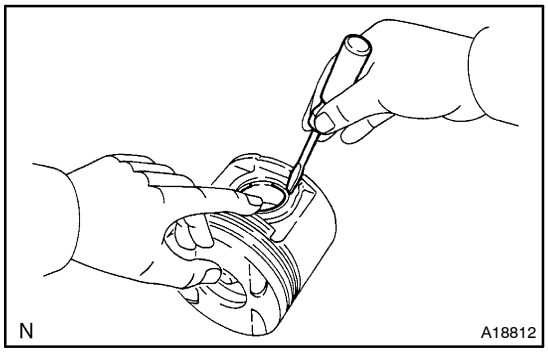
EM1TZ–01

REASSEMBLY

HINT:

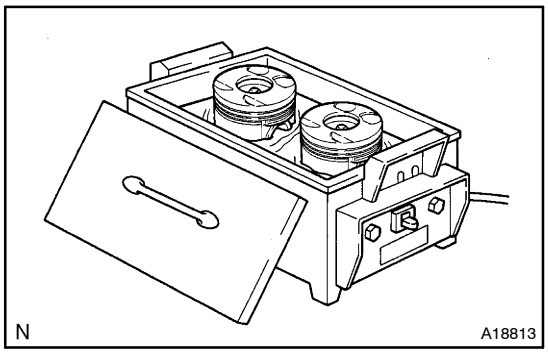
- Thoroughly clean all parts to be assembled.
- Before installing the parts, apply fresh engine oil to all sliding and rotating surfaces.
- Replace all gaskets, O–rings and oil seals with new parts.



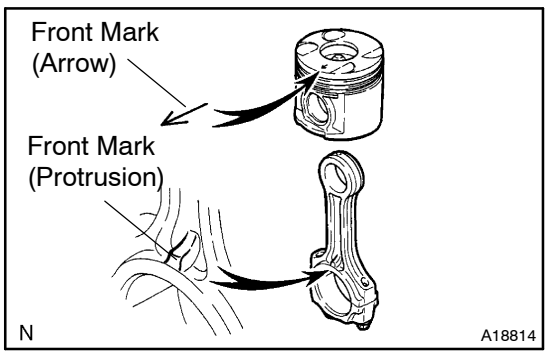
1. ASSEMBLE PISTON AND CONNECTING ROD

(a) Assemble the piston and connecting rod.

(1) Using a small screwdriver, install a new snap ring on one side of the piston pin hole.

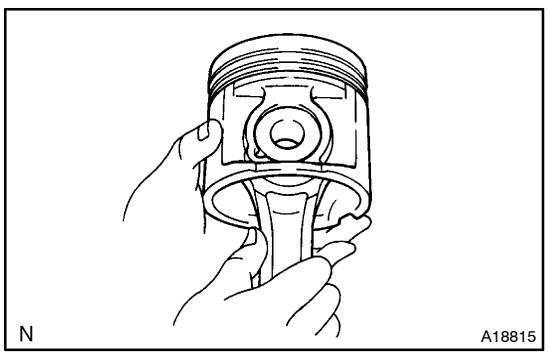


(2) Gradually heat the piston to about 60°C (140°F).



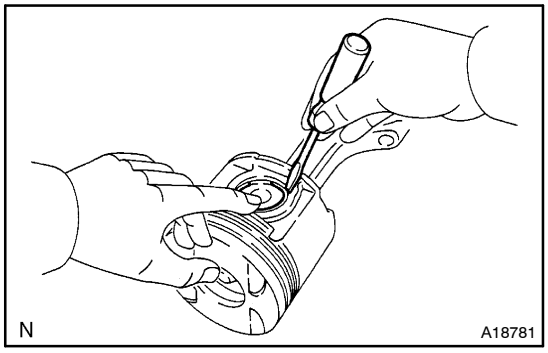
(3) Coat the piston pin with engine oil.

(4) Align the front marks of the piston and connecting rod, and push in the piston pin with your thumb.

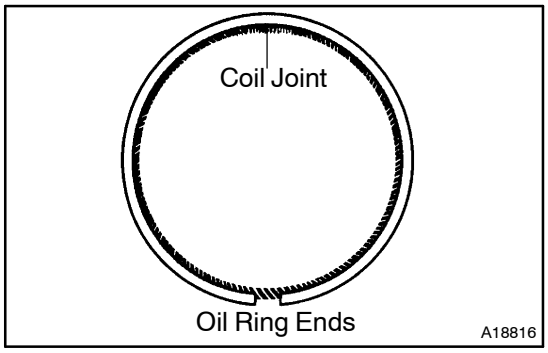


(5) Check fit between the piston and piston pin.

- Try to move the piston back and forth on the piston pin.

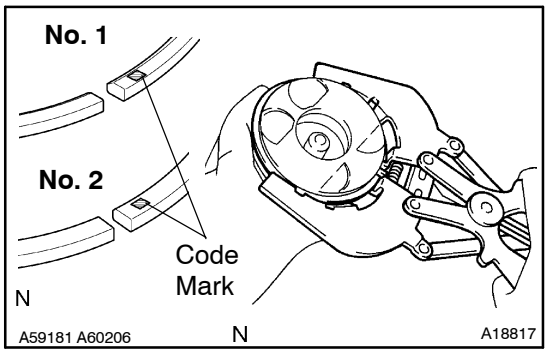


(6) Using a small screwdriver, install a new snap ring on the other side of the piston pin hole.



(b) Install the piston rings.
(1) Install the coil and oil ring by hand.
(2) Using a piston ring expander, install the oil ring.

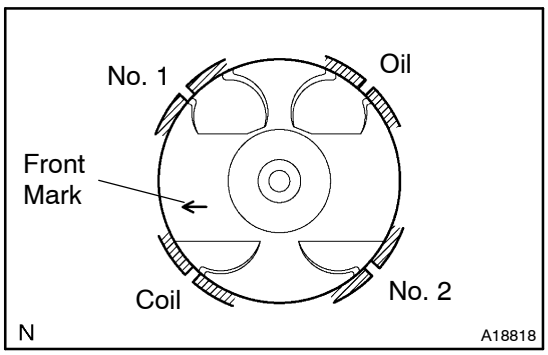
HINT:
Face the end gap of the oil ring in the opposite direction coil joint.



(3) Using a piston ring expander, install the No. 1 and No. 2 piston rings with the code mark facing upward.

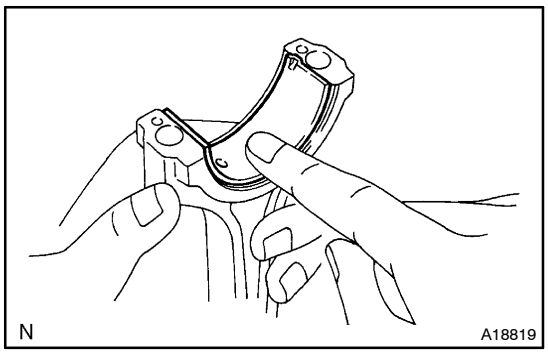
Code mark:

No. 1	1N
No. 2	2N



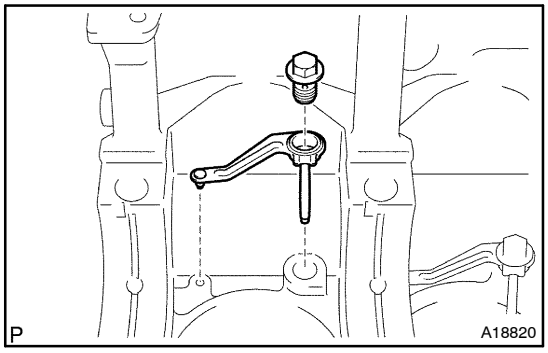
(4) Position the piston rings so that the ring ends are as shown.

NOTICE:
Do not align the ring ends.



2. INSTALL CONNECTING ROD BEARING

(a) Align the bearing claw with the groove of the connecting rod or connecting cap.
(b) Install the bearings in the connecting rod and connecting rod cap.

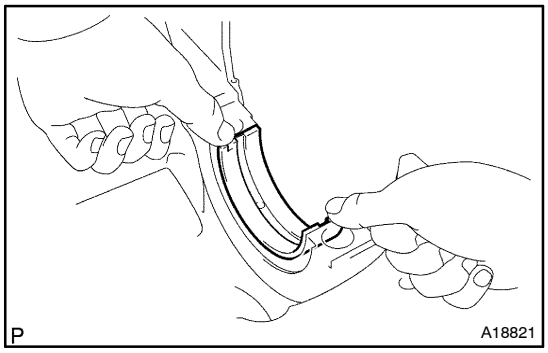


3. INSTALL OIL NOZZLES

(a) Align the pin of the oil nozzle with the pin hole of the cylinder block.

(b) Install the oil nozzle with the check valve. Install the 4 oil nozzles and check valves.

Torque: 26 N·m (265 kgf·cm, 19 ft·lbf)

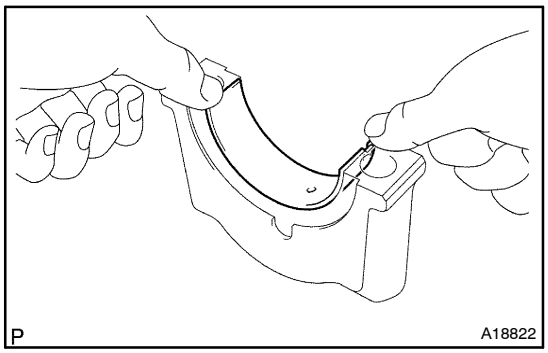


4. INSTALL MAIN BEARINGS

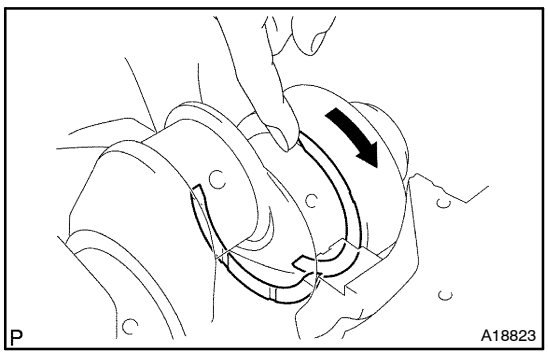
HINT:

Upper bearings have an oil groove and oil hole; lower bearings do not.

(a) Align the bearing claw with the claw groove of the cylinder block, and push in the 5 upper bearings.



(b) Align the bearing claw with the claw groove of the main bearing cap, and push in the 5 lower bearings.



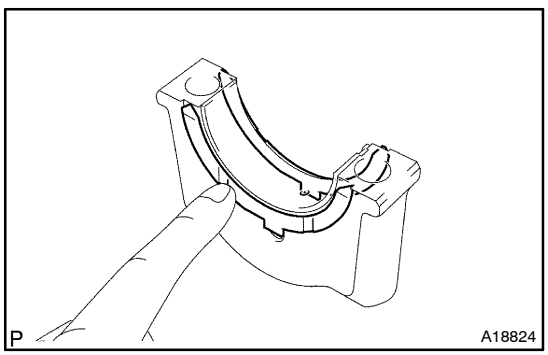
5. INSTALL CRANKSHAFT

(a) Place the crankshaft on the cylinder block.

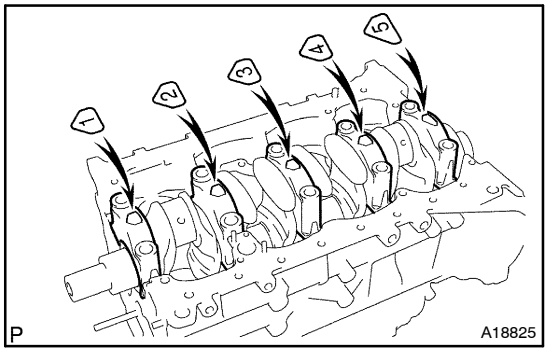
(b) Install the 2 upper thrust washers to the No. 5 journal position of the cylinder block.

(1) Push the crankshaft toward the front (rear) side.

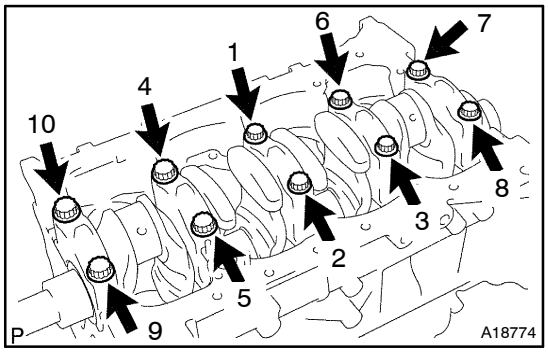
(2) Install the 2 thrust washers with the oil grooves facing outward.



(c) Install the 2 thrust washers on the No. 5 bearing cap with the grooves facing outward.



(d) Install the 5 main bearing caps in their proper locations.



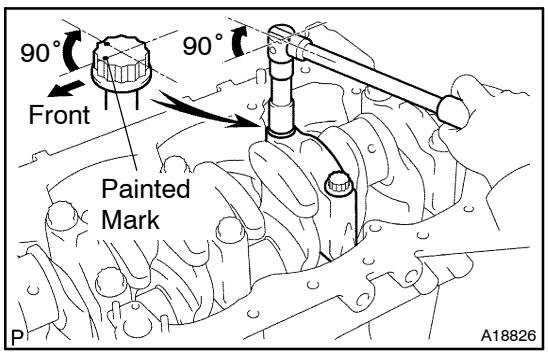
(e) Install the main bearing cap bolts.

HINT:

- The main bearing cap bolts are tightened in 2 progressive steps (steps (b) and (d)).
- If any one of the main bearing cap bolt is broken or deformed, replace it.
  (1) Apply a light coat of the engine oil on the threads and under the bolt heads of the main bearing caps.
  (2) Install and uniformly tighten the 10 bolts of the main bearing caps, in several passes, in the sequence shown.

  Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

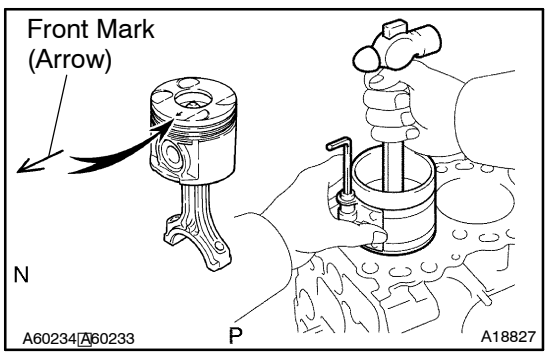
If any one of the main bearing cap bolts does not meet the torque specification, replace the main bearing cap bolt.



(3) Mark the front of the main bearing cap bolt with paint.
(4) Retighten the main bearing cap bolts 90 ° in the numerical order shown above.
(5) Check that the painted mark is now at a 90 ° angle to the front.

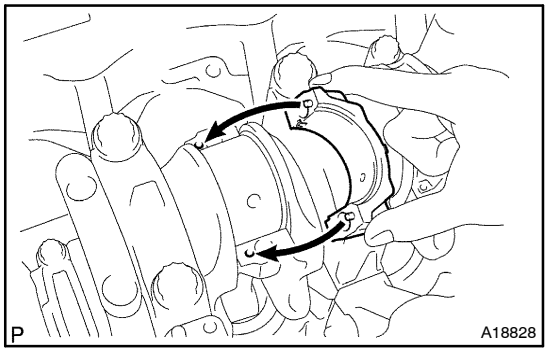
(f) Check that the crankshaft turns smoothly.

(g) Check the crankshaft thrust clearance (See page EM–66).

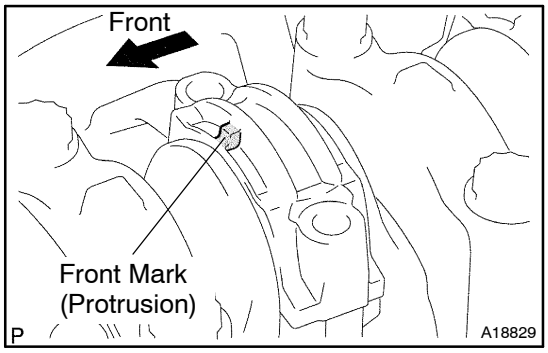


6. INSTALL PISTON AND CONNECTING ROD ASSEMBLIES

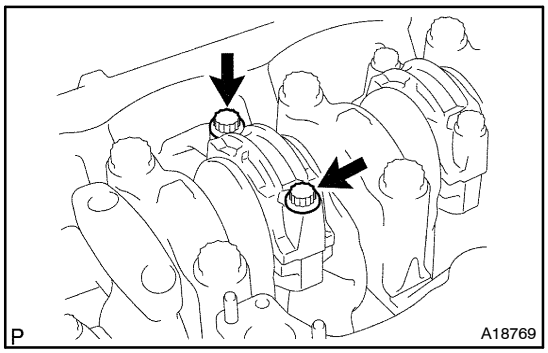
(a) Using a piston ring compressor, push the correctly numbered piston and connecting rod assembly into the cylinder with the front mark of the piston facing forward.



(b) Place the connecting rod cap on the connecting rod.
(1) Match the numbered connecting rod cap with the connecting rod.
(2) Align the pins of the connecting rod cap with the pin holes of the connecting rod, and install the connecting rod cap.



(3) Check that the front mark of the connecting rod cap is facing forward.



(c) Install the connecting rod cap bolts.

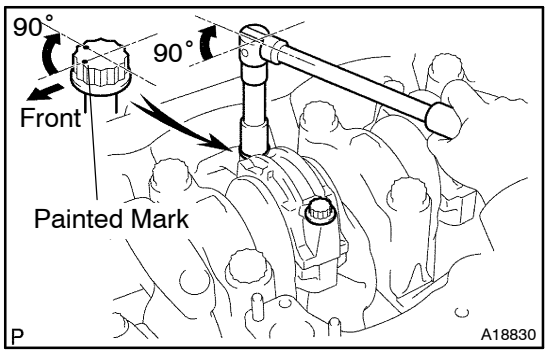
HINT:

- The connecting rod cap bolts are tightened in 2 progressive steps (steps (2) and (4)).
- If any connecting rod bolt is broken or deformed, replace it.

(1) Apply a light of engine oil on the threads and under the heads of the connecting rod cap bolts.
(2) Install and alternately tighten the bolts of the connecting rod cap in several passes.

Torque: 35 N·m (357 kgf·cm, 26 ft·lbf)

If any one of the connecting rod cap bolts does not meet the torque specification, replace the cap bolts.



(3) Mark the front of the connecting rod cap bolts with paint.
(4) Retighten the connecting rod cap bolts 90° as shown.
(5) Check that the painted mark is now at a 90° angle to the front.

(d) Check that the crankshaft turns smoothly.

(e) Check the connecting rod thrust clearance (See page EM–66).

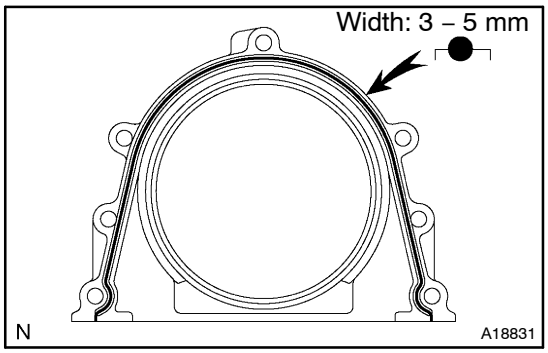
7. INSTALL REAR OIL SEAL RETAINER

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

(1) Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces and sealing groove.

(2) Thoroughly clean all components to remove all the loose material.

(3) Using a non–residue solvent, clean both sealing surfaces.



(b) Apply seal packing to the retainer as shown in the illustration.

Seal packing: Part No. 08826–00080 or equivalent

(1) Install a nozzle that has been cut to a 3 – 5 mm (0.12 – 0.20 in.) opening.

HINT:

Avoid applying an excessive amount to the surface.

(2) Parts must be assembled within 5 minutes of application. Otherwise the material must be removed and reapplied.

(3) Immediately remove nozzle from the tube and reinstall cap.

(c) Install the retainer with the 5 bolts.

Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

8. INSTALL CYLINDER BLOCK ORIFICE

9. INSTALL ENGINE MOUNTING BRACKETS

Install the mounting bracket with the 4 bolts.

Torque: 68 N·m (693 kgf·cm, 50 ft·lbf)

10. INSTALL WATER TEMPERATURE SENSOR

11. INSTALL THRMOSTAT AND WATER INLET (See page CO–10)

12. INSTALL NO. 2 WATER BYPASS PIPE AND VACUUM TRANSMITTING PIPES

Install a new gasket and the water bypass pipe with the 2 bolts and 2 nuts.

Torque:
8.0 N·m (82 kgf·cm, 71 in.·lbf) for bolt
13 N·m (133 kgf·cm, 10 ft·lbf) for nut

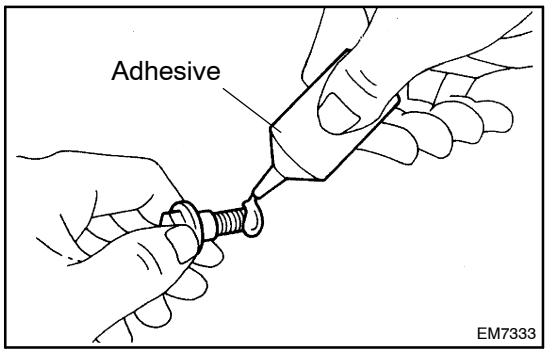
13. INSTALL OIL COOLER (See page LU–21)

14. INSTALL OIL STRAINER (See page LU–14)

15. **INSTALL TIMING GEAR CASE (See page LU–14)**
16. **INSTALL OIL PAN (See page LU–14)**
17. **INSTALL WATER PUMP (See page CO–6)**
18. **INSTALL TIMING GEARS (See page EM–30)**
19. **INSTALL CYLINDER HEAD (See page EM–57)**
20. **INSTALL PULLEYS AND TIMING BELT (See page EM–18)**
21. **DISCONNECT ENGINE FROM ENGINE STAND**
22. **INSTALL REAR END PLATE**

Install the rear end plate with the bolt.

Torque: 8.0 N·m (82 kgf·cm, 71 in.·lbf)



23. **M/T:**
INSTALL FLYWHEEL

(a) Apply adhesive to 2 or 3 threads of the mounting bolt end.
Adhesive:
Part No. 08833–00070, THREE BOND 1324, or equivalent

(b) Install the flywheel on the crankshaft.

(c) Install and uniformly tighten the mounting bolts in several passes, in the sequence shown.
Torque: 145 N·m (1,479 kgf·cm, 107 ft·lbf)

24. **A//T:**
INSTALL DRIVE PLATE (See procedure step 23)
Torque: 74 N·m (750 kgf·cm 54 ft·lbf)