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

PROBLEM SYMPTOMS TABLE

BR0MI-08

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

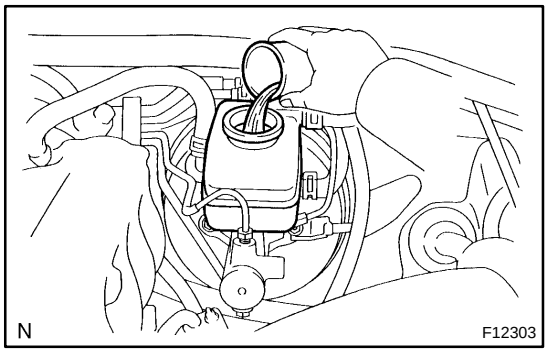
BLEEDING

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.

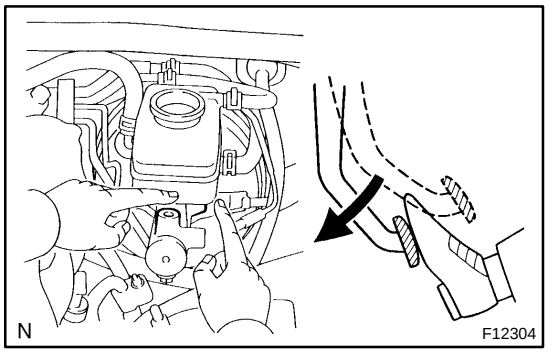
NOTICE:

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



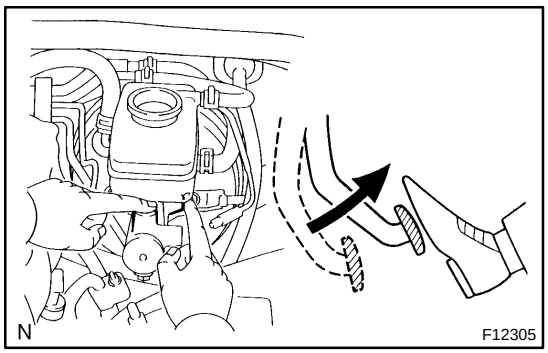
2. BLEED MASTER CYLINDER

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

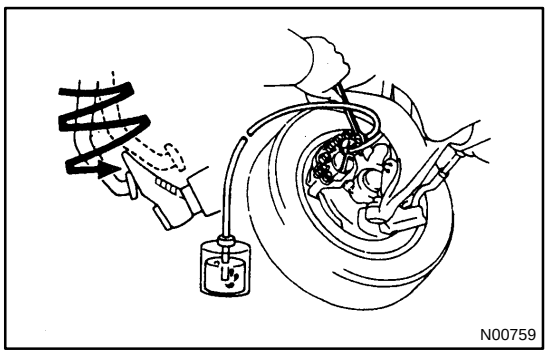
(b) Slowly depress the brake pedal and hold it.



(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

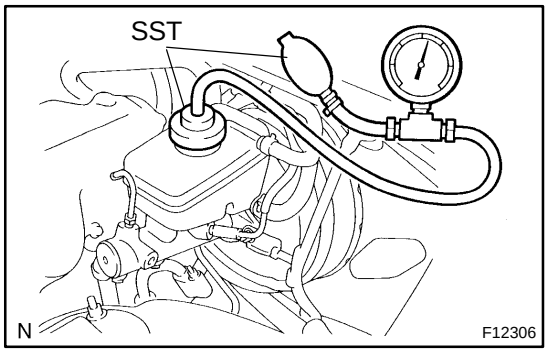
(a) Connect the vinyl tube to the caliper.

(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)

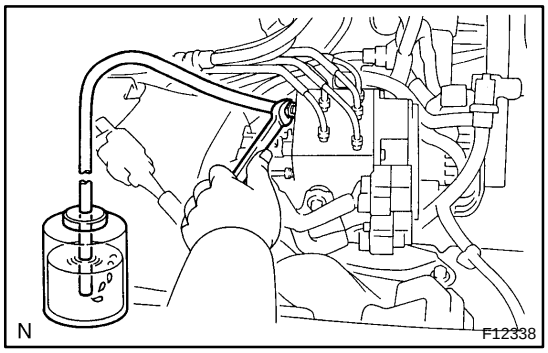


4. BLEED ABS & TRAC / VSC ACTUATOR

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



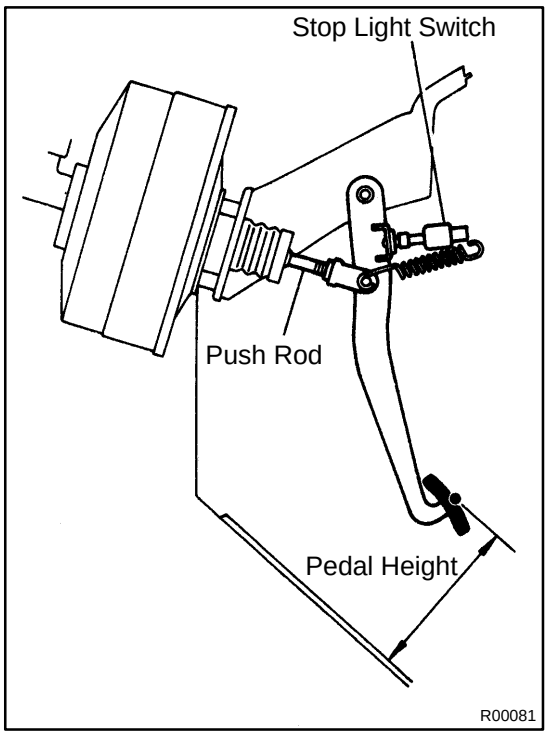
(b) Connect the vinyl tube to the ABS & TRAC / VSC actuator, and loosen the bleeder plug.

(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

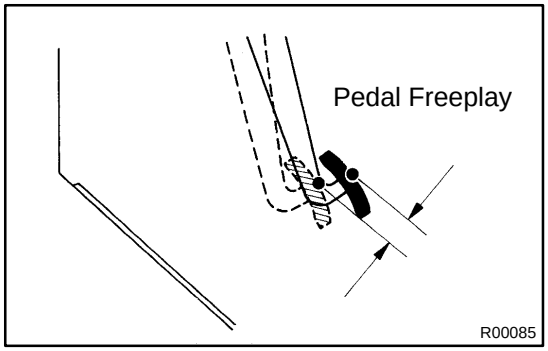
ON-VEHICLE INSPECTION

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).

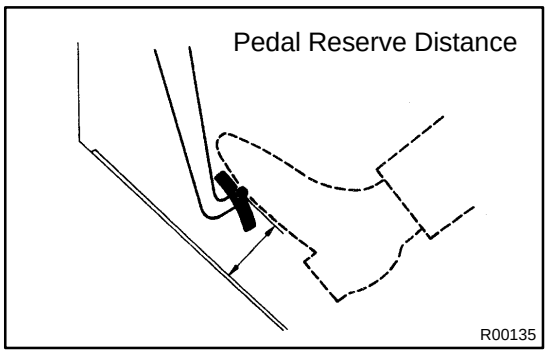


3. CHECK PEDAL FREE PLAY

(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.

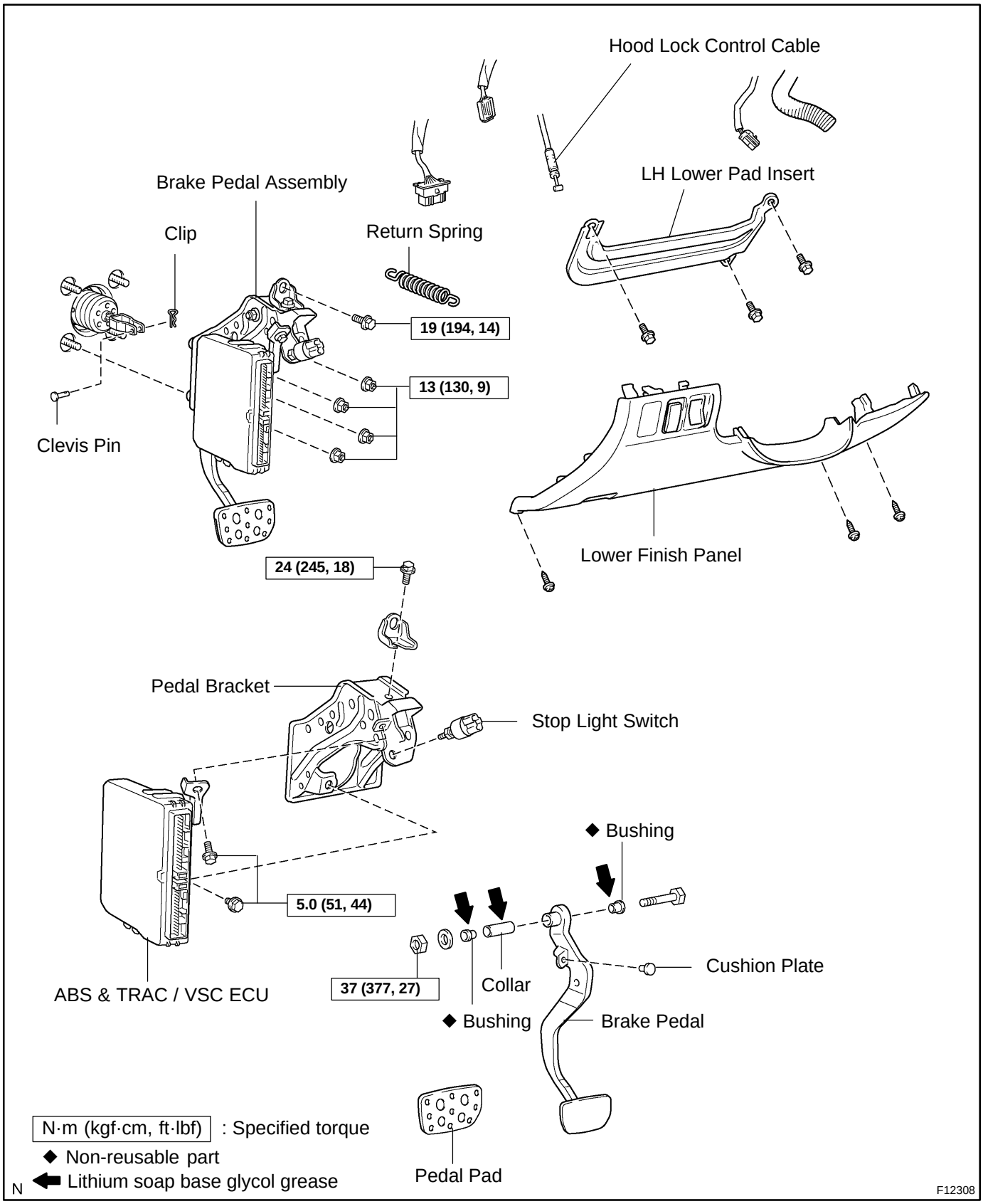
With the engine running, depress the pedal and measure the pedal reserve distance, as shown.

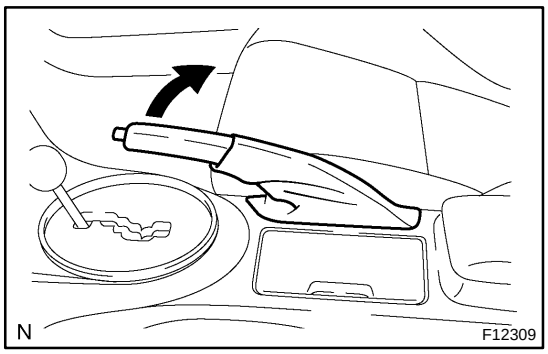
Pedal reserve distance from asphalt sheet at 490 N (50 Kgf, 110.2 lbf): More than 99 mm (3.90 in.)

If the reserve distance is incorrect, troubleshoot the brake system.

BR0YI-06

COMPONENTS





PARKING BRAKE LEVER

BR0ZV-02

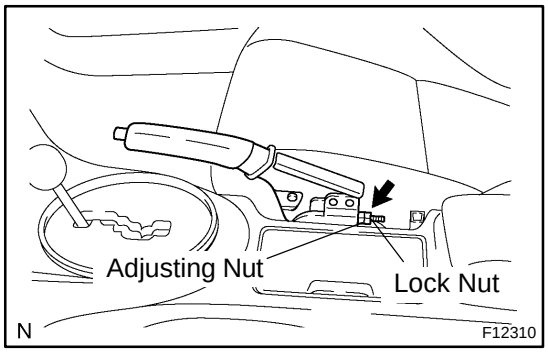
ON-VEHICLE INSPECTION

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.

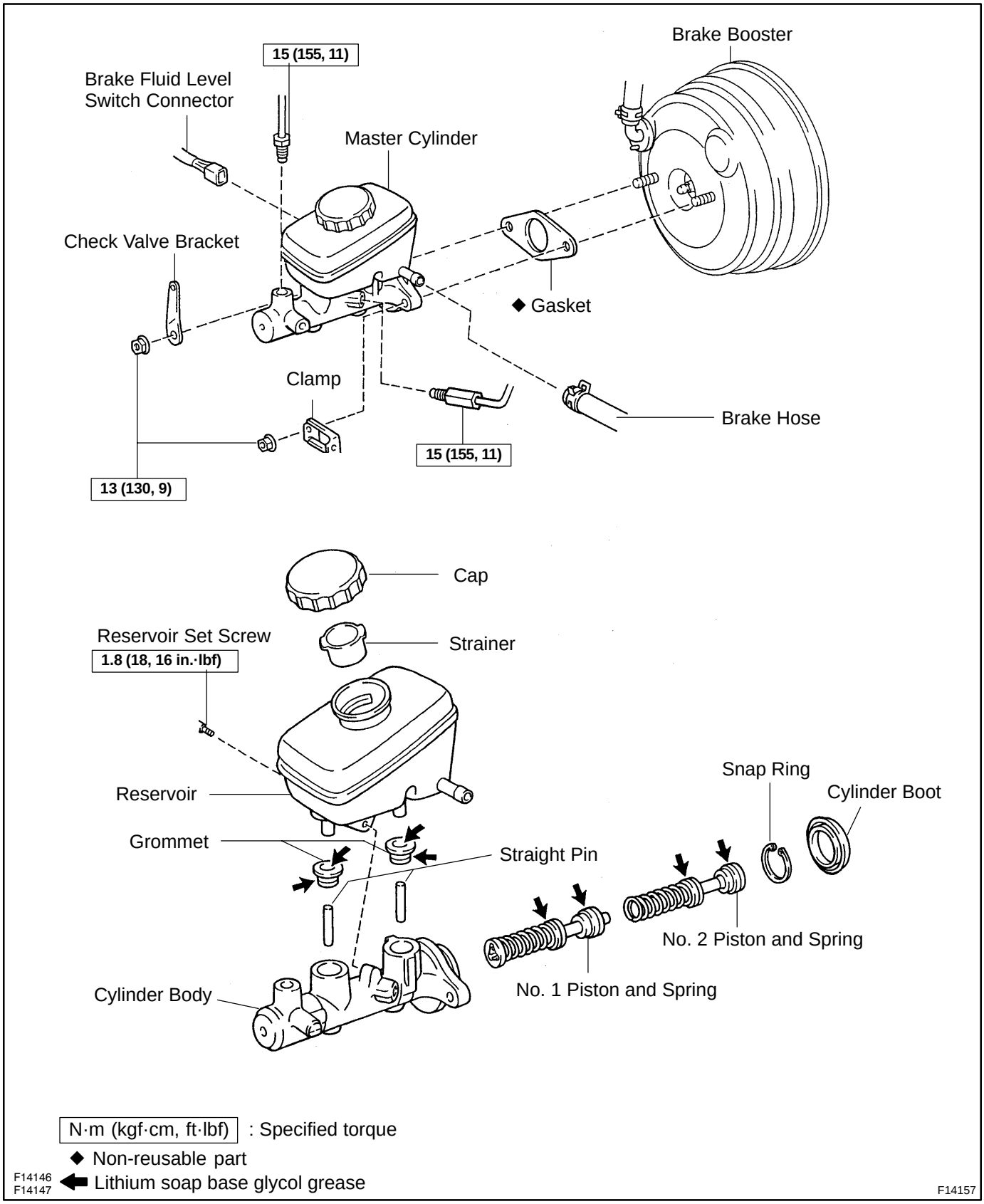
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

(d) Install the parking brake lever hole cover.

BRAKE MASTER CYLINDER

COMPONENTS

BR1JU-02



BR0AF-12

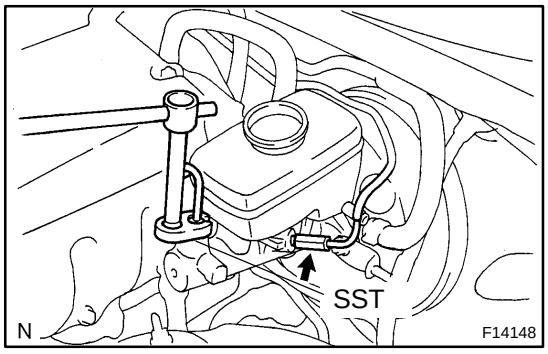
REMOVAL

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

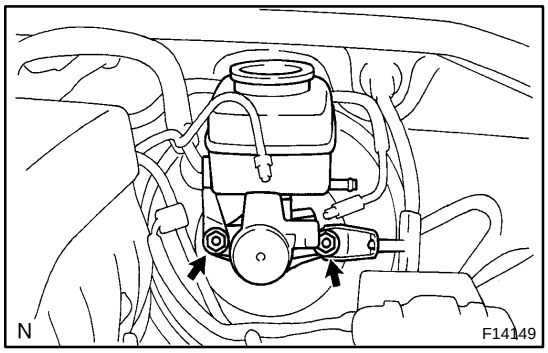


3. DISCONNECT BRAKE LINES

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

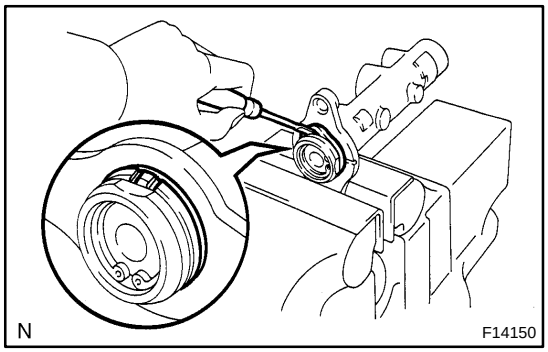
1. REMOVE RESERVOIR

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



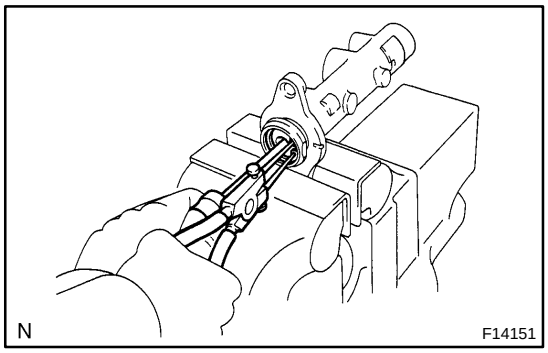
4. REMOVE MASTER CYLINDER BOOT

Using a screwdriver, remove the master cylinder boot.

HINT:

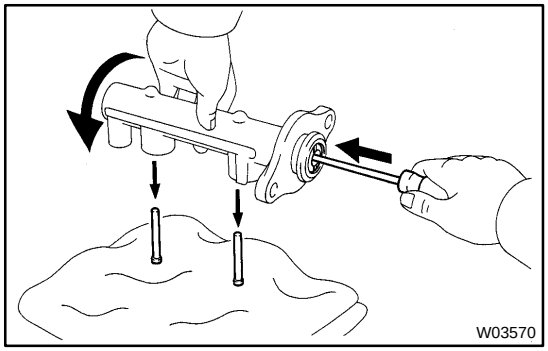
At the time of reassembly, please refer to the following item.

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.

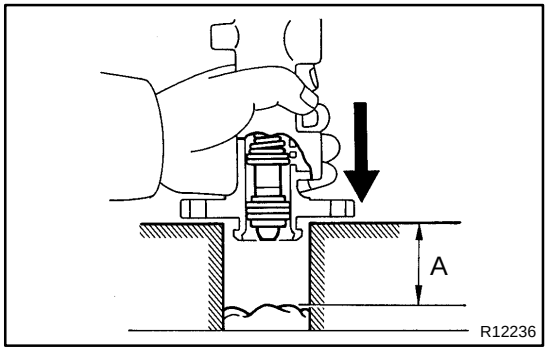


(b) Push in the piston with a screwdriver, and remove the 2 straight pins by turning over the cylinder body.

HINT:

Tape the screwdriver tip before use.

(c) Remove the 2 pistons and springs by hand, pulling straight out, not at angle.



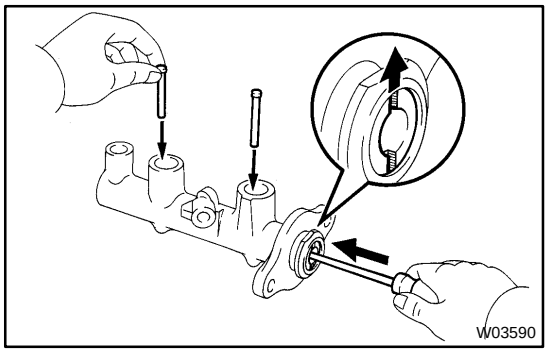
(d) Place a rag and 2 wooden blocks on the work table and lightly tap the cylinder flange against the block edges until the piston drops out of the cylinder.

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).

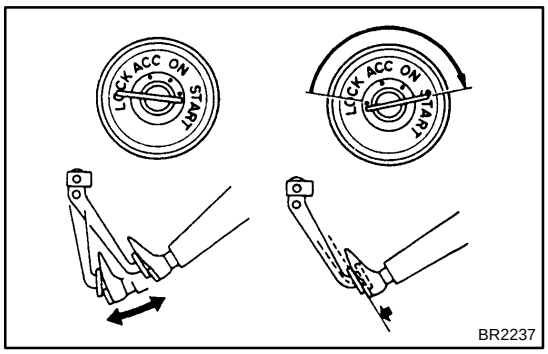
BR0MR-03

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

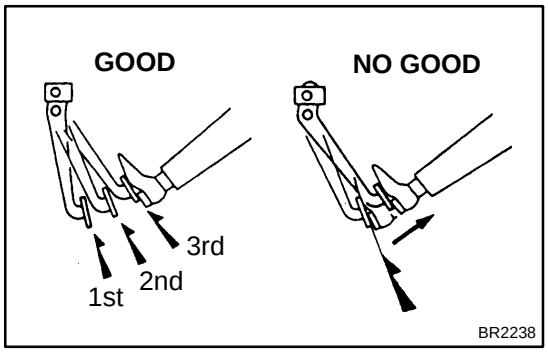
BR0NR-06

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.

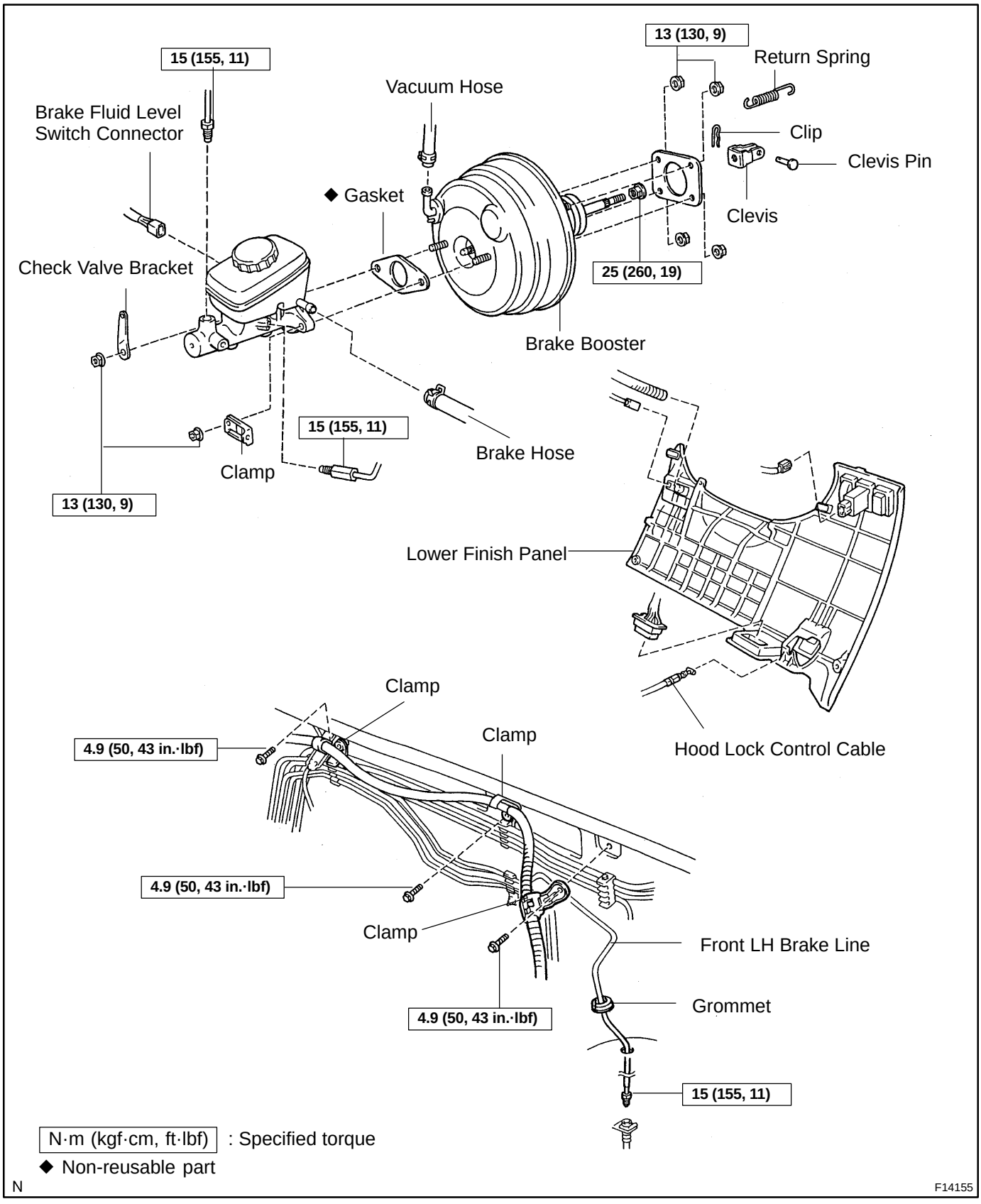
If the pedal goes down the farthest the 1st time, but gradually rises after the 2nd or 3rd time, the booster is air-tight.

(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



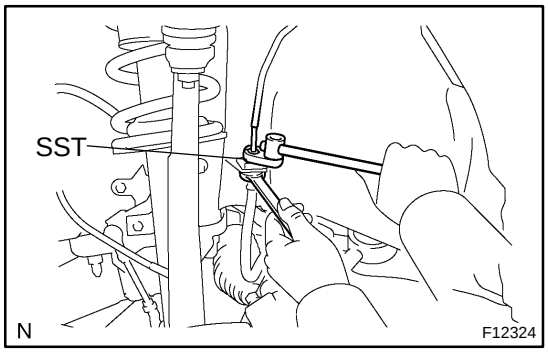
BR1JR-01

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)

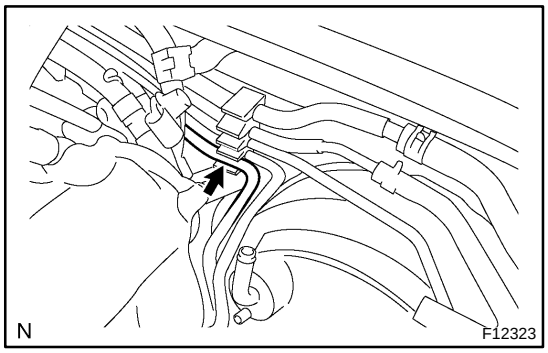
3. DISCONNECT VACUUM HOSE FROM BRAKE BOOSTER



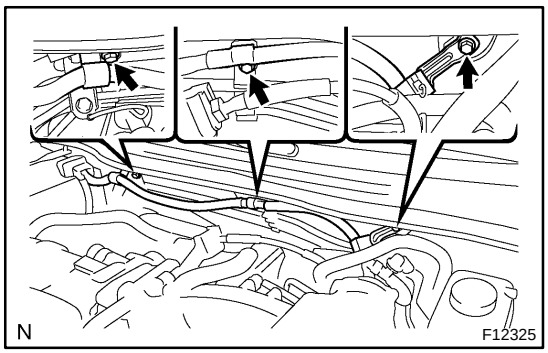
4. DISCONNECT FRONT LH BRAKE LINE

(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.

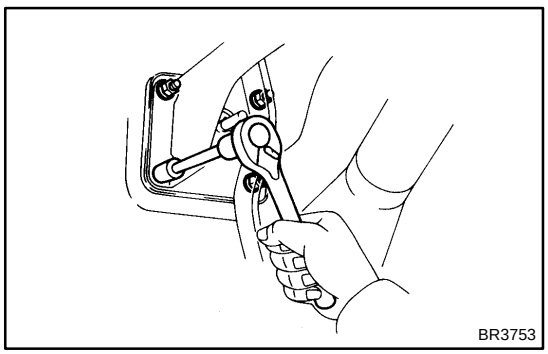


5. REMOVE BRAKE BOOSTER

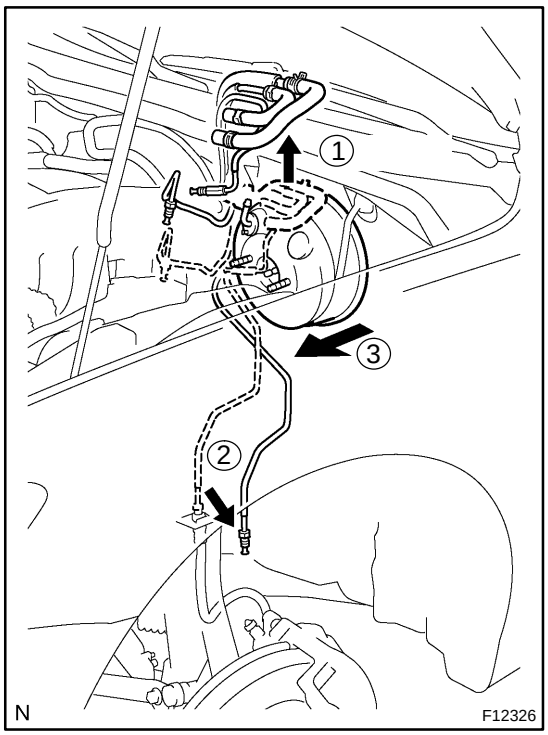
(a) Remove the 3 bolts and disconnect the 3 clamps.

(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.

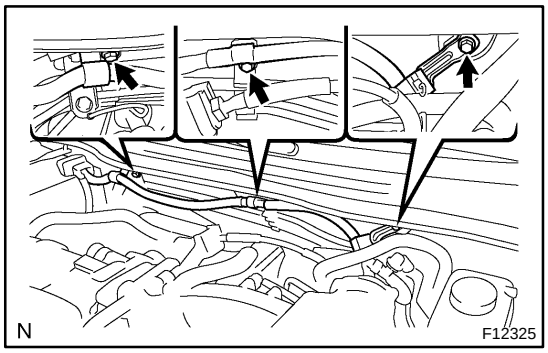
(f) Pull out the booster and gasket.

BR1JS-02

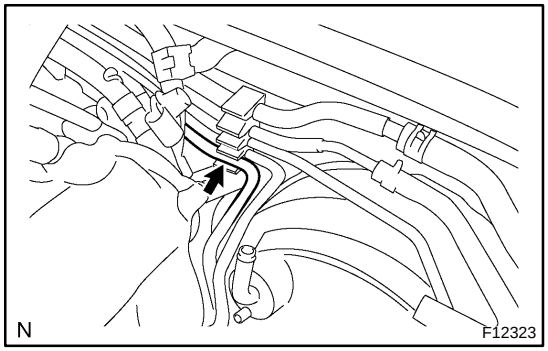
INSTALLATION

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.

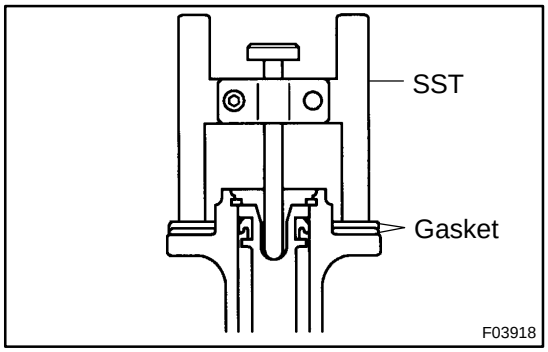


(h) Install the 3 clamps with 3 bolts.
Torque: 4.9 N·m (50 kgf·cm, 43 in.·lbf)



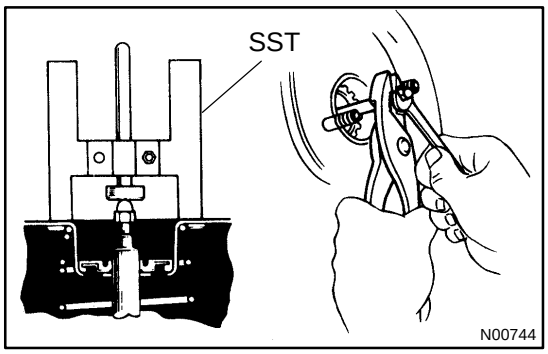
2. CONNECT FRONT LH BRAKE LINE

(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:

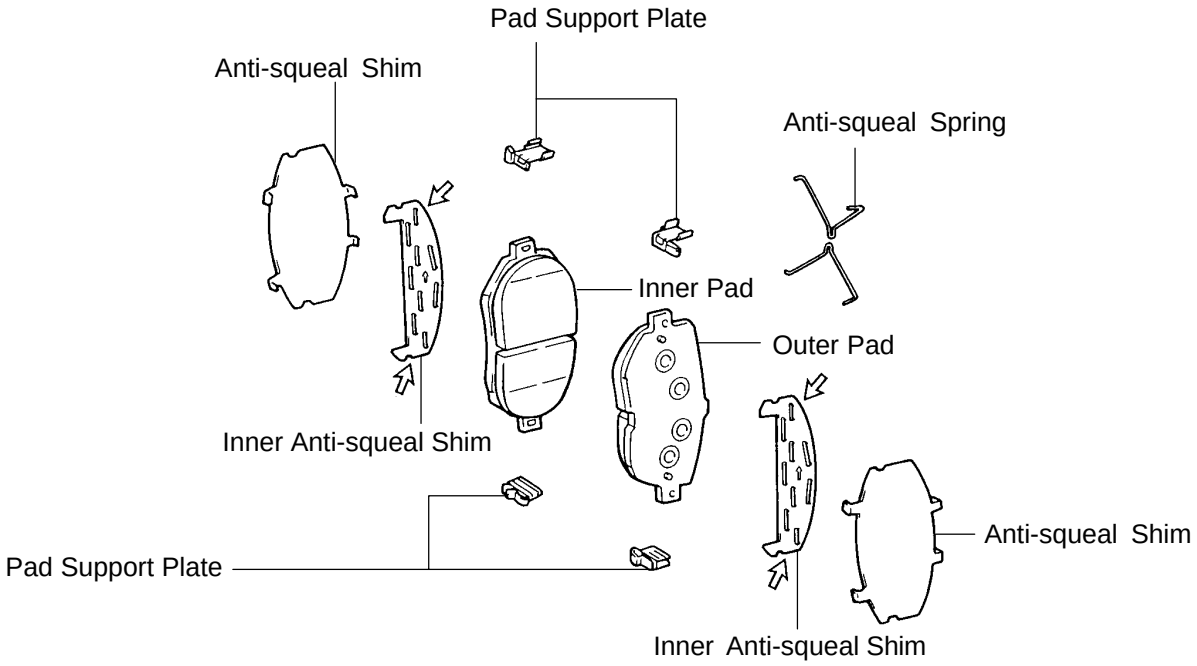
When adjusting the push rod, depress the brake pedal enough so that the push rod sticks out.

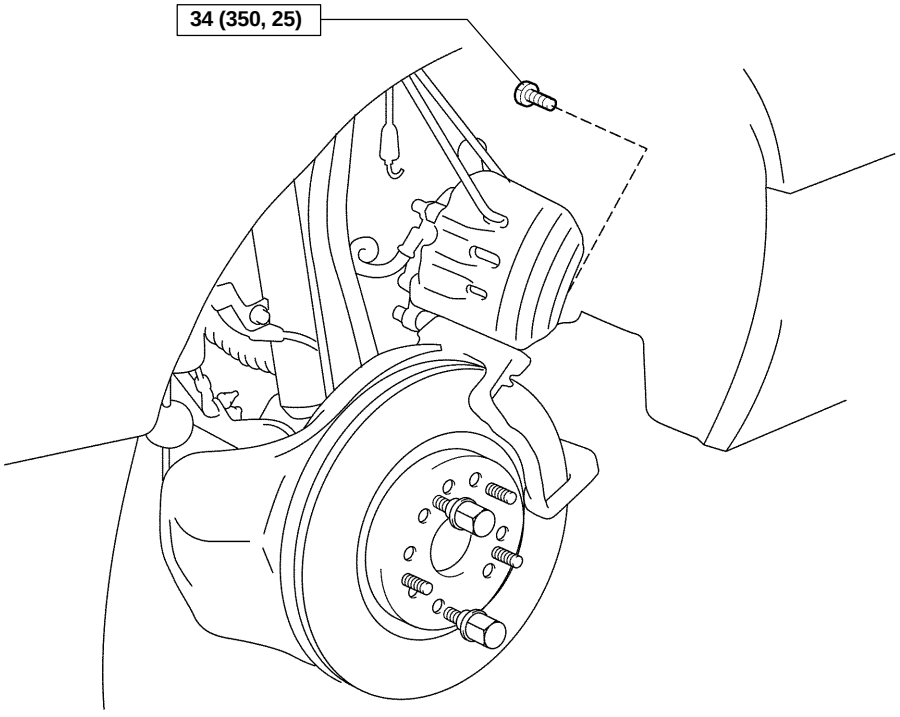
4. **INSTALL BRAKE MASTER CYLINDER (See page BR-16)**
5. **FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED BRAKE SYSTEM (See page BR-4)**
6. **CHECK FOR FLUID LEAKAGE**
7. **CHECK AND ADJUST BRAKE PEDAL (See page BR-6)**
8. **INSTALL LOWER FINISH PANEL (See page BO-135)**
9. **DO OPERATIONAL CHECK (See page BR-17)**

FRONT BRAKE PAD

COMPONENTS

BR0JH-08





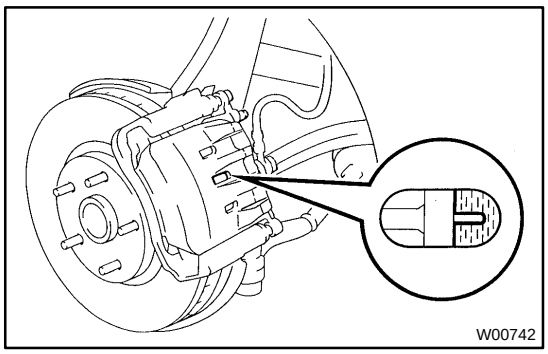
N·m (kgf·cm, ft·lbf) : Specified torque

⇨ Disc brake grease

F07909

BR1JT-01

REPLACEMENT

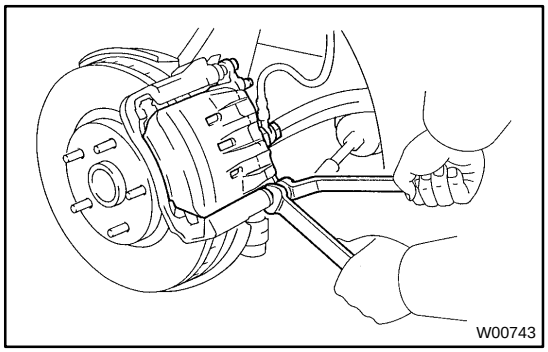


1. REMOVE FRONT WHEEL

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)

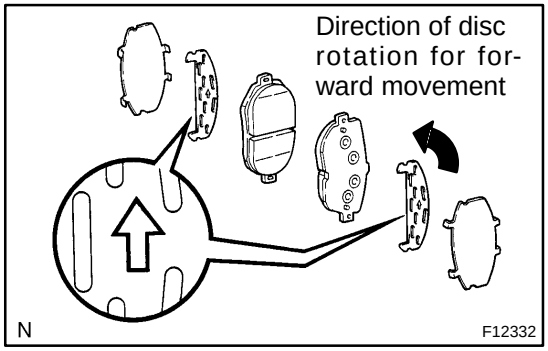
8. INSTALL 4 PAD SUPPORT PLATES

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:

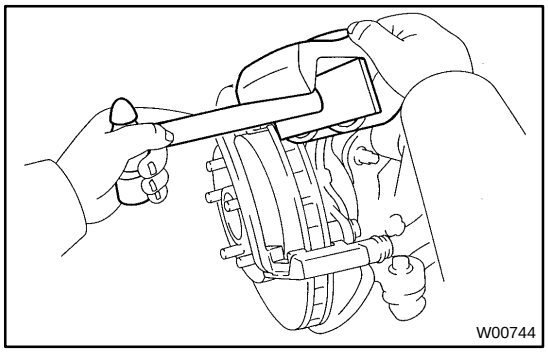
Make sure the arrows on the inner anti-squeal shims facing to the direction of disc rotation as shown in the illustration.

(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)

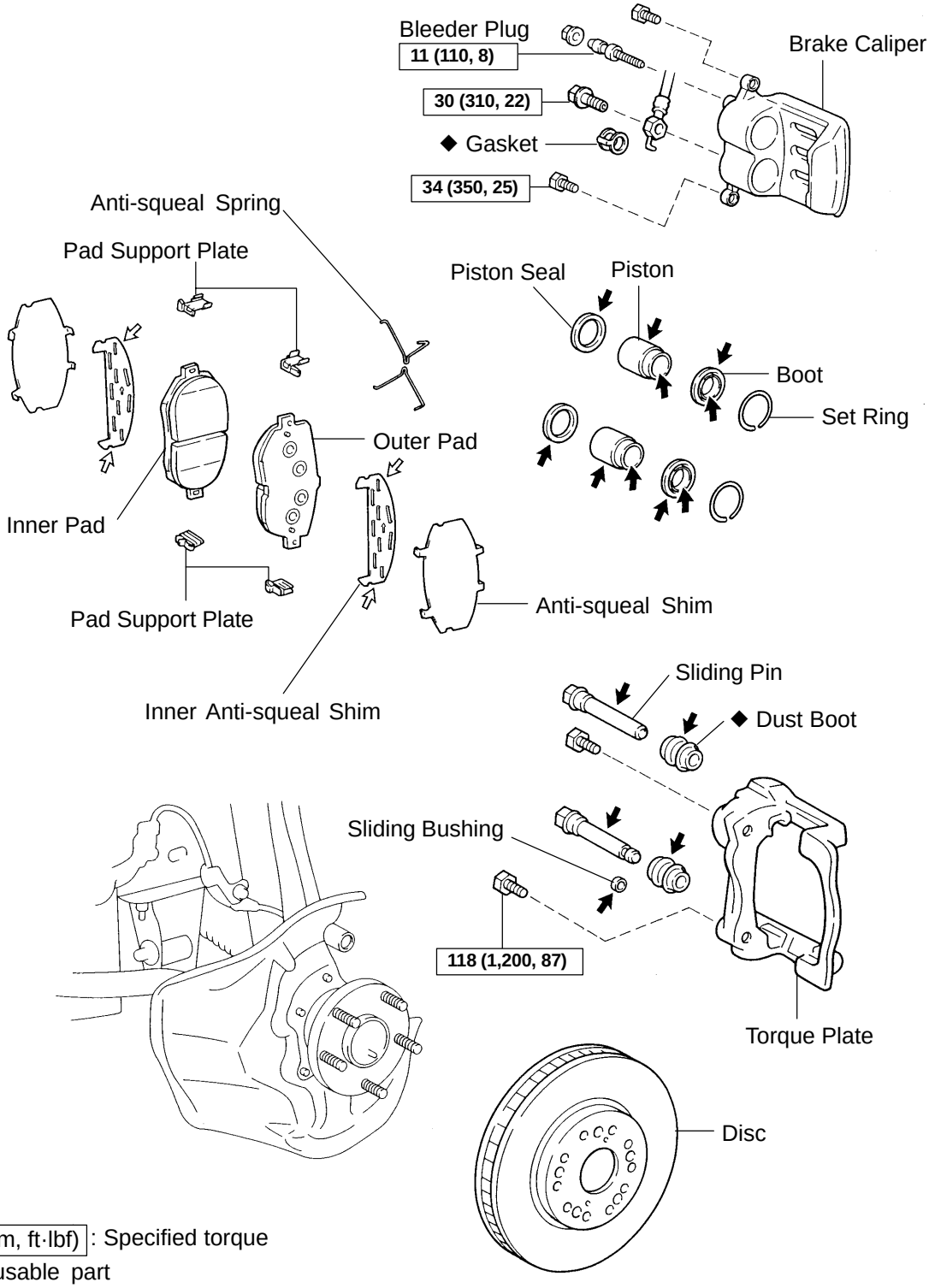
12. DEPRESS BRAKE PEDAL SEVERAL TIMES

13. CHECK THAT FLUID LEVEL IS AT MAX LINE

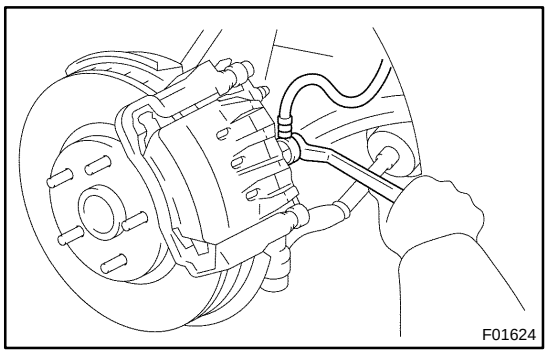
FRONT BRAKE CALIPER

BR0JJ-12

COMPONENTS



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.

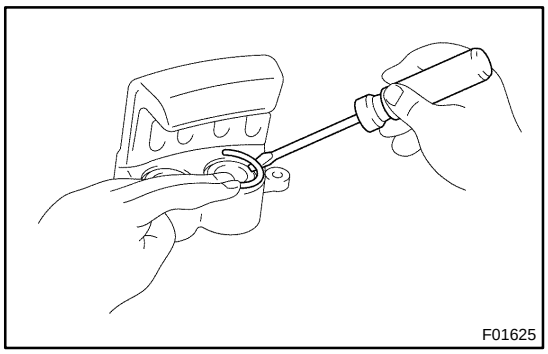
3. REMOVE 2 ANTI-SQUEAL SPRINGS

4. REMOVE 2 BRAKE PADS WITH 4 ANTI- SQUEAL SHIMS

5. REMOVE 4 PAD SUPPORT PLATES

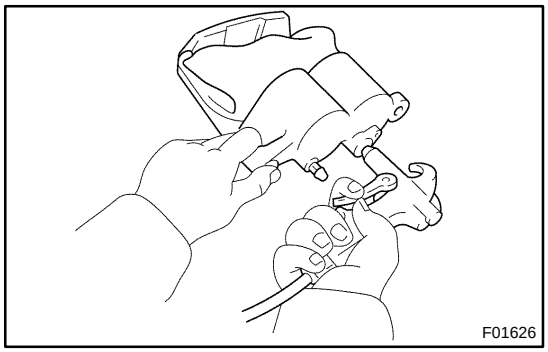
BR0JL-10

DISASSEMBLY



1. REMOVE SET RINGS AND CYLINDER BOOTS

Using a screwdriver, remove the 2 set rings and 2 cylinder boots.



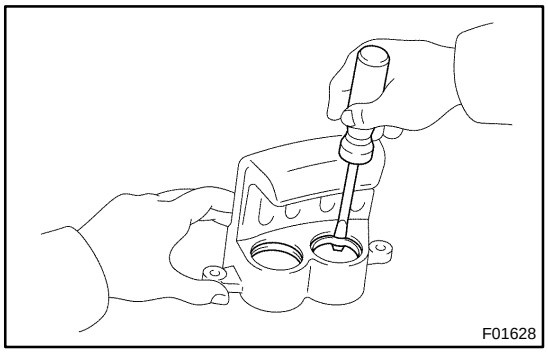
2. REMOVE PISTONS

(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.

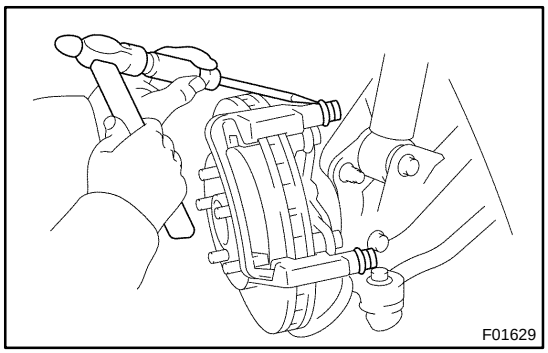
4. REMOVE SLIDING PINS AND DUST BOOTS

(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.

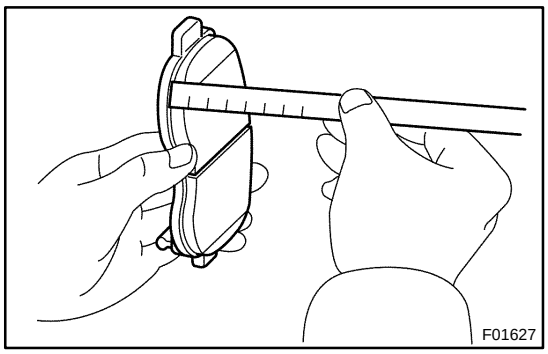
Confirm that the metal plate portion of the dust boot fits snugly in the torque plate.

HINT:

At the time of reassembly, use a 21 mm socket and tap in new dust boots into the torque plate.

BR0JM-11

INSPECTION



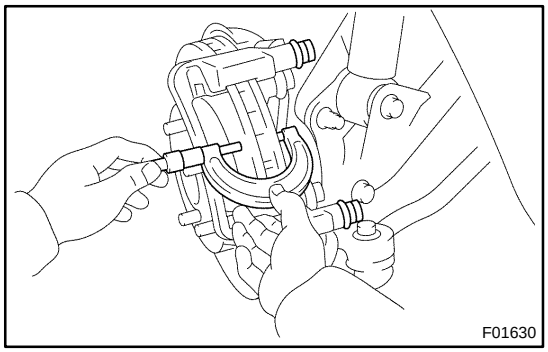
1. MEASURE PAD LINING THICKNESS

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.



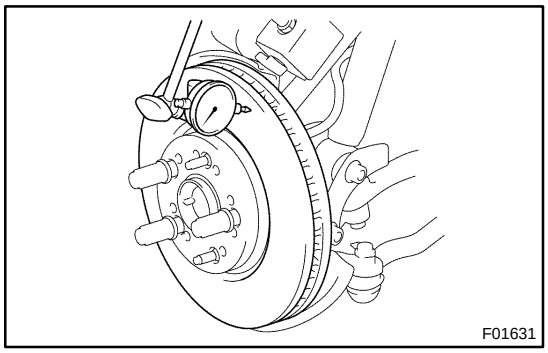
2. MEASURE DISC THICKNESS

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).

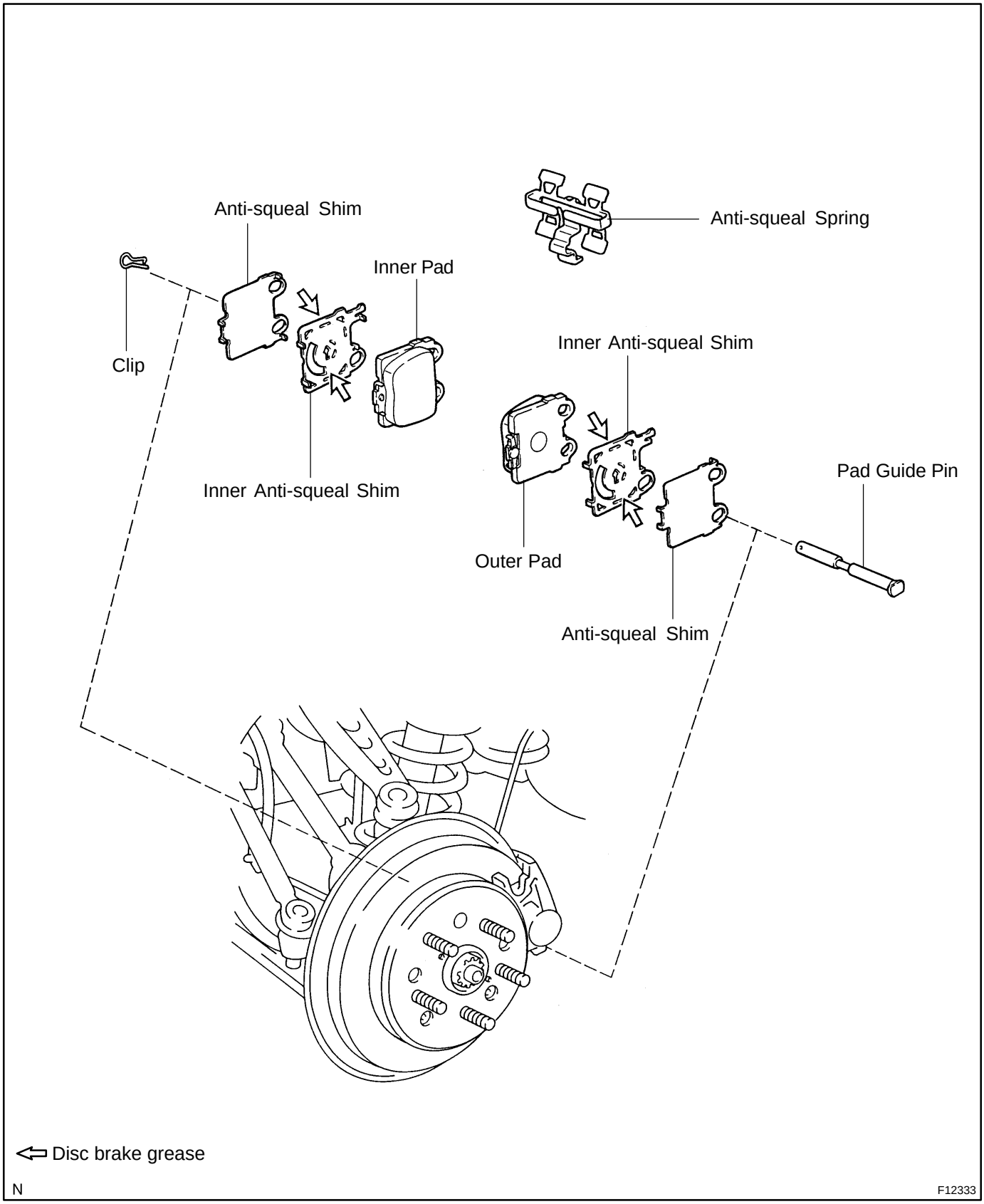
HINT:

- After installation, fill the brake reservoir with brake fluid and bleed brake system (See page BR-4).
- Check for leaks.

REAR BRAKE PAD

COMPONENTS

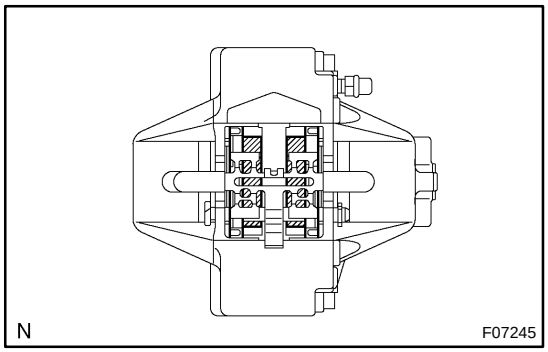
BR0JP-12



BR0ZX-03

REPLACEMENT

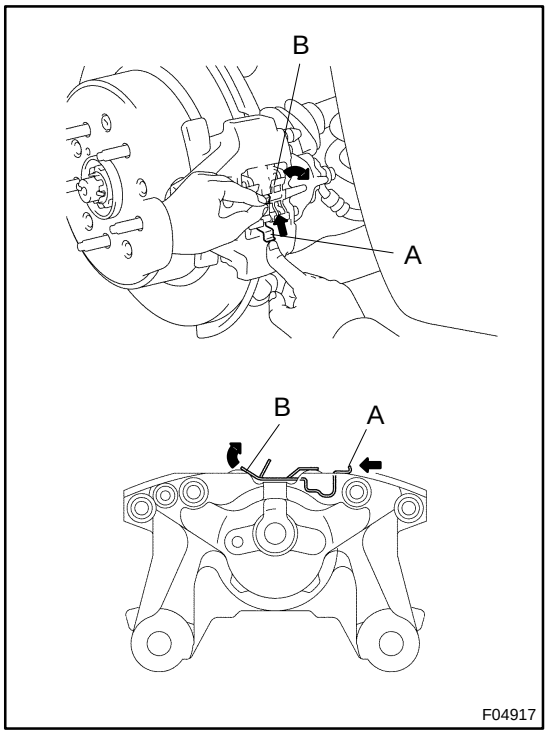
1. REMOVE REAR WHEEL



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

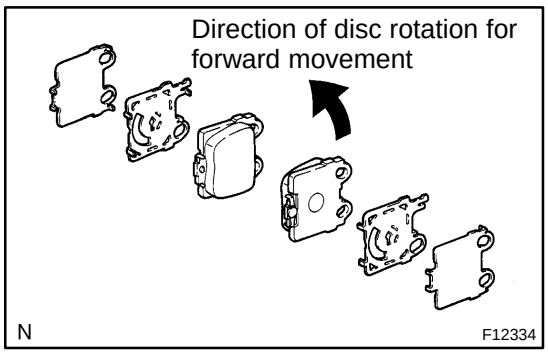
(See page BR-38)

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).

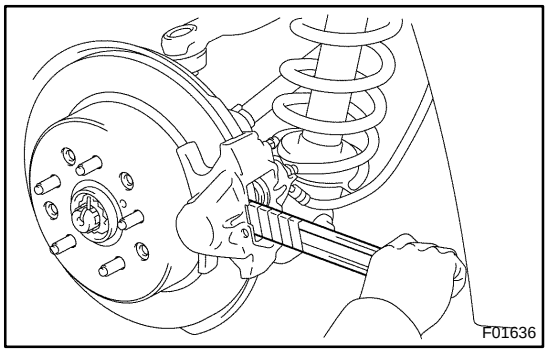


(b) Install the 2 anti-squeal shims on each pad.

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.

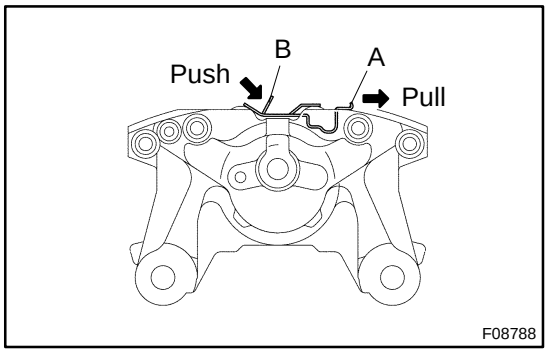


(d) Press in the pistons with a monkey wrench handle or equivalent.

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.

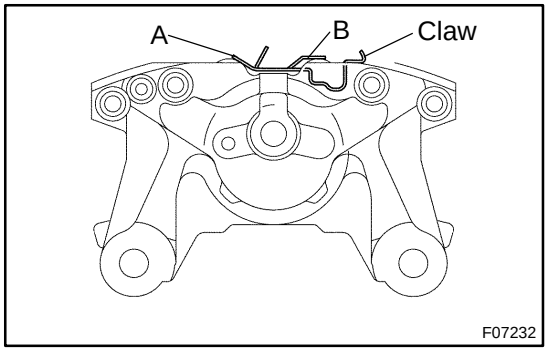


7. INSTALL PAD GUIDE PIN AND ANTI- SQUEAL SPRING

(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)

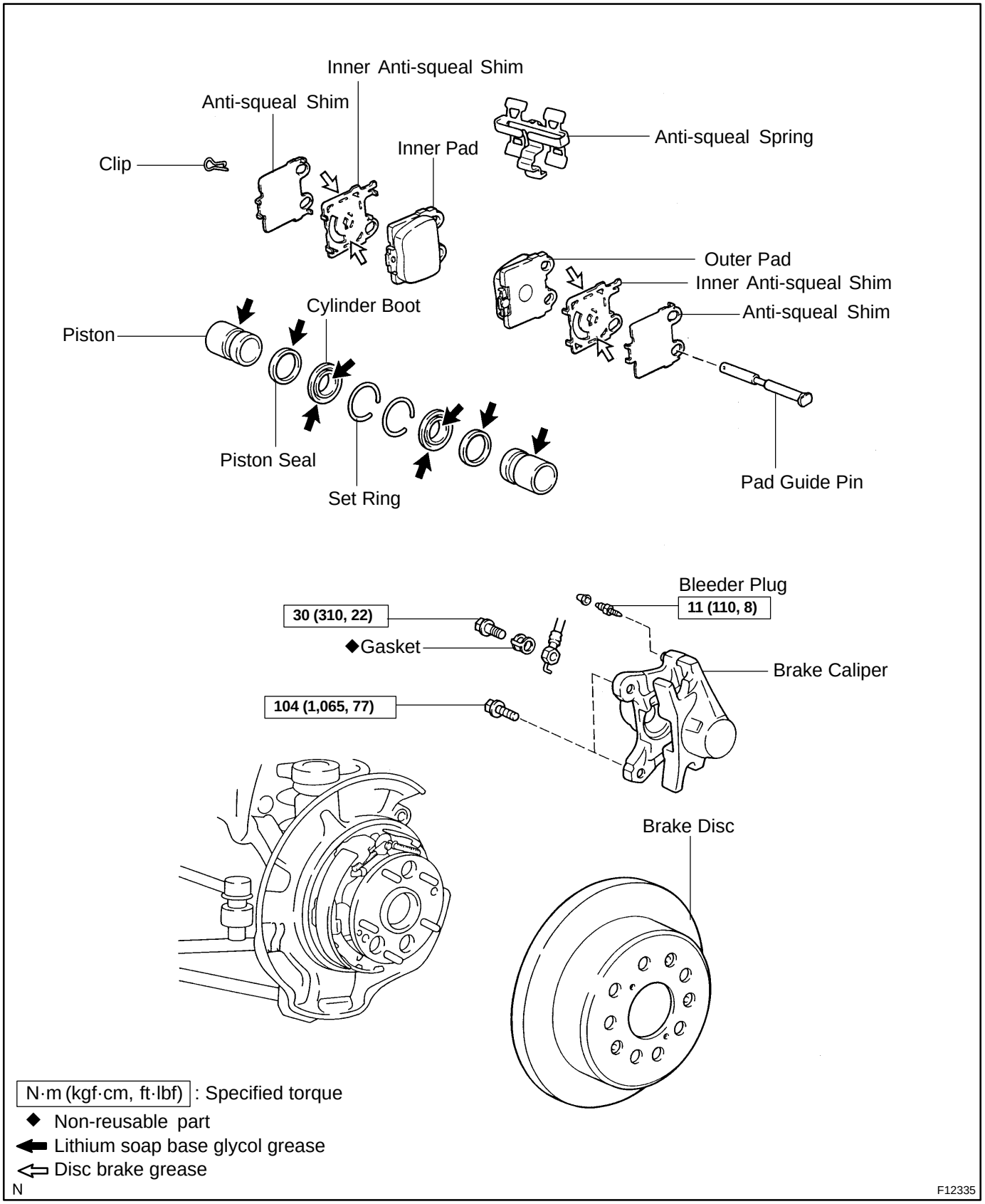
9. DEPRESS BRAKE PEDAL SEVERAL TIMES

10. CHECK THAT FLUID LEVEL IS AT MAX LINE

REAR BRAKE CALIPER

COMPONENTS

BR0JR-13



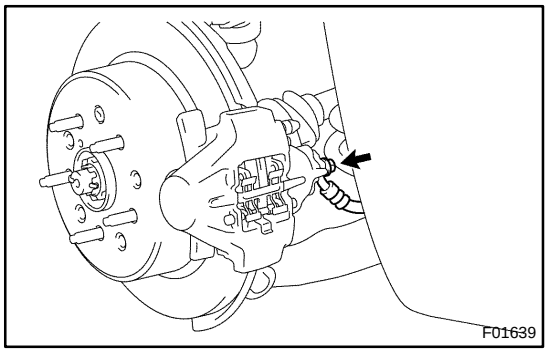
BR0JS-11

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)

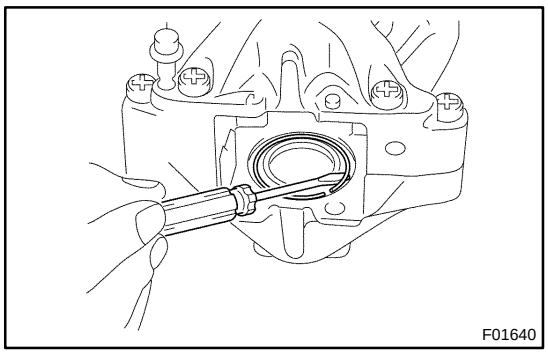
(a) Remove the anti-squeal spring.

(b) Remove the clip and pad guide pin.

(c) Remove the 2 pads with the 4 anti-squeal shims.

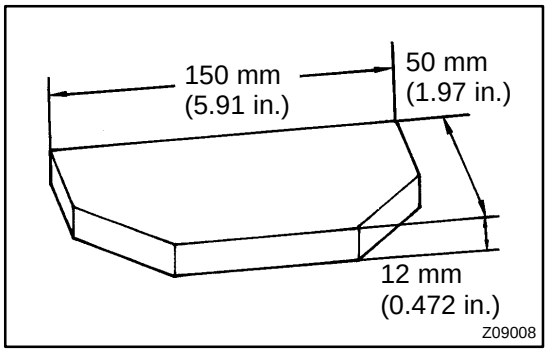
BR0JT-07

DISASSEMBLY



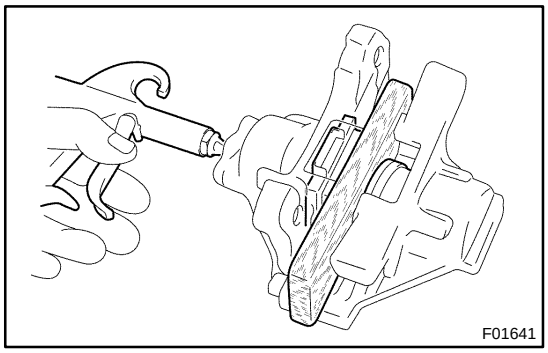
1. REMOVE SET RINGS AND BOOTS

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.

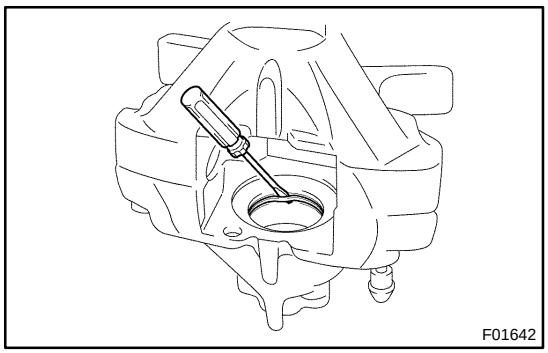


(b) Place the plate between the pistons and insert a pad on one side.

(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.

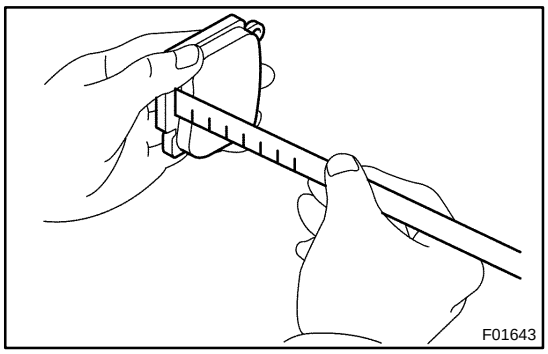


3. REMOVE PISTON SEALS

Using a screwdriver, remove the 2 piston seals from the caliper.

BR0JU-11

INSPECTION



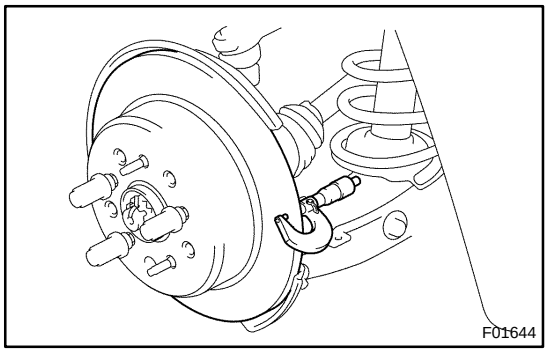
1. MEASURE PAD LINING THICKNESS

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.



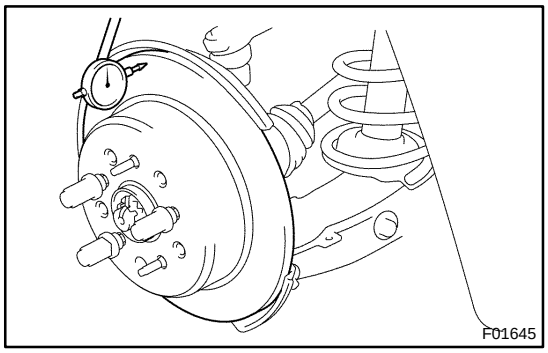
2. MEASURE DISC THICKNESS

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).

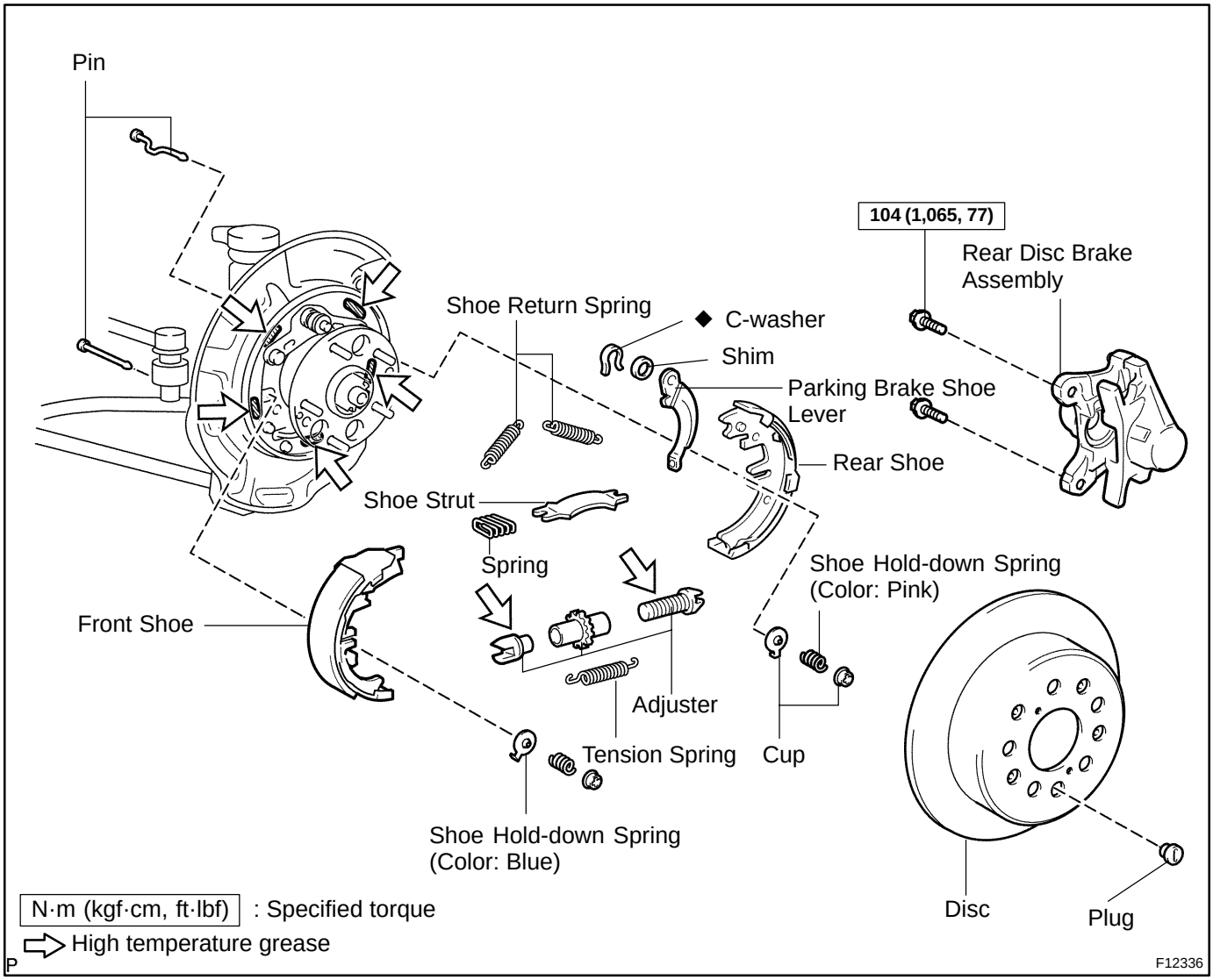
HINT:

- After installation, fill the brake reservoir with brake fluid and bleed brake system (See page BR-4).
- Check for leaks.

PARKING BRAKE

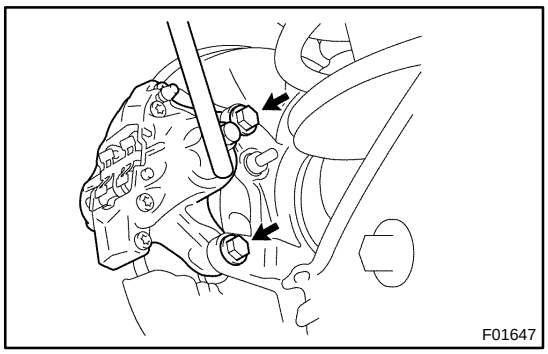
COMPONENTS

BR0JX-10



BR0JY-08

DISASSEMBLY


F01647

1. REMOVE REAR WHEEL

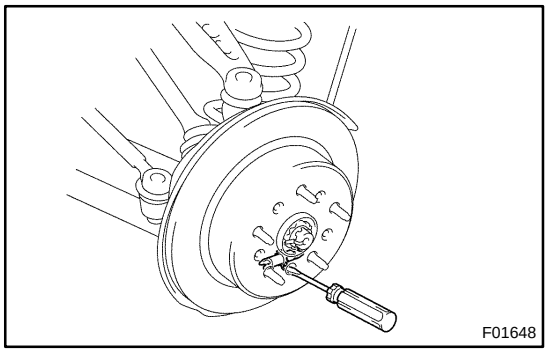
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

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

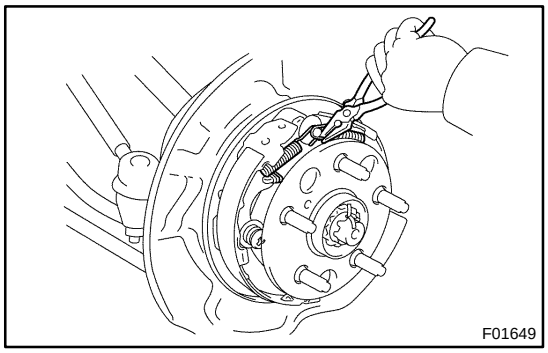
(a) Release the parking brake lever.

(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

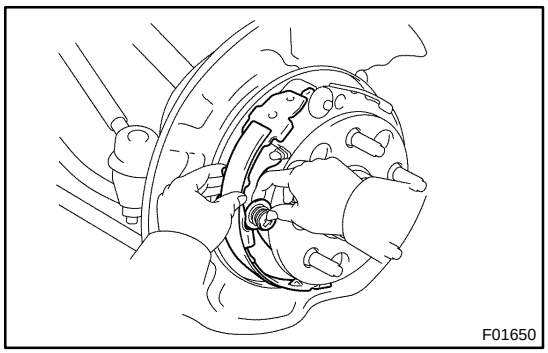
4. REMOVE SHOE RETURN SPRINGS

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.

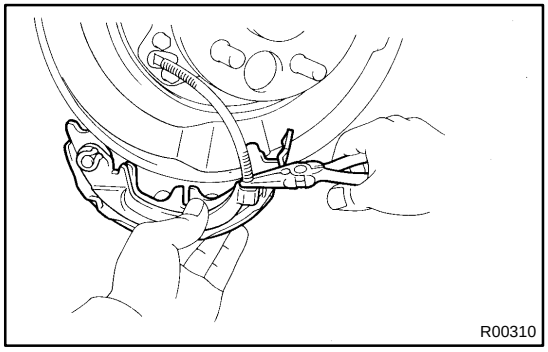
(b) Disconnect the tension spring and remove the front shoe.

(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.

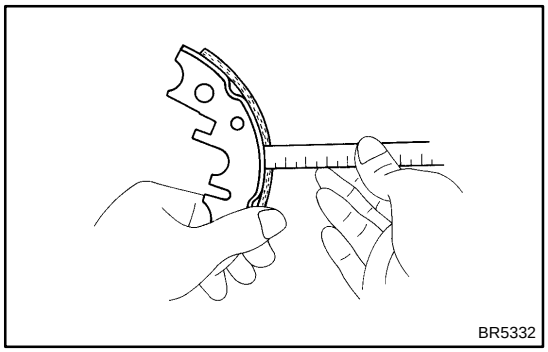
(d) Remove the 2 cups, shoe hold-down spring and pin.

BR0ZY-03

INSPECTION

1. INSPECT DISASSEMBLED PARTS

Inspect the disassembled parts for wear, rust or damage.



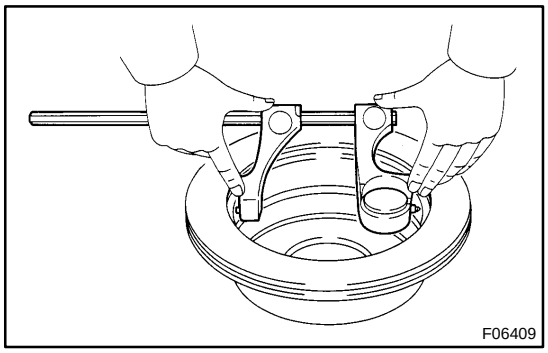
2. MEASURE BRAKE SHOE LINING THICKNESS

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

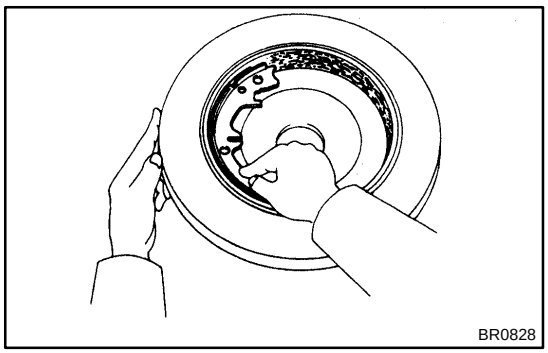
Using a brake drum gauge or equivalent, measure the inside diameter of the disc.

Standard inside diameter: 190 mm (7.48 in.)

Maximum inside diameter: 191 mm (7.52 in.)

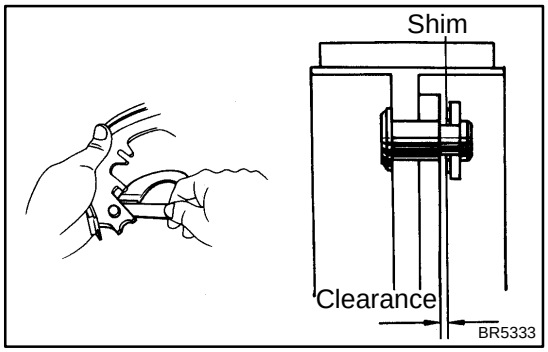
Replace the disc if the inside diameter is at the maximum value or more.

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.



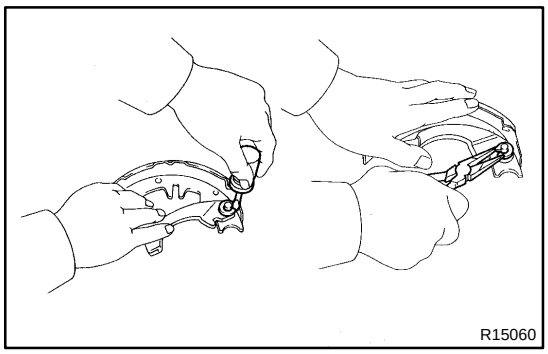
5. MEASURE CLEARANCE BETWEEN PARKING BRAKE SHOE AND LEVER

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.

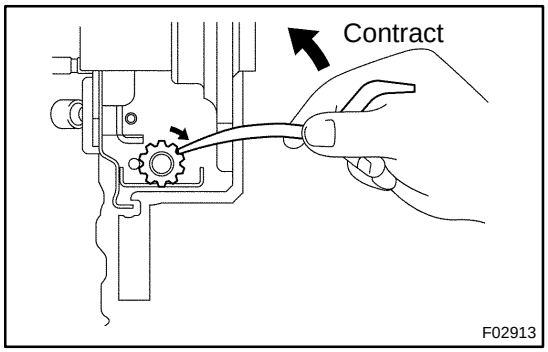
BR0K0-07

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

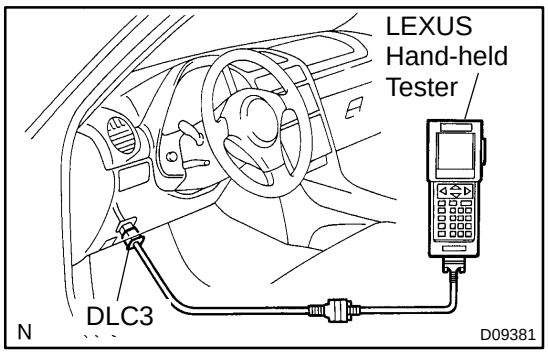
(a) Drive the vehicle at about 50 km/h (31 mph) on a safe, level and dry road.

(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.

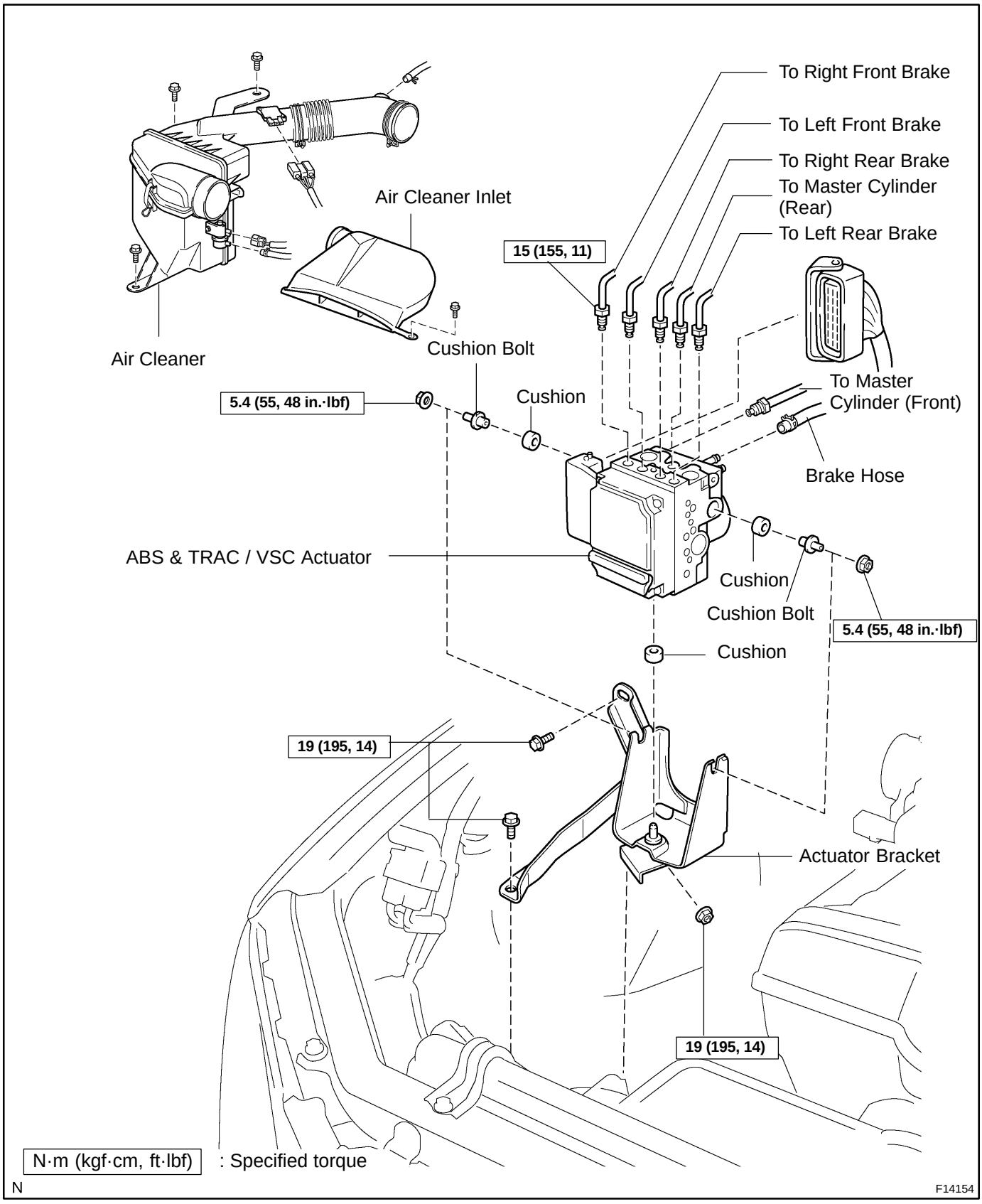
(d) Inspect other wheel operation.
As in the same procedure, check the solenoids of other wheels.

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).

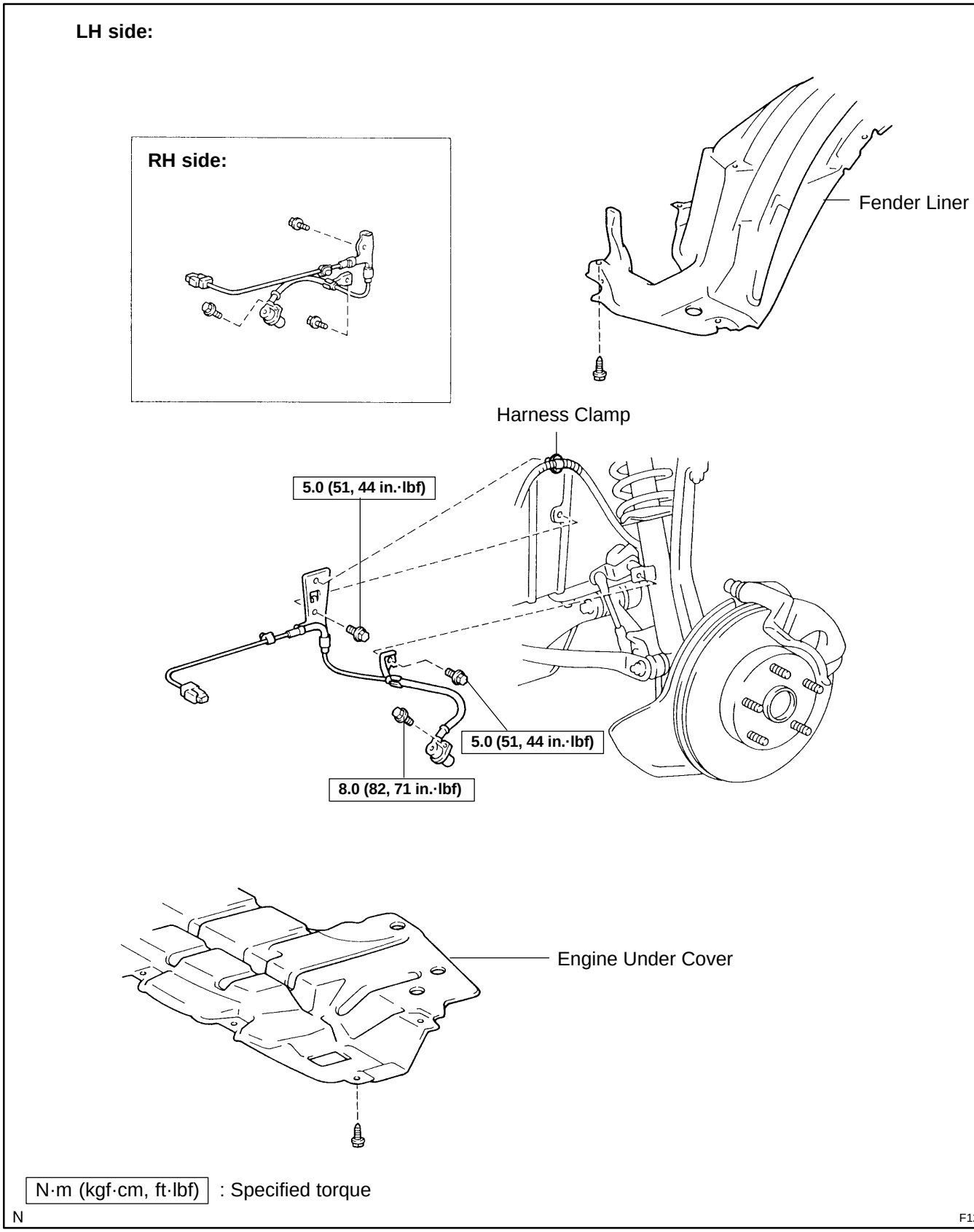
HINT:

- After installation, fill the brake reservoir with brake fluid, bleed brake system (See page BR-4).
- Check for leaks.

FRONT SPEED SENSOR

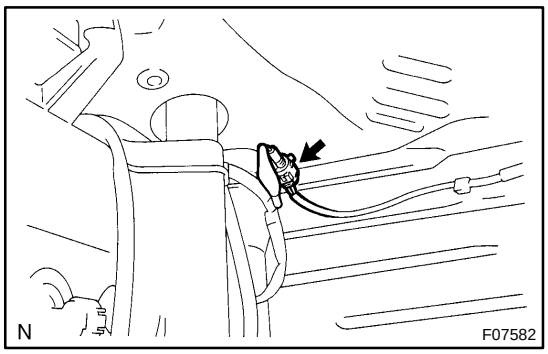
COMPONENTS

BR0K1-11



BR0K2-10

REMOVAL



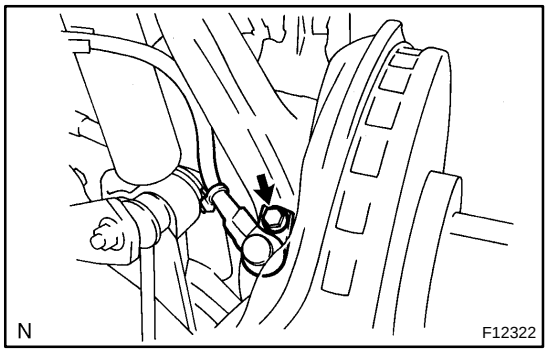
1. REMOVE FRONT WHEEL

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).

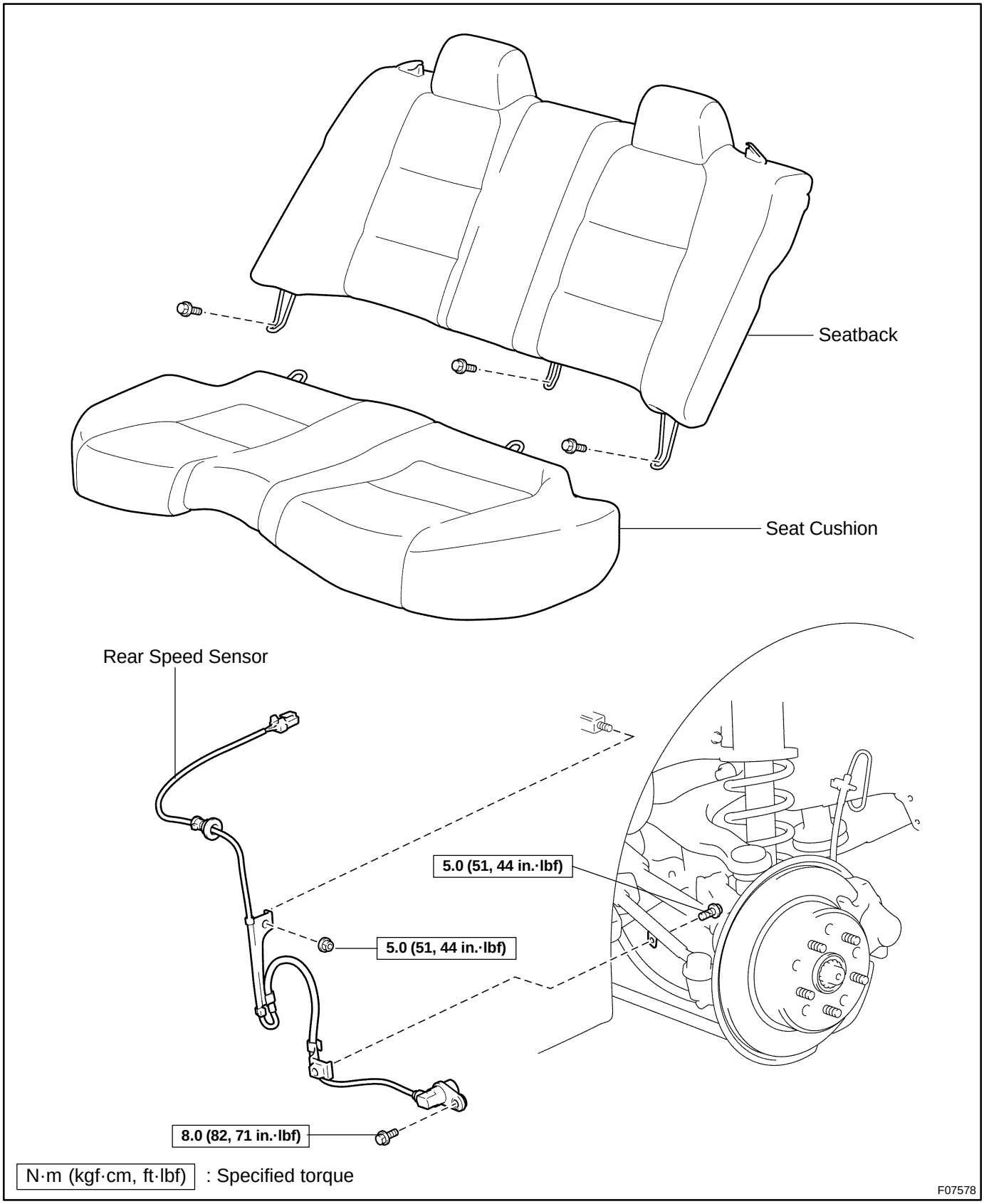
HINT:

After installation, check speed sensor signal (See page DI-437 or DI-507).

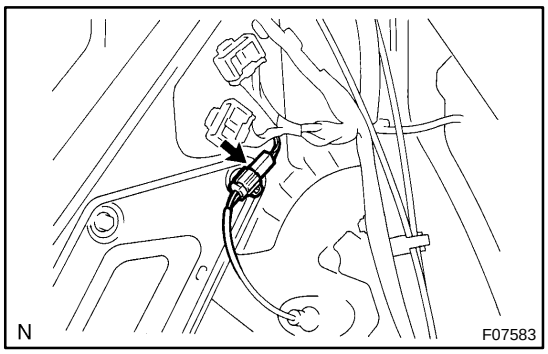
REAR SPEED SENSOR

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)

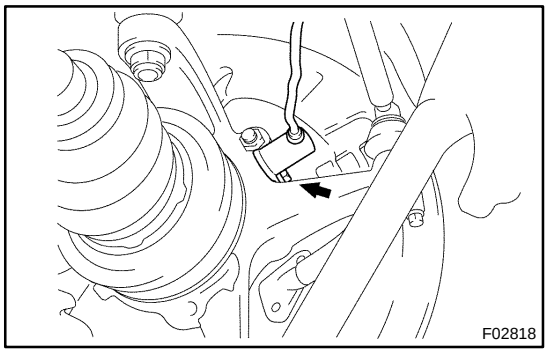
3. REMOVE SPEED SENSOR

(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).