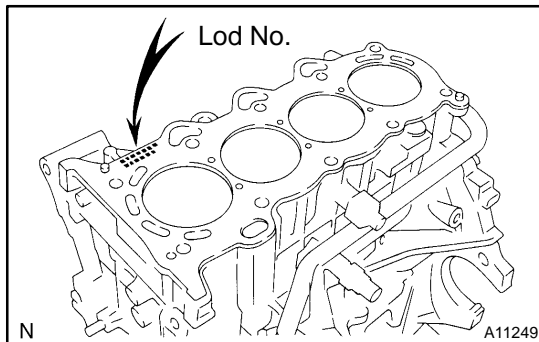


INSTALLATION

HINT:

- Thoroughly clean all parts to be assembled.
- Before installing the parts, apply fresh engine oil to all sliding and rotating surfaces.
- Replace all gaskets and oil seals with new ones.



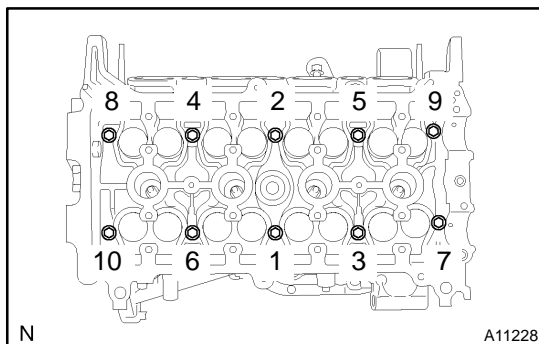
1. PLACE CYLINDER HEAD ON CYLINDER BLOCK

- Place a new cylinder head gasket on the cylinder block surface with the Lod No. stamp upward.

NOTICE:

Be careful of the installation direction.

- Place the cylinder head quietly in order not to damage the gasket with the bottom part of the head.



2. INSTALL CYLINDER HEAD BOLTS

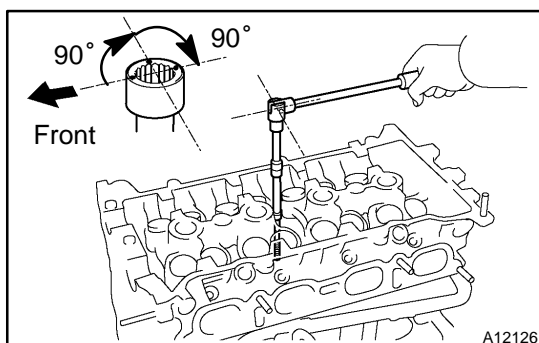
HINT:

- 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.

- Apply a light coat of engine oil on the threads and under the heads of the cylinder head bolts.
- Using a 8 mm bi-hexagon wrench, install and uniformly tighten the 10 cylinder head bolts and plate washers, in several passes, in the sequence shown.

Torque: 29.4 N·m (300 kgf·cm, 22 ft·lbf)

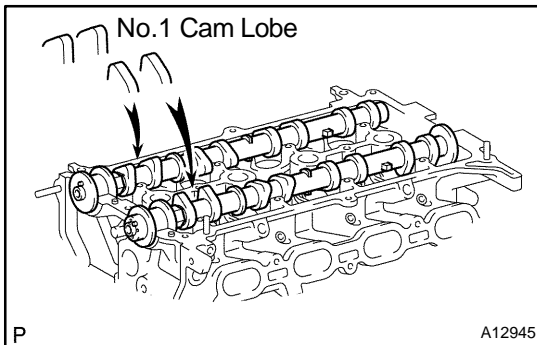
If any one of the cylinder head bolts does not meet the torque specification, replace the cylinder head bolt.



- Mark the front of the cylinder head bolt with paint.
- Retighten the cylinder head bolts by 90° and 90° in the numerical order shown.
- Check that the paint mark is now at a 180° angle to the front.
- Install the bolt holding the water bypass pipe to the cylinder head.

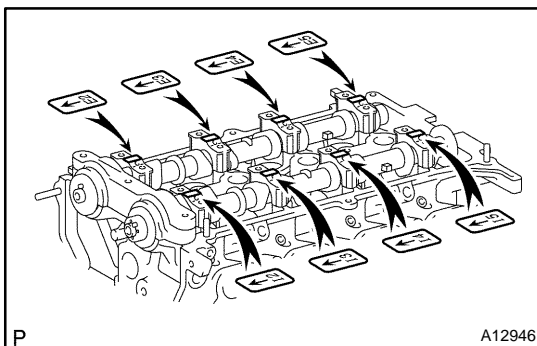
Torque: 9.0 N·m (92 kgf·cm, 80 in.-lbf)

- (g) Connect the upper radiator hose to the water hose unions.
- (h) Connect the heater hose to the water hose unions.



3. INSTALL CAMSHAFTS

- (a) Place the 2 camshafts on the cylinder head with the No.1 cam lobes facing as shown the illustration.

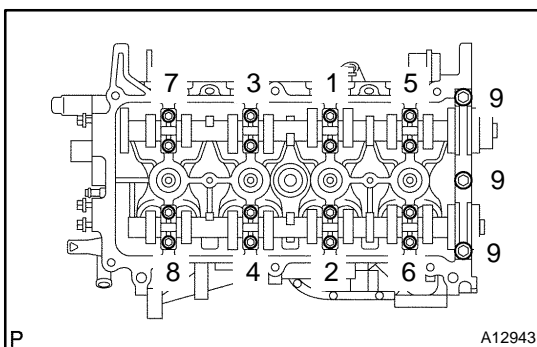


- (b) Install the bearing caps in their proper locations.

HINT:

No. 2 camshaft bearing cap has a number and front mark.

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



- (d) Install and uniformly tighten the 19 bearing cap bolts. After tightening the No.1 camshaft bearing cap, tighten then in several passes, in the sequence shown.

Torque:

No. 1 23 N·m (235 kgf·cm, 17 ft·lbf)

No. 2 12.7 N·m (130 kgf·cm, 10 ft·lbf)

4. INSTALL VALVE TIMING CONTROLLER ASSEMBLY AND CAMSHAFT TIMING SPROCKET

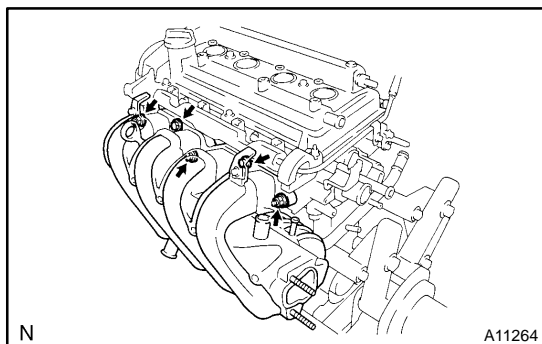
- (a) Apply engine oil in the rage from the tip of the intake camshaft to 16 mm from that tip.
- (b) Align the timing mark on the value timing controller assembly with the knock pin, and install the value timing controller assembly to the camshaft.

NOTICE:

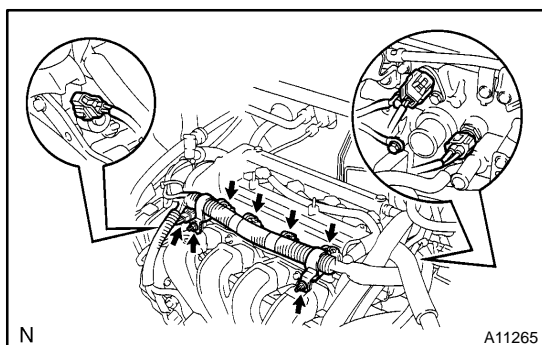
Do not push valve timing controller assembly to the camshaft forcibly when installing it.

- (c) Align the knock pin hole in the camshaft timing sprocket with the knock pin of the camshaft, and install the sprocket to the camshaft.
- (d) Temporarily install the timing sprocket bolt.

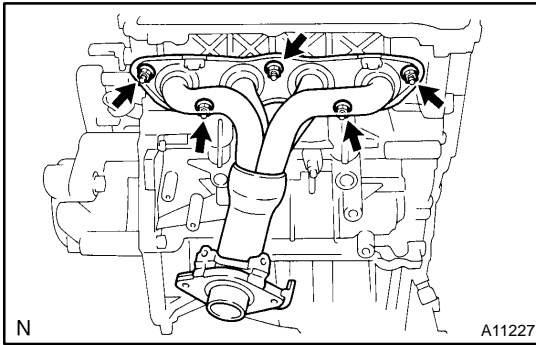
- (e) Hold the hexagon head portion of the camshaft with a wrench, and install the bolt.
Torque: 64 N·m (650 kgf-cm, 47 ft-lbf)
- 5. **CHECK AND ADJUST VALVE CLEARANCE**
(See page [EM-5](#))
- 6. **INSTALL CYLINDER HEAD COVER**
(See page [EM-20](#))
- 7. **INSTALL CAMSHAFT TIMING SPROCKETS**
(See page [EM-20](#))
- 8. **INSTALL OIL FILTER CAP**
- 9. **INSTALL PCV VALVE**
- 10. **INSTALL ECT SENSOR**
(See page [SF-54](#))
- 11. **INSTALL CAMSHAFT POSITION SENSOR**
(See page [IG-10](#))
- 12. **INSTALL TIMING CHAIN COVER**
(See page [EM-20](#))



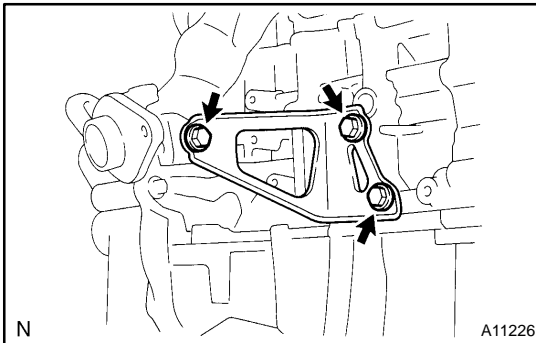
- 13. **INSTALL INTAKE MANIFOLD**
 - (a) Install a new gasket, the intake manifold and 2 brackets with the 2 bolts and 2 nuts. Uniformly tighten the bolts and nuts in several passes.
Torque: 30 N·m (300 kgf-cm, 22 ft-lbf)
 - (b) Connect the EVAP hose for ORVR.
 - (c) Connect the brake booster vacuum hose.



- 14. **CONNECT ENGINE WIRE TO CYLINDER HEAD**
 - (a) Install the engine wire protector to the 2 brackets on the intake manifold with the 2 bolts.
 - (b) Connect the ECT sensor connector.
 - (c) Connect the camshaft position sensor connector.
 - (d) Connect the oil control valve connector.
 - (e) Connect the 4 injector connectors.
 - (f) Connect the 2 ground wire.
- 15. **INSTALL THROTTLE BODY**
(See page [SF-36](#))
- 16. **INSTALL PCV HOSES**
- 17. **INSTALL SPARK PLUGS**
(See page [IG-1](#))
- 18. **INSTALL IGNITION COILS** (See page [IG-7](#))

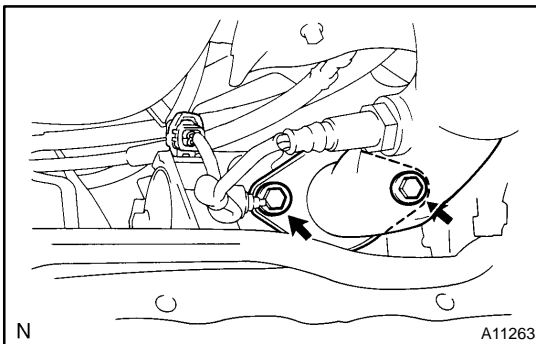
**19. INSTALL EXHAUST MANIFOLD**

- (a) Install a new gasket and the exhaust manifold with the 3 bolts 2 nuts. Uniformly tighten the nuts in several passes.
Torque: 27 N·m (275 kgf-cm, 20 ft-lbf)
- (b) Install the upper heat insulator with the 4 bolts.
Torque: 8.0 N·m (82 kgf-cm, 71 in.-lbf)

**20. INSTALL EXHAUST MANIFOLD STAY**

Install the manifold stay with the 3 bolts. Alternately tighten the bolts.

Torque: 37 N·m (377 kgf-cm, 27 ft-lbf)

**21. CONNECT FRONT EXHAUST PIPE TO EXHAUST MANIFOLD**

- (a) Place a new gasket to the exhaust manifold.
- (b) Install the 2 bolts and 2 springs holding the front exhaust pipe to the exhaust manifold.

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

22. CONNECT ACCELERATOR CABLE**23. INSTALL AIR CLEANER ASSEMBLY****24. INSTALL GENERATOR AND DRIVE BELT**

(See page [CH-17](#))

25. INSTALL WATER FILLER

Install the water filler with the 2 bolts.

Torque: 7.5 N·m (76 kgf-cm, 66 in.-lbf)

26. FILL WITH ENGINE COOLANT**27. START ENGINE AND CHECK FOR LEAKS****28. RECHECK ENGINE COOLANT LEVEL AND OIL LEVEL**