

2008 ENGINE

Fuel System - MX-5 Miata

FUEL SYSTEM FLOW DIAGRAM [LF]

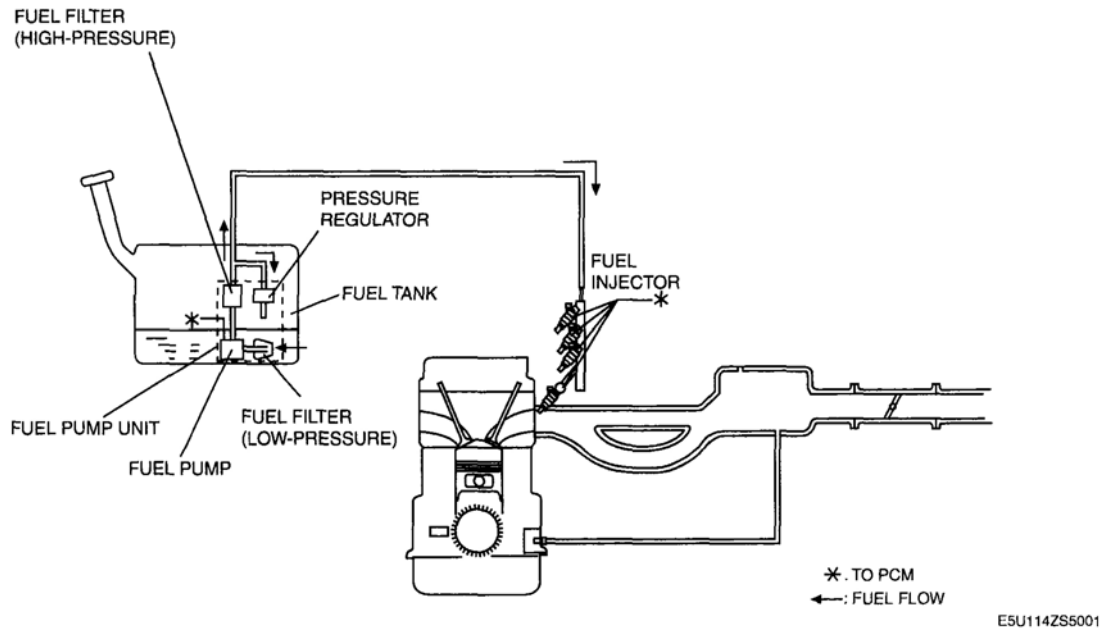


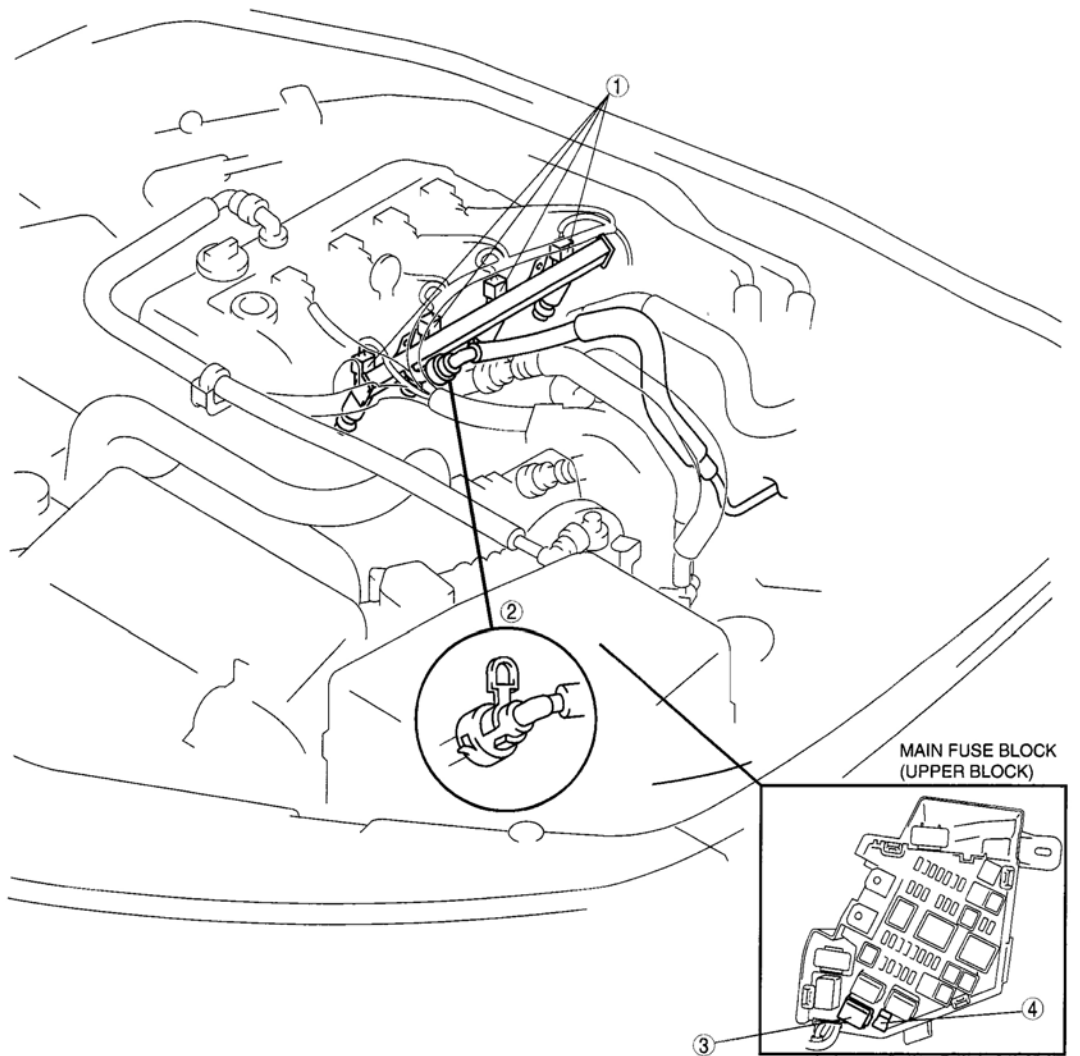
Fig. 1: Fuel System - Flow Diagram
Courtesy of MAZDA MOTORS CORP.

FUEL SYSTEM LOCATION INDEX [LF]

ENGINE COMPARTMENT SIDE

2008 Mazda MX-5 Miata Grand Touring

2008 ENGINE Fuel System - MX-5 Miata



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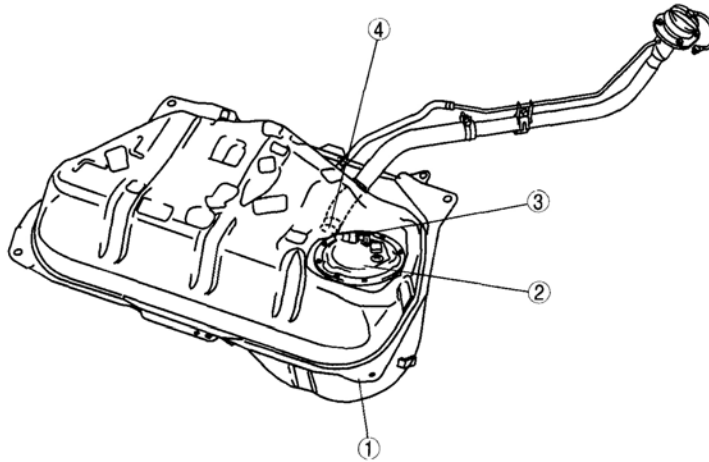
1	Fuel injector
2	Quick release connector (Type A)
3	Fuel pump relay
4	Check connector

Fig. 2: Identifying Location Of Fuel System Components (LF)
Courtesy of MAZDA MOTORS CORP.

FUEL TANK SIDE

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1	Fuel tank
2	Fuel pump unit
3	Quick release connector (Type B)
4	Nonreturn valve

Fig. 3: Identifying Location Of Fuel Tank Side Components
Courtesy of MAZDA MOTORS CORP.

BEFORE SERVICE PRECAUTION [LF]

WARNING:

- Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure".
- A person charged with static electricity could cause a fire or explosion, resulting in death or serious injury. Before performing work on the fuel system, discharge static electricity by touching the vehicle body.

CAUTION:

- If there is foreign material on the connecting area of the quick release connector, it might damage the connector or fuel pipe. To prevent this, disconnect the connector and clean the connecting area before connecting.

FUEL LINE SAFETY PROCEDURE

1. Remove the fuel-filler cap to release the pressure inside the fuel tank.
2. Remove the fuel pump relay.

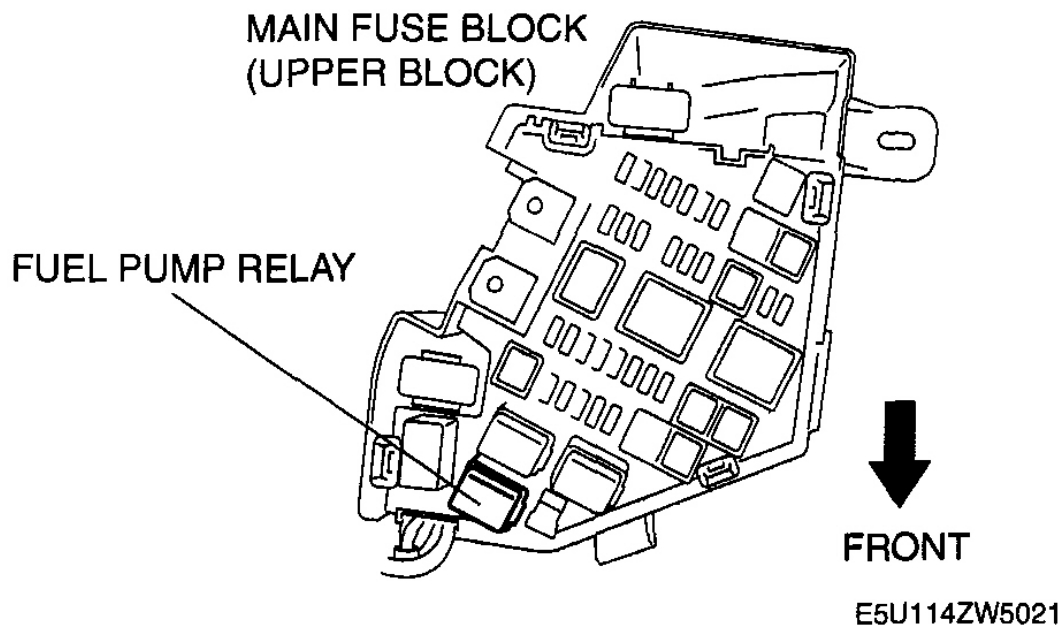


Fig. 4: View Of Fuel Pump Relay
Courtesy of MAZDA MOTORS CORP.

3. Start the engine.
4. After the engine stalls, crank the engine **several times**.
5. Turn the ignition switch to the LOCK position.
6. Install the fuel pump relay.

AFTER SERVICE PRECAUTION [LF]

WARNING:

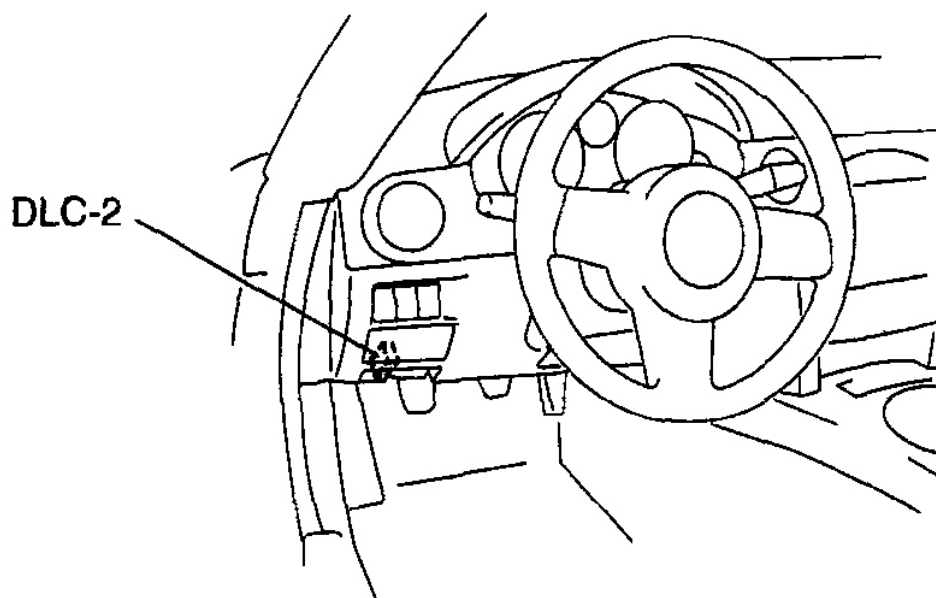
- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the [Fuel Leakage Inspection](#).

FUEL LEAKAGE INSPECTION

WARNING:

- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, complete the following inspection with the engine stopped.

1. Connect the M-MDS or equivalent to the DLC-2.



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Fig. 5: Locating DLC-2 Connector
Courtesy of MAZDA MOTORS CORP.

2. Start the fuel pump using the "FP" simulation function.
3. Verify that there is no fuel leakage from the pressurized parts.
 - If there is leakage, replace the fuel hoses and clips.
 - If there is damage on the seal on the fuel pipe side, replace the fuel pipe.

Standard

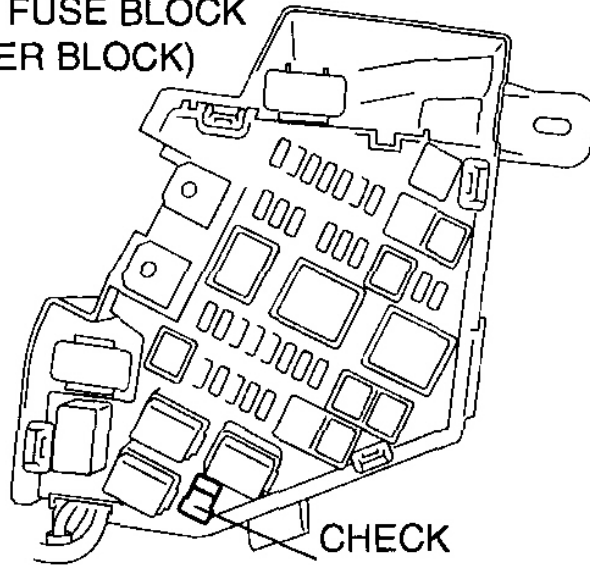
There shall be no leakage after 5 min.

4. After reinstallation, repeat step 2-3 in the fuel leakage inspection.

Not Using SST (M-MDS or Equivalent)

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF]** .)
3. Short the check connector terminal F/P to ground using a jumper wire.

MAIN FUSE BLOCK
(UPPER BLOCK)



CHECK
CONNECTOR

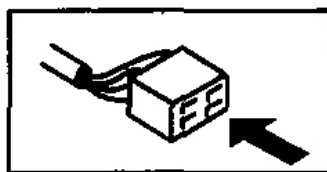
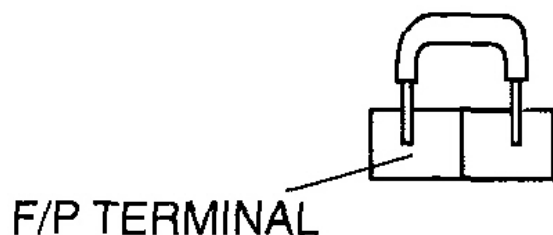


FRONT

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Fig. 6: Checking Connector Terminal F/P To Ground
Courtesy of MAZDA MOTORS CORP.

MAIN FUSE BLOCK (CHECK CONNECTOR)



E5U114ZW5027

Fig. 7: Identifying F/P Connector Terminal
Courtesy of MAZDA MOTORS CORP.

4. Connect the negative battery cable.
5. Turn the ignition switch to the ON position to operate the fuel pump.
6. Verify that there is no fuel leakage from the pressurized parts.
 - If there is leakage, replace the fuel hoses and clips.
 - If there is damage on the seal on the fuel pipe side, replace the fuel pipe.

Standard

There shall be no leakage after 5 min.

7. After reinstallation, repeat step 5 thru 6 in the fuel leakage inspection.

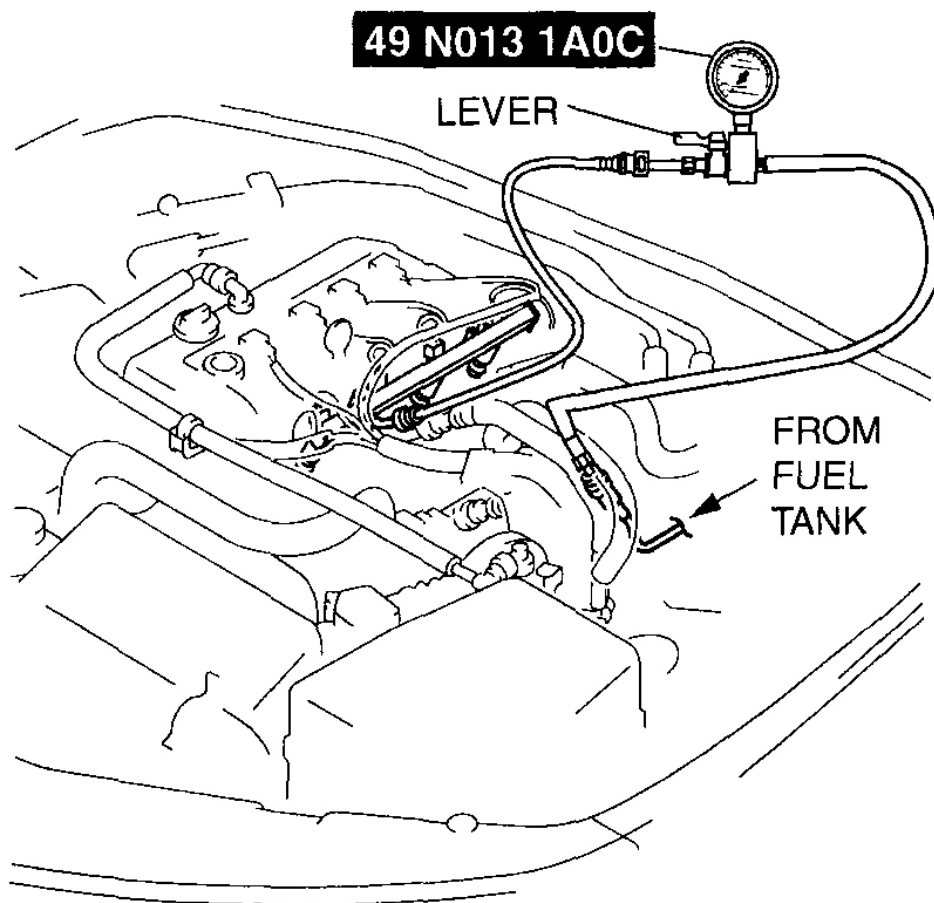
FUEL LINE PRESSURE INSPECTION [LF]

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 [LF]** .)
2. Remove the battery cover. (See **BATTERY REMOVAL/INSTALLATION [LF]** .)
3. Disconnect the negative battery cable.
4. Disconnect the quick release connector (in the engine compartment). (See **QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION [LF]** .)
5. Turn the lever of the SST parallel to the hose as shown in **Fig. 8** .
6. Insert the SST quick release connector into the fuel pipe until a click is heard.



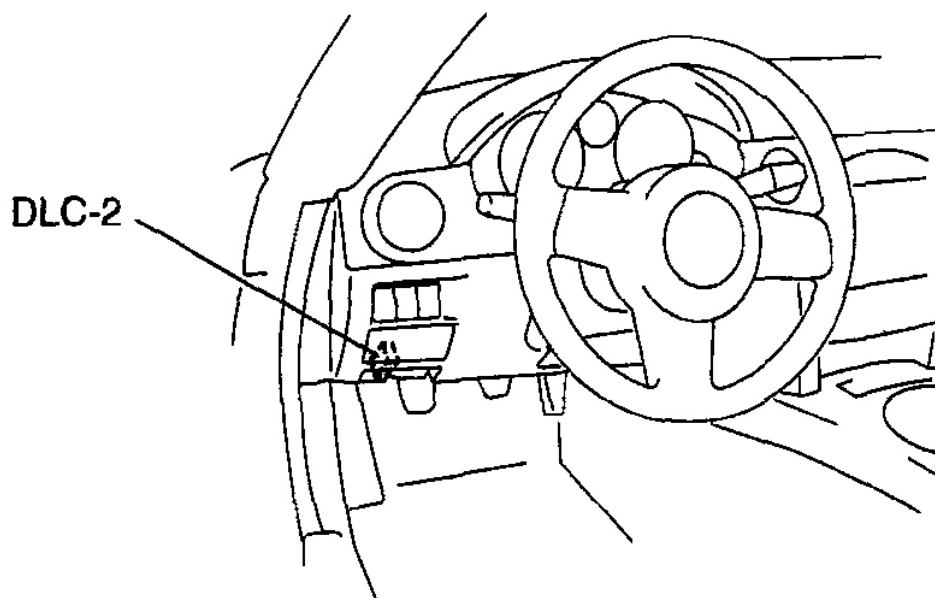
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Fig. 8: Inserting SST Quick Release Connector Into Fuel Pipe Until Click Is Heard
Courtesy of MAZDA MOTORS CORP.

7. Verify that the quick release connector is firmly connected by pulling it by hand.
8. Start the fuel pump using the following procedure:

Using M-MDS or equivalent

1. Connect the negative battery cable.
2. Connect the M-MDS or equivalent to the DLC-2.



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Fig. 9: Locating DLC-2 Connector
Courtesy of MAZDA MOTORS CORP.

3. Start the fuel pump using the "FP" simulation function.

Not using M-MDS or equivalent

1. Short the check connector terminal F/P to ground using a jumper wire.

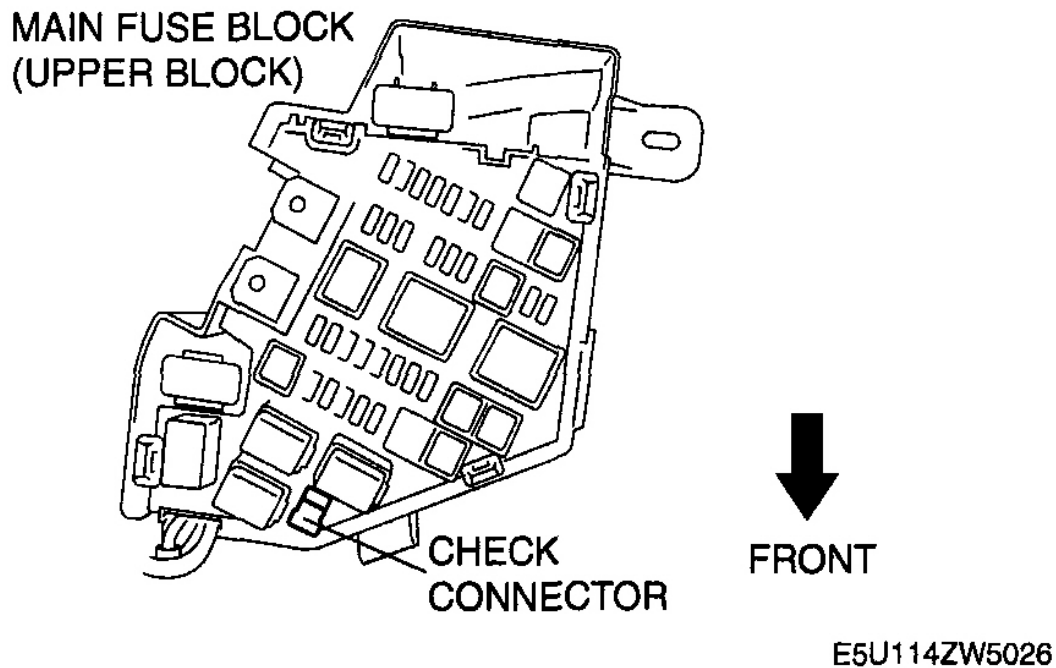
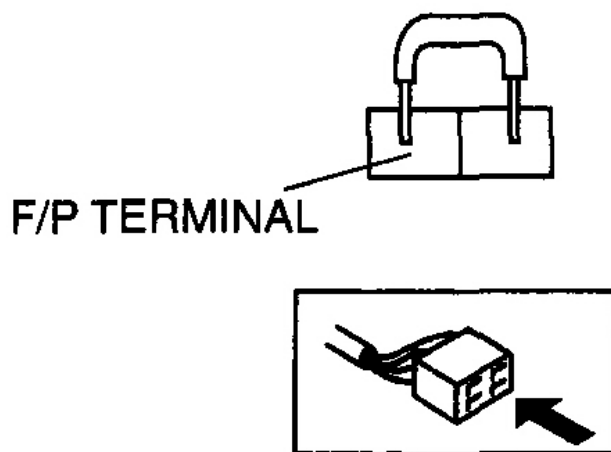


Fig. 10: Checking Connector Terminal F/P To Ground Using Jumper Wire
Courtesy of MAZDA MOTORS CORP.

MAIN FUSE BLOCK (CHECK CONNECTOR)



E5U114ZW5027

Fig. 11: Identifying F/P Connector Terminal
Courtesy of MAZDA MOTORS CORP.

2. Turn the ignition switch to the ON position to operate the fuel pump.
9. Operate the fuel pump for **10 s**.
10. Measure the fuel line pressure.
 - If not within the specification, inspect the following:

If it less than the specification:

- Fuel pump unit
- Fuel line leakage

If it exceeds the specification:

- Fuel line clogging

Fuel pressure (Reference)

350-410 kPa {3.57-4.18 kgf/cm² , 50.8-59.4 psi}

11. Stop the fuel pump using the following procedure:

Using M-MDS or equivalent

1. Stop the fuel pump using the "FP" simulation function.

Not using M-MDS or equivalent

1. Turn the ignition switch to off to stop the fuel pump.
12. Measure the fuel hold pressure **after 5 min** .
- If not within the specification, inspect the following:
 - Fuel line for clogging or leakage

Fuel hold pressure (Reference)

250 kPa {2.55 kgf/cm² ,36.2 psi} or more

13. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See **BEFORE SERVICE PRECAUTION [LF]** .)
14. Disconnect the **SST** .
15. Connect the quick release connector to the fuel distributor. (See **QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION [LF]** .)
16. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION [LF]** .)

FUEL TANK REMOVAL/INSTALLATION [LF]

WARNING:

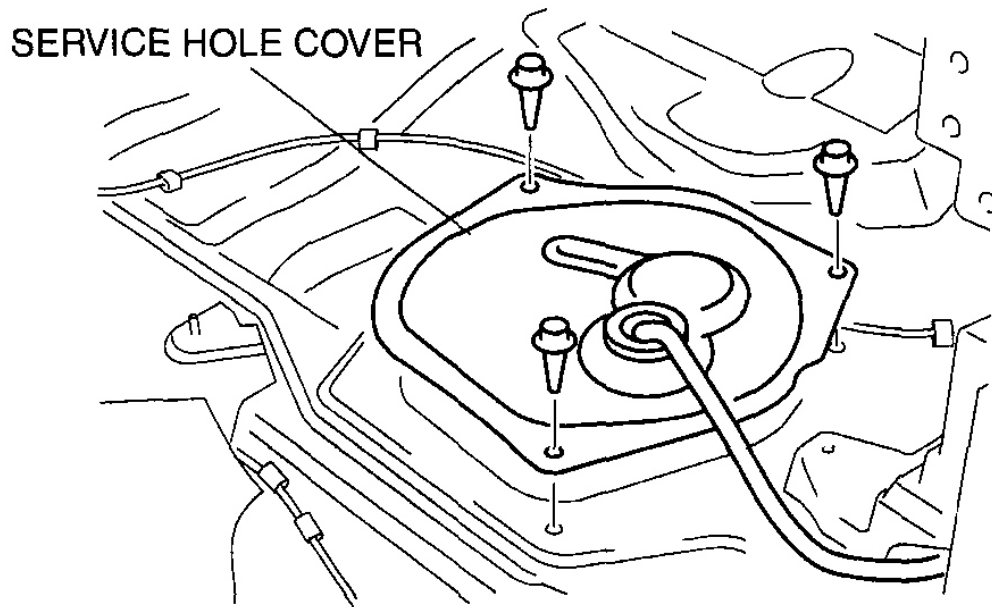
- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "**FUEL LINE SAFETY PROCEDURE**", while referring to **BEFORE SERVICE PRECAUTION [LF]** .
- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, before performing the fuel pump unit removal/installation, always complete the "Fuel Leak Inspection After Fuel Pump Unit Installation".
- A person charged with static electricity could cause a fire or explosion, resulting in death or serious injury. Before draining fuel, make sure to discharge static electricity by touching the vehicle body.

1. Park the vehicle on a level surface.

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2. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See **BEFORE SERVICE PRECAUTION [LF]** .)
3. Remove the battery cover.
4. Disconnect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF]** .)
5. Remove the following parts.
 1. Middle pipe (See **EXHAUST SYSTEM REMOVAL/INSTALLATION [LF]** .)
 2. Propeller shaft (See **PROPELLER SHAFT REMOVAL/INSTALLATION** .)
 3. Power plant frame (See **POWER PLANT FRAME REMOVAL NOTE** .) (See **POWER PLANT FRAME REMOVAL NOTE** .) (See **POWER PLANT FRAME REMOVAL NOTE** .)
 4. Rear drive shaft (See **REAR DRIVE SHAFT REMOVAL/INSTALLATION** .)
 5. Rear differential (See **REAR DIFFERENTIAL REMOVAL/INSTALLATION** .)
 6. Rear crossmember component (See **REAR CROSSMEMBER REMOVAL/INSTALLATION** .)
6. Perform the following procedure to remove the service hole cover.
 1. To remove the back trim, remove the following parts:
 1. Console (See **CONSOLE REMOVAL/INSTALLATION** .)
 2. Quarter trim (See **QUARTER TRIM REMOVAL/INSTALLATION** .)
 3. Scuff plate (See **SCUFF PLATE REMOVAL/INSTALLATION** .)
 4. Tire house trim (See **TIRE HOUSE TRIM REMOVAL/INSTALLATION** .)
 5. Aeroboard (See **AEROBOARD REMOVAL/INSTALLATION** .)
 6. Front seat bar garnish (See **SEAT BACK BAR GARNISH REMOVAL/INSTALLATION** .)
 2. Remove the back trim. (See **BACK TRIM REMOVAL/INSTALLATION** .)
 3. Remove the service hole cover.



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Fig. 12: Identifying Service Hole Cover
Courtesy of MAZDA MOTORS CORP.

7. Disconnect the quick release connector using the SST from the fuel pump unit. (See **QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION [LF]** .)
8. Remove the fuel pump unit. (See **FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]** .)
9. Siphon the fuel from the fuel tank.
10. Remove in the order indicated in **Fig. 13** .
11. Install in the reverse order of removal.
12. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION [LF]** .)

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FUEL TANK REMOVAL NOTE

1. Move the dust cover slightly out of the way.
2. Move the charcoal canister slightly out of the way. (See CHARCOAL CANISTER REMOVAL/INSTALLATION [LF] .)

INSULATOR REMOVAL NOTE

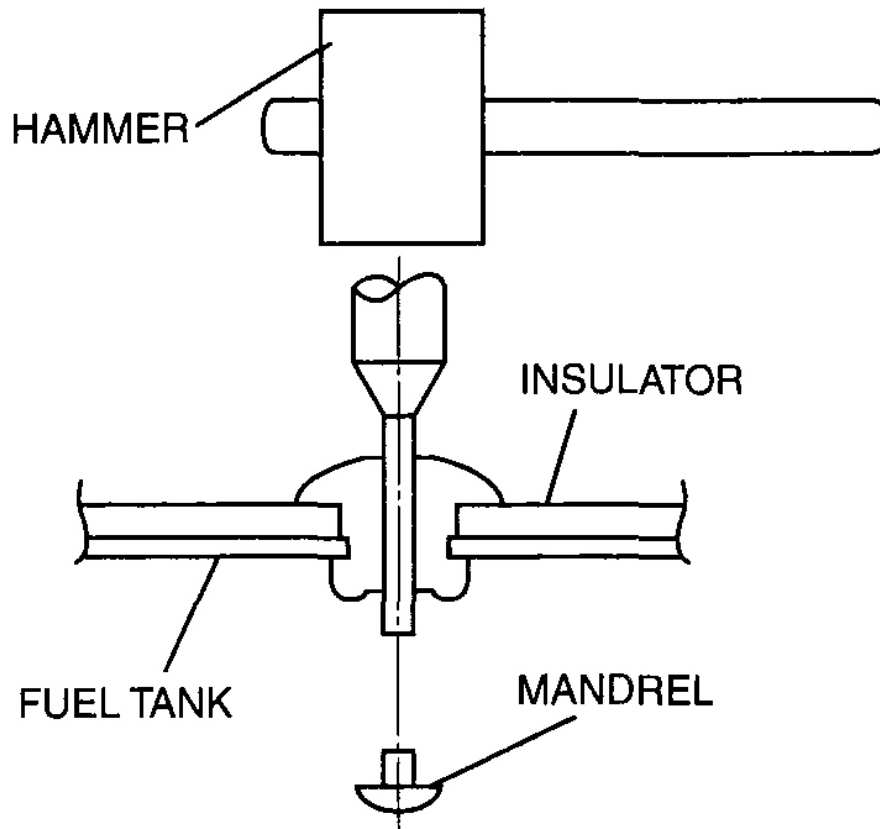
CAUTION:

- Be careful not to damage the fuel tank when removing the rivet. If the fuel tank is damaged, it may cause fuel leakage.

NOTE:

- The insulator is installed using rivets.
- When reinstalling the rivet, install the same rivet or M5 bolt and nut.

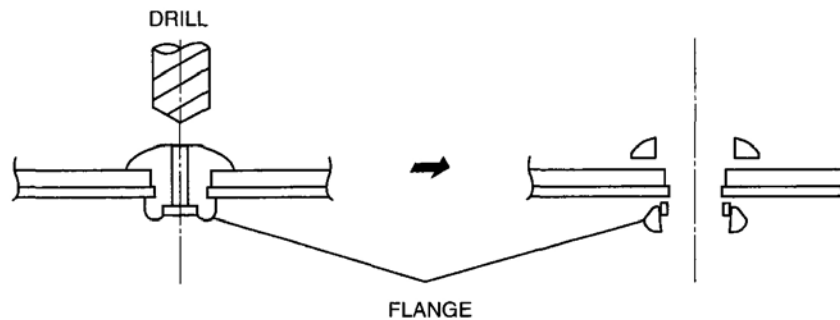
1. Push out the mandrel using a hammer and punch (2-2.8 mm {0.08-0.11 in} diameter).



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Fig. 14: Pushing Out Mandrel Using Hammer & Punch
Courtesy of MAZDA MOTORS CORP.

2. Remove the flange using a drill (5 mm {0.20 in} drill bit).

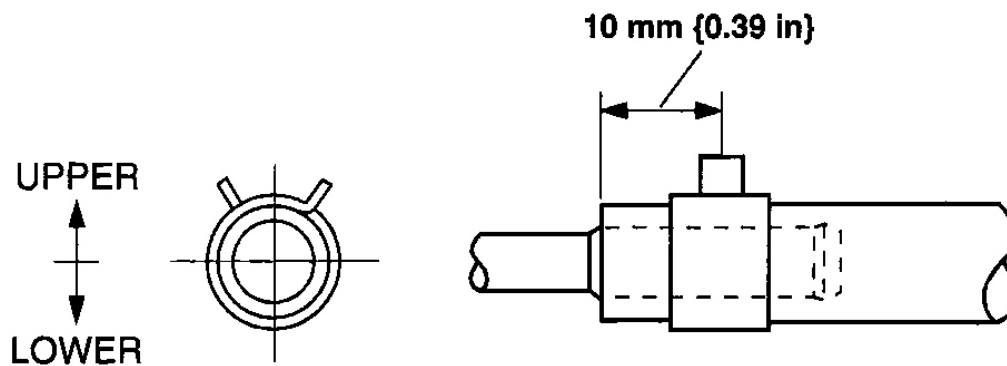


E5U114ZW9S02

Fig. 15: Removing Flange Using Drill
Courtesy of MAZDA MOTORS CORP.

BREATHER HOSE INSTALLATION NOTE

1. Install the breather hose and clamp as shown in **Fig. 16** .

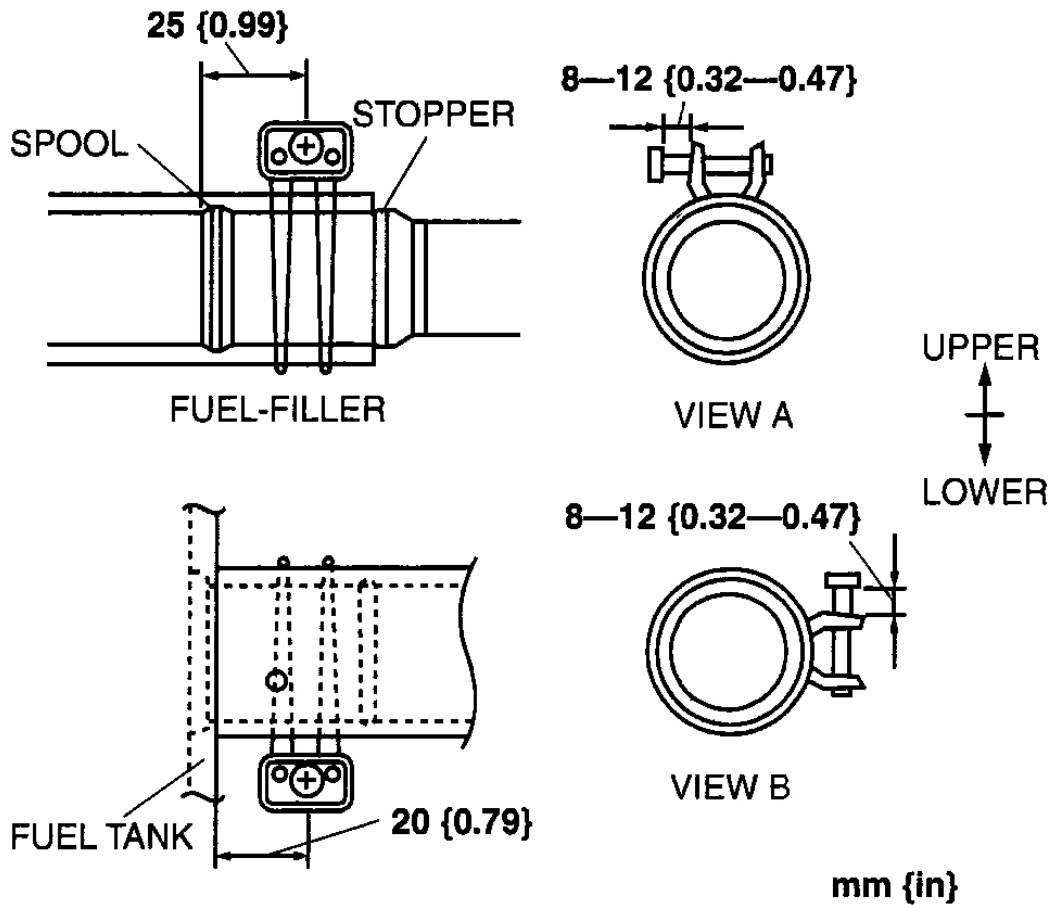


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Fig. 16: Installing Breather Hose & Clamp
Courtesy of MAZDA MOTORS CORP.

JOINT HOSE INSTALLATION NOTE

1. Install the joint hose and clamp as shown in **Fig. 17** .



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Fig. 17: View Of Joint Hose & Clamp
Courtesy of MAZDA MOTORS CORP.

2. Install the clamp between the spool and stopper without overlapping the stopper.

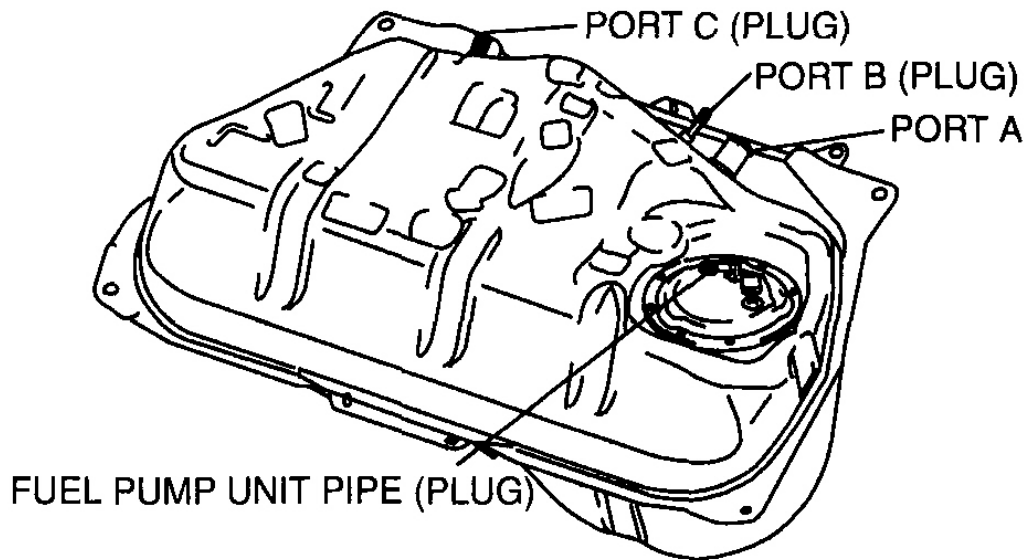
FUEL TANK INSPECTION [LF]

NOTE:

- The two rollover valves built into the fuel tank and check valves (two-way) built into the rollover valves are inspected in this inspection.

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

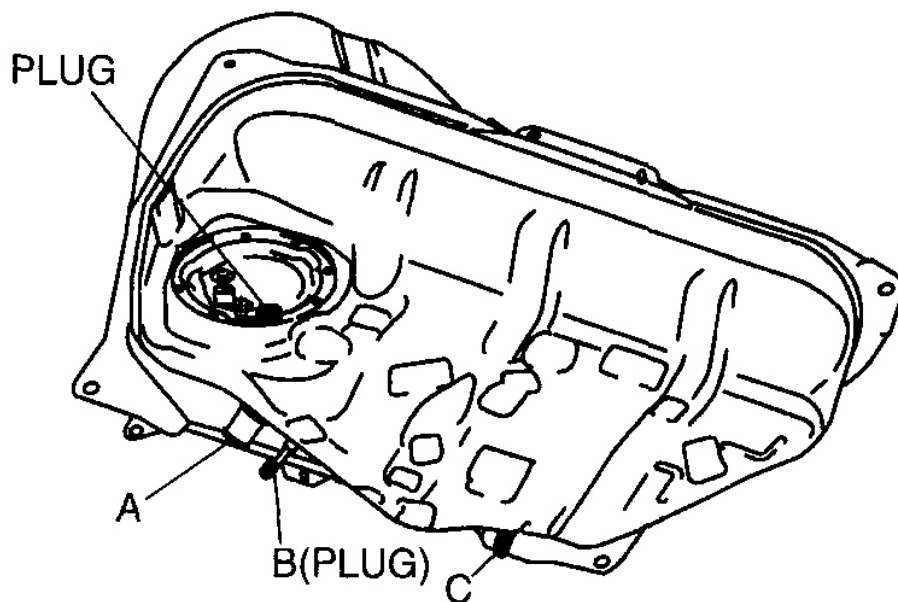
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF]** .)
4. Remove the fuel tank with the fuel pump unit. (See **FUEL TANK REMOVAL/INSTALLATION [LF]** .)
5. Perform the following procedure to verify the fuel tank airtightness.
 1. Plug the fuel pump unit pipe, port B and port C.



E5U114ZW5009

Fig. 18: Identifying Plug Fuel Pump Unit Pipe & Ports
Courtesy of MAZDA MOTORS CORP.

2. Apply a pressure of **3 kPa {23 mmHg, 0.9 inHg}** to port A and wait for a while.
3. Verify that there is no air leakage from the fuel tank.
 - If there is airflow, replace the fuel tank.
6. Plug the fuel pump unit pipe and port B.



E5U114ZW5010

Fig. 19: Identifying Plug
Courtesy of MAZDA MOTORS CORP.

7. Level the fuel tank.
8. Apply a pressure of **3 kPa {23 mmHg, 0.9 inHg}** to port C and wait for a while.
9. With the pressure still applied, verify that there is airflow from port A and the pressure is **0- 3 kPa {0-22 mmHg, 0- 0.8 inHg}** .
 - If there is no airflow, replace the fuel tank.
10. Apply a pressure of **-0.5 kPa {-3.8 mmHg, -0.1 inHg}** to port C and wait for a while.
11. With the pressure still applied, verify that there is airflow from port A and the pressure is **-0.5- 0 kPa {-3.8- 0 mmHg, -0.2- 0 inHg}** .
 - If there is no airflow, replace the fuel tank.
 - If there is airflow, place the fuel tank upside down.
12. Apply a pressure of **3 kPa {23 mmHg, 0.9 inHg}** to port C and wait for a while.
13. With the pressure still applied, verify that there is no airflow from port A.
 - If there is airflow, replace the fuel tank.

NON-RETURN VALVE INSPECTION [LF]

WARNING:

- Fuel is very flammable liquid. If fuel spills or leaks from the

pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "[FUEL LINE SAFETY PROCEDURE](#)", while referring to the "[BEFORE SERVICE PRECAUTION \[LF\]](#)".

1. Follow "[BEFORE SERVICE PRECAUTION](#)" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#) .)
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#) .)
4. Remove the fuel pump unit. (See [FUEL PUMP UNIT REMOVAL/INSTALLATION \[LF\]](#) .)
5. Siphon the fuel from the fuel tank.

NOTE:

- **Non-return valve is integrated in the fuel tank.**
- **The non-return valve is normally closed by the spring force.**

6. Verify that the non-return valve is closed.
 - If the non-return valve is stuck open and does not open even when pulled up by a finger, replace the fuel tank. (See [FUEL TANK REMOVAL/INSTALLATION \[LF\]](#) .)

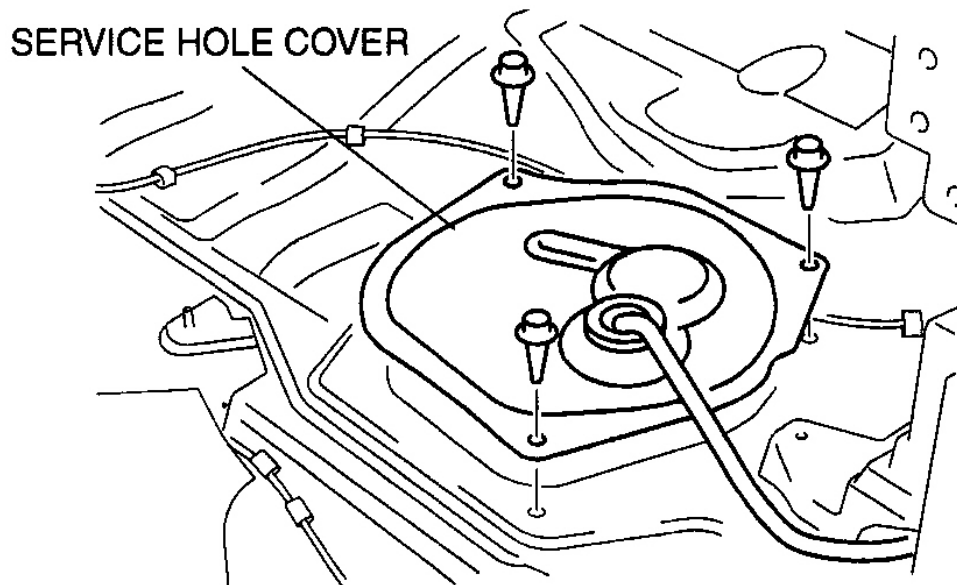
FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]

WARNING:

- **Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "[FUEL LINE SAFETY PROCEDURE](#)", while referring to [BEFORE SERVICE PRECAUTION \[LF\]](#) .**
- **Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, before performing the fuel pump unit removal/installation, always complete the "Fuel Leak Inspection After Fuel Pump Unit Installation".**

1. Follow "[BEFORE SERVICE PRECAUTION](#)" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#) .)
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#) .)
4. Perform the following procedure to remove the service hole cover.
 1. To remove the back trim, remove the following parts:
 1. Console (See [CONSOLE REMOVAL/INSTALLATION](#) .)
 2. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION](#) .)

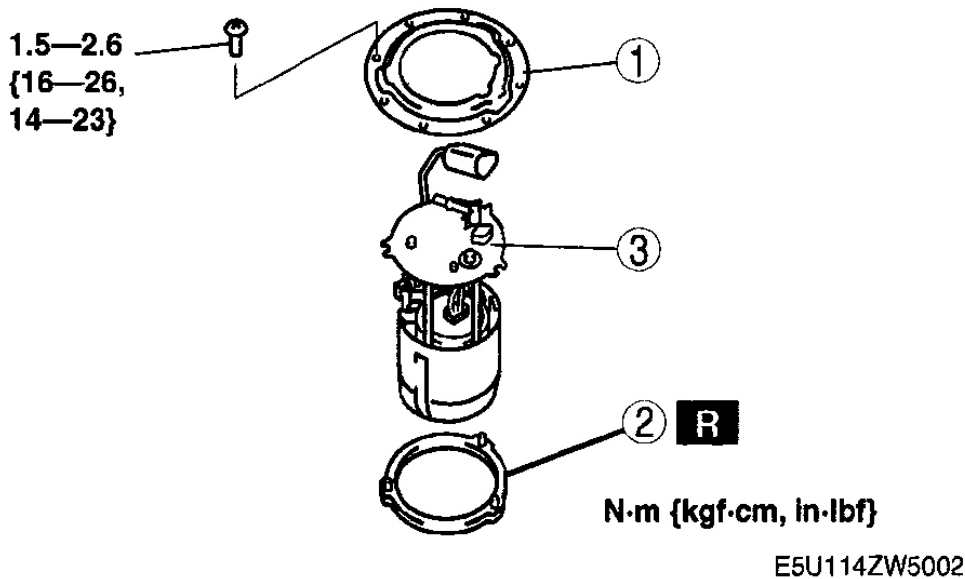
3. Scuff plate (See **SCUFF PLATE REMOVAL/INSTALLATION** .)
4. Tire house trim (See **TIRE HOUSE TRIM REMOVAL/INSTALLATION** .)
5. Aeroboard (See **AEROBOARD REMOVAL/INSTALLATION** .)
6. Front seat back bar garnish (See **SEAT BACK BAR GARNISH REMOVAL/INSTALLATION** .)
2. Remove the back trim. (See **BACK TRIM REMOVAL/INSTALLATION** .)
3. Remove the service hole cover.



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Fig. 20: Identifying Service Hole Cover
Courtesy of MAZDA MOTORS CORP.

5. Disconnect the quick release connector from the fuel pump unit. (See **QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION [LF]** .)
6. Disconnect the fuel pump unit connector.
7. Remove in the order indicated in **Fig. 21** .



1	Plate
2	Packing
3	Fuel pump unit

Fig. 21: Identifying Fuel Pump Unit (With Torque Specifications)
Courtesy of MAZDA MOTORS CORP.

- 8. Install in the reverse order of removal.
- 9. Complete the "AFTER SERVICE PRECAUTION" (See **AFTER SERVICE PRECAUTION [LF]** .)

FUEL LEAKAGE INSPECTION AFTER PUMP UNIT INSTALLATION

- 1. Before installing the fuel tank, verify that there is no leakage when a pressure of **5.9 kPa {44 mmHg, 1.7 inHg}** is applied to the fuel tank.
- 2. Install the fuel tank. (See **FUEL TANK REMOVAL/INSTALLATION [LF]** .)
- 3. Drive the vehicle starting from a standstill and brake suddenly **five to six times** at a low speed.
- 4. Stop the vehicle and verify from outside the vehicle that there is no fuel leakage around the fuel pump unit.

FUEL PUMP UNIT DISASSEMBLY/ASSEMBLY [LF]

WARNING:

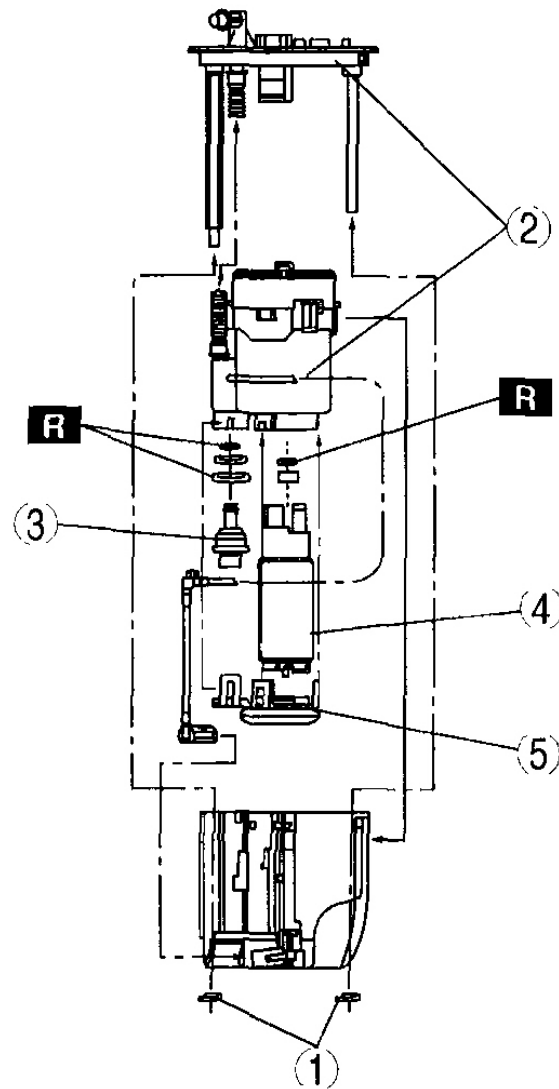
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate

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skin and eyes. To prevent this, do not damage the sealing surface of the fuel pump unit when removing or installing.

1. Disassemble in the order indicated in **Fig. 22** .
2. Assemble in the reverse order of disassembly.



E5U114ZW5022

1	E-ring
2	Fuel filter body
3	Fuel pressure regulator
4	Fuel pump
5	Fuel filter (low-pressure)

Fig. 22: View Of Fuel Pump Unit Components
 Courtesy of MAZDA MOTORS CORP.

FUEL PUMP UNIT INSPECTION [LF]

WARNING:

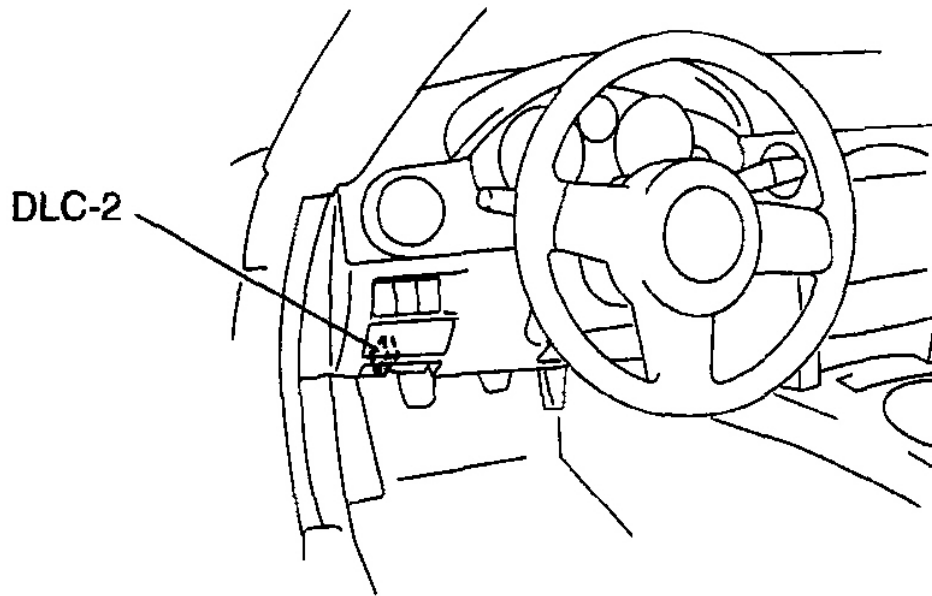
- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "[FUEL LINE SAFETY PROCEDURE](#)", while referring to **BEFORE SERVICE PRECAUTION [LF]** .
- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, before performing the fuel pump unit removal/installation, always complete the "Fuel Leak Inspection After Fuel Pump Unit Installation".
- A person charged with static electricity could cause a fire or explosion, resulting in death or serious injury. Before draining fuel, make sure to discharge static electricity by touching the vehicle body.

FUEL PUMP OPERATION INSPECTION

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See **BEFORE SERVICE PRECAUTION [LF]** .)
2. Remove the fuel-filler cap.
3. Start the fuel pump using the following procedure:

Using M-MDS

1. Connect the M-MDS to the DLC-2.



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Fig. 23: Locating DLC-2 Connector
Courtesy of MAZDA MOTORS CORP.

2. Start the fuel pump using the "FP" simulation function.

Not using M-MDS or equivalent

1. Short the check connector terminal F/P to ground using a jumper wire.

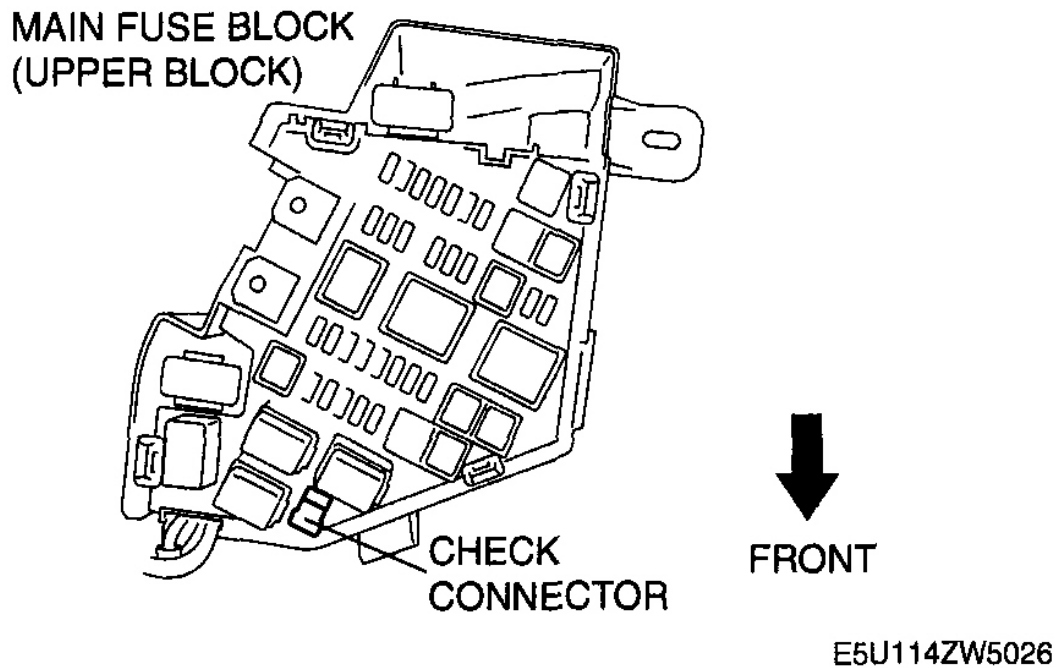
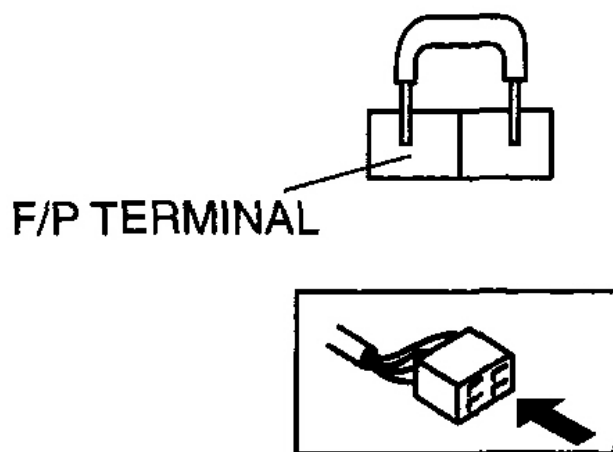


Fig. 24: Checking Connector Terminal F/P To Ground Using Jumper Wire
Courtesy of MAZDA MOTORS CORP.

MAIN FUSE BLOCK (CHECK CONNECTOR)

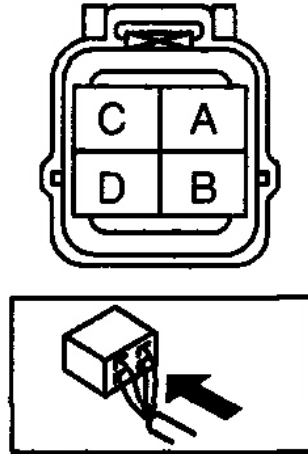


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Fig. 25: Identifying F/P Connector Terminal
Courtesy of MAZDA MOTORS CORP.

2. Turn the ignition switch to the ON position to operate the fuel pump.
4. Verify that operation sound is heard from the fuel pump.
 - If the operation sound cannot be verified, measure the voltage at fuel pump unit wiring harness-side connector terminal B.
 - If as specified, inspect the following:
 - Fuel pump unit continuity
 - If not within the specification, inspect the following:
 - Fuel pump unit relay
 - Wiring harnesses and connectors between main relay and fuel pump relay
 - Wiring harnesses and connectors between fuel pump relay and PCM
 - Wiring harnesses and connectors between battery and fuel pump relay
 - Wiring harnesses and connectors between fuel pump relay and fuel pump unit

FUEL PUMP UNIT WIRING HARNESS-SIDE CONNECTOR



E5U114ZW5028

Fig. 26: Identifying Fuel Pump Unit Connector Terminal
Courtesy of MAZDA MOTORS CORP.

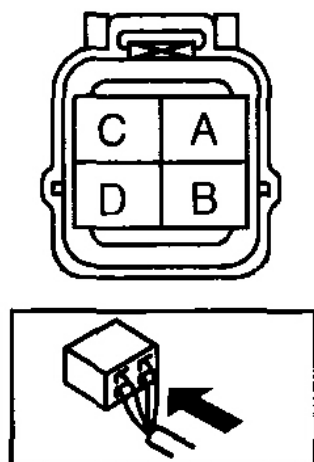
Standard

B+ (Ignition switch at ON)

CONTINUITY INSPECTION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF]** .)
3. Disconnect the fuel pump unit connector. (See **FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]** .)

FUEL PUMP UNIT WIRING HARNESS-SIDE CONNECTOR



E5U114ZW5028

Fig. 27: Disconnecting Fuel Pump Unit Connector
Courtesy of MAZDA MOTORS CORP.

4. Inspect for continuity between fuel pump unit terminals B and D.
 - If there is continuity, perform the **CIRCUIT OPEN/SHORT INSPECTION**.
 - If there is no continuity, replace the fuel pump. (See **FUEL PUMP UNIT DISASSEMBLY/ASSEMBLY [LF1]** .)

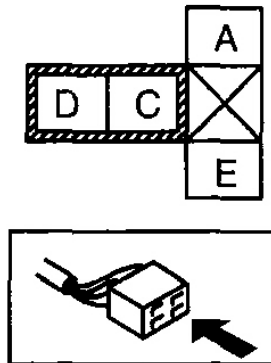
CIRCUIT OPEN/SHORT INSPECTION

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

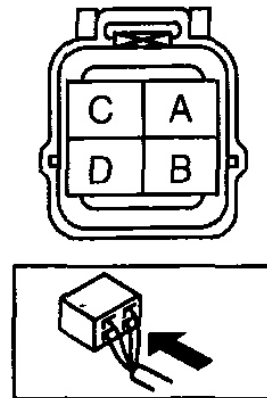
Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
 - Fuel pump unit terminal D and body ground

FUEL PUMP RELAY WIRING HARNESS-SIDE CONNECTOR



FUEL PUMP UNIT WIRING HARNESS-SIDE CONNECTOR



E5U114ZW5029

Fig. 28: Identifying Fuel Pump Unit Terminal
Courtesy of MAZDA MOTORS CORP.

FUEL STATIC PRESSURE INSPECTION

NOTE:

- The fuel static pressure inspection cannot be performed because the pressure regulator is integrated with the fuel pump unit.

QUICK RELEASE CONNECTOR (FUEL SYSTEM) REMOVAL/INSTALLATION [LF]

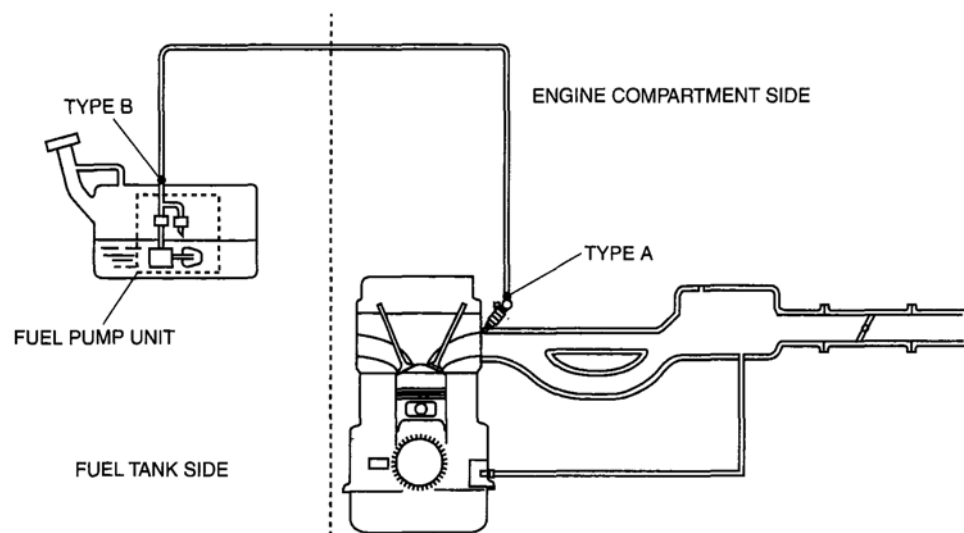
WARNING:

- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "[FUEL LINE SAFETY PROCEDURE](#)", while referring to the [BEFORE SERVICE PRECAUTION \[LF\]](#) .

QUICK RELEASE CONNECTOR TYPE

CAUTION:

- There are two types of quick release connectors. Verify the type and location, and install/remove properly.



E5U114ZW5011

Fig. 29: Identifying Quick Release Connector (Fuel System)

Courtesy of MAZDA MOTORS CORP.

TYPE A REMOVAL

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

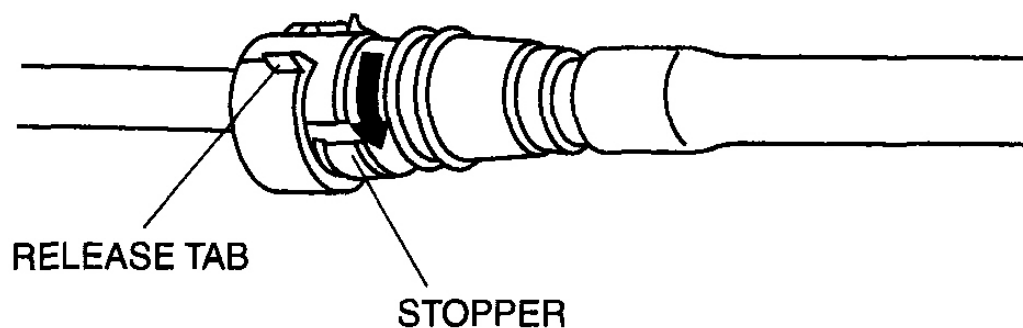
CAUTION:

- The quick release connector may be damaged if the release tab is bent excessively. Do not expand the release tab over the stopper.

NOTE:

- The fuel hose can be removed by pushing it to the pipe side to release the lock.

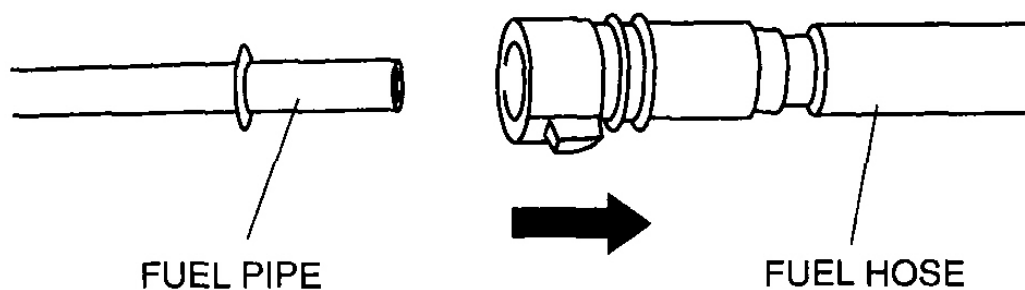
2. Rotate the release tab on the quick release connector to the stopper position.



B3E0114W039

Fig. 30: Releasing Tab On Quick Release Connector To Stopper Position
Courtesy of MAZDA MOTORS CORP.

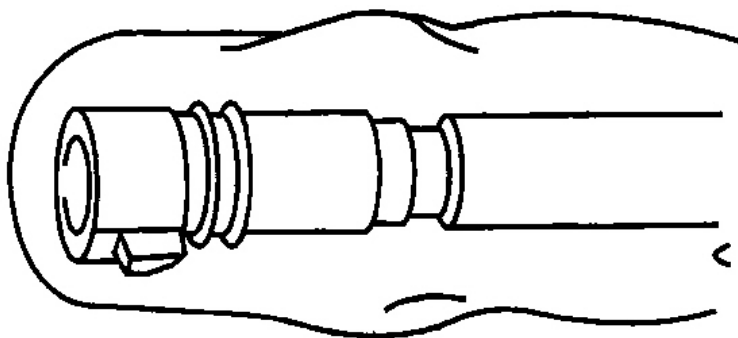
3. Pull out the fuel hose straight from the fuel pipe and disconnect it.



B3E0114W040

Fig. 31: View Of Fuel Hose & Fuel Pipe
Courtesy of MAZDA MOTORS CORP.

4. Cover the disconnected quick release connector and fuel pipe with vinyl sheeting or a similar material to prevent it from becoming scratched or dirty.



ADJ3912W019

Fig. 32: Covered Quick Release Connector
Courtesy of MAZDA MOTORS CORP.

TYPE B REMOVAL

CAUTION:

- Be careful not to damage the pipe when unlocking the retainer.

NOTE:

- If the quick release connector is removed, replace the retainer with a new one.

1. Follow "BEFORE SERVICE PRECAUTION" and remove dirt from the connecting surfaces before performing any work operations. (See **BEFORE SERVICE PRECAUTION [LF]** .)

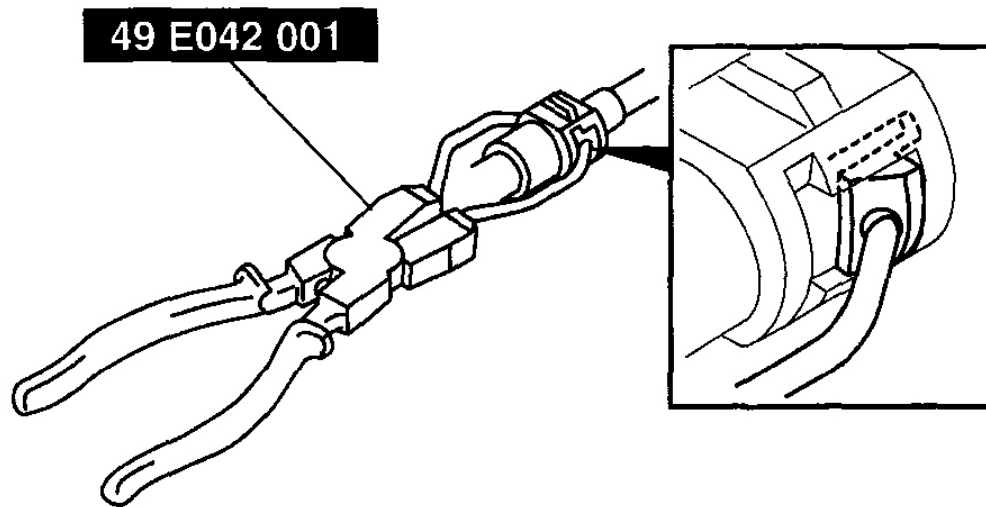
NOTE:

- The retainer is attached to the pipe even after the connector is disconnected.

2. Set the SST parallel to the quick release connector.

NOTE:

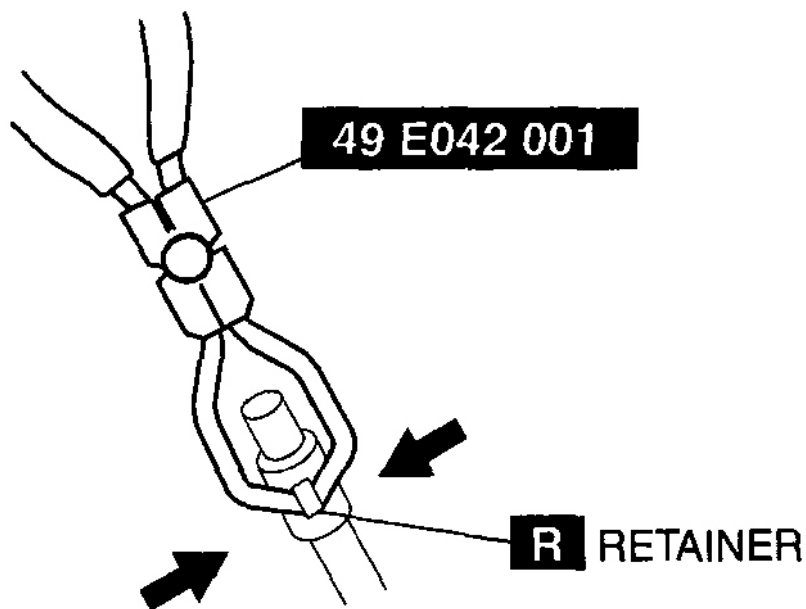
- The quick release connector can be removed by pushing the center of the retainer tabs.



E5U114ZW5850

Fig. 33: Setting SST Parallel To Quick Release Connector
Courtesy of MAZDA MOTORS CORP.

3. Hold the center of the retainer tabs with the **SST** ends and press the retainer.
4. Pull the connector side and disconnect the quick release connector.
5. Raise a retainer tab using the **SST** and remove the retainer.



E5U114ZW5012

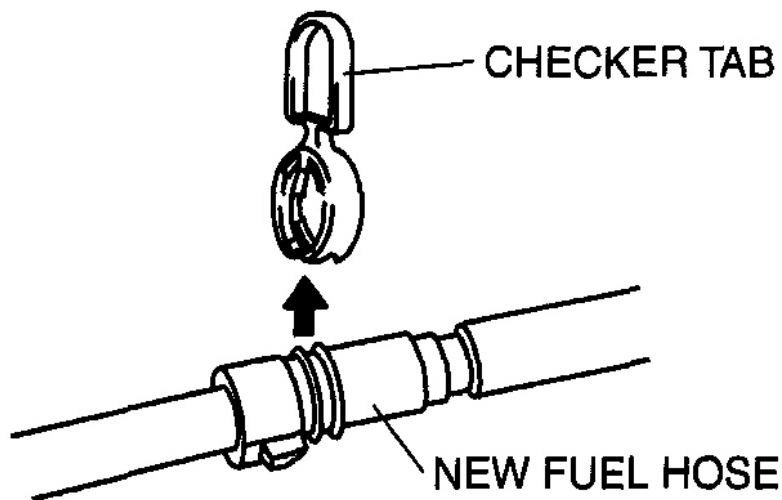
Fig. 34: Raising Retainer Tab Using SST & Removing Retainer
Courtesy of MAZDA MOTORS CORP.

6. Cover the disconnected quick release connector and fuel pipe with vinyl sheeting or a similar material to prevent it from scratches or dirt.

TYPE A INSTALLATION

NOTE:

- If the quick release connector O-ring is damaged or has slipped, replace the fuel hose.
- A checker tab is integrated with the quick release connector for new fuel hoses and evaporative hoses. Remove the checker tab from the quick release connector after the connector is completely engaged with the fuel pipe.



B3E0114W041

Fig. 35: Identifying Checker Tab
Courtesy of MAZDA MOTORS CORP.

1. Inspect the fuel hose and fuel pipe sealing surface for damage and deformation.
 - If there is any malfunction, replace it with a new one.
2. Apply a small amount of clean engine oil to the sealing surface of the fuel pipe.
3. Reconnect the fuel hose straight to the fuel pipe until a click is heard.

NOTE:

- If the quick release connector does not move at all, disconnect it, verify that the O-ring is not damaged or has not slipped, and then reconnect the quick release connector.
4. Lightly pull and push the quick release connector a few times by hand, and then verify that it can move **2.0-3.0 mm {0.08-0.12 in}** and is connected securely.
 5. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION [LF]** .)

TYPE B INSTALLATION

CAUTION:

- Always replace the retainer with a new one when using SST 49 E042 001, otherwise, fuel leakage could result.

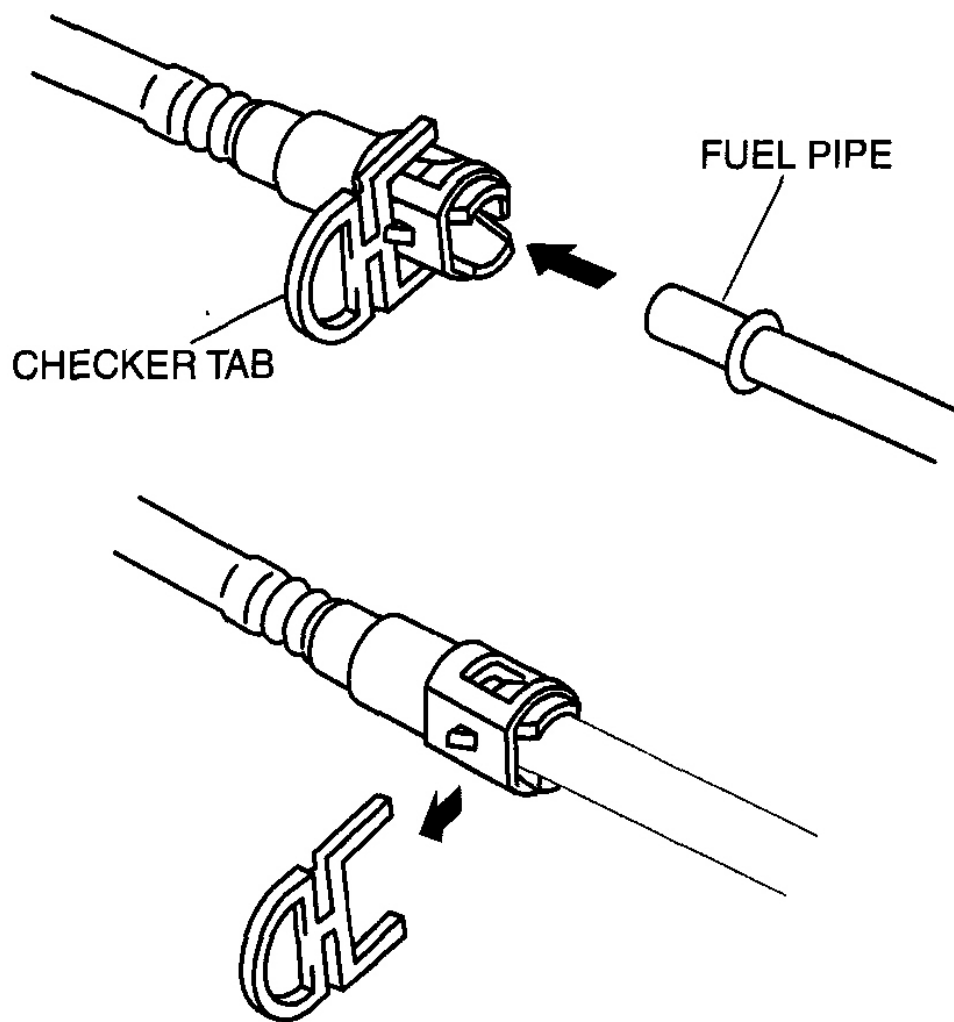
2008 Mazda MX-5 Miata Grand Touring

2008 ENGINE Fuel System - MX-5 Miata

NOTE:

- If the quick release connector O-ring is damaged or has slipped, replace the piping component.
- A checker tab is integrated with the quick release connector for new fuel hoses and evaporative hoses. Remove the checker tab from the quick release connector after the connector is completely engaged with the fuel pipe.

1. Inspect the fuel hose and fuel pipe sealing surface for damage and deformation.
 - If there is any malfunction, replace it with a new one.
2. Apply a small amount of clean engine oil to the sealing surface of the fuel pipe.
3. Install a new retainer to the quick release connector.



E5U114ZS5004

Fig. 36: Identifying Quick Release Connector
Courtesy of MAZDA MOTORS CORP.

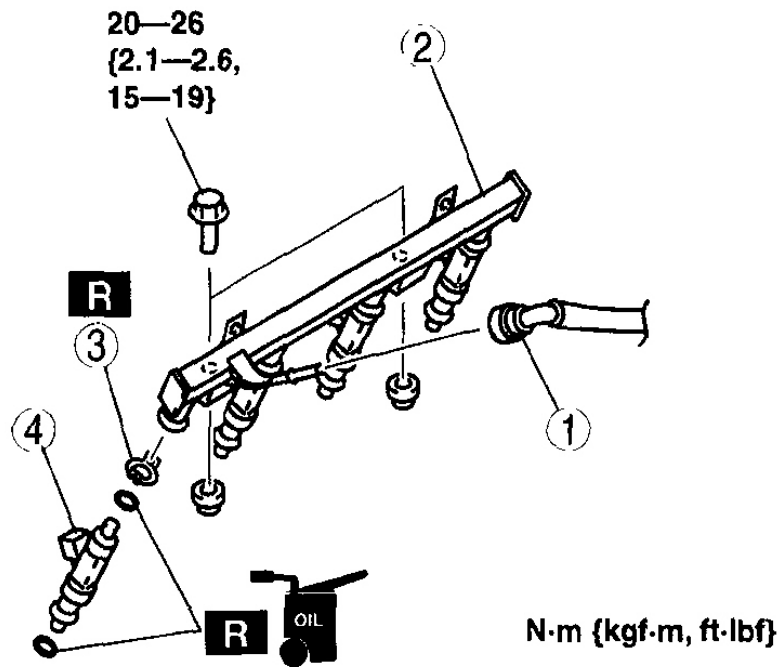
4. Reconnect the hose straight to the pipe until a click is heard.
5. Lightly pull and push the quick release connector a few times by hand, and then verify that it is connected securely.
6. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION [LF]** .)

FUEL INJECTOR REMOVAL/INSTALLATION [LF]

WARNING:

- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "[FUEL LINE SAFETY PROCEDURE](#)", while referring to the **BEFORE SERVICE PRECAUTION [LF]** .

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See **BEFORE SERVICE PRECAUTION [LF]** .)
2. Remove the plug hole plate. (See **PLUG HOLE PLATE REMOVAL/INSTALLATION [LF]** .)
3. Remove the battery cover.
4. Disconnect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF]** .)
5. Disconnect the fuel injector connector and move the harness slightly out of the way.
6. Remove in the order indicated in **Fig. 37** .



E5U114ZW5004

1	Quick release connector (Type A)
2	Fuel distributor
3	Injector clip
4	Fuel injector

Fig. 37: View Of Fuel Injector Components (With Torque Specifications)
Courtesy of MAZDA MOTORS CORP.

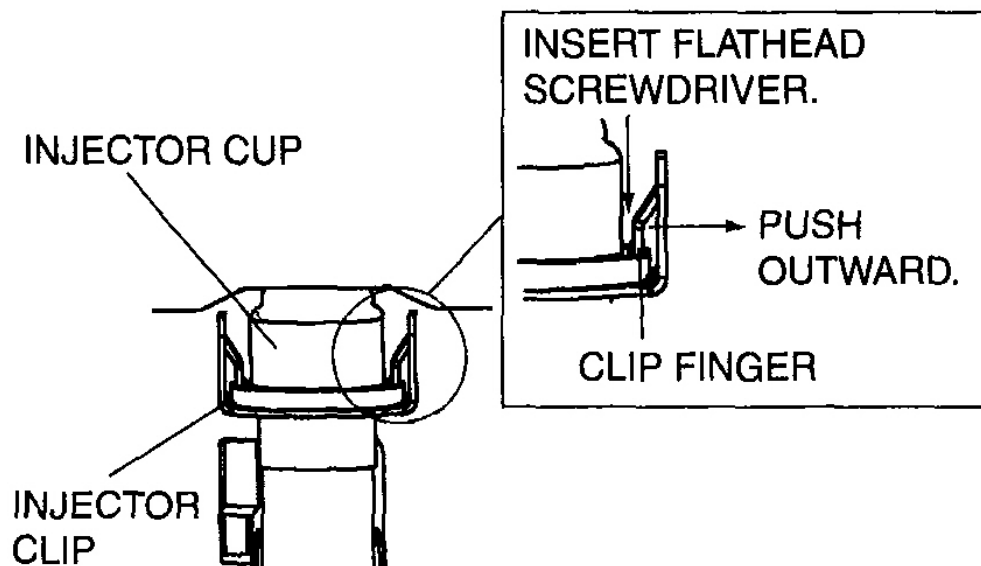
7. Install in the reverse order of removal.
8. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION [LF]** .)

FUEL INJECTOR REMOVAL NOTE

CAUTION:

- Use of a deformed injector clip will cause the fuel injector to be connected incorrectly and could result in fuel leakage. It will also cause the injector to rotate. Therefore, always replace the clip when the injector is removed.

1. Insert a flathead screwdriver between the injector cup and clip finger.



E5U114ZW5S01

Fig. 38: Inserting Flathead Screwdriver Between Injector Cup & Clip Finger
Courtesy of MAZDA MOTORS CORP.

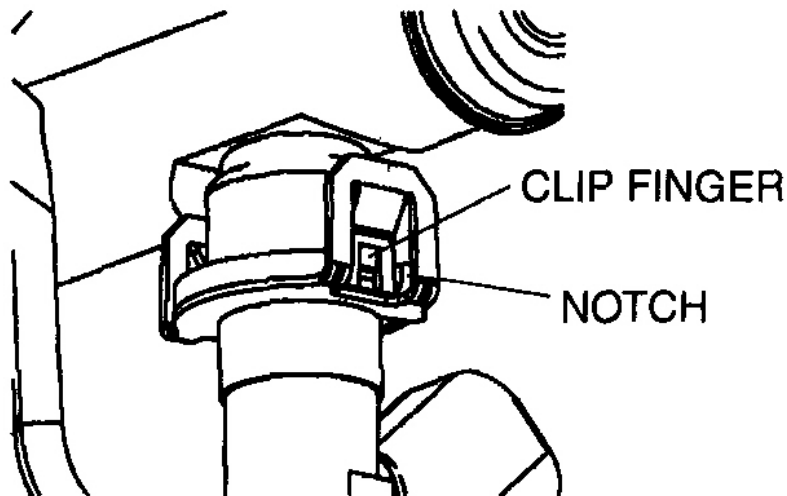
NOTE:

- When pushing the clip finger outward, deform the finger until it is removed completely from the cup notch.

2. Push the clip finger outward using a flathead screwdriver.
3. Remove the injector with the clip.
4. Remove the clip from the fuel injector using the following procedure:

NOTE:

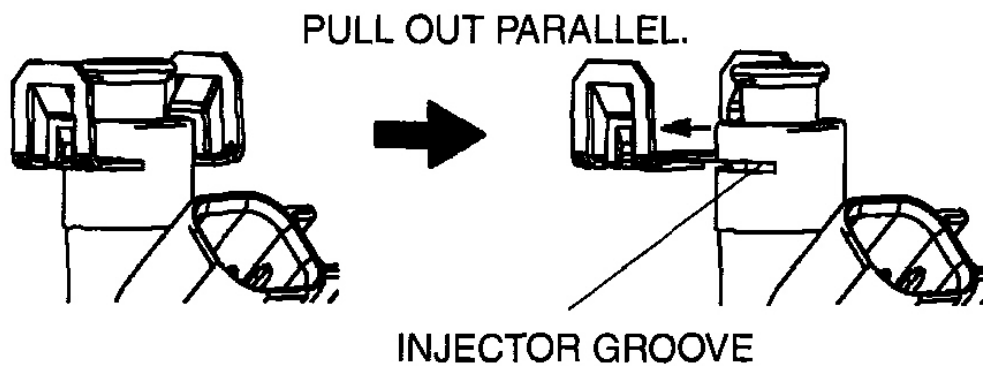
- The clip will not be reused.



B3E0114W020

Fig. 39: Identifying Clip Finger And Notch
Courtesy of MAZDA MOTORS CORP.

1. Hold the clip using pliers.
2. Pull the clip parallel to the injector groove and remove it from the injector.



B3E0114W021

Fig. 40: Pulling Clip Parallel To Injector Groove
Courtesy of MAZDA MOTORS CORP.

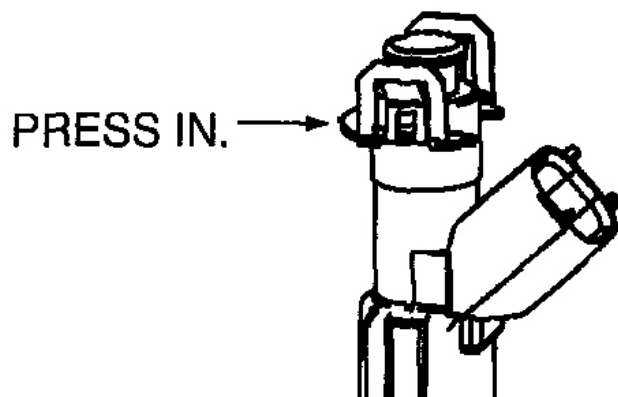
FUEL INJECTOR INSTALLATION NOTE

1. Apply a small amount of clean oil to the injector groove and the O-ring.
2. Temporarily attach a new clip to the injector groove.

NOTE:

- When the clip is attached correctly, the central area of the injector and the clip finger positions are aligned.

3. Hold the injector firmly and push the clip into the injector until the clip stops sliding.
4. Verify that the injector connector position is correct.
5. Press the injector into the injector cup. Continue pressing until the clip contacts the lower surface of the injector cup.
6. Verify that the injector and clip are correctly installed with the clip locked onto the injector cup notch.



B3E0114W026

Fig. 41: View Of Fuel Injector
Courtesy of MAZDA MOTORS CORP.

FUEL INJECTOR INSPECTION [LF]

NOTE:

- Perform the following inspection only when directed.

RESISTANCE INSPECTION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF]** .)
3. Disconnect the fuel injector connector.
4. Inspect the resistance between fuel injector terminals A and B using a tester.
 - If within the specification, perform the **CIRCUIT OPEN/SHORT INSPECTION**.
 - If not within the specification, replace the fuel injector. (See **FUEL INJECTOR REMOVAL/INSTALLATION [LF]** .)

Fuel injector resistance

11.4-12.6 ohms [20°C {68°F}]

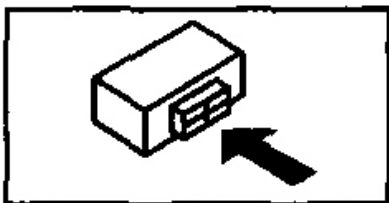
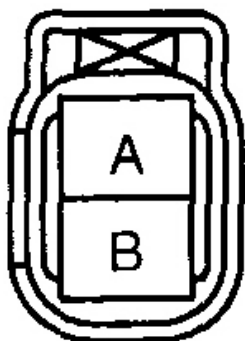
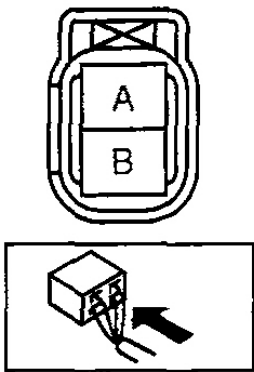


Fig. 42: Identifying Fuel Injector Terminals A & B Using Tester
Courtesy of MAZDA MOTORS CORP.

CIRCUIT OPEN/SHORT INSPECTION

- 1. Disconnect the PCM connector. (See **PCM REMOVAL/INSTALLATION [LF]** .)
- 2. Inspect the following wiring harnesses for open or short circuit (continuity check).

**FUEL INJECTOR
WIRING HARNESS-SIDE CONNECTOR**



**PCM
WIRING HARNESS-SIDE CONNECTOR**

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



E5U114ZW5030

Fig. 43: Identifying Fuel Injector Connector & PCM Connector Terminal
Courtesy of MAZDA MOTORS CORP.

Open Circuit

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

Short Circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
 - Fuel injector No.1 terminal B and body ground
 - Fuel injector No.1 terminal B and power supply
 - Fuel injector No.2 terminal B and body ground
 - Fuel injector No.2 terminal B and power supply
 - Fuel injector No.3 terminal B and body ground
 - Fuel injector No.3 terminal B and power supply
 - Fuel injector No.4 terminal B and body ground
 - Fuel injector No.4 terminal B and power supply
 - Fuel injector No.1 terminal A and body ground
 - Fuel injector No.2 terminal A and body ground
 - Fuel injector No.3 terminal A and body ground
 - Fuel injector No.4 terminal A and body ground

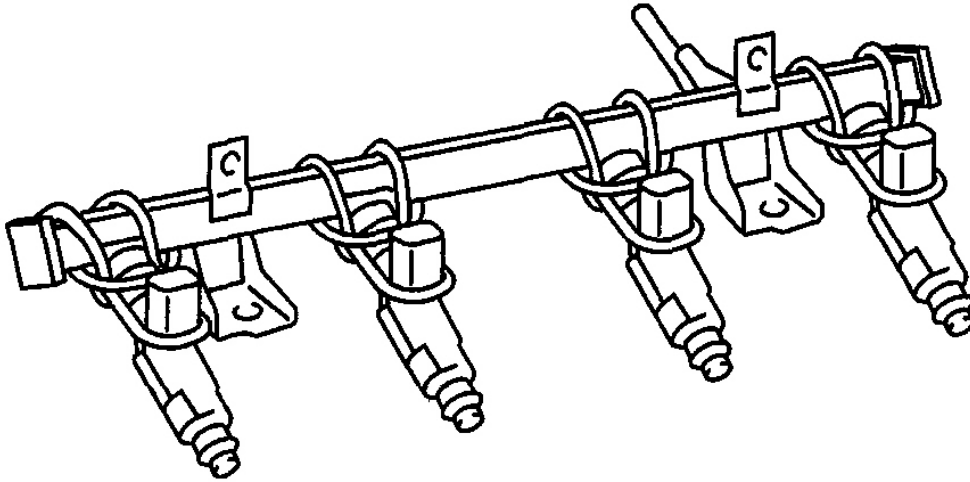
LEAKAGE INSPECTION**WARNING:**

- **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 [LF]** .)
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF]** .)
4. Remove the fuel injector and fuel distributor as a single unit. (See **FUEL INJECTOR**

REMOVAL/INSTALLATION [LF] .)

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



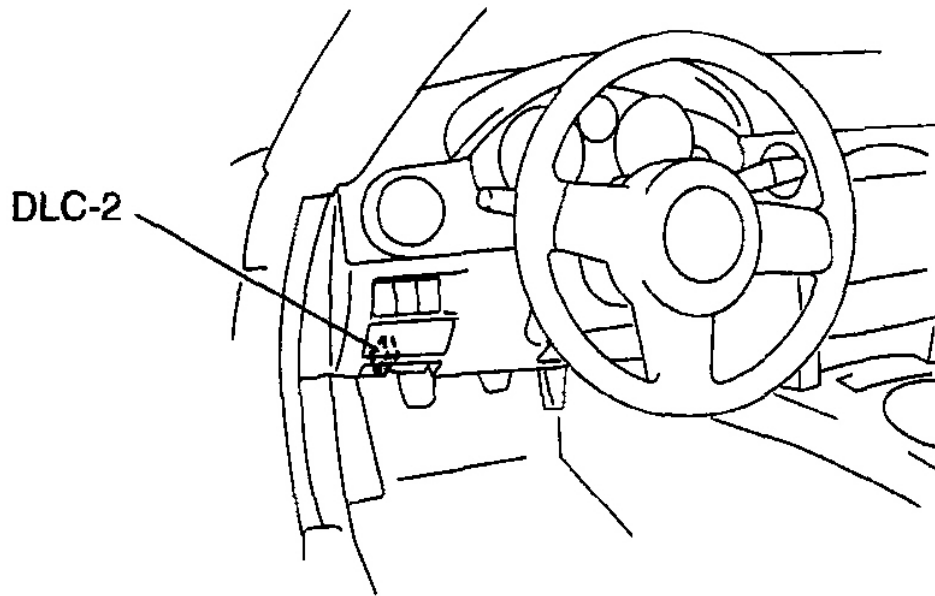
E5U114ZW5005

Fig. 44: Fixing Fuel Injector To Fuel Distributor With Wire
Courtesy of MAZDA MOTORS CORP.

6. Connect the fuel hose.
7. Start the fuel pump using the following procedure:

Using M-MDS

1. Connect the negative battery cable.
2. Connect the M-MDS to the DLC-2.



E5U102ZW5861

Fig. 45: Locating DLC-2 Connector
Courtesy of MAZDA MOTORS CORP.

3. Start the fuel pump using the "FP" simulation function.

Not using M-MDS

1. Short the check connector terminal F/P to ground using a jumper wire.

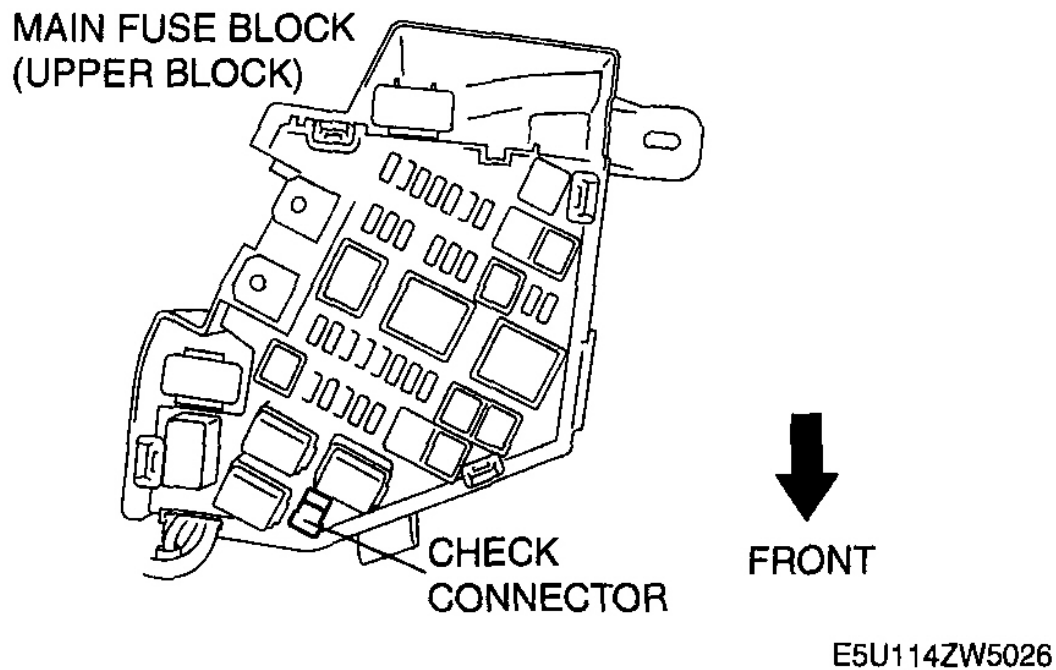
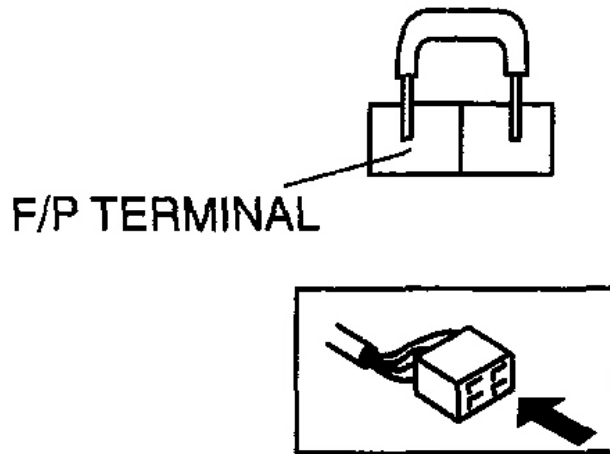


Fig. 46: Checking Connector Terminal F/P To Ground Using Jumper Wire
Courtesy of MAZDA MOTORS CORP.

MAIN FUSE BLOCK (CHECK CONNECTOR)



E5U114ZW5027

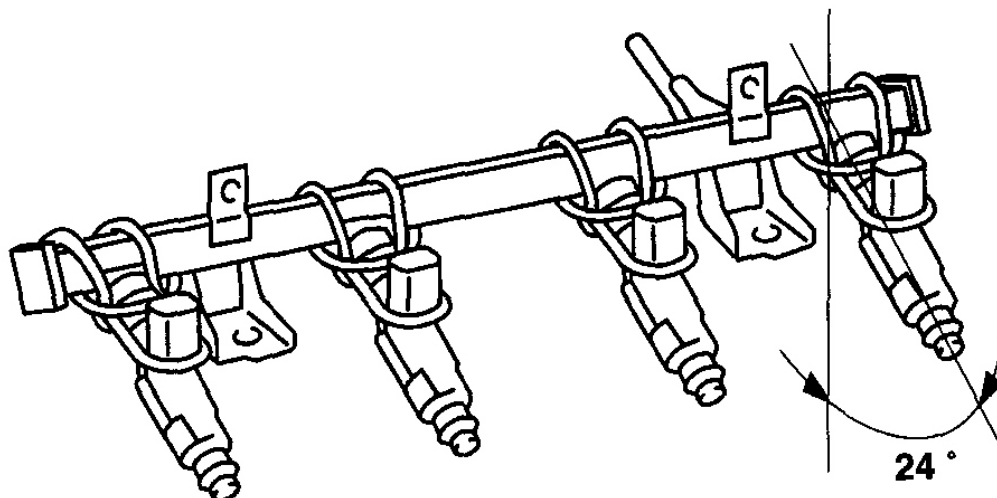
Fig. 47: Identifying F/P Connector Terminal
Courtesy of MAZDA MOTORS CORP.

2. Turn the ignition switch to the ON position to operate the fuel pump.

NOTE:

- Prepare a container to collect the gasoline.

8. Tilt the fuel injector at an angle of **24°** to inspect for leakage.
 - If not within the specification, replace the fuel injector. (See **FUEL INJECTOR REMOVAL/INSTALLATION [LF]** .



E5U114ZW5006

Fig. 48: Tilting Fuel Injector
Courtesy of MAZDA MOTORS CORP.

Fuel injector leakage amount

Less than 1 drop/2 min

9. Stop the fuel pump using the following procedure:

Using M-MDS

1. Stop the fuel pump using the "FP" simulation function.

Not using M-MDS

1. Turn the ignition switch to off to stop the fuel pump.
10. Remove the battery cover.
11. Disconnect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF]** .)
12. Remove the wire or equivalent securing the fuel injector.
13. Install the fuel injector. (See **FUEL INJECTOR REMOVAL/INSTALLATION [LF]** .)
14. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION [LF]** .)

INJECTION VOLUME INSPECTION

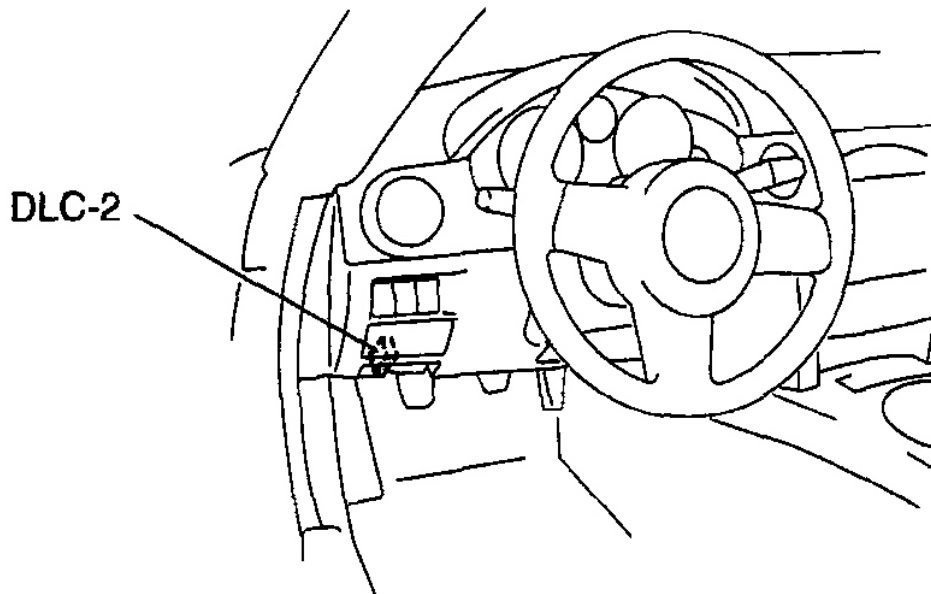
WARNING:

- 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 [LF]** .)
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF]** .)
4. Remove the fuel injector. (See **FUEL INJECTOR REMOVAL/INSTALLATION [LF]** .)
5. Connect the fuel injector to the fuel injector tester.
6. Start the fuel pump using the following procedure:

Using M-MDS

1. Connect the negative battery cable.
2. Connect the M-MDS or equivalent to the DLC-2.



E5U102ZW5861

Fig. 49: Locating DLC-2 Connector
Courtesy of MAZDA MOTORS CORP.

3. Start the fuel pump using the "FP" simulation function.

Not using M-MDS

1. Short the check connector terminal F/P to ground using a jumper wire.

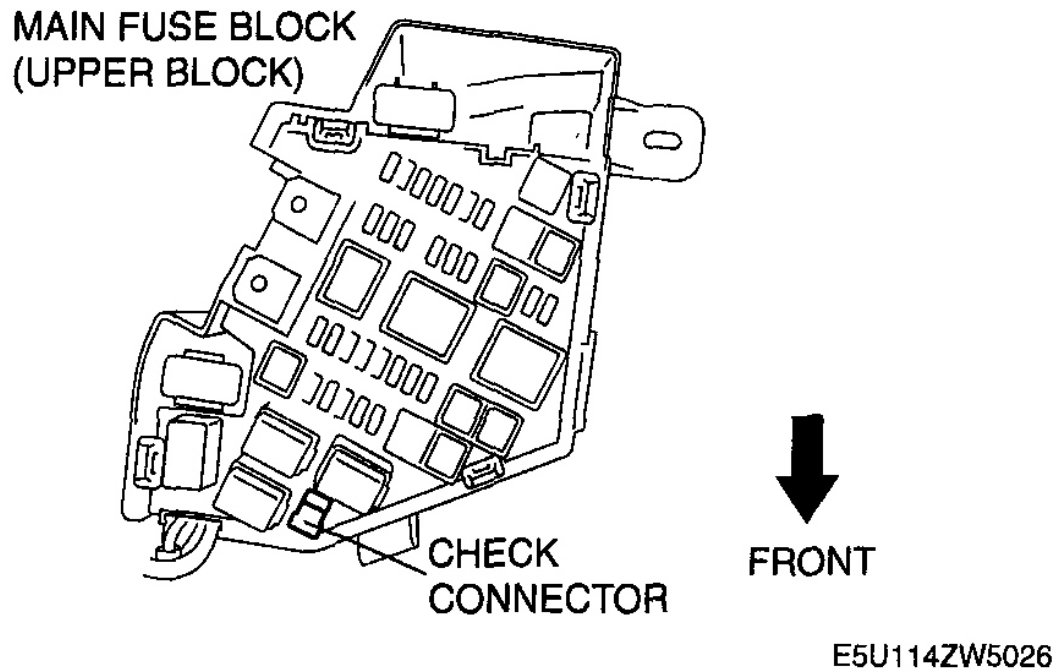
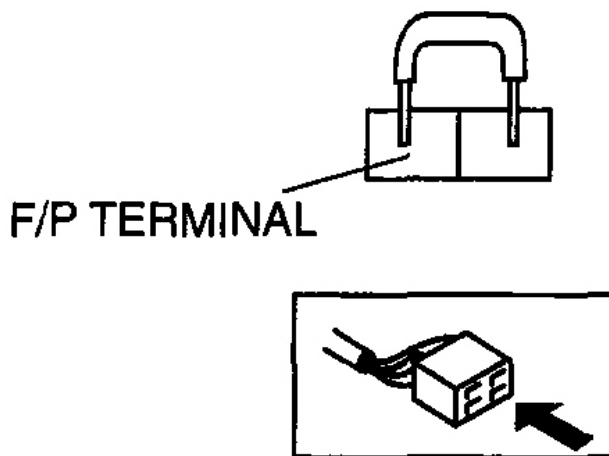


Fig. 50: Checking Connector Terminal F/P To Ground Using Jumper Wire
Courtesy of MAZDA MOTORS CORP.

MAIN FUSE BLOCK (CHECK CONNECTOR)



E5U114ZW5027

Fig. 51: Identifying F/P Connector Terminal
Courtesy of MAZDA MOTORS CORP.

2. Turn the ignition switch to the ON position to operate the fuel pump.
7. Measure the injection volume of each fuel injector.
 - If not within the specification, replace the fuel injector. (See **FUEL INJECTOR REMOVAL/INSTALLATION [LF]** .)

Fuel injection volume

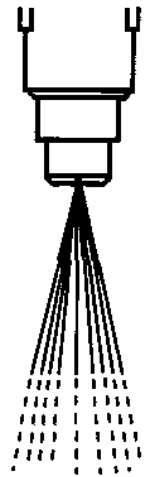
204-216 ml {204-216 cc, 12.5-13.1 cu in}/min

8. Turn the ignition switch to off to stop the fuel pump.
9. Install the fuel injector. (See **FUEL INJECTOR REMOVAL/INSTALLATION [LF]** .)
10. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION [LF]** .)

ATOMIZATION INSPECTION

1. Inspect the atomization status.
 - If not normal, replace the fuel injector. (See **FUEL INJECTOR REMOVAL/INSTALLATION**

[LF] .)



NORMAL



NOT NORMAL

B3E0114W034

Fig. 52: Inspecting Atomization Status
Courtesy of MAZDA MOTORS CORP.