

### C. Crankshaft

The crankshaft is built up of pressed together parts. It has four full circle crank wheels. The entire unit runs in four main bearings, three rollers and one ball bearing (the ball bearing is the outer right-hand bearing). The rods run parallel (360° crank) on needle bearings over hollow center crank pins. The left and right crank halves are pressed together with the cam chain drive sprocket between the halves.

#### 1. Crankshaft removal:

Tap the crankshaft with a rubber hammer to loosen it, then lift it out.

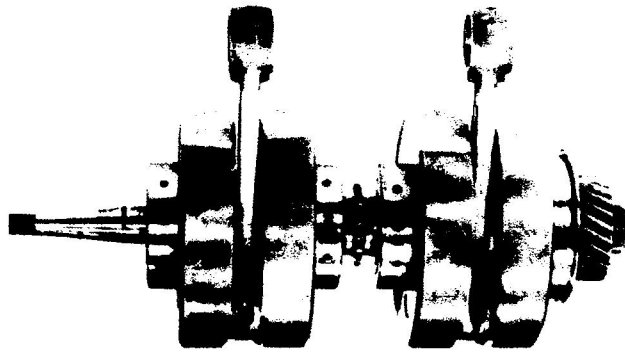
#### 2. Crankshaft main bearing wear

Though the crankshaft main bearings are heavy duty and will withstand much abuse, they should still be checked for wear.

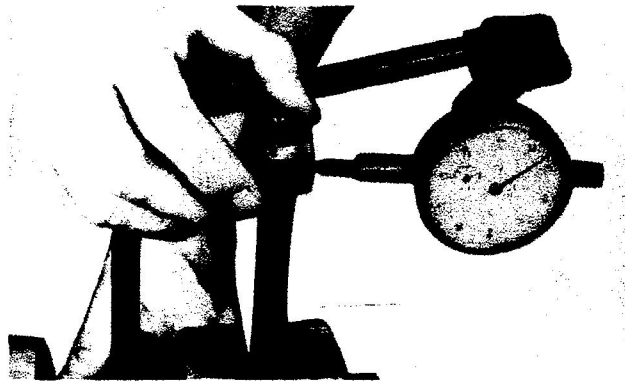
#### 3. Clean the bearing in solvent and dry it with air. Visually inspect all friction surfaces for obvious pits, scratches, chatter marks, or rust. Any of these bearing conditions that are bad enough to be readily seen should be sufficient cause for bearing replacement.

#### 4. Measure connecting rod axial looseness at the small end to determine the amount of wear in the big end (crank pin and big end bearing). Hold the big end stable to prevent it from sliding, then rock the small end.

Maximum Allowable Tolerance: 2 mm. Small End Play



Completely assembled crankshaft



Checking for big end wear

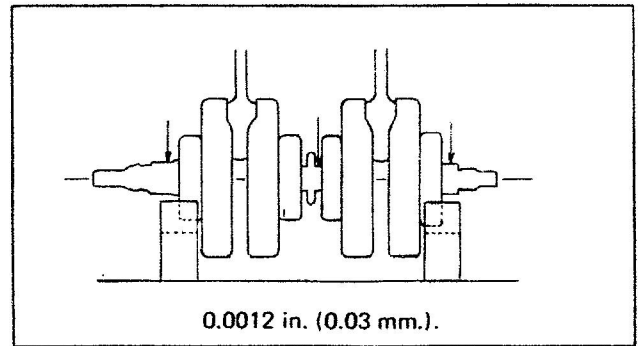
#### 5. If small end side play exceeds 2 mm., disassemble the crankshaft and check the connecting rod, crank pin, and needle bearing for wear. Replace worn parts and recheck small end play. It should measure no more than 1.0 mm. with new parts.

#### 6. Check for correct connecting rod big end side play. Slide the big end to one side and insert a feeler gauge between the crankwheel and rod big end. It should measure between 0.012 in. (0.3 mm.) and 0.024 in. (0.6 mm.). If it exceeds 0.26 in. (0.65 mm.), the connecting rod big end should be closely checked for excessive wear. In addition, total crankshaft width should be measured.



Measuring big end side clearance

7. Check the crankshaft unit for excessive run out. Mount the crankshaft in V-blocks and check for run out using a dial indicator. Run out at all measurement points should not exceed 0.0012 in. (0.03 mm.)



#### D. Crankshaft Installation (including cam chain)

##### Note:

Prior to crankshaft installation, make sure the left-hand crank seal is mounted on the crankshaft, teflon lip facing out.

1. Lubricate all crank bearings, then install the crankshaft into the top case. Make sure that each main bearing outer race fits in place over its locating pin in the case. **DO NOT STRIKE THE CRANKSHAFT OR MAIN BEARINGS WITH A HAMMER TO SEAT THE CRANKSHAFT** but rather fit each bearing over each locating pin and push the crankshaft into position by hand. Each bearing outer race has a punch mark, and lining this mark up with the crankcase mating surface helps the bearing race to fit in the locating pin.
2. Fit the chain over the crankshaft cam sprocket so that it drops into the center slot. Attach safety wire to each end of the cam chain and tie it off to prevent the chain from dropping back into the cases during further engine assembly.

