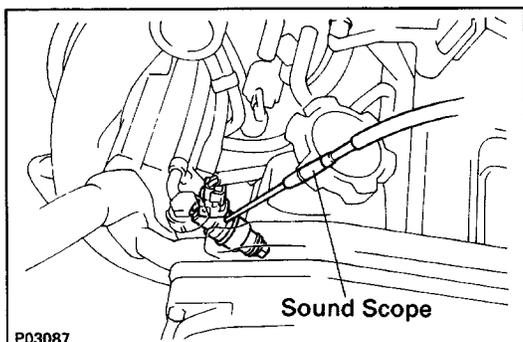
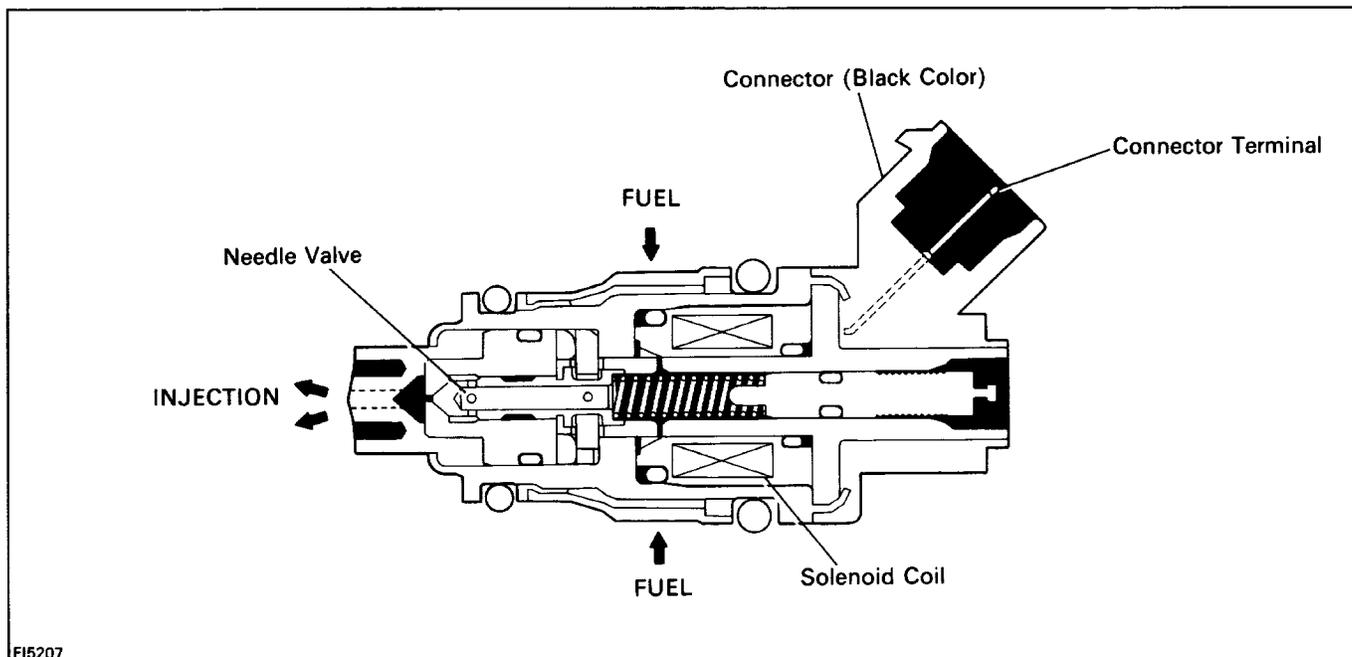


Injectors (3S-GTE)

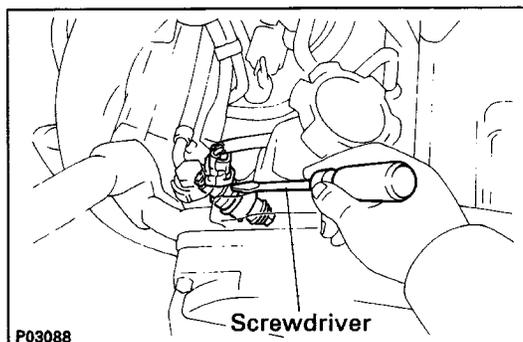


ON-VEHICLE INSPECTION

1. INSPECT INJECTOR OPERATION

Check operation sound from each injector.

- (a) With the engine running or cranking, use a sound scope to check that there is normal operating noise in proportion to engine rpm.



- (b) If you have no sound scope, you can check the injector transmission operation with a screwdriver. If no sound or unusual sound is heard, check the wiring connector, injector or injection signal from the ECM.

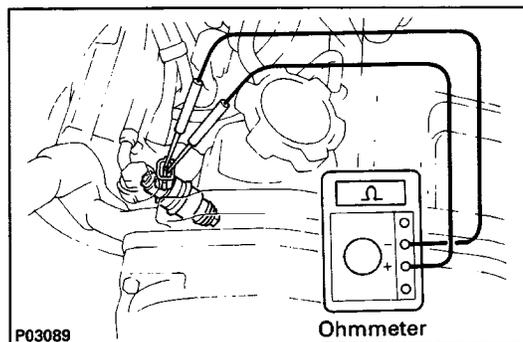
2. INSPECT INJECTOR RESISTANCE

- (a) Remove the throttle body.
(See steps 1 to 8, 10 and 11 on pages [FI-194](#) and [195](#))
- (b) Disconnect the injector connector.
- (c) Using an ohmmeter, measure the resistance between the terminals.

Resistance: 2 – 4Ω

If the resistance is not as specified, replace the injector.

- (d) Reconnect the injector connector.
- (e) Reinstall the throttle body.
(See steps 2, 3 and 5 to 12 on pages [FI-197](#) and [198](#))



REMOVAL OF INJECTORS

1. REMOVE THROTTLE BODY

(See steps 1 to 8, 10 and 11 on pages FI-194 and 195)

2. REMOVE AIR CLEANER

(See step 7 on page EM-224)

3. REMOVE CHARCOAL CANISTER

(See step 20 on page EM-226)

4. REMOVE EGR VSV AND VACUUM MODULATOR

(See step 20 on page EM-121)

5. REMOVE EGR VALVE AND PIPE

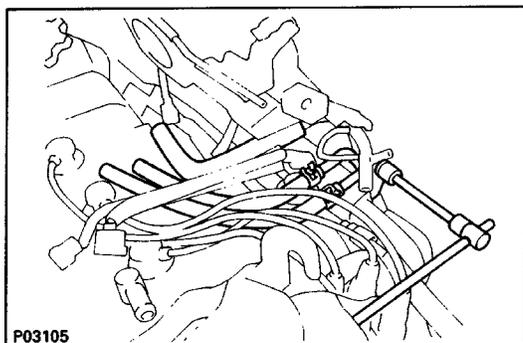
(See step 21 on page EM-121)

6. REMOVE COLD START INJECTOR PIPE

(See step 3 on page FI-146)

7. REMOVE COLD START INJECTOR

(See step 4 on page FI-147)

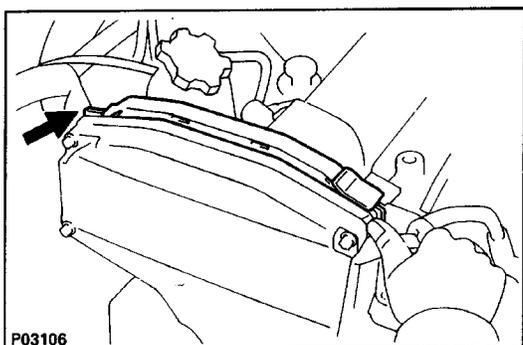


8. REMOVE AIR HOSE

9. DISCONNECT WATER BY-PASS PIPE WITH HOSES

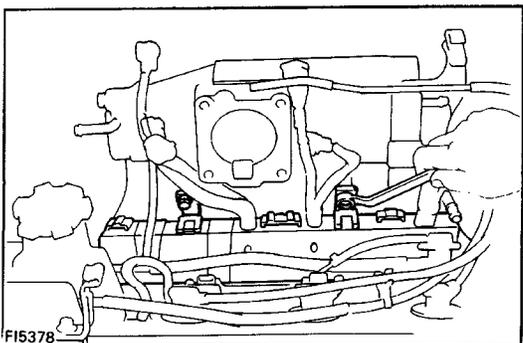
Remove the bolt and disconnect the water by-pass pipe with hoses.

10. DISCONNECT INJECTOR CONNECTORS

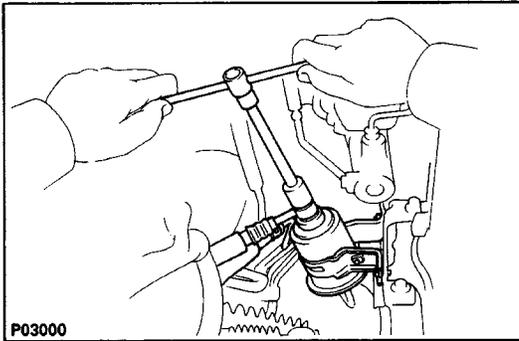


11. DISCONNECT ENGINE WIRE

(a) Disconnect the two wire clamps from the mounting bolts of the No.2 timing belt cover.

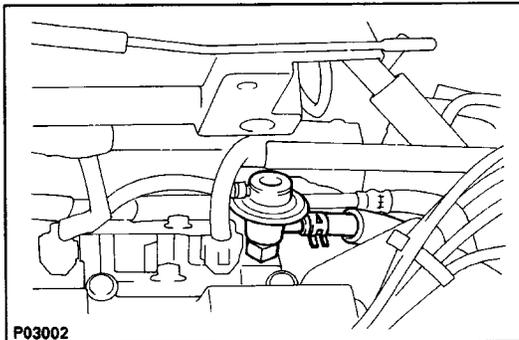


(b) Disconnect the two wire clamps from the wire brackets on the intake manifold.

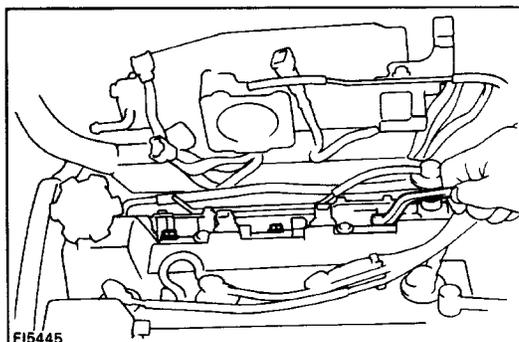


12. DISCONNECT FUEL INLET HOSE FROM FUEL FILTER

Remove the union bolt and two gaskets, and disconnect the inlet hose.



13. DISCONNECT FUEL RETURN HOSE FROM FUEL PRESSURE REGULATOR

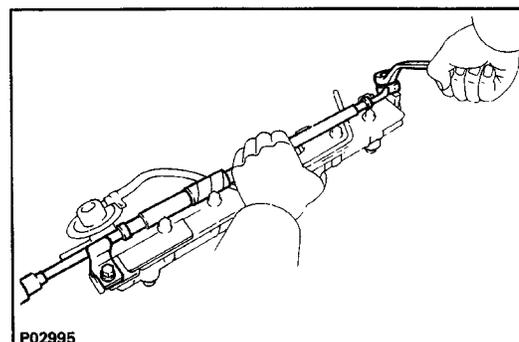
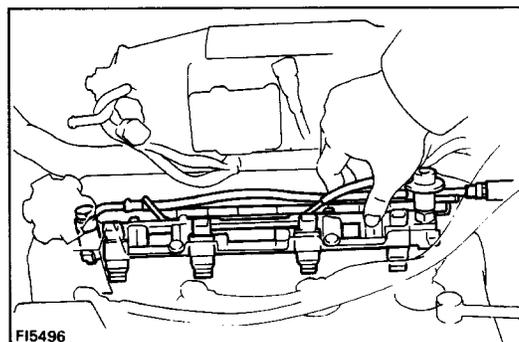


14. REMOVE INJECTOR, FUEL PRESSURE REGULATOR AND DELIVERY PIPE ASSEMBLY

(a) Remove the three bolts holding the delivery pipe to the cylinder head.

(b) Remove the delivery pipe assembly.

(c) Remove the four insulators and three spacers.



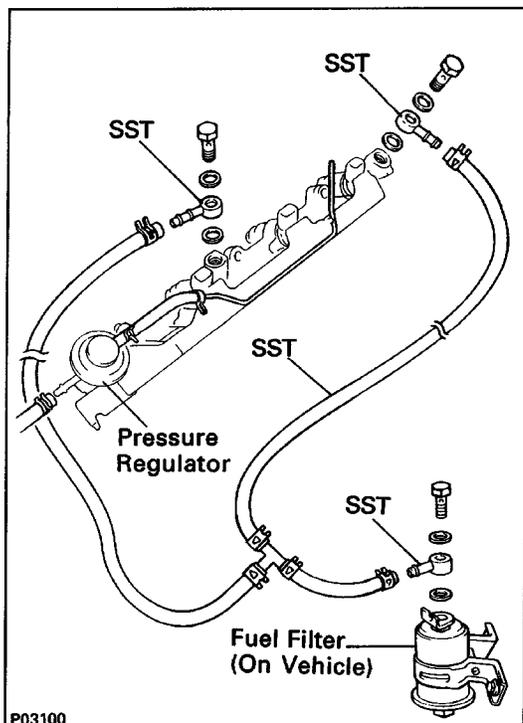
15. REMOVE FUEL INLET HOSE FROM DELIVERY PIPE

Remove the bolt, union bolt, two gaskets and inlet hose.

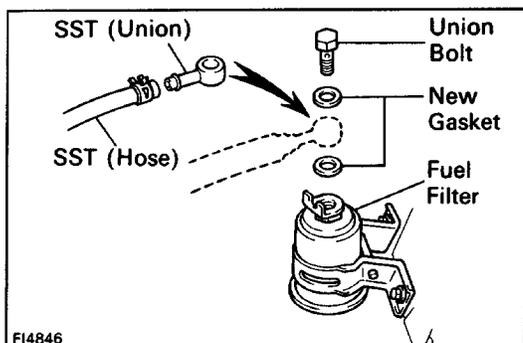
INSPECTION OF INJECTORS

1. INSPECT INJECTOR INJECTION

CAUTION: Keep injector clear of sparks during the test.



P03100



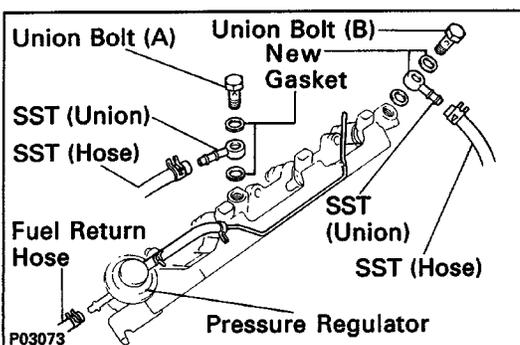
FI4846

- (a) Connect SST (union and hose) to the fuel filter outlet with two new gaskets and the union bolt.

SST 09268-41045 (90405-09015)

Torque: 29 N-m (300 kgf-cm, 22 ft-116)

HINT: Use the vehicle's fuel filter.



P03073

- (b) Connect the fuel return hose to the fuel outlet of the pressure regulator on the delivery pipe.

- (c) Connect SST (union and hose) to the delivery pipe with four new gaskets and the two union bolts (A and B).

SST 09268-41045 (09268-41080, 90405-09015)

Torque:

A 12 N-m (125 kgf-cm, 9 ft-lbf)

B 29 N-m (300 kgf-cm, 22 ft-lbf)

- (d) Put the injector into the graduated cylinder.

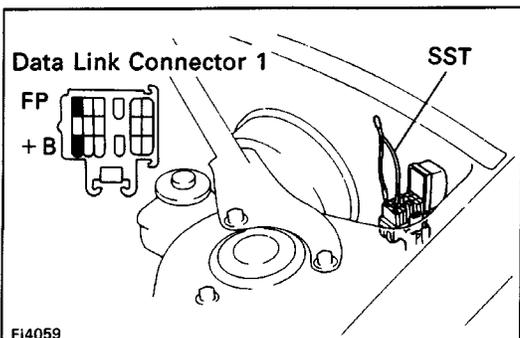
- (e) Using SST, connect terminals +B and FP of the data link connector 1.

SST 09843-18020

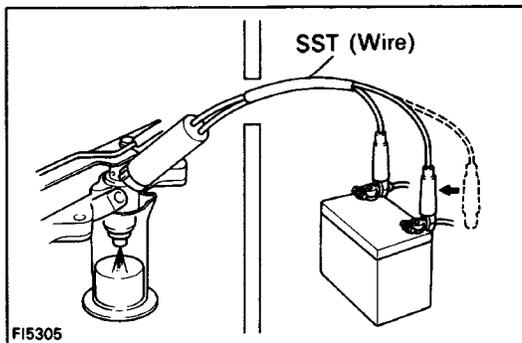
- (f) Reconnect the battery negative (-) cable.

- (g) Turn the ignition switch ON.

NOTICE: Do not start the engine.



FI4059



FI5305

- (h) Connect SST (wire) to the injector and battery for 15 seconds, and measure the injection volume with a graduated cylinder. Test each injector two or three times.

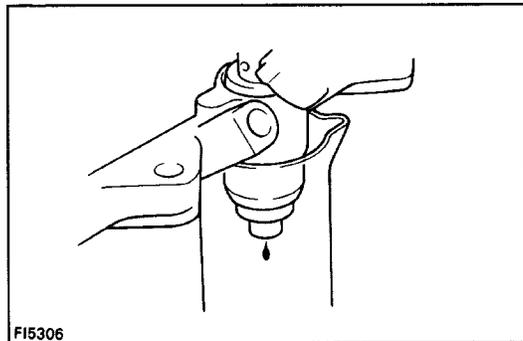
SST 09842-30060

Volume: 95 – 120 cm³ (5.8 – 7.3 cu in.) per 50 sec.

Difference between each injector:

5 cm³ (0.3 cu in.) or less

If the injection volume is not as specified, replace the injector.



FI5306

2. INSPECT LEAKAGE

- (a) In the condition above, disconnect the test probes of SST (wire) from the battery and check for fuel leakage from the injector.

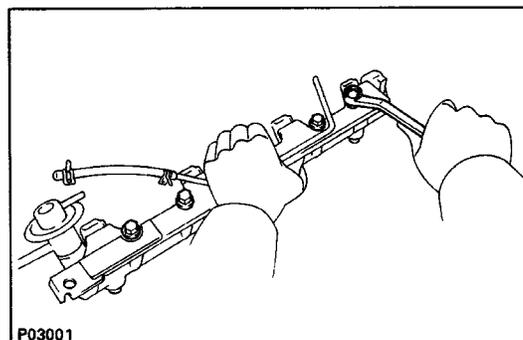
SST 09842-30060

Fuel drop: One drop or less per minute

- (b) Disconnect the battery negative (-) cable.

- (c) Remove SST.

SST 09268-41045 and 09843-18020

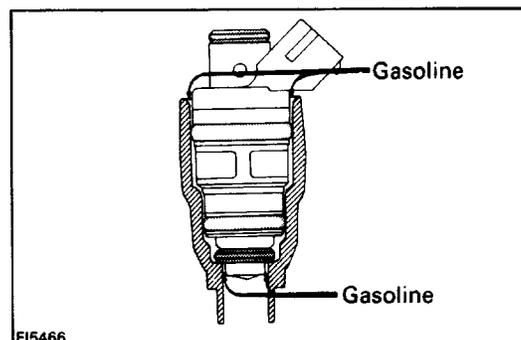


P03001

REPLACEMENT OF INJECTORS

1. REMOVE INJECTOR COVER

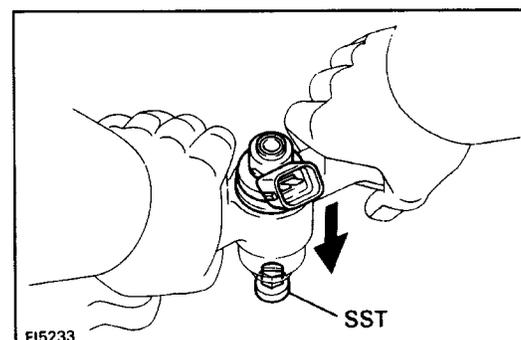
- (a) Disconnect the vacuum sensing hose from the pressure regulator.
- (b) Remove the four bolts and injector cover.
- (c) Remove the four insulators from the injectors.



FI5466

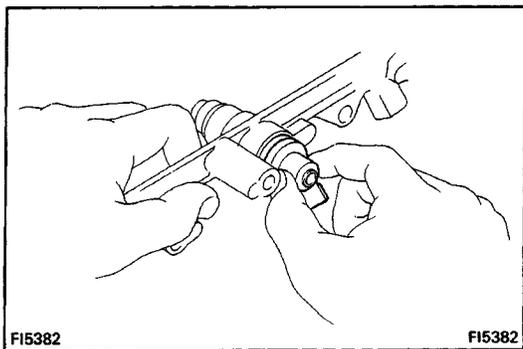
2. REMOVE INJECTORS

- (a) Apply gasoline between the delivery pipe and injectors.

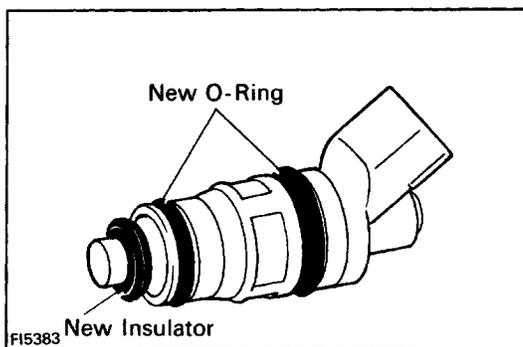


FI5233

- (b) Using SST, lift up the injector.
SST 09268-74010

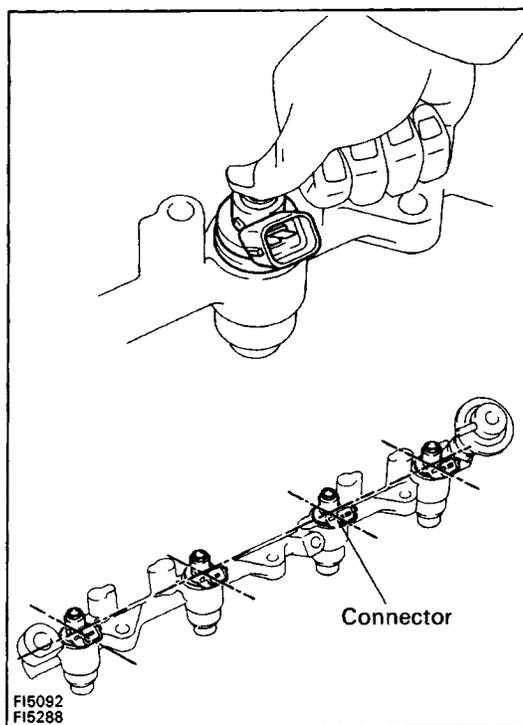


- (c) Pull out the four injectors from the delivery pipe.
- (d) Remove the insulator and two O-rings from each injector.

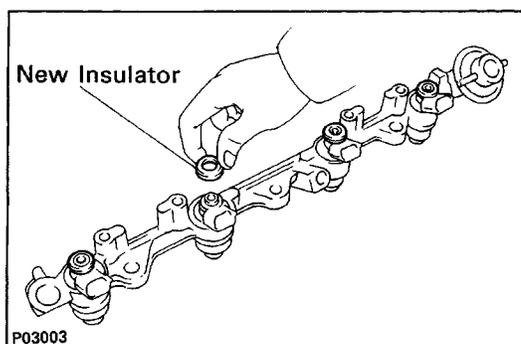


3. INSTALL INJECTORS

- (a) Apply a light coat of gasoline to two new O-rings, and install them to the injector.
- (b) Install new insulator and two O-rings to each injector.

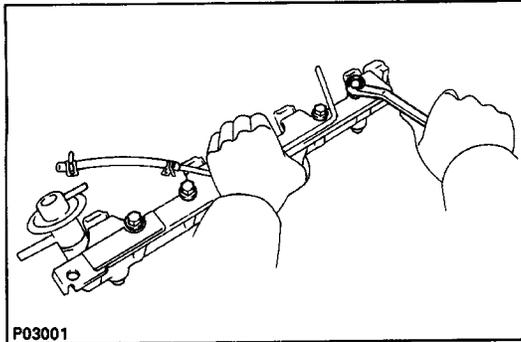


- (c) Push in the four injectors so that the injector connectors are positioned as shown in the illustration.



4. INSTALL INJECTOR COVER

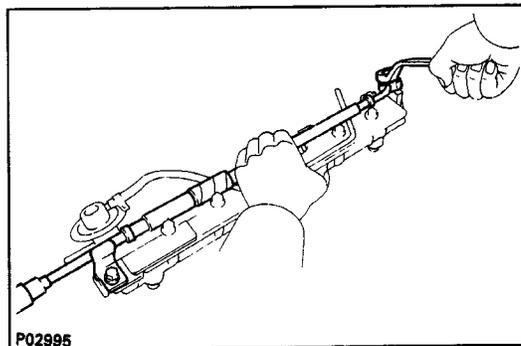
- (a) Place a new insulator on each injector.



(b) Install the injector cover with the four bolts.

Torque: 7.8 N-m (80 kgf-cm, 69 in.-lbf)

(c) Connect the vacuum sensing hose to the pressure regulator.



INSTALLATION OF INJECTORS

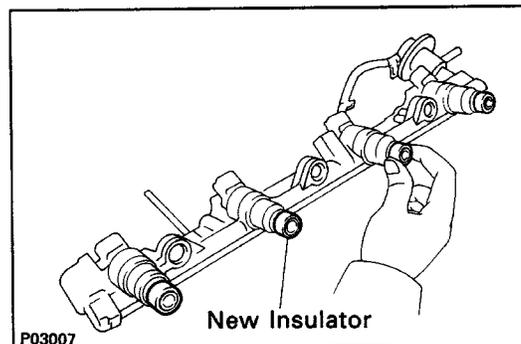
1. INSTALL FUEL INLET HOSE TO DELIVERY PIPE

Install the inlet hose with the bolt, two new gaskets and union bolt.

Torque:

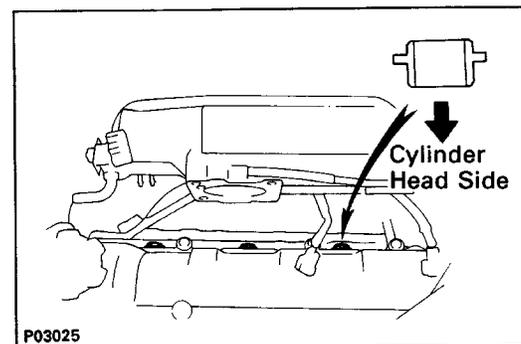
Bolt 7.8 N-m (80 kgf-cm, 69 in.-lbf)

Union bolt 29 N-m (300 kgf-cm, 22 ft-lbf)

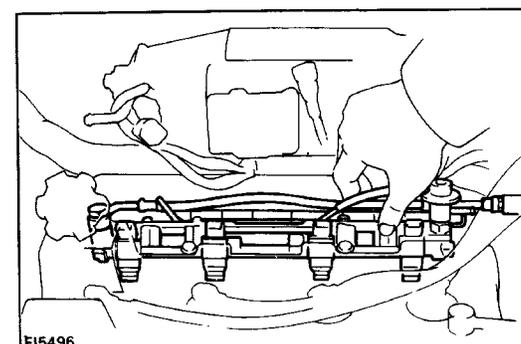


2. INSTALL INJECTORS, FUEL PRESSURE REGULATOR AND DELIVERY PIPE ASSEMBLY

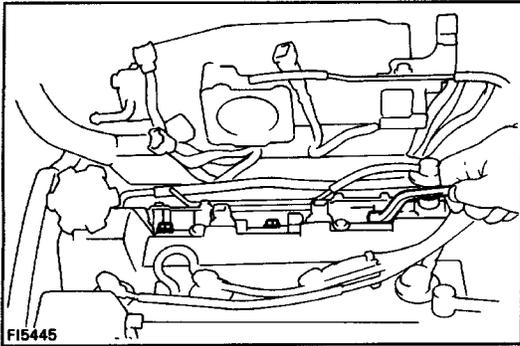
(a) Install a new insulator to each injector.



(b) Place the three spacers in position on the cylinder head.

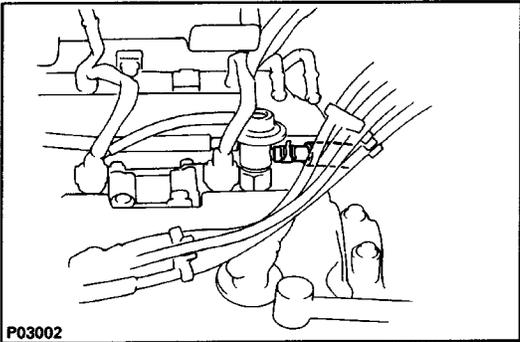


(c) Place the delivery pipe in position on the cylinder head.

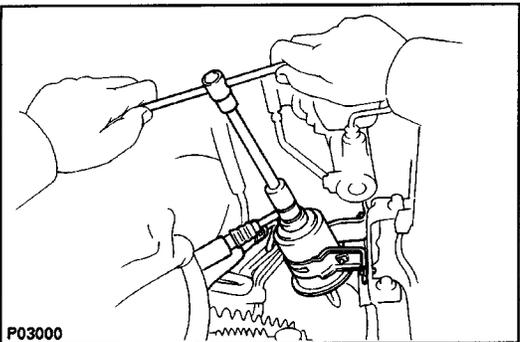


(d) Install the three bolts.

Torque: 19 N-m (195 kgf-cm, 14 ft.lbf)



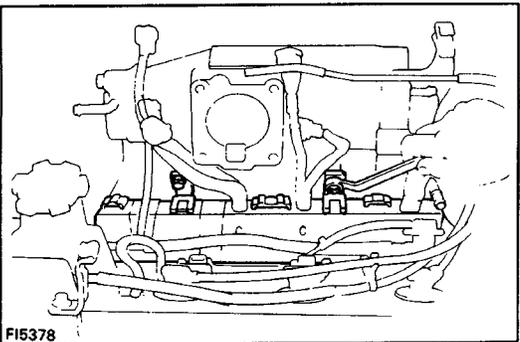
3. CONNECT FUEL RETURN HOSE TO FUEL PRESSURE REGULATOR



4. CONNECT FUEL INLET HOSE TO FUEL FILTER

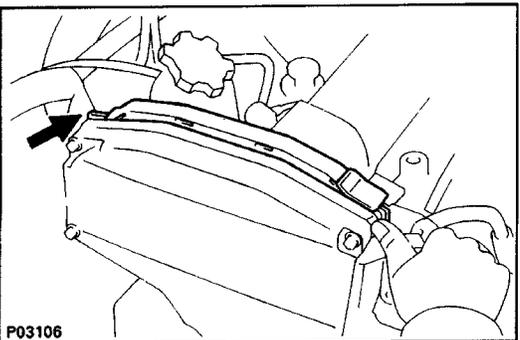
Install the inlet hose with two new gaskets and the union bolt.

Torque: 29 N-m (300 kgf-cm, 22 ft-lbf)

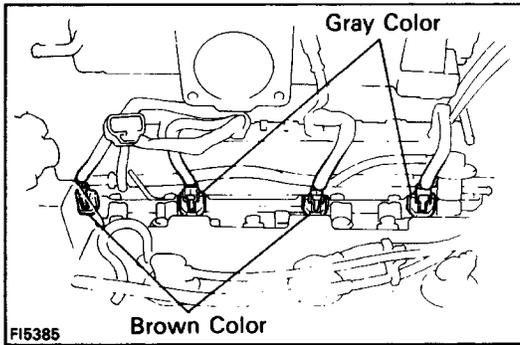


5. INSTALL ENGINE WIRE

(a) install the two wire clamps to the wire brackets on the intake manifold.



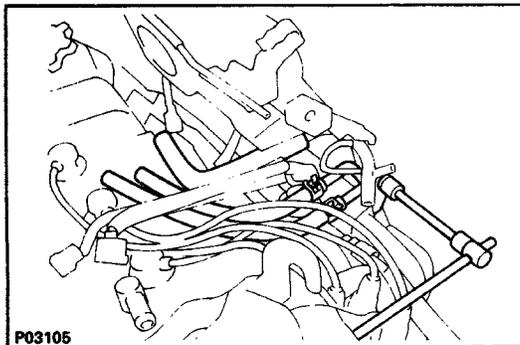
(b) Install the two wire clamps to the mounting bolts of the No.2 timing belt cover.



6. CONNECT INJECTOR CONNECTORS

Connect the injector connectors as shown in the illustration.

HINT: No.1 and No.3 injector connectors are brown.
No. 2 and No.4 injector connectors are gray.



7. CONNECT WATER BY-PASS PIPE WITH HOSES

Install the water by-pass pipe with hoses with the bolt.

8. INSTALL AIR HOSE

9. INSTALL COLD START INJECTOR

(See step 1 on page FI-148)

10. INSTALL COLD START INJECTOR PIPE

(See step 2 on page FI-148)

11. INSTALL EGR VALVE AND PIPE

(See step 19 on page EM-145)

12. INSTALL EGR VSV AND VACUUM MODULATOR

(See step 20 on page EM-146)

13. INSTALL CHARCOAL CANISTER

(See step 32 on page EM-264)

14. INSTALL AIR CLEANER

(See step 45 on page EM-266)

15. INSTALL THROTTLE BODY

(See steps 2, 3 and 5 to 12 on pages FI-197 and 198)