

## INSTALLATION

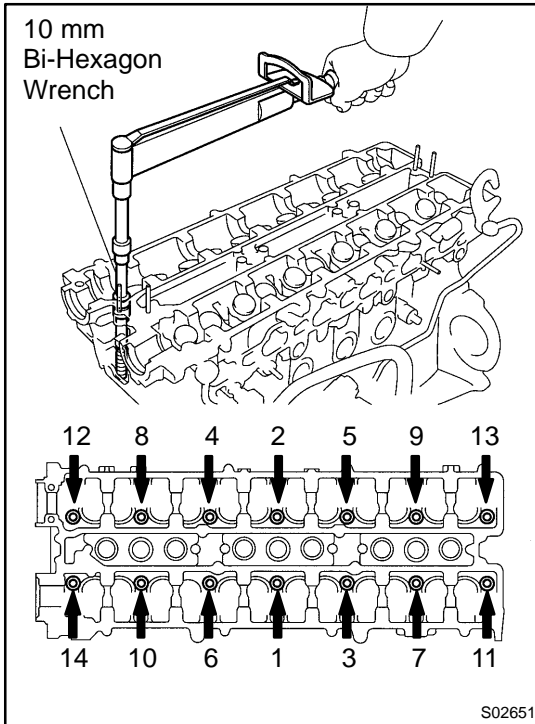
### 1. PLACE CYLINDER HEAD ON CYLINDER BLOCK

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

#### NOTICE:

**Be sure to install it correctly.**

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



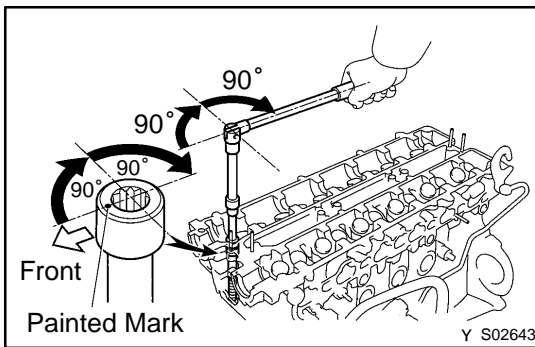
### 2. INSTALL CYLINDER HEAD BOLTS

#### HINT:

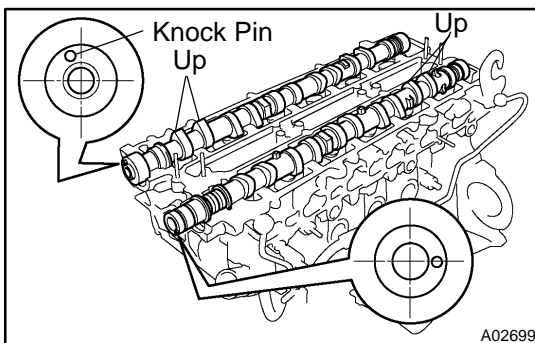
- The cylinder head bolts are tightened in 2 progressive steps (steps (c) and (f)).
  - If any of bolts break or deform, replace them.
- Apply a light coat of engine oil on the threads and under the heads of the cylinder head bolts.
  - Install the 14 plate washers to each cylinder head bolt.
  - Using a 10 mm bi-hexagon wrench, uniformly tighten the cylinder head bolts, in several passes, in the sequence shown.

**Torque: 35 N·m (350 kgf·cm, 26 ft·lbf)**

If any of the bolts do not meet the torque specification, replace the bolt.

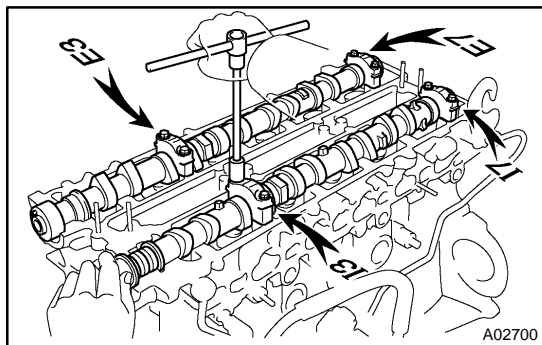


- Mark the front of the cylinder head bolt head with paint.
- Retighten the cylinder head bolts 90° in the numerical order shown.
- Retighten cylinder head bolts by an additional 90° shown.
- Check that the painted mark is now turned to the rear.

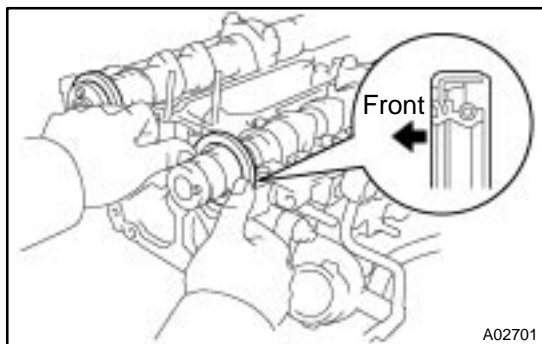


### 3. INSTALL CAMSHAFTS

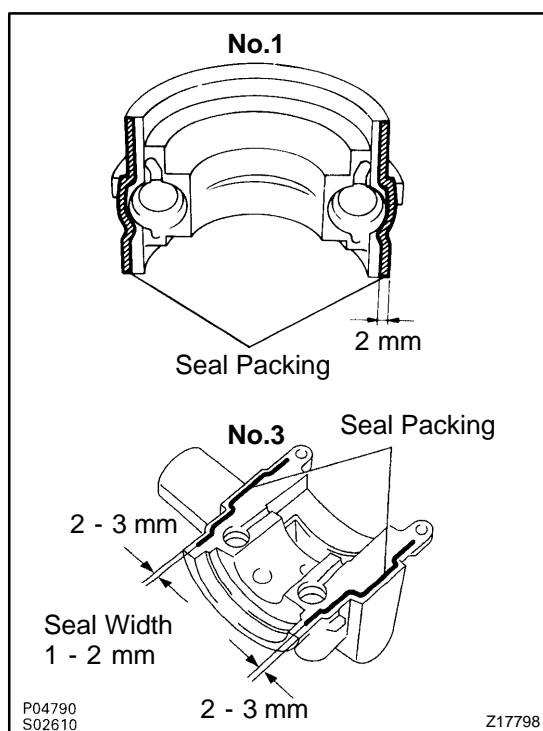
- Apply engine oil to the thrust portion of the camshaft.
- Place the camshaft on the cylinder head with the cam lobe facing up as shown.



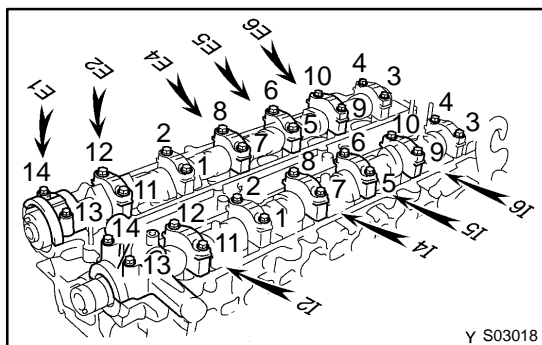
- (c) Place the (Nos. 3, 7 journal) camshaft bearing caps in their proper location.
- (d) Apply a light coat of engine oil on the threads and under the heads of the bearing cap bolts.
- (e) Temporarily tighten these bearing cap bolts uniformly and alternately, in several passes, until the bearing caps are snug with the cylinder head.



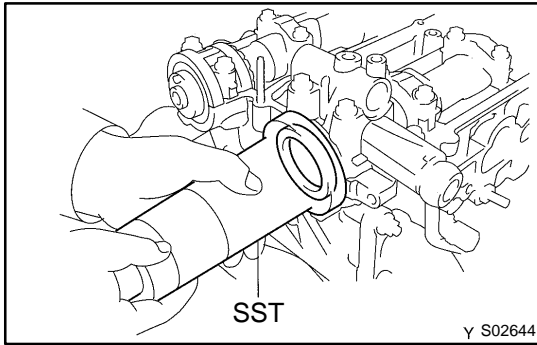
- (f) Apply MP grease to a new camshaft oil seal lip.
- (g) Install the 2 oil seals to the camshafts.



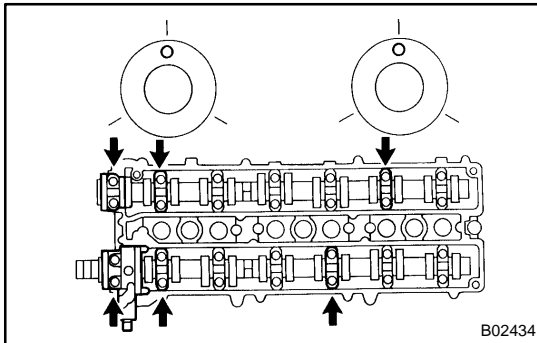
- (h) Clean the installed surfaces of the Nos. 1, 3 camshaft bearing cap and cylinder head with cleaner.
- (i) Apply seal packing to the bearing caps as shown.  
**Seal packing: Part No. 08826-00080 or equivalent**



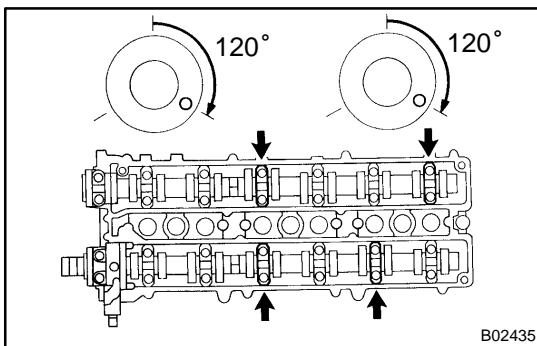
- (j) Install the other bearing caps in their proper locations.
- (k) Apply a light coat of engine oil on the threads and under the heads of the bearing cap bolts.
- (l) Install and uniformly tighten the 14 bearing cap bolts on one side, in several passes, in the sequence shown.  
**Torque: 20 N·m (200 kgf-cm, 15 ft-lbf)**
- (m) Using a 5 mm hexagon wrench, the 2 No. 3 camshaft bearing cap bolts.  
**Torque: 5.0 N·m (50 kgf-cm, 44 in.-lbf)**



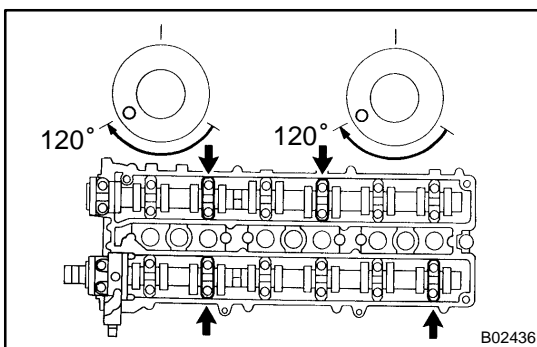
- (n) Using SST, push the 2 oil seals in as far as they can go.  
SST 09316-6001 1 (09316-00011, 09316-00051)



- (o) Rotate the camshaft with a wrench at the hexagon position, bring the forward straight pin up.  
(p) Loosen the 12 bearing cap bolts as shown, until they can be turned by hand; retighten in several passes.  
**Torque: 20 N·m (200 kgf-cm, 15 ft-lbf)**



- (q) Turn the camshaft 1/3 of a revolution.  
(r) Loosen the 8 bearing cap bolts as shown, until they can be turned by hand; retighten in several passes.  
**Torque: 20 N·m (200 kgf-cm, 15 ft-lbf)**



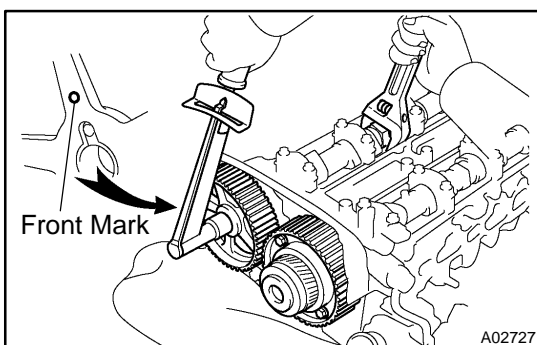
- (s) Turn the camshaft a further 1/3 of a revolution.  
(t) Loosen the 8 bearing cap bolts as shown, until they can be turned by hand; retighten in several passes.  
**Torque: 20 N·m (200 kgf-cm, 15 ft-lbf)**

#### 4. CHECK AND ADJUST VALVE CLEARANCE (See page EM-5)

#### 5. INSTALL NO. 4 TIMING BELT COVER

Install the timing belt cover with 4 bolts.

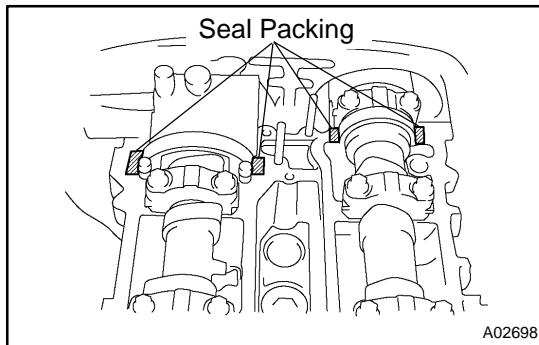
**Torque: 8.0 N·m (80 kgf-cm, 71 in.-lbf)**



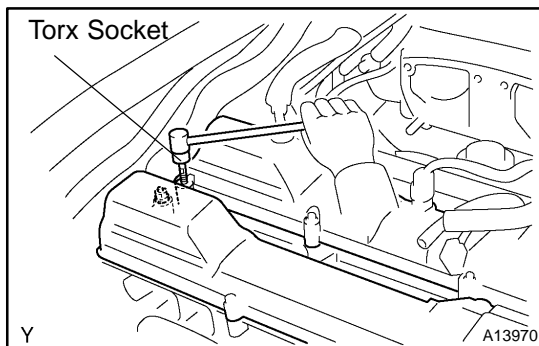
#### 6. INSTALL CAMSHAFT TIMING PULLEYS

- (a) Install the exhaust camshaft timing pulley.
- (1) Align the camshaft knock pin with the groove in the pulley, and slide on the pulley.
  - (2) Slide the timing pulley on the camshaft, facing the front mark forward.
  - (3) Hold the hexagon portion of the camshaft with a wrench, and tighten the timing pulley bolt.
- Torque: 81 N·m (810 kgf-cm, 60 ft-lbf)**

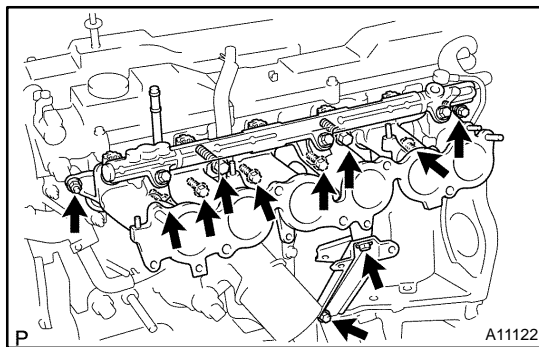
- (b) Install the VV-i (intake camshaft timing) pulley (See page [EM-24](#) ).
- 7. **CONNECT TIMING BELT TO CAMSHAFT TIMING PULLEYS** (See page [EM-24](#) )



- 8. **INSTALL NO. 1 AND NO. 2 CYLINDER HEAD COVERS**
    - (a) Remove the any old packing (FIPG) material.
    - (b) Apply seal packing to the cylinder head as shown in the illustration.
- Seal packing: Part No. 08826-00080 or equivalent**
- (c) Install the gaskets to the cylinder head covers.
  - (d) Install the cylinder head covers with the 12 bolts.
- Torque: 8.5 N·m (85 kgf·cm, 75 in.-lbf)**

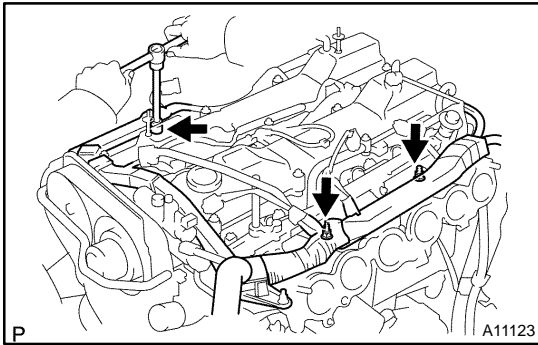


- (e) Using a torx socket (E5), install the 4 stud bolts.
- Torque: 8.5 N·m (85 kgf·cm, 75 in.-lbf)**
- (f) Install the 4 nuts to the stud bolts.
- Torque: 8.5 N·m (85 kgf·cm, 75 in.-lbf)**



- 9. **INSTALL INTAKE MANIFOLD ASSEMBLY**
    - (a) Install a new gasket and the intake manifold and delivery pipe assembly with the 7 bolts and 2 nuts.

**Torque: 28 N·m (280 kgf·cm, 21 ft-lbf)**
  - (b) Pass the water bypass hose between the No. 2, No. 3 intake ports of the manifold and delivery pipe.
  - (c) Install the manifold stay with the 2 bolts.
- Torque: 40 N·m (400 kgf·cm, 30 ft-lbf)**
- (d) Install the starter wire to the manifold stay.
10. **INSTALL FUEL PRESSURE PULSATION DAMPER** (See page [SF-27](#) )

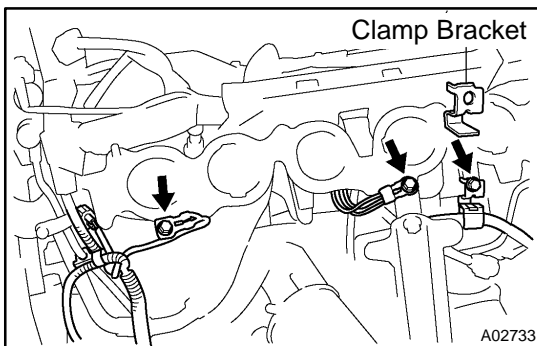
**11. CONNECT ENGINE WIRE TO CYLINDER HEAD**

- (a) Install the engine wire protector with the 3 nuts.
- (b) Using a 5 mm hexagon wrench, install the bolt holding the engine wire protector to the No. 2 cylinder head cover.
- (c) Connect the 6 injector connectors.

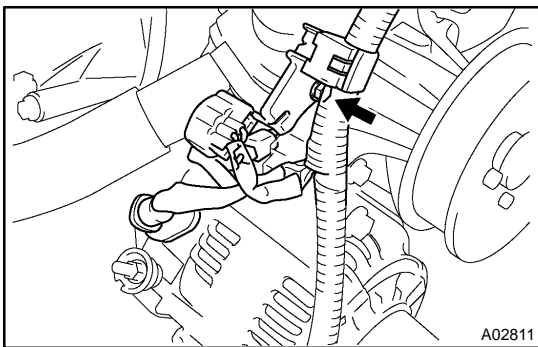
**HINT:**

The Nos. 1, 3, 5 injector connectors and dark gray, and the Nos. 2, 4, 6 injector connectors are brown.

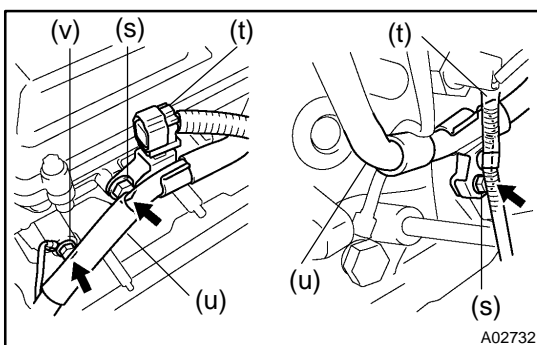
- (d) Connect the camshaft timing oil control valve connector.
- (e) Connect the camshaft position sensor connector.
- (f) Connect the ECT sensor connector.
- (g) Connect the 2 knock sensor connector.
- (h) Connect the starter connector.
- (i) Connect the oil pressure switch connector.
- (j) Connect the oil level sensor connector.



- (k) Install the clamp bracket to the intake manifold.
- (l) Connect the 2 wire clamps to the No. 1 oil pipe and clamp bracket on the intake manifold.
- (m) Install the 2 ground terminals to the intake manifold. Tighten so that each calking part should face inside.



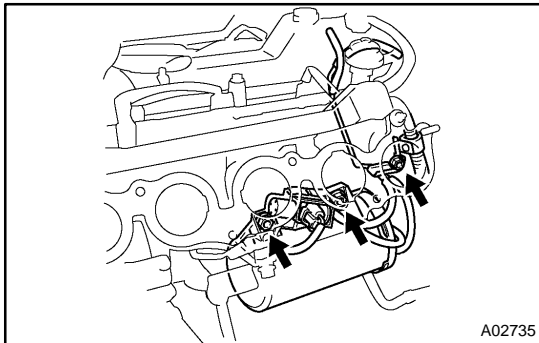
- (n) Install the clamp bracket to the water pump.
- (o) Connect the generator connector.
- (p) Connect the crankshaft position sensor connector.
- (q) Connect the heated oxygen sensor (bank 1 sensor 1) connector.
- (r) Secure the engine wire with the clamp.



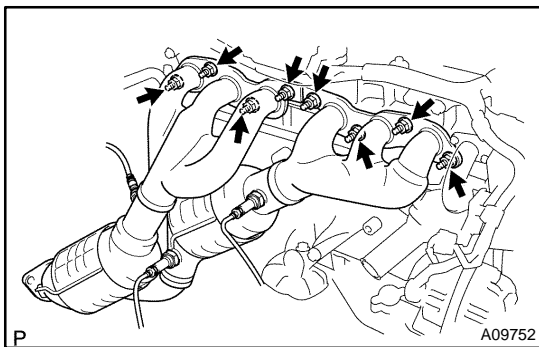
- (s) Install the 2 hose clamps to the cylinder head and oil filter bracket.
- (t) Install the heated oxygen sensor (bank 2 sensor 1) connector and engine wire clamp to the hose clamps.
- (u) Install the 2 water bypass hoses to the hose clamps on the cylinder head and oil filter bracket.
- (v) Install the ground strap to the cylinder head.

**12. INSTALL SPARK PLUGS****13. INSTALL IGNITION COILS AND HIGH-TENSION CORD SET ASSEMBLY (See page IG-9)**

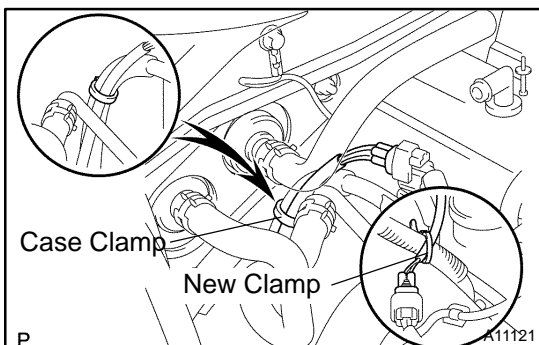
- 14. INSTALL NO. 3 TIMING BELT COVER**  
Torque: 8.0 N·m (80 kgf-cm, 71 in.-lbf)



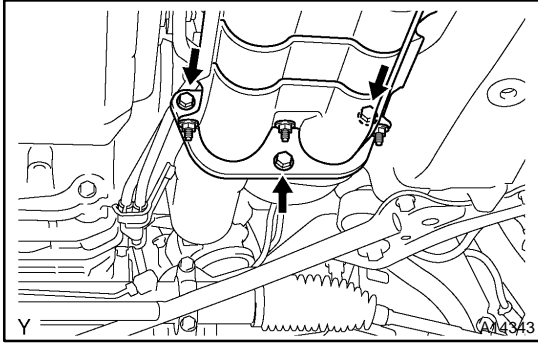
- 15. INSTALL VACUUM CONTROL VALVE SET AND NO. 2 VACUUM PIPE**
- (a) Install the vacuum control valve set and No. 2 vacuum pipe with the 3 nuts.  
Torque: 21 N·m (210 kgf-cm, 15 ft-lbf)
  - (b) Install the engine wire clamp to the clamp bracket of the No. 2 vacuum pipe.
  - (c) Connect the VSV connector for the ACIS.
- 16. INSTALL AIR INTAKE CHAMBER (See page SF-49 )**
- 17. INSTALL OIL DIPSTICK AND GUIDE FOR A/T (See page EM-71 )**
- 18. INSTALL OIL DIPSTICK AND GUIDE FOR ENGINE (See page LU-12 )**
- 19. INSTALL THROTTLE BODY AND INTAKE AIR CONNECTOR ASSEMBLY (See page EM-5 )**
- 20. INSTALL WATER BYPASS OUTLET AND NO. 1 WATER BYPASS PIPE (See page CO-14 )**



- 21. INSTALL EXHAUST MANIFOLD**
- (a) Install 2 new gaskets to the cylinder head.
  - (b) Using a 14 mm deep socket wrench, install the exhaust manifold with the 8 nuts. Uniformly tighten the nuts in several passes.  
Torque: 40 N·m (410 kgf-cm, 30 ft-lbf)
  - (c) Connect the 3 heated oxygen sensor connectors and clamp.



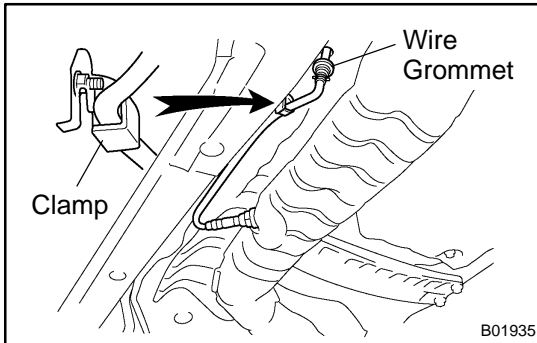
- (d) Install a new clamp and the case clamp as shown in the illustration.



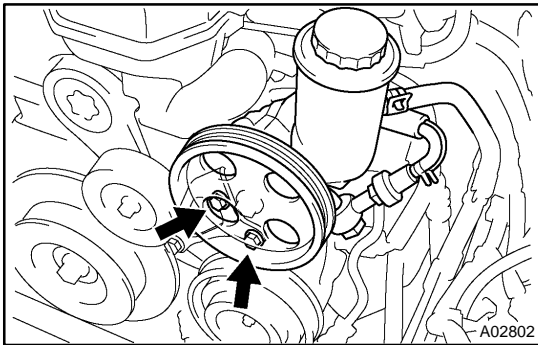
## 22. CONNECT FRONT EXHAUST PIPE TO EXHAUST MANIFOLD

- Temporarily install the pipe support bracket to the transmission with the 2 bolts.
- Install 2 new gaskets to front end of the front exhaust pipe, and connect the front exhaust pipe to the exhaust manifold with the 3 bolts nuts and retainer.

**Torque: 43 N·m (438 kgf-cm, 32 ft-lbf)**



- Connect the wire grommet and sensor wire of the the heated oxygen sensor (bank 2 sensor 2) to the hole and clamp on the floor.



## 23. INSTALL PS PUMP

- Install the vane pump with the 2 bolts.  
**Torque: 58 N·m (590 kgf-cm, 43 ft-lbf)**
- Install the pump rear stay with the 2 bolts.  
**Torque: 39.2 N·m (400 kgf-cm, 29 ft-lbf)**
- Connect the PS air hose to the No.4 timing belt cover.
- Connect the PS air hose to the air intake chamber.

## 24. INSTALL DRIVE BELT (See page [CH-1](#) )

## 25. M/T:

### INSTALL DRIVE BELT TENSIONER ABSORBER

Install the absorber with the 2 nuts.

**Torque: 20 N·m (200 kgf-cm, 14 ft-lbf)**

## 26. INSTALL AIR CLEANER, MAF METER AND INTAKE AIR RESONATOR ASSEMBLY (See page [EM-71](#) )

## 27. INSTALL AIR CLEANER INLET

## 28. CONNECT UPPER RADIATOR HOSE TO WATER OUT-LET

## 29. INSTALL ENGINE COVER

Install the engine cover with the 4 nuts.

## 30. FILL WITH ENGINE COOLANT

## 31. START ENGINE AND CHECK FOR LEAKS

## 32. INSTALL ENGINE UNDER COVER

## 33. ROAD TEST

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

## 34. RECHECK ENGINE COOLANT LEVEL