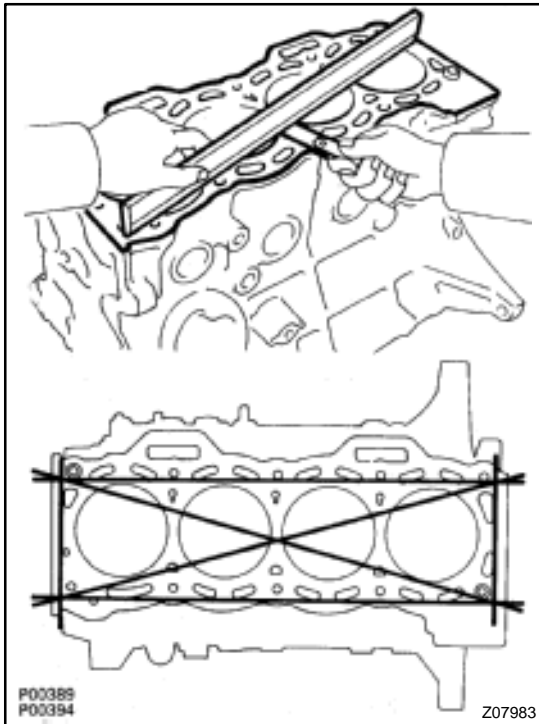


INSPECTION

1. CLEAN CYLINDER BLOCK

- (a) Remove gasket material.
Using a gasket scraper, remove all the gasket material from the top surface of the cylinder block.
- (b) Clean cylinder block.
Using a soft brush and solvent, thoroughly clean the cylinder block.

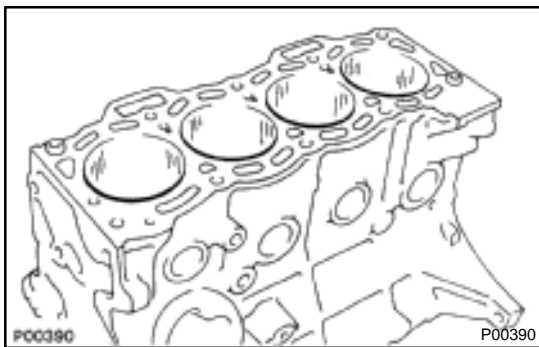


2. INSPECT TOP SURFACE OF CYLINDER BLOCK FOR FLATNESS

Using a precision straight edge and feeler gauge, measure the surfaces contacting the cylinder head gasket for warpage.

Maximum warpage: 0.05 mm (0.0020 in.)

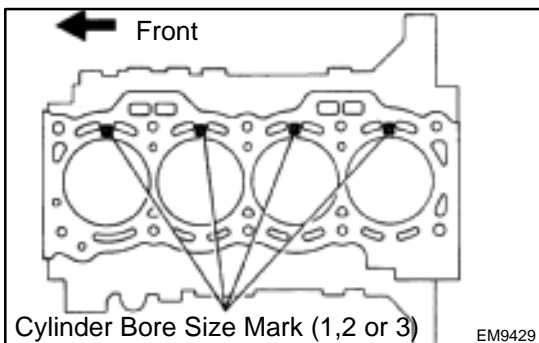
If warpage is greater than maximum, replace the cylinder block.



3. INSPECT CYLINDER FOR VERTICAL SCRATCHES

Visually check the cylinder for vertical scratches.

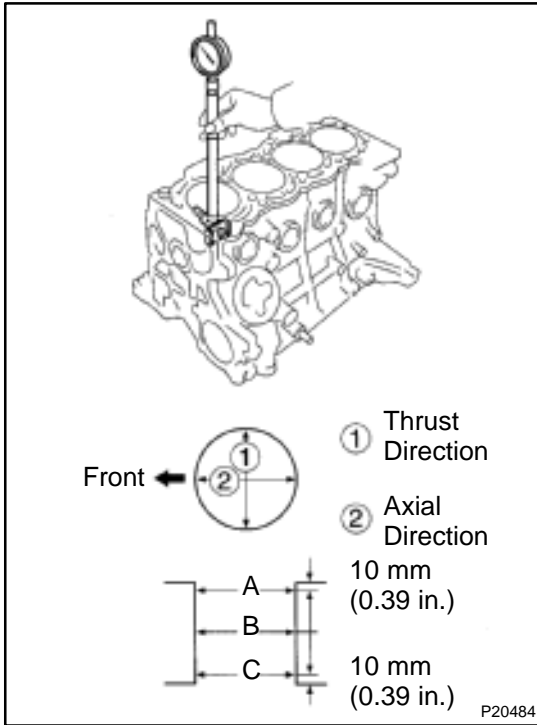
If deep scratches are present, replace the cylinder block.



4. INSPECT CYLINDER BORE DIAMETER

HINT:

There are 3 sizes of the standard cylinder bore diameter, marked "1", "2" and "3" accordingly. The mark is stamped on the top of the cylinder block.



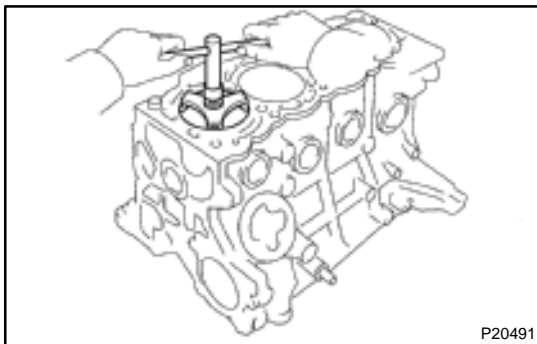
Using a cylinder gauge, measure the cylinder bore diameter at positions A, B and C in the thrust and axial directions.

Standard diameter:

Mark "1"	74.000 – 74.010 mm (2.9134 – 2.9138 in.)
Mark "2"	74.011 – 74.020 mm (2.9138 – 2.9142 in.)
Mark "3"	74.021 – 74.030 mm (2.9142 – 2.9146 in.)

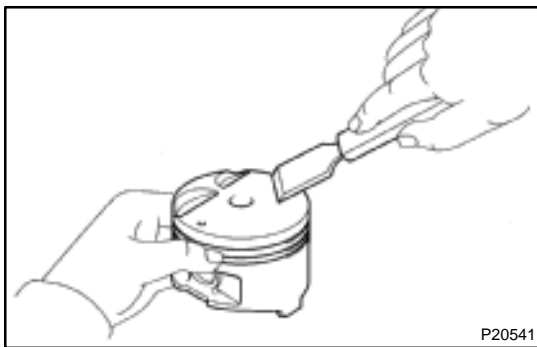
Maximum diameter: 74.23 mm (2.9224 in.)

If the diameter is greater than maximum, replace the cylinder block.



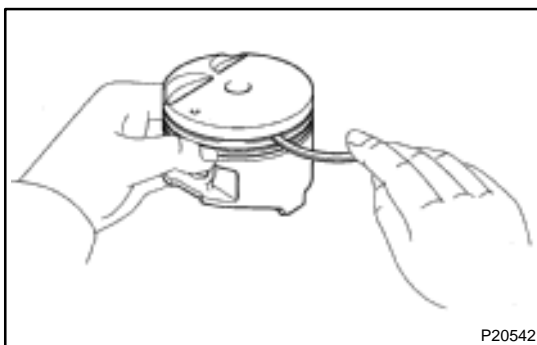
5. REMOVE CYLINDER RIDGE

If the wear is less than 0.2 mm (0.008 in.), using a ridge reamer, grind the top of the cylinder.

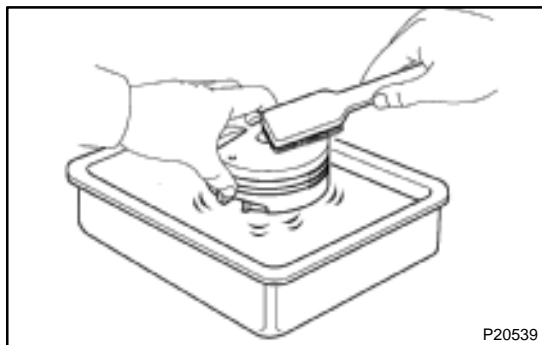


6. CLEAN PISTON

(a) Using a gasket scraper, remove the carbon from the piston top.



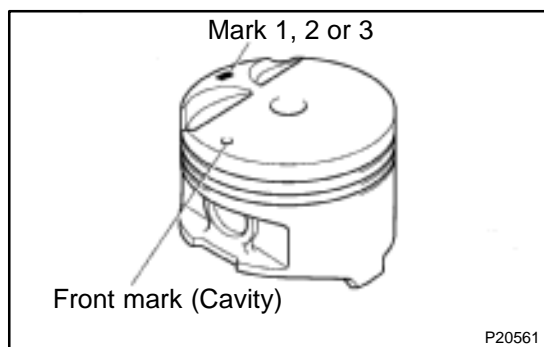
(b) Using a groove cleaning tool or broken ring, clean the ring grooves.



- (c) Using a soft brush and solvent, thoroughly clean the piston.

NOTICE:

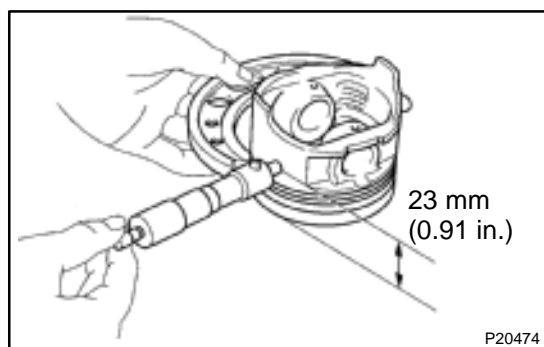
Do not damage the piston.



7. INSPECT PISTON OIL CLEARANCE

HINT:

There are 3 sizes of the standard piston diameter, marked "1", "2" and "3" accordingly. The mark is stamped on the piston top.



- (a) Using a micrometer, measure the piston diameter at right angles to the piston pin center line, 23 mm (0.91 in.) from the piston head.

Piston diameter:

Mark "1"	73.900 – 73.910 mm (2.9094 – 2.9098 in.)
Mark "2"	73.910 – 73.920 mm (2.9098 – 2.9120 in.)
Mark "3"	73.920 – 73.930 mm (2.9120 – 2.9106 in.)

- (b) Measure the cylinder bore diameter in the thrust directions. (See step 4)
- (c) Subtract the piston diameter measurement from the cylinder bore diameter measurement.

Standard oil clearance:

0.09 – 0.11 mm (0.0035 – 0.0043 in.)

Maximum oil clearance:

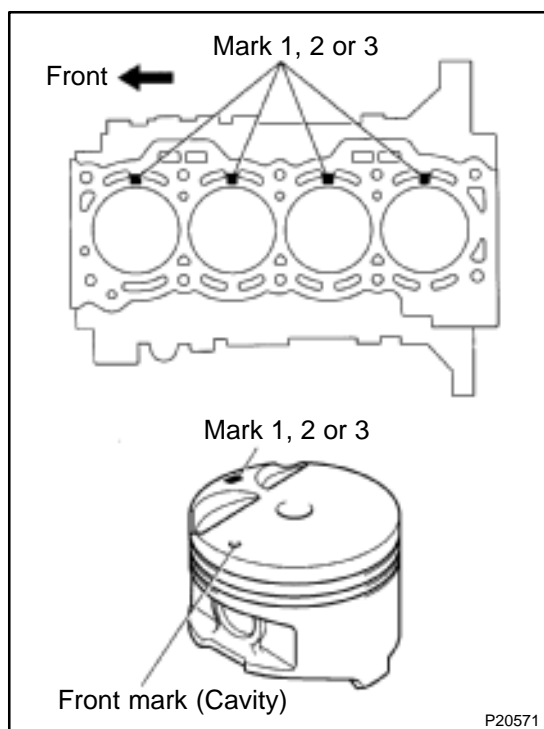
0.13 mm (0.0051 in.)

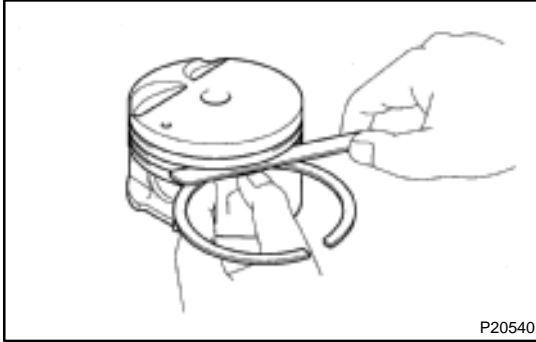
If the oil clearance is greater than maximum, replace all 4 pistons. If necessary, replace the cylinder block.

HINT:

Use new cylinder block:

Use a piston with the same number mark as the cylinder bore diameter marked on the cylinder block.





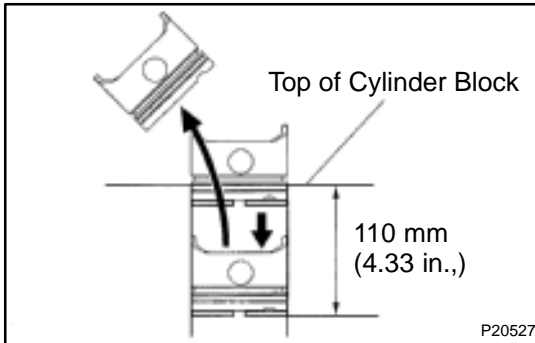
8. INSPECT PISTON RING GROOVE CLEARANCE

Using a feeler gauge, measure the clearance between new piston ring and the wall of the ring groove.

Ring groove clearance:

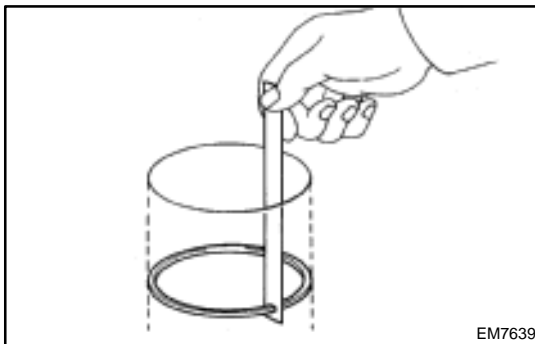
No.1	0.04 – 0.08 mm (0.0016 – 0.0031 in.)
No.2	0.03 – 0.07 mm (0.0012 – 0.0028 in.)

If the oil clearance is greater than maximum, replace the piston.



9. INSPECT PISTON RING END GAP

- Insert the piston ring into the cylinder bore.
- Using a piston, push the piston ring a little beyond the bottom of the ring travel, 110 mm (4.33 in.) from the top of the cylinder block.



- Using a feeler gauge, measure the end gap.

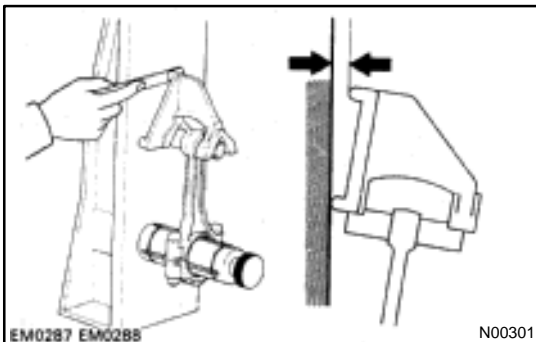
Standard end gap:

No.1	0.26 – 0.48 mm (0.0102 – 0.0189 in.)
No.2	0.36 – 0.57 mm (0.0142 – 0.0224 in.)
Oil (Side rail)	0.13 – 0.50 mm (0.0051 – 0.0197 in.)

Maximum end gap:

No.1	1.07 mm (0.0421 in.)
No.2	1.02 mm (0.0402 in.)
Oil (Side rail)	1.10 mm (0.0433 in.)

If the end gap is greater than maximum, replace the piston ring. If necessary, replace the cylinder block.



10. INSPECT CONNECTING RODS

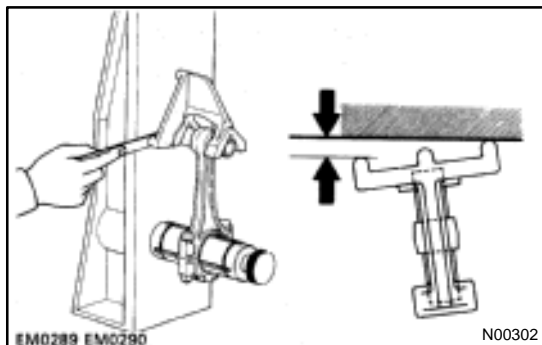
Using a rod aligner, check the connecting rod alignment.

- Check for out-of-alignment.

Maximum out-of-alignment:

0.03 mm (0.0012 in.) per 100 mm (3.94 in.)

If out-of-alignment is greater than maximum, replace the connecting rod assembly.



- Check for twist

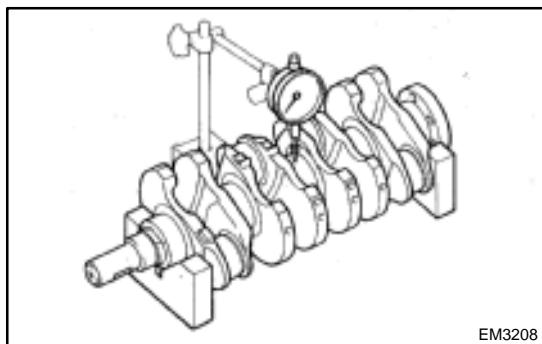
Maximum twist:

0.05 mm (0.0020 in.) per 100 mm (3.94 in.)

If twist is greater than maximum, replace the connecting rod assembly.

HINT:

If replacing the connection rods, replace the same number of connecting rod bearings as that of new connecting rod caps.

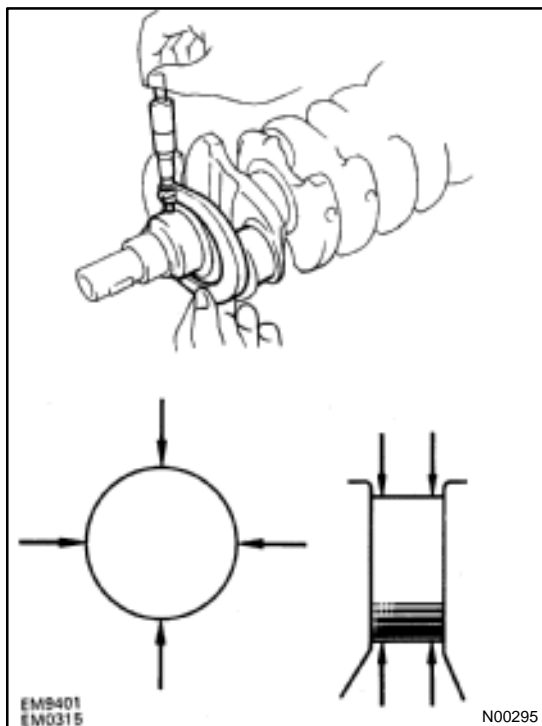


11. INSPECT CRANKSHAFT FOR RUNOUT

- Place the crankshaft on V-blocks.
- Using a dial indicator, measure the circle runout at the center journal.

Maximum circle runout: 0.06 mm (0.0024 in.)

If the circle runout is greater than maximum, replace the crankshaft.



12. INSPECT MAIN JOURNALS AND CRANK PINS

- Using a micrometer, measure the diameter of each main journal and crank pin.

Main journal diameter:

STD	49.985 – 50.000 mm (1.9679 – 1.9685 in.)
U/S 0.25	49.745 – 49.755 mm (1.9585 – 1.9589 in.)

Crank pin diameter:

STD	42.985 – 43.000 mm (1.6923 – 1.6929 in.)
U/S 0.25	42.745 – 42.755 mm (1.6829 – 1.6833 in.)

If the diameter is not as specified, check the oil clearance (See steps 3 and 6 in cylinder block disassembly). If necessary, grind or replace the crankshaft.

- Check each main journal and crank pin for taper and out-of-round as shown.

Maximum taper:

0.08 mm (0.0031 in.)

Maximum out-of-round:

0.07 mm (0.0028 in.)

If the taper and out-of-round is greater than maximum, replace the crankshaft.

13. IF NECESSARY, GRIND AND HONE MAIN JOURNALS AND/OR CRANK PINS

- Grind and hone the main journals and/or crank pins to the finished undersized diameter (See procedure in step 2).
- Install new main journal and/or crank pin undersized bearings.