

INSTALLATION

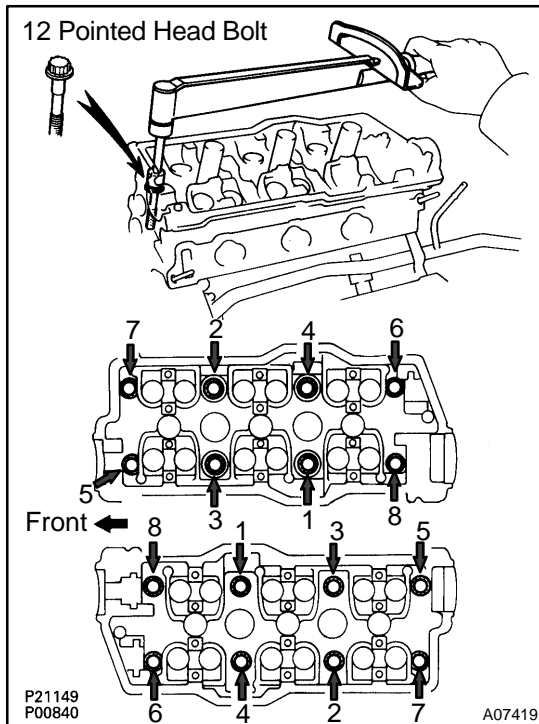
1. PLACE CYLINDER HEAD ON CYLINDER BLOCK

- Place 2 new cylinder head gaskets in position on the cylinder block.

NOTICE:

Be careful of the installation direction.

- Place the 2 cylinder heads in position on the cylinder head gaskets.



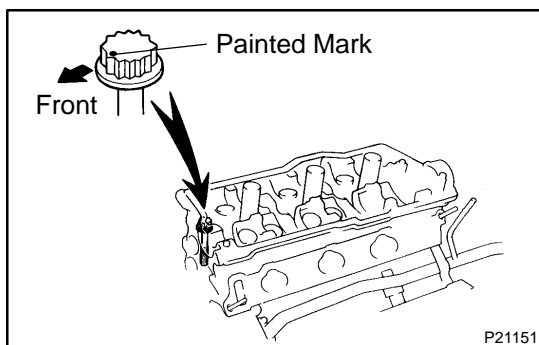
2. INSTALL 12 POINTED HEAD CYLINDER HEAD BOLTS

HINT:

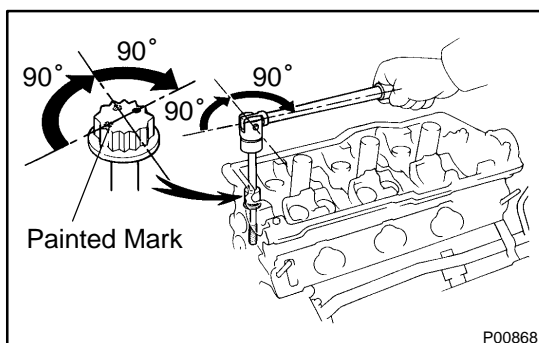
- The cylinder head bolts are tightened in 3 progressive steps (steps (b), (d) and (e)).
 - If any bolt is broken or deformed, replace it.
- Apply a light coat of engine oil on the threads and under the heads of the cylinder head bolts.
 - Install and uniformly tighten the cylinder head bolts on each cylinder head in several passes, in the sequence shown, then repeat for the other side as shown.

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

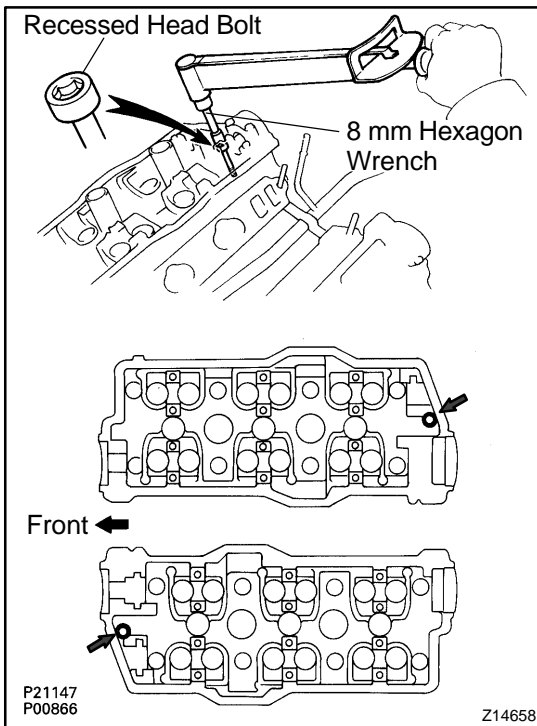
If any of the cylinder head bolts does not meet the torque specification, replace the cylinder head bolt.



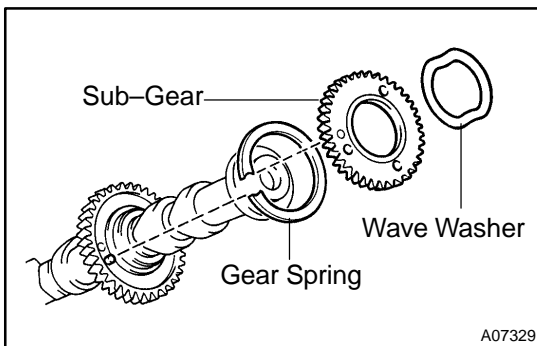
- Mark the front of the cylinder head bolt head with paint.



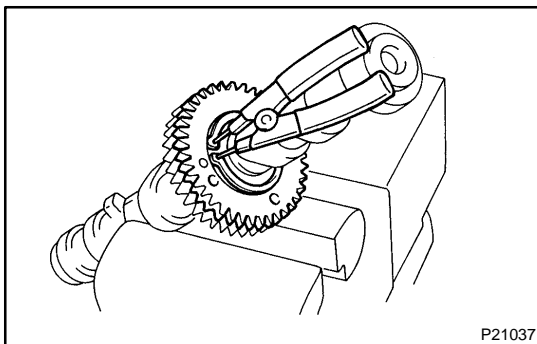
- Retighten the cylinder head bolts by 90° in the numerical order shown.
- Retighten the cylinder head bolts by an additional 90°.
- Check that the painted mark is now facing rearward.



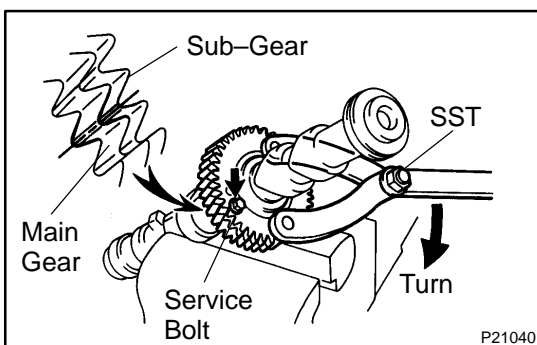
- 3. INSTALL RECESSED HEAD CYLINDER HEAD BOLTS**
- Apply a light coat of engine oil on the threads and under the heads of the cylinder head bolts.
 - Using an 8 mm hexagon wrench, install the cylinder head bolt on each cylinder head, then repeat for the other side as shown.
Torque: 18 N·m (185 kgf-cm, 13 ft-lbf)
 - Connect the ground strap with the bolt.



- 4. ASSEMBLE EXHAUST CAMSHAFTS**
- Mount the hexagonal wrench head portion of the camshaft in a vise.
- NOTICE:**
Be careful not to damage the camshaft.
- Install the camshaft gear spring, camshaft sub-gear and Wave washer.
- HINT:**
Attach the pins on the gears to the gear spring ends.



- Using snap ring pliers, install the snap ring.

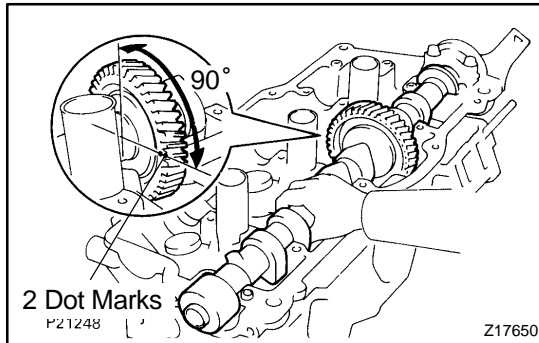


- Using SST, align the holes of the camshaft main gear and sub-gear by turning camshaft sub-gear clockwise, and temporarily install a service bolt.
SST 09960-10010 (09962-01000, 09963-00600)
- Align the gear teeth of the main gear and sub-gear, and tighten the service bolt.

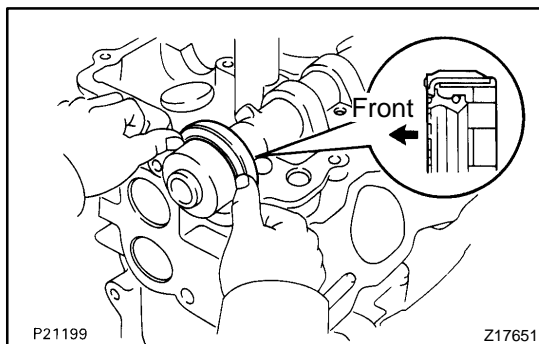
5. INSTALL CAMSHAFTS

NOTICE:

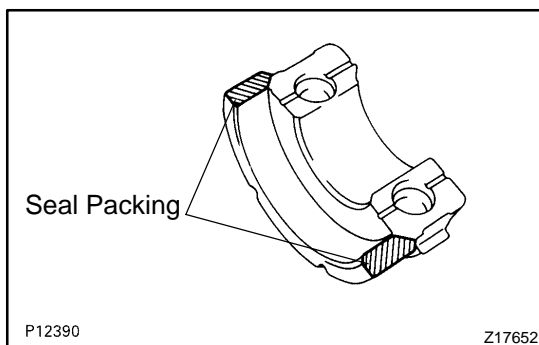
Since the thrust clearance of the camshaft is small, the camshaft must be kept level while it is being installed. If the camshaft is not kept level, the portion of the cylinder head receiving the shaft thrust may crack or be damaged, causing the camshaft to seize or break. To avoid this, these steps should be carried out.



- (a) Install the intake camshaft of the RH cylinder head.
- (1) Apply new engine oil to the thrust portion and journal of the camshaft.
 - (2) Place the intake camshaft at 90° angle of timing mark (2 dot marks) on the cylinder head.

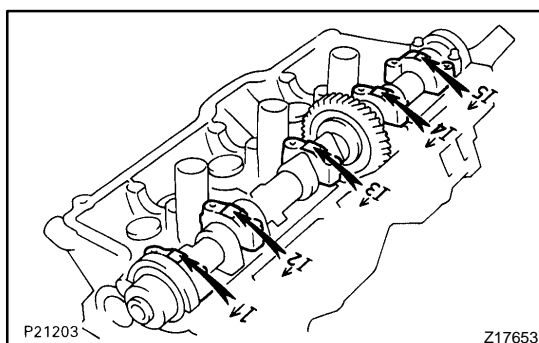


- (3) Apply MP grease to a new oil seal lip.
- (4) Install the oil seal to the camshaft.

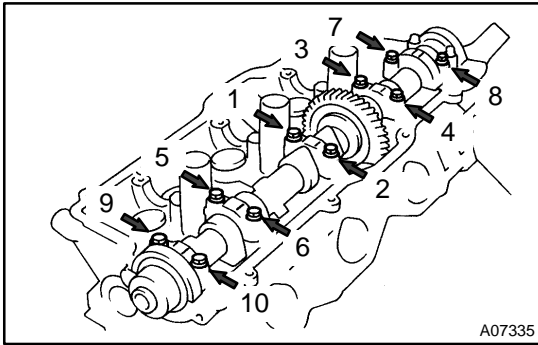


- (5) Remove any old packing (FIPG) material.
- (6) Apply seal packing to the No.1 bearing cap as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

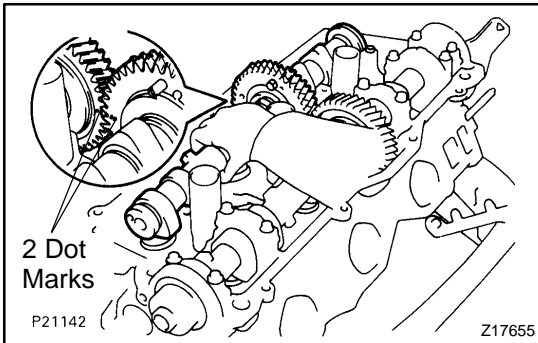


- (7) Install the 5 bearing caps in their proper locations.

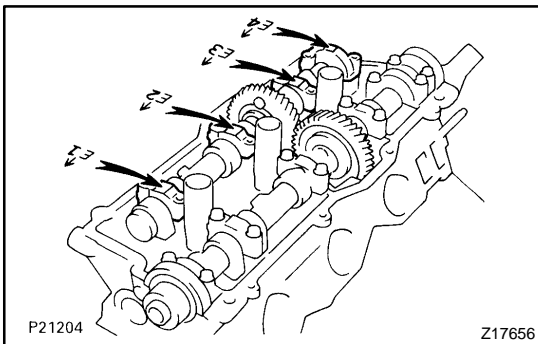


- (8) Apply a light coat of engine oil on the threads and under the heads of the bearing cap bolts.
- (9) Install and uniformly tighten the 10 bearing cap bolts, in several passes, in the sequence shown.

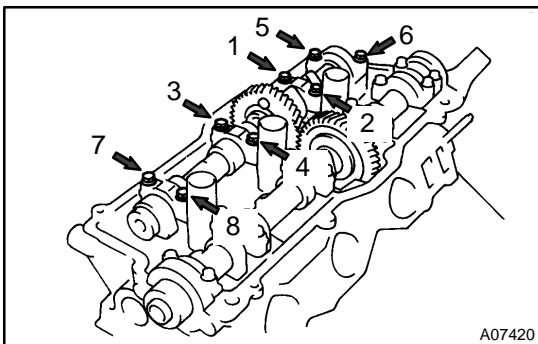
Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)



- (b) Install the exhaust camshaft of the RH cylinder head.
 - (1) Apply new engine oil to the thrust portion and journal of the camshaft.
 - (2) Align the timing marks (2 dot marks) of the camshaft drive and driven gears.
 - (3) Place the exhaust camshaft on the cylinder head.



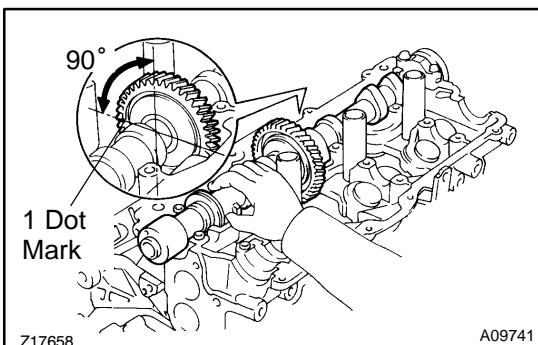
- (4) Install the 4 bearing caps in their proper locations.



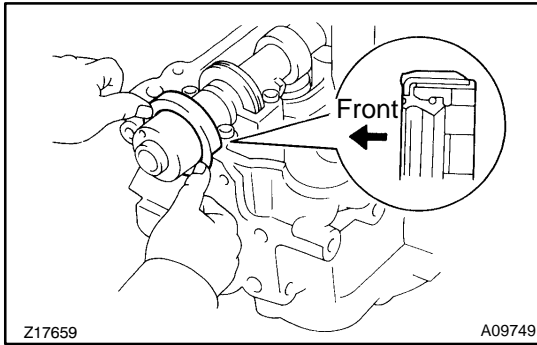
- (5) Apply a light coat of engine oil on the threads and under the heads of the bearing cap bolts.
- (6) Install and uniformly tighten the 8 bearing cap bolts, in several passes, in the sequence shown.

Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)

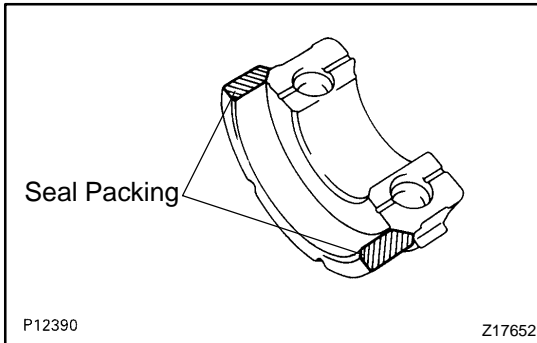
- (7) Remove the service bolt.



- (c) Install the intake camshaft of the LH cylinder head.
 - (1) Apply new engine oil to the thrust portion and journal of the camshaft.
 - (2) Place the intake camshaft at 90° angle of timing mark (1 dot mark) on the cylinder head.

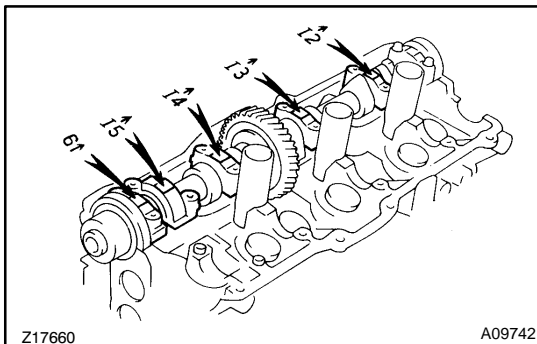


- (3) Apply MP grease to a new oil seal lip.
- (4) Install the oil seal to the camshaft.

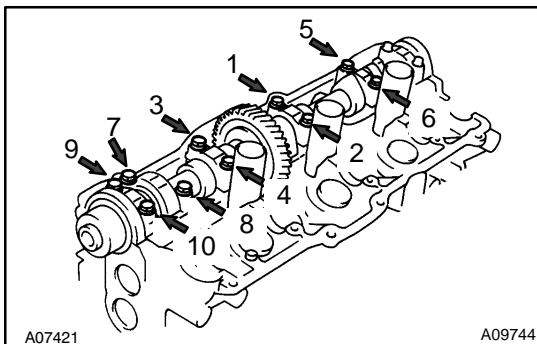


- (5) Remove any old packing (FIPG) material.
- (6) Apply seal packing to the No.1 bearing cap as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

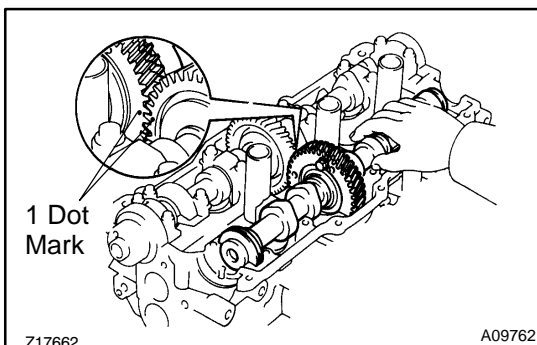


- (7) Install the 5 bearing caps in their proper locations.

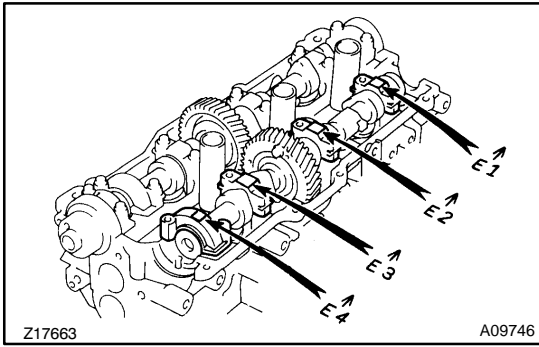


- (8) Apply a light coat of engine oil on the threads and under the heads of the bearing cap bolts.
- (9) Install and uniformly tighten the 10 bearing cap bolts, in several passes, in the sequence shown.

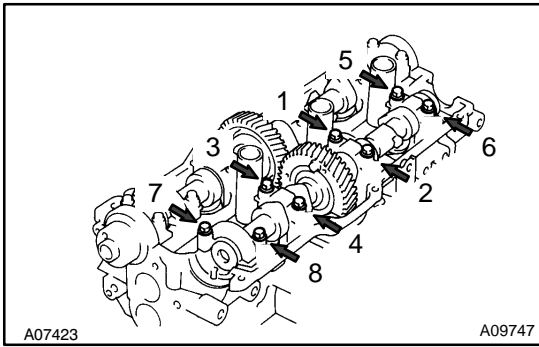
Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)



- (d) Install the exhaust camshaft of the LH cylinder head.
 - (1) Apply new engine oil to the thrust portion and journal of the camshaft.
 - (2) Align the timing marks (1 dot mark) of the camshaft drive and driven gears.
 - (3) Place the exhaust camshaft on the cylinder head.



(4) Install the 4 bearing caps in their proper locations.



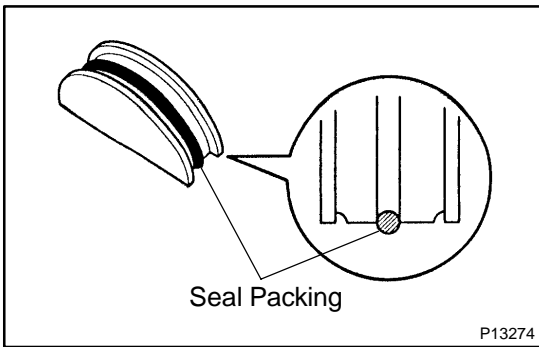
(5) Apply a light coat of engine oil on the threads and under the heads of bearing cap bolts.

(6) Install and uniformly tighten the 8 bearing cap bolts, in several passes, in the sequence shown.

Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)

(7) Remove the service bolt.

6. CHECK AND ADJUST VALVE CLEARANCE (See page EM-4)

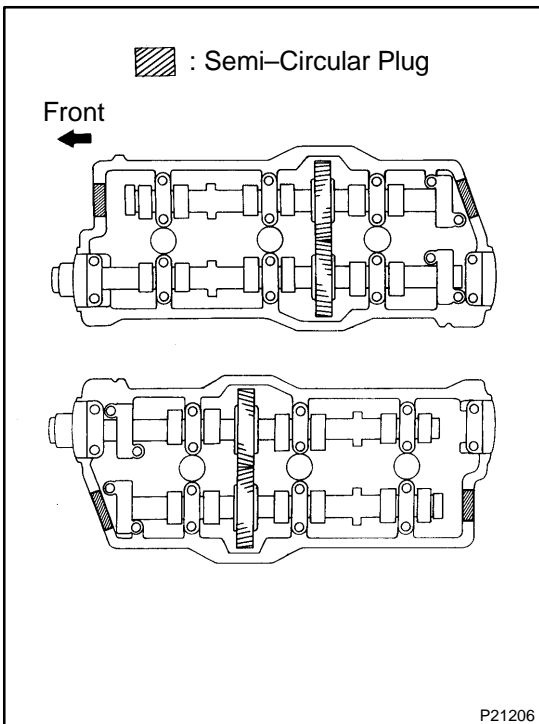


7. INSTALL SEMI-CIRCULAR PLUGS

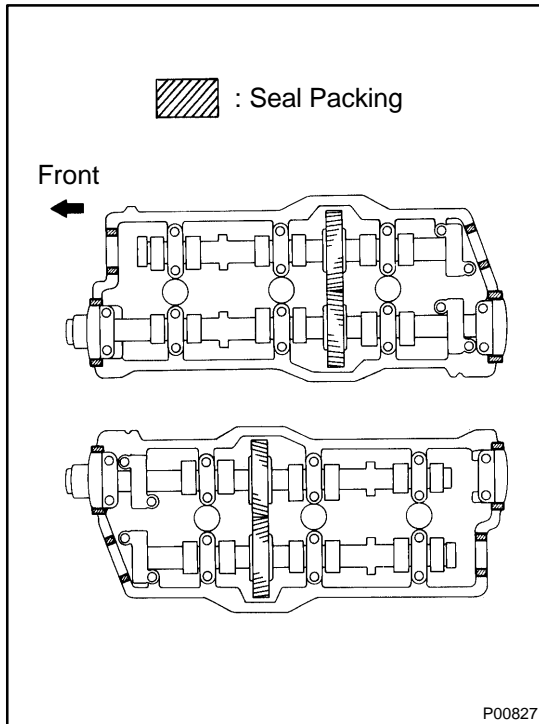
(a) Remove any old packing (FIPG) material.

(b) Apply seal packing to the semi-circular plug groove.

Seal packing: Part No. 08826-00080 or equivalent



(c) Install the 4 semi-circular plugs to the cylinder heads.



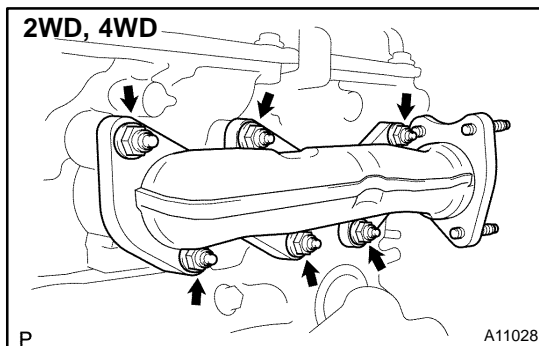
8. INSTALL CYLINDER HEAD COVERS

- (a) Apply seal packing to the cylinder heads as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

- (b) Install the gasket to the cylinder head cover.
 (c) Install the cylinder head cover with the 8 bolts. Uniformly tighten the bolts in several passes. Install the 2 cylinder head covers.

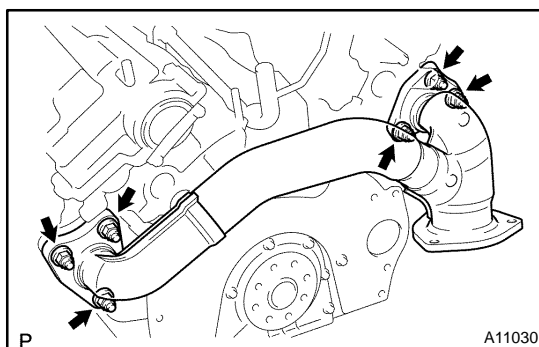
Torque: 6 N·m (60 kgf·cm, 53 in.-lbf)



9. INSTALL EXHAUST MANIFOLDS

- Install 2 new gaskets and the 2 exhaust manifolds with the 12 nuts.

Torque: 40 N·m (400 kgf·cm, 30 ft·lbf)



10. INSTALL EXHAUST CROSSOVER PIPE

- Install 2 new gaskets and the crossover pipe with the 6 nuts.

Torque: 45 N·m (450 kgf·cm, 33 ft·lbf)

11. INSTALL PS PUMP BRACKET

Torque: 18.5 N·m (185 kgf·cm, 14 ft·lbf)

12. INSTALL GENERATOR BRACKET

Torque: 18.5 N·m (185 kgf·cm, 14 ft·lbf)

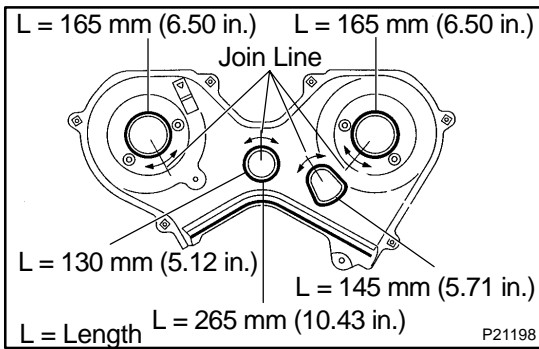
13. INSTALL GENERATOR (See page CH-15)

14. INSTALL NO.3 TIMING BELT COVER

- (a) Check that the timing belt cover gaskets have no cracks or peeling, etc.

If the gaskets have cracks or peeling etc., replace them using these steps:

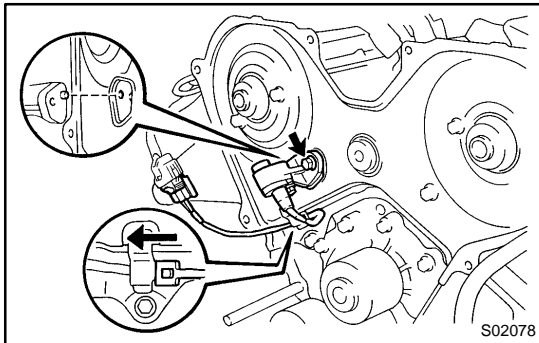
- (1) Using a screwdriver and gasket scraper, remove all the old gasket material.
- (2) Thoroughly clean all components to remove all the loose material.



- (3) Remove the backing paper from a new gasket and install the gasket evenly to the part of the timing belt cover shaded black in the illustration.

- (b) Install the timing belt cover with the 6 bolts.

Torque: 9 N·m (90 kgf·cm, 80 in.-lbf)



15. INSTALL CAMSHAFT POSITION SENSOR

- (a) Install the camshaft position sensor with the bolt.

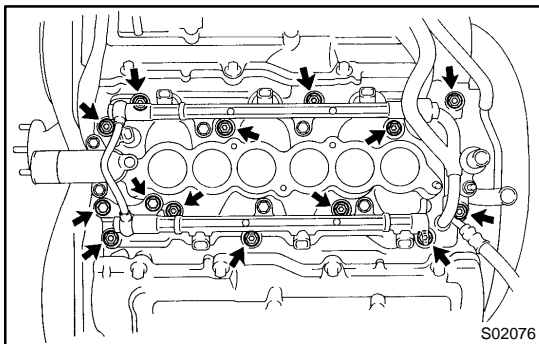
Torque: 8 N·m (80 kgf·cm, 71 in.-lbf)

HINT:

Match the protrusion of the sensor with the indentation of the RH cylinder head.

- (b) Connect the clamp to the No.3 timing belt cover.
(c) Connect the camshaft position sensor connector.

16. INSTALL TIMING BELT (See page [EM-19](#))



17. INSTALL INTAKE MANIFOLD ASSEMBLY

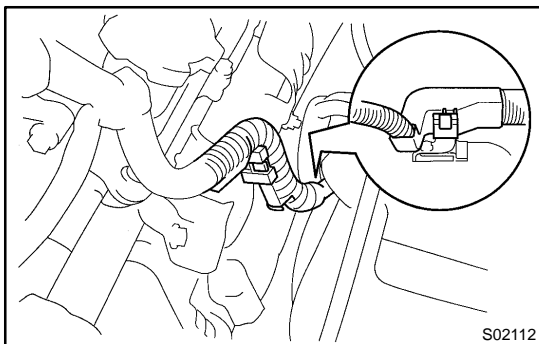
- (a) Install 2 new gaskets and the intake manifold assembly with the 8 bolts, 4 plate washers and 4 nuts.

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

- (b) Install the intake manifold stay with the 2 bolts.

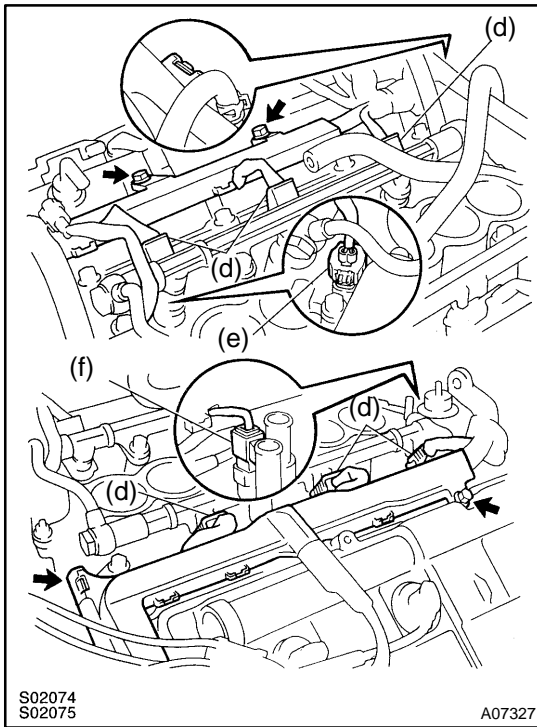
Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)

18. INSTALL FUEL PRESSURE REGULATOR (See page [SF-15](#))

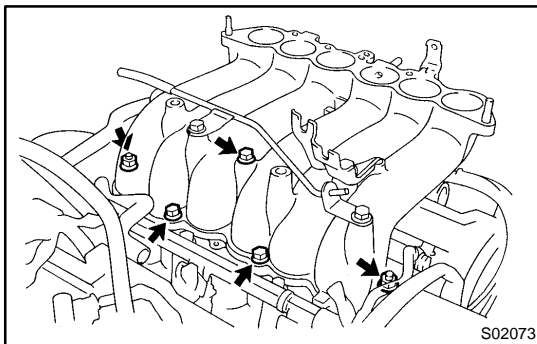


19. CONNECT ENGINE WIRE PROTECTOR

- (a) Connect the 2 engine wire clamps.



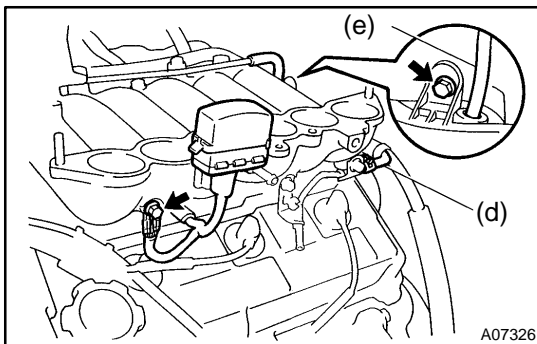
- (b) Install the engine wire with the 3 bolts.
- (c) Connect the 2 engine wire clamps.
- (d) Connect the 6 injector connectors.
- (e) Connect the ECT sensor connector.
- (f) Connect the ECT sender gauge connector.



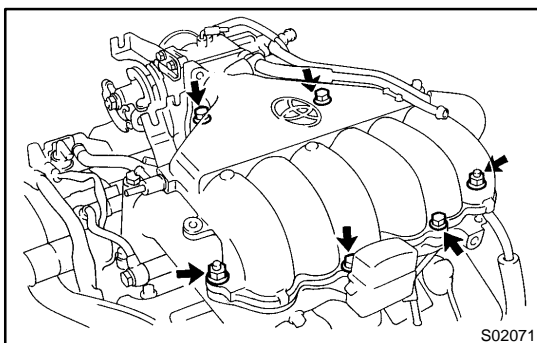
20. INSTALL INTAKE AIR CONNECTOR ASSEMBLY

- (a) Install a new gasket and the intake air connector assembly with the 3 bolts and 2 nuts.

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



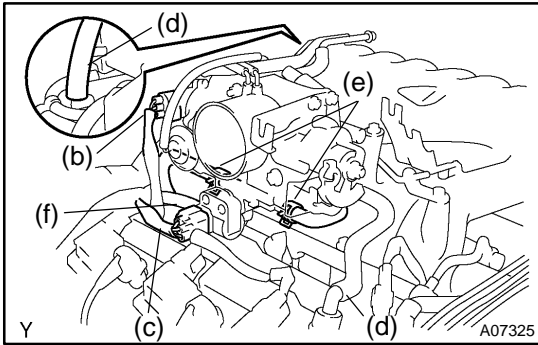
- (b) Install the DLC1 to the bracket.
- (c) Install the ground strap to the intake air connector with the bolt.
- (d) Connect the fuel return hose.
- (e) Connect the vacuum sensing hose to the fuel pressure regulator.
- (f) Install the engine wire with the bolt.



21. INSTALL AIR INTAKE CHAMBER ASSEMBLY

- (a) Install a new gasket and the air intake chamber assembly with the 4 bolts and 2 nuts.

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



- (b) Connect the throttle position sensor connector.
- (c) Connect the IAC valve connector.
- (d) Connect the 2 PCV hoses.
- (e) Connect the 2 water bypass hoses.
- (f) Connect the air assist hose to the throttle body.

22. INSTALL NO.2 TIMING BELT COVER (See page [EM-19](#))

23. INSTALL AIR INTAKE CHAMBER STAY

- (a) Install the air intake chamber stay with the 2 bolts.
Torque: 40 N·m (400 kgf·cm, 30 ft·lbf)
- (b) Install the No.1 throttle cable clamp with the 2 bolts.

24. CONNECT HOSES

- (a) Connect the fuel return hose.
- (b) Connect the fuel inlet hose.
- (c) Connect the brake booster vacuum hose.
- (d) Connect the EVAP hose.
- (e) 4WD:
Connect the A.D.D. vacuum hose.

25. CONNECT CABLES

- (a) A/T:
Connect the throttle cable.
- (b) Connect the accelerator cable.
- (c) w/ Cruise Control:
Connect the cruise control actuator cable.

26. INSTALL SPARK PLUGS AND HIGH-TENSION CORDS WITH IGNITION COILS (See page [IG-7](#))

27. CONNECT HEATER HOSE

28. INSTALL AIR CLEANER ASSEMBLY

29. 2WD, 4WD:

**INSTALL NO.1 EXHAUST PIPE (WITH TWC)
(See page [EM-105](#))**

30. FILL WITH ENGINE COOLANT

31. START ENGINE AND CHECK FOR LEAKS

32. CHECK IGNITION TIMING (See page [EM-9](#))

33. INSTALL ENGINE UNDER COVER

34. PERFORM ROAD TEST

Check for abnormal noise, shock, slippage, correct shift points and smooth operation.

35. RECHECK ENGINE COOLANT LEVEL