

REASSEMBLY

1. INSTALL STUD BOLT

- (a) Install the stud bolts as shown in the illustration.

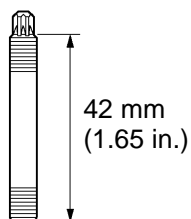
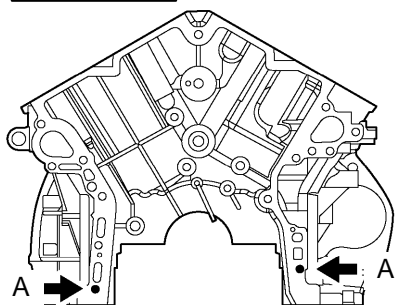
Torque:

Stud bolt A: 11 N·m (112 kgf·cm, 8.1 ft·lbf)

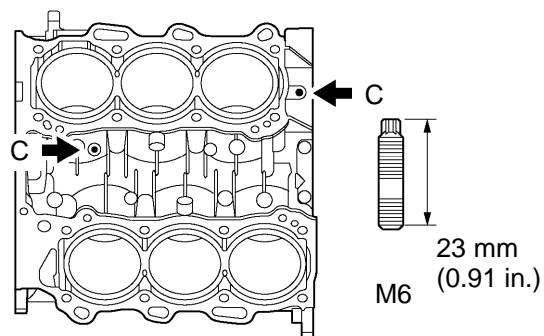
Stud bolt B: 4.5 N·m (46 kgf·cm, 40 in·lbf)

Stud bolt C: 4.0 N·m (41 kgf·cm, 35 in·lbf)

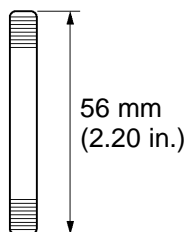
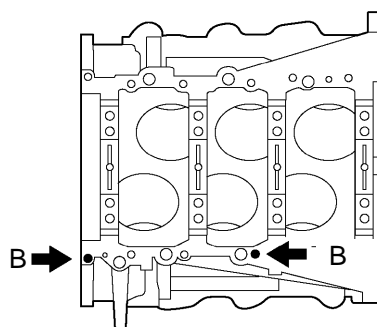
Front Side



Upper Side

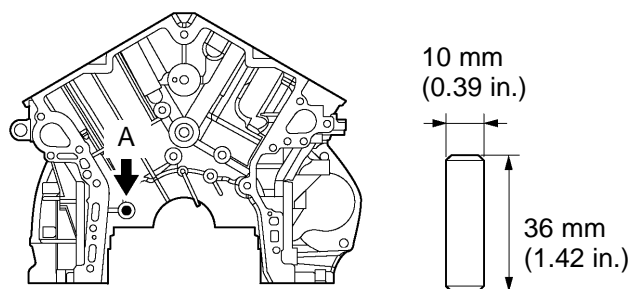


Lower Side

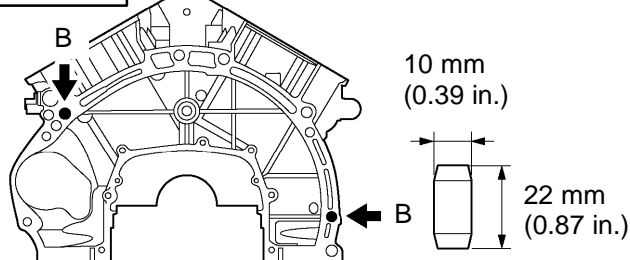


2. INSTALL STRAIGHT PIN

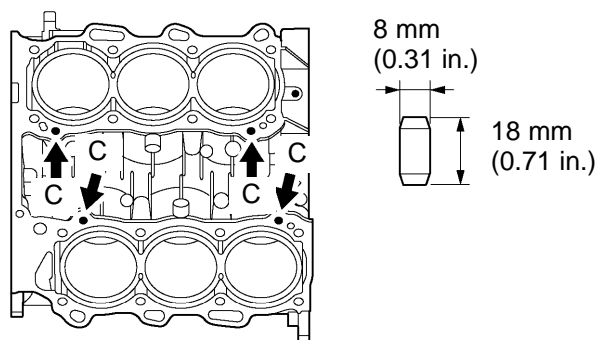
- (a) Using a plastic-faced hammer, tap in the straight pin.

Standard protrusion:**Pin A: 22.5 to 23.5 mm (0.886 to 0.925 in.)****Pin B: 10.5 to 11.5 mm (0.413 to 0.453 in.)****Pin C: 8.5 to 9.5 mm (0.335 to 0.374 in.)****Pin D: 5.5 to 6.5 mm (0.217 to 0.256 in.)****Front Side**

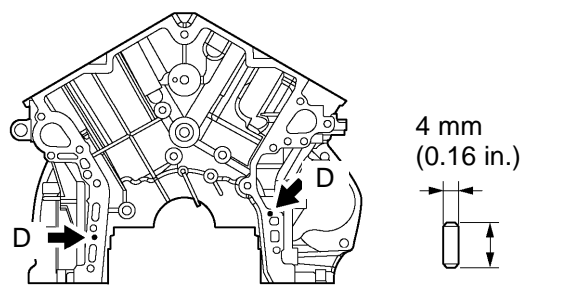
Protrusion Height: 22.5 to 23.5 mm
(0.886 to 0.925 in.)

Rear Side

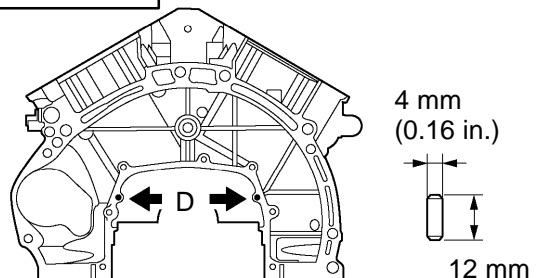
Protrusion Height: 10.5 to 11.5 mm
(0.413 to 0.453 in.)

Upper Side

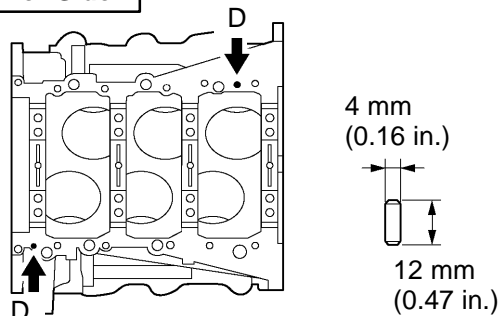
Protrusion Height: 8.5 to 9.5 mm (0.335 to 0.374 in.)

Front Side

Protrusion Height: 5.5 to 6.5 mm
(0.217 to 0.256 in.)

Rear Side

Protrusion Height: 5.5 to 6.5 mm (0.47 in.)
(0.217 to 0.256 in.)

Lower Side

Protrusion Height: 5.5 to 6.5 mm
(0.217 to 0.256 in.)

3. INSTALL TIGHT PLUG

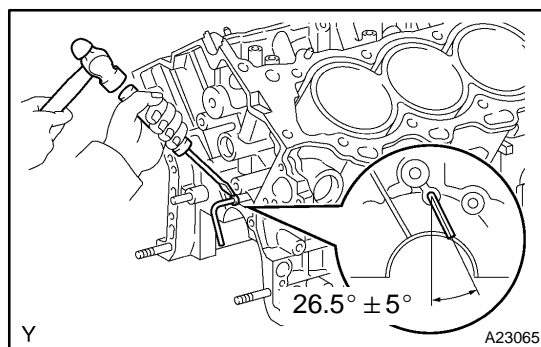
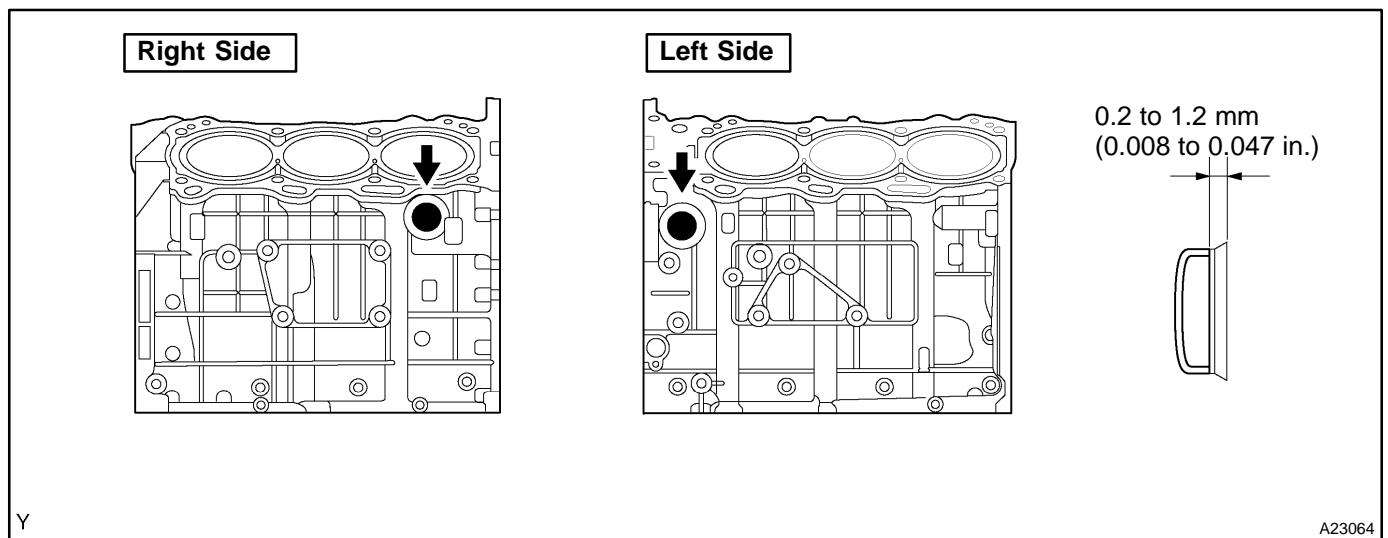
- (a) Apply adhesive around the tight plugs.

Adhesive: Part No. 08833-00070, THREE BOND 1324 or equivalent.

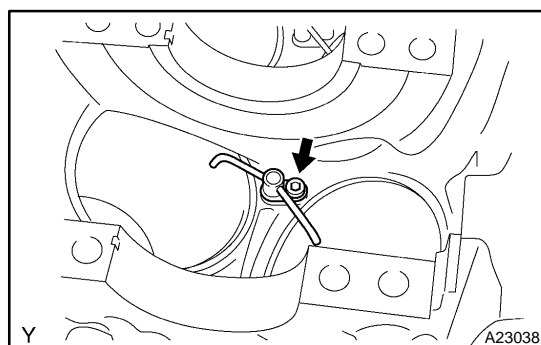
- (b) Using SST, install the tight plugs as shown in the illustration.

SST 09950-60010 (09951-00350), 09950-70010 (09951-07150)

Standard depth: 0.2 to 1.2 mm (0.008 to 0.047 in.)

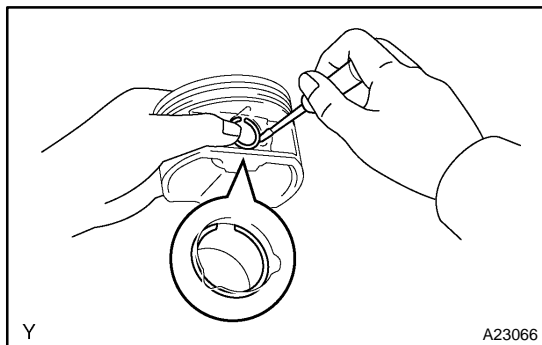
**4. INSTALL OIL JET**

Using a screwdriver and hammer, tap in an oil jet.

**5. INSTALL OIL NOZZLE**

Using a 5 mm socket hexagon wrench, install the 3 oil nozzles.

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

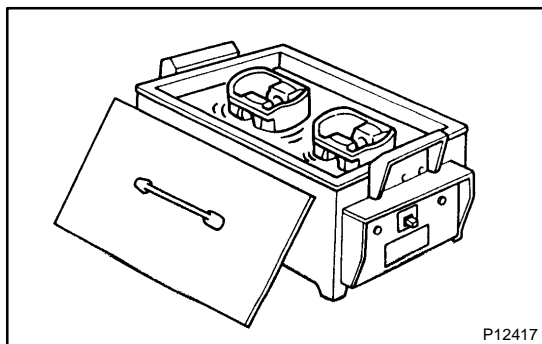


6. INSTALL PISTON PIN HOLE SNAP RING

Using a screwdriver, install a new snap ring at one side of the piston pin hole.

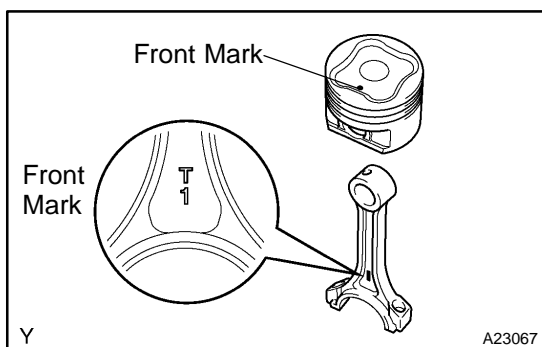
HINT:

Check that the end gap of the snap ring does not overlap the pin hole cutout portion of the piston.



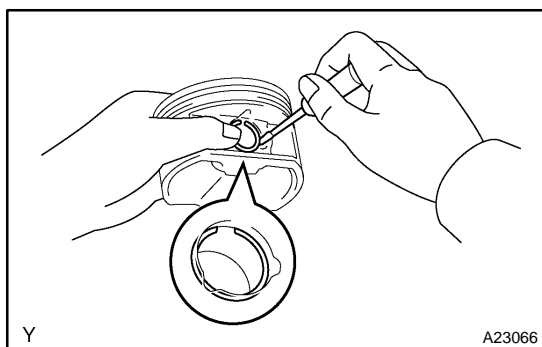
7. INSTALL PISTON

- (a) Gradually heat the piston to about 80°C (176°F).



- (b) Coat the piston pin with engine oil.

- (c) Align the front marks of the piston and connecting rod, and push in the piston pin with a thumb.

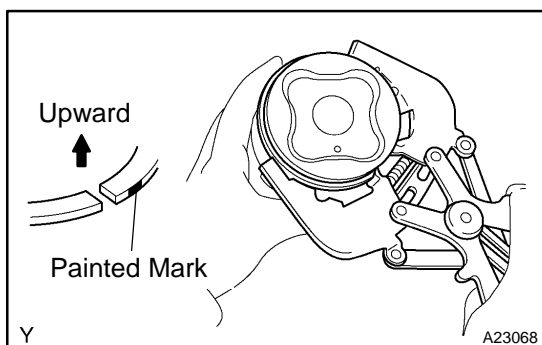


8. INSTALL PISTON PIN HOLE SNAP RING

Using a screwdriver, install a new snap ring on the other side of the piston pin hole.

HINT:

Be sure that the end gap of the snap ring does not overlap the pin hole cutout portion of the piston.

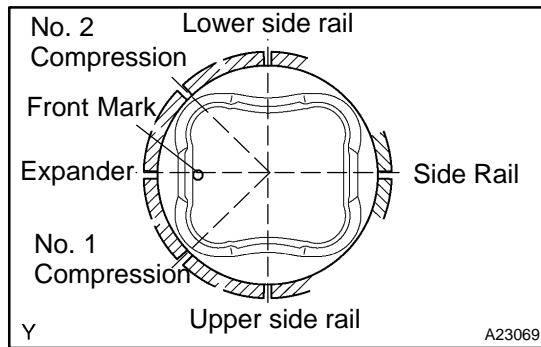


9. INSTALL PISTON RING SET

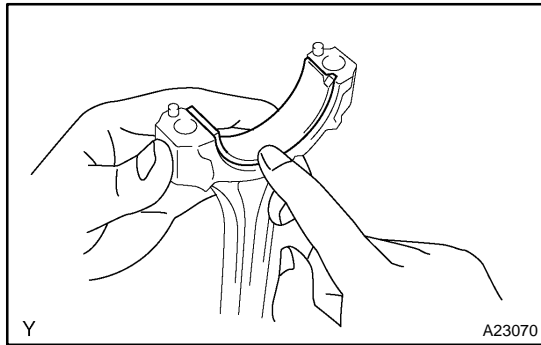
- (a) Install the oil ring expander and 2 side rails by hand.
- (b) Using a piston ring expander, install the 2 compression rings.

NOTICE:

Install the compression ring No. 2 with the painted mark facing upward.



- (c) Position the piston rings so that the ring ends are as shown in the illustration.

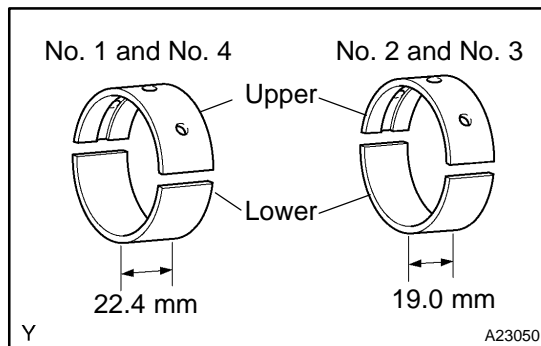


10. INSTALL CONNECTING ROD BEARING

Align the bearing claw with the groove of the connecting rod or connecting cap.

NOTICE:

Clean the backside of the bearing and the bearing surface of the connecting rod and prevent oil from adhering to them.

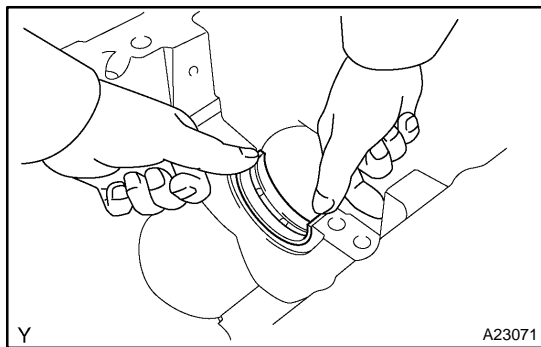


11. INSTALL CRANKSHAFT BEARING

HINT:

Main bearings come in widths of 19.0 mm (0.748 in.) and 22.4 mm (0.882 in.). Install the 22.4 mm (0.882 in.) bearings in the No. 1 and No. 4 cylinder block journal positions with the main bearing cap. Install the 19.0 mm (0.748 in.) bearings in the No. 2 and No. 3 positions.

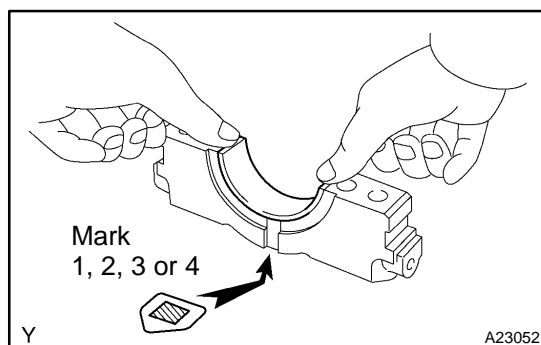
- (a) Clean each main journal and bearing.



- (b) Align the bearing claw with the claw groove of the cylinder block, and push in the 4 upper bearings.

NOTICE:

Do not apply engine oil to the bearing or its contact surface.



- (c) Align the bearing claw with the claw groove of the main bearing cap, and push in the 4 lower bearings.

NOTICE:

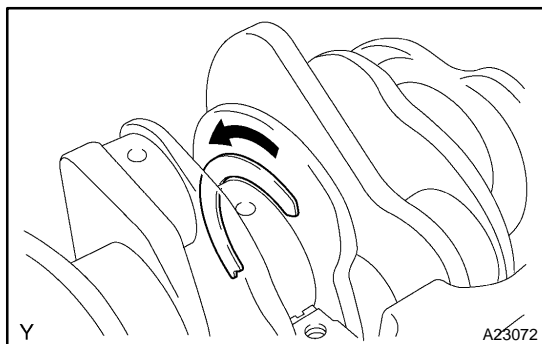
Do not apply engine oil to the bearing or its contact surface.

HINT:

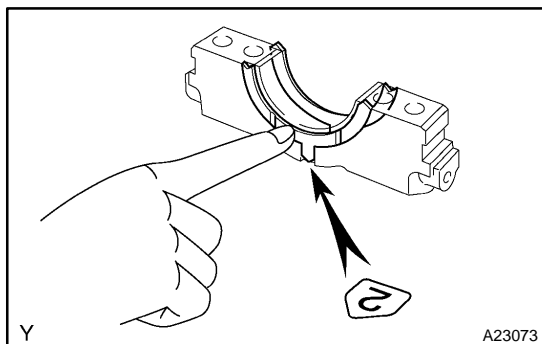
The number marked on each main bearing cap indicates the installation position.

12. INSTALL CRANKSHAFT

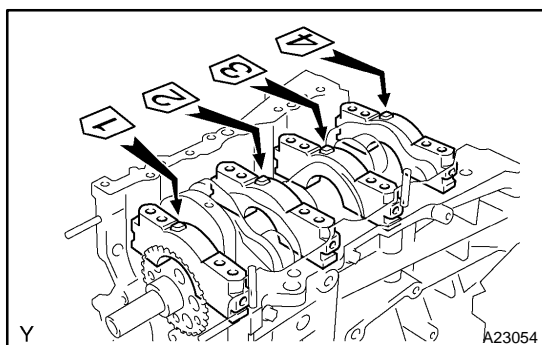
- (a) Apply engine oil to the upper bearing and install the crankshaft on the cylinder block.



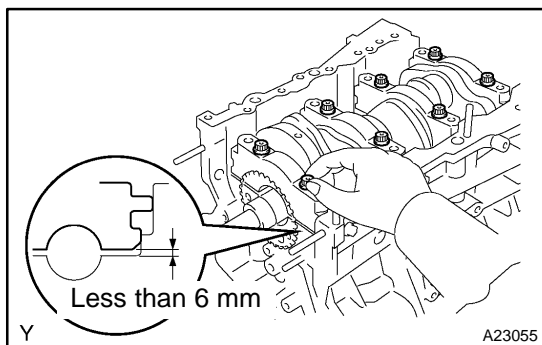
- (b) Install the 2 upper thrust washers to the No. 2 journal position of the cylinder block.
- (1) Push the crankshaft toward the front (rear) side.
 - (2) Install the 2 upper thrust washers with the oil grooves facing outward.



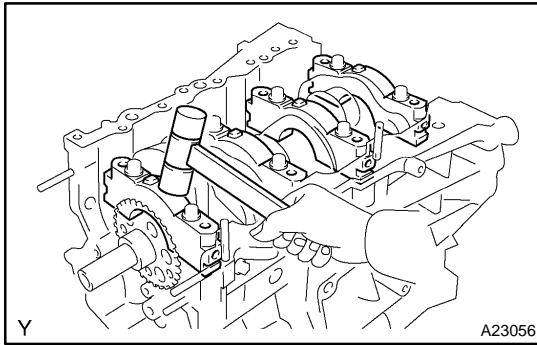
- (c) Install the 2 lower thrust washers on the No. 2 bearing cap with the grooves facing outward.



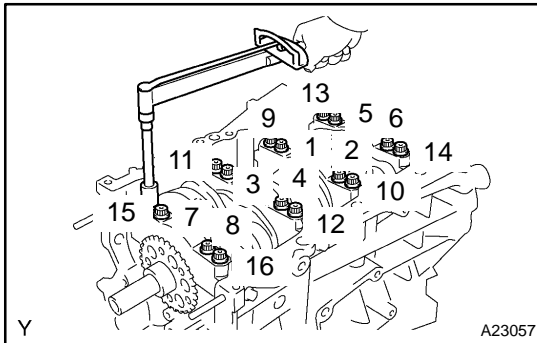
- (d) Examine the front marks and numbers and install the bearing caps on the cylinder block.
- (e) Apply a light coat of engine oil to the threads of the bearing cap bolts.
- (f) Temporarily install the 8 main bearing cap bolts to the inside positions.



- (g) Install the main bearing caps. Tighten the 2 bolts for each bearing cap until the clearance between the bearing cap and the cylinder block becomes less than 6 mm (0.23 in.).

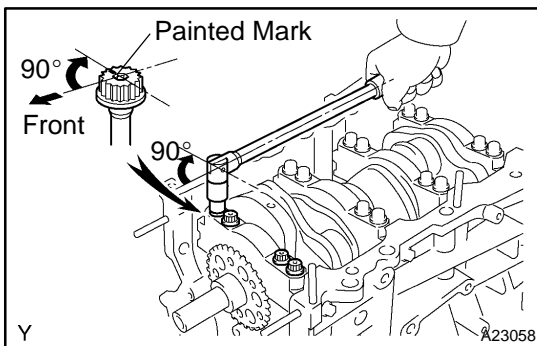


- (h) Using a plastic-faced hammer, lightly tap the bearing cap to ensure a proper fit.
- (i) Apply a light coat of engine oil to the threads of the main bearing cap bolts.

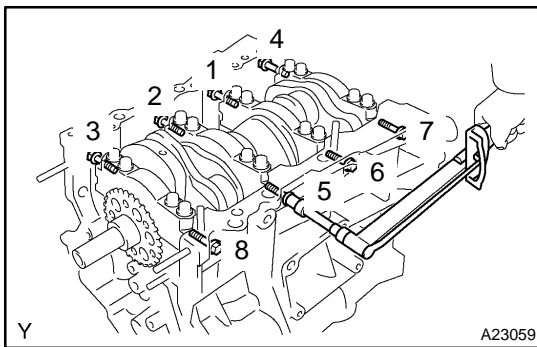


- (j) Install the 16 main bearing cap bolts. Using several steps, uniformly tighten the bolts in the sequence shown in the illustration.

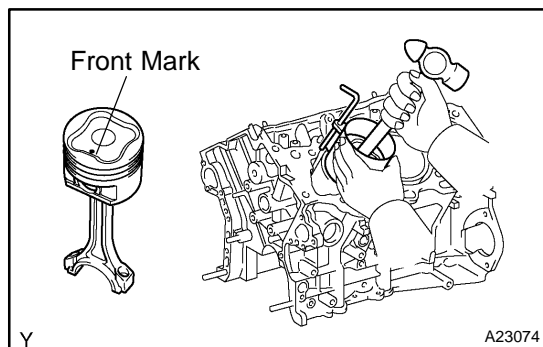
Torque: 61 N·m (622 kgf·cm, 45 ft·lbf)



- (k) Mark the front side of the bearing cap bolts with paint.
- (l) Retighten the bearing cap bolts 90° in the sequence as shown in the illustration.
- (m) Check that the painted mark is now at a 90° angle to the front.
- (n) Check that the crankshaft turns smoothly.



- (o) Using several steps, uniformly tighten the 8 main bearing cap bolts in the sequence as shown in the illustration.
- Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)**

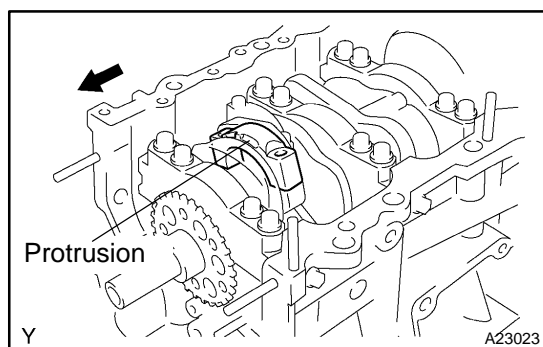


13. INSTALL PISTON W/CONNECTING ROD

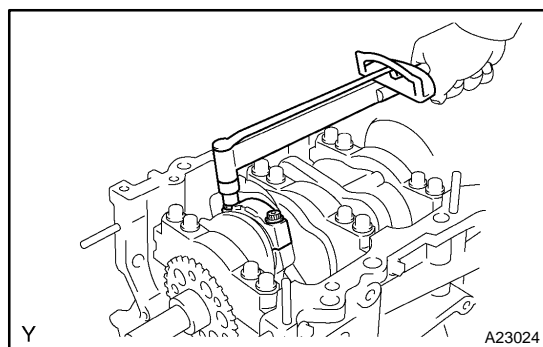
- Apply engine oil to the cylinder walls, the pistons, and the surfaces of the connecting rod bearings.
- Check the position of the piston ring ends.
- Using a piston ring compressor, push the correctly numbered piston and connecting rod assemblies into each cylinder with the front mark of the piston facing forward.

NOTICE:

- Clean the backside of the bearing and the bearing surface of the connecting rod cap and prevent oil from adhering to them.**
- Match the numbered connecting rod cap with the connecting rod.**



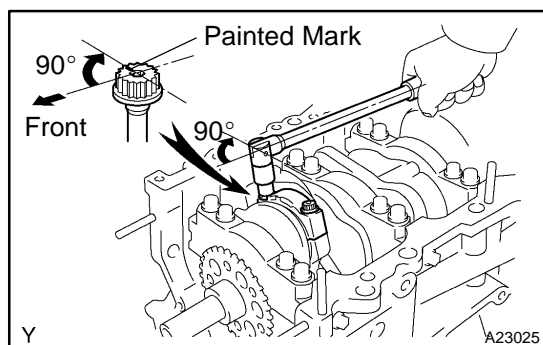
- Check that the protrusion of the connecting rod cap is facing the correct direction.
- Apply a light coat of engine oil to the threads of the connecting rod cap bolts.



- Using SST, tighten the bolts alternately to the specified torque.

SST 09011-38121

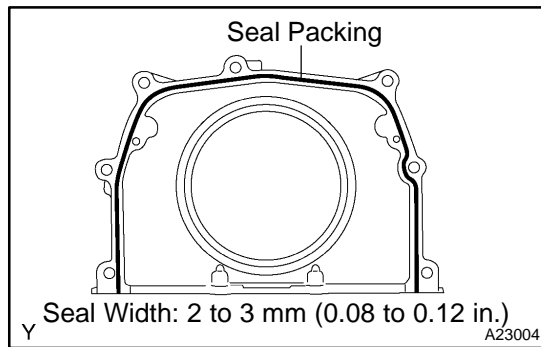
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



- Mark the front side of each connecting cap bolt with paint.
- Retighten the cap bolts 90° as shown.
- Check that the crankshaft turns smoothly.

14. INSTALL ENGINE REAR OIL SEAL RETAINER

- Remove any old packing material (FIPG) and be careful not to drop any oil on the contact surfaces of the oil seal retainer and cylinder block.



- (b) Apply a continuous bead of seal packing (diameter 2 to 3 mm (0.08 to 0.12 in.)) to the oil seal retainer as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

NOTICE:

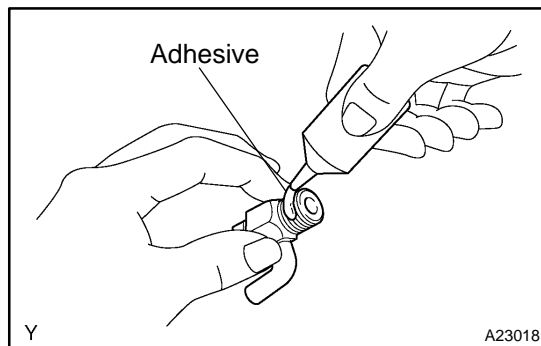
Parts must be assembled within 3 minutes of application. Otherwise the seal packing must be removed and reapplied.

- (c) Install the oil seal retainer with the 5 bolts and 2 nuts.

Torque:

Bolt: 10 N·m (102 kgf·cm, 7 ft·lbf)

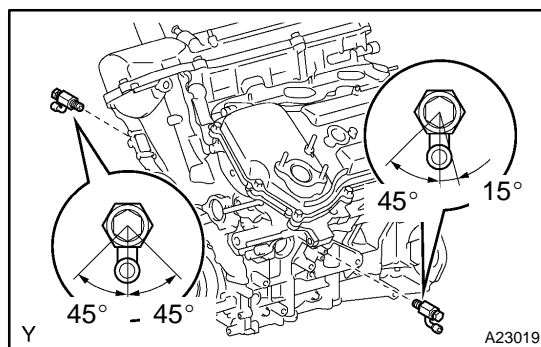
Nut: 9.0 N·m (92 kgf·cm, 80 in·lbf)



15. INSTALL WATER DRAIN COCK

- (a) Apply adhesive to 2 or 3 threads of the drain cock ends.

Adhesive: Part No. 08833-00070, THREE BOND 1324 or equivalent

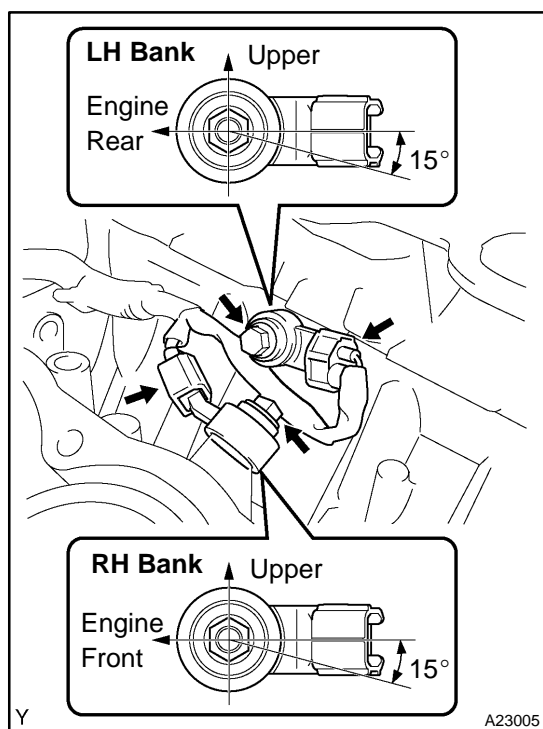


- (b) After tightening the drain cocks to the specified torque, rotate them clockwise as shown in the illustration.

Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

NOTICE:

- Do not rotate the drain cocks more than 1 complete revolution (360°) after tightening the drain cocks to the specified torque.
- Do not loosen the drain cocks after setting them correctly.

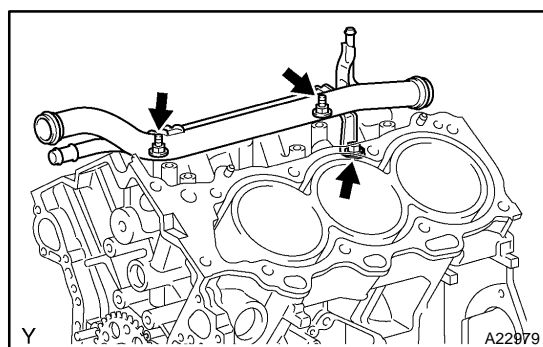


16. INSTALL KNOCK SENSOR

- (a) Install the 2 knock sensors with the 2 bolts within a 15° angle as shown in the illustration.

Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

- (b) Connect the knock sensor connectors.



17. INSTALL WATER OUTLET PIPE NO.1

Install the water outlet pipe with the 3 bolts.

Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)