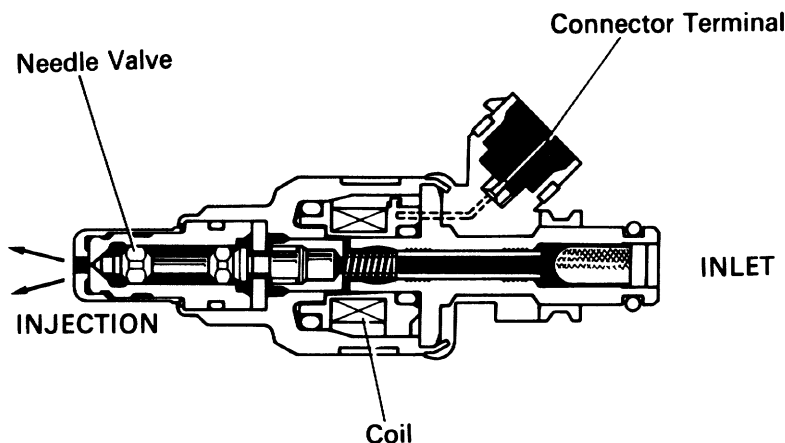


Injectors



FI2478

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.

Sound Scope

FI2513

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

FI2511

2. INSPECT INJECTOR RESISTANCE

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

Resistance: Approx. 13.8Ω

If the resistance is not as specified, replace the injector

- (c) Reconnect the injector connector.

Ohmmeter

FI2506

REMOVAL OF INJECTOR

1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY
2. DISCONNECT ACCELERATOR AND THROTTLE CABLES

3. REMOVE AIR INTAKE HOSE

4. DISCONNECT FOLLOWING HOSES:

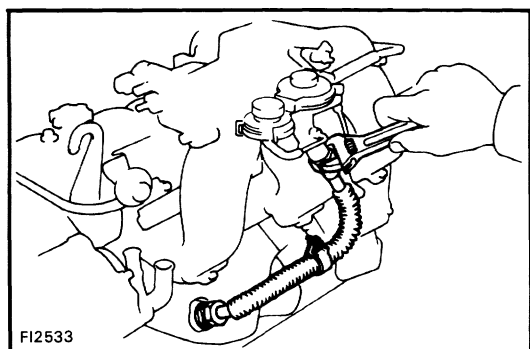
- (a) Emission control hoses

HINT: Before disconnecting the emission control hoses, use tags to identify how they should be reconnected.

- (b) Air hose from AI check valve
 - (c) Vacuum sensing hose
 - (d) PCV hose
 - (e) Brake booster hose

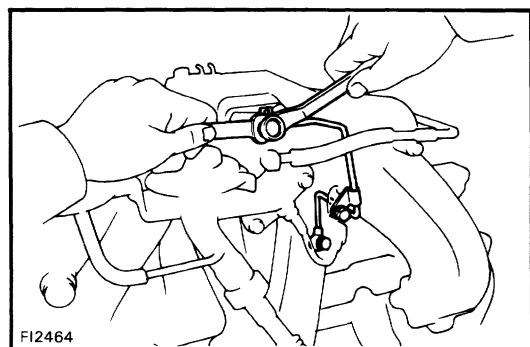
5. DISCONNECT FOLLOWING CONNECTORS AND WIRE:

- (a) ISC valve connector
 - (b) Throttle position sensor connector
 - (c) Oxygen sensor connector
 - (d) Manifold temperature sensor connector
 - (e) Cold start injector connector
 - (f) EGR gas temp. sensor connector
 - (g) Ground strap

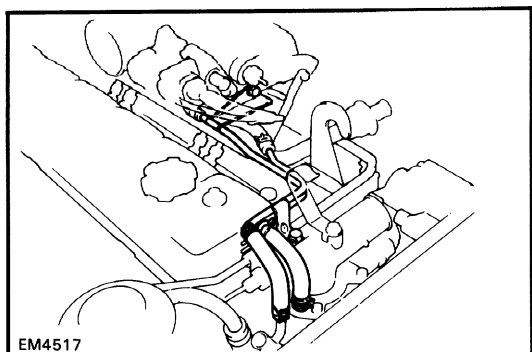


6. REMOVE AIR INTAKE CHAMBER

- (a) Loosen the two union nuts, and remove the two clamp bolts and EGR pipe.

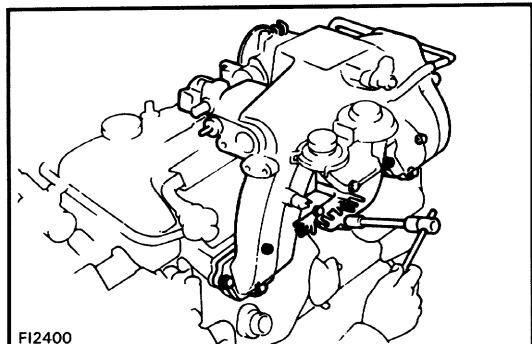


- (b) Remove the two union bolts, four gaskets, clamp bolt and cold start injector pipe.



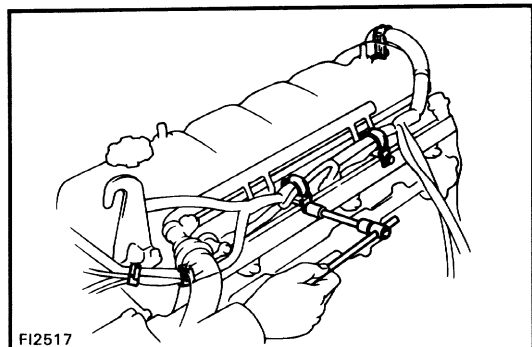
EM4517

- (c) Disconnect the water hoses and remove the two bolts and water by-pass pipe.
- (d) Remove the four bolts and two intake chamber stays.



FI2400

- (e) Remove the seven bolts, two nuts and air intake chamber.
- (f) Remove the bolt, manifold temperature sensor with stay and air intake chamber gasket.



FI2517

7. DISCONNECT ENGINE WIRE HARNESS ON INTAKE MANIFOLD

- (a) Disconnect the following connectors:
 - (1) Cold start injector time switch connector
 - (2) Water temperature sensor connector
 - (3) Water temperature sender gauge connector
 - (4) Water temperature switch
 - (5) Six injector connectors
- (b) Remove the two clamps and three clamp bolts, and disconnect the engine wire harness.

8. REMOVE NO.1 FUEL PIPE AND NO.2 FUEL PIPE WITH ENGINE HANGER

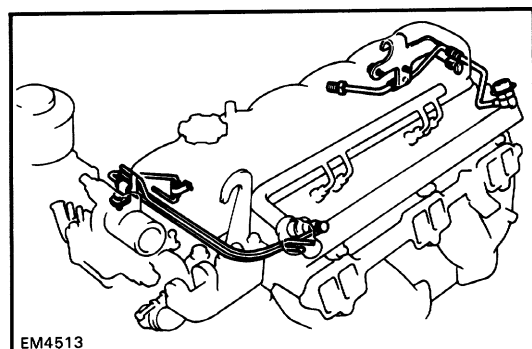
- (a) Disconnect the fuel and vacuum hoses.
- (b) Remove the pulsation damper and two gaskets.
- (c) Remove the two bolts and No.2 fuel pipe with engine hanger.
- (d) Remove the union bolt and two gaskets from the pressure regulator.
- (e) Remove the two bolts and No.1 fuel pipe.

9. REMOVE DELIVERY PIPE AND INJECTORS

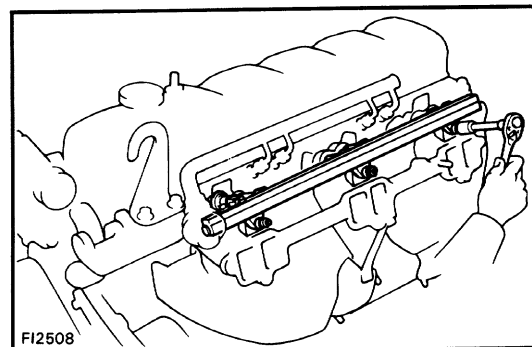
- (a) Remove the three nuts, plate washers, spacers and delivery pipe together with the six injectors.

NOTICE: Be careful not to drop the injectors, when removing the delivery pipe.

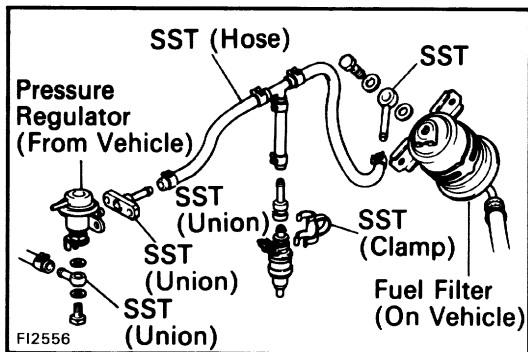
- (b) Remove the six insulators, six spacers and three collars from the intake manifold.
- (c) Pull out the six injectors from the delivery pipe.



EM4513



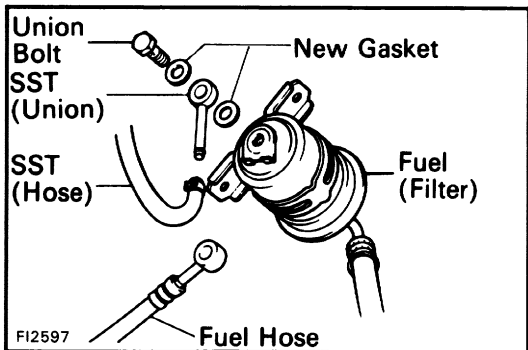
FI2508



INSPECTION OF INJECTORS

1. INSPECT INJECTOR INJECTION

CAUTION: Keep clear of sparks during the test.

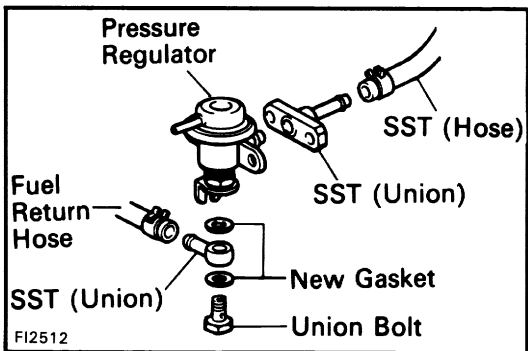


(a) Disconnect the fuel hose from the fuel filter outlet.

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

SST 09268-41045 (90405-09015)

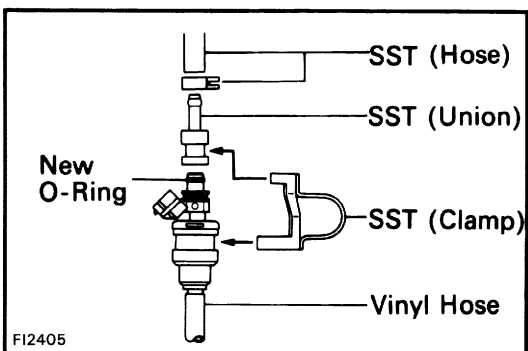
HINT: Use the vehicle's fuel filter.



(c) Remove the pressure regulator. (See page [FI-59](#))

(d) Connect the fuel return hose and SST (hose) to the pressure regulator with SST (unions), new gaskets and union bolt.

SST 09268-41045 (09268-41080, 09268-41090)



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

SST 09268-41045

(f) Put the injector into the graduated cylinder.

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

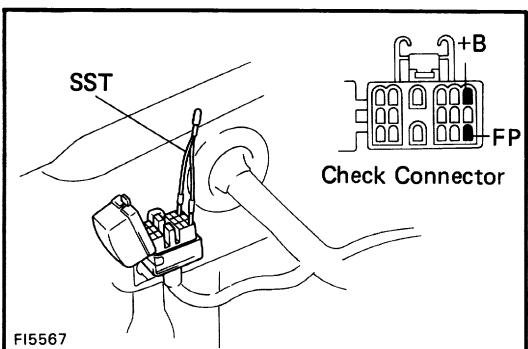
(g) Reconnect the battery negative (-) cable.

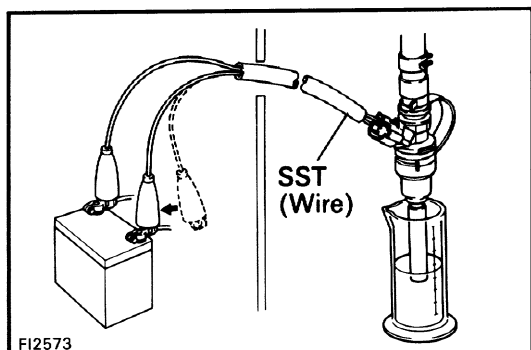
(h) Turn the ignition switch ON.

HINT: Do not start the engine.

(i) Using SST, connect terminals +B and FP of the check connector.

SST 09843-18020





- (j) 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: 47 – 59 cc (2.9 – 3.6 cu in.) per 15 sec.

Difference between each injector:

5 cc (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.

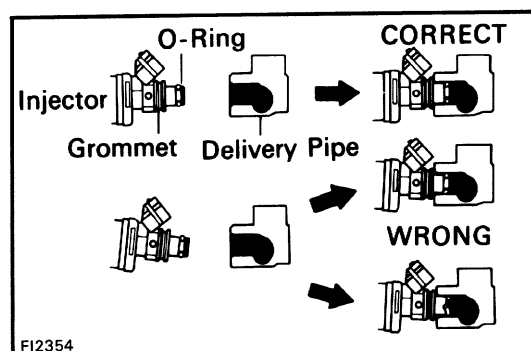
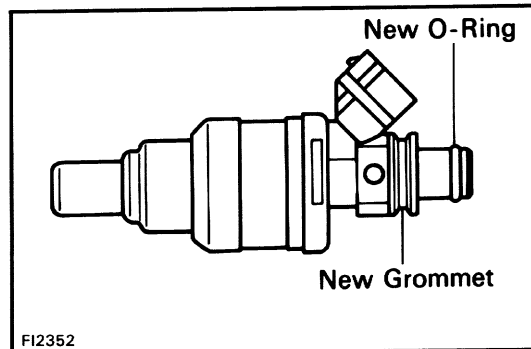
- (b) Disconnect the battery negative (–) cable.
(c) Remove SST.

SST 09268-41045 and 09843-18020

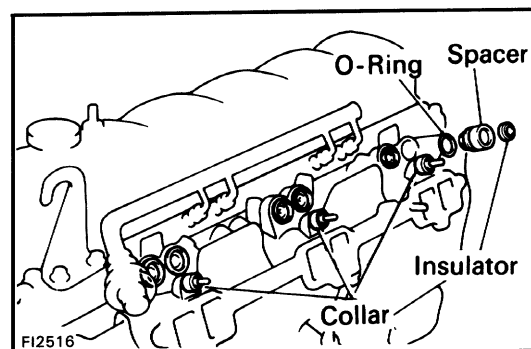
INSTALLATION OF INJECTORS

1. INSTALL INJECTORS AND DELIVERY PIPE

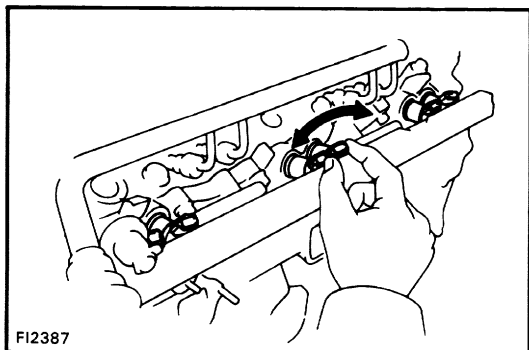
- (a) Install a new grommet to the injector.
(b) Apply a light coat of gasoline to a new O-ring and install it to the injector.



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



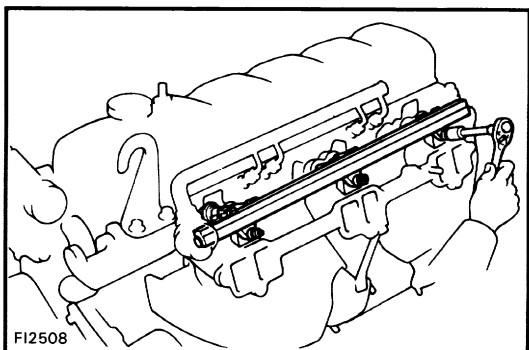
- (d) Install a new O-ring to the insulator.
(e) Place the six insulators, six spacers and three collars in position on the intake manifold.



(f) Place the injectors together with the delivery pipe in position on the intake manifold.

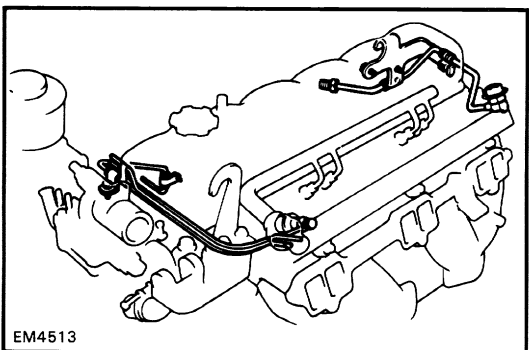
(g) Check that the injectors rotate smoothly.

HINT: If injectors do not rotate smoothly, the probable cause is incorrect installation of O-rings. Replace the O-rings.



(h) Install the three spacers, plate washers and nuts. Torque the nuts.

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



2. INSTALL NO-1 FUEL PIPE AND NO.2 FUEL PIPE WITH ENGINE HANGER

(a) Install the No.1 fuel pipe with the two bolts.

(b) Install the union bolt and two new gaskets to the pressure regulator.

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

(c) Install the No.2 fuel pipe with engine hanger with the two bolts.

(d) Install the pulsation damper with the two new gaskets.

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

(e) Connect the two fuel hoses and vacuum hoses.

3. CONNECT ENGINE WIRE HARNESS ON INTAKE MANIFOLD

(a) Connect the following connectors:

- (1) Cold start injector time switch connector
- (2) Water temperature sensor connector
- (3) Water temperature sender gauge connector
- (4) Water temperature switch
- (5) Six injector connectors

(b) Install the three clamp bolts and two clamps.

4. INSTALL AIR INTAKE CHAMBER

(a) Install a new gasket and air intake chamber with the seven bolts and two nuts.

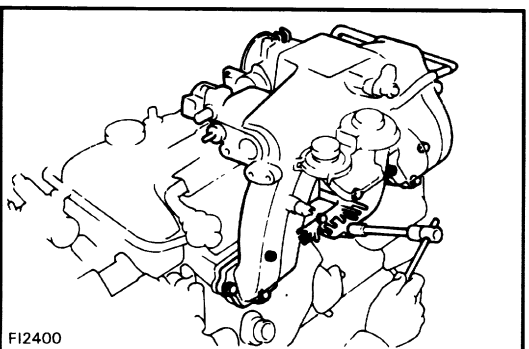
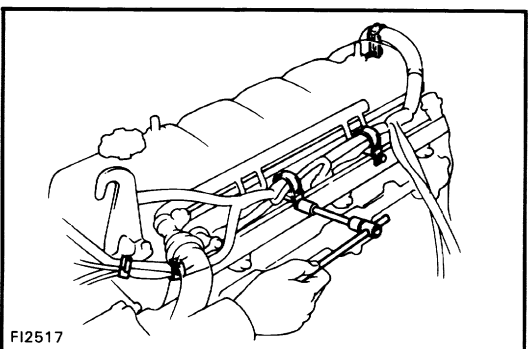
Torque: 25 N-m (250 kgf-cm, 18 ft-lbf)

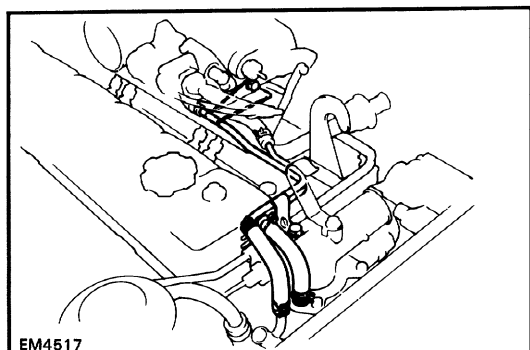
(b) Install the manifold temperature sensor with stay with the bolt.

Torque: 12 N-m (120 kgf-cm, 9 ft-lbf)

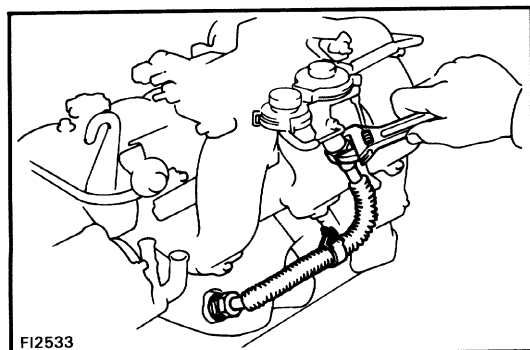
(c) Install the two intake chamber stays with the four bolts.

Torque: 12 N-m (120 kgf-cm, 9 ft-lbf)





- (d) Install the water by-pass pipe with the two bolts and connect the water hoses.
- (e) Install the cold start injector pipe.
(See page [FI-58](#))



- (f) Install the EGR pipe with the two union nuts.
Torque: 64 N-m (650 kgf-cm, 47 ft-lbf)
- (g) Install the two clamp mount bolts.

5. CONNECT FOLLOWING CONNECTORS AND WIRE:

- (a) ISC valve connector
- (b) Throttle position sensor connector
- (c) Oxygen sensor connector
- (d) Manifold temperature sensor connector
- (e) Cold start injector connector
- (f) EGR gas temp. sensor connector
- (g) Ground strap

6. CONNECT FOLLOWING HOSES:

- (a) Emission control hoses
- (b) Air hose from AI check valve
- (c) Vacuum sensing hose
- (d) PCV hose
- (e) Brake booster hose

7. INSTALL AIR INTAKE HOSE

8. CONNECT ACCELERATOR AND THROTTLE CABLES, AND ADJUST THEM

9. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY