
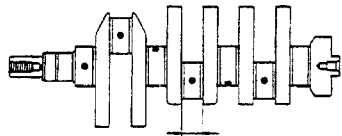


mm (inch)

	Width of big end of connecting rod in thrust direction	Side width of crankpin
CB-23	21.80 - 21.85 (0.858 - 0.860)	22.00 - 22.13 (0.866 - 0.871)
CB-61	21.80 - 21.85 (0.858 - 0.860)	22.00 - 22.13 (0.866 - 0.871)
CB-80	24.80 - 24.85 (0.976 - 0.978)	25.0 - 25.2 (0.984 - 0.992)
Reference		

WM-05306

#### 4. Checking of crankshaft

##### (1) Checking crankshaft for runout

- ① Measure the crankshaft runout at the main bearing journal No.3.

**Maximum runout limit: 0.06 mm (0.0024 inch)**

##### NOTE:

Be very careful not to scratch the crankshaft journals.

##### (2) Checking crankshaft for wear

Check the crankshaft main bearing journals and crankpin journals for evidence of seizure or scratches.

##### (3) Checking crankshaft main bearing journals and crankpin journals

Measure the outer diameter at four points of each of the main bearing journals and crankpin journals. This measurement should be conducted over the entire periphery of each journal, avoiding the oil holes provided on the journals.

Calculate the difference between the maximum value and minimum value for each measurement of the main bearing journals and crankpin journals.

**Out-of-roundness and taper limit:**

**0.01 mm (0.0004 inch)**

##### NOTE:

- ① The measurement results should be recorded.
- ② Be careful not to scratch the crankshaft.

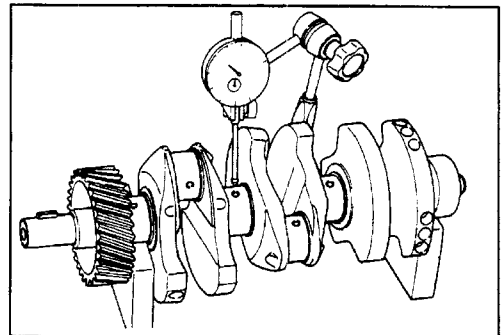


Fig. 5-261

WM-05307

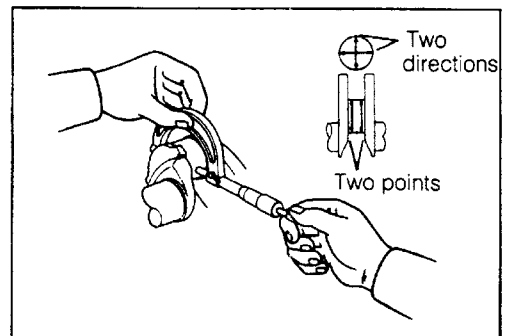


Fig. 5-262

WM-05308

## ENGINE MECHANICALS

(4) Checking main bearing journal oil clearance

- ① Install the bearings in the cylinder block and main bearing caps. Do not touch the front surface or the back surface of the bearings and also the bearing installation surfaces of the cylinder block and bearing cap during the check.

**NOTE:**

Care must be exercised not to mistake the installation position of the upper bearing for that of the lower bearing.

Upper bearing (cylinder block side) .... A groove is provided.

Lower bearing (bearing cap side) ..... No groove is provided.

WM-05309

② Install the crankshaft in the cylinder block.

**NOTE:**

- ① Be careful not to scratch the crankshaft and bearing.
- ② Do not apply engine oil to the crankshaft and bearings.

③ Install the plastigage.

④ Tighten the bearing cap to the specified torque.

**Tightening Torque:**

kg-m (ft-lb)

CB-23 & CB-61 engines	5.4 - 6.6 (40 - 48)
CB-80 engine	6.4 - 7.6 (46 - 55)

⑤ Remove the bearing cap. Take the reading of the oil clearance.

**Main bearing journal oil clearance:**

0.020 - 0.070 mm (0.0008 - 0.0028 inch)

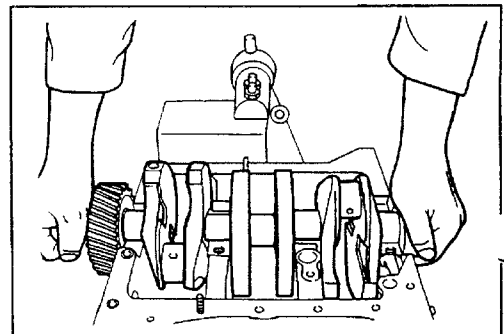


Fig. 5-263

WM-05310

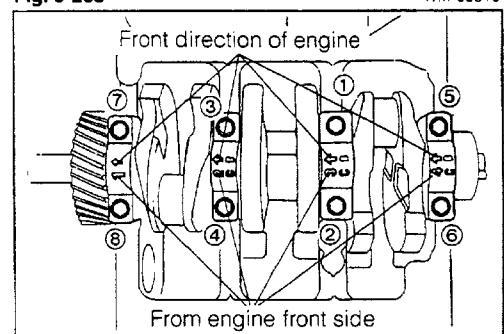


Fig. 5-264

WM-05311

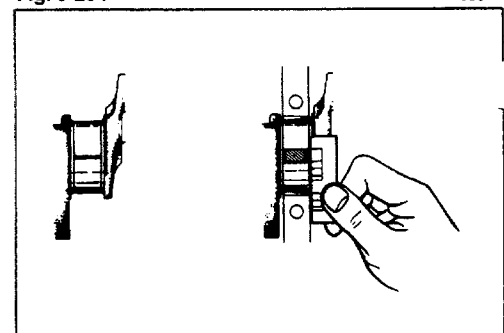


Fig. 5-265

WM-05312

- ⑥ 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 diameters of the main bearing journals given below.

mm (inch)

Bearing size	Main bearing journal diameter		
	Engine type		
	CB-23	CB-61	CB-80
Repair standard	41.958 - 41.992 (1.652 - 1.653)	41.958 - 41.992 (1.652 - 1.653)	47.962 - 47.992 (1.888 - 1.889)
U/S 0.25	41.734 - 41.742 (1.6430 - 1.6434)	—	—
U/S 0.50	41.484 - 41.492 (1.633 - 1.634)	—	—

**NOTE:**

- ① When grinding the main bearing journal, finish each main bearing journal so that its radius at the corner becomes 0.25 mm. (CB-23 engine only)
- ② On Type CB-61 and CB-80 engines, no undersize bearing is available.

WM-05313

(5) Checking crankshaft thrust clearance

- ① Install the bearings in the cylinder block and main bearing caps. Do not touch the front surface or the back surface of the bearings and also the bearing installation surfaces of the cylinder block and bearing cap during the check.

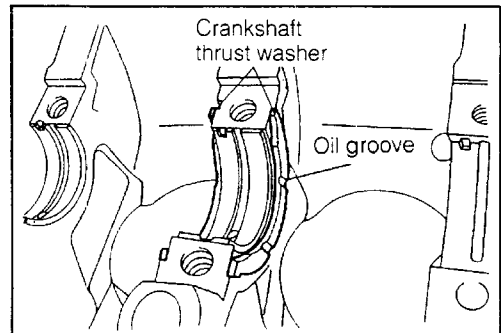


Fig. 5-266

WM-05314

- ② Install the thrust washers in the cylinder block.

**NOTE:**

Do not apply oil to the thrust washers.

- ③ Place the crank shaft to the cylinder block.

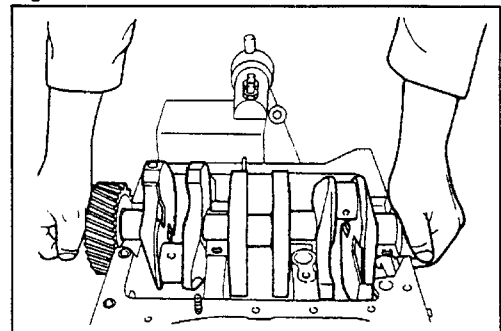


Fig. 5-267

WM-05315

- ④ Measure the thrust clearance, using a dial gauge.

**Thrust Clearance:**

0.02 - 0.30 mm (0.00079 - 0.01180 inch)

**NOTE:**

The measurement results should be recorded.

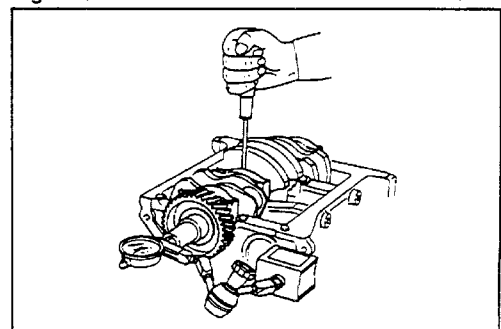


Fig. 5-268

WM-05316

## ENGINE MECHANICALS

- ⑤ Remove the parts which have been assembled to the cylinder block.
- ⑥ If the thrust clearance exceeds the specified value, determine which thrust washers should be used or whether the crankshaft should be replaced, based on the following calculation.

Measured thrust clearance: A

Sum of thicknesses of thrust washers at right and left sides: B

Specified thrust clearance: C

Required thrust washer thickness: D

$$\{(A+B)-C\} \pm 2 = D$$

Based on the thus-calculated value D, select a suitable thrust washer from among those in the table below.

Thrust washer size	Thrust washer thickness	Remarks
Standard	1.940 - 1.990 (0.0764 - 0.0783)	To be used when the maximum value of D is 1.990 or less.
O/S 0.125	2.065 - 2.115 (0.0813 - 0.0833)	To be used when the maximum value of D exceeds 1.990.
O/S 0.25	2.190 - 2.240 (0.0862 - 0.0882)	To be used when maximum value of D exceeds 2.115.

mm (inch)

### [Example]

Measured thrust clearance: A = 0.53 mm

Sum of thicknesses of thrust washers at right and left sides: B = 3.80 mm

Specified thrust clearance: C = 0.02 to 0.30

Required thrust washer thickness: D = ?

$$D = \{(0.53+3.80)-C\} \pm 2$$

$$= 2.015 \text{ to } 2.115$$

In this case, use a O/S 0.125 mm thrust washer.

However, if the minimum value of D exceeds 2.240 mm (0.0882 inch), replace the crankshaft and thrust washer in a set.

### [Reference]

Such determination can also be made by measuring the width of the thrust bearing contact surface of the crankshaft.

	Measurement value (A)
Standard	23.000 - 23.130 (0.905 - 0.911)
O/S 0.125	23.125 - 23.255 (0.910 - 0.916)
O/S 0.25	23.25 - 23.38 (0.915 - 0.920)
Replace crankshaft.	23.38 (0.920) or more

mm (inch)

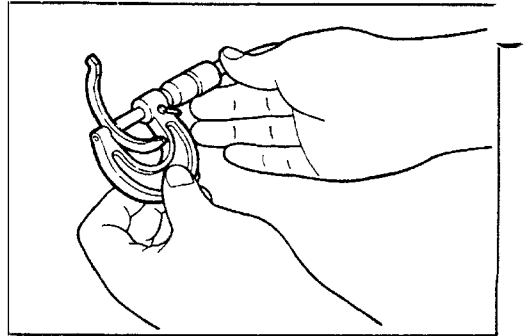


Fig. 5-269

WM-05317

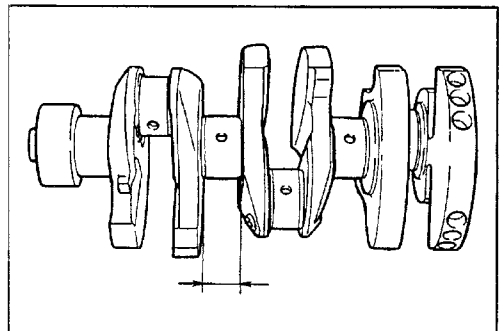


Fig. 5-270

WM-05320

- ⑦. Checking of balance shaft and gear  
 (1) Check the balance shaft and gear for damage, abnormal wear, cracks or seizure.

**NOTE:**

As for the disassembling procedure for the balance shaft and gear, see the sections (2) - ⑤ onward.

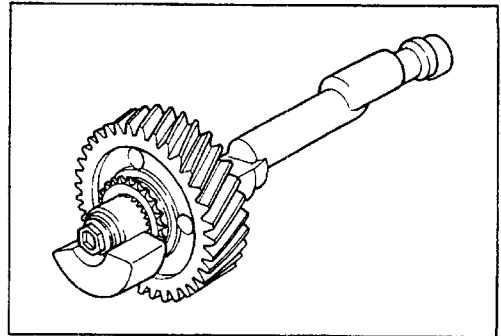


Fig. 5-271

WM-05321

- (2) Checking thrust clearance

- ① Attach the balance shaft to the cylinder block. Tighten the hexagon socket head cap bolt, using a hexagon wrench key (5 mm).

Tightening Torque:  $1.25 \pm 0.25$  kg-m ( $9 \pm 1.8$  ft-lb)

**NOTE:**

Be sure to apply oil to the balance shaft bearing section.

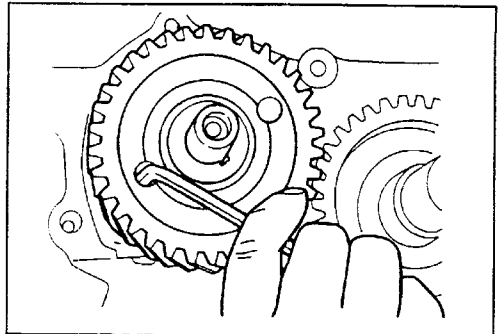


Fig. 5-272

WM-05322

- ② With a dial gauge attached at the forward end of the balance shaft at the balance shaft gear side, measure the thrust clearance of the balance shaft.

Thrust clearance:

0.03 - 0.20 mm (0.0012 - 0.0079 inch)

- ③ If the thrust clearance exceeds the specified value, replace the thrust washer with a new one. Then, measure the thrust clearance again.

Thrust clearance:

0.03 - 0.20 mm (0.0012 - 0.0079 inch)

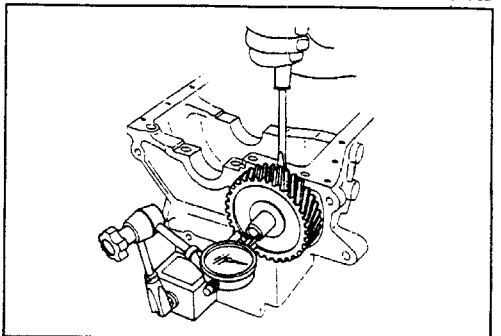


Fig. 5-273

WM-05323

**NOTE:**

As for the disassembling procedure for the balance gear and balance shaft, see section ⑤ onward.

- ④ If the thrust clearance still exceeds the specified value even after the new thrust washer has been assembled, replace the balance shaft with a new one.

**NOTE:**

As for the disassembling procedure for the balance gear and balance shaft, see section ⑤ onward.

WM-05324

## ENGINE MECHANICALS

- ⑤ Disassembling balance shaft and balance shaft gear  
Remove the balance shaft gear from the balance shaft, using the following SSTs.

SST: 09214-87701-000  
09253-87202-000

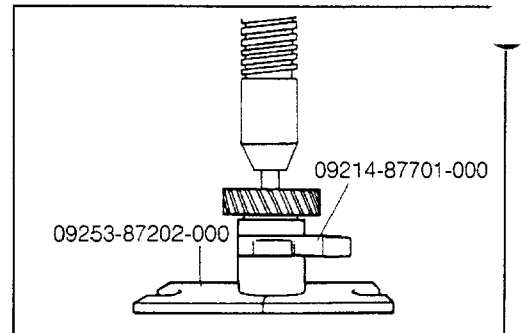


Fig. 5-274

WM-05325

- ⑥ Assembling balance shaft and balance shaft gear  
Attach the thrust plate to the balance shaft. Press the balance shaft gear into position, using a press in combination with the following SSTs.

SST: 09214-87701-000  
09253-87201-000  
09506-87303-000

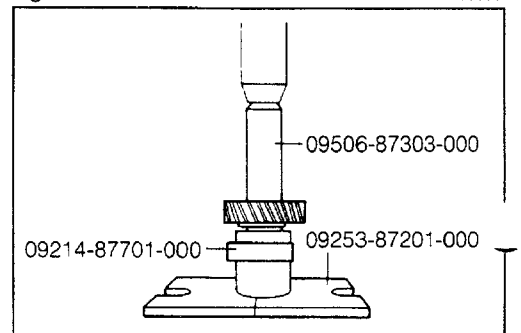


Fig. 5-275

WM-05326

- (3) Checking balance shaft for oil clearance

- ① Measure the outer diameters of the front and rear bearing journals of the balance shaft.

The measurement should be performed at the mid-point of each of the front and rear journals, in the two directions, 90 degrees apart from each other. The maximum value in the measurement is regarded as the outer diameter.

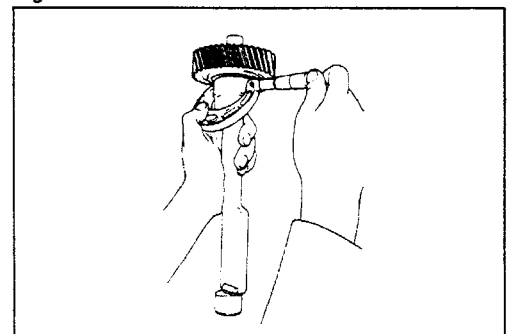


Fig. 5-276

WM-05327

- ② Measure the inner diameters of the bearing bores of the balance shaft.

The measurement should be performed at the mid-point of each of the front and rear bearing bores, in the two directions, 90 degrees apart from each other. The maximum value in the measurement is regarded as the inner diameter.

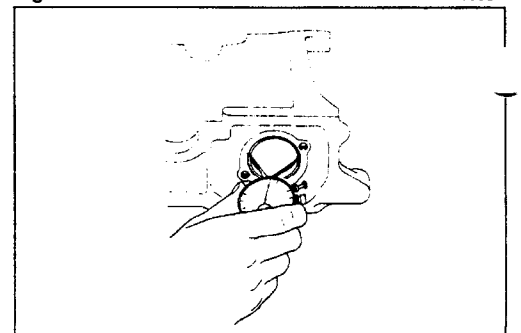


Fig. 5-277

WM-05328

- ③ Calculate the oil clearance.  
Oil clearance: 0.25 - 0.1 mm (0.0098 - 0.0039 inch)
- ④ If the oil clearance exceeds the specified value, replace the balance shaft bearing and/or grind or replace the balance shaft so that the oil clearance may meet the specifications, referring to the diameters of the balance shaft bearing given below.

**Balance shaft bearing sets**

mm (inch)

Balance shaft bearing	Balance shaft bearing inner diameter	
	Front	Rear
Repair standard	44.925 - 44.975 (1.769 - 1.771)	33.925 - 33.975 (1.336 - 1.338)
U/S 0.5	44.425 - 44.475 (1.749 - 1.751)	33.425 - 33.475 (1.316 - 1.318)

WM-05329

- ⑤ Pull out the balance shaft bearing, using the following SST.  
SST: 09215-87701-000

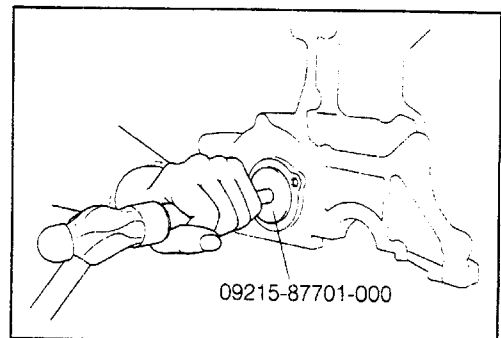


Fig. 5-278

WM-05330

- ⑥ Install the balance shaft bearing, using the following SST.  
SST: 09215-87701-000

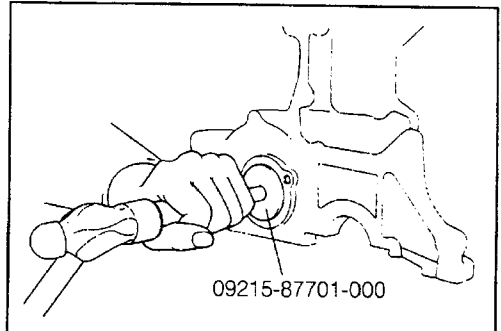


Fig. 5-279

WM-05331

**NOTE:**

- ① Be sure to install the bearing in the correct direction. Also, align the oil hole of the cylinder block with that of the bearing during the installation.
- ② After the bearing has been pressed into position, make sure that no burr or the like exists at the bearing bore. If the bearing exhibits any burr or the like, remove such harmful burrs, using an adjustable reamer.

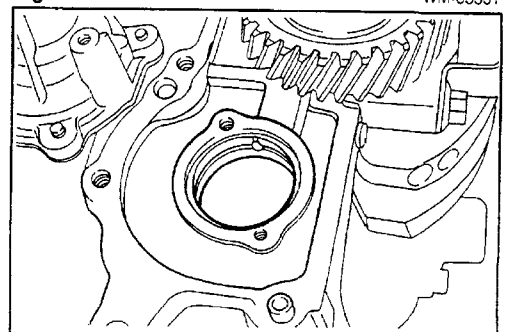


Fig. 5-280

WM-05332