

SEQUENTIAL ELECTRONIC FUEL INJECTION (SEFI)

General Information

The Sequential Electronic Fuel Injection (SEFI) system is used on all Super High Output (SHO) vehicles, as well as on 1993 and later 3.0L and 3.8L engines. It is classified as a multi-point, pulse time, speed density control fuel injection system. The fuel is metered into the intake manifold port, in sequence, in accordance with the engine demand through the injectors mounted on a tuned intake manifold. The Electronic Engine Control (EEC-IV) computer outputs a command to the fuel injectors to meter the appropriate quantity of fuel. The remainder of the fuel system is basically the same as the EFI system installed on some earlier model 3.0L and 3.8L engines.

The SEFI fuel subsystem includes a high pressure (30-45 psi/209-310 kPa) tank-mounted electric fuel pump, fuel charging manifold, pressure regulator, fuel filter, and both solid and flexible fuel lines.

The fuel pressure regulator maintains a constant pressure drop across the injector nozzles. The regulator is referenced to intake manifold vacuum and is connected parallel to the fuel injectors and positioned on the far end of the fuel rail. Any excess fuel supplied by the pump passes through the regulator and is returned to the fuel tank via a return line.

The fuel pressure regulator is a diaphragm operated relief valve in which one side of the diaphragm senses fuel pressure and the other side senses manifold vacuum. Normal fuel pressure is established by a spring preload applied to the diaphragm. Control of the fuel system is maintained through the EEC-IV power relay and the EEC-IV control unit, although electrical power is routed through the fuel pump relay and an inertia switch. The fuel pump relay is normally located on a bracket somewhere above the Electronic Control Assembly (ECA) and the inertia switch is located in the storage compartment. Tank-mounted pumps can be either high or low pressure, depending on the model.

The fuel injectors used with the SEFI system are an electromechanical (solenoid) type designed to meter and atomize fuel delivered to the intake ports of the engine. The injectors are mounted in the lower intake manifold and positioned so that their spray nozzles direct the fuel charge in front of the intake valves. The injector body consists of a solenoid actuated pintle and needle valve assembly. The control unit sends an electrical impulse that activates the solenoid, causing the pintle to move inward off the seat, allowing the fuel to flow. The amount of fuel delivered is controlled by the length of time the injector is energized (pulse width), since the fuel flow orifice is fixed and the fuel pressure drop across the injector tip is constant. Correct atomization is achieved by contouring the pintle at the point where the fuel enters the pintle chamber.

Exercise care when handling fuel injectors during service. Be careful not to lose the pintle cap and replace O-rings to assure a tight seal. Never apply direct battery voltage to test a fuel injector.

The injectors receive high pressure fuel from the fuel manifold (fuel rail) assembly. The complete assembly includes a single, preformed tube with six injector connectors, mounting flange for the pressure regulator, mounting attachments which locate the fuel manifold assembly and provide fuel injector retention, and a Schrader® quick-disconnect fitting used to perform fuel pressure tests.

The fuel manifold is normally removed with fuel injectors and pressure regulator attached. Fuel injector electrical connectors are plastic and have locking tabs that must be released when disconnecting the wiring harness.

The air subsystem components include the air cleaner assembly, air flow (vane) meter, throttle air bypass valve and air ducts that connect the air system to the throttle body assembly. The throttle body regulates the air flow to the engine through a single butterfly-type throttle plate controlled by conventional accelerator linkage. The throttle body has an idle adjustment screw (throttle air bypass valve) to set the throttle plate position, a PCV fresh air source upstream of the throttle plate, individual vacuum taps for PCV and control signals, and a throttle position sensor that provides a voltage signal for the EEC-IV control unit.

The throttle air bypass valve is an electro-mechanical (solenoid) device whose operation is controlled by the EEC-IV control unit. A variable air metering valve controls both cold and warm idle air flow in response to commands from the control unit. The valve operates by bypassing a regulated amount of air around the throttle plate; the higher the voltage signal from the control unit, the more air is bypassed through the valve. In this manner, additional air can be added to the fuel mixture without moving the throttle plate. At curb idle, the valve provides smooth idle for various engine coolant temperatures, adjusts for A/C load, and compensates for transaxle load and no-load conditions. The valve also provides fast idle for start-up, replacing the fast idle cam, throttle kicker and anti-dieseling solenoid common to previous models.

There are no curb idle or fast idle adjustments. As in curb idle operation, the fast idle speed is proportional to engine coolant temperature. Fast idle kick-down will occur when the throttle is kicked. A time-out feature in the ECA will also automatically kick-down fast idle to curb idle after approximately 15-25 seconds once the coolant has reached approximately 160°F (71°C). The signal duty cycle from the ECA to the valve will be at 100% (maximum current) during the crank to provide maximum air flow, allowing no-touch starting at any time (engine cold or hot).

Relieving Fuel System Pressure

1. **Remove the air cleaner assembly. For details, please refer to the procedure in *Section 1* of this manual.**
2. **Connect EFI/CFI Fuel Pressure Gauge T80L-9974-B or equivalent to the fuel pressure relief valve on the fuel supply manifold.**
3. **Open the manual valve on the EFI/CFI fuel pressure gauge tool to relieve the fuel system pressure.**

Fuel Filter

REMOVAL & INSTALLATION

1. **Disconnect the negative battery cable. Relieve the fuel system pressure.**

2. Remove the push connect fittings at both ends of the fuel filter. This is accomplished by removing the hairpin clips from the fittings. Remove the hairpin clips by first bending and then breaking the shipping tabs on the clips. Then spread the 2 clip legs approximately $\frac{1}{8}$ in. (3mm) to disengage the body and push the legs into the fitting. Pull on the triangular end of the clip and work it clear of the fitting.
3. Remove the filter from the mounting bracket by loosening the worm gear mounting clamp enough to allow the filter to pass through.

To install:

4. Install the filter in the mounting bracket, ensuring that the flow direction arrow is pointing forward. Locate the fuel filter against the tab at the lower end of the bracket.
5. Insert a new hairpin clip into any 2 adjacent openings on each push connect fitting, with the triangular portion of the clip pointing away from the fitting opening. Install the clip to fully engage the body of the fitting. This is indicated by the legs of the hairpin clip being locked on the outside of the fitting body. Apply a light coat of engine oil to the ends of the fuel filter and then push the fittings onto the ends of the fuel filter. When the fittings are engaged, a definite click will be heard. Pull on the fittings to ensure that they are fully engaged.
6. Tighten the worm gear mounting clamp to 15-25 inch lbs. (1.7-2.8 Nm).
7. Start the engine and check for leaks.

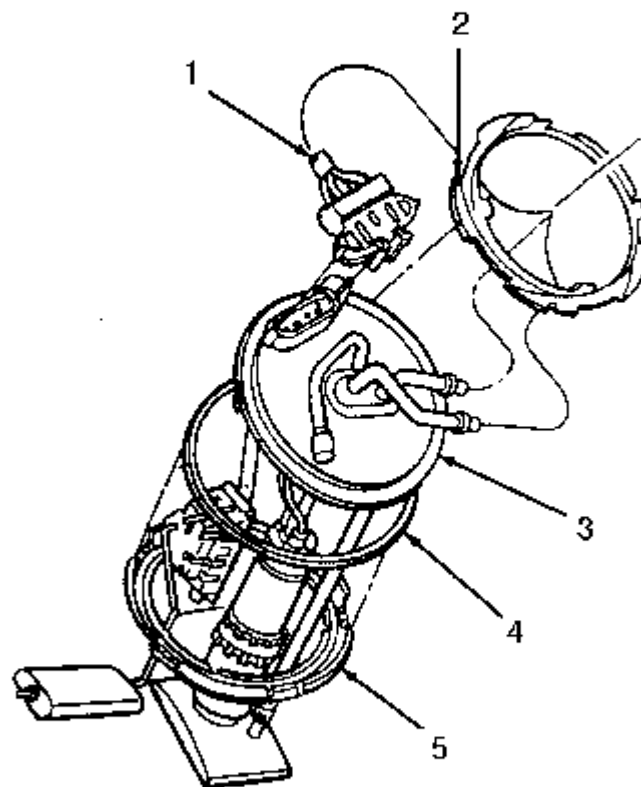
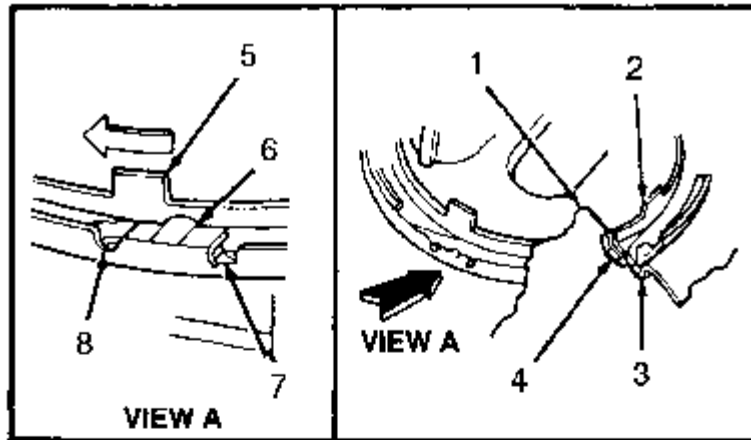
Electric Fuel Pump

REMOVAL & INSTALLATION

Except 3.0L Flexible Fuel (FF) Vehicles

1. Disconnect the negative battery cable.
2. Relieve the fuel system pressure. For details, please refer to the procedure earlier in this section.
3. Drain the fuel from the fuel tank by inserting Rotunda Fuel Tanker Adapter Hose 034-00012 or equivalent into the fuel tank through the fuel tank filler pipe, then remove the fuel tank with Rotunda Fuel Storage Tanker 034-00002 or equivalent.
4. Remove the fuel tank filler pipe:
 1. Open the filler door to remove the three screws securing the fuel tank filler pipe to the pocket. Mark the fuel tank filler cap tether location.
 2. Raise and safely support the vehicle.
 3. Loosen the filler and vent hose on the fuel tank filler pipe.
 4. Remove the bolt securing the fuel tank filler pipe assembly to the underbody of the vehicle, then remove the fuel tank filler pipe.
5. Support the fuel tank, then remove the fuel tank straps. Partially lower the tank, then remove the fuel lines, electrical connectors and vent lines from the tank. Remove the fuel tank and place it on a work bench.
6. Remove any accumulated dirt from around the fuel pump retaining flange so that it will not enter the fuel tank during removal and installation.

7. Turn the fuel pump locking ring counterclockwise using Fuel Tank Sender Wrench D84P-9275-A or equivalent, then remove the lock ring.
8. Remove the fuel pump from the fuel tank and discard the flange gasket.



1. Fuel pump
2. Fuel pump locking retainer ring
3. Retainer ring (part of 9C385)
4. O-ring
5. Locating tabs (part of 9C385)
6. Tab (part of 9C385)
7. Stop (part of 9C385)
8. Detent (part of 9C385)

View of the SEFI system fuel pump-except 3.0L FF vehicles

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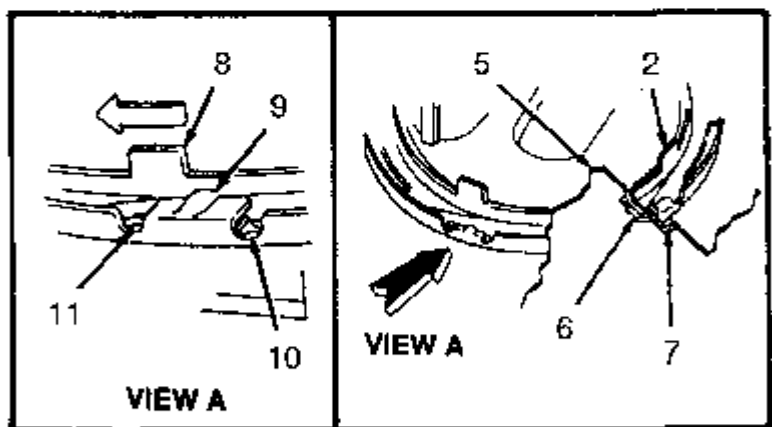
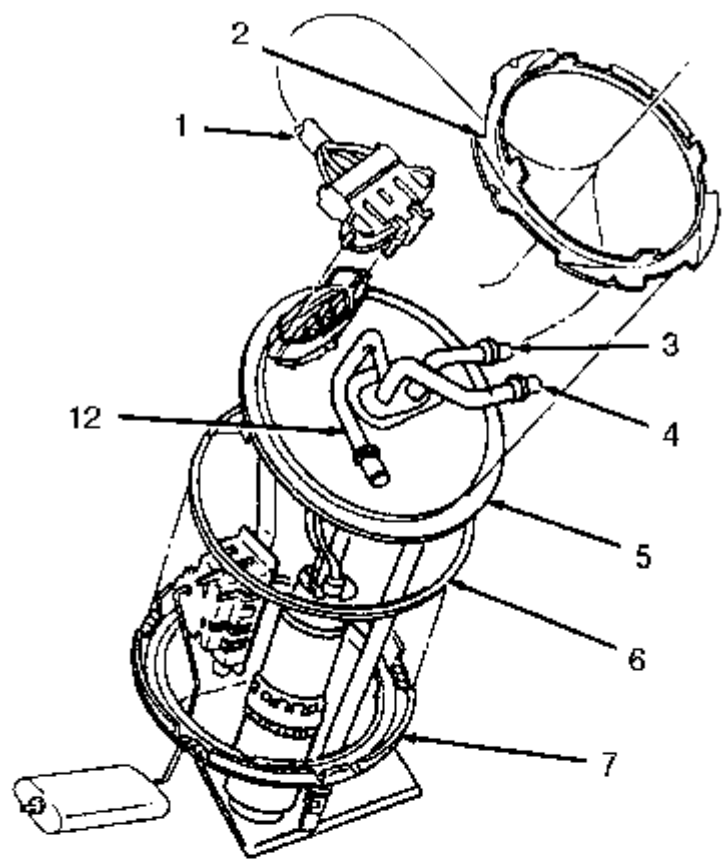
To install:

9. Clean the fuel pump mounting flange and fuel tank mating surfaces and seal ring groove.
10. Put a light coating of grease on the new seal gasket to hold it in place during assembly and install it in the fuel ring groove.
11. Install the fuel pump and sender assembly carefully to be sure that the filter is not damaged. Make sure the locating keys are in the keyways and the seal gasket remains in place.
12. Hold the assembly in place and install the lock ring making sure all locking tabs are under the tank lock ring tabs. Tighten the lock ring by turning it clockwise using Fuel Tank Sender Wrench D84P-9275-A until it is up against the stops.
13. Remove the fuel tank from the bench and to the vehicle, then support the fuel tank while connecting the fuel lines, vent line and electrical connectors to the appropriate places. Install the fuel tank and secure it with the tank support straps.
14. Lower the vehicle.
15. Install the fuel tank filler pipe:
 1. Position the fuel tank filler pipe in the body location.
 2. Connect the hoses with clamps to the fuel tank filler pipe.
 3. Install the underbody fuel tank filler pipe assembly bolt, then tighten the bolt to 36-53 inch lbs. (4-6 Nm), then lower the vehicle.
 4. Install the fuel tank filler cap to the tether location, then install the three retaining screws.
16. Fill the tank with a minimum of 10 gallons of fuel, then check for leaks.
17. Connect the negative battery cable.
18. Connect a suitable fuel pressure gauge. Turn the ignition switch to the ON position 5-10 times, leaving it on for 3 seconds at a time, until the pressure gauge reads at least 30 psi (207 kPa). Check for leaks at the fittings.
19. Remove the pressure gauge, start the engine and recheck for leaks.

3.0L Flexible Fuel (FF) Engine

1. Disconnect the negative battery cable.
2. Depressurize the fuel system. For details, please refer to the procedure earlier in this section.





- 1. Electrical connector
- 2. Fuel pump locking retainer ring
- 3. Fuel return
- 4. Fuel supply
- 5. Fuel pump
- 6. Fuel pump mounting gasket
- 7. Retainer ring
- 8. Locating tabs
- 9. Tab
- 10. Stop
- 11. Detent
- 12. Fuel tank drain tube

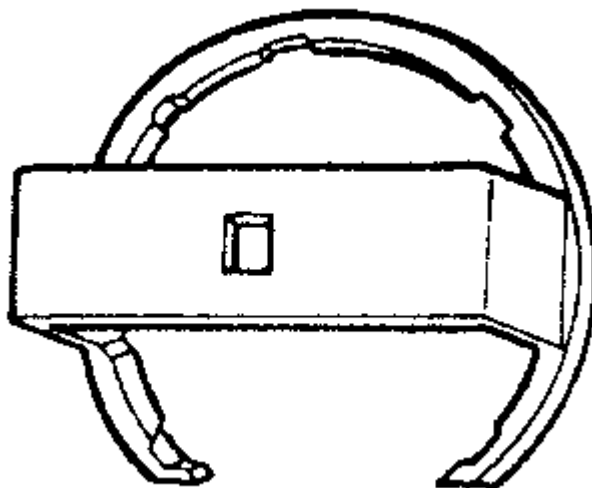
Exploded view of the fuel pump and related components-3.0L Flexible Fuel (FF) engine

[Click to enlarge](#)

The FF fuel tank cannot be drained through the fuel tank filler pipe because a special screen is installed in the fuel tank filler pipe to prevent siphoning of fuel through the pipe. The fuel tank on this vehicle is equipped with a drain tube connected to the fuel pump module on the right-hand side of the vehicle, which had a quick disconnect for this purpose. It is not necessary to lower the fuel tank to drain the system.

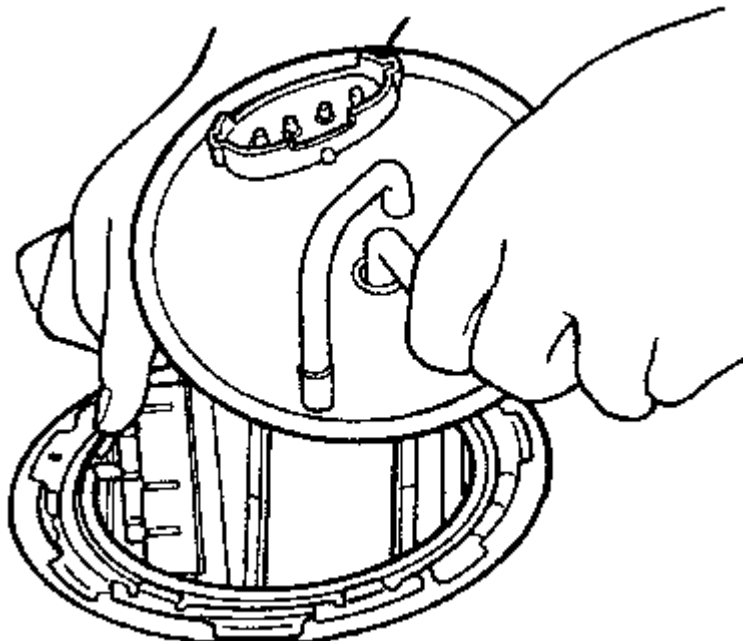
3. Drain the fuel tank:
 1. Remove the foam cover and protective rubber cover from the drain tube.
 2. Connect the drain tube quick disconnect fitting to the Rotunda Fuel Storage Tanker and Adapter Hose 034-00020, then drain the fuel from the tank into a suitable container.
4. Raise and safely support the vehicle.
5. Disconnect and remove the fuel filler pipe:
 1. Open the filler door to remove the three screws securing the fuel tank filler pipe to the pocket. Mark the fuel tank filler cap tether location.
 2. If not done already, raise and safely support the vehicle.
 3. Loosen the filler and vent hose on the fuel tank filler pipe.
 4. Remove the bolt securing the fuel tank filler pipe assembly to the underbody of the vehicle, then remove the fuel tank filler pipe.
6. Support the fuel tank, then remove the fuel tank support straps. Partially lower the tank, then disconnect the fuel lines, electrical connectors and fuel vapor and vent lines from the fuel tank.
7. Remove the fuel tank and place it on a work bench. Remove any dirt that has accumulated around the fuel pump so that dirt does not enter the fuel tank during pump removal.
8. Remove the fuel pump locking retainer ring using Fuel Tank Locking Wrench D90P-9275-A, or equivalent.





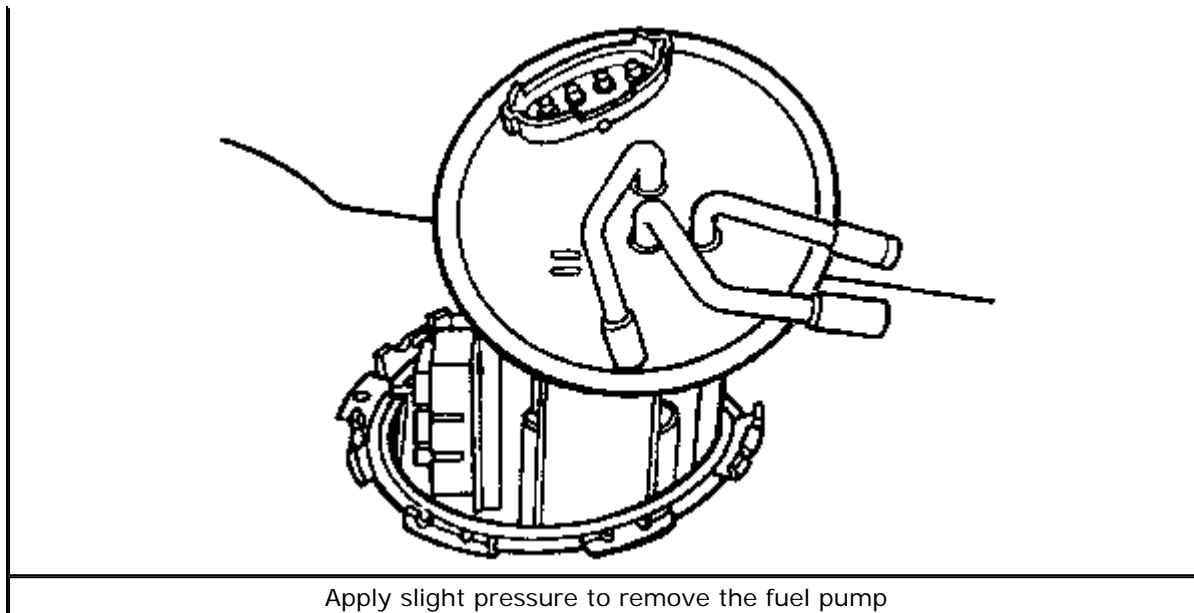
Fuel pump locking retainer ring

9. Lift the fuel pump locating tabs from the fuel tank location slots.
10. Lift the fuel pump upward rotating left, while aligning the float wiper arm retainer and return line into the fuel tank location slots.

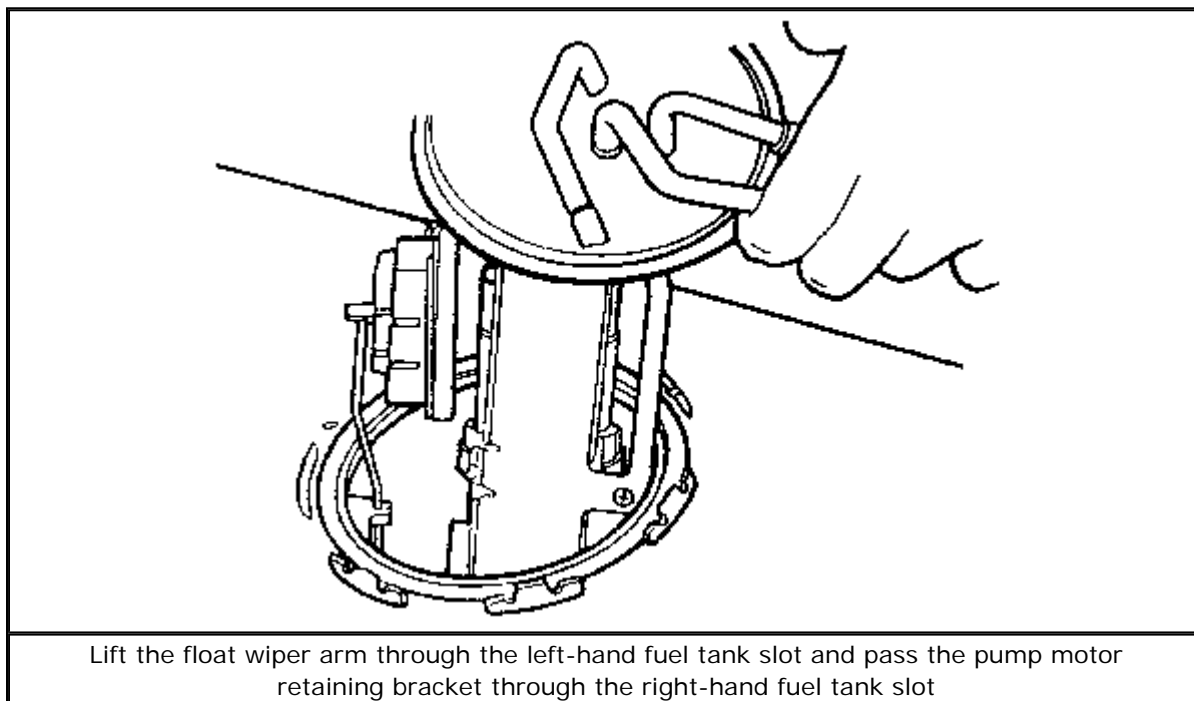


Lift fuel pump upward rotating left, while aligning the float wiper arm retainer and return line into the fuel tank location slots

11. Apply light pressure to remove the fuel pump.

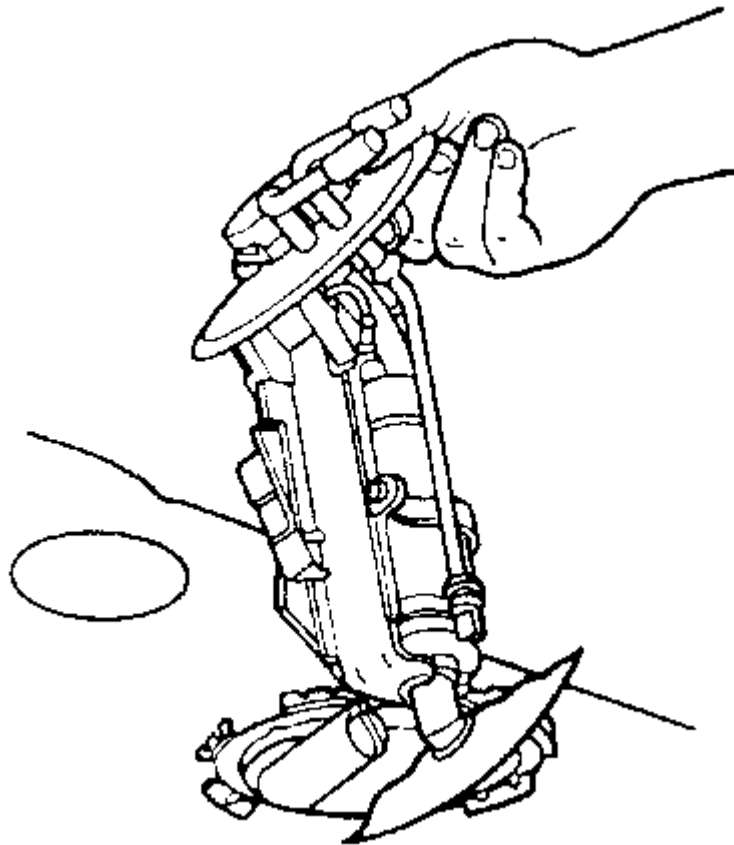


12. Lift the float wiper arm through the left-hand fuel tank slot, then pass the pump motor retaining bracket through the right-hand fuel tank slot.



13. Remove the fuel pump keeping return line in the fuel tank slot. Lift the fuel pump inlet filter then sender arm float through the fuel tank opening.





Remove the fuel pump while keeping the return line in the fuel tank slot. Lift the fuel pump inlet filter and then the sender arm float through the fuel tank opening

14. Remove and discard the fuel pump mounting gasket.

To install:

15. Position a new methanol compatible pump gasket on the fuel pump.
16. Install the fuel pump carefully to be sure that it is not damaged.
17. Hold the assembly in place and install the the fuel pump locking retainer finger tight. Make sure that all of the locking tabs are are under the fuel tank lock ring tabs.
18. Secure the unit with the fuel pump locking retainer ring using Fuel Tank Locking Wrench D90P-9275-A, or equivalent.
19. Remove the fuel tank from the bench to the vehicle, then support the fuel tank while connecting the fuel vapor and vent lines, electrical connectors and the fuel lines.
20. Install the fuel tank in the vehicle, then connect the support straps.
21. Install the fuel filler pipe:
1. Position the fuel tank filler pipe in the body location.
 2. Connect the hoses with clamps to the fuel tank filler pipe.
 3. Install the underbody fuel tank filler pipe assembly bolt, then tighten the bolt to 36-53 inch lbs. (4-6 Nm), then lower the vehicle.
 4. Install the fuel tank filler cap to the tether location,

then install the three retaining screws.

22. Insert Rotunda Fuel Tanker Adapter Hose 034-00020 or equivalent into the fuel tank through the fuel tank filler pipe.
23. Transfer the fuel from the Rotunda Fuel Storage Tanker 034-00002 or equivalent to the fuel tank.
24. Connect the negative battery cable, then check for fuel leaks.

TESTING

1. Ground the fuel pump lead of the self-test connector through a jumper wire at the FP lead.
2. Connect a suitable fuel pressure tester to the fuel pump outlet.
3. Turn the ignition key to the RUN position to operate the fuel pump.
4. The fuel pressure should be 35-45 psi for all engines.

A safety inertia switch is installed to shut off the electric fuel pump in case of collision. The switch is located on the left hand side (driver's side) of the car, behind the rear most seat side trim panel, or inside the rear quarter shock tower access door. If the pump shuts off, or if the vehicle has been hit and will not start, check for leaks first then reset the switch. The switch is reset by pushing down on the button provided.

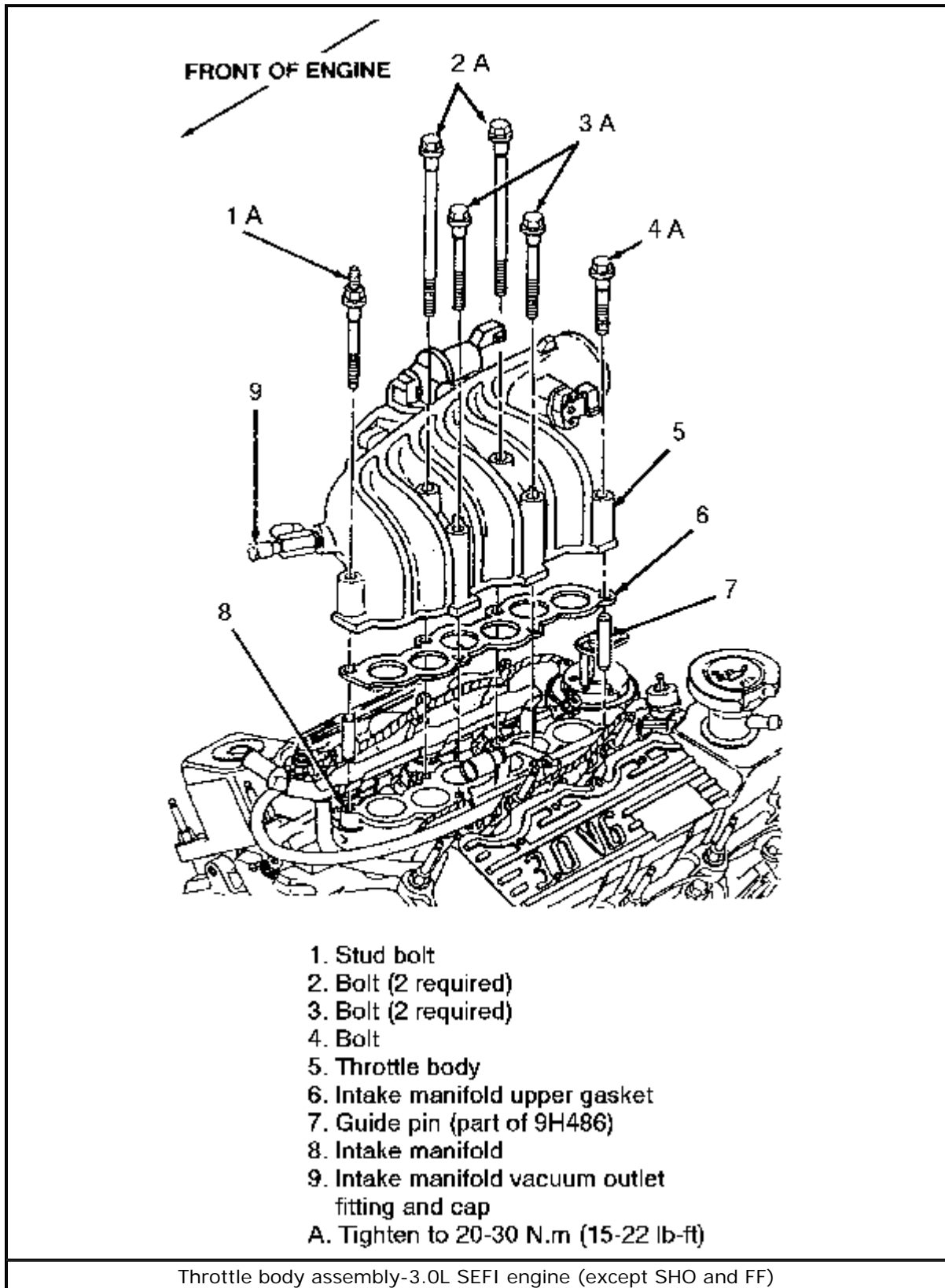
Throttle Body

REMOVAL & INSTALLATION

3.0L Engine-Except SHO and FF

1. Disconnect the negative battery cable. Loosen the air cleaner tube retaining clamps.
2. Disconnect the crankcase ventilation tube and aspirator hoses from the air cleaner outlet tube, then remove the air cleaner outlet tube.
3. Remove the idle speed control solenoid shield.
4. Remove the accelerator cable retaining bolt, then disconnect the accelerator cable from the throttle body lever.
5. Remove the two accelerator cable bracket retaining bolts from the side of the throttle body, then remove the accelerator cable bracket.
6. Tag and disconnect the vacuum hoses from the intake manifold vacuum outlet fitting and cap and the EGR valve.
7. Loosen the EGR valve to exhaust manifold tube nuts at the EGR valve and the EGR valve tube-to-manifold connector. Remove or rotate the tube to the side, out of the way.
8. Remove the PCV hose from the fitting under the throttle body.
9. Disengage the electrical connectors for the intake air temperature (IAT) sensor, idle control valve and the TP sensor.
10. Remove the retaining bolts from the alternator brace, then remove the brace.
11. Loosen and remove the five throttle body retaining bolts and the one stud bolt. Make sure to note the location of the bolt to aid in installation.

12. Lift and remove the throttle body assembly from the manifold. Discard the intake manifold upper gasket.



[Click to enlarge](#)

To install:

13. Clean and inspect all gasket surfaces. When cleaning aluminum parts be careful

not to gouge the surfaces. Lightly coat all bolts with clean engine oil prior to installation.

14. If available, install guide pins to guide the assembly onto its mounting. Place a new gasket on the manifold surface.
15. Aligning the bolt holes, install the throttle body on the intake manifold. Install the stud bolt and five retaining bolts then tighten to 15-22 ft. lbs. (20 -30 Nm).
16. Install the alternator brace to the throttle body mounting stud and alternator mounting bracket. Tighten the nuts to 9-15 ft. lbs. (12-20 Nm).
17. Connect the PCV hose to the fitting under the throttle body.
18. Install the EGR valve-to-exhaust manifold tube to the EGR valve and the EGR valve tube to manifold connector. Tighten to 26-48 ft. lbs. (35-65 Nm).
19. Connect the vacuum hoses to the intake manifold vacuum outlet fitting and cap and the EGR valve.
20. Engage the electrical connectors to the intake air temperature sensor, idle air control valve and the TP sensor.
21. Install the accelerator cable bracket to the side of the throttle body. Tighten the retaining bolts to 13 ft. lbs. (17 Nm).
22. Connect the accelerator cable to the throttle body lever, then install the retaining bolt and tighten to 13 inch lbs. (1.4 Nm).
23. Connect the air cleaner outlet tube to the throttle body and the air cleaner assembly. Tighten the clamp to 12-22 inch lbs. (1.4-2.5 Nm). Connect the crankcase tube and the aspirator hose.
24. Connect the negative battery cable. Start the engine and check for vacuum leaks.

The Throttle Valve (TV) cable must be adjusted if the throttle body is removed for any reason and if the throttle plate idle adjustment screw position is changed.

25. Adjust the TV cable as follows:
 1. Connect the TV cable eye to the transaxle throttle control lever link, then attach the cable boot to the chain cover.
 2. If equipped with the 3.0L engine, with the TV cable mounted in the engine bracket, make sure the threaded shank is fully retracted. To retract the shank, pull up on the spring rest with the index fingers and wiggle the top of the thread shank through the spring with the thumbs.
 3. If equipped with the 3.8L engine, the TV cable must be unclipped from the right intake manifold clip. To retract the shank, span the crack between the two 180° segments of the adjuster spring rest with a suitable tool. Compress the spring by pushing the rod toward the throttle body with the right hand. While the spring is compressed, push the threaded shank toward the spring with the index and middle fingers of the left hand. Do not pull on the cable sheath.
 4. Attach the end of the TV cable to the throttle body.
 5. If equipped with the 3.8L engine, rotate the throttle body primary lever by hand, the lever to which the

TV-driving nail is attached, to the wide-open-throttle position. The white adjuster shank must be seen to advance. If not, look for the cable sheath/foam hang-up on engine/body components. Attach the TV cable into the top position of the right intake manifold clip. The threaded shank must show movement or "ratchet" out of the grip jaws. If there is no movement, inspect the TV cable system for broken or disconnected components, then repeat the procedure.

26. Check and adjust the engine idle speed as necessary. Adjust the transaxle TV cable. Install the idle speed control solenoid shield. Tighten the retaining bolts to 13 inch lbs. (1.5 Nm).

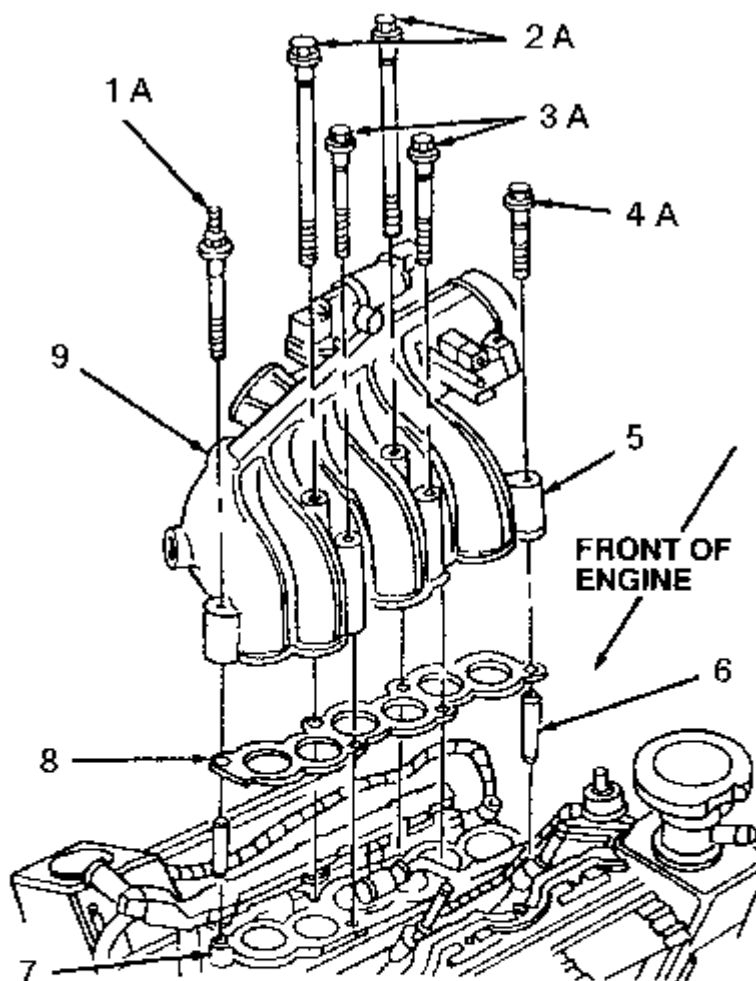
3.0L Flexible Fuel (FF) Engine

1. Disconnect the negative battery cable.
2. Remove the crankcase ventilation tube and the aspirator hoses from the air cleaner outlet tube.
3. Loosen the air cleaner tube clamp at the throttle body and the air cleaner outlet tube.

Before relieving fuel pressure, cover the hoses with a shop cloth to prevent accidental fuel spray into eyes!

4. Properly relieve the fuel system pressure.
5. Remove the snow shield from the idle air control valve.
6. Remove the accelerator cable retaining bolts, then disconnect the accelerator cable from the throttle body.
7. Remove the two accelerator cable bracket retaining bolts from the side of the throttle body, then remove the bracket.
8. Tag and disconnect the vacuum hoses attached to the intake manifold vacuum outlet fitting and cap and the EGR valve.
9. Disconnect the differential pressure feedback (DPFE) sensor hoses from the EGR valve-to-exhaust manifold tube.
10. Loosen the EGR valve-to-exhaust manifold tube nut at the EGR valve.
11. Remove the crankcase ventilation tube from the fitting on the throttle body.
12. Disengage the fuel charging wiring connections from the idle air control valve, differential pressure feedback and the throttle position sensors.
13. Remove the alternator brace retaining nuts from the alternator mounting bracket and throttle body stud, then remove the brace.
14. Note the location of the throttle body retaining bolts, then loosen and remove the five throttle body retaining bolts and the stud bolt.
15. Lift and remove the throttle body from the intake manifold, then discard the intake manifold upper gasket.





- 1. Stud bolt
- 2. Bolt (2 required)
- 3. Bolt (2 required)
- 4. Bolt
- 5. Throttle body
- 6. Guide pin (2 required)
- 7. Intake manifold
- 8. Intake manifold upper gasket
- 9. Intake manifold vacuum outlet fitting and cap
- A. Tighten to 20-30 N.m (15-22 lb-ft)

Throttle body assembly-3.0L Flexible Fuel (FF) engine

[Click to enlarge](#)

To install:

For the FF vehicle, the throttle body is to be replaced as an assembly. If replacing the throttle body with a new one, reuse the original intake manifold vacuum outlet fitting and cap, EGR valve and EGR pressure sensor with the new throttle body.

16. Carefully clean the intake manifold and throttle body gasket mating surfaces, being careful not to gouge the aluminum which will cause leaks, then inspect the mating surfaces for damage. Lightly coat all bolt and stud threads with oil.
17. If available, install guide pins in the front and rear bolt holes to aid in alignment.
18. Place a new intake manifold gasket on the intake manifold, using the guide pins if available.
19. Aligning the bolt holes, install the throttle body on the intake manifold. Install and hand-tighten the four center retaining bolts, then remove the guide pins if used. Install the stud bolt and the remaining retaining bolt. Tighten the bolts to 15-22 ft. lbs. (20-30 Nm).
20. Install the alternator brace to the throttle body mounting stud and alternator mounting bracket. Tighten the nuts to 9-15 ft. lbs. (12-20 Nm).
21. Install the EGR valve-to-exhaust manifold tube to the EGR valve and EGR valve tube to the manifold connector. Tighten the EGR valve-to-exhaust manifold tube nut to 26-48 ft. lbs. (35-65 Nm).
22. Connect the hoses from the EGR pressure sensor to the EGR valve-to-exhaust manifold tube. Check the condition of the hoses, and replace if damaged.
23. Connect the vacuum lines to their original locations on the intake manifold vacuum outlet fitting and cap, and EGR valve as tagged during removal. Check the condition of the hoses, and replace if damaged.
24. Engage the electrical connectors to the throttle position sensor, EGR pressure sensor and intake air temperature sensor.
25. Install the crankcase ventilation tube to the throttle body.
26. Install the accelerator cable bracket to the side of the throttle body, then tighten the retaining bolts to 13 ft. lbs. (17 Nm).
27. Connect the accelerator cable to the throttle body lever. Install the accelerator cable retaining bolt and tighten to 13 inch lbs. (1.4 Nm).
28. Install the air cleaner outlet tube to the throttle body. Tighten the tube clamps to 12-22 inch lbs. (1.4-2.5 Nm). Connect the crankcase ventilation tube and aspirator hose to their original locations.
29. Connect the negative battery cable, then start the engine and check for vacuum, exhaust and fuel leaks.

The Throttle Valve (TV) cable must be adjusted if the throttle body is removed for any reason and if the throttle plate idle adjustment screw position is changed.

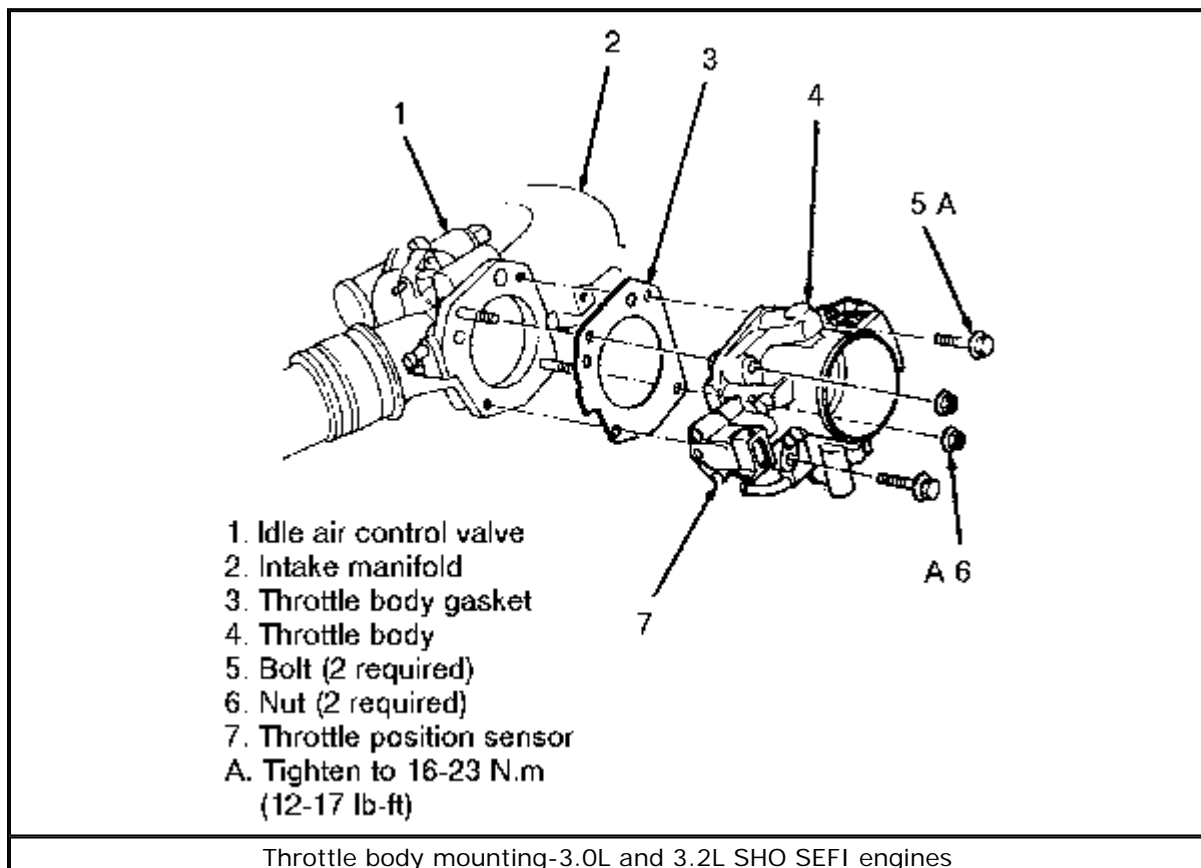
30. Adjust the TV cable as follows:
 1. Connect the TV cable eye to the transaxle throttle control lever link, then attach the cable boot to the chain cover.
 2. If equipped with the 3.0L engine, with the TV cable mounted in the engine bracket, make sure the threaded shank is fully retracted. To retract the shank, pull up on the spring rest with the index fingers and wiggle the top of the thread shank through the spring with the thumbs.
 3. Attach the end of the TV cable to the throttle body. The threaded shank must show movement or "ratchet" out of the grip jaws. If there is no movement, inspect the TV cable system for broken

or disconnected components, then repeat the procedure.

31. Install the snowshield onto the idle air control valve, then tighten the retaining screw to 13 inch lbs. (1.4 Nm).

3.0L and 3.2L SHO Engines

1. Disconnect the negative battery cable.
2. Remove the fuel tank filler cap to relieve the fuel tank pressure, then properly relieve the fuel system pressure. There is a fuel pressure relief valve located on the fuel injection supply manifold for this purpose. For more details, please refer to the fuel pressure relief procedure located earlier in this section.
3. Remove the air cleaner outlet tube and accelerator cables.
4. Disconnect the fuel charging wiring connectors at the throttle position (TP) sensor and the idle air control valve.
5. Carefully relieve the cooling system pressure by releasing the pressure at the radiator cap, then remove the water bypass hoses.
6. Disconnect the crankcase ventilation tubes.
7. Remove the throttle body retaining bolts and nuts, then remove the throttle body from the vehicle. Discard the gasket.



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To install:

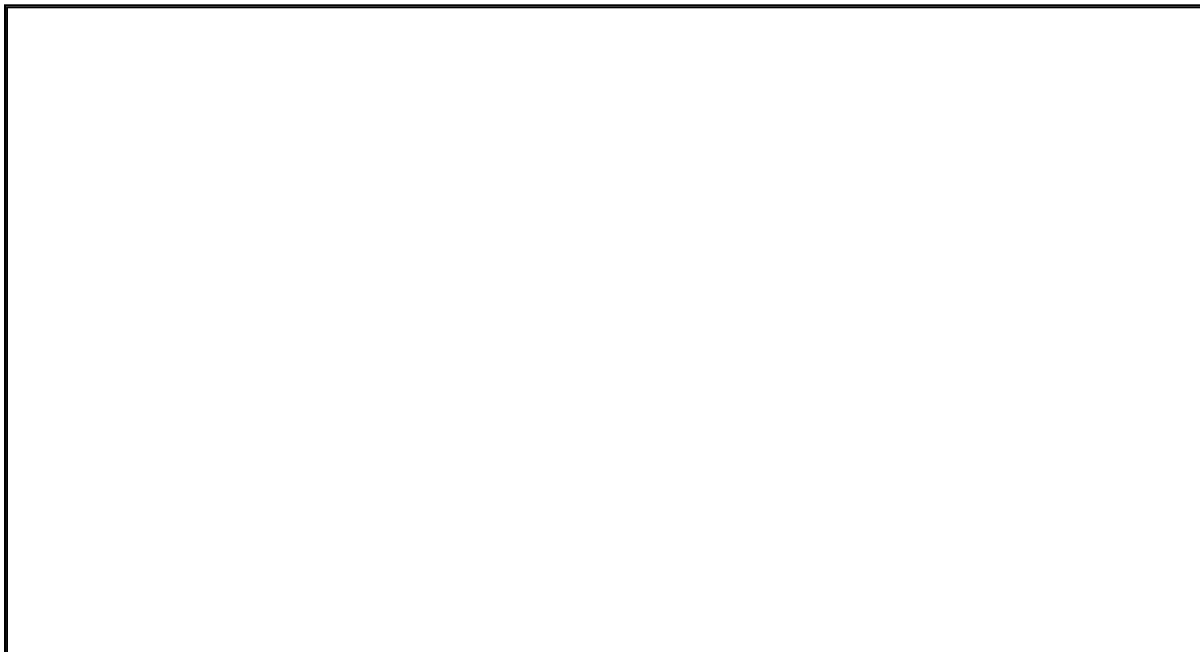
8. Clean and inspect the throttle body and intake manifold mating surfaces. If scraping is necessary to clean the surfaces, be careful not to damage to gasket

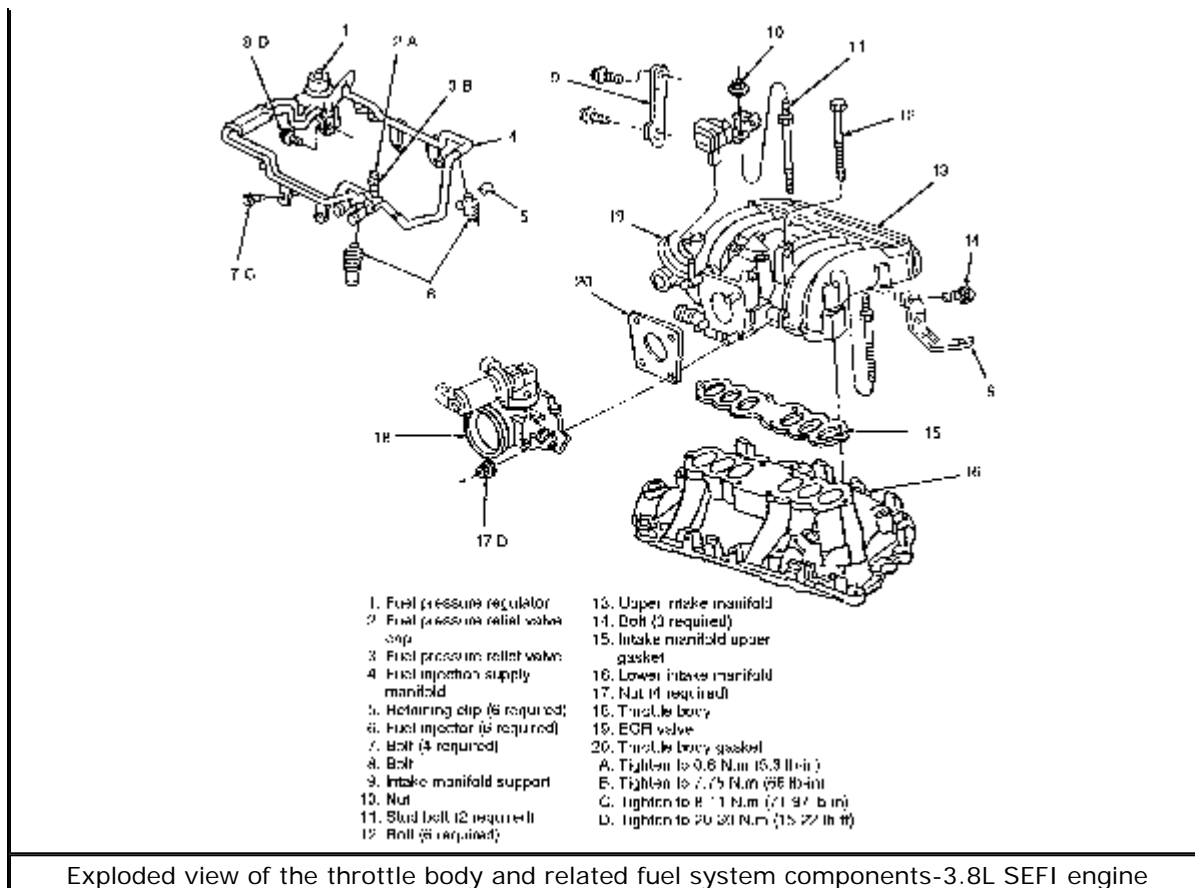
surfaces or allow gasket and/or foreign material to enter the intake manifold.

9. Install a new throttle body gasket, then position the throttle body and secure using the retaining bolts. Tighten the bolts to 12-17 ft. lbs. (16-23 Nm).
10. Connect the crankcase ventilation tubes.
11. Connect the water bypass hoses, then refill the cooling system to the proper level. For details regarding this procedure, please refer to *Section 1* of this manual.
12. Fasten the fuel charging wiring connectors at the throttle position (TP) sensor and idle air control valve.
13. Install the accelerator cables and the air cleaner outlet tube.
14. Install the fuel tank filler cap at the fuel tank.
15. Connect the negative battery cable, then check all of the connections at the fuel injection supply manifold, fuel injectors, push connect fittings, etc. to make sure they are all connected/fastened securely.
16. Turn the ignition switch ON and OFF several times without starting the engine to pressurize the fuel system.
17. Start the engine and run it until the engine reaches normal operating temperatures, then check for coolant leaks. Check the coolant level and add if necessary.

3.8L Engine

1. Disconnect the negative battery cable.
2. Remove the fuel tank filler cap to relieve the fuel tank pressure, then properly relieve the fuel system pressure. There is a fuel pressure relief valve located on the fuel injection supply manifold for this purpose. For more details, please refer to the fuel pressure relief procedure located earlier in this section.
3. Remove the air cleaner outlet tube from the throttle body, then disconnect the accelerator cable from the throttle body lever.
4. Disengage the fuel charging wiring connectors from the throttle position (TP) sensor and the idle air control valve.
5. Remove the four throttle body retaining nuts, then remove the throttle body from the upper intake manifold and discard the throttle body gasket.





[Click to enlarge](#)

To install:

6. Clean and inspect the gasket mating surfaces. If scraping is required to clean the surface, be careful not to damage the gasket surfaces or allow any gasket material or foreign material to drop into the intake manifold.
7. Using a new throttle body gasket, install the throttle body in the four studs of the upper intake manifold, then tighten the retaining nuts to 15-22 ft. lbs. (20-30 Nm).
8. Engage the fuel charging wiring connectors to the throttle position sensor and idle air control valve.
9. Install the air cleaner outlet tube to the throttle body.
10. Install the fuel tank filler cap at the fuel tank.
11. Connect the negative battery cable, then check all of the connections at the fuel injection supply manifold, fuel injectors, push connect fittings, etc. to make sure they are all connected/fastened securely.
12. Turn the ignition switch ON and OFF several times without starting the engine to pressurize the fuel system.

Fuel Charging Assembly

REMOVAL & INSTALLATION

The fuel charging assembly consists of the air throttle body, and the upper and lower intake manifolds. Prior to service or removal of the fuel charging assembly, the following procedures must be taken.

1. Open the hood and install protective fender covers.
2. Disconnect the negative battery cable.
3. Remove the fuel cap at the tank.
4. Release the fuel pressure from the fuel system. Depressurize the fuel system by connecting a Fuel Pressure Gauge part No. T80L-9974-B or equivalent to the pressure relief valve on the fuel rail assembly.
5. Remove the intake air boot from the throttle body and airflow sensor and disconnect the throttle cable.
6. Disconnect the vacuum and electrical connectors from the throttle body.
7. Disconnect the coolant bypass hoses at the throttle body.

WARNING

The cooling system may be under pressure. Release the pressure at the radiator cap before removing the hoses. Also, allow the engine to cool down before performing any service.

8. Disconnect the EGR pipe from the EGR valve, if so equipped.
9. Remove the eight bolts at the intake manifold support brackets and remove the brackets.
10. Remove the bolt retaining the coolant hose bracket and disconnect the PCV hoses, if so equipped.
11. Remove the intake and throttle body assembly.

To install:

12. Clean and inspect the manifold mounting surfaces.
13. Position new intake manifold gaskets and install the manifold assembly onto the cylinder heads.
14. Install the 12 intake-to-head attaching bolts and tighten to 11-17 ft. lbs. (15-23 Nm).
15. Install the intake manifold support brackets and coolant hose bracket.
16. Connect all the coolant and vacuum hoses.
17. Connect the electrical connectors at the DIS module, vacuum switching valve, throttle position sensor, and the air bypass valve.
18. Install the throttle cable and intake air boot.
19. Connect the negative battery cable. Start the engine and check for fuel and coolant leaks.

Fuel Injectors

REMOVAL & INSTALLATION

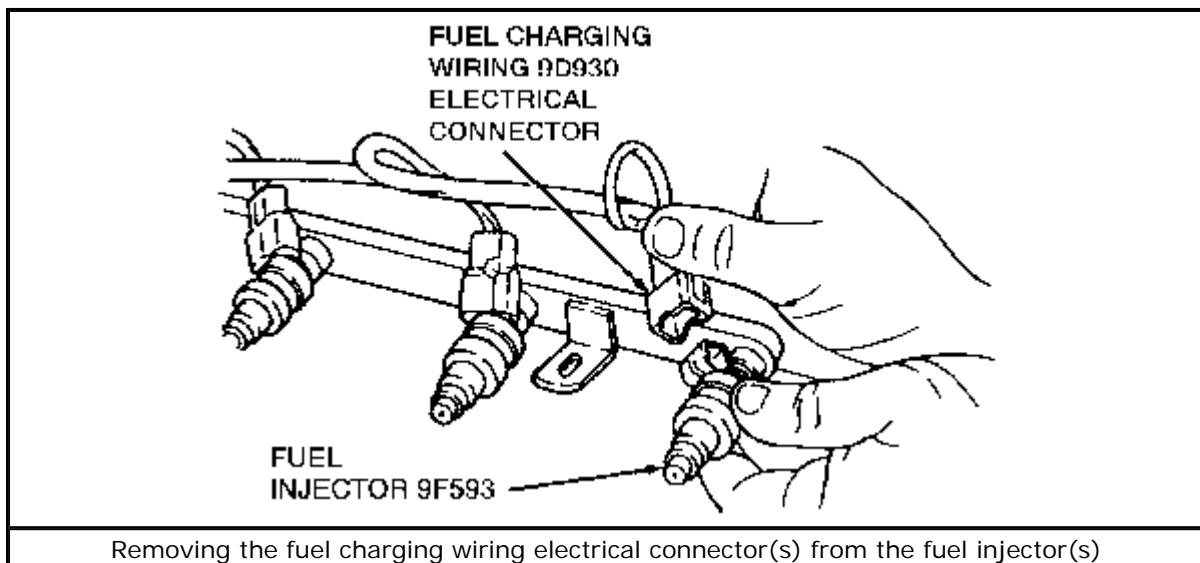
3.0L Engine

1. Disconnect the negative battery cable.

CAUTION

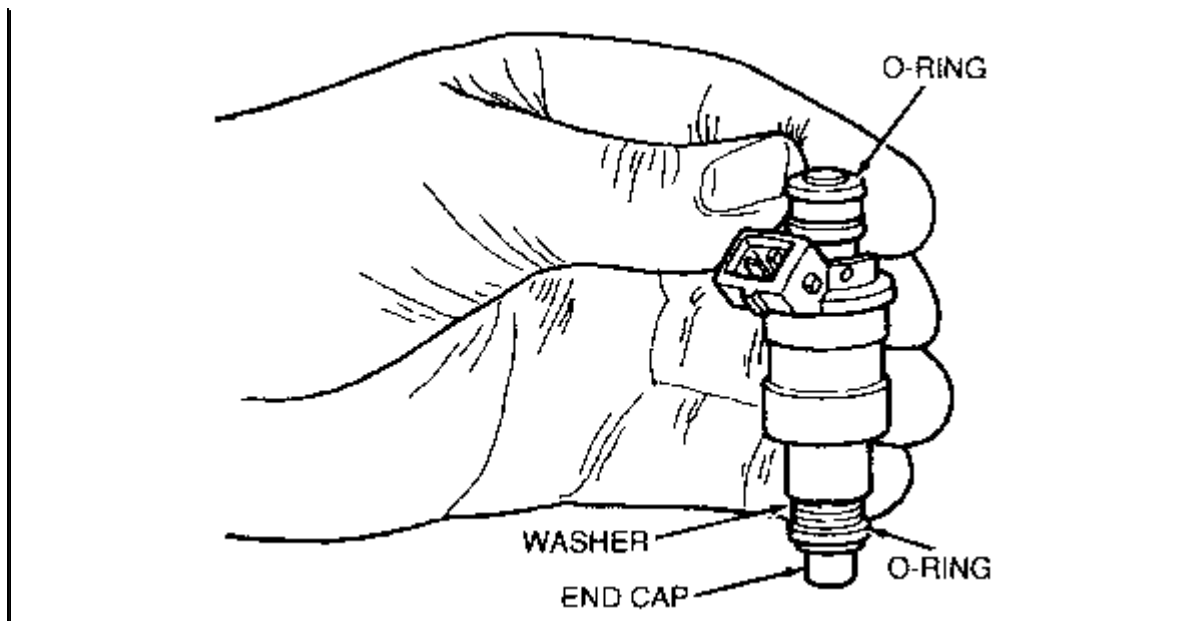
The fuel system is under high pressure. Use care when servicing the fuel system or personal injury may occur.

2. Remove the fuel tank filler cap to release the fuel tank pressure, then properly release the fuel system pressure.
3. Remove the fuel injection supply manifold. For details, please refer to the procedure located later in this section.
4. Carefully remove the fuel charging wiring connectors from the fuel injectors, as required.



[Click to enlarge](#)

5. Grasping the fuel injector body, pull up while gently rocking the fuel injector from side-to-side.
6. Inspect the fuel injector O-rings, there are two per injector, for signs of damage and/or deterioration and replace as necessary.
7. Inspect the fuel injector end cap, body and washer for signs of dirt and/or deterioration and replace as necessary.



Inspect the injector O-rings, end cap, body and washer for signs of damage and/or deterioration, and replace worn components as necessary

To install:

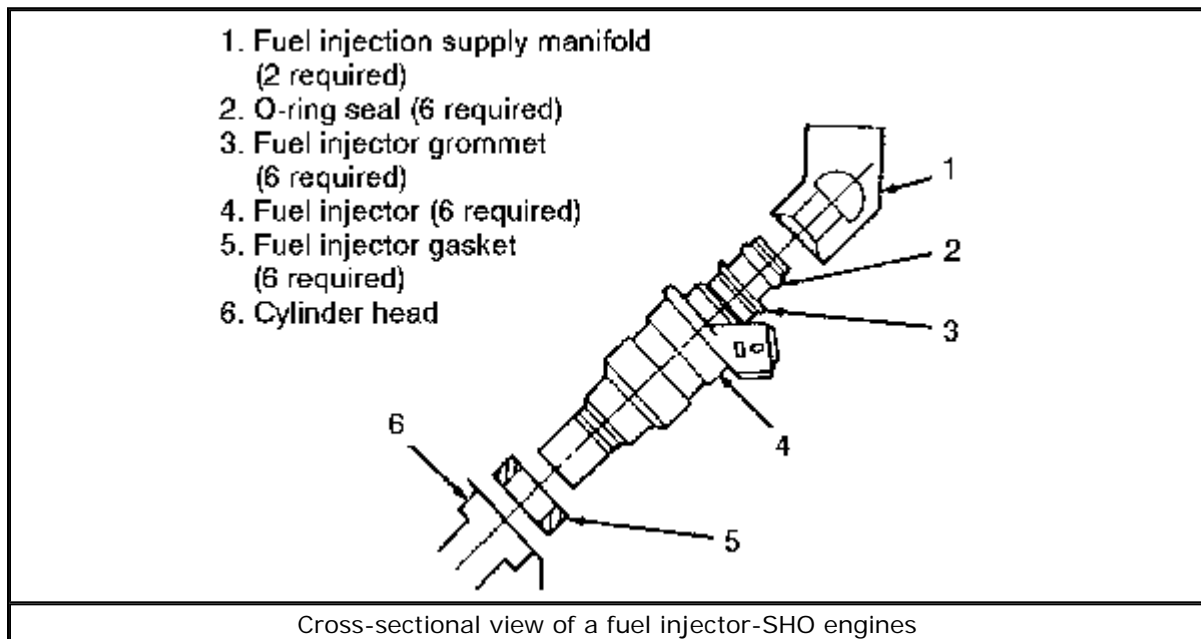
8. Lubricate new O-rings with clean engine oil.
9. Install the fuel injectors using a light, twisting-pushing motion.
10. Install the fuel injection supply manifold. For details, please refer to the procedure later in this section.
11. Engage the fuel charging wiring connectors to the fuel injectors.
12. Install the fuel tank filler cap, then connect the negative battery cable.
13. Turn the ignition switch ON and OFF several times without starting the engine to pressurize the system, then check for fuel leaks.

3.0L and 3.2L SHO Engines

1. Disconnect the negative battery cable.
2. Remove the fuel tank filler cap, then properly relieve the fuel system pressure.
3. Remove the intake manifold as follows:
 1. Properly drain the cooling system into a suitable container.
 2. Remove the intake air tube from the throttle body and MAP sensor. Disconnect the throttle cables.
 3. Disengage the electrical connectors at the TP sensor, air bypass valve, vacuum switching valve and DIS module.
 4. Disconnect the coolant bypass hoses and vacuum lines.
 5. Disconnect the EGR pipe from the EGR valve.
 6. Remove the 8 bolts at the intake manifold support brackets, then remove the brackets.
 7. Remove the bolt retaining the coolant hose bracket,

then disconnect the PCV hoses.

8. Remove the 12 manifold retaining bolts, then remove the intake manifold and throttle body assembly.
4. Disengage the electrical connectors at the fuel injectors.
5. Remove the fuel injection supply manifold/rail retaining bolts.
6. Raise and slightly rotate the fuel injection supply manifold/rail assembly, then remove the injectors.



[Click to enlarge](#)

To install:

7. Inspect the fuel injector O-ring seals and insulators for damage and/or deterioration, then replace as necessary.
8. Lubricate new O-rings with engine oil, then install them on the fuel injectors.
9. Install the injectors in the fuel injection supply manifold/rail by lightly twisting and pushing the injectors into position.
10. Install the fuel injection supply manifold/rail, making sure the injectors seat properly in the cylinder head.
11. Install the fuel injection supply manifold/rail retaining bolts, then tighten the bolts to 11-17 ft. lbs. (15-23 Nm).
12. Engage the electrical connectors at the fuel injectors.
13. Install the intake manifold by reversing the removal procedure.
14. Install the fuel tank filler cap, then connect the negative battery cable.
15. Then turn the ignition switch ON and OFF several times to pressurize the fuel system.
16. Start the engine and let it run until it reaches normal operating temperature, then check for leaks for fuel and/or coolant leaks. Check the coolant level and add if necessary.

3.8L Engine

1. Disconnect the negative battery cable.
2. Remove the fuel cap at the tank to release the fuel tank pressure.
3. Properly relieve the pressure from the fuel system. For details, please refer to the procedure located earlier in this section.
4. Remove the upper intake manifold and the fuel supply manifold as follows:
 1. Disengage the electrical connectors at the air bypass valve, TP sensor and EGR position sensor.
 2. Disconnect the throttle linkage at the throttle ball and the transmission linkage from the throttle body. Remove the 2 bolts securing the bracket to the intake manifold and position the bracket with the cables aside.
 3. Disconnect the upper intake manifold vacuum fitting connections by disconnecting all vacuum lines to the vacuum tree, EGR valve and pressure regulator.
 4. Disconnect the PCV hose and remove the nut retaining the EGR transducer to the upper intake manifold.
 5. Loosen the EGR tube at the exhaust manifold, then disconnect at the EGR valve.
 6. Remove 2 bolts retaining the EGR valve to the upper intake manifold, then remove the EGR valve and EGR transducer as an assembly.
 7. Remove the 2 canister purge lines from the fittings on the throttle body, then remove the 6 upper intake manifold retaining bolts.
 8. Remove 2 retaining bolts on the front and rear edges of the upper intake manifold where the manifold support brackets are located.
 9. Remove the nut retaining the alternator bracket to the upper intake manifold and the 2 bolts retaining the alternator bracket to the water pump and alternator.
 10. Remove the upper intake manifold and throttle body as an assembly.
 11. Disconnect the fuel supply and return lines from the fuel rail assembly.
 12. Remove the fuel rail assembly retaining bolts, carefully disengage the fuel rail from the fuel injectors, then remove the fuel rail.
5. Remove the injector retaining clips.
6. Remove the electrical connectors from the fuel injectors.
7. To remove the injector, pull it up while gently rocking it from side-to-side.
8. Inspect the injector O-rings, pintle protection cap (plastic hat) and washer for deterioration and replace, as required.

To install:

9. Lubricate new engine O-rings with engine oil and install 2 on each injector.
10. Install the injectors, using a light, twisting, pushing motion to install them.
11. Reconnect the injector retaining clips.
12. Install the fuel rail assembly.
13. Install the electrical harness connectors to the injectors.
14. Install the upper intake manifold by reversing the removal procedure.
15. Install the fuel cap at the tank.
16. Connect the negative battery cable.
17. Turn the ignition switch from ON to OFF position several times without starting the engine to check for fuel leaks.

Fuel Injection Supply Manifold

REMOVAL & INSTALLATION

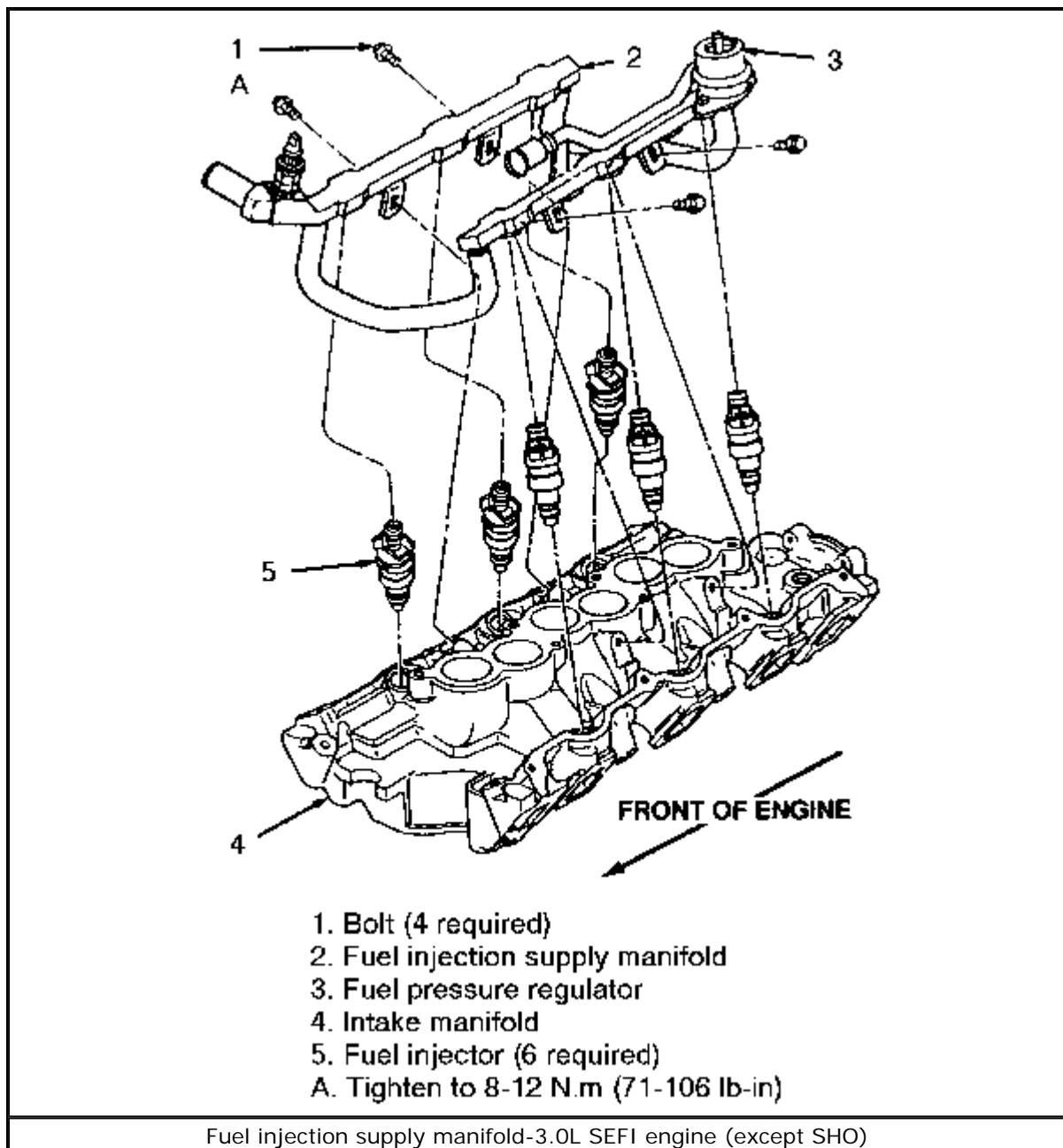
3.0L Engine-Except SHO

1. Disconnect the negative battery cable, then properly relieve the fuel system pressure.
2. Remove the throttle body. For details, please refer to the procedure located earlier in this section.
3. On unleaded gasoline vehicles only:
 1. Scribe an alignment mark on the base of the distributor and the intake manifold.
 2. Remove the hold down clamp, then lift the distributor enough to allow the fuel injection supply manifold to clear the distributor and intake manifold.
4. Disconnect the fuel supply and return lines.
5. Carefully disconnect the fuel charging wiring from the fuel injectors.
6. Disconnect the fuel charging wiring from the fuel pressure regulator.
7. Remove the four fuel injection supply manifold retaining bolts. There are two on each side.

WARNING

The fuel injectors and supply manifold must be handled with extreme care to avoid damage to the sealing areas and sensitive fuel-metering orifices.

8. Carefully disengage the fuel injection supply manifold from the fuel injectors by lifting and gently rocking the fuel injection supply manifold, then remove the fuel injectors by lifting while gently rocking from side-to-side.
9. Place the removed components in a clean container to avoid dirt of other contamination.



[Click to enlarge](#)

To install:

When installing the manifold, make sure that the O-rings are properly seated to avoid leakage.

10. Examine the fuel injector O-rings for deterioration, and install new ones if necessary.

To avoid cutting the O-rings, do NOT try to install them if they are swollen. Allow them to dry out first.

11. Using clean engine oil, lubricate the O-rings, then install two on each injector.
12. Make sure that the cups are clean and do not have any dirt or contamination.
13. Install the fuel injectors in the fuel injection supply manifold using a light, twisting-pushing motion.

14. On unleaded gasoline engines only:
 1. Lift the distributor enough to allow the fuel injection supply manifold to clear the distributor and intake manifold, then position the fuel injection manifold.
 2. Lower the distributor into position, then install the hold-down clamp and align the scribe marks made during removal. Tighten the clamp bolt to 18 ft. lbs. (24 Nm).
15. Carefully install the fuel injection supply manifold and fuel injectors into the intake manifold, one side at a time. Firmly push down on the fuel injection supply manifold to be sure that the injector O-rings are fully seated.
16. While holding the fuel injection manifold in place, install the retaining bolts, then tighten to 6-9 ft. lbs. (8-12 Nm).
17. Connect the fuel supply and return lines.
18. Connect the negative battery cable, then turn the ignition switch ON and OFF several times to pressurize the fuel system.
19. Using a clean paper towel and rubber gloves, check for leaks where the fuel injectors connect to the fuel injection supply manifold and intake manifold.
20. Connect the fuel charging wiring to the fuel injectors.
21. Connect the vacuum line to the fuel injectors.
22. Install the throttle body. For details, please refer to the procedure located earlier in this section.
23. Start the engine and allow it to idle, then check for fuel leaks and service as necessary.

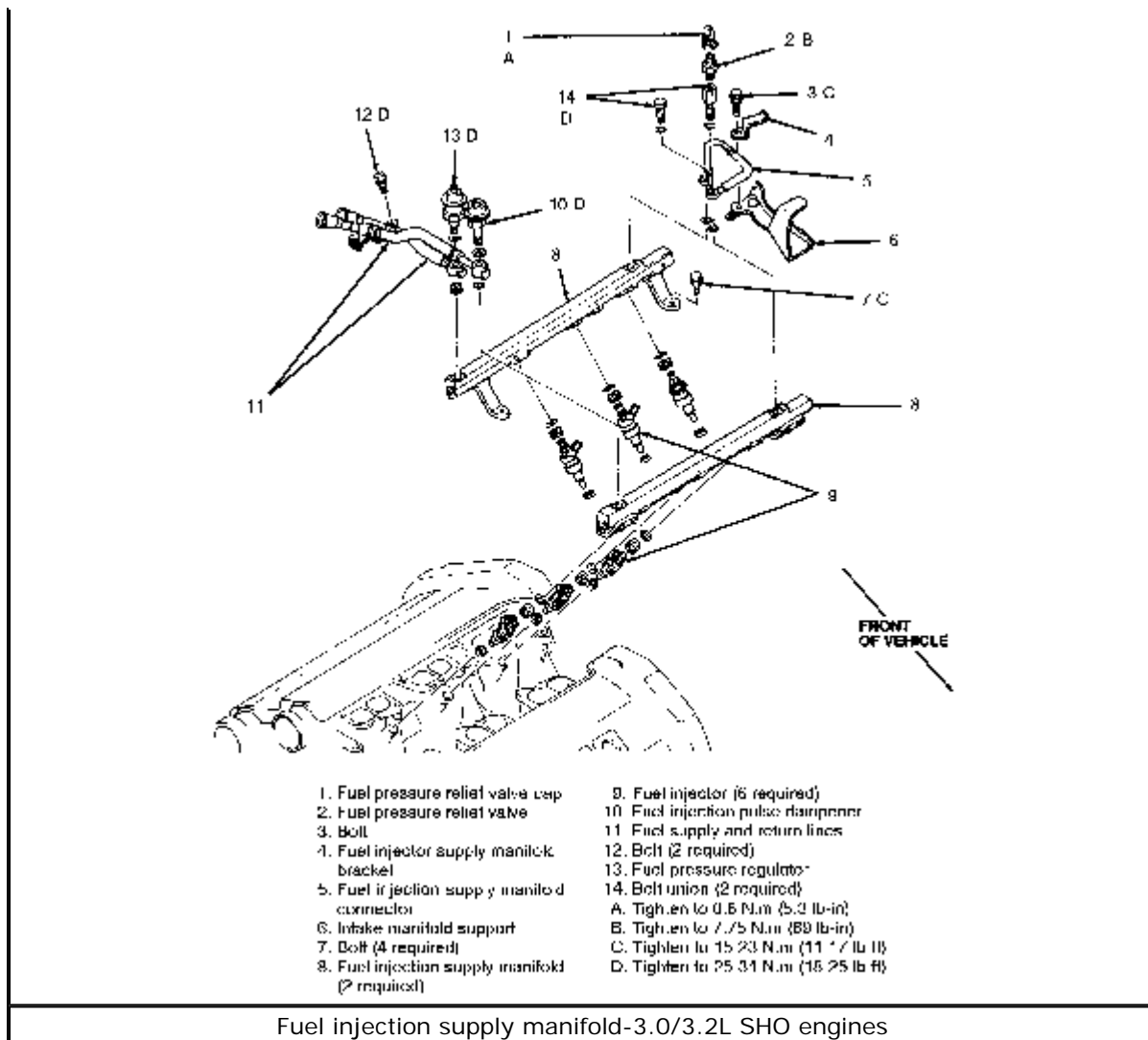
3.0L and 3.2L SHO Engines

1. Disconnect the negative battery cable.
2. Remove the fuel tank filler cap to release the fuel tank pressure, then properly relieve the fuel system pressure. For details, please refer to the procedure located earlier in this section.
3. Remove the intake manifold. For details, please refer to the procedure located in *Section 3* of this manual.
4. Disconnect the fuel line spring lock couplings. For details, please refer to the procedure located earlier in this section.
5. Disengage the connectors from the fuel charging wiring at the fuel injectors. Disconnect the vacuum hose at the fuel pressure regulator.

The fuel injection supply manifolds are mounted on bushings. Keep the bushings for installation.

6. Remove the four fuel injection supply manifold retaining bolts, then remove the fuel injection supply manifold.





[Click to enlarge](#)

To install:

WARNING

ALWAYS use new gaskets when assembling the fuel injection supply manifold to avoid possible fire from fuel leakage!

7. Using a new gasket, install the fuel injection supply manifolds, making sure that all of the injectors are properly seated.
8. Install the four fuel injection supply manifold retaining bolts, then tighten the bolts to 11-17 ft. lbs. (15-23 Nm).
9. Connect the fuel line spring couplings. For details, please refer to the procedure located later in this section.
10. Install the intake manifold. For details regarding this procedure, please refer to the intake manifold installation in *Section 3* of this manual.
11. Connect the vacuum lines, then fasten the remaining fuel charging wiring connectors.
12. Install the cap on the fuel tank.

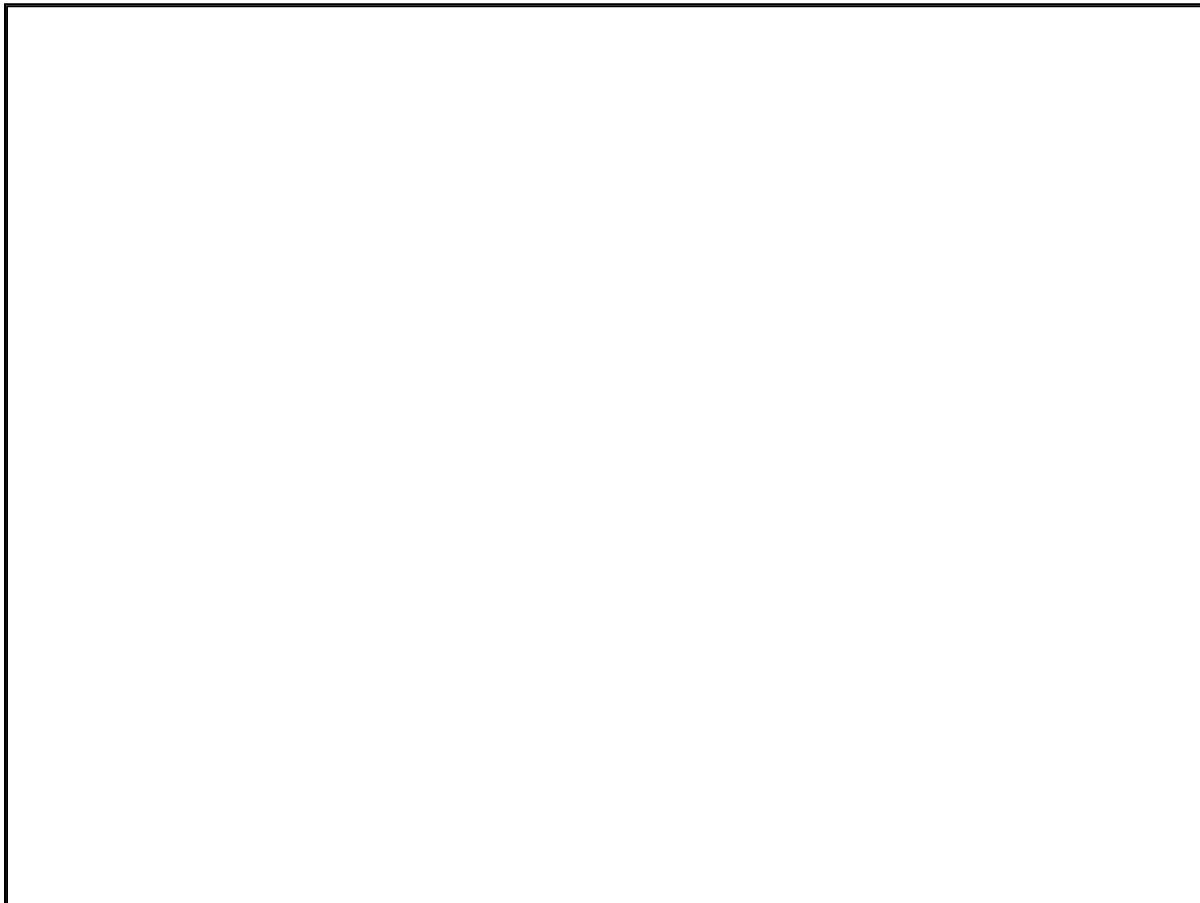
13. Connect the negative battery cable, then turn the ignition ON and OFF several times, without starting the engine, to pressurize the fuel system.
14. Start and run the engine, then check for leaks.

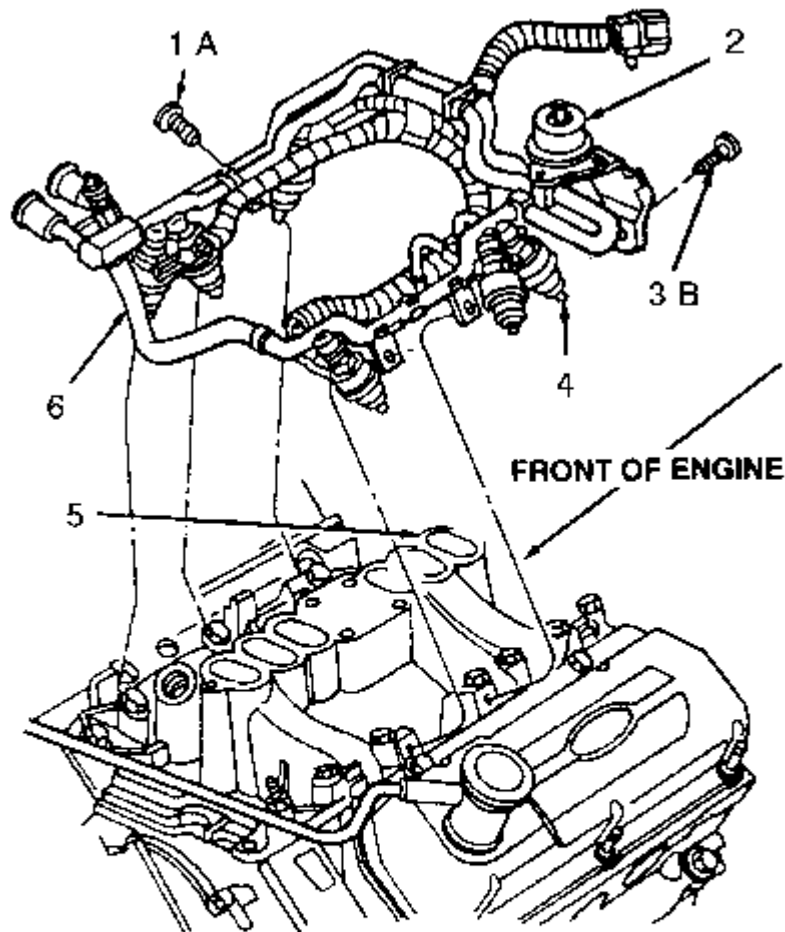
3.8L Engine

1. Disconnect the negative battery cable.
2. Remove the fuel tank filler cap to release the fuel tank pressure, then properly relieve the fuel system pressure. There is a fuel pressure relief valve located on the fuel injection supply manifold for this purpose. For more details, please refer to the procedure located earlier in this section.
3. Remove the upper intake manifold. For details regarding this procedure, please refer to the intake manifold removal procedure located in *Section 3* of this manual.
4. Remove the spring lock coupling fittings from the fuel inlet and return fittings. For details, please refer to the procedure located later in this section.
5. Using Spring Lock Coupling Disconnect Tool D87L-9280-A ($\frac{3}{8}$ in.) or D87L-9280-B ($\frac{1}{2}$ in.) or equivalent, disconnect the inlet and outlet fuel lines from the fuel injection supply manifold.
6. Remove the four fuel injection supply manifold retaining bolts. There are two on each side. Remove the fuel pressure regulator bracket retaining bolt from the cylinder head.

It may be easier to remove the fuel injectors with the fuel injection supply manifold as an assembly.

7. Carefully disengage the fuel injection supply manifold from the fuel injectors, then remove the fuel injection supply manifold.





1. Bolt (4 required)
 2. Fuel pressure regulator
 3. Bolt
 4. Fuel injector (6 required)
 5. Lower intake manifold
 6. Fuel injection supply manifold
- A. Tighten to 8-11 N.m (71-97 lb-in)
 B. Tighten to 20-30 N.m (15-22 lb-ft)

Fuel injection supply manifold and related components-3.8L SEFI engine

[Click to enlarge](#)

To install:

When installing the fuel injection supply manifold, make sure that the O-rings are properly seated so that there is no fuel leakage.

8. Push the fuel injector supply manifold down to be sure that all of the fuel injector O-rings are fully seated in the cylinder head pockets.
9. While holding the fuel injection supply manifold down, install the retaining bolts. Tighten the fuel injection supply manifold retaining bolts to the lower intake manifold to 6-8 inch lbs. (8-11 Nm). Tighten the fuel pressure regulator bracket retaining bolt to cylinder head to 15-22 ft. lbs. (20-30 Nm).
10. Install the spring lock coupling as described later in this section.

11. Install the fuel tank cap, then connect the negative battery cable.
12. With the fuel charging wiring still disconnected, turn the ignition switch ON and OFF several times. This allows the fuel pump to pressurize the system. Using a clean towel, check for fuel leaks.
13. Connect the fuel charging wiring.
14. Install the upper intake manifold. For details regarding this procedure, please refer to the upper intake manifold installation procedure in *Section 3* of this manual.
15. Start the vehicle and let it run for two minutes, then turn the engine OFF and check for leaks.

Fuel Pressure Regulator

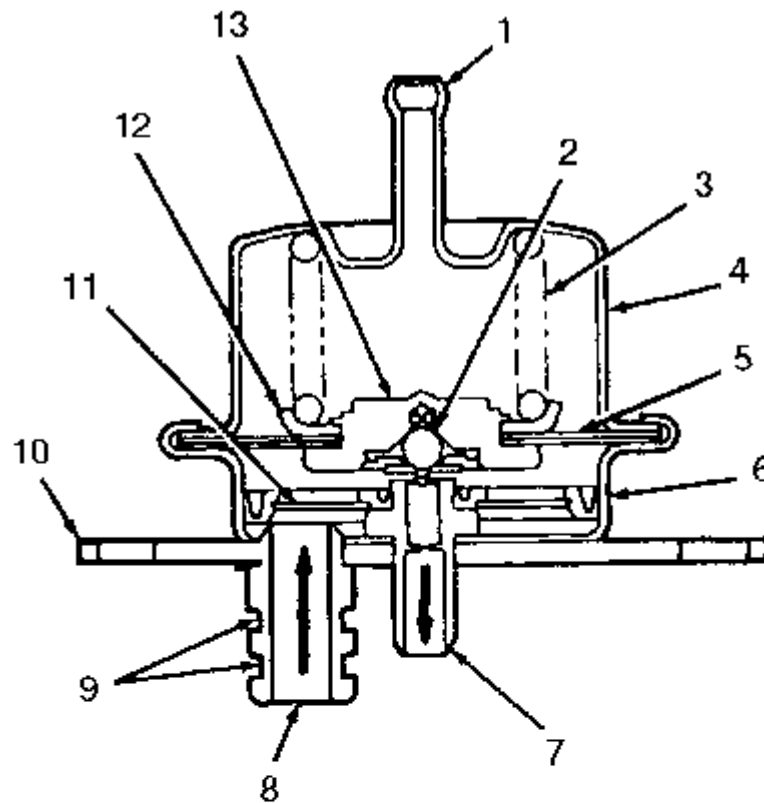
REMOVAL & INSTALLATION

3.0L Engine-Except SHO

WARNING

Flexible Fuel vehicle pressure regulator components are strictly methanol compatible. Do NOT use components that are not specially designed for use with methanol fuel. The use of different parts or materials could produce an untested configuration that could result in fire, personal injury and/or engine damage.

1. Disconnect the negative battery cable.
2. Remove the fuel tank filler cap to release the fuel tank pressure.
3. Properly release the fuel system pressure. There is a fuel pressure relief valve on the fuel injection supply manifold for this purpose. For more details, please refer to the fuel system relief procedure located earlier in this section.
4. Remove the vacuum line at the fuel pressure regulator.
5. Remove the two fuel injection supply manifold-to-intake manifold retaining bolts. Carefully lift the fuel injection supply manifold off of the fuel injectors to get to the fuel pressure regulator retaining screws.
6. Remove the Allen® head retaining screws from the fuel pressure regulator housing and discard them.
7. Remove the fuel pressure regulator, return seal and O-rings, then discard the return seal and the O-rings.



1. Engine vacuum reference tube (part of 9C968)
2. Ball seat (part of 9C968)
3. Spring (part of 9C968)
4. Upper housing (part of 9C968)
5. Diaphragm (part of 9C968)
6. Lower housing (part of 9C968)
7. Fuel outlet (return tube) (part of 9C968)
8. Fuel inlet (supply tube) (part of 9C968)
9. O-ring grooves (part of 9C968)
10. Mounting plate (part of 9C968)
11. Fuel filter screen (part of 9C968)
12. Spring seat (part of 9C968)
13. Valve assembly (part of 9C968)

Cross-sectional view of a fuel pressure regulator-3.0L SEFI engine (except SHO)

[Click to enlarge](#)

To install:

8. Lubricate new regulator O-rings with clean engine oil, then make sure the mating surfaces of the regulator and fuel injection supply manifold are clean. If scraping is necessary, be careful not to damage the fuel pressure regulator or fuel injection supply manifold sealing surfaces.
9. Install the new fuel pressure regulator return seal and O-rings on the fuel pressure regulator.

10. Using new Allen® head retaining screws, install the fuel pressure regulator on the fuel injection supply manifold. Tighten the screws to 34 inch lbs. (4 Nm).
11. Carefully install the fuel injection supply manifold to the fuel injectors. If the fuel injectors were completely disengaged from the fuel injection supply manifold, lubricate the fuel injector O-rings with clean engine oil before inserting them in the fuel supply manifold cups. Push the fuel injection supply manifold down on the fuel injector, then tighten the retaining bolts to 6-9 ft. lbs. (8-12 Nm) while holding down on the fuel injection supply manifold.
12. Install the fuel filler tank cap to the fuel tank.
13. Check all of the connections at the fuel injection supply manifold, fuel injectors, fuel line push connect fittings, etc. to make sure they are all fastened securely.
14. Connect the negative battery cable, then turn the ignition switch ON and OFF several times without starting the engine to pressurize the fuel system and check for fuel leaks.
15. Start the engine and allow it to warm up to normal operating temperature, then check for leaks.

3.0L and 3.2L SHO Engines

1. Disconnect the negative battery cable.
2. Remove the fuel tank filler cap to release the fuel tank pressure, then properly relieve the fuel system pressure. There is a pressure relieve valve located on the fuel injection supply manifold for this purpose. For details, please refer to the procedure located earlier in this section.
3. Disconnect the vacuum hose at the pressure regulator.
4. Remove the fuel pressure regulator from the fuel return lines and fuel injection supply manifold, then discard the sealing gaskets.

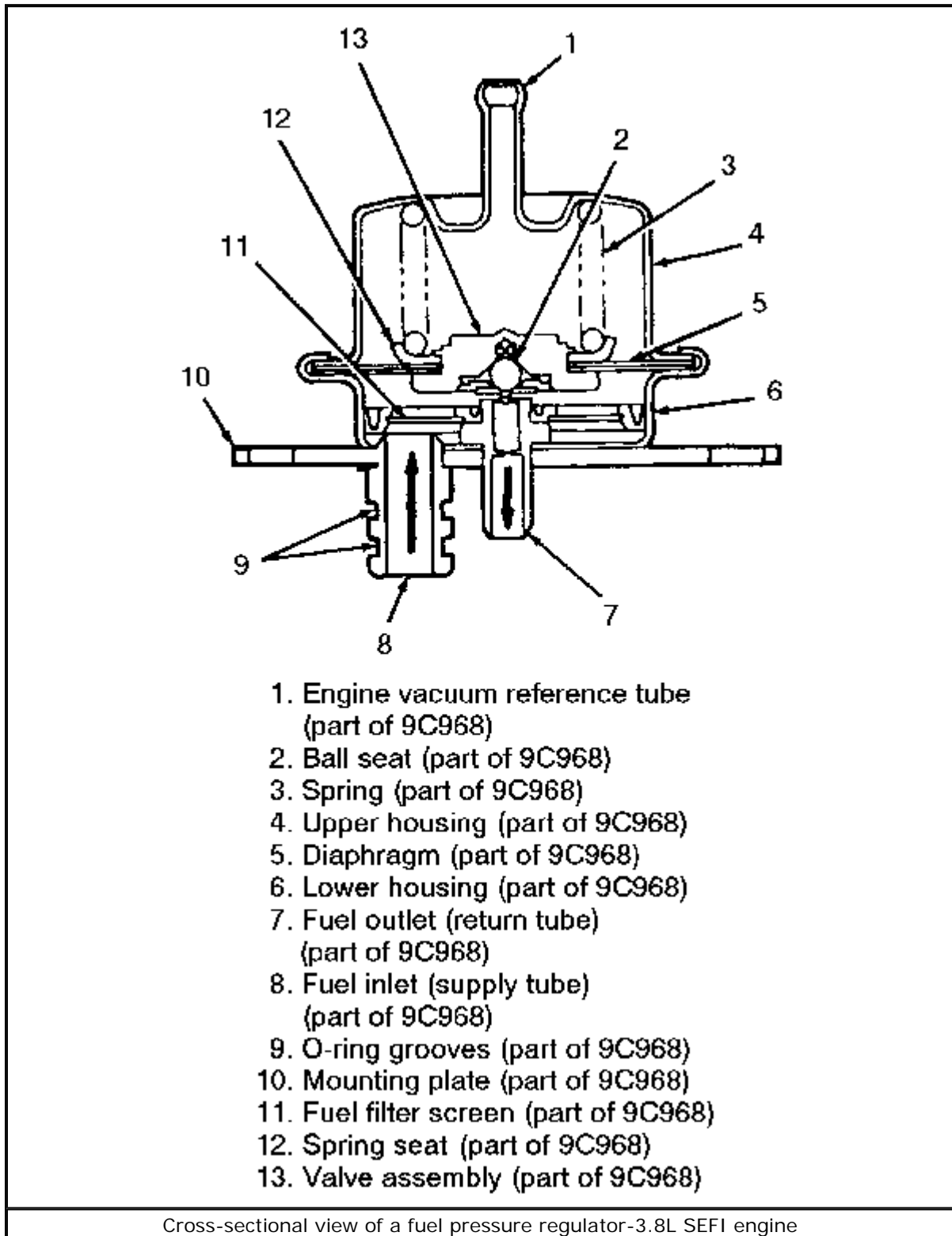
To install:

5. Install the fuel pressure regulator into the fuel return line and fuel injection supply manifold using new gaskets. Tighten the fuel pressure regulator to 18-25 ft. lbs. (25-34 Nm).
6. Connect the vacuum hose to the fuel pressure regulator.
7. Install the fuel tank cap, then connect the negative battery cable.
8. Check all of the fuel system connections to make sure they are all fastened/connected securely.
9. Turn the ignition switch ON and OFF without starting the engine and check for fuel leaks.

3.8L Engine

1. Disconnect the negative battery cable.
2. Remove the fuel tank filler cap to release the fuel tank pressure, then properly relieve the fuel system pressure. There is a pressure relieve valve located on the fuel injection supply manifold for this purpose. For details, please refer to the procedure located earlier in this section.
3. Remove the vacuum hose at the fuel pressure regulator.
4. Remove the Allen® head retaining screw from the fuel pressure regulator housing.

- Remove the fuel pressure regulator, return seal and the O-rings. Discard the return seal and the O-rings.



[Click to enlarge](#)

To install:

- Make sure the mating surfaces of the fuel pressure regulator and the fuel injection supply manifold are clean. If scraping is necessary, be careful not to damage the regulator or manifold.

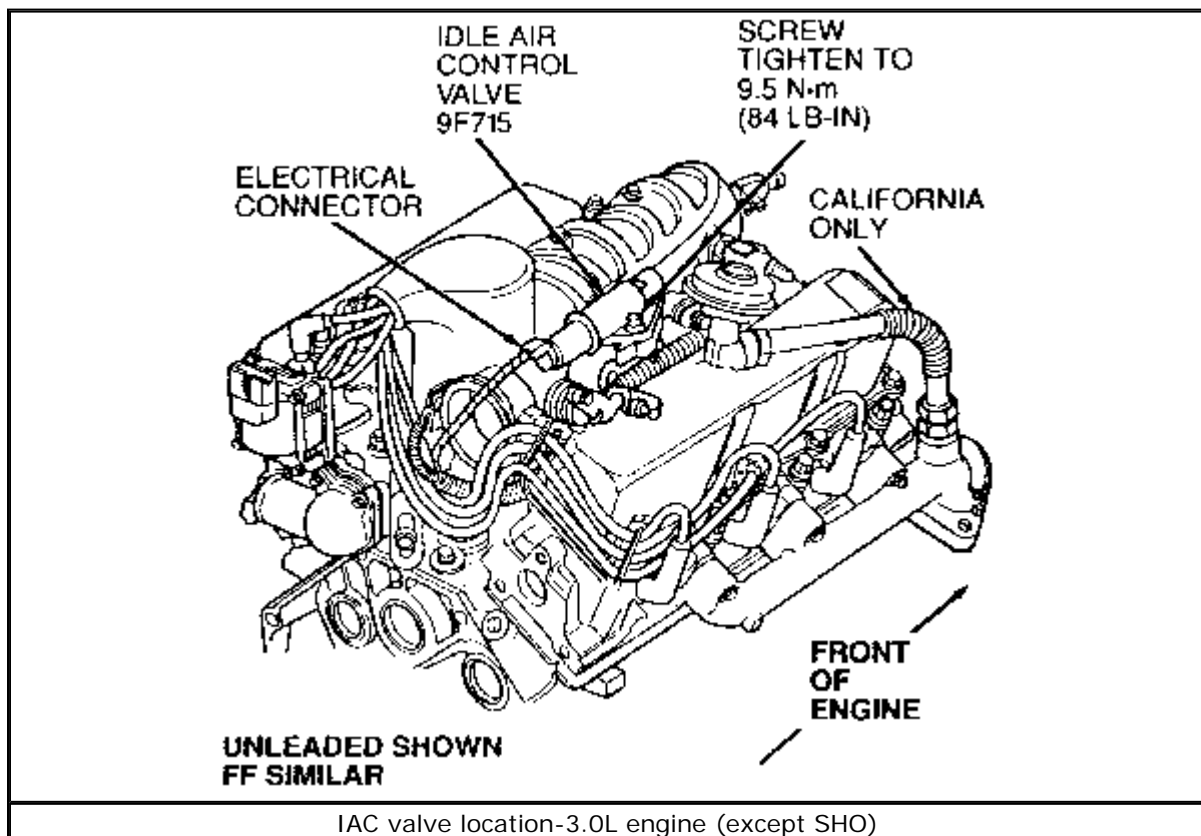
7. Lubricate new O-rings with clean engine oil, then install a new return seal and O-rings on the fuel pressure regulator.
8. Install the fuel pressure regulator on the fuel injection supply manifold. Tighten the retaining screws to 34 inch lbs. (4 Nm).
9. Install the vacuum hose to the fuel pressure regulator.
10. Install the fuel tank cap, then connect the negative battery cable.
11. Check all of the fuel system connections to make sure they are all fastened/connected securely.
12. Turn the ignition switch ON and OFF without starting the engine and check for fuel leaks.

Idle Air Control (IAC) Bypass Valve

REMOVAL & INSTALLATION

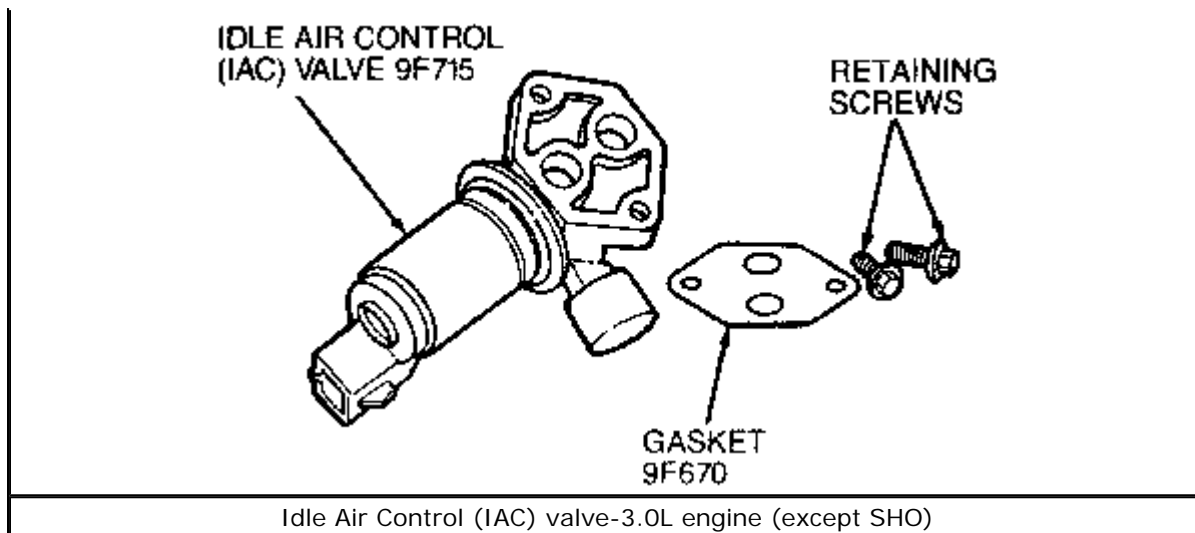
3.0L (Except SHO) and 3.8L Engine

1. Disconnect the negative battery cable. Properly relieve the fuel system pressure, as required.



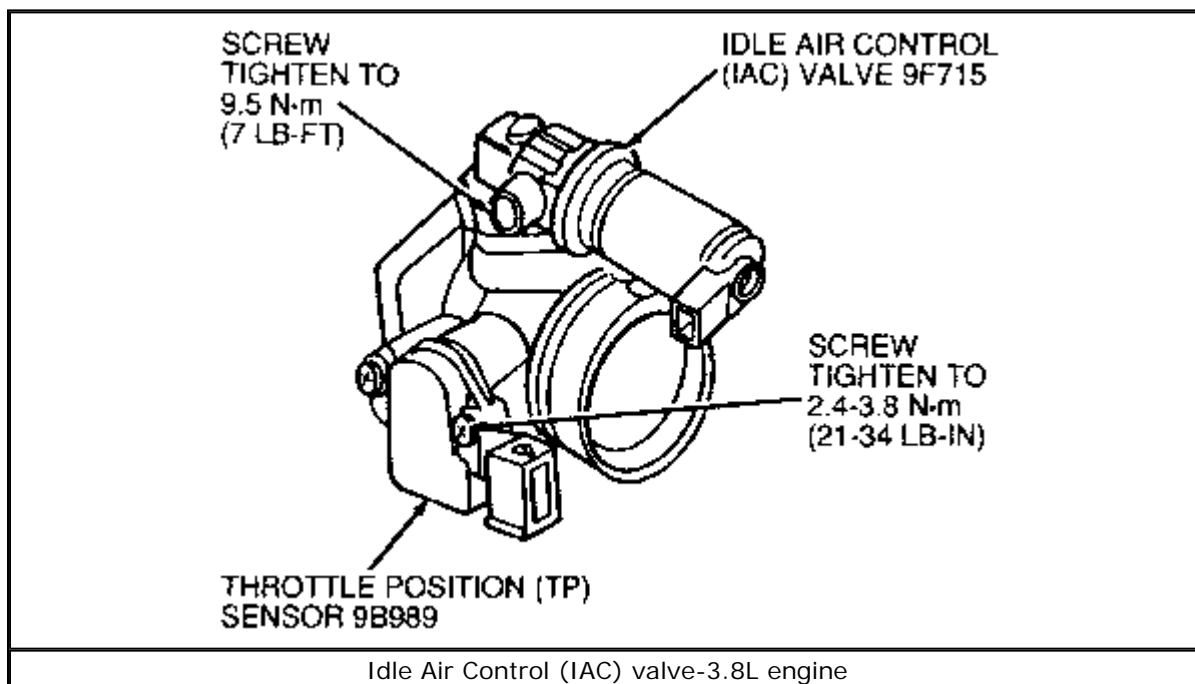
[Click to enlarge](#)

2. Disengage the idle air control bypass valve assembly electrical connector from the wiring harness.
3. Remove the two IAC valve retaining screws, then remove the valve and gasket.



To install:

4. Clean the gasket mating surfaces. If scraping is necessary, be careful not to damage the idle air control valve or throttle body gasket surfaces. Also, do not allow gasket material to drop into the throttle body.
5. Install the gasket on the throttle body surface, then mount the IAC valve to its mounting and secure using the retaining screws. Tighten the screws to 84 inch lbs. (9.5 Nm).



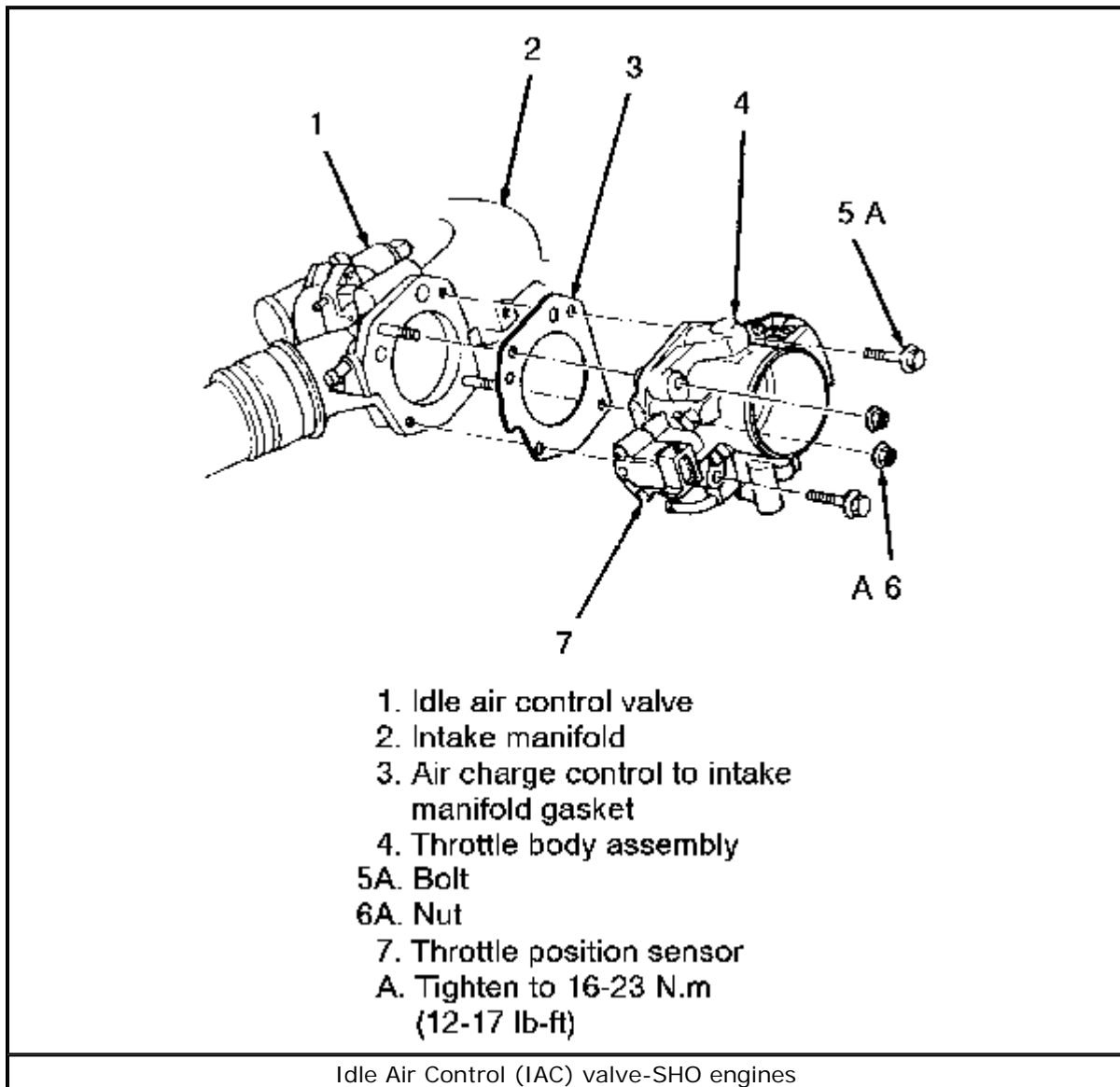
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6. Engage the air bypass valve electrical connector to the wiring harness.
7. Connect the negative battery cable.

3.0L and 3.2L SHO Engines

1. Disconnect the negative battery cable. Properly relieve the fuel system pressure, as required.

2. Disengage the idle air control bypass valve assembly electrical connector from the wiring harness.
3. Remove the IAC valve retaining bolts. Remove the top retaining bolt first and swing the valve upward to provide working clearance in order to remove the lower retaining bolt. Remove the valve and gasket.



[Click to enlarge](#)

To install:

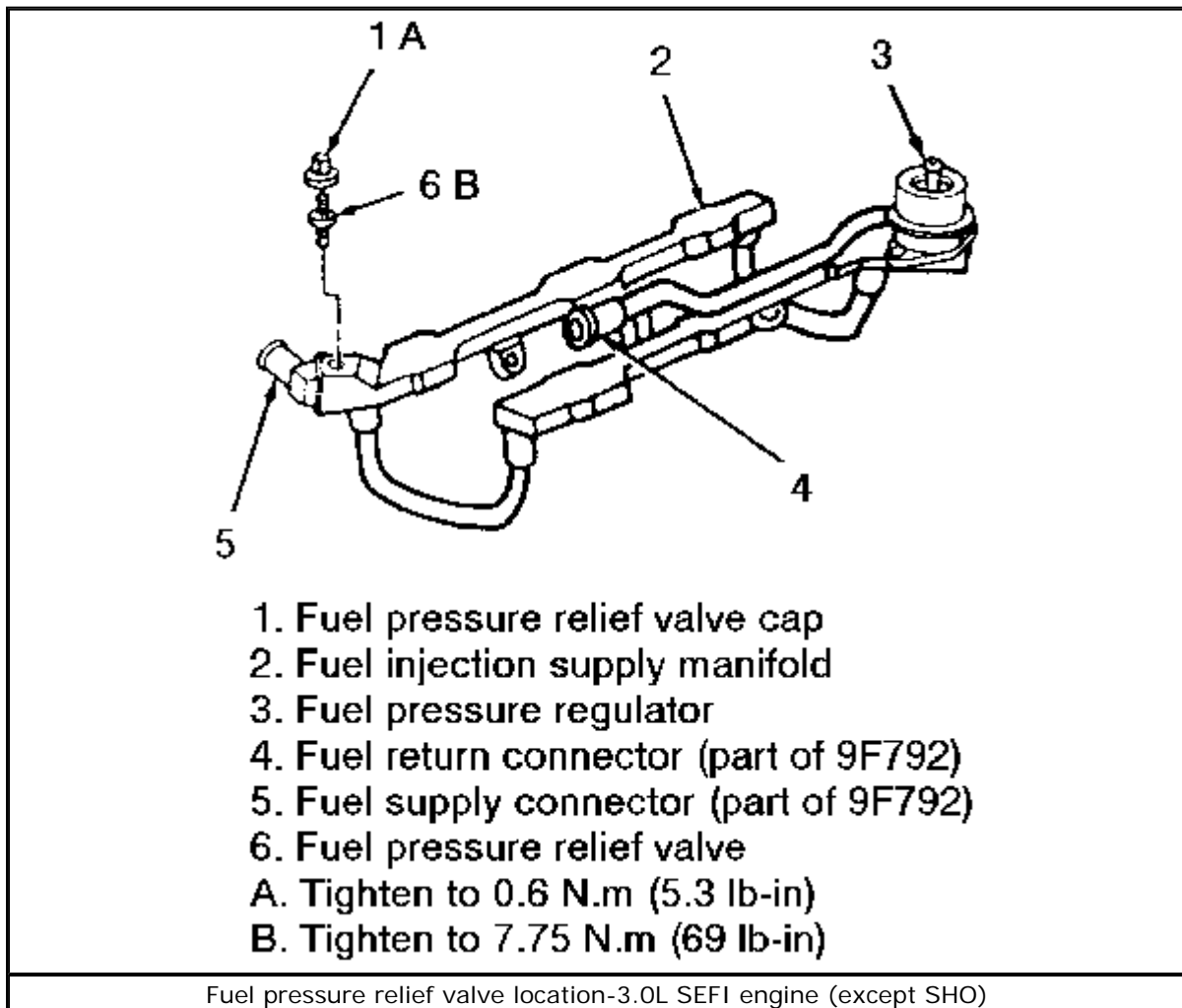
4. Clean the gasket mating surfaces. If scraping is necessary, be careful not to damage the IAC valve or throttle body gasket surfaces. Also, do not allow gasket material to drop into the throttle body.
5. Install the gasket on the throttle body surface. Mount the air bypass valve to its mounting.
6. Tighten the retaining bolts to 63-97 inch lbs. (7-11 Nm).
7. Engage the IAC valve electrical connector to the wiring harness.
8. Connect the negative battery cable.

Fuel Pressure Relief Valve

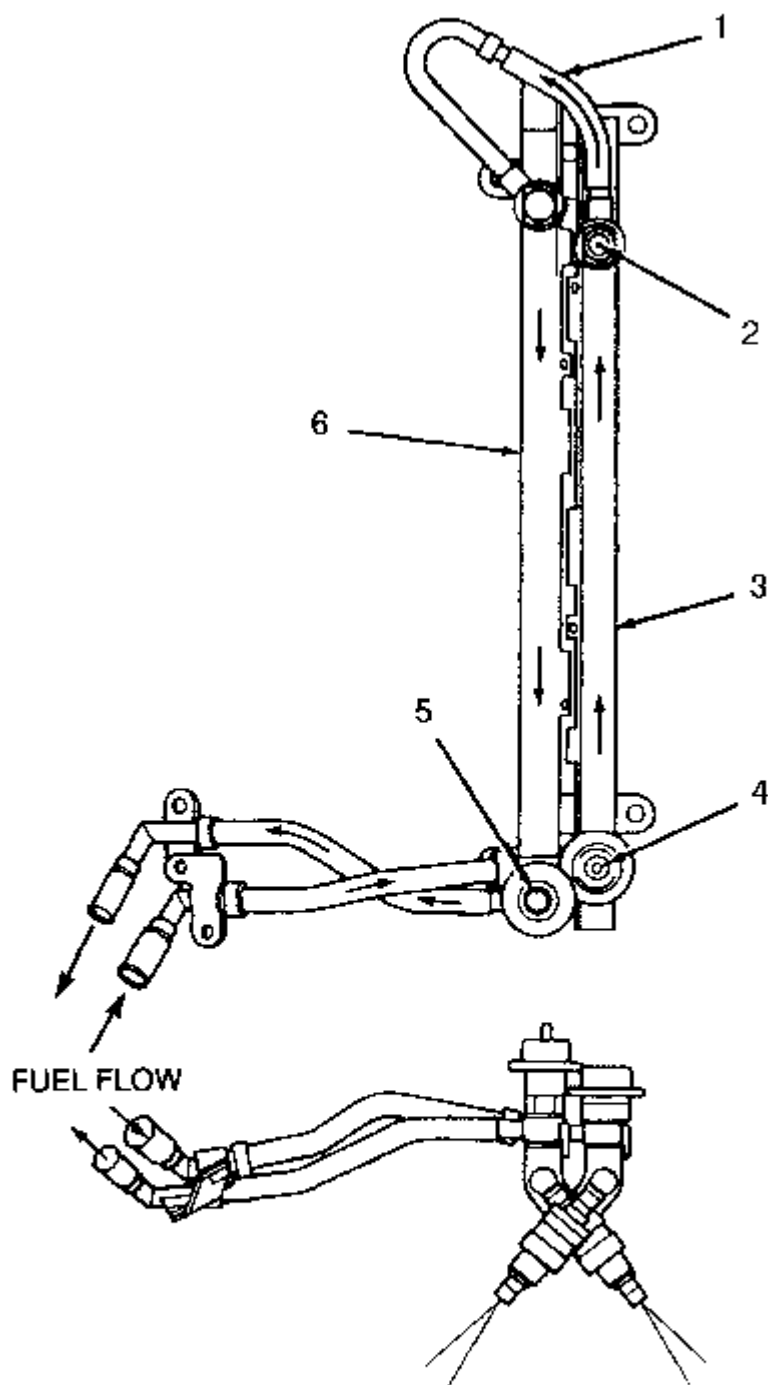
REMOVAL & INSTALLATION

Be sure to remove the cap from the fuel pressure relief valve!

1. Disconnect the negative battery cable.
2. If the fuel injection supply manifold is mounted to the engine, remove the fuel tank filler cap. Release the fuel system pressure at the fuel pressure relief valve on the fuel injection supply manifold using EFI/CFI Fuel Pressure Gauge T80L-9974-B, or equivalent.
3. Using an open-end wrench or a suitable deep-well socket, remove the fuel pressure relief valve.



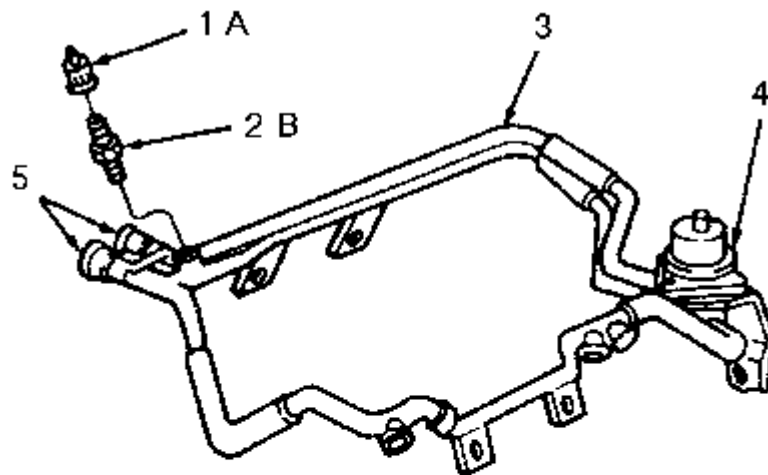
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1. Fuel injection supply manifold connector hose
2. Fuel pressure relief valve
3. Fuel injection supply manifold, RH
4. Fuel injection pulse dampener, RH
5. Fuel pressure regulator
6. Fuel injection supply manifold, LH

Location of the fuel pressure relief valve-3.0L and 3.2L SHO engines

[Click to enlarge](#)



1. Fuel pressure relief valve cap
 2. Fuel pressure relief valve
 3. Fuel injection supply manifold
 4. Fuel pressure regulator
 5. Fuel supply and return connectors
(part of 9F792)
- A. Tighten to 0.6 N.m (5.3 lb-in)
B. Tighten to 7.75 N.m (69 lb-in)

Fuel pressure relief valve location-3.8L SEFI engine

[Click to enlarge](#)

To install:

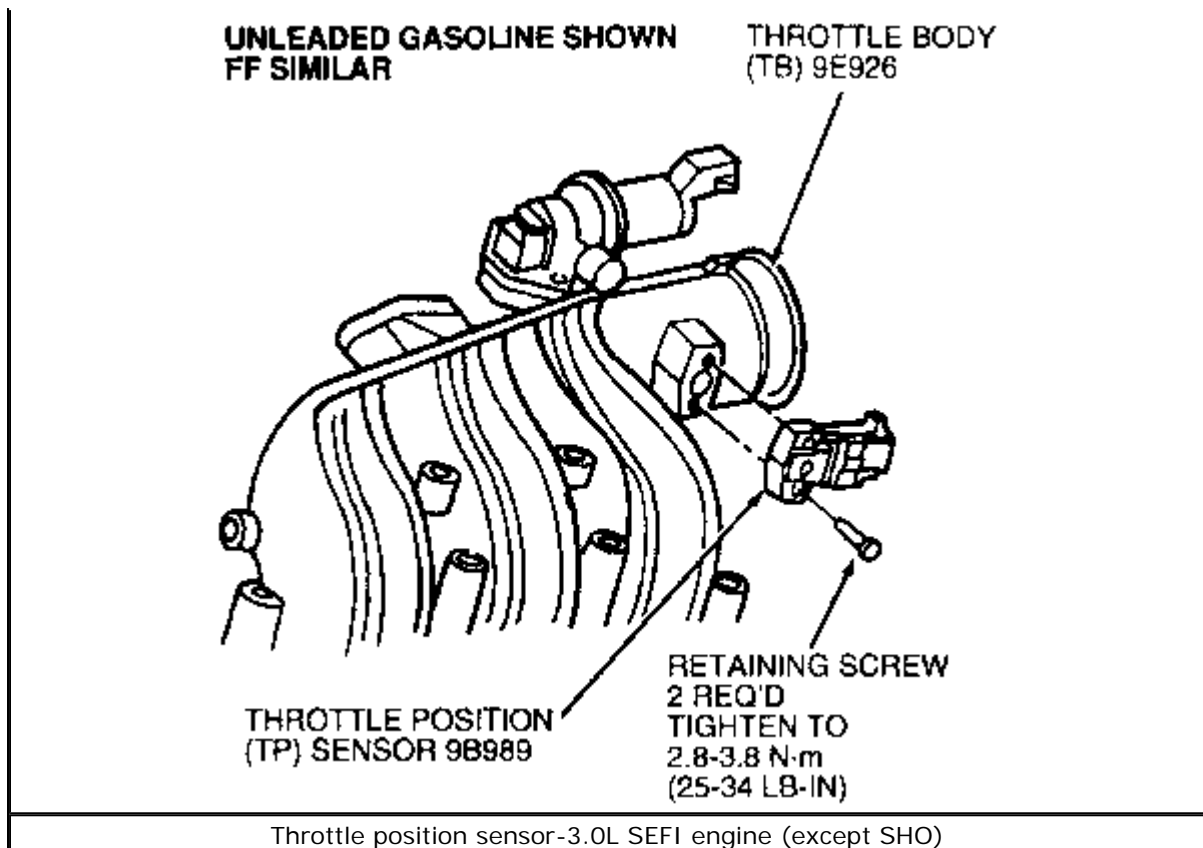
4. Install the fuel pressure relief valve and fuel pressure relief valve cap. Tighten the valve to 69 inch lbs. (7.75 Nm) and the cap to 5.3 inch lbs. (0.6 Nm).
5. Connect the negative battery cable.

Throttle Position (TP) Sensor

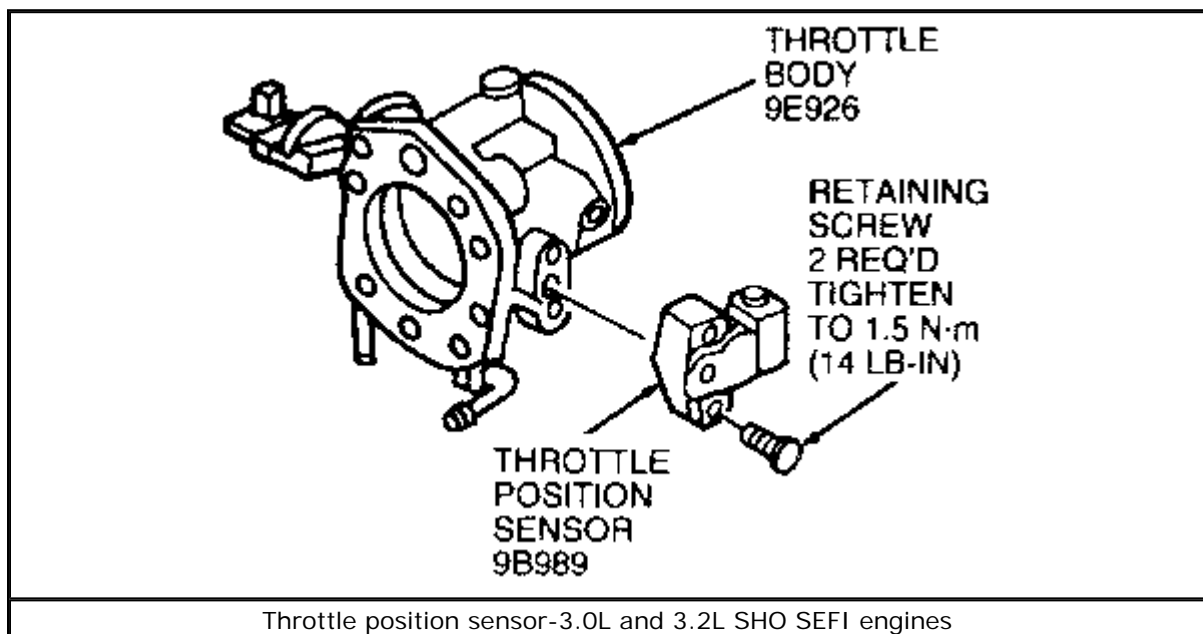
REMOVAL & INSTALLATION

3.0L, 3.0L SHO and 3.2L SHO Engines

1. Disconnect the negative battery cable.
2. Disconnect the throttle position (TP) sensor from the fuel charging wiring.
3. Remove the two throttle position (TP) sensor retaining screw, then remove the sensor.



[Click to enlarge](#)



[Click to enlarge](#)

To install:

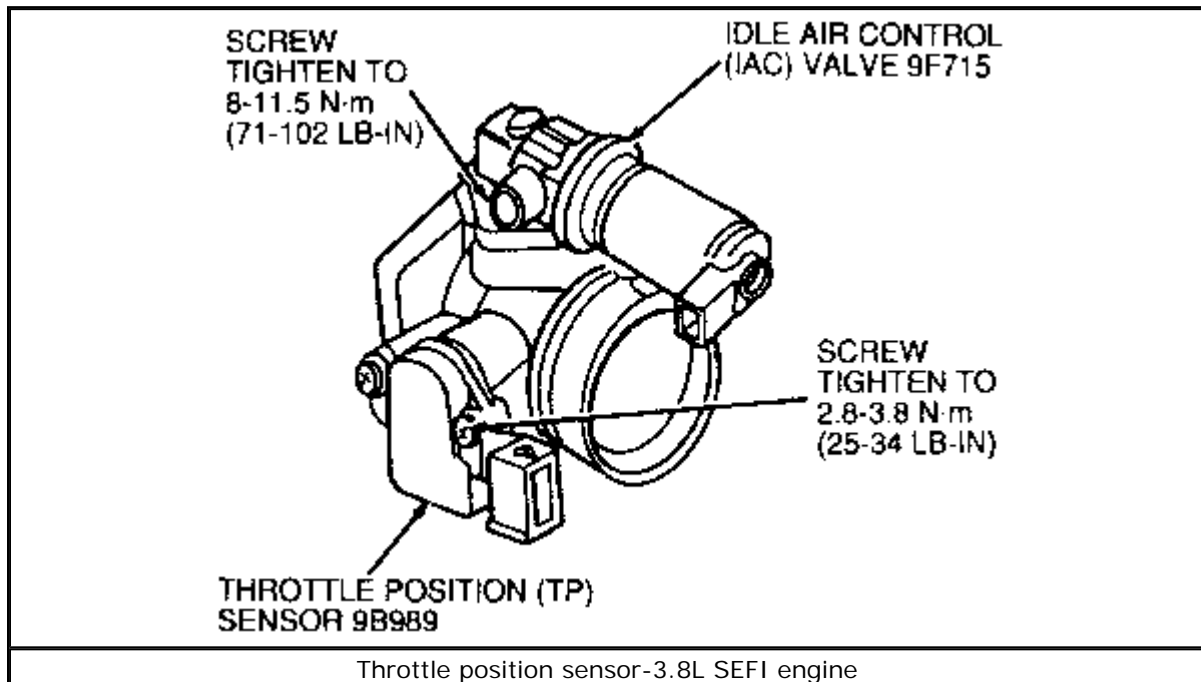
Slide the rotary tangs into position over the throttle shaft blade, then rotate the throttle position sensor clockwise to the installed position only. Failure to install the TP sensor in this way may result in excessive idle speeds.

4. Install the TP sensor, make sure that the rotary tangs on the sensor are in proper alignment and that the red seal is inside the connector.
5. Secure the TP sensor to the throttle body assembly with the two retaining screws, then tighten the screws as follows:
 1. For the 3.0L unleaded and flexible fuel vehicles, tighten the screws to 25-34 inch lbs. (2.8-3.8 Nm).
 2. For the 3.0L SHO and the 3.2L SHO, tighten the screws to 14 inch lbs. (1.5 Nm).
6. Connect the fuel charge wiring to the TP sensor, then connect the negative battery cable.

3.8L Engine

1. Disconnect the negative battery cable.
2. Disconnect the TP sensor from the engine control sensor wiring.
3. Remove the two throttle position sensor retaining screws, then remove sensor.

To install:



[Click to enlarge](#)

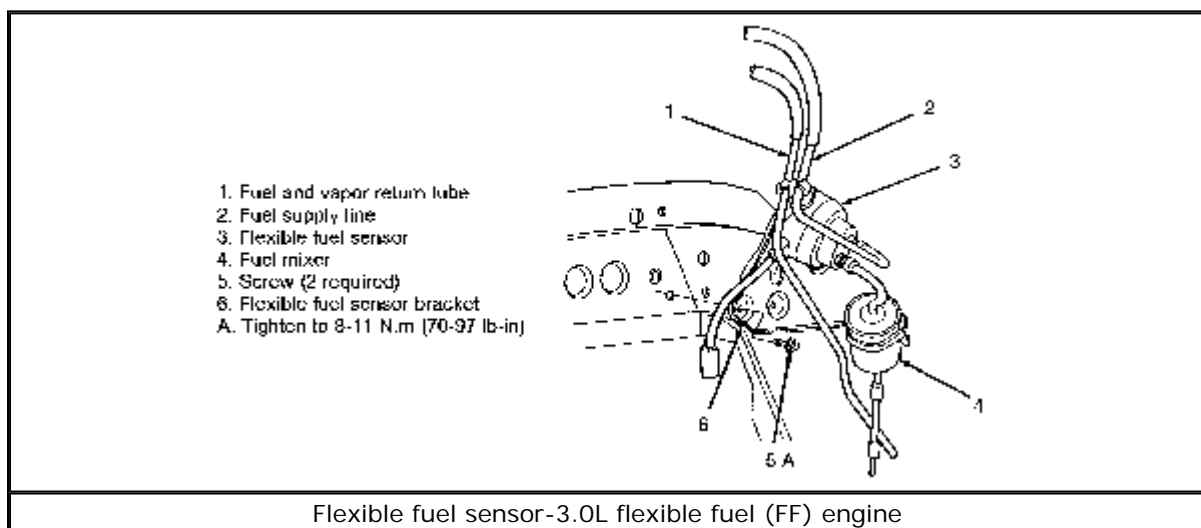
4. Install the TP sensor, then secure using the two retaining screws. Tighten the screws to 25-34 inch lbs. (2.8-3.8 Nm).
5. Connect the TP sensor to the engine control sensor wiring, then connect the negative battery cable.

Flexible Fuel (FF) Sensor

REMOVAL & INSTALLATION

3.0L Flexible Fuel (FF) Vehicles

1. Disconnect the negative battery cable.
2. Remove the fuel filler tank cap to relieve the fuel tank pressure.
3. Properly relieve the fuel system pressure. There is a pressure relief valve located on the fuel injection supply manifold for this purpose. For more details regarding this procedure, please refer to the fuel pressure relief procedure located earlier in this section.
4. Disengage the flexible fuel sensor electrical connector.
5. Raise and safely support the vehicle.
6. Remove the front right-hand side tire and wheel assembly.
7. Remove the fuel line retaining clip, and the fuel line from the fuel mixer at the inlet hose using Fuel Lines Disconnect Tool ($\frac{3}{8}$ in.) T90T-9550-C, or equivalent.
8. Disconnect the flexible fuel sensor outlet hose using Fuel Line Disconnect Tool ($\frac{3}{8}$) T90T-9550-C.
9. Remove the flexible fuel bracket-to-frame rail retaining bolts and flexible fuel sensor/mixer and bracket assembly from the vehicle.
10. Loosen the fuel mixer retainer clamp and disconnect the fuel mixer outlet tube from the flexible fuel sensor using Fuel Line Disconnect Tool ($\frac{3}{8}$) T90T-9550-C.
11. Remove the flexible fuel sensor retaining bolts, then remove the sensor from the bracket.



[Click to enlarge](#)

To install:

12. Install the flexible fuel sensor to the bracket, then secure using the retaining bolts. Tighten the bolts to 27-34 inch lbs. (3-4 Nm).
13. Connect the fuel mixer outlet tube to the flexible fuel sensor, then tighten the fuel mixer retaining clamp to 51-82 inch lbs. (5.8-9.3 Nm).
14. Install the flexible fuel sensor/mixer and bracket assembly and secure with the retaining bolts. Tighten the bolts to 70-97 inch lbs. (8-11 Nm).
15. Connect the flexible fuel sensor outlet hose, then connect the fuel line to the fuel mixer and install the fuel line retaining clip.
16. Install the front right-hand wheel and tire assembly. Tighten the lug nuts to 85-105 ft. lbs. (115-142 Nm).

17. Carefully lower the vehicle.
 18. Engage the flexible fuel sensor electrical connector.
 19. Install the fuel tank filler cap at the fuel tank.
 20. Connect the negative battery cable, then check all of the connections at the fuel injection supply manifold, fuel injectors, push connect fittings, etc. to make sure they are all properly connected/fastened.
 21. Turn the ignition switch ON and OFF several times without starting the engine to pressurize the fuel system, then check for fuel leaks.
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