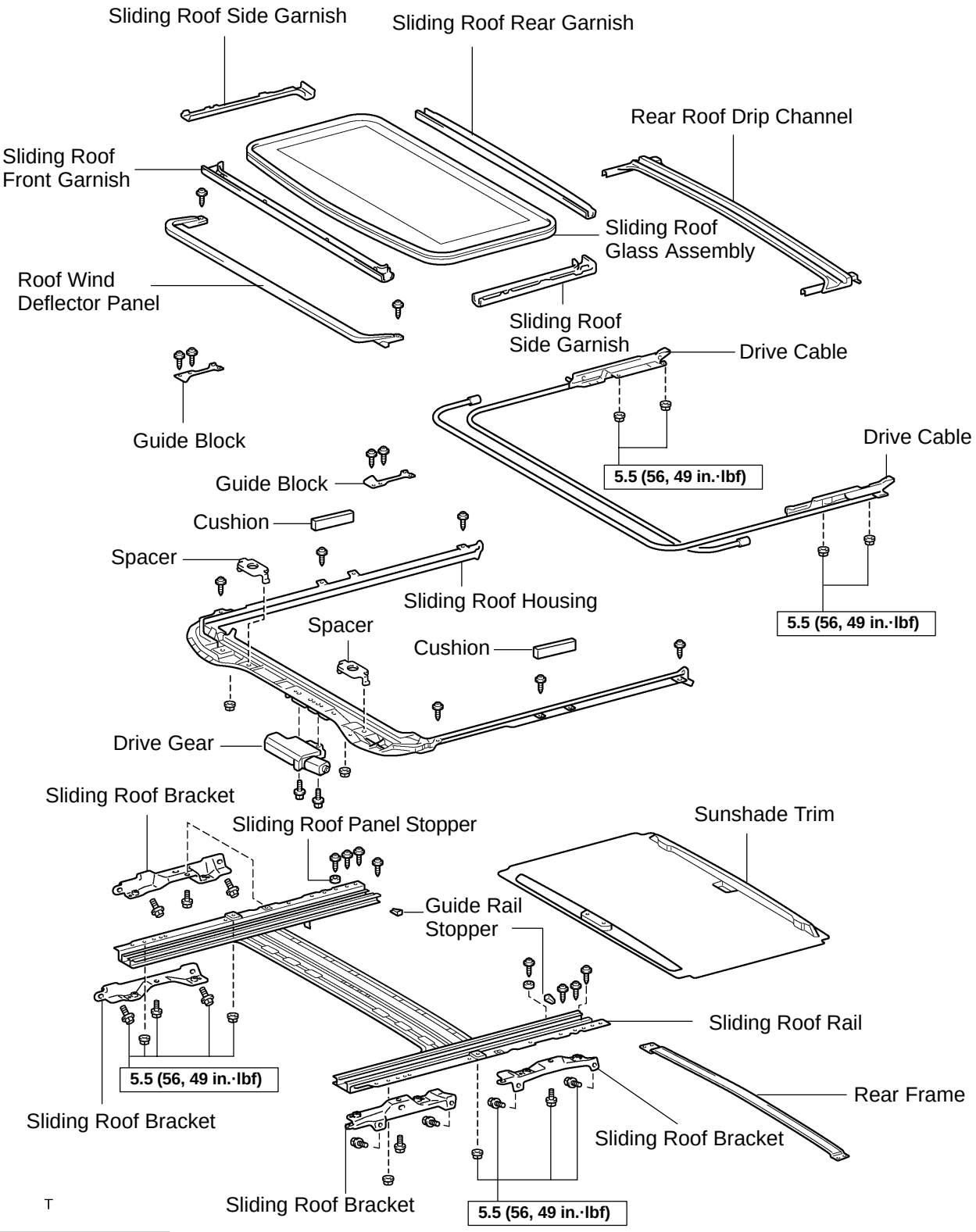
Rear end:

0 - 1.0 mm (0 - 0.039 in.)

0 + 2.0 mm (0 + 0.079 in.)

BO0M2-06

COMPONENTS



H10510

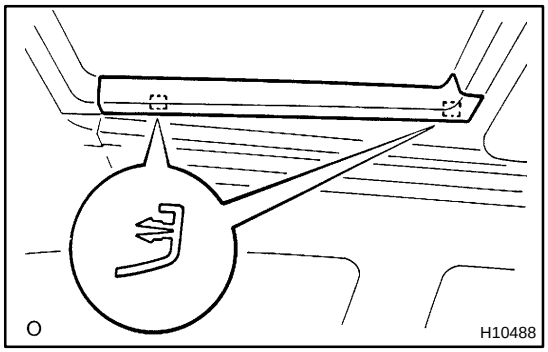
BO2CS-04

REMOVAL

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. **Sedan type:**
   REMOVE ROOF HEADLINING (See page BO-156)
2. **Wagon type:**
   REMOVE ROOF HEADLINING (See page BO-164)



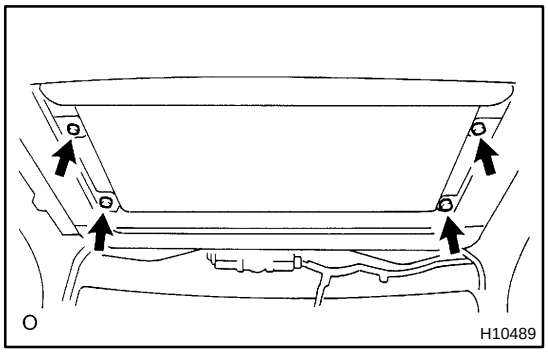
3. **REMOVE SLIDING ROOF SIDE GARNISH**

(a) Using a screwdriver, remove the garnish.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



4. **REMOVE SLIDING ROOF GLASS ASSEMBLY**

(a) Using a torx wrench, remove the 4 nuts.

Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

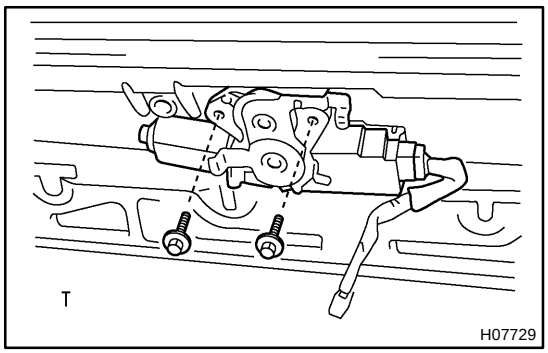
(b) Pull the glass upward to remove it.

5. **REMOVE SLIDING ROOF FRONT AND REAR GARNISHES**

Using a screwdriver, remove the front and rear garnishes.

HINT:

Tape the screwdriver tip before use.



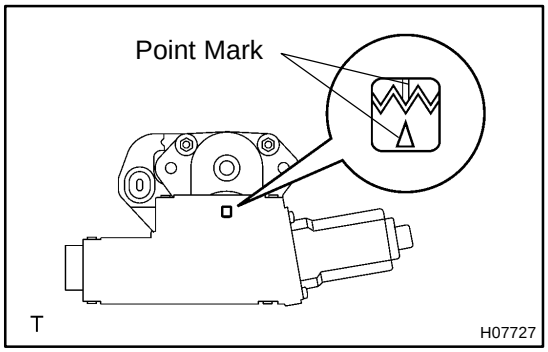
6. **REMOVE DRIVE GEAR**

NOTICE:

Remove the drive gear with the sliding roof fully closed.

(a) Disconnect the connector.

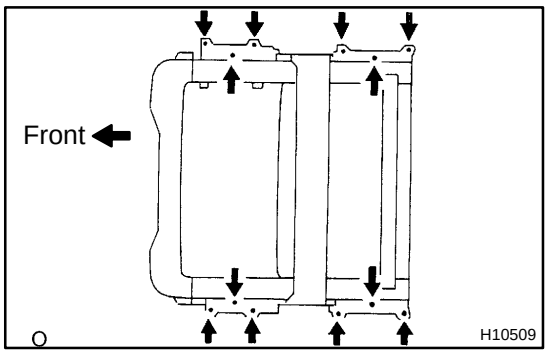
(b) Remove the 2 bolts and drive gear.



(c) Turn the drive gear to align the point marks as shown in the illustration.

NOTICE:

At the time of installation, if the sliding roof position and drive gear fully closed position are not matched, the sliding roof does not operate normally.



7. REMOVE SLIDING ROOF BRACKET

(a) Remove the 3 bolts and sliding roof bracket.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)

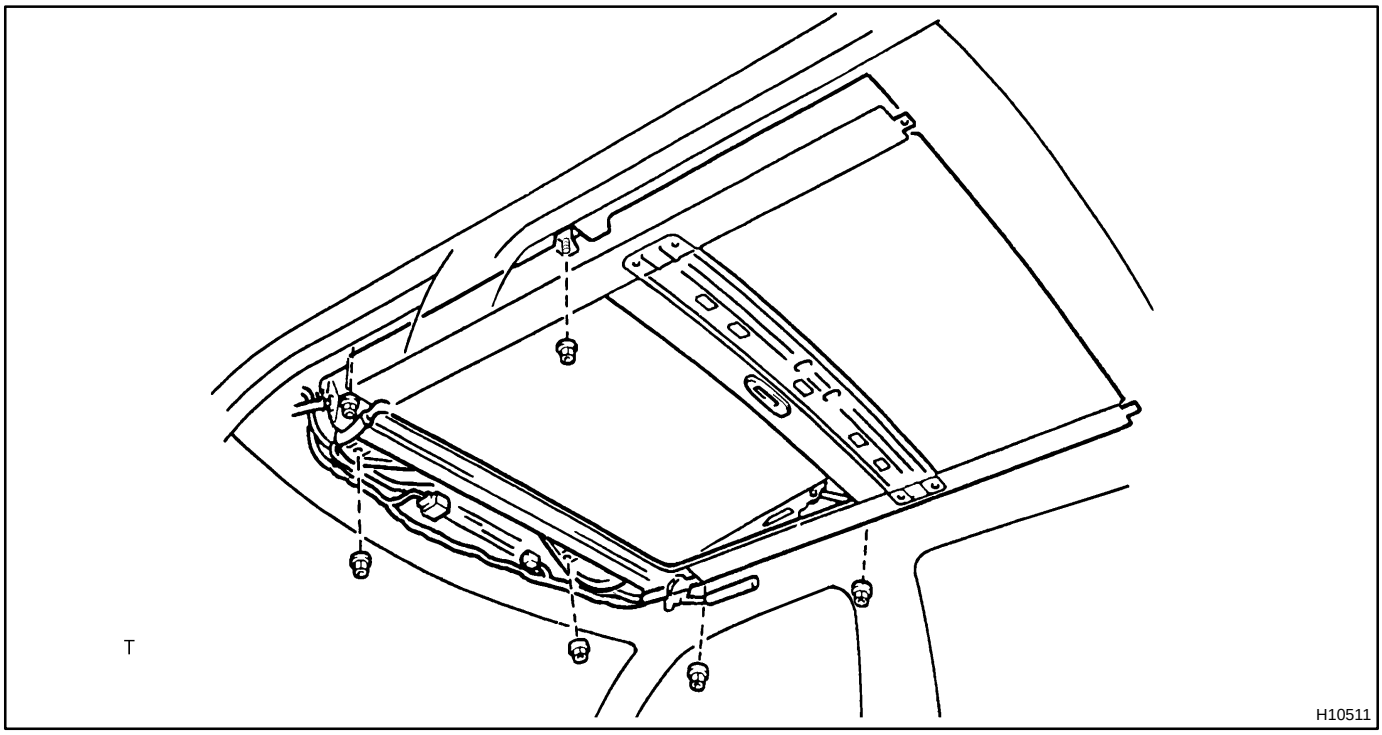
(b) Employ the same manner described above to the other sides.

8. REMOVE SLIDING ROOF HOUSING

(a) Disconnect the 4 drain hoses from the housing.

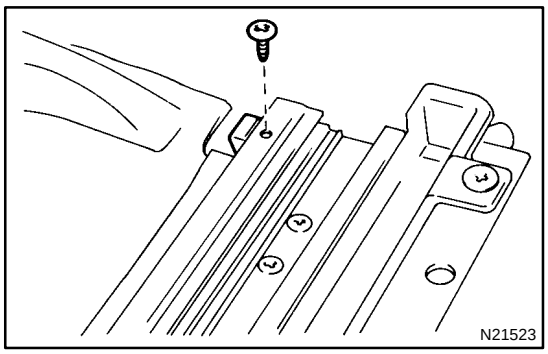
(b) Disengage the wire harness clamps.

(c) Remove the 6 nuts, then remove the housing as shown in the illustration.
Torque: 5.5 N·m (56 kgf·cm, 49 in.·lbf)



BO0M4-06

DISASSEMBLY

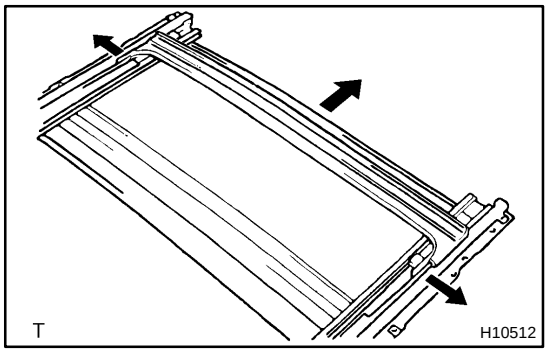


1. REMOVE GUIDE RAIL STOPPER

(a) Remove the screw and stopper.

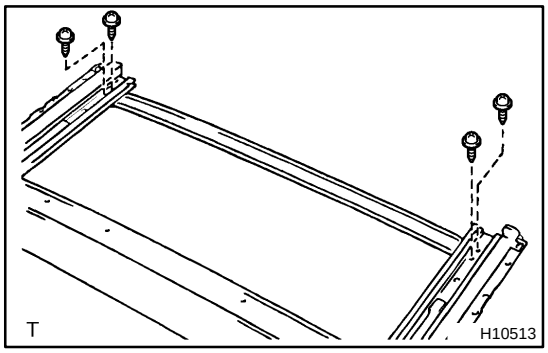
(b) Employ the same manner described above to the other side.

2. REMOVE SUNSHADE TRIM



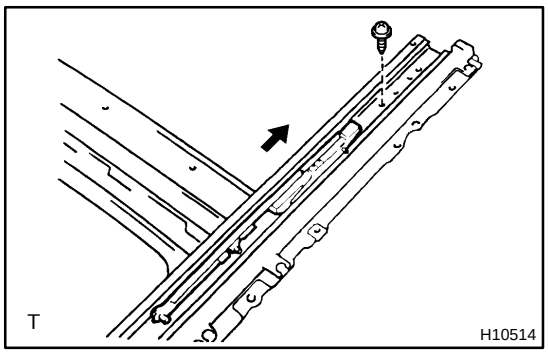
3. REMOVE REAR ROOF DRIP CHANNEL

Remove the rear roof drip channel as shown in the illustration.



4. REMOVE REAR FRAME

Remove the 4 screws and rear frame.

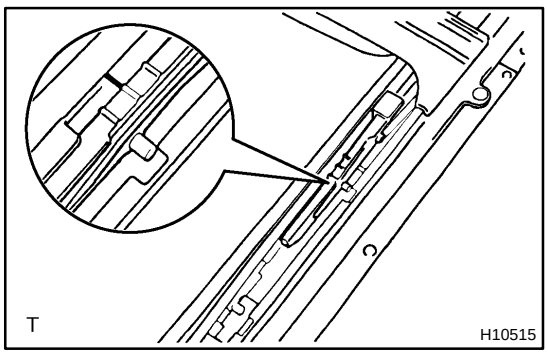


5. REMOVE DRIVE CABLE

(a) Remove the screw and sliding roof panel stopper.

(b) Slide the drive cable rearward, then remove it.

(c) Employ the same manner described above to the other side.

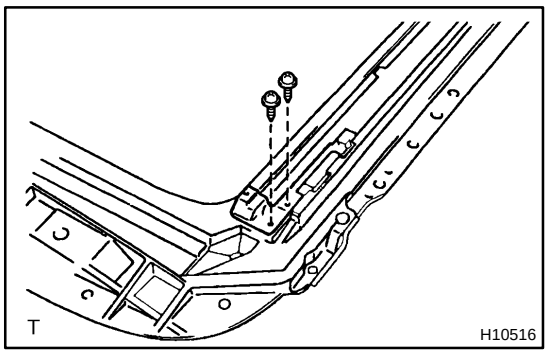


HINT:

At the time of reassembly, please refer to the following items.

- Adjust the drive cable at the closed and tilted position.
- Slide the cable forward or backward to align the 2 marks as shown in the illustration.
- Slide the cable to the forefront with fingers.

6. REMOVE ROOF WIND DEFLECTOR PANEL

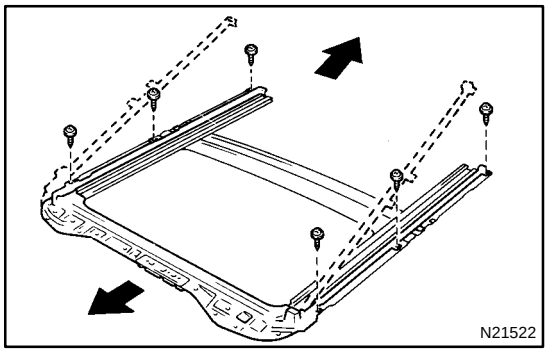


7. REMOVE GUIDE BLOCK

(a) Remove the 2 screws and guide block.

(b) Employ the same manner described above to the other side.

8. REMOVE CUSHIONS

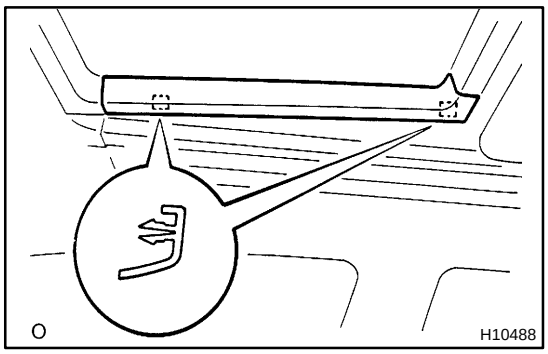


9. REMOVE SLIDING ROOF HOUSING

Remove the 6 screws and sliding roof housing.

BO0M5-05

ADJUSTMENT



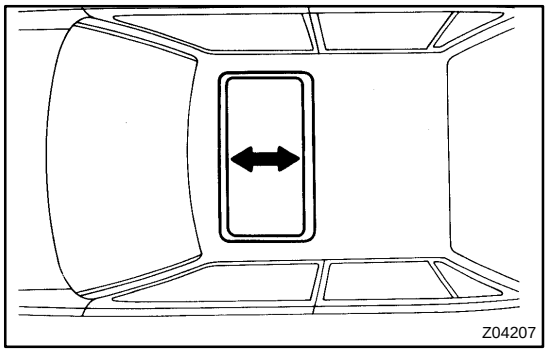
1. REMOVE SIDE GARNISH

HINT:

- Tape the screwdriver tip before use.
- After adjustment, reinstall the side garnishes.

(a) Before making adjustments, using a screwdriver, remove the side garnish.

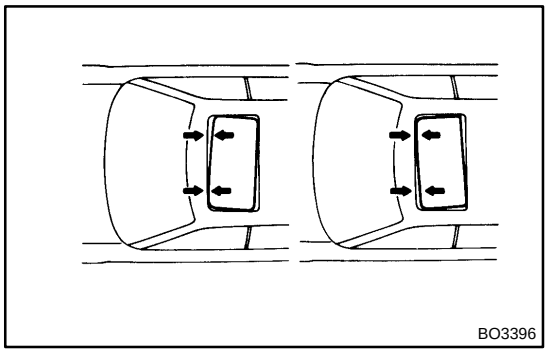
(b) Employ the same manner described above to the other side.



2. TO ADJUST FORWARD OR REARWARD

(a) Loosen the sliding roof glass installation nuts.

(b) Adjust the sliding roof glass forward and rearward.

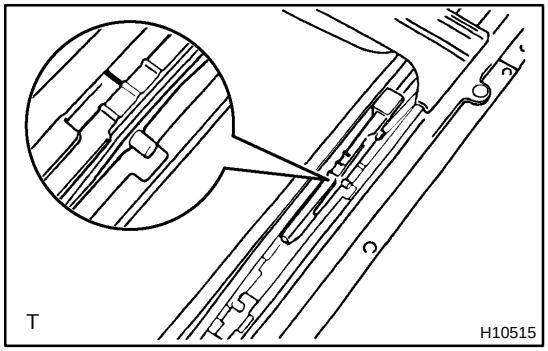


3. TO ADJUST CLEARANCE
(Difference in left and right clearance)

(a) When the front or rear alignment is not correct, remove the drive gear and sliding roof glass, then adjust the drive rail.

NOTICE:

Remove the drive gear with sliding roof fully closed.



(b) Adjust by sliding the cable forward or rearward to align the 2 marks as shown in the illustration.

(c) Install the drive gear and sliding roof glass.

BO22O-03

REASSEMBLY

The reassembly procedures are the disassembly procedures in reverse order (See page BO-130).

BO0M7-04

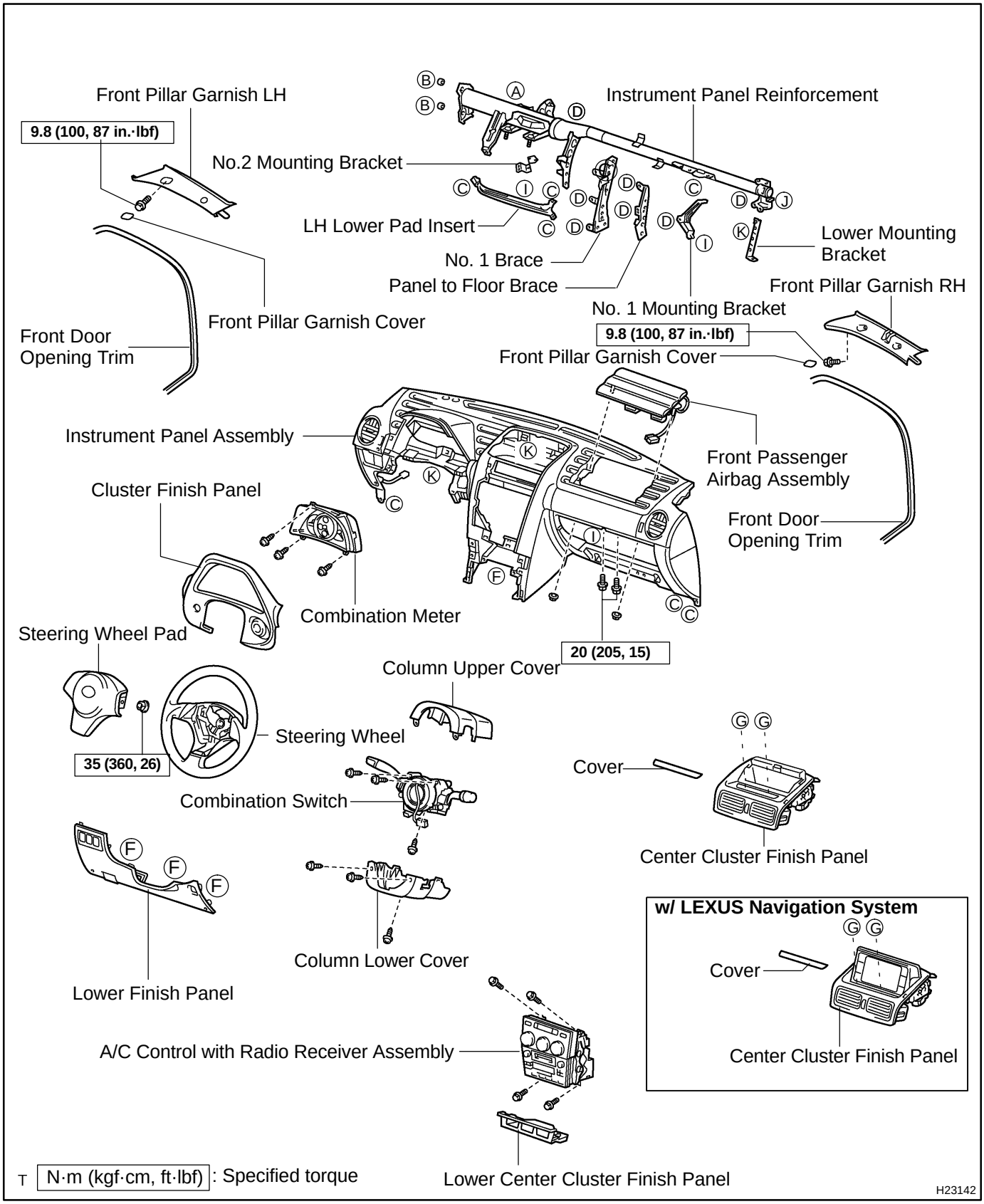
INSTALLATION

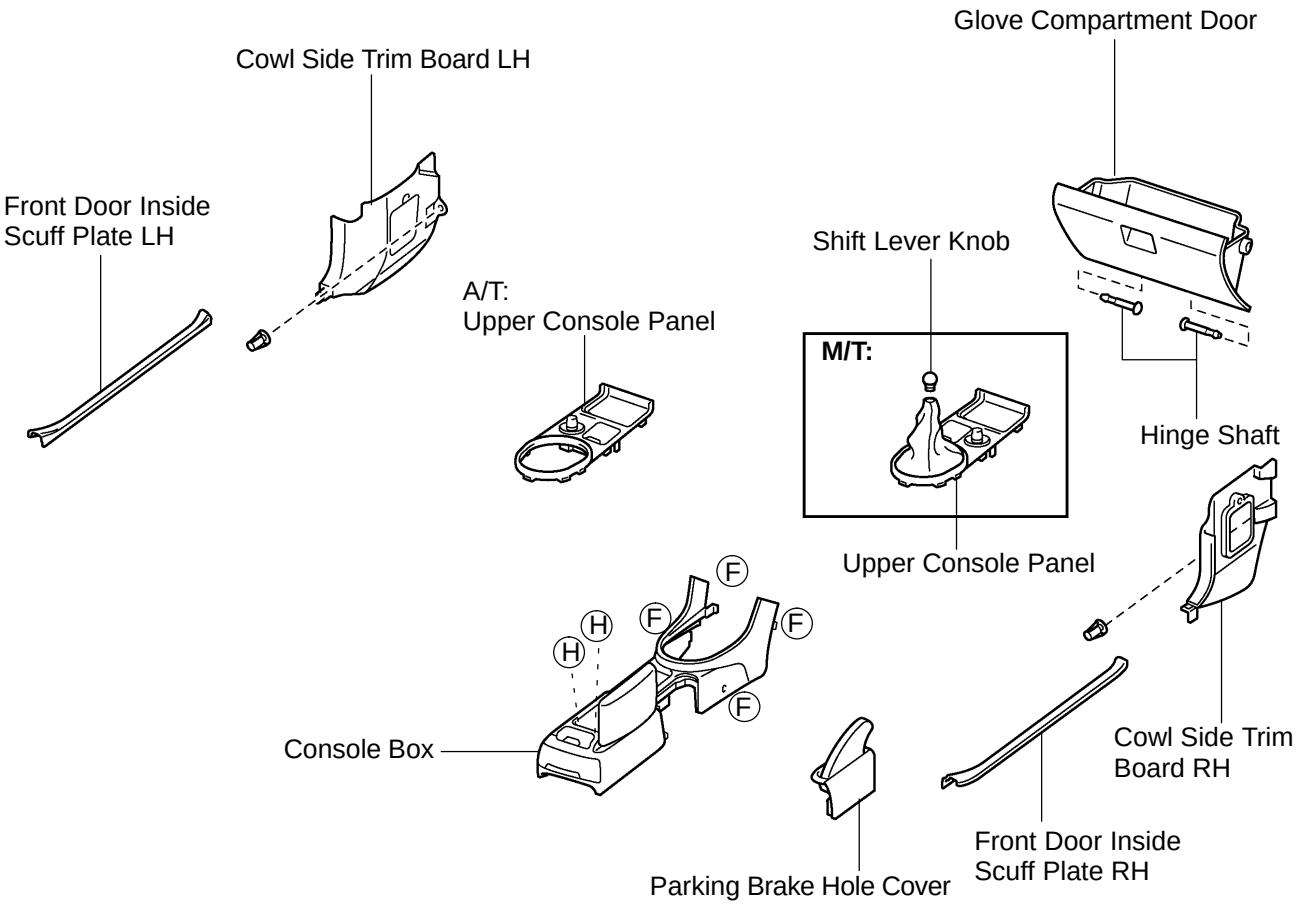
The installation procedures are the removal procedures in reverse order (See page BO-128).

INSTRUMENT PANEL

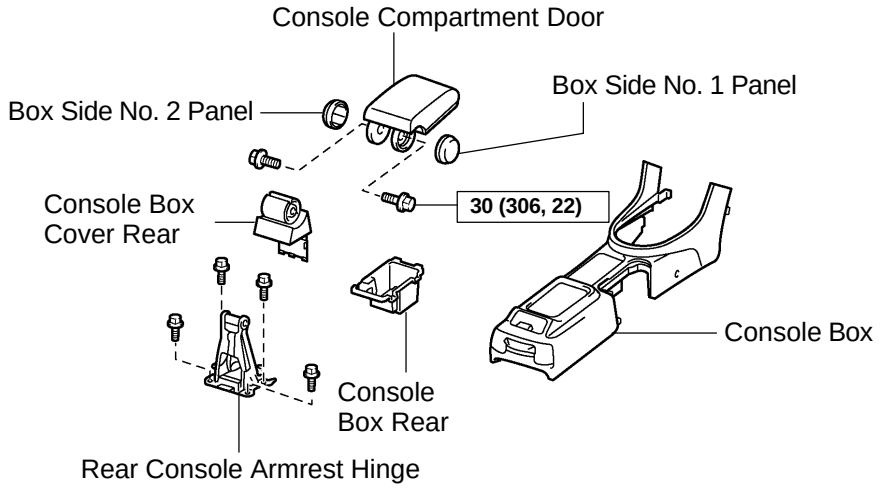
COMPONENTS

BO4DS-03



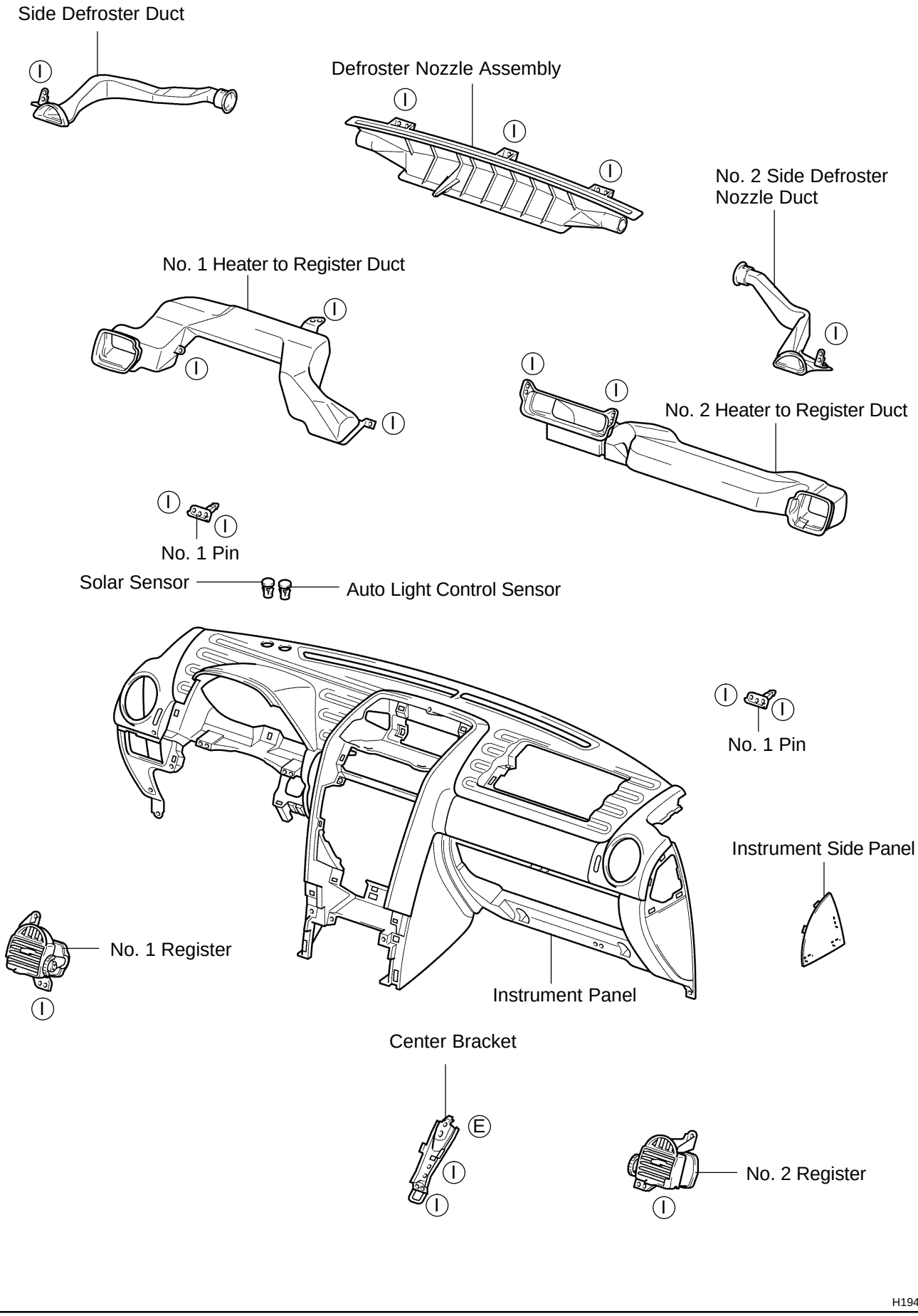


w/ Armrest



T N·m (kgf·cm, ft·lbf) : Specified torque

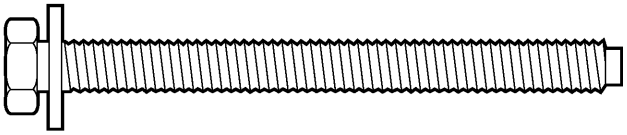
H22779

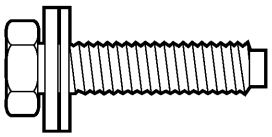
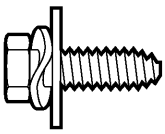

Side Defroster Duct
Defroster Nozzle Assembly
No. 2 Side Defroster Nozzle Duct
No. 1 Heater to Register Duct
No. 2 Heater to Register Duct
No. 1 Pin
Solar Sensor
Auto Light Control Sensor
No. 1 Pin
Instrument Side Panel
No. 1 Register
Instrument Panel
Center Bracket
E
No. 2 Register
H19464

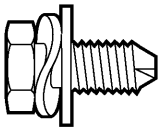
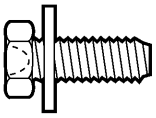
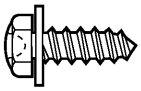
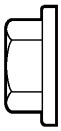
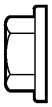
HINT:

Screw shapes and sizes are indicated in the table below. The codes (”A” - ”K”) correspond to those indicated on the previous pages.

mm (in.)

code	Shape	Size
Ⓐ		ø = 8 (0.31) L = 90 (3.54)

code	Shape	Size	code	Shape	Size
Ⓑ		ø = 8 (0.31) L = 35 (1.38)	Ⓒ		ø = 6 (0.24) L = 20 (0.79)

code	Shape	Size	code	Shape	Size	code	Shape	Size
Ⓓ		ø = 8 (0.31) L = 18 (0.71)	Ⓔ		ø = 6 (0.24) L = 18 (0.71)	Ⓕ		ø = 5.22 (0.2055) L = 16 (0.63)
Ⓖ		ø = 5 (0.20) L = 16 (0.63)	Ⓗ		ø = 5 (0.20) L = 16 (0.63)	Ⓘ		ø = 5 (0.20) L = 14 (0.55)
Ⓙ		ø = 8 (0.31)	Ⓚ		ø = 6 (0.24)			

T

H11337

BO4OU-01

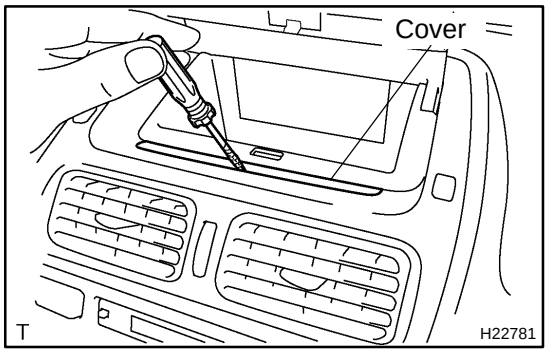
REMOVAL

CAUTION:

Work must be started more than 90 seconds after the ignition switch is turned into the "LOCK" position and the negative (-) terminal cable is disconnected from the battery. The SRS is equipped with a back-up power source. If work is started within 90 seconds from disconnecting the negative (-) terminal cable of the battery, the SRS may be deployed.

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

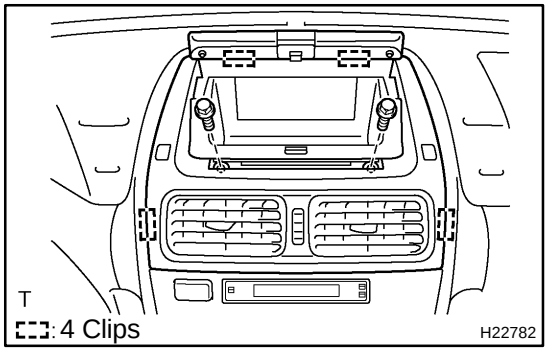


1. REMOVE CENTER CLUSTER FINISH PANEL

(a) Using a screwdriver, pry out the cover.

HINT:

Tape the screwdriver tip before use.



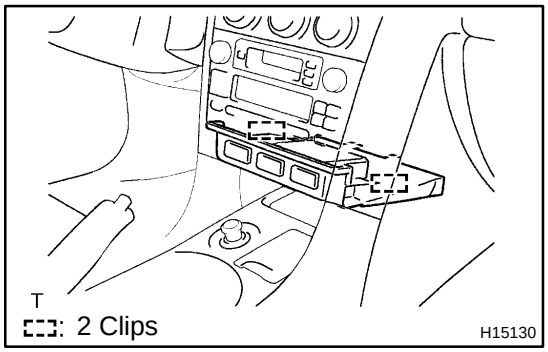
(b) Remove the 2 screws.

(c) Using a screwdriver, disengage the 4 clips and remove the center cluster finish panel.

HINT:

Tape the screwdriver tip before use.

(d) w/ LEXUS navigation system:
Disconnect the connectors.



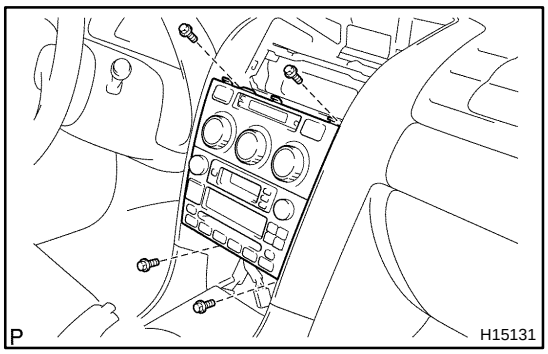
2. REMOVE LOWER CENTER CLUSTER FINISH PANEL

(a) Using a screwdriver, disengage the 2 clips and remove the lower center cluster finish panel.

HINT:

Tape the screwdriver tip before use.

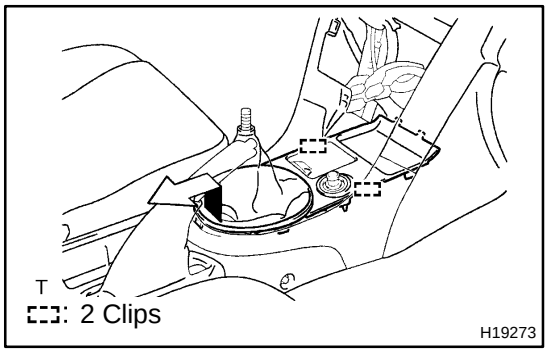
(b) Disconnect the connectors.



3. REMOVE A/C CONTROL WITH RADIO RECEIVER ASSEMBLY

(a) Remove the 4 bolts and A/C control with radio receiver assembly.

(b) Disconnect the connectors.



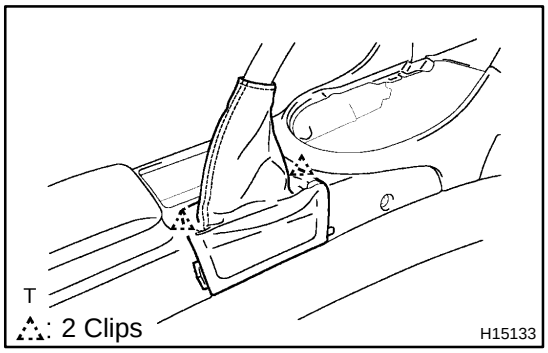
4. REMOVE UPPER CONSOLE PANEL

(a) M/T:
Remove the shift lever knob.

(b) Using a screwdriver, disengage the 2 clips and remove the upper console panel as shown in the illustration.

HINT:
Tape the screwdriver tip before use.

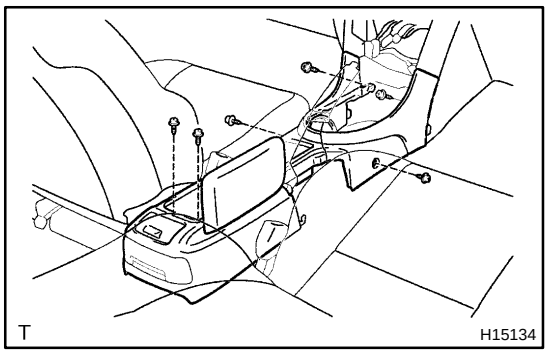
(c) Disconnect the connector.



5. REMOVE PARKING BRAKE HOLE COVER

Using a screwdriver, disengage the 2 clips and remove the parking brake hole cover.

HINT:
Tape the screwdriver tip before use.

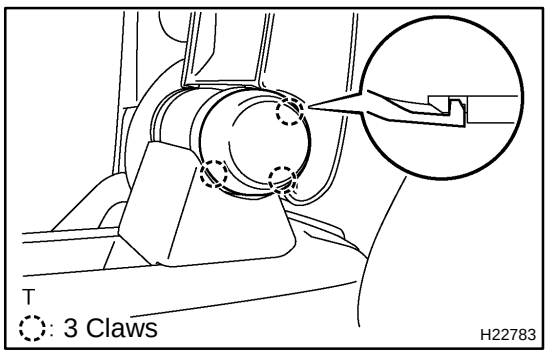


6. w/o Arm rest:
REMOVE CONSOLE BOX

(a) Remove the 6 screws.

(b) w/o LEXUS navigation system:
Pull the console box rearward to remove it.

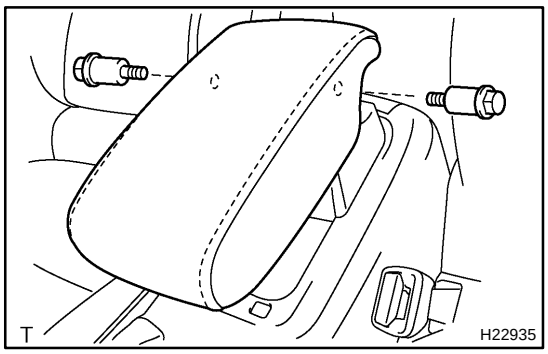
(c) w/ LEXUS navigation system:
Pull the console box rearward to remove it, then disconnect the connector.



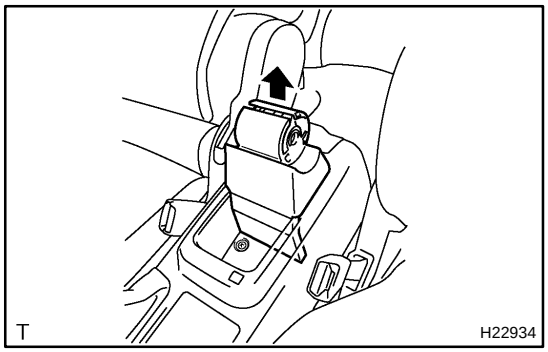
7. w/ Arm rest:
REMOVE CONSOLE BOX

(a) Using a screwdriver, disengage the 3 claws and remove the box side No. 1 and No. 2 panels.

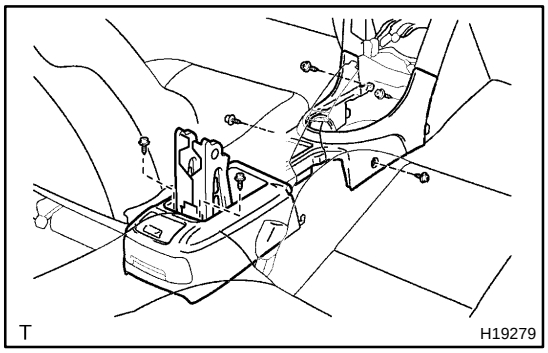
HINT:
Tape the screwdriver tip before use.



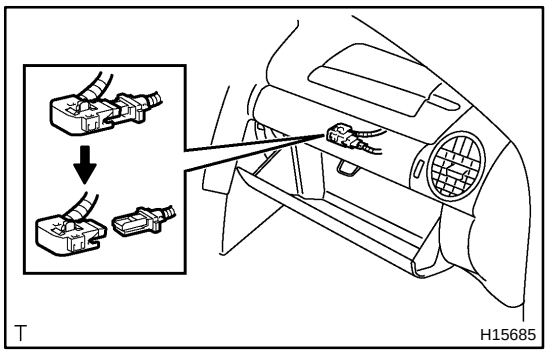
(b) Remove the 2 bolts and remove the console compartment door.
Torque:30 N·m (306 kgf·cm, 22 ft·lbf.)



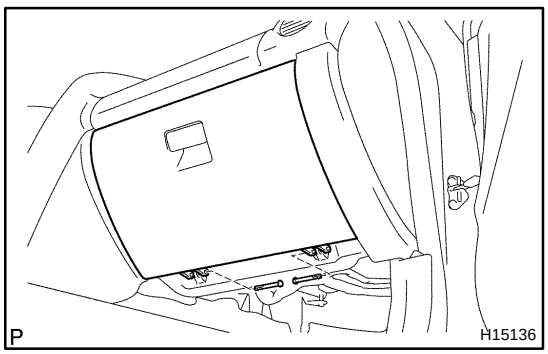
(c) Remove the console box cover rear.



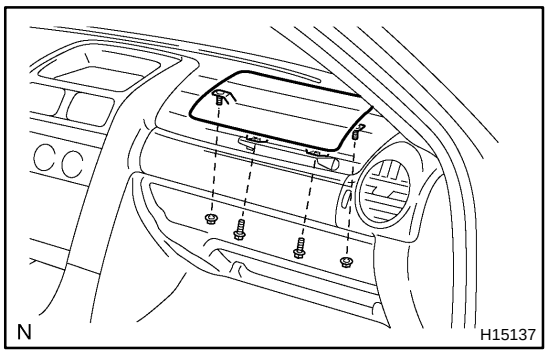
(d) Remove the 6 screws.
(e) w/o LEXUS navigation system:
Pull the console box rearward to remove it.
(f) w/ LEXUS navigation system:
Pull the console box rearward to remove it, then disconnect the connector.
(g) Remove the 4 bolts and rear console armrest hinge.



8. DISCONNECT PASSENGER AIRBAG CONNECTOR
(a) Using a clip remover, disengage the connector clamp.
(b) Disconnect the passenger airbag connector.
NOTICE:
When disconnecting the airbag connector, take care not to damage the airbag wire harness.



9. REMOVE GLOVE COMPARTMENT DOOR
Disconnect the hinge shaft and remove the glove compartment door.



10. REMOVE FRONT PASSENGER AIRBAG ASSEMBLY

Remove the 2 bolts, 2 nuts and the passenger airbag assembly from the instrument panel.

Torque:
20 N·m (205 kgf·cm, 15 ft·lbf.) for bolt
5.5 N·m (56 kgf·cm, 49 in.·lbf) for nut

CAUTION:

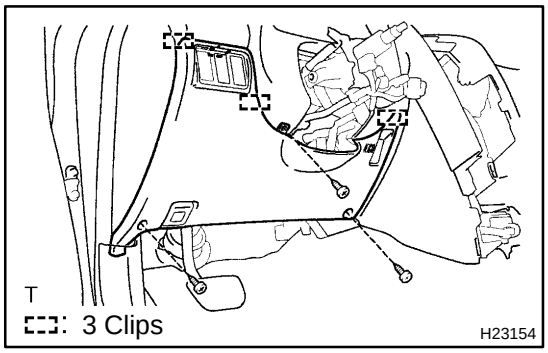
- **Do not store the front passenger airbag assembly with the airbag deployment side facing down.**
- **Never disassemble the front passenger airbag assembly.**

11. REMOVE STEERING WHEEL PAD (See page SR-13)

12. REMOVE STEERING WHEEL (See page SR-13)

13. REMOVE COLUMN UPPER AND LOWER COVERS (See page SR-13)

14. REMOVE SPIRAL CABLE (See page SR-13)



15. REMOVE LOWER FINISH PANEL

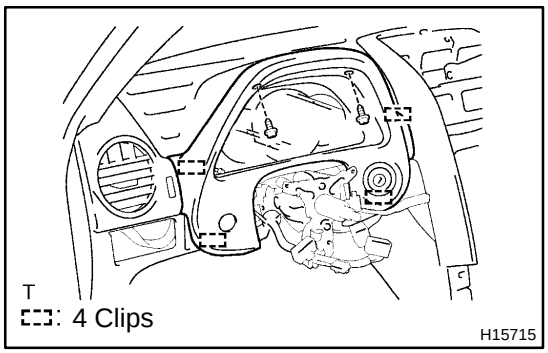
(a) Remove the 3 screws.

(b) Using a screwdriver, disengage the 3 clips and remove the lower finish panel.

HINT:

Tape the screwdriver tip before use.

(c) Disconnect the connectors and hood lock control cable.



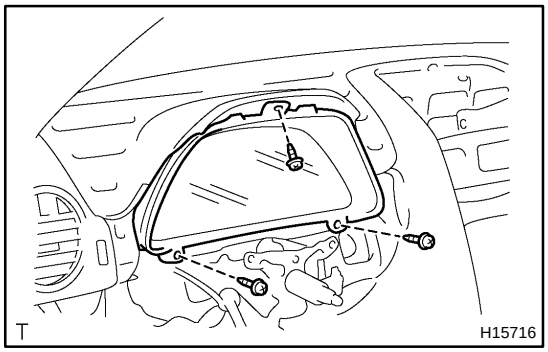
16. REMOVE CLUSTER FINISH PANEL

(a) Remove the 2 screws.

(b) Using a screwdriver, disengage the 4 clips and remove the cluster finish panel.

HINT:

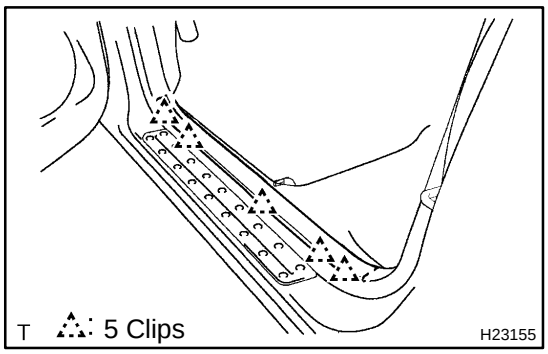
Tape the screwdriver tip before use.



17. REMOVE COMBINATION METER

(a) Remove the 3 screws and combination meter.

(b) Disconnect the connector.



18. REMOVE FRONT DOOR INSIDE SCUFF PLATE LH

(a) Using a screwdriver, disengage the 5 clips and remove the front door inside scuff plate.

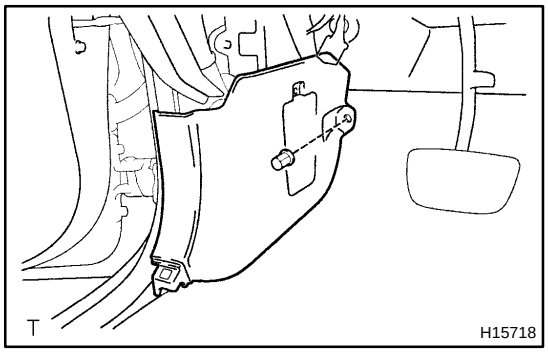
HINT:

Tape the screwdriver tip before use.

19. REMOVE FRONT DOOR INSIDE SCUFF PLATE RH

HINT:

Use the same procedures described for the LH side.



20. REMOVE COWL SIDE TRIM BOARD LH

(a) Remove the clip.

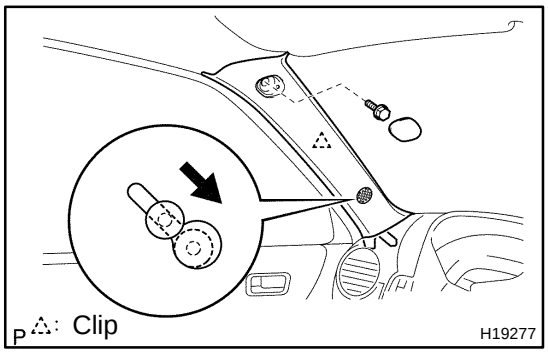
(b) Pull the cowl side trim board rearward to remove it.

21. REMOVE COWL SIDE TRIM BOARD RH

HINT:

Use the same procedures described for the LH side.

22. REMOVE FRONT PART OF FRONT DOOR OPENING TRIMS



23. REMOVE FRONT PILLAR GARNISH LH

(a) Using a screwdriver, remove the pillar garnish cover.

(b) Remove the bolt.

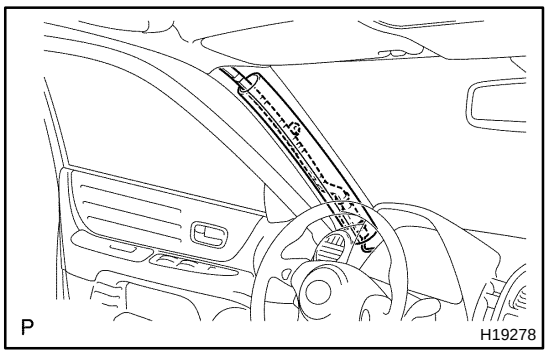
(c) Using a screwdriver, remove the pillar garnish.

HINT:

Tape the screwdriver tip before use.

(d) Remove the bolt.

Torque: 9.8 N·m (100 kgf·cm, 87in.·lbf)



(e) Cover the airbag with protective cover as shown in the illustration..

24. REMOVE FRONT PILLAR GARNISH RH

HINT:

Use the same procedures described for the LH side.

25. REMOVE INSTRUMENT PANEL

(a) Disconnect the connectors.

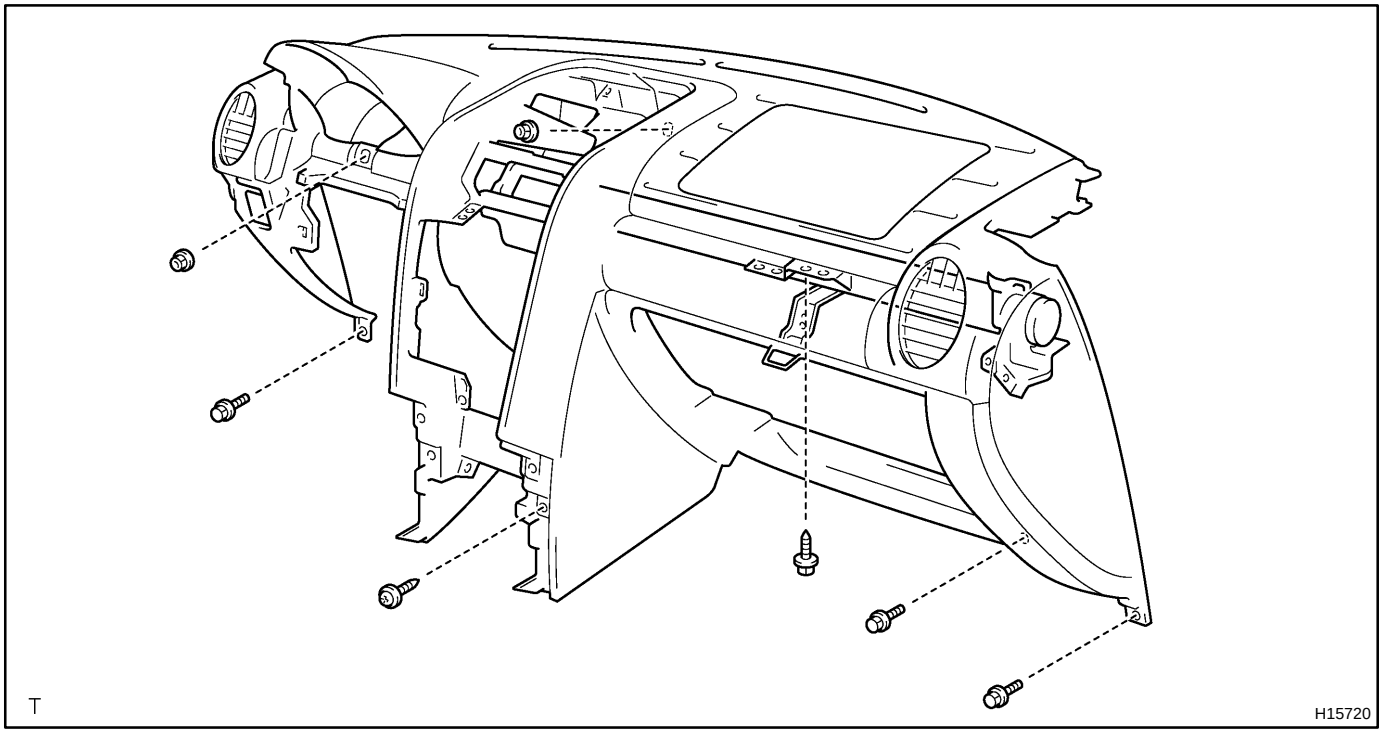
(b) Disengage the wire harness clamps.

(c) Remove the 3 bolts, 2 screws and 2 nuts.

(d) Pull the instrument panel rearward to remove it.

NOTICE:

Be careful not to damage the instrument panel and wire harness

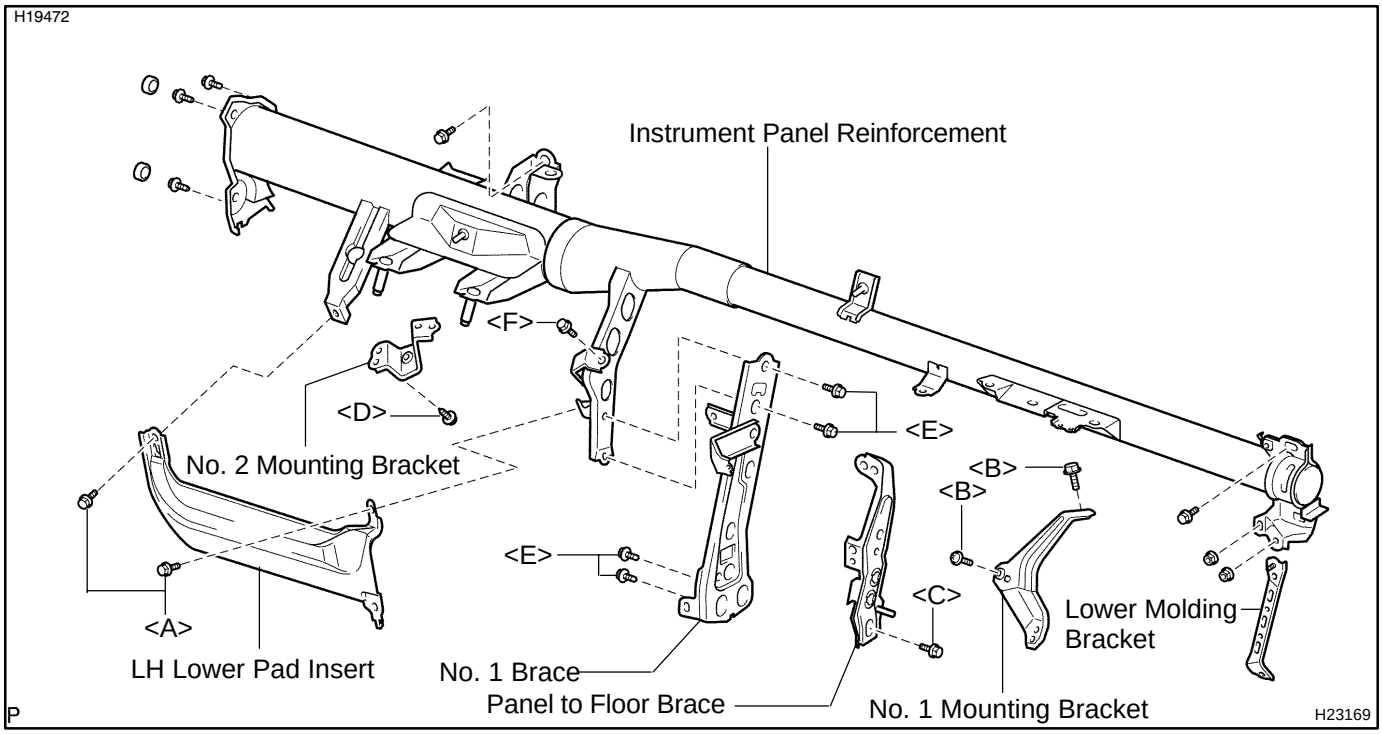


26. REMOVE INSTRUMENT PANEL REINFORCEMENT

(a) Disengage the wire harness clamps.
(b) Remove the bolt<F> and ground cable.
(c) Remove the 2 bolts <A> and LH lower pad insert.
(d) Remove the bolt<B>, screw<B> and No. 1 mounting bracket.
(e) Remove the bolt<C> and panel to floor brace.
(f) Remove the bolt<D> and No. 2 mounting bracket.
(g) Remove the 4 bolts<E> and No. 1 brace.
(h) Remove the 5 bolts, 2 nuts, instrument panel reinforcement and the lower mounting bracket.

NOTICE:

Be careful not to damage the body and wire harness.



BO2CV-04

DISASSEMBLY

1. REMOVE SIDE DEFROSTER DUCT

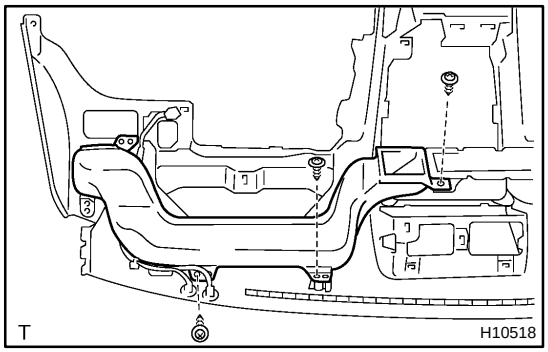
Remove the screw, then disconnect the side defroster duct as shown in the illustration.

2. REMOVE NO. 2 SIDE DEFROSTER NOZZLE DUCT

Remove the screw and side defroster nozzle duct.

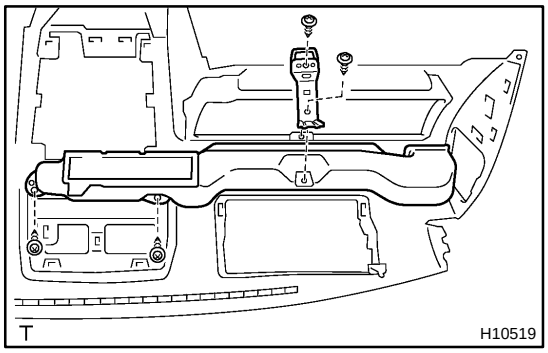
3. REMOVE DEFROSTER NOZZLE ASSEMBLY

Remove the 3 screws and defroster nozzle assembly.



4. REMOVE NO. 1 HEATER TO REGISTER DUCT

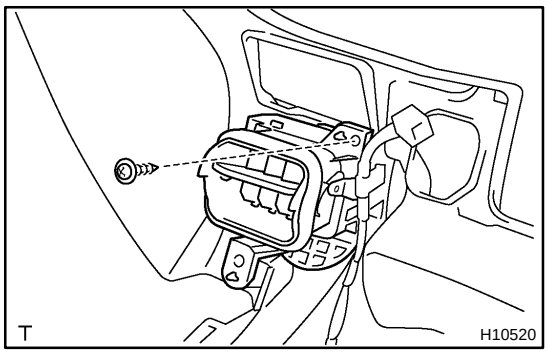
Remove the 3 screws and heater to register duct.



5. REMOVE NO. 2 HEATER TO REGISTER DUCT

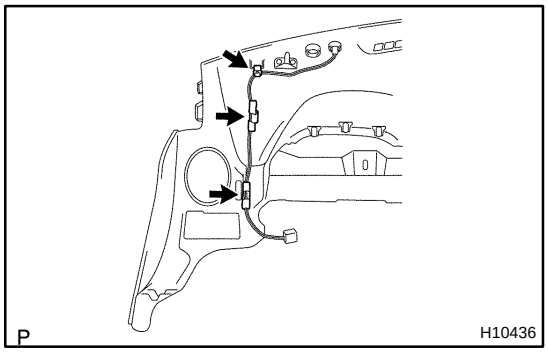
(a) Remove the 2 screws and center bracket.

(b) Remove the 2 screws and heater to register duct.



6. REMOVE NO. 1 REGISTER AND NO. 2 REGISTER

Remove the screw and register as shown in the illustration.



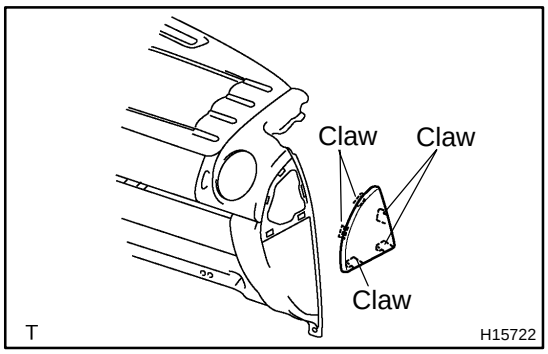
7. REMOVE NO. 2 INSTRUMENT PANEL WIRE

(a) Disconnect the connectors.

(b) Disengage the wire harness clamps and remove the instrument panel wire.

8. REMOVE SOLAR SENSOR

9. REMOVE LIGHT CONTROL SWITCH SENSOR AND HOLE COVER



10. REMOVE INSTRUMENT SIDE PANEL

Using a screwdriver, disengage the 5 claws and remove the instrument side panel.

HINT:

Tape the screwdriver tip before use.

11. REMOVE NO. 1 PINS

Remove the 4 screws and pins.

12. REMOVE INSTRUMENT PANEL END PAD

(a) Using a heat light, heat the end pad between 20 to 30˚C (68 to 86˚F).

NOTICE:

Do not heat the end pad excessively.

(b) Remove the end pad.

HINT:

When replacing the end pad, use a new pad.

BO2CX-03

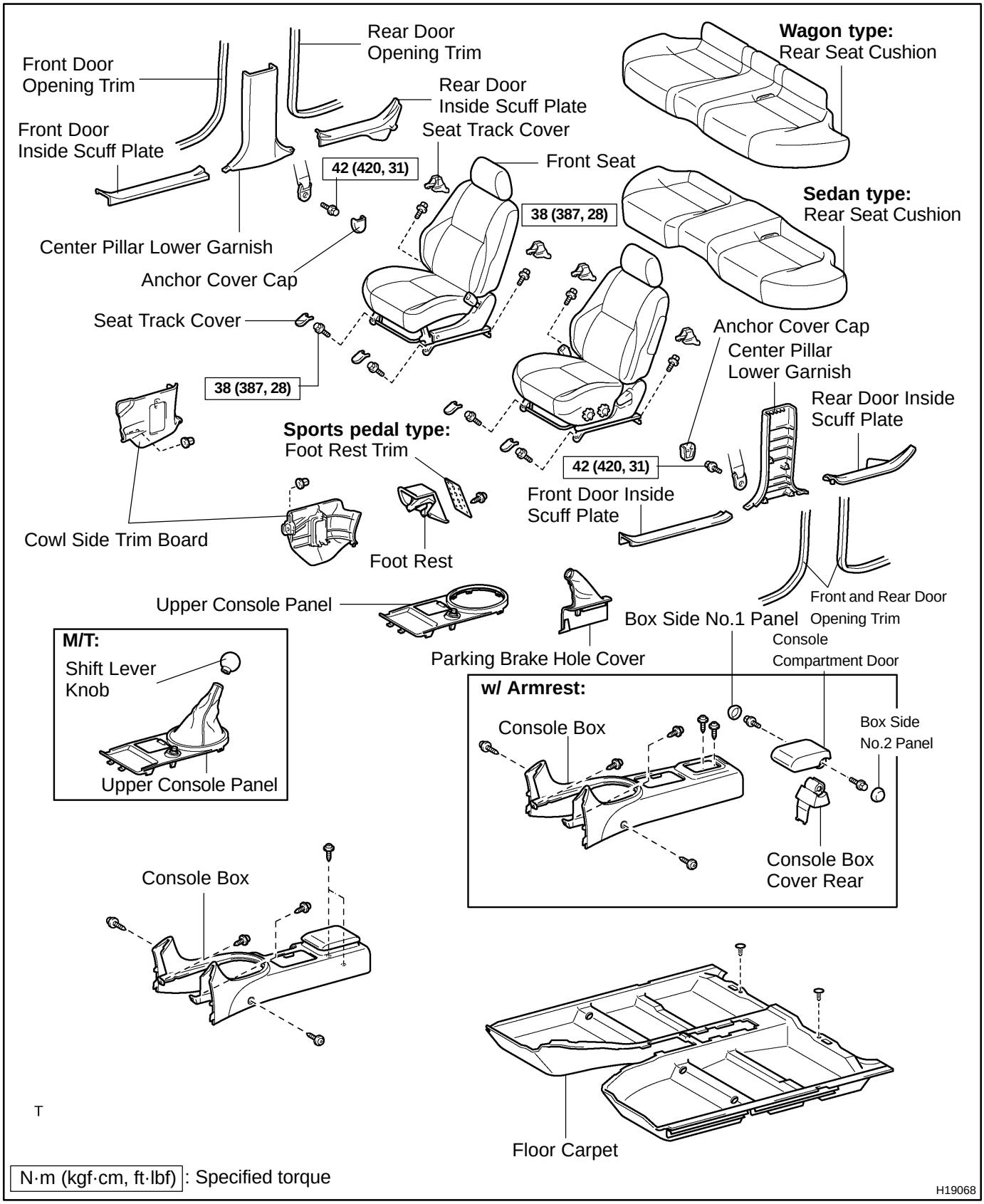
INSTALLATION

The installation procedures are the removal procedures in reverse order (see page BO-139).

FLOOR CARPET

COMPONENTS

BOOWI-10



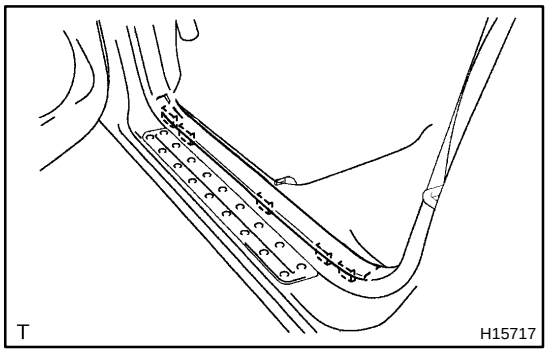
BO2CY-05

REMOVAL

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. **REMOVE FRONT SEAT**
   (See page BO-173 and BO-185)
2. **Sedan Type:**
   REMOVE REAR SEAT CUSHION (See page BO-204)
3. **Wagon Type:**
   REMOVE REAR SEAT CUSHION (See page BO-204)



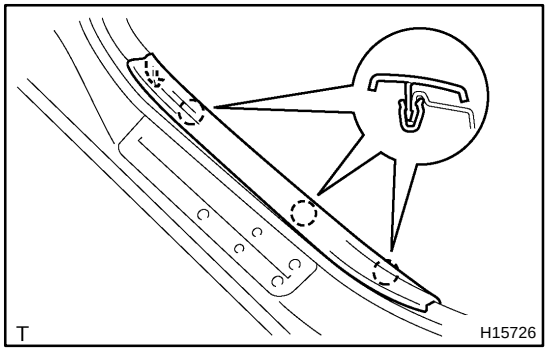
4. **REMOVE FRONT DOOR INSIDE SCUFF PLATE**

(a) Using a screwdriver, remove the front door inside scuff plate.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



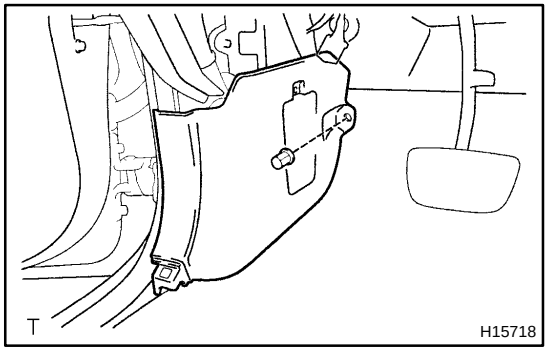
5. **REMOVE REAR DOOR INSIDE SCUFF PLATE**

(a) Using a screwdriver, remove the rear door inside scuff plate.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



6. **REMOVE COWL SIDE TRIM BOARD**

(a) Remove the clip and cowl side trim board.

(b) Employ the same manner described above to the other side.

7. **REMOVE FRONT DOOR OPENING TRIMS**
8. **REMOVE REAR DOOR OPENING TRIMS**
9. **REMOVE FRONT SEAT OUTER BELT FLOOR ANCHORS**

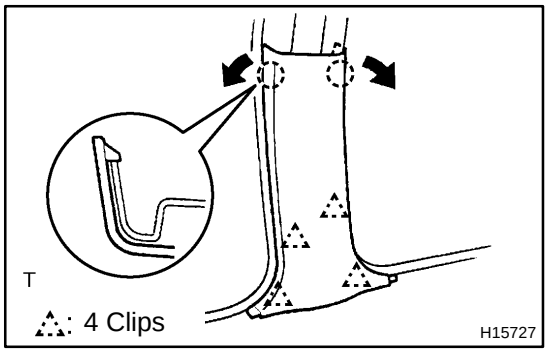
(a) Using a screwdriver, remove the floor anchor cover caps.

HINT:

Tape the screwdriver tip before use.

(b) Remove the 2 bolts and floor anchors.

Torque: 41 N·m (420 kgf·cm, 30 ft·lbf)



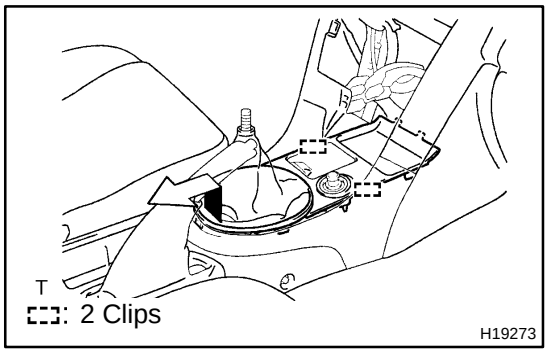
10. REMOVE CENTER PILLAR LOWER GARNISH

(a) Remove the center pillar lower garnish as shown in the illustration.

(b) Employ the same manner described above to the other side.

11. M/T:

REMOVE SHIFT LEVER KNOB



12. REMOVE UPPER CONSOLE PANEL

(a) M/T:

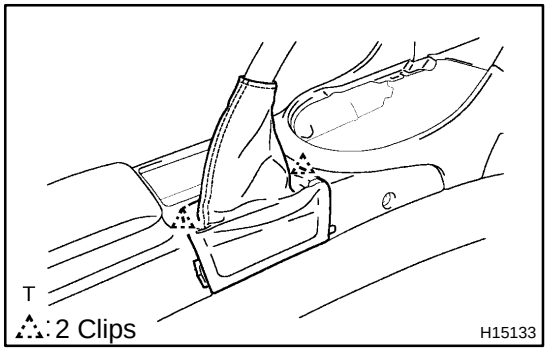
Remove the shift lever knob.

(b) Using a screwdriver, remove the upper console panel as shown in the illustration.

HINT:

Tape the screwdriver tip before use.

(c) Disconnect the connector.

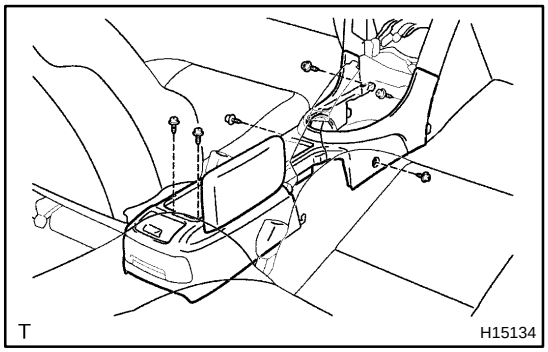


13. REMOVE PARKING BRAKE HOLE COVER

Using a screwdriver, remove the parking brake hole cover.

HINT:

Tape the screwdriver tip before use.



14. w/o Arm Rest:

REMOVE CONSOLE BOX

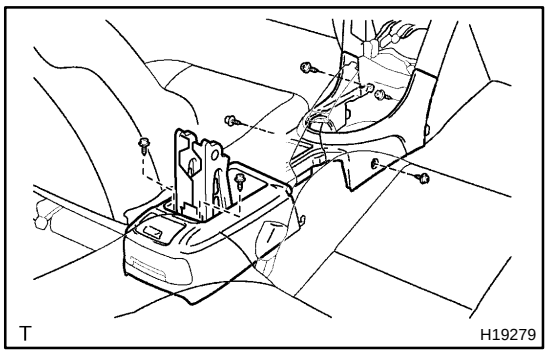
(a) Remove the 6 screws.

(b) w/o LEXUS navigation system:

Pull the console box rearward to remove it.

(c) w/ LEXUS navigation system:

Pull the console box rearward to remove it, then disconnect the connector.



15. w/ Arm Rest:
REMOVE CONSOLE BOX

(a) Using a screwdriver, remove the box side No.1 and No.2 panel.

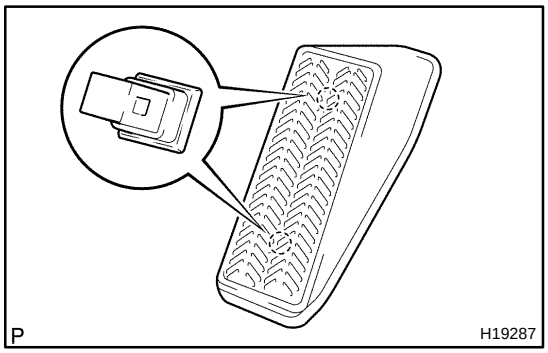
HINT:

Tape the screwdriver tip before use.

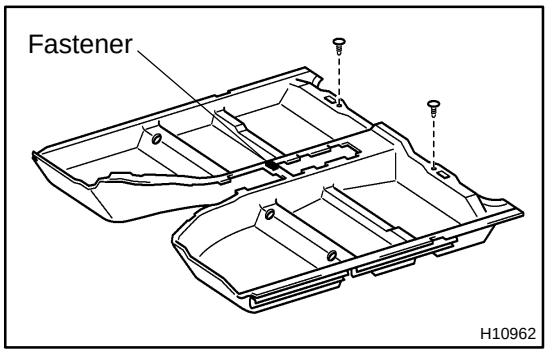
(b) Remove the 2 bolts and console compartment door.
(c) Remove the console box cover rear.
(d) Remove the 6 screws.
(e) w/o LEXUS navigation system:
Pull the console box rearward to remove it.
(f) w/ LEXUS navigation system:
Pull the console box rearward to remove it, then disconnect the connector.

16. REMOVE FOOT REST

(a) Sports pedal type:
Remove the 4 screws and foot rest trim.



(b) Using a screwdriver, remove the foot rest as shown in the illustration.



17. REMOVE FLOOR CARPET

(a) Peel off the fastener.
(b) Remove the 2 clips.
(c) Disengage the hooks and remove the floor carpet.

NOTICE:

Be careful not to pull the wire harness.

HINT:

At the time of installation, please refer to the following items.

- When installing the floor mat, pull out the wire harness and levers through the cutout of the floor carpet.
- There should be no wrinkles or folds after attaching the floor carpet.

BO0WK-03

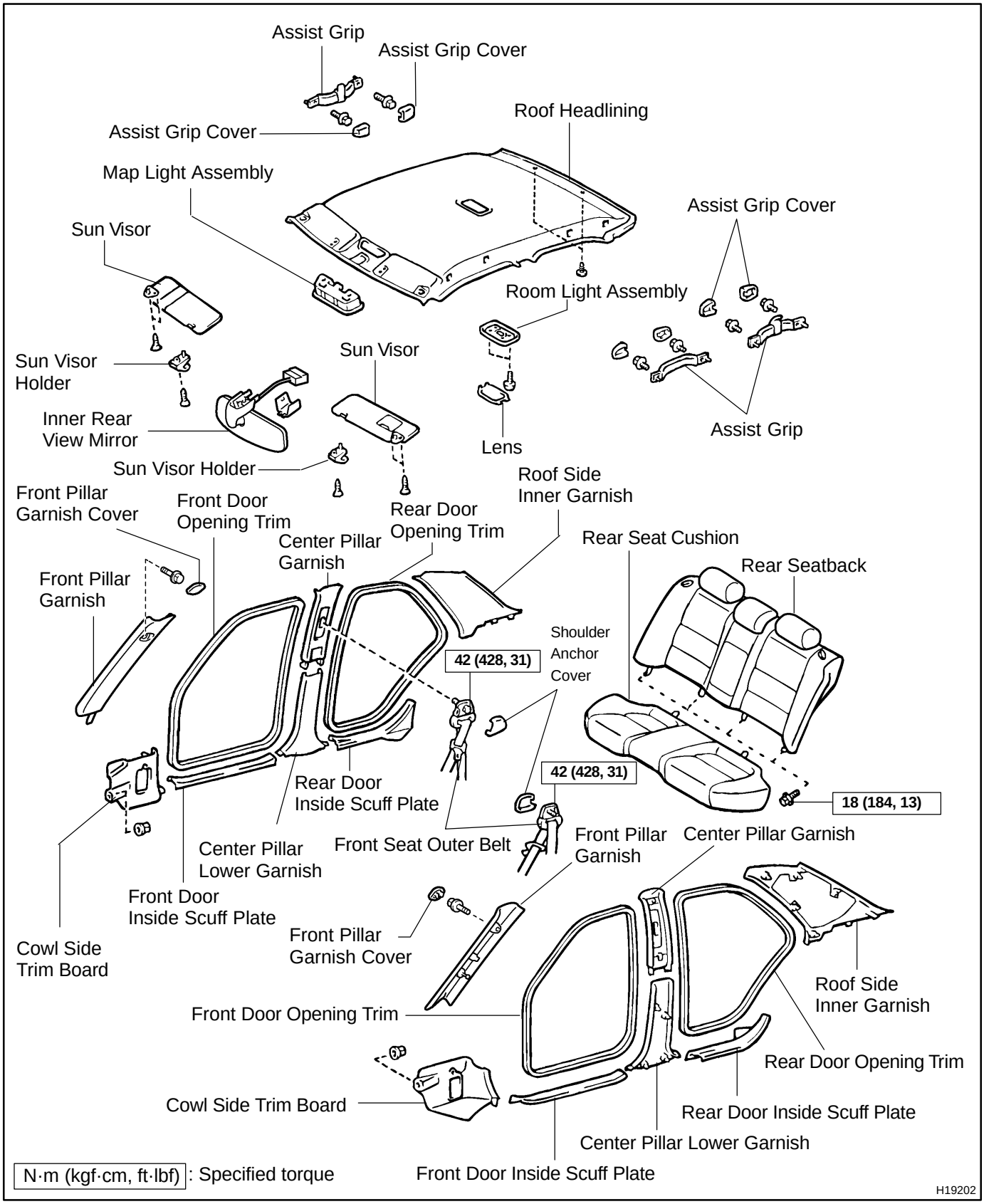
INSTALLATION

The installation procedures are the removal procedures in reverse order (See page BO-151).

ROOF HEADLINING (Sedan)

BO4DU-02

COMPONENTS



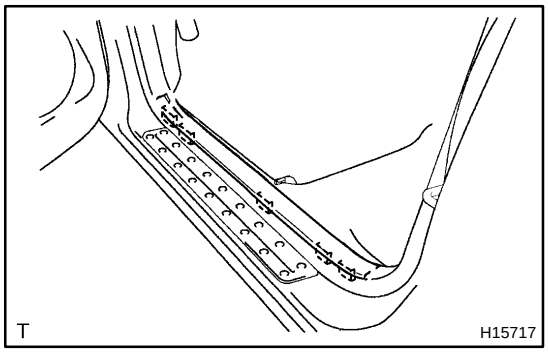
BO4DV-02

REMOVAL

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. **REMOVE REAR SEAT CUSHION (See page BO-196)**
2. **REMOVE REAR SEATBACK (See page BO-196)**



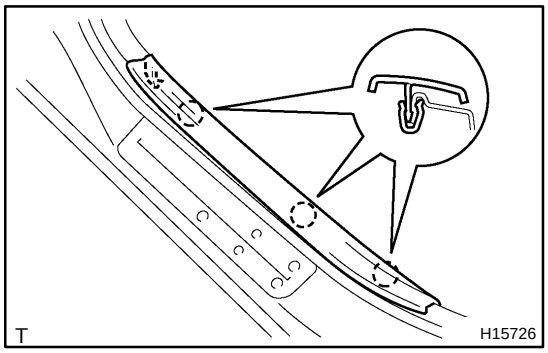
3. **REMOVE FRONT DOOR INSIDE SCUFF PLATE**

(a) Using a screwdriver, remove the front door inside scuff plate as shown in the illustration.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



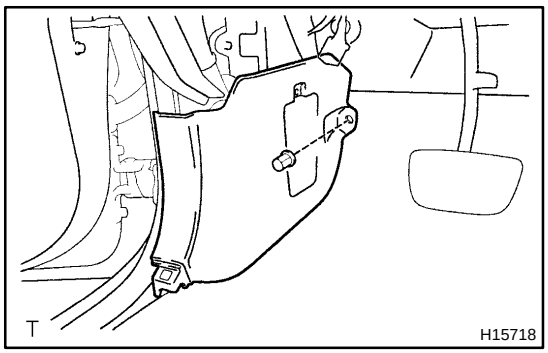
4. **REMOVE REAR DOOR INSIDE SCUFF PLATE**

(a) Using a screwdriver, remove the rear door inside scuff plate as shown in the illustration.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

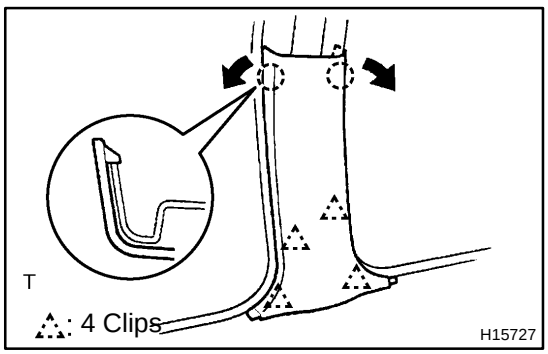


5. **REMOVE COWL SIDE TRIM BOARD**

(a) Remove the clip and cowl side trim board.

(b) Employ the same manner described above to the other side.

6. **REMOVE FRONT DOOR OPENING TRIMS**
7. **REMOVE REAR DOOR OPENING TRIMS**



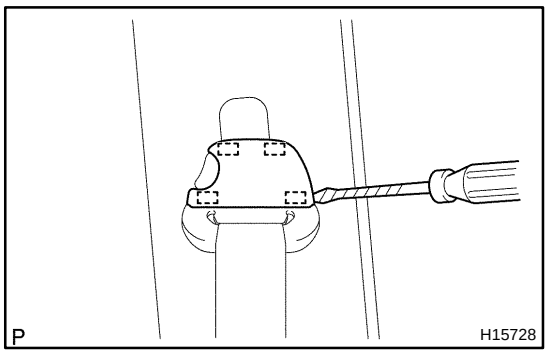
8. **REMOVE CENTER PILLAR LOWER GARNISH**

(a) Using a screwdriver, remove the center pillar lower garnish.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



9. REMOVE FRONT SEAT OUTER BELT SHOULDER ANCHOR

(a) Using a screwdriver, remove the anchor cap.

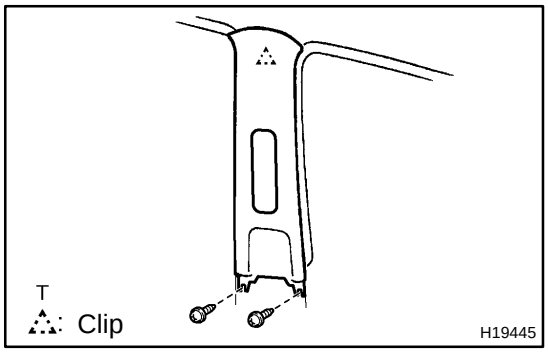
HINT:

Tape the screwdriver tip before use.

(b) Remove the bolt and front seat outer belt shoulder anchor.

Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

(c) Employ the same manner described above to the other side.



10. REMOVE CENTER PILLAR GARNISH

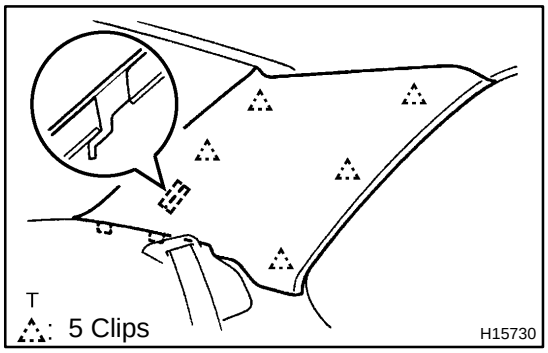
(a) Remove the 2 screws.

(b) Using a screwdriver, remove the center pillar garnish.

HINT:

Tape the screwdriver tip before use.

(c) Employ the same manner described above to the other side.



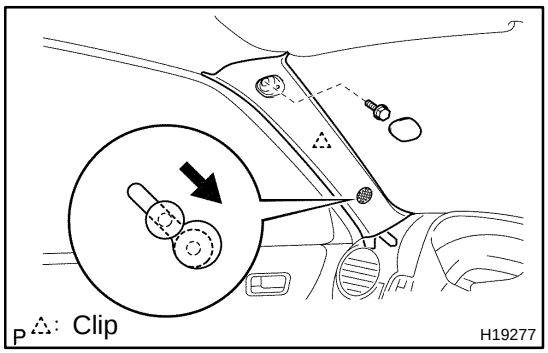
11. REMOVE ROOF SIDE INNER GARNISH

(a) Using a screwdriver, remove the roof side inner garnish.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



12. REMOVE FRONT PILLAR GARNISH

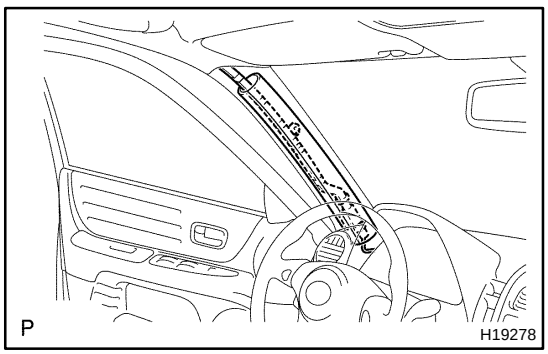
(a) Using a screwdriver, remove the front pillar garnish cover.

HINT:

Tape the screwdriver tip before use.

(b) Remove the bolt.

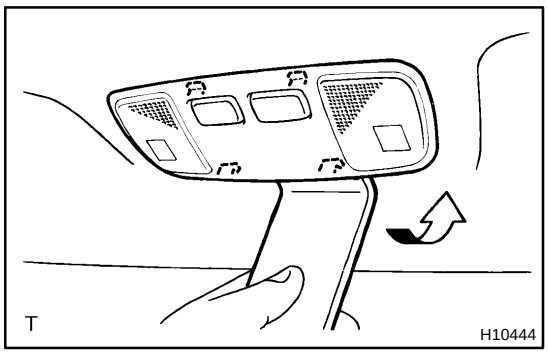
(c) Using a screwdriver, remove the front pillar garnish.



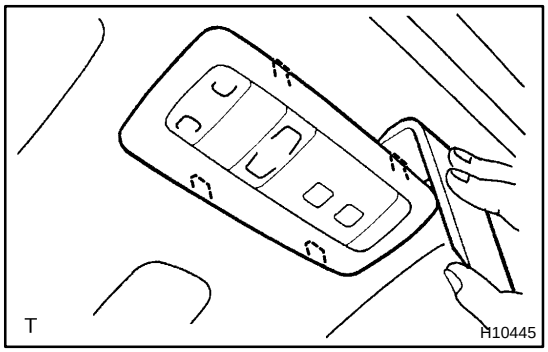
(d) Remove the bolt.

(e) Pack the airbag with protection cover.

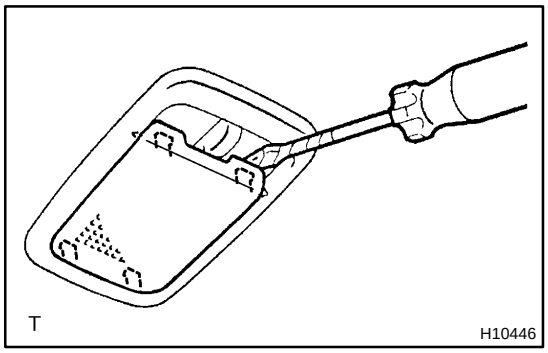
(f) Employ the same manner described above to the other side.



13. w/o Sliding roof:
REMOVE MAP LIGHT ASSEMBLY
(a) Using a moulding remover, remove the lens.
(b) Remove the 2 screws and the map light assembly.
(c) Disconnect the connector.

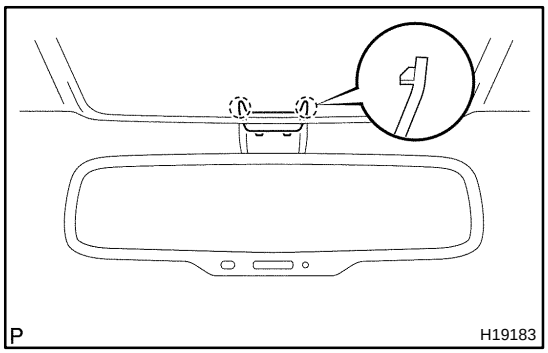


14. w/ Sliding roof:
REMOVE MAP LIGHT ASSEMBLY
(a) Using a moulding remover, remove the cover.
(b) Remove the 2 screws and the the map light assembly.
(c) Disconnect the connector.

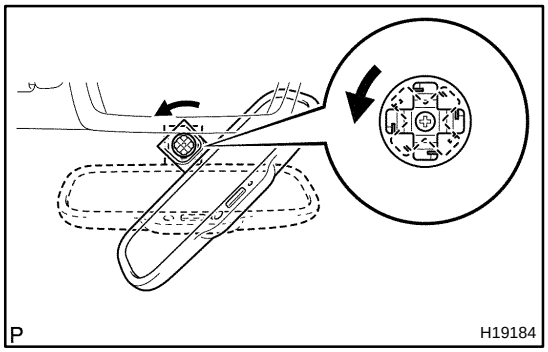


15. REMOVE ROOM LIGHT ASSEMBLY
(a) Using a screwdriver, remove the lens.
HINT:
Tape the screwdriver tip before use.
(b) Remove the 2 screws and the room light assembly.
(c) Disconnect the connector.

16. w/ Sliding roof:
REMOVE ROOF OPENING TRIM



17. REMOVE INNER REAR VIEW MIRROR
(a) Using a screwdriver, remove the inner rear view mirror stay holder cover.
HINT:
Tape the screwdriver tip before use.



(b) Electro chromic inner mirror:
Disconnect the connector.
(c) Remove the mirror assembly by turning the stay part of the mirror counterclockwise.

18. REMOVE ASSIST GRIPS
(a) Using a screwdriver, remove the caps.
HINT:
Tape the screwdriver tip before use.
(b) Remove the 6 bolts and 3 assist grips.

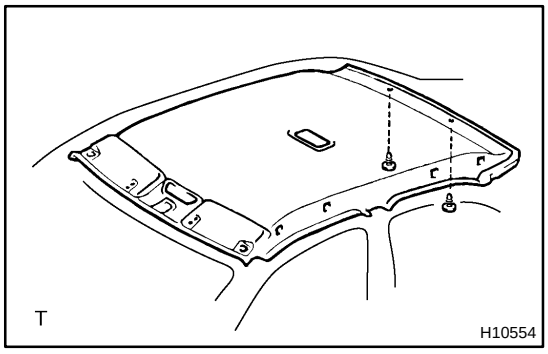
19. REMOVE SUN VISORS

(a) Remove the 4 screws and pull the sun visors downward.

(b) Disconnect the connectors.

20. REMOVE SUN VISOR HOLDERS

Remove the 2 screws and 2 holders.



21. REMOVE ROOF HEADLINING

(a) Remove the 2 clips.

(b) Pull the roof headlining downward to remove it.

BO4DW-02

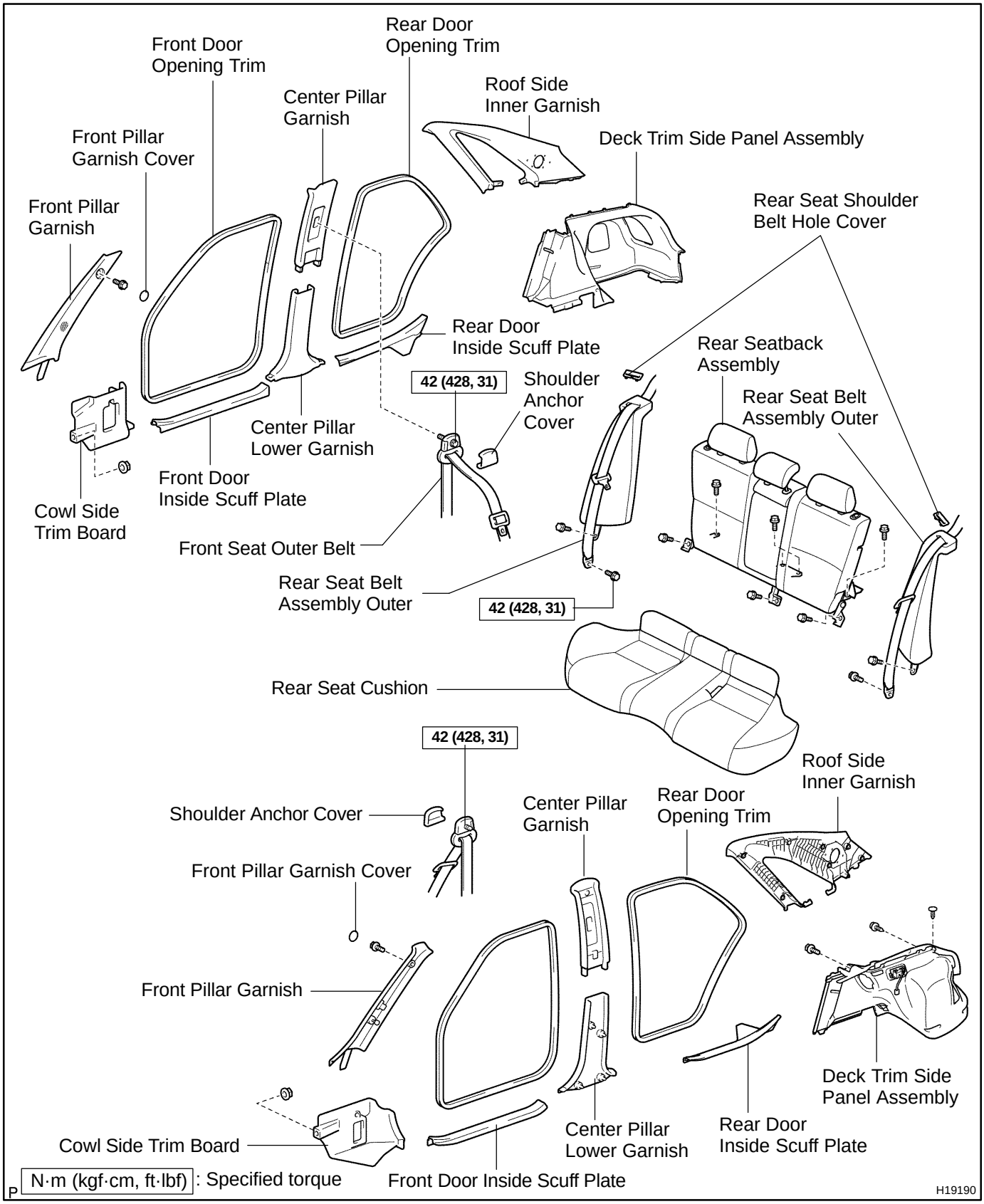
INSTALLATION

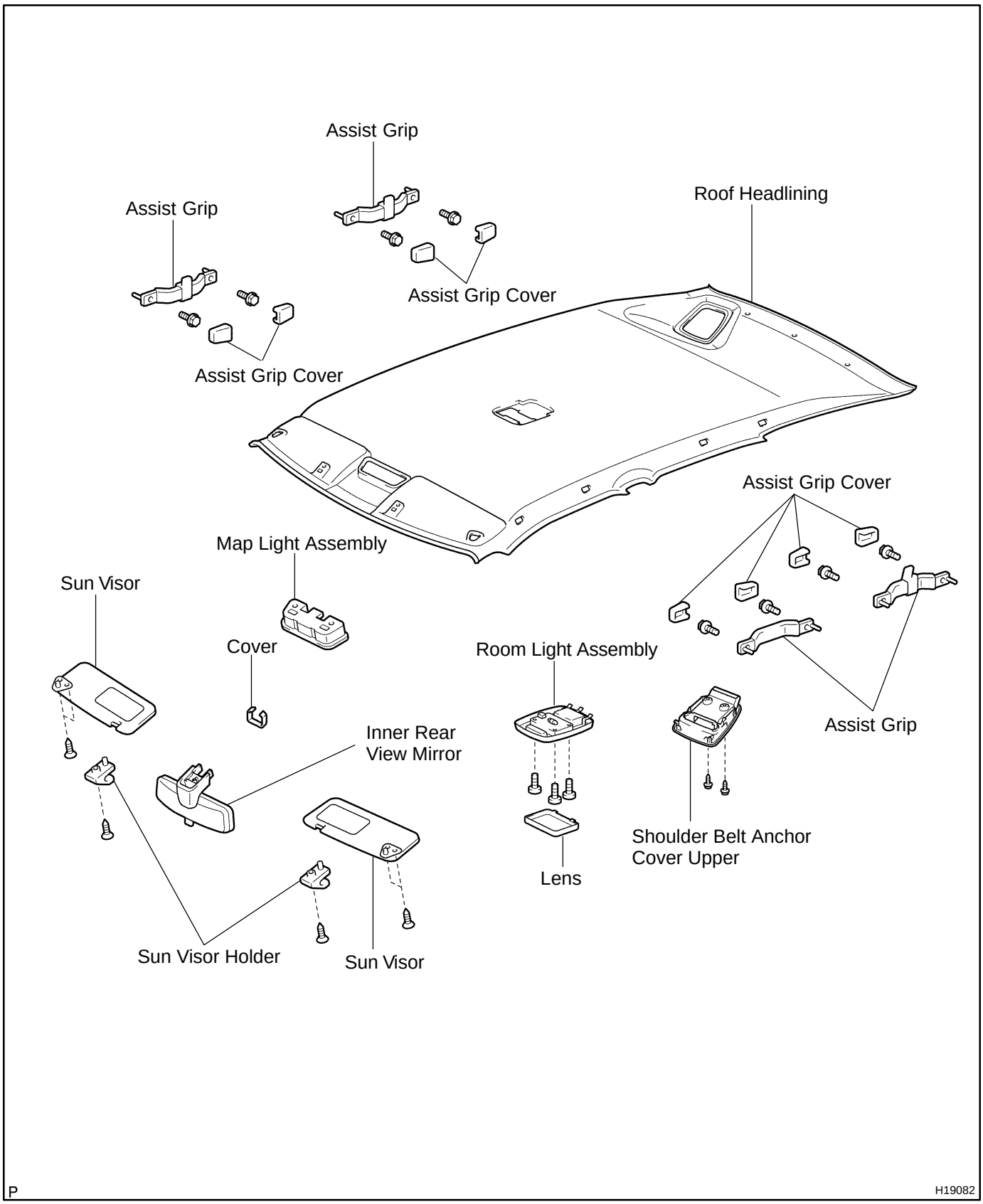
The installation procedures are the removal procedures in reverse order (See page BO-156).

ROOF HEADLINING (Wagon)

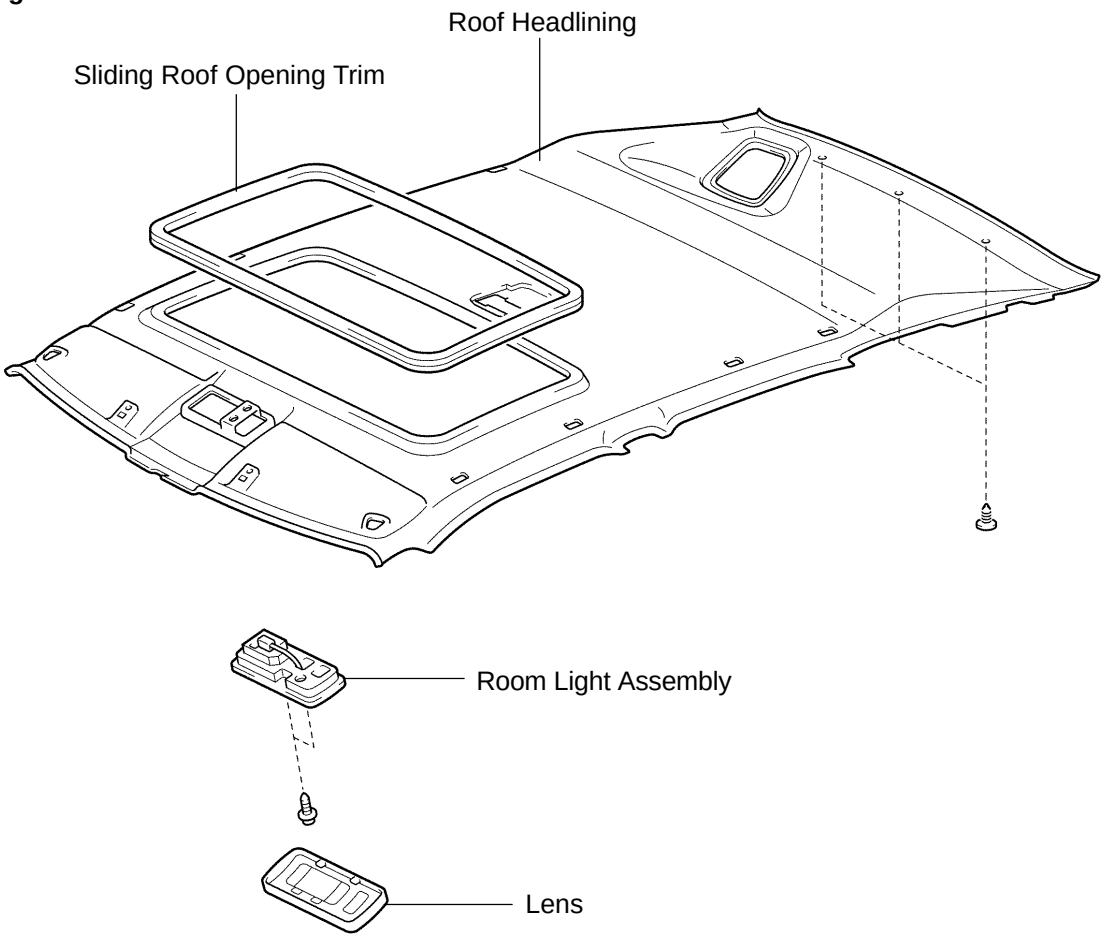
BO4DX-02

COMPONENTS




Assist Grip
Assist Grip
Assist Grip Cover
Roof Headlining
Assist Grip Cover
Assist Grip Cover
Map Light Assembly
Sun Visor
Cover
Room Light Assembly
Assist Grip
Inner Rear
View Mirror
Shoulder Belt Anchor
Cover Upper
Lens
Sun Visor Holder
Sun Visor
P
H19082

w/ Sliding Roof:



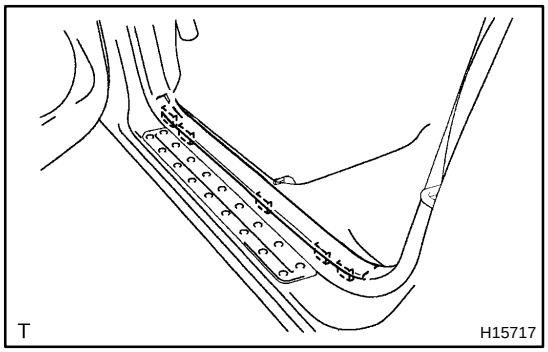
BO4DY-03

REMOVAL

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. **REMOVE REAR SEAT CUSHION (See page BO-204)**
2. **REMOVE SIDE SEATBACK ASSEMBLY(See page BO-204)**



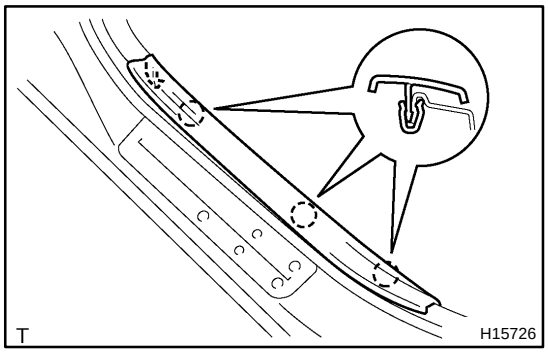
3. **REMOVE FRONT DOOR INSIDE SCUFF PLATE**

(a) Using a screwdriver, remove the front door inside scuff plate as shown in the illustration.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



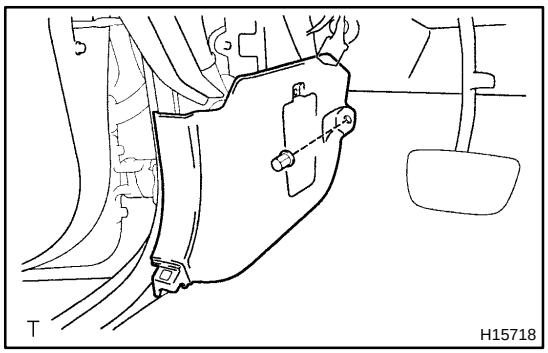
4. **REMOVE REAR DOOR INSIDE SCUFF PLATE**

(a) Using a screwdriver, remove the rear door inside scuff plate as shown in the illustration.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.

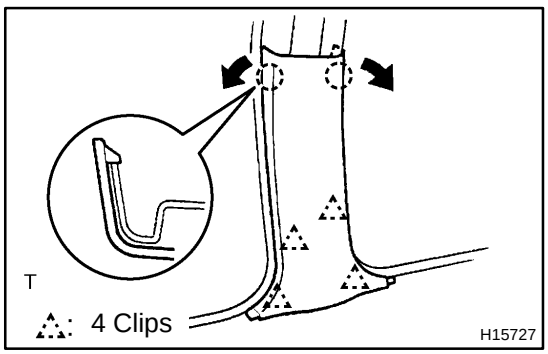


5. **REMOVE COWL SIDE TRIM BOARD**

(a) Remove the clip and cowl side trim board.

(b) Employ the same manner described above to the other side.

6. **REMOVE FRONT DOOR OPENING TRIMS**
7. **REMOVE REAR DOOR OPENING TRIMS**



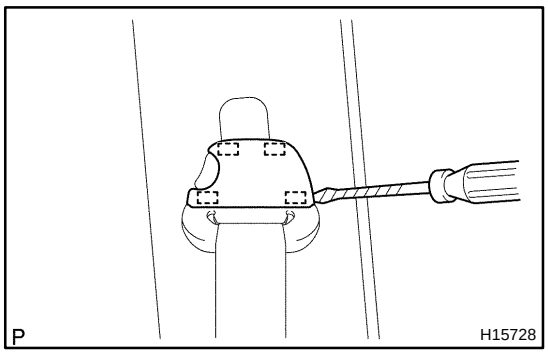
8. **REMOVE CENTER PILLAR LOWER GARNISH**

(a) Using a screwdriver, remove the center pillar lower garnish.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



9. REMOVE FRONT SEAT OUTER BELT SHOULDER ANCHOR

(a) Using a screwdriver, remove the anchor cap.

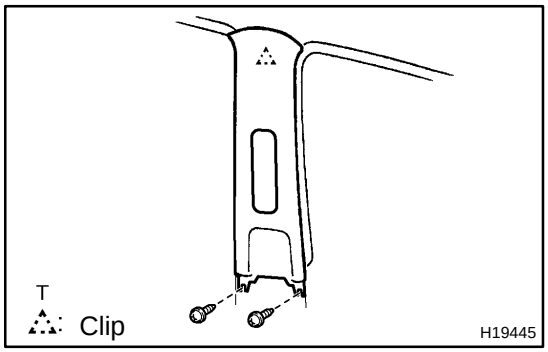
HINT:

Tape the screwdriver tip before use.

(b) Remove the bolt and front seat outer belt shoulder anchor.

Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

(c) Employ the same manner described above to the other side.



10. REMOVE CENTER PILLAR GARNISH

(a) Remove the 2 screws.

(b) Using a screwdriver, remove the center pillar garnish.

HINT:

Tape the screwdriver tip before use.

(c) Employ the same manner described above to the other side.

11. REMOVE REAR SEAT CUSHION (See page BO-204)

12. REMOVE REAR SIDE SEAT BACK (See page BO-204)

13. REMOVE REAR SEAT FLOOR BOARD NO.4

(a) Remove the seat back board carpets.

(b) Remove the 2 bolts and rear floor board No.4.

14. REMOVE DECK FLOOR BOX FRONT

(a) Remove the 2 bolts and 2 rope hook assemblies.

(b) Remove the 2 bolts and 2 tether anchor brackets.

Torque: 21 N·m (214 kgf·cm, 15ft·lbf)

(c) Remove the restraint seat tether anchor cover.

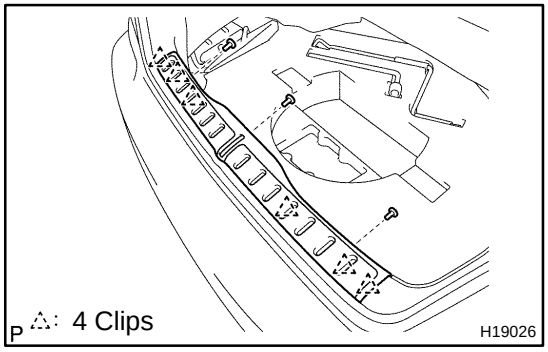
(d) Remove the deck floor box front.

15. REMOVE DECK BOARD NO.2

16. REMOVE REAR FLOOR BOARD NO.2

17. REMOVE REAR FLOOR BOARD NO.3

18. REMOVE TONNEAU COVER ASSEMBLY



19. REMOVE REAR FLOOR FINISH PLATE

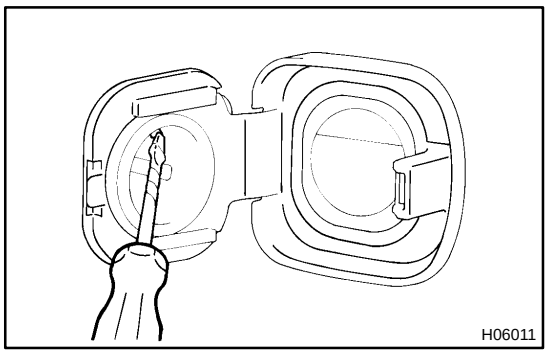
(a) Remove the 2 bolts and 2 rope hook assemblies.

(b) Remove the 3 clips.

(c) Using a screwdriver, remove the rear floor finish plate.

HINT:

Tape the screwdriver tip before use.

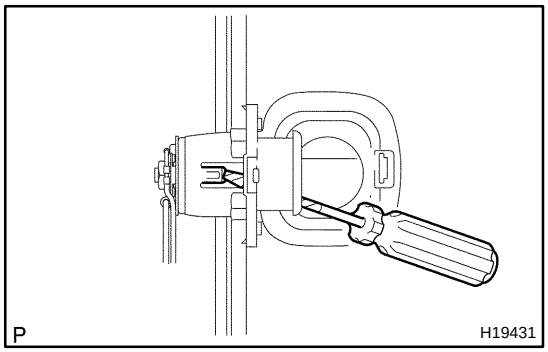


20. RH Side:
REMOVE ACCESSORY SOCKET

(a) Using a screwdriver, disengage the claw on the accessory socket cover from the hole in the accessory socket, then pull out the accessory socket approx. 10 mm (0.39 in.).

HINT:

Tape the screwdriver tip before use.



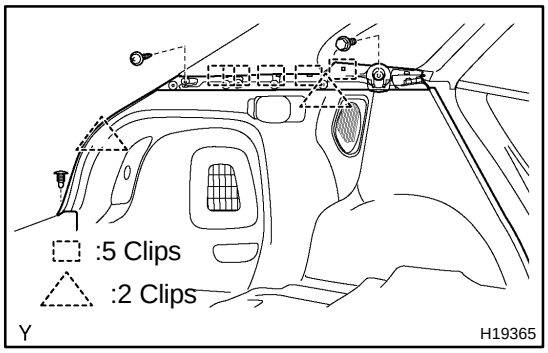
(b) Using a screwdriver, disengage the claw on the accessory socket cover from the body and remove the accessory socket and cover as a unit.

HINT:

Tape the screwdriver tip before use.

(c) Disconnect the connector.

(d) Disassemble the accessory socket from the socket cover.



21. REMOVE DECK TRIM SIDE PANEL ASSEMBLY

(a) Remove the 2 bolts and 2 floor hooks.

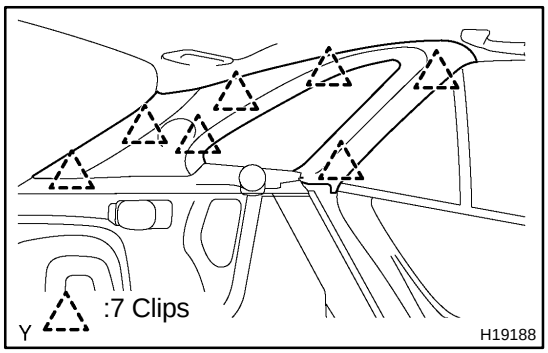
(b) Remove the screw, bolt and clip.

(c) Using a screwdriver, remove the deck trim side panel assembly then disconnect the connector.

HINT:

Tape the screwdriver tip before use.

(d) Employ the same manner described above to the other side.



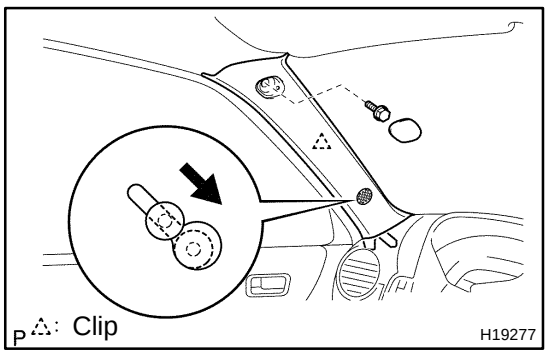
22. REMOVE ROOF SIDE INNER GARNISH

(a) Using a screwdriver, remove the roof side inner garnish.

HINT:

Tape the screwdriver tip before use.

(b) Employ the same manner described above to the other side.



23. REMOVE FRONT PILLAR GARNISH

(a) Using a screwdriver, remove the front pillar garnish cover.

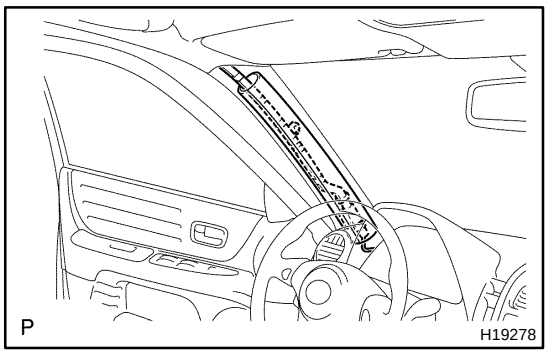
HINT:

Tape the screwdriver tip before use.

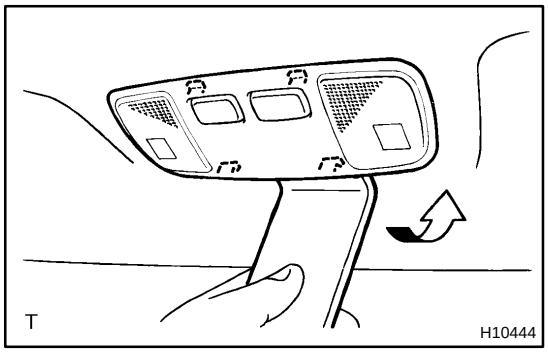
(b) Remove the bolt.

(c) Using a screwdriver, remove the front pillar garnish.

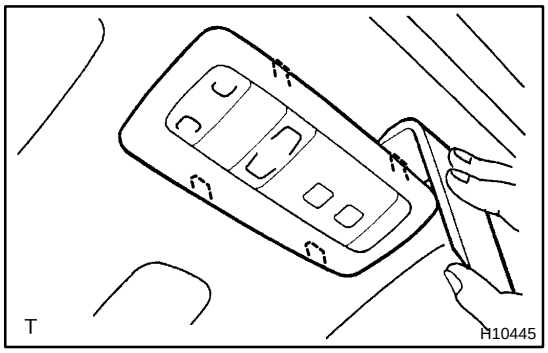
(d) Remove the bolt.



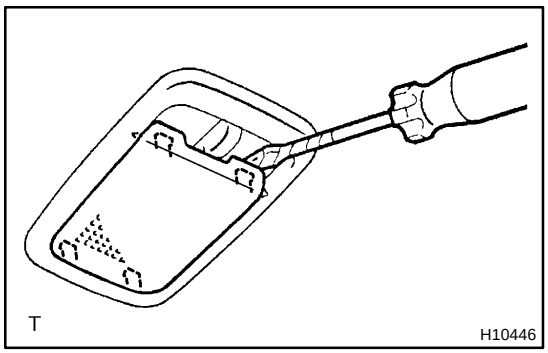
(e) Pack the airbag with protection cover.
(f) Employ the same manner described above to the other side.



24. w/o Sliding roof:
REMOVE MAP LIGHT ASSEMBLY
(a) Using a moulding remover, remove the lens.
(b) Remove the 2 screws and map light assembly.
(c) Disconnect the connector.

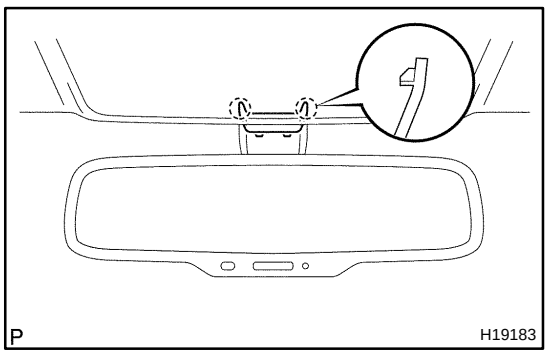


25. w/ Sliding roof:
REMOVE MAP LIGHT ASSEMBLY
(a) Using a moulding remover, remove the cover.
(b) Remove the 2 screws and map light assembly.
(c) Disconnect the connector.

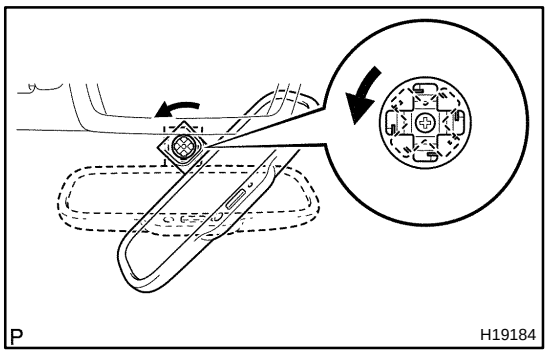


26. REMOVE ROOM LIGHT ASSEMBLY
(a) Using a screwdriver, remove the lens.
HINT:
Tape the screwdriver tip before use.
(b) Remove the 2 screws and room light assembly.
(c) Disconnect the connector.

27. w/ Sliding Roof:
REMOVE SLIDING ROOF OPENING TRIM



28. REMOVE INNER REAR VIEW MIRROR
(a) Using a screwdriver, remove the inner rear view mirror stay holder cover.
HINT:
Tape the screwdriver tip before use.



(b) Electro Chromic Inner Mirror:
Disconnect the connector.

(c) Remove the mirror assembly by turning the stay part of the mirror counterclockwise.

29. REMOVE ASSIST GRIPS

(a) Using a screwdriver, remove the caps.

HINT:

Tape the screwdriver tip before use.

(b) Remove the 6 bolts and 3 assist grips.

30. REMOVE 2 SUN VISOR

(a) Remove the 4 screws and pull the sun visors downward.

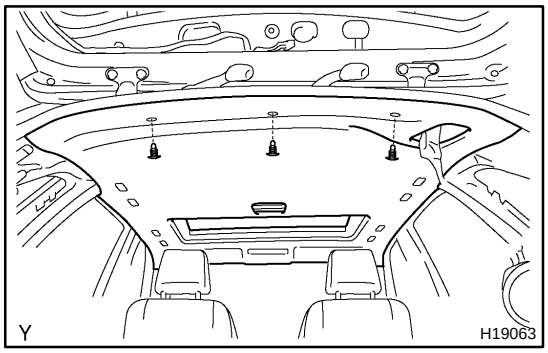
(b) Disconnect the connectors.

31. REMOVE 2 SUN VISOR HOLDER

Remove the 2 screws and 2 holders.

32. REMOVE SHOULDER BELT ANCHOR COVER UPPER

Remove the 2 screws and shoulder belt anchor cover upper.



33. REMOVE ROOF HEADLINING

(a) Remove the 3 clips.

(b) Pull the roof headlining downward to remove it.

BO4DZ-02

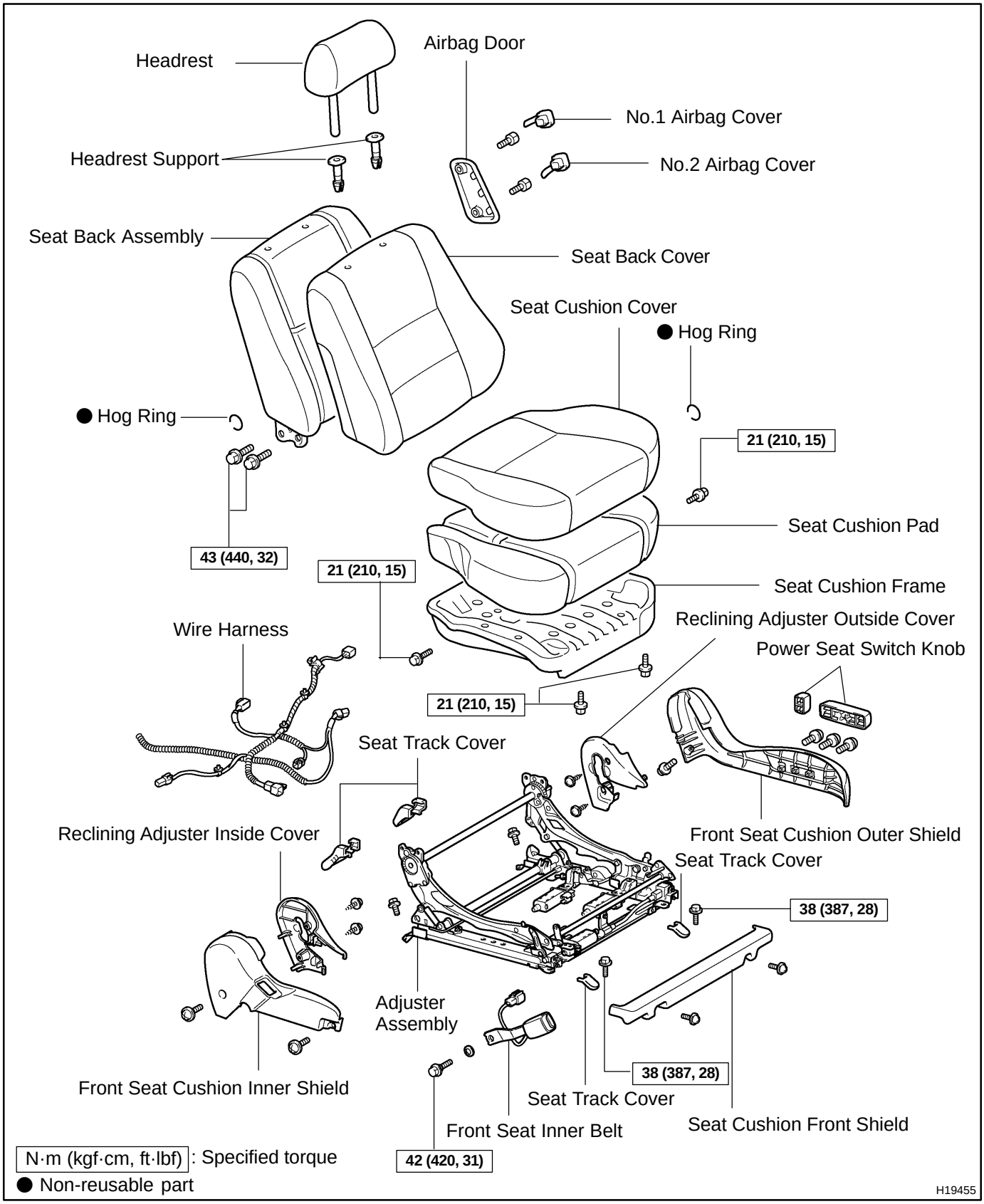
INSTALLATION

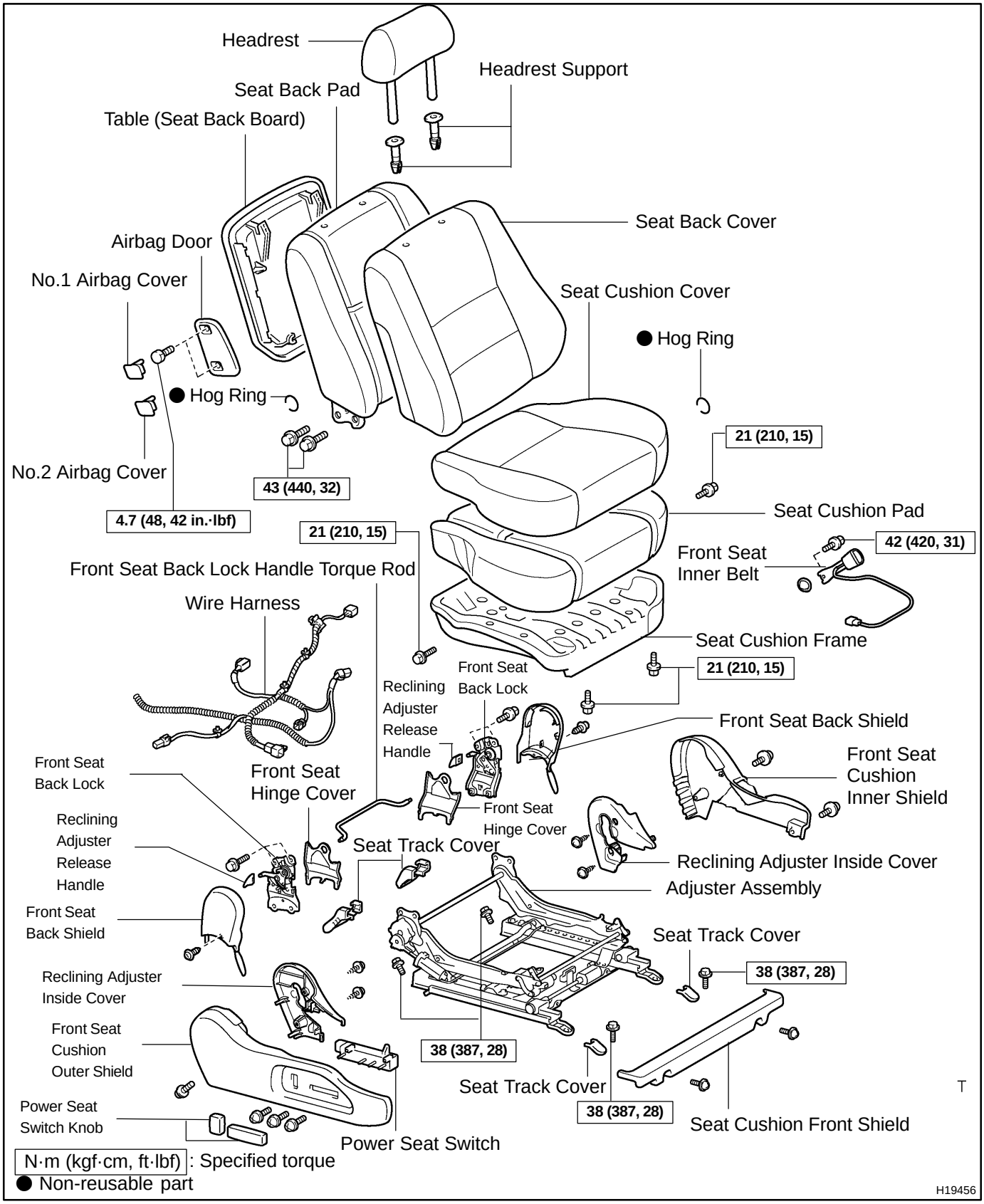
The installation procedures are the removal procedures in reverse order (See page BO-164).

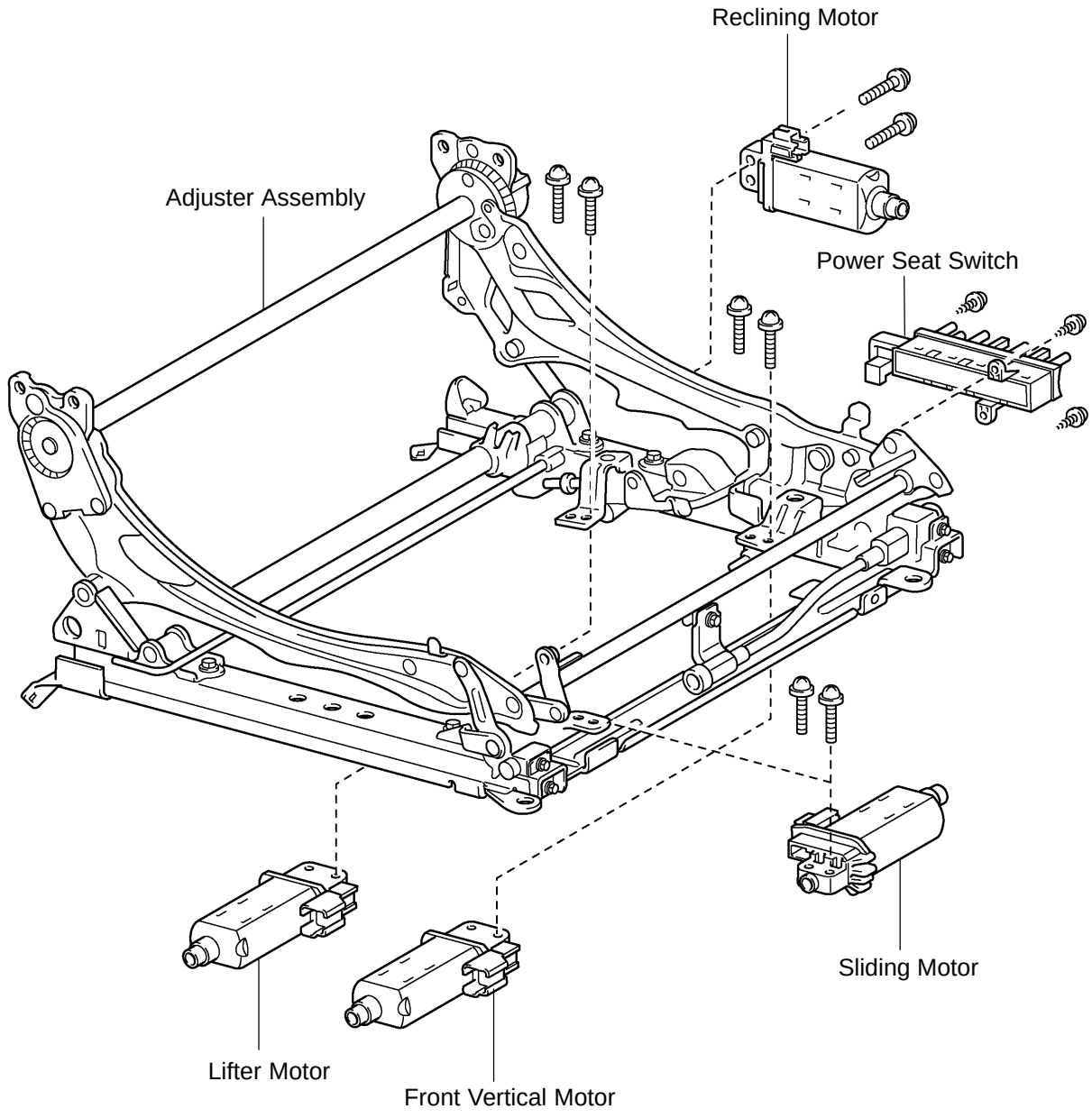
FRONT SEAT (Power Adjuster Type)

BO4E0-02

COMPONENTS



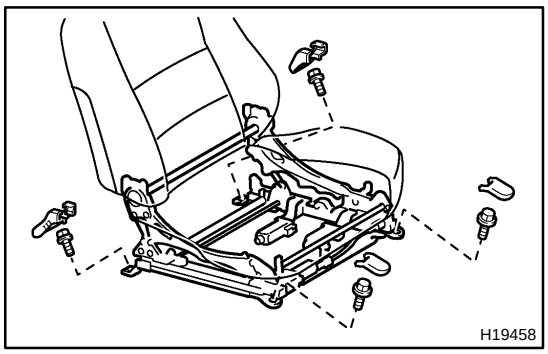

Headrest
Headrest Support
Seat Back Pad
Table (Seat Back Board)
Seat Back Cover
Airbag Door
No.1 Airbag Cover
Seat Cushion Cover
● Hog Ring
● Hog Ring
21 (210, 15)
No.2 Airbag Cover
43 (440, 32)
4.7 (48, 42 in.·lbf)
Seat Cushion Pad
21 (210, 15)
42 (420, 31)
Front Seat Inner Belt
Front Seat Back Lock Handle Torque Rod
Wire Harness
Seat Cushion Frame
Front Seat Back Lock
Reclining Adjuster Release Handle
21 (210, 15)
Front Seat Back Shield
Front Seat Cushion Inner Shield
Front Seat Back Lock
Front Seat Hinge Cover
Front Seat Hinge Cover
Reclining Adjuster Release Handle
Seat Track Cover
Reclining Adjuster Inside Cover
Adjuster Assembly
Front Seat Back Shield
Seat Track Cover
38 (387, 28)
Reclining Adjuster Inside Cover
Front Seat Cushion Outer Shield
38 (387, 28)
Seat Track Cover
38 (387, 28)
Seat Cushion Front Shield
Power Seat Switch Knob
Power Seat Switch
N·m (kgf·cm, ft·lbf): Specified torque
● Non-reusable part
H19456


Reclining Motor
Adjuster Assembly
Power Seat Switch
Sliding Motor
Lifter Motor
Front Vertical Motor

T

H15132

BO2D3-04



REMOVAL

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. REMOVE SEAT TRACK COVERS

Using a screwdriver, remove the 4 seat track covers.

HINT:

Tape the screwdriver tip before use.

2. REMOVE FRONT SEAT

(a) Remove the 4 bolts.

(b) Disconnect the connectors.

(c) Remove the front seat.

NOTICE:

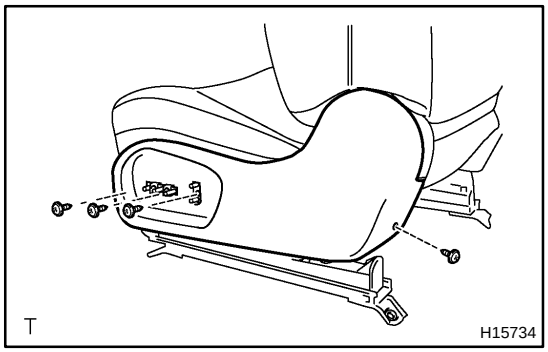
Be careful not to damage the body.

BO4E1-02

DISASSEMBLY

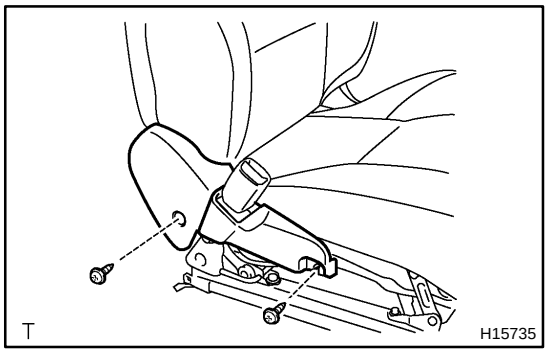
1. REMOVE HEADREST

2. REMOVE POWER SEAT SWITCH KNOB



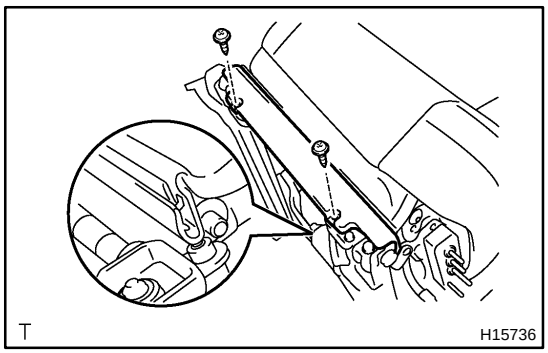
3. REMOVE FRONT SEAT CUSHION OUTER SHIELD

Remove the 4 screws and front seat cushion outer shield.



4. REMOVE FRONT SEAT CUSHION INNER SHIELD

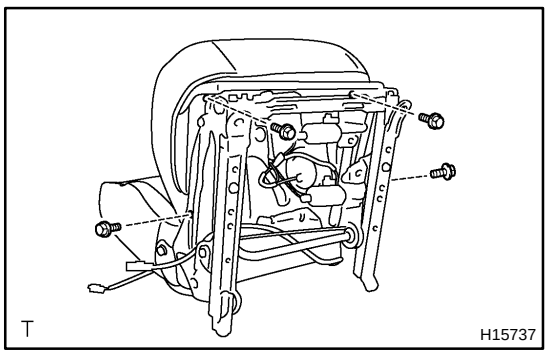
Remove the 2 screws and front seat cushion inner shield.



5. REMOVE SEAT CUSHION FRONT SHIELD

(a) Remove the 2 screws.

(b) Unlatch the seat cushion cover hook, then remove the seat cushion front shield.

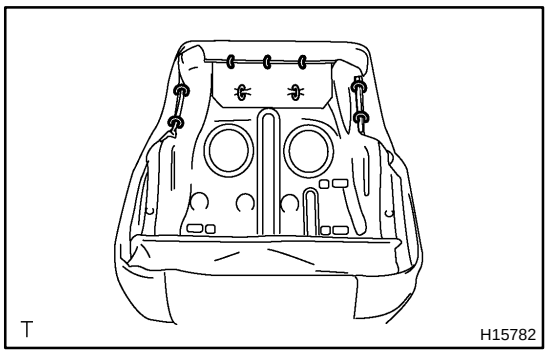


6. REMOVE SEAT CUSHION ASSEMBLY

(a) Disconnect the connectors and unlatch the wire harness clamps.

(b) Remove the 4 bolts and seat cushion assembly with wire harness.

(c) Unlatch the wire harness clamps to remove the wire harness from seat cushion assembly.

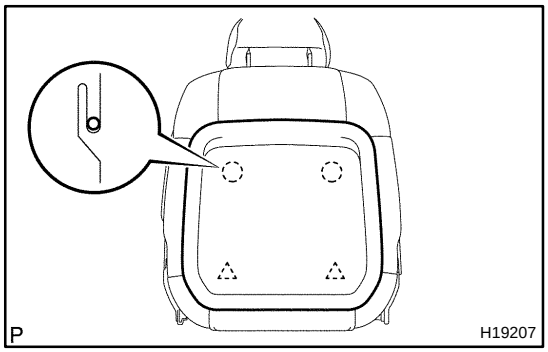


7. REMOVE SEAT CUSHION COVER

(a) Remove the hog rings.

(b) Unlatch the seat cushion cover hooks and remove the seat cushion frame from the seat cushion cover with pad.

(c) Remove the hog rings and seat cushion cover from the seat cushion pad.



8. w/ Table:
REMOVE SEATBACK BOARD

Using a screwdriver, remove the seatback board.

HINT:

Tape the screwdriver tip before use.

9. REMOVE SEATBACK ASSEMBLY

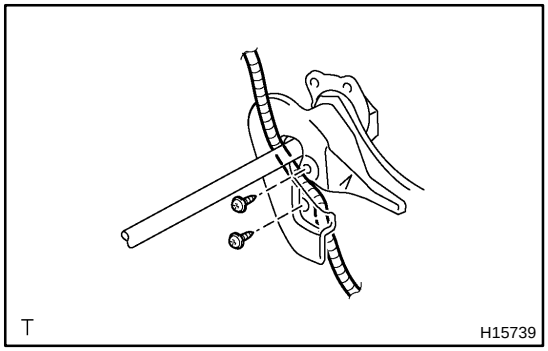
(a) Remove the hog rings.

(b) Turn the seatback cover over, then remove the hog rings.

(c) Remove the 4 seatback assembly set bolts.

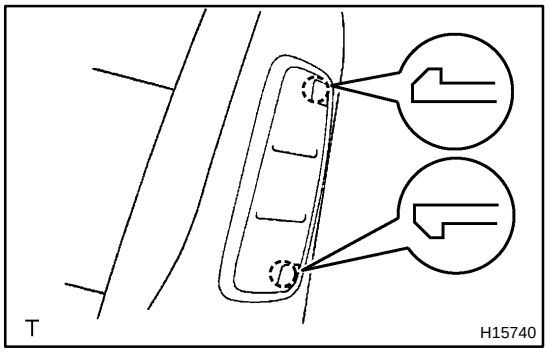
NOTICE:

Be careful not to pull the side airbag assembly wire harness.



(d) Remove the 2 screws and reclining adjuster inside cover and employ the same manner described above to the other side.

(e) Disengage the side airbag assembly wire harness from the reclining adjuster inside cover, then remove the seatback assembly.

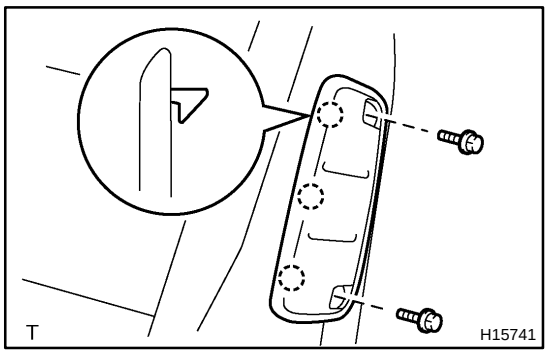


10. REMOVE SEATBACK COVER

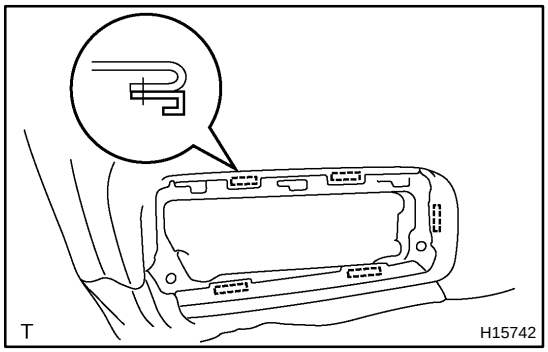
(a) Using a screwdriver, remove the No. 1 and No. 2 airbag covers.

HINT:

Tape the screwdriver tip before use.

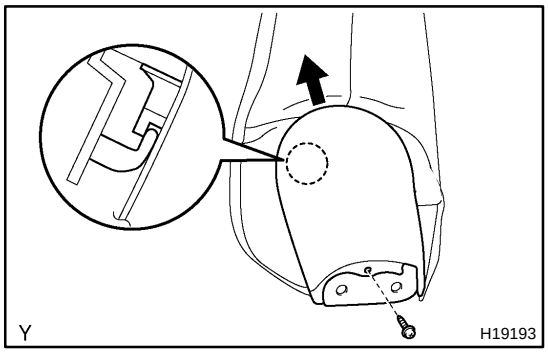


(b) Remove the 2 bolts.
(c) Slide the airbag door upward to remove it.



(d) Disengage the seatback cover hooks around the side airbag assembly.
(e) w/ Table:
Using a screwdriver, remove the reclining adjuster release handle and and employ the same manner described above to the other side.

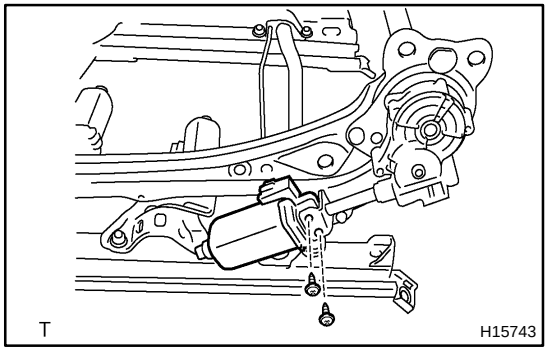
HINT:
Tape the screwdriver tip before use.



(f) w/ Table:
Remove the screw and front seatback shield and employ the same manner described above to the other side.
(g) w/ Table:
Remove the 2 bolts and front seatback lock and employ the same manner described above to the other side.
(h) Remove the hog rings, headrest supports and seatback cover.
(i) Remove the hog rings, headrest supports and seatback cover as shown in the illustration.

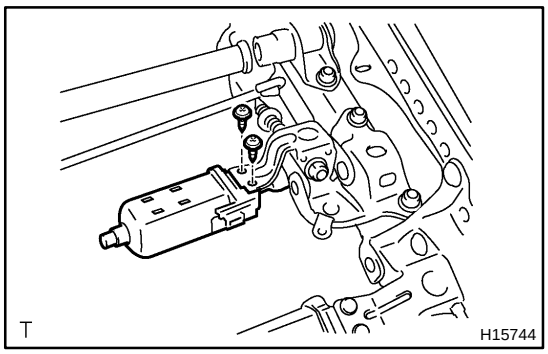
11. REMOVE FRONT SEAT INNER BELT

Remove the bolt, washer and front seat inner belt.



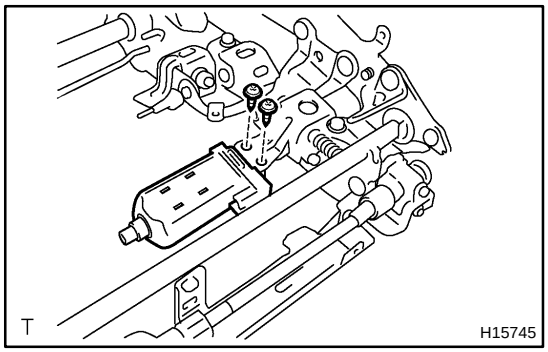
12. REMOVE RECLINING MOTOR

Remove the 2 screws, then disconnect the reclining motor.



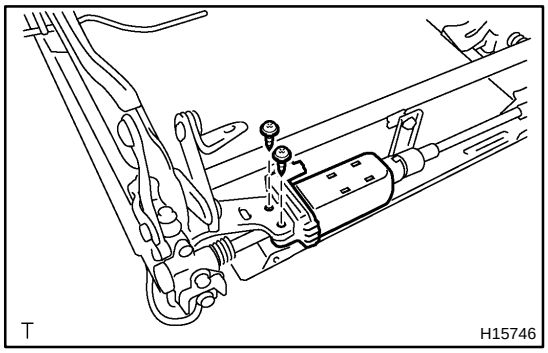
13. REMOVE LIFTER MOTOR

Remove the 2 screws, then disconnect the lifter motor.



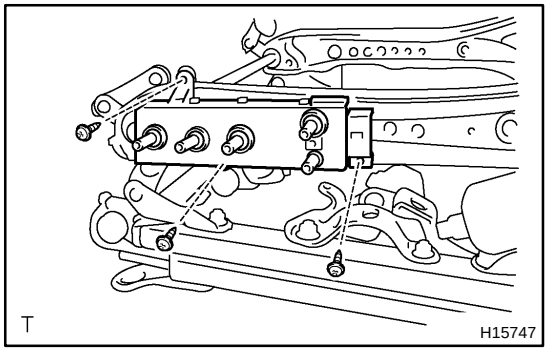
14. REMOVE FRONT VERTICAL MOTOR

Remove the 2 screws, then disconnect the front vertical motor.



15. REMOVE SLIDING MOTOR

Remove the 2 screws, then disconnect the sliding motor.

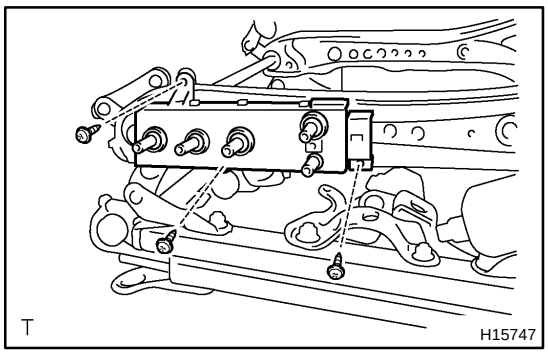


16. REMOVE POWER SEAT SWITCH

Remove the 3 screws and power seat switch.

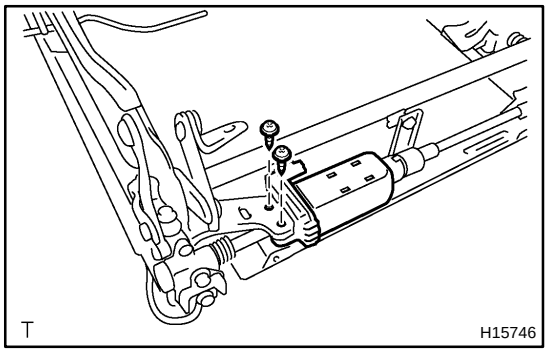
BO4E2-02

REASSEMBLY



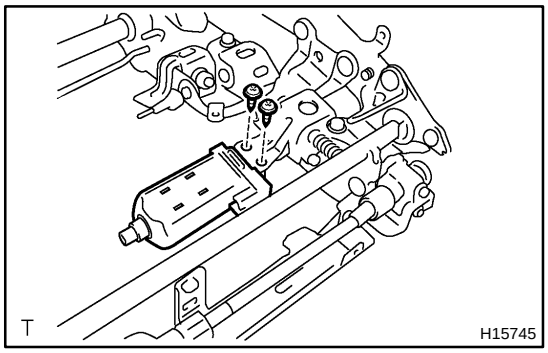
1. INSTALL POWER SEAT SWITCH

Install the power seat switch with the 3 screws.



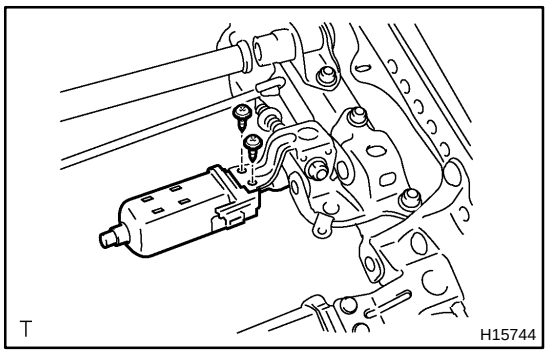
2. INSTALL SLIDING MOTOR

Connect the slide motor to the shaft, then install the 2 screws.



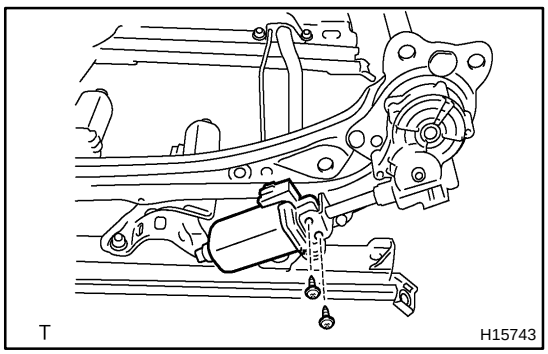
3. INSTALL FRONT VERTICAL MOTOR

Connect the front vertical motor, then install the 2 screws.



4. INSTALL LIFTER MOTOR

Connect the lifter motor, then install the 2 screws.



5. INSTALL RECLINING MOTOR

Connect the reclining motor, then install the 2 screws.

6. INSTALL FRONT SEAT INNER BELT

Install the front seat inner belt with the bolt and washer.

Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

7. INSTALL SEATBACK COVER

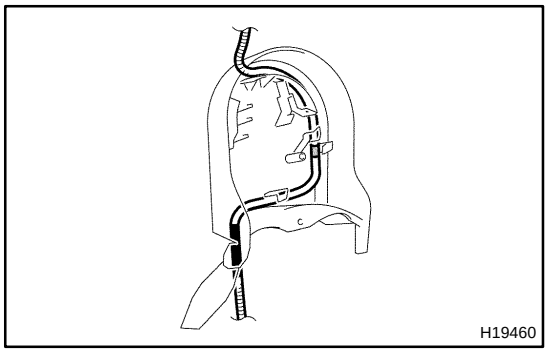
(a) Install the seatback cover with new hog rings.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

(b) Install the headrest supports.

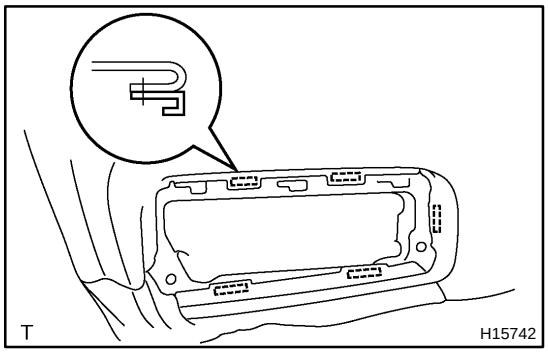
(c) w/ Table:
Install the front seatback lock with the 2 bolts, and employ the same manner described above to the other side.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)



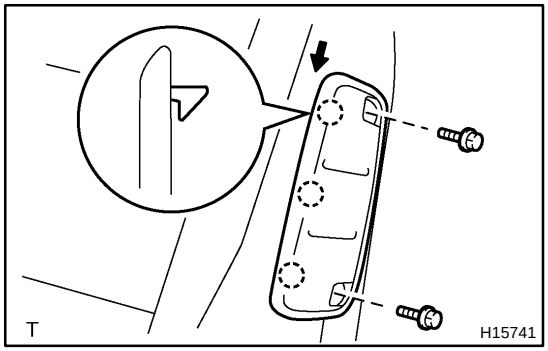
(d) w/ Table:
Set the side airbag assembly wire harness to the front seat back shield.

(e) w/ Table:
Install the front seatback shield with the screw, and employ the same manner described above to the other side.

(f) w/ Table:
Install the reclining adjuster release handle, and employ the same manner described above to the other side.

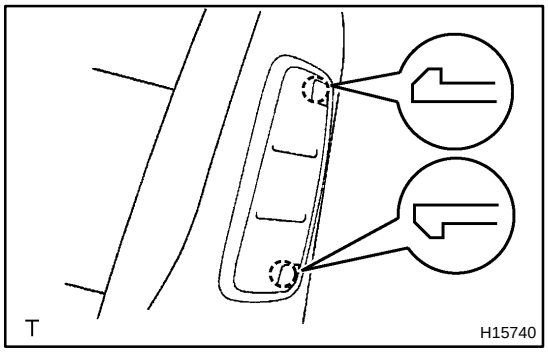


(g) Hook the seatback cover hooks through the holes around the side airbag assembly.

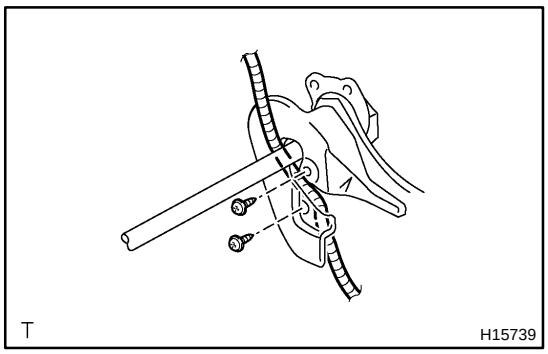


(h) Slide the airbag door downward to install it.

(i) Install the 2 bolts.
Torque: 4.7 N·m (48 kgf·cm, 42 in.·lbf)



(j) Install the No.1 and No.2 airbag covers.



8. INSTALL SEATBACK ASSEMBLY

NOTICE:

Never use the seatback assembly from another vehicle. When replacing parts, replace them with new parts.

(a) Set the side airbag assembly wire harness to the reclining adjuster inside cover.

(b) Install the 2 screws and reclining adjuster inside cover, and employ the same manner described above to the other side.

(c) Install the seatback assembly with the 4 bolts.

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

(d) Turn the seatback cover over, then install new hog rings.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

(e) Install new hog rings.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

9. w/ Table:

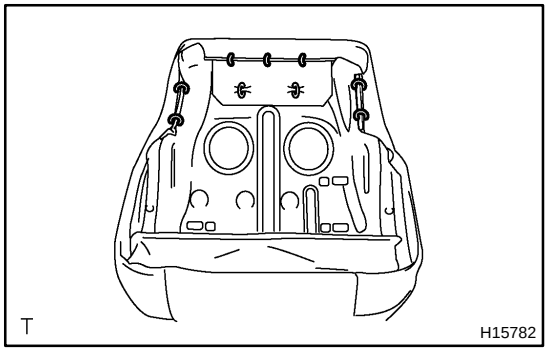
INSTALL SEAT BACK BOARD

10. INSTALL SEAT CUSHION COVER

(a) Install the seat cushion cover with new hog rings to the seat cushion pad.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

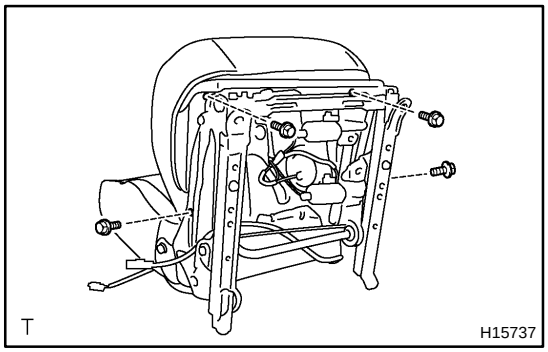


(b) Latch the seat cushion cover hooks to install the seat cushion cover with pad to the seat cushion pad.

(c) Install 6 new hog rings.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.



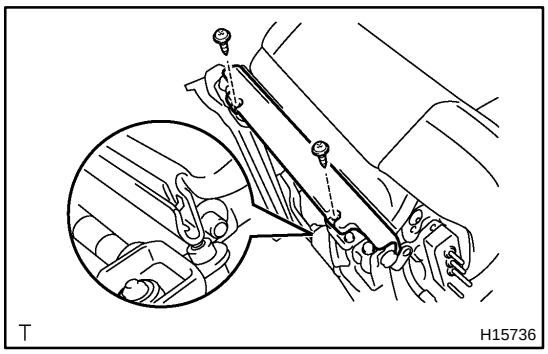
11. INSTALL SEAT CUSHION ASSEMBLY

(a) Install the seat cushion assembly with the 4 bolts.

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

(b) Attach the wire harness clamps.

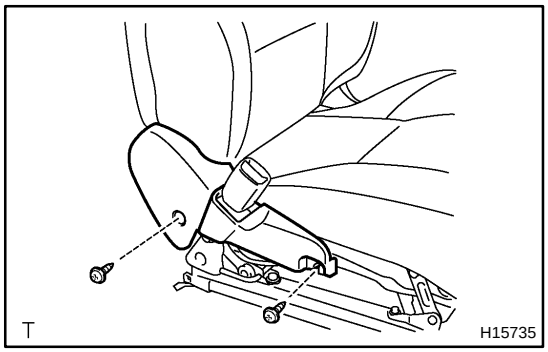
(c) Attach the side airbag assembly wire harness clamps.



12. INSTALL SEAT CUSHION FRONT SHIELD

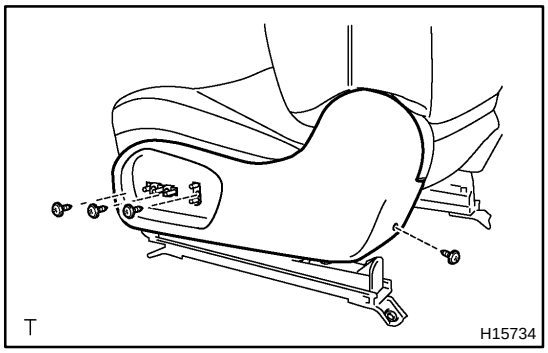
(a) Latch the seat cushion cover hook to the seat cushion front shield.

(b) Install the seat cushion front shield with the 2 screws.



13. INSTALL FRONT SEAT CUSHION INNER SHIELD

Install the front seat cushion inner shield with the 2 screws.



14. INSTALL FRONT SEAT CUSHION OUTER SHIELD

Install the front seat cushion outer shield with the 4 screws.

15. INSTALL POWER SEAT SWITCH KNOBS

16. INSTALL HEADREST

BO2D6-04

INSTALLATION

1. INSTALL FRONT SEAT

(a) Mount the front seat to the vehicle.

NOTICE:

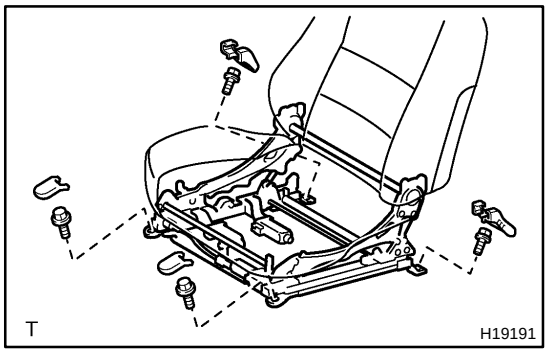
Be careful not to damage the body.

(b) Connect the connectors.

NOTICE:

When the wiring connector of the side airbag assembly is disconnected and the ignition switch is at ON or ACC position, DTC will be recorded. To clear DTC, see page DI-607 .

(c) Slide the front seat to the rearmost position.



(d) Temporarily tighten the bolts on the front side. Then, tighten them to the final torque starting from the inner side.
Torque: 38 N·m (387 kgf·cm, 28 ft·lbf)

(e) Slide the front seat to the most front position.

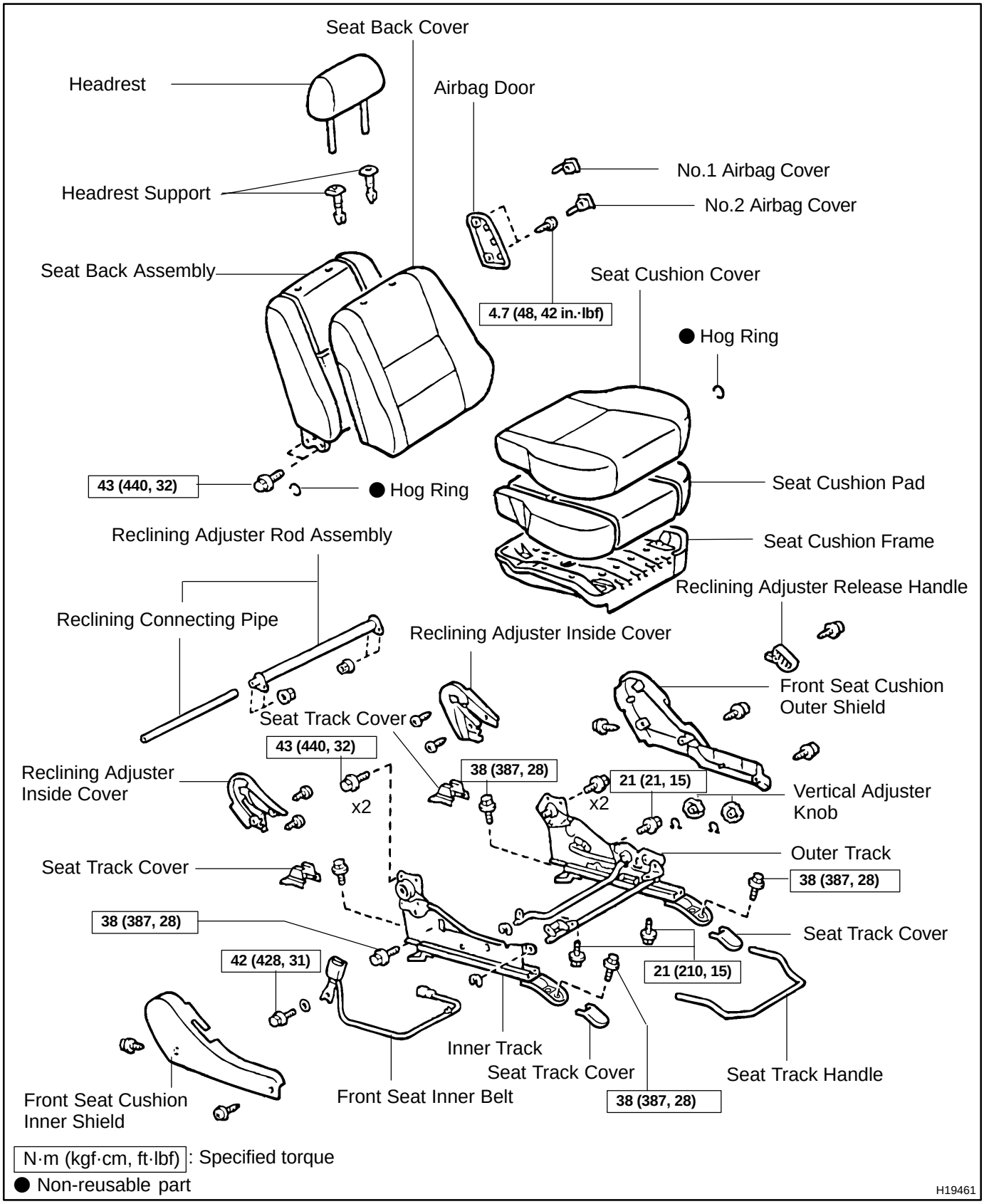
(f) Temporarily tighten the bolts on the rear side. Then, tighten them to the final torque starting from the inner side.
Torque: 38 N·m (387 kgf·cm, 28 ft·lbf)

2. INSTALL SEAT TRACK COVERS

FRONT SEAT (Manual Adjuster Type)

BO4E3-02

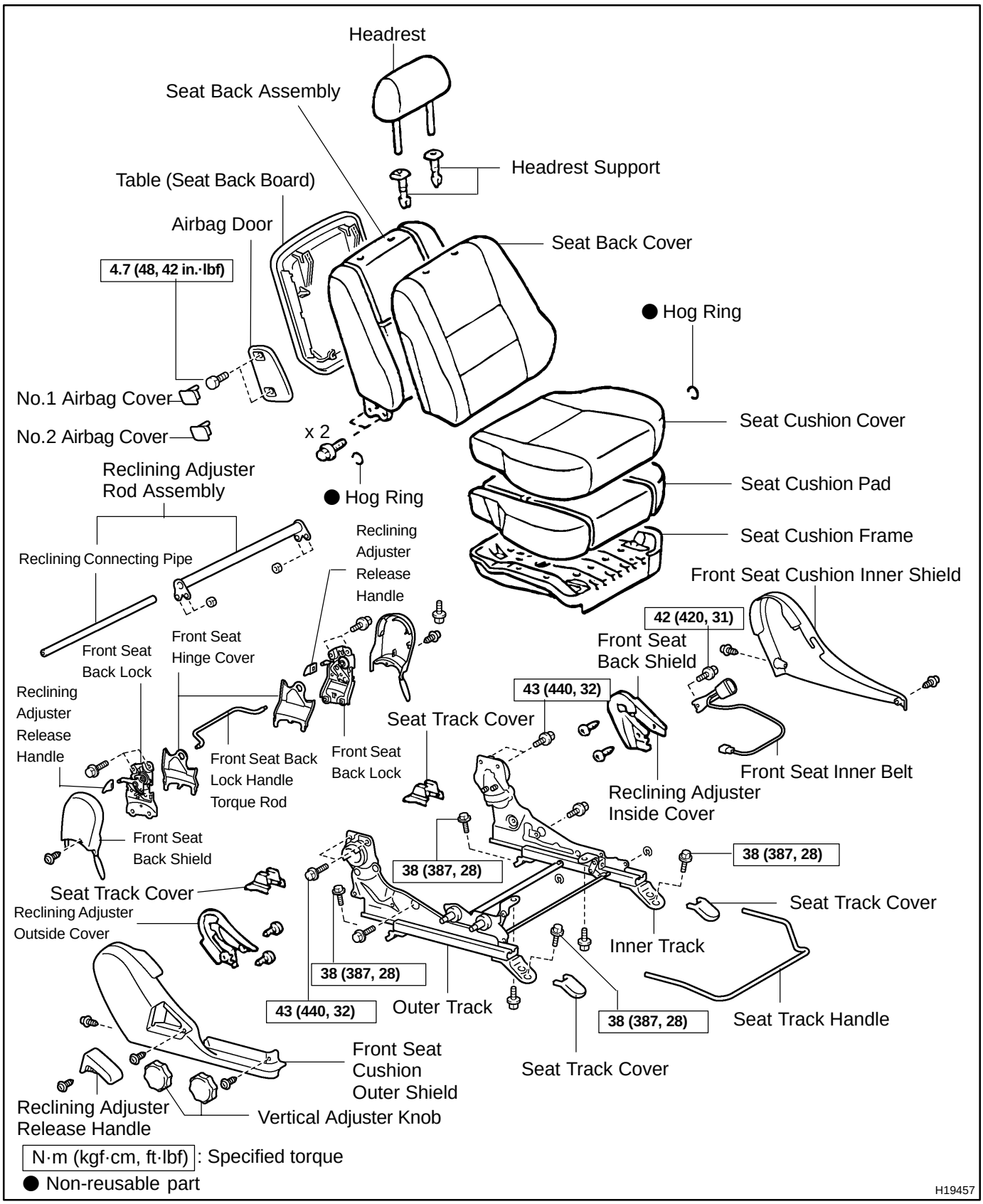
COMPONENTS



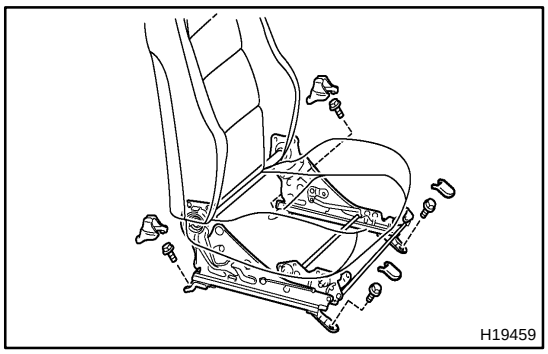
N·m (kgf·cm, ft·lbf): Specified torque

● Non-reusable part

H19461


Headrest
Seat Back Assembly
Headrest Support
Table (Seat Back Board)
Airbag Door
Seat Back Cover
4.7 (48, 42 in.·lbf)
Hog Ring
No.1 Airbag Cover
No.2 Airbag Cover
x 2
Seat Cushion Cover
Reclining Adjuster Rod Assembly
Hog Ring
Seat Cushion Pad
Seat Cushion Frame
Reclining Connecting Pipe
Reclining Adjuster Release Handle
Front Seat Cushion Inner Shield
42 (420, 31)
Front Seat Back Shield
Front Seat Back Lock
Front Seat Hinge Cover
43 (440, 32)
Reclining Adjuster Release Handle
Seat Track Cover
Front Seat Back Lock Handle Torque Rod
Front Seat Back Lock
Front Seat Inner Belt
Reclining Adjuster Inside Cover
Front Seat Back Shield
38 (387, 28)
38 (387, 28)
Seat Track Cover
Seat Track Cover
Reclining Adjuster Outside Cover
Inner Track
38 (387, 28)
43 (440, 32)
Outer Track
38 (387, 28)
Seat Track Handle
Front Seat Cushion Outer Shield
Seat Track Cover
Reclining Adjuster Release Handle
Vertical Adjuster Knob
N·m (kgf·cm, ft·lbf): Specified torque
Non-reusable part
H19457

BO2D8-04



REMOVAL

HINT:

A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. REMOVE SEAT TRACK COVERS

Using a screwdriver, remove the 4 seat track covers.

HINT:

Tape the screwdriver tip before use.

2. REMOVE FRONT SEAT

(a) Remove the 4 bolts.

(b) Disconnect the connector.

(c) Remove the front seat.

NOTICE:

Be careful not to damage the body.

BO4E4-02

DISASSEMBLY

1. REMOVE HEADREST

2. REMOVE VERTICAL ADJUSTER KNOBS

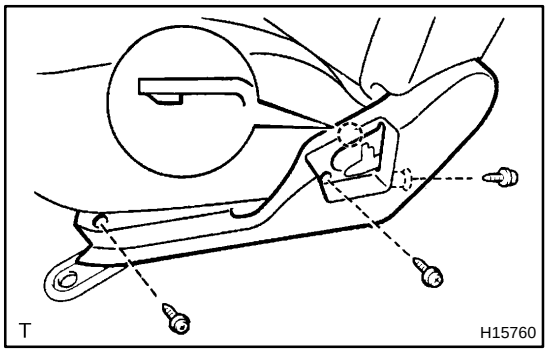
Using a screwdriver, remove the 2 clips and 2 vertical adjuster knobs.

HINT:

Tape the screwdriver tip before use.

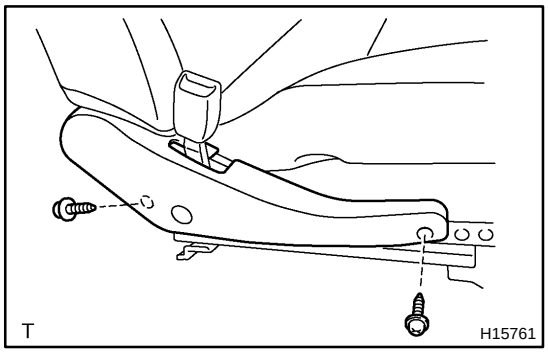
3. REMOVE RECLINING ADJUSTER RELEASE HANDLE

Remove the screw and reclining adjuster release handle.



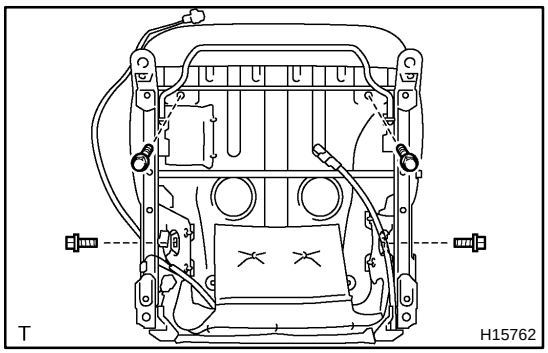
4. REMOVE FRONT SEAT CUSHION OUTER SHIELD

Remove the 3 screws and front seat cushion outer shield.



5. REMOVE FRONT SEAT CUSHION INNER SHIELD

Remove the 2 screws and front seat cushion inner shield.

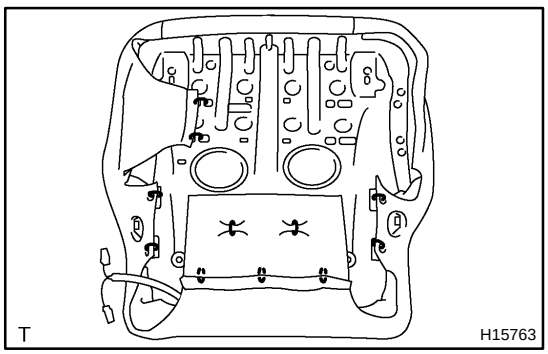


6. REMOVE SEAT CUSHION ASSEMBLY

(a) Unlatch the side airbag assembly wire harness clamps.

(b) Disengage the wire harness clamp.

(c) Remove the 4 bolts and the seat cushion assembly.

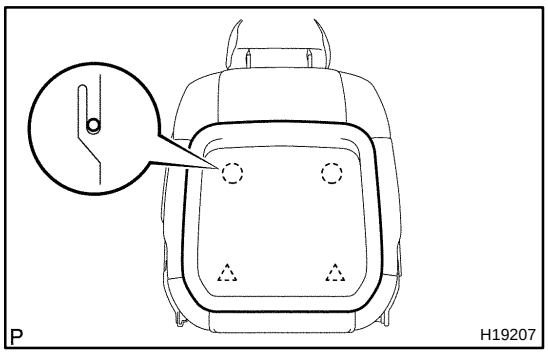


7. REMOVE SEAT CUSHION COVER

(a) Remove the hog rings.

(b) Unlatch the seat cushion cover hooks and remove the seat cushion frame from the seat cushion cover with pad.

(c) Remove the hog rings and seat cushion cover from the seat cushion pad.



8. w/ Table:
REMOVE SEATBACK BOARD

Using a screwdriver, remove the seatback board.

HINT:

Tape the screwdriver tip before use.

9. REMOVE SEATBACK ASSEMBLY

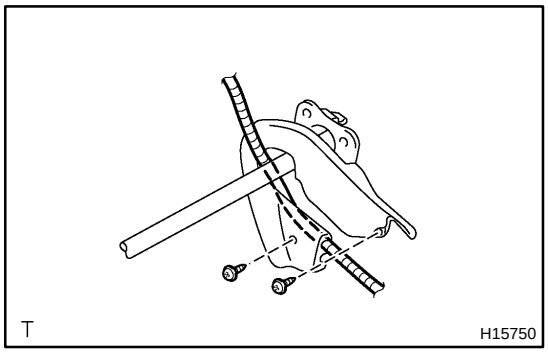
(a) Remove the hog rings.

(b) Turn the seatback cover over, then remove the hog rings.

(c) Remove the 4 seatback assembly set bolts.

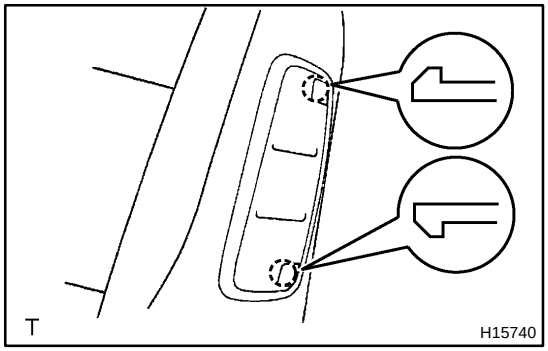
NOTICE:

Be careful not to pull the side airbag assembly wire harness.



(d) Remove the 2 screws and reclining adjuster inside cover and employ the same manner described above to the other side.

(e) Disengage the side airbag assembly wire harness from the reclining adjuster inside covers, then remove the seatback assembly.

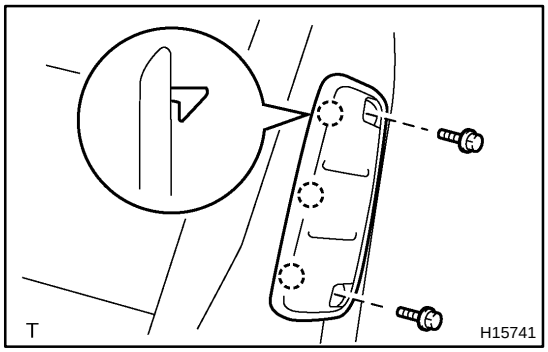


10. REMOVE SEATBACK COVER

(a) Using a screwdriver, remove the No.1 and No.2 airbag covers.

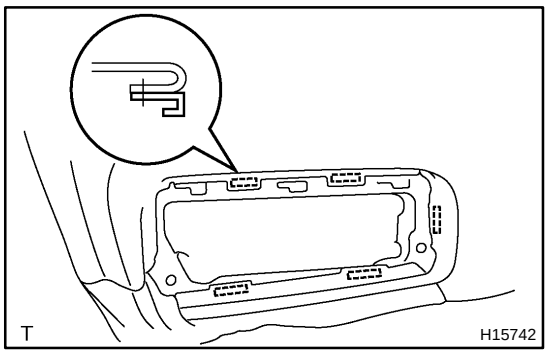
HINT:

Tape the screwdriver tip before use.



(b) Remove the 2 bolts.

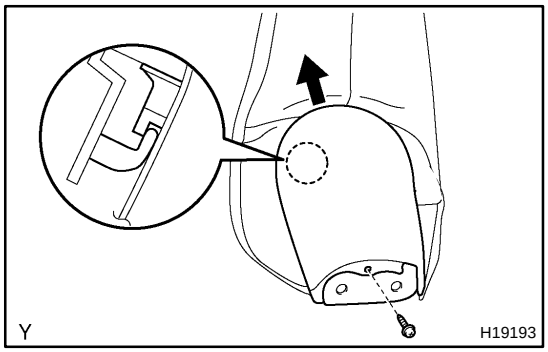
(c) Slide the airbag door upward to remove it.



(d) Unlatch the seatback cover hooks around the side airbag assembly.

(e) w/ Table:
Using a screwdriver, remove the reclining adjuster release handle and employ the same manner described above to the other side.

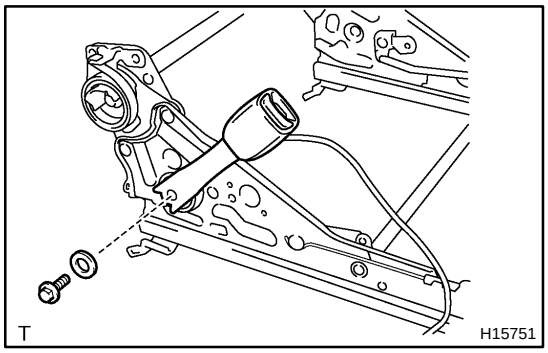
HINT:
Tape the screwdriver tip before use.



(f) w/ Table:
Remove the screw and front seatback shield, and employ the same manner described above to the other side.

(g) w/ Table:
Remove the 2 bolts and front seatback lock, and employ the same manner described above to the other side.

(h) Remove the hog rings, headrest supports and seatback cover.



11. REMOVE FRONT SEAT INNER BELT

Remove the bolt, washer and front seat inner belt.

12. REMOVE SEAT TRACK HANDLE

Using a screwdriver, remove the seat track handle.

HINT:
Tape the screwdriver tip before use.

13. REMOVE RECLINING ADJUSTER ROD ASSEMBLY

Remove the 4 nuts and the reclining adjuster rod assembly.

14. DISASSEMBLE OUTER TRACK AND INNER TRACK

Using a screwdriver, remove the 2 E-rings from the outer side on the inner track.

HINT:
Tape the screwdriver tip before use.

BO2DA-01

INSPECTION

INSPECT RECLINING LOCK POSITION AND SLIDING LOCK POSITION SLIPPING OFF

(a) When reclining the seat, inspect that the outer and inner recliners are released at the same time.

HINT:

When the reclining lock position slips off, disassemble the seat to adjust the position.

(b) When sliding the seat, inspect that the outer and inner tracks are locked at the same time.

HINT:

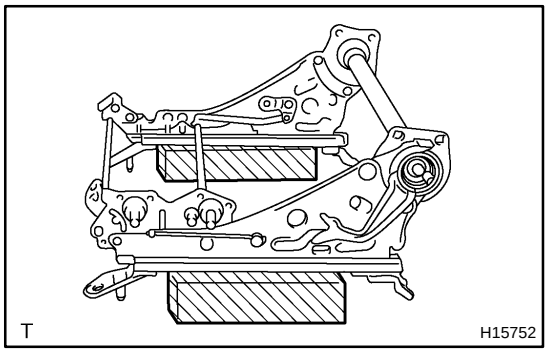
When sliding lock positions slip off, loosen the bolts to adjust the position.

BO4E5-02

REASSEMBLY

1. ASSEMBLE OUTER TRACK AND INNER TRACK

Assemble the outer track and inner track with 2 new E-rings.



2. INSTALL RECLINING ADJUSTER ROD ASSEMBLY

(a) Adjust the reclining lock positions of the seat adjusters.

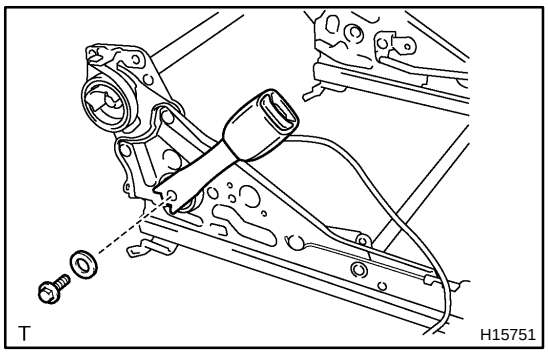
(b) Slide the seat adjusters to the most front position.

(c) Place the adjusters on a spacer to adjust the seat rails in parallel and install the reclining adjuster rod assembly with the 4 nuts.

HINT:

When installing the connecting pipe while raising up the adjusters, the lock positions adjusted in 2 - (a) step slip off, and that will lead to locker error.

3. INSTALL SEAT TRACK HANDLE



4. INSTALL FRONT SEAT INNER BELT

Install the front seat inner belt with the washer and bolt.

Torque: 42 N·m (428 kgf·cm, 31 ft·lbf)

5. INSTALL SEATBACK COVER

(a) Install the seatback cover with new hog rings.

HINT:

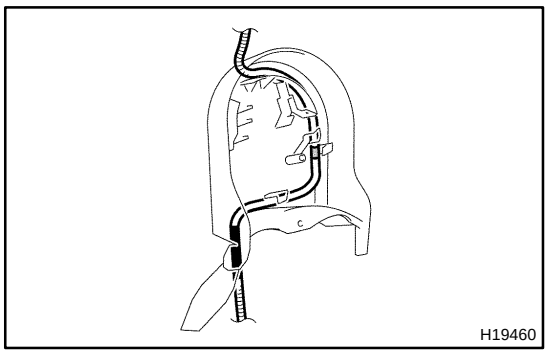
When installing the hog rings, take care to prevent wrinkles as little as possible.

(b) Install the 2 headrest supports.

(c) w/ Table:

Install the front seatback lock with the 2 bolts and employ the same manner described above to the other side.

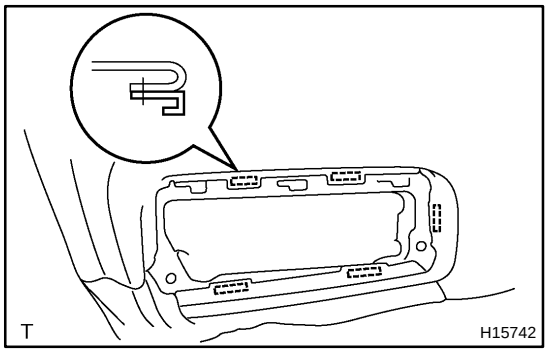
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)



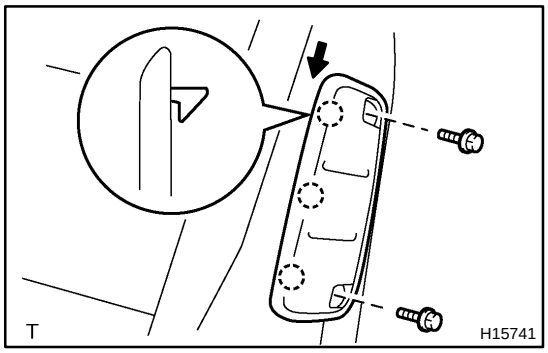
(d) w/ Table:
Set the side airbag assembly wire harness to the front seat back shield.

(e) w/ Table:
Install the front seatback shield with the screw and employ the same manner described above to the other side.

(f) w/ Table:
Install the reclining adjuster release handle and employ the same manner described above to the other side.

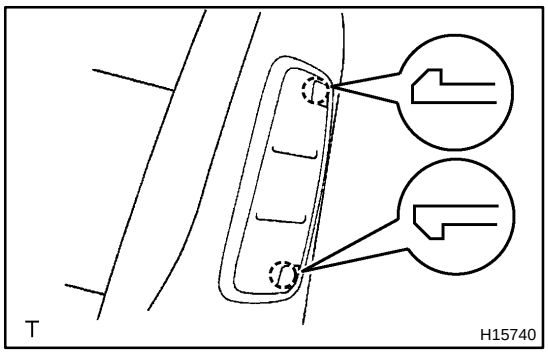


(g) Hook the seatback cover hooks through the holes in the circumference of the side airbag assembly.

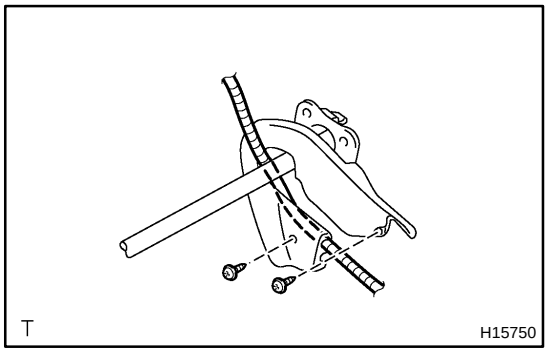


(h) Slide the airbag door downward to install it.

(i) Install the 2 bolts.
Torque: 4.7 N·m (48 kgf·cm, 42 in.·lbf)



(j) Install the No.1 and No.2 airbag covers.



6. INSTALL SEATBACK ASSEMBLY

NOTICE:

Never use the seatback assembly from another vehicle. When replacing parts, replace them with new parts.

(a) Set the side airbag assembly wire harness to the reclining adjuster inside covers.

(b) Install the reclining adjuster inside cover with the 2 screws and employ the same manner described above to the other side.

(c) Install the seatback assembly with the 4 bolts.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

(d) Turn the seatback cover over, then install new hog rings.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

(e) Install new hog rings.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

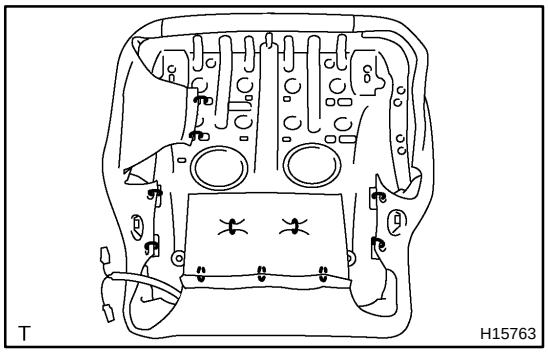
7. w/ Table:
INSTALL SEATBACK BOARD

8. INSTALL SEAT CUSHION COVER

(a) Install the seat cushion cover with new hog rings to the seat cushion pad.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

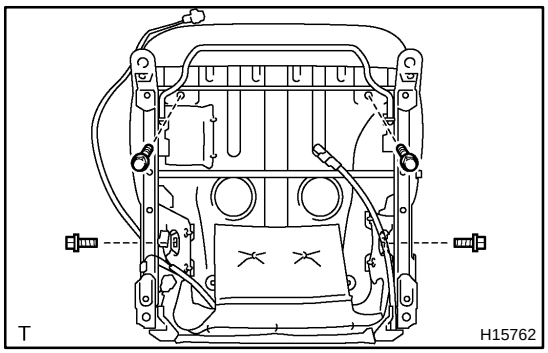


(b) Latch the seat cushion cover hooks to install the seat cushion cover with pad to the seat cushion pad.

(c) Install new hog rings.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

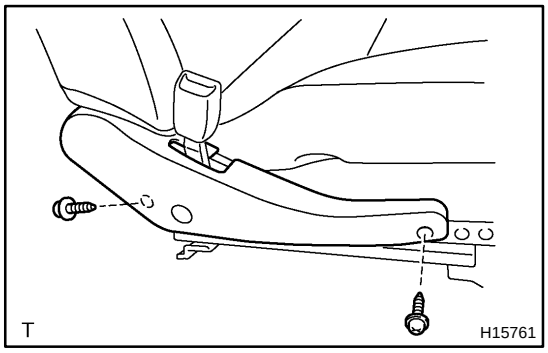


9. INSTALL SEAT CUSHION ASSEMBLY

(a) Install the seat cushion assembly with the 4 bolts.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

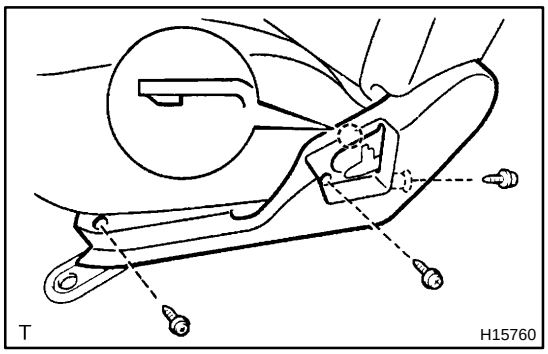
(b) Attach the wire harness clamps.

(c) Attach the side airbag assembly wire harness clamps.



10. INSTALL FRONT SEAT CUSHION INNER SHIELD

Install the front seat cushion inner shield with the 2 screws.



11. INSTALL FRONT SEAT CUSHION OUTER SHIELD

Install the front seat cushion outer shield with the 3 screws.

12. INSTALL RECLINING ADJUSTER RELEASE HANDLE

Install the reclining adjuster release handle with the screw.

13. INSTALL VERTICAL ADJUSTER KNOBS

Install the 2 vertical adjuster knobs with the 2 clips.

14. INSTALL HEADREST

BO2DC-04

INSTALLATION

1. INSTALL FRONT SEAT

(a) Mount the front seat to the vehicle.

NOTICE:

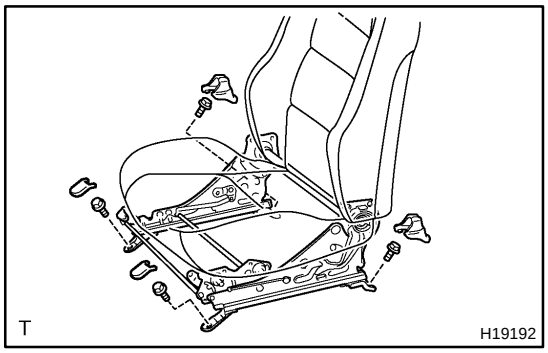
Be careful not to damage the body.

(b) Connect the connectors.

NOTICE:

When the wiring connector of the side airbag assembly is disconnected and the ignition switch is at ON or ACC position, DTC will be recorded. To clear DTC, see page DI-607 .

(c) Slide the front seat to the rearmost position .



(d) Temporarily tighten the bolts on the front side. Then, tighten them to the final torque starting from the inner side.
Torque: 38 N·m (387 kgf·cm, 28 ft·lbf)

(e) Slide the front seat to the most front position.

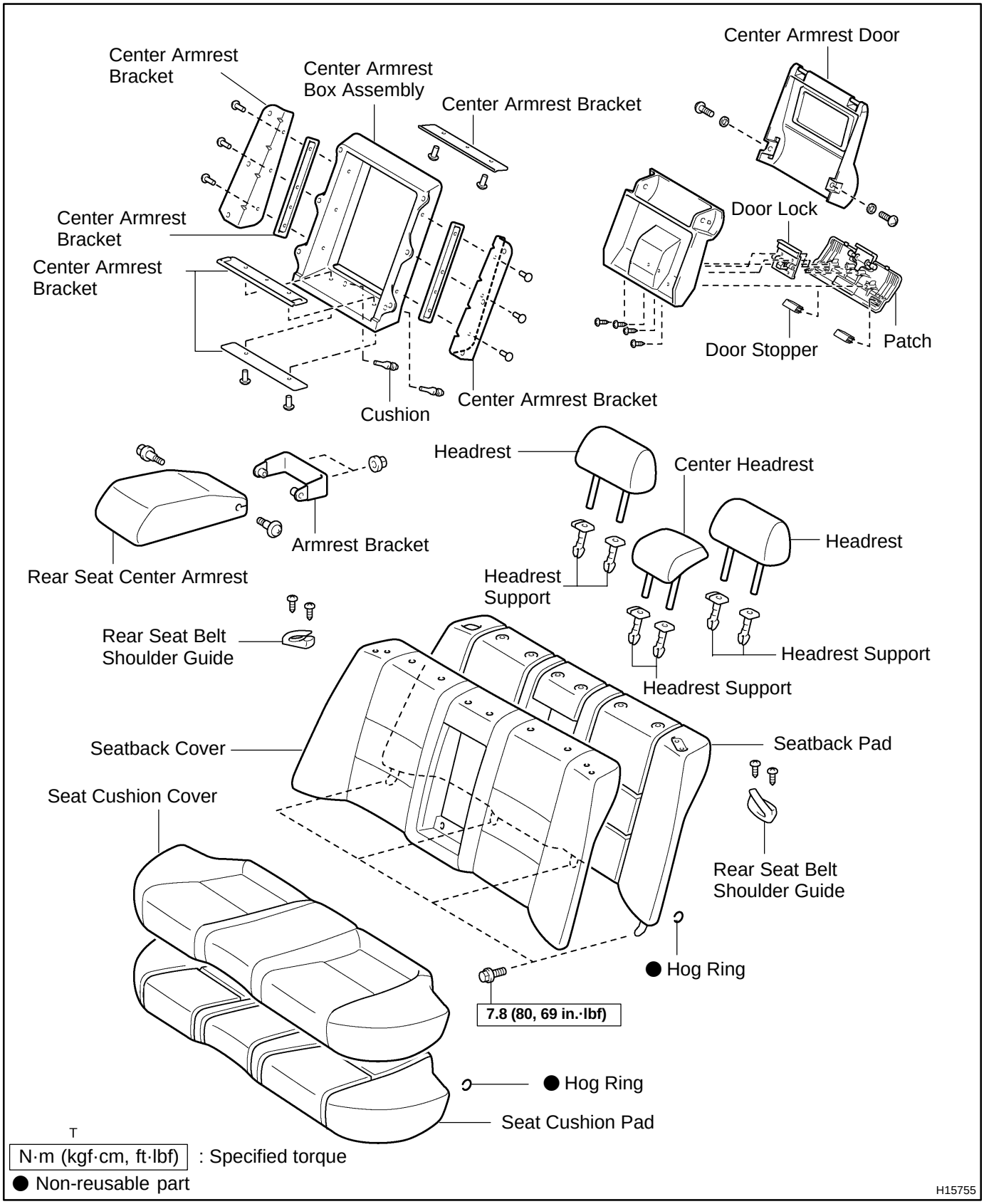
(f) Temporarily tighten the bolts on the rear side. Then, tighten them to the final torque starting from the inner side.
Torque: 38 N·m (387 kgf·cm, 28 ft·lbf)

2. INSTALL SEAT TRACK COVERS

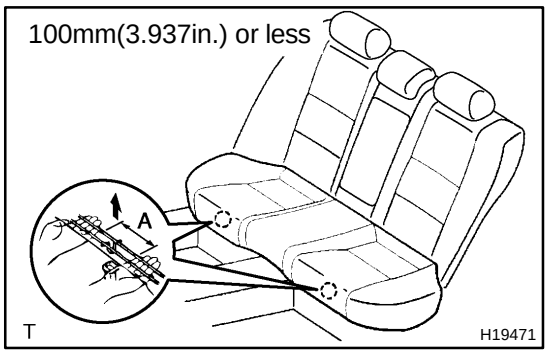
REAR SEAT (Sedan)

COMPONENTS

BO4E6-02



BO4E7-03



REMOVAL

HINT:

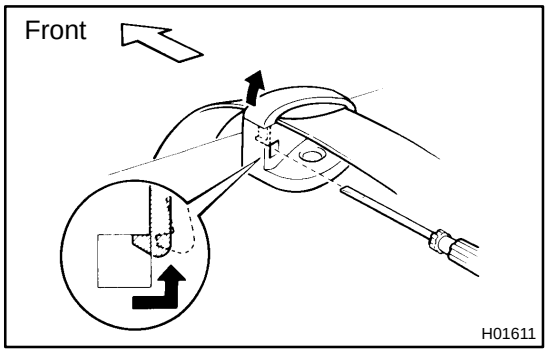
A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. REMOVE SEAT CUSHION ASSEMBLY

Pull up the front portion of the seat cushion assembly, then remove it.

NOTICE:

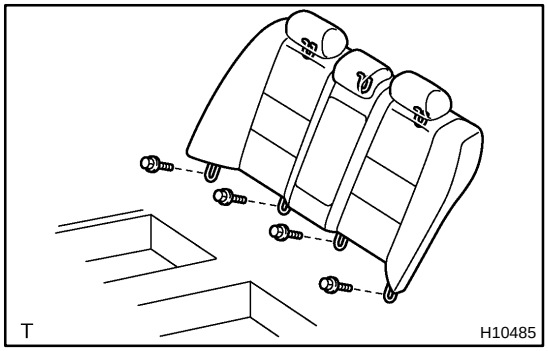
Hold up the clip base to prevent the cushion frame from being distorted.



2. REMOVE SEATBACK ASSEMBLY

(a) Using a screwdriver, remove the rear seat belt from the belt guide as shown in the illustration.

(b) Employ the same manner described above to the other sides.



(c) Remove the 4 bolts, then raise the seatback assembly upward to remove the seatback assembly.

3. REMOVE REAR SEAT CENTER ARMREST BOX ASSEMBLY

Remove the 6 bolts and rear seat center armrest box assembly.

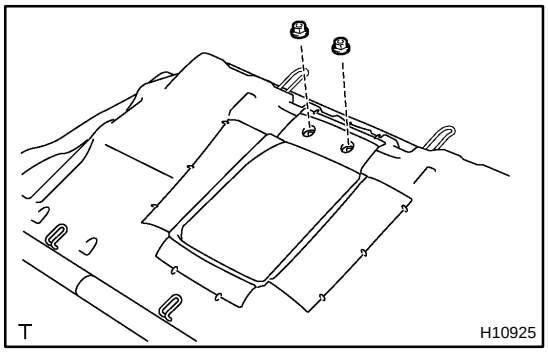
BO4E8-02

DISASSEMBLY

1. REMOVE HEADRESTS

2. REMOVE REAR SEAT BELT SHOULDER GUIDES

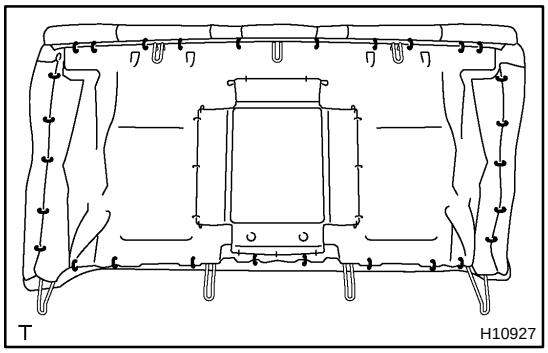
Remove the 4 screws and rear seat belt shoulder guides.



3. REMOVE REAR SEAT CENTER ARMREST

(a) Remove the 2 nuts and rear seat center armrest with bracket.

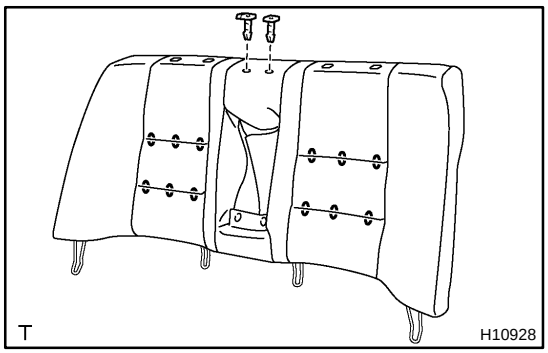
(b) Remove the 2 screws and armrest bracket.



4. REMOVE SEATBACK COVER

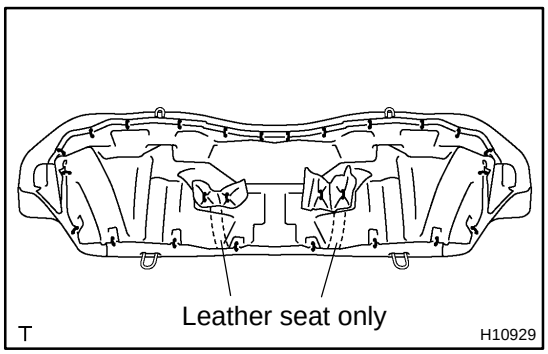
(a) Remove the 4 headrest supports.

(b) Remove the hog rings on the back of seatback assembly.



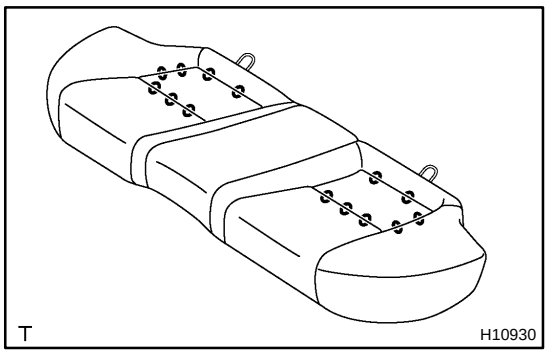
(c) Remove the center headrest supports.

(d) Remove the hog rings and seatback cover on the front of seatback assembly.



5. REMOVE SEAT CUSHION COVER

(a) Remove the hog rings on the back of seat cushion assembly.



(b) Remove the hog rings and seat cushion cover on the front of the seat cushion assembly.

6. REMOVE REAR SEAT CENTER ARMREST DOOR, DOOR LOCK, PATCH AND STOPPER

(a) Remove the rear seat center armrest door from the rear seat center armrest box.
(b) Remove the 2 screws and door lock.
(c) Remove the 2 screws and patch.
(d) Remove the 2 door stoppers.
(e) Remove the 2 screws, 2 shims and rear seat center armrest door.

7. REMOVE REAR SEAT CENTER ARMREST BRACKETS FROM REAR SEAT CENTER ARMREST BOX

(a) Using a drill of less than 4.0 mm (0.157 in.), drill out the rivet heads.

HINT:

Gently and vertically put the drill to the rivet, and cut the rivet flanges.

CAUTION:

Take care as the cut rivet is hot.

NOTICE:

Prizing the hole with a drill can lead to damage to the rivet hole or breaking the drill.

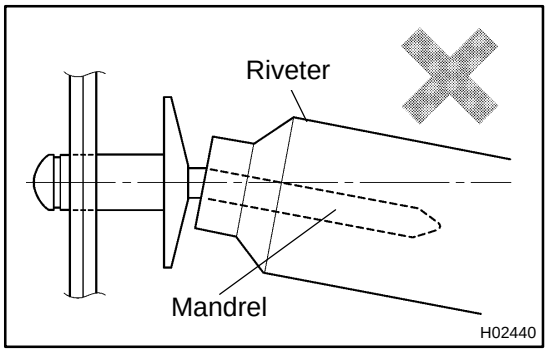
(b) Remove the rear seat center armrest brackets.

BO4E9-02

REASSEMBLY

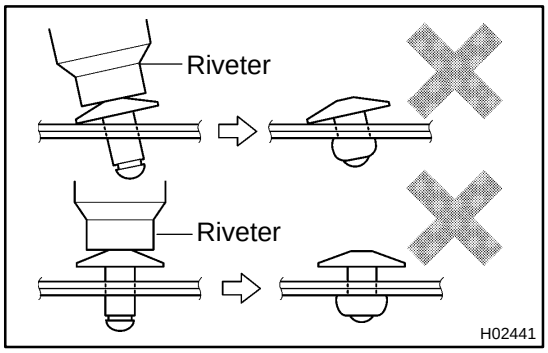
1. INSTALL REAR SEAT CENTER ARMREST BRACKETS TO REAR SEAT CENTER ARMREST BOX

Using a air riveter with nose piece No. 1, install the rivets to the brackets and box.

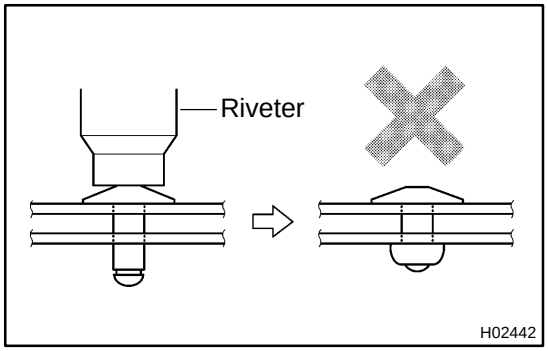


NOTICE:

- **Do not prize a riveter. It could damage the riveter and cause loose fitting and mandrel bend.**



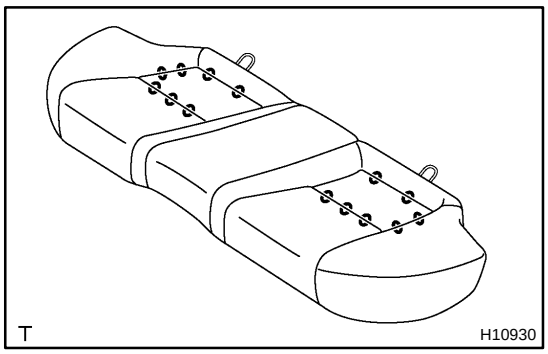
- **Do not tilt the riveter when fastening the rivet to the material to avoid loose fitting.**
- **Do not allow gap spacing between the rivet head and the material.**



- **Do not allow gap spacing between the materials.**

2. INSTALL REAR SEAT CENTER ARMREST DOOR, DOOR LOCK, PATCH AND STOPPER

(a) Install the rear seat center armrest door with the 2 shims and 2 screws.
(b) Install the 2 door stoppers.
(c) Install the patch with the 2 screws.
(d) Install the door lock with the 2 screws.
(e) Install the rear seat center armrest door to the rear seat center armrest box.

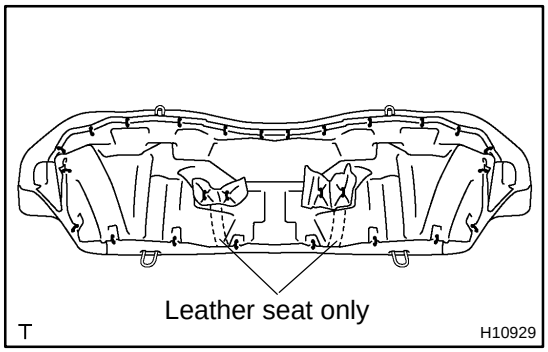


3. INSTALL SEAT CUSHION COVER

(a) Install the seat cushion cover with new hog rings to the front of seat cushion assembly.

HINT:

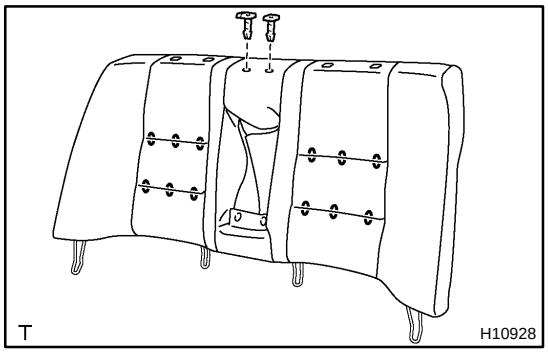
When installing the hog rings, take care to prevent wrinkles as little as possible.



(b) Install new hog rings to the back of seat cushion assembly.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.



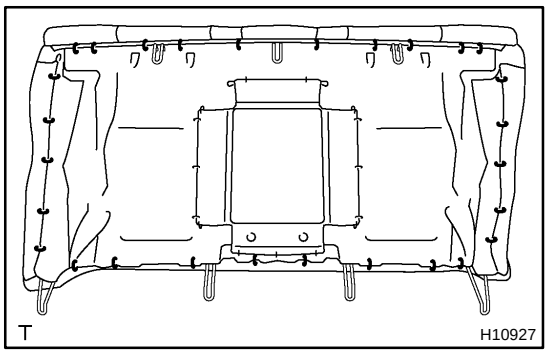
4. INSTALL SEATBACK COVER

(a) Install seatback cover with new hog rings to the front of seatback assembly.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

(b) Install the center headrest supports.

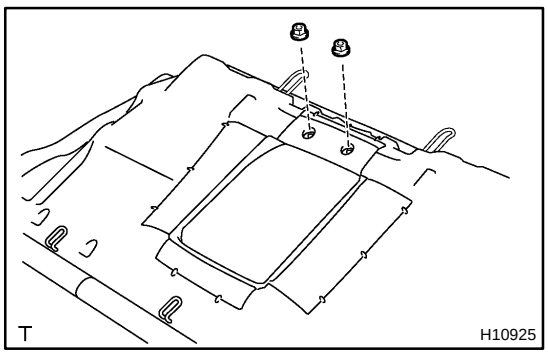


(c) Install new hog rings on the back of seatback assembly.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

(d) Install the 4 headrest supports.



5. INSTALL REAR SEAT CENTER ARMREST

(a) Install the armrest bracket with the 2 screws to the rear seat center armrest.

(b) Install the rear seat center armrest with the bracket to the seatback assembly with the 2 nuts.

6. INSTALL REAR SEAT BELT SHOULDER GUIDES

Install the rear seat belt shoulder guides with the 4 screws to the seatback assembly.

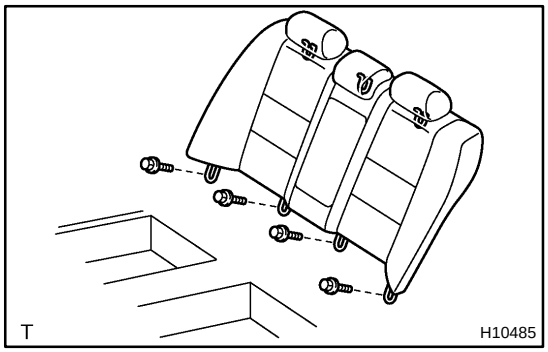
7. INSTALL HEADRESTS

BO4EA-01

INSTALLATION

1. INSTALL REAR SEAT CENTER ARMREST BOX ASSEMBLY

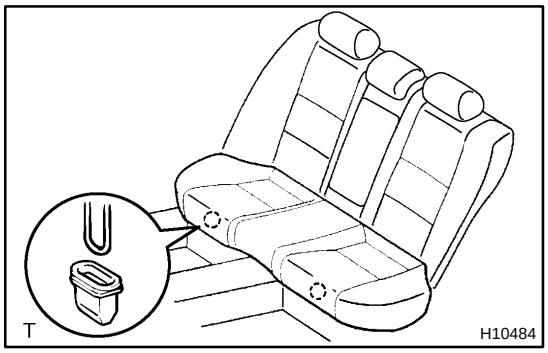
Install the rear seat center armrest box assembly with the 6 bolts.



2. INSTALL SEATBACK ASSEMBLY

(a) Install the seatback assembly with the 4 bolts.
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

(b) Install the rear seat belts to the belt guides, then close the belt guides.



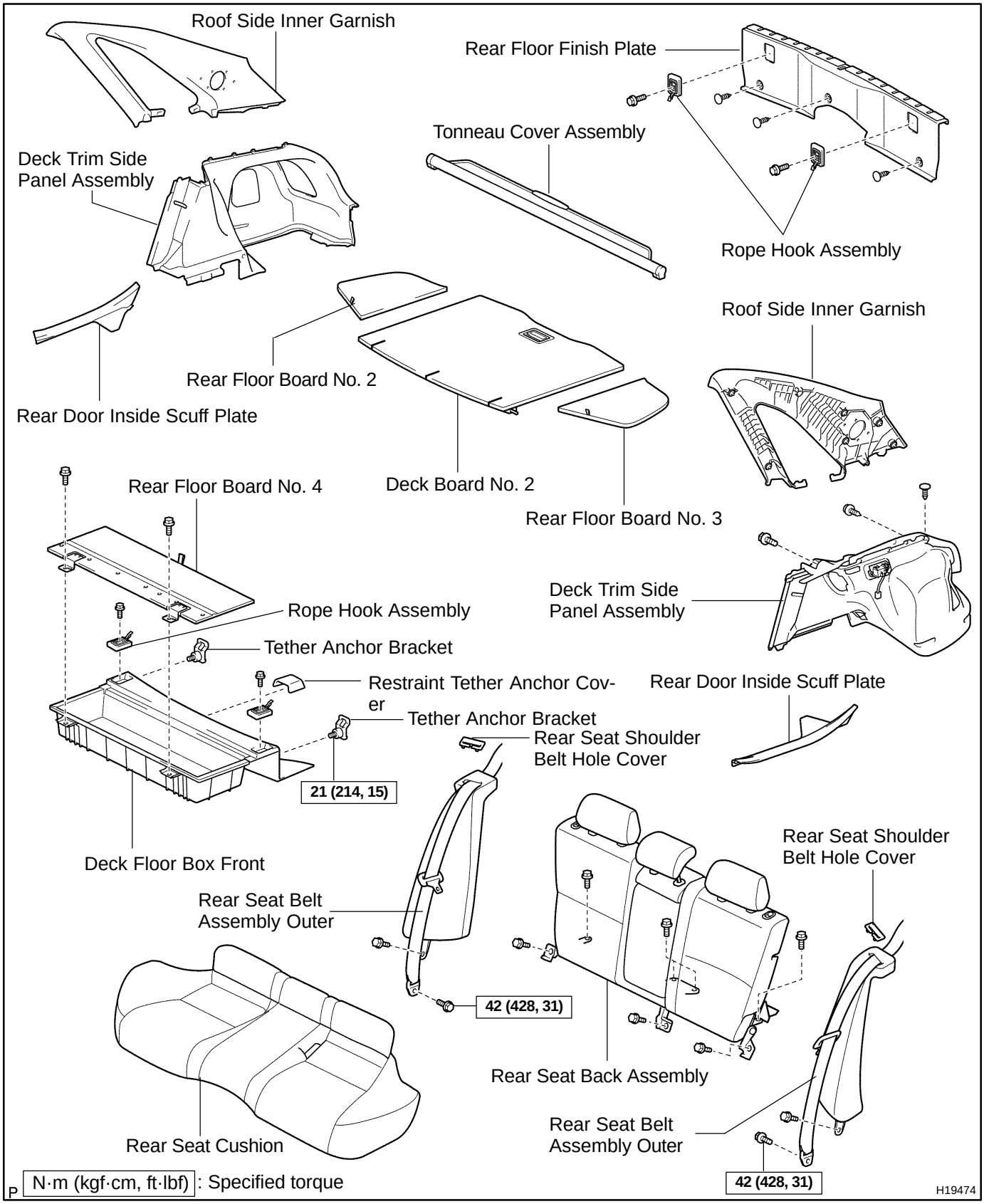
3. INSTALL SEAT CUSHION ASSEMBLY

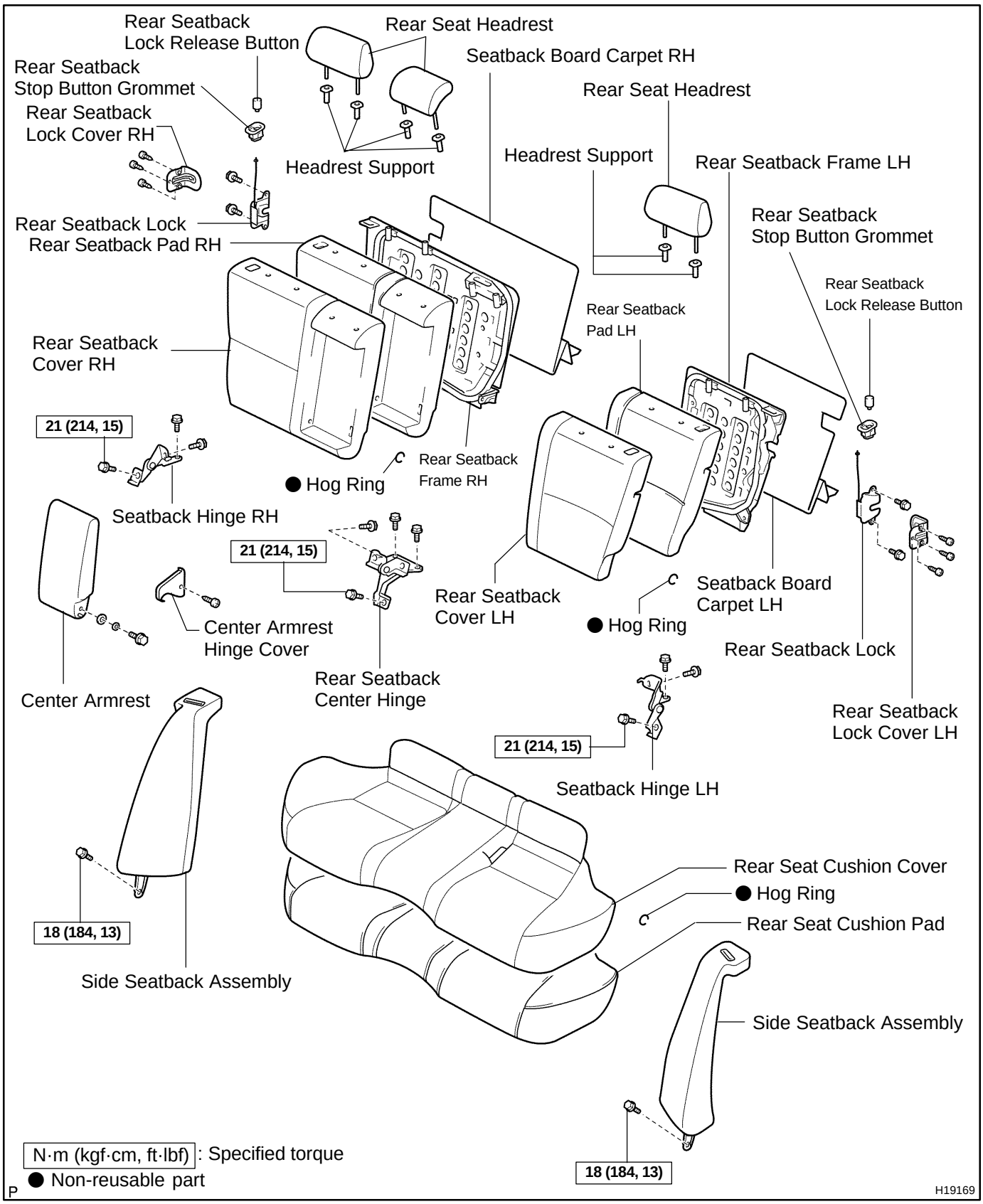
Push down the front portion of the seat cushion assembly to install it.

REAR SEAT (Wagon)

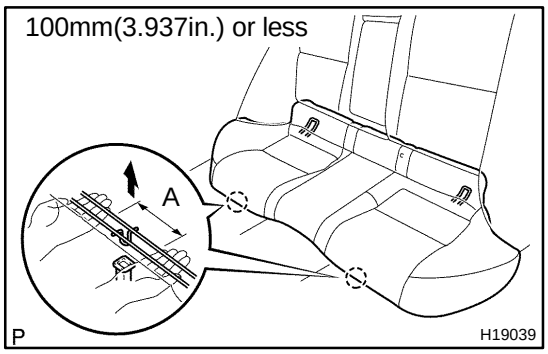
COMPONENTS

BO4EB-02




Rear Seatback Lock Release Button
Rear Seat Headrest
Seatback Board Carpet RH
Rear Seatback Stop Button Grommet
Rear Seat Headrest
Rear Seatback Lock Cover RH
Headrest Support
Headrest Support
Rear Seatback Frame LH
Rear Seatback Lock
Rear Seatback Pad RH
Rear Seatback Stop Button Grommet
Rear Seatback Lock Release Button
Rear Seatback Pad LH
Rear Seatback Cover RH
21 (214, 15)
Rear Seatback Frame RH
● Hog Ring
Seatback Hinge RH
21 (214, 15)
Rear Seatback Cover LH
Seatback Board Carpet LH
● Hog Ring
Center Armrest Hinge Cover
Rear Seatback Lock
Rear Seatback Center Hinge
Center Armrest
Rear Seatback Lock Cover LH
21 (214, 15)
Seatback Hinge LH
Rear Seat Cushion Cover
● Hog Ring
Rear Seat Cushion Pad
18 (184, 13)
Side Seatback Assembly
Side Seatback Assembly
18 (184, 13)
N·m (kgf·cm, ft·lbf): Specified torque
● Non-reusable part
P
H19169

BO4EC-03



REMOVAL

HINT:

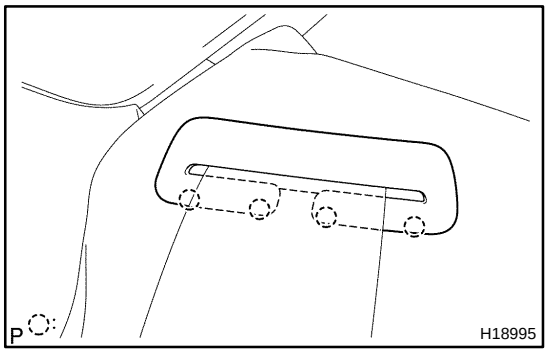
A bolt without a torque specification is shown in the standard bolt chart. (see page SS-2)

1. REMOVE SEAT CUSHION ASSEMBLY

Pull up the front portion of the seat cushion assembly, then remove it.

NOTICE:

Hold up the clip base to prevent the cushion frame from being distorted.



2. REMOVE SIDE SEAT BACK ASSEMBLY

(a) Remove the bolt and floor anchor.

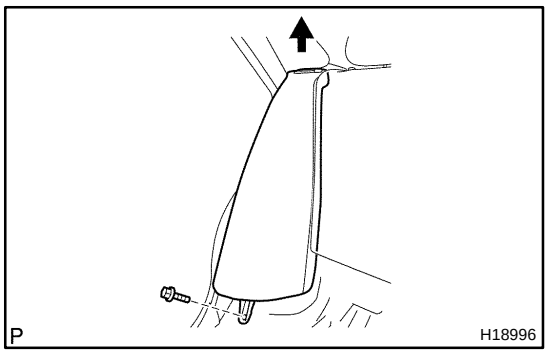
Torque: 42 N·m (428 kgf·cm, 31ft·lbf)

(b) Using a screwdriver, remove the rear seat shoulder belt hole cover.

HINT:

Tape the screwdriver tip before use.

(c) Employ the same manner described above to the other sides.



(d) Remove the bolt and side seat back assembly as shown in the illustration.

Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

3. REMOVE REAR SEAT FLOOR BOARD NO.4 (See page BO-164)

4. REMOVE DECK FLOOR BOX FRONT (See page BO-164)

5. REMOVE DECK BOARD NO.2 (See page BO-164)

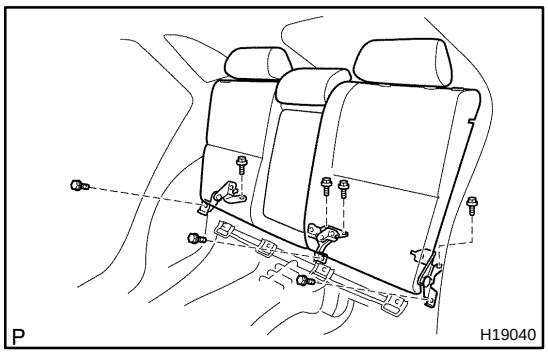
6. REMOVE REAR FLOOR BOARD NO.2 (See page BO-164)

7. REMOVE REAR FLOOR BOARD NO.3 (See page BO-164)

8. REMOVE TONNEAU COVER ASSEMBLY (See page BO-164)

9. REMOVE REAR FLOOR FINISH PLATE (See page BO-164)

10. REMOVE DECK TRIM SIDE PANEL ASSEMBLY (See page BO-164)



11. REMOVE SEAT BACK ASSEMBLY

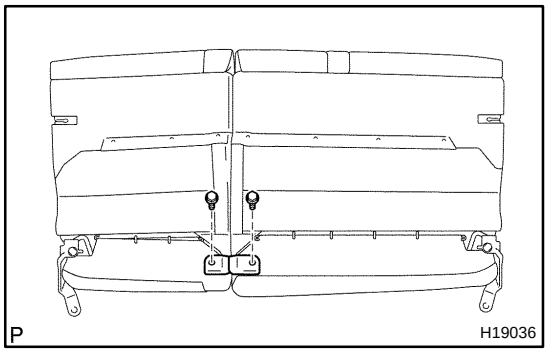
Remove the 7 bolts and seat back assembly.

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

BO4ED-02

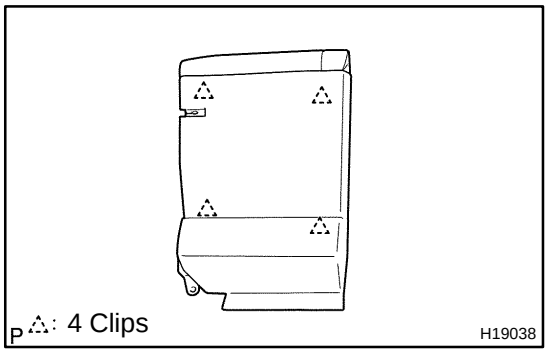
DISASSEMBLY

1. REMOVE REAR SEAT HEADRESTS



2. REMOVE REAR SEAT BACK CENTER HINGE SUB-ASSEMBLY

Remove the 2 bolts and rear seat center hinge sub-assembly.



3. REMOVE REAR SEAT BACK BOARD CARPET LH

(a) Remove the 3 screws and rear seat back lock cover LH.

(b) Using a screwdriver, remove the seat back board carpet LH.

HINT:

Tape the screwdriver tip before use.

4. REMOVE REAR SEAT BACK COVER LH

(a) Remove the bolt and rear seat back hinge LH.

(b) Remove the headrest supports.

(c) Remove the rear back lock release button.

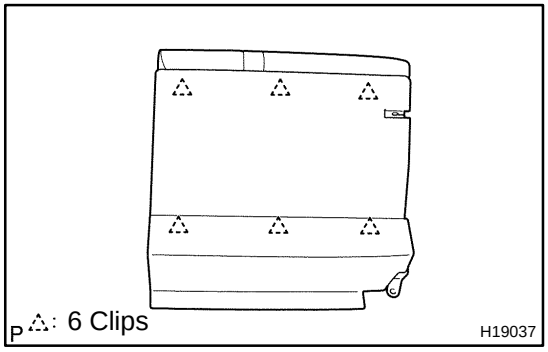
(d) Remove the rear seat back stop button grommet.

(e) Remove the hog rings and rear seat back cover with pad.

(f) Remove the hog rings and rear seat back cover LH from the seat back pad.

5. REMOVE REAR SEAT BACK LOCK ASSEMBLY LH

Remove the 2 bolts and rear seat back lock assembly.



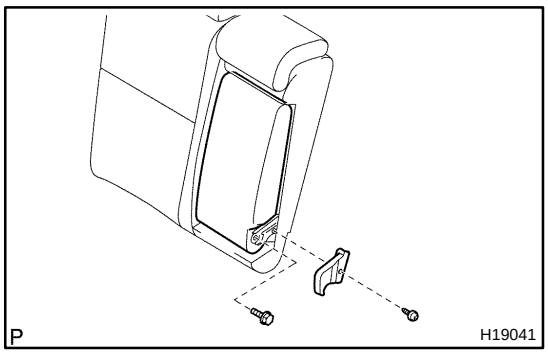
6. REMOVE REAR SEAT BACK BOARD CARPET RH

(a) Remove the 3 screws and rear seat back lock cover RH.

(b) Using a screwdriver, remove the rear seat back board carpet RH.

HINT:

Tape the screwdriver tip before use.



7. REMOVE CENTER ARMREST

(a) Remove the screw and center armrest hinge cover.

(b) Remove the bolt and center armrest.

8. REMOVE REAR SEAT BACK COVER RH

(a) Remove the bolt and rear seat back hinge RH.

(b) Remove the headrest supports.

(c) Remove the rear back lock release button.

(d) Remove the rear seat back stop button grommet.

(e) Remove the hog rings and rear seat back cover with pad from the seat back frame.

(f) Remove the hog rings and rear seat back cover RH from the seat back pad.

9. REMOVE REAR SEAT BACK LOCK ASSEMBLY RH

Remove the 2 bolts and rear seat back lock assembly RH.

10. REMOVE REAR SEAT CUSHION COVER

Remove the hog rings and rear seat cushion cover from the seat cushion pad.

BO4EE-02

REASSEMBLY

1. INSTALL REAR SEAT CUSHION COVER

Install the rear seat cushion cover with new hog rings to the front of seat cushion pad.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

2. INSTALL REAR SEATBACK LOCK ASSEMBLY RH

3. INSTALL REAR SEATBACK COVER RH

(a) Install rear seatback cover with new hog rings to the seatback pad.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

(b) Install seatback cover with pad to the seatback frame with new hog rings.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

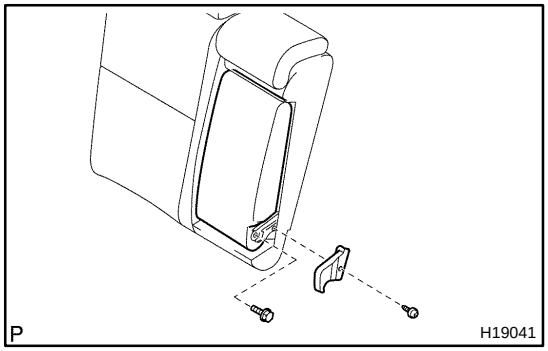
(c) Install the 6 headrest supports.

(d) Install the rear seatback stop button grommet.

(e) Install the rear back lock release button.

(f) Install the bolt and rear seatback hinge RH.

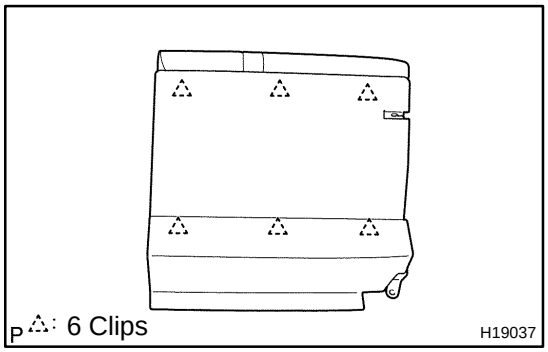
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)



4. INSTALL CENTER ARMREST

(a) Install the center armrest with the bolt.

(b) Install the center armrest hinge cover with the screw.



5. INSTALL SEATBACK BOARD CARPET RH

(a) Install the seatback board carpet RH.

(b) Install the rear seatback lock cover RH.

6. INSTALL REAR SEATBACK LOCK ASSEMBLY LH

7. INSTALL SEATBACK COVER LH

(a) Install rear seatback cover with new hog rings to the seatback pad.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

(b) Install seatback cover with pad to the seatback frame with new hog rings.

HINT:

When installing the hog rings, take care to prevent wrinkles as little as possible.

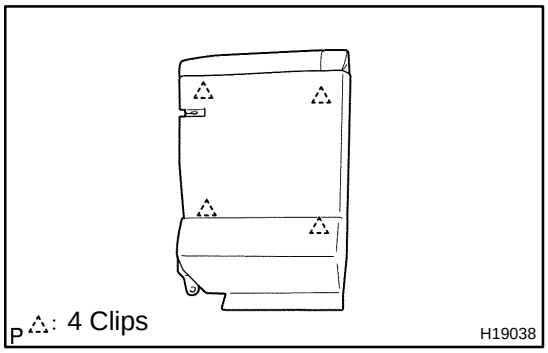
(c) Install the 6 headrest supports.

(d) Install the rear seatback stop button grommet.

(e) Install the rear back lock release button.

(f) Install the bolt and rear seatback hinge LH.

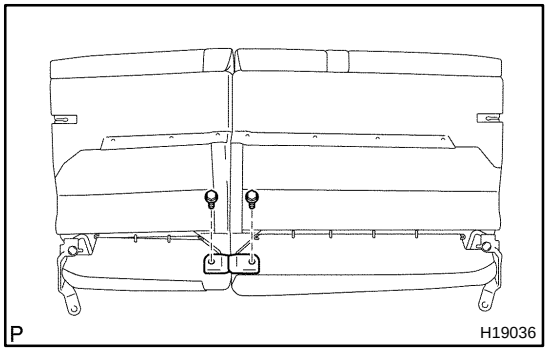
Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)



8. INSTALL SEATBACK BOARD CARPET RH

(a) Install the seatback board carpet LH.

(b) Install the rear seatback lock cover LH.



9. INSTALL REAR SEATBACK CENTER HINGE

Install the rear seat center hinge with the 2 bolts.

Torque: 21 N·m (214 kgf·cm, 15 ft·lbf)

10. INSTALL REAR SEAT HEADRESTS

BO4EF-02

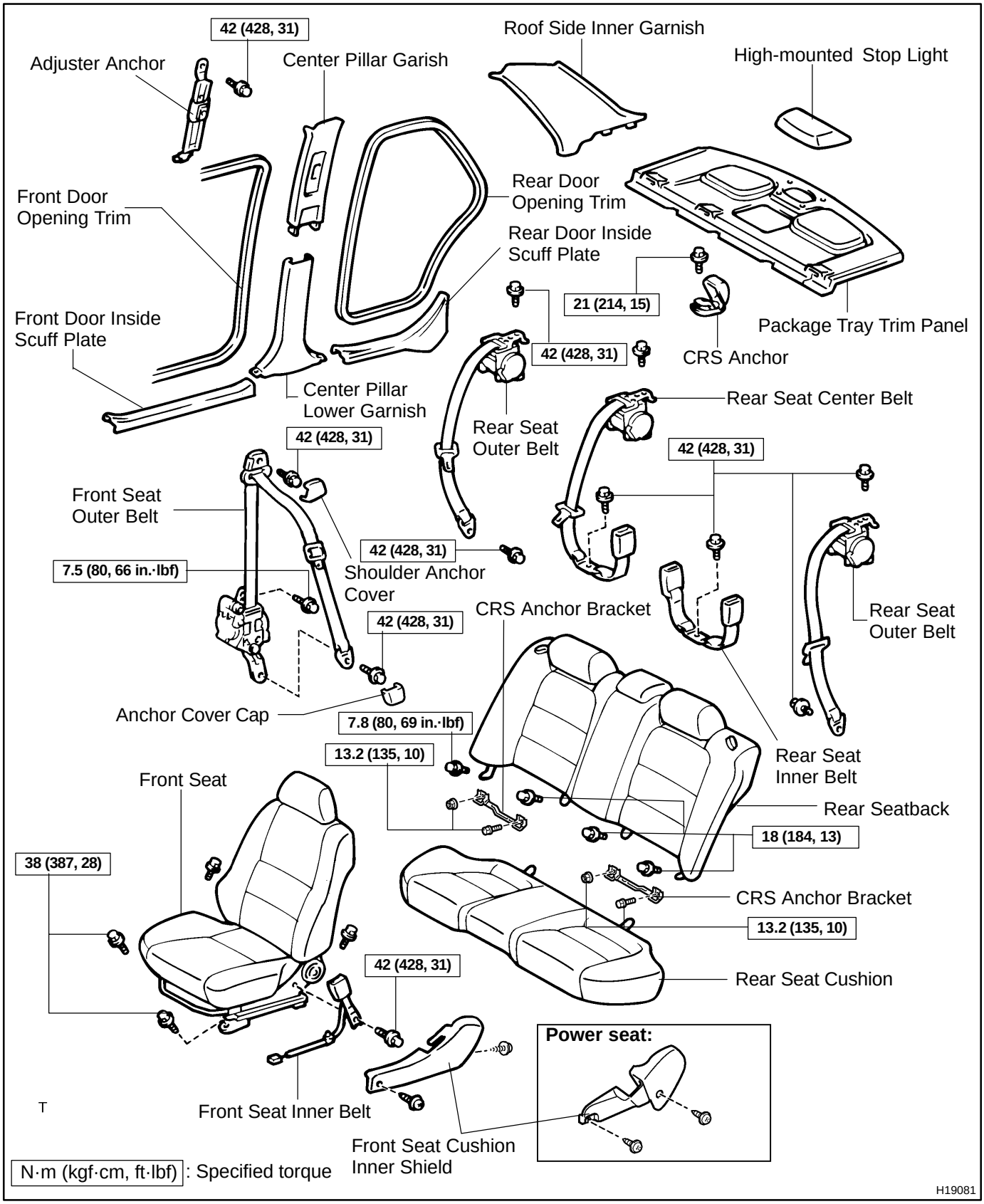
INSTALLATION

The installation procedures are the removal procedures in reverse order (See page BO-204).

SEAT BELT (Sedan)

BO4EG-02

COMPONENTS



BO4EH-02

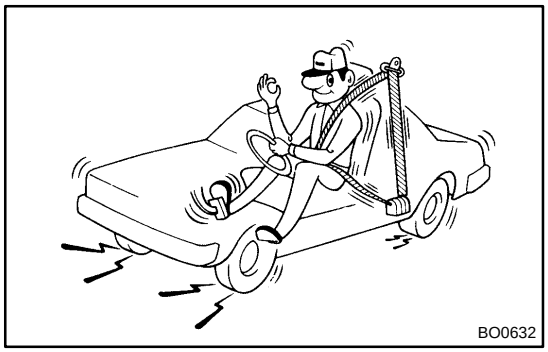
INSPECTION

CAUTION:

Replace the seat belt assembly (outer belt, inner belt, bolts or nuts) if it has been used in a severe impact. The entire assembly should be replaced even if damage is not obvious.

1. RUNNING TEST (IN SAFE AREA)

(a) Fasten the front seat belts.


BO0632

(b) Drive the car at 10 mph (16 km/h) and slam on the brakes. Check that the belt locks and cannot be extended at this time.

HINT:

Conduct this test in a safe area. If the belt does not lock, remove the belt mechanism assembly and conduct the following static check. Also, whenever installing a new belt assembly, verify the proper operation before installation.

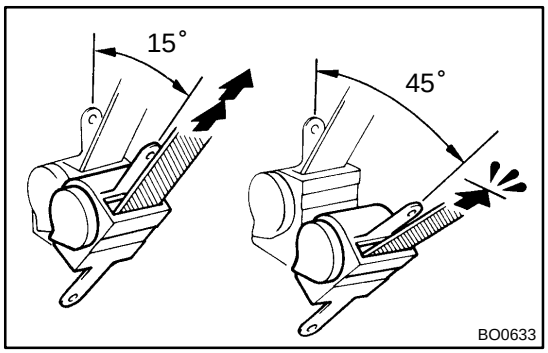
2. Driver's Seat Belt (ELR):

STATIC TEST

(a) Make sure that the belt locks when pulled out quickly.

(b) Remove the locking retractor assembly.

(c) Tilt the retractor slowly.



BO0633

(d) Make sure that the belt can be pulled out at a tilt of 15 degrees or less, and cannot be pulled out over 45 degrees of tilt.

If a problem is found, replace the assembly.

3. Except Driver's Seat Belt (ELR/ALR):

STATIC TEST

(a) Make sure that the belt locks when pulled out quickly.

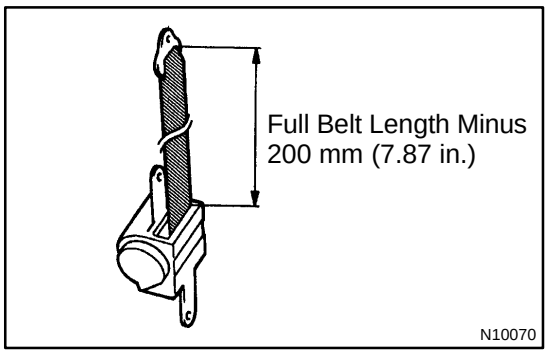
(b) Remove the locking retractor assembly.

(c) Pull out the whole belt and measure the length of the whole belt.

Then retract the belt slightly and pull it out again

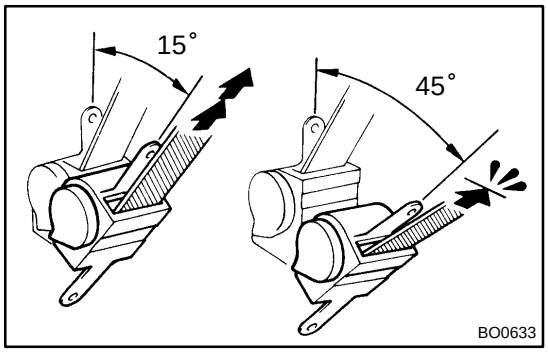
(d) Make sure that the belt cannot be extended further.

If a problem is found, replace the assembly.



(e) Retract the whole belt, then pull out the belt until 200 mm (7.87 in.)of belt remains in the retractor.

(f) Tilt the retractor slowly.



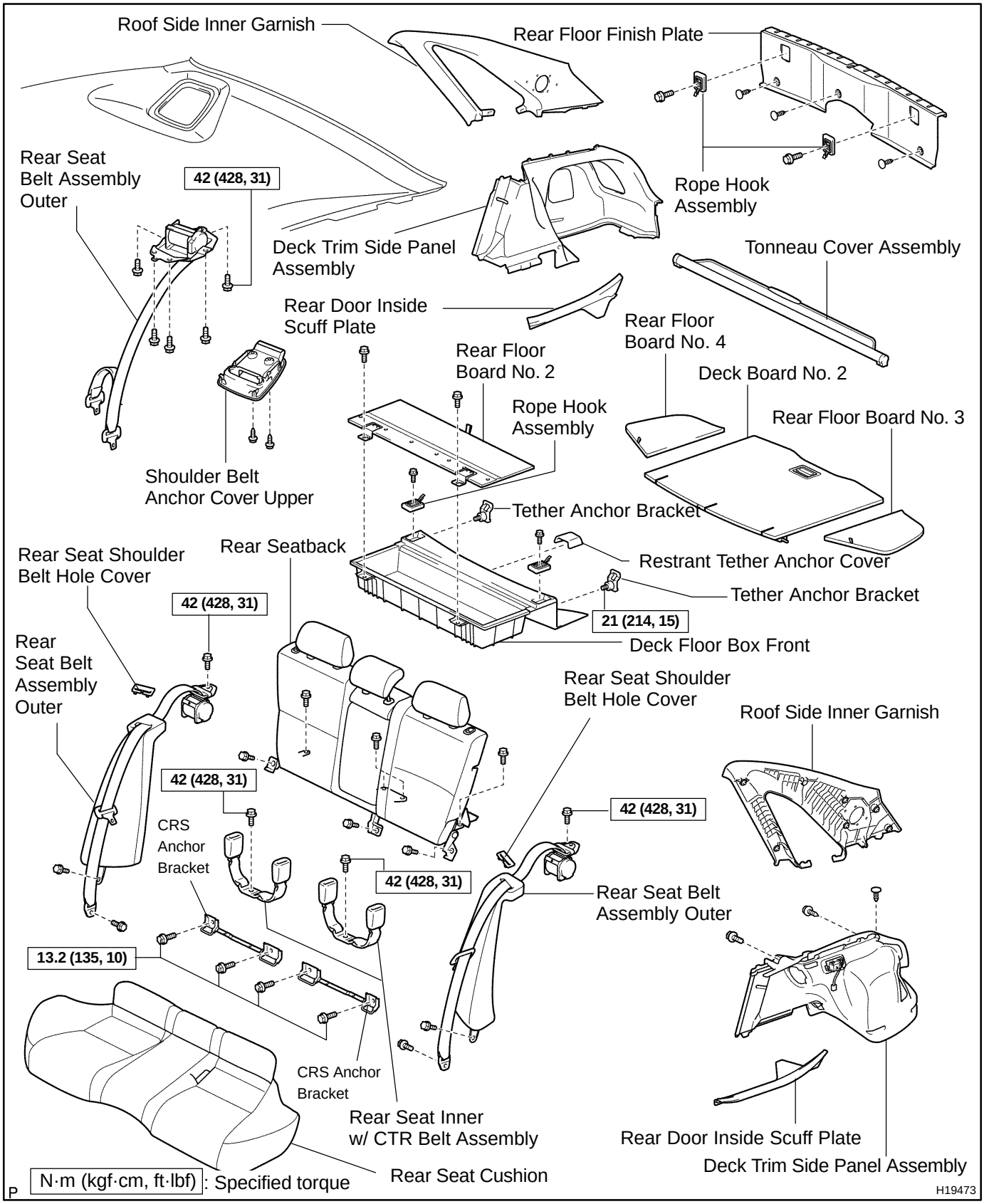
(g) Make sure that the belt can be pulled out at a tilt of 15 degrees or less, and cannot be pulled out at over 45 degrees of tilt.

If a problem is found, replace the assembly.

SEAT BELT (Wagon)

COMPONENTS

BO4EI-02



BO4EJ-02

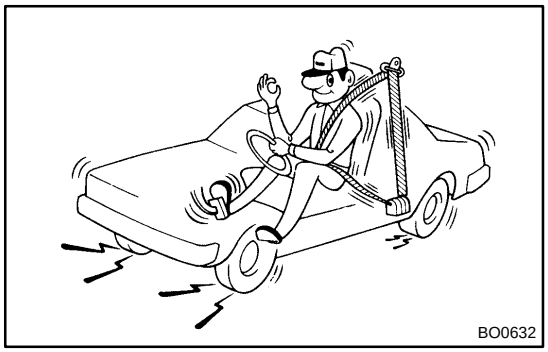
INSPECTION

CAUTION:

Replace the seat belt assembly (outer belt, inner belt, bolts or nuts) if it has been used in a severe impact. The entire assembly should be replaced even if damage is not obvious.

1. RUNNING TEST (IN SAFE AREA)

(a) Fasten the front seat belts.


BO0632

(b) Drive the car at 10 mph (16 km/h) and slam on the brakes. Check that the belt locks and cannot be extended at this time.

HINT:

Conduct this test in a safe area. If the belt does not lock, remove the belt mechanism assembly and conduct the following static check. Also, whenever installing a new belt assembly, verify the proper operation before installation.

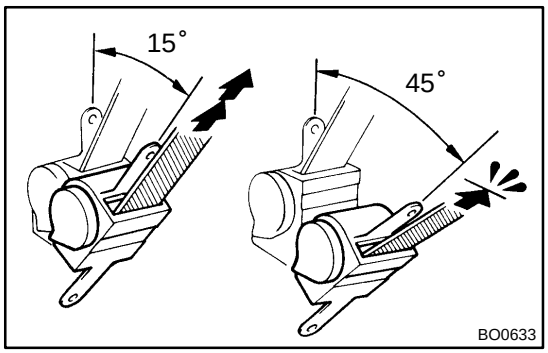
2. Driver's Seat Belt (ELR):

STATIC TEST

(a) Make sure that the belt locks when pulled out quickly.

(b) Remove the locking retractor assembly.

(c) Tilt the retractor slowly.



BO0633

(d) Make sure that the belt can be pulled out at a tilt of 15 degrees or less, and cannot be pulled out over 45 degrees of tilt.

If a problem is found, replace the assembly.

3. Except Driver's Seat Belt (ELR/ALR):

STATIC TEST

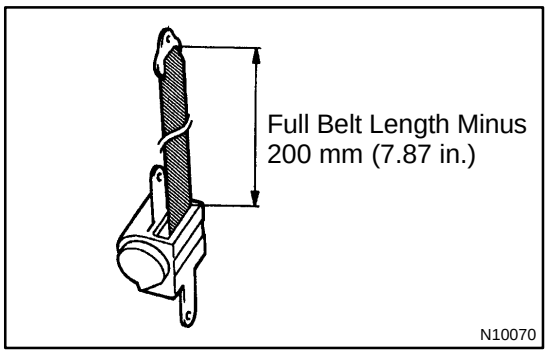
(a) Make sure that the belt locks when pulled out quickly.

(b) Remove the locking retractor assembly.

(c) Pull out the whole belt and measure the length of the whole belt. Then retract the belt slightly and pull it out again.

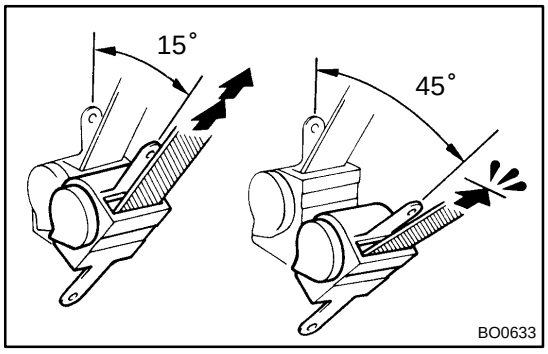
(d) Make sure that the belt cannot be extended further.

If a problem is found, replace the assembly.



(e) Retract the whole belt, then pull out the belt until 200 mm (7.87 in.) of belt remains in the retractor.

(f) Tilt the retractor slowly.



(g) Make sure that the belt can be pulled out at a tilt of 15 degrees or less, and cannot be pulled out at over 45 degrees of tilt.

If a problem is found, replace the assembly.

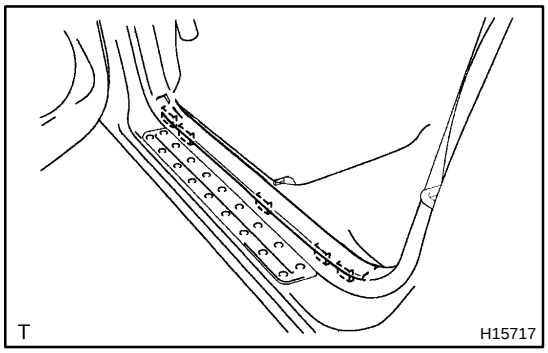
SEAT BELT PRETENSIONER

BO2DG-05

REMOVAL

NOTICE:

- **If the wiring connector of the seat belt pretensioner is disconnected with the ignition switch at ON or ACC, diagnostic trouble codes will be recorded.**
- **Never use seat belt pretensioner from another vehicle. When replacing parts, replace them with new parts.**

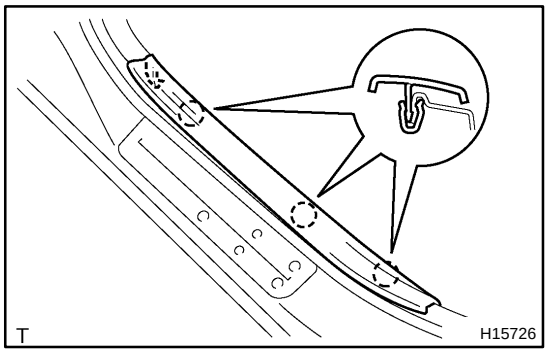


1. REMOVE FRONT DOOR INSIDE SCUFF PLATE

Using a screwdriver, remove the front door inside scuff plate.

HINT:

Tape the screwdriver tip before use.



2. REMOVE REAR DOOR INSIDE SCUFF PLATE

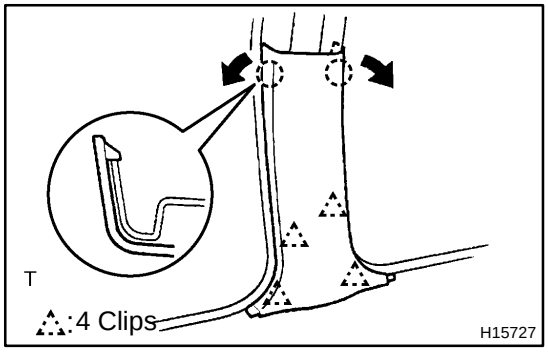
Using a screwdriver, remove the rear door inside scuff plate.

HINT:

Tape the screwdriver tip before use.

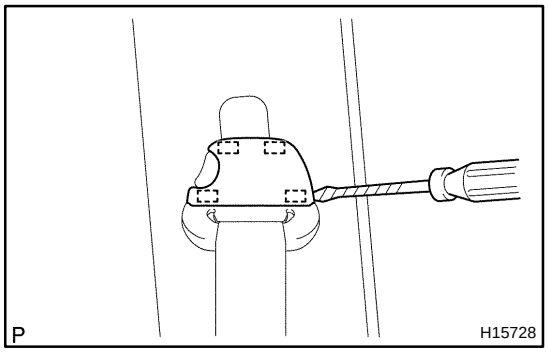
3. REMOVE REAR PART OF FRONT DOOR OPENING TRIM

4. REMOVE FRONT PART OF REAR DOOR OPENING TRIM



5. REMOVE CENTER PILLAR LOWER GARNISH

Remove the center pillar lower garnish as shown in the illustration.



6. REMOVE FRONT SEAT OUTER BELT

(a) Using a screwdriver, remove the shoulder anchor cover.

HINT:

Tape the screwdriver tip before use.

(b) Remove the bolt and shoulder anchor.

(c) Using a screwdriver, remove the floor anchor cover.

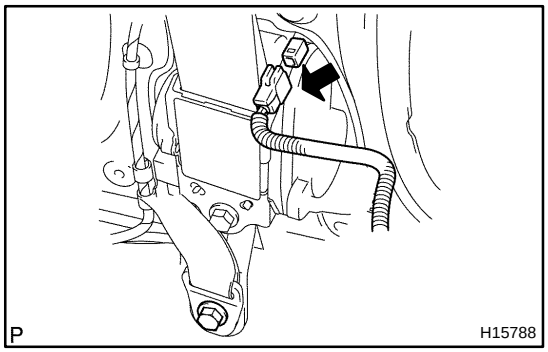
HINT:

Tape the screwdriver tip before use.

(d) Remove the bolt and floor anchor.

(e) Remove the retractor of front seat outer belt.

CAUTION:
Never disassemble the front seat outer belt.
NOTICE:
When removing the retractor of front seat outer belt, take care not to pull the seat belt pretensioner wire harness.



(1) Disconnect the pretensioner connector as shown in the illustration.

CAUTION:
When removing the seat belt pretensioner, work must be started within 90 seconds after the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.

(2) Remove the upper bolt and retractor of front seat outer belt.

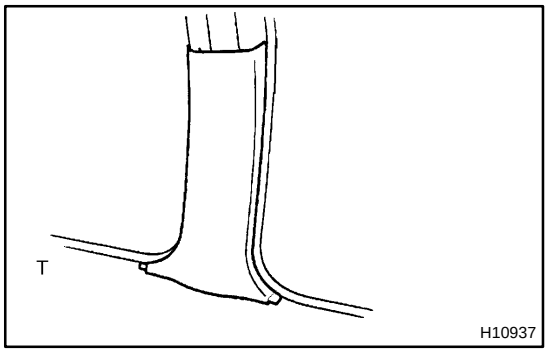
NOTICE:
Except when disposing of the seat belt pretensioner, do not remove the shoulder belt anchor plate from the retractor.

BO259-07

INSPECTION

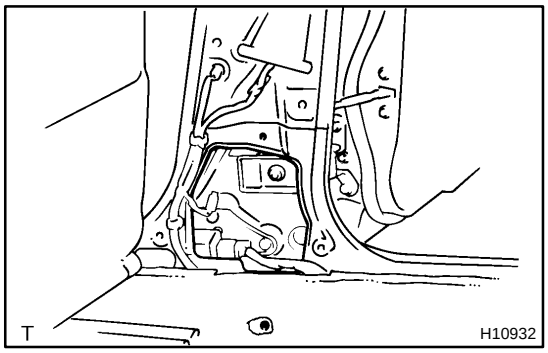
1. PRETENSIONER IS NOT ACTIVATED

(a) Perform a diagnostic system check.
(See page DI-607)

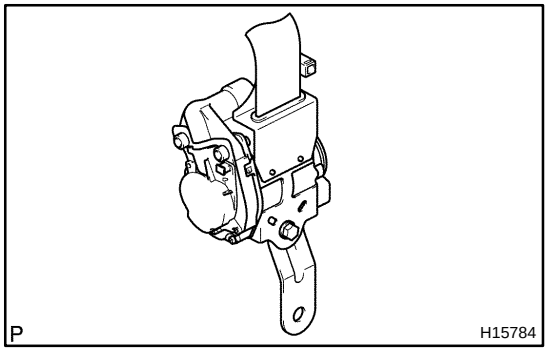


(b) Perform a visual check which includes the following items with the front seat outer belt removed from the vehicle.

- Check for cuts and cracks in, or marked discoloration on the center pillar lower garnish.
- Check for cuts and cracks in wire harness, and for chipping in connectors.



- Check for deformation of the center pillar.



- Check for small cuts and miute cracks in wire harness or marked discoloration on the front seat outer belt.

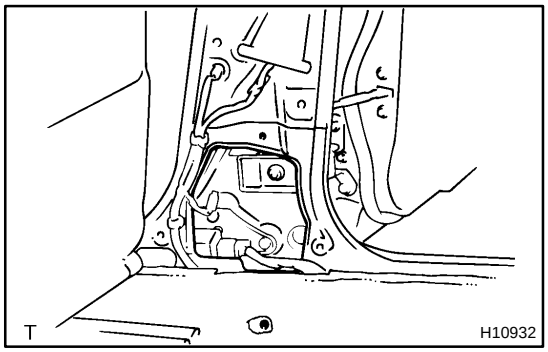
CAUTION:
For removal and installation of the front seat outer belt, see page BO-217 and BO-226 .
Be sure to follow the correct procedure.

2. PRETENSIONER IS ACTIVATED

(a) Perform a diagnostic system check.
(See page DI-607)

(b) Perform a visual check which includes the following items with the front seat outer belt removed from the vehicle.

- Check for deformation of the center pillar.
- Check for damage on the connector and wire harness.

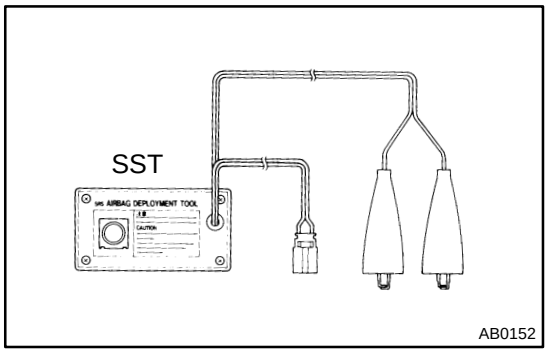


BO2DH-06

DISPOSAL

HINT:

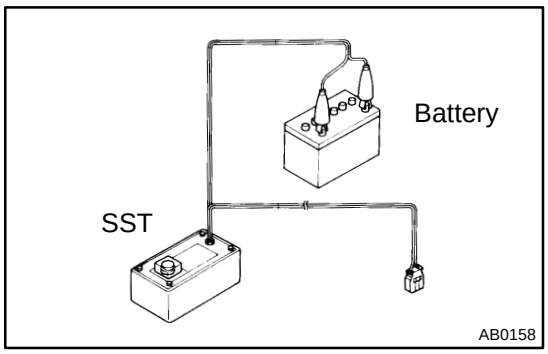
When scrapping vehicles equipped with a seat belt pretensioner or disposing of a front seat outer belt (with seat belt pretensioner), always first activate the seat belt pretensioner in accordance with the procedure described below. If any abnormality occurs in the seat belt pretensioner operation, contact the SERVICE DEPT. of TOYOTA MOTOR SALES, U.S.A. INC. When disposing of a front seat outer belt (with seat belt pretensioner) activated in a collision, follow the same procedure given in step 1-(e) in "DISPOSAL".



CAUTION:

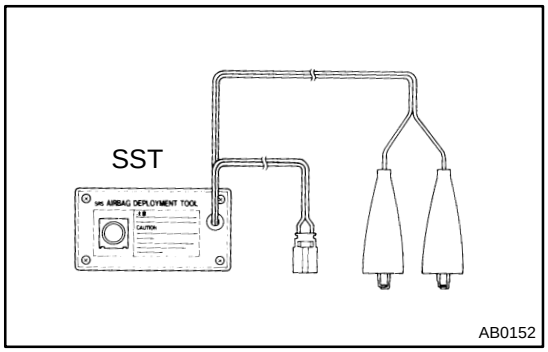
- **Never dispose of front seat outer belt which has an inactivated pretensioner.**
- **The seat belt pretensioner produces a sizeable exploding sound when it activates, so perform the operation outdoors and where it will not create a nuisance to nearby residents.**
- **When activating the seat belt pretensioner, always use the specified SST (SRS Airbag Deployment Tool). Perform the operation in a place away from electrical noise.**

  SST 09082-00700, 09082-00730
- **When activating a front seat outer belt (with seat belt pretensioner), perform the operation at least 10 m (33 ft) away from the front seat outer belt.**
- **Use gloves and safety glasses when handling the front seat outer belt with activated pretensioner.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to the front seat outer belt with activated pretensioner.**



1. SEAT BELT PRETENSIONER ACTIVATION WHEN SCRAPPING VEHICLE

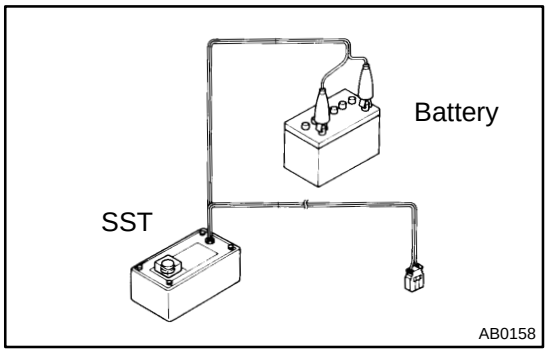
HINT:
Have a battery ready as the power source to activate the seat belt pretensioner.



(a) Check the functioning of SST.

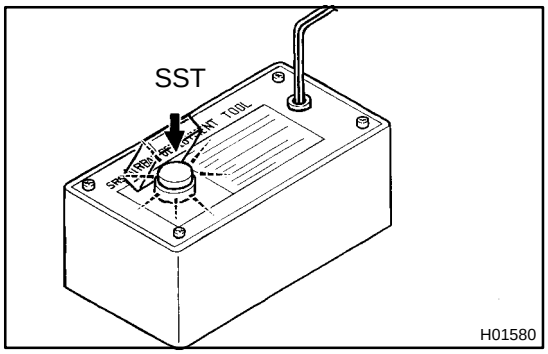
CAUTION:
When activating the seat belt pretensioner, always use the specified SST: SRS Airbag Deployment Tool.

SST 09082-00700, 09082-00730



(1) Connect the SST to the battery.
Connect the SST red clip to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.

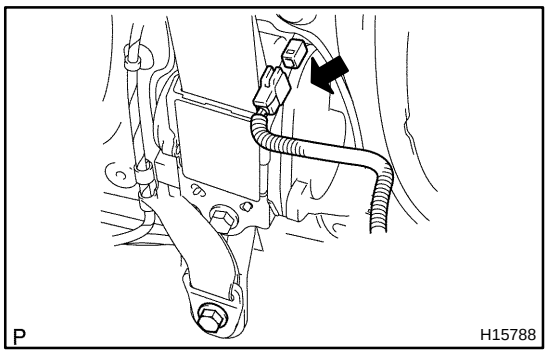
HINT:
Do not connect the yellow connector to the battery which should be connected with the seat belt pretensioner.



(2) Press the SST activation switch, and check the LED of the SST activation switch comes on.

CAUTION:
If the LED comes on when the activation switch is not being pressed, SST malfunction is probable, so definitely do not use the SST.

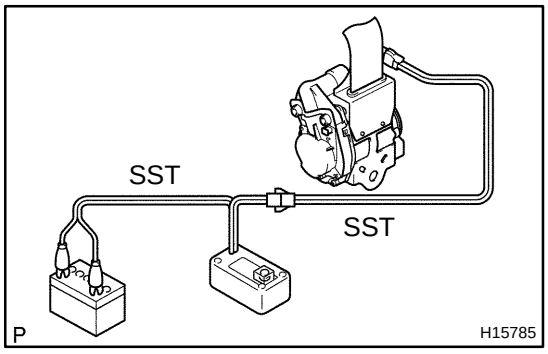
(b) Disconnect the pretensioner connector.
(1) Remove the front door inside scuff plate.
(2) Remove the rear door inside scuff plate.
(3) Remove the rear part of front door opening trim.
(4) Remove the front part of rear door opening trim.
(5) Remove the center pillar lower garnish.



(6) Disconnect the pretensioner connector as shown in the illustration.

(c) Install the SST.

(1) Buckle the front seat belt and check that there is no looseness and slack in the front seat inner belt and front seat outer belt.

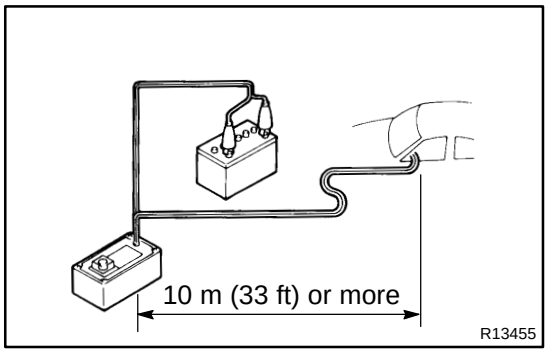


(2) Connect the 2 SST, then connect them to the seat belt pretensioner.

SST 09082-00700, 09082-00730

NOTICE:

Avoid damaging the SST connector and wire harness.



(3) Move the SST to at least 10 m (33 ft) away from the front of the vehicle.

(4) Close all the doors and windows of the vehicle.

NOTICE:

Take care not to damage the SST wire harness.

(5) Connect the SST red clip to the battery positive (+) terminal and the SST black clip to the negative (-) terminal.

(d) Activate the seat belt pretensioner.

(1) Confirm that no one is inside the vehicle or within 10 m (33 ft) area around the vehicle.

(2) Press the SST activation switch and activate the seat belt pretensioner.

HINT:

The seat belt pretensioner operates simultaneously as the LED of the SST activation switch comes on.

(e) Dispose of front seat outer belt (with seat belt pretensioner).

CAUTION:

- **The front seat outer belt is very hot when the seat belt pretensioner is activated, so leave it alone for at least 30 minutes after activation.**
- **Use gloves and safety glasses when handling a front seat outer belt with activated seat belt pretensioner.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front seat outer belt with activated seat belt pretensioner.**

HINT:
When scrapping a vehicle, dispose the seat belt pretensioner and scrap the vehicle with activated front seat outer belt being installed.

2. ACTIVATION WHEN DISPOSING OF FRONT SEAT OUTER BELT ONLY

NOTICE:

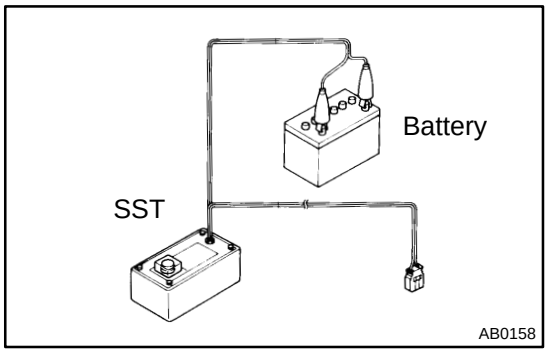
- **When disposing of the front seat outer belt (with seat belt pretensioner) only, never use the customer's vehicle to activate the seat belt pretensioner.**
- **Be sure to follow the procedure given on the next page when activating the seat belt pretensioner.**

HINT:
Have a battery ready as the power source when activating the seat belt pretensioner.

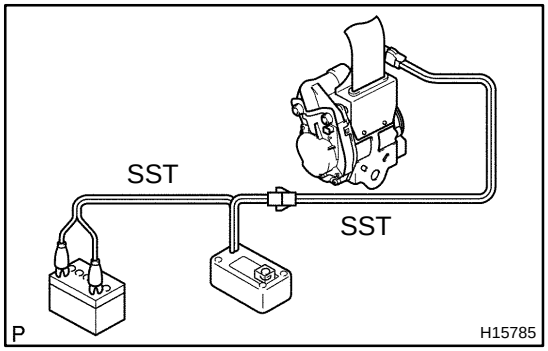
(a) Remove the front seat outer belt (See page BO-217).

HINT:
Cut the belt near the seat belt retractor.

(b) Remove the bolt and the shoulder belt anchor plate.

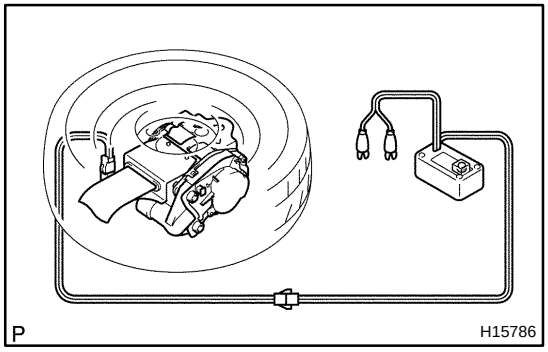


(c) Check functioning of SST (See step 1-(a)).
SST 09082-00700, 09082-00730



(d) Install the SST.
(1) Connect the 2 SST, then connect them to the seat belt pretensioner.
SST 09082-00700, 09082-00730

NOTICE:
Take care not to damage the SST connector and wire harness.



(2) Place the front seat outer belt on the ground, and cover it with the disc wheel with tire.

NOTICE:
Place the front seat outer belt as shown in the illustration.

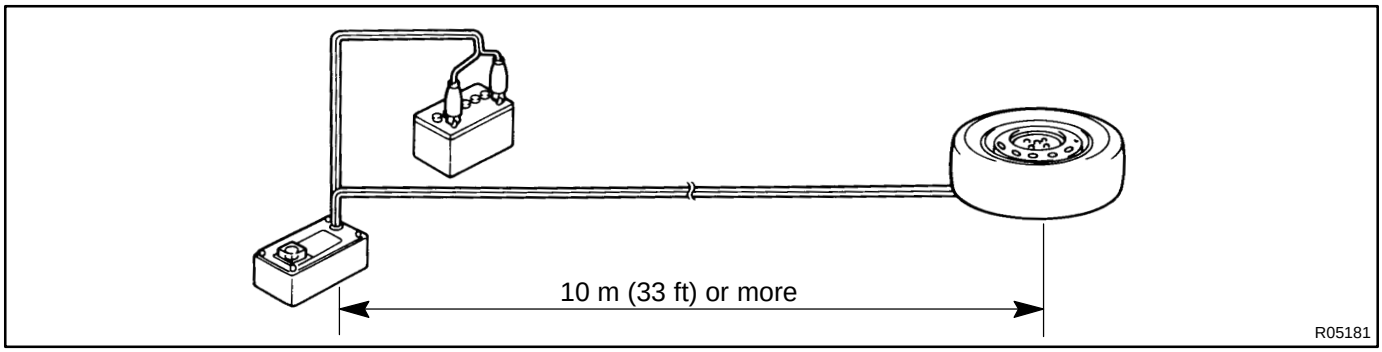
(3) Move the SST at least 10 m (33 ft) away from the disc wheel.

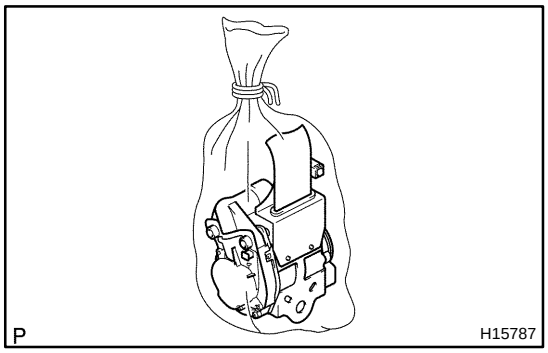
NOTICE:
Take care not to damage the SST wire harness.

(e) Activate the seat belt pretensioner.

(1) Connect the SST red clip to the battery positive (+) terminal and the SST black clip to the battery negative (-) terminal.
(2) Check that no one is within 10 m (33 ft) area around the disc wheel.
(3) Press the SST activation switch and activate the seat belt pretensioner.

HINT:
The seat belt pretensioner operates simultaneously as the LED of the SST activation switch comes on.





(f) Dispose of front seat outer belt (with seat belt pretensioner).

CAUTION:

- **The front seat outer belt is very hot when the seat belt pretensioner is activated, so leave it alone for at least 30 minutes after activation.**
- **Use gloves and safety glasses when handling a front seat outer belt with activated seat belt pretensioner.**
- **Always wash your hands with water after completing the operation.**
- **Do not apply water, etc. to a front seat outer belt with activated seat belt pretensioner.**

(1) Remove the disc wheel and SST.
(2) Place the front seat outer belt in a vinyl bag, and tie the end tightly and dispose of it in the same way as other general parts.

BO1QY-07

REPLACEMENT

REPLACE REQUIREMENTS

In the following cases, replace the seat belt pretensioner.

- If the seat belt pretensioner has been activated.
- If the seat belt pretensioner has been found to be faulty in troubleshooting.
- If the front seat outer belt has been found to be faulty during checking items 1-(b) or 2-(b) (See page BO-219).
- If the front seat outer belt has been dropped.

CAUTION:

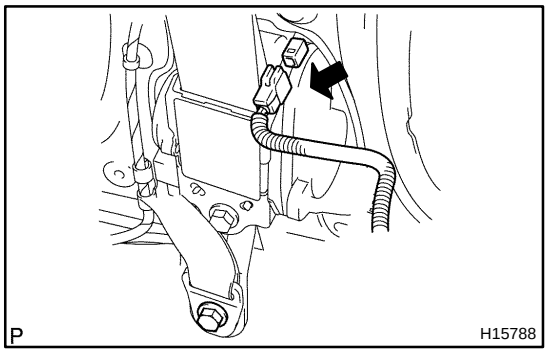
For removal and installation of the seat belt pretensioner, see page BO-217 and BO-226 .
Be sure to follow the correct procedure.

BO2DI-05

INSTALLATION

NOTICE:

- **Never use seat belt pretensioner from another vehicle. When replacing parts, replace them with new parts.**
- **Make sure that the front seat outer belt is installed with the specified torque.**
- **If the front seat outer belt has been dropped, or if there are cracks, dents or other defects in the case or connector, replace the front seat outer belt with a new one.**
- **When installing the front seat outer belt, take care that the wiring does not interfere with other parts and is not pinched between other parts.**



1. INSTALL FRONT SEAT OUTER BELT

(a) Install the retractor of front seat outer belt.

(1) Install the retractor of front seat outer belt with the upper bolt.

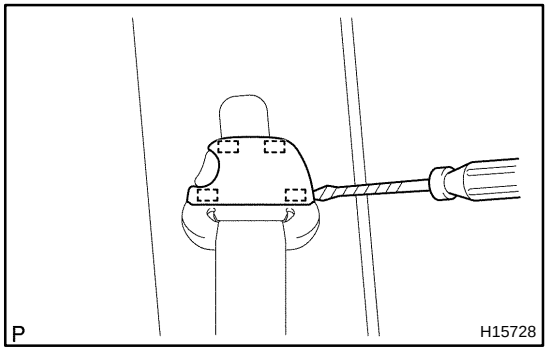
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

(2) Connect the pretensioner connector as shown in the illustration.

(b) Install the floor anchor with the bolt.

Torque: 41 N·m (420 kgf·cm, 30 ft·lbf)

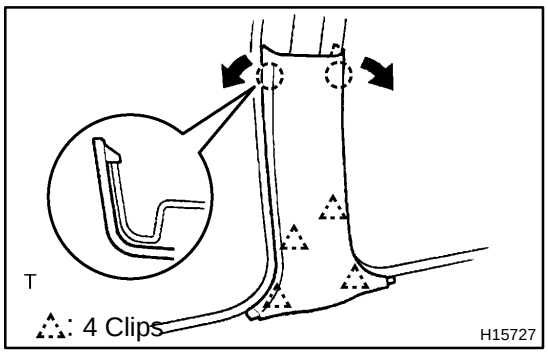
(c) Install the floor anchor cover.



(d) Install the shoulder anchor with the bolt.

Torque: 41 N·m (420 kgf·cm, 30 ft·lbf)

(e) Install the shoulder anchor cover.

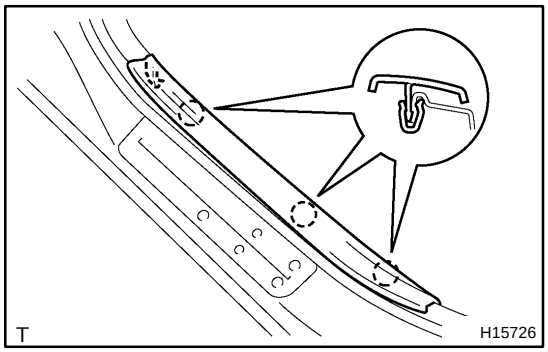


2. INSTALL CENTER PILLAR LOWER GARNISH

Install the center pillar lower garnish to the body.

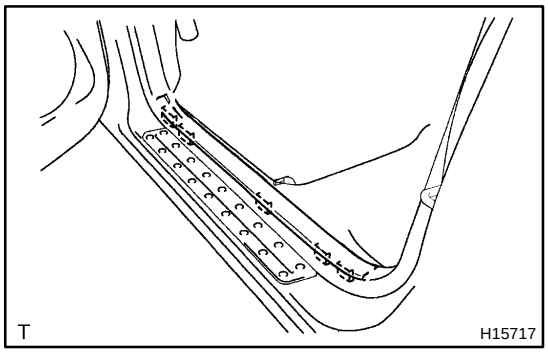
3. INSTALL FRONT PART OF REAR DOOR OPENING TRIM

4. INSTALL REAR PART OF FRONT DOOR OPENING TRIM



5. INSTALL REAR DOOR INSIDE SCUFF PLATE

Install the rear door inside scuff plate to the body.



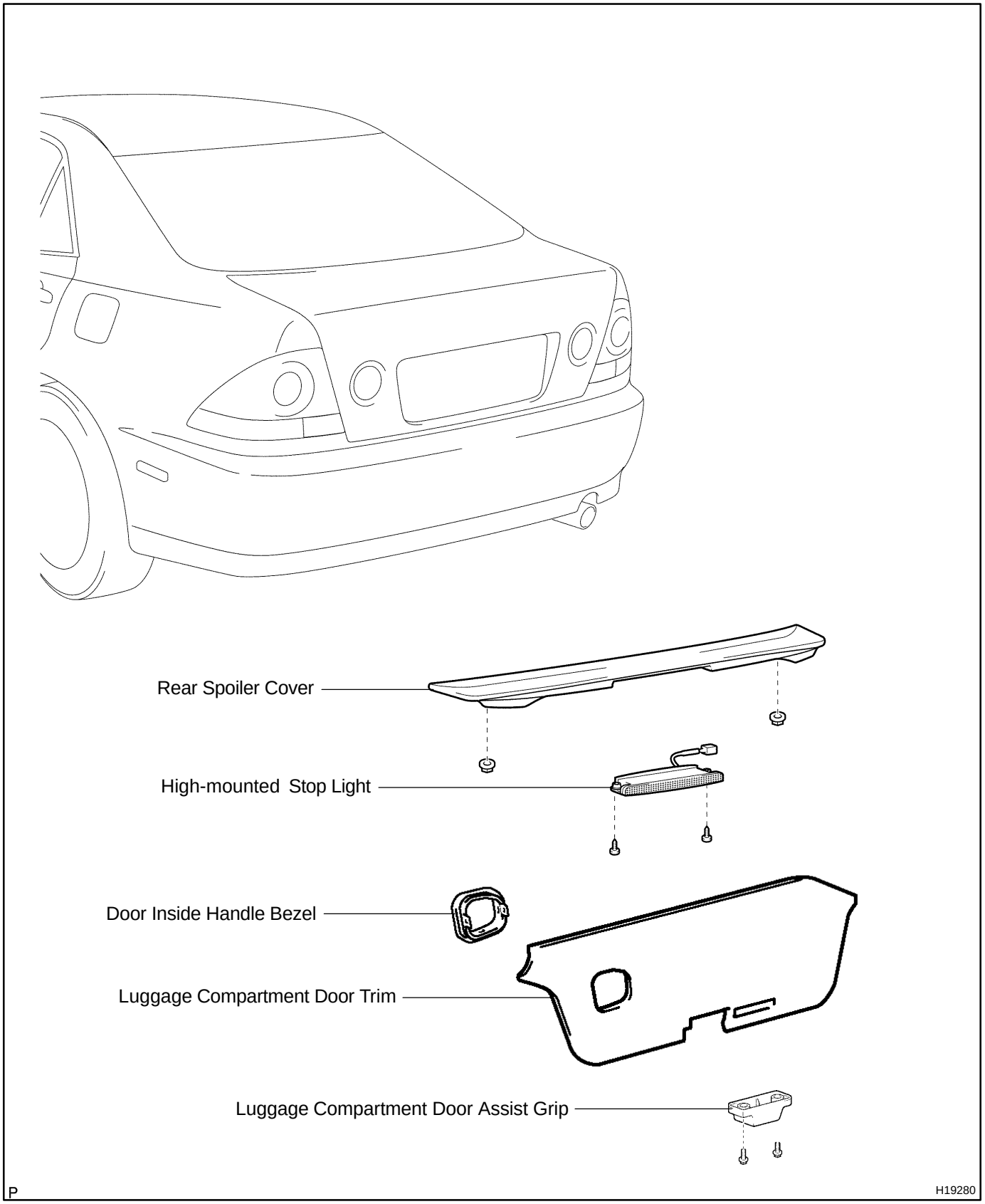
6. INSTALL FRONT DOOR INSIDE SCUFF PLATE

Install the front door inside scuff plate to the body.

SPOILER (Sedan)

COMPONENTS

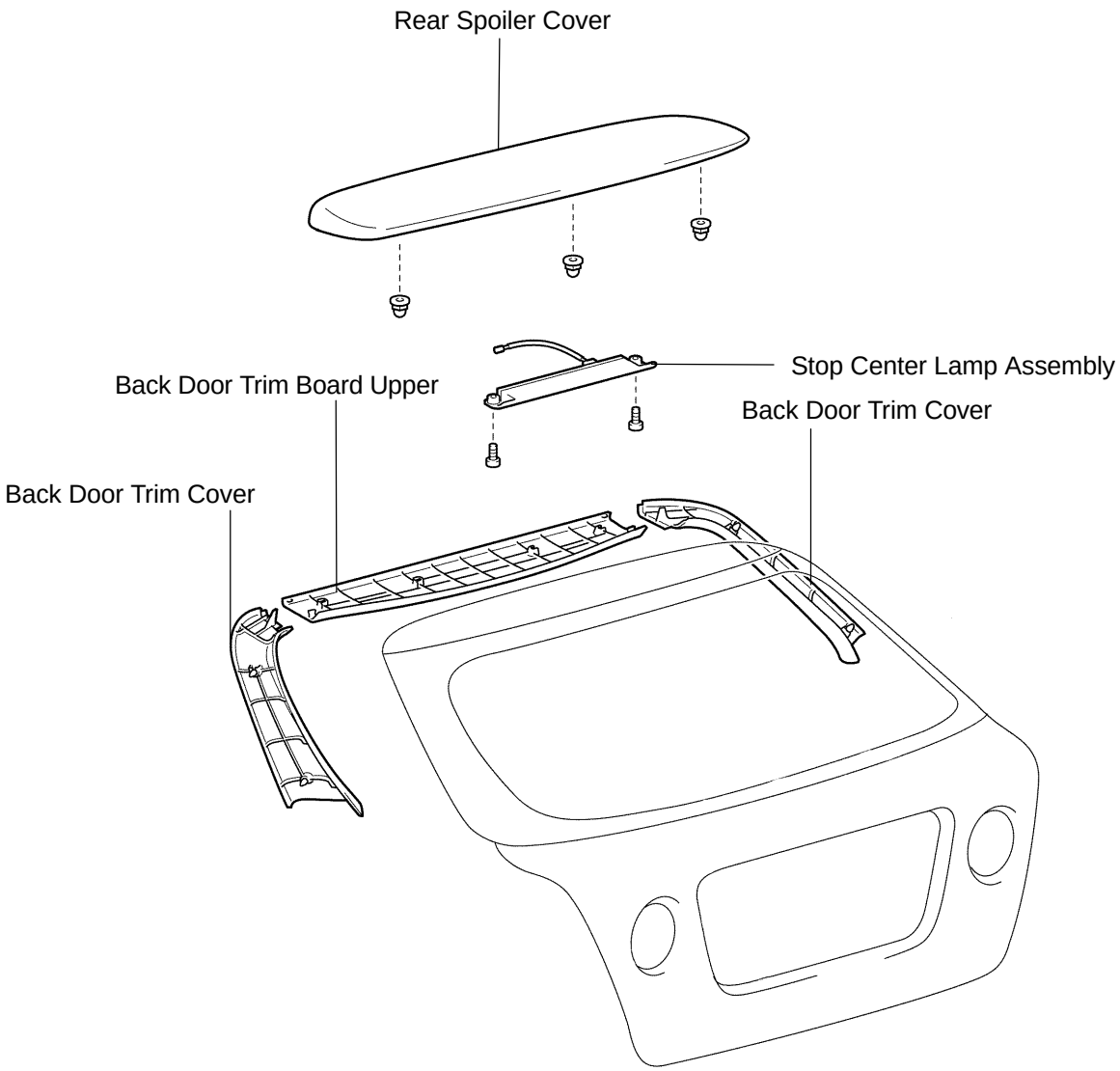
BO4EK-01



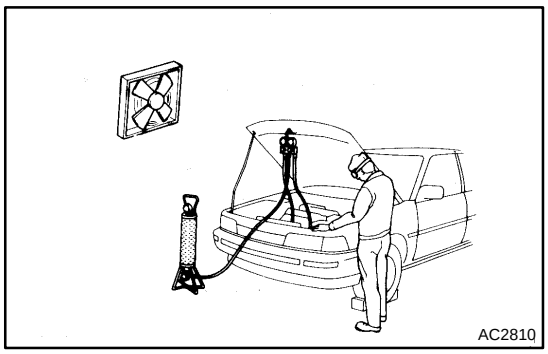
SPOILER (Wagon)

COMPONENTS

BO4EL-01



H19205


AC2810

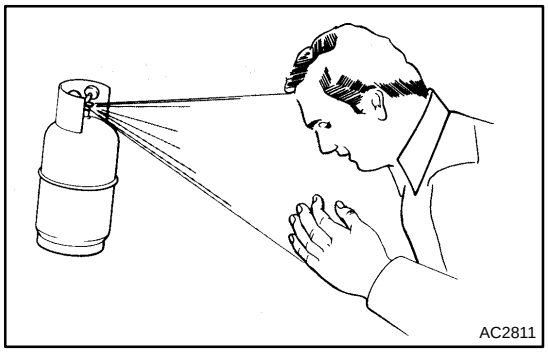
AIR CONDITIONING SYSTEM

AC15I-04

PRECAUTION

1. DO NOT HANDLE REFRIGERANT IN AN ENCLOSED AREA OR NEAR AN OPEN FLAME

2. ALWAYS WEAR EYE PROTECTION


AC2811

3. BE CAREFUL NOT TO GET LIQUID REFRIGERANT IN YOUR EYES OR ON YOUR SKIN

If liquid refrigerant gets in your eyes or on your skin.

(a) Wash the area with lots of cool water.

CAUTION:

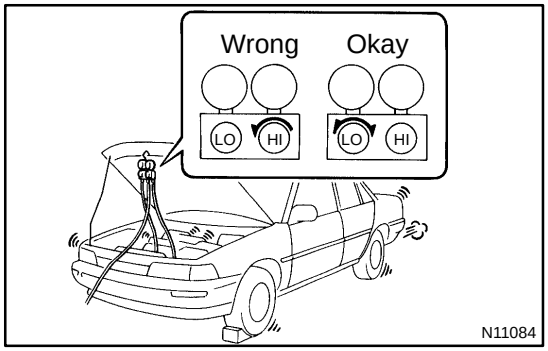
Do not rub your eyes or skin.

(b) Apply clean petroleum jelly to the skin.

(c) Go immediately to a physician or hospital for professional treatment.

4. NEVER HEAT CONTAINER OR EXPOSE IT TO NAKED FLAME

5. BE CAREFUL NOT TO DROP CONTAINER AND NOT TO APPLY PHYSICAL SHOCKS TO IT



N11084

6. DO NOT OPERATE COMPRESSOR WITHOUT ENOUGH REFRIGERANT IN REFRIGERANT SYSTEM

If there is not enough refrigerant in the refrigerant system oil lubrication will be insufficient and compressor burnout may occur, so take care to avoid this, necessary care should be taken.

7. DO NOT OPEN HIGH PRESSURE MANIFOLD VALVE WHILE COMPRESSOR IS OPERATING

If the high pressure valves opened, refrigerant flows in the reverse direction and could cause the charging cylinder to rupture, so open and close the only low pressure valve.

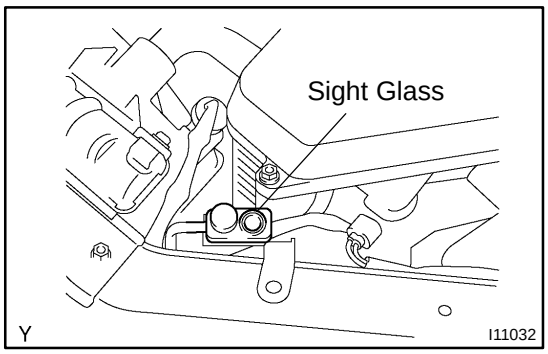
8. BE CAREFUL NOT TO OVERCHARGE SYSTEM WITH REFRIGERANT

If refrigerant is overcharged, it causes problems such as insufficient cooling, poor fuel economy, engine overheating etc.

9. SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The LEXUS IS300 is equipped with an SRS (Supplemental Restraint System) such as the driver, passenger and side airbag. Failure to carry out service operations in the correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notices in the RS section.

AC15J-04



ON-VEHICLE INSPECTION

1. INSPECT REFRIGERANT VOLUME

Observe the sight glass on the liquid tube.

Test conditions:

- Running engine at 1,500 rpm
- Blower speed control switch at ”HI” position
- A/C switch ON
- Temperature control dial at ”COOL” position
- Fully open the doors

Item	Symptom	Amount of refrigerant	Remedy
1	Bubbles present in sight glass	Insufficient*	(1) Check for gas leakage with gas leak detector and repair if necessary (2) Add refrigerant until bubbles disappear
2	No bubbles present in sight glass	None, sufficient or too much	Refer item 3 and 4
3	No temperature difference between compressor inlet and outlet	Empty or nearly empty	(1) Check for gas leakage with gas leak detector and repair if necessary (2) Add refrigerant until bubbles disappear
4	Temperature between compressor inlet and outlet is noticeably different	Correct or too much	Refer to items 5 and 6
5	Immediately after air conditioner is turned off, refrigerant in sight glass stays clear	Too much	(1) Discharge refrigerant (2) Evacuate air and charge proper amount of purified refrigerant
6	When air conditioner is turned off, refrigerant foams and then stays clear	Correct	-

*: Bubbles in the sight glass with ambient temperatures higher than usual can be considered normal if cooling is sufficient.

2. INSPECT REFRIGERANT PRESSURE WITH MANIFOLD GAUGE SET

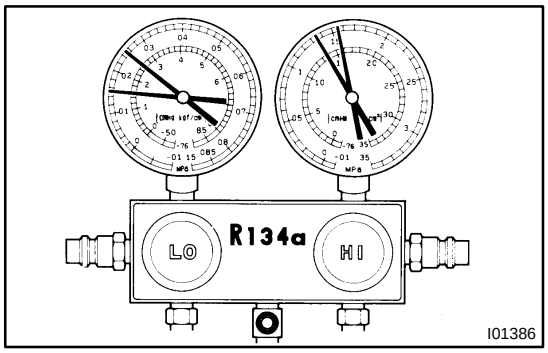
This is a method in which the trouble is located by using a manifold gauge set. Read the manifold gauge pressure when these conditions are established.

Test conditions:

- Temperature at the air inlet with the switch set at RECIRC is 30 - 35 °C (86 - 95 °F)
- Engine running at 2,000 rpm
- Blower speed control switch at "HI" position
- Temperature control dial on "COOL" position

HINT:

It should be noted that the gauge indications may vary slightly due to ambient temperature conditions.



(1) Normally functioning refrigeration system.

Gauge reading:

Low pressure side:

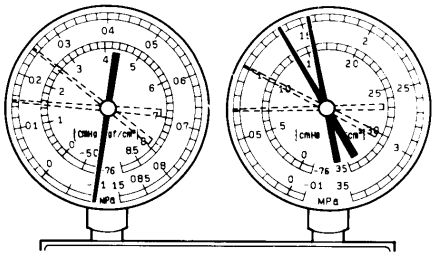
0.15 - 0.25 MPa (1.5 - 2.5 kgf/cm^2)

High pressure side:

1.37 - 1.57 MPa (14 - 15 kgf/cm$^{2)}$

(2) Moisture present in refrigeration system.

Condition: Periodically cools and then fails to cool

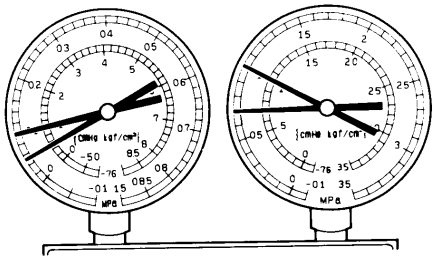


I01387

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
During operation, pressure on low pressure side sometimes become a vacuum and sometime normal	Moisture entered in refrigeration system freezes at expansion valve orifice and temporarily stops cycle, but normal state is restored after a time when the ice melts	●Drier in oversaturated state ●Moisture in refrigeration system freezes at expansion valve orifice and blocks circulation of refrigerant	(1) Replace dryer (2) Remove moisture in cycle through repeatedly evacuating air (3) Charge proper amount of new refrigerant

(3) Insufficient cooling

Condition: Insufficient cooling

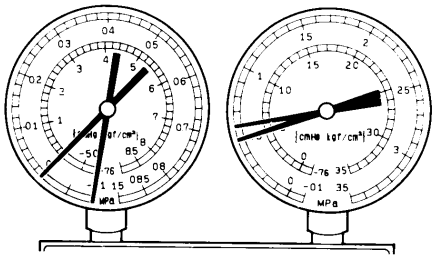


I01388

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
●Pressure low on both low and high pressure sides ●Bubbles seen in sight glass continuously ●Insufficient cooling performance	Gas leakage at some place in refrigeration system	●Insufficient refrigerant in system ●Refrigerant leaking	(1) Check for gas leakage with gas leak detector and repair if necessary (2) Charge proper amount of refrigerant (3) If indicated pressure value is near 0 when connected to gauge, create the vacuum after inspecting and repairing the location of the leak

(4) Poor circulation of refrigerant

Condition: Insufficient cooling

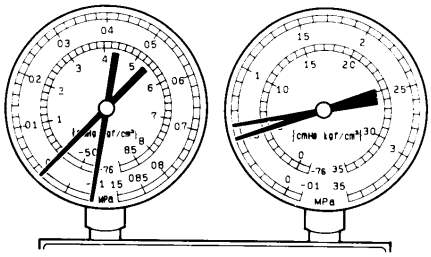


I01389

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
●Pressure low in both low and high pressure sides ●Frost on tube from condenser to unit	Refrigerant flow obstructed by dirt in condenser	condenser clogged	Replace dryer

(5) Refrigerant does not circulate

Condition: Does not cool (Cools from time to time in some cases)

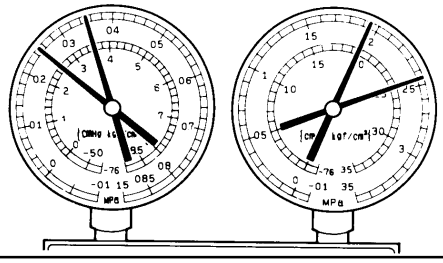


I01449

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
●Vacuum indicated on low pressure side, very low pressure indicated on high pressure side ●Frost or dew seen on piping before and after condenser/ drier or expansion valve	●Refrigerant flow obstructed by moisture or dirt in refrigeration system ●Refrigerant flow obstructed by gas leakage from expansion valve	Refrigerant does not circulate	(1) Check expansion valve (2) Clean out dirt in expansion valve by blowing with air (3) Replace dryer (4) Evacuate air and charge new refrigerant to proper amount (5) For gas leakage from expansion valve, replace expansion valve

(6) Refrigerant overcharged or insufficient cooling of condenser

Condition: Insufficient cooling

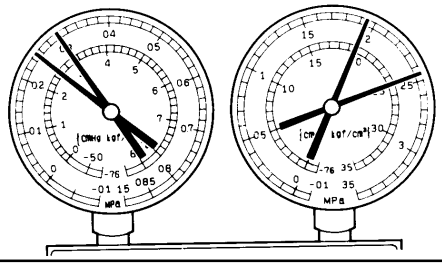


I01390

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
●Pressure too high on both low and high pressure sides ●No air bubbles seen through the sight glass even when the engine rpm is lowered	●Unable to develop sufficient performance due to excessive refrigeration system ●Insufficient cooling of condenser	●Excessive refrigerant in cycle → refrigerant over charged ●Condenser cooling → condenser fins clogged of condenser fan faulty	(1) Clean condenser (2) Check condenser fan motor operation (3) If (1) and (2) are in normal state, check amount of refrigerant Charge proper amount of refrigerant

(7) Air present in refrigeration system

Condition: Insufficient cooling



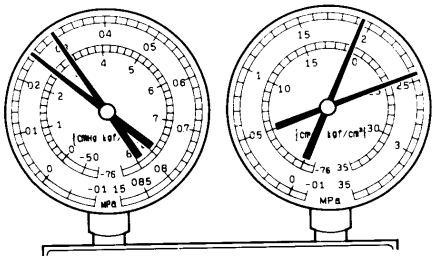
NOTE : These gauge indications are shown when the refrigeration system has been opened and the refrigerant charged without vacuum purging.

I01392

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
●Pressure too high on both low and high pressure sides ●The low pressure piping hot to touch ●Bubbles seen in sight glass	Air entered in refrigeration system	●Air present in refrigeration system ●Insufficient vacuum purging	(1) Check compressor oil to see if it is dirty or insufficient (2) Evacuate air and charge new refrigerant

(8) Expansion valve improperly

Condition: Insufficient cooling

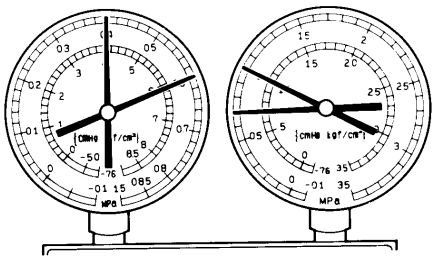


I01450

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
●Pressure too high on both low and high pressure sides ●Frost or large amount of dew on piping on low pressure side	Trouble in expansion valve	●Excessive refrigerant in low pressure piping ●Expansion valve opened too wide	Check expansion valve Replace if defective

(9) Defective compression compressor

Condition : Does not cool



I01393

Symptom seen in refrigeration system	Probable cause	Diagnosis	Remedy
●Pressure too high on low and high pressure sides ●Pressure too low on high pressure side	Internal leak in compressor	●Compression defective ●Valve leaking or broken sliding parts	Repair or replace compressor

3. INSPECT IDLE-UP SPEED

(a) Warm up engine.

(b) Inspect idle-up speed when the these conditions are established.

Test conditions:

- Blower speed control switch at "HI" position
- Temperature control dial at "COOL" position
- A/C switch ON
- Put gear shift in neutral

Magnetic clutch condition	Idle speed
Magnetic clutch not engaged	600 ± 50 rpm
Magnetic clutch engaged	650 ± 50 rpm

If idle speed is not as specified, check the idle control system.

4. INSPECT FOR LEAKAGE OF REFRIGERANT

(a) Perform in these conditions.

- Stop engine
- Secure good ventilation (If the gas leak detector may not react volatile gases which are not refrigerant, such as evaporated gasoline and exhaust gas)
- Repeat the test 2 or 3 times
- Make sure that there is some refrigerant remaining in the refrigeration system.
  When compressor is OFF: approx. 392 - 588 kPa (4 - 6 kgf·cm^2, 57 - 85 psi)

(b) Bring the gas leak detector close to the drain hose before performing the test.

HINT:

- After the blower motor has stopped, leave the cooling for more than 15 minutes.
- Expose the gas leak detector sensor under the drain hose.
- When bring the gas leak detector close to the drain hose, make sure that the gas leak detector does not react to the volatile gases.

If such reaction is unavoidable, the vehicle must be lifted up.

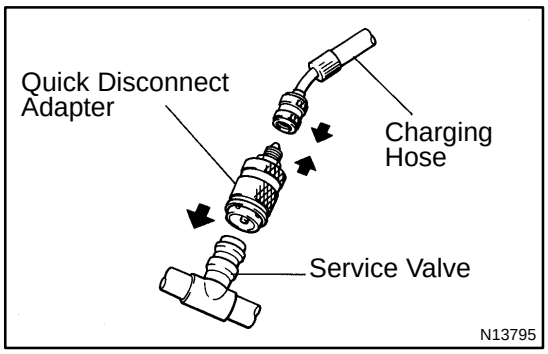
(c) If gas leak is not detected on the drain hose, remove the blower resistor from the cooling unit. Then insert the gas leak detector sensor into the unit and perform the test.

(d) Disconnect the connector and leave the pressure switch for approx. 20 minutes. Then bring the gas leak detector close to the pressure switch and perform the test.

(e) Bring the gas leak detector close to the refrigerant lines.

AC15K-05

EVACUATING



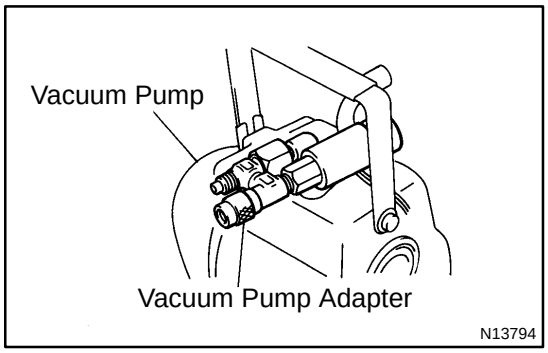
1. CONNECT QUICK DISCONNECT ADAPTER TO CHARGING HOSES

2. REMOVE CAPS FROM SERVICE VALVES ON REFRIGERANT LINES

3. SET ON MANIFOLD GAUGE SET

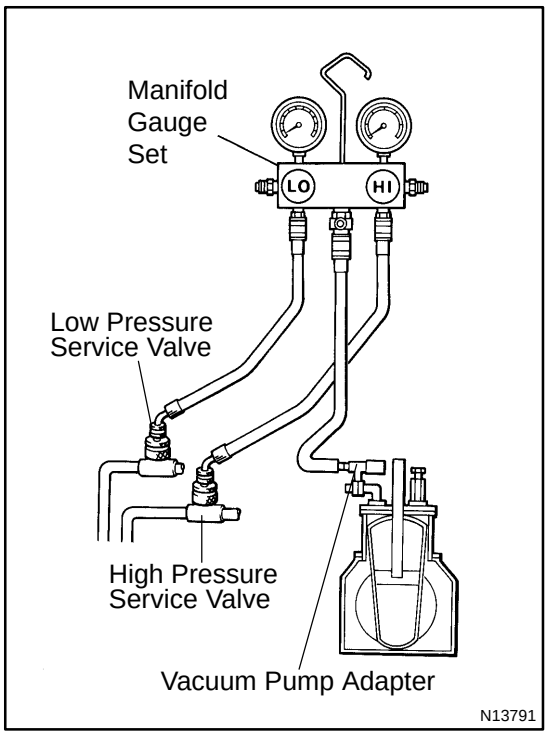
(a) Close both hand valves of manifold gauge set.

(b) Connect the quick disconnect adapters to the service valves.



4. EVACUATE AIR FROM REFRIGERATION SYSTEM

(a) Connect the vacuum pump adapter to the vacuum pump.



(b) Connect the center hose of the manifold gauge set to the vacuum pump adapter.

(c) Open both the high and low hand valves and run the vacuum pump.

(d) After 10 minutes or more, check that the low pressure gauge indicates 750 mmHg (30 in. Hg) or more.

HINT:

If the reading is 750 mmHg (30 in. Hg) or more, close both hand valves of manifold gauge set and stop the vacuum pump.

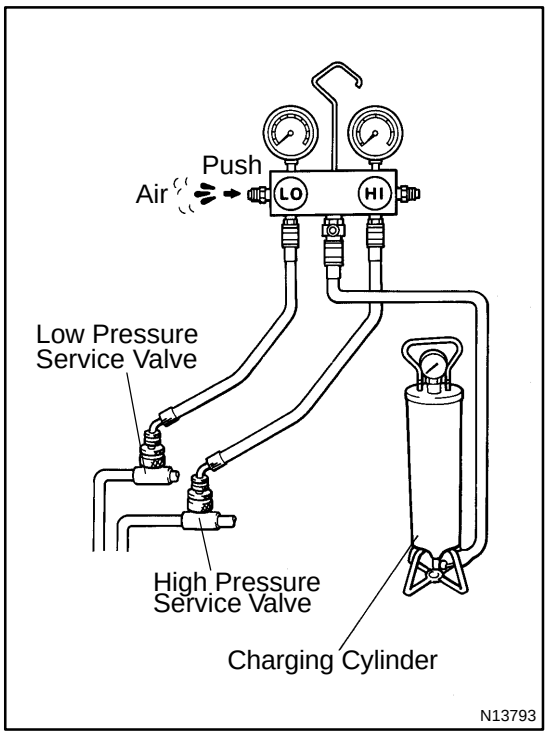
Check the system for leaks and repair if necessary.

(e) Close both the high and low hand valves and stop the vacuum pump.

(f) Leave the system in this condition for 5 minutes or more and check that there is no gauge indicator.

AC25K-02

CHARGING



1. INSTALL CHARGING CYLINDER

HINT:

When handling the charging cylinder, always follow the directions given in the instruction manual.

(a) Charge the proper amount of refrigerant into the charging cylinder.

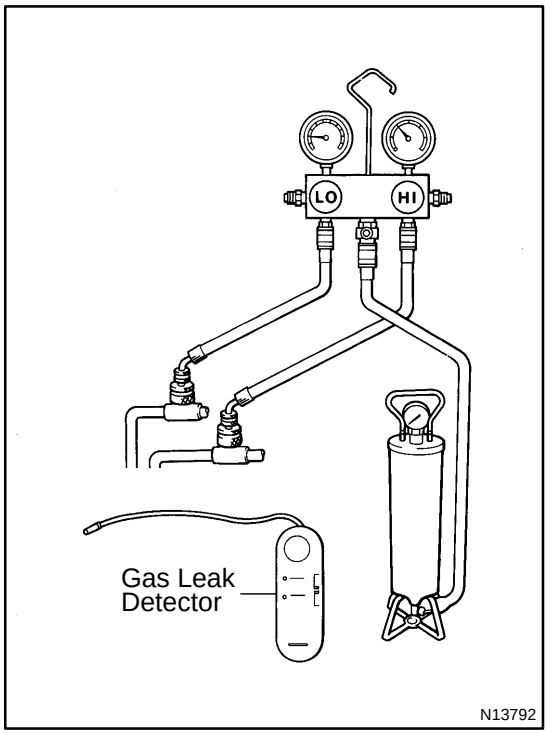
(b) Connect the center hose to the charging cylinder.

CAUTION:

Do not open both high and low hand valves of manifold gauge set.

(c) Open the valve of charging cylinder.

(d) Press the valve core on the side of manifold gauge and expel the air inside of the center hose.



2. INSPECT REFRIGERATION SYSTEM FOR LEAKS

(a) Open the high pressure hand valve and charge refrigerant.

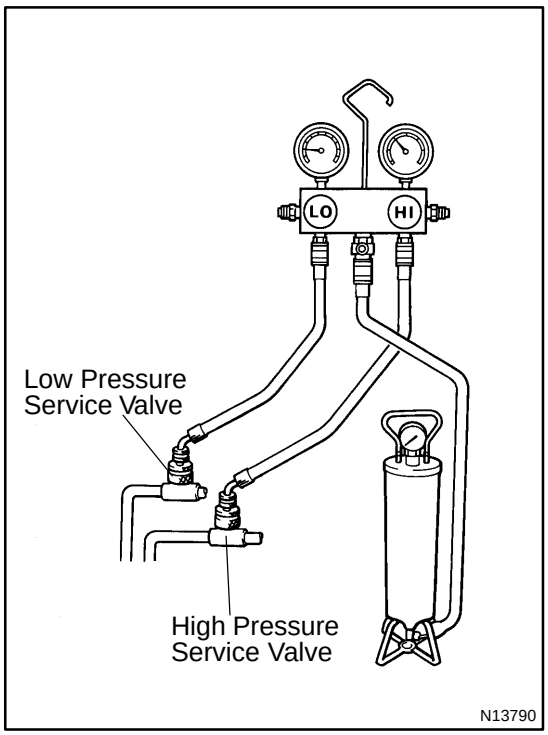
(b) When the low pressure gauge indicates 98 kPa (1 kgf/cm^2, 14 psi) close the high pressure hand valve.

(c) Using a gas leak detector, check the system for leakage.

If leak is found, repair the faulty component or connection.

CAUTION:

Use the refrigerant recovery/ recycling machine to recover the refrigerant whenever replacing parts.



3. CHARGE REFRIGERANT INTO REFRIGERATION SYSTEM

If there is no leak after refrigerant leak check charge, the proper amount of refrigerant in to refrigeration system.

CAUTION:

- **Never run the engine when charging the system through the high pressure side.**
- **Do not open the low pressure hand valve when the system is being charged with liquid refrigerant.**

(a) Open he high pressure hand valve fully.

(b) Charge specified amount of refrigerant, then close the high pressure hand valve.

HINT:

A fully charged system is indicated by the sight glass being free of any bubbles.

(c) Charge partially refrigeration system with refrigerant.

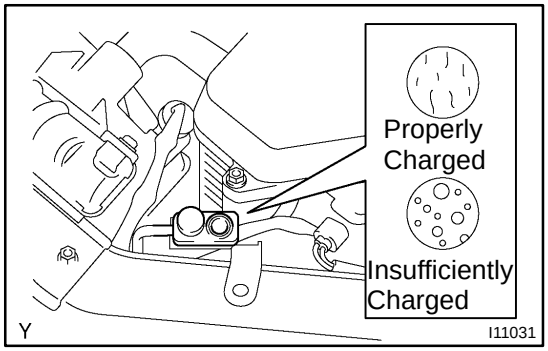
(1) Set vehicle in these conditions:

- Running engine at 1,500 rpm
- Blower speed control set at ”HI”
- Temperature control set at ”MAX. COOL” position
- Air inlet control set at ”RECIRC”
- Fully open doors (Sliding roof : closed)

(2) Open the low pressure hand valve.

CAUTION:

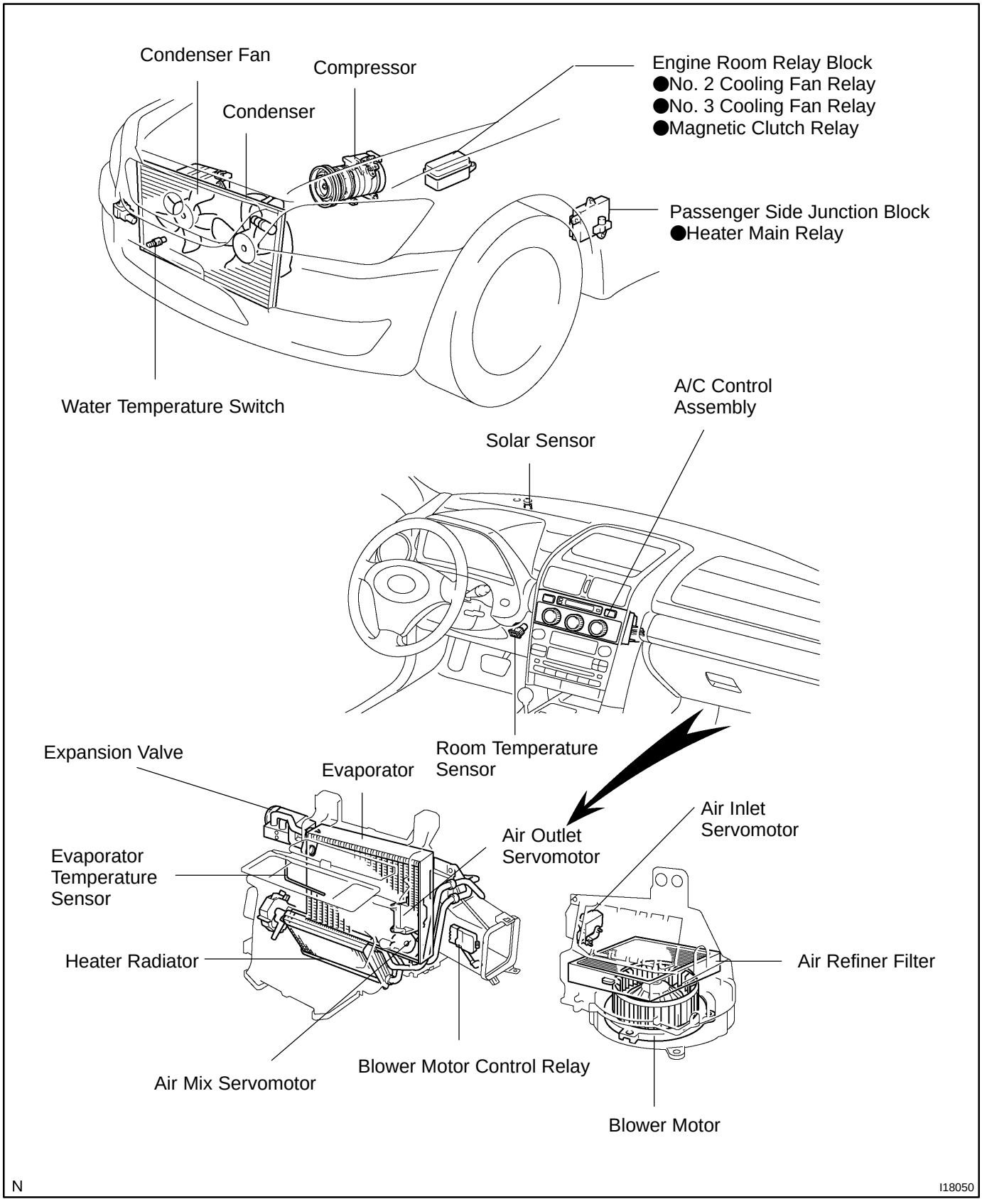
Do not open the high pressure hand valve.



(3) Charge refrigerant until bubbles disappear and check the pressure on the gauge through the sight glass.

AC15M-03

LOCATION



N

I18050

TROUBLESHOOTING

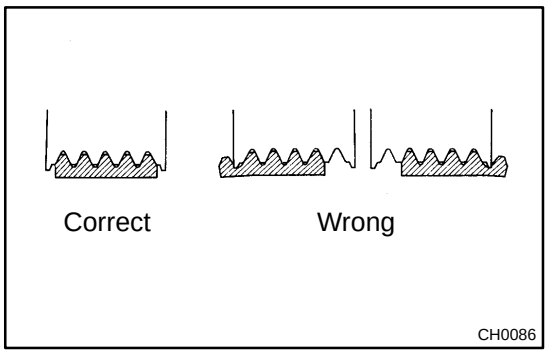
AC20D-03

PROBLEM SYMPTOMS TABLE

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order If necessary , replace these parts.

Symptom	Suspect Area	See page
Whole functions of A/C system do not operate	1. A.C Fuse	-
	2. A/C control assembly	AC-79
No blower operation	1. Heater main relay	AC-69
	2. Blower motor	AC-55
	3. Blower motor control relay	AC-56
	4. A/C control assembly	AC-79
	5. Wire harness	-
No blower control	1. Blower motor	AC-55
	2. Blower motor control relay	AC-56
	3. A/C control assembly	AC-79
	4. Wire harness	-
Insufficient air out	1. Blower motor	AC-55
No cool air comes out	1. Refrigerant volume	AC-3
	2. Drive belt	AC-16
	3. Refrigerant pressure	AC-3
	4. Compressor	AC-38
	5. Pressure switch	AC-66
	6. Igniter circuit	-
	7. Air mix servomotor	AC-30
	8. Room temp. sensor	AC-62
	9. Ambient temp. sensor	AC-63
	10.A/C control assembly	AC-79
	11.Wire harness	-
No warm air comes out	1. Engine coolant volume	-
	2. Air mix servomotor	AC-30
	3. Ambient temp. sensor	AC-63
	4. Room temp. sensor	AC-62
	5. A/C control assembly	AC-79
	6. Heater radiator	AC-30
Out put air is warmer or cooler than the set temperature or response is slow	1. Refrigerant volume	AC-3
	2. Engine coolant volume	-
	3. Drive belt	AC-16
	4. Refrigerant pressure	AC-3
	5. Condenser fan	AC-72
	6. Ambient temp. sensor	AC-63
	7. Evaporator temp. sensor	AC-64
	8. Solar sensor	AC-61
	9. Air mix servomotor	AC-30
	10.Compressor	AC-38
	11.Condenser	AC-47
	12.Evaporator	AC-30
	13.Heater radiator	AC-30
	14.Expansion valve	AC-52
	15.A/C control assembly	AC-79
	16.Wire harness	-
No temperature control	1. Air mix servomotor	AC-30
	2. A/C control assembly	AC-79

No air inlet control	1. Air inlet servomotor 2. A/C control assembly 3. Wire harness	AC-57 AC-79 -
No mode control	1. Air outlet servomotor 2. A/C control assembly 3. Wire harness	AC-59 AC-79 -
No engine idle-up when A/C switch ON	1. A/C control assembly 2. Wire harness	AC-79 -
Set temperature value does not match up with operation of temperature control switch	1. A/C control assembly	AC-79
Brightness does not change when light control switch is turned	1. Headlight and taillight system 2. A/C control assembly	BE-31 AC-79



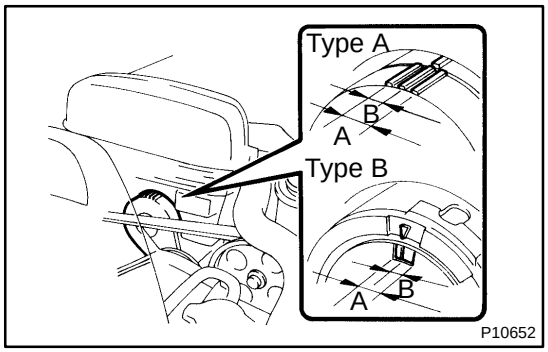
DRIVE BELT

AC37T-01

ON-VEHICLE INSPECTION

1. INSPECT DRIVE BELT'S INSTALLATION CONDITION

Check that the drive belt fits properly in the ribbed grooves.



2. INSPECT DRIVE BELT TENSION

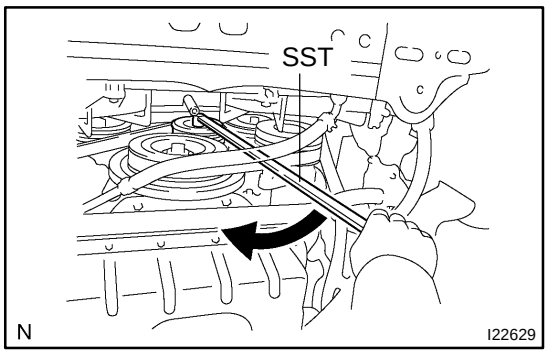
Check that the arrow mark on the belt tensioner falls within area "A" of the scale.

If it is out side area "A", replace the drive belt.

HINT:

When a new belt is installed, it should be lie within area B.

AC17Z-05



REMOVAL

1. REMOVE ENGINE UNDER COVER

2. REMOVE DRIVE BELT

Using SST, loosen the drive belt tension by turning the drive belt tensioner arm clockwise from the bottom side, and remove the drive belt.

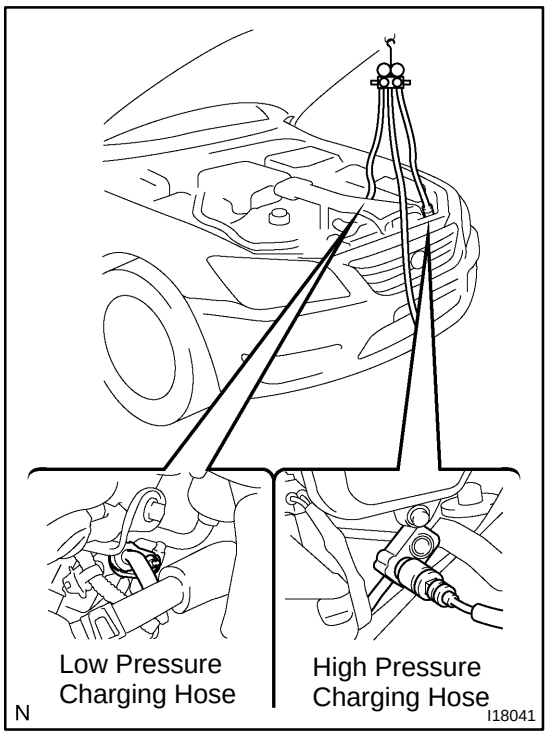
SST 09216-00041

AC37U-01

INSTALLATION

Installation is in the reverse order of removal (See page AC-17).

AFTER INSTALLATION, CHECK DRIVE BELT'S INSTALLATION CONDITION



MANIFOLD GAUGE SET

AC15Q-04

SET ON

1. CONNECT CHARGING HOSES TO MANIFOLD GAUGE SET

Tighten the nuts by hand.

CAUTION:

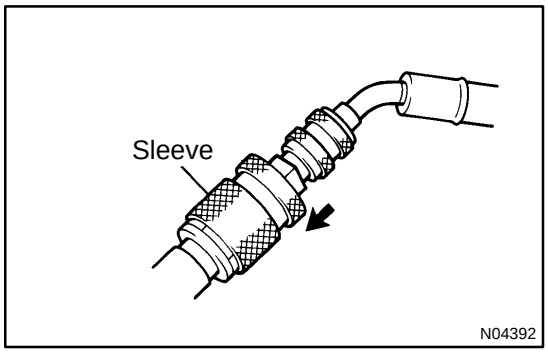
Do not connect the wrong hoses.

2. CONNECT QUICK DISCONNECT ADAPTERS TO CHARGING HOSES

Tighten the nuts by hand.

3. CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET

4. REMOVE CAPS FROM SERVICE VALVE ON REFRIGERANT LINES

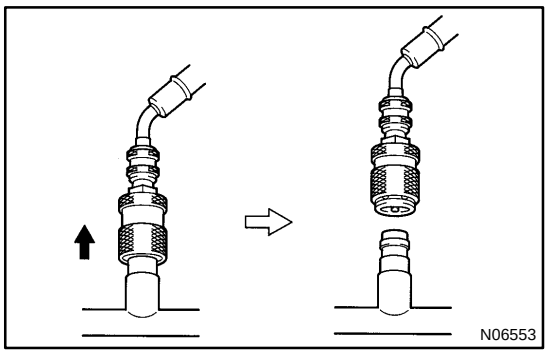


5. CONNECT QUICK DISCONNECT ADAPTERS TO SERVICE VALVES

HINT:

Push the quick disconnect adapter onto the service valve, then slide the sleeve of the quick disconnect adapter downward to lock it.

AC15R-04



SET OFF

1. **CLOSE BOTH HAND VALVES OF MANIFOLD GAUGE SET**
2. **DISCONNECT QUICK DISCONNECT ADAPTERS FROM SERVICE VALVES ON REFRIGERANT LINE**

HINT:

Slide the sleeve of the quick disconnect adapter upward to unlock the adapter and remove it from the service valve.

3. **INSTALL CAPS TO SERVICE VALVES ON REFRIGERANT LINES**

REFRIGERANT LINE

AC15S-01

ON-VEHICLE INSPECTION

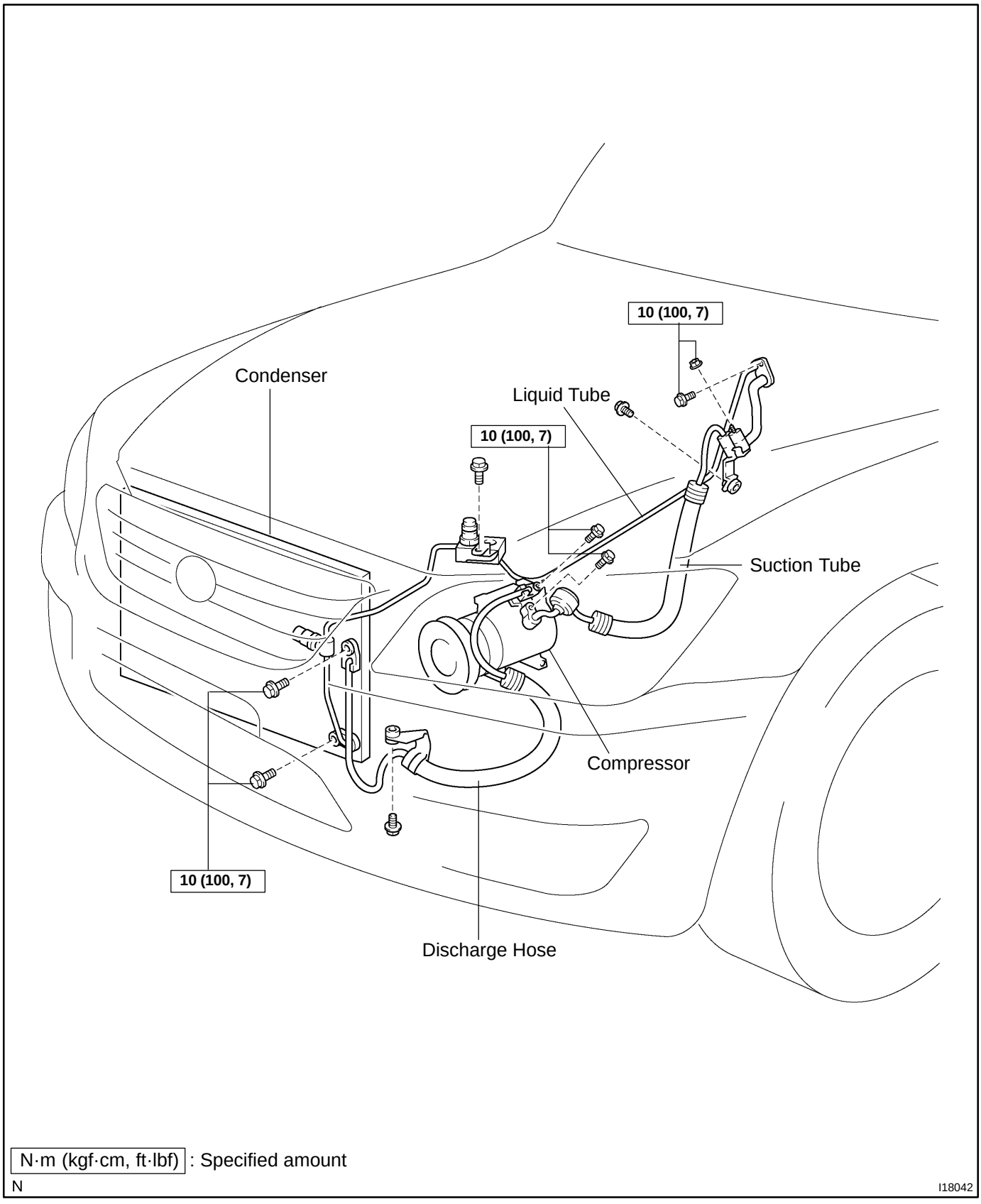
1. INSPECT HOSE AND TUBE CONNECTIONS FOR LOOSENESS

2. INSPECT HOSES AND TUBES FOR LEAKAGE

Using a gas leak detector, check for leakage of refrigerant.

AC15T-04

COMPONENTS



AC15U-02

REPLACEMENT

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

2. REPLACE FAULTY TUBE OR HOSE

NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.

3. TIGHTEN JOINT OF BOLT OR NUT TO SPECIFIED TORQUE

NOTICE:

Connections should not be torqued tighter than the specified torqued.

Part tightened	N·m	kgf·cm	ft·lbf
Compressor x Discharge hose	10	100	7
Compressor x Suction hose	10	100	7
Condenser x Discharge hose	10	100	7
Condenser x Liquid tube	10	100	7
A/C unit x Liquid and Suction tubes	10	100	7
Suction line (Block joint)	10	100	7

4. EVACUATE AIR FROM REFRIGERATION SYSTEM AND CHARGE SYSTEM WITH REFRIGERANT
Specified amount: 600 ± 50 g (21.16 ± 1.76 oz.)

5. INSPECT FOR LEAKAGE OF REFRIGERANT

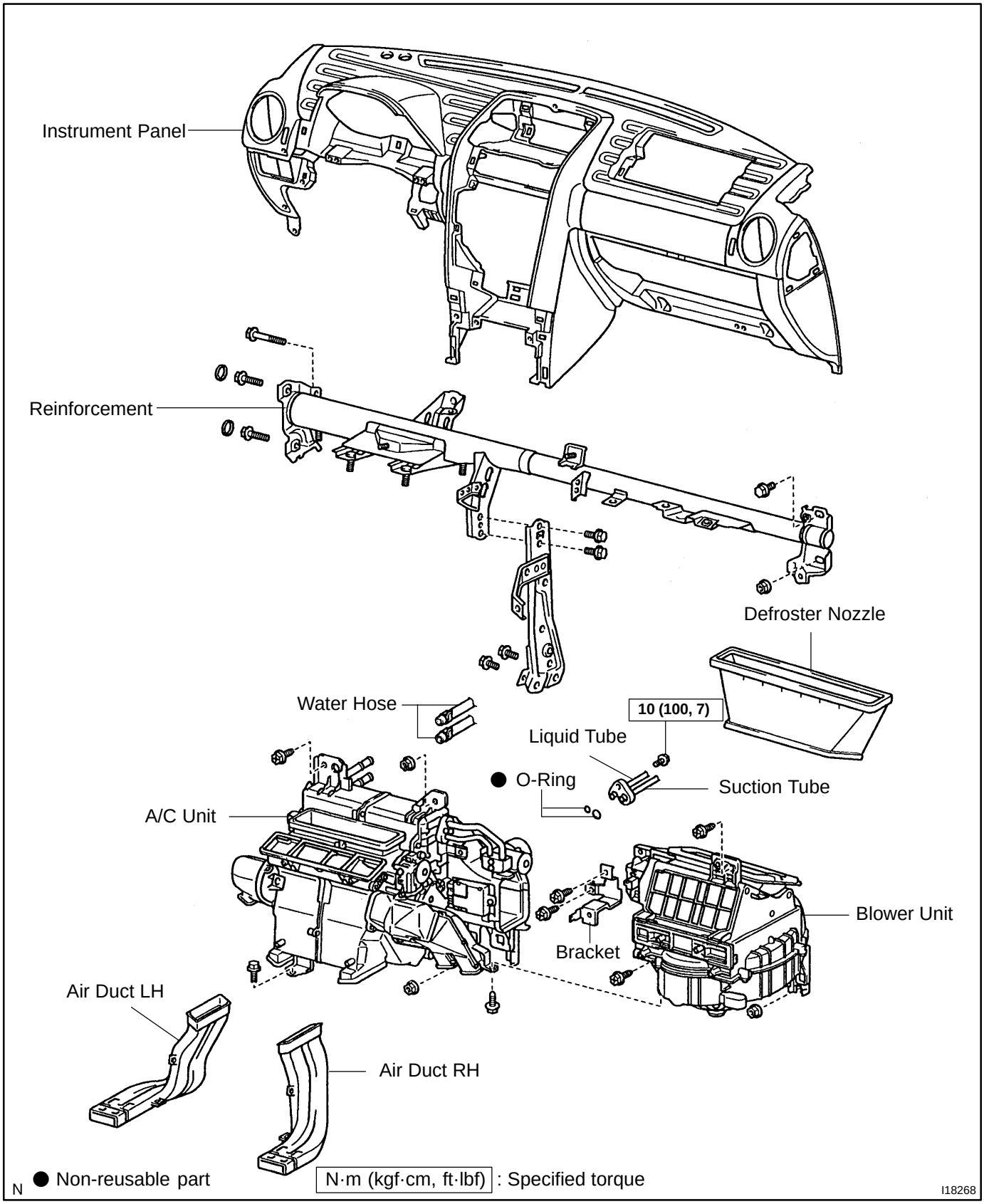
Using a gas leak detector, check for leakage of refrigerant.

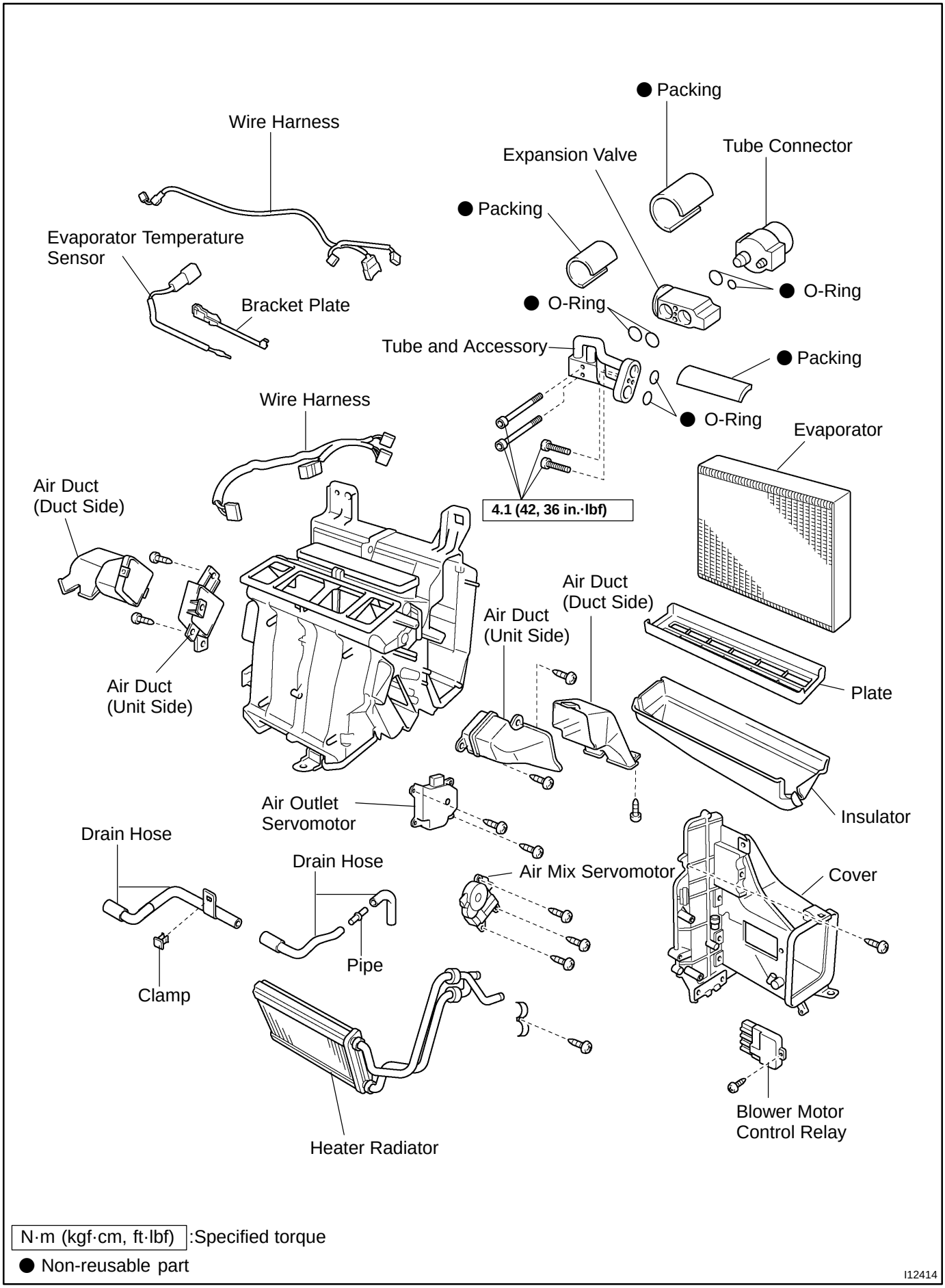
6. INSPECT AIR CONDITIONING OPERATION

AIR CONDITIONING UNIT

AC37V-01

COMPONENTS





N·m (kgf·cm, ft·lbf) :Specified torque

● Non-reusable part

I12414

AC15W-03

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

HINT:

At the time of installation, please refer to the following item.

Evacuate air from refrigeration system.

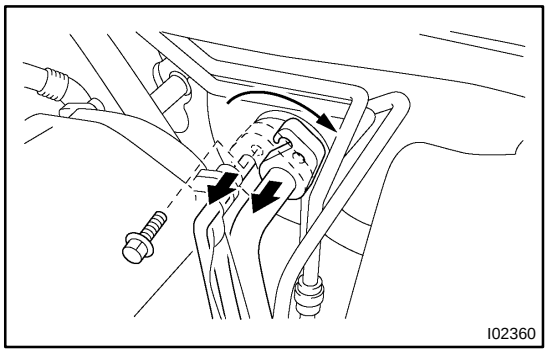
Charge system with refrigerant and inspect for leakage of refrigerant.

Specified amount: 600 ± 50 g (21.16 ± 1.76 oz.)

2. DRAIN ENGINE COOLANT FROM RADIATOR

HINT:

It is not necessary to drain out all coolant.



3. DISCONNECT LIQUID TUBE AND SUCTION HOSE FROM A/C UNIT

Remove the bolt and slide the plate, then disconnect the both tubes.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

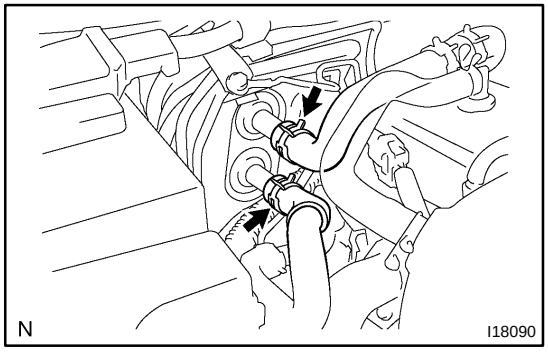
NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.

HINT:

At the time of installation, please refer to the following item.

Lubricate 2 new O-rings with compressor oil and install them to the tubes.

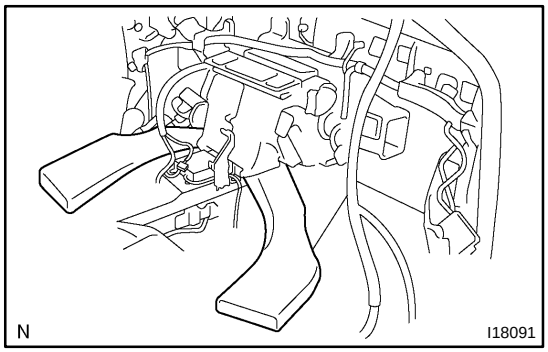


4. DISCONNECT WATER HOSES FROM HEATER RADIATOR PIPES

(a) Grip the claws of the hose clip and slide the hose clip along the hose.

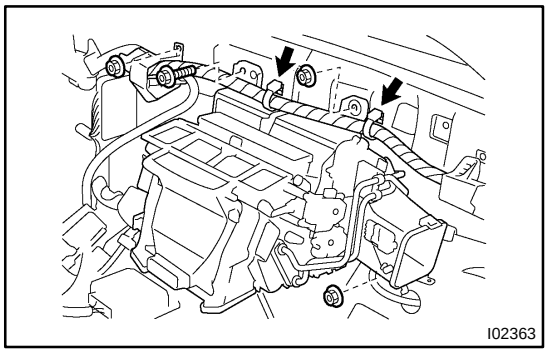
(b) Disconnect the water hose.

5. **REMOVE COOLER NO. 1 GROMMET**
6. **REMOVE HEATER PIPE GROMMET**
7. **REMOVE DRAIN HOSE GROMMET**
8. **REMOVE INSTRUMENT PANEL AND REINFORCEMENT (See page BO-139)**
9. **REMOVE BLOWER UNIT (See page AC-34)**



10. REMOVE 2 AIR DUCTS

(a) Slide the floor carpet backward.
(b) Remove the air ducts LH, RH.



11. REMOVE A/C UNIT

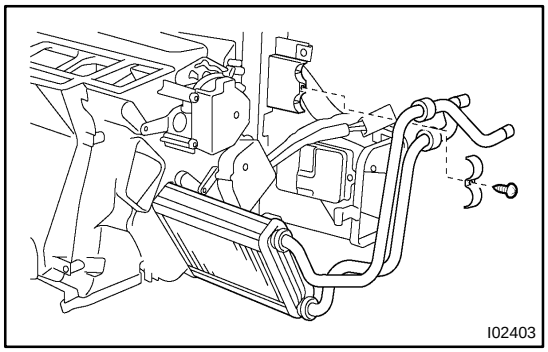
(a) Disconnect the connectors.
(b) Disconnect the wire harness clamps.
(c) Remove the 2 nuts, 2 bolt and A/C unit.

AC37W-01

DISASSEMBLY

1. REMOVE WIRE HARNESS

2. REMOVE DRAIN HOSE



3. REMOVE HEATER RADIATOR

(a) Remove the screw and clamp.

(b) Pull out the heater radiator.

4. REMOVE BLOWER MOTOR CONTROL RELAY

Remove the screw and blower motor control relay.

5. REMOVE AIR MIX SERVOMOTOR

Remove the 3 screws and servomotor.

6. REMOVE AIR OUTLET SERVOMOTOR

Remove the 2 screws and servomotor.

7. REMOVE EXPANSION VALVE

(a) Pry out the packing.

HINT:

At the time of reassembly, please refer to the following item.

Do not reuse the packing.

(b) Using SST, remove the 2 bolts, then separate the expansion valve, and tube connector.

SST 07110-61050

Torque: 4.1 N·m (42 kgf·cm, 36 in.·lbf)

HINT:

At the time of reassembly, please refer to the following item.

Lubricate 4 new O-rings with compressor oil and install them to the valve.

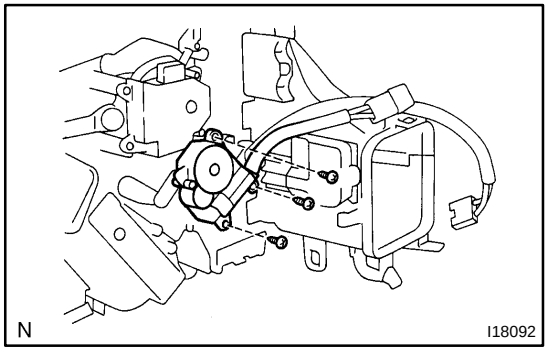
8. REMOVE EVAPORATOR TEMPERATURE SENSOR

(a) Using a screwdriver, pull out the sensor with bracket plate.

HINT:

Tape the screwdriver tip before use.

(b) Release the 2 claws and sensor from bracket plate.

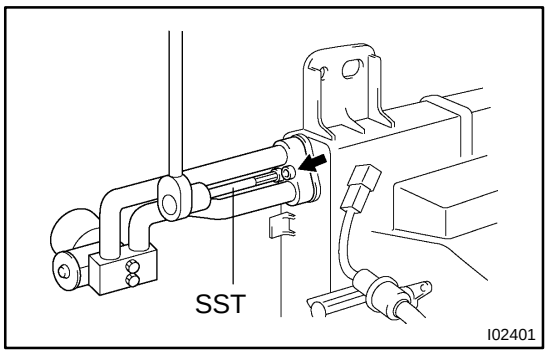


9. REMOVE EVAPORATOR

(a) Remove air mix servomotor.

(1) Disconnect the connector.

(2) Remove the 3 screws and servomotor.



(b) Remove tube and accessory.

(1) Pry out packing.

HINT:

At the time of installation, please refer to the following item.

Do not reuse the packing.

(2) Using SST, remove the 2 bolts and the tube and accessory.

SST 07110-61050

Torque: 4.1 N·m (42 kgf·cm, 36 in.·lbf)

NOTICE:

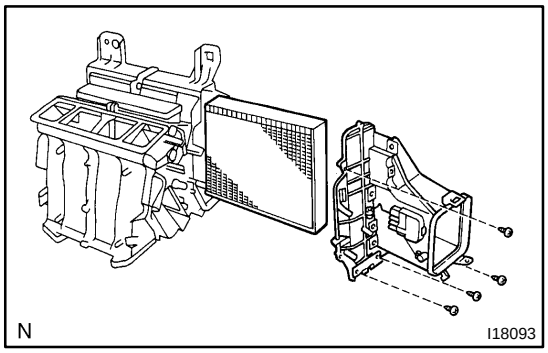
Cap the open fittings immediately to keep moisture or dirt out of the system.

HINT:

At the time of installation, please refer to the following item.

Lubricate 2 new O-rings with compressor oil and install them to the tube.

(3) Remove screw and drain pipe.



(c) Remove evaporator.

(1) Remove the screw and drain hose.

(2) Remove the 4 screws and cover.

(3) Pull out the evaporator.

HINT:

At the time of installation, please refer to the following item.

If evaporator is replaced, add compressor oil to evaporator.

Add 40 cc (1.4 fl.oz.)

Compressor oil: ND-OIL 8 or equivalent

10. REMOVE INSULATOR FROM HEATER CASE

11. REMOVE AIR DUCT

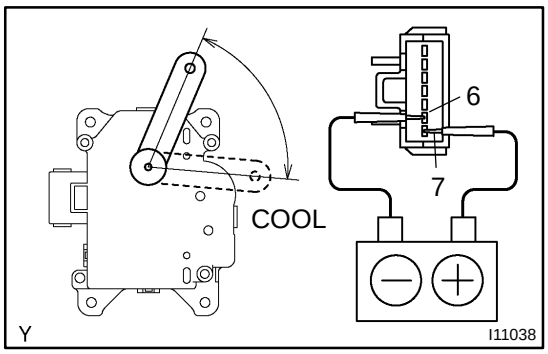
AC25N-02

INSPECTION

1. INSPECT AIR MIX SERVOMOTOR

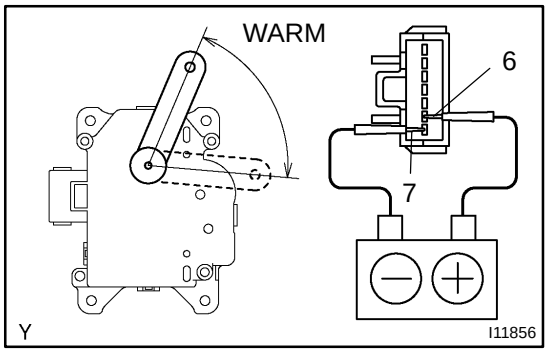
(a) Inspect the air mix servomotor operation.

(1) Connect the positive (+) lead from the battery to terminal 7 and negative (-) lead to terminal 6, then check that the arm turns to "COOL" side smoothly.



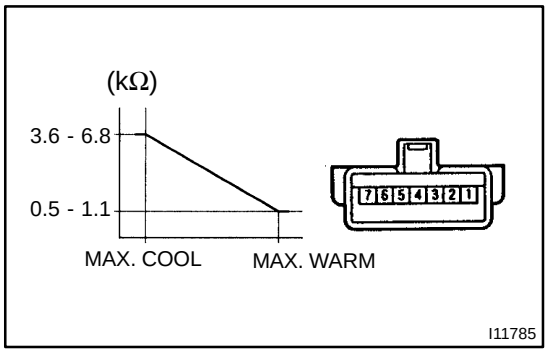
(2) Connect the positive (+) lead from the battery to terminal 6 and negative (-) lead to terminal 7, then check that the arm turns to "WARM" side smoothly.

If operations are not as specified, replace the servomotor.



(b) Inspect position sensor resistance.

Measure resistance between terminals at servomotor arm each position as shown in the chart.



Tester connection	Condition	Specified condition
1 - 3	Constant	4.2 - 7.8 kΩ
1 - 5	Max. cool	3.6 - 6.8 kΩ
1 - 5	Max. warm	0.5 - 1.1 kΩ

If resistance is not as specified, replace the servomotor.

2. INSPECT EVAPORATOR

(a) Check evaporator fins for blockage.

If the fins are clogged, clean them with compressed air.

NOTICE:

Never use water to clean the evaporator.

(b) Check fitting for cracks or scratches.

If necessary, repair or replace.

3. INSPECT HEATER RADIATOR

Inspect fins for blockage.

If the fins are clogged, clean them with compressed air.

AC15Y-02

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC-28).

AC15Z-02

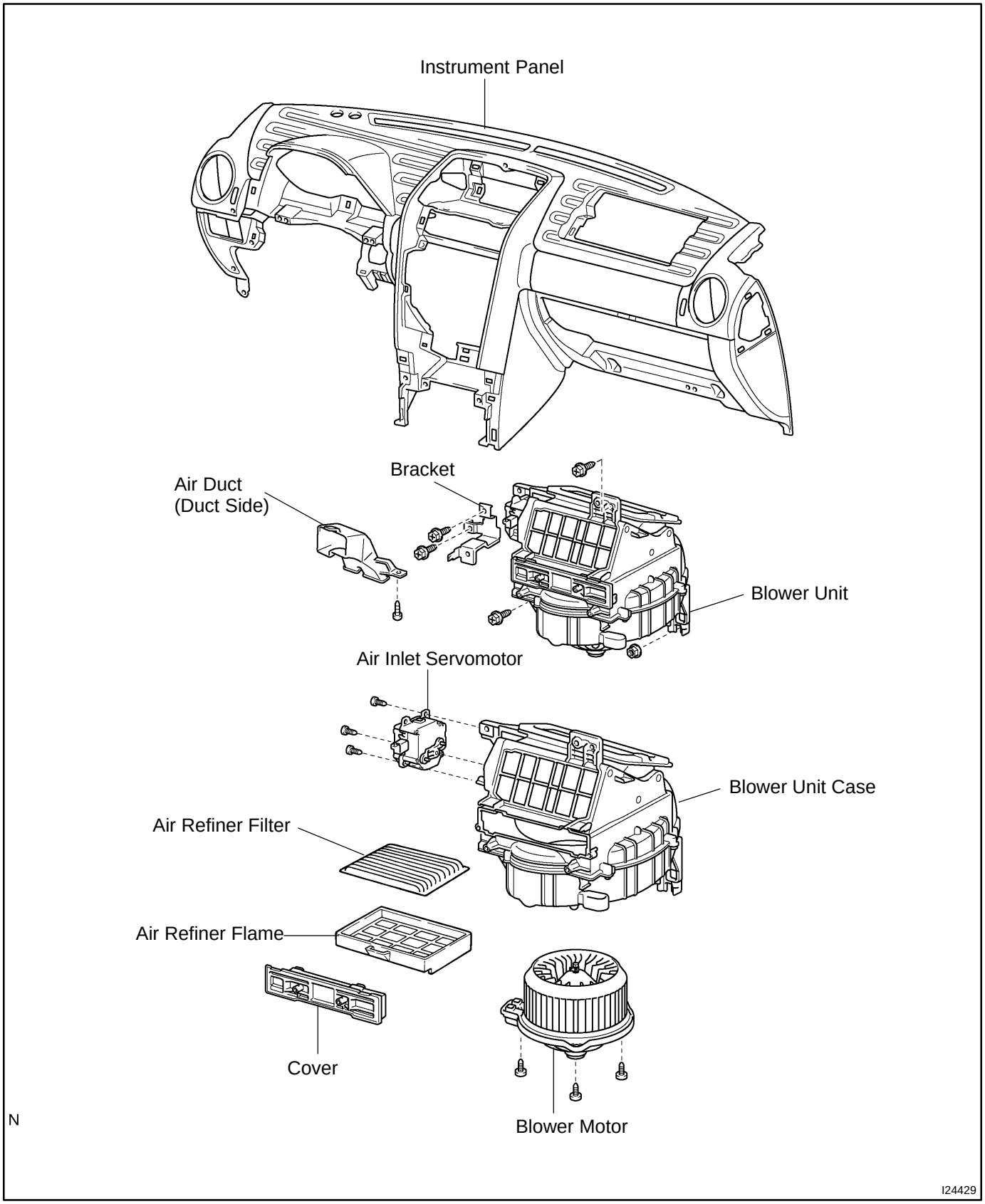
INSTALLATION

Installation is in the reverse order of removal (See page AC-26).

BLOWER UNIT

COMPONENTS

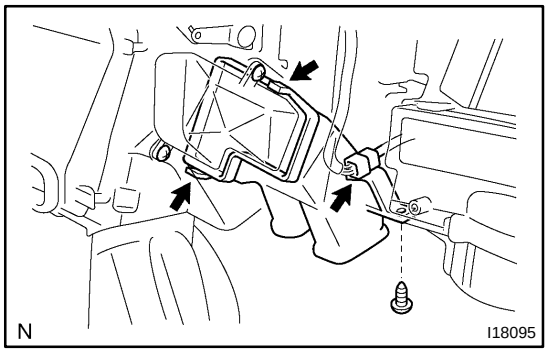
AC160-05



AC25O-03

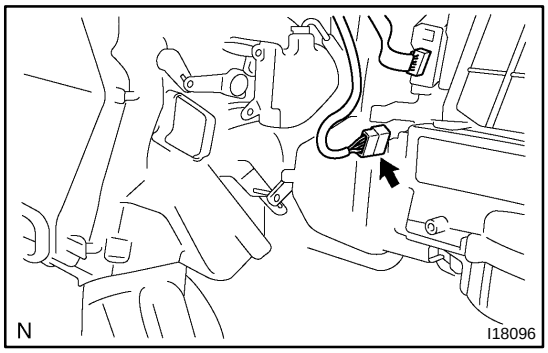
REMOVAL

1. REMOVE INSTRUMENT PANEL (See page BO-139)



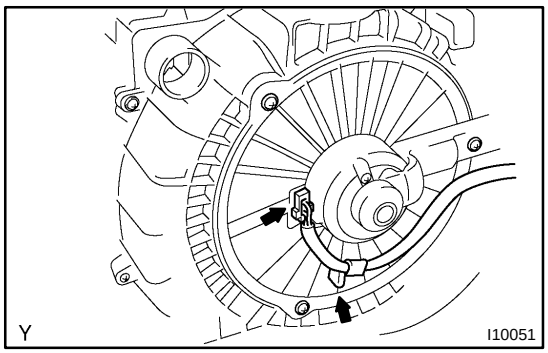
2. REMOVE AIR DUCT (DUCT SIDE)

(a) Disconnect the connector and connector clamp.
(b) Remove the screw.
(c) Release the 2 claws and pull out the air duct.

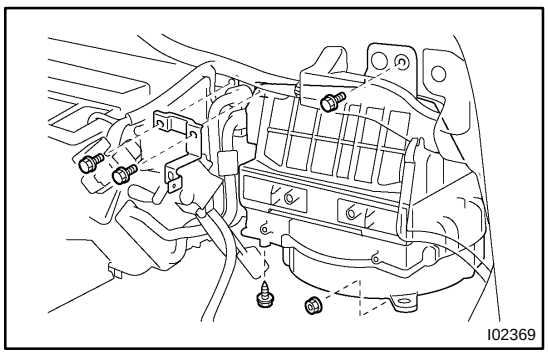


3. DISCONNECT WIRE HARNESS

(a) Disconnect the connector and connector clamp.



(b) Remove the wire harness clamp and disconnect the connector.



4. REMOVE BLOWER UNIT

(a) Remove the 2 bolts and bracket.
(b) Remove the bolt, screw and nut.
(c) Release the claw and remove the blower unit.

AC162-02

DISASSEMBLY

1. REMOVE AIR REFINER FILTER

(a) Release the 4 claws and remove the cover.

(b) Pull out the air refiner filter.

2. REMOVE AIR INLET SERVOMOTOR

Remove the 3 screws and servomotor.

3. REMOVE BLOWER MOTOR

Remove the 3 screws and blower motor.

AC163-01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC-35).

AC164-01

INSTALLATION

Installation is in the reverse order of removal (See page AC-34).

COMPRESSOR AND MAGNETIC CLUTCH

AC37X-01

ON-VEHICLE INSPECTION

1. INSPECT COMPRESSOR FOR METALLIC SOUND

Check there is abnormal metallic sound from the compressor when the A/C switch is ON.

If abnormal metallic sound is heard, replace the compressor assembly.

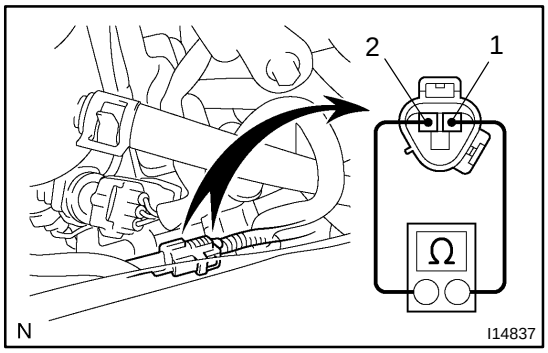
2. INSPECT REFRIGERANT PRESSURE

(See page AC-3)

3. INSPECT VISUALLY FOR LEAKAGE OF REFRIGERANT

Using a gas leak detector, check for leakage of refrigerant.

If there is any leakage, replace the compressor assembly.



4. INSPECT COMPRESSOR LOCK SENSOR RESISTANCE

(a) Disconnect the connector.

(b) Measure resistance between terminals 1 and 2.

Standard resistance: 990 - 1,210 Ω at 20˚C (68 ˚F)

If resistance is not as specified, replace the compressor.

5. MAKE THESE VISUAL CHECKS:

(a) Leakage of grease from the clutch bearing.

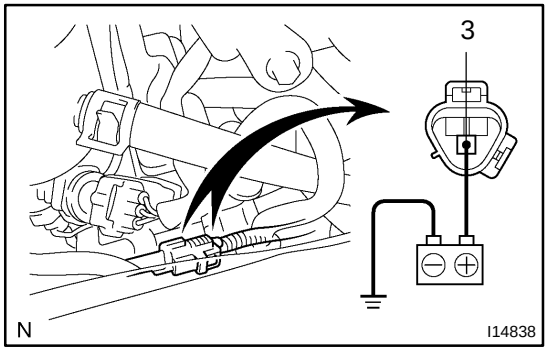
(b) Signs of oil on the pressure plate or rotor.

6. INSPECT MAGNETIC CLUTCH BEARING FOR NOISE

(a) Start engine.

(b) Check for abnormal noise from the compressor when the A/C switch is OFF.

If abnormal noise is being emitted, replace the rotor of magnetic clutch.



7. INSPECT MAGNETIC CLUTCH OPERATION

(a) Disconnect the connector.

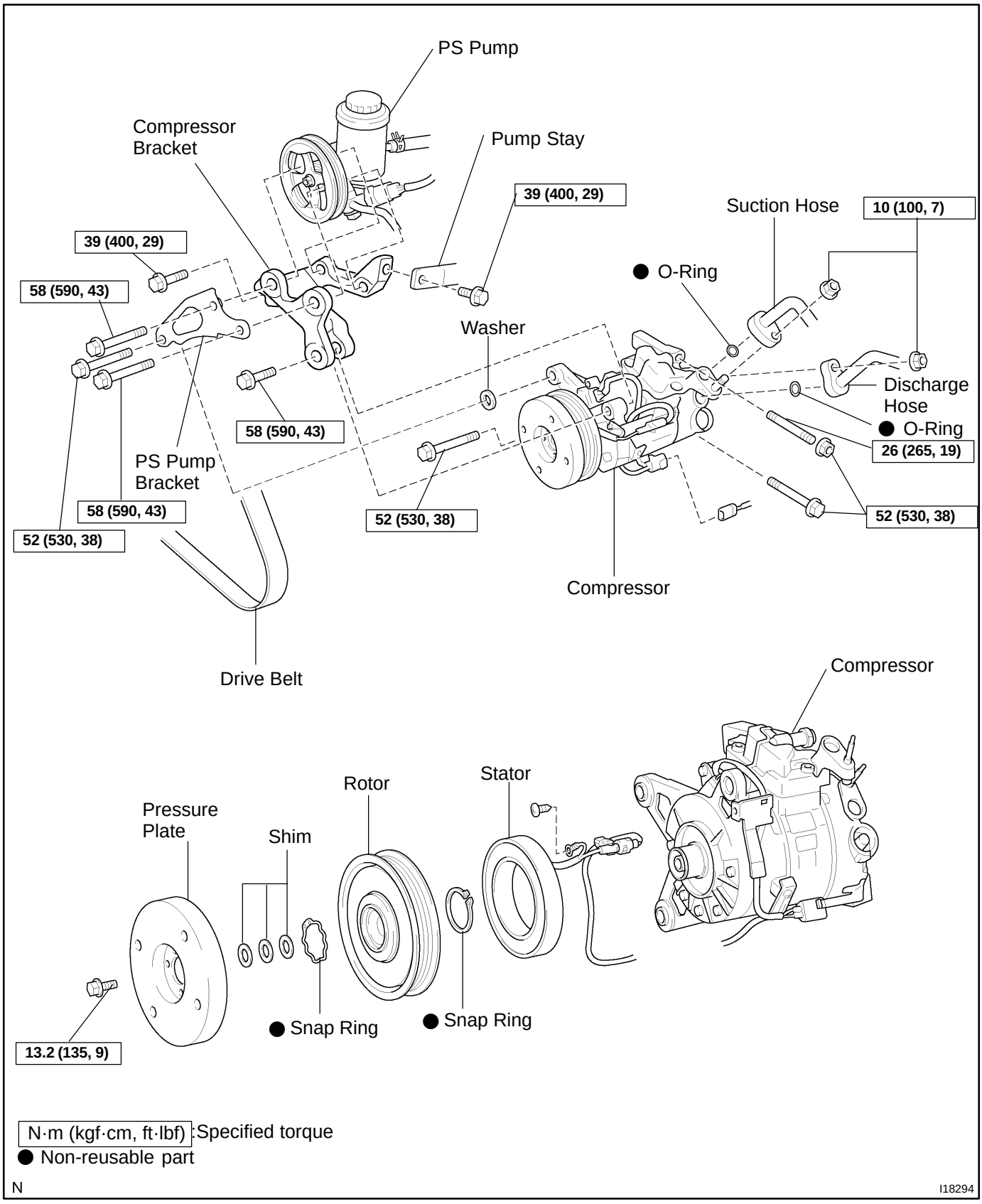
(b) Connect the positive (+) lead from the battery to terminal 3 and the negative (-) lead to the body ground.

(c) Check that the magnetic clutch is energized.

If operation is not as specified, replace the magnetic clutch.

AC0YY-05

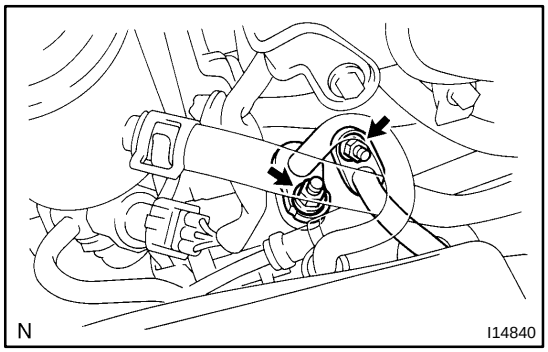
COMPONENTS



AC37Y-01

REMOVAL

1. **RUN ENGINE AT IDLE SPEED WITH A/C ON FOR APPROX. 10 MINUTES**
2. **STOP ENGINE**
3. **DISCONNECT NEGATIVE (-) TERMINAL CABLE FROM BATTERY**
4. **DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM**
5. **REMOVE DRIVE BELT (See page AC-17)**

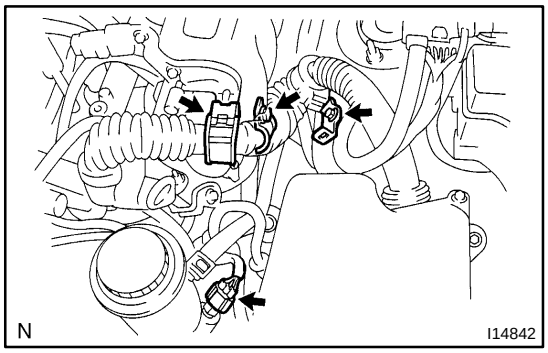


6. **DISCONNECT DISCHARGE AND SUCTION HOSES**

Remove the 2 nuts and disconnect the both hoses.

NOTICE:

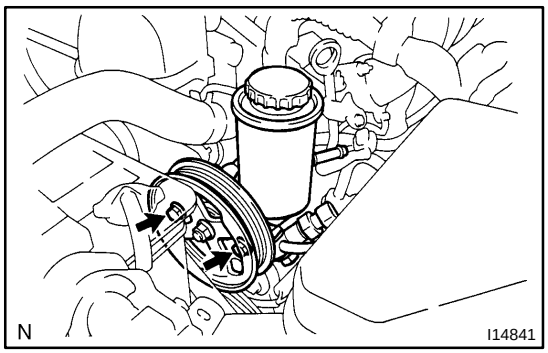
Cap the open fitting immediately to keep moisture or dirt out of the system.



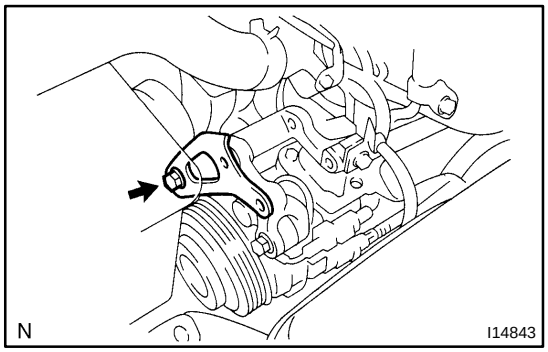
7. **REMOVE PS PUMP WITH PRESSURE FEED AND RETURN TUBES STILL CONNECTED**

(a) Disconnect the PS pump connector and PS pump tube clamp.

(b) Disconnect the engine wire.

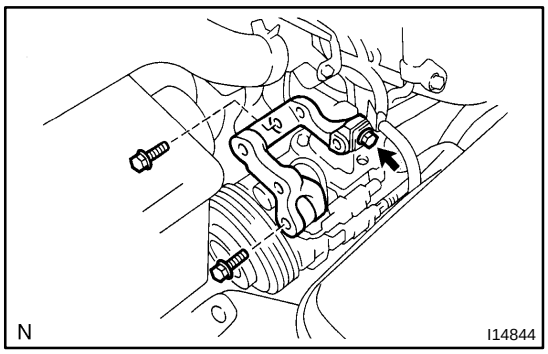


(c) Remove the 2 PS pump set bolts and slide the PS pump backward.

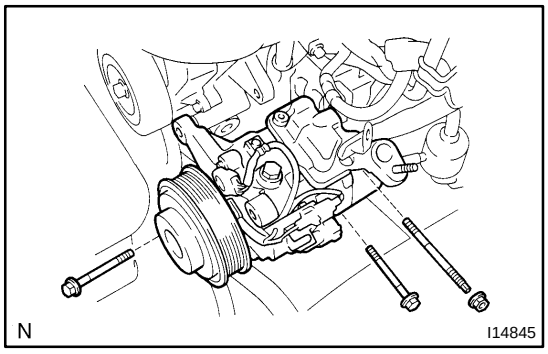


8. **REMOVE COMPRESSOR**

(a) Remove the bolt and PS pump bracket.



(b) Remove the 3 bolts and compressor bracket.
(c) Disconnect the connector.



(d) Remove the nut and 2 bolts.
(e) Using a torx socket (E10), remove the stud bolt and compressor.

AC37Z-01

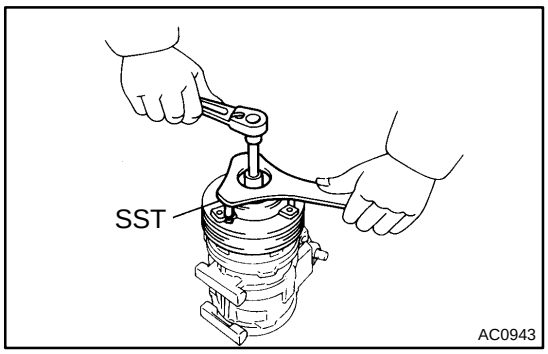
DISASSEMBLY

DISASSEMBLE MAGNETIC CLUTCH

(a) Remove the pressure plate.

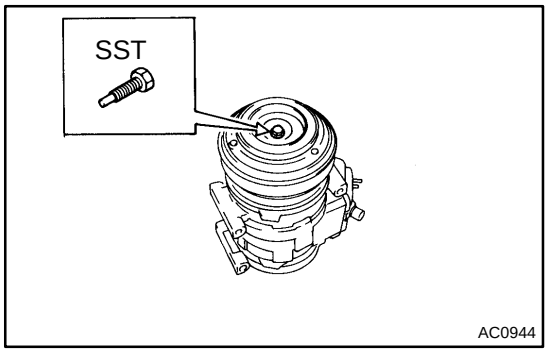
(1) Using SST and a socket wrench, remove the shaft bolt.

SST 07112-76060



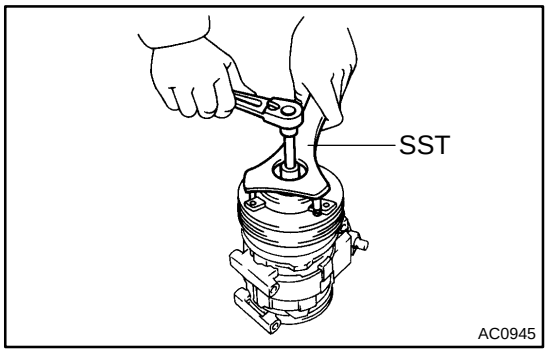
(2) Install SST on the pressure plate.

SST 07112-66040

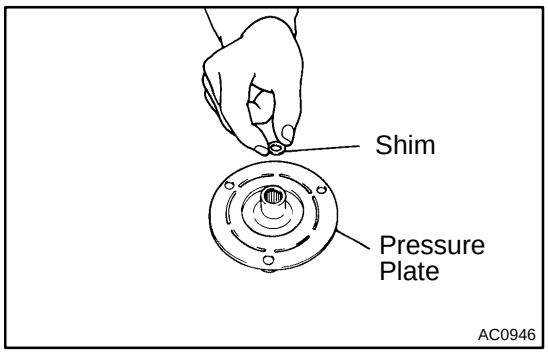


(3) Using SST and a socket wrench, remove the pressure plate.

SST 07112-66040, 07112-76060

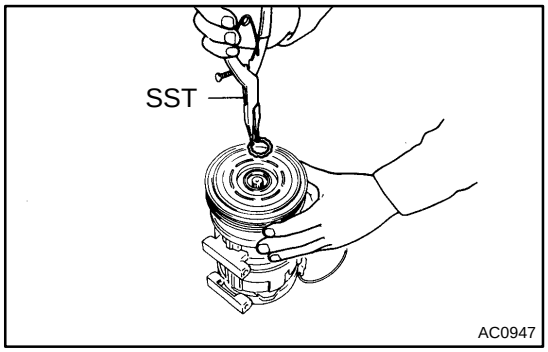


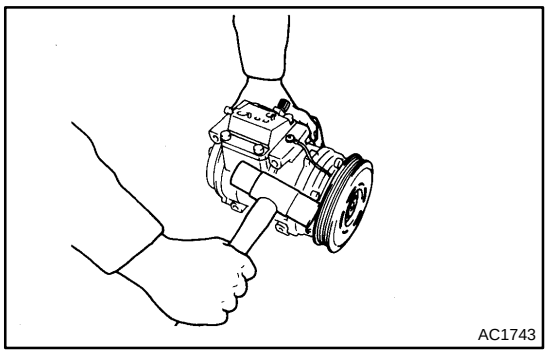
(4) Remove the shims from the pressure plate.



(b) Remove the rotor.

(1) Remove the snap ring.

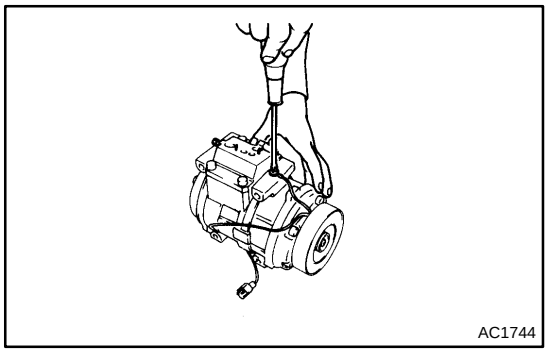




(2) Using a plastic hammer, tap the rotor off the shaft.

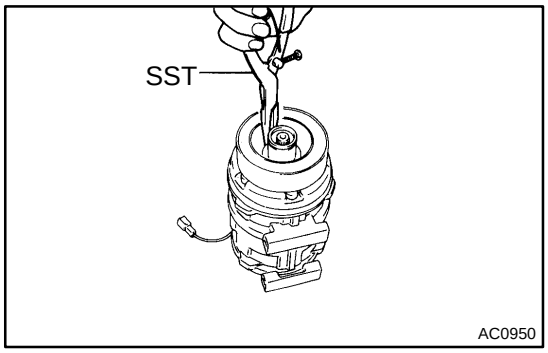
NOTICE:

Be careful not to damage the pulley when tapping on the rotor.

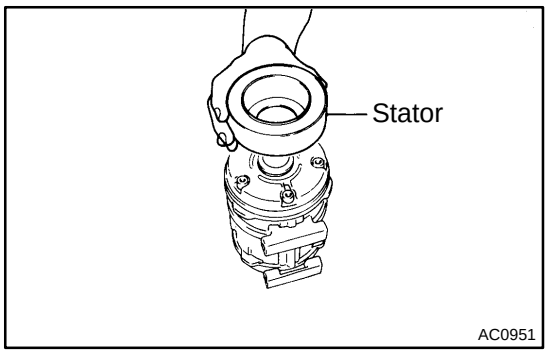


(c) Remove the stator.

(1) Disconnect the stator lead wire from the compressor.



(2) Remove the snap ring.



(3) Remove the stator.

AC380-01

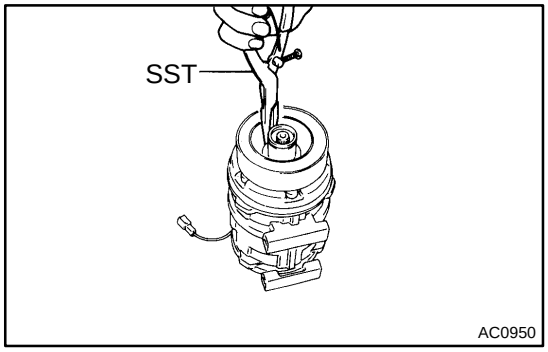
REASSEMBLY

1. ASSEMBLE MAGNETIC CLUTCH

(a) Install the stator.

(1) Install the stator on compressor.

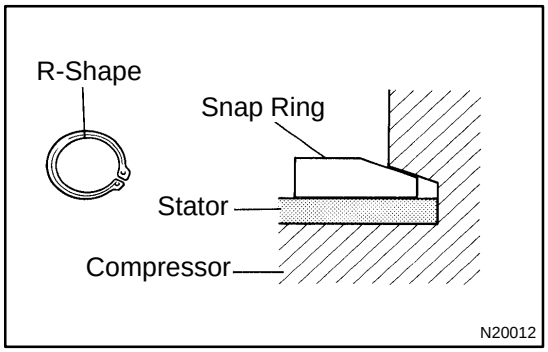
(2) Install the new snap ring.



NOTICE:

The snap ring should be installed so that its beveled side faces up.

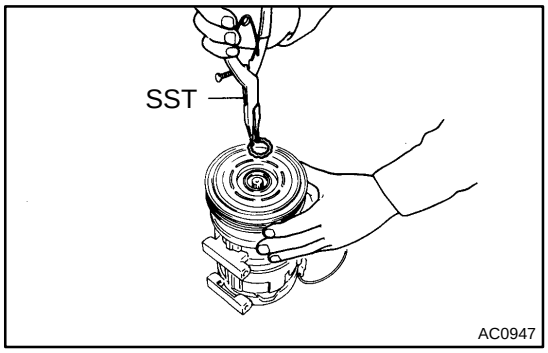
(3) Connect the stator lead wire to the compressor.



(b) Install the rotor.

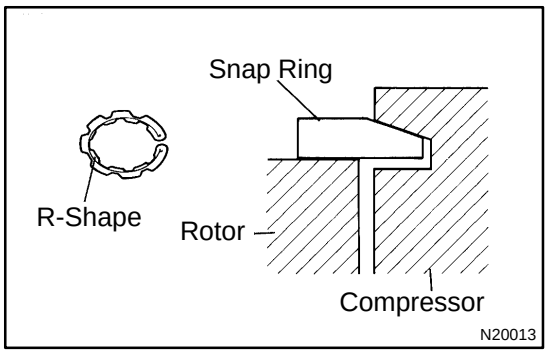
(1) Install the rotor on the compressor.

(2) Install the new snap ring.



NOTICE:

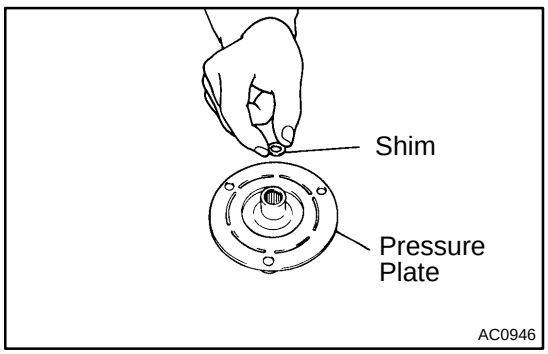
The snap ring should be installed so that its beveled side faces up.

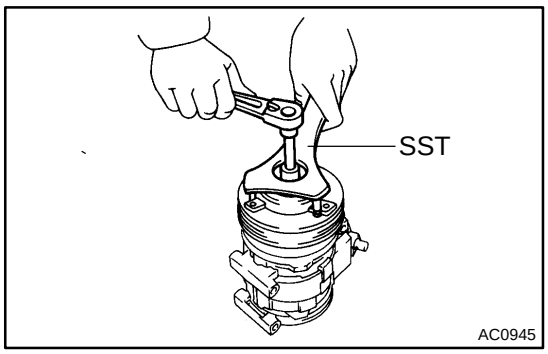


(c) Install the pressure plate.

(1) Install the shims to the pressure plate.

(2) Install the pressure plate on the rotor.

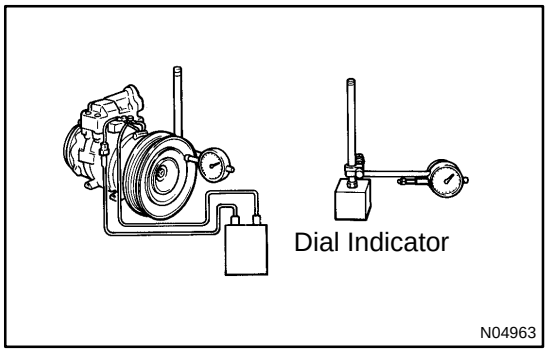




(3) Using SST and a torque wrench, install the shaft bolt.

Torque: 13.2 N·m (135 kgf·cm, 9 ft·lbf)

SST 07112-76060



2. AFTER REASSEMBLY, CHECK MAGNETIC CLUTCH CLEARANCE

(a) Set the dial indicator to the pressure plate of the magnetic clutch.

(b) Connect the magnetic clutch lead wire to the positive (+) terminal of the battery.

(c) Check the clearance between the pressure plate and rotor when connecting the negative (-) terminal to the battery.

Standard clearance:

0.5 ± 0.15 mm (0.020 ± 0.0059 in.)

If the clearance is not within the standard clearance, adjust the clearance using shims to obtain the standard clearance.

Shim thickness:

0.1 mm (0.004 in.)

0.3 mm (0.012 in.)

0.5 mm (0.020in.)

AC381-01

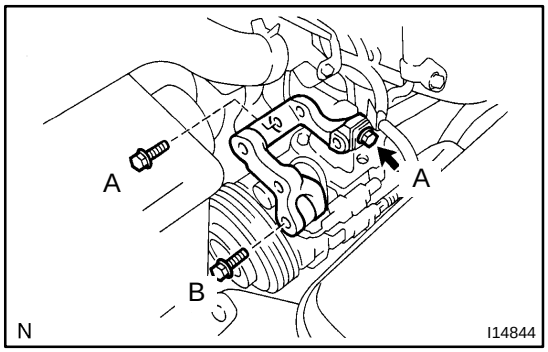
INSTALLATION

1. INSTALL COMPRESSOR

(a) Install the compressor with the stud bolt.
Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)

(b) Install the 2 bolts and nut.
Torque:
Bolt: 52 N·m (530 kgf·cm, 38 ft·lbf)
Nut: 52 N·m (530 kgf·cm, 38 ft·lbf)

(c) Connect the connector.



(d) Install the compressor bracket with the 3 bolts.
Torque:
bolt A: 39 N·m (400 kgf·cm, 29 ft·lbf)
bolt B: 52 N·m (530 kgf·cm, 38 ft·lbf)

(e) Install the PS pump bracket with the bolt.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

2. INSTALL PS PUMP

(a) Install 2 PS pump set bolt.
Torque: 58 N·m (590 kgf·cm, 43 ft·lbf)

(b) Connect the engine wire.

(c) Connect the PS pump connector and wire harness clamp.

3. CONNECT DISCHARGE AND SUCTION HOSES

Connect the both hoses with 2 nut.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

NOTICE:
Hose should be connected immediately after the caps have been removed.

HINT:
Lubricate 2 new O-rings with compressor oil and install them to the hoses.

4. INSTALL DRIVE BELT (See page AC-18)

5. INSPECT DRIVE BELT TENSION (See page AC-16)

6. CONNECT NEGATIVE (-) TERMINAL CABLE TO BATTERY

7. EVACUATE AIR FROM REFRIGERATION SYSTEM AND CHARGE SYSTEM WITH REFRIGERANT
Specified amount: 600 ± 50 g (21.16 ± 1.76 oz.)

8. INSPECT FOR LEAKAGE OF REFRIGERANT

Using a gas leak detector, check for leakage of refrigerant.
If there is leakage, check the tightening torque at the joints.

9. INSPECT A/C OPERATION

CONDENSER

AC16B-01

ON-VEHICLE INSPECTION

1. INSPECT CONDENSER FINS FOR BLOCKAGE OR DAMAGE

If the fins are clogged, wash them with water and dry with compressed air.

NOTICE:

Be careful not to damage the fins.

If the fins are bent, straighten them with a screwdriver or pliers.

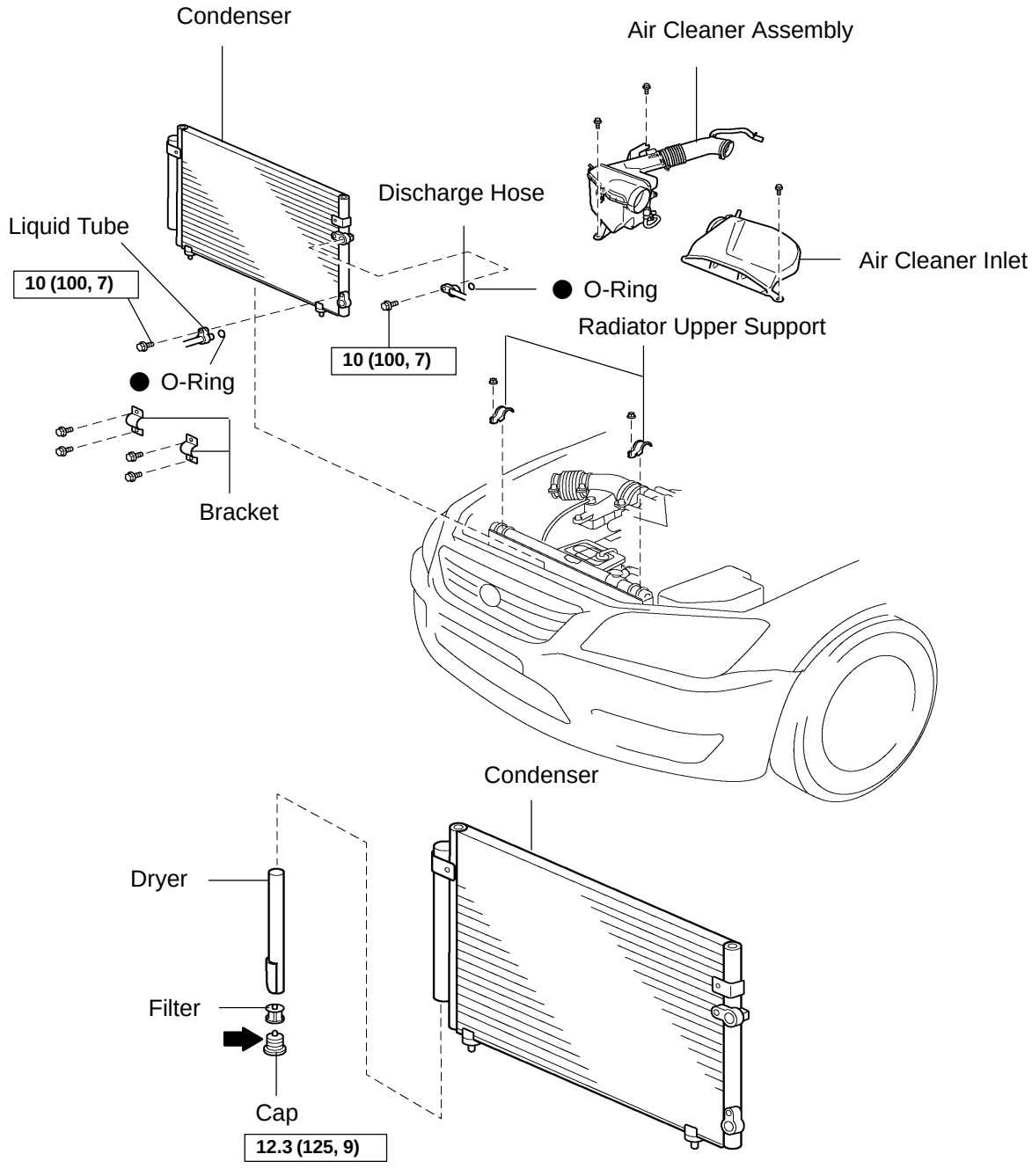
2. INSPECT CONDENSER AND FITTINGS FOR LEAKAGE OF REFRIGERANT

Using a gas leak detector, check for leakage of refrigerant.

If there is leakage, check the tightening torque at the joints.

AC25R-03

COMPONENTS



N N·m (kgf·cm, ft·lbf) : Specified torque

● Non-reusable part

⬅ Compressor oil ND-OIL 8 or equivalent

I18097

AC382-01

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

HINT:

At the time of installation, please refer to the following item.

Evacuate air from refrigeration system.

Charge system with refrigerant and inspect for leakage of refrigerant.

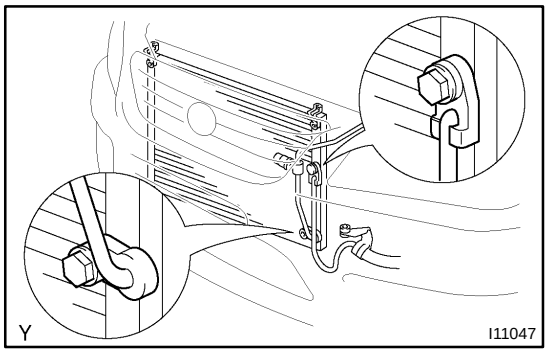
Specified amount : 600 ± 50 g (21.16 ± 1.76 oz.)

2. REMOVE AIR CLEANER DUCT AND AIR CLEANER ASSEMBLY

3. REMOVE ECU OUTLET DUCT

4. REMOVE 2 RADIATOR UPPER SUPPORTS

Remove the 2 bolts and upper supports.



5. DISCONNECT DISCHARGE HOSE AND LIQUID TUBE

Remove the 2 bolts and disconnect the hose and tube.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

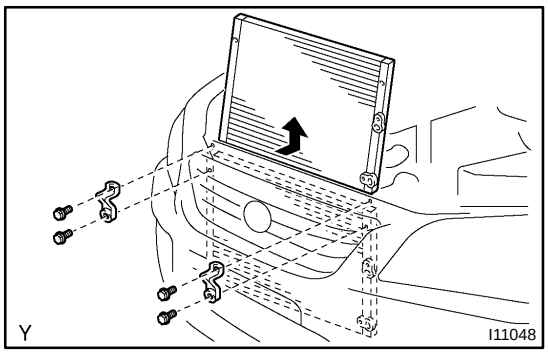
NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.

HINT:

At the time of installation, please refer to the following item.

Lubricate 2 new O-rings with compressor oil and install them to the hose and tube.



6. REMOVE CONDENSER

(a) Remove the 4 bolts and 2 brackets.

(b) Push the radiator toward engine.

(c) Push the condenser toward radiator and pull it upward.

HINT:

At the time of installation, please refer to the following item.

If condenser is replaced, add compressor oil to the condenser.

Add 40 cc (1.4 fl. oz)

Compressor oil: ND - OIL 8 or equivalent

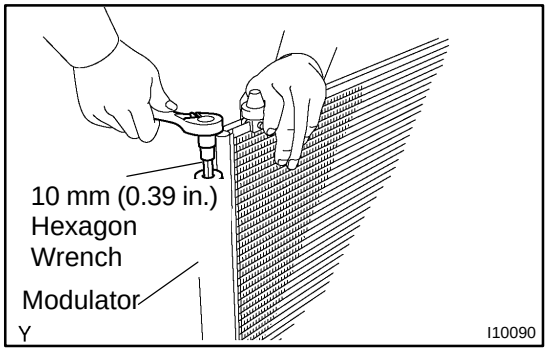
AC22C-07

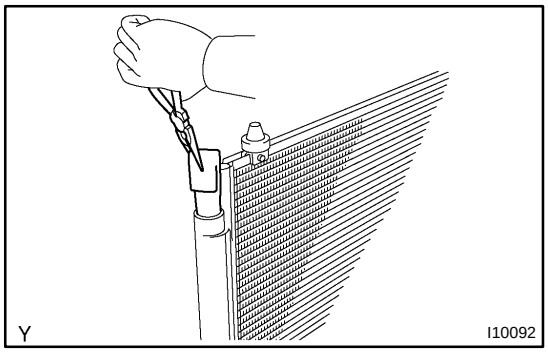
REPLACEMENT

REPLACE DRYER FROM MODULATOR

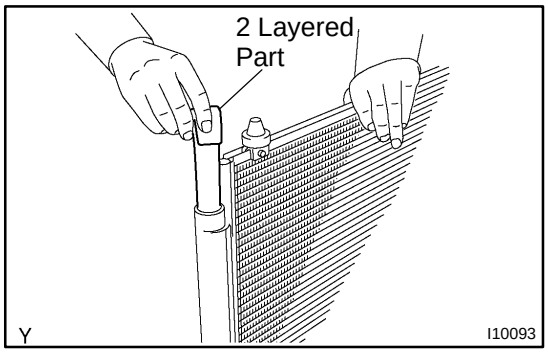
(a) Using a hexagon wrench (10 mm, 0.39 in.), remove the cap from the modulator.

(b) Remove the filter from the modulator.





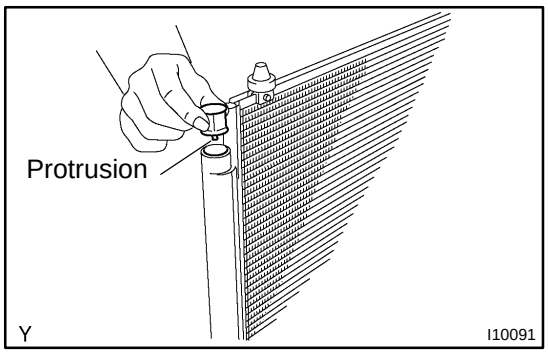
(c) Using pliers, remove the dryer.



(d) Insert a new dryer into the modulator.

NOTICE:

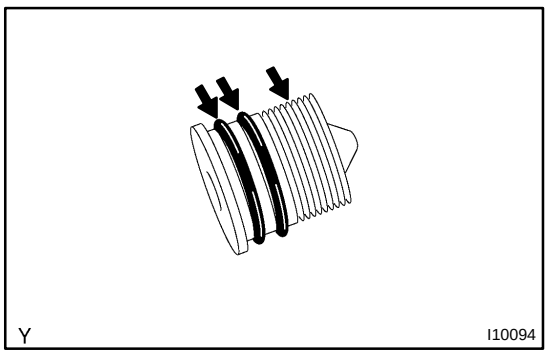
- **Do not remove the dryer from a vinyl bag until inserting it into the modulator.**
- **Install the dryer with its 2 layered part faced upward to the modulator.**



(e) Insert the filter into the modulator.

NOTICE:

Install the filter with its protrusion faced downward to the modulator.



(f) Install the cap to the modulator.

(1) Apply compressor oil to the O-rings and screw part of the cap.

Compressor oil: ND-OIL 8 or equivalent

(2) Using a hexagon wrench (10 mm, 0.39 in.), install the caps.

Torque: 12.3 N·m (125 kgf·cm, 9 ft·lbf)

AC16D-01

INSTALLATION

Installation is in the reverse order of removal (See page AC-49).

EXPANSION VALVE

AC16K-03

ON-VEHICLE INSPECTION

1. CHECK QUANTITY OF GAS DURING REFRIGERATION CYCLE

2. SET ON MANIFOLD GAUGE SET (See page AC-19)

3. RUN ENGINE

Run the engine at 1,500 rpm for at least 5 minutes.

Then check that the high pressure reading is 1.37 - 1.57 MPa (14 - 16 kgf/cm^2, 199 -228 psi).

4. CHECK EXPANSION VALVE

If the expansion valve is faulty, the low pressure reading will drop to 0 kPa (0 kgf/cm^2, 0 psi).

AC383-01

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

HINT:

At the time of installation, please refer to the following item.

Evacuate air from refrigeration system.

Charge system with refrigerant and inspect for leakage of refrigerant.

Specified amount: 600 ± 50 g (21.16 ± 1.76 oz.)

2. REMOVE INSTRUMENT PANEL (See page BO-139)

3. REMOVE EXPANSION VALVE

(a) Pry out the packings.

HINT:

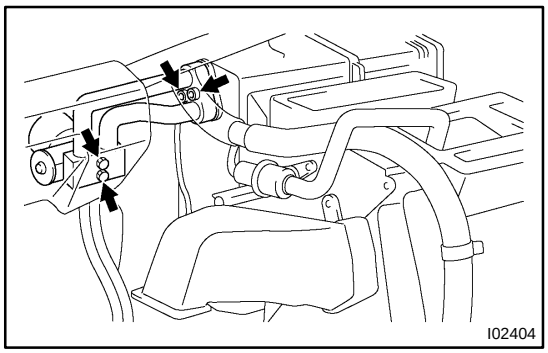
At the time of installation, please refer to the following item.

Do not reuse the packing.

(b) Using SST, remove the 4 bolts and separate the expansion valve and tube and accessory.

SST 07110-61050

Torque: 4.1 N·m (42 kgf·cm, 36 in.·lbf)



NOTICE:

Cap the open fittings immediately to keep moisture or dirt out of the system.

HINT:

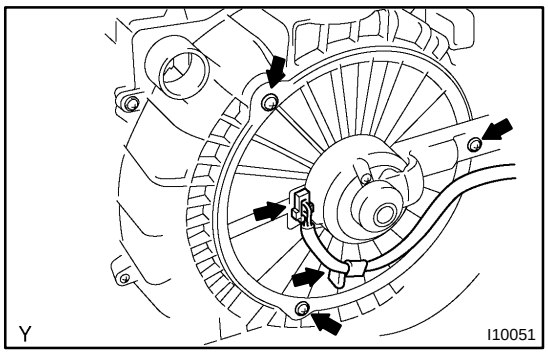
At the time of installation, please refer to the following item.

Lubricate 6 new O-rings with compressor oil and install them to the tube and valve.

AC16M-01

INSTALLATION

Installation is in the reverse order of removal (See page AC-53).



BLOWER MOTOR

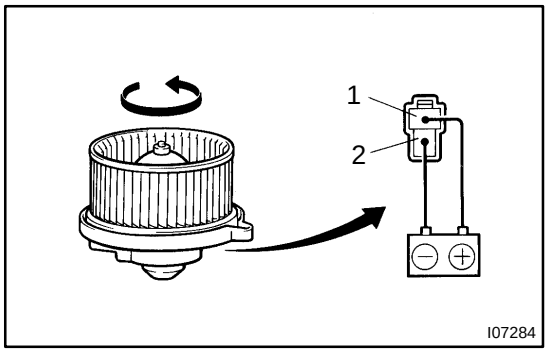
AC20I-03

INSPECTION

1. REMOVE BLOWER MOTOR

(a) Remove the wire harness clamp and disconnect the connector.

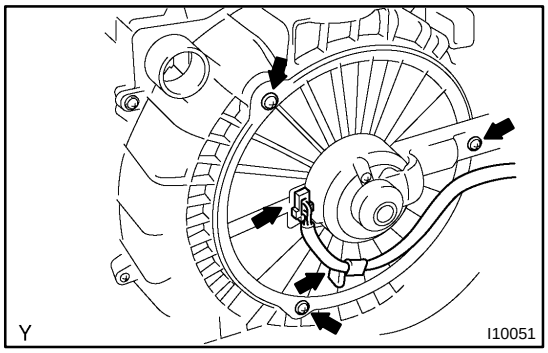
(b) Remove the 3 screws and blower motor.



2. INSPECT BLOWER MOTOR OPERATION

Connect the positive (+) lead from the battery to terminal 2 and negative (-) lead to terminal 1, then check that the motor operations smoothly.

If operation is not as specified, replace the blower motor.



3. INSTALL BLOWER MOTOR

(a) Install the blower motor with the 3 screws.

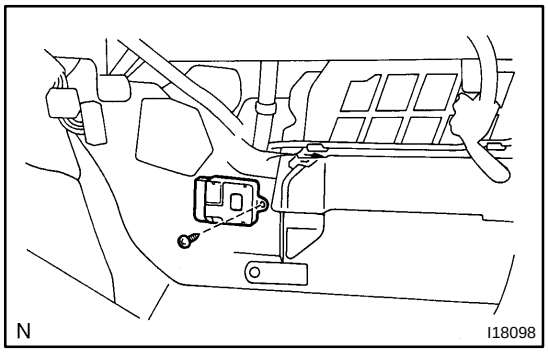
(b) Connect the connector and wire harness clamp.

BLOWER MOTOR CONTROL RELAY

AC25T-02

INSPECTION

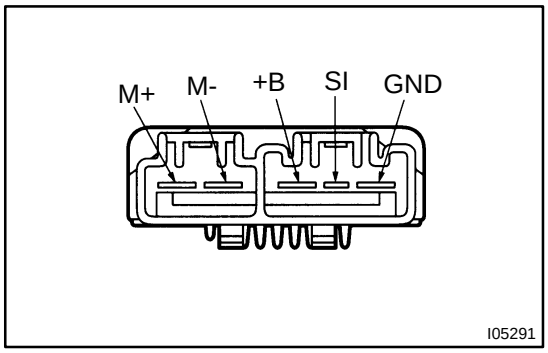
1. REMOVE GLOVE COMPARTMENT DOOR
(See page BO-139)



2. REMOVE BLOWER MOTOR CONTROL RELAY

(a) Disconnect the connectors.

(b) Remove the screw and blower motor control relay.



3. INSPECT BLOWER MOTOR CONTROL CIRCUIT

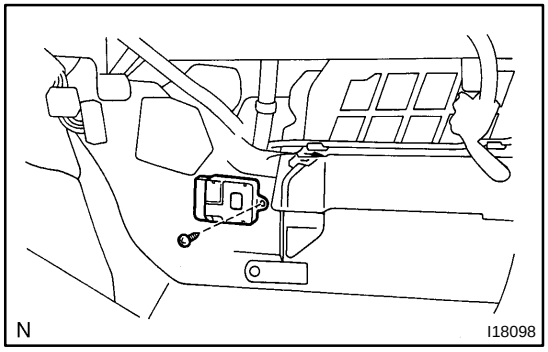
Inspect the wire harness side connector from the back side, as shown in the chart.

Test conditions:

- Turn ignition switch to ON
- Operate blower motor (High blower speed)

Terminals	Standard Value
GND ↔ Body Ground	Continuity
+B ↔ Body Ground	Battery positive voltage
+M ↔ Body Ground	Battery positive voltage
M+ ↔ M-	Battery positive voltage
SI ↔ Body Ground	1 - 3 V

If resistance is not as specified, replace the blower motor control relay.



4. INSTALL BLOWER MOTOR CONTROL RELAY

(a) Install the blower motor control relay with the screw.

(b) Connect the connectors.

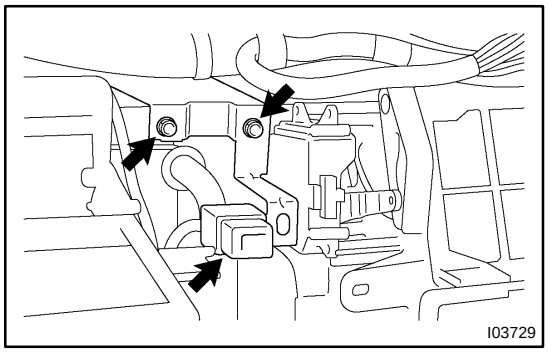
5. INSTALL GLOVE COMPARTMENT DOOR
(See page BO-149)

AIR INLET SERVOMOTOR

AC384-01

INSPECTION

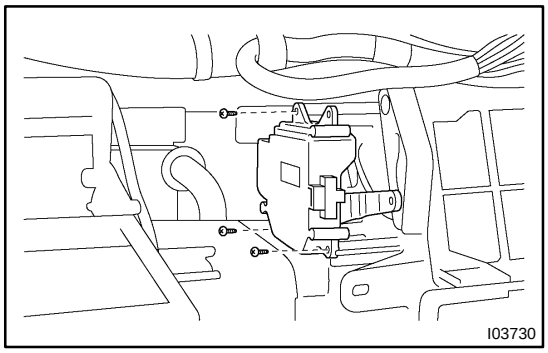
1. REMOVE GLOVE COMPARTMENT DOOR
(See page BO-139)



2. REMOVE BRACKET

(a) Disconnect the wire harness clamp.

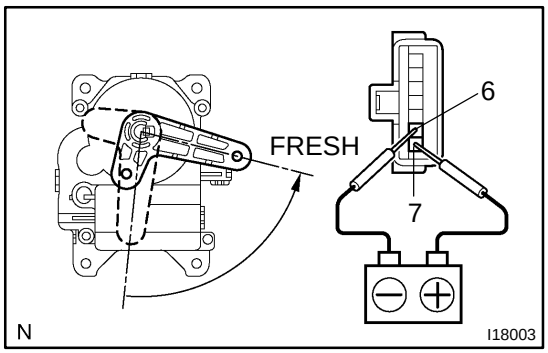
(b) Remove the 2 bolts and bracket.



3. REMOVE AIR INLET SERVOMOTOR

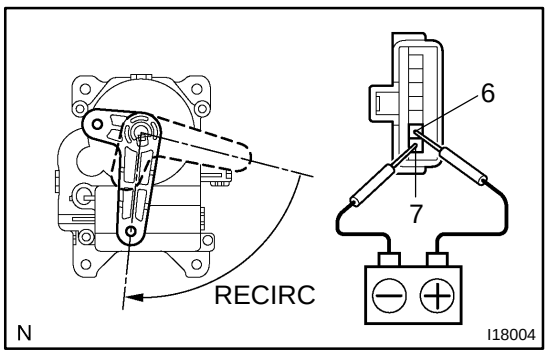
(a) Disconnect the connector.

(b) Remove the 3 screws and servomotor.



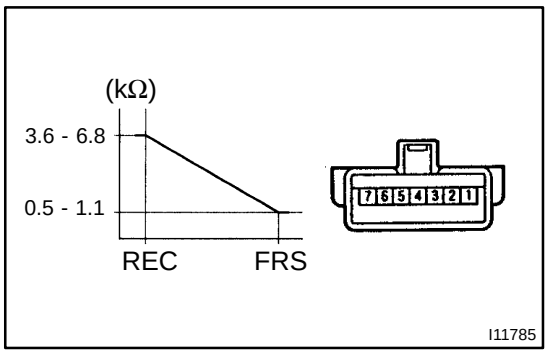
4. INSPECT AIR INLET SERVOMOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 7 and negative (-) lead to terminal 6, then check that the arm turns to ”FRESH” side smoothly.



(b) Connect the positive (+) lead from the battery to terminal 6 and negative (-) lead to terminal 7, then check that the arm turns to ”RECIRC” side smoothly.

If operations are not as specified, replace the servomotor.

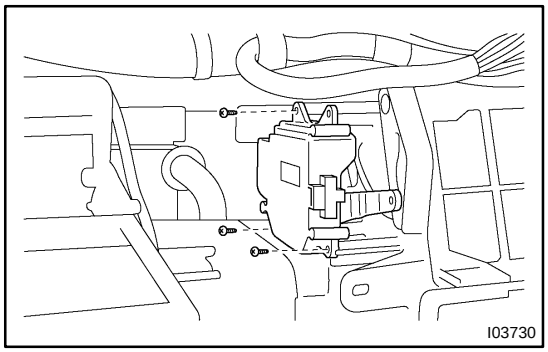


5. INSPECT POSITION SENSOR RESISTANCE

Measure resistance between terminals at servomotor arm each position as shown in the chart.

Tester connection	Condition	Specified condition
1 - 3	Constant	4.2 - 7.8 kΩ
3 - 5	REC	3.1 - 5.8 kΩ
3 - 5	FRS	0.8 - 1.6 kΩ

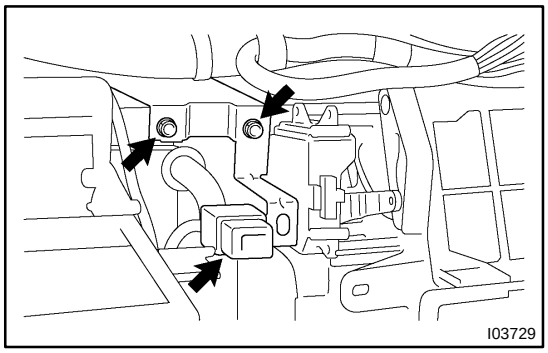
If resistance is not as specified, replace the servomotor.



6. INSTALL AIR INLET SERVOMOTOR

(a) Install the servomotor with the 3 screws.

(b) Connect the connector.



7. INSTALL BRACKET

(a) Install the bracket with 2 bolts.

(b) Connect the wire harness clamp.

8. INSTALL GLOVE COMPARTMENT DOOR

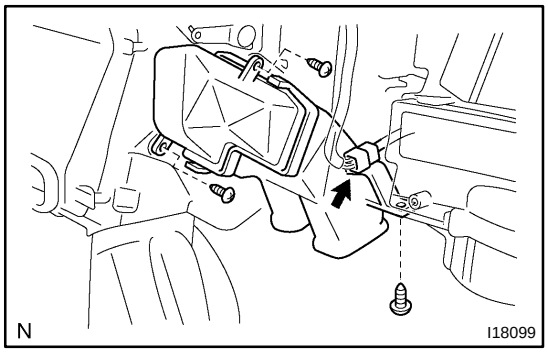
(See page BO-149)

AIR OUTLET SERVOMOTOR

AC25W-02

INSPECTION

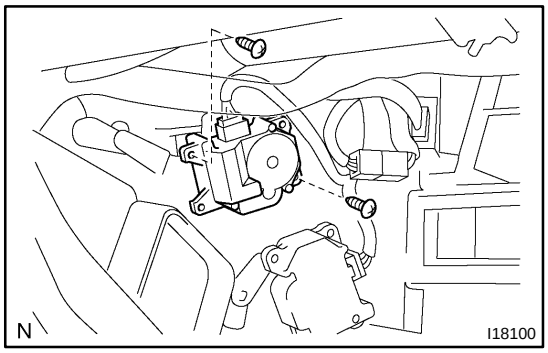
1. REMOVE INSTRUMENT PANEL (See page BO-139)



2. REMOVE AIR DUCT

(a) Disconnect the connector clamp.

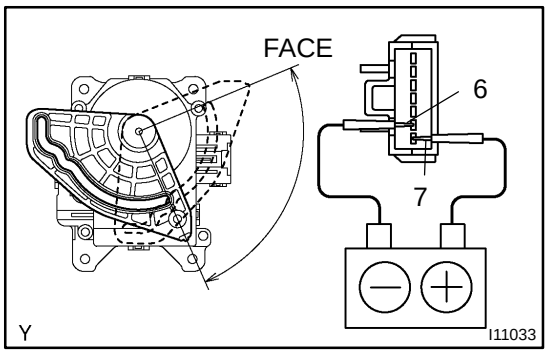
(b) Remove the 3 screws and air duct.



3. REMOVE AIR OUTLET SERVOMOTOR

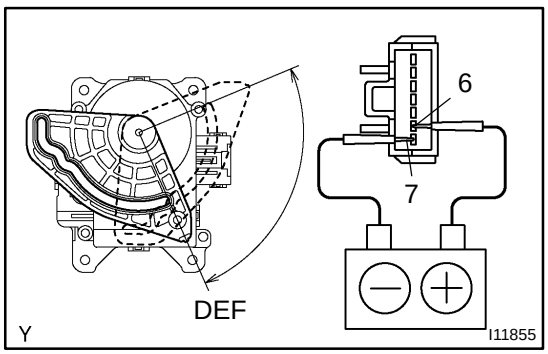
(a) Disconnect the connector.

(b) Remove the 2 screws and servomotor.



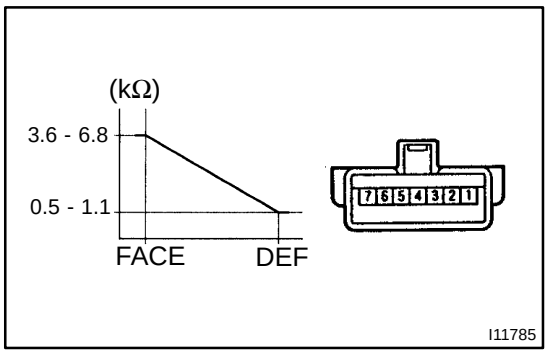
4. INSPECT AIR OUTLET SERVOMOTOR OPERATION

(a) Connect the positive (+) lead from the battery to terminal 7 and negative (-) lead to terminal 6, then check that the arm turns to ”FACE” side smoothly.



(b) Connect the positive (+) lead from the battery to terminal 6 and negative (-) lead to terminal 7, then check that the arm turns to ”DEF” side smoothly.

If operations are not as specified, replace the servomotor.

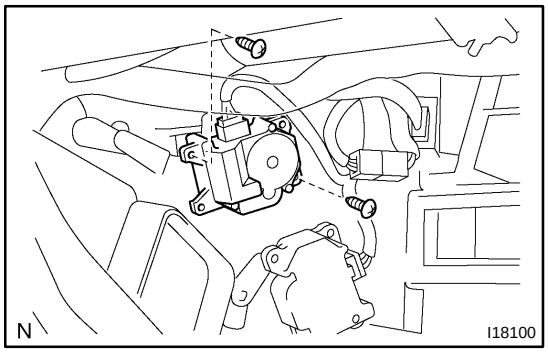


5. INSPECT POSITION SENSOR RESISTANCE

Measure resistance between terminals at servomotor arm each position as shown in the chart.

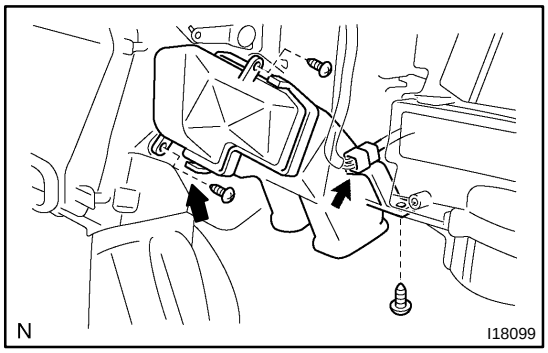
Tester connection	Condition	Specified condition
1 - 3	Constant	4.2 - 7.8 kΩ
3 - 5	FACE	3.6 - 6.8 kΩ
3 - 5	DEF	0.5 - 1.1 kΩ

If resistance is not as specified, replace the servomotor.



6. INSTALL AIR OUTLET SERVOMOTOR

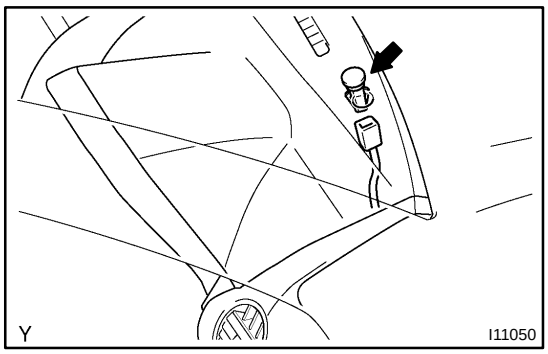
(a) Install the servomotor with the 2 screws.
(b) Connect the connector.



7. INSTALL AIR DUCT

(a) Install the air duct with the 3 screws.
(b) Connect the connector clamp.

8. INSTALL INSTRUMENT PANEL (See page BO-149)



SOLAR SENSOR

AC25X-02

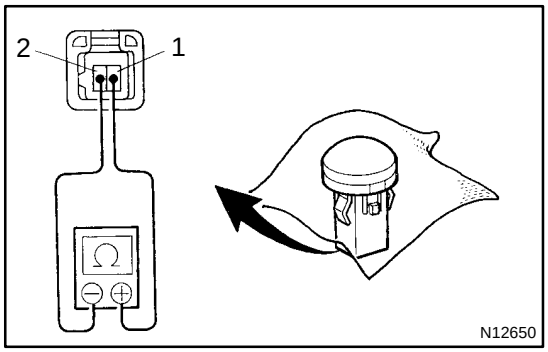
INSPECTION

1. REMOVE SOLAR SENSOR

Using a screwdriver, pull out the sensor, then disconnect the connector.

HINT:

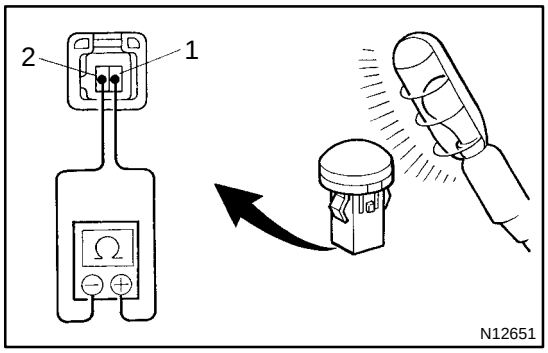
Tape the screwdriver tip before use.



2. INSPECT SOLAR SENSOR CONTINUITY

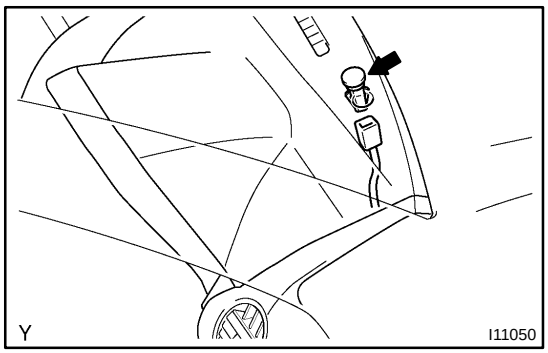
(a) Cover the sensor with a cloth, check that the no continuity exists between terminals.

If continuity exists, replace the sensor.



(b) Remove the cloth from the sensor and subject the sensor to electric light, check that continuity exists between terminals.

If no continuity exists, replace the sensor.



3. INSTALL SOLAR SENSOR

Connect the connector and install the solar sensor.

ROOM TEMPERATURE SENSOR

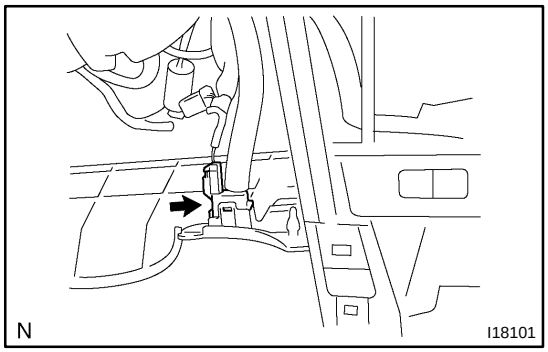
AC20Q-04

INSPECTION

1. REMOVE LOWER FINISH PANEL

(a) Remove the 3 screws.

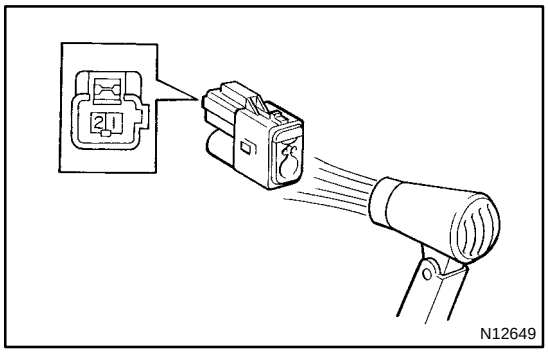
(b) Release the 3 claws and pull out the lower finish panel.



2. REMOVE ROOM TEMPERATURE SENSOR

(a) Disconnect the connector and aspirator hose.

(b) Release the 2 claws and pull out the sensor.

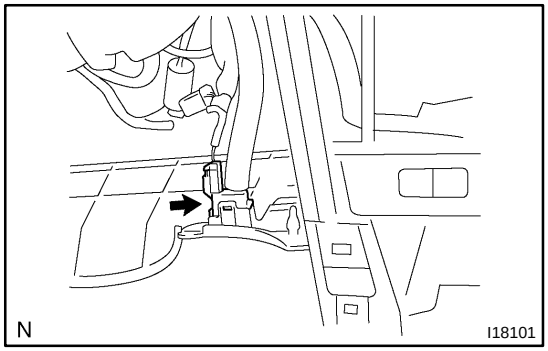


3. INSPECT ROOM TEMPERATURE SENSOR RESISTANCE

Measure resistance between terminals at each temperature as shown in the chart.

Temperature	Specified condition
25 °C (77 °F)	1.6 - 1.8 kΩ
50 °C (122 °F)	0.6 - 0.8 kΩ

If resistance is not as specified, replace the sensor.



4. INSTALL ROOM TEMPERATURE SENSOR

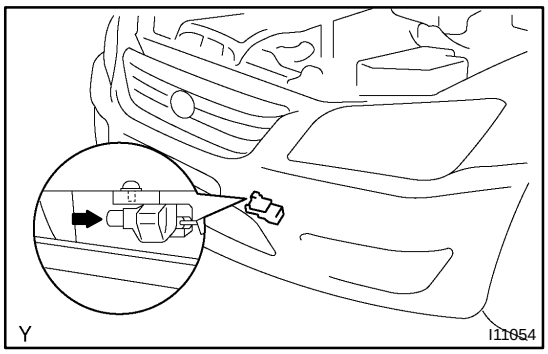
(a) Install the sensor and fit the 2 claws.

(b) Connect the aspirator hose and connector.

5. INSTALL LOWER FINISH PANEL

(a) Install the lower finish panel and fit the 3 claws.

(b) Install the 3 screws.



AMBIENT TEMPERATURE SENSOR

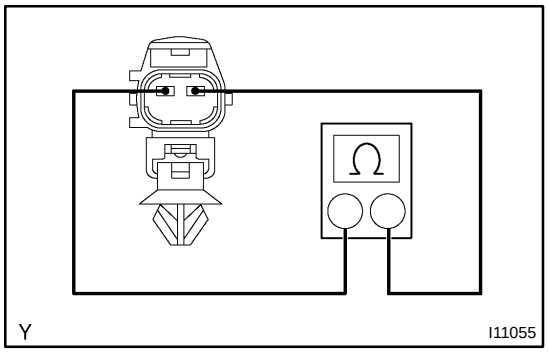
AC20R-03

INSPECTION

1. REMOVE AMBIENT TEMPERATURE SENSOR

(a) Disconnect the connector.

(b) Using a clip remover, pull out the sensor from bumper reinforcement.

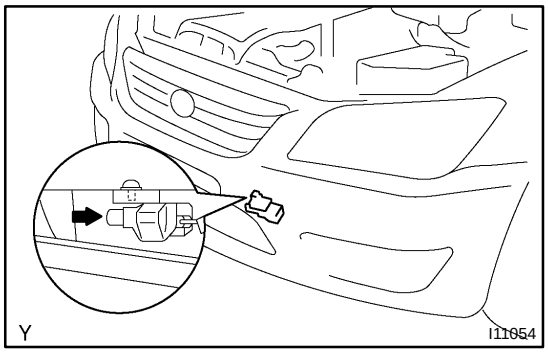


2. INSPECT AMBIENT TEMPERATURE SENSOR RESISTANCE

Measure resistance between terminals at each temperature as shown in the chart.

Temperature	Specified condition
25 °C (77 °F)	1.6 - 1.8 kΩ
50 °C (122 °F)	0.5 - 0.7 kΩ

If resistance is not as specified, replace the sensor.



3. INSTALL AMBIENT TEMPERATURE SENSOR

(a) Push the sensor in bumper reinforcement.

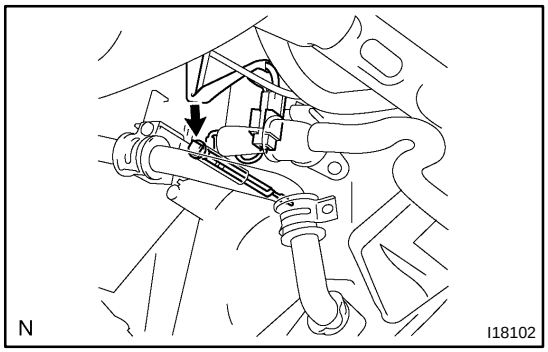
(b) Connect the connector.

EVAPORATOR TEMPERATURE SENSOR

AC25Y-02

INSPECTION

1. REMOVE LOWER FINISH PANEL (See page BO-139)



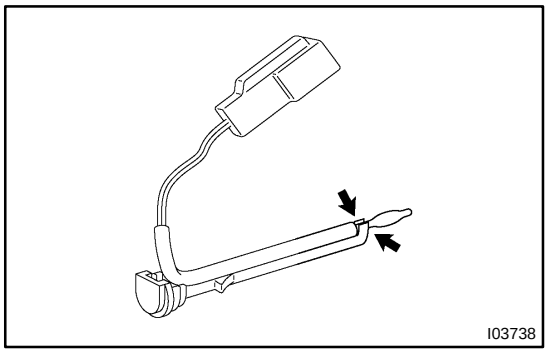
2. REMOVE EVAPORATOR TEMPERATURE SENSOR

(a) Disconnect the connector.

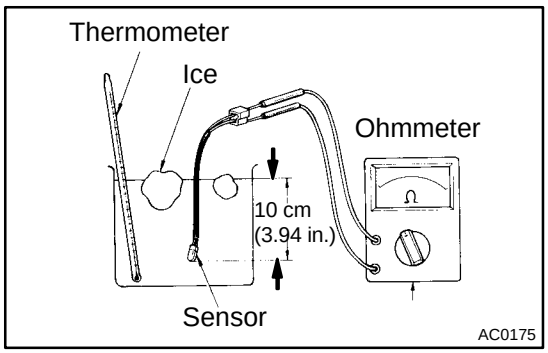
(b) Using a screwdriver, pull out the sensor with bracket plate.

HINT:

Tape the screwdriver tip before use.

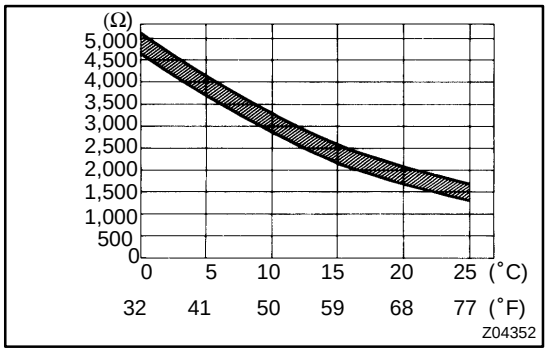


(c) Release the 2 claws and remove the sensor from bracket plate.



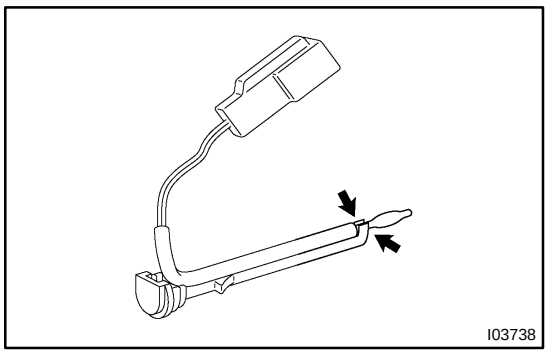
3. INSPECT EVAPORATOR TEMPERATURE SENSOR RESISTANCE

(a) Place the sensor in cold water, and while changing the temperature of the water, measure resistance at the connector and at the same time, measure temperature of the water with a thermometer.



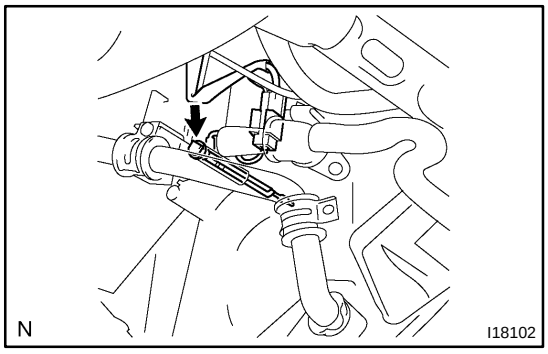
(b) Compare the 2 readings on the chart.

If resistance value is not as specified, replace the sensor.



4. INSTALL EVAPORATOR TEMPERATURE SENSOR

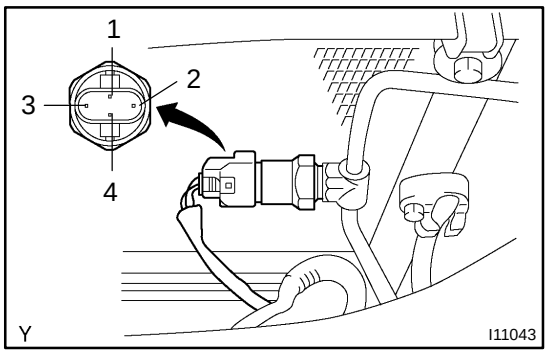
(a) Install the sensor in bracket plate and 2 claws.



(b) Push in the sensor with the bracket plate.

(c) Connect the connector.

5. INSTALL LOWER FINISH PANEL (See page BO-149)

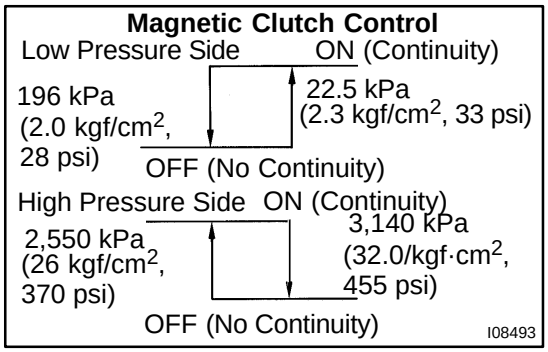


PRESSURE SWITCH

AC16Z-04

ON-VEHICLE INSPECTION

1. **SET ON MANIFOLD GAUGE SET (See page AC-19)**
2. **DISCONNECT CONNECTOR FROM PRESSURE SWITCH**
3. **RUN ENGINE AT APPROX. 1,500 RPM**

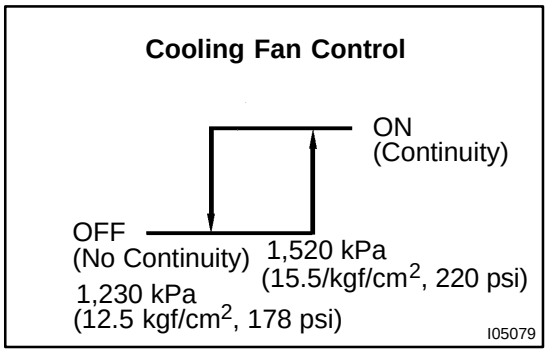


4. **Magnetic clutch control:**
   INSPECT PRESSURE SWITCH OPERATION

(a) Connect the positive (+) lead from the ohmmeter to terminal 4 and the negative (-) lead to terminal 1.

(b) Check continuity between terminals when refrigerant pressure is changed, as shown in the illustration.

If operation is not as specified, replace the pressure switch.



5. **Cooling fan control:**
   INSPECT PRESSURE SWITCH OPERATION

(a) Connect the positive (+) lead from the ohmmeter to terminal 2 and the negative (-) lead to terminal 3.

(b) Check continuity between terminals when refrigerant pressure is changed, as shown in the illustration.

If operation is not as specified, replace the pressure switch.

6. **STOP ENGINE AND SET OFF MANIFOLD GAUGE SET**
7. **CONNECT CONNECTOR TO PRESSURE SWITCH**

AC170-04

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM

HINT:

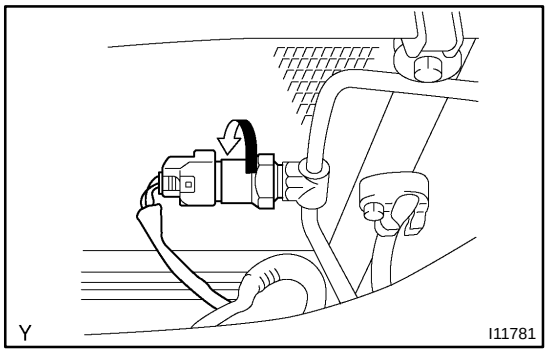
At the time of installation, please refer to the following item.

Evacuate air from refrigeration system.

Charge system with refrigerant and inspect for leakage of refrigerant.

Specified amount: 600 ± 50 g (21.16 ± 1.76 oz.)

2. REMOVE RADIATOR GRILLE (See page BO-4)



3. REMOVE PRESSURE SWITCH FROM LIQUID TUBE

Disconnect the connector and remove the pressure switch.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

HINT:

- Lock the switch mount on the tube with an open end wrench, being careful not to deform the tube, and remove the switch.
- At the time of installation, please refer to the following item.
  Lubricate a new O-ring with compressor oil and install the switch.

AC171-01

INSTALLATION

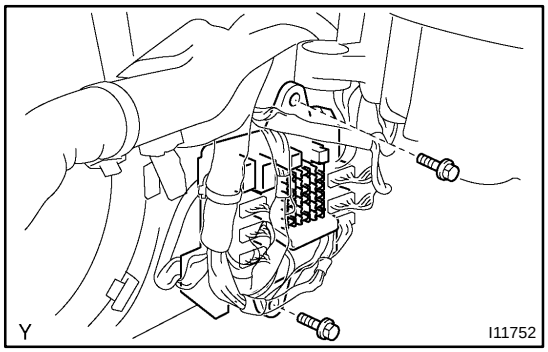
Installation is in the reverse order of removal (See page AC-67).

HEATER MAIN RELAY

AC25Z-02

INSPECTION

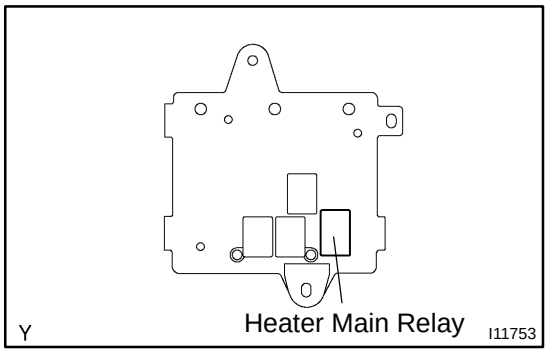
1. **REMOVE FRONT DOOR SCUFF PLATE LH**
   (See page BO-139)
2. **REMOVE COWL SIDE TRIM BOARD LH**
   (See page BO-139)



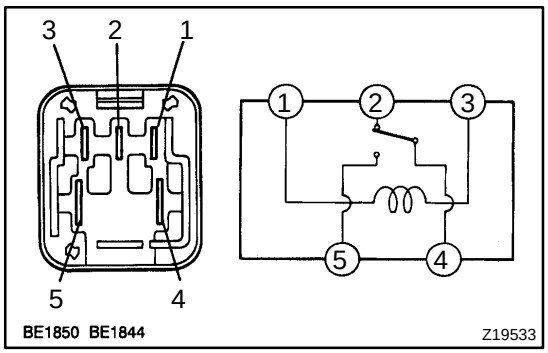
3. **REMOVE HEATER MAIN RELAY**

(a) Disconnect the connectors.

(b) Remove the 2 passenger side junction block set nuts.



(c) Remove the heater main relay from passenger side junction block.



4. **INSPECT HEATER MAIN RELAY CONTINUITY**

Condition	Tester connection	Specified condition
Constant	2 - 4 1 - 3	Continuity
Apply B+ between terminals 1 and 3.	4 - 5	Continuity

If continuity is not as specified, replace the relay.

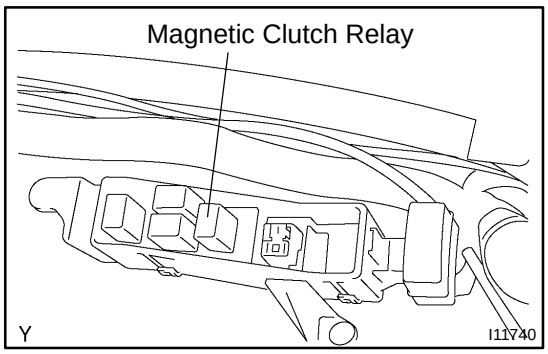
5. **INSTALL HEATER MAIN RELAY**

(a) Install the heater main relay to passenger side junction block.

(b) Install the passenger side junction block set nuts.

(c) Connect the connectors.

6. **INSTALL COWL SIDE TRIM BOARD LH**
   (See page BO-149)
7. **INSTALL FRONT DOOR SCUFF PLATE LH**
   (See page BO-149)

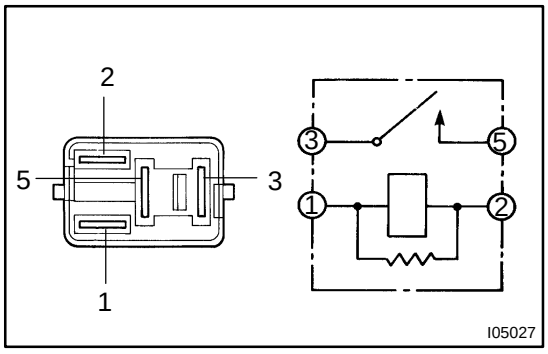


MAGNETIC CLUTCH RELAY

AC20U-05

INSPECTION

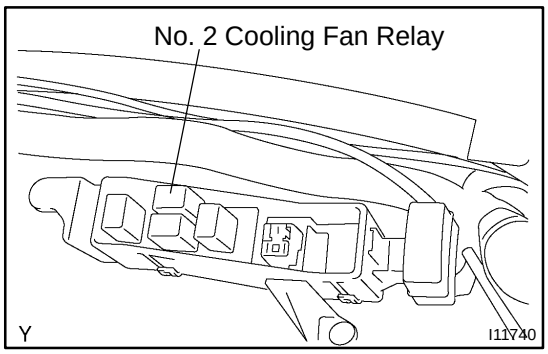
1. REMOVE MAGNETIC CLUTCH RELAY FROM RELAY BLOCK NO.3



2. INSPECT MAGNETIC CLUTCH RELAY (Marking: A.C COMP) CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 - 2	Continuity
Apply B+ between terminals 1 and 2.	3 - 5	Continuity

If continuity is not as specified, replace the relay.

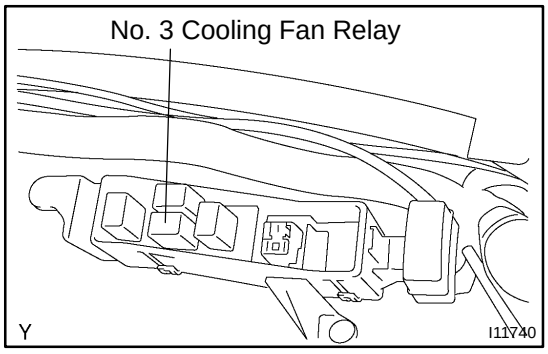


COOLING FAN RELAY

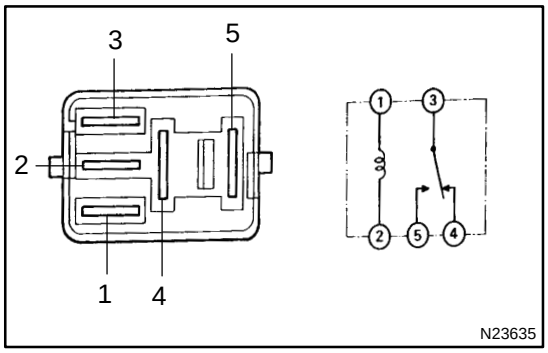
AC260-02

INSPECTION

1. REMOVE NO.2 COOLING FAN RELAY FROM RELAY BLOCK NO.3



2. REMOVE NO.3 COOLING FAN RELAY FROM RELAY BLOCK NO.3



3. INSPECT NO.2 COOLING FAN RELAY (Marking: FAN NO.2) CONTINUITY

Condition	Tester connection	Specified condition
Constant	1 - 2 3 - 4	Continuity
Apply B+ between terminals 1 and 2.	3 - 5	Continuity

If continuity is not as specified, replace the relay.

4. INSPECT NO.3 COOLING FAN RELAY (Marking: FAN NO.3) CONTINUITY

Check the relay in the same way as for ”MAGNETIC CLUTCH RELAY”.

CONDENSER FAN

AC173-03

ON-VEHICLE INSPECTION

1. INSPECT CONDENSER FAN OPERATION

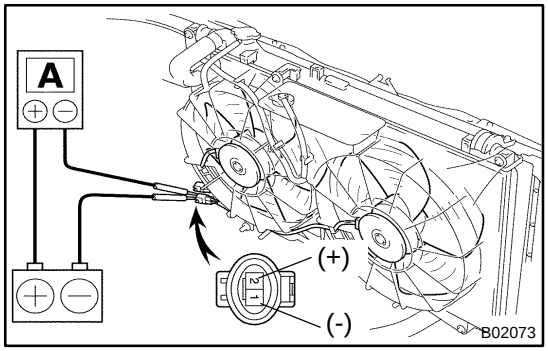
Inspect the fan operation, as shown in the chart below.

Test conditions:

- Ignition switch ON
- Blower speed control switch position ”HI”
- Temperature control dial at ”MAX. COOL” position
- Install manifold gauge set”
- A/C switch ON

Condition	Fan operation (Fan speed)
Engine coolant temperature 91˚C (196 ˚F) or below	Rotate (Low speed)
Engine coolant temperature 100˚C (212 ˚F) or above	Rotate (High speed)
Refrigerant pressure is less than 1,520 kPa (15.5 kgf·cm^2, 220 psi)	Rotate (Low speed)
Refrigerant pressure is 1,520 kPa (15.5 kgf·cm^2, 220 psi) or above	Rotate (High speed)

If operation is not as specified, proceed to the next inspection.



2. INSPECT CONDENSER FAN MOTOR OPERATION

(a) Disconnect the fan connector.

(b) Connect battery and ammeter.

(c) Check that the fan rotates smoothly, and then check the reading on the ammeter.

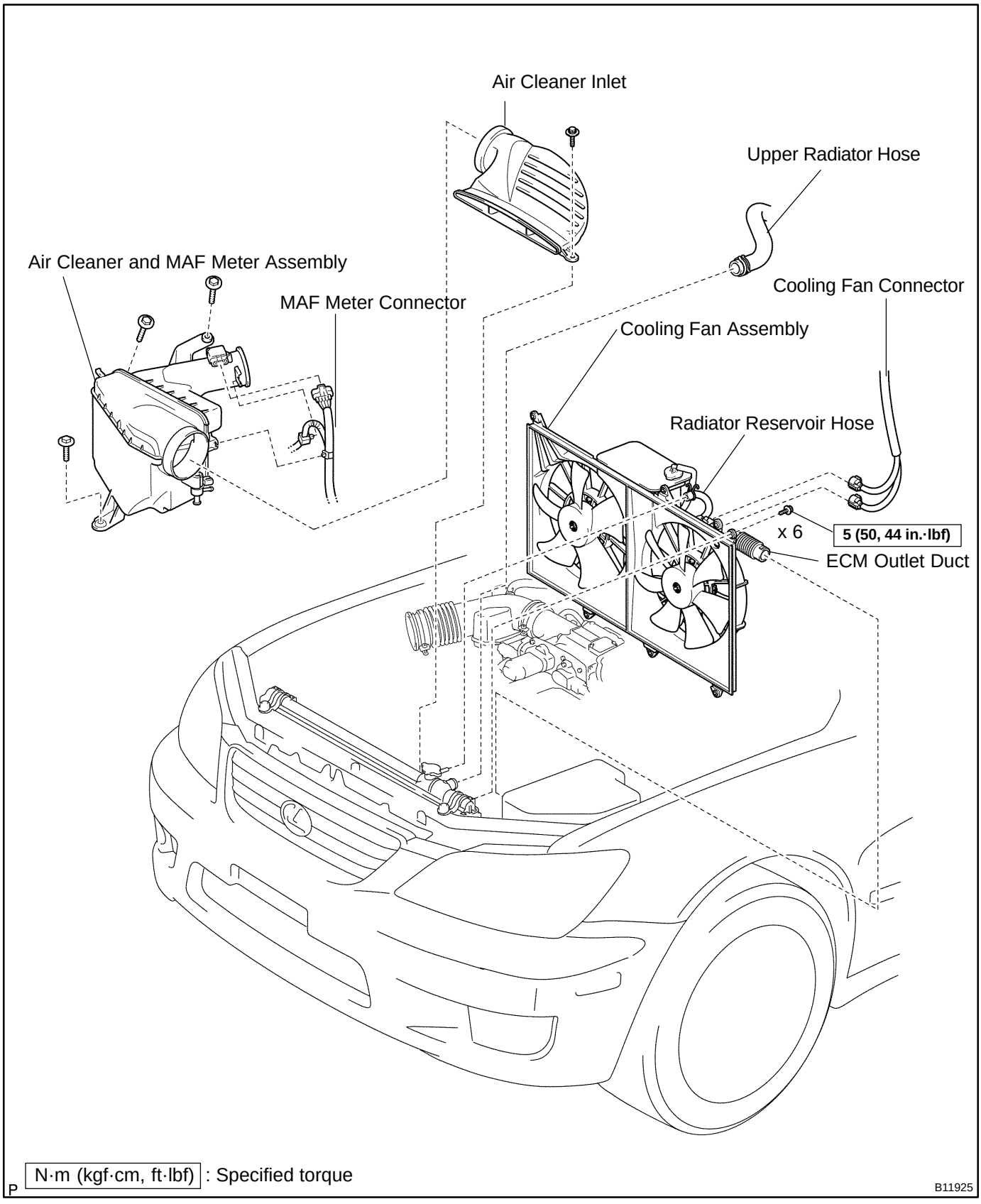
Specified amperage: 8.5 - 11.5 A ar 20 ˚C (68 ˚F)

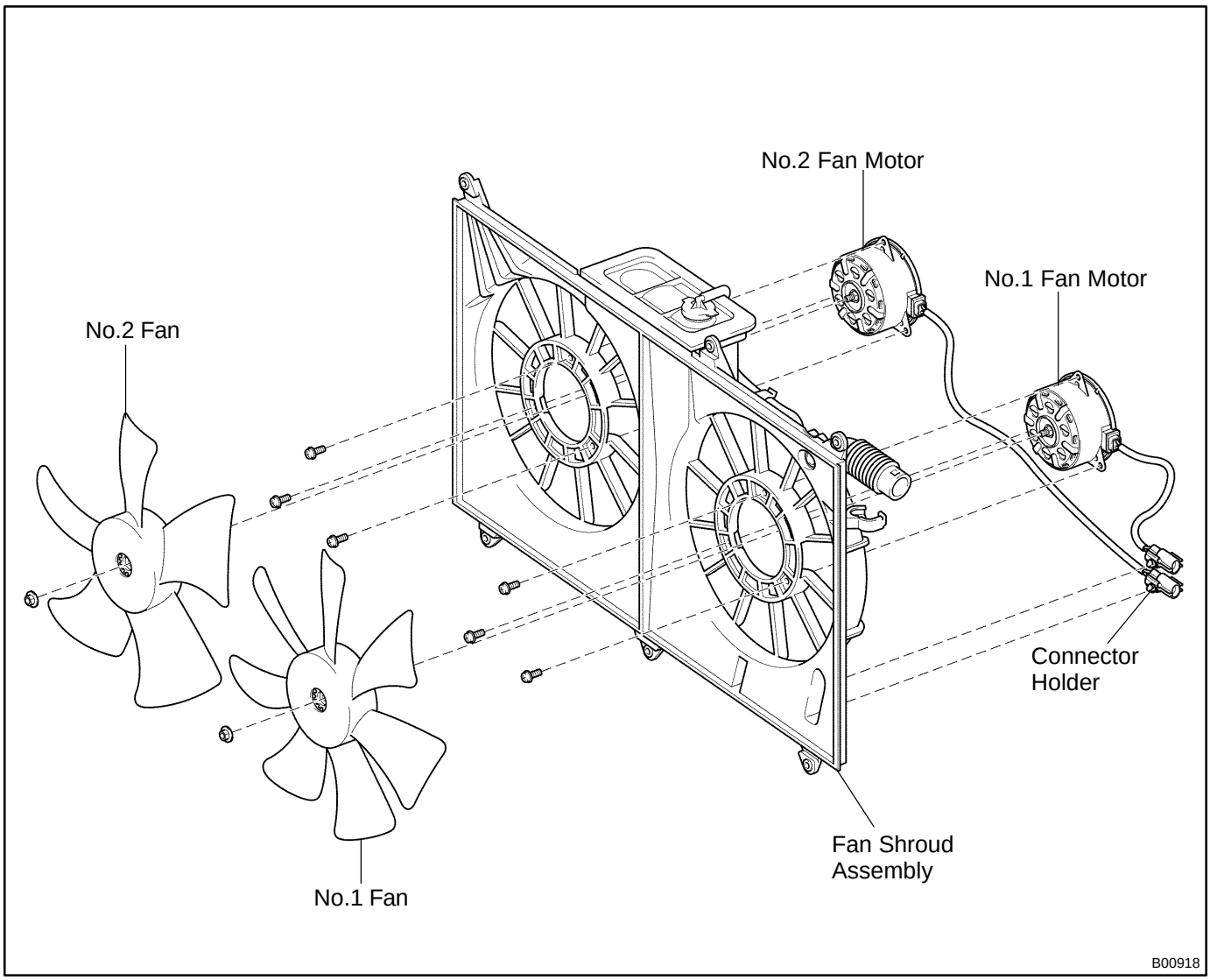
If operation is not as specified, replace the fan motor.

If operation is as specified, check the pressure switch, cooling fan relays and engine coolant temp. switch.

AC386-01

COMPONENTS




No.2 Fan Motor
No.1 Fan Motor
No.2 Fan
Connector Holder
Fan Shroud Assembly
No.1 Fan
B00918

AC387-01

REMOVAL

1. DRAIN ENGINE COOLANT FROM RADIATOR

HINT:

It is not necessary to drain out all coolant.

2. REMOVE AIR CLEANER INLET

3. REMOVE AIR CLEANER AND MAF METER ASSEMBLY

4. REMOVE COOLING FAN

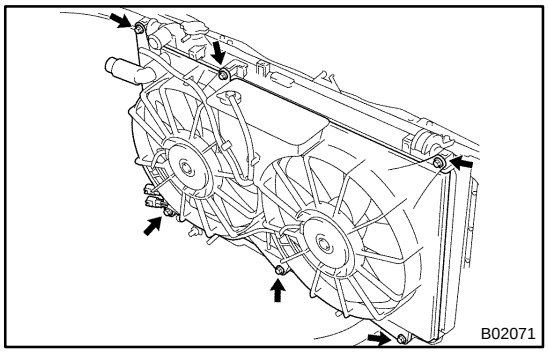
(a) Disconnect the upper radiator hose from the radiator.

(b) Disconnect the ECM outlet duct from the ECM box.

(c) Disconnect the wire for cooling fan from the clamp on the cooling fan.

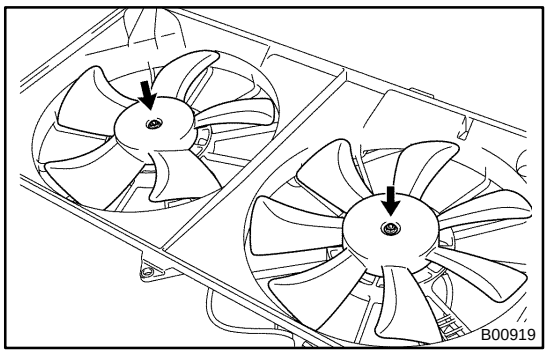
(d) Disconnect the 2 cooling fan connector.

(e) Disconnect the radiator reservoir hose from the radiator.



(f) Remove the 6 bolts and cooling fan.

AC388-01

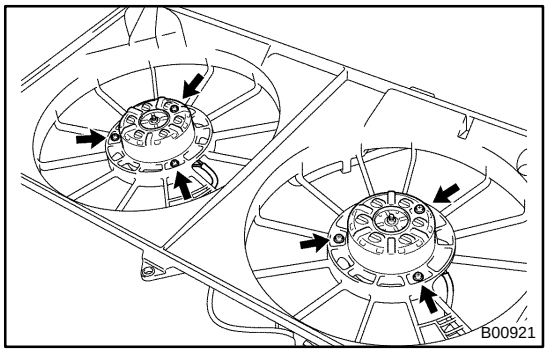


DISASSEMBLY

1. REMOVE FANS

(a) Remove the nut and fan.

(b) Remove the 2 fans.



2. REMOVE FAN MOTORS

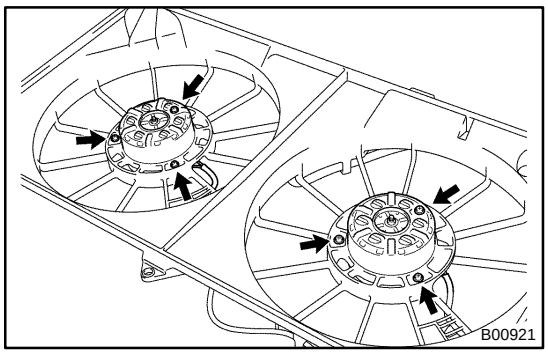
(a) Disconnect the wires and connector holders from the fan shroud.

(b) Remove the 3 screws and fan motor.

(c) Remove the 2 fan motors.

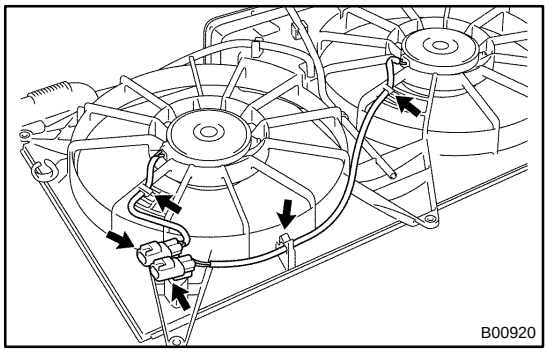
AC389-01

REASSEMBLY

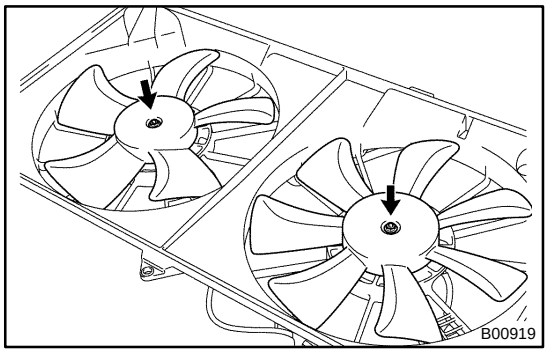


1. INSTALL FAN MOTORS

(a) Install the fan motor with the 3 screws. Install the 2 fan motors.



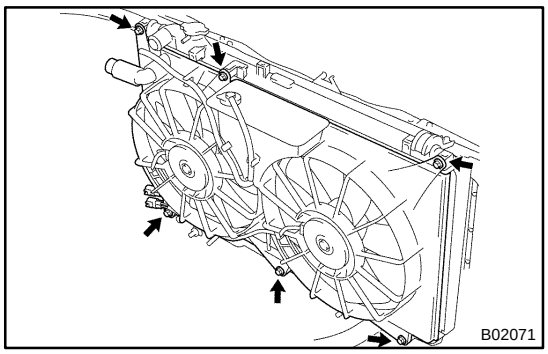
(b) Install the wires and connector holders to the fan shroud as shown in the illustration.



2. INSTALL FANS

Install the fan with the nut. Install the 2 fans.

AC38A-01



INSTALLATION

1. INSTALL COOLING FAN

(a) Install the cooling fan with the 6 bolts.
Torque: 5.0 N·m (50 kgf·cm, 44 in.·lbf)

(b) Connect the upper radiator hose to the radiator.

(c) Connect the ECM outlet duct to the ECM box.

(d) Connect the wire for cooling fan to clamp on the cooling fan.

(e) Connect the 2 cooling fan connectors.

(f) Connect the radiator reservoir hose to the radiator.

2. INSTALL AIR CLEANER AND MAF METER ASSEMBLY

3. INSTALL AIR CLEANER INLET

4. FILL WITH ENGINE COOLANT

5. START ENGINE AND CHECK FOR COOLANT LEAKS

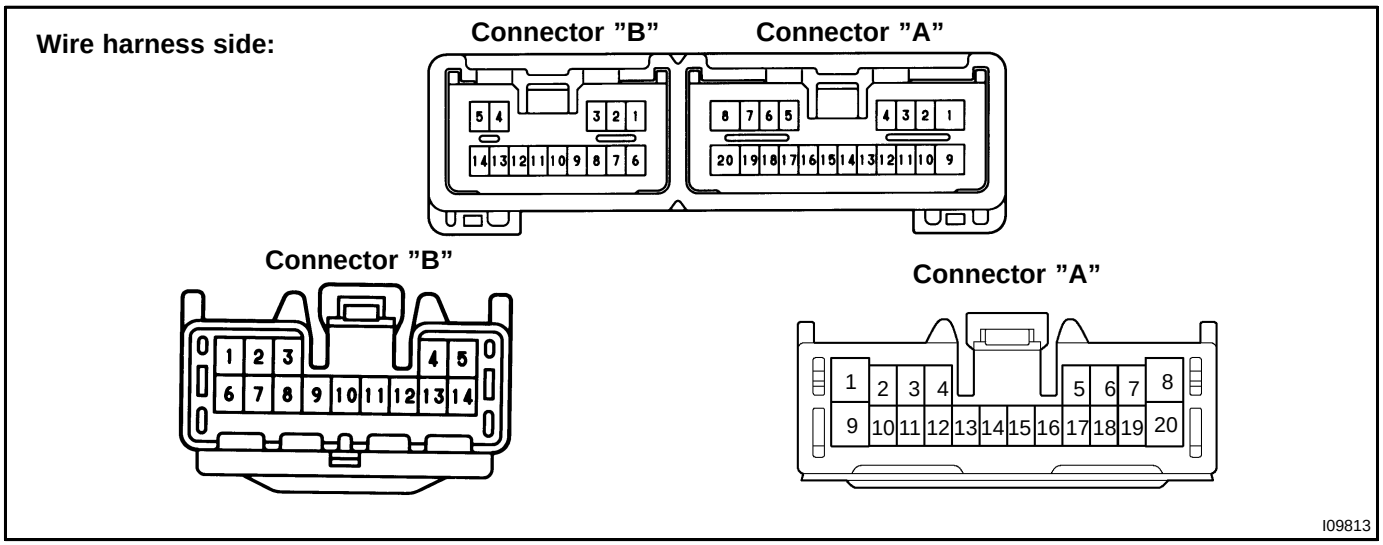
AIR CONDITIONING CONTROL ASSEMBLY

AC261-03

ON-VEHICLE INSPECTION

1. **REMOVE A/C CONTROL ASSEMBLY**
   (See page AC-84)
2. **INSPECT A/C CONTROL ASSEMBLY CIRCUIT**

(a) Disconnect the connector from the A/C control assembly and inspect the connector on the wire harness side, as shown in the chart below.
Test condition:
Turn ignition switch ON



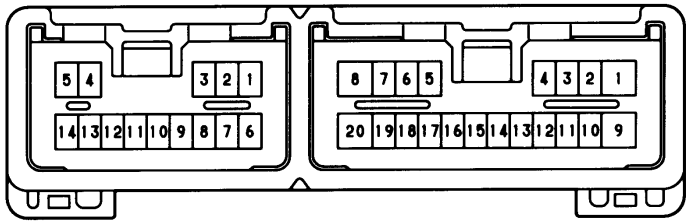
Tester connection	Condition	Specified condition
A13 - A6	Cover solar sensor with a cloth	No continuity
	Solar sensor subject to electric light	Continuity
B14 - Ground	Constant	Continuity
A17 - A18	Cabin temperature at 25 °C (77 °F)	Approx. 1.7 kΩ
A5 - A18	Evaporator temperature at 25 °C (77 °F)	Approx. 1.5 kΩ
B4 - Ground	Turn ignition switch to ACC	Battery positive voltage
B13 - Ground	Turn ignition switch to ON	Battery positive voltage
	Turn ignition switch to LOCK or ACC	No voltage
B12 - Ground	Turn light control switch to "TAIL"	Battery positive voltage
B5 - Ground	Constant	Battery positive voltage

If the circuit is not as specified, inspect the circuit connected to other parts.
If the circuit is as specified, proceed to "INSPECTION" on page AC-88 .

(b) Connect the connector to amplifier and inspect the wire harness side connector from the back side, as shown in the chart.
Test conditions:
- Running engine at idle speed
- Blower speed control dial at ”HI” position
- Temperature control dial at ”MAX. COOL” position
- A/C switch ON

From back side:

Connector ”B” **Connector ”A”**



I07266

Tester connection	Condition	Specified condition
A18 - Ground	Constant	Continuity
A1 - Ground	Hazard switch: OFF	No continuity
	Hazard switch: ON	Continuity
A2 - Ground	R/F switch: FRESH	Battery positive voltage
	R/F switch: RECIRC	Below 1.0 V
A3 - Ground	Mode control dial: FACE	Below 1.0 V
	Mode control dial: DEF	Battery positive voltage
A4 - Ground	Temperature control dial: MAX COOL	Below 1.0 V
	Temperature control dial: MAX HOT	Battery positive voltage
A6 - A18	Constant	5.0 ± 0.5 V
A9 - Ground	R/F switch: FRESH	Below 1.0 V
	R/F switch: RECIRC	Battery positive voltage
A10 - Ground	Mode control dial: DEF	Below 1.0 V
	Mode control dial: FACE	Battery positive voltage
A11 - Ground	Temperature control dial: MAX HOT	Below 1.0 V
	Temperature control dial: MAX COOL	Battery positive voltage
A14 - A18	Temperature control dial: MAX HOT	Approx. 1.0 V
	Temperature control dial: MAX COOL	Approx. 4.0 V
A15 - A18	Mode control dial: DEF	Approx. 1.0 V
	Mode control dial: FACE	Approx. 4.0 V
A16 - A18	R/F switch: FRESH	Approx. 1.0 V
	R/F switch: RECIRC	Approx. 4.0 V
B2 - Ground	Parking drake lever: Release	Battery positive voltage
	Parking drake lever: Operate	Below 1.0 V
B3 - Ground	Pattern select switch: Except PWR	Battery positive voltage
	Pattern select switch: PWR	Below 1.0 V

B6 - Ground	Ignition switch: ON	Below 1.0 V
	Ignition switch: OFF	Battery positive voltage
B7 - Ground	Blower motor: ON	Pulse generation
	Blower motor: OFF	Approx. 5.0 V
B8 - Ground	Pattern select switch: Except SNOW	Battery positive voltage
	Pattern select switch: SNOW	Below 1.0 V
B10 - Ground	Passenger seat belt: unfastened	Below 1.0 V
	Passenger seat belt: fasted	Battery positive voltage

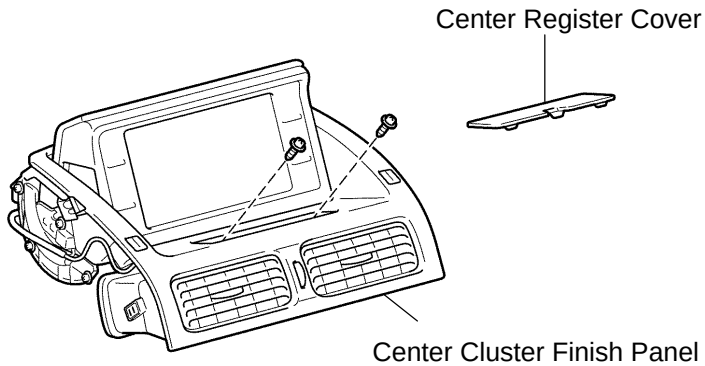
If the circuit is not as specified, proceed to ”INSPECTION” on page AC-88 .

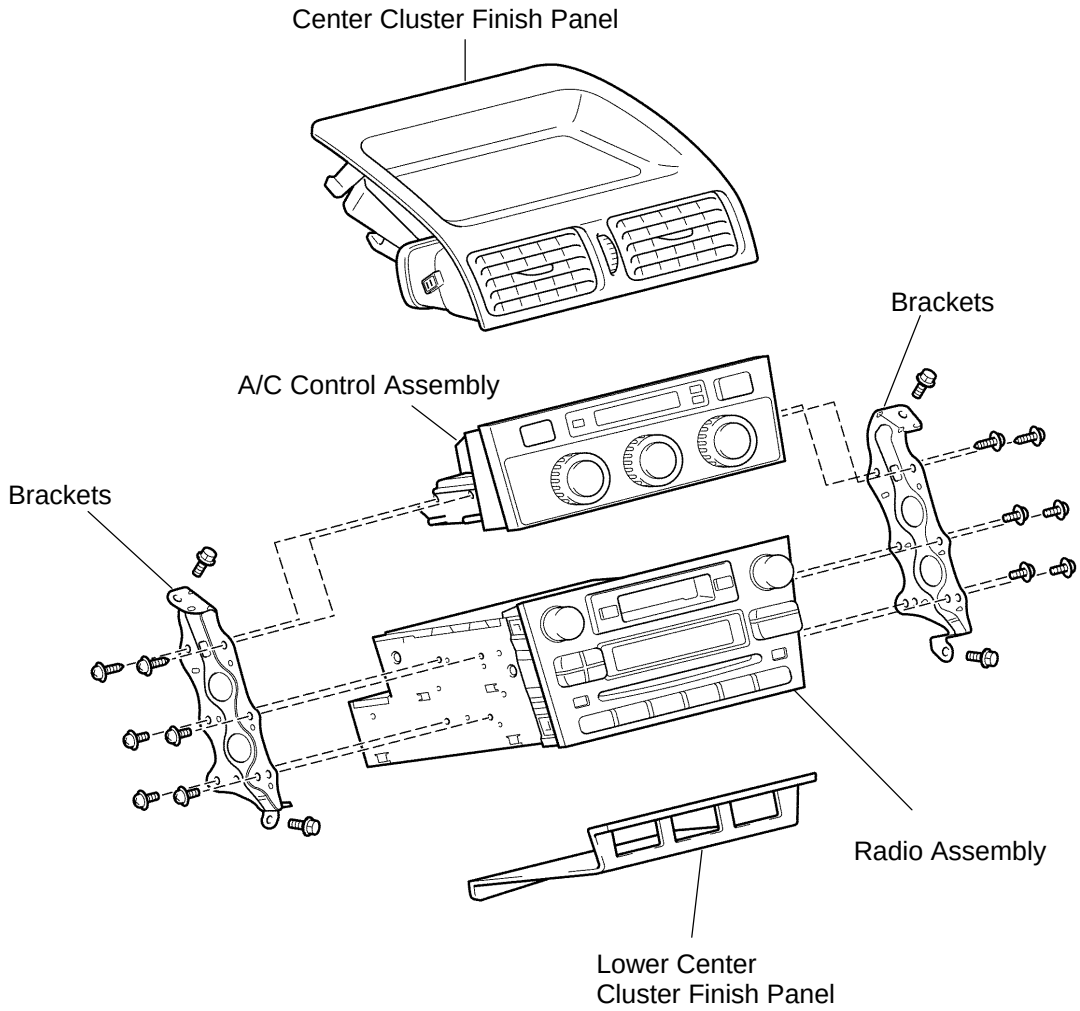
3. INSTALL A/C CONTROL ASSEMBLY
(See page AC-91)

AC262-02

COMPONENTS

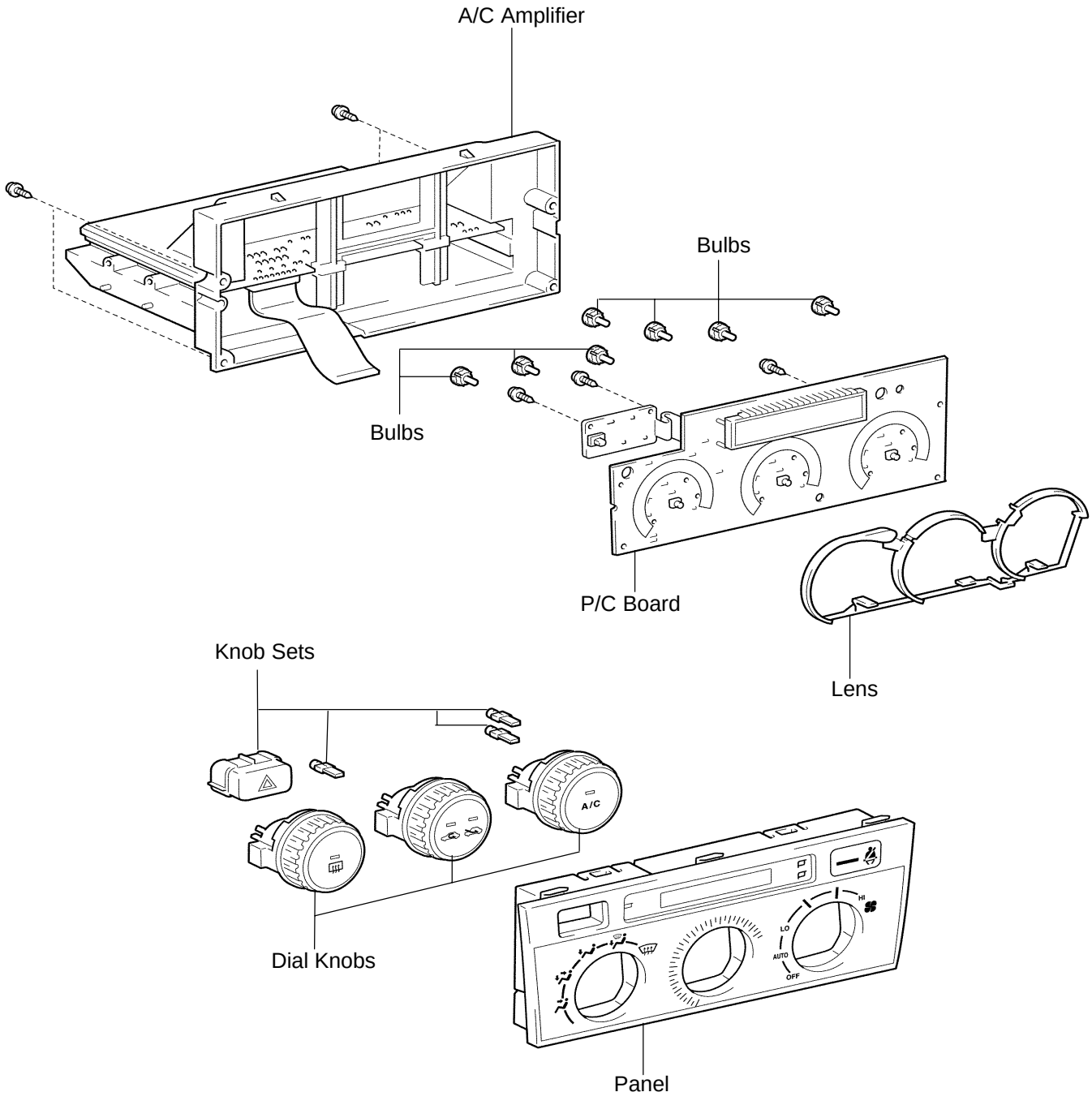
w/ LEXUS Navigation System:





P

I11755

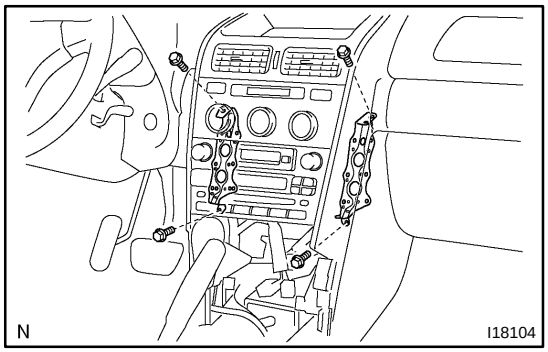

A/C Amplifier
Bulbs
Bulbs
P/C Board
Lens
Knob Sets
A/C
Dial Knobs
HI
LO
AUTO
OFF
Panel
I18269

P

AC263-02

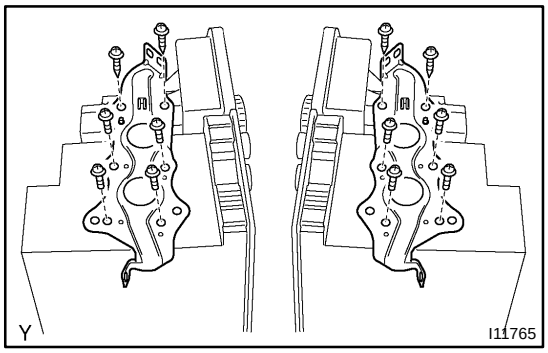
REMOVAL

1. **REMOVE CENTER CLUSTER FINISH PANEL (See page BO-139)**
2. **REMOVE LOWER CENTER CLUSTER FINISH PANEL (See page BO-139)**



3. **REMOVE A/C CONTROL ASSEMBLY**

(a) Remove the 4 bolts and pull out the A/C control assembly with radio assembly, then disconnect the connectors.



(b) Remove the 12 screws and 2 brackets.

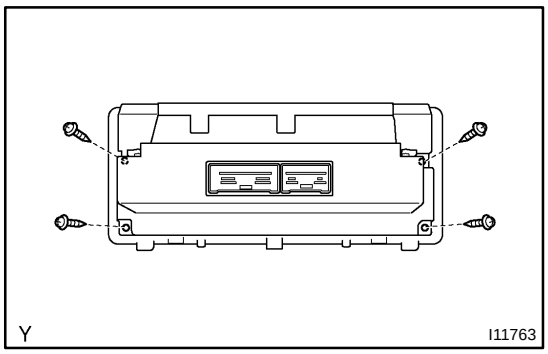
(c) Separate the A/C control assembly and radio assembly.

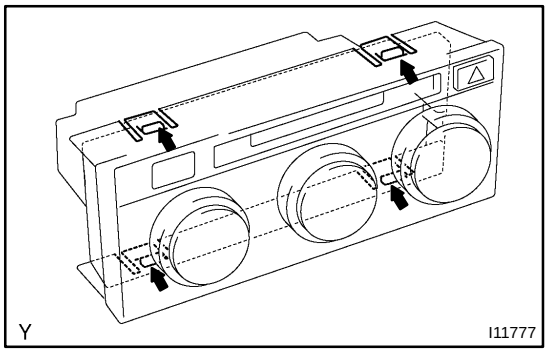
AC264-02

DISASSEMBLY

1. REMOVE A/C AMPLIFIER

(a) Remove the 4 screws.

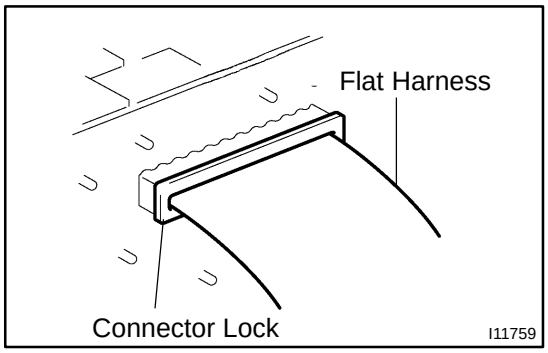




(b) Using a screwdriver, release the 4 claws and pull out the A/C amplifier.

HINT:

Tape the screwdriver tip before use.



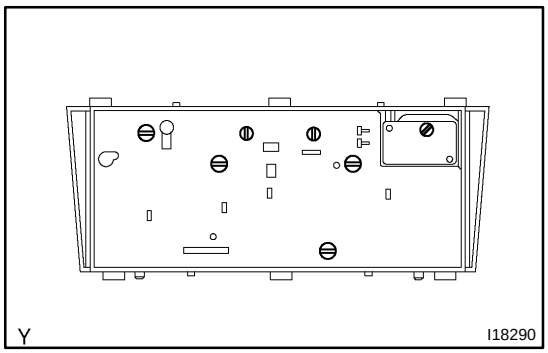
(c) Release the connector lock and pull out the flat harness.

NOTICE:

Pull the lock of the connector securely toward you and pull off the flexible flat cable.

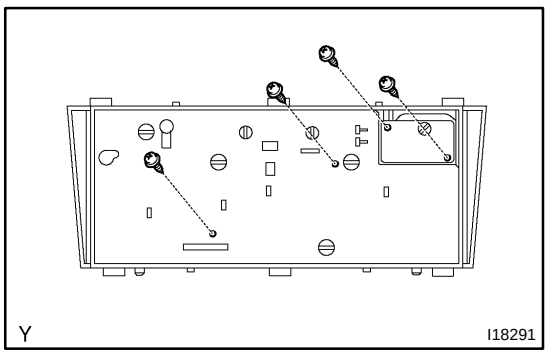
2. REMOVE BULBS

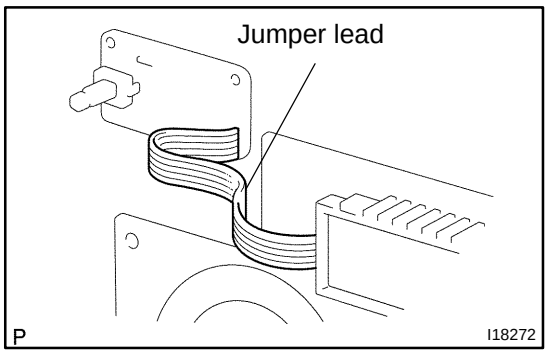
Using a screwdriver, turn the bulbs to the left and pull out the bulbs.



3. REMOVE P/C BOARD

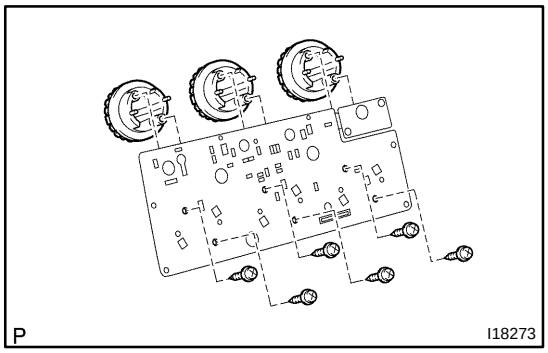
Remove the 4 screws and P/C board.





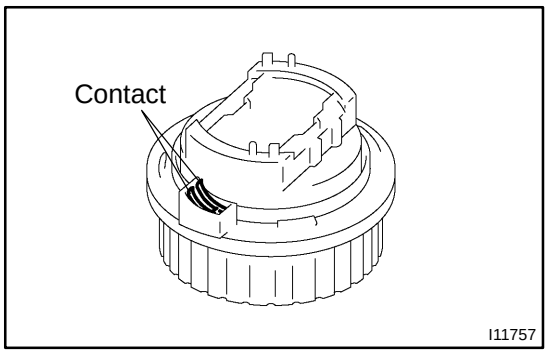
NOTICE:

- **Do not let any oil, dirt or foreign object on the connecting part of the P/C board.**
- **When holding the P/C board by hand, hold it at the edge and do not touch the soldered part and connecting part.**
- **Do not apply unnecessary force to the jumper lead.**
- **Do not let the accumulated static electricity in an operator apply to the electronic components.**
- **Do not tumble the LED as this soldered to the P/C board at right angles.**



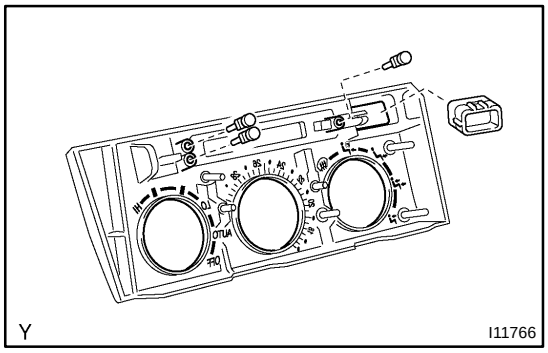
4. REMOVE DIAL KNOBS

Remove the 6 screws and dial knobs.



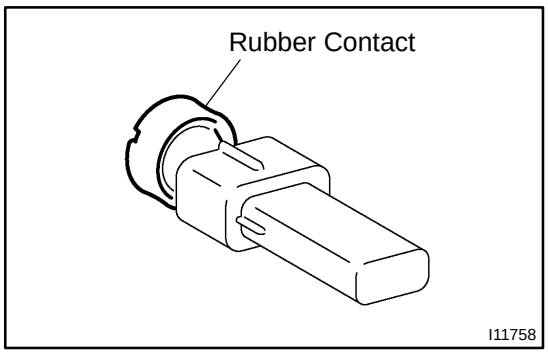
NOTICE:

- **Do not let any oil, dirt or foreign object attach on the connecting part of the connector.**
- **Do not deform the contact.**
- **Be careful not to drop the contact.**

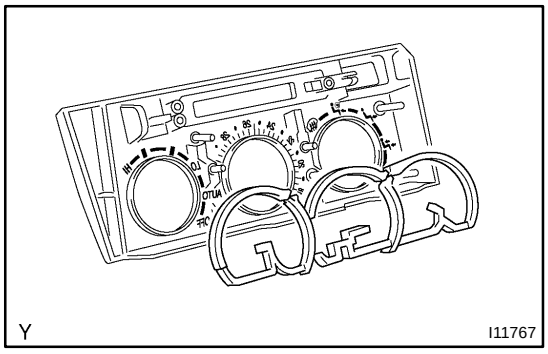


5. REMOVE KNOB SETS

Pull out the knob sets.

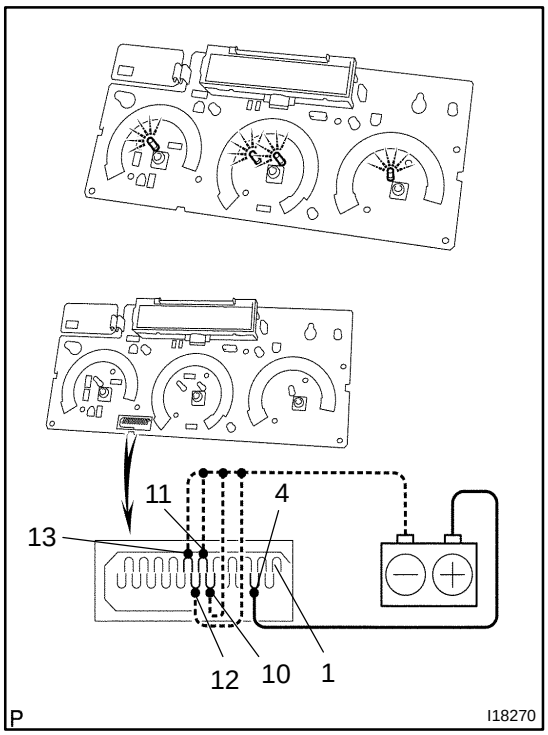


NOTICE:
Do not let any oil, dirt or foreign object attach on the rubber contact part.



6. REMOVE LENS

AC265-03



INSPECTION

1. INSPECT INDICTOR OPERATION

Connect the positive (+) lead from the battery to terminal 4 and negative (-) lead to each terminal, then check that the indicator lights up as shown in the chart.

Switch	Tester connection
DEF	13
FRESH	12
RECIRC	11
A/C	10

If operation is not as specified, replace the P/C board.

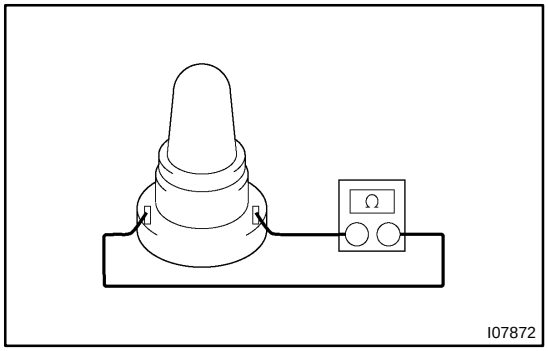
2. INSPECT INDICATOR DIMMING OPERATION

(a) Perform each indicator light up (See step 1).

(b) Connect the positive (+) lead from the battery to terminal 1 and check that the each indicator dims.

If the operation is not as specified, replace the P/C board.

If the operation is as specified, replace the A/C amplifier.

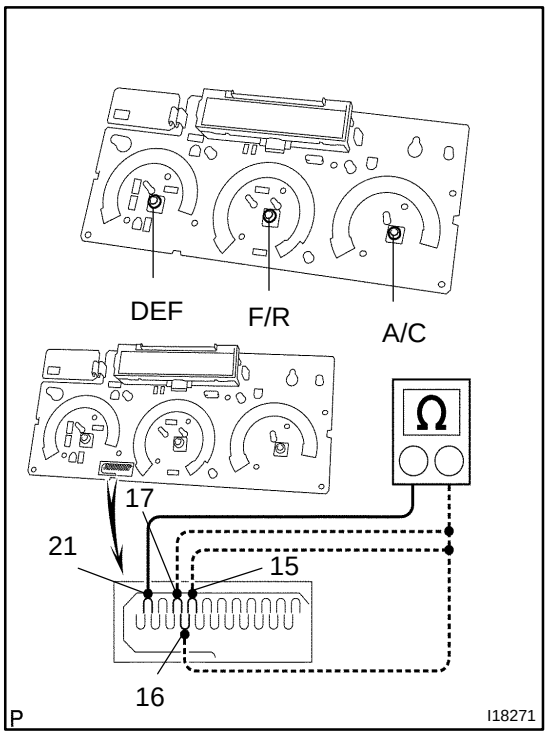


3. INSPECT BULB OPERATION

Apply the tester as shown in the illustration to the test for continuity.

If continuity exists, replace the P/C board.

If on continuity exists, replace the bulb.



4. INSPECT SWITCH OPERATION

Check the continuity exists between terminals while the switch is pressed.

Switch	Tester connection	Specified condition
A/C	15 - 21	Continuity
DEF	16 - 21	Continuity
F/R	17 - 21	Continuity

If operations is not as specified, replace the P/C board.
If operations is as specified, check the wire harness or replace the A/C amplifier.

AC266-02

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page AC-85).

AC267-02

INSTALLATION

Installation is in the reverse order of removal (See page AC-84).

ENGINE COOLANT TEMPERATURE (ECT) SWITCH

AC385-01

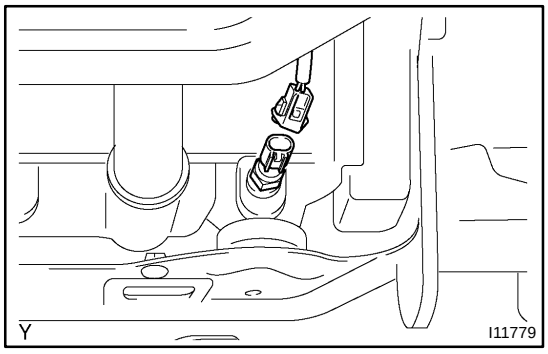
INSPECTION

1. REMOVE ENGINE UNDER COVER

2. DRAIN ENGINE COOLANT FROM RADIATOR

HINT:

It is not necessary to drain out all coolant

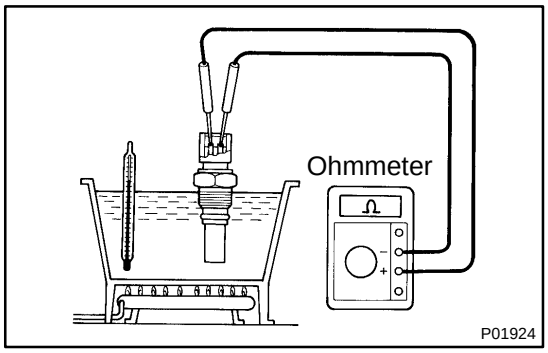


3. REMOVE ENGINE COOLANT TEMPERATURE SWITCH

(a) Disconnect the connector.

(b) Remove the engine coolant temperature switch.

(c) Remove the O-ring from the switch.



4. INSPECT ENGINE COOLANT TEMPERATURE SWITCH

(a) Using an ohmmeter, check that no continuity exists between the terminals when the coolant temperature is above 100 ˚C (212 ˚F).

If continuity exists, replace the switch.

(b) Using an ohmmeter, check that continuity exists between the terminals when the coolant temperature is below 91 ˚C (196 ˚F).

If there no continuity exists, replace the switch.

5. INSTALL ENGINE COOLANT TEMPERATURE SWITCH

(a) Install the new O-ring to the switch.

(b) Install the engine coolant temperature switch.

Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

6. FILL WITH ENGINE COOLANT TO RADIATOR

7. INSTALL ENGINE UNDER COVER

AC0Y1-01

INSTALLATION

Installation is in the reverse order of removal (See page AC-93).