

Shim Procedure without a Shim Tool for Tapered Bearings

Special Instructions

The shim procedure can be done in the horizontal or vertical position. The procedure is done the same.

CAUTION

Use genuine Eaton® replacement gaskets for the Auxiliary Housing and Countershaft Bearing Cover. Do not omit the gaskets. Bearing endplay is influenced by the compressed thickness of the gasket (0.011–0.012" or 0.28–0.30 mm).

The bearing endplay must be checked and adjusted any time a Countershaft, Bearing, or Housing is replaced. If, during reassembly, the same Countershaft, Bearings, Housing, and Shims are reused and kept in the same location, it is not necessary to reset bearing endplay.

The following procedure is used to adjust the endplay for the Auxiliary Countershaft Tapered Bearings. By correctly following this procedure, each Countershaft will have 0.001–0.005" (0.03–0.12 mm) endplay.

Shims must be aligned properly or else the Rear Bearing Cover may be damaged when final torque is applied.

Procedure -

1. The Auxiliary Countershaft Bearing Covers or Countershaft Straps and Shims should be removed. Make sure all old gasket material is cleaned from the gasket mounting surfaces on the Countershaft Bearing Covers and the Auxiliary Housing.
2. Verify that the Auxiliary Section is in gear. When the Output Shaft is rotated, the Countershafts must also rotate. If not, shift the Auxiliary into gear by applying shop air to the High Range Air Port on Range Cylinder to shift into gear.
3. Make sure a 0.100 Countershaft Rear Bearing Shim is installed. Be sure the Countershaft Rear Bearing Races are seated in the Bearing bores.



4. Install two (2) clean 3/8" x 1" Capscrews without washers directly across from each other in each Bearing Cover. Tapped holes in Auxiliary Case must be free of thread adhesive.
5. Evenly tighten the capscrews to 7 lb. in. of torque. Do not install the Countershaft Rear Bearing Cover Gasket. The gap between the Bearing Cover and the Housing surface should be even from side to side.

Note: 7 lb. in. is slightly more than finger tight. Do not overtighten the capscrews. If the capscrews are too tight, the Bearing Cover will become distorted.



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6. Rotate the Output Shaft 4 times clockwise and 4 times counterclockwise. The rotation will seat and align the rollers in each tapered bearing. Re-torque the capscrews to 7 lb. in. If the Countershafts do not rotate, the Range Sliding Clutch or Deep Reduction Sliding Clutch is in neutral. Apply shop compressed air to Shift Cylinders to shift the Sliding Clutches into gear.



7. Use a Feeler Gauge, as close to each capscrew location as possible, and measure the gap between the Countershaft Rear Bearing Cover and the Auxiliary Housing Gasket surface. Measure and record the gap at two capscrew locations.



8. Average the two Feeler Gauge measurements by adding the measurements together and dividing by 2 as shown in the following example:

Shim Selection Example

Gap 1 = 0.060; Gap 2 = 0.050
Total Gap = 0.060 + 0.050 = 0.110
Average = 110/2 = 0.055
Select Yellow Shim as indicated in the "Shim Table" at the end of this section.

9. Locate the Feeler Gauge average measurement in the "Shim Table" to determine the required Shim and Color Code.

Note: The Oil Pump Shim is used when an Auxiliary Oil Pump or PTO is mounted on the Countershaft. The Oil Pump Shims have a smaller outside diameter.

10. Remove the Countershaft Rear Bearing Cover and Gauging Shim.
11. Place the selected Shim on the Rear Countershaft Bearing Race.
12. Position a new gasket on Countershaft Rear Bearing Cover mounting surface.
13. Position the Countershaft Rear Bearing Cover over the new gasket.
14. Apply Eaton® Fuller® Thread Sealant #71205 or equivalent to the Auxiliary Countershaft Rear Bearing Cover Capscrews and Auxiliary Countershaft Rear Bearing Cover.

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15. Install the Auxiliary Countershaft Rear Bearing Cover and secure it with the capscrews. Make sure the shim is in the proper location and is not pinched between the cover and the housing. Tighten the capscrews to 40–45 lb. ft. (54–61 Nm).

Note: Use a thick grease to hold the shim in position when installing the Cover.

16. Repeat this procedure for the remaining Countershaft.

Note: Make sure capscrews are properly torqued.

Note: Make sure the Input Shaft rotates.



Shim Table

Feeler Gauge Average Gap	Shim Thickness	Standard Shim Part Number	Oil Pump Shim Part Number	Color Code
0.072–0.075	0.033–0.034	4302345	4302346	Gold
0.69–0.0715	0.036–0.037	21452	21472	Red
0.066–0.0685	0.039–0.040	21453	21473	Pink
0.063–0.0655	0.042–0.043	21454	21474	Brown
0.060–0.0625	0.045–0.046	21455	21475	Tan
0.057–0.0595	0.048–0.049	21456	21476	Orange
0.054–0.0565	0.051–0.052	21457	21477	Yellow
0.051–0.0535	0.054–0.055	21458	21478	Green
0.048–0.0505	0.057–0.058	21459	21479	Light Blue
0.045–0.0475	0.060–0.061	21460	21480	Lavender
0.042–0.0445	0.063–0.064	21461	21481	White
0.039–0.0415	0.066–0.067	21684	21686	Black
0.036–0.0385	0.069–0.070	21685	21687	Silver