

# FUEL INJECTOR INSPECTION [ZJ, Z6, LF]

B3E011413250W03

## Fuel Injector Operation Inspection

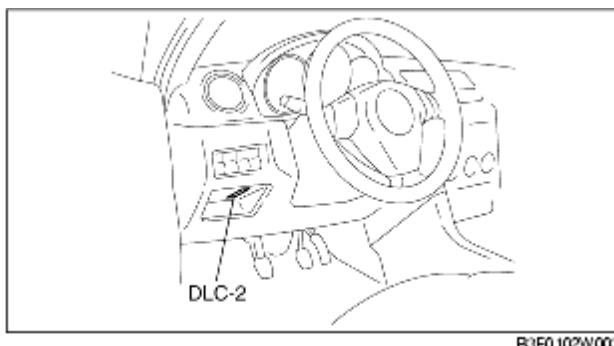
### Warning

- To prevent serious injury or damage, always perform diagnosis while referring to the warnings and cautions in each procedure when inspecting or repairing the fuel system.

STEP	INSPECTION	RESULT	ACTION
1	Is there fuel injector operation sound from each cylinder when the engine is cranked? (Use a soundscope or equivalent tool.)	Yes	The fuel injector operation system is normal.
		No	If the operation sound cannot be verified at all cylinders, go to Step 2. If the operation sound cannot be verified at specific cylinders, go to Step 3.
2	Is the main relay operation normal?	Yes	Inspect the following: <ul style="list-style-type: none"> <li>• Wiring harnesses and connectors related to fuel injector power supply system</li> <li>• PCM connector</li> <li>• Fuel injector ground and related wiring harnesses and connectors</li> </ul>
		No	Replace the main relay.
3	Remove the fuel injector where the operation sound cannot be verified, install it to the connector where the operation sound is verified, and then crank the engine again. Is there operation sound?	Yes	Inspect for open or short circuit in the wiring harnesses and connectors, and repair or replace the malfunctioning part.
		No	Replace the fuel injector.

## Fuel Cut Control Inspection

1. Connect the WDS or equivalent to the DLC-2.



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2. Warm up the engine and idle it.
3. Turn off all the electrical loads and the A/C switch.
4. Using "RPM" of the PID/data monitor function, verify the engine speed.

5. Using a soundscope or a screwdriver, verify the operation sound of the fuel injector at all cylinders.

(1) Open the throttle valve and increase the engine speed to **4,000 rpm**.

(2) Close the throttle valve instantaneously and verify that the fuel injector operation sound stops until the engine speed decreases to approx. **1,200 rpm** and the sound is heard when the engine speed is approx. **1,200 rpm** or less.

- If the sound does not stop at all cylinders, inspect the following:
  - PCM input signal circuit (sensor, wiring harness)
    - Throttle opening signal (TP sensor)
- If the sound does not stop at specific cylinders, inspect the following:
  - Corresponding fuel injector and related wiring harnesses and connectors
- If the operation sound stops at all cylinders but the engine speed at which the operation sound recovers is not within the specification, inspect the following:
  - PCM input signal circuit (sensor, wiring harness)
    - Load/no load detection signal (neutral/CPP switch (MTX), TR switch (ATX))
    - Water temperature signal (ECT sensor)

6. Place the vehicle on a chassis dynamometer.

7. Inspect the following using the WDS or equivalent.

(1) Verify the injector actuation time using the PID/data monitor function.

(2) Depress the accelerator pedal and increase the engine speed to **4,000 rpm**. (Loaded range)

(3) With the accelerator pedal released (without depressing the brake pedal), verify that the injector actuation time of **0 ms** is indicated until the engine speed decreases to **approx. 1,200 rpm**, and then the actuation time **2-5 ms** is indicated when the engine speed decreases to **approx. 1,000 rpm or less**.

- If it cannot be verified, inspect the PCM input signal circuit.
  - Load/no load detection signal (neutral/CPP switch (MTX), TR switch (ATX))

## Resistance Inspection

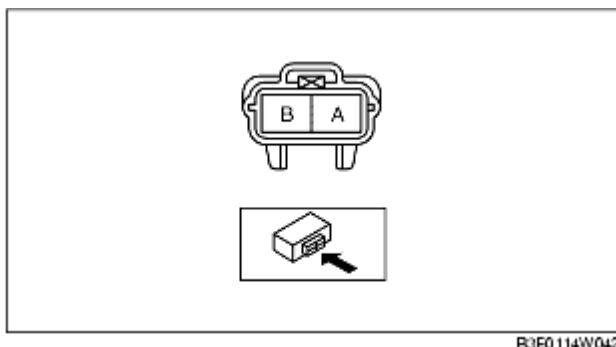
1. Turn the ignition switch to the LOCK position.

2. Disconnect the negative battery cable.

3. Disconnect the fuel injector connector.

4. Inspect the resistance between fuel injector terminals A and B using a tester.

**ZJ, Z6**

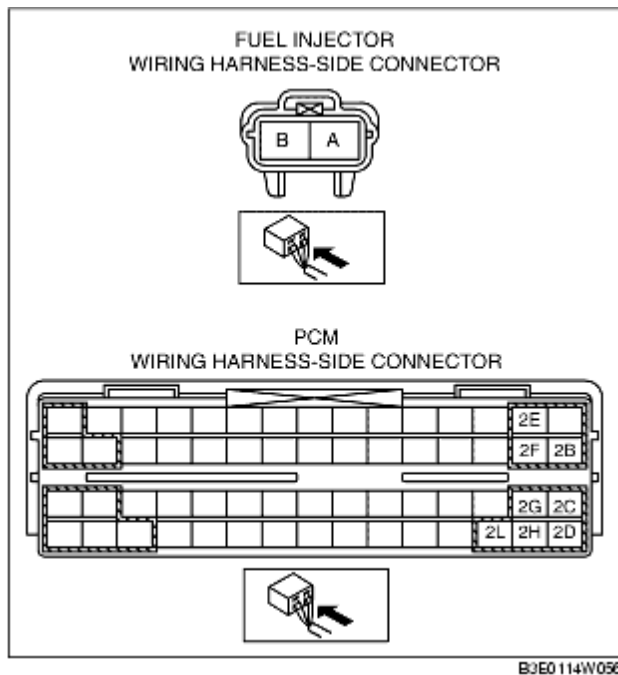


**LF**

- If within the specification, perform the "Circuit Open/Short Inspection".
- If not within the specification, replace the fuel injector.

**Standard****ZJ, Z6: Approx. 13.8 ohms [20 °C {68 °F}]****LF: 11.4-12.6 ohms [20 °C {68 °F}]****Circuit Open/Short Inspection [ZJ, Z6]**

1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[ZJ, Z6\]](#).)
2. Inspect the following wiring harnesses for an open or short circuit (continuity check).

**Open circuit**

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - Fuel injector No.1 terminal A and PCM terminal 2E
  - Fuel injector No.2 terminal A and PCM terminal 2F
  - Fuel injector No.3 terminal A and PCM terminal 2G
  - Fuel injector No.4 terminal A and PCM terminal 2L
  - Fuel injector No.1 terminal B and PCM terminal 2B
  - Fuel injector No.2 terminal B and PCM terminal 2C
  - Fuel injector No.3 terminal B and PCM terminal 2D
  - Fuel injector No.4 terminal B and PCM terminal 2H

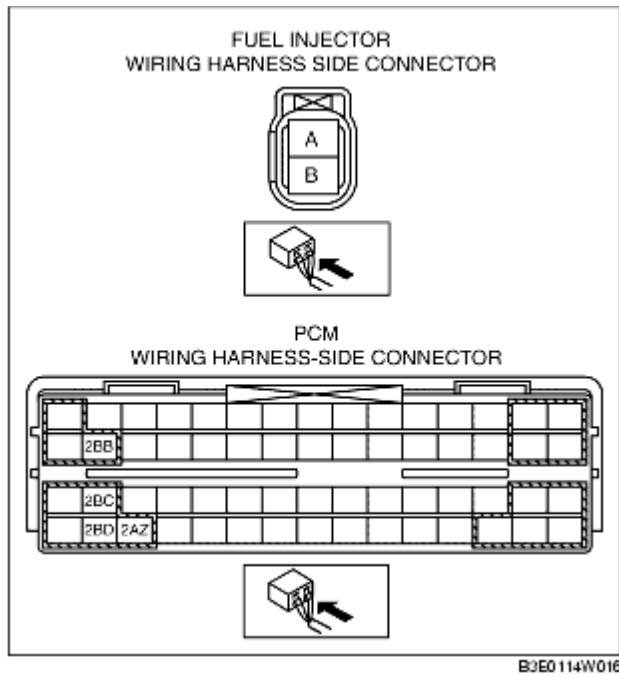
**Short circuit**

- If there is continuity, the circuit is short. Repair or replace the harness.
  - Fuel injector No.1 terminal A and body GND
  - Fuel injector No.2 terminal A and body GND
  - Fuel injector No.3 terminal A and body GND
  - Fuel injector No.4 terminal A and body GND

**Circuit Open/Short Inspection [LF]**

1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)

2. Inspect the following wiring harnesses for an open or short circuit (continuity check).



### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - Fuel injector No.1 terminal A and PCM terminal 2BB
  - Fuel injector No.2 terminal A and PCM terminal 2BC
  - Fuel injector No.3 terminal A and PCM terminal 2BD
  - Fuel injector No.4 terminal A and PCM terminal 2AZ
  - Fuel injector No.1 terminal B and main relay terminal A
  - Fuel injector No.2 terminal B and main relay terminal A
  - Fuel injector No.3 terminal B and main relay terminal A
  - Fuel injector No.4 terminal B and main relay terminal A

### Short circuit

- If there is continuity, the circuit is short. Repair or replace the harness.
  - Fuel injector No.1 terminal A and body GND
  - Fuel injector No.2 terminal A and body GND
  - Fuel injector No.3 terminal A and body GND
  - Fuel injector No.4 terminal A and body GND

## Leakage Inspection

### Warning

- Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. To prevent this, complete the following inspection with the engine stopped.

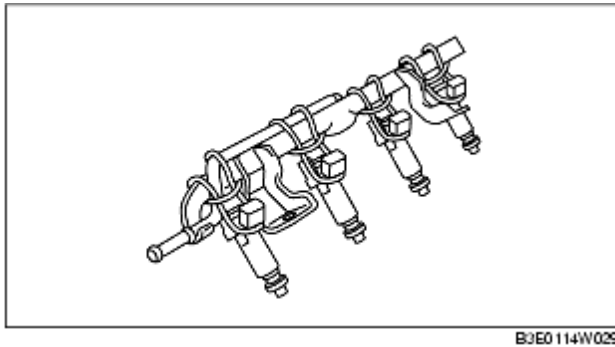
1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[ZJ, Z6, LF\]](#).)

2. Disconnect the negative battery cable.

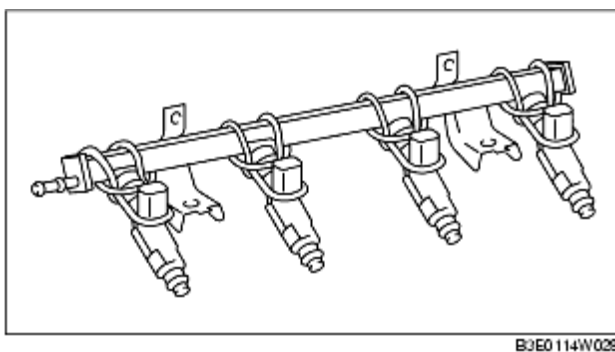
3. Remove the fuel injector and fuel distributor as a single unit. (See [FUEL INJECTOR REMOVAL/INSTALLATION \[LF\]](#).) (See [FUEL INJECTOR REMOVAL/INSTALLATION \[ZJ, Z6\]](#).)

4. Fix the fuel injector to the fuel distributor with a wire or the equivalent.

#### ZJ, Z6



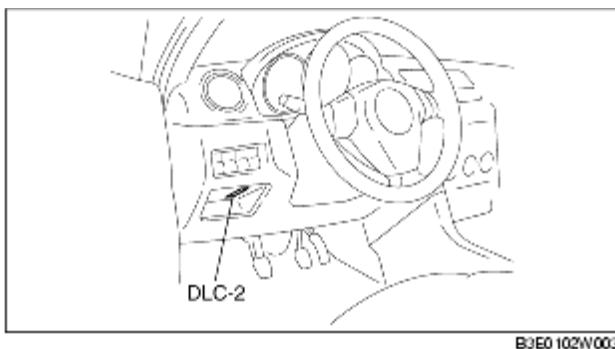
#### LF



5. Connect the fuel hose.

6. Connect the negative battery cable.

7. Connect the WDS or equivalent to the DLC-2.



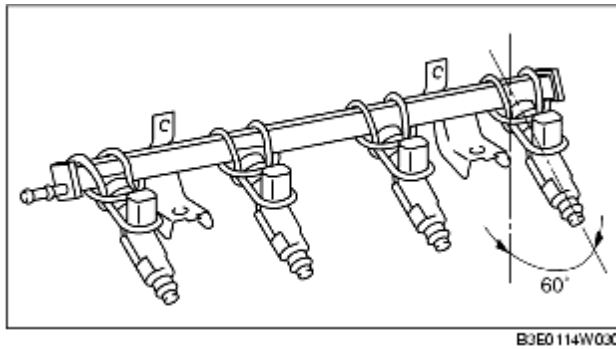
8. Turn the ignition switch to the ON position.

9. Using the simulation function "FP", start the fuel pump.

10. Tilt the fuel injector at an angle of **60°** to inspect for leakage.

#### ZJ, Z6

LF



- If not within the specification, replace the fuel injector.

**Standard****1 drop or less/2 min**

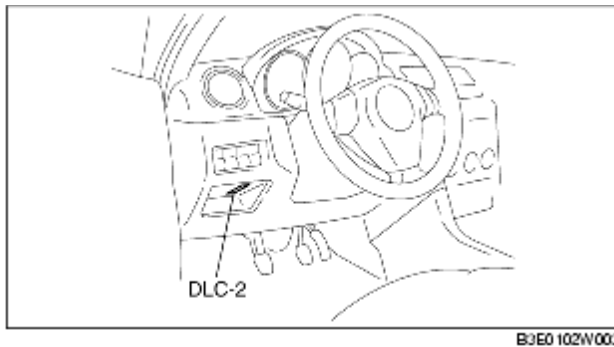
11. Turn the ignition switch to the LOCK position and stop the fuel pump.
12. Remove the wire or the equivalent securing the fuel injector.
13. Install the fuel injector. (See [FUEL INJECTOR REMOVAL/INSTALLATION \[ZJ, Z6\]](#).) (See [FUEL INJECTOR REMOVAL/INSTALLATION \[LF\]](#).)
14. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See [AFTER SERVICE PRECAUTION \[ZJ, Z6, LF\]](#).)

**Injection volume Inspection [ZJ, Z6]****Warning**

- Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. To prevent this, complete the following inspection with the engine stopped.

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[ZJ, Z6, LF\]](#).)
2. Disconnect the negative battery cable.
3. Remove the fuel injector and fuel distributor as a single unit. (See [FUEL INJECTOR REMOVAL/INSTALLATION \[ZJ, Z6\]](#).)
4. Fix the fuel injector to the fuel distributor with a wire or the equivalent.
5. Connect the **SST** to the corresponding fuel injector and battery.

6. Connect the negative battery cable.
7. Connect the WDS or equivalent to the DLC-2.



8. Turn the ignition switch to the ON position.
9. Using the simulation function "FP", start the fuel pump.
10. Measure the fuel injection volume.

- If not within the specification, replace the fuel injector.

#### **Standard**

**64-84 ml {64-84 cc, 3.9-5.1 cu in}/15 s**

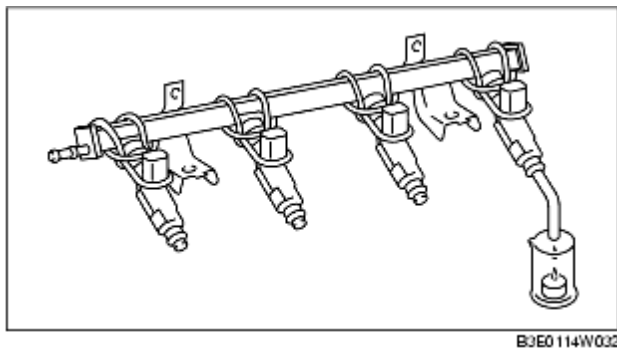
11. Turn the ignition switch to the LOCK position and stop the fuel pump.
12. Remove the wire or the equivalent securing the fuel injector.
13. Install the fuel injector. (See [FUEL INJECTOR REMOVAL/INSTALLATION \[ZJ, Z6\]](#).)
14. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See [AFTER SERVICE PRECAUTION \[ZJ, Z6, LF\]](#).)

## **Injection Volume Inspection [LF]**

### **Warning**

- Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. To prevent this, complete the following inspection with the engine stopped.

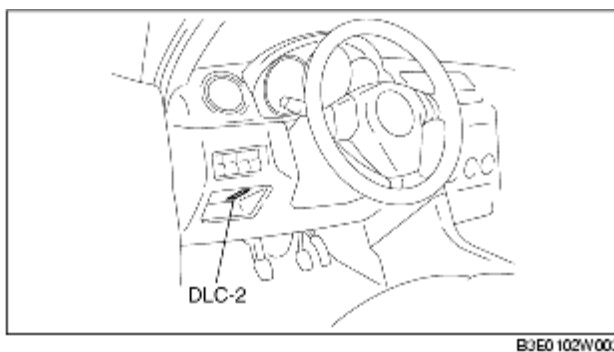
1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[ZJ, Z6, LF\]](#).)
2. Disconnect the negative battery cable.
3. Remove the PCM.
4. Connect the PCM connector.
5. Remove the fuel injector and fuel distributor as a single unit. (See [FUEL INJECTOR REMOVAL/INSTALLATION \[LF\]](#).)
6. Fix the fuel injector to the fuel distributor with a wire or the equivalent.



7. Connect the corresponding fuel injector connector.

8. Connect the negative battery cable.

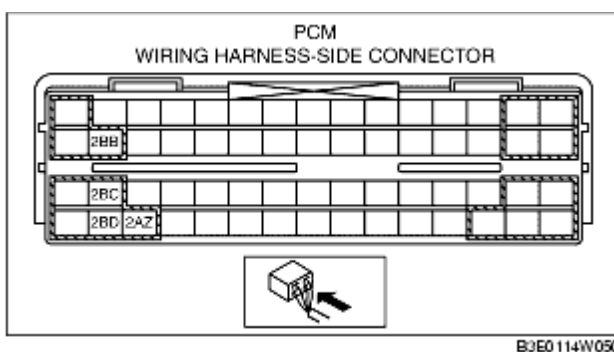
9. Connect the WDS or equivalent to the DLC-2.



10. Turn the ignition switch to the ON position.

11. Using the simulation function "FP", start the fuel pump.

12. Ground the following PCM terminals using a jumper wire and measure the injection volume of each fuel injector.



- If not within the specification, replace the fuel injector.

#### Standard

46-66 ml {44-66 cc, 2.8-4.0 cu in}/15 s

Fuel injector No.	PCM terminal
1	2BB
2	2BC

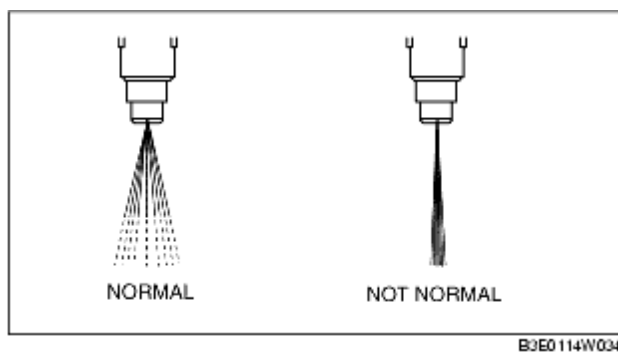


3	2BD
4	2AZ

13. Turn the ignition switch is to the LOCK position and stop the fuel pump.
14. Remove the wire or the equivalent securing the fuel injector.
15. Install the fuel injector. (See [FUEL INJECTOR REMOVAL/INSTALLATION \[LF\]](#).)
16. Inspect all related parts by performing "AFTER SERVICE PRECAUTION". (See [AFTER SERVICE PRECAUTION \[ZJ, Z6, LF\]](#).)

## Atomization Inspection

1. Inspect the atomization status.



- If not normal, replace the fuel injector.