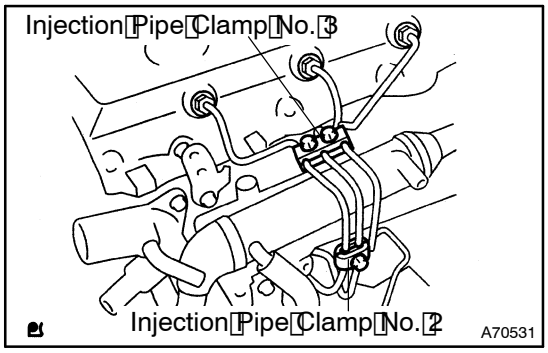
110LO–01

REPLACEMENT

NOTICE:

When removing the injection pipes, clean them up with a brush and compressed air.

1. **REMOVE INTERCOOLER PROTECTOR (See page 13–30)**
2. **REMOVE INTERCOOLER ASSY (See page 10–31)**
3. **REMOVE AIR HOSE NO.1**
4. **REMOVE VACUUM SWITCHING VALVE ASSY NO.1 (See page 10–31)**
5. **REMOVE DIESEL THROTTLE BODY ASSY (See page 10–31)**
6. **REMOVE CYLINDER HEAD COVER SUB–ASSY NO.2 (See page 14–223)**



7. **REMOVE INJECTION PIPE**

NOTICE:

- **After removing the fuel pipe, affix the gum tape to outlets on the common rail for preventing dust from coming into them.**
- **After removing the fuel pipe, put a vinyl bag and rubber band for preventing from mixing foreign objects over the injectors inlet.**

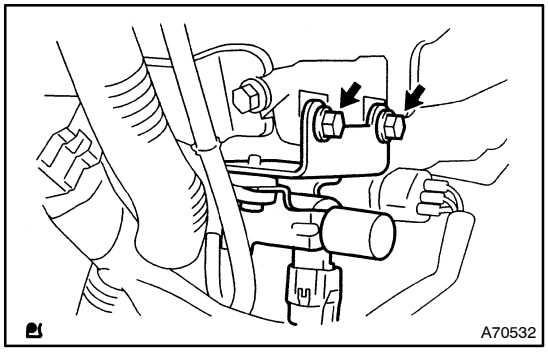
(a) Remove the injection pipe No. 1, No. 2 and No. 3.

(1) Remove the 2 bolts and injection pipe clamp No. 3.

(2) Remove the bolt and injection pipe clamp No. 2.

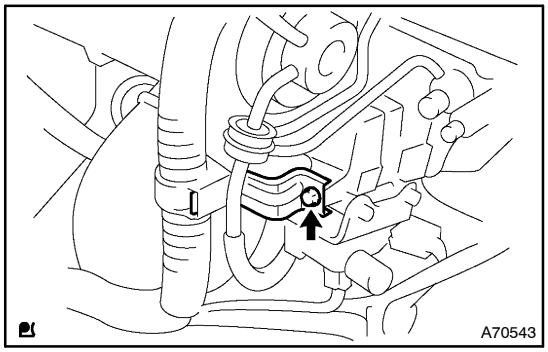
(3) Using SST, remove the injection pipe No. 1, No. 2 and No. 3.

SST 09023–12700

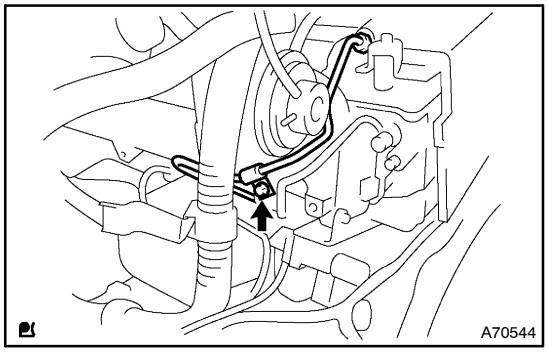


(b) Remove the injection pipe No. 4.

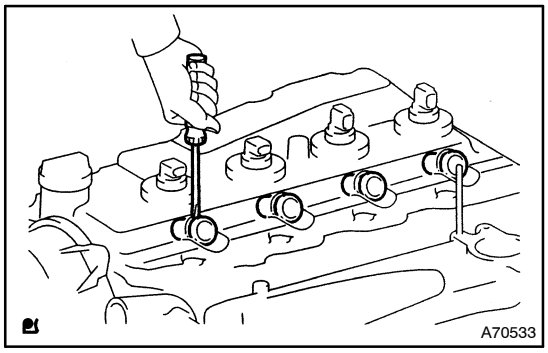
(1) Remove the 2 bolts and disconnect the E–VRV with bracket.



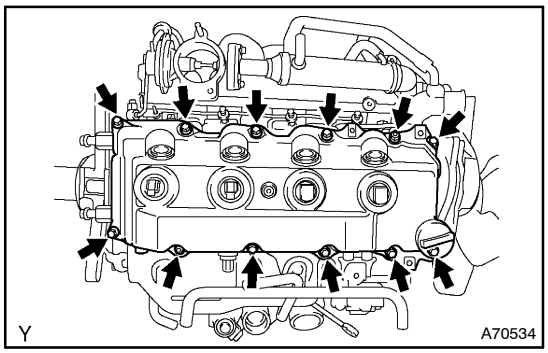
(2) Remove the bolt and wire harness clamp bracket.



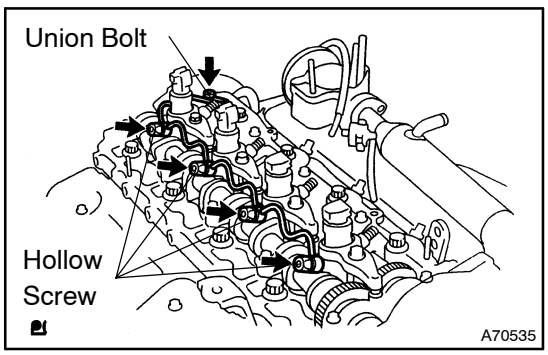
(3) Remove the bolt and disconnect the injection pipe clamp No. 1.
(4) Using SST, remove the injection pipe No. 4.
SST 09023–12700



8. REMOVE CYLINDER HEAD COVER SUB–ASSY
(a) Remove the 4 nozzle holder seals.
(b) Disconnect the ventilation hose No. 2.

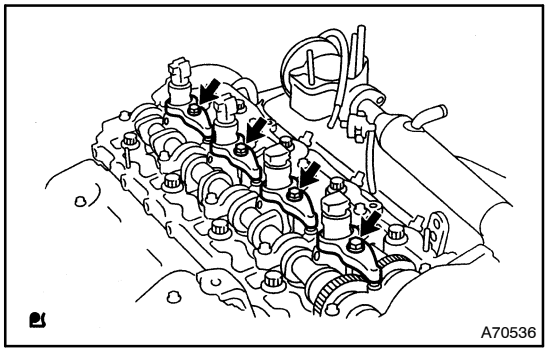


(c) Remove the 10 bolts, 2 nuts and cylinder head cover.

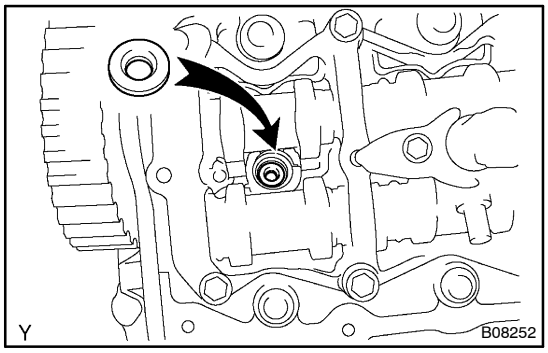


9. REMOVE INJECTOR ASSY
(a) Remove the nozzle leakage pipe assy.
(1) Remove the union bolt, hollow screw and nozzle leakage pipe assy.

NOTICE:
- **Put a vinyl bag for preventing from foreign substance over the injector.**
- **When removing the return pipe, place the shop rag and the likes under pipe.**
- **Pay attention not to deform or scratch the union seal surface.**



(b) Remove the nozzle holder clamp.
(1) Remove the bolt, washer and nozzle holder clamp.
(c) Remove the injector.

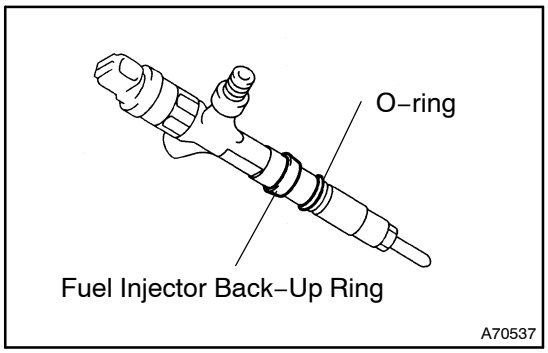


10. INSTALL INJECTOR ASSY

NOTICE:

Be sure to install the injector, nozzle holder clamp, washer and bolt to the removed cylinder.

(a) Install a new injection nozzle sheet to the cylinder head.



(b) Install a new O–ring, fuel injector back–up ring and injector.

HINT:

Apply a light coat of engine oil on the O–ring.

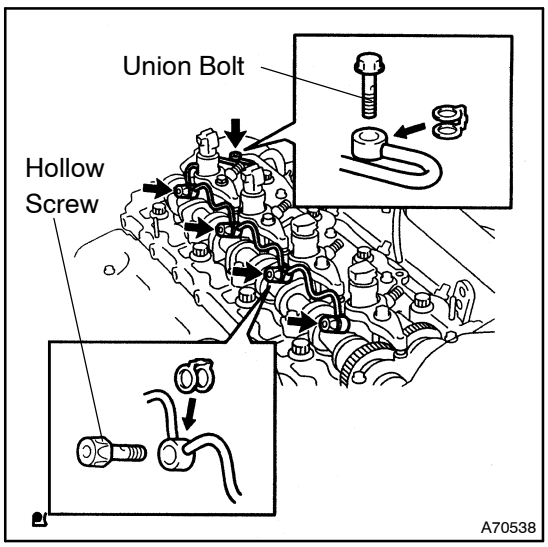
(c) Temporarily install the 4 injection pipes.

NOTICE:

In case of having the injector replaced, must replace injection pipe, too.

HINT:

Tighten the nut of injection pipe by hand until it can not turn.



(d) Apply a light coat of engine oil on hollow screw and union bolt.

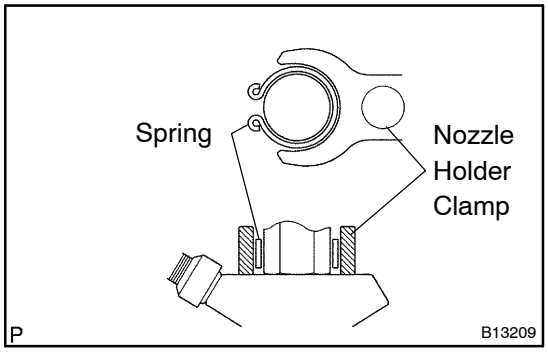
(e) Temporarily install a new gasket and nozzle leakage pipe assy.

NOTICE:

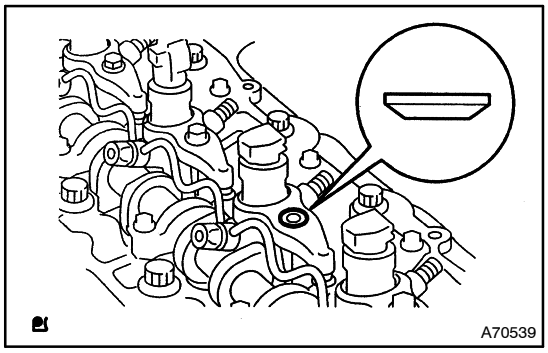
- **At this time, insert the injector until it touches the nozzle sheet surface.**
- **When installing the injector to the cylinder head and in case that the injector comes to float up with the reaction of O–ring, pull out the injector once, install it again.**
- **During the time after equipping the head cover and before installing the injection pipe, install the irregular object prevention cover.**
- **Do not excharge the injector cylinder.**

HINT:

Tighten the hollow screw and union bolt by hand until they can not turn.



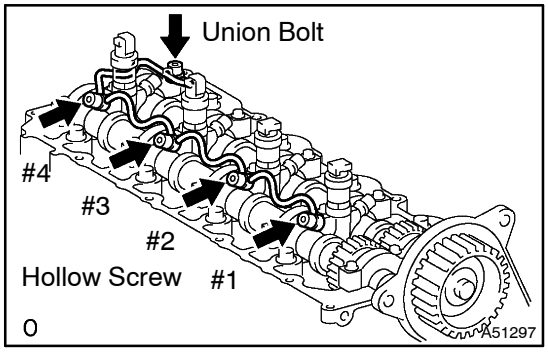
(f) Set the spring to each injector as shown in the illustration.



(g) Install new washer and nozzle clamp with the bolt.
Torque: 22 N·m (220 kgf·cm, 16 ft·lbf)

NOTICE:

- **Clip the infector at the fork portion with a clamp which is set on the head of the cam cap bolt. At this time, check that the clamp does not hold the injector at the part where the spring is attached.**
- **To fasten the clamp bolt, temporally torque it with hand until the bearing surface of the bolt touches the washer, then tighten by the specified torque.**
- **In case of tighten by the specified torque, pay attention not to tilt the bolt and the clamp.**
- **The washer can not be reused.**
- **In case of tightening the washer with over–torque, replace it with new one.**



(h) Tighten the 4 hollow screws from #1 to #4 in order.
Torque: 16 N·m (163 kgf·cm, 12 ft·lbf)

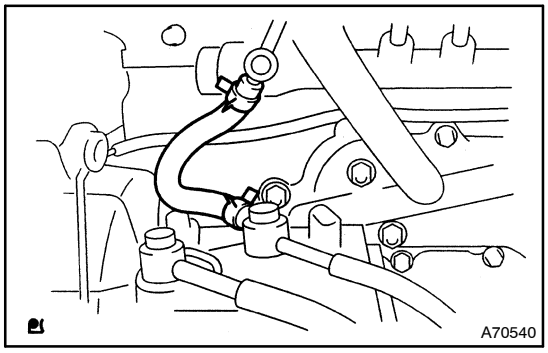
NOTICE:

In case of over–torque, replace the nozzle leakage pipe assy with new one.

(i) Tighten the union bolt.
Torque: 12.5 N·m (127 kgf·cm, 9 ft·lbf)

NOTICE:

In case of over–torque, replace the nozzle leakage pipe assy with new one.



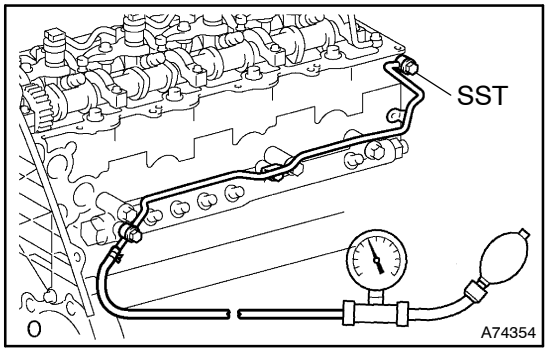
11. INSPECT FOR FUEL LEAKS

HINT:

Check that there are no leaks from nozzle leakage pipe assy.

(a) Remove the fuel hose.

(b) Remove the check valve, install a new gasket and SST.
SST 09280–00010
Torque: 21 N·m (214 kgf·cm, 16 ft·lbf)

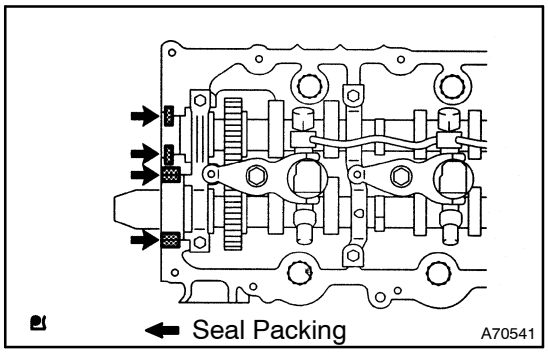


(c) Apply a light coat of soapy water (any fluid to detect fuel leakage) on the nozzle leakage pipe assy No. 2 connection.

(d) Using SST (turbocharger pressure gauge), apply the SST to the fuel return side of the nozzle leakage pipe assy No. 2, and maintain 100 kPa (1.0 kgf/cm^2, 14.5 psi) of pressure for 60 seconds to check that there are no bubbles from applying the soapy water place.
SST 09992–00242

(e) Remove the SST, install a new gasket and check valve.
Torque: 21 N·m (214 kgf·cm, 16 ft·lbf)

(f) Connect the fuel hose.



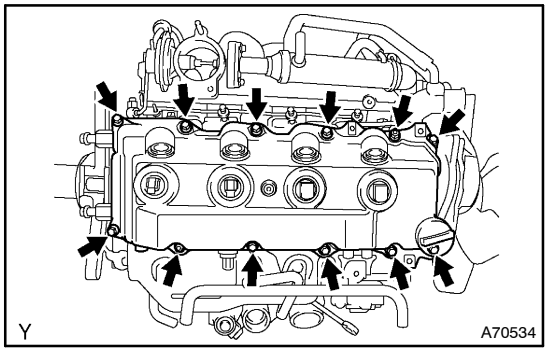
12. INSTALL CYLINDER HEAD COVER SUB–ASSY

(a) Remove old seal packing (FIPG) from the cylinder head.

(b) Apply a seal packing to the specific places described in the illustration.
Seal packing: Part No. 08826 – 00080 or equivalent

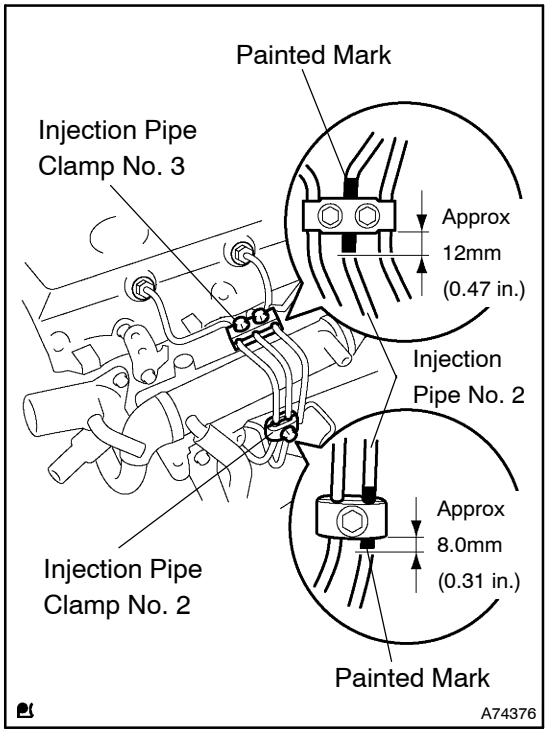
NOTICE:

- **After applying the seal packing, parts must be assembled within 3 minutes, and then tighten them within 15 minutes.**
- **Otherwise the material must be removed and reapplied.**
- **Do not start the engine 2 hours after the installation.**



(c) Install the cylinder head cover with 10 bolts and 2 nuts.
Torque: 9 N·m (92 kgf·cm, 80 in.·lbf)

(d) Install a new nozzle holder seal.



13. INSTALL INJECTION PIPE

NOTICE:

- **When replacing the injector, replace the injection pipe as well.**
- **Keep clean for the joint of the injection pipe.**

(a) Install the injection pipe No. 1, 2 and 3.

(1) Temporarily install the injection pipes.

(2) Attach the injection pipe clamp No. 2 and No. 3.

Torque: 5 N·m (51 kgf·cm, 44 in.·lbf)

HINT:

- Make sure to install the injection pipe clamp No. 2 and No. 3 in the correct position indicated by the painted marks on the injection pipe No. 2.
- If the painted marks on the injection pipe No. 2 are disappeared, install the injection clamp No. 2 and No. 3 as shown in the illustration.

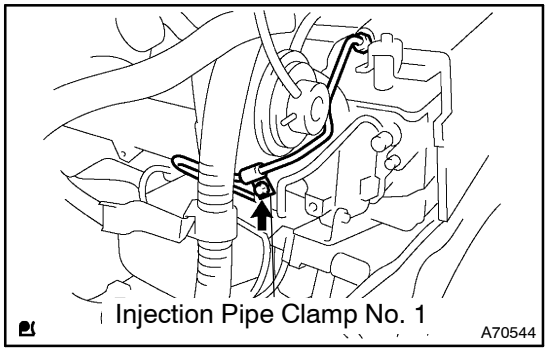
(3) Fasten the unions sequentially, from the injection pipe common rail to the injector, using a union nut wrench (17 mm).

SST 09023–12700

Torque:

32 N·m (326 kgf·cm, 24 ft·lbf) for use with SST

35 N·m (357 kgf·cm, 26 ft·lbf)



(b) Install the injection pipe No. 4.

(1) Temporarily install the injection pipe.

(2) Install a new injection pipe clamp No. 1.

Torque: 5 N·m (51 kgf·cm, 44 in.·lbf)

NOTICE:

- **Make sure that the inner–rubber fits inside the clamp.**
- **When installing the pipe, check that the inner–rubber and the clamp are on proper position.**

(3) Fasten the unions sequentially, from the injection pipe common rail to the injector, using a union nut wrench (17 mm).

SST 09023–12700

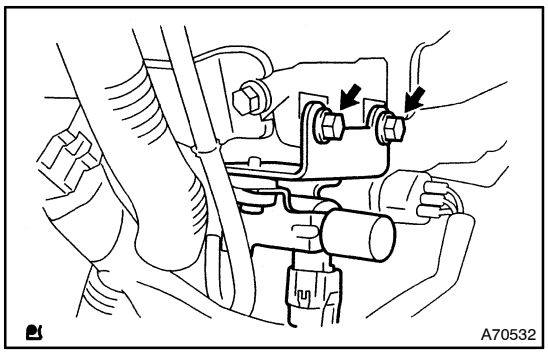
Torque:

32 N·m (326 kgf·cm, 24 ft·lbf) for use with SST

35 N·m (357 kgf·cm, 26 ft·lbf)

(4) Install the E–VRV w/ bracket with the 2 bolts.

Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)



14. INSTALL CYLINDER HEAD COVER SUB–ASSY NO.2 (See page 14–223)
15. INSTALL DIESEL THROTTLE BODY ASSY (See page 10–31)
16. INSTALL VACUUM SWITCHING VALVE ASSY NO.1 (See page 10–31)
17. INSTALL AIR HOSE NO.1
18. INSTALL INTERCOOLER ASSY (See page 10–31)
19. INSTALL INTERCOOLER PROTECTOR
(a) Install the intercooler protector with the 5 bolts.
Torque: 6.0 N·m (61 kgf·cm, 53 in.·lbf)
20. CHECK FUEL LEAK (See page 11–101)