TROUBLESHOOTING

TROUBLESHOOTING

HINTS

1. Engine troubles are usually not caused by the EFI system.
   When troubleshooting, always first check the condition of the other systems.
   (a) Electronic source
   - Battery
   - Fusible links
   - Fuses

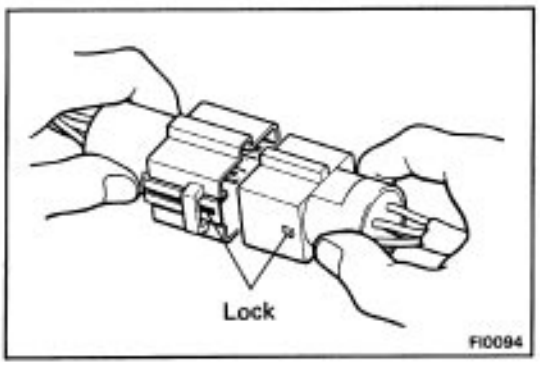
   (b) Body ground
   (c) Fuel supply
   - Fuel leakage
   - Fuel filter
   - Fuel pump

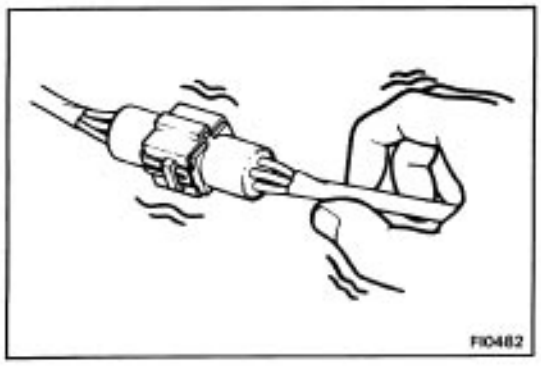
   (d) Ignition system
   - Spark plugs
   - High–tension cords
   - Distributor
   - Igniter and ignition coil

   (e) Air induction system
   - Vacuum leaks

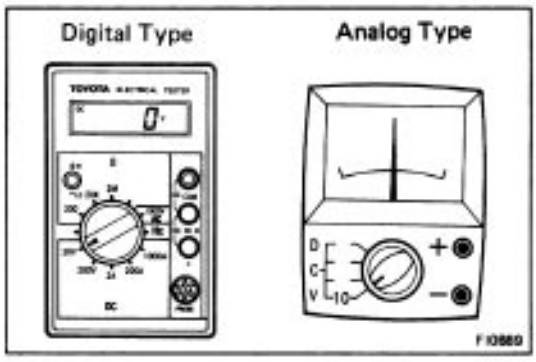
   (f) Emission control system
   - PCV system
   - EGR system

   (g) Others
   - Ignition timing (ESA system)
   - Idle speed
   - etc.





2. The most frequent cause of problems is simply a bad contact in wiring connectors. Always make sure that connections are secure.
   When inspecting the connector, pay particular attention to the following points:
   (a) Check to see that the terminals are not bent.
   (b) Check to see that the connector is pushed in completely and locked.
   (c) Check to see that there is no signal change when the connector is slightly tapped or wiggled.
3. Sufficiently troubleshoot for other causes before replacing the ECU. The ECU is of high quality and is expensive.



4. Use a volt/ohmmeter with high impedance (10 kΩ/V minimum) for troubleshooting of the electrical circuit. (See page FI–113)

TROUBLESHOOTING PROCEDURES

SYMPTOM – DIFFICULT TO START OR NO START (ENGINE WILL NOT CRANK OR CRANKS SLOWLY)

CHECK ELECTRIC SOURCE

BAD →
1. Battery
   (1) Connection
   (2) Gravity–Drive belt–Charging system
   (3) Voltage
2. Fusible links

OK ↓

CHECK STARTING SYSTEM

BAD →
1. Ignition switch
2. Clutch start switch
3. Clutch starter relay
4. Starter
5. Wiring/Connection

SYMPTOM – DIFFICULT TO START OR NO START (CRANKS OK)

CHECK DIAGNOSIS SYSTEM
Check for output of diagnostic code.
(See page FI–105)

Malfunction code →
Diagnostic code(s)
(See pages FI–108 and FI–109)

Normal code ↓

CHECK FOR VACUUM LEAKS IN AIR INDUCTION SYSTEM

BAD →
1. Oil dipstick
2. Hose connections
3. PCV hose
4. EGR system – EGR valve stays open
5. Brake booster line
6. Throttle valve adjusting (open stick)

OK ↓

CHECK IGNITION SPARK
1. Unplug connectors of injector and start injector time switch.
2. Check by holding spark plug cord 8 – 10 mm (0.31 – 0.39 in.) away from engine block while cranking engine.
   A strong spark should be noted.

BAD →
1. High–tension cords
2. Distributor
3. Ignition coil, Igniter

OK ↓

CONTINUED ON PAGE FI–95

↓ OK CONTINUED FROM PAGE FI–94

CHECK IGNITION TIMING
1. Connect terminals TE1 and E1 of the check engine connector.
2. Check ignition timing.
STD: 10° BTDC @ idling (w/ TE1 and E1 connected)

NO → Ignition timing – Adjust (See page IG–19)

OK ↓

CHECK FUEL SUPPLY TO INJECTOR
1. Fuel in tank
2. Fuel pressure in fuel line
(1) Connect terminals +B and FP of the check connector.
(2) Fuel pressure at fuel return hose can be felt.
(See page FI–130)

BAD →
1. Fuel line – Leakage – Deformation
2. Fuse
3. Circuit opening relay (See page FI–157)
4. Fuel pump (See page FI–129)
5. Fuel filter
6. Fuel pressure regulator (See page FI–138)

OK ↓

CHECK FUEL PUMP SWITCH IN AIR FLOW METER
Check continuity between terminals FC and E1 while measuring plate of air flow meter is open.

BAD → Air flow meter (See page FI–147)

OK ↓

CHECK SPARK PLUGS
Plug gap: 0.8 mm (0.031 in.)
HINT:
Check compression pressure and valve clearance if necessary.

NO →
1. Spark plugs (See page IG–10)
2. Compression pressure (See page EM–29)
Limit: 10.0 kg/cm^2 0 42 psi, 981 kPa) at 250 rpm
3. Valve clearance (Cold) (See page EM–22)
STD: IN 0.15 – 0.25 mm (0.006 – 0.010 in.)
EX 0.20 – 0.30 mm (0.008 – 0.012 in.)

BAD (All Plugs WET) →
1. Injectors – Shorted or leaking
2. Injector wiring(s)
3. Cold start injector – Leakage (See page FI–135)
4. Start injector time switch (See page FI–158)

OK ↓

CHECK AUXILIARY AIR VALVE
(See page FI–154)

BAD →
1. Auxiliary air valve
2. Water hoses
3. Air hoses

OK ↓

CHECK INTAKE VALVE

BAD → Intake valve – Deposit

OK ↓

CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
(See page FI–111)

BAD →
1. Wiring connection
2. Power to ECU
(1) Fusible links
(2) Fuses
(3) EFI main relay
3. Air flow meter
4. Water temp. sensor
5. Intake air temp. sensor
6. Injection signal circuit
(1) Injector– wiring
(2) ECU

SYMPTOM – ENGINE OFTEN STALLS

CHECK DIAGNOSIS SYSTEM
Check for output of diagnostic code.
(See page FI–105)

Malfunction code(s) → Diagnostic code(s)
(See pages FI–108 and FI–109)

Normal code ↓

CHECK FOR VACUUM LEAKS IN AIR INTAKE LINE

BAD →
1. Oil dipstick
2. Hose connections
3. PCV hose
4. EGR system – EGR valve stays open

OK ↓

CHECK FUEL SUPPLY TO INJECTOR
1. Fuel in tank
2. Fuel pressure in fuel line
   (1) Connect terminals + B and FP of the check connector.
   (2) You can feel fuel pressure at fuel hose of fuel filter.
   (See page FI–46)

BAD →
1. Fuel line – Leakage – Deformation
2. Fuse
3. Circuit opening relay (See page FI–157)
4. Fuel pump (See page FI–129)
5. Fuel filter
6. Fuel pressure regulator (See page FI–138)

OK ↓

CHECK AIR FILTER ELEMENT

BAD → Element – Clean or replace

OK ↓

CHECK IDLE SPEED
STD: 800 rpm

NO → Idle speed – Adjust
(See page MA–19)

OK ↓

CHECK IGNITION TIMING
1. Connect terminals TE1 and E1 of the check connector.
2. Check ignition timing.
   STD: 10° BTDC @ idling
   (w/ TE1 – E1 connected)

NO → Ignition timing – Adjust
(See page IG–19)

OK ↓

CHECK SPARK PLUGS
Plug gap: 0.8 mm (0.031 in.)
HINT:
Check compression pressure and valve clearance if necessary.

NO →
1. Spark plugs (See page IG–10)
2. Compression pressure (See page EM–29)
   Limit: 10.0 kg/cm^2 (142 psi, 981 kPa) at 250 rpm
3. Valve clearance (Cold) (See page EM–22)
   STD: IN 0.15 – 0.25 mm
   (0.006 – 0.010 in.)
   EX 0.20 – 0.30 mm
   (0.008 – 0.012 in.)

OK ↓

CHECK COLD START INJECTOR
(See page FI–135)

BAD →
1. Cold start injector
2. Start injector time switch. (See page FI–158)

OK ↓ CONTINUED ON PAGE FI–97

OK CONTINUED FROM PAGE FI–96

CHECK AUXILIARY AIR VALVE
(See page FI–154)
→ BAD → 1. Auxiliary air
2. Water hoses
3. Air hoses

OK

CHECK FUEL PRESSURE
(See page FI–130)
→ BAD → 1. Fuel pump (See page FI–129)
2. Fuel filter
3. Fuel pressure regulator
(See page FI–138)

OK

CHECK INJECTORS
(See page FI–139)
→ BAD → Injection condition

OK

CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
(See page FI–111)
→ BAD → 1. Wiring connection
2. Power to ECU
(1) Fusible links
(2) Fuses
(3) EFI main relays
3. Air flow meter
4. Water temp. sensor
5. Intake air temp. sensor
6. Injection signal circuit
(1) Injector wiring
(2) ECU

SYMPTOM – ENGINE SOMETIMES STALLS

CHECK DIAGNOSIS SYSTEM
Check for output of diagnostic code.
(See page FI–105)
→ Malfunction code(s) → Diagnostic code(s)
(See pages FI–108 and FI–109)

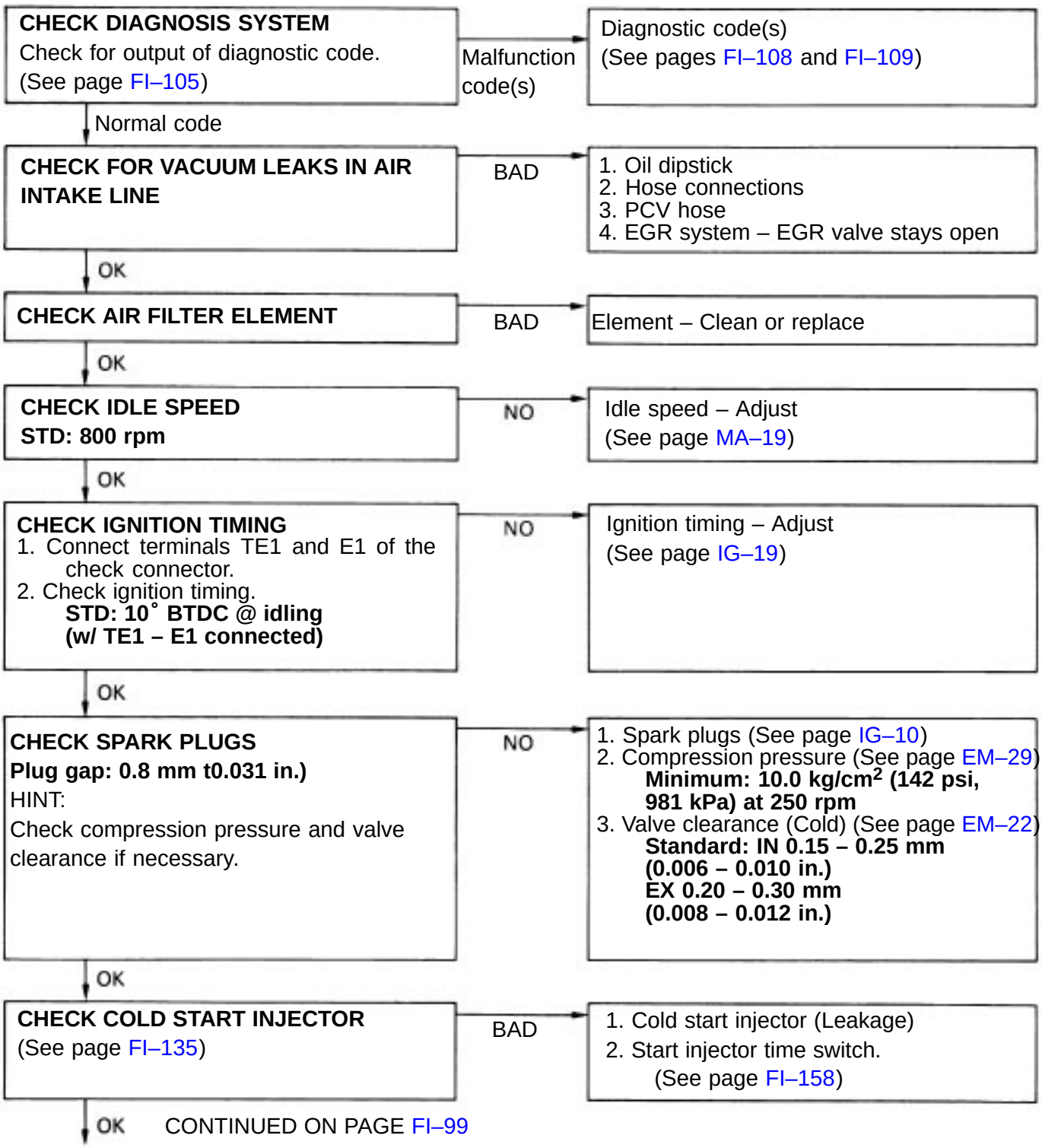
Normal code

CHECK AIR FLOW METER
(See page FI–147)
→ BAD → Air flow meter

OK

CHECK WIRING CONNECTORS AND RELAYS
Check that there is a signal change when the connector or relay is slightly tapped or wiggled.
→ BAD → 1. Connectors
2. EFI main relay (See page FI–156)
3. Circuit opening relay (See page FI–157)

SYMPTOM – ROUGH IDLING AND/OR MISSING



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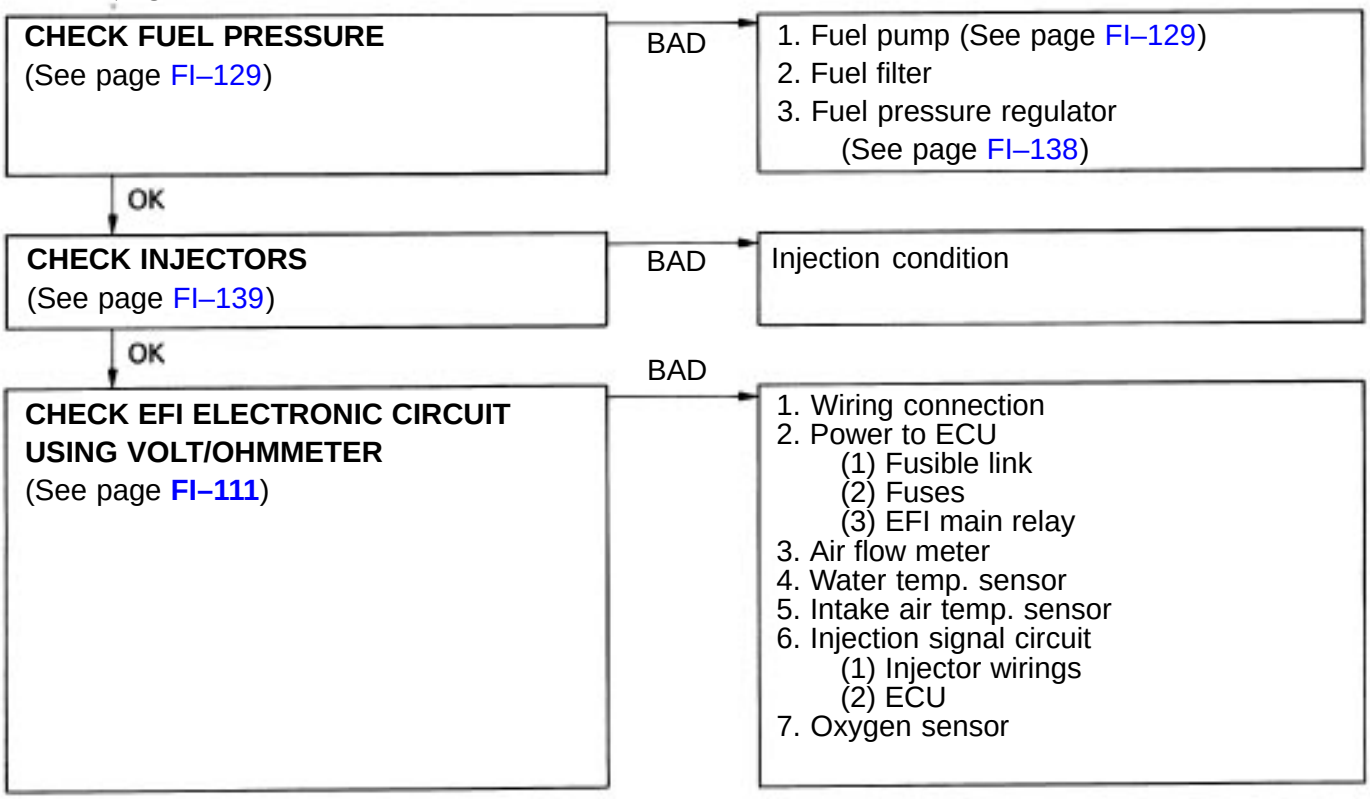
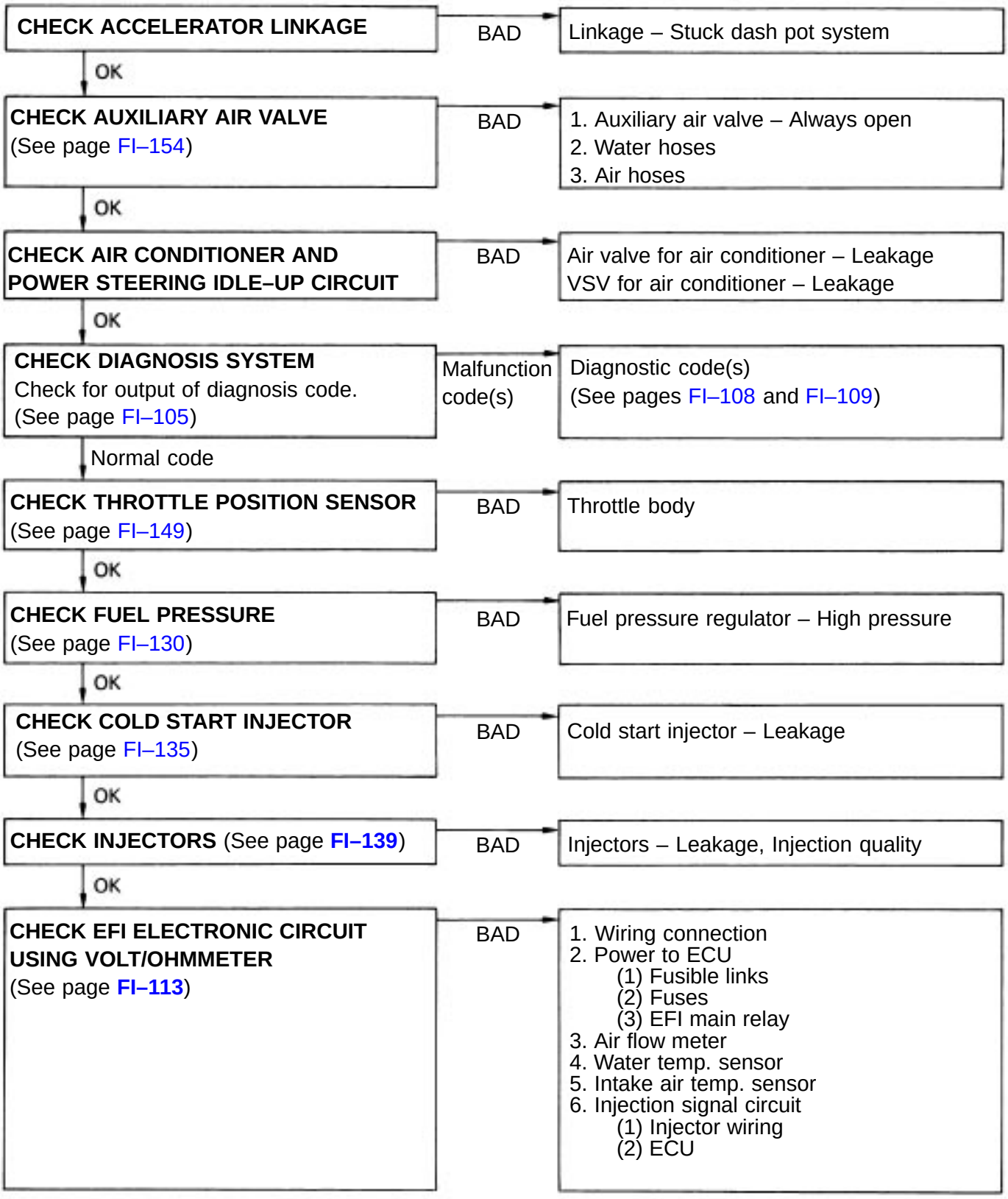


SYMPTOM – HIGH ENGINE IDLE SPEED (NO DROP)



SYMPTOM – ENGINE BACKFIRES–Lean Fuel Mixture

CHECK DIAGNOSIS SYSTEM
Check for output of diagnostic code.
(See page FI–105)

Malfunction code(s) → Diagnostic code(s)
(See pages FI–108 and FI–109)

Normal code ↓

CHECK FOR VACUUM LEAKS IN AIR INTAKE LINE

BAD →
1. Oil dipstick
2. Hose connections
3. PCV hose
4. EGR system – EGR valve stays open

OK ↓

CHECK IGNITION TIMING
1. Connect terminals TE1 and E1 of the check connector.
2. Check ignition timing.
STD: 10° BTDC @ idling
(w/ TE1 – E1 connected)

NO → Ignition timing – Adjust
(See page IG–19)

OK ↓

CHECK IDLE SPEED
STD: 800 rpm

NO → Idle speed – Adjust
(See page MA–19)

OK ↓

CHECK COLD START INJECTOR
(See page FI–135)

BAD →
1. Cold start injector
2. Start injector time switch
(See page FI–158)

OK ↓

CHECK FUEL PRESSURE
(See page FI–130)

BAD →
1. Fuel pump (See page FI–129)
2. Fuel filter
3. Fuel pressure regulator (See page FI–138)

OK ↓

CHECK INJECTORS
(See page FI–139)

BAD → Injectors – Clogged

OK ↓

CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
(See page **FI–113**)

BAD →
1. Wiring connection
2. Power to ECU
(1) Fusible links
(2) Fuses
(3) EFI main relay
3. Air flow meter
4. Water temp. sensor
5. Intake air temp. sensor
6. Throttle position sensor
7. Injection signal circuit
(1) Injector– wirings
(2) ECU
(3) Fuel cut RPM (See page FI–168)
8. Oxygen sensor

SYMPTOM – MUFFLER EXPLOSION (AFTER FIRE) –Rich Fuel Mixture–Misfire

CHECK DIAGNOSIS SYSTEM
Check for output of diagnostic code.
(See page FI–105)

→ Malfunction code (s) → Diagnostic code(s)
(See pages FI–108 and FI–109)

↓ Normal code

CHECK IGNITION TIMING
1. Connect terminals TE1 and E1 of the check connector.
2. Check ignition timing.
STD: 10° BTDC @ idling
(w/ TE1 – E1 connected)

→ NO → Ignition timing – Adjust
(See page IG–19)

↓ OK

CHECK IDLE SPEED
STD: 800 rpm

→ NO → Idle speed – Adjust
(See page MA–19)

↓ OK

CHECK COLD START INJECTOR
(See page FI–135)

→ BAD →
1. Cold start injector
2. Start injector time switch
(See page FI–158)

↓ OK

CHECK FUEL PRESSURE
(See page FI–130)

→ BAD → Fuel pressure regulator

↓ OK

CHECK INJECTORS (See page **FI–139**)

→ BAD → Injectors – Leakage

↓ OK

CHECK SPARK PLUGS
Plug gap: 0.8 mm (0.031 in.)
HINT:
Check compression pressure and valve clearance if necessary.

→ NO →
1. Spark plugs (See page IG–10)
2. Compression pressure (See page EM–29)
Limit: 10.0 kg/cm^2 (142 psi, 981 kPa) at 250 rpm
3. Valve clearance (Cold) (See page EM–22)
STD: IN 0.15 – 0.25 mm
(0.006 – 0.010 in.)
EX 0.20 – 0.30 mm
(0.008 – 0.012 in.)

↓ OK

CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
(See page **FI–113**)

→ BAD →
1. Throttle position sensor
2. Injection signal
(1) Injector wiring
(2) Fuel cut RPM (See page FI–168)
(3) ECU
3. Oxygen sensor

SYMPTOM – ENGINE HESITATES AND/OR POOR ACCELERATION

CHECK CLUTCH OR BRAKE → BAD → 1. Clutch – Slips; 2. Brakes – Drag

OK ↓

CHECK FOR VACUUM LEAKS IN AIR INTAKE LINE → BAD → 1. Oil dipstick; 2. Hose connections; 3. PCV hose; 4. EGR system – EGR valve stays open

OK ↓

CHECK AIR FILTER ELEMENT → BAD → Element – Clean or replace

OK ↓

CHECK DIAGNOSIS SYSTEM
Check for output of diagnostic code.
(See page FI–102)
→ Malfunction code(s) → Diagnosis code(s) (See pages FI–108 and FI–109)

Normal code ↓

CHECK IGNITION SPARK
1. Unplug connectors of injector and start injector time switch.
2. Check by holding spark plug 8 – 10 mm (0. 31 – 0.39 in.) away from engine block while cranking engine. A strong spark should be noted.

→ BAD → 1. High–tension cords; 2. Distributor; 3. Ignition coil, Igniter

OK ↓

CHECK IGNITION TIMING
1. Connect terminals TE1 and E1 of the check connector.
2. Check ignition timing.
STD: 10° BTDC @ idling (w/ TE1 – E1 connected)

→ NO → Ignition timing – Adjust (See page IG–19)

OK ↓

CHECK FUEL PRESSURE
(See page FI–130)
→ BAD → 1. Fuel pump (See page FI–129); 2. Fuel filter; 3. Fuel pressure regulator (See page FI–138)

OK ↓

CHECK INJECTORS
(See page FI–139)
→ BAD → Injection condition

OK ↓

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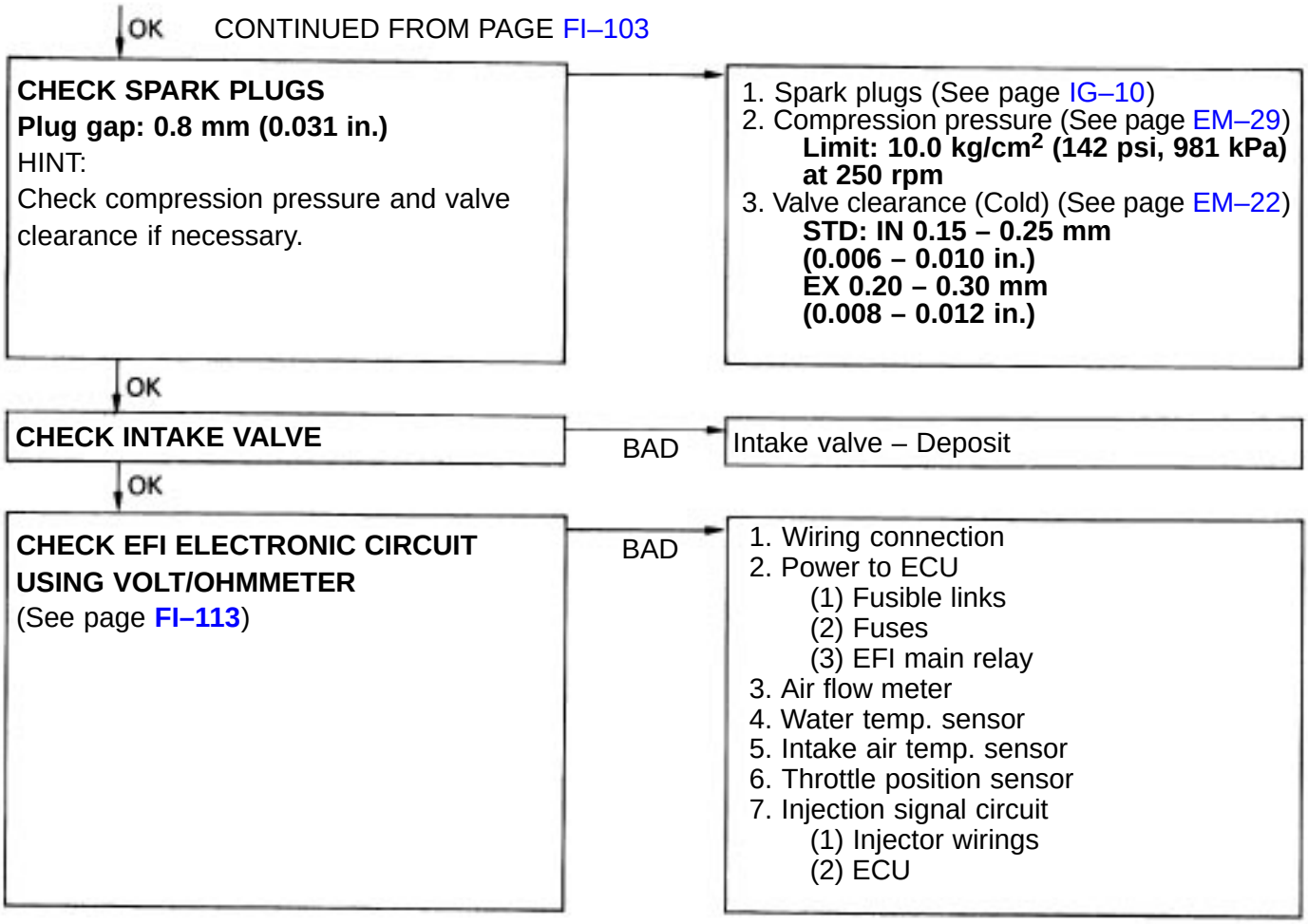
OK
CONTINUED FROM PAGE FI–103
CHECK SPARK PLUGS
Plug gap: 0.8 mm (0.031 in.)
HINT:
Check compression pressure and valve clearance if necessary.
1. Spark plugs (See page IG–10)
2. Compression pressure (See page EM–29)
Limit: 10.0 kg/cm2 (142 psi, 981 kPa) at 250 rpm
3. Valve clearance (Cold) (See page EM–22)
STD: IN 0.15 – 0.25 mm (0.006 – 0.010 in.)
EX 0.20 – 0.30 mm (0.008 – 0.012 in.)
OK
CHECK INTAKE VALVE
BAD
Intake valve – Deposit
OK
CHECK EFI ELECTRONIC CIRCUIT USING VOLT/OHMMETER
(See page FI–113)
BAD
1. Wiring connection
2. Power to ECU
(1) Fusible links
(2) Fuses
(3) EFI main relay
3. Air flow meter
4. Water temp. sensor
5. Intake air temp. sensor
6. Throttle position sensor
7. Injection signal circuit
(1) Injector wirings
(2) ECU