INSTRUCTIONS

-J04672 REV. 2008-07-23

TIMKEN BEARING CONVERSION TOOL

GENERAL

Kit Number

34823-08

Models

For model fitment information, see the P&A Retail Catalog or the Parts and Accessories section of www.harley-davidson.com (English only).

Additional Tools and Materials Required

Separate purchases of a bearing sleeve (34822-08), a bearing assembly (9028), and a model-specific sprocket spacer (per P&A Retail Catalog) are required to complete installation. See the P&A Retail Catalog or the parts and Accessories section of www.harley-davidson.com (English only) for any additional parts or accessories required for your model.

2-ton press (must be square to within .010", ram to table)

Inch-lb torque wrench

Foot-lb torque wrench

T15 TORX® drive socket (for inch-lb torque wrench)

5/32 inch hex drive socket (for inch-lb torque wrench)

5/16 inch hex drive socket (for foot-lb torque wrench)

5/64 inch hex key wrench

1/16 inch hex key wrench

3/8 inch drive hand drill

small tap handle (suitable for #8-32 tap)

Tapping Fluid

Press Fit Lube (non-drip)

Loctite® 620 threadlocker and sealant

⚠WARNING

The rider's safety depends upon the correct installation of this kit. Use the appropriate service manual procedures. If the procedure is not within your capabilities or you do not have the correct tools, have a Harley-Davidson dealer perform the installation. Improper installation of this kit could result in death or serious injury. (00333a)

NOTE

This instruction sheet references service manual information. A service manual for your model motorcycle is required for this installation and is available from a Harley-Davidson Dealer.

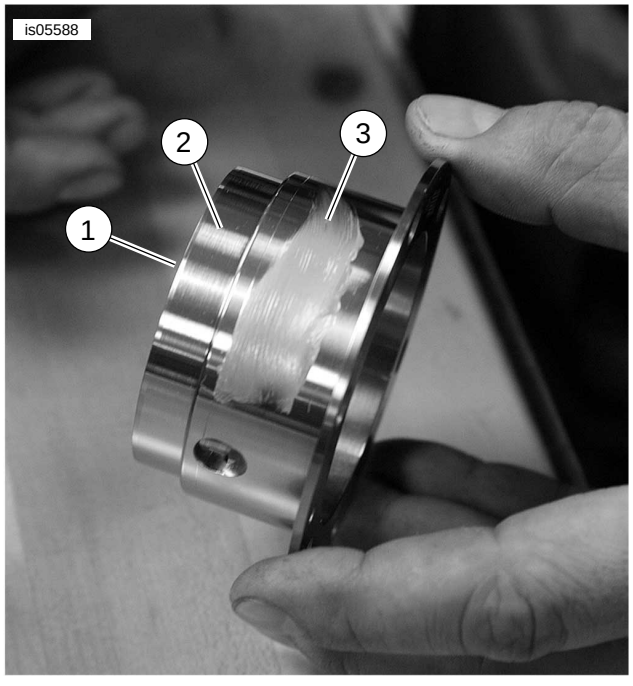
Kit Contents

See Figure 21 and Table 3.

If replacement parts are needed contact JIMS® at 805-482-6913 or www.jimsusa.com.

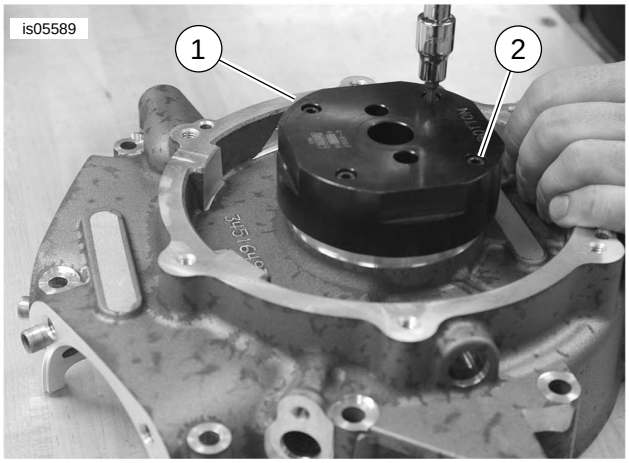
INSTALLATION

1. Remove and disassemble the engine as necessary to remove the left side engine case. Bearings and seals must be removed from the left case. Refer to the service manual for the disassembly procedures.
2. Use an appropriate solvent to clean the left engine case. Also clean the bearing sleeve (1) supplied in the kit.
3. Apply Loctite 620 to the smaller inside diameter portion of the left case bearing bore.
4. See Figure 1. Apply Loctite 620 using a cotton swab to the smaller portion of the outside diameter (2) surface of the bearing sleeve (1).
5. Apply a spare amount of non-drip press fit lube (3) to the larger outside diameter of the bearing sleeve.
6. See Figure 2. Fit the bottom locater plate (1) to the to the outside of the case over the bearing bore. The word "BOTTOM" will be at the bottom of the case when installed at the 6 o'clock position.



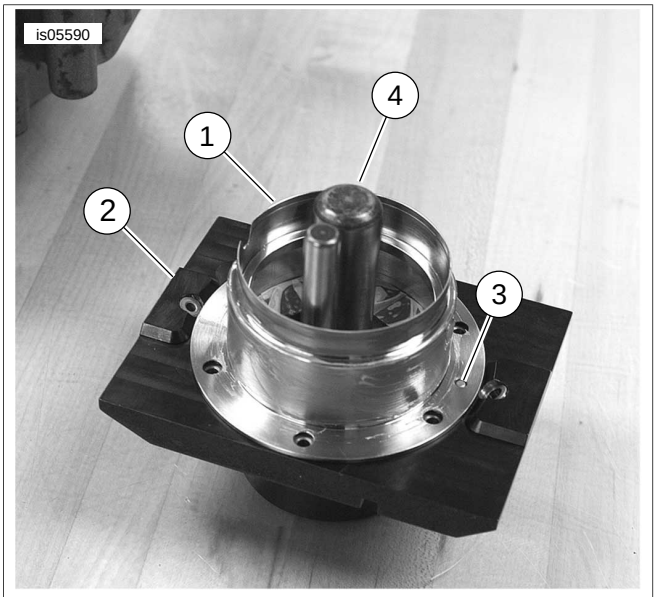
1. **Bearing sleeve**
2. **Apply Loctite to small outer diameter**
3. **Apply lubricant to large outer diameter**

Figure 1. Bearing Insert Preparation



1. **Bottom locator plate installed**
2. **Socket head screws (4)**

Figure 2. Bottom Locator Plate



1. **Bearing sleeve**
2. **Press plate**
3. **Dowel pin**
4. **Press plug**

Figure 3. Bearing Insert and Press Plate

7. Apply a small amount of lube to the four socket head cap screws (2) and thread the screws by hand letting the locater plate align itself to the case. Tighten screws in a criss-cross pattern to 40 **in-lbs** (4.5 Nm).

8. Place the bearing sleeve (1) on the underside of the press plate (2) while aligning the press plates 1/8 inch dowel pin (3) with the 1/8 inch hole in the bearing sleeve flange.

9. Insert the press plug (4) through the center hole in the press plate (2) and through the center of the sleeve.

10. See Figure 4. Holding the press plate assembly and sleeve together, place the assembly over the bearing bore of left case with the sleeve aligned and centered in the case bore. The 1/2 inch and 3/8 inch dowel pins should be aligned and through the bottom locater plate. Align this assembly under the press.

NOTES

The only time you should stop the pressing operation is if the sleeve did not start in the bore straight.

The tool is designed so that it only allows the sleeve to be installed straight into the case bore. One major reason for the sleeve not starting straight into the bore is the press ram is not within 0.010 inch to the press plate. Shim the press as needed.

If for any reason you need to remove the sleeve because it is not installing straight, you will need to support the case around the sleeve on the inside of the left case. It needs to be deep enough to receive the length of the sleeve and the tool press plug (4). The sleeve is 1.50 inches long. You also need the press plug supplied in this kit to press the sleeve out. Heat the case and sleeve to 200 degrees. Then press the sleeve out of the case. This would be the only time this sleeve is to be removed.

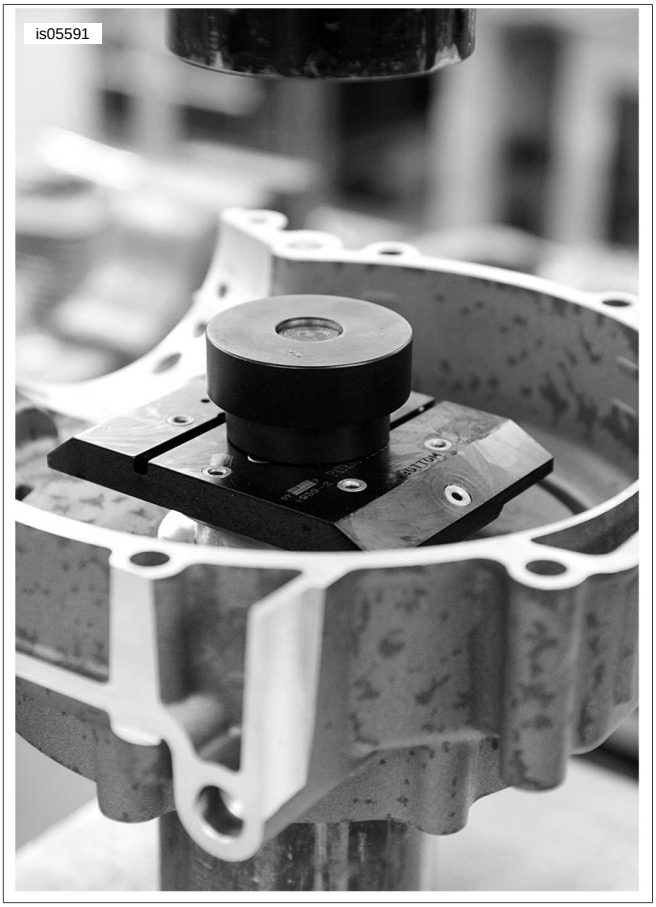
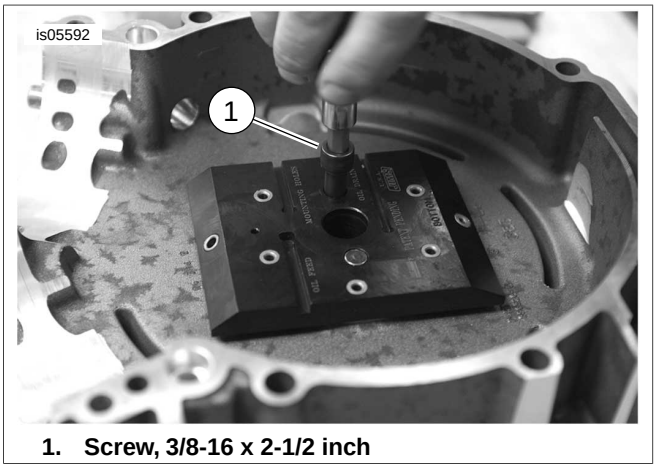


Figure 4. Insert Press Assembly



1. Screw, 3/8-16 x 2-1/2 inch

Figure 5. Install Press Plate Screw

11. Verify the bearing sleeve is square to the case bore. Press from the top of the press plug until it has reached 2000 to 4000 psi and the sleeve's flange has stopped on the case.
12. Remove the press plug from the press plate.
13. See Figure 5. Apply lube to screw (1) and install screw through the press plate and thread it into the bottom locater plate. Verify the dowel pin in the press plate is still located in the 1/8 inch hole in the sleeve. Tighten screw to 25 ft-lbs (33.9 Nm).

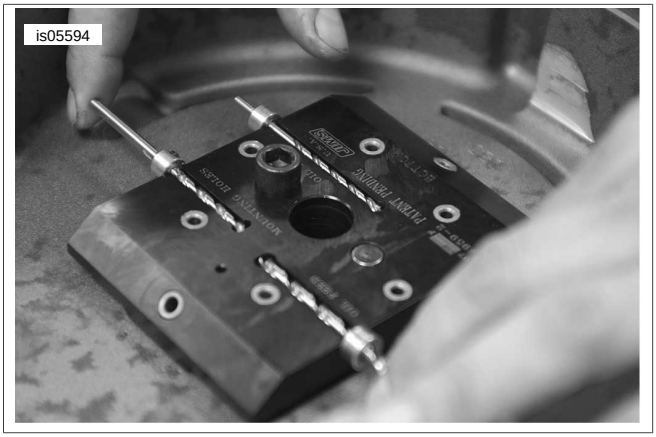


Figure 6. Installing drill bit collars

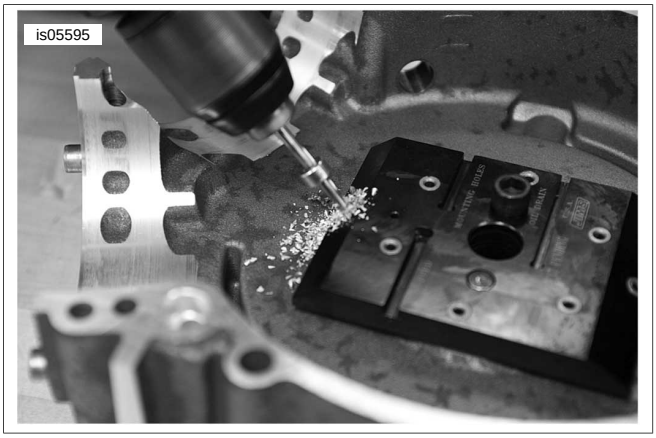


Figure 7. Drilling Oil Feed Hole

14. See Figure 21, Table 3 and Figure 6. In this step the lock collars with be installed on the drill bits using the gauges milled into the press plate.

- Place stop collar (7) over drill bit (8). Place this assembly into the milled groove labeled "OIL FEED" on the face of the press plate. Hold the drill bit firmly in the groove and slide the collar to the press plate. Torque the stop collar set screw to 10 **in-lbs** (1.1 Nm).
- Use the same procedure as above and attach stop collar (5) to drill bit (4) using the milled groove "OIL DRAIN". Torque the stop collar set screw to 10 **in-lbs** (1.1 Nm).
- Use the milled groove "MOUNTING HOLES" for stop collar (15) and drill bit (11). Torque the stop collar set screw to 10 **in-lbs** (1.1 Nm).

NOTES

Insert a drill bit into a clean drill chuck and tighten. Spin the drill in the chuck and check for runout. It is strongly suggested that runout should not exceed 0.005 inch.

The drill bit should be properly aligned bushing and lubricated. Spin the drill into the bushing and maintain the angle while drilling the case.

While drilling it is necessary to clear the drilling chips. To clear the chips retract the spinning drill bit, but not out of the bushing. If the chips are dry, lubricate the bit. As you drill deeper you will need to clear the chips more frequently.

Do not allow the stop collar to move up the drill bit by pushing too hard when drilling.

If you break a drill bit while drilling the feed or drain holes you must remove the bolt and press plate. Carefully work the press plate off ***following the drill angle.*** *Remove any pieces of drill bit.*

15. See Figure 21, Table 3 and Figure 7. Use drill bit (8) assembly to start low speed drilling for the oil feed hole. Allow the drill bit to go through the top guide hole in the press plate. Use tapping fluid as needed to keep the drill bit from clogging. Drill down into the case until the stop collar stops at the press plate.

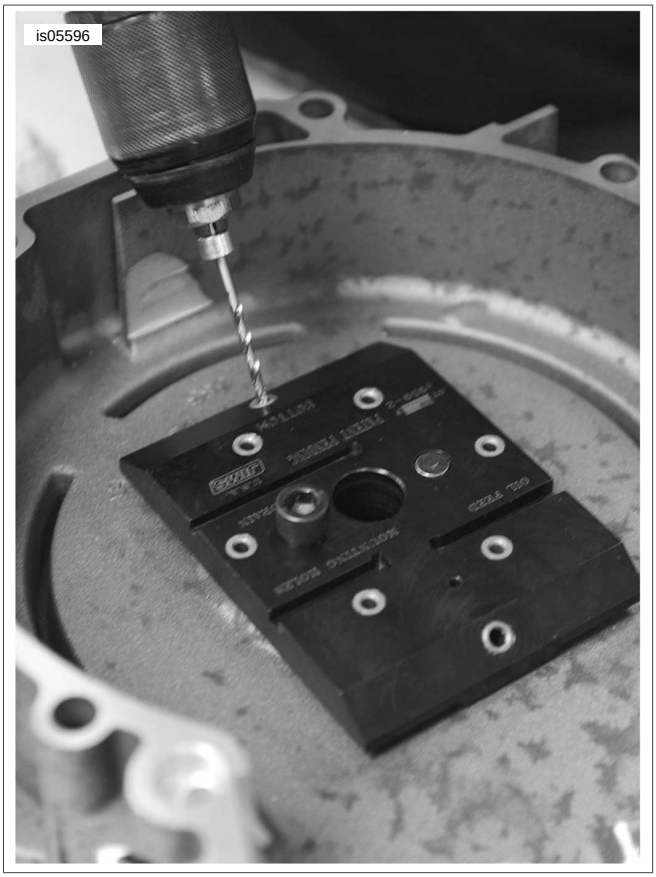


Figure 8. Drilling Oil Drain Hole

Figure 9. Drilling Mounting Screw Holes

16. See Figure 21, Table 3 and Figure 8. Use drill bit (4) assembly to start low speed drilling for the oil drain hole. Allow the drill to go through the bottom guide hole into the press plate. Use tapping fluid as needed to keep the drill bit from clogging. Drill down into the case until the stop collar stops at the press plate.

17. See Figure 21, Table 3 and Figure 9. Using drill bit (10) assembly start low speed drilling through the "2 o'clock" guide hole for the flange mounting screws. Use tap lubricant as needed to keep the drill bit from clogging up. Drill down into the case until the stop collar stops at the press plate. Repeat for the remaining 5 guided drill holes. Remove all chips when drilling is completed.

Figure 10. Tapping Lock Screw Holes

18. See Figure 21, Table 3 and Figure 10. Install the tap (11) into your tap handle. Hold tap guide (14) with the laser marked side up in your hand. Insert the tap through the hole of the tap guide plate (14) with the tap protruding about 1/8 inch out of the other side of the tap guide.

19. Center the protruding tap over one of the 6 holes previously drilled.

20. Apply 3 or 4 drops of tapping fluid in the hole you will be tapping. Center the protruding tap over the hole with the tap guide across the centerline of the journal. Apply pressure to the tap guide at the centerline. Center the tap in the hole and apply a constant light downward pressure to the tap handle as you turn the tap in a clockwise direction for 3-3 turns. Downward pressure is required to start the "formed" tap. Continue to turn the tap clockwise while relaxing the downward pressure. Turn for a total of 12 revolutions. turn the tap handle counterclockwise to fully retract the tap. **Do not** pull on the tap handle. This could result in damaged threads.

21. Blow out the tapped hole and test the fitment of screw. Repeat for the remaining 5 holes.

NOTES

Taps will break if over stressed. Do not pull or push sideways. Do not rotate the tap into the case more than the 12 revolutions. Do not tap without tap fluid. If the tap starts to get hard to turn

before you have made 12 revolutions then retract the tap a couple of turns and add more tap fluid. Slowly start tapping as above.

22. Apply Loctite 620 to the threads and the under side of the screw head on all 6 screws. Also apply about one drop to all 6 tap holes.

23. See Figure 11. Using a torque wrench and a TORX T-15 driver, torque each screw in a crisscross pattern to 25-30 **in-lbs** (2.8-3.4 Nm).

24. Remove the bottom plate and clean off all pieces of the tool and store it in the original container. Do a visual check of the oil feed and drain holes. These must be open and clean from any chips or Loctite.

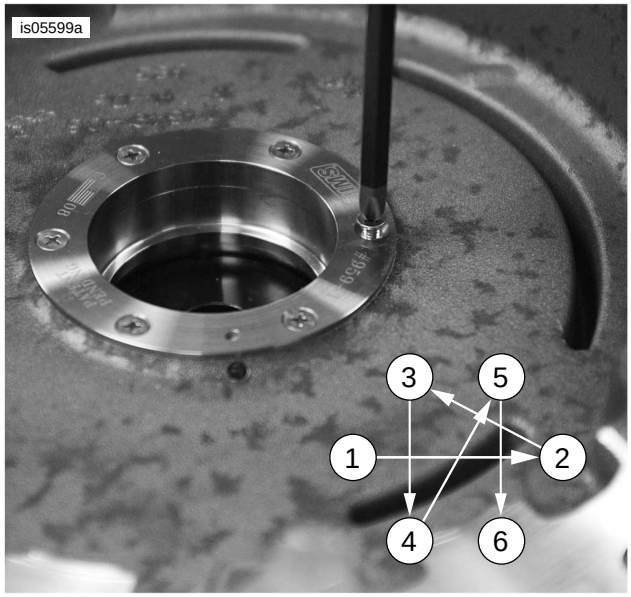
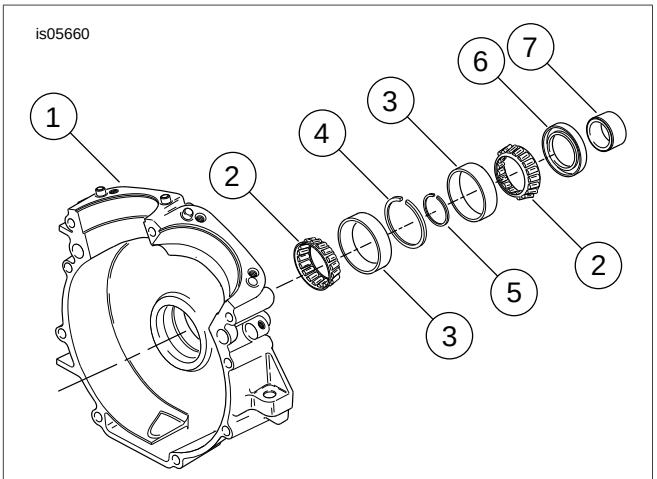


Figure 11. Screw Torque Sequence

ASSEMBLY

Table 1. Tools

PART NO.	SPECIALTY TOOL
HD44358	Flywheel rebuilding jig
HD-39361A	Sprocket shaft oil seal installer
HD-97225-55B	Sprocket shaft Timken bearing cone installer
2246-4	Press installer plug (#3 from kit)
2246-1	Tool base (#14 from kit)



1. **Left crankcase half**
2. **Sprocket shaft (Timklen) bearing cone**
3. **Sprocket Shaft (Timken) bearing cup**
4. **Lock ring**
5. **Spacer ring**
6. **Oil seal**
7. **Sprocket shaft spacer**

Figure 12. Left Side Crankcase Assembly

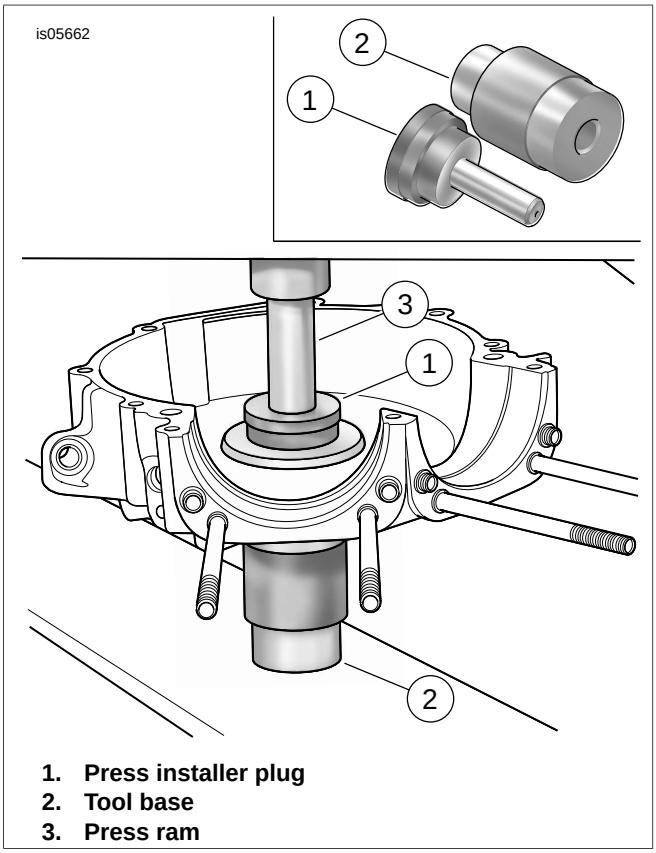
1. See Figure 12. Obtain new Timken bearing set (2, 3) and discard lock ring (4).

NOTE

Smaller OD of support tube is intended for Sportster models. Verify that the Sportster pilot/driver is not installed in opposite end of support tube or procedure will be interrupted as the two pilot/drivers make contact.

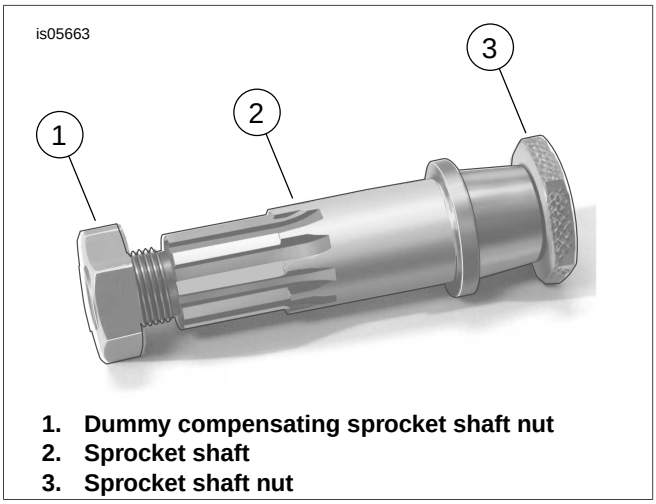
2. See Figure 21. Obtain the tool base (13) and press installer plug (3) and proceed as follows:
   a. SeeFigure 13. Set tool base (2) on table of hydraulic press with the larger OD topside.
   b. Center bearing cup on top of tool base with the lettered side up.
   c. With the inboard side up, position crankcase half over tool so that it rests flat on bearing cup.
   d. Start second bearing cup into bearing bore with the lettered side down.
   e. Slide press installer plug (1) through bore (and both bearing cups) into support tube.
   f. Center press installer plug under ram of hydraulic press.

      Apply pressure until both bearing cups make firm contact with installed lock ring.



1. **Press installer plug**
2. **Tool base**
3. **Press ram**

Figure 13. Sprocket Shaft Timken Bearing Cup Installer



1. **Dummy compensating sprocket shaft nut**
2. **Sprocket shaft**
3. **Sprocket shaft nut**

Figure 14. Dummy Sprocket Shaft and Nut

NOTE

Dummy sprocket shaft should be sufficiently polished so that it only requires the thumbs of both hands to lightly press on bearing cone.

3. Perform first end play check by simulating assembly.
   a. Fashion dummy sprocket shaft using parts used on Evolution models prior to introduction of one-piece flywheel assembly. Weld sprocket shaft nut (part number HD-24017-80) to threads on inboard side of sprocket shaft (part number HD-23909-80).
   b. See Figure 14. Obtain a dummy compensating sprocket shaft nut (part number HD-40392-91 or 7/8 inch-14 nut from hardware store), spacer sleeve and flat washer. To verify complete thread engagement when nut is installed, spacer sleeve must be about 2-1/4 inch long with a 1-3/4 inch OD and a 1-1/4 in. ID Flat washer must be large enough to allow nut to rest flat against spacer sleeve.
   c. Clamp welded sprocket shaft nut in vise so that the dummy sprocket shaft points straight up.
   d. With the tapered side up, slide bearing cone over end of dummy sprocket shaft. Using the thumbs of both hands, lightly press on bearing cone until it bottoms against shoulder.
   e. With the outboard side up, carefully place left crankcase half over dummy shaft so that it rests flat on installed bearing cone.
   f. Slide new spacer ring over dummy shaft until it contacts bearing cone.
   g. Place new bearing cone over dummy shaft with the tapered side down.
   h. Install spacer sleeve, flat washer and dummy compensating sprocket shaft nut. Tighten nut to 150-165 ft-lbs (203-224 Nm).

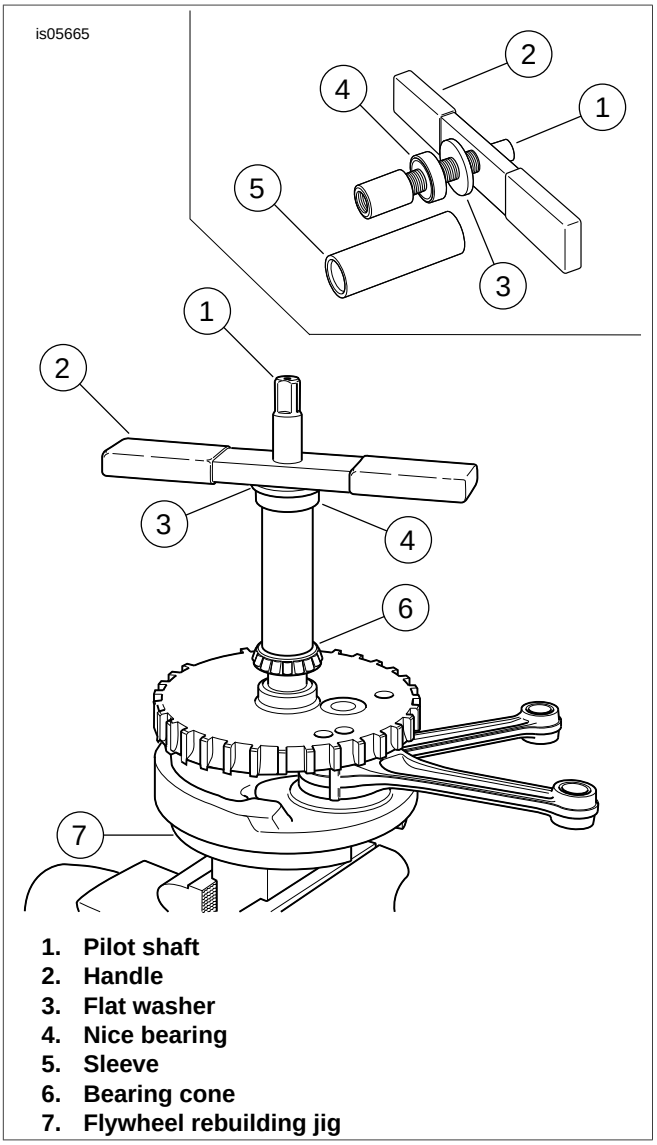
Figure 15. Check Flywheel End Play

4. Using dial indicator.
   a. See Figure 15. Mount a dial indicator on the case half. Set the indicator contact point on the end of the dummy sprocket shaft.
   b. Standing on a stool for leverage, if necessary, firmly push down on the case as far as it will go while rotating it back and forth.
   c. Holding the case down, zero the dial indicator gauge.
   d. Firmly pull up on the case as far as it will go while rotating it back and forth. Stand on a stool for leverage, if necessary.
   e. Holding the case up, note the reading of the dial indicator. Repeat procedure to verify the reading.
   f. If the end play falls between 0.003-0.007 in. (0.076-0.178 mm) using a dummy shaft, proceed to step 5. If end play must be adjusted, change spacer according to step 4.

NOTE

For testing purposes only, dummy shaft end play specification is not equal to final end play specification of 0.001-0.005 inch (0.025-0.127 mm).

5. If end play is not within specification, remove dummy compensating sprocket shaft nut, flat washer, spacer sleeve, bearing cone and spacer ring. Measure spacer ring with dial vernier caliper and see Table 3. Replace spacer with one of those listed using a thinner spacer ring for less end play or a thicker spacer ring for more end play. Return to step 3f to repeat end play check.
6. Remove dummy compensating sprocket shaft nut, flat washer and spacer sleeve. Carefully remove all Timken bearing parts from dummy sprocket shaft.
7. See Figure 16. Place base of FLYWHEEL REBUILDING JIG (7) (part number HD-44358) in vise. Insert crankshaft end of flywheel assembly into fixture.



1. **Pilot shaft**
2. **Handle**
3. **Flat washer**
4. **Nice bearing**
5. **Sleeve**
6. **Bearing cone**
7. **Flywheel rebuilding jig**

Figure 16. Sprocket Shaft Timken Bearing Cone Installer

8. Place new bearing cone (6) over sprocket shaft with the tapered side up.
9. Obtain the SPROCKET SHAFT TIMKEN BEARING CONE INSTALLER (part number HD-97225-55B).
   a. Thread pilot shaft (1) onto sprocket shaft until contact is made with shoulder.
   b. Sparingly apply graphite lubricant to threads of pilot shaft to prolong service life and verify smooth operation.
   c. Slide sleeve (5) over pilot until it contacts bearing cone (6).
   d. Slide Nice bearing (4) and large flat washer (3) over pilot until contact is made with sleeve.
   e. Thread handle (2) onto pilot shaft.

Table 2. Spacer Sizes

Inch	Millimeter	Part Number
0.0905-0.0895	2.299-2.273	9110
0.0925-0.0915	2.350-2.324	9120
0.0945-0.0935	2.400-2.375	9121
0.0965-0.0955	2.451-2.426	9122
0.0985-0.0975	2.502-2.476	9123
0.1005-0.0995	2.553-2.527	9124
0.1025-0.1015	2.604-2.578	9125
0.1045-0.1035	2.654-2.629	9126
0.1065-0.1055	2.705-2.680	9127
0.1085-0.1075	2.756-2.731	9128
0.1105-0.1095	2.807-2.781	9129
0.1125-0.1115	2.858-2.832	9130
0.1145-0.1135	2.908-2.883	9131
0.1165-0.1155	2.959-2.934	9132
0.1185-0.1175	3.010-2.985	9133
0.1205-0.1195	3.061-3.035	9134

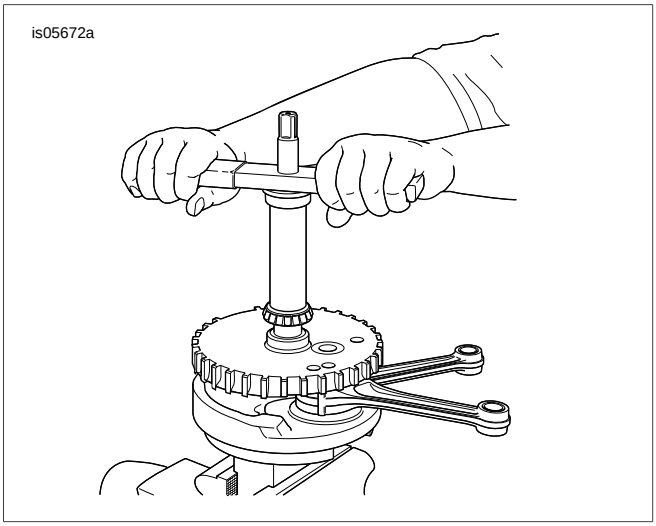


Figure 17. Press Inner Bearing Cone to sprocket Shaft

10. See Figure 17. Rotate handle of tool in a clockwise direction until bearing cone bottoms on shoulder of sprocket shaft.
11. Remove handle, flat washer, Nice bearing, sleeve and pilot from sprocket shaft.
12. Carefully place crankcase half over sprocket shaft so that it rests flat on installed bearing cone.
13. Slide spacer ring previously selected over sprocket shaft until it contacts bearing cone.
14. Place second bearing cone over sprocket shaft with the tapered side down.
15. Assemble SPROCKET SHAFT TIMKEN BEARING CONE INSTALLER (part number HD-97225-55B) onto sprocket shaft following procedure outlined under step 8.

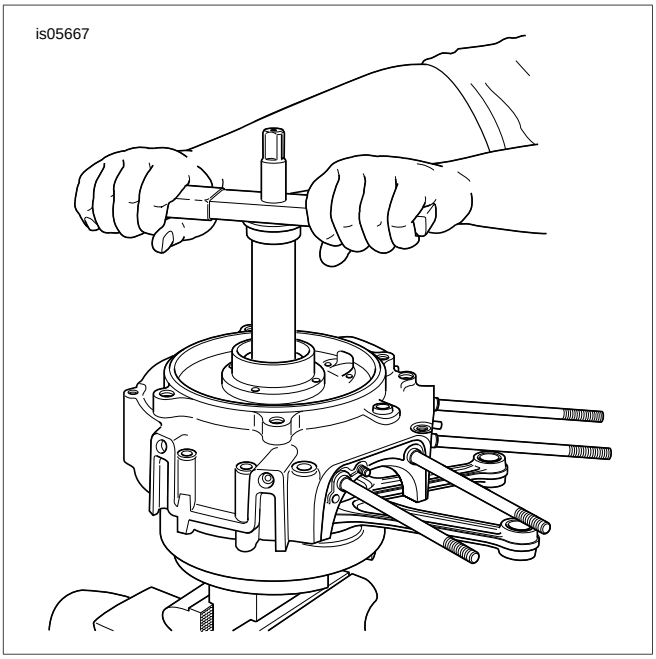
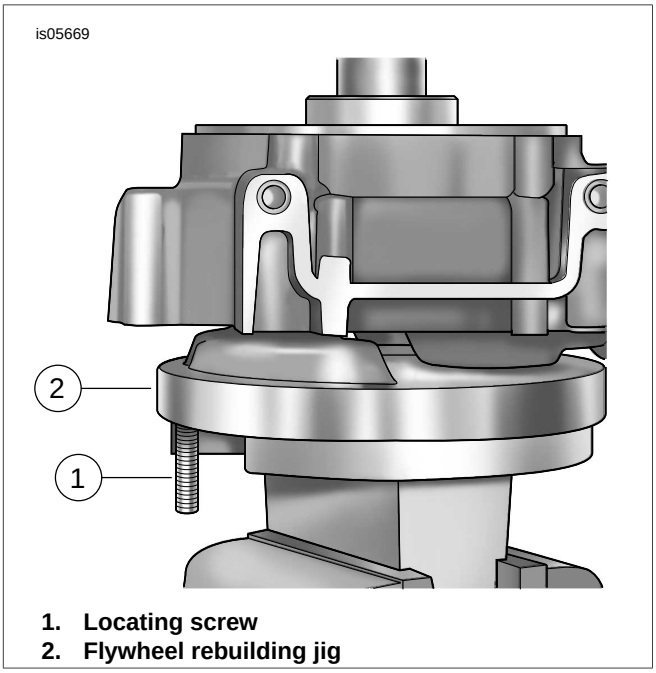


Figure 18. Press Outer Bearing Cone to Sprocket Shaft

NOTE

While installing outer bearing cone, carefully observe position of connecting rods. If necessary, stop frequently to verify that rods are still free. If rods happen to move out of cylinder bore area, they will be bent by the crankcase during the press procedure. Bent connecting rods require replacement of the flywheel assembly.

16. See Figure 18. Rotate handle of tool in a clockwise direction until bearing cone makes firm contact with spacer ring. Inner and outer bearing cones must be tight against spacer ring for correct bearing clearance.
17. Remove handle, flat washer, Nice bearing, sleeve and pilot from sprocket shaft.

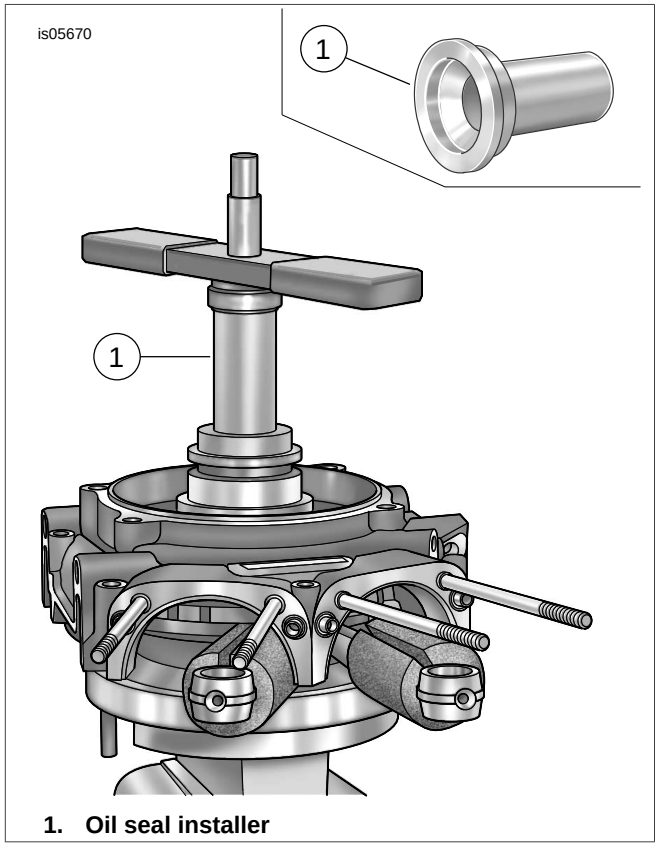


1. Locating screw
2. Flywheel rebuilding jig

Figure 19. Place Locating Screw in Balancing Hole to Prevent Rotation

18. Perform second end play check as follows:
    a. Gently tap case half to verify that it moves freely under its own weight. Pull up and push down on case to verify that there is no noticeable up and down movement.
    b. Install spacer sleeve, flat washer and dummy compensating sprocket shaft nut first used under step 3h.
    c. See Figure 19. To prevent rotation when dummy compensating sprocket shaft nut is tightened, obtain locating screw from FLYWHEEL REBUILDING JIG and insert in deepest balancing hole at bottom of flywheel assembly (right side). Turn flywheel slightly so that screw makes firm contact with flat on jig. Tighten nut to 150-165 ft-lbs (203-224 Nm).
    d. See Figure 15. Mount a dial indicator on the case half. Set the indicator contact point on the end of the sprocket shaft.
    e. Standing on a stool for leverage, if necessary, firmly push down on the case as far as it will go while rotating it back and forth.
    f. Holding the case down, zero the dial indicator gauge.
    g. Firmly pull up on the case as far as it will go while rotating it back and forth. Stand on a stool for leverage, if necessary.
    h. Holding the case up, note the reading of the dial indicator. Repeat the procedure to verify the reading.
    i. If the final or installed end play falls between 0.001-0.005 inch (0.025-0.127 mm), proceed to the next step. If end play is not within specification, restart procedure with new Timken bearing set.
19. Remove dummy compensating sprocket shaft nut, flat washer and spacer sleeve.
20. Lubricate bearing cones with clean H-D 20W50 engine oil.
21. See Figure 20. Install new oil seal using pilot, Nice bearing, large flat washer and handle from SPROCKET SHAFT TIMKEN BEARING CONE INSTALLER (part number HD-97225-55B).
    a. Verify that seal lip garter spring is in place on both sides of seal.
    b. Thread pilot onto sprocket shaft until contact is made with shoulder.
    c. With the lettering facing outside, slide oil seal over pilot until it contacts bearing bore.
    d. Set SPROCKET SHAFT OIL SEAL INSTALLER (1) (part number HD-39361A) over pilot until it contacts oil seal.
    e. Slide Nice bearing and large flat washer over pilot until contact is made with seal installer.
    f. Thread handle onto pilot shaft.
    g. Rotate handle in a clockwise direction until oil seal installer makes firm contact with crankcase stator mount.
    h. Remove handle, flat washer, Nice bearing, seal installer and pilot from sprocket shaft.
22. Obtain model-specific replacement sprocket shaft spacer. See P&A retail catalog.

    Slide sprocket shaft spacer over end of sprocket shaft. Push spacer into oil seal until seated against outer bearing cone.
23. Refer to the appropriate service manual to finish the engine assembly and installation.



1. Oil seal installer

Figure 20. Sprocket Shaft Oil Seal Installer

SERVICE PARTS

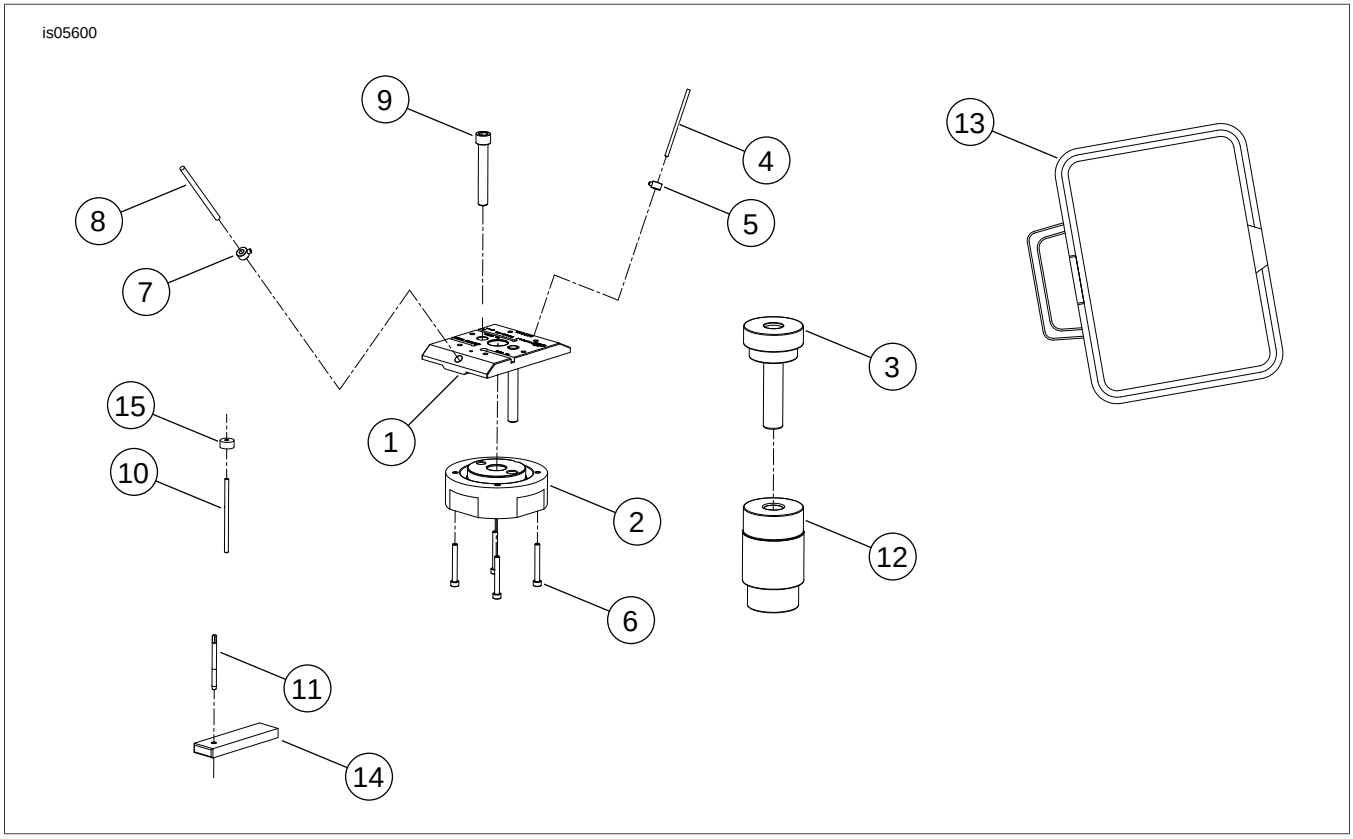


Figure 21. Service Parts: Timken Bearing Conversion Tool

Table 3. Service Parts Table

Item	Description (Quantity)	JIMS Part No.
1	Press plate	959-2
2	Bottom locator plate	959-3
3	Press installer plug	2246-4
4	Drill bit, 1/8 inch (2)	1721
5	Drill stop collar, 1/8 inch ID	1264
6	Screw, 10-24 x 1-1/2 inch SHCS (4)	1234
7	Drill stop collar, 3/16 inch ID	1267
8	Drill bit, 3/16 inch, HSS, jobber length (2)	1714
9	Screw, 3/8-16 x 2-1/2 inch SHCS	1128
10	Drill bit, #25, HSS, jobber length	1713
11	Roll tap, 8-32	2288
12	Tool base	2246-1
13	Tool case	2120
14	Tap guide tool	959-4
15	Drill bit collar, 0.1495 ID, 8-32	1292