

## INSTALLATION

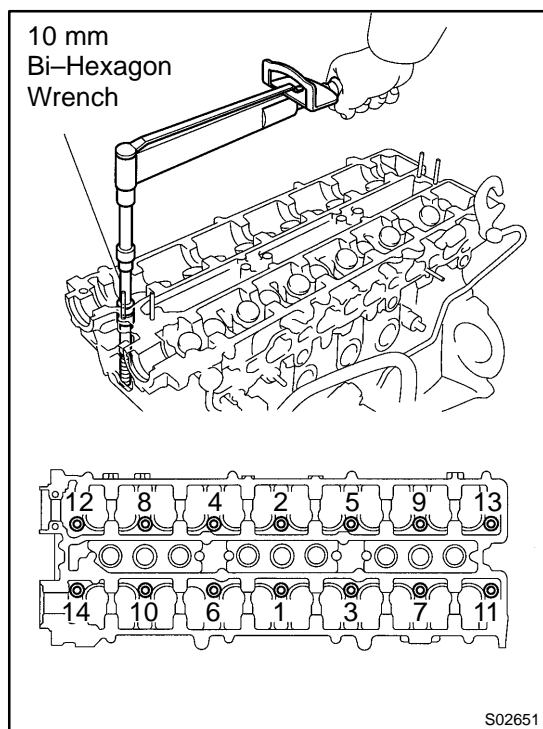
### 1. PLACE CYLINDER HEAD ON CYLINDER BLOCK

- 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.



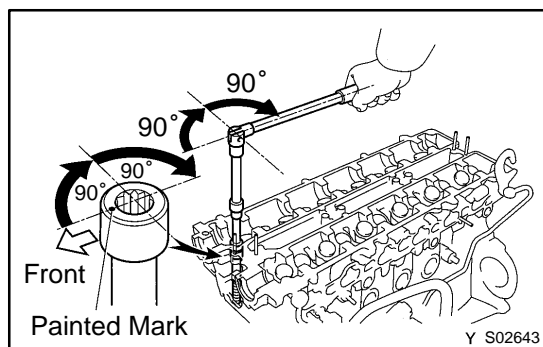
### 2. INSTALL CYLINDER HEAD BOLTS

#### HINT:

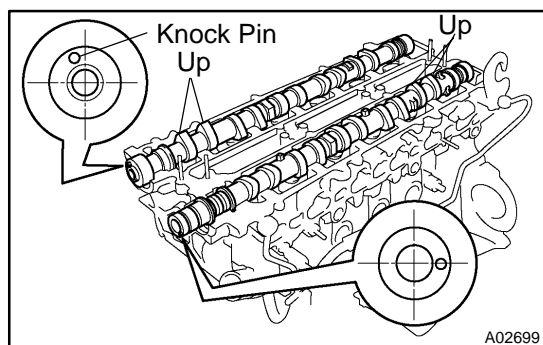
- The cylinder head bolts are tightened in 2 progressive steps (steps (c) and (f)).
  - If any of bolts break or deform, replace them.
- Apply a light coat of engine oil on the threads and under the heads of the cylinder head bolts.
  - Install the 14 plate washers to each cylinder head bolt.
  - Using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

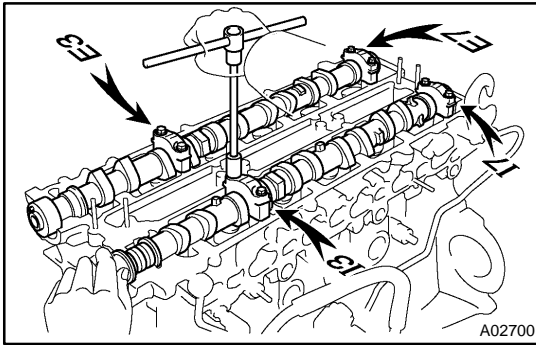


- Mark the front of the cylinder head bolt head with paint.
- Retighten the cylinder head bolts 90° in the numerical order shown.
- Retighten cylinder head bolts by an additional 90° shown.
- Check that the painted mark is now turned to the rear.

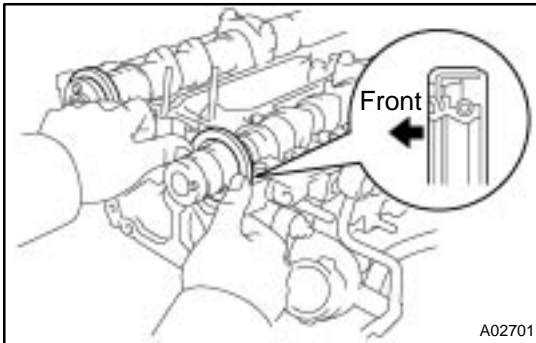


### 3. INSTALL CAMSHAFTS

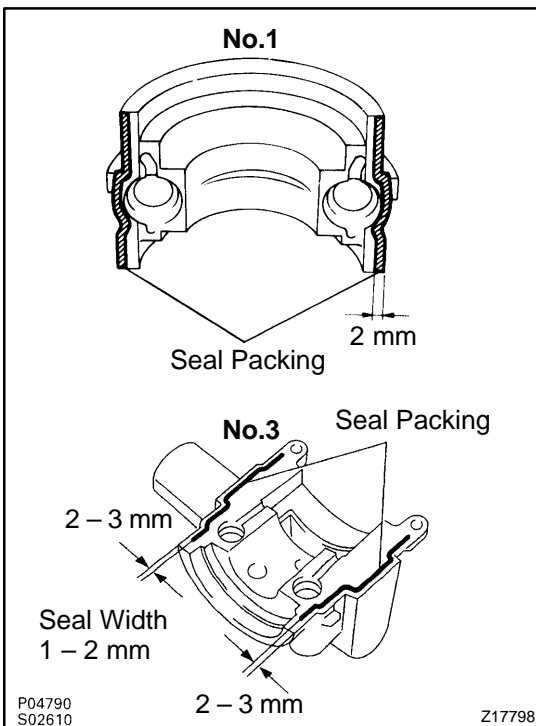
- Apply engine oil to the thrust portion of the camshaft.
- Place the camshaft on the cylinder head with the cam lobe facing up as shown.



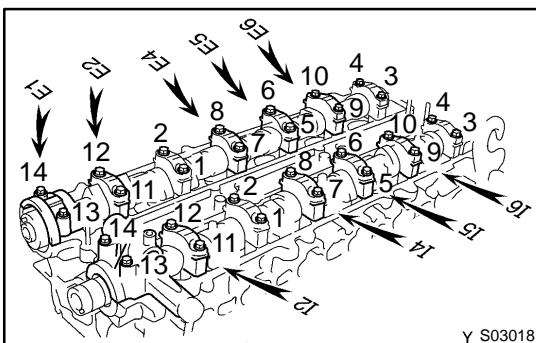
- (c) Place the (Nos. 3, 7 journal) camshaft bearing caps in their proper location.
- (d) Apply a light coat of engine oil on the threads and under the heads of the bearing cap bolts.
- (e) Temporarily tighten these bearing cap bolts uniformly and alternately, in several passes, until the bearing caps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



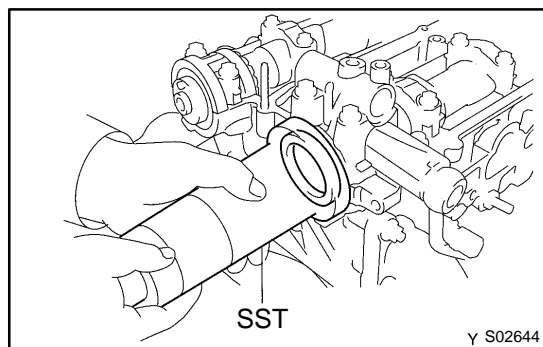
- (f) Apply MP grease to a new camshaft oil seal lip.
- (g) Install the 2 oil seals to the camshafts.



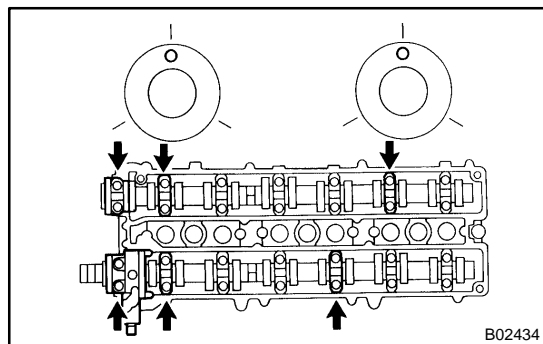
- (h) Clean the installed surfaces of the Nos.1, 3 camshaft bearing cap and cylinder head with cleaner.
- (i) Apply seal packing to the bearing caps as shown.  
**Seal packing: Part No. 08826-00080 or equivalent**



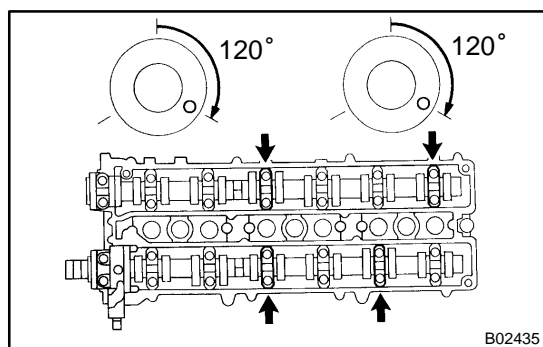
- (j) Install the other bearing caps in their proper locations.
- (k) Apply a light coat of engine oil on the threads and under the heads of the bearing cap bolts.
- (l) Install and uniformly tighten the 14 bearing cap bolts on one side, in several passes, in the sequence shown.  
**Torque: 20 N·m (200 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)**



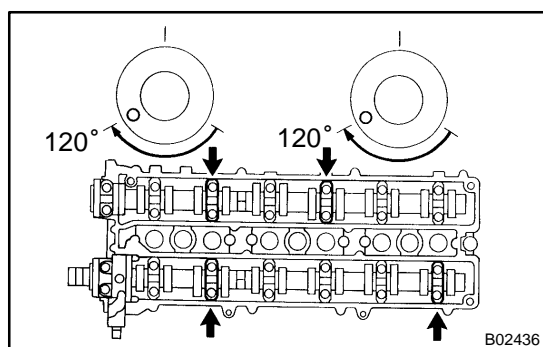
- (n) Using SST, push the 2 oil seals in as far as they can go.  
SST 09316-60011 (09316-00011, 09316-00051)



- (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)**



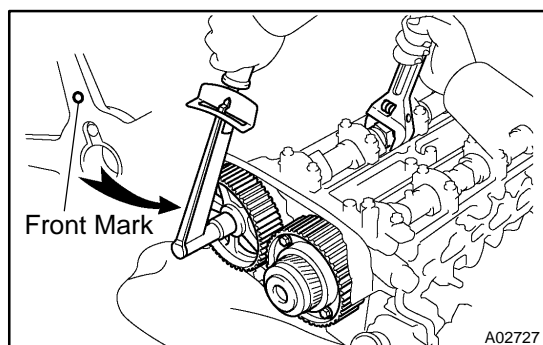
- (s) Turn the camshaft a further 1/3 of a revolution.  
(t) Loosen the 8 bearing cap bolts as shown, until they can be turned by hand; retighten in several passes.  
**Torque: 20 N·m (200 kgf-cm, 15 ft-lbf)**

#### 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.

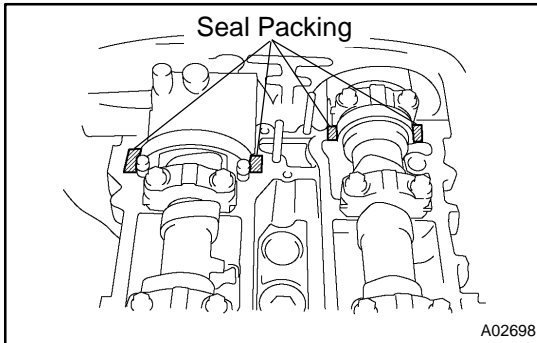
**Torque: 8.0 N·m (80 kgf-cm, 71 in.-lbf)**



#### 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-23](#)).
- 7. **CONNECT TIMING BELT TO CAMSHAFT TIMING PULLEYS** (See page [EM-23](#))

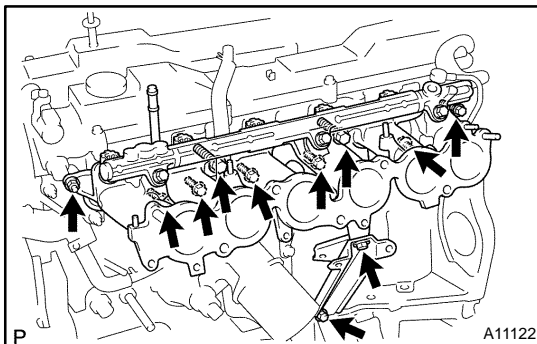


- 8. **INSTALL NO.1 AND NO.2 CYLINDER HEAD COVERS**
  - (a) Remove the any old packing (FIPG) material.
  - (b) Apply seal packing to the cylinder head as shown in the illustration.

**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 and 4 nuts.

**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.

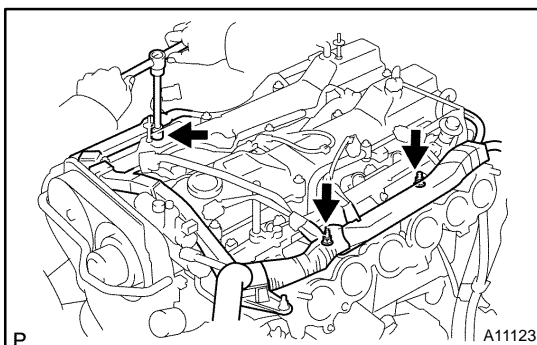
**Torque: 28 N·m (280 kgf·cm, 21 ft·lbf)**

- (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**

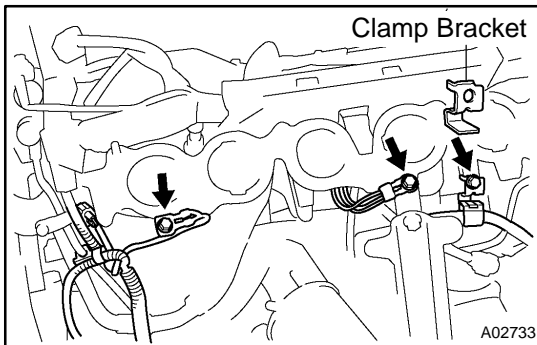
- (a) Install the engine wire protector with the 3 nuts.
- (b) Using a 5 mm hexagon wrench, install the bolt holding the engine wire protector to the No.2 cylinder head cover.
- (c) Connect the 6 injector connectors.

**HINT:**

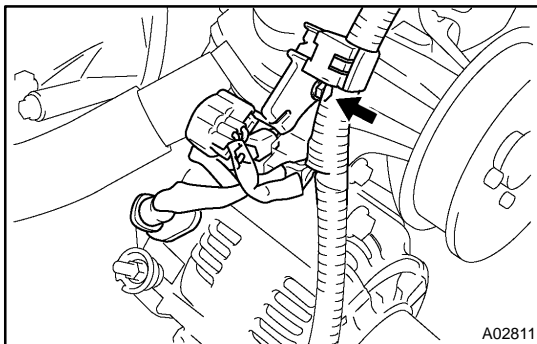
The Nos.1, 3, 5 injector connectors and dark gray, and the Nos.2, 4, 6 injector connectors are brown.

- (d) Connect the camshaft timing oil control valve connector.
- (e) Connect the camshaft position sensor connector.

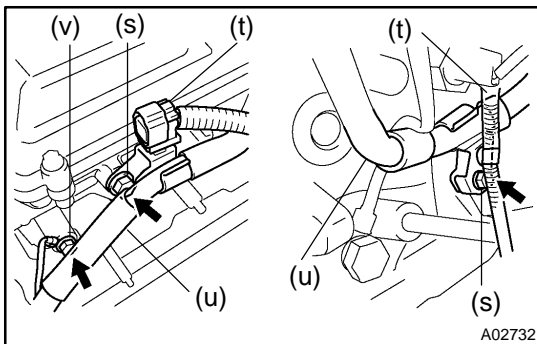
- (f) Connect the ECT sensor connector.
- (g) Connect the 2 knock sensor connector.
- (h) Connect the starter connector.
- (i) Connect the oil pressure switch connector.
- (j) Connect the oil level sensor connector.



- (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.



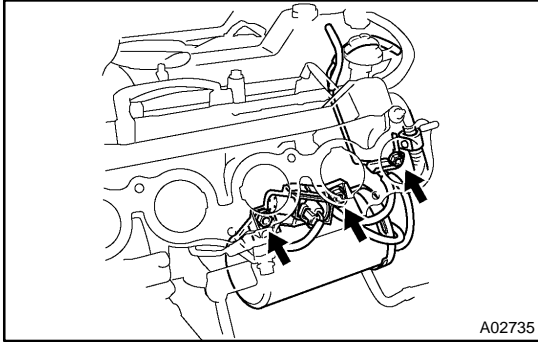
- (n) Install the clamp bracket to the water pump.
- (o) Connect the generator connector.
- (p) Connect the crankshaft position sensor connector.
- (q) Connect the heated oxygen sensor (bank 1 sensor 1) connector.
- (r) Secure the engine wire with the clamp.



- (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.

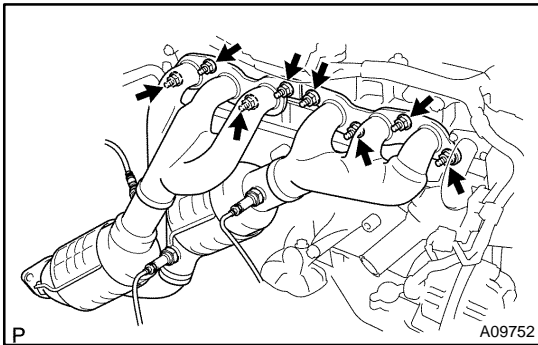
### 16. INSTALL AIR INTAKE CHAMBER (See page SF-49)

### 17. INSTALL OIL DIPSTICK AND GUIDE FOR A/T (See page EM-68)

### 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-13)

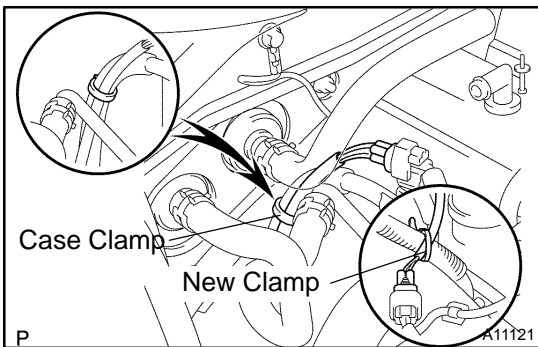


### 21. INSTALL EXHAUST MANIFOLD

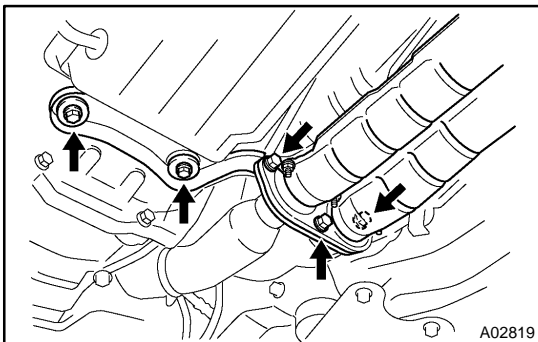
- (a) Install 2 new gaskets to the cylinder head.  
 (b) Using a 14 mm deep socket wrench, install the exhaust manifold with the 8 nuts. Uniformly tighten the nuts in several passes.

**Torque: 40 N·m (408 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.

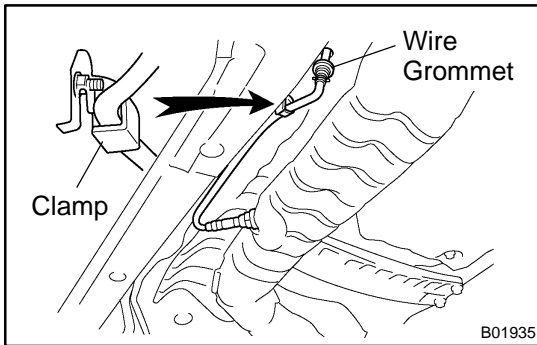


### 22. CONNECT FRONT EXHAUST PIPE TO EXHAUST MANIFOLD

- (a) Temporarily install the pipe support bracket to the transmission with the 2 bolts.  
 (b) 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 and nuts.

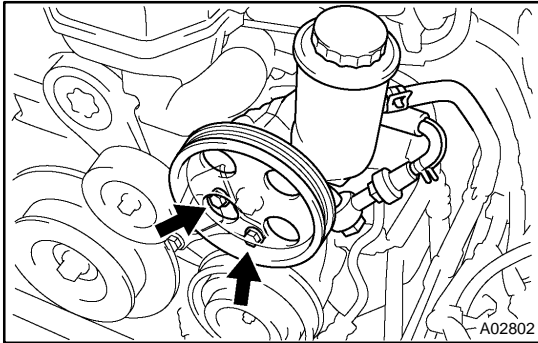
**Torque: 44 N·m (440 kgf-cm, 32 ft-lbf)**

- (c) Tighten the 2 bolts holding the pipe support bracket to the transmission.



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

- (d) 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

- (a) Install the vane pump with the 2 bolts.  
**Torque: 58 N·m (590 kgf-cm, 43 ft-lbf)**  
 (b) Install the pump rear stay with the 2 bolts.  
**Torque: 39.2 N·m (400 kgf-cm, 29 ft-lbf)**

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

### 25. INSTALL AIR CLEANER, MAF METER AND INTAKE AIR RESONATOR ASSEMBLY (See page [EM-68](#))

### 26. INSTALL AIR CLEANER INLET

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

### 28. INSTALL ENGINE COVER

Install the engine cover with the 4 nuts.

### 29. FILL WITH ENGINE COOLANT

### 30. START ENGINE AND CHECK FOR LEAKS

### 31. INSTALL ENGINE UNDER COVER

### 32. ROAD TEST

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

### 33. RECHECK ENGINE COOLANT LEVEL