

V-Twin Mfg.
COMBO LAPPING TOOL
ENG & TRANS 1930-98 BT 1954-77 XL
VT No. 16-0039

This tool should only be used by a knowledgeable and trained motorcycle technician. V-Twin Mfg. accepts no responsibility for improper use.

Lapping Tool Instructions:

After the bushing is installed, this tool takes out the little out of round that occurs from being pressed in. This tool is a lapping tool not a cutting tool, it is meant to take out a couple "tenths" not "thousandths" of material.

Do not over tighten the nuts holding the lap head on the tapered shaft, if you do so the lap head will crack.

Do not use a drill to spin the shaft, you will wear out the grooves in the lap head. It is to be used with the hand crank that came with the tool.

Truing and Sizing Main Bearing Races:

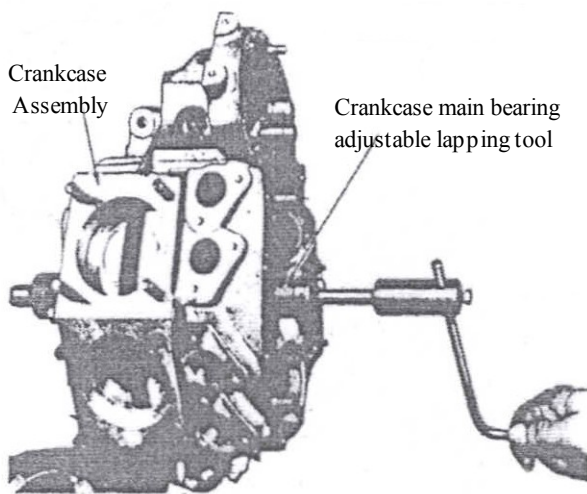
1. Before refitting worn main bearings, lap outer races to true them and remove any trace of wear shoulder at sides of roller paths using the lap tool.

Note: Before lap can be inserted in crankcase bushings, bearing washers, bearing spring rings and oil retaining bushing must be removed from the crankcase bushings. A race that is worn .0005" or more should be renewed.

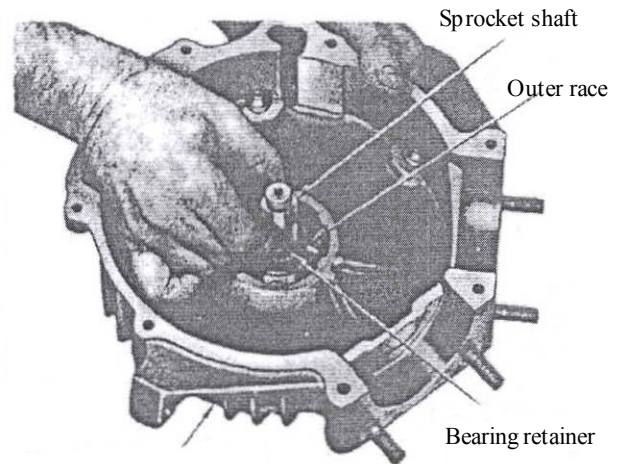
2. When renewing main bearing races, heat cases (not over 300' F.) around races. Heating expands cases slightly and less force is required to press old races out and new races in. New races after installation, should also be lapped smoothed, trued, aligned and sized so that the specified bearing clearance can be attained with roller sizes available.
3. When lapping main bearing races, right and left cases must be assembled and three or more studs securely tightened as in final assembly. This is to assure perfect alignment between left and right races in final assembly. Lap one side first and then the other, guiding lap by means of pilot bushing in opposite race.
4. Adjust lap snugly in race and use only a light application of fine lapping compound. A loose lap and the use of excessive amount of compound results in tapered bearing surface.

Fitting Main Bearings:

1. When fitting main bearings, the shafts that are to be used when flywheels are reassembled can be used as gauges to help determine what bearings are needed to be used for the correct clearance.
2. Use the largest roller size that will allow shaft just a noticeable shake in bearing. Bearing must not be fitted so light that shaft has no shake at all. In making this check, all bearing parts must be perfectly clean and dry; oil in the bearing will take up some clearance and make bearing feel tighter than it is actually fitted.
3. Sprocket shaft clearance in left main bearing should be .0005" to .001"; pinion gear shaft clearance in right main bearing should be .0008" to .0012".
4. After main bearing fitting is completed, crankcases with roller and retainer assembly can be set aside until flywheels are assembled.
5. Mainshafts can now be installed to their respective flywheels. Sprocket shaft to left (heavier) flywheel, pinion gear shaft to right (lighter) flywheel.
6. Wipe shaft tapers and flywheel tapers perfectly to make sure they are clean and free of oil. Be sure keys are in place.
7. Tighten nuts very tight, using Harley-Davidson special wrench. Part No. 11933-X.
8. Install lock washers. Lock washer can be installed either side up as it best matches lock screw hole.
9. If necessary, tighten nut a trifle more to make lock screw holes match.
10. Install lock screw and tighten securely.
11. After right side (pinion gear) shaft is installed check oil passage through shaft and side of flywheel with compressed air to be sure passage is open.



Truing and sizing main bearing races.



Left crankcase assembly

Using sprocket shaft as gauge to determine bearing fit.