



FUEL SYSTEM

Fuel System

Fuel System Service Precautions

Safety is the most important factor when performing not only fuel system maintenance, but any type of maintenance. Failure to conduct maintenance and repairs in a safe manner may result in serious personal injury or death. Work on a vehicle's fuel system components can be accomplished safely and effectively by adhering to the following rules and guidelines.

- To avoid the possibility of fire and personal injury, always disconnect the negative battery cable unless the repair or test procedure requires that battery voltage be applied.
- Always relieve the fuel system pressure prior to disconnecting any fuel system component (injector, fuel rail, pressure regulator, etc.) fitting or fuel line connection. Exercise extreme caution whenever relieving fuel system pressure, to avoid exposing skin, face and eyes to fuel spray. Please be advised that fuel under pressure may penetrate the skin or any part of the body that it contacts.
- Always place a shop towel or rag around the fitting or connection prior to loosening to absorb any excess fuel due to spillage. Ensure that all fuel spillage is quickly removed from engine surfaces. Ensure that all fuel-soaked cloths or towels are deposited into a flame-proof waste container with a lid.
- Always keep a dry chemical (Class B) fire extinguisher near the work area.
- Do not allow fuel spray or fuel vapors to come into contact with a light bulb, spark or open flame.
- Always use a second wrench when loosening or tightening fuel line connections fittings. This will prevent unnecessary stress and torsion to fuel piping. Always follow the proper torque specifications.
- Always replace worn fuel fitting O-rings with new ones. Do not substitute fuel hose where rigid pipe is installed.





Fuel System Pressure

RELIEVING

CAUTION

Failure to relieve fuel pressure before repairs or disassembly can cause serious personal injury and/or property damage. Fuel pressure is maintained within the fuel lines, even if the engine is

OFF or has not been run in a period of time. This pressure must be safely relieved before any fuel-bearing line or component is loosened or removed. On vehicles equipped with inflatable restraints or air bag systems, wait at least 90 seconds after disconnecting the battery cable before performing any other work. The back-up power will keep the restraint system energized for a period of time after the battery is disconnected.

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Perform the following:
 - Remove the fuse for the fuel pump.
 - Start the engine until the engine stalls.
 - Disconnect the negative battery terminal.
 - Place a catch-pan under the joint to be disconnected. A large quantity of fuel may be released when the joint is opened.
 - Wear eye or full face protection.
 - Place a shop towel over the area and slowly release the joint using a wrench of the correct size.
 - Allow the any fuel left in the line to bleed off slowly before fully disconnecting the joint.
 - Plug the opened lines.
3. After connecting fuel lines, install the fuse for the fuel pump and start the engine.



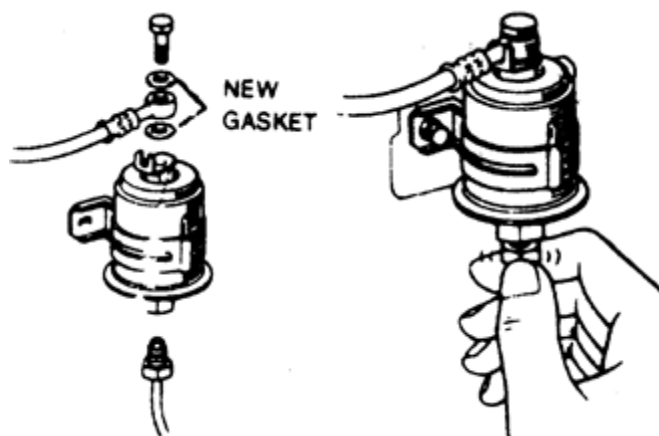


Fuel Filter

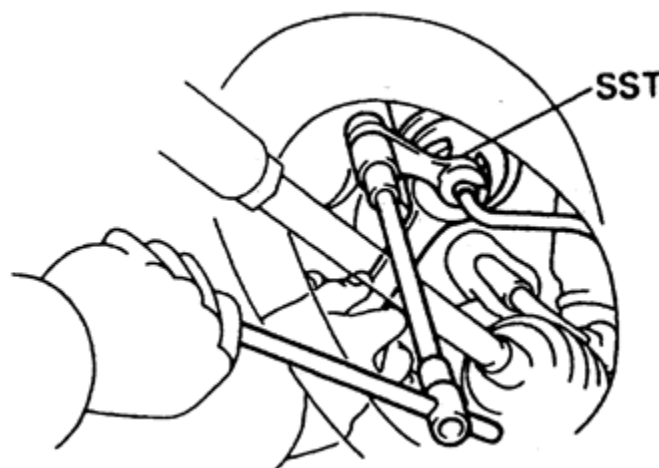
REMOVAL & INSTALLATION

All Models

Always use new gaskets when replacing a fuel filter —
Tercel shown



A line wrench with an extension may be needed to
loosen the inlet line at the filter — Corolla



1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Remove or disconnect the following:
 - Negative battery cable. On vehicles equipped with an air bag, wait at least 90 seconds before proceeding.
 - Protective shield for the fuel filter.
 - If necessary, air cleaner hose and cap.
 - If necessary, charcoal canister.
 - Slowly loosen the lower flare nut fitting until all the pressure is relieved.
 - Banjo fitting and 2 metal gaskets. Discard the gaskets.
 - Fuel line with the flared nut from the filter

- Filter from the mounting bracket

To install:**3. Install or connect the following:**

- New fuel filter
- Banjo fitting with a new metal gasket on each side and install the union bolt. Bolt: 22 ft. lbs. (30 Nm).
- Flare nut to the lower connection. Nut: 22 ft. lbs. (30 Nm).
- Charcoal canister
- Air cleaner hose and cap
- Protective shield
- Negative battery cable





Fuel Pump

REMOVAL & INSTALLATION

Avalon, Camry and Camry Solara

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Relieve the fuel system pressure.
3. Remove or disconnect the following:
 - Negative battery cable. On vehicles equipped with an air bag, wait at least 90 seconds before proceeding.
 - Fuel tank

NOTE: On some models it will be necessary to remove the rear seat cushion.

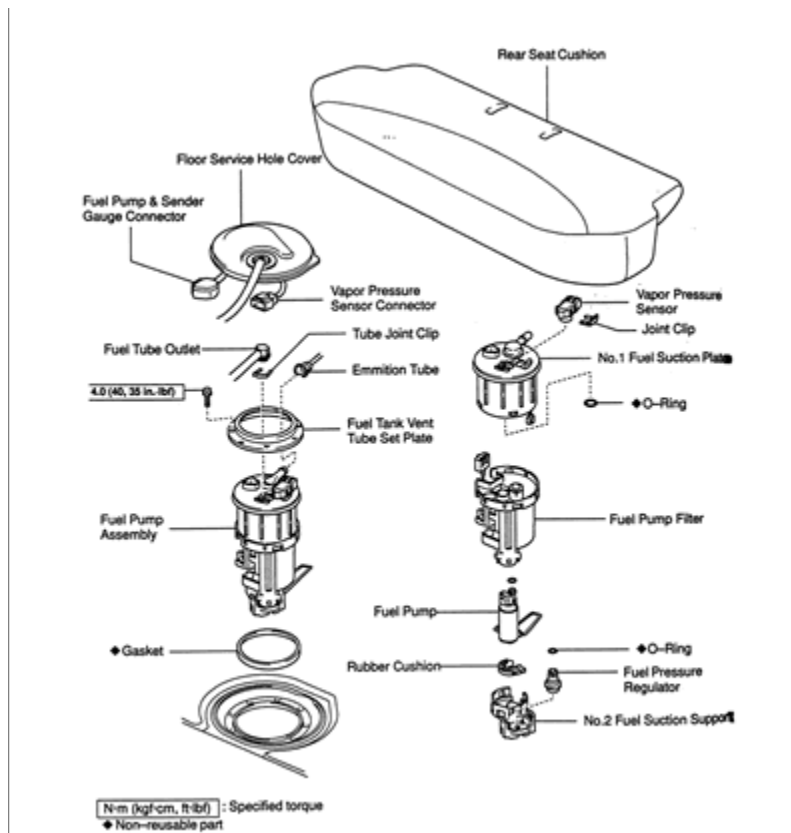
4. Floor service hole cover
5. Electrical connector at the fuel pump assembly.
6. Fuel outlet pipe from the fuel pump bracket.
7. Return hose from the fuel pump bracket.
8. Fuel pump bracket assembly from the fuel tank by removing the bolts.
9. Pump bracket assembly.
10. Fuel pump from the fuel bracket.

To install:

11. Install or connect the following:
 - Fuel pump to the fuel bracket.
 - Pump bracket assembly
 - Fuel pump to the fuel tank. Bolts: 35 inch lbs. (4 Nm).
 - Return hose to the fuel pump bracket.
 - Outlet pipe to the fuel pump bracket. Tighten to 21 ft. lbs. (28 Nm).
 - Service hole cover to the fuel tank.
 - Fuel pump connector
 - Rear seat cushion
 - Fuel tank
 - Negative battery cable

Echo

Fig. 1: Fuel pump removal — Echo



1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Relieve the fuel system pressure.
3. Remove or disconnect the following:
 - Negative battery cable. On vehicles equipped with an air bag, wait at least 90 seconds before proceeding.
 - Rear seat cushion
 - Floor service hole cover
 - Electrical connector at the fuel pump assembly.
 - Fuel outlet pipe from the fuel pump bracket.
 - Return hose from the fuel pump bracket.
 - Fuel pump set plate from the fuel tank by removing the 8 bolts
 - Fuel pump from the fuel bracket.

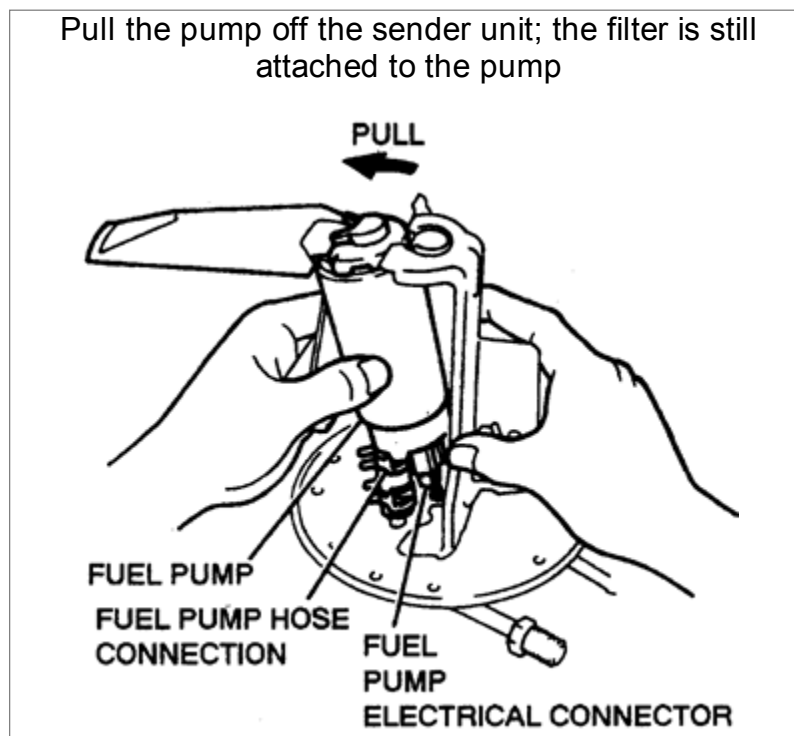
To install:

4. Install or connect the following:
 - Fuel pump to the fuel tank. Bolts: 35 inch lbs. (4 Nm).
 - Return hose to the fuel pump bracket.
 - Outlet pipe to the fuel pump bracket. Tighten to 21 ft. lbs. (28 Nm).
 - Service hole cover to the fuel tank.
 - Fuel pump connector
 - Rear seat cushion
 - Negative battery cable

Celica, GT-S, Corolla, Paseo and Tercel

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Relieve the fuel system pressure.
3. Remove or disconnect the following:

- Negative battery cable. On vehicles equipped with an air bag, wait at least 90 seconds before proceeding.



- Rear seat cushion and floor service hole cover.
- Access plate-to-fuel tank bolts, then pull out the plate/fuel pump assembly.
- Fuel pump sender and fuel pump connector.
- Outlet pipe from the fuel pump bracket
- Return hose from the pump bracket.
- Fuel pump bracket assembly from the fuel tank.
- Lower side of the fuel pump from the pump bracket.
- Fuel pump connector.
- Fuel hose from the fuel pump
- Rubber cushion from the pump.
- Fuel filter from the pump by removing the small clip.

To install:

4. Install or connect the following:
 - New cushion to the fuel pump.
 - Fuel filter and new clip to the fuel pump.
 - Fuel hose to the fuel pump, fuel pump connector and fuel pump to the bracket.
 - Fuel pump bracket assembly to the fuel tank using a new gasket. Bolts: 30 inch lbs. (3 Nm).
 - Fuel return hose and the fuel outlet pipe to the fuel pump bracket.
 - Fuel pump and fuel pump sender connector.
 - Fuel tank
 - Negative battery cable
 - Floor service hole cover and rear seat cushion.

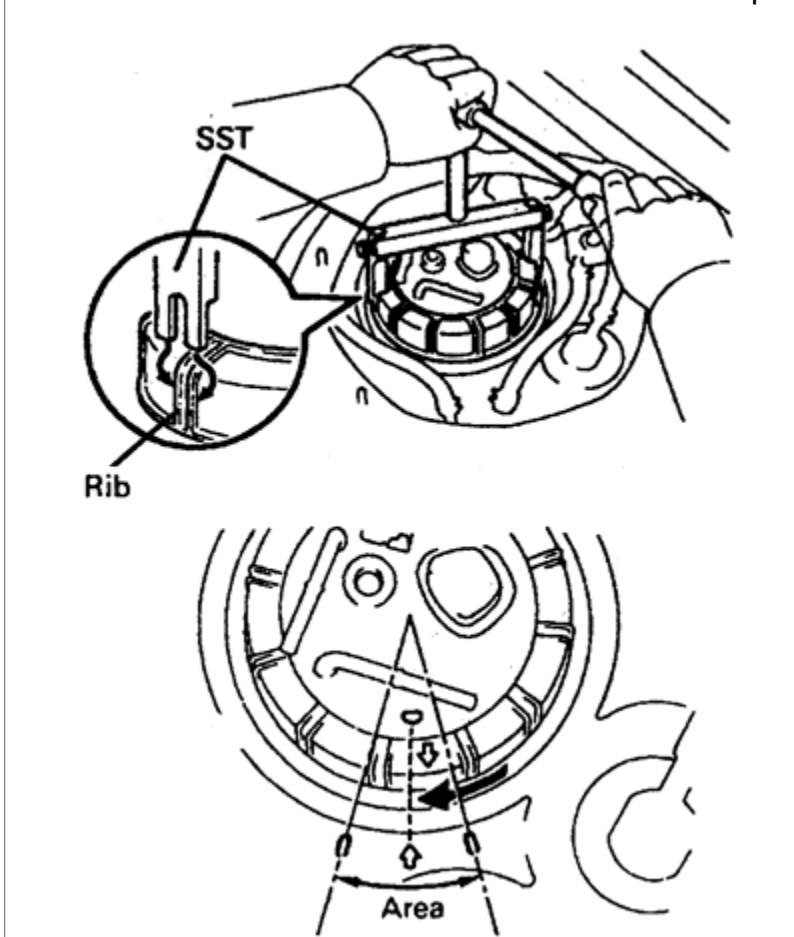
Supra

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Relieve the fuel system pressure.

3. Remove or disconnect the following:

- Negative battery cable. On vehicles equipped with an air bag, wait at least 90 seconds before proceeding.

Tighten the fuel pump retainer until the arrow mark on the retainer is within the lines on the fuel tank — Supra



- Floor carpet, spare wheel cover, spare wheel, service hole cover
- Fuel pump electrical connector from the fuel pump.
- Outlet hose from the fuel pump.
- Fuel return hose from the fuel pump.
- Fuel breather clamp
- Loosen retainer to the fuel pump.
- Fuel return hose from the return port of the fuel pump bracket.
- Retainer, fuel pump, sender gauge assembly, and the gasket as a unit.

To install:

4. Install or connect the following:

- New gasket to the fuel pump.
- Fuel pump and sender gauge assembly into the fuel tank.
- Align the arrow marks of the fuel pump bracket and the fuel tank.
- Fuel pump retainer until the arrow mark on the retainer is within the lines on the fuel tank.
- Retainer clamp to the fuel pump.
- Fuel pump electrical connector to the fuel pump.
- Outlet hose with 2 new gaskets. Bolt: 22 ft. lbs. (29 Nm).
- Fuel return hose to the fuel pump.
- Fuel breather hose to the fuel pump.

- Negative battery cable
- Service hole cover
- Spare wheel, spare wheel cover, floor carpet





Fuel Injectors

REMOVAL & INSTALLATION

Avalon and Camry

5S-FE ENGINE

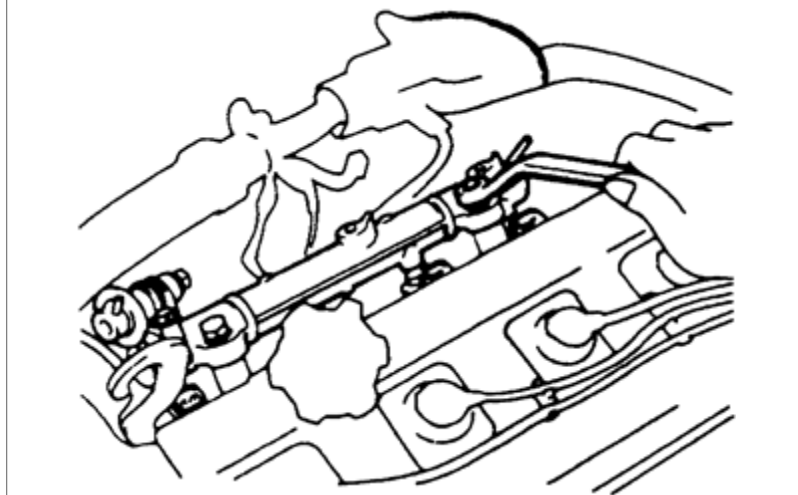
1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Remove or disconnect the following:
 - Negative battery cable
 - Coolant
 - Accelerator cable from the throttle body
 - If equipped with automatic transmission, the throttle cable
 - Air intake temperature sensor connector
 - Cruise control actuator cable from the clamp on the resonator
 - Air cleaner
 - Wiring from the throttle position sensor and the ISC valve
 - Hoses from the PCV, EGR vacuum modulator and EVAP VSV
 - Throttle body
 - PS vacuum hoses
 - Hoses from the EVAP Bi-metal Vacuum Switching Valve (BVSF)
 - EGR valve and the vacuum modulator
 - Vacuum sensor hose at the air intake chamber
 - Brake booster vacuum hose and the vacuum sensing hose
 - With air conditioning, the magnet switch VSV wiring
 - Ground straps from the intake manifold
 - Knock sensor and EGR Vacuum Switching Valve (VSV) wiring
 - Engine wire harness
 - Stays or supports holding the air intake chamber and the intake manifold
 - Intake manifold
 - Wiring from each injector
 - Fuel inlet pipe
 - Fuel return hose

Fig. 1: Loosening and removing the pulsation damper — 5S-FE engine



- Delivery pipe or fuel rail along with the injectors

Fig. 2: Unbolt and remove the fuel delivery pipe and injectors as an assembly

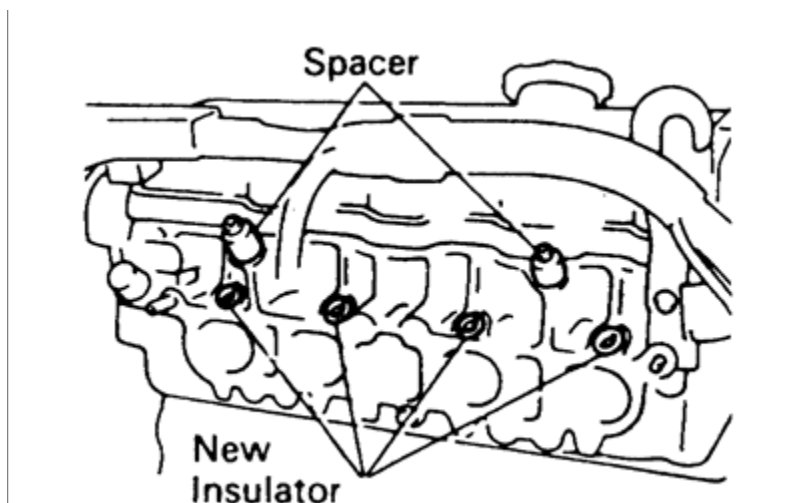


- Insulators and rail spacers from the head
- Injectors from the fuel rail
- O-ring and grommet from each injector

To install:

3. Install or connect the following:
 - New grommet on each injector
 - New O-rings, coated with gasoline, on each injector

Fig. 3: Place new injector seals and spacers in position on the cylinder head — 5S-FE engine shown



- Injectors into the fuel rail while turning each left and right. After installation, check that the injectors turn freely in place; if not, remove the injector and inspect the O-ring for damage or deformation.
- New insulators and spacers on the head
- Fuel rail and injectors; check that the injectors still turn freely in position. Position the injector connectors upward.
- Retaining bolts, tightening them to 9 ft. lbs. (13 Nm)
- Fuel return hose
- Fuel inlet pipe and pulsation damper to the delivery pipe. Use new gaskets; tighten the union bolt to 25 ft. lbs. (34 Nm).
- Wiring to each injector
- Intake manifold. Nuts and bolts evenly in several passes to 14 ft. lbs. (19 Nm)
- Air chamber and manifold stays. 14mm bolt: 31 ft. lbs. (42 Nm) and the 12mm bolt to 16 ft. lbs. (22 Nm)
- Engine wire harness
- Wiring to the knock sensor and the EGR VSV
- Both engine ground straps to the intake manifold
- A/C magnet switch wiring
- Hoses for the vacuum sensor, brake booster and vacuum sensing hose
- EGR valve and vacuum modulator. Use new gaskets. Tighten the union nut to 43 ft. lbs. (59 Nm) and the bolt to 9 ft. lbs. (13 Nm).
- Hoses to the charcoal canister and EGR VSV
- Wiring to the EGR temperature sensor if it was removed
- Vacuum hoses to the EVAP BVS
- PS vacuum hoses
- Throttle body. Bolts, evenly and alternately, to 14 ft. lbs. (19 Nm)

NOTE: The upper mounting bolts are shorter than the lower mounting bolts. Make certain the bolts are correctly placed before tightening.

4. PCV, EGR vacuum modulator and EGR VSV hoses to the throttle body
5. Wiring for the throttle position sensor
6. Air cleaner cap, resonator and intake hose
7. Wiring to the air intake temperature sensor
8. Cruise control actuator cable
9. Throttle control cable
10. Accelerator cable
11. Coolant
12. Negative battery terminal

1MZ-FE ENGINE

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Remove or disconnect the following:
 - Negative battery cable. Work must be started approximately 90 seconds or longer after the negative battery cable has been disconnected, if equipped with an air bag.
 - Coolant
 - Accelerator and throttle cables
 - Air cleaner assembly
 - V-bank cover
 - Emission valve control set
 - No. 2 EGR pipe
 - Hydraulic motor pressure pipe from the water inlet and air inlet chamber
 - Air intake chamber assembly
 - Injector wiring
 - Air assist pipe from the bracket on the No. 1 fuel pipe
 - Air assist hoses from the intake manifold
 - Fuel return hose from the No. 1 fuel pipe
 - Fuel inlet hose for the fuel filter
 - 2 union bolts holding the No. 2 fuel pipe to the delivery pipes
 - Fuel return hose from the fuel pressure regulator
 - Union bolt for the right hand delivery pipe, 2 gaskets, 2 bolts, left hand delivery pipe together with the 3 injectors and the No. 2 fuel pipe
 - Union bolt for the delivery pipe and 2 gaskets from the No. 2 fuel pipe
 - The 3 bolts, right hand delivery pipe together with the 3 injectors and the No. 1 fuel pipe
 - The 4 spacers from the intake manifold
 - The 6 injectors from the delivery pipes
 - The two O-rings and two grommets from each injector

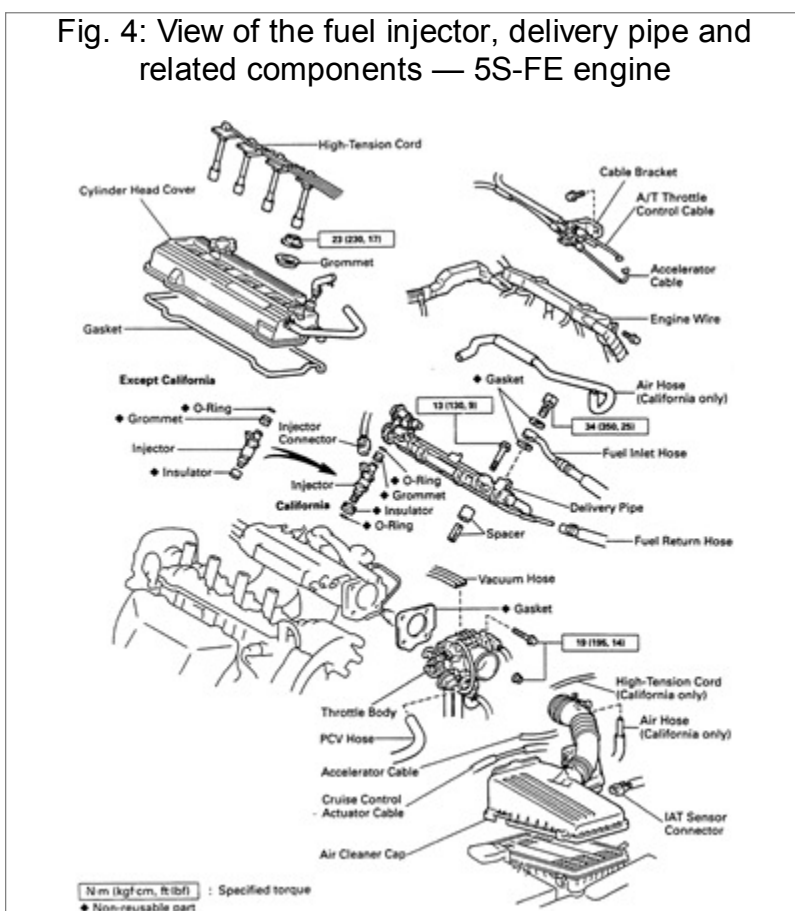
To install:

3. Install or connect the following:
 - 2 new grommets to each injector
 - New O-rings, with a light coat of fuel, to each injector
 - Injectors
 - The 4 spacers on the intake manifold
 - Right hand delivery pipe and the No. 1 fuel pipe together with the 3 injectors in position on the intake manifold
 - Bolt holding the right side delivery pipe, temporarily, to the intake manifold
 - Left hand delivery pipe and the No. 2 fuel pipe together with the 3 injectors in position on the intake manifold
 - Fuel return hose to the fuel pressure regulator
4. Temporarily install the 2 bolts holding the left hand delivery pipe to the intake manifold.
5. Temporarily install the No. 2 fuel pipe to the left side delivery pipe with the union bolt and 2 new gaskets.
6. Check that the injectors rotate smoothly. If they do not, Replace the O-rings.
7. Position the injector connector outward. Tighten the 4 bolts holding the delivery pipes to the intake manifold and tighten to 7 ft. lbs. (10 Nm). Tighten the bolt holding the No. 1 fuel pipe to the intake manifold to 14 ft. lbs. (20 Nm). Tighten the 2 union bolts holding the no. 2 fuel pipe to the delivery pipes to 24 ft. lbs. (32 Nm).
8. Install or connect the following:
 - Fuel inlet and return hoses. Union bolt: 22 ft. lbs. (30 Nm)
 - Fuel return hose to the No. 1 fuel pipe. Pass the fuel return hose under the heater hoses.
 - Air assist hoses to the intake manifold
 - Air assist pipe to the bracket on the No. 1 fuel pipe

- Fuel injector wiring connectors
- Air intake chamber assembly
- Hydraulic motor pressure pipe to the intake chamber. Bolts: 69 inch lbs. (8 Nm)
- No. 2 EGR pipe with new gaskets, tighten to 9 ft. lbs. (12 Nm)
- Emission control valve set
- V-bank cover
- Air cleaner hose
- Throttle and accelerator cables
- Coolant
- Negative battery cable

Celica, Supra, GT-S, Tercel and Paseo

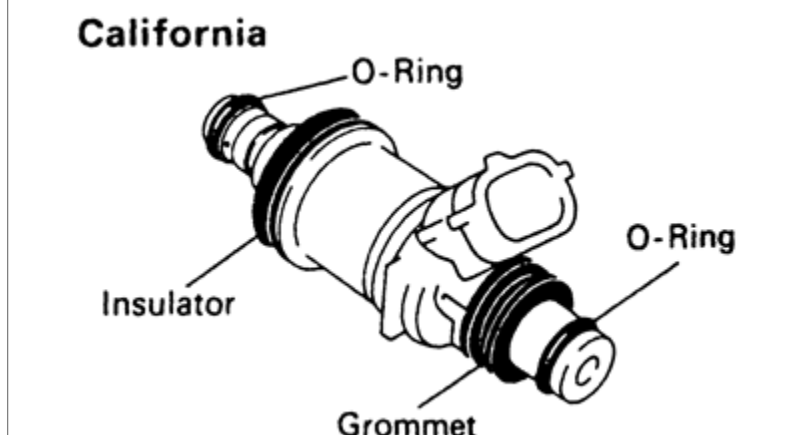
5S-FE ENGINE



1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Remove or disconnect the following:
 - Negative battery cable
 - Air cleaner cap and hose
 - Throttle body assembly as outlined
 - Valve cover assembly
 - Vacuum sensing hose from the fuel pressure regulator
 - Air hose from the air assist system at the intake manifold port
 - Engine wire protector from the left side of the intake manifold
 - Injector wiring

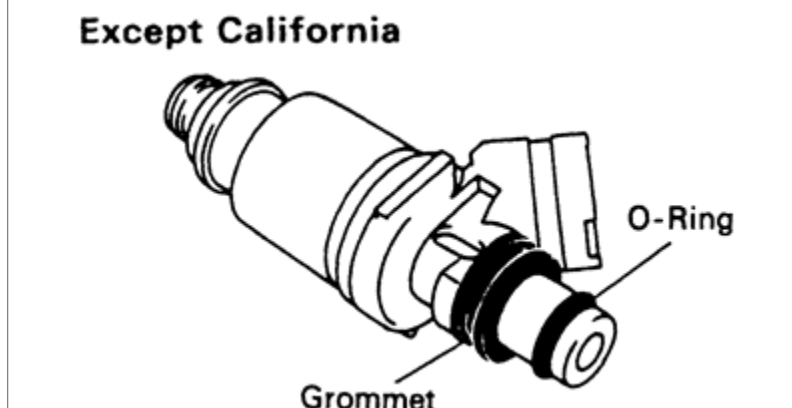
- Engine wiring protector from the 2 brackets on the front of the intake manifold
- Union bolt, 2 gaskets, and the fuel inlet hoses from the delivery pipe
- Fuel return hose from the return pipe
- Delivery pipe from the cylinder head
- Delivery pipe from the 4 injectors and extract the pipe
- Injectors from the pipe
- 4 insulators and 2 spacers from the intake manifold
- The 2 O-rings, insulator and grommet from each injector

Fig. 5: The California fuel injector has 2 O-rings a insulator and grommet



- The O-ring and grommet from each injector

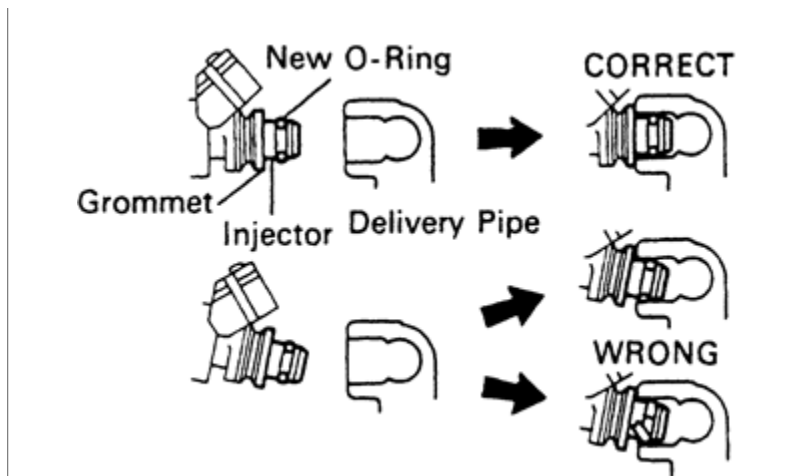
Fig. 6: View of the non-California fuel injector



To install:

3. Install or connect the following:
 - New insulator and grommet on each injector
 - New grommet on each insulator
 - O-ring(s) on each injector

Fig. 7: The correct way to install a new fuel injector O-ring



- Spacers and insulators to the intake manifold
- Delivery pipe between the intake manifold and cylinder head
- Injectors into the delivery pipe

Fig. 8: When inserting the injector, turn left and right making sure the connector is facing upward

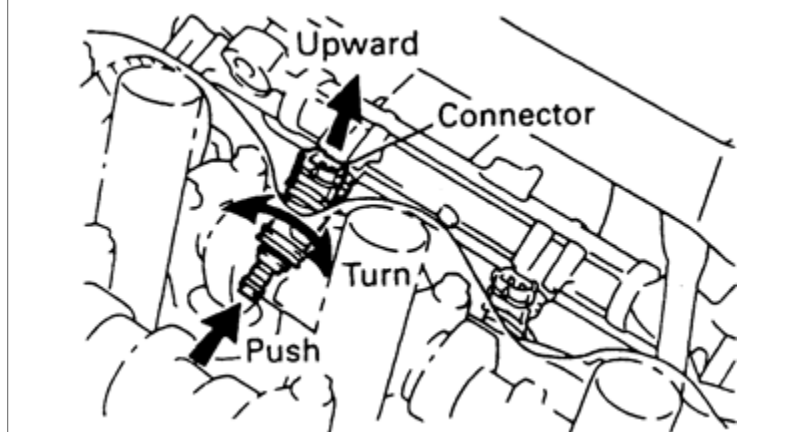
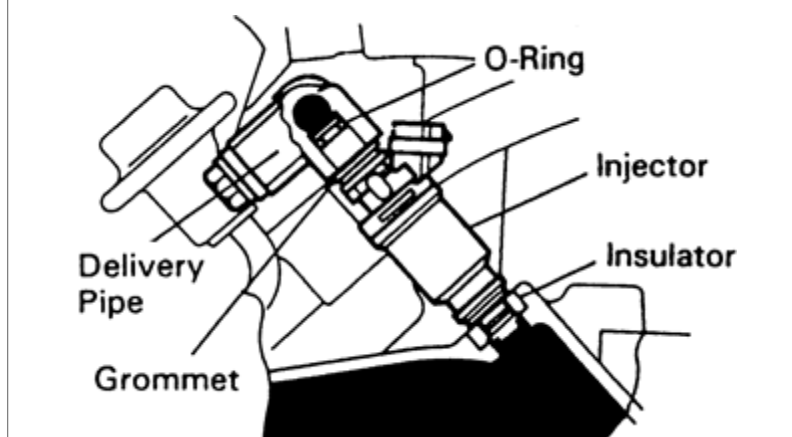


Fig. 9: The injector will seat in the fuel rail and intake manifold as shown

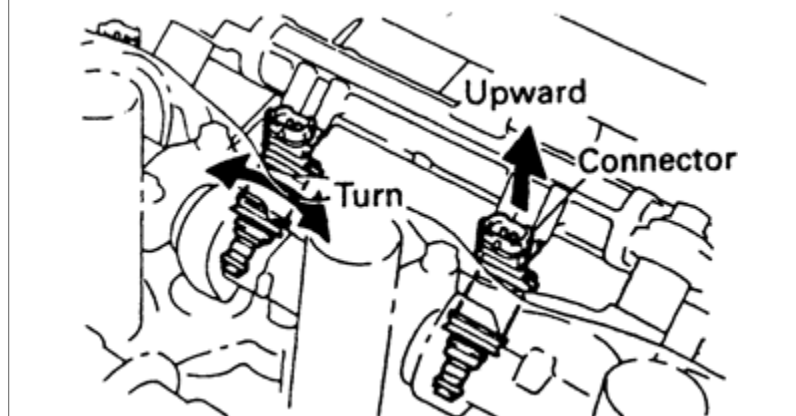


NOTE: Position each injector in with the connector facing upward.

4. Delivery pipe assembly to the cylinder head
5. Temporarily install the bolts holding the pipe to the cylinder head. Check that the injectors rotate

smoothly. If they do not rotate smoothly, the O-ring(s) may have been install incorrectly. Replace the O-ring if this occurs.

Fig. 10: Once the injector is in check for it to rotate smoothly

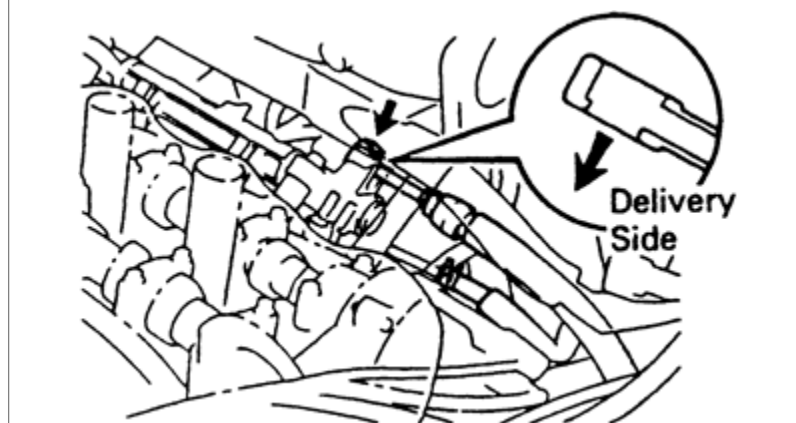


6. Install or connect the following:

- Delivery pipe retaining bolts: 9 ft. lbs. (13 Nm).
- Fuel inlet hose to the delivery pipe with new gaskets and union bolt. Tighten the assembly to 25 ft. lbs. (34 Nm).

NOTE: Be careful of the fuel inlet hose installation direction.

Fig. 11: Place the fuel inlet hose on in the correct direction



- Fuel return hose to the return pipe
- Engine wire protector to the brackets on the front side of the intake manifold
- Injector wiring harnesses

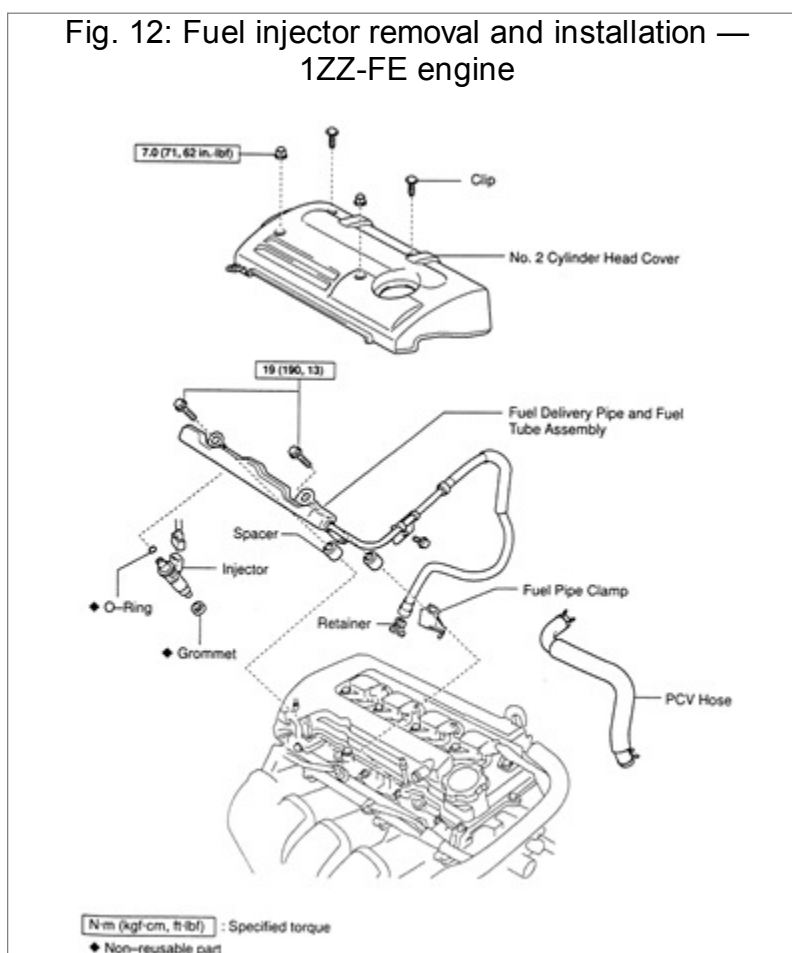
NOTE: The No. 1 and No. 3 injector wiring are brown and the No. 2 and No. 4 are gray.

7. Engine wire protector to the left side of the intake manifold
8. Vacuum sensing hose to the fuel pressure regulator
9. Air hose for the air assist system to the intake manifold port
10. Valve cover assembly
11. Throttle body
12. Control cables to the throttle body
13. Air cleaner cap and hose
14. Negative battery cable

1ZZ-FE ENGINE

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Remove or disconnect the following:
 - No. 2 cylinder head cover
 - PCV hose
 - Fuel tube from the fuel pipe
 - Injector connectors
 - Delivery pipe and injectors
 - Spacers from the head
 - Injectors from the delivery pipe
 - O-ring and grommet from each injector

Fig. 12: Fuel injector removal and installation — 1ZZ-FE engine



To install:

3. Install or connect the following:
 - New grommets
 - New O-rings coated with light machine oil
 - Injectors on the delivery pipe

NOTE: Coat the contact point on the pipe with light machine oil and twist the injectors into place. The connector should face outward.

4. Spacers

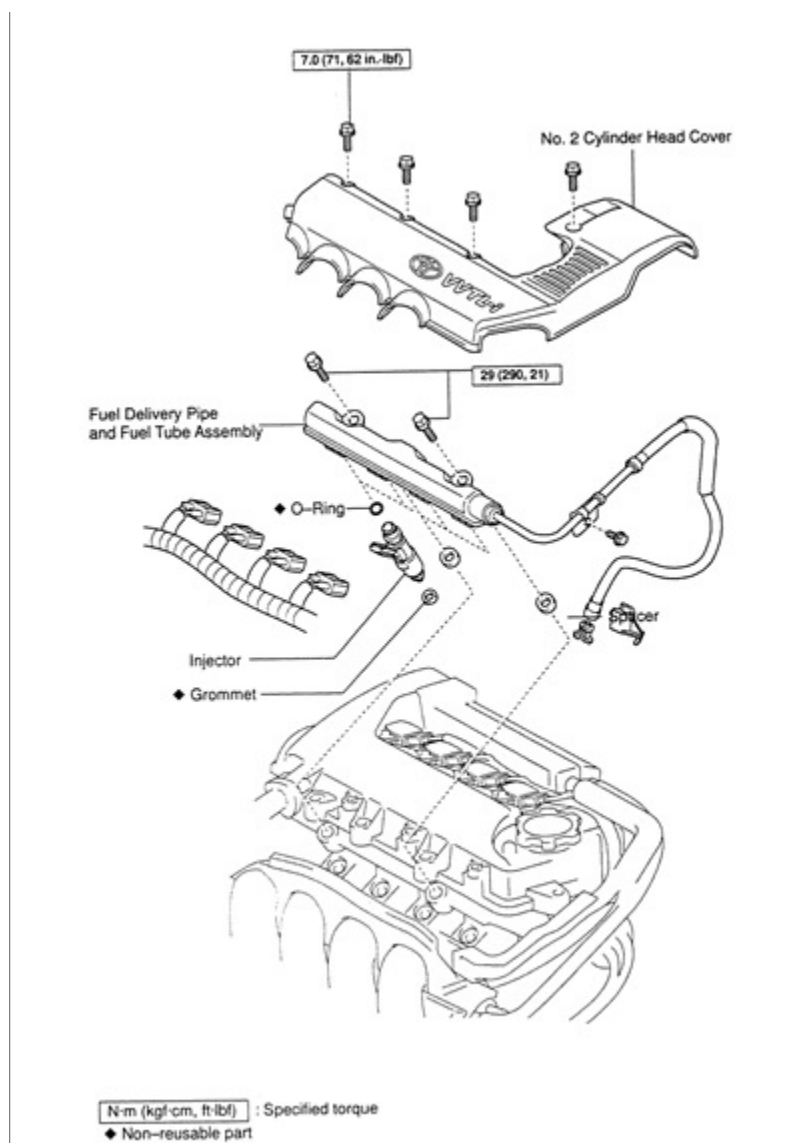
NOTE: Coat the seats in the head where the injectors contact, with light machine oil.

5. Delivery pipe and injectors
6. Loosely install the hold-down bolts and check that the injectors rotate smoothly. If they don't, the probable cause is incorrect O-ring installation.
7. Torque the hold-down bolts to 14 ft. lbs. (19 Nm).
8. Torque the fuel pipe bolt to 84 inch lbs. (9 Nm).
9. Connect the fuel line.
10. Install the PCV hose.
11. Install the No. 2 cover.

2ZZ-GE ENGINE

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Remove or disconnect the following:
 - No. 2 cylinder head cover
 - Fuel tube from the fuel pipe
 - Injector connectors
 - Delivery pipe and injectors
 - Spacers from the head
 - Injectors from the delivery pipe
 - O-ring and grommet from each injector

Fig. 13: Fuel injector removal and installation —
2ZZ-GE engine



To install:

3. Install or connect the following:
 - New grommets
 - New O-rings coated with light machine oil
 - Injectors on the delivery pipe

NOTE: Coat the contact point on the pipe with light machine oil and twist the injectors into place. The connector should face outward.

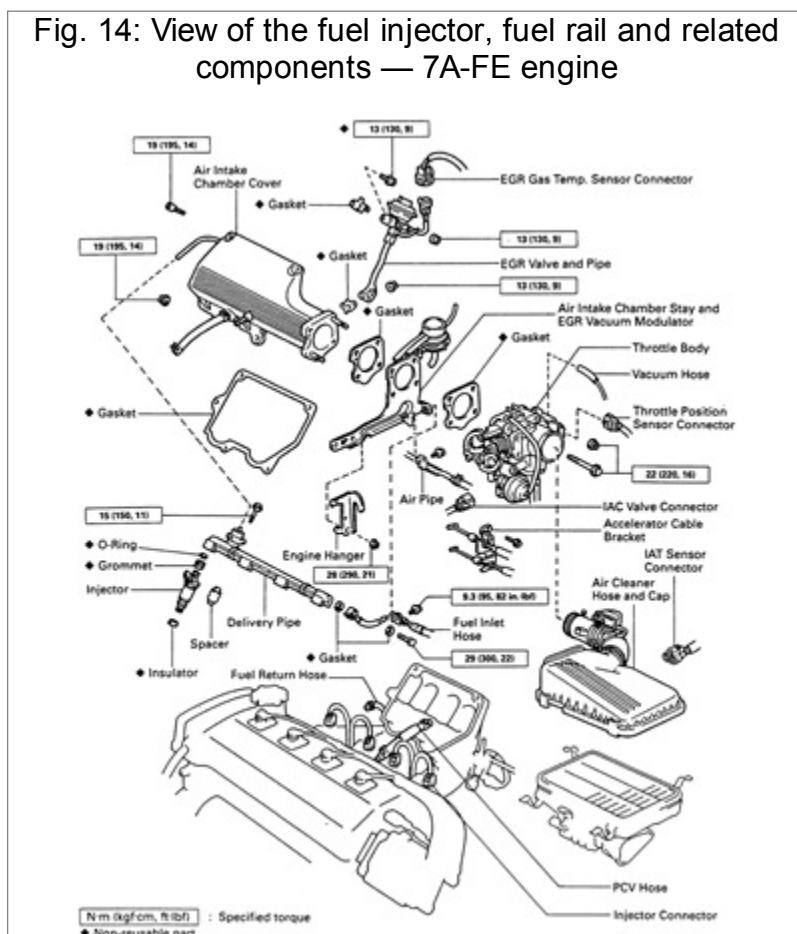
4. Spacers

NOTE: Coat the seats in the head where the injectors contact, with light machine oil.

5. Delivery pipe and injectors
6. Loosely install the hold-down bolts and check that the injectors rotate smoothly. If they don't, the probable cause is incorrect O-ring installation.
7. Torque the hold-down bolts to 21 ft. lbs. (29 Nm).
8. Torque the fuel pipe bolt to 84 inch lbs. (9 Nm).
9. Connect the fuel line.
10. Install the PCV hose.
11. Install the No. 2 cover.

7A-FE ENGINE

Fig. 14: View of the fuel injector, fuel rail and related components — 7A-FE engine



1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Remove or disconnect the following:
 - Air cleaner cap and air hose
 - Accelerator cable bracket from the throttle body
 - Throttle body from the air intake chamber
 - Engine hanger
 - Air intake chamber stay
 - EGR vacuum modulator
 - EGR valve and pipe
 - Air intake chamber cover
 - All hoses and wiring incorporated with the removal
 - Injector wiring
 - Inlet hose from the delivery pipe
 - Fuel return hose from the pressure regulator
 - Fuel rail together with the 4 injectors
 - The 4 insulators and 2 spacers from the intake manifold
 - Injectors from the delivery pipe
 - O-ring and grommet from each injector

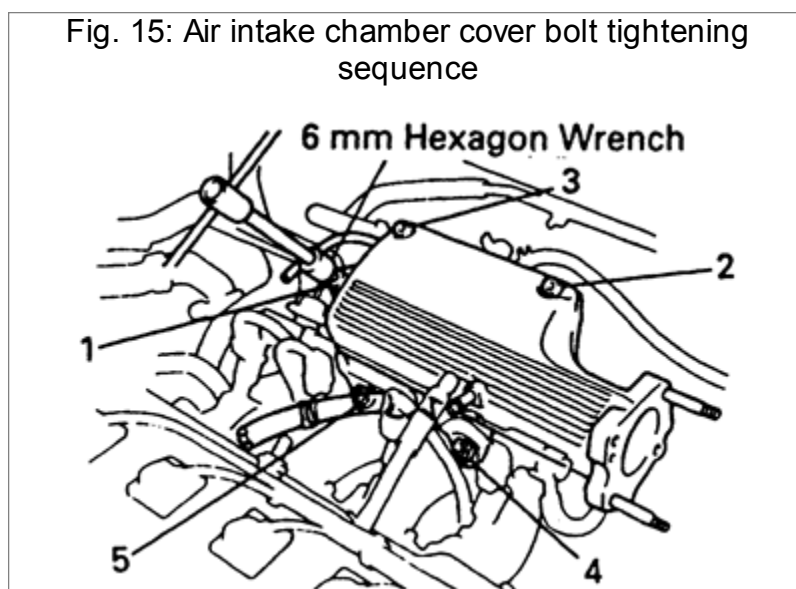
To install:

3. Install or connect the following:
 - New grommet on each injector
 - Apply a light coat of gasoline to the new O-ring and install it to the injector.

- While turning the injector left and right, install it to the delivery pipe. Install each injector in the same manner.
- Position the injector wiring connector upward.
- Place new insulators and spacers in position on the intake manifold.
- Place the injectors and delivery pipe assembly in position on the intake manifold.
- Check the injectors rotate smoothly.

NOTE: If the injectors do not rotate smoothly, the O-rings were probably not installed correctly. Remove the injector and install a new O-ring, then reinsert the injector.

4. Position the injector connector upward.
5. Tighten the bolts holding the delivery pipe to the intake manifold. Secure the bolts to 11 ft. lbs. (15 Nm).
6. Connect the fuel return hose to the pressure regulator.
7. Attach the fuel inlet hose with the 2 gaskets and union bolt and secure to 22 ft. lbs. (29 Nm).
8. Attach the injector connectors.
9. Install the air intake chamber cover. Secure the bolts in the correct sequence.



10. If removed, install the EGR valve and pipe.
11. If removed, attach the air intake chamber stay, EGR vacuum modulator and engine hanger.
12. Install the throttle body. Refer to the procedure in this section.
13. Connect the accelerator cable bracket to the throttle body.
14. Attach the air cleaner cap and hose.
15. Connect the negative battery cable.

Echo

1NZ-FE ENGINE

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Remove or disconnect the following:
 - Negative battery cable
 - Cylinder head cover
 - Fuel pipe clamp
 - Fuel inlet line from the fuel pipe

- Injector connectors from the injectors
- Delivery pipe (3 bolts) and injectors
- 2 spacers from the head
- Injectors from the pipe
- O-rings (discard) and grommets (discard)

To install:**3. Install or connect the following:**

- New grommets
- New O-rings coated with clean engine oil
- Injectors to the pipe. Coat the contact area with light machine oil. The injectors twist into place. The connector should face outward.
- Delivery pipe bolts. Torque: 14 ft. lbs. (19 Nm)
- Fuel pipe bolt. Torque: 80 inch lbs. (9 Nm)
- Fuel hose to fuel pipe
- Pipe clamp
- Wire harness cover
- PCV hose
- Negative battery cable

Corolla**4A-FE, 7A-FE, 1ZZ-FE ENGINES**

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
2. Disconnect the negative battery cable. Relieve the fuel pressure.
3. Remove or disconnect the following:
 - Air cleaner
 - Accelerator cable bracket from the throttle body
 - Throttle body from the air intake chamber
 - Engine hanger and air intake chamber stay
 - EGR vacuum modulator if so equipped
 - EGR valve and pipe if so equipped
 - Air intake chamber cover and gasket
 - Injector electrical connections
 - Fuel inlet hose from the delivery pipe
 - Fuel return hose from the fuel pressure regulator
 - Fuel delivery pipe (rail)
 - The 4 insulators and 2 collars from the intake manifold
 - Injectors

To install:**4. Install or connect the following:**

NOTE: Before installing the injectors back into the fuel rail, install a NEW O-ring on each injector, coated with a light coat of gasoline (NEVER use oil of any sort).

5. Injectors

NOTE: Make certain each injector can be smoothly rotated. If they do not rotate smoothly, the

O-ring is not in its correct position.

6. Insulators into each injector hole
7. The two spacers on the delivery pipe mounting holes in the intake manifold
8. Place the delivery pipe and injectors on the intake manifold and again check that the injectors rotate smoothly. Position the injector connector upward. Install the two bolts and tighten them to 11 ft. lbs.
9. Install or connect the following:
 - Electrical connectors to each injector
 - Gaskets, the inlet pipe and fuel union bolt. Bolt to 22 ft. lbs.
 - Air intake chamber cover with a NEW gasket. Torque the retaining bolts in steps to 14 ft. lbs.
 - All necessary hoses and electrical connections
 - EGR valve and pipe if so equipped
 - Engine hanger and air intake chamber stay
 - EGR vacuum modulator if so equipped
 - Throttle body. Torque the bolts evenly (in a X-pattern) to 16 ft. lbs.
 - Accelerator cable bracket to the throttle body
 - Air cleaner hose and cap
 - Battery cable to the negative battery terminal

