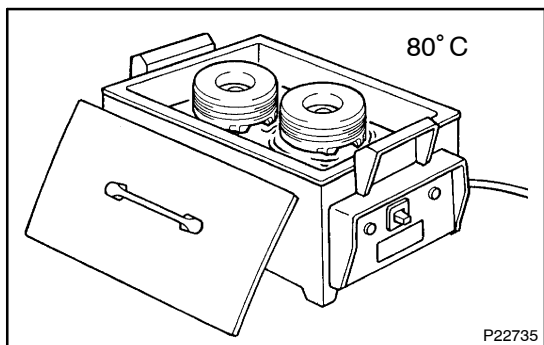


P22734

## REASSEMBLY

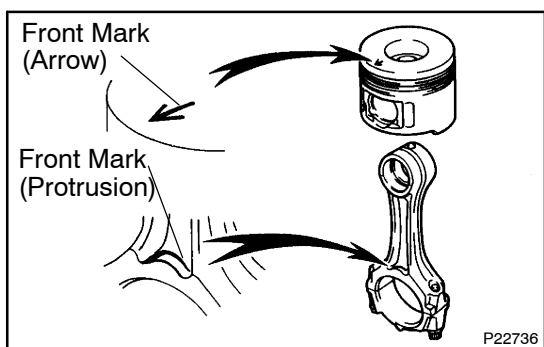
### 1. ASSEMBLE PISTON AND CONNECTING ROD

- (a) Install a new snap ring on one side of the piston pin hole.



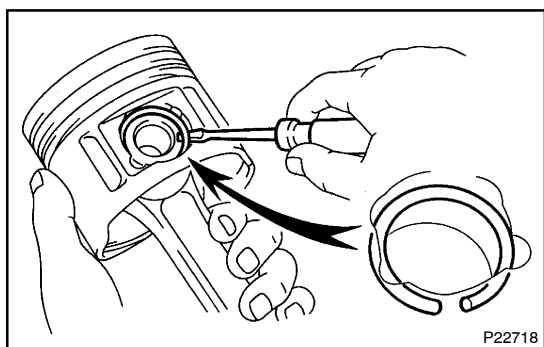
P22735

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



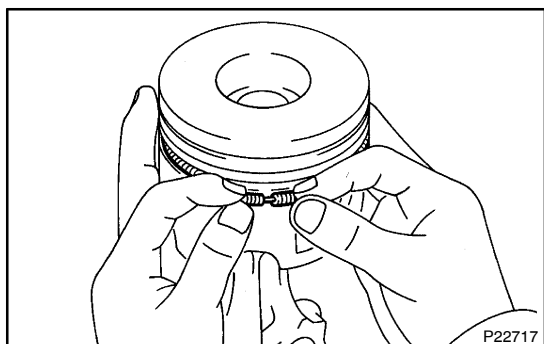
P22736

- (c) Coat the piston pin with engine oil.  
(d) Align the front marks of the piston and connecting rod, and push in the piston pin with your thumb.



P22718

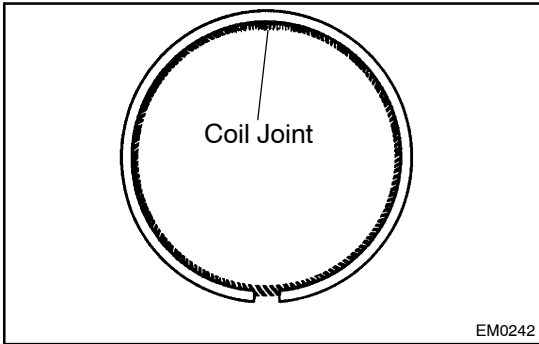
- (e) Install a new snap ring on the other side of the piston pin hole.



P22717

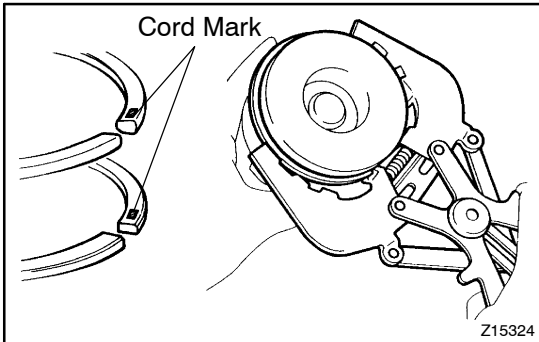
### 2. INSTALL PISTON RINGS

- (a) Install the coil by hand.  
(b) Install a piston ring expander, install the oil ring.



HINT:

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



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

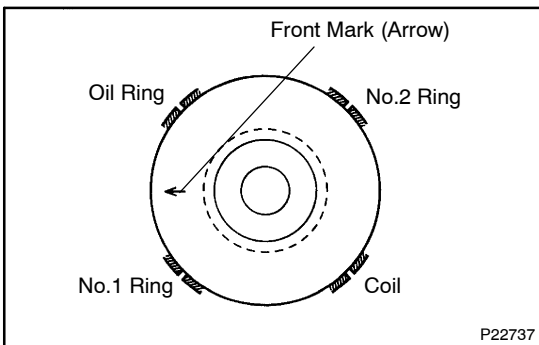
**Code mark:**

**No.1:**

**1HZ, 1HD-T: T1**

**1HD-FTE: 1T**

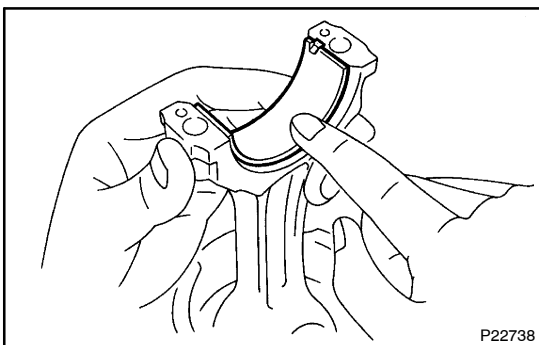
**No.2: 2T**



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

**NOTICE:**

**Do not align the ring ends.**



### 3. INSTALL CONNECTING ROD BEARINGS

- Align the bearing claw with the groove of the connecting rod or connecting rod cap.
- Install the bearings in the connecting rod and connecting rod cap.

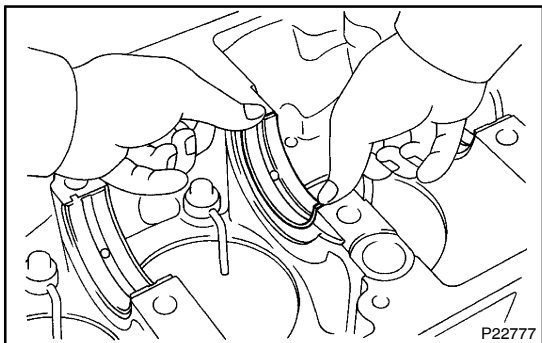
### 4. CYLINDER BLOCK ASSEMBLY

HINT:

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

### 5. INSTALL OIL NOZZLES AND CHECK VALVES

(See page LU-28)

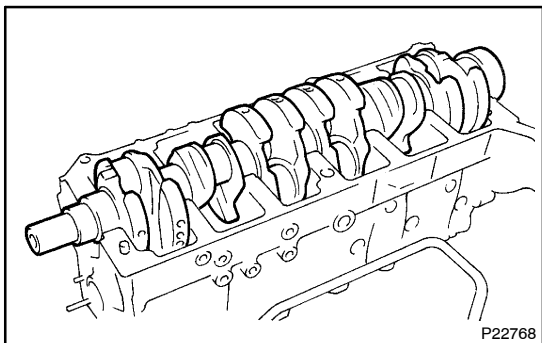


## 6. INSTALL MAIN BEARINGS

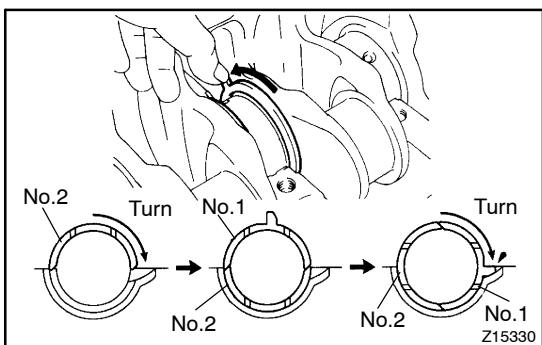
### HINT:

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 7 upper bearings.
- (b) Align the bearing claw with the claw groove of the main bearing cap, and push in the 7 lower bearings.



## 7. PLACE CRANKSHAFT ON CYLINDER BLOCK

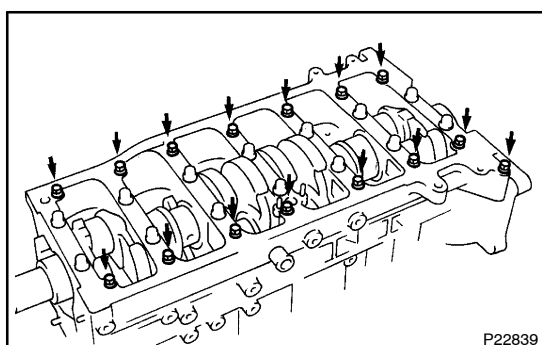
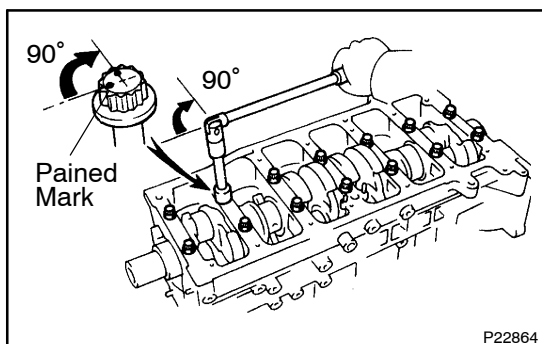
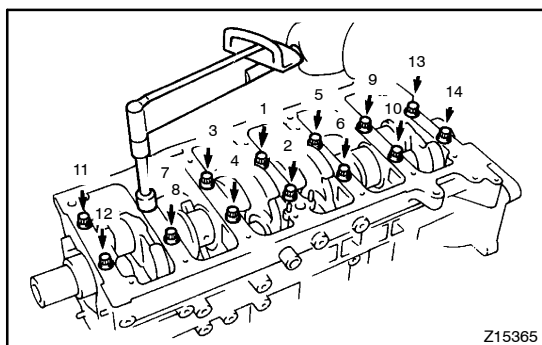
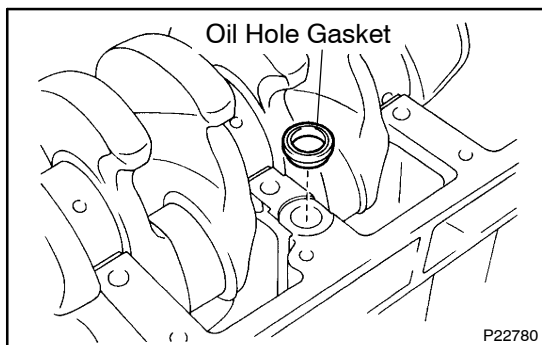
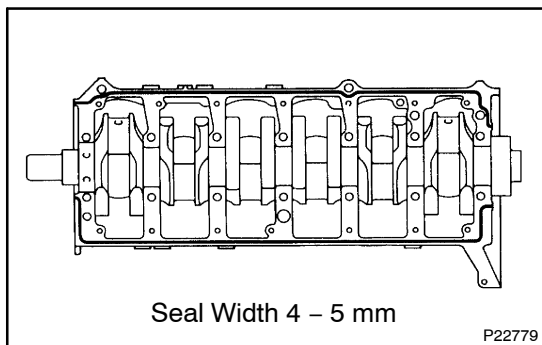


## 8. INSTALL THRUST WASHERS

- (a) Push the crankshaft toward the front (rear) side.
- (b) Install the 4 thrust washers to the No.4 journal position of the cylinder block with the oil grooves facing outward.

## 9. INSTALL MAIN BEARING CAPS

- (a) Place main bearing cap on cylinder block
  - (1) Remove any old packing (FIPG) material and be careful not to drop any oil the contact surfaces of the main bearing cap and cylinder block.
    - Thoroughly clean all components to remove all the loose material.
    - Using a non -residue solvent, clean both sealing surfaces.



- (2) Apply seal packing to the cylinder block as shown in the illustration.

**Seal packing: Part No. 08826-00080 or equivalent**

- Install a nozzle that has been cut to a 4 – 5 mm (0.16 – 0.20 in.) opening.
- Parts must be assembled within 5 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.

- (3) Install a new cylinder block hole gasket.

- (4) Place the main bearing cap on the cylinder block.

- (b) Install main bearing cap bolts (12 pointed head)

**HINT:**

- The main bearing cap bolts are tightened in 2 progressive steps (steps (b) and (c)).
- If any one of the main bearing cap bolts is broken or deformed, replace it.

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

- (2) Install and uniformly tighten the 14 main bearing cap bolts in several passes, in the sequence shown.

**Torque: 103 N·m (1,050 kgf·cm, 76 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.

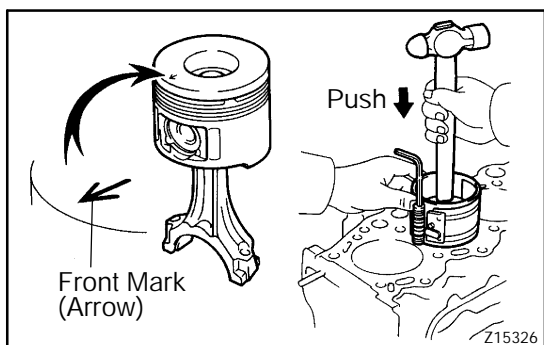
- (6) Check that the crankshaft turns smoothly.

- (c) Install main bearing cap bolts (6 pointed head)  
Install the 15 main bearing bolts.

**Torque: 18 N·m ( 185 kgf·cm, 13 ft·lbf)**

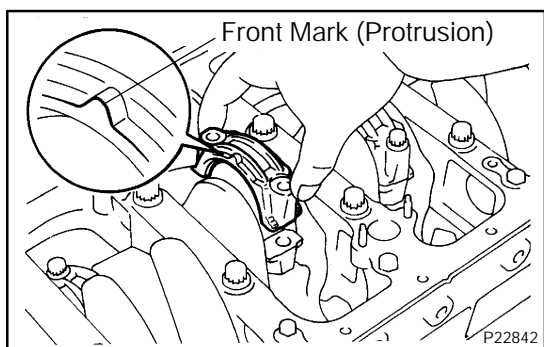
**10. CHECK CRANKSHAFT THRUST CLEARANCE**

(See page EM-102)



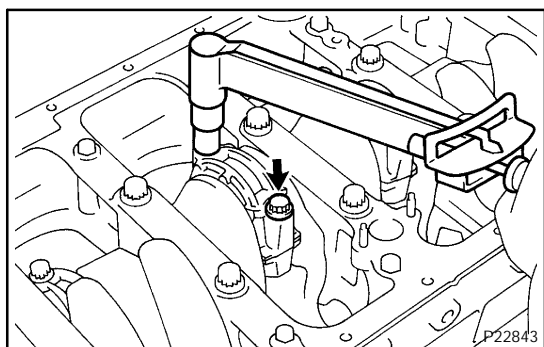
## 11. INSTALL PISTON AND CONNECTING ROD ASSEMBLES

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.



## 12. INSTALL CONNECTING ROD CAPS

- (a) Place connecting rod cap on connecting rod
  - (1) Match the numbered connecting rod cap with the connecting rod.
  - (2) Install the connecting rod cap with the front mark facing forward.



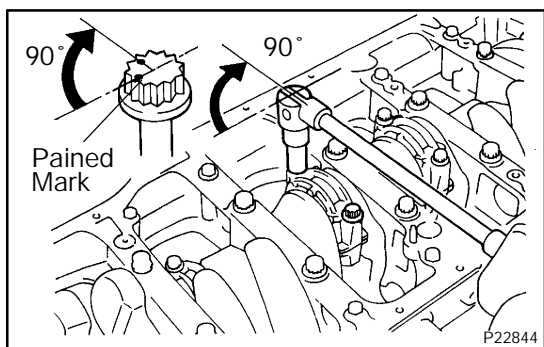
- (b) Install connecting rod cap bolts

### HINT:

- S The connecting rod cap nuts are tightened in 2 progressive steps (steps (b) and (d)).
- S 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: 36.8 N·m (375 kgf·cm, 27 ft·lbf)**

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



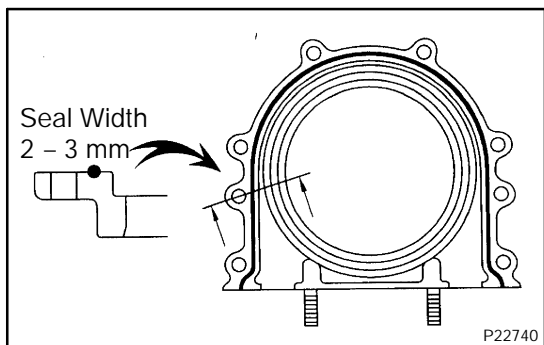
- (3) Mark the front of the connecting rod cap bolt with paint.
- (4) Retighten the connecting rod cap bolts 90° as shown.
- (5) Check that the painted mark is now at a 90° angle to the front.
- (6) Check that the crankshaft turns smoothly.

## 13. CHECK CONNECTING ROD THRUST CLEARANCE (See page EM-102)

## 14. 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.
  - S Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces and sealing groove.

- S Thoroughly clean all components to remove all the loose material.
- S Using a non-residue solvent, clean both sealing surfaces.



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

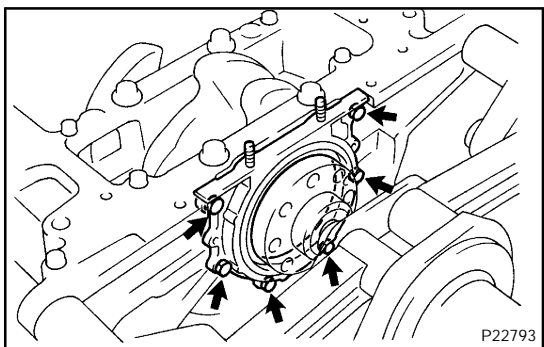
**Seal packing: Part No. 08826-00080 or equivalent**

- S Install a nozzle that has been cut to a 2 – 3 mm (0.08 – 0.12 in.) opening.

**HINT:**

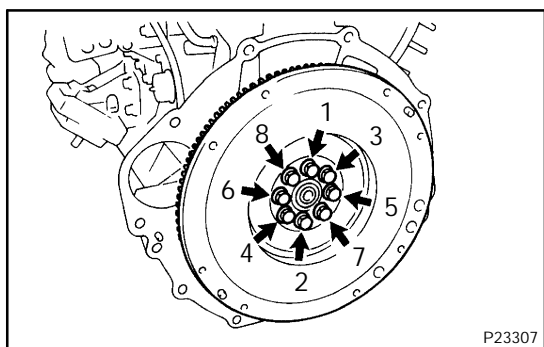
Avoid applying an excessive amount to the surface.

- S Parts must be assembled within 5 minutes of application. Otherwise the material must be removed and reapplied.
- S Immediately remove nozzle from the tube and reinstall



- (c) Install the retainer with the 6 bolts.  
**Torque: 6.4 N·m (65 kgf·cm, 57 in·lbf)**
15. **INSTALL TURBO WATER PIPE**
  16. **1HD-FTE:  
INSTALL CRANKSHAFT POSITION SENSOR**
  17. **INSTALL DRAIN PLUG**
  18. **INSTALL ENGINE MOUNTING BRACKETS**  
**Torque: 68.6 N·m (700 kgf·cm, 51 ft·lbf)**
  19. **INSTALL TURBO OIL HOSE**
  20. **INSTALL OIL PRESSURE SENDER**
  21. **INSTALL OIL COOLER ASSEMBLY, OIL DIPSTICK, GUIDE AND NO.1 CYLINDER BLOCK INSULATOR**  
**(See page LU-23)**
  22. **INSTALL OIL STRAINER, TIMING GEAR CASE (OIL PUMP) AND OIL PAN**
  23. **INSTALL INJECTION PUMP STAY**  
**Torque: 68.6 N·m (700 kgf·cm, 51 ft·lbf)**
  24. **INSTALL 3 INSULATORS**

25. INSTALL INJECTION PUMP  
1HZ, 1HD-T: (See page FU-111)  
1HD-FTE: (See page FU-121)
26. INSTALL ALTERNATOR AND BRACKET  
Torque: 68.6 N·m (700 kgf·cm, 51 ft·lbf)
27. INSTALL WATER INLET AND THERMOSTAT  
1HZ, 1HD-T: (See page EM-66)  
1HD-FTE: (See page EM-94)
28. INSTALL WATER PUMP, TURBO WATER PIPE AND ALTERNATOR ADJUSTING BAR  
(See page CO-9)
29. INSTALL TIMING GEARS  
(See page EM-44)
30. INSTALL CYLINDER HEAD  
1HZ, 1HD-T: (See page EM-66)  
1HD-FTE: (See page EM-94)
31. INSTALL TIMING BELT AND PULLEYS  
(See page EM-31)
32. DISCONNECT ENGINE FROM ENGINE STAND
33. INSTALL REAR END PLATE  
Install the rear end plate with the bolt.  
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



34. M/T:  
INSTALL FLYWHEEL
  - (a) Install the flywheel on the crankshaft.
  - (b) Install and uniformly tighten the bolt in several passes, in the sequence shown.  
Torque: 127.4 N·m (1,300 kgf·cm, 94 ft·lbf)
35. A/T:  
INSTALL FLYWHEEL, DRIVE PLATE AND REAR PLATE