

## INSTALLATION

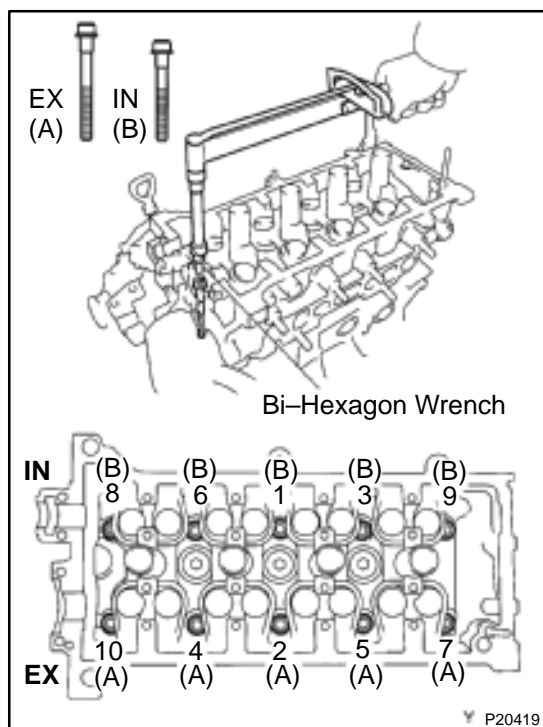
### 1. PLACE CYLINDER HEAD ON CYLINDER BLOCK

- Place a new cylinder head gasket in position on the cylinder block.

#### NOTICE:

**Be careful of the installation direction.**

- Place the cylinder head in position on the cylinder head gasket.



### 2. INSTALL CYLINDER HEAD BOLTS

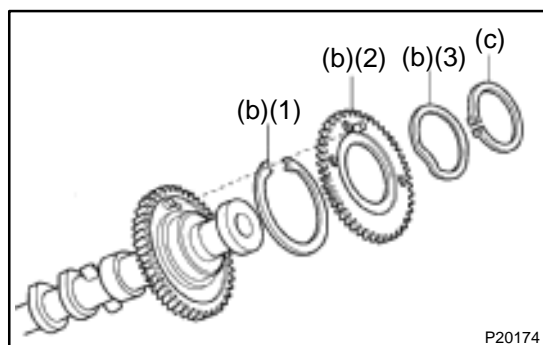
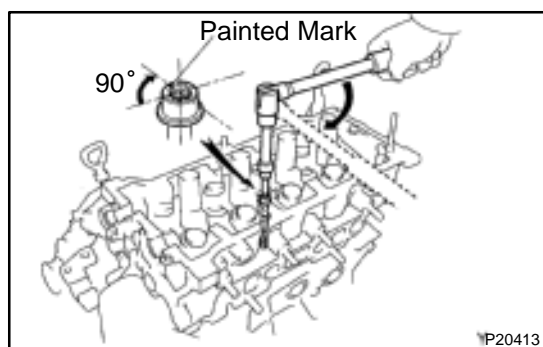
#### HINT:

- The cylinder head bolts are tightened in 2 progressive steps (steps (b) and (d)).
  - If any cylinder head bolt is broken or deformed, replace it.
  - There are 2 lengths of cylinder head bolts, long (A) and short (B).
- Apply a light coat of engine oil on the threads and under the heads of the cylinder head bolts.
  - First, using a bi-hexagon wrench 8 mm, install and uniformly tighten the 10 cylinder head bolts, in several passes, in the sequence shown.

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

If any one 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 90° in the numerical order shown.
- Check that the painted mark is now at a 90° angle to front.



### 3. ASSEMBLE INTAKE CAMSHAFT

- Mount the hexagonal wrench head portion of the camshaft in a vise.

#### NOTICE:

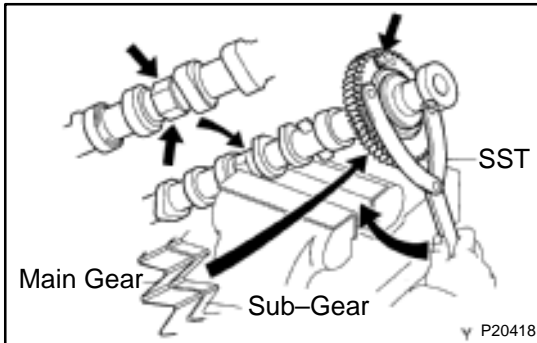
**Be careful not to damage the camshaft.**

- Install these parts:
  - Camshaft gear spring
  - Camshaft sub-gear
  - Wave washer

**HINT:**

Align the pins on the gears with the gear spring ends.

- (c) Using snap ring pliers, install the snap ring.



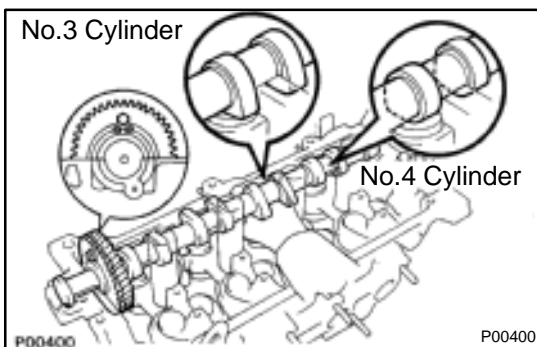
- (d) Using SST, align the holes of the camshaft main gear and sub-gear by turning camshaft sub-gear clockwise, and install a service bolt.

SST 09960-10010 (09962-01000, 09963-00500)

#### 4. INSTALL INTAKE AND EXHAUST CAMSHAFTS

**NOTICE:**

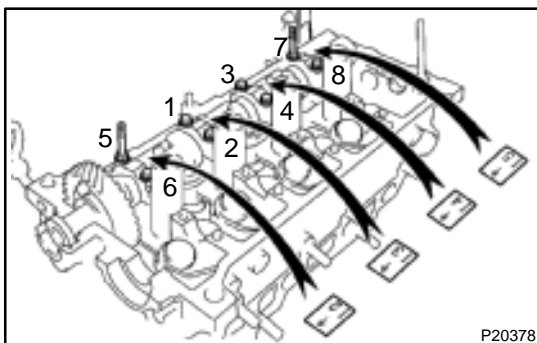
Since the thrust clearance of the camshaft is small, the camshaft must be kept level while it is being installed. If the camshaft is not kept level, the portion of the cylinder head receiving the shaft thrust may crack or be damaged, causing the camshaft to seize or break. To avoid this, the following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



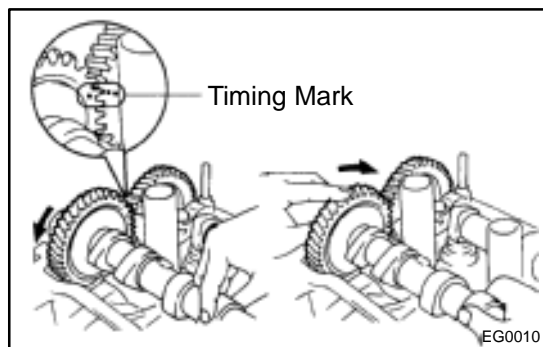
- (a) Apply engine oil to the thrust portion of intake camshaft.  
(b) Place the intake camshaft as shown in the illustration so that the service bolt of the intake camshaft gears are directly above.

**HINT:**

This helps to lift the intake camshaft in a level and uniform manner by pushing No.3 and No.4 cylinder cam lobes of the intake camshaft toward their valve lifters.



- (c) Install the 4 bearing caps in their proper locations.  
(d) Temporarily tighten the bearing cap bolts uniformly and alternately, in several passes, in the sequence shown until the bearing caps are snug with the cylinder head.

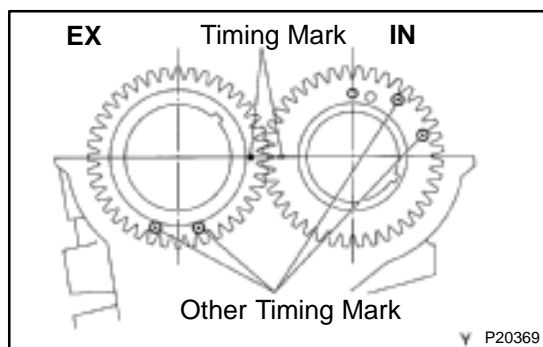


- (e) Apply engine oil to thrust portion of the exhaust camshaft.
- (f) Engage the exhaust camshaft gear to the intake camshaft gear by matching the timing marks on each gear.

**NOTICE:**

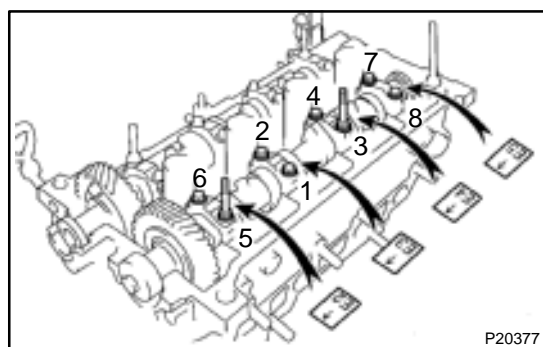
**There are also assembly reference marks on each gear as shown in the illustration. Do not use these marks.**

- (g) Roll down the exhaust camshaft onto the bearing journals while engaging gears with each other.

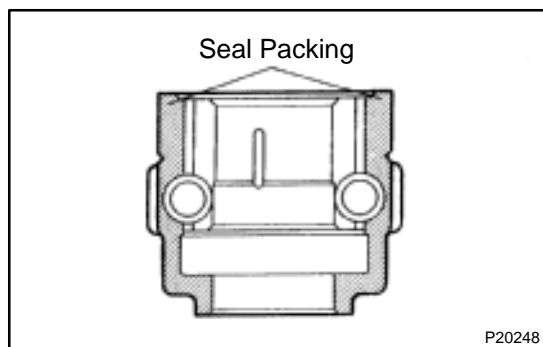
**HINT:**

The above angle allows the No.2 and No.4 cylinder cam lobes of the exhaust camshaft to push their valve lifters evenly.

- (h) Lightly push the exhaust camshaft gear without applying excessive force.



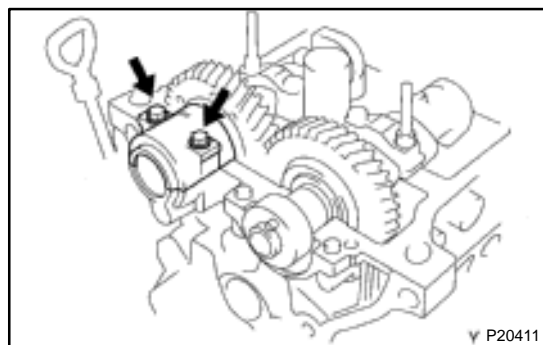
- (i) Install the 4 bearing caps in their proper locations.
- (j) Temporarily tighten the bearing cap bolts uniformly and alternately, in several passes, in the sequence shown until the bearing caps are snug with the cylinder head.
- (k) Remove the service bolt.



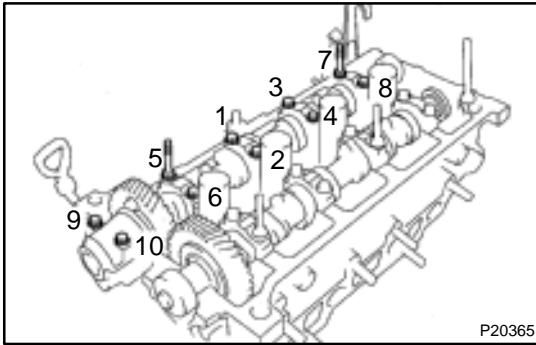
- (l) Clean the installed surfaces of the No.2 bearing cap and cylinder head with cleaner.
- (m) Apply seal packing to the No.2 bearing cap as shown.

**Seal packing:**

**Part No. 08826-00080 or equivalent**

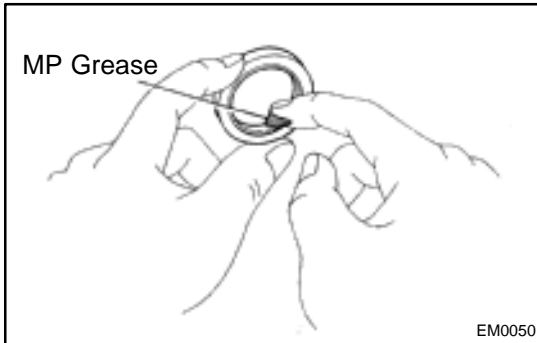


- (n) Place the No.2 bearing cap in its proper location. When doing this, check that there is no gap between the cylinder head and the contact surface of bearing cap.
- (o) Temporarily tighten the bearing cap bolts, alternately tightening the left and right bolts uniformly.
- (p) Install the camshaft housing plug.

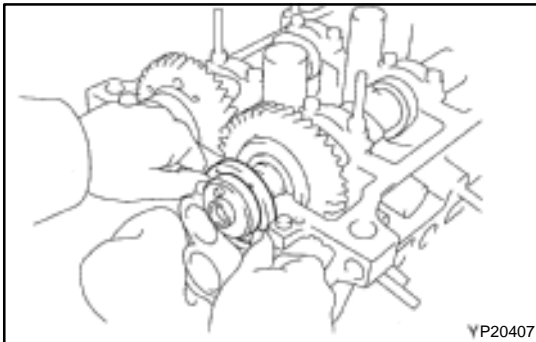


- (q) Install and uniformly tighten the 10 bearing cap bolts, in several passes, in the sequence shown.

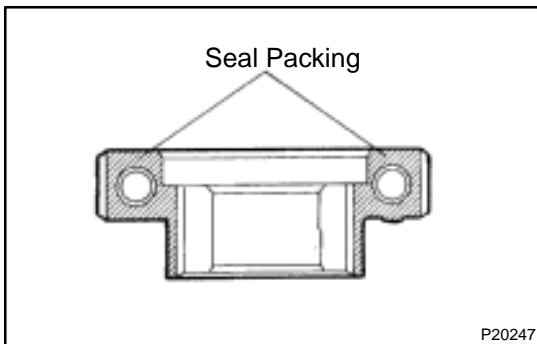
**Torque: 13 N·m (130 kgf-cm, 9 ft-lbf)**



- (r) Apply MP grease to a new camshaft oil seal lip.



- (s) Install the oil seal as far as the deepest part of the cylinder head.

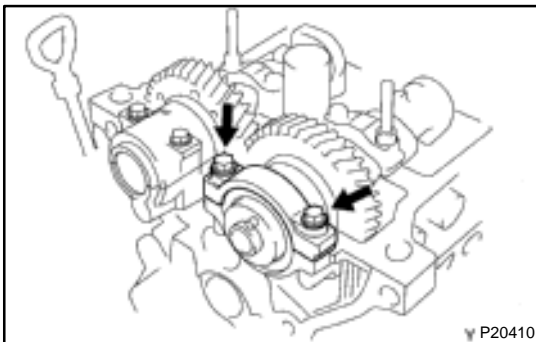


- (t) Clean the installed surfaces of the No.1 bearing cap and cylinder head with cleaner.

- (u) Apply seal packing to the No.1 bearing cap as shown.

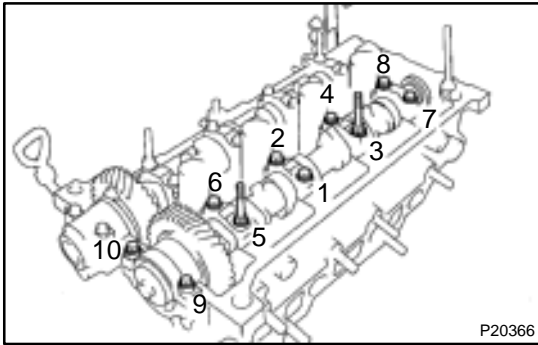
**Seal packing:**

**Part No. 08826-00080 or equivalent**



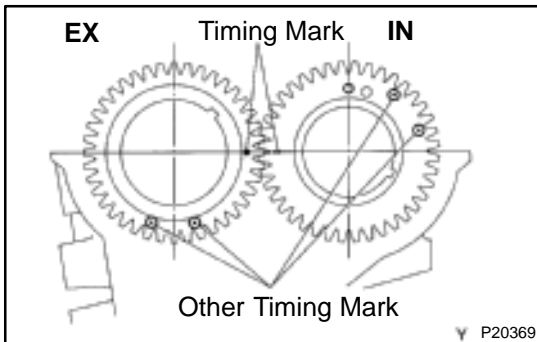
- (v) Place the No.1 bearing cap in its proper location. When doing this, check that there is no gap between the cylinder head and the contact surface of bearing cap.

- (w) Temporarily tighten the bearing cap bolts, alternately tightening the left and right bolts uniformly.



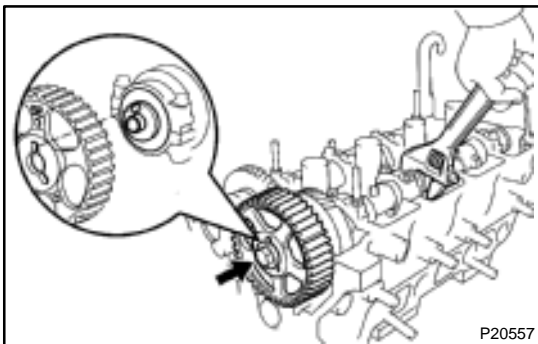
- (x) Install and uniformly tighten the 10 bearing cap bolts, in several passes, in the sequence shown.

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



- (y) Turn the camshaft 1 revolution and check that the timing marks of the camshaft gears are aligned.

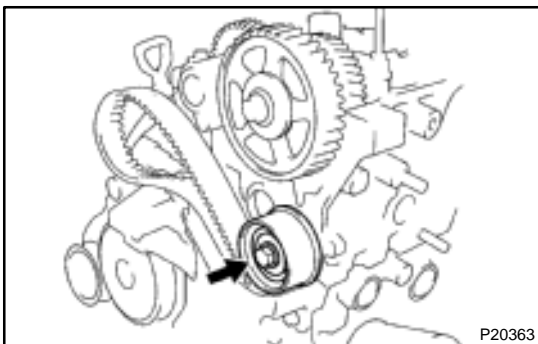
**5. CHECK AND ADJUST VALVE CLEARANCE**  
(See page [EM-5](#))



**6. INSTALL CAMSHAFT TIMING PULLEY**

- (a) Align the camshaft knock pin with the knock pin groove on the pulley side with the 5E mark, and slide the pulley.  
(b) Secure the hexagonal portion of the camshaft, and install and torque the bolt.

**Torque: 51 N·m (510 kgf-cm, 37 ft-lbf)**



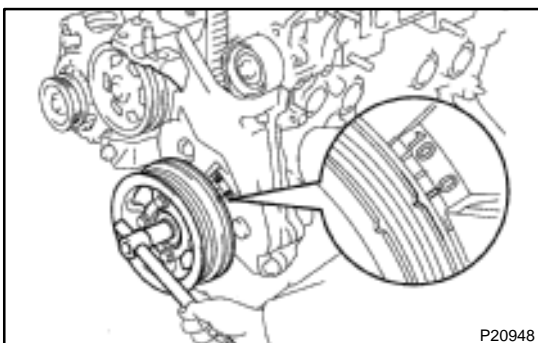
**7. INSTALL NO.2 IDLER PULLEY**

Install the idler pulley with the bolt. Torque the bolt.

**Torque: 28 N·m (280 kgf-cm, 20 ft-lbf)**

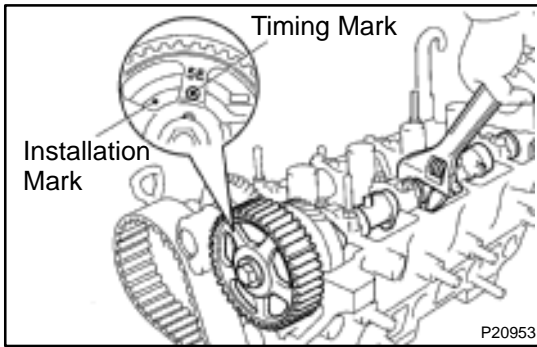
**HINT:**

Remove any oil or water on the idler pulley and keep it clean.

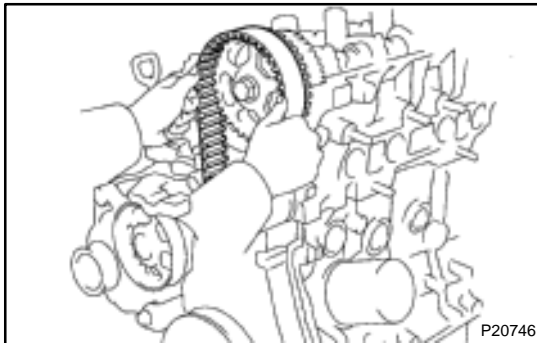


**8. SET NO.1 CYLINDER TO TDC/COMPRESSION**

- (a) Turn the crankshaft pulley, and align its groove with timing mark "0" of the No.1 timing belt cover.

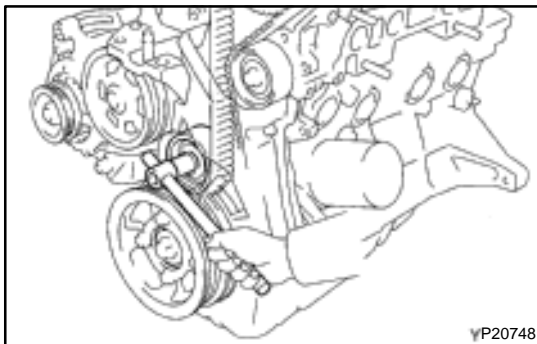


- (b) Turn the camshaft, and align the hole of the camshaft timing pulley on the side with the 5E mark with the timing mark of the bearing cap.

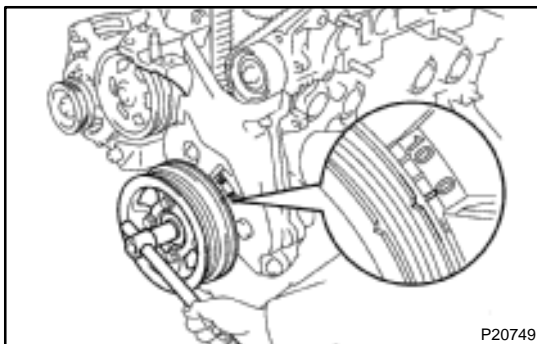


## 9. INSTALL TIMING BELT

- (a) Starting from the right hand side of the pulley and installing the belt counterclockwise.



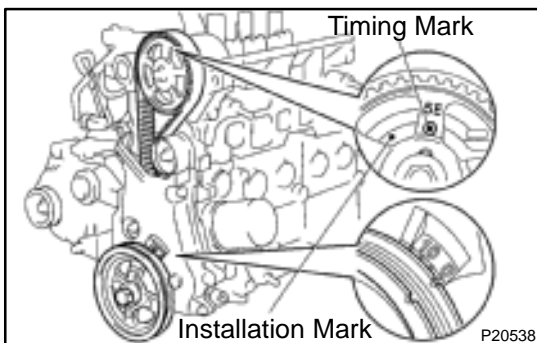
- (b) Loosen the No.1 idler pulley mounting bolt until the pulley is moved slightly by the spring tension.



- (c) Turn the crankshaft pulley 2 revolutions from TDC to TDC.

### NOTICE:

**Always turn the crankshaft clockwise.**



- (d) Check that each pulley aligns with the timing marks as shown in the illustration.

If the timing marks do not align, remove the timing belt and reinstall it.

- (e) Tighten the mounting bolt of the No.1 idler pulley.

**Torque: 18.5 N·m (185 kgf·cm, 13 ft·lbf)**

## 10. INSTALL NO.3 TIMING BELT COVER

## 11. INSTALL GENERATOR DRIVE BELT

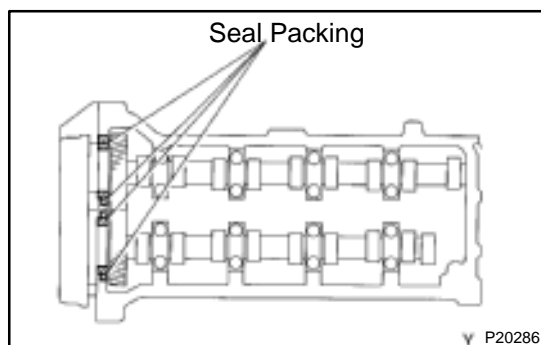
(See page [CH-2](#))

**12. INSTALL NO.2 TIMING BELT COVER**

- (a) Install the gasket to the belt cover.
- (b) Install the belt cover with the 4 bolts.

**13. INSTALL CHARCOAL CANISTER**

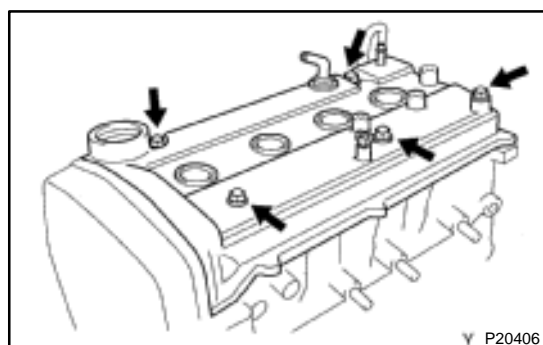
(See page [EM-18](#))

**14. INSTALL CYLINDER HEAD COVER**

- (a) Apply seal packing to the cylinder head 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 5 seal washers and nuts.

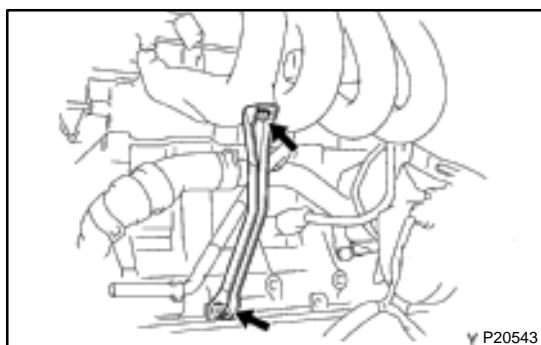
**Torque: 7.0 N·m (70 kgf·cm, 61 in.-lbf)**

- (d) Install the oil filler cap.

**15. INSTALL INTAKE MANIFOLD**

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

**Torque: 19.5 N·m (195 kgf·cm, 14 ft·lbf)**



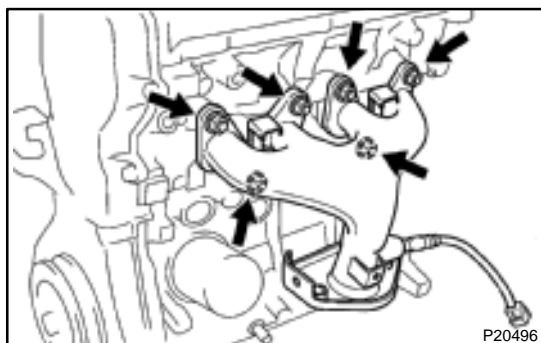
- (b) Install the manifold stay with the bolt and nut.

**Torque: 20 N·m (200 kgf·cm, 15 ft·lbf)**

- (c) Connect the engine wire clamps to the intake manifold stay.

**16. CONNECT BRAKE BOOSTER AND MAP VACUUM HOSES****17. INSTALL INJECTORS AND DELIVERY PIPE**

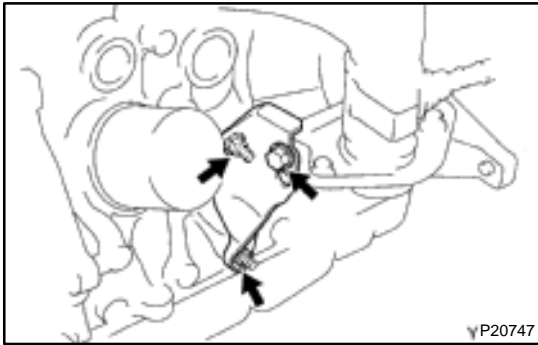
(See page [SF-21](#))

**18. INSTALL EXHAUST MANIFOLD**

- (a) Install a new gasket and the exhaust manifold with the 6 nuts. Uniformly tighten the nuts in several passes.

**Torque: 48 N·m (480 kgf·cm, 35 ft·lbf)**

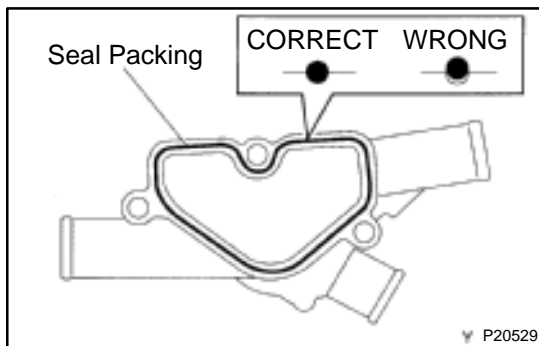




- (b) Place the exhaust manifold stay snug against the cylinder block and exhaust manifold.
- (c) First, tighten the bolt (A) and then the 2 nuts.  
**Torque: 40 N·m (400 kgf·cm, 29 ft·lbf)**
- (d) Install the heat insulator with the 3 bolts.  
**Torque: 8.0 N·m (80 kgf·cm, 69 in·lbf)**

#### 19. INSTALL WATER INLET AND OUTLET HOUSING

- (a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contacting surfaces of the water outlet housing and cylinder head.
  - Using a razor blade and gasket scraper, remove all the packing (FIPG) material from the gasket surfaces.
  - Thoroughly clean all components to remove all the loose material.
  - Clean both sealing surfaces with a non-residue solvent.



- (b) Apply seal packing to the water outlet housing as shown in the illustration.

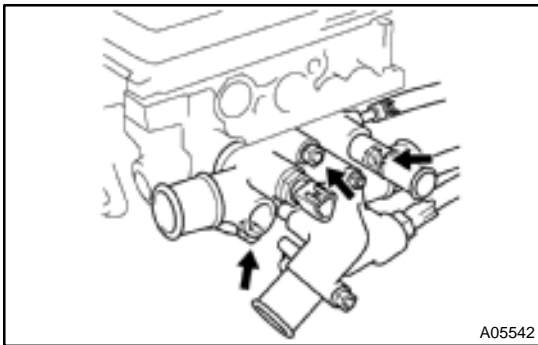
#### Seal packing:

**Part No. 08826-00100, THREE BOND 1282B or equivalent**

- Install a nozzle that has been cut to a 2 – 3 mm (0.08 – 0.12 in.) opening.

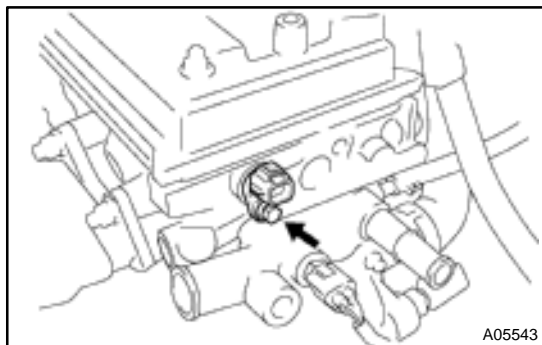
#### HINT:

Avoid applying an excess amount to the surface. Be especially careful near oil passages.



- Parts must be assembled within 15 minutes of application. Otherwise, the material must be removed and reapplied.
- Immediately remove nozzle from tube and reinstall cap.
- Do not pour in any coolant until at least 2 hours after installation is completed.
- (c) Install the water outlet housing with the bolt and 2 nuts.  
**Torque: 17.5 N·m (175 kgf·cm, 13 ft·lbf)**
- (d) Connect these hoses:
  - 2 radiator hoses
  - Water inlet hose
  - Heater outlet hose
- (e) Connect these connectors:
  - Engine coolant temperature sensor connector
  - Fan engine coolant temperature switch connector



**20. INSTALL CAMSHAFT POSITION SENSOR**

- (a) Install a new O-ring to the position sensor.
- (b) Install the position sensor with the bolt.

**Torque: 8.0 N·m (80 kgf·cm, 69 in.-lbf)**

- (c) Connect the position sensor connectors.

**21. INSTALL THROTTLE BODY (See page [SF-30](#))****22. INSTALL IGNITION COILS AND SPARK PLUGS****23. w/ A/C and w/o PS:****INSTALL IDLER PULLEY BRACKET**

- (a) Install the idler pulley bracket with the 3 bolts.

**Torque:**

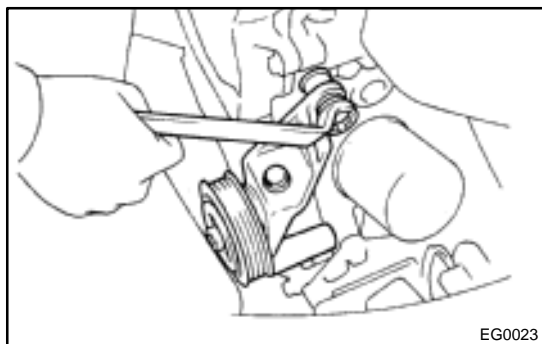
**12 mm head bolt**

**27 N·m (275 kgf·cm, 20 ft-lbf)**

**14 mm head bolt**

**37 N·m (375 kgf·cm, 27 ft-lbf)**

- (b) Install and adjust the drive belt (See page [AC-16](#)).

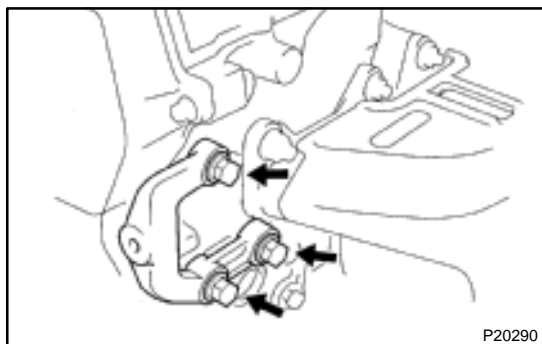
**24. w/ PS:****INSTALL PS PUMP BRACKET AND PS PUMP**

- (a) Install the PS pump bracket with the 3 bolts.

**Torque: 44 N·m (440 kgf·cm, 32 ft-lbf)**

- (b) Temporarily install the PS pump and drive belt with the 2 bolts (See page [SR-29](#)).

- (c) Adjust the belt tension (See page [SR-3](#)).

**25. CONNECT FUEL HOSE**

Connect the fuel inlet hose with the union bolt and 2 new gas-kets.

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

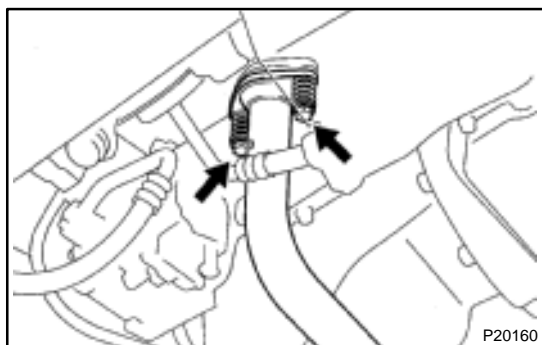
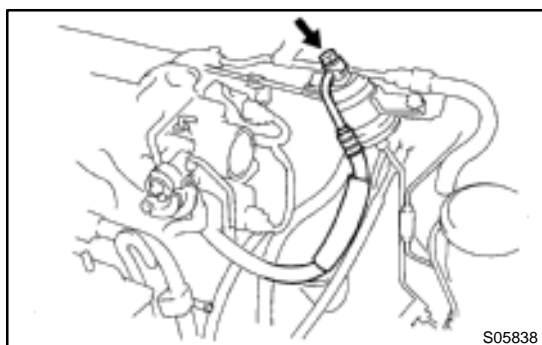
**26. INSTALL AIR CLEANER ASSEMBLY WITH AIR INTAKE CONNECTOR****27. INSTALL VSV FOR EVAP CONNECTOR****28. INSTALL ACCELERATOR CABLE, AND ADJUST IT****29. A/T:****CONNECT THROTTLE CABLE, AND ADJUST IT****30. CONNECT FRONT EXHAUST PIPE**

- (a) Place a new gasket on the exhaust pipe.
- (b) Connect the exhaust pipe to the exhaust manifold with the 2 compression spring and 2 bolts.

**Torque: 62 N·m (630 kgf·cm, 46 ft-lbf)**

**31. INSTALL RH ENGINE UNDER COVER****32. FILL WITH ENGINE COOLANT**

(See page [CO-2](#))

**33. START ENGINE AND CHECK FOR LEAKS**

**34. PERFORM ENGINE ADJUSTMENT****35. PERFORM ROAD TEST**

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

**36. RECHECK ENGINE COOLANT AND ENGINE OIL LEVELS**