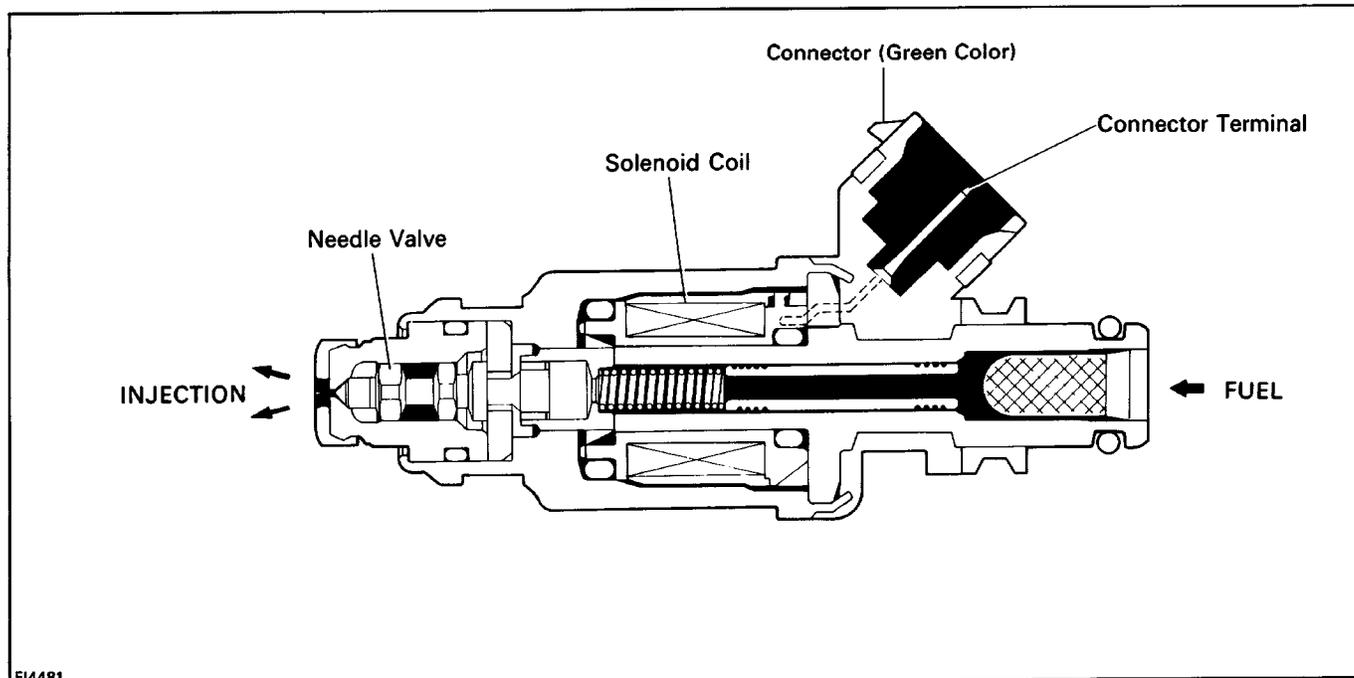
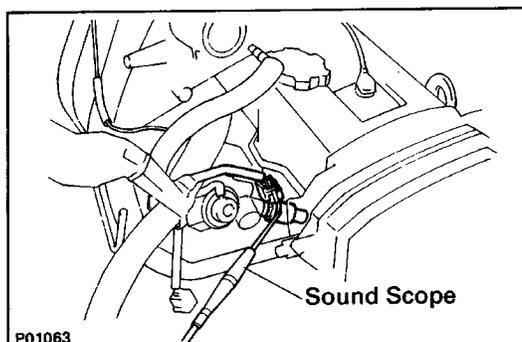


Injectors (5S-FE)



FI4481

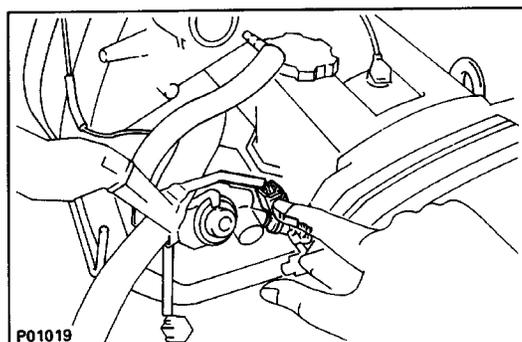


ON-VEHICLE INSPECTION

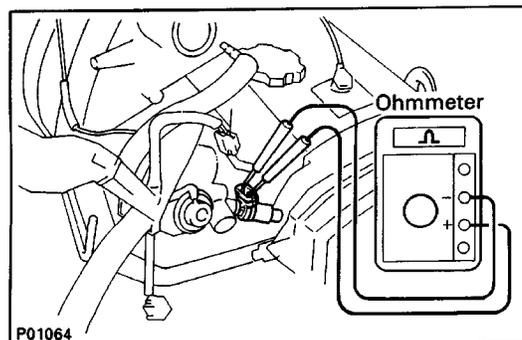
1. INSPECT INJECTOR OPERATION

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 your finger. If no sound or unusual sound is heard, check the wiring connector, injector or injection signal from the ECM.



2. INSPECT INJECTOR RESISTANCE

- (a) Disconnect the injector connector.
 (b) Using an ohmmeter, measure the resistor between the terminals.

Resistance: Approx. 13.8 Ω

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

- (c) Reconnect the injector connector.

REMOVAL OF INJECTORS**1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY**

CAUTION: Work must be started after approx. 20 seconds or longer from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.

2. DRAIN ENGINE COOLANT**3. DISCONNECT ACCELERATOR CABLE FROM THROTTLE BODY****4. (AIT)**

DISCONNECT THROTTLE CABLE FROM THROTTLE BODY

5. REMOVE AIR CLEANER CAP, RESONATOR AND AIR CLEANER HOSE

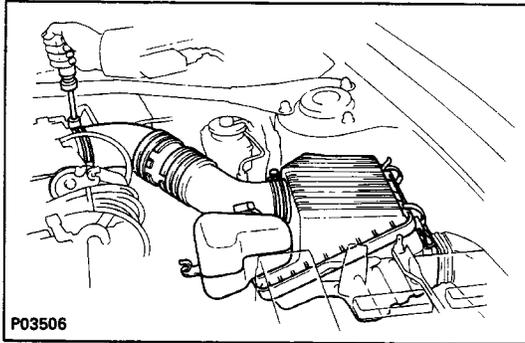
- (a) Disconnect the air intake temperature sensor connector.
- (b) Disconnect the cruise control actuator cable from the clamp on the resonator.
- (c) Loosen the air cleaner hose clamp bolt.
- (d) Disconnect the four air cleaner cap clips.
- (e) Disconnect the air cleaner hose from the throttle body, and remove the air cleaner cap together with the resonator and air cleaner hose.

6. REMOVE THROTTLE BODY

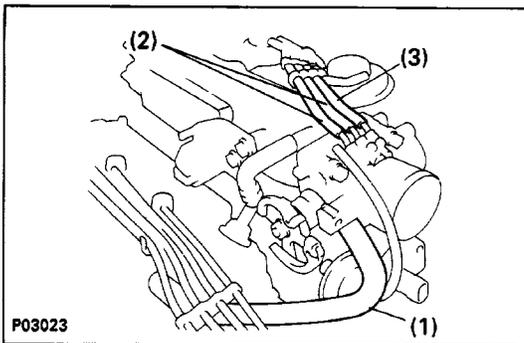
- (a) Disconnect throttle position sensor connector.
- (b) Disconnect IAC valve connector.

- (c) Disconnect the following hoses from the throttle body:
 - (1) PCV hose
 - (2) Two vacuum hoses from EGR vacuum modulator
 - (3) Vacuum hose from EVAP VSV

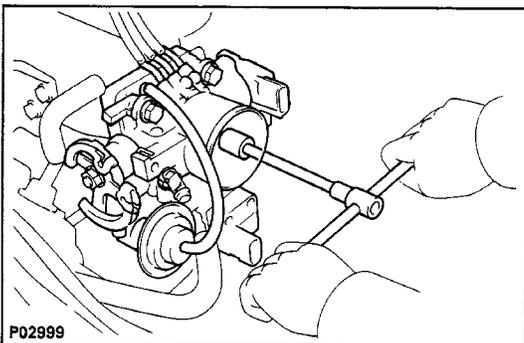
- (d) Remove the four throttle body mounting bolts.



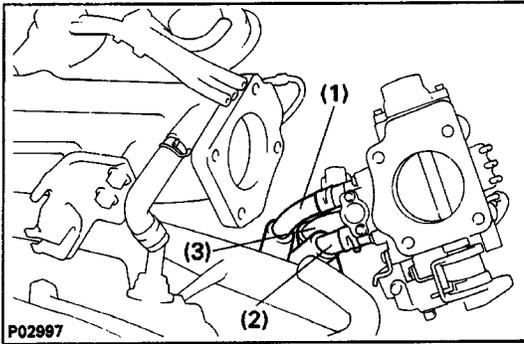
P03506



P03023

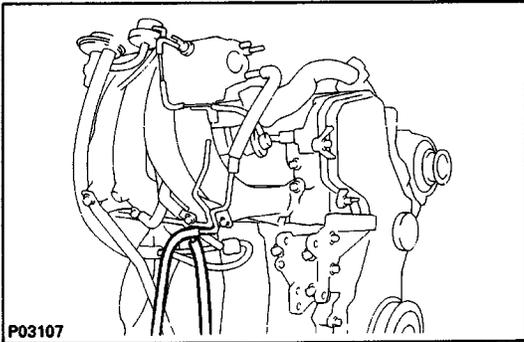


P02999

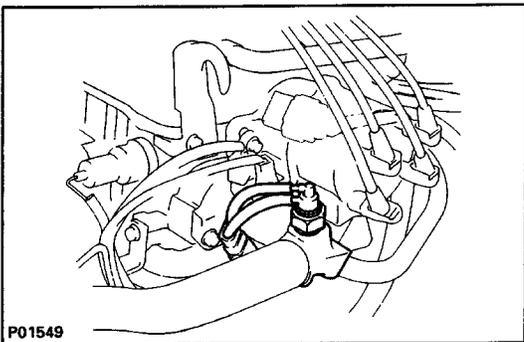


(e) Disconnect the hoses from the throttle body, and remove the throttle body.

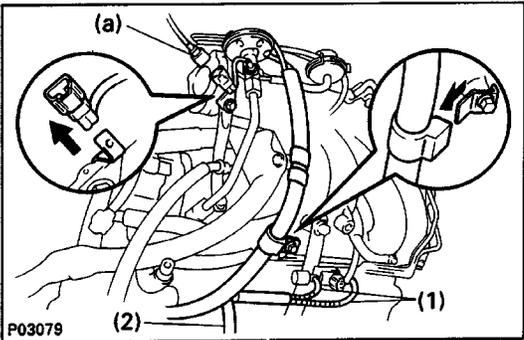
- (1) Water by-pass hose from water outlet
- (2) Water by-pass hose from water by-pass pipe
- (3) Air hose from air tube



7. DISCONNECT PS VACUUM HOSES

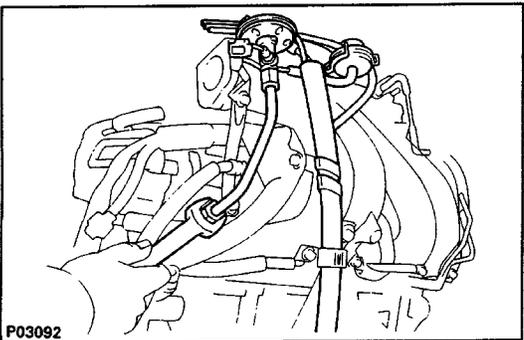


8. DISCONNECT VACUUM HOSES FROM EVAP TVV

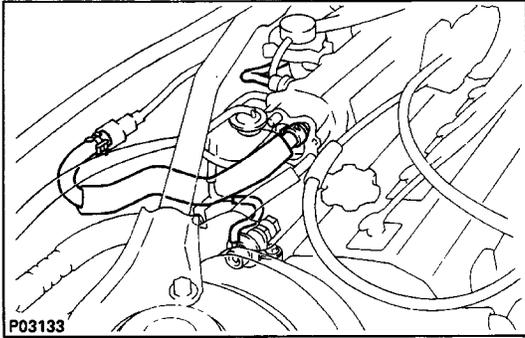


9. REMOVE EGR VALVE AND VACUUM MODULATOR

- (a) (Calif. only)
Disconnect EGR gas temperature sensor connector.
- (b) Remove the following hoses:
 - (1) Two vacuum hoses from EGR VSV
 - (2) Vacuum hose from charcoal canister
- (c) Disconnect the vacuum hose clamp.



- (d) Loosen the union nut of the EGR pipe, and remove two nuts, the EGR valve, vacuum modulator, vacuum hoses assembly and gasket.

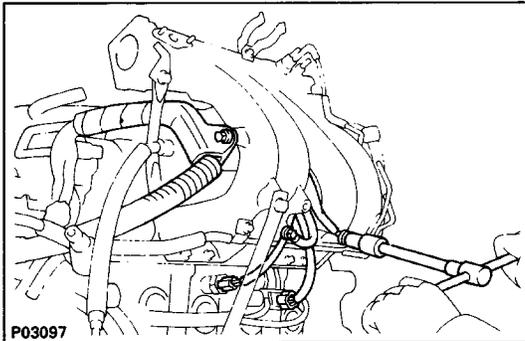


10. DISCONNECT VACUUM HOSES

- (a) Vacuum sensor hose from air intake chamber
- (b) Brake booster vacuum hose from air intake chamber
- (c) Vacuum sensing hose

11. (w/ A/C)

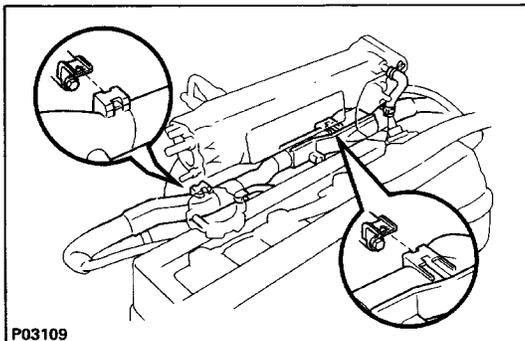
DISCONNECT A/C MAGNET SWITCH VSV CONNECTOR



12. DISCONNECT ENGINE WIRE GROUND STRAPS FROM INTAKE MANIFOLD

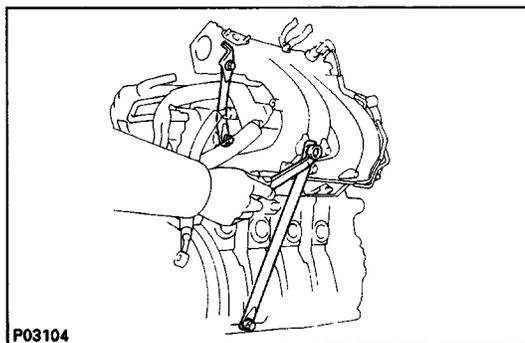
13. DISCONNECT KNOCK SENSOR AND EGR VSV CONNECTORS

14. REMOVE BOLT AND WIRE CLAMP, AND DISCONNECT ENGINE WIRE HARNESS

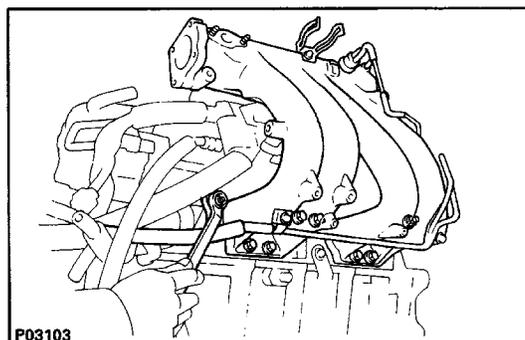


15. REMOVE INTAKE MANIFOLD

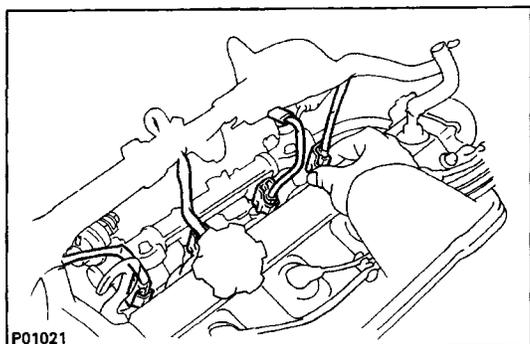
- (a) Disconnect the two wire clamps from the wire brackets on the intake manifold.



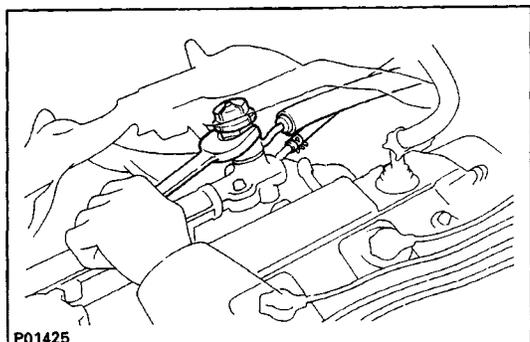
- (b) Remove the four bolts, wire bracket (Calif. only), No.1 air intake chamber and manifold stays.



- (c) Remove the six bolts, two nuts, intake manifold and gasket.

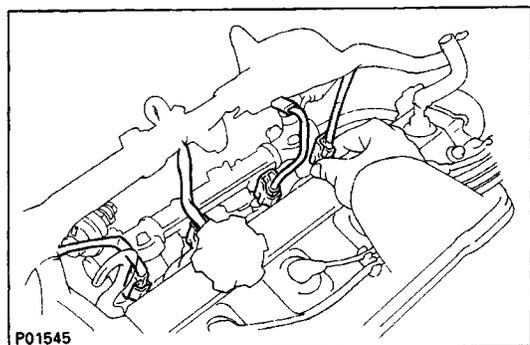


16. DISCONNECT INJECTOR CONNECTORS

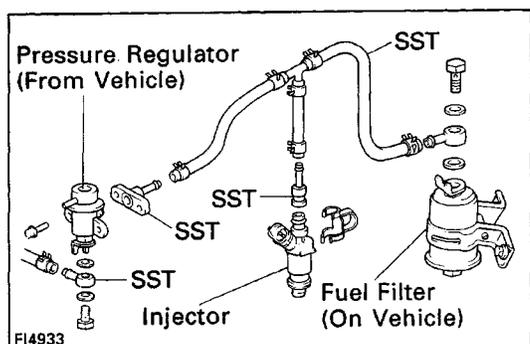


17. REMOVE DELIVERY PIPE AND INJECTORS

- (a) Loosen the pulsation damper, and disconnect the fuel inlet pipe.
- (b) Disconnect the fuel return hose.



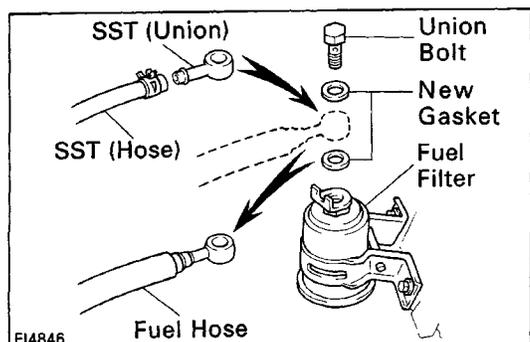
- (c) Remove the two bolts and delivery pipe together with the four injectors.
- NOTICE: Be careful not to drop the injectors when removing the delivery pipe.**
- (d) Remove the four insulators and two spacers from the cylinder head.
- (e) Pull out the four injectors from the delivery pipe.
- (f) Remove the O-ring and grommet from each injector.



INSPECTION OF INJECTORS

1. INSPECT INJECTOR INJECTION

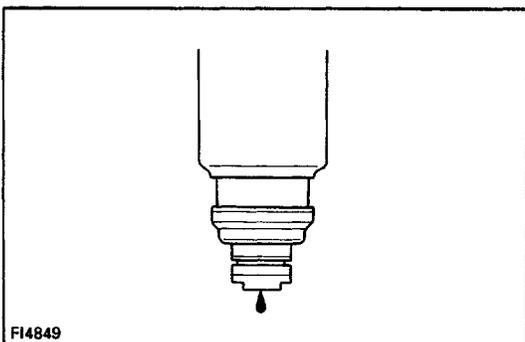
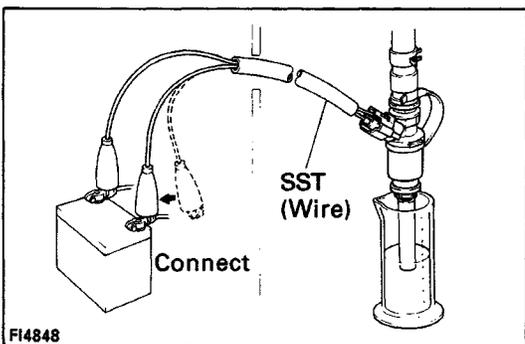
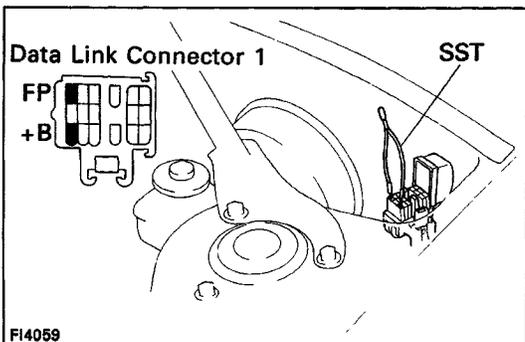
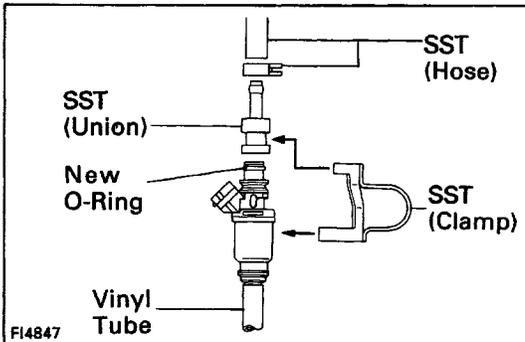
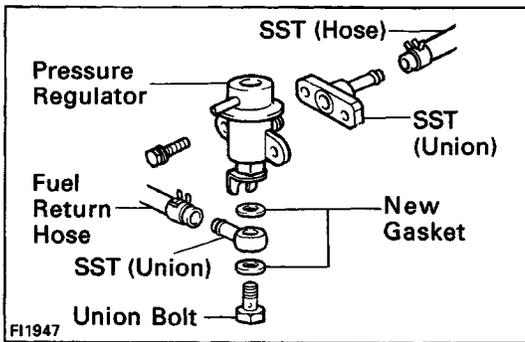
CAUTION: Keep injector clear of sparks during the test.



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

SST 09s268-41045 (90405-09015)
Torque: 29 N-m (300 kgf-cm, 22 ft-lbf)

HINT: Use the vehicle's fuel filter.



- (c) Install a new O-ring to the fuel inlet of pressure regulator.
- (d) Connect SST (hose) to the fuel inlet of the pressure regulator with SST (union) and the two bolts.

SST 09268-41045 (09268-41090)

Torque: 5.4 N-m (55 kgf-cm, 48 in.-lbf)

- (e) Connect the fuel return hose to the fuel outlet of the pressure regulator with SST (union), two new gaskets and union bolt.

SST 09268-41045 (09268-41080)

Torque: 18 N-m (180 kgf-cm, 13 ft-lbf)

- (f) Install the grommet and a new O-ring to the injector.

- (g) Connect SST (union and hose) to the injector, and hold the injector and union with SST (clamp).

SST 09268-41045

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

HINT: Install a suitable vinyl hose onto the injector to prevent gasoline from splashing out.

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

SST 09843-18020

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

- (k) Turn the ignition switch ON.

NOTICE: Do not start the engine.

- (l) 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 09842-30070

Volume: 49 – 59 cm³ (3.0 – 3.6 cu in.) per 15 sec.

Difference between each injector:

5 cm³ (0.3 cu in.) or less

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

2. INSPECT LEAKAGE

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

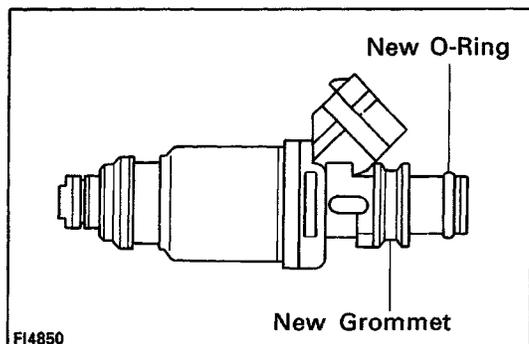
SST 09842-30070

Fuel drop: One drop or less per minute

- (b) Disconnect the battery negative H cable.

- (c) Remove SST.

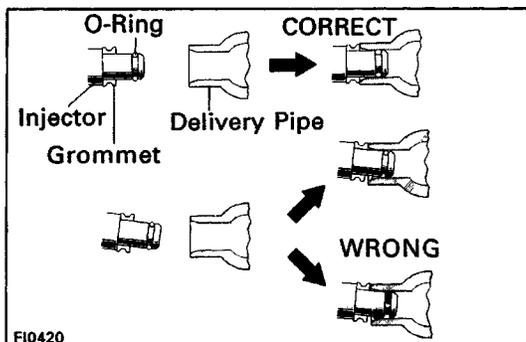
SST 09268-41045 and 09843-18020



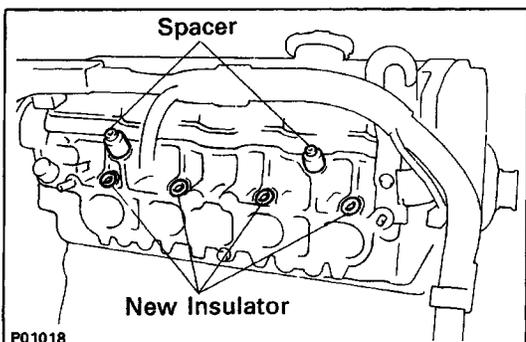
INSTALLATION OF INJECTORS

1. INSTALL INJECTORS AND DELIVERY PIPE

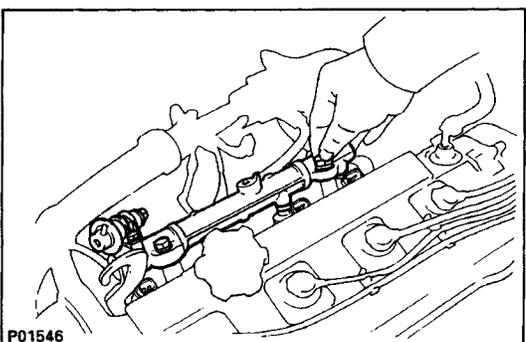
- (a) Install a new grommet to the injector.
- (b) Apply a light coat of gasoline to a new O-ring and install it to the injector.



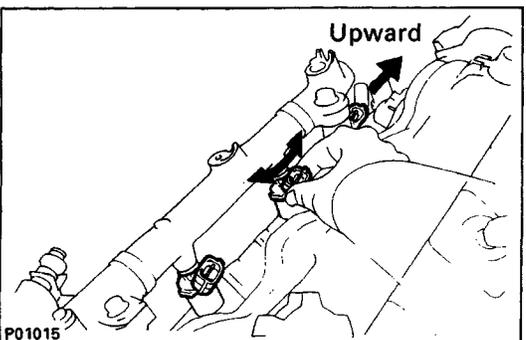
- (c) While turning the injector left and right, install it to the delivery pipes. Install the four injectors.



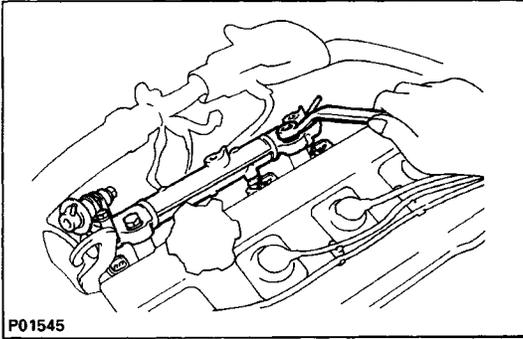
- (d) Place four new insulators and the two spacers in position on the cylinder head.



- (e) Place the four injectors together with the delivery pipe in position on the cylinder head.
- (f) Temporarily install the two bolts holding the delivery pipe to the cylinder head.

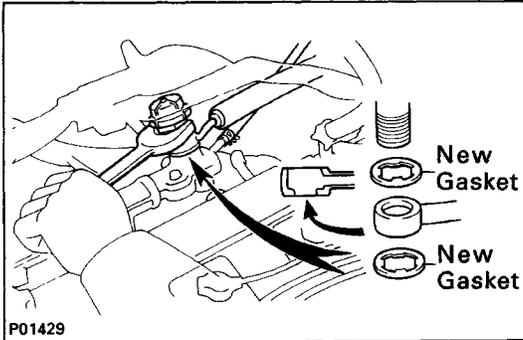


- (g) Check that the injectors rotate smoothly.
HINT: If injectors do not rotate smoothly, the probable cause is incorrect installation of O-rings. Replace the O-rings.
- (h) Position the injector-connector upward.



(l) Tighten the two bolts holding the delivery pipe to the cylinder head.

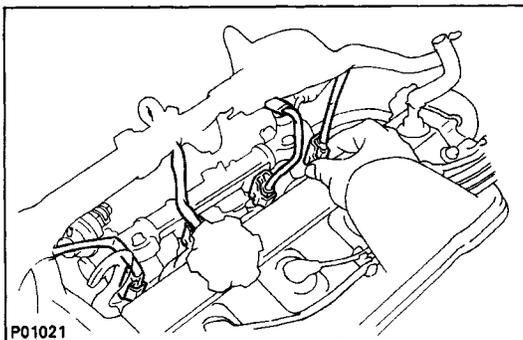
Torque: 13 N-m (130 kgf-cm, 9 ft-lbf)



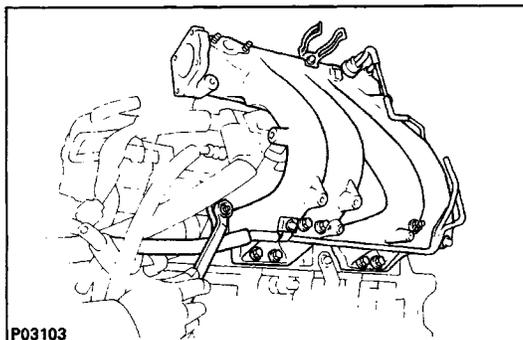
(j) Connect the fuel return hose.

(k) Connect the fuel inlet pipe to the delivery pipe with two new gaskets and the pulsation damper.

Torque: 34 N-m (350 kgf-cm, 25 ft-lbf)



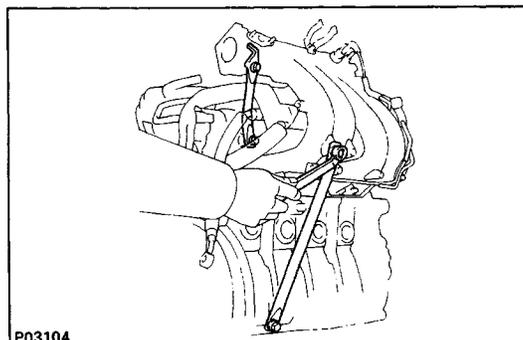
2. CONNECT INJECTOR CONNECTORS



3. INSTALL INTAKE MANIFOLD

(a) Install a new gasket and the intake manifold with the six bolts and two nuts. Uniformly tighten the bolts and nuts in several passes.

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

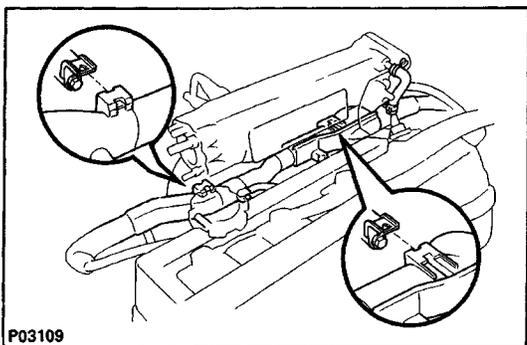


(b) Install the No.1 air intake chamber and manifold stays, wire bracket (Calif. only) with the four bolts.

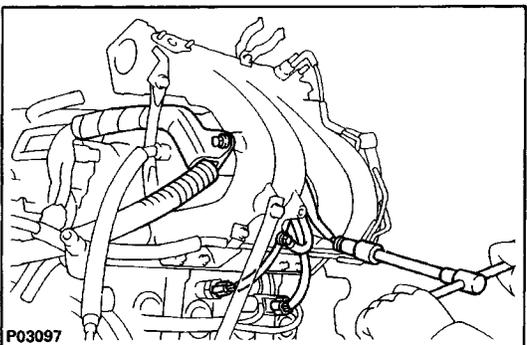
Torque:

14 mm head bolt 42 N-m (425 kgf-cm, 31 ft-lbf)

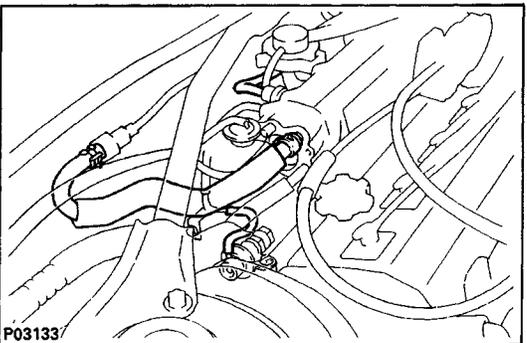
12 mm head bolt 22 N-m (220 kgf-cm, 16 ft-lbf)



(c) Connect the two wire clamps to the wire brackets on the intake manifold.

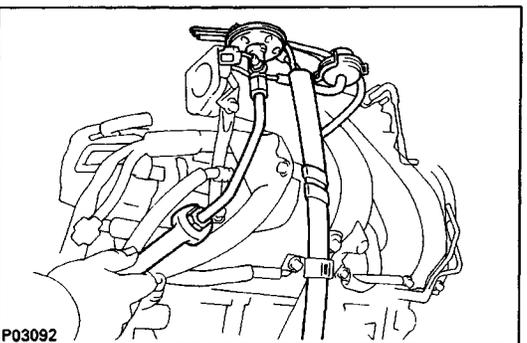


4. CONNECT ENGINE WIRE HARNESS WITH WIRE CLAMP AND BOLT
5. CONNECT KNOCK SENSOR AND EGR VSV CONNECTORS
6. CONNECT TWO ENGINE WIRE GROUND STRAP TO INTAKE MANIFOLD



7. (w/ A/C)
CONNECT A/C MAGNET SWITCH VSV CONNECTOR
8. CONNECT VACUUM HOSES

- (a) Vacuum sensor hose to air intake chamber.
- (b) Brake booster vacuum hose to air intake chamber.
- (c) Vacuum sensing hose.



9. INSTALL EGR VALVE AND VACUUM MODULATOR

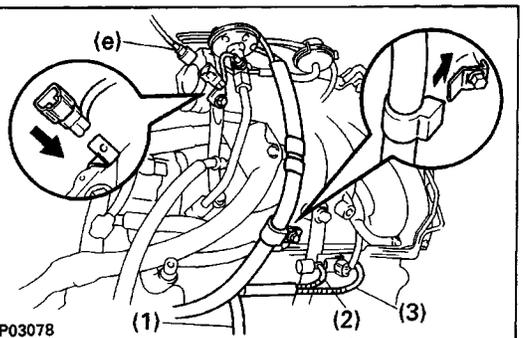
- (a) Install a new gasket and the EGR valve with the union nut and two nuts.

Torque:

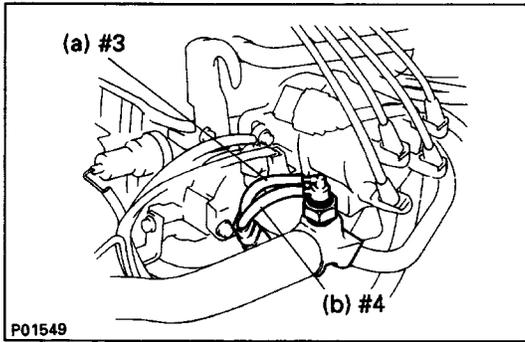
Union nut 59 N-m (600 kgf-cm, 43 ft-lbf)

Nut 13 N-m (130 kgf-cm, 9 ft-lbf)

- (b) Install the EGR modulator to the clamp.



- (c) Connect the vacuum hose clamp.
- (d) Connect the following hoses:
 - (1) Vacuum hose to charcoal canister
 - (2) Vacuum hose (from EGR valve) to E port of EGR VSV
 - (3) Vacuum hose (from Q port EGR vacuum modulator) to G port of EGR VSV
- (e) (Calif. only)
Connect the EGR gas temperature sensor connector.

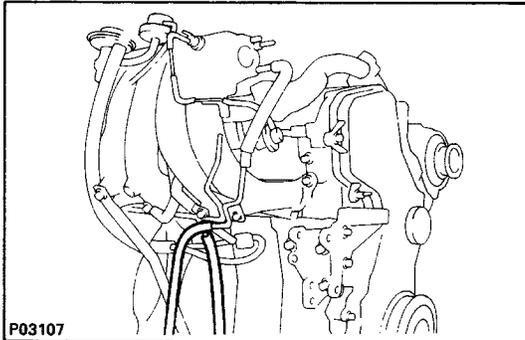


10. CONNECT TWO VACUUM HOSES TO EVAP TVV

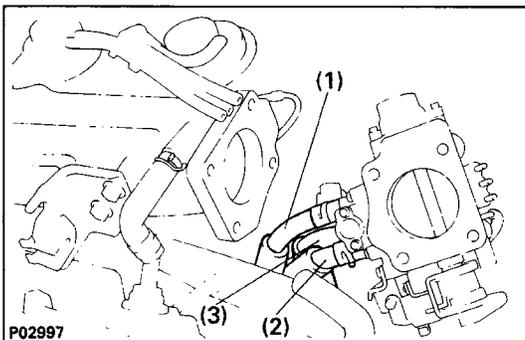
(a) To P port of throttle body

(b) To charcoal canister

HINT: Hose Nos. are indicated in the illustration.



11. CONNECT TWO PS VACUUM HOSES



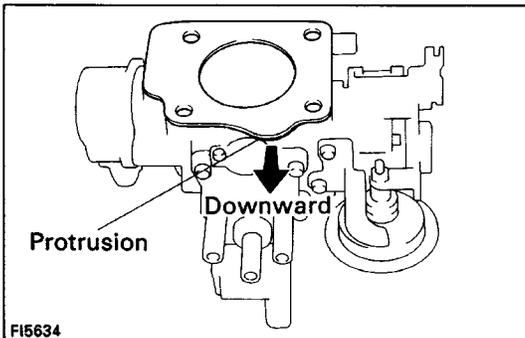
12. INSTALL THROTTLE BODY

(a) Connect the following hoses to the throttle body:

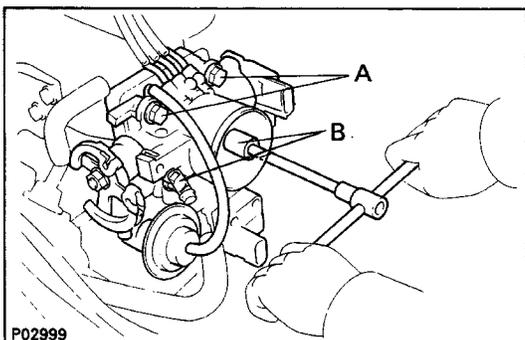
(1) Water by-pass hose to water outlet

(2) Water by-pass hose to water by-pass pipe

(3) Air hose to air tube



(b) Place a new gasket on the throttle body, facing the protrusion downward.



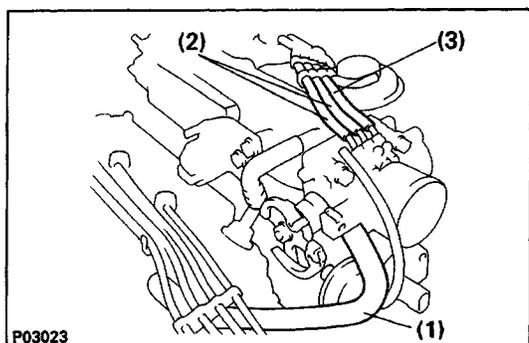
(c) Install the throttle body with the four bolts.

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

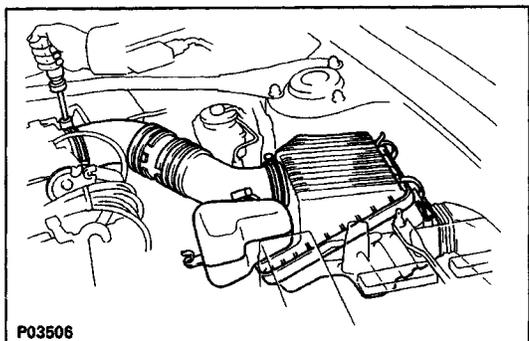
HINT: Each bolt is indicated in the illustration.

Bolt length: A 45 mm (1.77 in.)

B 55 mm (2.17 in.)



- (d) Connect the following hoses to the throttle body:
 - (1) PCV hose
 - (2) Two vacuum hoses to EGR vacuum modulator
 - (3) Vacuum hose to EGR VSV
- (e) Connect the IAC valve connector.
- (f) Connect the throttle position sensor connector.



13. INSTALL AIR CLEANER CAP, RESONATOR AND AIR CLEANER HOSE

- (a) Connect the air cleaner hose to the throttle body.
- (b) Install the air cleaner cap together with the resonator and air cleaner hose.
- (c) Connect the air intake temperature sensor connector.
- (d) Connect the cruise control actuator cable to the clamp on the resonator.

14. (AIT)

CONNECT THROTTLE CABLE, AND ADJUST IT

15. CONNECT ACCELERATOR CABLE, AND ADJUST IT

16. FILL WITH ENGINE COOLANT (See page [CO-6](#))

17. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY