

2005 Mazda MX-5 Miata

2005 ENGINE PERFORMANCE Fuel System - MX-5 Miata

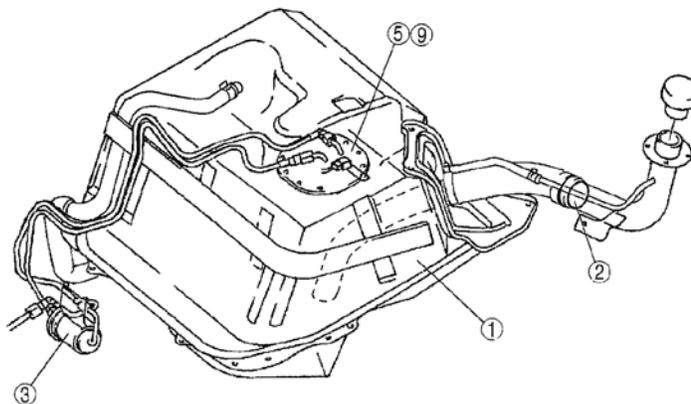
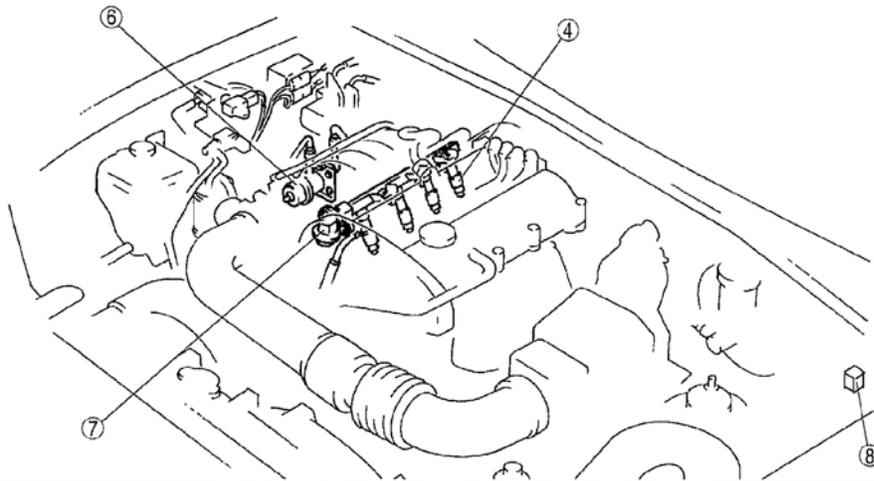
2005 ENGINE PERFORMANCE

Fuel System - MX-5 Miata

FUEL SYSTEM LOCATION INDEX (BP, BP WITH TC)

2005 Mazda MX-5 Miata

2005 ENGINE PERFORMANCE Fuel System - MX-5 Miata



1	Fuel tank (See FUEL TANK REMOVAL/ INSTALLATION [BP, BP WITH TC])
2	Nonreturn valve (See NONRETURN VALVE INSPECTION [BP, BP WITH TC])
3	Fuel Filter (high-pressure) (See FUEL FILTER (HIGH-PRESSURE) REMOVAL/INSTALLATION [BP, BP WITH TC])
4	Fuel injector (See FUEL INJECTOR REMOVAL/ INSTALLATION [BP, BP WITH TC]) (See FUEL INJECTOR INSPECTION [BP, BP WITH TC])
5	Pressure regulator (See PRESSURE REGULATOR REMOVAL/INSTALLATION [BP, BP WITH TC]) (See PRESSURE REGULATOR INSPECTION [BP, BP WITH TC])

6	Pulsation damper No.1 (See PULSATION DAMPER NO.1 REMOVAL/INSTALLATION [BP, BP WITH TC]) (See PULSATION DAMPER NO.1, NO.2 INSPECTION [BP, BP WITH TC])
7	Pulsation damper No.2 (See PULSATION DAMPER NO.2 REMOVAL/INSTALLATION [BP, BP WITH TC]) (See PULSATION DAMPER NO.1, NO.2 INSPECTION [BP, BP WITH TC])
8	Fuel pump relay (See RELAY INSPECTION)
9	Fuel pump (FP) (See FUEL PUMP (FP) REMOVAL/ INSTALLATION [BP, BP WITH TC]) (See FUEL PUMP (FP) DISASSEMBLY/ ASSEMBLY [BP, BP WITH TC]) (See FUEL PUMP (FP) INSPECTION [BP, BP WITH TC])

G03637807

Fig. 1: Locating Fuel System (BP, Bp With TC) Components
Courtesy of MAZDA MOTORS CORP.

BEFORE SERVICE PRECAUTION (BP, BP WITH TC)

2005 Mazda MX-5 Miata

2005 ENGINE PERFORMANCE Fuel System - MX-5 Miata

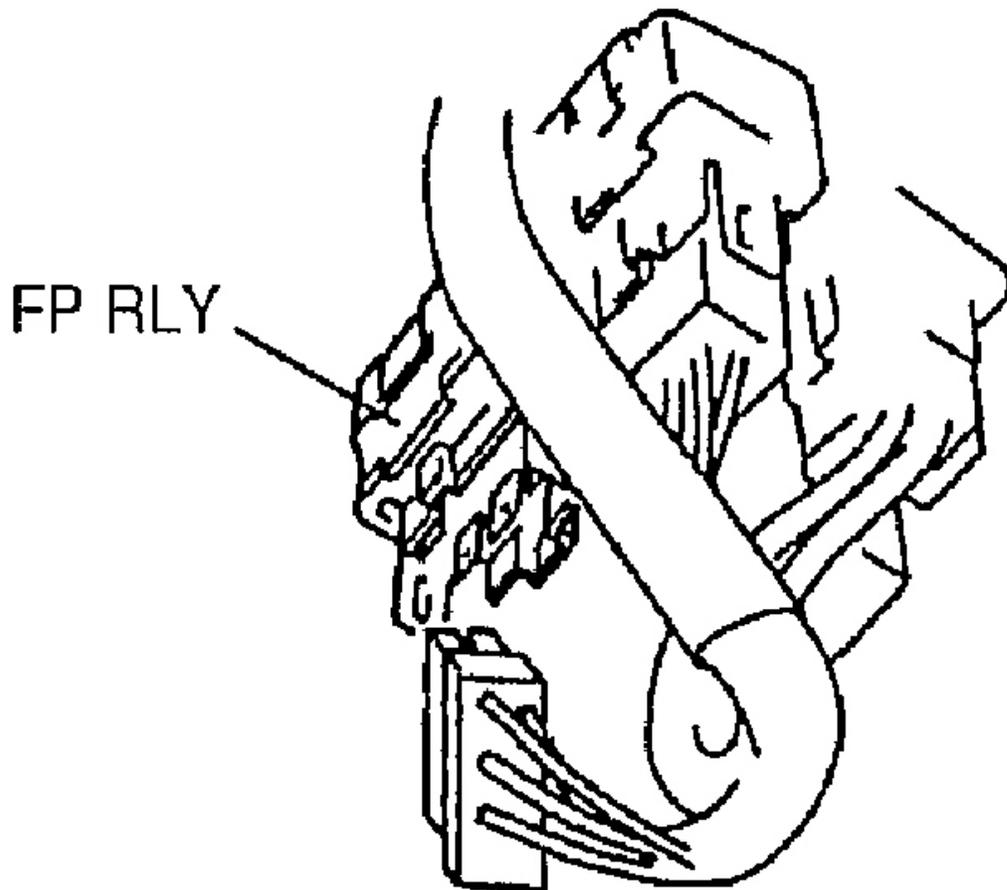
WARNING:

- Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the **FUEL LINE SAFETY PROCEDURE**.

FUEL LINE SAFETY PROCEDURE

NOTE:

- Fuel in the fuel system is under high pressure also when the engine is not running.
1. Remove the fuel-filler cap and release the pressure in the fuel tank.
 2. Disconnect the fuel pump relay (FP RLY) connector (6-pin type connector:4 terminal) located above the accelerator pedal (AP).



G03637808

Fig. 2: Disconnecting Fuel Pump Relay (FP RLY) Connector
Courtesy of MAZDA MOTORS CORP.

3. Start the engine.
4. After the engine stalls, crank the engine several times.
5. Turn the ignition switch to the LOCK position.
6. Connect the FP RLY connector.

AFTER SERVICE PRECAUTION (BP, BP WITH TC)

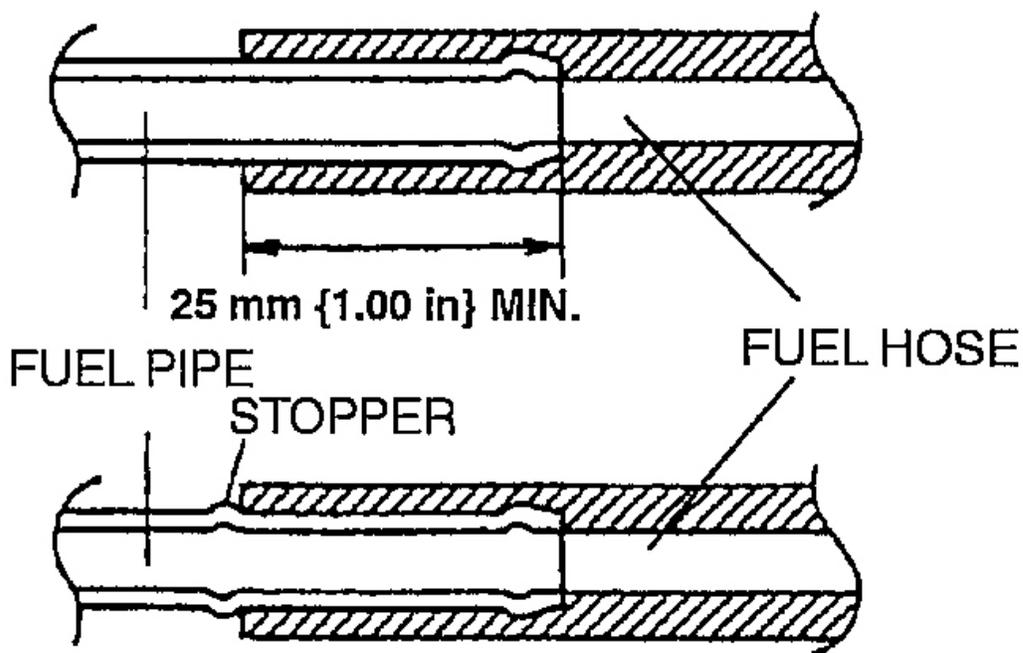
WARNING:

- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. When installing the fuel

hose, observe "Fuel Hose Installation" and "Fuel Leakage Inspection" described below.

FUEL HOSE INSTALLATION

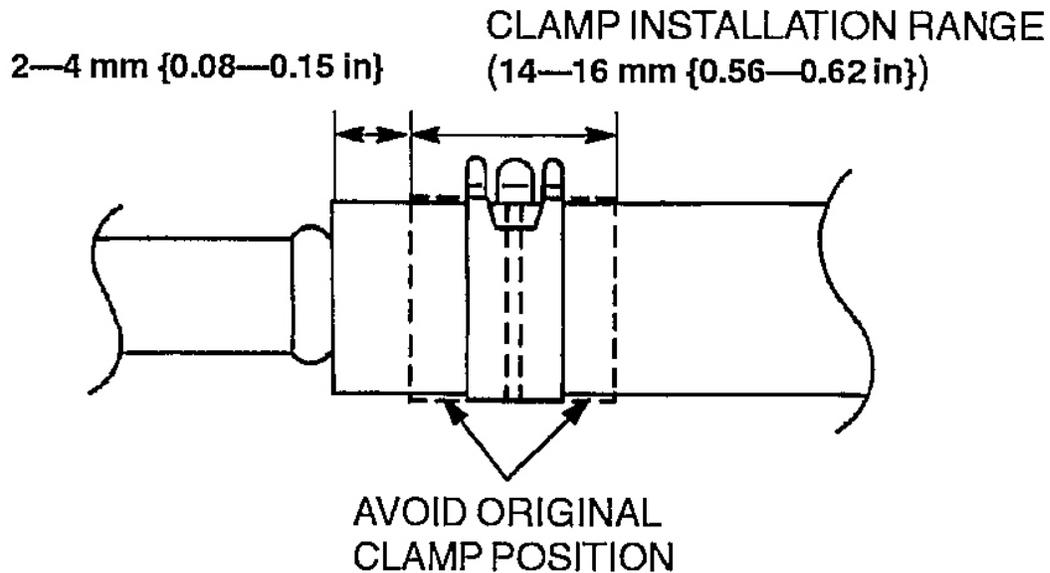
1. Replace damaged or deformed fuel hoses, fuel pipes, and hose clamps.
2. When installing the fuel hose onto the fuel pipe, fit the hose onto the pipe over **25 mm {1.00 in}**. When the pipe has a stopper, fit the hose until it contacts the stopper.



G03637809

Fig. 3: Installing Fuel Hose Onto Fuel Pipe
Courtesy of MAZDA MOTORS CORP.

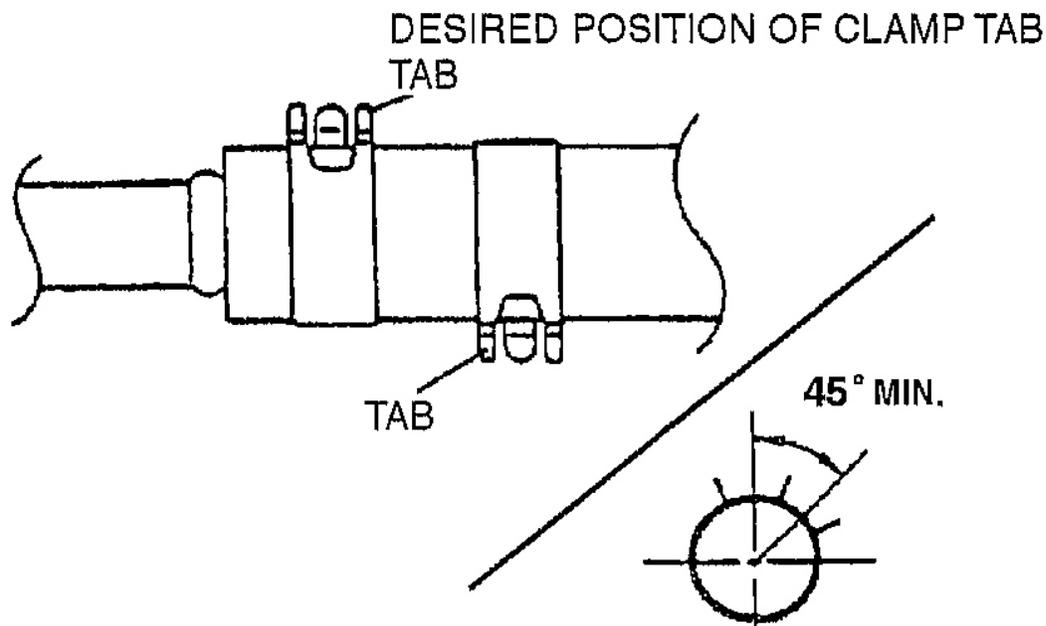
3. Install a hose clamp over the fuel hose within the clamp installation range as shown, avoiding the original clamp position.



G03637810

Fig. 4: Installing Hose Clamp Over Fuel Hose Within Clamp
Courtesy of MAZDA MOTORS CORP.

4. When installing two clamps, their tabs must be positioned **more than 45° (desired 180°)** apart.



G03637811

Fig. 5: Installing Clamps
Courtesy of MAZDA MOTORS CORP.

FUEL LEAKAGE INSPECTION

WARNING:

- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.

CAUTION:

- Connecting to the wrong DLC terminals may cause a malfunction. Carefully connect only to the specified terminals.

1. Short the DLC terminals F/P and body GND using a jumper wire.

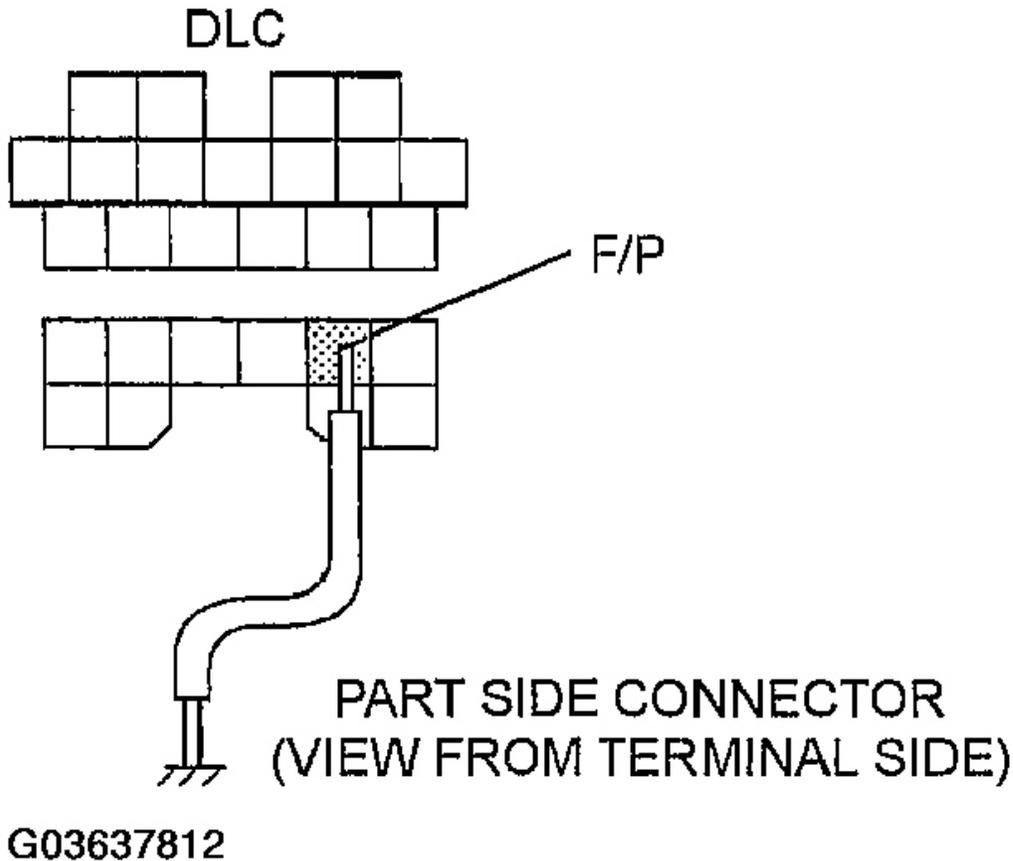


Fig. 6: Shorting DLC Terminals F/P And Body Gnd Using Jumper Wire
 Courtesy of MAZDA MOTORS CORP.

2. Turn the ignition switch to the ON position to operate the fuel pump.
3. Pressurize the system this way for **at least 5 min** to be sure of no leakage.
 - If there is fuel leakage, inspect for damaged fuel hoses, hose clamps, and fuel pipe sealing surface and replace if necessary.
4. After repair, assemble the system and repeat Steps 1 to 3.

FUEL LINE PRESSURE INSPECTION (BP, BP WITH TC)

WARNING:

- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.

1. Complete the "BEFORE SERVICE PRECAUTION". (See **BEFORE SERVICE PRECAUTION (BP, BP WITH TC)**(+))
2. Disconnect the negative battery cable.
3. Disconnect the fuel pipe on the pulsation damper No.1 outlet side. Set the **SST** between the pulsation damper No.1 and the fuel distributor as shown in the figure. (See **FUEL INJECTOR REMOVAL/INSTALLATION (BP, BP WITH TC)**(+))

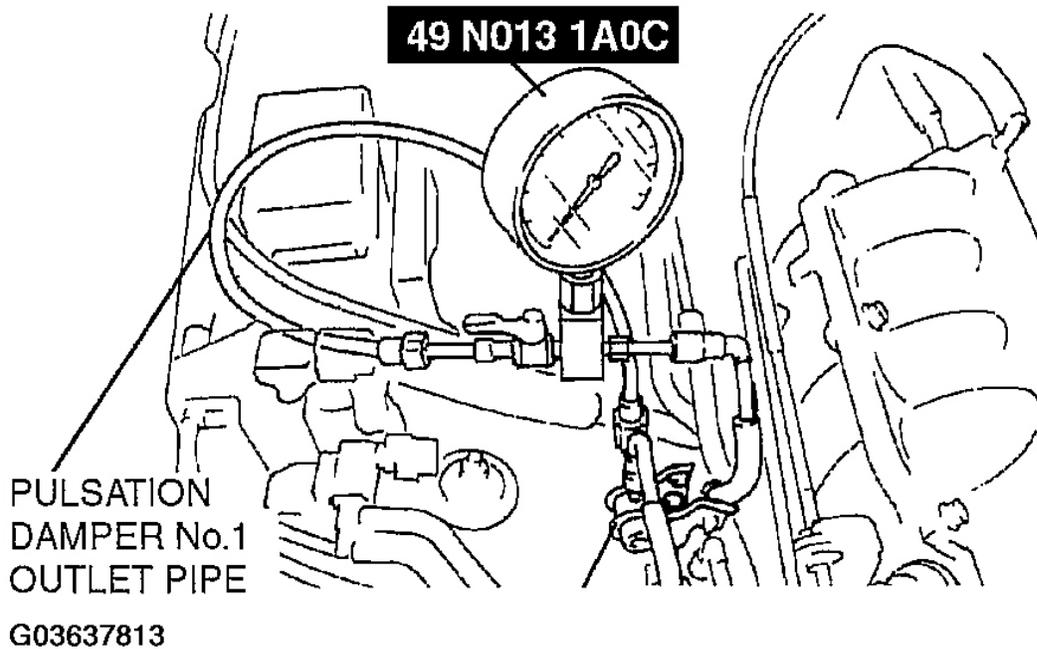


Fig. 7: Setting SST Between Pulsation Damper No.1 And Fuel Distributor
 Courtesy of MAZDA MOTORS CORP.

NOTE:

- Verify that a click is heard when the SST is pushed into pulsation damper No.1.

4. Pull the connector by hand and verify that it is installed securely. Visually inspect that the tabs of the retainer are securely fitted into the connector.
5. Connect the negative battery cable.
6. Verify that AT vehicles are in the N range, and MT vehicles are in the neutral position.
7. Start the engine and idle it. Measure the fuel line pressure.
 - If not as specified, inspect the following:

Zero or low

2005 Mazda MX-5 Miata

2005 ENGINE PERFORMANCE Fuel System - MX-5 Miata

- FP circuit
- FP
- Main fuel line (clogged)
- Fuel leakage inside pressure regulator

High

- Pressure regulator due to high pressure
- Return fuel line (clogged)

Fuel line pressure

370-420 kPa {3.7-4.3 kgf/cm², 53-61 psi}

8. Observe the fuel pressure gauge indicator during heavy acceleration.
9. Verify that the fuel pressure fluctuation is within the specification during the test.
 - If not as specified, inspect the following:
 - PCM
 - FP
 - Fuel line for improper routing, kinks or leakage

Fuel pressure fluctuation

370-420 kPa {3.7-4.3 kgf/cm², 53-61 psi}

10. Turn the ignition switch to the LOCK position.
11. Measure the fuel hold pressure **after 5 min.**
 - If not as specified, inspect the following:
 - FP hold pressure
 - Fuel injector for leakage
 - Fuel line for improper routing, kinks or leakage

Fuel hold pressure

More than 250 kPa {2.55 kgf/cm², 36.3 psi}

12. Disconnect the **SST** and connect the fuel pipe to the pulsation damper No.1. (See **FUEL INJECTOR REMOVAL/INSTALLATION (BP, BP WITH TC)**)(+)
13. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION (BP, BP WITH TC)**)(+)

FUEL PRESSURE HOLD INSPECTION (BP, BP WITH TC)

WARNING:

- Fuel line spills and leakage are dangerous. Fuel can ignite and

cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.

1. Complete the "BEFORE SERVICE PRECAUTION". (See **BEFORE SERVICE PRECAUTION (BP, BP WITH TC)**)(+)
2. Disconnect the negative battery cable.
3. Disconnect the fuel pipe on the pulsation damper No.1 outlet side. Set the **SST** between pulsation damper No.1 and the fuel distributor as shown in the figure. (See **FUEL INJECTOR REMOVAL/INSTALLATION (BP, BP WITH TC)**)(+)

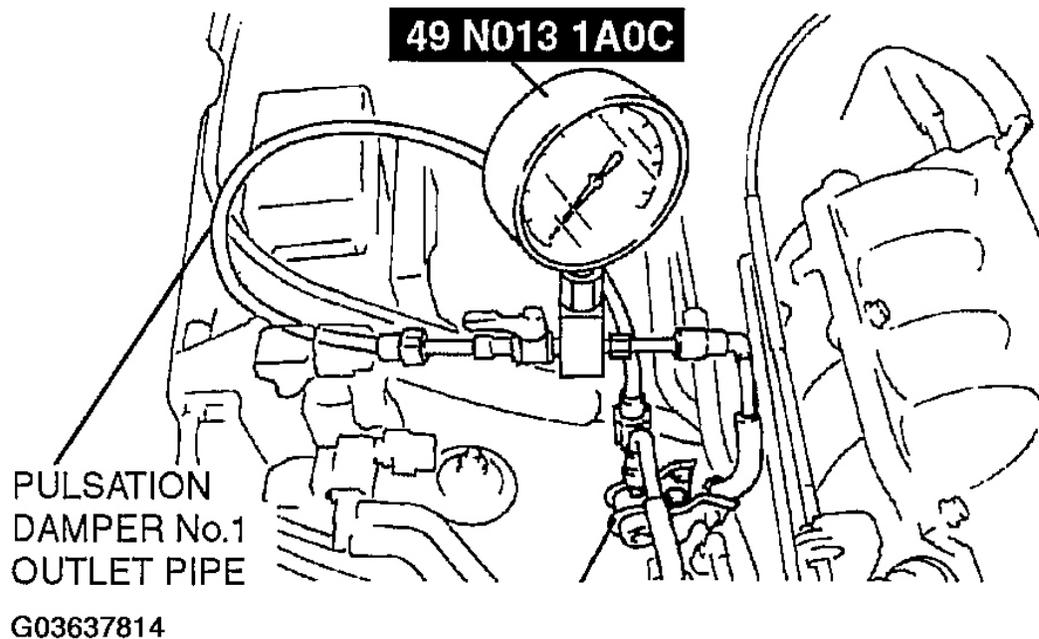


Fig. 8: Setting SST Between Pulsation Damper No.1 And Fuel Distributor
Courtesy of MAZDA MOTORS CORP.

NOTE:

- Verify that a click is heard when the SST is pushed into pulsation damper No.1.

4. Pull the connector by hand and verify that it is installed securely. Visually inspect that the tabs of the retainer are securely fitted into the connector.
5. Connect the negative battery cable.
6. Verify that AT vehicles are in the N range and MT vehicles are in the neutral position, then start the engine.
7. Observe the fuel pressure gauge indicator during heavy acceleration.

8. Verify that the fuel pressure holds steady within specification during the test.

Fuel hold pressure

370-420 kPa {3.7-4.3 kgf/cm², 53-61 psi}

9. Disconnect the **SST** and connect the fuel pipe to pulsation damper No.1. (See **FUEL INJECTOR REMOVAL/INSTALLATION (BP, BP WITH TC)**(+)
 - If not as specified, inspect fuel hold pressure. (See **FUEL PRESSURE HOLD INSPECTION (BP, BP WITH TC)**(+))

FUEL TANK REMOVAL/INSTALLATION (BP, BP WITH TC)

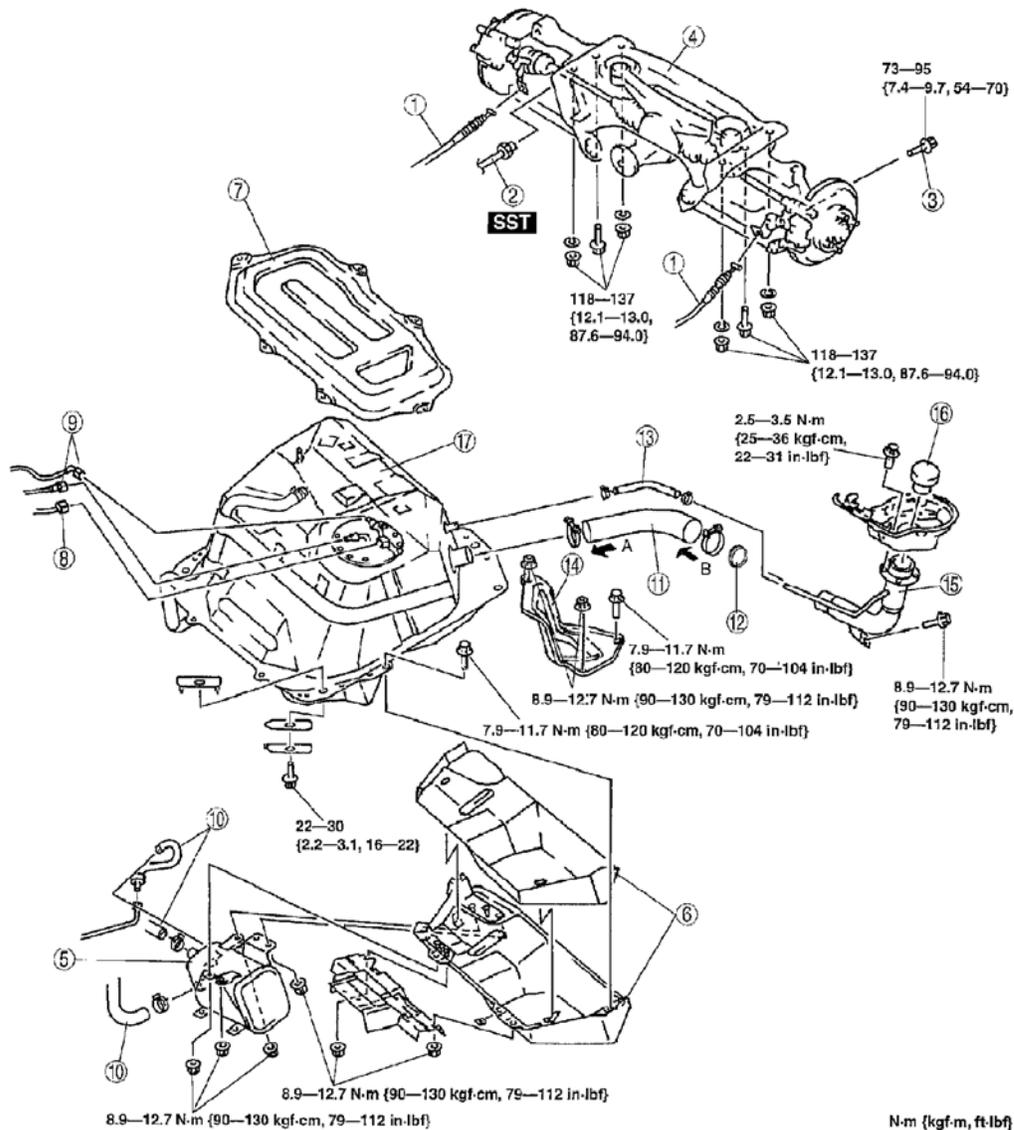
WARNING:

- Repairing a fuel tank that has not been properly steam cleaned can be dangerous. Explosion or fire may cause death or serious injury. Always properly steam clean a fuel tank before repairing it.

1. Complete the "BEFORE SERVICE PRECAUTION". (See **BEFORE SERVICE PRECAUTION (BP, BP WITH TC)**(+))
2. Disconnect the negative battery cable.
3. Siphon the fuel from the fuel tank. (See **FUEL DRAWING NOTE**(+))
4. Remove the middle pipe (BP) or the presilencer (BP WITH TC). (See **EXHAUST SYSTEM REMOVAL/INSTALLATION (BP)** (+) (See **EXHAUST SYSTEM REMOVAL/INSTALLATION (BP WITH TC)** (+))
5. Remove the propeller shaft. (See **PROPELLER SHAFT REMOVAL/INSTALLATION** (+))
6. Remove the power plant frame. (See **MANUAL TRANSMISSION REMOVAL/INSTALLATION (M15M-D)** (+) (See **AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION** (+))
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.
9. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION (BP, BP WITH TC)**(+))

2005 Mazda MX-5 Miata

2005 ENGINE PERFORMANCE Fuel System - MX-5 Miata



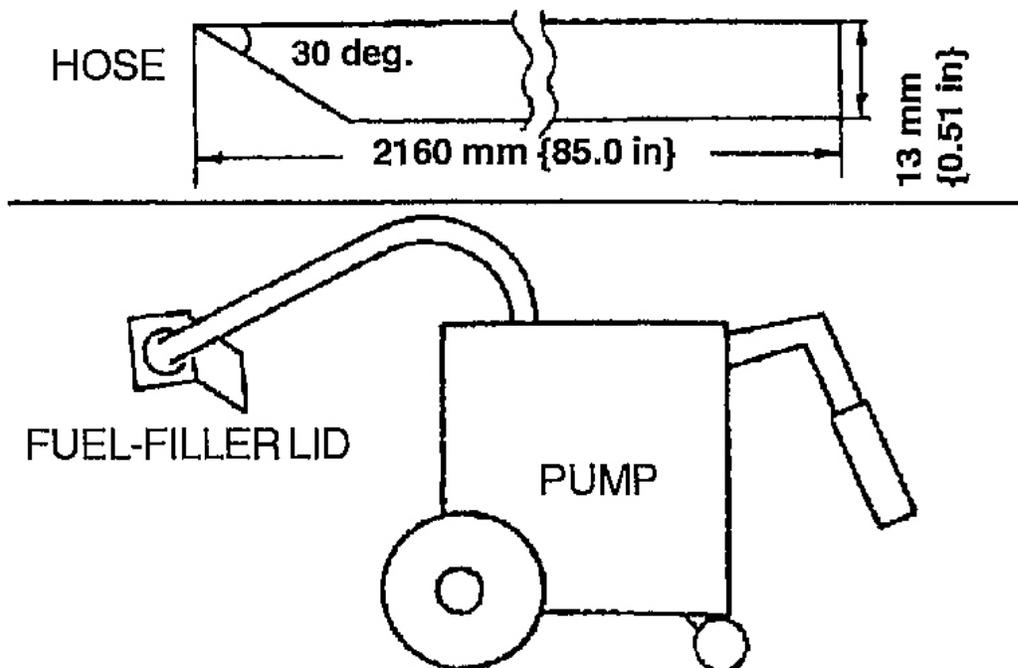
1	Parking brake cable (See PARKING BRAKE CABLE REMOVAL/INSTALLATION)
2	Brake pipe (See AIR BLEEDING)
3	Shock absorber bolt
4	Rear crossmember component (See Rear Crossmember Component Removal Note)
5	Charcoal canister
6	Fuel tank insulator
7	Service hole cover
8	Connector
9	Plastic fuel hose (See Plastic Fuel Hose Disassembly Note) (See Plastic Fuel Hose Assembly Note)
10	Evaporative hose (See Breather Hose, Evaporative Hose Installation Note)
11	Joint hose (See Joint Hose Installation Note)

12	Nonreturn valve (See NONRETURN VALVE INSPECTION [BP, BP WITH TC])
13	Breather hose (See Breather Hose, Evaporative Hose Installation Note)
14	Dust cover
15	Fuel-filler pipe
16	Fuel-filler cap
17	Fuel tank

Fig. 9: Installing Fuel Tank & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

FUEL DRAWING NOTE

1. Remove the fuel-filler cap and insert a hose into the fuel tank through the fuel-filler pipe.
2. Siphon the fuel into a container using a fuel drawing pump.



G03637816

Fig. 10: Identifying Siphon Fuel Into A Container Using Fuel Drawing Pump
 Courtesy of MAZDA MOTORS CORP.

NOTE: • For ease of work, prepare a hose of the following size.

Specification

Outer diameter: 13 mm {0.51 in}

Length: 2160 mm {85.0 in} or longer

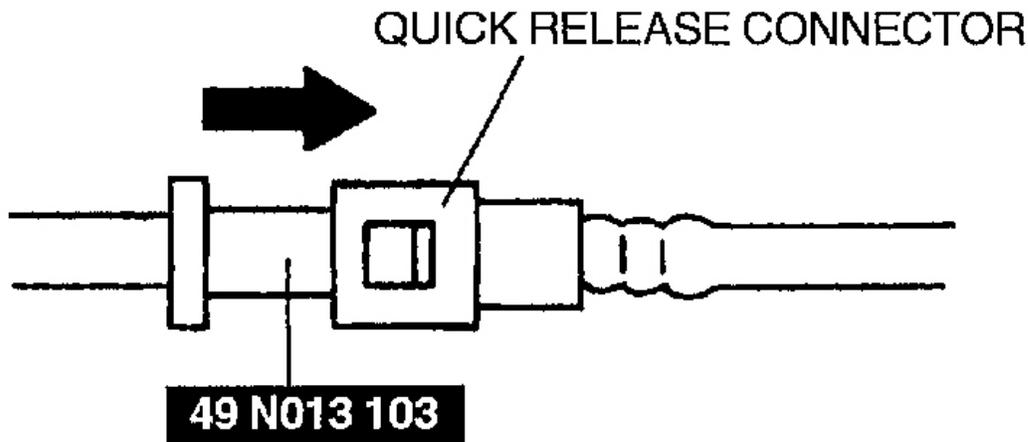
REAR CROSSMEMBER COMPONENT REMOVAL NOTE

1. Support the rear crossmember component using a transmission jack.
2. Remove the rear crossmember mounting bolts and nuts.
3. Lower the rear crossmember component.

PLASTIC FUEL HOSE DISASSEMBLY NOTE

CAUTION: • The retainer must be replaced if removed from the fuel pipe without using the SST. Otherwise, effectiveness of the retainer will be reduced.

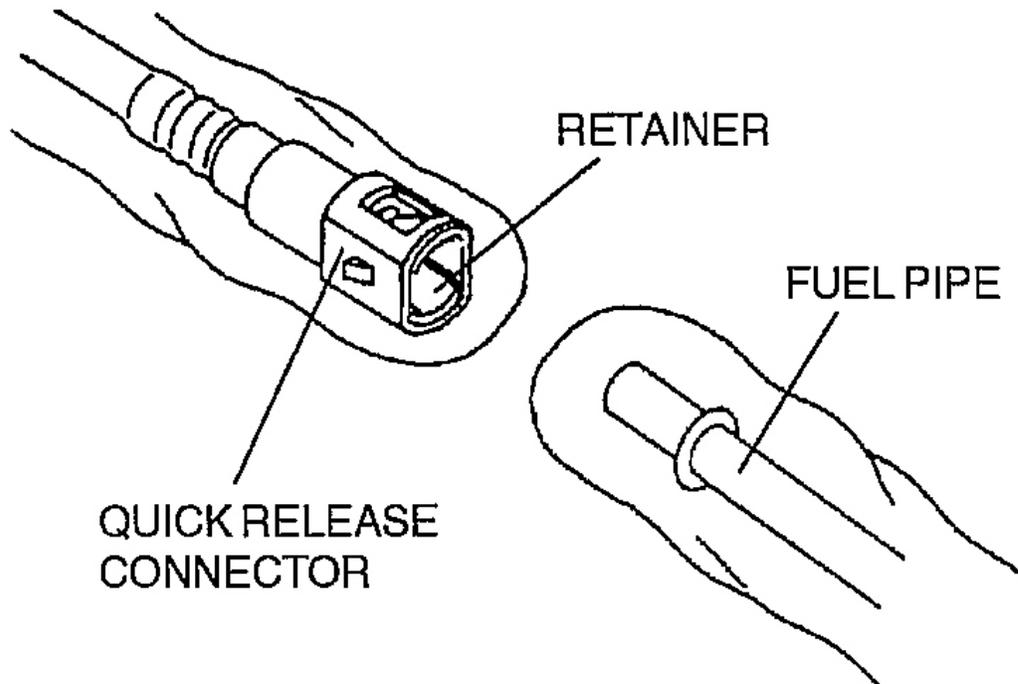
1. Verify that the quick release connector joint area is free of foreign material.
2. Clean if necessary.
3. Set the SST as shown and push it into the quick release connector to disconnect the plastic fuel hose.



G03637817

Fig. 11: Identifying Quick Release Connector
Courtesy of MAZDA MOTORS CORP.

4. Cover the disconnected quick release connector and fuel pipe to prevent them from being scratched or contaminated with foreign material.

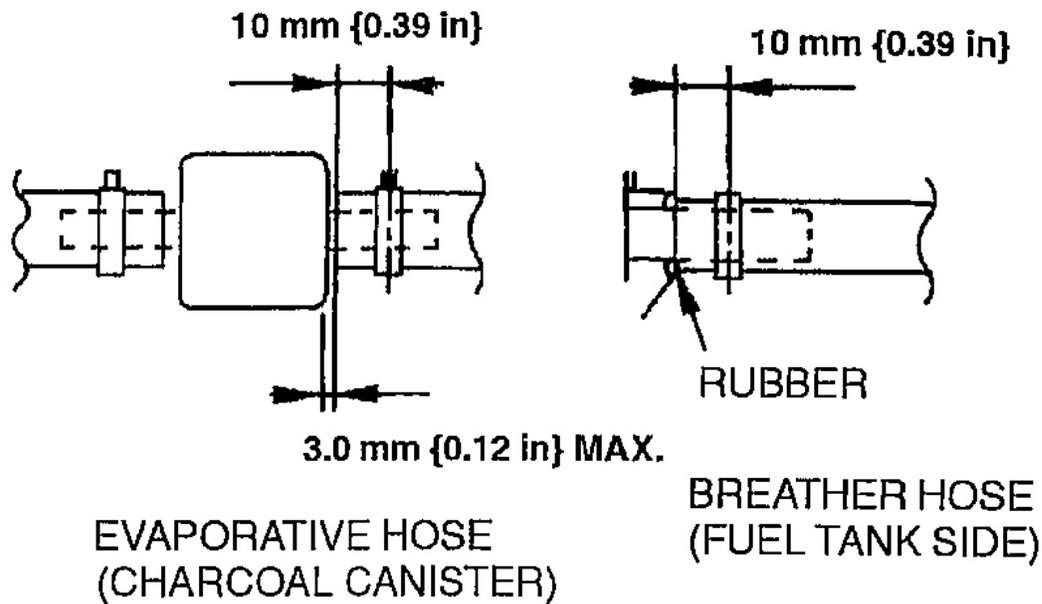


G03637818

Fig. 12: Disconnecting Quick Release Connector And Fuel Pipe
Courtesy of MAZDA MOTORS CORP.

BREATHER HOSE, EVAPORATIVE HOSE INSTALLATION NOTE

1. Fit each hose onto the respective fittings within specification, and install clamps as shown.



G03637819

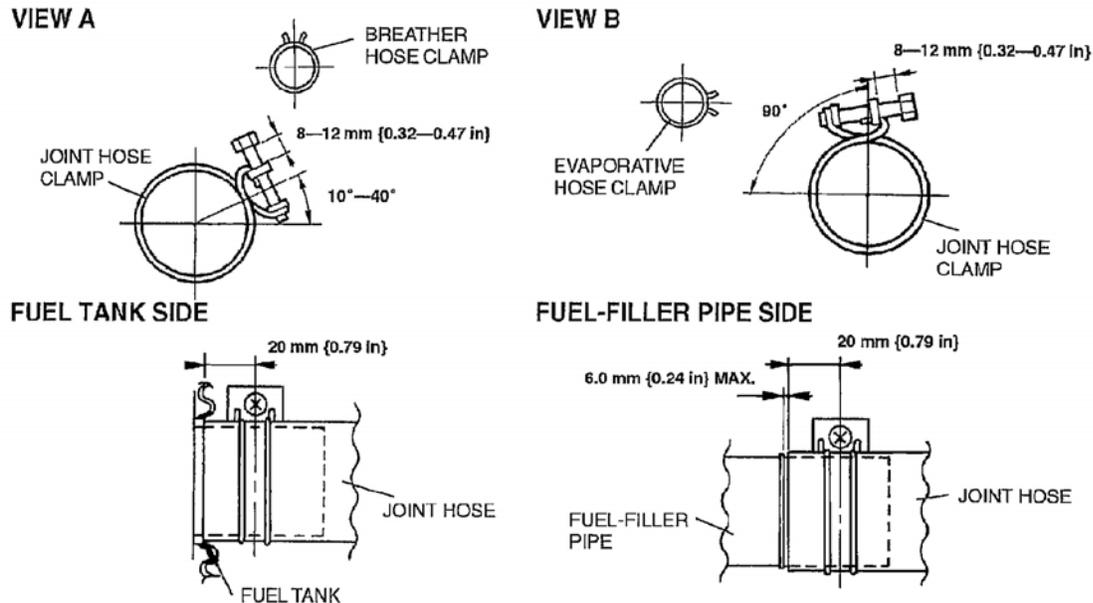
Fig. 13: Fitting Hose Within Specification
Courtesy of MAZDA MOTORS CORP.

JOINT HOSE INSTALLATION NOTE

1. Fit the joint hose onto the respective fittings within specification, and install clamps as shown.

2005 Mazda MX-5 Miata

2005 ENGINE PERFORMANCE Fuel System - MX-5 Miata

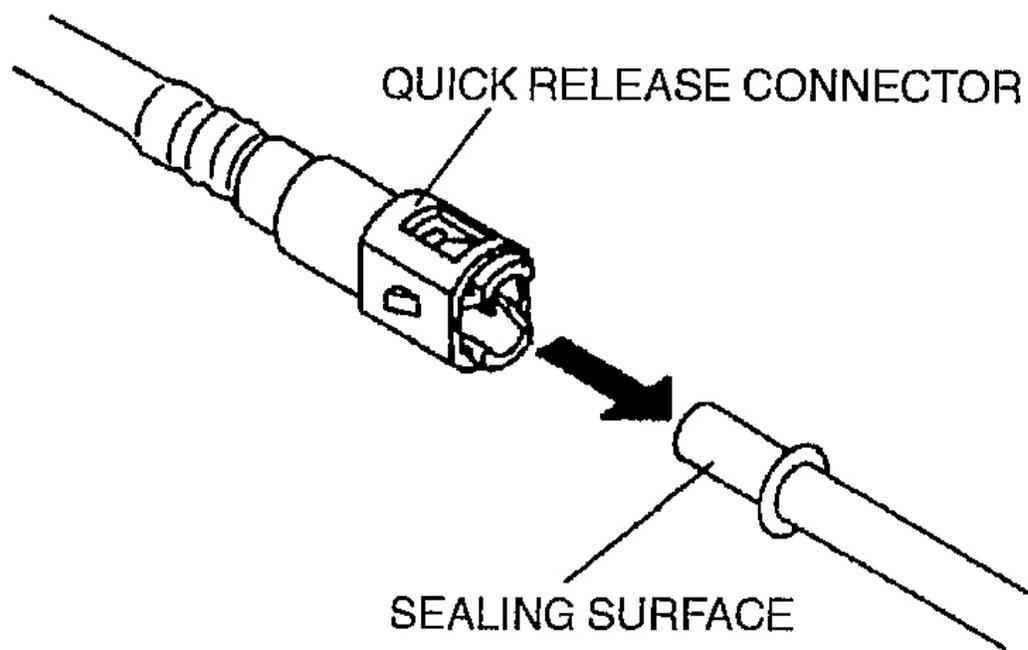


G03637820

Fig. 14: Fitting Joint Hose Within Specification
Courtesy of MAZDA MOTORS CORP.

PLASTIC FUEL HOSE ASSEMBLY NOTE

1. Verify that the inside of the fuel pipe and the quick release connector is free of foreign material and damage.
2. Clean if necessary, taking care not to damage the sealing surfaces.
3. Push the quick release connector into the fuel pipe until a click is heard.
4. Pull the quick release connector by hand and verify that it is installed securely.

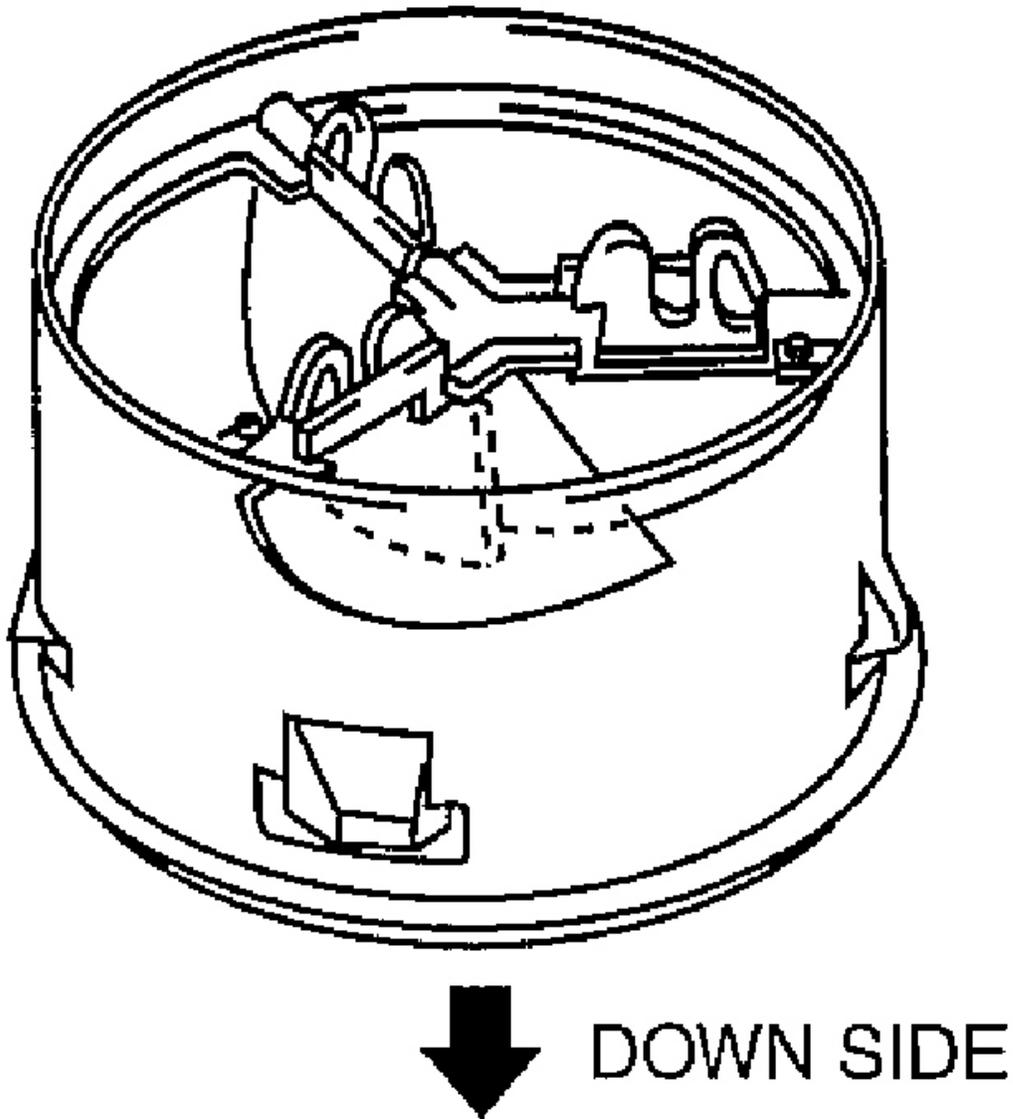


G03637821

Fig. 15: Pulling Quick Release Connector
Courtesy of MAZDA MOTORS CORP.

NONRETURN VALVE INSPECTION (BP, BP WITH TC)

1. Remove the nonreturn valve. (See FUEL TANK REMOVAL/INSTALLATION (BP, BP WITH TC) (+))
2. Verify that the nonreturn valve operates under its own weight.
 - If the valve does not operate, replace the nonreturn valve.



G03637822

Fig. 16: Removing Nonreturn Valve
Courtesy of MAZDA MOTORS CORP.

FUEL PUMP (FP) REMOVAL/INSTALLATION (BP, BP WITH TC)

WARNING: • Fuel line spills and leakage are dangerous. Fuel can ignite and

2005 Mazda MX-5 Miata

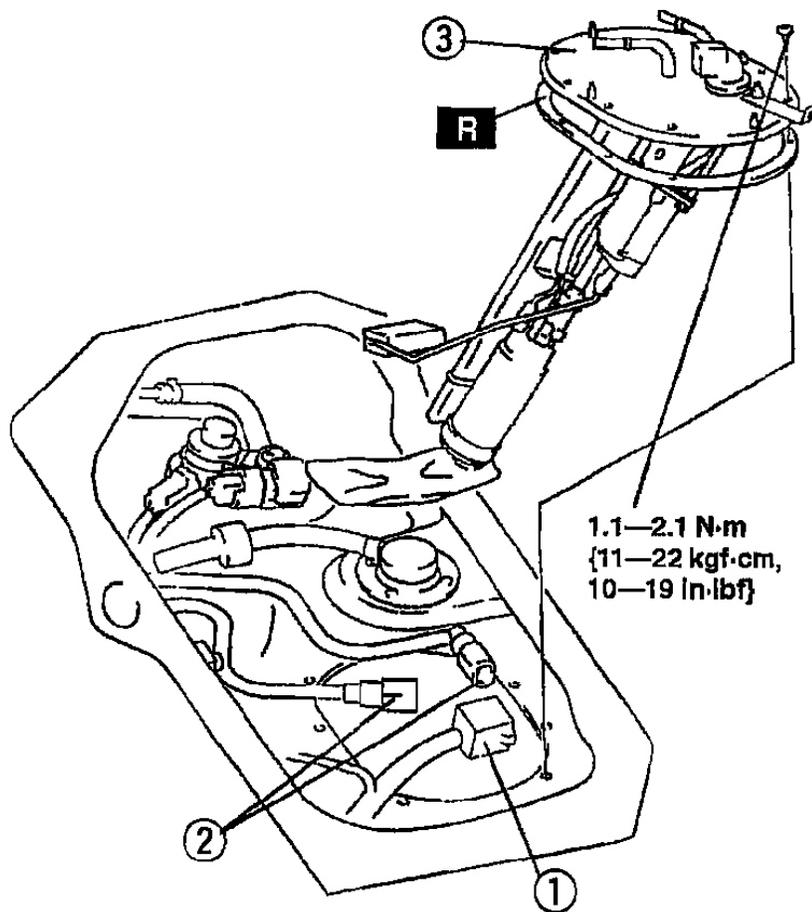
2005 ENGINE PERFORMANCE Fuel System - MX-5 Miata

cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, do not damage the sealing surface of the FP unit when removing or installing.

CAUTION:

- **Disconnecting/connecting the quick release connector without cleaning it may cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.**

1. Complete the "BEFORE SERVICE PRECAUTION". (See **BEFORE SERVICE PRECAUTION (BP, BP WITH TC)**)(+)
2. Disconnect the negative battery cable.
3. Uncover the rear package trim.
4. Remove the service hole cover.
5. Remove in the order indicated in the table.



1	Connector
2	Plastic fuel hose (See Plastic Fuel Hose Disassembly Note) (See Plastic Fuel Hose Assembly Note)
3	FP

G03637823

Fig. 17: Installing Fuel Pump (FP) & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

6. Install in the reverse order of removal.
7. Complete the "AFTER SERVICE PRECAUTION". (See AFTER SERVICE PRECAUTION (BP, BP WITH TC)(+))

FUEL PUMP (FP) DISASSEMBLY/ASSEMBLY (BP, BP WITH TC)

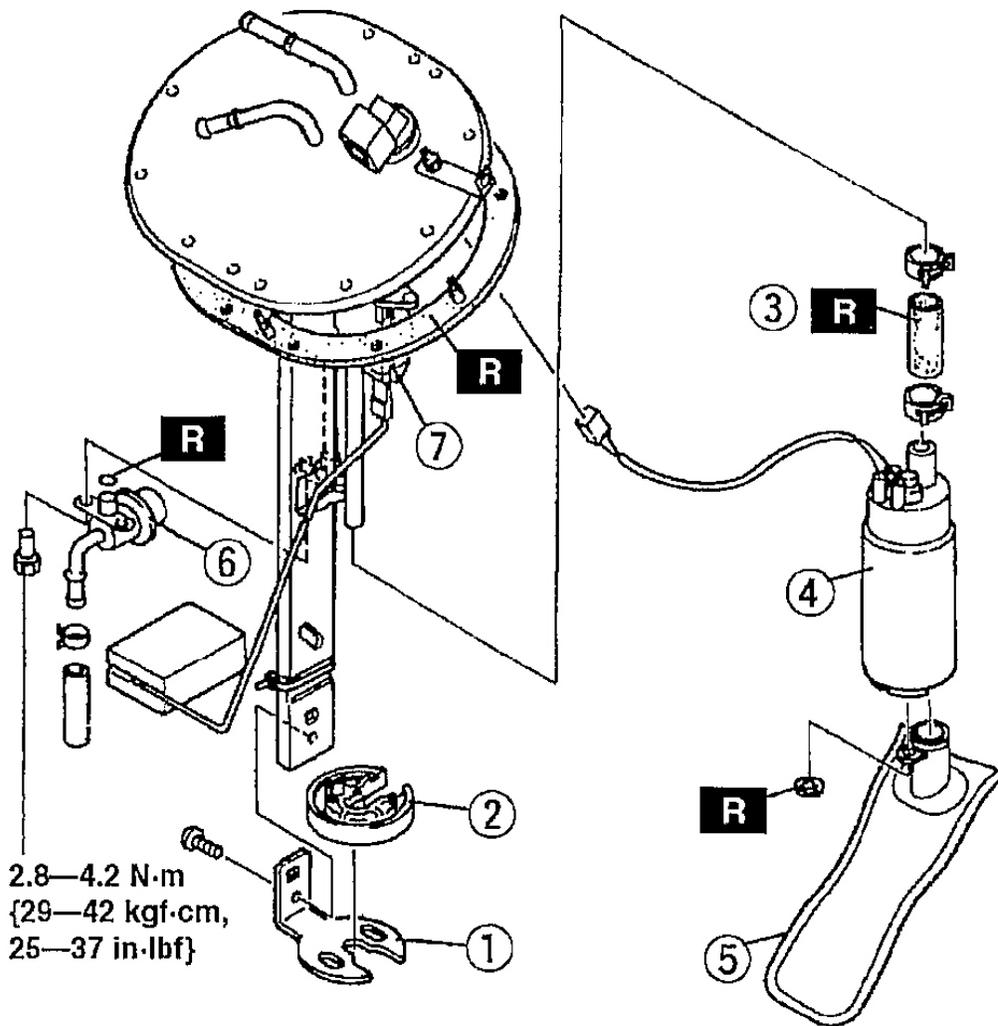
2005 Mazda MX-5 Miata

2005 ENGINE PERFORMANCE Fuel System - MX-5 Miata

1. Disassemble in the order indicated in the table.

2005 Mazda MX-5 Miata

2005 ENGINE PERFORMANCE Fuel System - MX-5 Miata



1	Bracket
2	Rubber mount
3	Fuel hose (See Fuel Hose Assembly Note)
4	FP (See FP Assembly Note)
5	Fuel filter (low-pressure)
6	Pressure regulator
7	Fuel gauge sender unit

Fig. 18: Disassembling Fuel Pump (FP) & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

2. Assemble in the reverse order of disassembly.

FP ASSEMBLY NOTE

1. After installing the FP to the bracket, pull the pump down so that it is flush against the bracket and there is no gap.

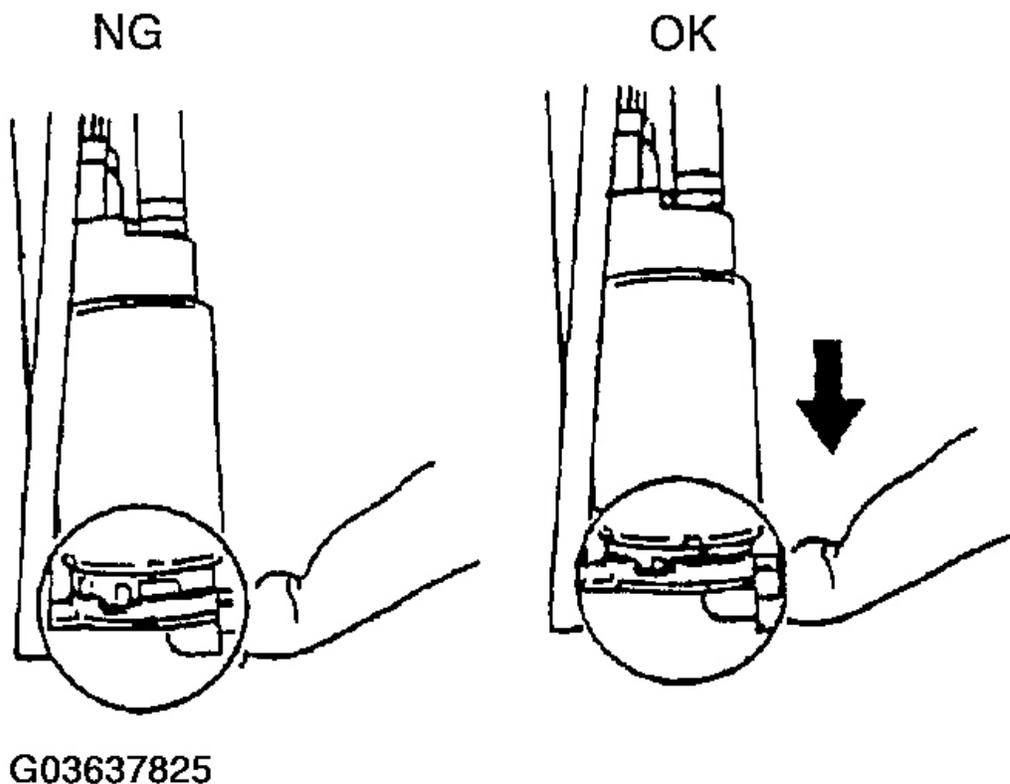
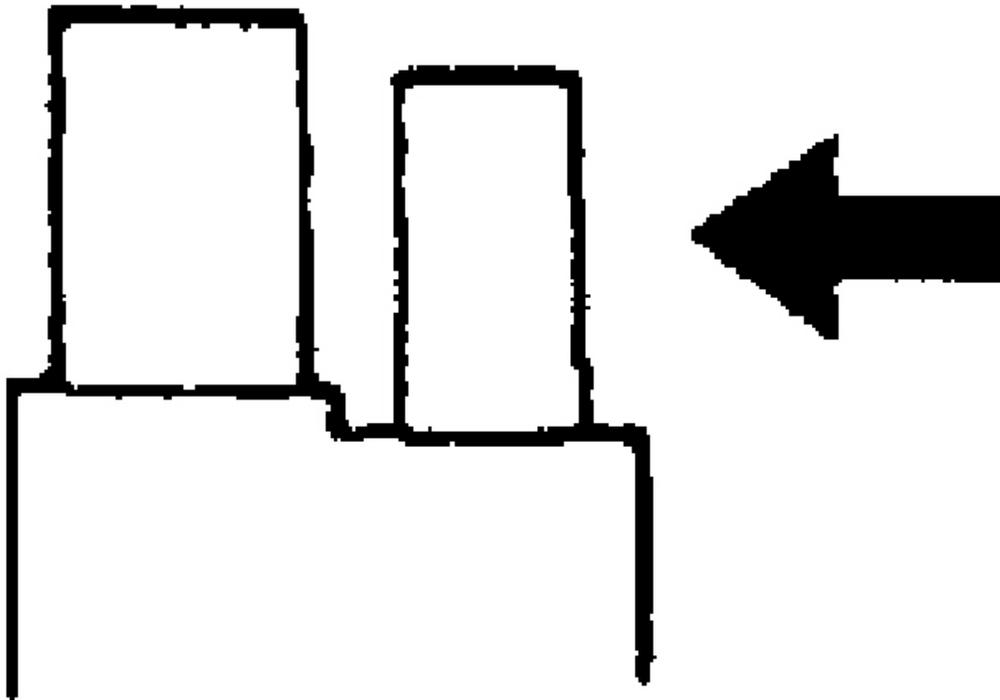


Fig. 19: Installing FP To Bracket
Courtesy of MAZDA MOTORS CORP.

FUEL HOSE ASSEMBLY NOTE

1. Do not apply excessive side force when pushing the fuel hose onto the FP nipple.

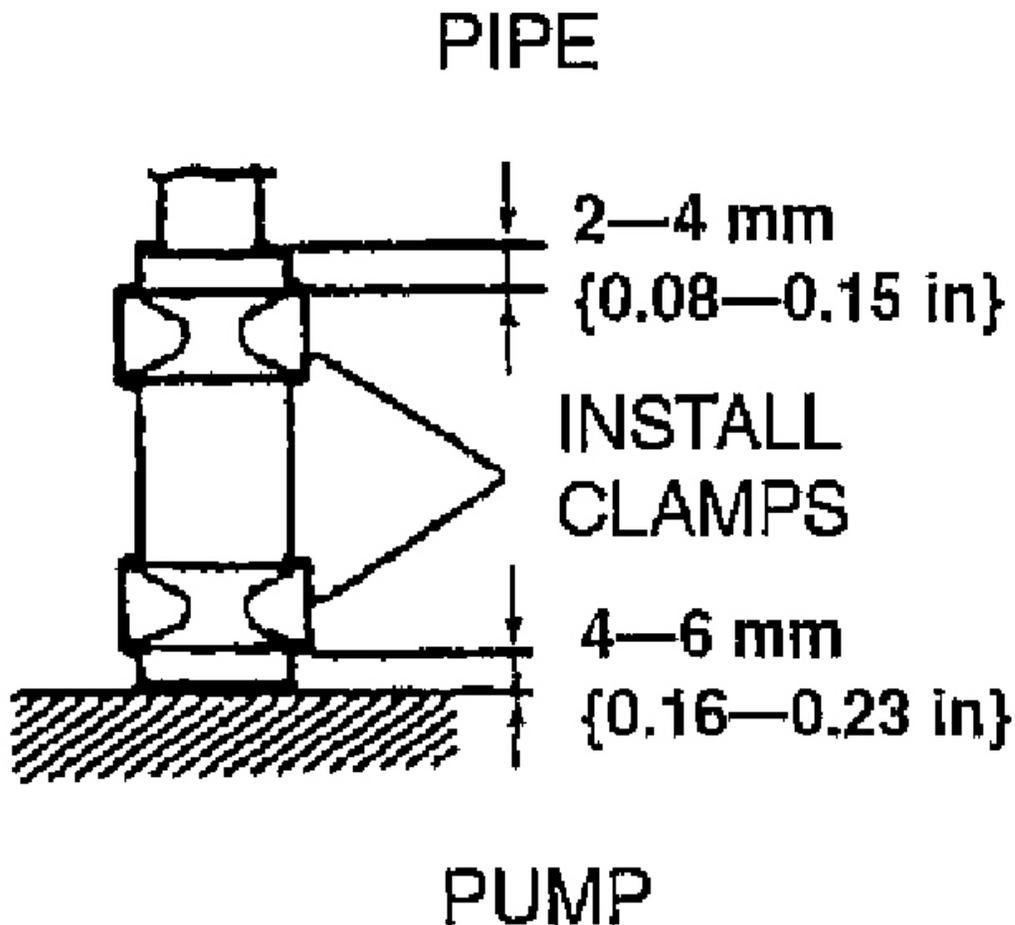
NG



G03637826

Fig. 20: Assembling Fuel Hose Assembly
Courtesy of MAZDA MOTORS CORP.

2. Install the clamps as shown.



G03637827

Fig. 21: Installing Clamps
Courtesy of MAZDA MOTORS CORP.

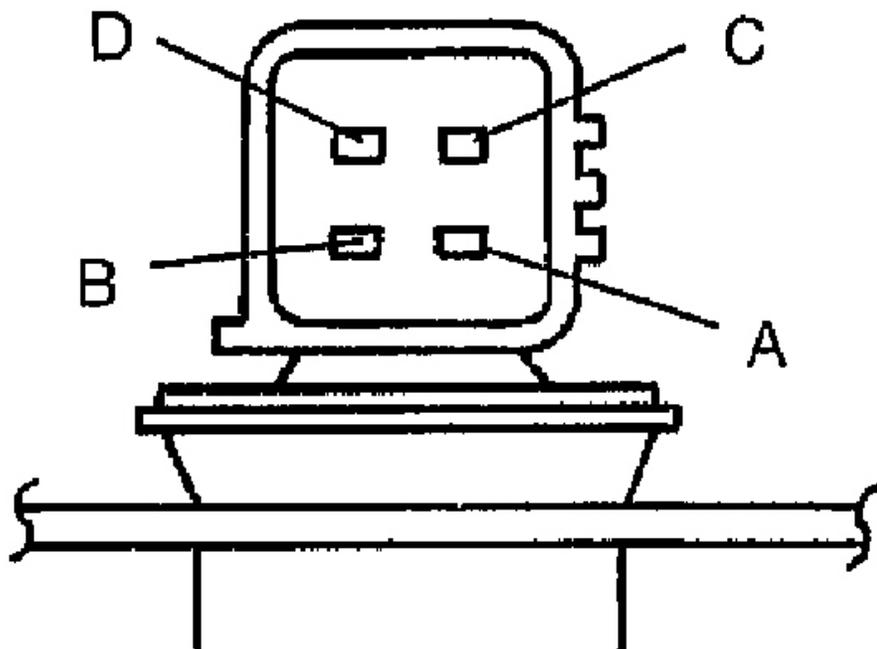
FUEL PUMP (FP) INSPECTION (BP, BP WITH TC)

CONTINUITY INSPECTION

NOTE: • Perform the following test only when directed.

1. Disconnect the negative battery cable.
2. Remove the service hole cover.

3. Disconnect the FP connector.
4. Inspect for continuity between FP connector terminals B and D.
 - If there is no continuity, replace the FP body.
 - If as specified, carry out the "Circuit Open/Short Inspection".



**PART SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)**

G03637828

Fig. 22: Inspecting Continuity Between FP Connector Terminals
Courtesy of MAZDA MOTORS CORP.

CIRCUIT OPEN/SHORT INSPECTION

1. Inspect the following wiring harness for an open or short circuit. (Continuity check).

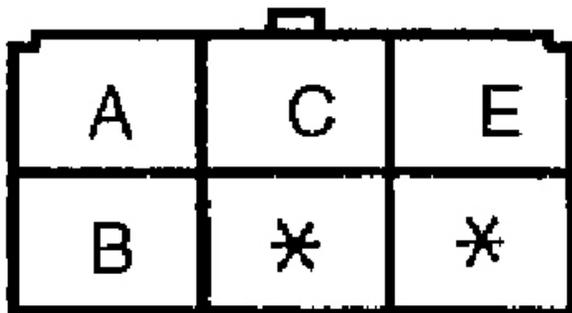
Open circuit

- If there is no continuity, the circuit is open.

Repair or replace the harness.

- GND circuit (FP connector terminal D and body GND)
- Power circuit (fuel pump relay (FP RLY) connector terminal C and FP connector terminal B through common connector)

FUEL PUMP RELAY (FP RLY)



HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)

G03637829

Fig. 23: Identifying Fuel Pump Relay (FP RLY) Connector Terminal
Courtesy of MAZDA MOTORS CORP.

Short circuit

- If there is no continuity, the circuit is shorted.

Repair or replace the harness.

2005 Mazda MX-5 Miata

2005 ENGINE PERFORMANCE Fuel System - MX-5 Miata

- FP RLY connector terminal C and FP

connector terminal B through common connector to GND

FUEL PUMP (FP) PRESSURE INSPECTION

WARNING:

- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.

CAUTION:

- Disconnecting/connecting the quick release connector without cleaning it may cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting using a cloth or soft brush, and make sure that it is free of foreign material.

NOTE:

- Perform the following test only when directed.

1. Complete the "BEFORE SERVICE PRECAUTION". (See **BEFORE SERVICE PRECAUTION (BP, BP WITH TC)(+)**)
2. Disconnect the negative battery cable.
3. Lift up the vehicle with safety stands.
4. Remove the fuel filter cover.
5. Verify that the quick release connector joint area is free of foreign material.
6. Clean if necessary.
7. Set the **SST** to the fuel filter outlet pipe and push it into the quick release connector, and disconnect the fuel pipe.
 - If removal of the retainer is required, remove it by squeezing the tabs of the retainer.

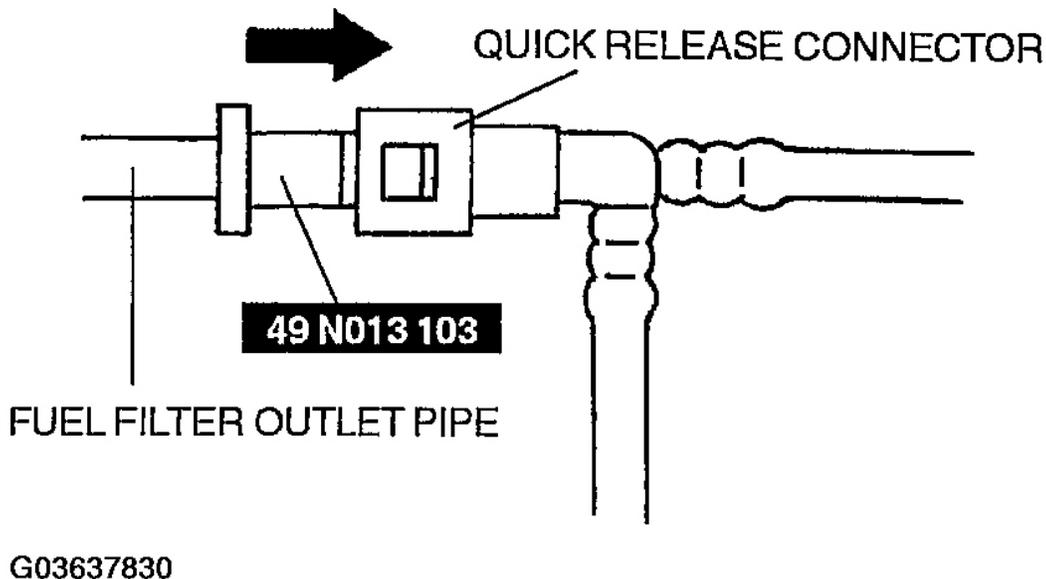


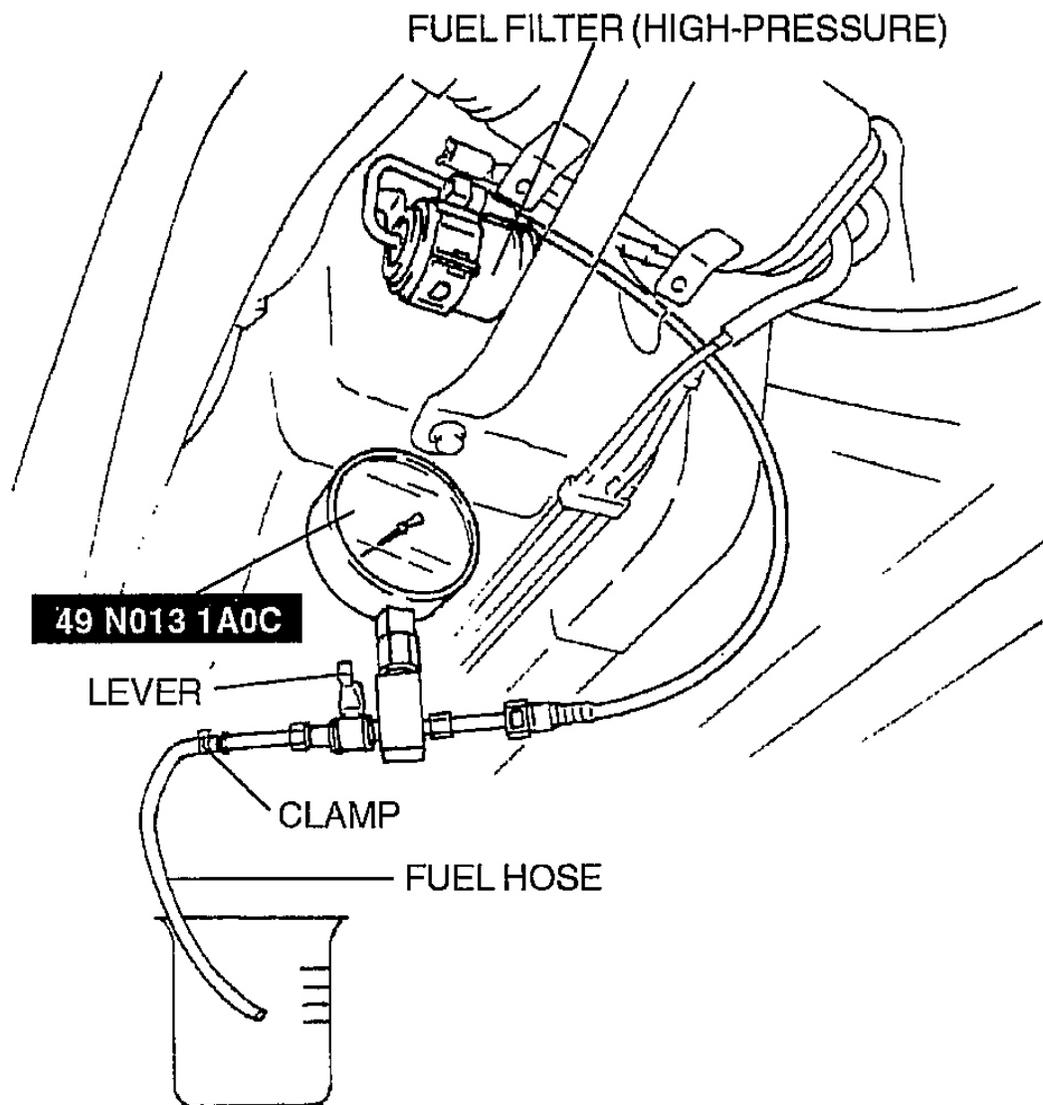
Fig. 24: Disconnecting Fuel Pipe
Courtesy of MAZDA MOTORS CORP.

- CAUTION:**
- Removing the retainer from the disconnected fuel pipe will reduce the effectiveness of the retainer. The retainer must be replaced when any of the following applies:
 1. Scratches or damage is observed on the retainer.
 2. Fuel pipe has been replaced.
 3. Fuel filter (high-pressure) has been replaced.

8. Cover the disconnected quick release connector and fuel filter outlet pipe to prevent them from being scratched or contaminated with foreign material.
9. Turn the lever as shown in **Fig. 25** to plug the **SST** outlet.
10. Push the **SST** into the fuel filter outlet pipe until a click is heard.
11. Connect a fuel hose and clamp to the **SST** outlet pipe.
12. Set the fuel hose into a container to avoid fuel spills.
13. Pull the quick release connector by hand and verify that it is installed securely.
14. Connect the negative battery cable.

- CAUTION:**
- Connecting to the wrong DLC terminals may cause a malfunction. Carefully connect only to the specified terminals.

- Short the DLC terminals F/P and body GND using a jumper wire.



G03637831

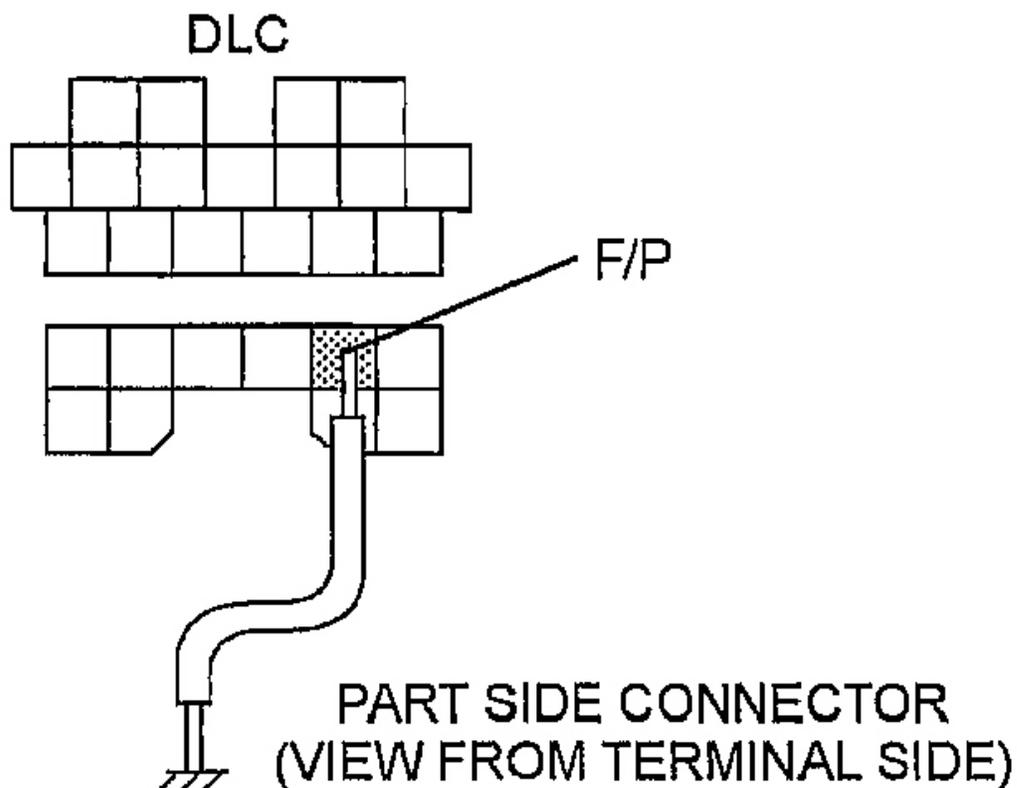
Fig. 25: Setting Fuel Hose Into A Container To Fuel Spills
Courtesy of MAZDA MOTORS CORP.

- Turn the lever **90°** against the hose of the SST.
- Turn the ignition switch to the ON position to operate the FP.
- Measure the FP maximum pressure.
 - If not as specified, inspect the following:

- FP
- FP RLY
- Fuel filter for clogging
- Fuel line for clogging or leakage

FP maximum pressure

Less than 637 kPa {6.5 kgf/cm², 92 psi}



G03637832

Fig. 26: Shorting DLC Terminals F/P And Body Gnd
Courtesy of MAZDA MOTORS CORP.

19. Turn the ignition switch to the ON position for **10 s** to operate the FP.
20. Turn the ignition switch to the LOCK position.
21. Measure the FP hold pressure **after 5 min.**

- If not as specified, replace the FP.

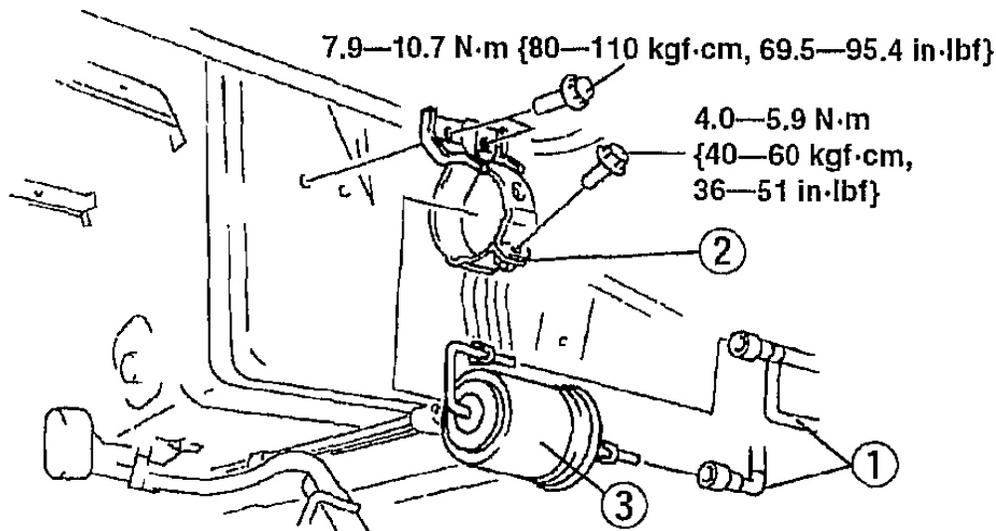
FP hold pressure

More than 343 kPa {3.5 kgf/cm², 50 psi}

22. Disconnect the jumper wire.
23. Disconnect the **SST**.
24. Inspect the fuel pipe for kinks.
25. Replace the fuel pipe if necessary.
26. Verify that the inside of the fuel filter outlet pipe and the quick release connector is free of foreign material and damage.
27. Clean if necessary, taking care not to damage the sealing surfaces.
28. Push the fuel pipe into the fuel filter outlet pipe until a click is heard.
29. Pull the quick release connector by hand and verify that it is installed securely.
30. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION (BP, BP WITH TC)**)(+)

FUEL FILTER (HIGH-PRESSURE) REMOVAL/INSTALLATION (BP, BP WITH TC)

1. Complete the "BEFORE SERVICE PRECAUTION". (See **BEFORE SERVICE PRECAUTION (BP, BP WITH TC)**)(+)
2. Disconnect the negative battery cable.
3. Raise the rear of the vehicle and support it with safety stands.
4. Remove the fuel filter protector.
5. Remove in the order indicated in the table.



1	Plastic fuel hose (See Plastic Fuel Hose Disassembly Note) (See Plastic Fuel Hose Assembly Note)
2	Fuel filter bracket
3	Fuel filter (high-pressure) (See Fuel Filter (High-pressure) Removal Note) (See Fuel Filter (High-pressure) Installation Note)

G03637833

Fig. 27: Identifying Fuel Filter (High-Pressure) (BP, BP With TC) & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

6. Install in the reverse order of removal.
7. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION (BP, BP WITH TC)** (+))

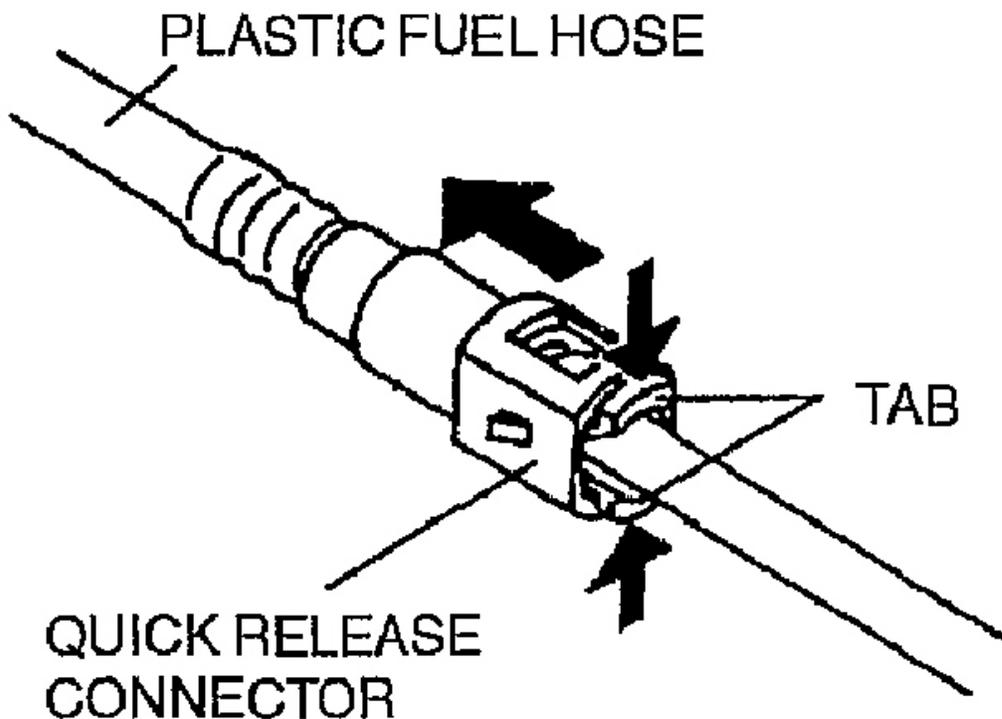
PLASTIC FUEL HOSE DISASSEMBLY NOTE

1. Verify that the quick release connector joint area is free of foreign material.
2. Clean if necessary.

- Squeeze the tabs of the retainer and disconnect the quick release connector.

CAUTION:

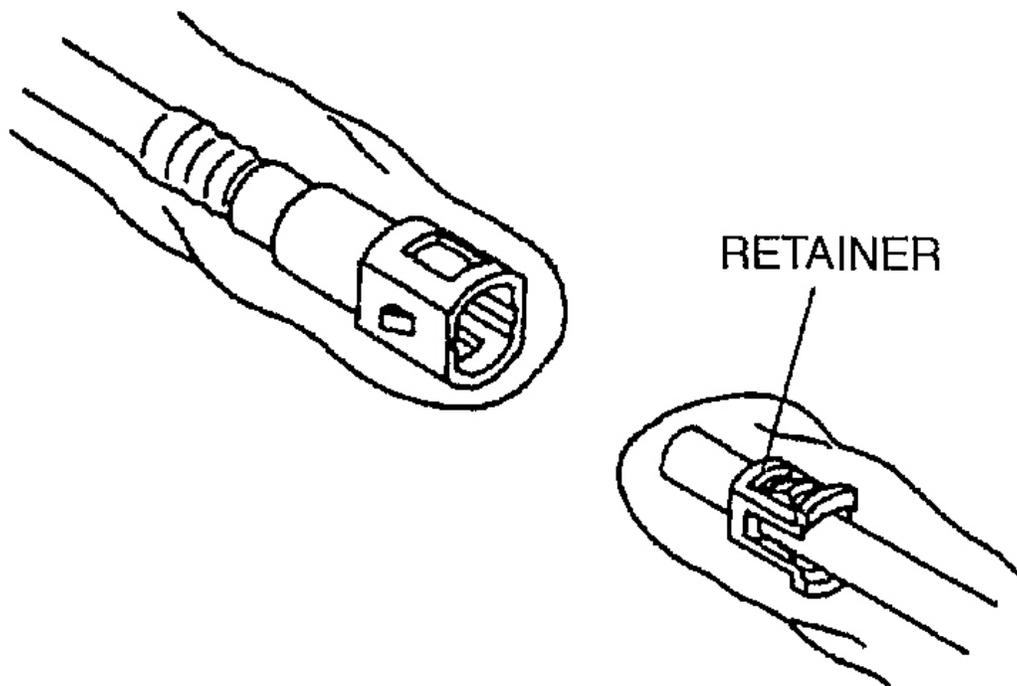
- Removing the retainer from the disconnected fuel pipe will reduce the effectiveness of the retainer. The retainer must be replaced when any of the following applies:
 - Retainer has been removed.
 - Scratches or damage is observed on the retainer.
 - Plastic fuel hose has been replaced.
 - Fuel filter (high-pressure) has been replaced.



G03637834

Fig. 28: Disconnecting Quick Release Connector
Courtesy of MAZDA MOTORS CORP.

- Cover the disconnected quick release connector and fuel pipe to prevent them from being scratched or contaminated with foreign materials.
 - If removal of the retainer is required, remove it in the following procedure:



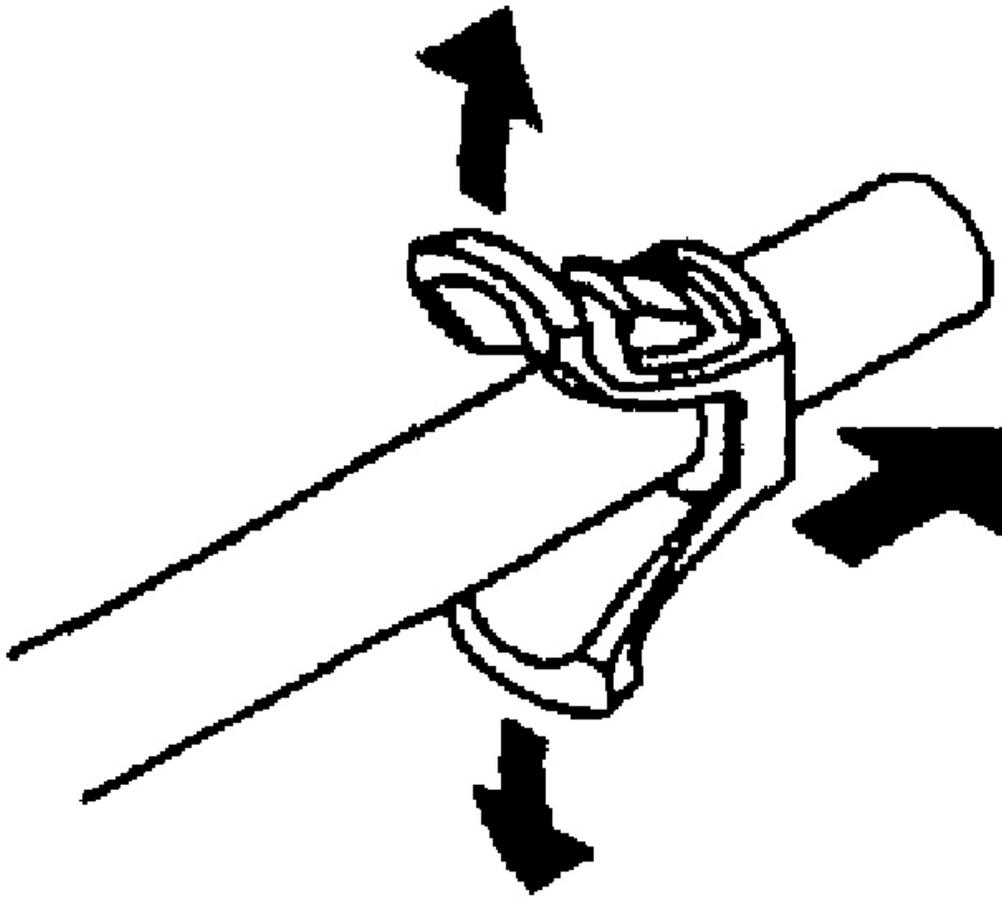
G03637835

Fig. 29: Removing Retainer
Courtesy of MAZDA MOTORS CORP.

CAUTION:

- Removing the retainer using a tool can damage the fuel pipe and cause fuel leakage. Remove the retainer by opening the tabs outward by hand.

1. Open the tabs of the retainer outward.
2. Remove and discard the retainer.

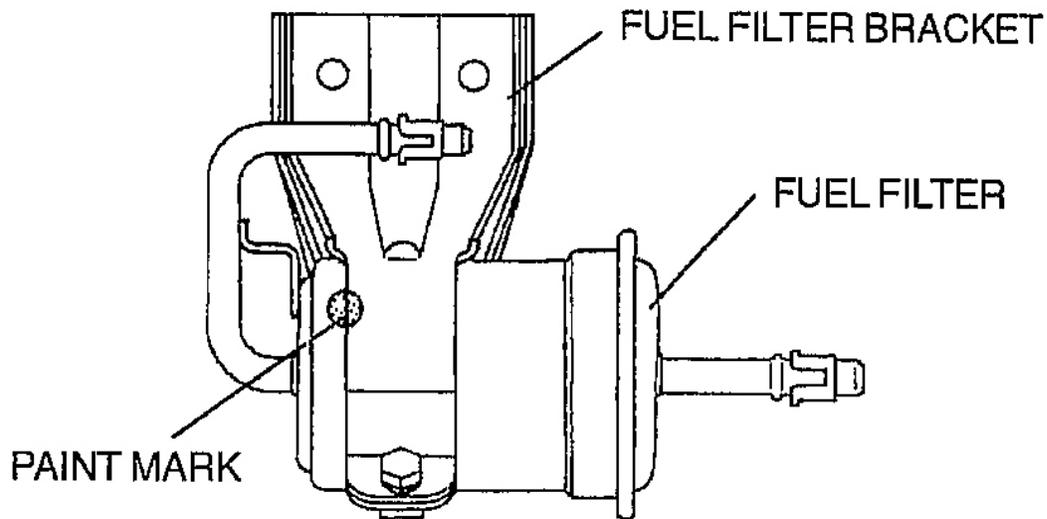


G03637836

Fig. 30: Discarding Retainer
Courtesy of MAZDA MOTORS CORP.

FUEL FILTER (HIGH-PRESSURE) REMOVAL NOTE

1. Before removing the fuel filter, paint mark the fuel filter and fuel filter bracket for correct reassembly.



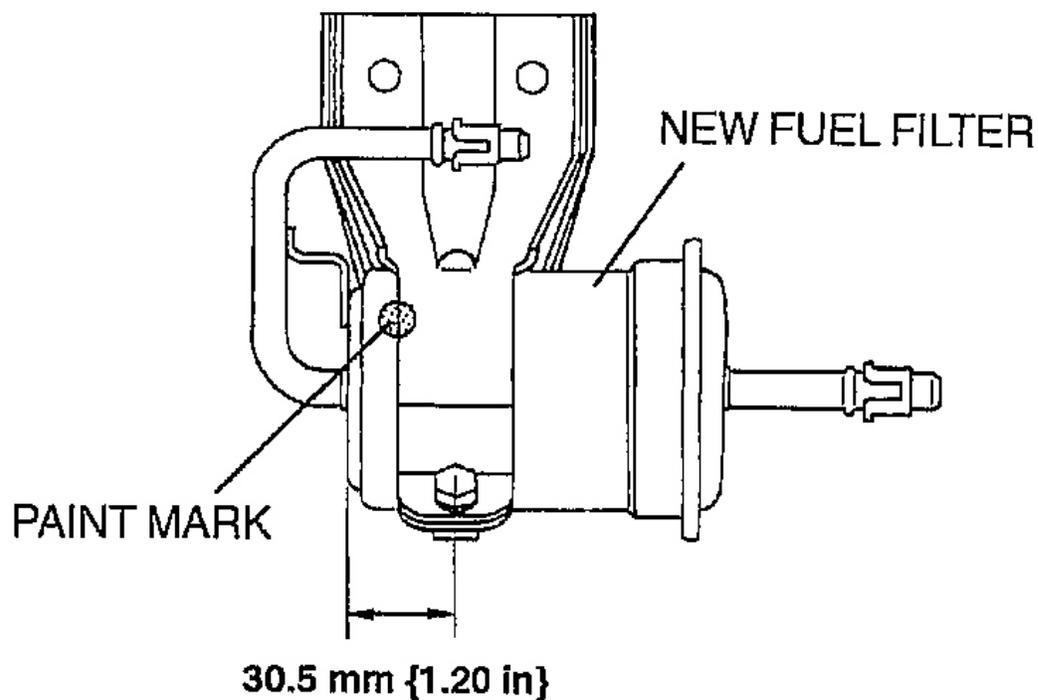
G03637837

Fig. 31: Removing Fuel Filter (High-Pressure)
Courtesy of MAZDA MOTORS CORP.

FUEL FILTER (HIGH-PRESSURE) INSTALLATION NOTE

Replacing the fuel filter:

1. Paint mark the new fuel filter on the same spot as the removed fuel filter.
2. Align the paint marks and install the fuel filter.

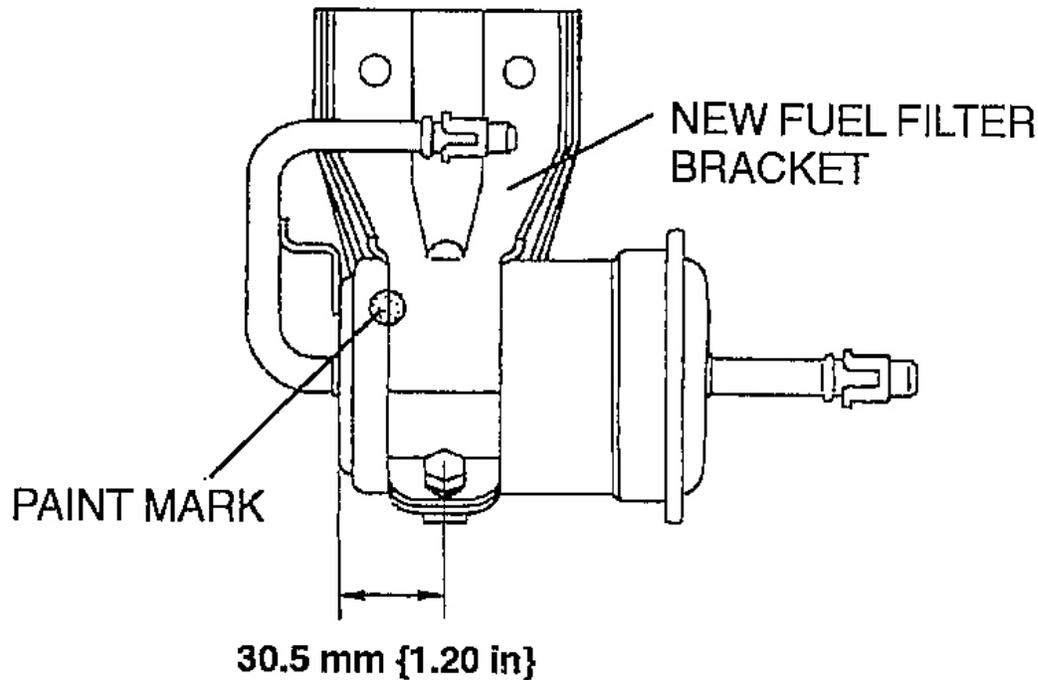


G03637838

Fig. 32: Aligning Paint Marks
Courtesy of MAZDA MOTORS CORP.

REPLACING THE FUEL FILTER BRACKET:

1. Paint mark the new fuel filter bracket on the same spot as the removed fuel filter bracket.
2. Align the paint marks and install the fuel filter bracket.



G03637839

Fig. 33: Installing Fuel Filter Bracket
Courtesy of MAZDA MOTORS CORP.

PLASTIC FUEL HOSE ASSEMBLY NOTE

1. When the retainer is not removed, observe the following procedure:
 1. Inspect the plastic fuel hose for kinks.
 2. Replace if necessary.
 3. Verify that the inside of the fuel pipe and the quick release connector is free of foreign material and damage.
 4. Clean if necessary, taking care not to damage the sealing surfaces.
 5. Align the fuel pipe and quick release connector so that the tabs of the retainer are correctly fitted into the quick release connector.
 6. Push the quick release connector into the retainer until a click is heard.
 7. Pull the quick release connector by hand and verify that it is installed securely.
 8. Visually inspect that the tabs of the retainer are securely fitted into the quick release connector.
2. When the retainer is removed, observe the following procedure:

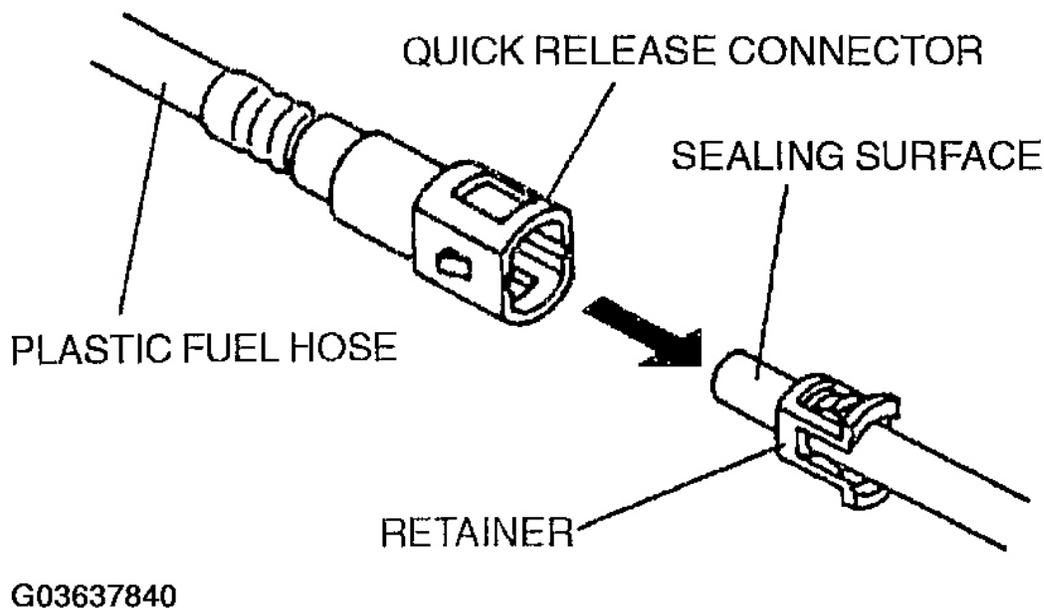
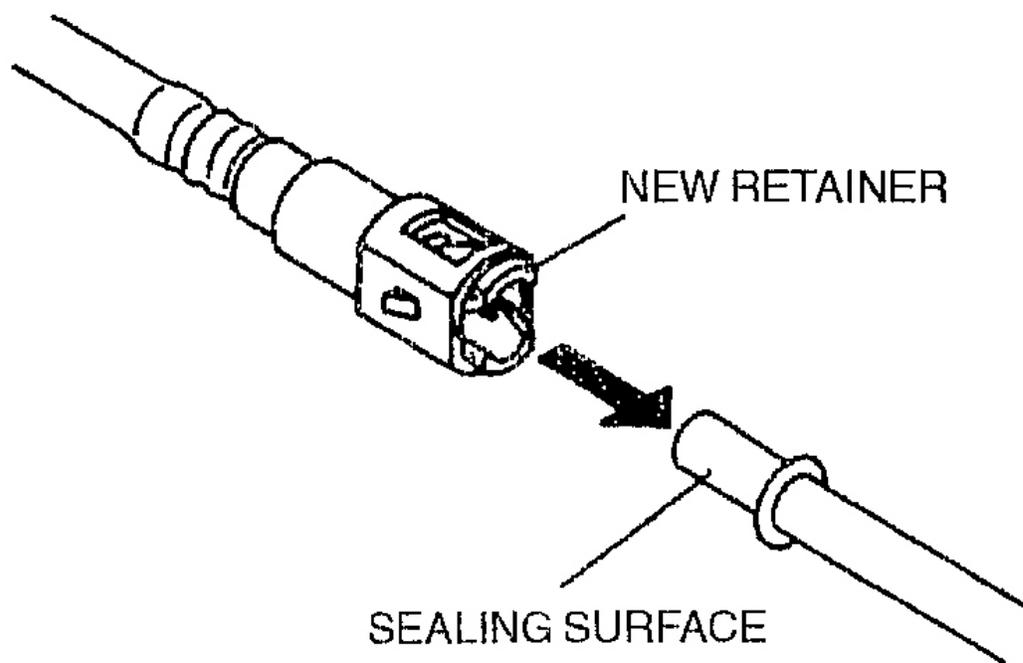


Fig. 34: Pushing Quick Release Connector
Courtesy of MAZDA MOTORS CORP.

NOTE:

- Use the designated genuine retainer only.

1. Install a new retainer onto the quick release connector.
2. Visually inspect that the tabs of the retainer are securely fitted into the quick release connector.
3. Verify that the inside of the fuel pipe and the quick release connector are free of foreign material and damage.
4. Clean if necessary, taking care not to damage the sealing surfaces.
5. Push the quick release connector into the fuel pipe until a click is heard.
6. Pull the quick release connector by hand and verify that it is installed securely.



G03637841

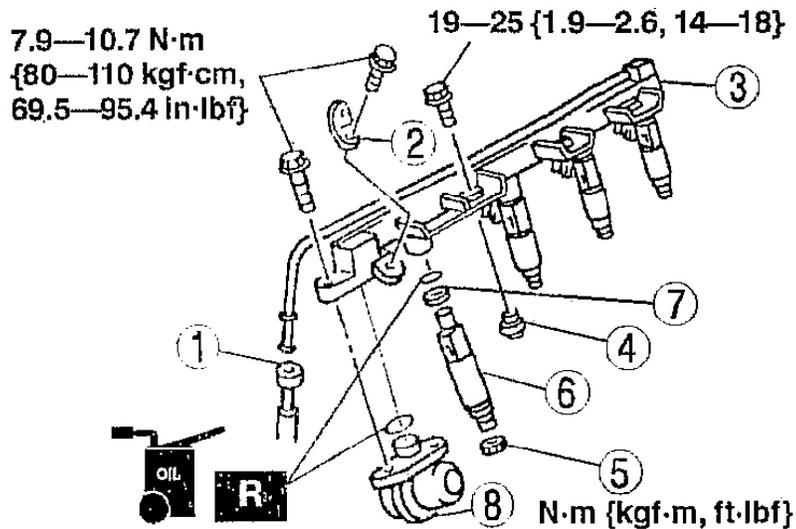
Fig. 35: Identifying New Retainer
Courtesy of MAZDA MOTORS CORP.

FUEL INJECTOR REMOVAL/INSTALLATION (BP, BP WITH TC)

1. Complete the "BEFORE SERVICE PRECAUTION". (See **BEFORE SERVICE PRECAUTION (BP, BP WITH TC)** (+)
2. Disconnect the negative battery cable.
3. Remove the dynamic chamber. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION (BP)** (+)
(See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION (BP WI)** (+)
4. Remove in the order indicated in the table.

2005 Mazda MX-5 Miata

2005 ENGINE PERFORMANCE Fuel System - MX-5 Miata



1	Plastic fuel hose (See Plastic Fuel Hose Disassembly Note) (See Plastic Fuel Hose Assembly Note)
2	Fuel distributor bracket
3	Fuel distributor
4	Fuel distributor insulator
5	Fuel injector insulator
6	Fuel injector (See Fuel Injector Installation Note)
7	Grommet
8	Pulsation damper No.2

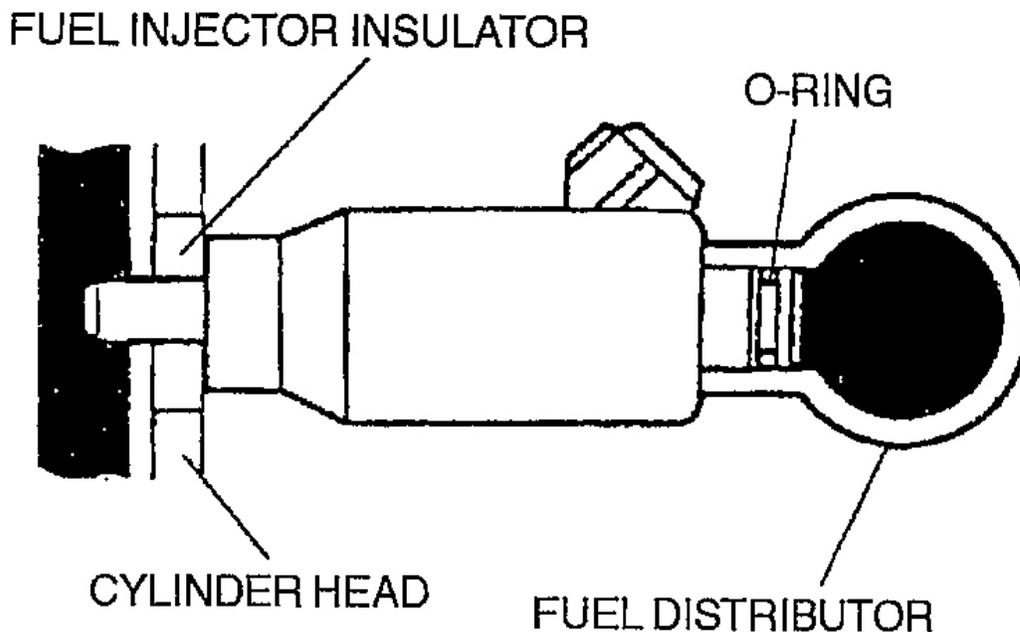
G03637842

Fig. 36: Installing Fuel Injector (BP, BP With TC) & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

5. Install in the reverse order of removal.
6. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION (BP, BP WITH TC)** (+))

FUEL INJECTOR INSTALLATION NOTE

1. Use new fuel injector O-rings.
2. Apply a small amount of engine oil to the O-rings and install them into the fuel distributor.
3. Verify that the O-rings and the fuel injector sealing surfaces are free of foreign material.
4. Clean with gasoline if necessary.
5. Install the fuel injectors in the fuel distributor with a light twisting motion so that the O-rings will not be folded.



G03637843

Fig. 37: Identifying Fuel Injector Insulator
 Courtesy of MAZDA MOTORS CORP.

FUEL INJECTOR INSPECTION (BP, BP WITH TC)

ON-VEHICLE INSPECTION

1. Warm up the engine and idle it.
2. Listen for operation sound of each fuel injector with a screwdriver or a soundscope.
 - If no sound is heard, perform the "Fuel Injector Resistance Inspection".

NOTE:

- The best way to judge the performance of a fuel injector is to

compare its sound with the sound of other fuel injectors.

RESISTANCE INSPECTION

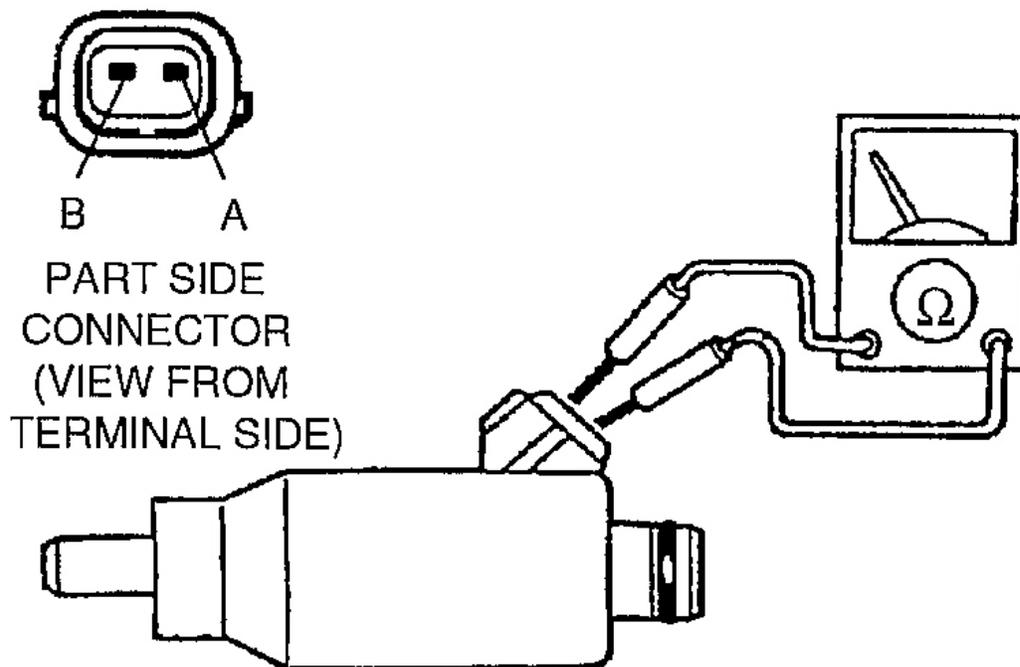
NOTE:

- Perform the following test only when directed.

1. Disconnect the fuel injector connectors.
2. Measure the resistance of the fuel injector using an ohmmeter.
 - If as specified but the On-vehicle Inspection failed, perform the "**CIRCUIT OPEN/SHORT INSPECTION**".
 - If not as specified, replace the fuel injector. (See **FUEL INJECTOR REMOVAL/INSTALLATION (BP, BP WITH TC)(+)**)

Resistance

12-13 ohms (20°C {68°F})

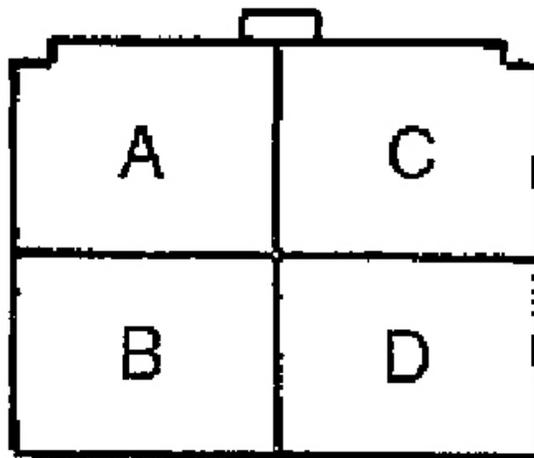


G03637844

Fig. 38: Measuring Resistance Of Fuel Injector Using Ohmmeter
Courtesy of MAZDA MOTORS CORP.

CIRCUIT OPEN/SHORT INSPECTION**Open circuit**

- GND circuit (No.1 cylinder fuel injector connector terminal B and PCM connector terminal 2A)
- GND circuit (No.2 cylinder fuel injector connector terminal B and PCM connector terminal 2D)
- GND circuit (No.3 cylinder fuel injector connector terminal B and PCM connector terminal 2G)

MAIN RELAY**HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)**

G03637845

Fig. 39: Identifying Main Relay Harness Side Connector
Courtesy of MAZDA MOTORS CORP.

- GND circuit (No.4 cylinder fuel injector connector terminal B and PCM connector terminal 2J)
- Power circuit (No.1 cylinder fuel injector connector terminal A and main relay connector terminal D)

2005 Mazda MX-5 Miata

2005 ENGINE PERFORMANCE Fuel System - MX-5 Miata

through common connector)

- Power circuit (No.2 cylinder fuel injector connector terminal A and main relay connector terminal D through common connector)
- Power circuit (No.3 cylinder fuel injector connector terminal A and main relay connector terminal D through common connector)
- Power circuit (No.4 cylinder fuel injector connector terminal A and main relay connector terminal D through common connector)

Short circuit

- No.1 cylinder fuel injector connector terminal B and PCM connector terminal 2A to GND
- No.2 cylinder fuel injector connector terminal B and PCM connector terminal 2D to GND
- No.3 cylinder fuel injector connector terminal B and PCM connector terminal 2G to GND
- No.4 cylinder fuel injector connector terminal B and PCM connector terminal 2J to GND

FUEL LEAKAGE AND VOLUME TEST

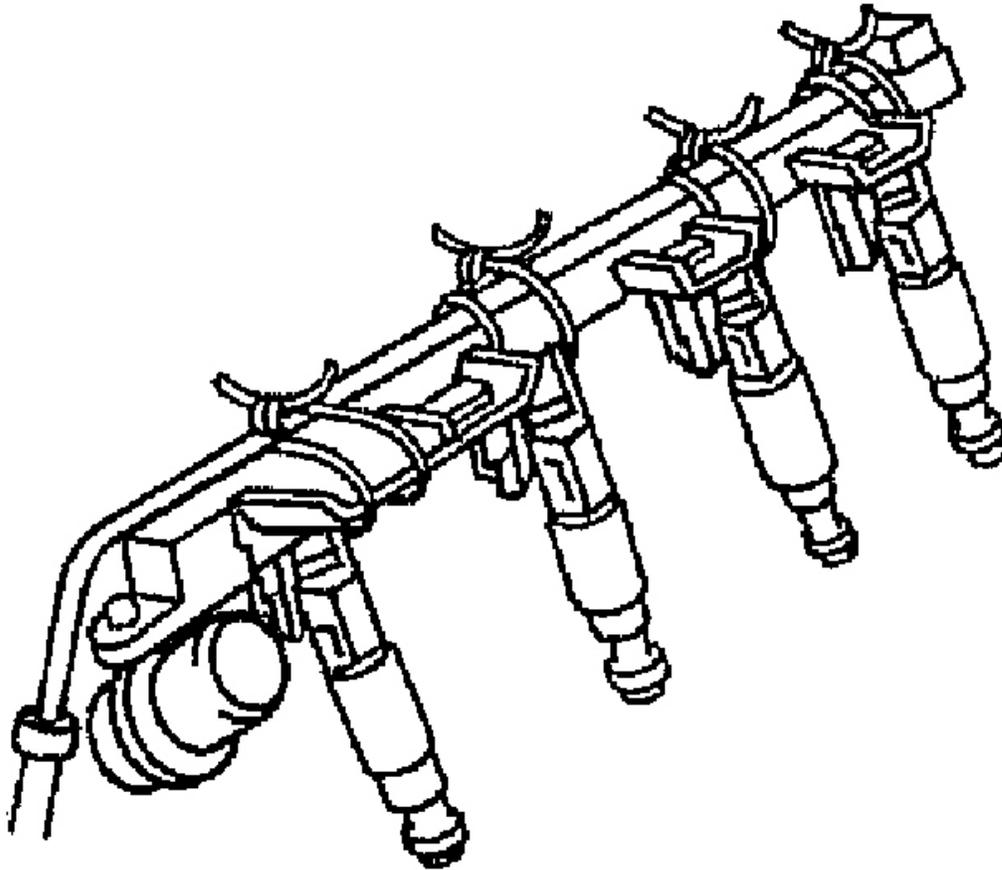
WARNING:

- **Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Always carry out the following procedure with the engine stopped.**

1. Complete the "BEFORE SERVICE PRECAUTION". (See **BEFORE SERVICE PRECAUTION (BP, BP WITH TC)**)(+)
2. Disconnect the negative battery cable.
3. Remove the dynamic chamber. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION (BP)** (+) (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION (BP WITH TC)** (+))
4. Remove the fuel injectors together with the fuel distributor. (See **FUEL INJECTOR REMOVAL/INSTALLATION (BP, BP WITH TC)**)(+)
5. Fasten the fuel injectors firmly to the fuel distributor with wire and connect the fuel pipe connector.
6. Connect the negative battery cable.

CAUTION:

- **Connecting to the wrong DLC terminals may cause a malfunction. Carefully connect only to the specified terminals.**



G03637846

Fig. 40: Identifying Fuel Injectors
Courtesy of MAZDA MOTORS CORP.

7. Connect DLC terminal F/P and body GND using a jumper wire.
8. Turn the ignition switch to the ON position to operate the FP.

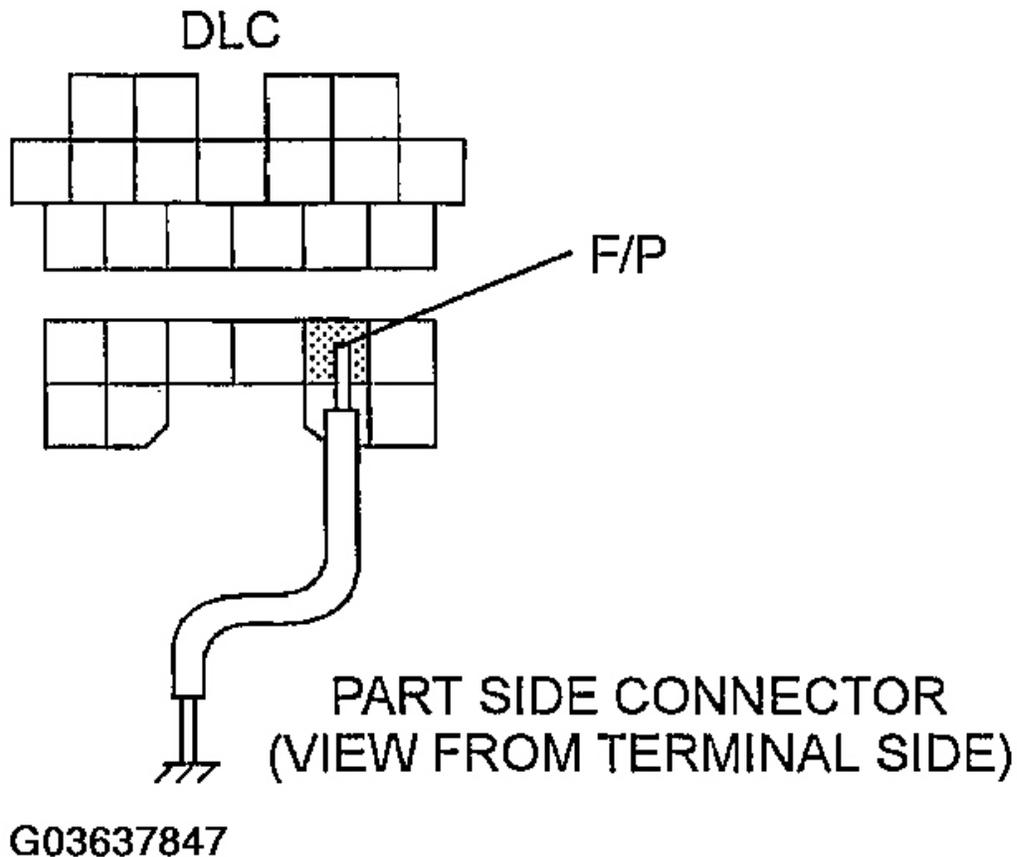


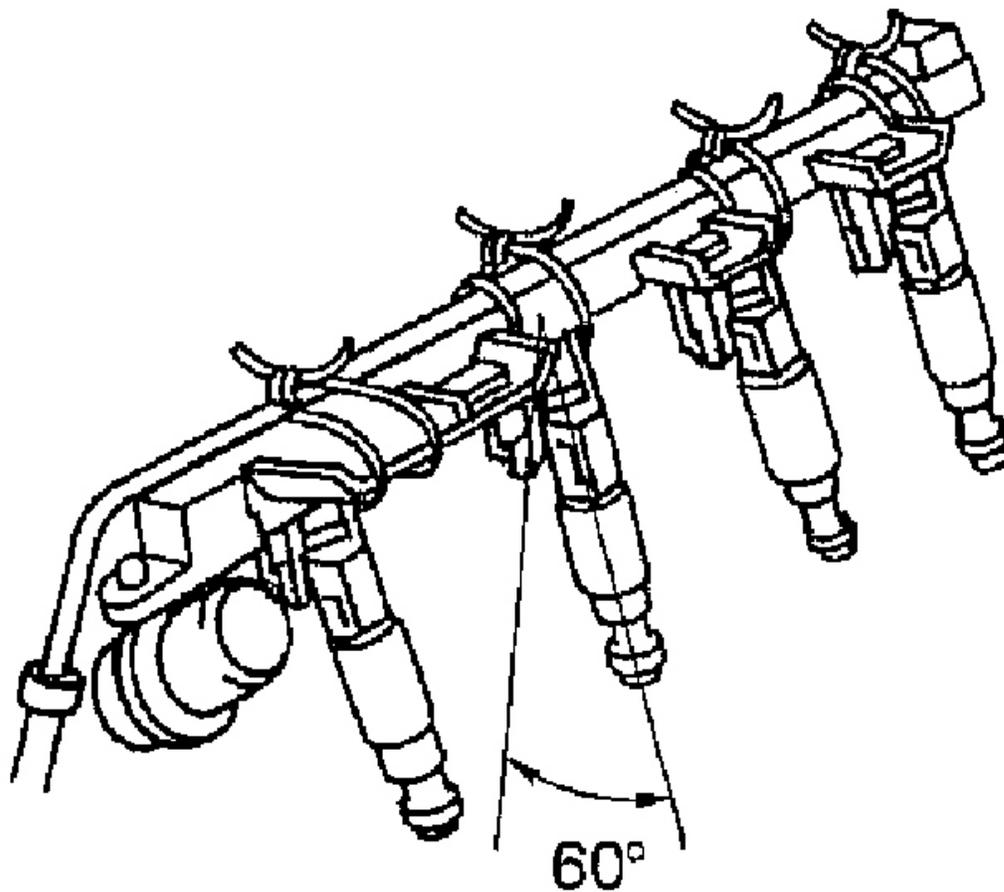
Fig. 41: Connecting DLC Terminal F/P And Body Gnd Using Jumper Wire
Courtesy of MAZDA MOTORS CORP.

9. Tilt the fuel injectors **approx.60 deg.** and verify that fuel leaking from the fuel injector nozzles is within the specification.
 - If not as specified, replace the fuel injector.

Fuel leakage

Less than 1 drop/2 min

10. Turn the ignition switch to the LOCK position.



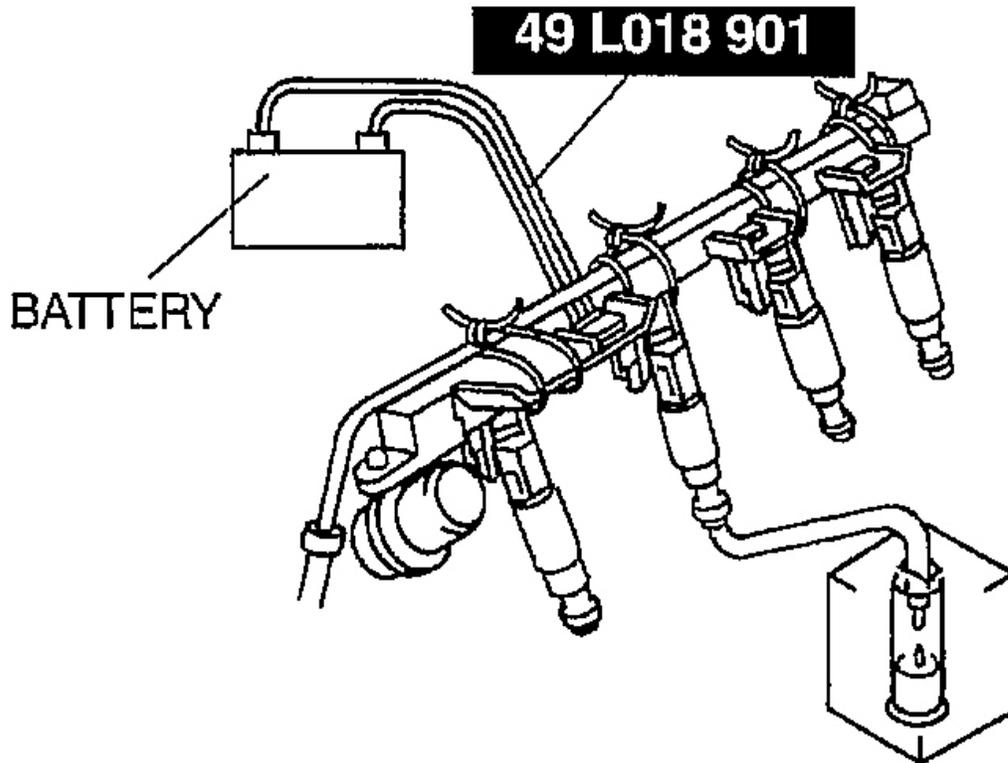
G03637848

Fig. 42: Identifying Tilt Fuel Injectors
Courtesy of MAZDA MOTORS CORP.

11. Connect the SST as shown in **Fig. 43** the figure.
12. Turn the ignition switch to the ON position to operate the FP.
13. Measure the injection volume of each fuel injector using a graduated container.
 - If not as specified, replace the fuel injector.

Injection volume

66-82 ml {66-82 cc, 2.3-2.7 fl oz}/15 s



G03637849

Fig. 43: Measuring Injection Volume Of Fuel Injector Using Graduated Container
Courtesy of MAZDA MOTORS CORP.

14. Turn the ignition switch to the LOCK position and disconnect the jumper wire.
15. Install the dynamic chamber. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION (BP) (+)** (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION (BP WI) (+)**
16. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION (BP, BP WITH TC)(+)**

Using a fuel injector tester

1. Remove the fuel injectors. (See **FUEL INJECTOR REMOVAL/INSTALLATION (BP, BP WITH TC)(+)**
2. Connect the fuel injector to the fuel injector tester.
3. Measure the injection volume of each fuel injector.
 - If not as specified, replace the fuel injector.

2005 Mazda MX-5 Miata

2005 ENGINE PERFORMANCE Fuel System - MX-5 Miata

Injection volume

66-82 ml {66-82 cc, 2.3-2.7 fl oz}/15 s.

4. Complete the "AFTER SERVICE PRECAUTION". (See AFTER SERVICE PRECAUTION (BP, BP WITH TC)(+))

PRESSURE REGULATOR REMOVAL/INSTALLATION (BP, BP WITH TC)

1. Remove and install the pressure regulator. (See FUEL PUMP (FP) DISASSEMBLY/ASSEMBLY (BP, BP WITH TC)(+))

PRESSURE REGULATOR INSPECTION (BP, BP WITH TC)

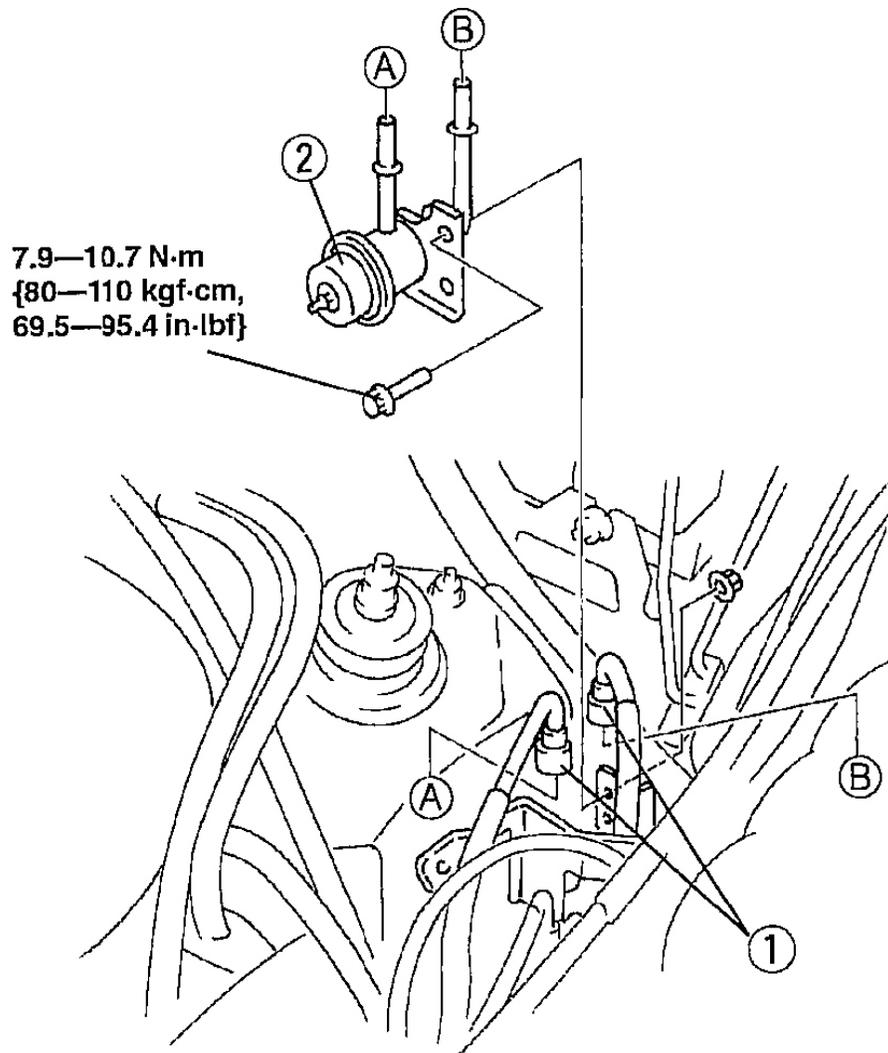
NOTE:

- Due to the adoption of the mechanical returnless fuel system, the pressure regulator cannot be inspected separately.

1. Perform FUEL LINE PRESSURE INSPECTION (BP, BP WITH TC).

PULSATION DAMPER NO.1 REMOVAL/INSTALLATION (BP, BP WITH TC)

1. Complete the "BEFORE SERVICE PRECAUTION". (See BEFORE SERVICE PRECAUTION (BP, BP WITH TC)(+))
2. Disconnect the negative battery cable.
3. Remove in the order indicated in the table.



1	Plastic fuel hose (See Plastic Fuel Hose Disassembly Note) (See Plastic Fuel Hose Assembly Note)
2	Pulsation damper No.1

G03637850

Fig. 44: Removing Pulsation Damper (BP, BP With TC) & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

4. Install in the reverse order of removal.
5. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION (BP, BP**

WITH TC(+)

PULSATION DAMPER NO.2 REMOVAL/INSTALLATION (BP, BP WITH TC)

1. Remove and install pulsation damper No.2.

(See **FUEL INJECTOR REMOVAL/INSTALLATION (BP, BP WITH TC)**(+)

PULSATION DAMPER NO.1, NO.2 INSPECTION (BP, BP WITH TC)

1. Visually inspect pulsation dampers No.1 and No.2 for damage and cracks. Also verify that there is no extreme rust which will cause fuel leakage.
 - If either is observed, replace the faulty pulsation damper.