

Crankshaft Condition

All the journals must be smooth. Any roughness, ridging, scoring, or nicks will have to be removed. If the journals are found to be in good condition after a visual inspection they must then be measured for out-of-round and taper wear.

The journal must be measured, near one end, in several spots around the diameter. Be careful to keep off the corner fillet radius. Write down each measurement. Repeat this process near the other end of the journal. Fig 14-5

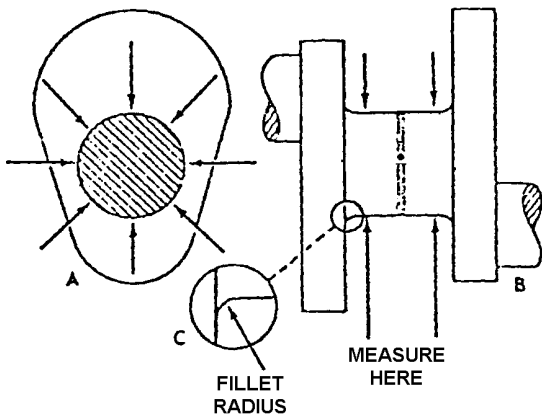


FIG 14-5 A Cross sectional view of journal. Make measurements indicated in A at both ends as shown in B.

OUT OF ROUNDNESS, TAPER, AND UNDERSIZE

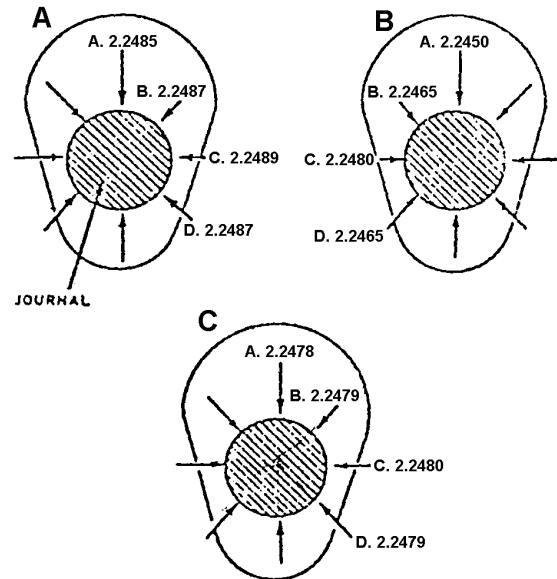
The measurements in Fig. 14-5 will determine three important points – out-of-roundness, taper and undersize.

Out-of-roundness will be computed by figuring the difference in the diameter measurements at the various points. (OUT-OF-ROUNDNESS MUST NOT EXCEED .001”) Fig. 14-6. illustrates three journals - one within limits (would accept a standard size insert), one requiring grinding, and one within limits but worn .001 undersize (would accept a .001” undersize bearing).

You will note that the journal in A. Fig. 14-

6, is only .0003” out-of-round and has worn a mere .0001” (maximum reading). Providing the taper is within limits, this journal will be satisfactory. If a new bearing is required, a STANDARD SIZE is required. In B., Fig. 14-6. the Journal is .003 out-of-round, and has worn .001 (maximum reading). This journal is unfit for service and should be machined.

In C., Fig. 14-6. the journal is only .0002” out-of round, but has worn an even .001 (maximum measurement). If the taper is satisfactory, this crankshaft can still be used, but will require a .001 undersize bearing.



	A	B	C
STANDARD DIAMETER	2.2490	2.2490	2.2490
LARGEST DIAMETER - C	2.2489	2.2480	2.2480
MINIMUM AMOUNT OF WEAR	.0001	.0010	.0010
LARGEST DIAMETER - C	2.2489	2.2480	2.2480
SMALLEST DIAMETER - A	2.2486	2.2450	2.2478
MAXIMUM OUT OF ROUND	.0003	.0030	.0002

FIG 14-6 End cross sectional view of three journals. A. O.K. for a standard bearing. B. must be machined. C. O.K. for a .001 undersize bearing.

SELECTING CORRECT UNDERSIZE BEARING

With minor journal wear, in which the journal out-of-roundness and taper is within limits, the proper oil clearance can often be maintained by the installation of .001 or

.002 undersize bearings. When determining the correct undersize ALWAYS USE THE LARGEST JOURNAL MEASUREMENT. If the smallest measurement, or an average of the measurements is used, there could be an insufficient oil clearance, and the bearings will quickly fail. If the largest measurement indicates the journal has worn .0005 below standard, no undersize is required. For wear from .001 to .0019, a .001 undersize bearing is needed. For wear from .002 to around .003, a .002 undersize will work. For wear much above .003, a .002 undersize will not bring the oil clearance within limits. An average oil clearance would be about .001 for each inch of shaft diameter for pressure lubricated systems.

Bearing material, engine design, rpm, etc., all affect the amount of clearance required so ALWAYS check the manufacturer's specs.

Connecting rod journals tend to wear more out-of-round and tapered than do the main bearing journals. This is basically due to the fluctuating load that places certain areas of the journal under heavy, sudden stresses. Rod twist and bend exert uneven edge loading that tends to taper the journal.

TAPER

By computing the difference in diameter readings between both ends of the journal, the amount of taper can be determined. In A, Fig. 14-7, the journal taper is .0002, and is thus acceptable. The journal in B, shows a taper of .003 and must therefore be machined. (TAPER SHOULD NOT EXCEED .001),- Fig. 14-7,

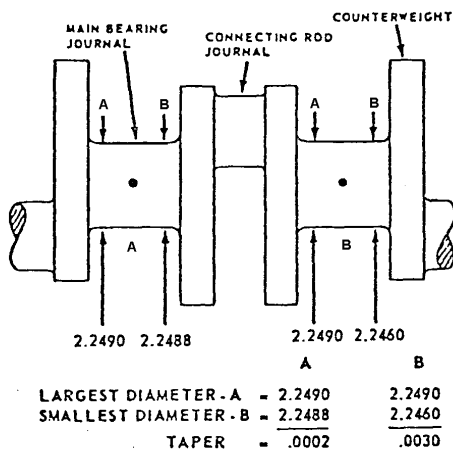


FIG 14-7 Journal A has only .0002 taper and is O.K.. Journal B Shows a taper of .003, and must be machined.