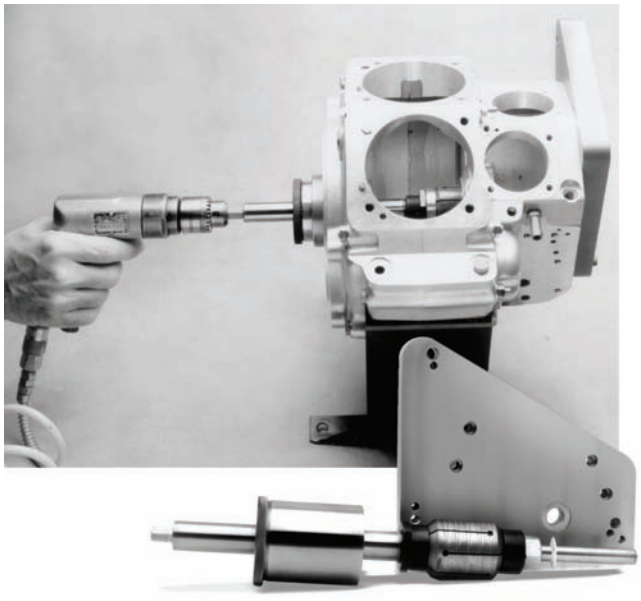
A Division of Thiessen Products, INC

Instruction Sheet For #96710-TL

BIG TWIN CASE LAP TOOL

USE ON SINGLE CAM BIG TWIN 1958-PRESENT NOTE: INCLUDES AFTERMARKET ENGINES

CAUTION: FOR USE ON 1958-1969 USE 1/4-24 SCREWS (NOT INCLUDED). READ ALL INSTRUCTIONS BEFORE STARTING ANY WORK!



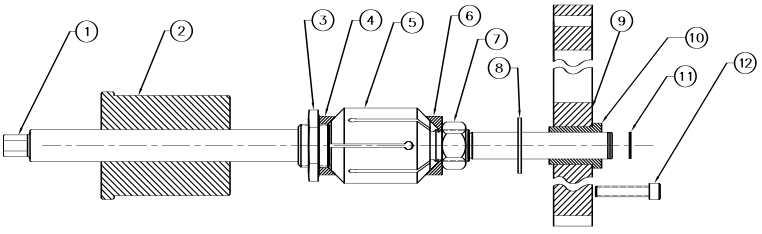
When a new right case race JIMS® #24599-58A or #24599-58B is installed or fitted for over size rollers, race must be lapped to true (or size) and aligned with the left case and pinion bushing centerline.

1. See H-D® Service Manual for specifications.
   Note: Because of the high tolerances, JIMS recommends using this lap tool in a room or shop with a stable temperature of 70˚ - 75˚ fahrenheit, or 22˚ - 22.4˚ celsius.
2. Remove tool from package and go over all parts of tool (see parts list). Become familiar with each part. There are a few parts you'll need to be cautious with such as the #1 main body shaft as both ends are precision ground. The #2 left sleeve bearing. Use care with both the I.D. and O.D. and the #9 cam cover plate. Treat these parts with special care for a lifetime of service work.
3. Other tools and material needed to do the job are: (1)1-5/16" open end wrench, (1) 1-1/8" open end wrench, (1) 3/16 allen wrench, (1) 1/2 drive variable speed drill motor to run at 150-200 rpm or a speed wrench with a 7/16" six point socket. A can of lapping compound, JIMS® #1083 220 grit oil or grease base. 220 grit will give you an approximate micron finish of 33.0. If you like a finer finish, leave a few tenths of an inch smaller I.D. and lap with a 320 grit JIMS® #1084 which will give you an approximate micron finish of 16.5.
4. Before lapping pinion bearing race do not install new cam bearing or sprocket shaft bearings.
5. Remove sprocket shaft bearing races and snap ring using JIMS No.94547-80A Race Remover and JIMS No.1710 Snap ring remover.
6. Check left bearing bore for burrs, remove even the smallest burr. Doing this will allow the bearing sleeve #2 to set centered in its bore, as this bearing sleeve is precision ground at a slight taper.(See H-D® service manual for 1987 to 1998, bearing removal).
7. Wash the two case halves paying attention to the inside mating surfaces, and the cam cover gasket surface. (Note! Some motor builders like to lightly lap the two case halves together to remove imperfections for a better sealing surface.)
8. Assemble right and left case with all lubed crank case studs. JIMS® recommends all bolts be used and torqued in order per H-D® service manual. Tighten lubed nuts to 15 ft. lbs. starting with the back bottom, next top center followed by front bottom. JIMS® also recommends that cylinder torque plates be installed and torqued per H-D® Service manual over both cylinder bores at the time of lapping race.

CAUTION: WEAR SAFETY GLASSES. EXCESSIVE FORCE MAY DAMAGE PARTS!
SEE JIMS® CATALOG FOR HUNDREDS OF TOP QUALITY PROFESSIONAL TOOLS.
THE LAST TOOLS YOU WILL EVER NEED TO BUY.

9. Securely mount motor case in motor stand JIMS® #1006T secured to workbench.
10. Oil the bearing sleeve with a light lube on O.D. Push sleeve into bearing bore with a clockwise motion. Do Not Force this sleeve, use only light hand pressure.
11. With item #1 main body shaft lying on a clean shop rag, remove nut #7 from shaft. Follow with right collar #6 and lap head #5. Lube taper lightly where the lap head rides on main body shaft. Reassemble to #1 main body shaft.
12. Lube I.D. of #2 and O.D. of item #1 big end, slip the hex end of shaft through item #2 until lap head is through pinion race. Stop before hitting sleeve #2.
13. Apply a small amount of lube to the small end of shaft #1, slip item #8 (flat washer) over end of shaft #1. This is the stroke stop for the inside.
14. Position item #9 over small end of lubed shaft, gently press cover plate #9 over the (2) lubed dowel pins. Lube items #12 (the four cover screws) install and tighten in a criss cross pattern to about 80-120 in. lbs. Install snap ring to end of shaft. This is the stroke stop for the outside.
15. Push end of shaft #1 until lap #5 is in the middle of pinion race. Tighten #7 with your 1-1/8 inch wrench through one of the tappet block holes. You can hold this nut #7 and turn shaft #1 with a 7/16 wrench. You may have to back off #3 a little to obtain a small amount of drag. Do not adjust arbor too snugly in race or race may be sized too big at both ends.
16. Push lap back until lap #5 is in the middle of cases. Apply a small amount of JIMS No. 1083, 220 grit lapping compound to lap only. Do not apply a heavy coat. **DO NOT GET ANY LAPPING COMPOUND ON THE SHAFT ENDS.**
17. Lock on your low rpm drill to hex end of shaft and stroke lap from stop to stop at about 200 rpm. Stroke at a rate of 80 strokes per minute.
18. It will take approximately 30 seconds to remove .0002 but still check I.D. size in several locations before lapping over 1 minute.
19. To remove lap from case, unscrew the (4) #12 screws using a 3/16 allen wrench, turn in the (2) pushing screws #12 in until plate #9 clears the (2) dowel pins. (Note: unscrew both #12 so plate #9 will go back on.)
20. Pull lapping assembly from case (be sure not to get any lapping compound on shaft). Wipe lapping compound from race and check size. Continue lapping until you have the right size you need. See H-D® Service manual for specifications.
21. Wash all lapping compound from race and oil holes. For best results wash in the direction oil flows only, with as high pressure as you can get. Do not wash from the opposite direction, this can push the lapping compound further into the crevices.

Notes: If lap is removing more material from one end or the other, lap the small end more, in other words do not stroke lap into big side of race. Make short strokes at small side. You can also try a little less lapping compound at the big side of race. If plate #9 is not going onto dowel pins make sure the (2) removing screws #12 are backed out from the inside face of the plate. If this doesn't work check left bearing bore for burrs, remove if any, lube sleeve #2 and install. If the plate #9 still will not go onto dowel pins your case halves might have some foreign material between them, remove if any.



PARTS AVAILABLE SEPARATELY

No.	Qty.	Description	Part No.
1	1	MAIN BODY SHAFT	96710-TL-1
2	1	LEFT SLEEVE BEARING	96710-TL-2
3	1	LEFT LOCKING NUT	2266
4	1	LEFT COLLAR	96710-TL-4
5	1	LAP HEAD 1-3/4" O.D.	96710-TL-5
6	1	RIGHT COLLAR	96710-TL-6
7	1	NUT	1100
8	1	WASHER	2020
9	1	CAM COVER PLATE	96710-TL-11
10	1	DRILL BUSHING	2132
11	1	RETAINING RING	2134
12	7	SCREW	2135