

ENGINE MECHANICALS

22. Remove the rear end plate.
23. Remove the oil seal retainer with the oil seal.
24. Remove the gasket.
25. Remove the balance shaft rear cover.
26. Remove the balance shaft rear cover gasket.
27. Removal of crankshaft bearing caps
 - (1) Slacken the crankshaft bearing cap bolts evenly over two or three stages. Then, remove the bolts.
 - (2) Remove the crankshaft bearing caps.

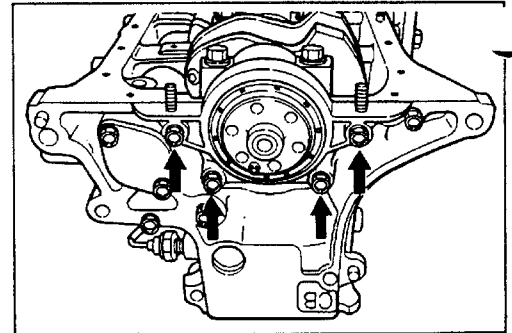


Fig. 5-239

WM-05279

28. Removal of crankshaft bearing (lower)

Remove the connecting rod bearing, as follows: Push the connecting rod bearing at the side without the turning-preventive tang by your finger so that the opposite end may float. Thus, take out the bearing. Do not touch the front surface or the back surface of the bearing by your finger during the removal.

NOTE:
Arrange the removed bearings in order so that their installation positions may be known readily.

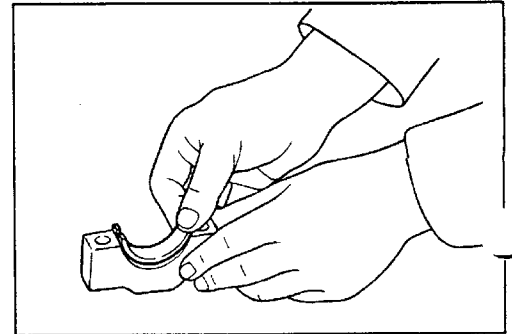


Fig. 5-240

WM-05280

29. Removal of crankshaft

Remove the crankshaft by lifting it vertically so that no scratch may be made to the crankshaft journals and the crankshaft may not interfere with the cylinder block.

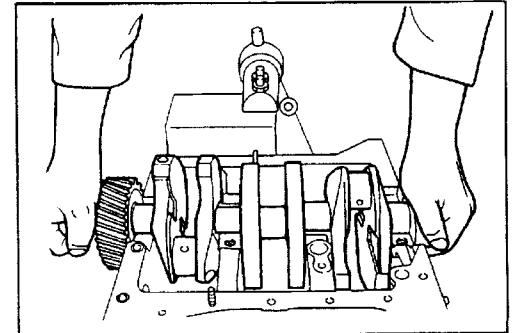


Fig. 5-241

WM-05281

30. Remove the thrust washers.

The thrust washers are provided at both sides of the bearing No.3.

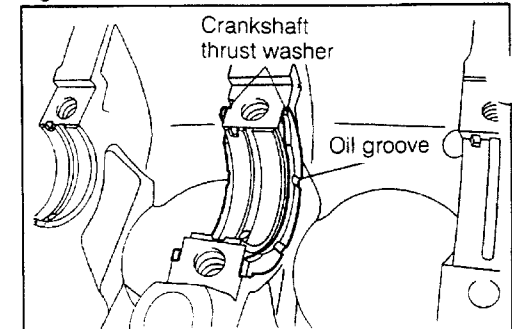


Fig. 5-242

WM-05282

31. Removal of crankshaft bearing (lower)

Remove the connecting rod bearing, as follows: Push the connecting rod bearing at the side without the turning-preventive tang by your finger so that the opposite end may float. Thus, take out the bearing. Do not touch the front surface or the back surface of the bearing by your finger during the removal.

NOTE:

 - ① Arrange the removed bearings in order so that their installation positions may be known readily.
 - ② Clean the disassembled parts with a cleaning solvent. Blow them by compressed air. This note does not apply to the rubber parts.

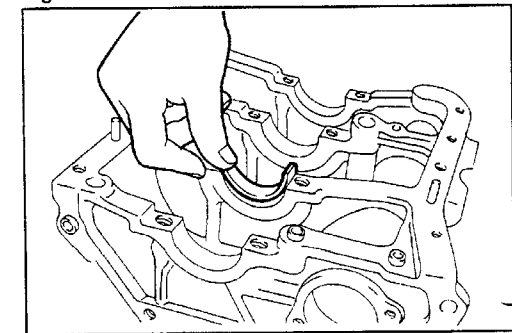


Fig. 5-243

WM-05283

32. Remove the cylinder block from the SST.

WM-05284

INSPECTION

1. Checking of cylinder block

- (1) Check the cylinder block for damage or cracks.
- (2) Check the cylinder head gasket surface for distortion.

NOTE:

Perform the measurement in six directions.

Maximum distortion limit: 0.1 mm (0.0039 inch)

[CB-23 engine only]

If the distortion exceeds the maximum distortion limit, recondition the surface. However, this reconditioning should not be performed beyond the grinding limit of 0.3 mm (0.012 inch).

Furthermore, make sure that the width between the cylinder head gasket contact surface and the oil pan attaching surface is at least 200.55 mm (7.896 inches).

(3) Measure the cylinder bore diameters.

Measure the bore diameter of each cylinder. The measurement should be made at six points.

- ① Ensure that the difference between the maximum and minimum bore diameters of each cylinder is within 0.1 mm (0.039 inch).

NOTE:

The measurement results should be recorded.

- ② If the difference between the maximum and minimum values exceeds the specified value (0.1 mm or 0.039 inch), perform boring and honing for the cylinder.

Specified cylinder bore diameter after honing

When repair standard piston is used:	76.00 - 76.03 mm (2.992 - 2.993 inch)
When O/S 0.25 piston is used:	76.25 - 76.28 mm (3.002 - 3.003 inches)
When O/S 0.50 piston is used:	76.50 - 76.53 mm (3.012 - 3.013 inches)

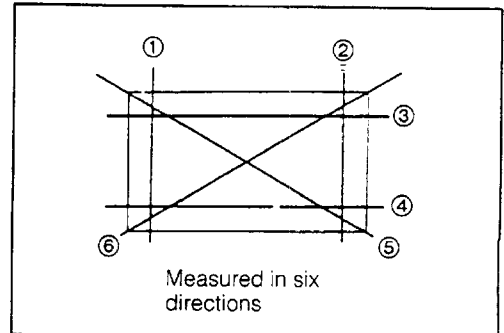


Fig. 5-244

WM-05285

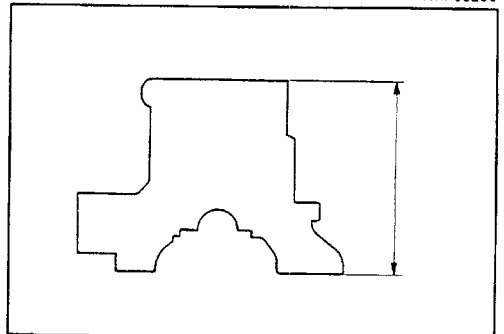


Fig. 5-245

WM-05286

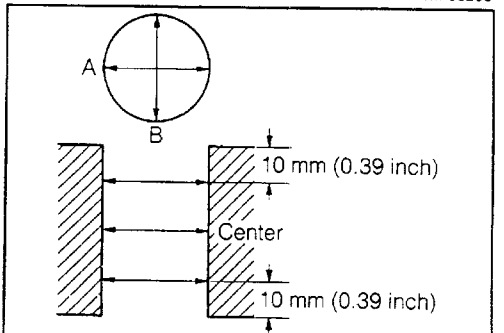


Fig. 5-246

WM-05287

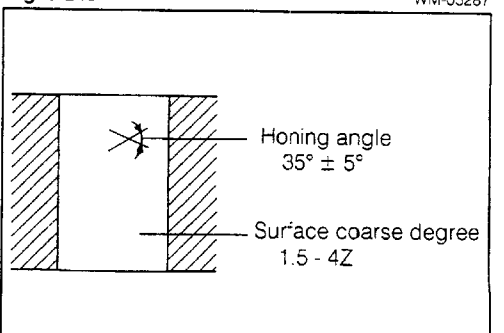


Fig. 5-247

WM-05288

ENGINE MECHANICALS

- ③ After the cylinder block has been cleaned and checked, calculate the cylinder-to-piston clearance. At this calculation, use the minimum measurement value as the cylinder bore diameter of each cylinder.

Cylinder-to-piston clearance:

0.03 - 0.12 mm (0.0012 - 0.0047 inch)

NOTE:

If the calculated clearance exceeds the specified value, perform boring and honing, referring to the specifications in ②. However, if the oversize pistons have been installed and the cylinder-to-piston clearance has exceeded the specified value, replace the cylinder block and pistons.

WM-05289

2. Checking of piston and piston rings

- (1) Remove the piston rings No.1 and No.2, using a commercially-available piston ring expander or the like.

NOTE:

- ① Arrange the removed piston rings in order so that their installation positions may be known readily.
② Do not expand the piston ring unnecessarily beyond the required extent.

- (2) Remove the oil ring by hand.

NOTE:

- ① Arrange the removed oil rings in order so that their installation positions may be known readily.
② Do not expand the oil ring unnecessarily beyond the required extent.
(3) Disassemble the piston pin from the piston, using the following SST.

SST: 09221-25018-000

- ① Assemble the spring to the main body of the SST.
② Attach the smaller bar on the spring. While pushing the lever into the body, install the fitting piece to the main body, with the surface having a cut-out section facing upward. Then, secure it with the attaching screw.
③ Place the piston on the fitting piece, aligning the cut-out sections.
④ Install the longer lever into the piston hole.
⑤ Press off the piston pin, using a press.

NOTE:

Arrange the disassembled pistons and piston pins in order so that their installation positions may be known readily.

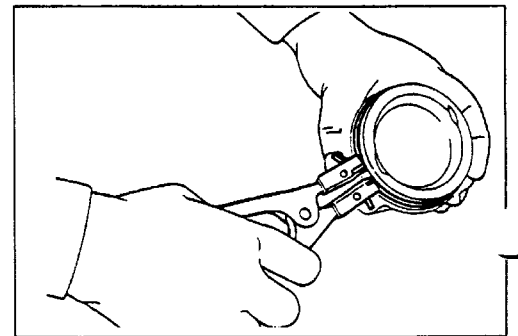


Fig. 5-248

WM-05290

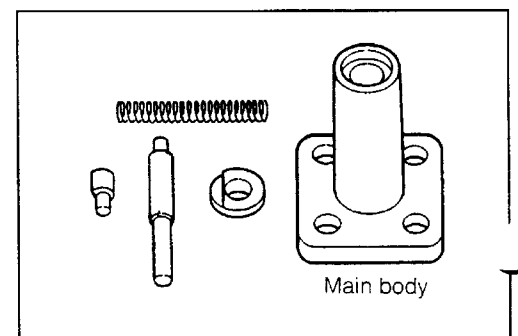


Fig. 5-249

WM-05291

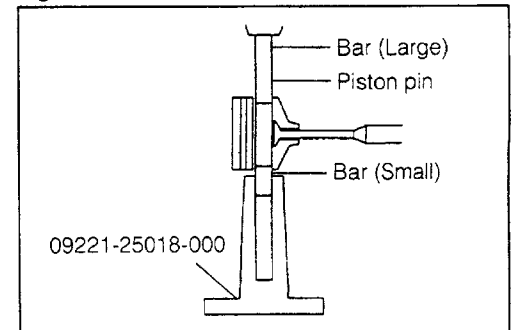


Fig. 5-250

WM-05292

(4) Cleaning of pistons

- ① Remove the carbon deposits from the piston top, using a gasket scraper or the like.
- ② Clean the piston ring groove with a broken piston ring or a groove cleaning tool.
- ③ Clean the piston with a soft brush and a cleaning solvent.

NOTE:

Be very careful not to scratch the piston.

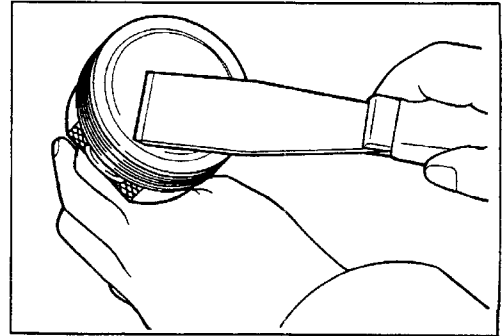


Fig. 5-251

WM-05293

(5) Check the pistons for cracks, damage or seizure.

(6) Checking piston ring side clearance

Check the piston ring side clearance over the entire periphery of each groove, using a filler gauge or a thickness gauge.

The maximum value in the measurement is regarded as the side clearance.

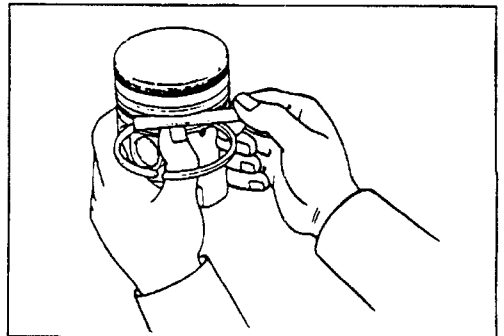


Fig. 5-252

WM-05294

Side clearance

mm (inch)

	CB-23 & CB-61 engines	CB-80 engine
Compression ring No.1	0.03 - 0.12 (0.0012 - 0.0047)	0.05 - 0.12 (0.0002 - 0.0047)
Compression ring No.2	0.02 - 0.12 (0.0008 - 0.0047)	0.02 - 0.12 (0.0008 - 0.0047)

If the measured side clearance exceeds the specified value, measure the piston ring thickness with a micrometer. To make the side clearance meet the specifications, replace the piston ring or the piston, or both of them, referring to the piston ring standard thicknesses given below.

Piston ring standard thickness

mm (inch)

	CB-23 & CB-61 engines	CB-80 engine
Compression ring No.1	1.47 (0.058)	1.47 (0.058)
Compression ring No.2		

WM-05295

(7) Check the oil ring for damage.

NOTE:

If any of the ring No.1, ring No.2 and oil ring is defective, replace all of them as a set for one cylinder.

WM-05296

ENGINE MECHANICALS

- (8) Measuring outer diameter of piston
 Measure the outer diameter of the piston at the specified measuring point from the lower end of the piston.

Measuring points of piston outer diameter mm (inch)

	Measuring point
CB-23 & CB-61 engines	15 (0.6) from lower end
CB-80 engine	10 (0.4) from lower end

NOTE:

The measurement results should be recorded.
 (The measurement results become necessary when the cylinder-to-piston clearance is calculated.)

- (9) Checking piston pin oil clearance
- ① Measure the diameter of the piston pin hole.
 - ② Measure the outer diameter of the piston pin.
 - ③ Measure the piston-to-piston pin oil clearance.
- Allowable limit: 0.03 mm (0.0018 inch)

NOTE:

If the oil clearance exceeds the specified value, replace the piston and piston pin as a set.

- (10) Checking piston ring end gap
 After the cylinder has been checked or reconditioned, insert the piston ring into the cylinder bore down to a point about 110 mm (4.3 inches) measured from the cylinder head gasket attaching surface. Then, measure the piston ring end gap.

NOTE:

Apply engine oil to the piston ring before inserting it.

End gap

[CB-23 & CB-61 engines]

Compression ring No.1

0.20 - 0.70 mm (0.079 - 0.028 inch)

Compression ring No.2

0.20 - 0.70 mm (0.079 - 0.028 inch)

Oil ring 0.20 - 1.10 mm (0.079 - 0.043 inch)

[CB-80 engine]

Compression ring No.1

0.35 - 0.70 mm (0.014 - 0.028 inch)

Compression ring No.2

0.28 - 0.70 mm (0.011 - 0.028 inch)

Oil ring 0.20 - 1.10 mm (0.008 - 0.043 inch)

If the end gap exceeds the specified limit, replace piston ring as a set.

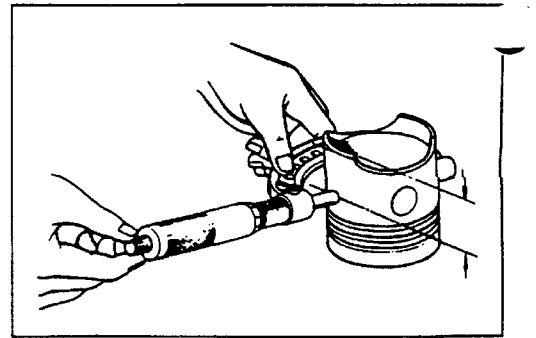


Fig. 5-253

WM-05297

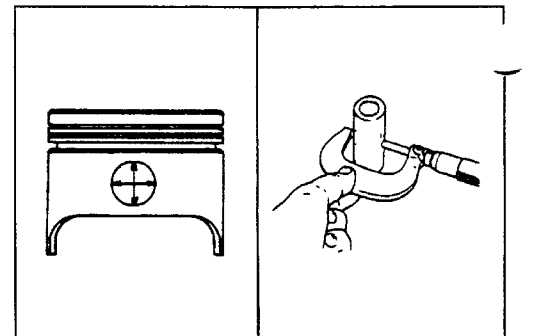


Fig. 5-254

WM-05298

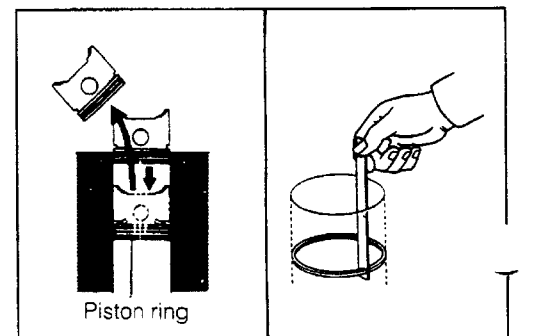


Fig. 5-255

WM-05299

- 3. Checking connecting rod
 - (1) Check the connecting rod for damage or cracks.
 - (2) Check the connecting rod for bend or twist.
 - Maximum bend limit: 0.05 mm (0.0020 inch)
 - Maximum twist limit: 0.05 mm (0.0020 inch)

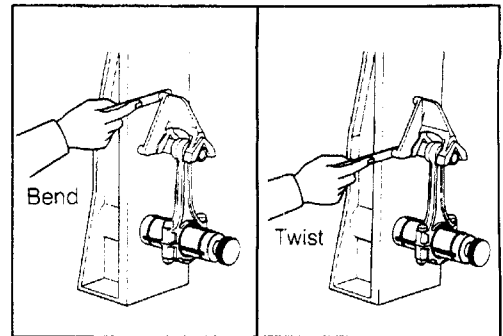


Fig. 5-256

WM-05300

- (3) Measure the oil clearance at the big end.
 - ① Install the bearing to the connecting rod and bearing cap.

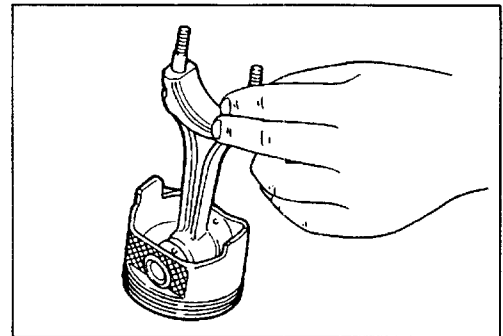


Fig. 5-257

WM-05301

- ② Install the plastigage on the crankpin journal. Tighten the bearing cap to the specified torque.

Tightening Torque:

kg-m (ft-lb)

CB-23 & CB-61 engines	2.5 ± 0.4 (18 ± 3)
CB-80 engine	4.7 ± 0.5 (34 ± 7)

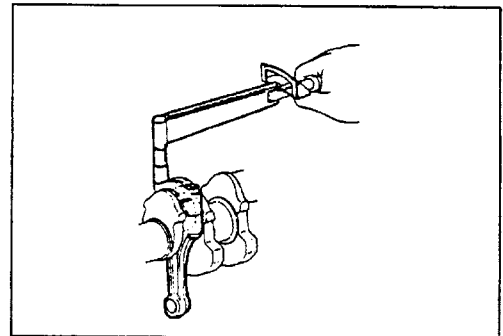


Fig. 5-258

WM-05302

- ③ Remove the bearing cap. Measure the oil clearance.
 - Oil clearance
 - [CB-23 & CB-61 engines]
 - 0.020 - 0.070 mm (0.00079 - 0.00280 inch)
 - [CB-80 engine]
 - 0.024 - 0.070 mm (0.00094 - 0.00280 inch)

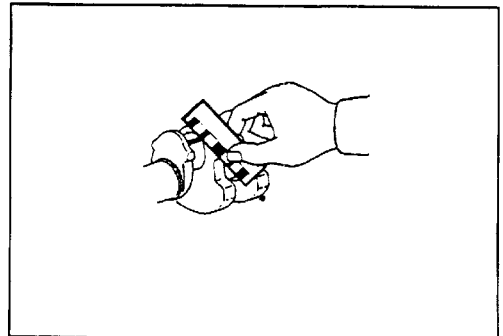


Fig. 5-259

WM-05303

If the oil clearance exceeds the specified value, grind or replace the crankshaft so that the oil clearance may meet the specifications, referring to the dimensions of the crankpin journal given below.

ENGINE MECHANICALS

Bearing size	Crankpin journal diameter		
	Engine type		
	CB-23	CB-61	CB-80
Repair standard	39.958 - 39.992 (1.573 - 1.574)	39.958 - 39.992 (1.573 - 1.574)	42.962 - 42.992 (1.691 - 1.692)
U/S 0.25	39.734 - 39.742 (1.564 - 1.565)	—	42.738 - 42.742 (1.682 - 1.683)
U/S 0.50	39.484 - 39.492 (1.554 - 1.555)	—	42.488 - 42.492 (1.672 - 1.673)

NOTE:

- ① When grinding the crankpin journal, finish each crankpin journal should be finished so that its radius at the corner becomes 0.25 mm.
- ② On Type CB-61 engine, no undersize bearing is available.

WM-05307

- ④ Checking connecting rod thrust clearance
Measure the thrust clearance between the connecting rod and the crankshaft, using a thickness gauge.

Thrust clearance

[CB-23 Engine]

0.15 - 0.38 mm (0.0059 - 0.0150 inch)

[CB-61 Engine]

0.15 - 0.38 mm (0.0059 - 0.0150 inch)

[CB-80 Engine]

0.15 - 0.45 mm (0.0059 - 0.0177 inch)

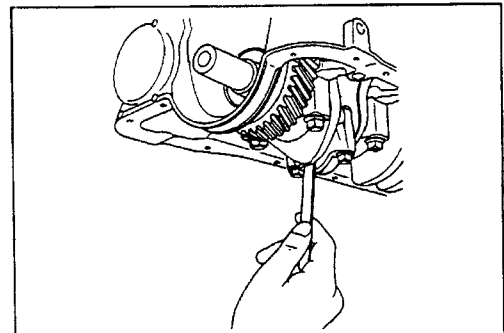


Fig. 5-260

WM-05305

NOTE:

The thrust clearance should be measured while the connecting rod being pushed against either side of the crankshaft in the axial direction. Measure the clearance at the opposite side.

- ⑤ If the clearance exceeds the specified value, replace the connecting rod or the crankshaft, or both of them, referring to the width of the big end of the connecting rod in the thrust direction and the side width of the crankpin journal.