

Table 50 Crankshaft Bearing Insert/Journal Clearance

0.040"	"0.082 mm	0.11 mm
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Measure the journals which wear on these bearing inserts. If the micrometer reading is less than the service limit, replace the crankshaft.

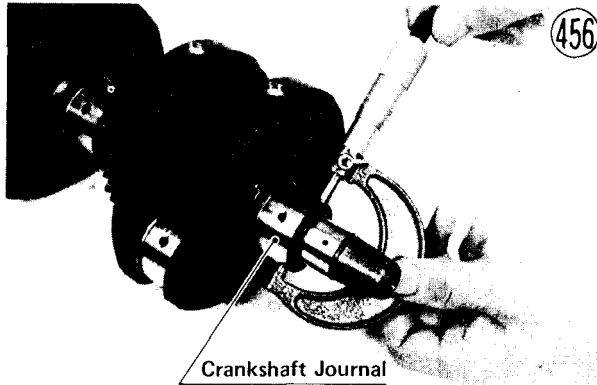


Table 51 Crankshaft Journal Diameter (Not Connecting Rod)

Standard	Service Limit
37.984- 38.000 mm	38.02 mm

Measure the crankshaft thrust clearance with a thickness gauge as shown. Replace the crankcase halves as a set, if the clearance exceeds the service limit.

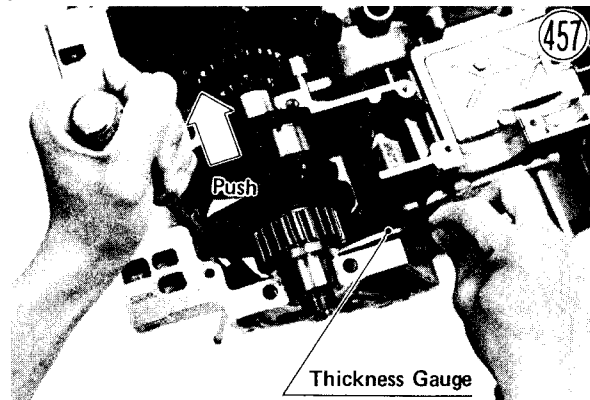


Table 52 Crankshaft Thrust Clearance

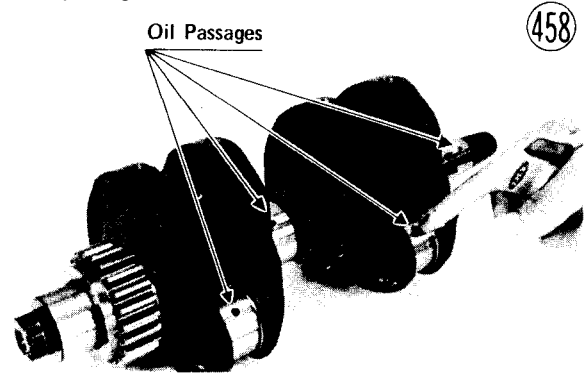
Standard	Service Limit
0.05-0.23 mm	0.45 mm

NOTES:

1. The upper crankcase half and the lower crankcase half are machined at the factory in the assembled state, so the crankcase halves must be replaced as a set.
2. When replacing the crankcase halves, check the alignment of the primary sprocket (on the crankshaft) as described in Pg. 139.
3. When replacing new crankcase halves, to seat the bypass valve steel ball in the bottom of the upper crankcase half, insert a mild steel rod and hammer lightly on the rod.

Oil passage cleaning

There is an oil passage running between the crankshaft journals on each side. Use compressed air to remove any foreign particles or residue that may have accumulated in these passages.



BALANCER MECHANISM

The balancer mechanism basically consists of two weights, which are chain-driven by the crankshaft. The following explanation covers how this mechanism reduces vibration.

The vibration of a 4-stroke, 2-cylinder engine is generally greater with larger engine displacement. This up-and-down vibration is natural due to the mechanics of a reciprocating engine, but the proper addition of counterweights on the crankshaft can reduce this vibration. However, troublesome revolving vibration remains unless some additional measure is taken.

Fig. 459 shows the internal engine forces when the centrifugal force of the counterweights is one half the inertial force of the pistons. The arrows show the amount and direction of these forces.

As the crankshaft rotates clockwise, A-E in Fig. 459, one half of the inertial force of the pistons is negated by the vertical component of the centrifugal force of the counterweights. However, the horizontal component of the centrifugal force of the counterweights (brought about by having counterweights) is not negated by anything. The thick arrows indicate the resulting unbalanced force, which is the main cause of engine revolving vibration.

The balancer mechanism includes two balancing weights having one half the centrifugal force of the counterweights. A balancing weight is installed at an equal distance on each side of the crankshaft and chain-driven in the opposite direction of crankshaft rotation.

Fig. 461 shows how this mechanism works at one crankshaft position (D). The centrifugal force of the balancer weights exerts a pull on the engine to the upper right as the arrows in the figure show. At the same time the crankshaft counterweights are exerting a pull on the engine to the lower left. The centrifugal force of the two balancer weights equals the unbalanced force of the crankshaft counterweights, but the forces