

IL4057



Read through the safety information and overhaul instructions carefully before repairing your Waterous model C21 Chain Drive Transmission.

NOTE: Instructions subject to change without notice

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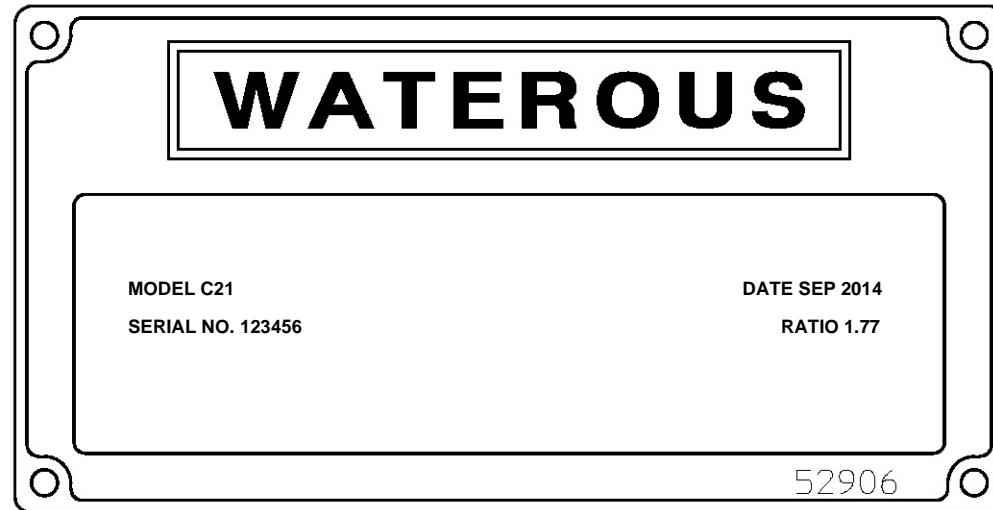
Introduction

This instruction provides the necessary steps involved to overhaul the C21 Series Transmission. Note that the instructions are divided into Disassembly and Reassembly instructions.

Ordering Repair Parts

Refer to C21 Series Transmission Service Parts List furnished with your pump for identification of individual components. When ordering repair parts, furnish the reference number of the component (from Service Parts List) along with the Pump Model or Transmission Model serial number. Gasket and O-ring repair kit is available from Waterous that includes all the gaskets and O-rings required for a complete overhaul. Note that this kit does not include shims installed between the cap and case which must be ordered separately.

Refer to the serial plate diagram below for Model and Serial Number locations:



IL3270

General Overhaul Information



WARNING

Pressure Hazard. May result in personal injury

Prior to connection or removal of hoses, caps or other closures with pump intake or pump discharge connections, relieve pressure by opening drains or bleeder valves. Bleeder valves should also be used while filling a hose connected to an intake with water



WARNING

Rotating Parts Hazard or Unexpected Truck Movement. May result in serious personal injury or death.

Stop the engine, set parking brake and chock the wheels before attempting to remove or repair the transmission



WARNING

Pump Body / Transmission Temperature Hazard. May result in serious burns.

The pump body / transmission may be warm from operation. Make sure that the pump body / transmission has cooled sufficiently prior to removal or repair.

Tools and Equipment

The following tools and equipment may be needed to overhaul your transmission:

1. Usual automotive mechanic's hand tools.
2. An arbor press for assembling or disassembling components.
3. A suitable hoist and slings.
4. Torque capability up to 325 lb-ft.

While no special tools and equipment are required, a few special items are illustrated or described on Pages 6 through 9 so the mechanic can make them or they are available from the apparatus manufacturer or the Waterous Company. These special items are not absolutely necessary, but they will make the mechanic's work much easier.

Cleaning

Satisfactory operation depends to a great extent upon the cleanliness of its internal parts. Sand, dirt or other abrasive material will wear sprockets and related parts. Before disassembling a transmission for repairs, be sure to clean its exterior. Make sure the working space, benches and tools are clean. Use only clean, lint-free cloths to wipe off components. Before reassembling, be sure to clean all components thoroughly.

Bearings, Gaskets, Seals and O-rings

Parts of this nature are frequently damaged during removal or disassembly. In addition, they sometimes deteriorate or lose their effectiveness because of age or misuse. Replacing these parts whenever overhauling a transmission is a good policy.

Installing Ball Bearings

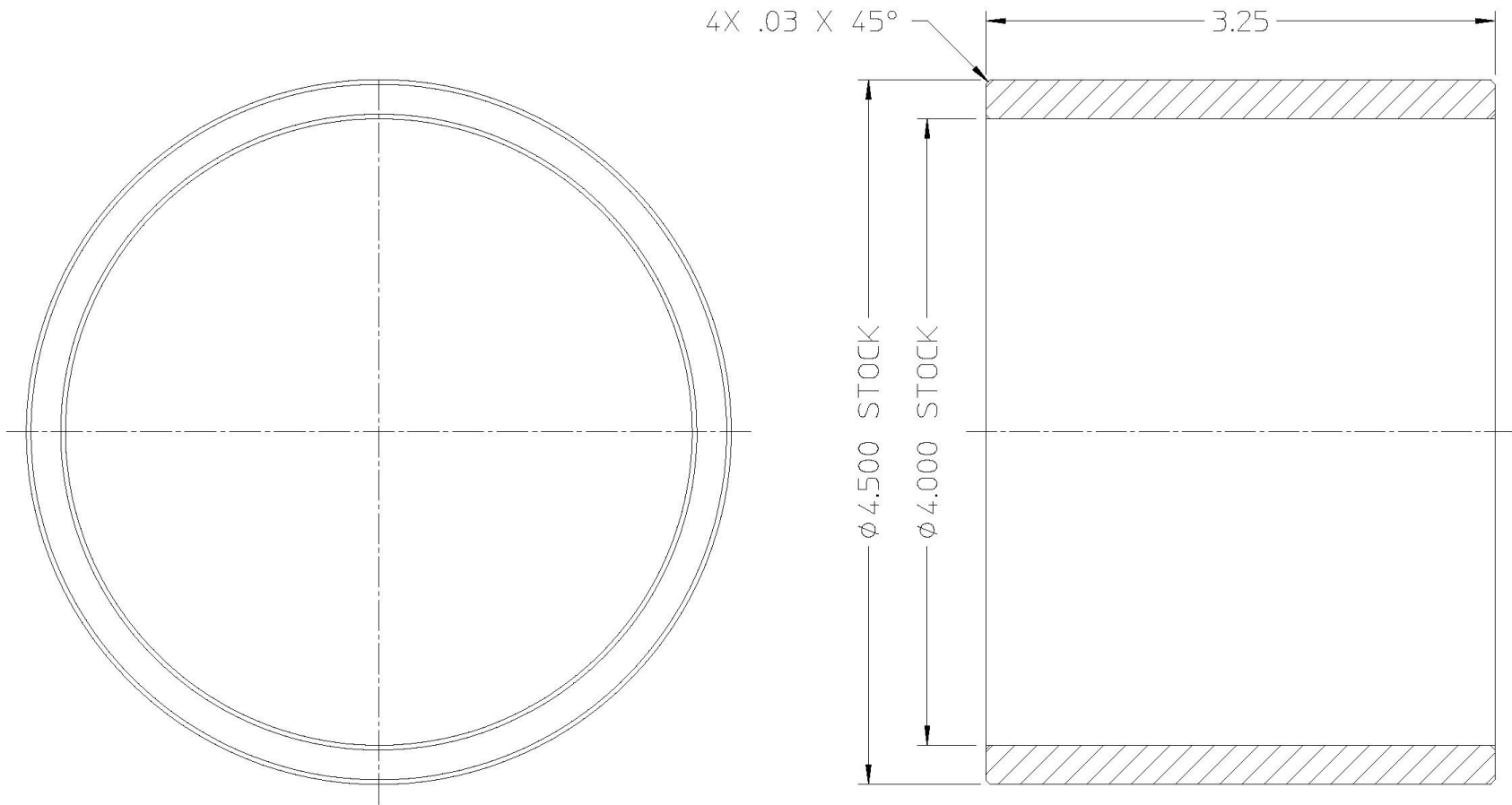
Most Waterous transmissions are designed so that ball bearings fit tightly on their shafts and have relatively loose fits in the bearing housings. When mounting these bearings on shafts, always apply force to the inner races. When bearings have tight fit in the housings, and a heavy force is necessary to install them, be sure to apply force only to the outer bearing races. For either type of fit, applying force to the wrong bearing race may damage the balls and race.

End Yoke and Companion Flange Nuts

Do not reuse self-locking nuts. Apply lubrication oil to the threads before removing. Apply anti-seize to the threads before installing a new self-locking nut.

Drive (input) Shaft Removal Sleeve

Waterous Part No. 63431



IL3272

Material: 4 in. Schedule 40 PVC Pipe

Special Tools Continued

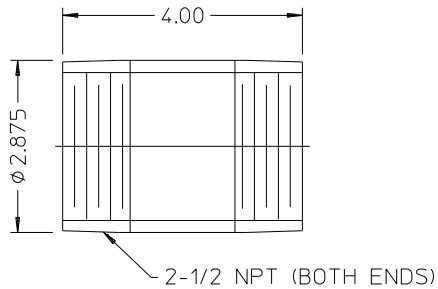
Drive (Input) Shaft Installation Sleeve Assembly

Waterous Part No. 63432

This sleeve is used when installing the Driveline in the transmission case. This sleeve is available from Waterous or may be fabricated per the diagrams below.

Pipe Nipple

(Reference Waterous Part No. W 6040-64)

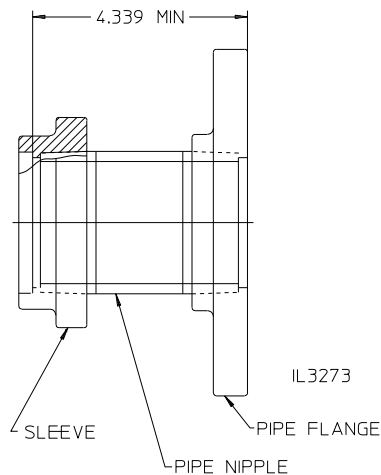


IL3273

Material: 2-1/2 NPT x 4.00 in. Long Pipe Nipple

Assembly

(Reference Waterous Part No. 63432)



IL3273

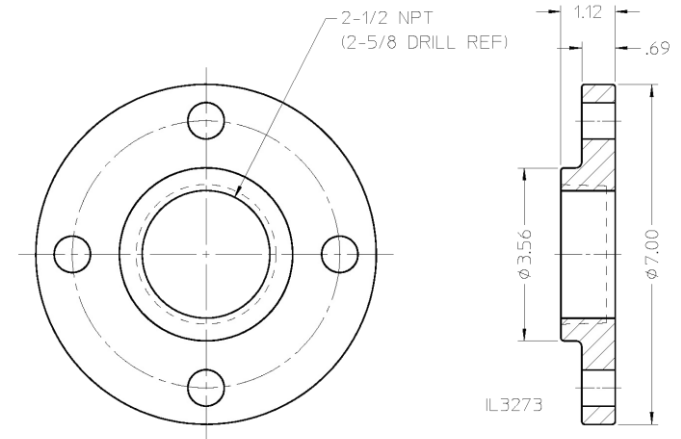
SLEEVE

PIPE FLANGE

PIPE NIPPLE

Pipe Flange

(Reference Waterous Part No. V 3743)

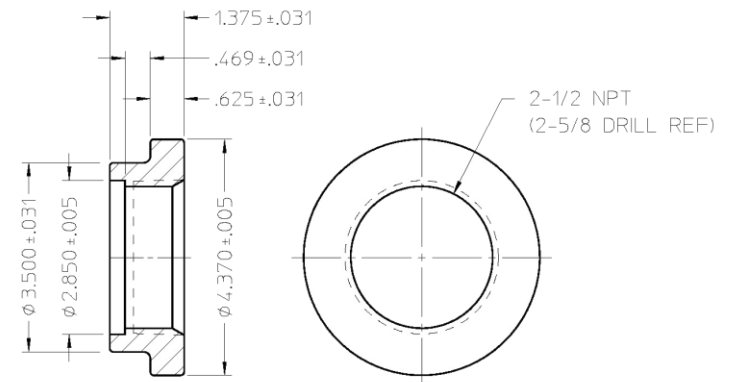


IL3273

**Material: 2-1/2 in. ANSI Class 125 Pipe Flange
(2-1/2 NPT x 7.00 in. O.D.)**

Sleeve

(Reference Waterous Part No. 63599)

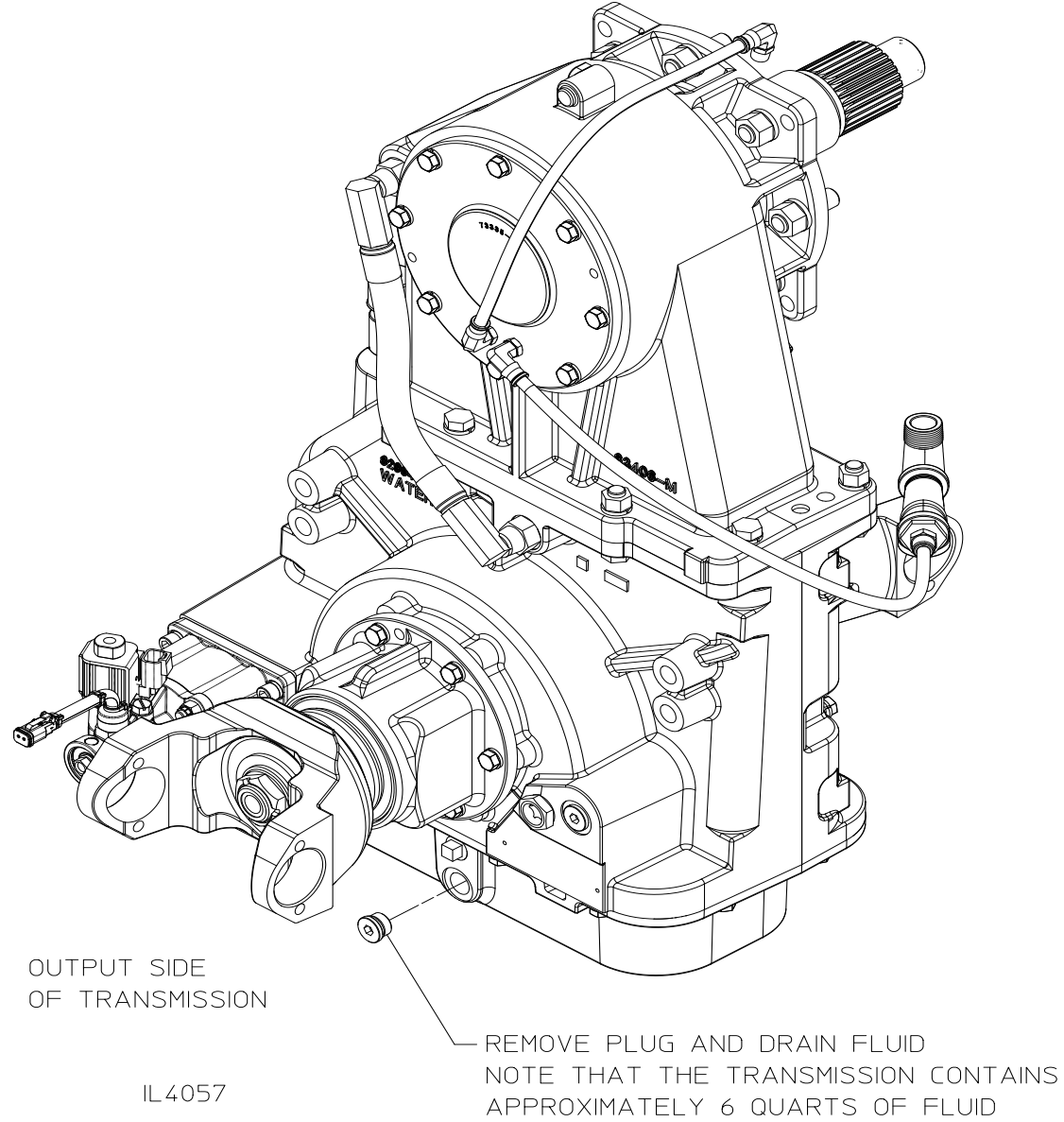


IL3273

Material: 4.50 in. Diameter Mild Steel Bar Stock

Disassembly

Drain Fluid from Transmission



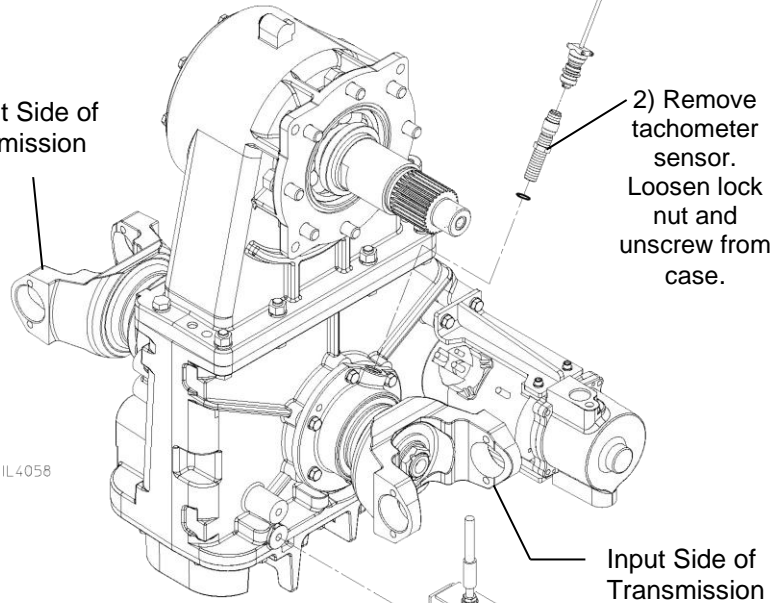
Disassembly - Disconnect Optional Accessories

Tachometer and Drain Valve

Tachometer (if equipped):

- 1) Disconnect Tachometer Cable. Unscrew cable from tachometer sensor on case.
- 2) Remove tachometer sensor. Loosen lock nut and unscrew from case.

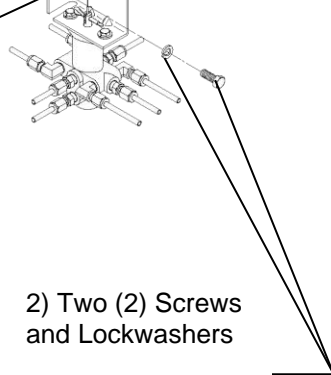
Output Side of Transmission



IL4058

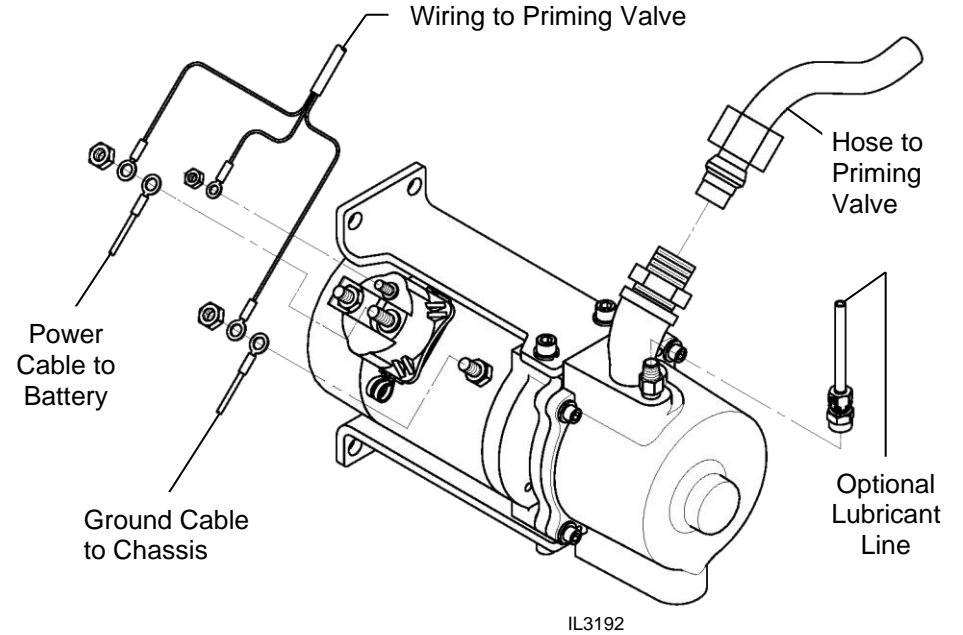
Drain Valve (if equipped):

- 1) Disconnect the Drain Valve from Transmission.



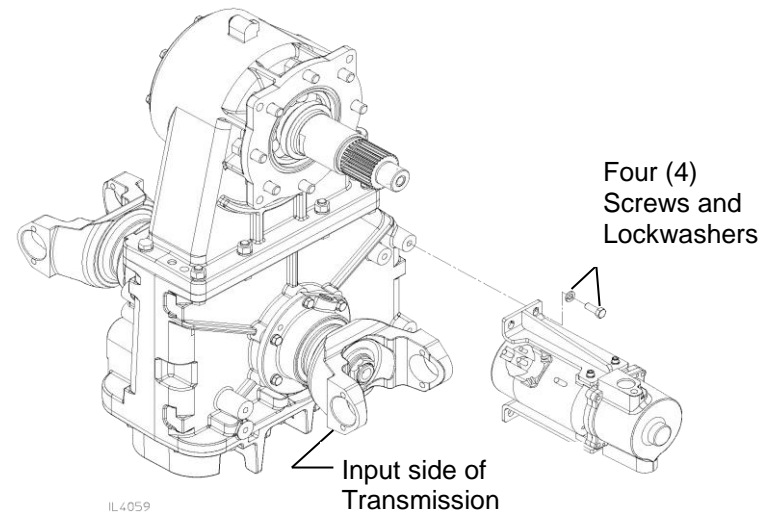
- 2) Two (2) Screws and Lockwashers

Priming Pump - Disconnect Wiring and Hoses



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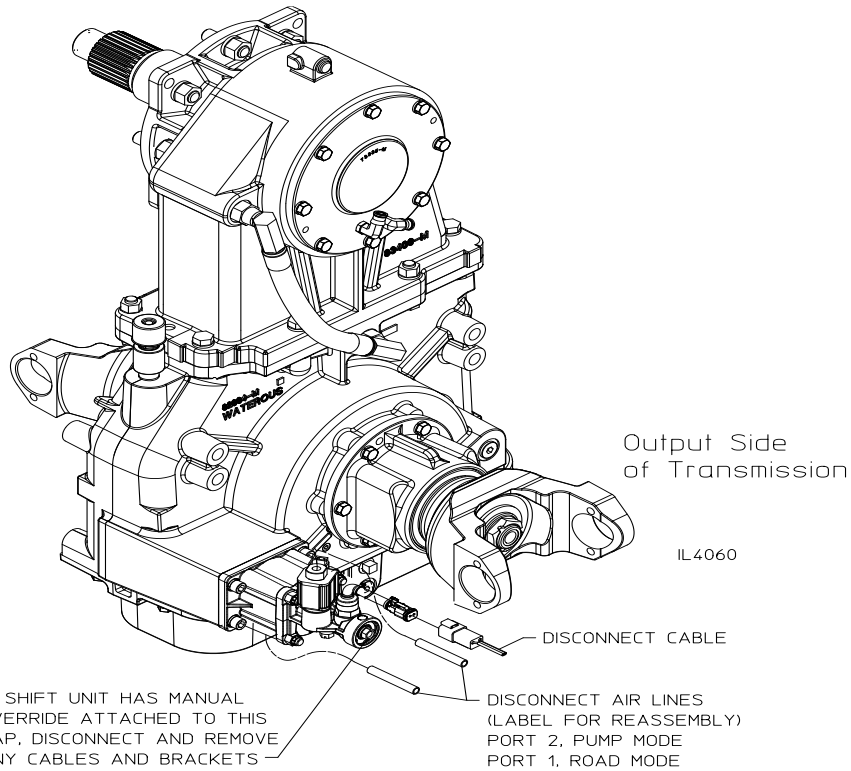
Priming Pump - Remove Priming Pump from Transmission



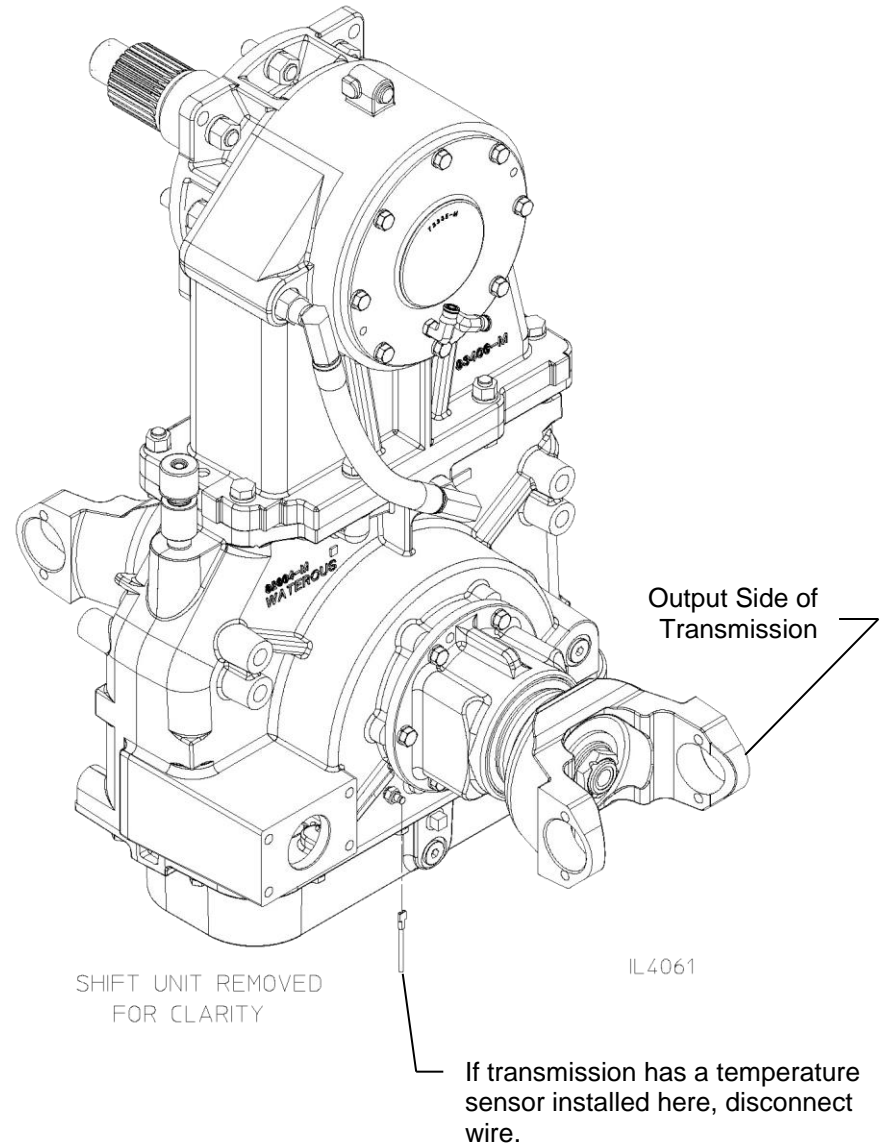
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Disassembly - Disconnect Optional Accessories

Shift Unit

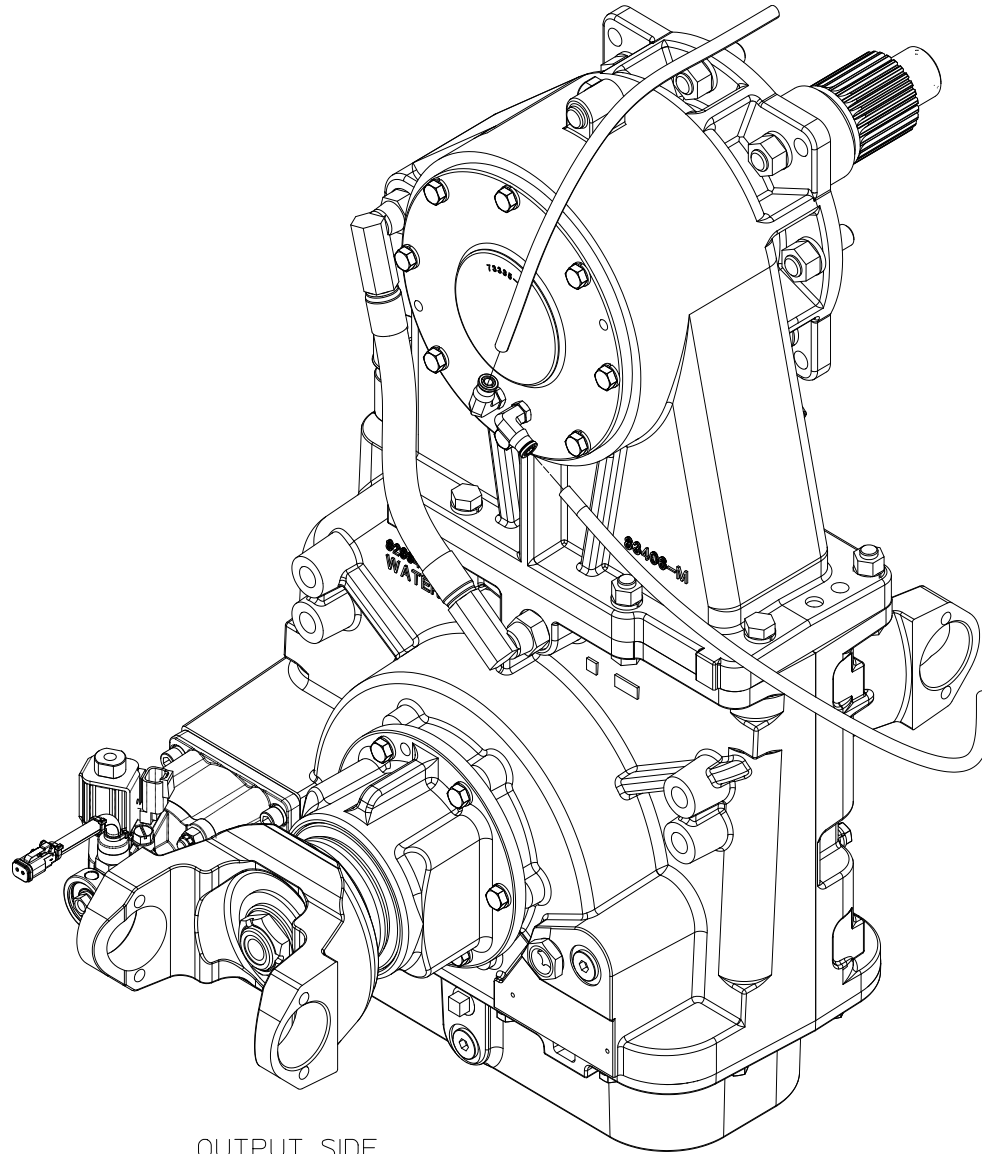


Oil Temperature Sensor



Disassembly - Disconnect Optional Accessories

Oil Cooler Lines



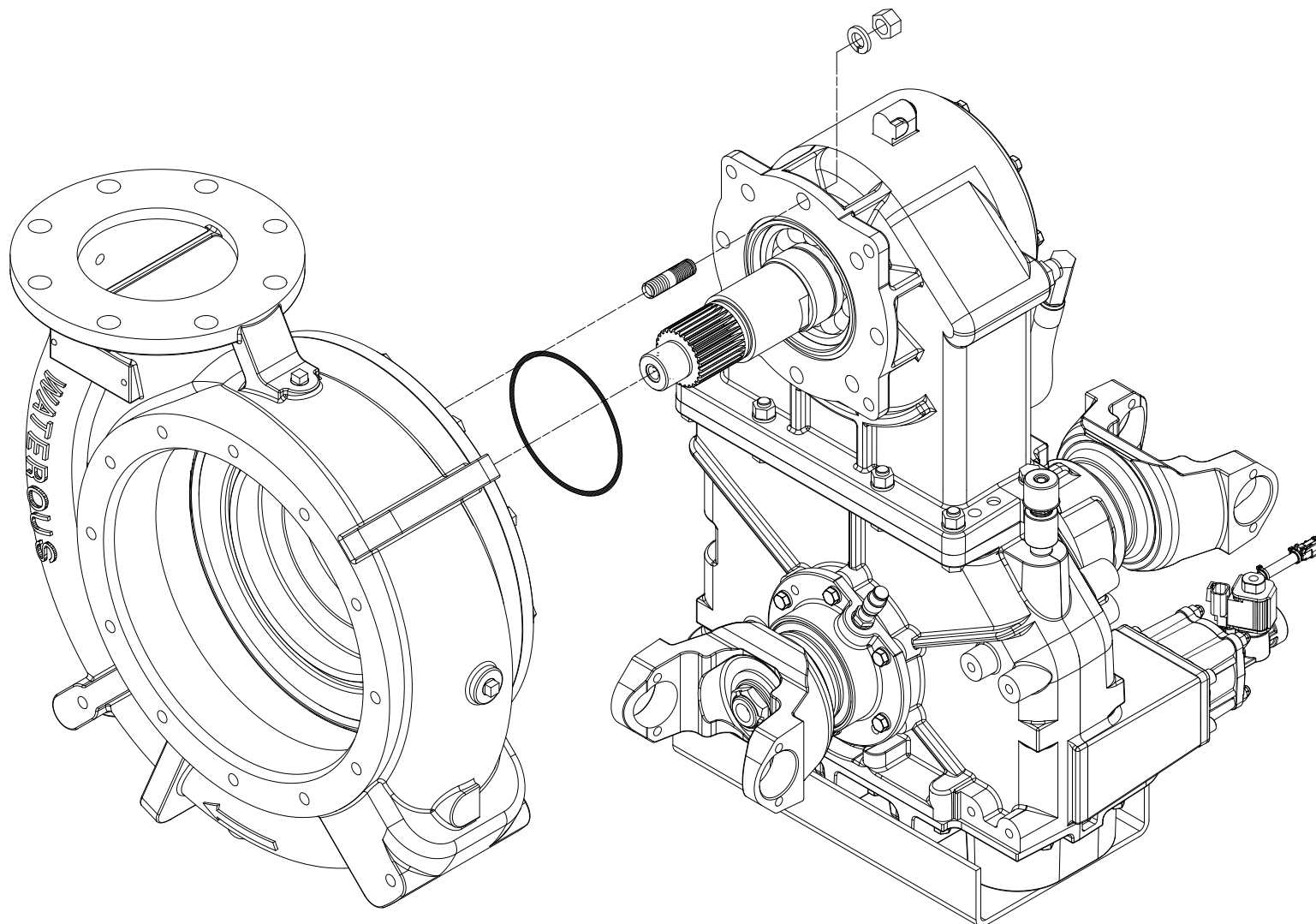
OUTPUT SIDE
OF TRANSMISSION

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Disassembly

Remove Transmission from Pump

1. Remove intake adapter, impeller, and mechanical seal. See pump overhaul instructions.
2. Remove pump mounting hardware: Eight (8) screws and washers.
3. Remove pump body.

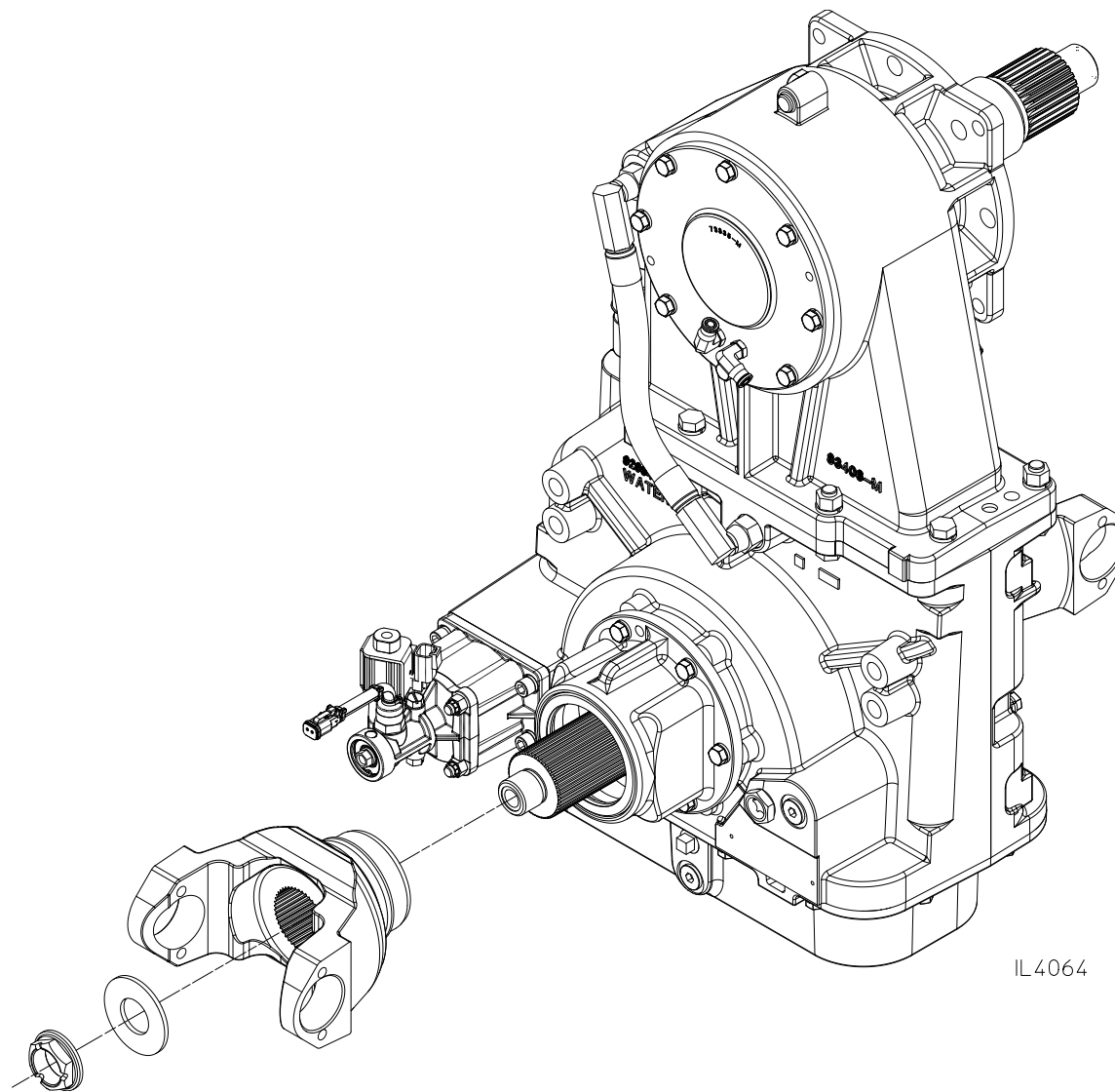


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Disassembly - Remove Driveline from Case

End Yokes or Companion Flanges

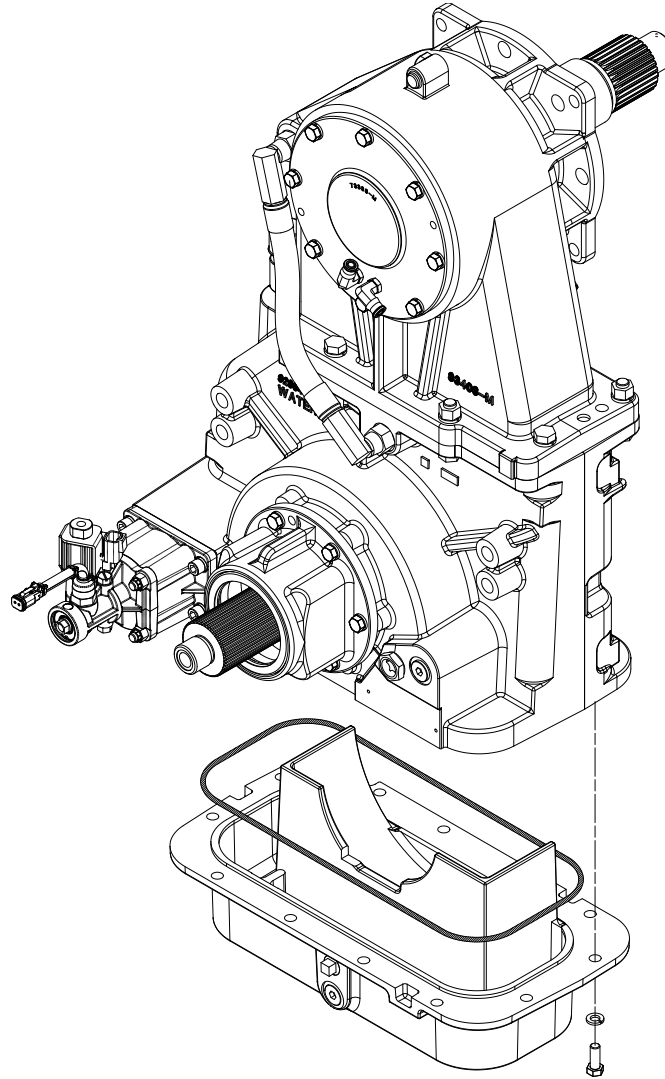
1. Remove end yoke or companion flange from input and output shafts. Note that the oil seal will remain in the housing.
2. Discard lock nuts as they are not to be re-used. Note that new locks nuts are included in gasket kit.



Disassembly - Remove Driveline from Case (con't)

Oil Pan

1. Remove twelve (12) screws from oil pans.
2. Remove oil pan and gasket.
3. If a new gasket is required, note that a new gasket is included in gasket kit.

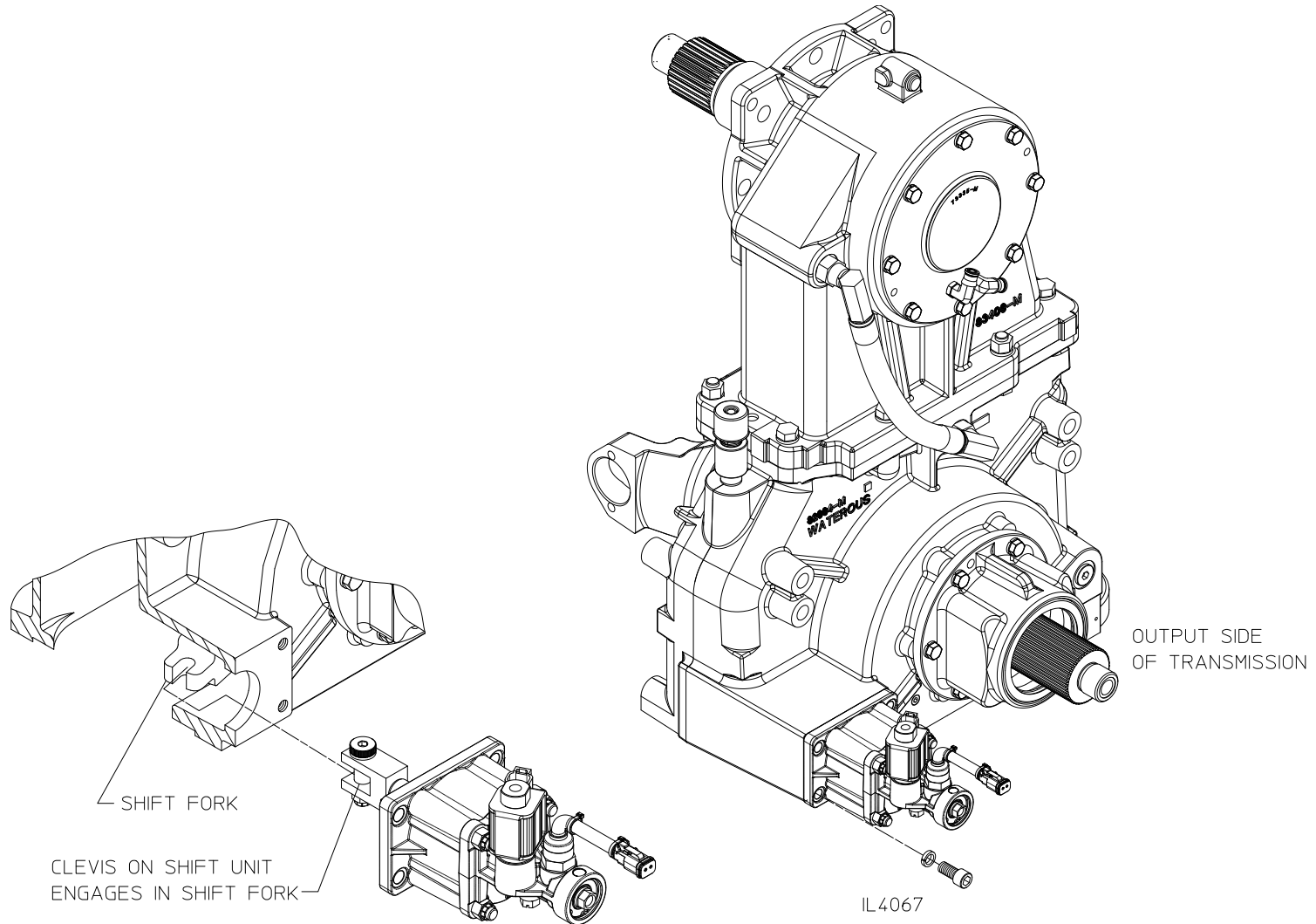


IL4065

Disassembly - Remove Driveline from Case (con't)

Chain

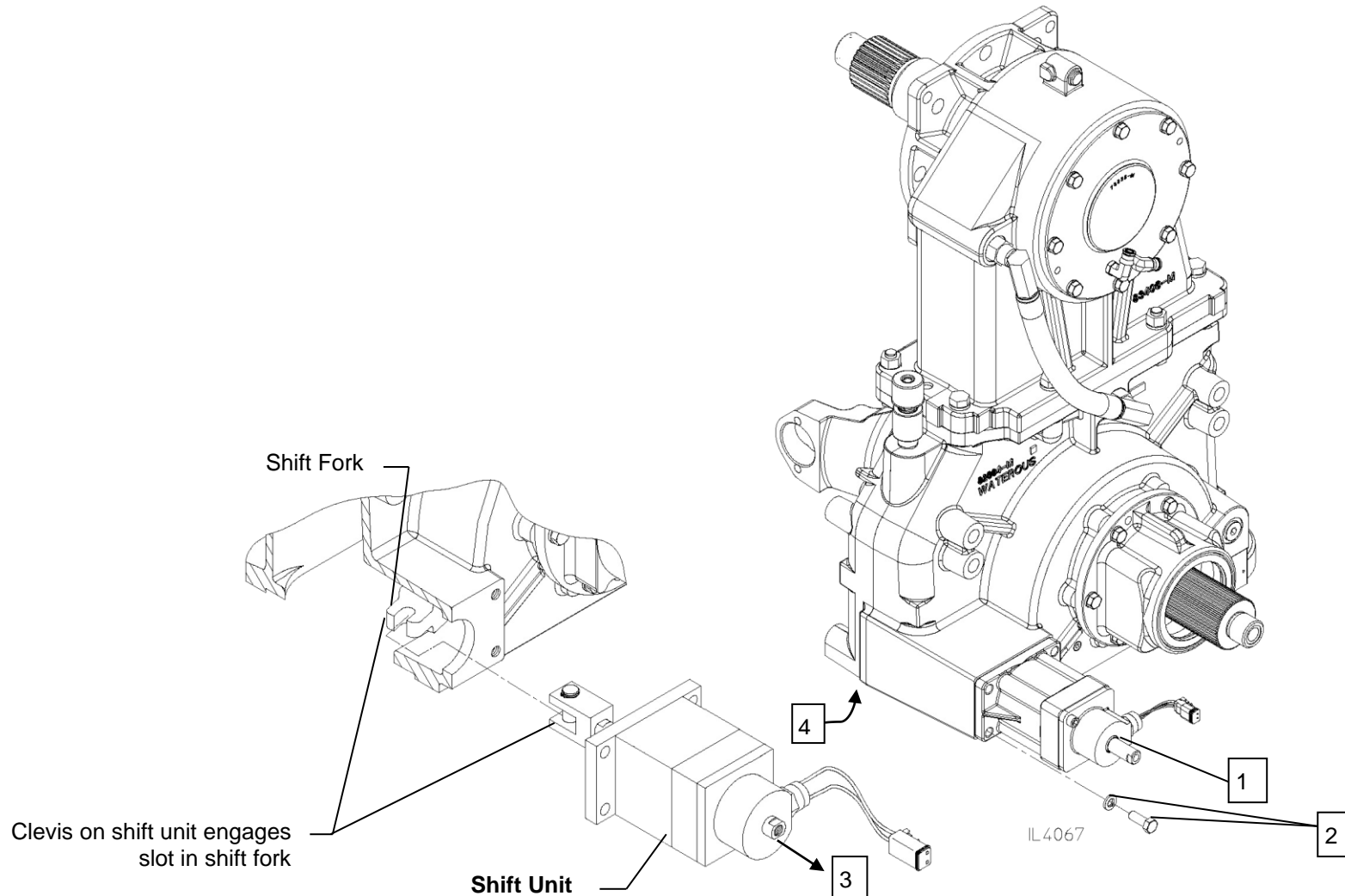
1. Rotate drive shaft until connecting pin in chain is visible.
2. Remove split pin in end of connecting pin.
3. Drive the connecting pin and connecting rocker from the chain.
4. Separate ends of chain and pull out of transmission.



Disassembly - Remove Driveline from Case (Continued)

Shift Unit

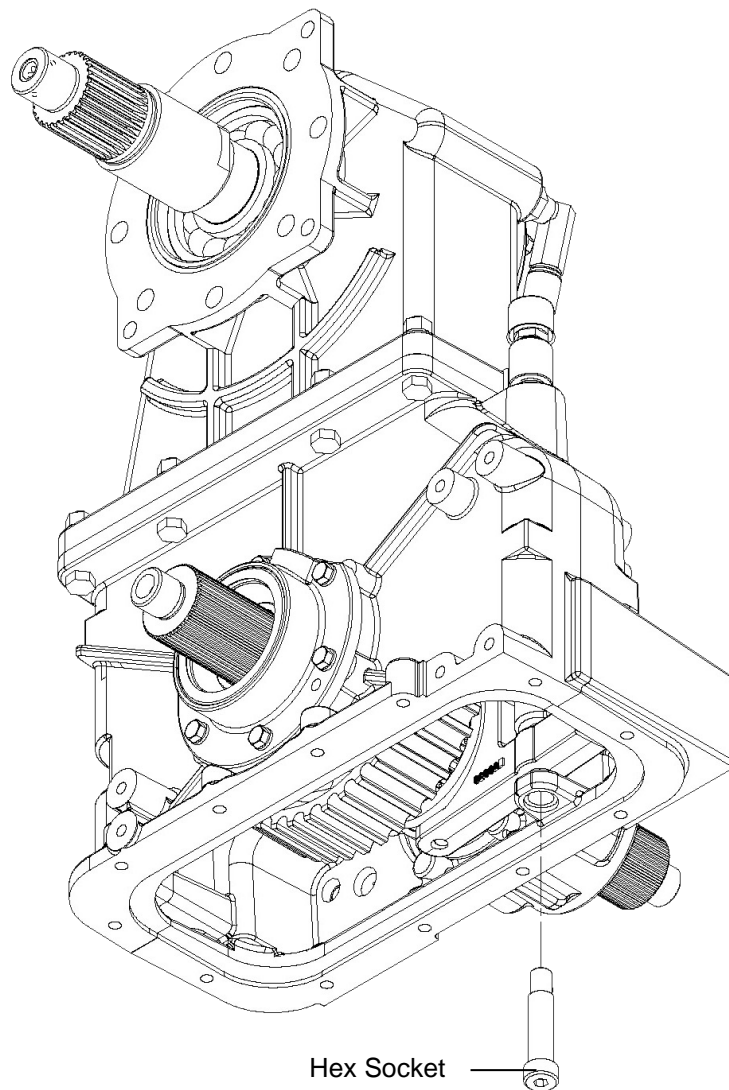
1. Place shift unit in ROAD Mode by pushing override rod in.
2. Remove the four (4) mounting screws and washers.
3. Pull shift unit straight back as far as possible.
4. Rotate shift unit towards case to disengage clevis from shift fork.



Disassembly - Remove Driveline from Case (Continued)

Shift Fork

1. Shift collar to PUMP position. Remove shoulder screw and discard. Screw is self-locking and is not to be re-used. Note that a new screw is included in gasket kit.



IL4068

Disassembly - Remove Driveline from Case (Continued)

Remove Coupling (Output) Shaft

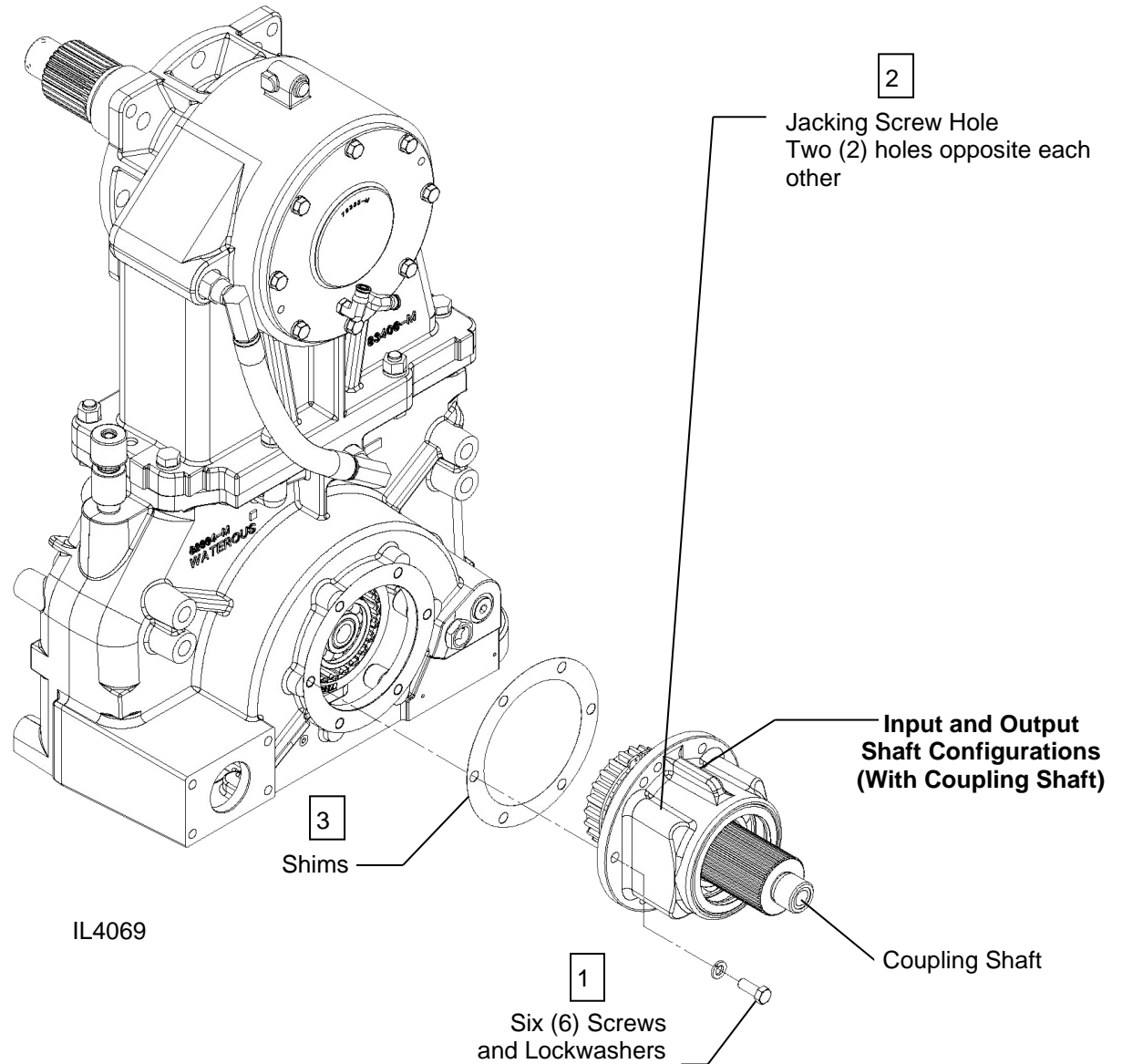
To remove coupling shaft from output side of case:

1. Remove six screws and lockwashers.
2. Install screws in jacking screw holes and tighten to disengage coupling shaft housing from case.

- **Input and Output Shaft Configurations:**

Until coupling shaft housing shoulder / lip clears case bore, grasp coupling shaft and pull while rocking shaft side to side and up and down.

3. Remove shims.



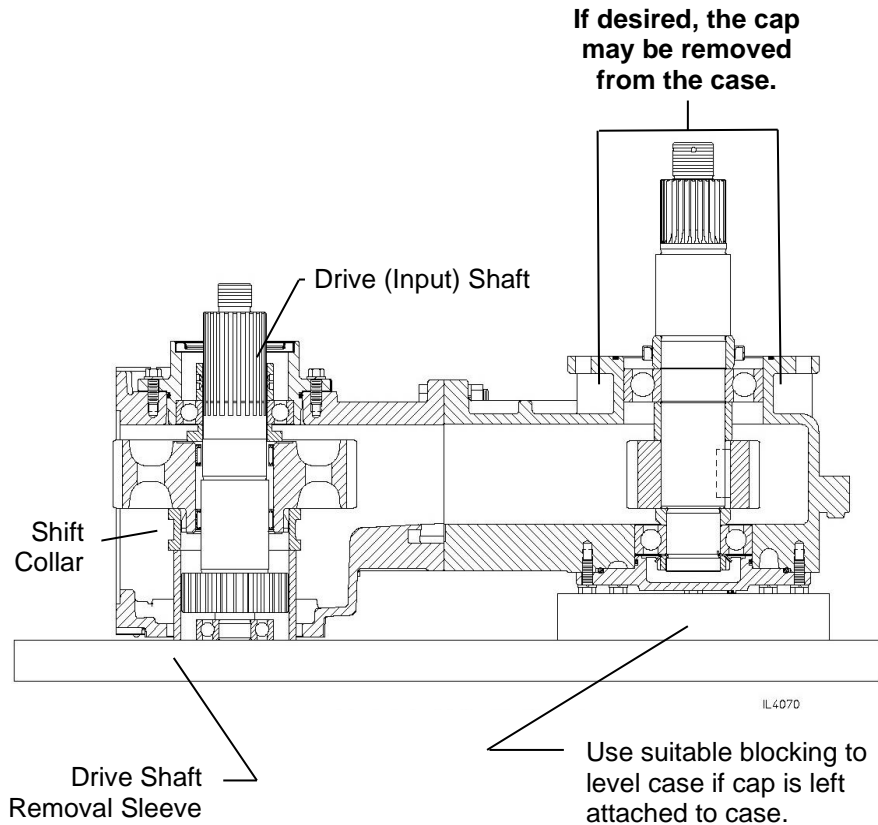
Disassembly - Remove Driveline from Case (Continued)

Remove Drive (Input) Shaft

Shift Collar Retaining Ring (Input Shaft Only Configurations)

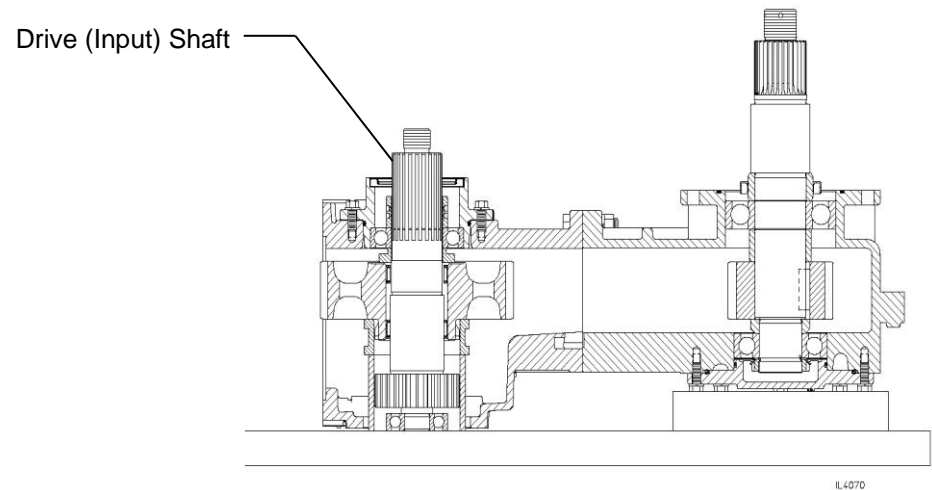
Step 1

Place case on a suitable press as shown with drive shaft removal sleeve installed under the shift collar. Use suitable blocking to level the case.



Step 2

Apply force to the drive (input) shaft in the direction shown to disengage shaft from case.



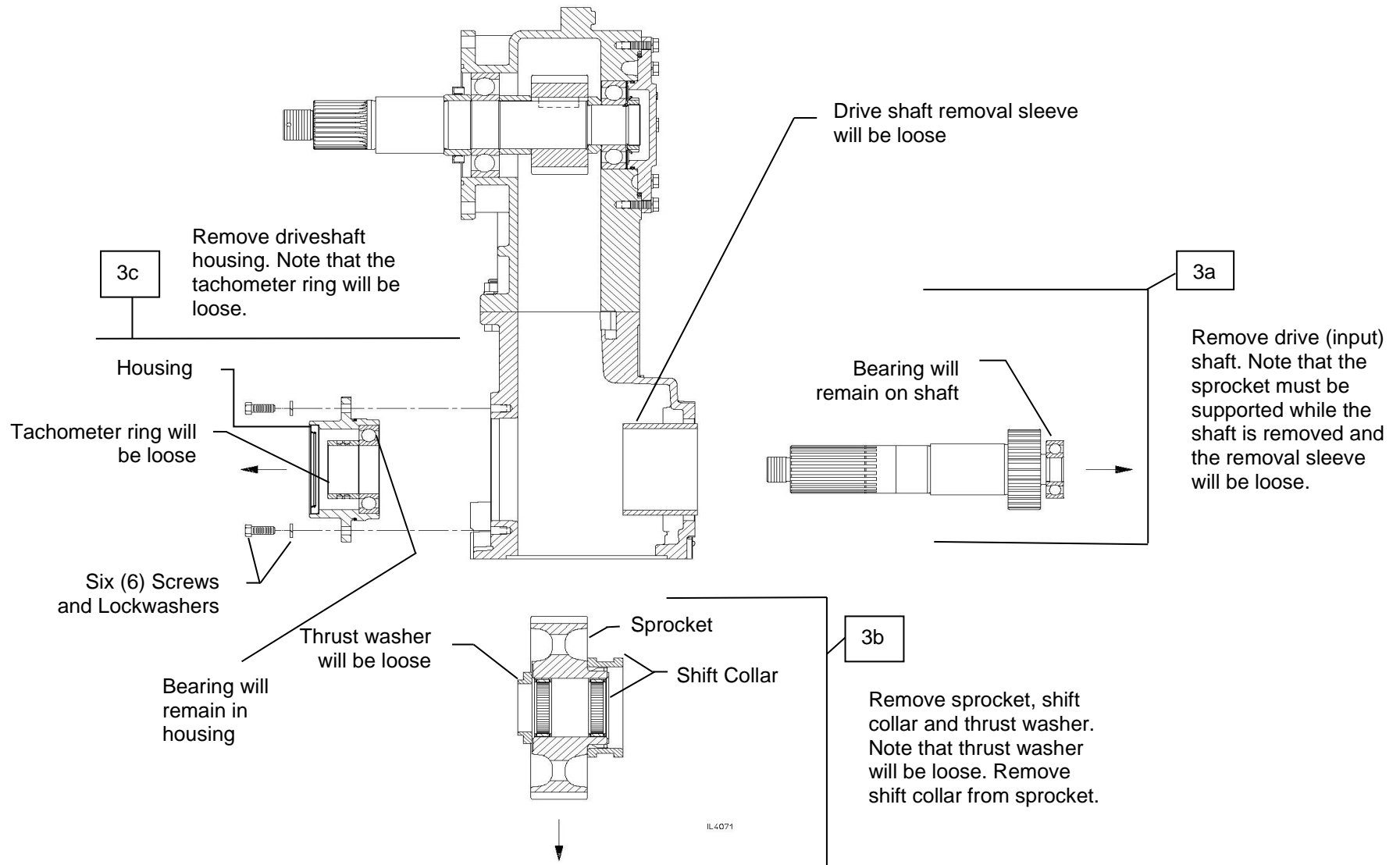
Disassembly - Remove Driveline from Case (Continued)

Remove Drive (Input) Shaft

Remove Drive Shaft, Sprocket and Housing

Step 3

Remove case from the press and remove components as shown.

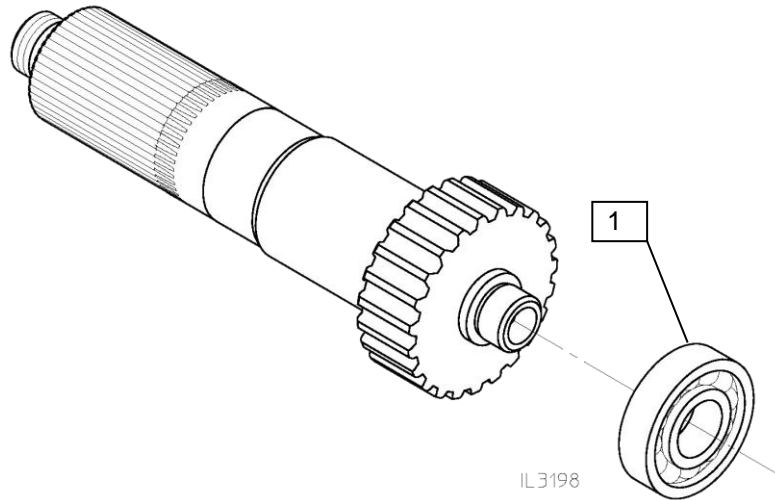


Disassemble Driveline Components

Drive (Input) Shaft

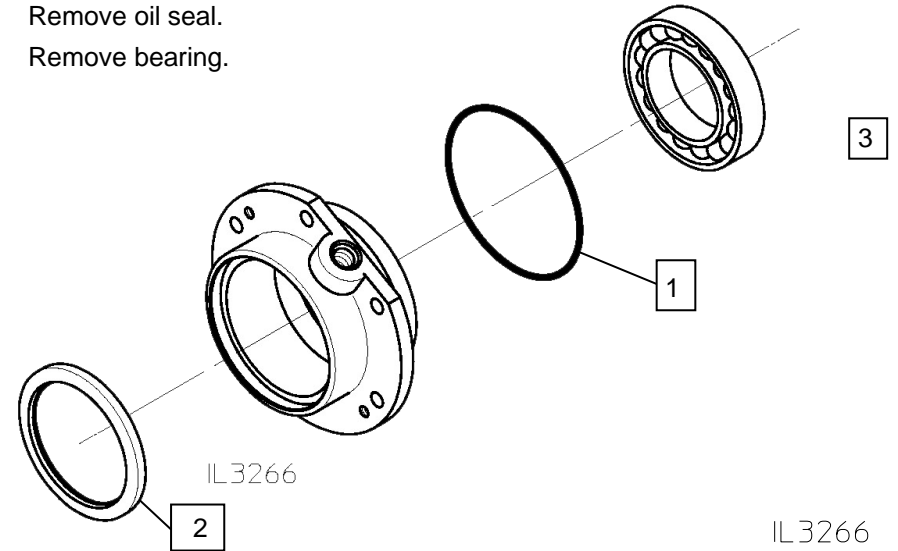
Shaft

1. Remove bearing from shaft



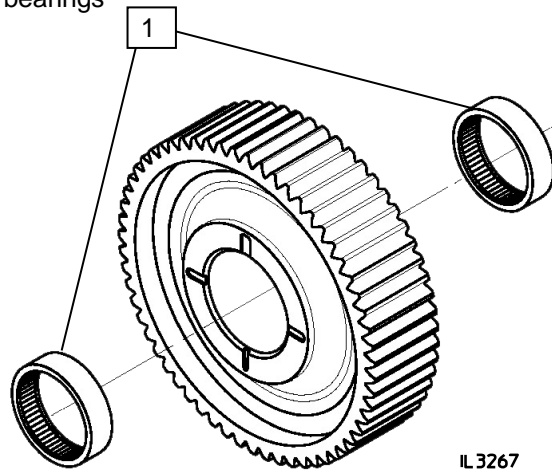
Housing

1. Remove O-ring.
2. Remove oil seal.
3. Remove bearing.



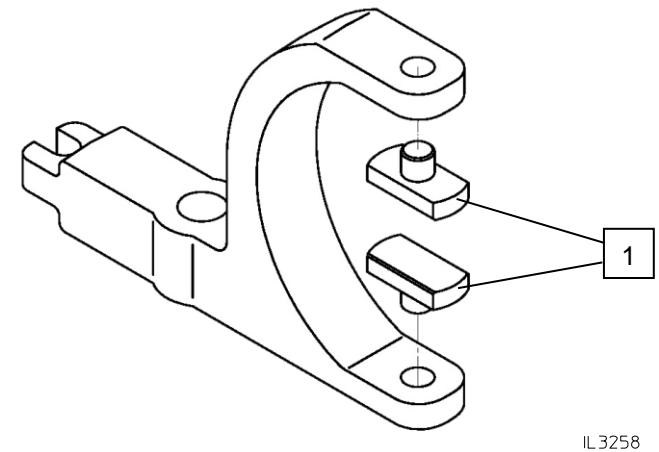
Sprocket

1. Remove both needle bearings from sprocket bore.



Shift Fork Shoes

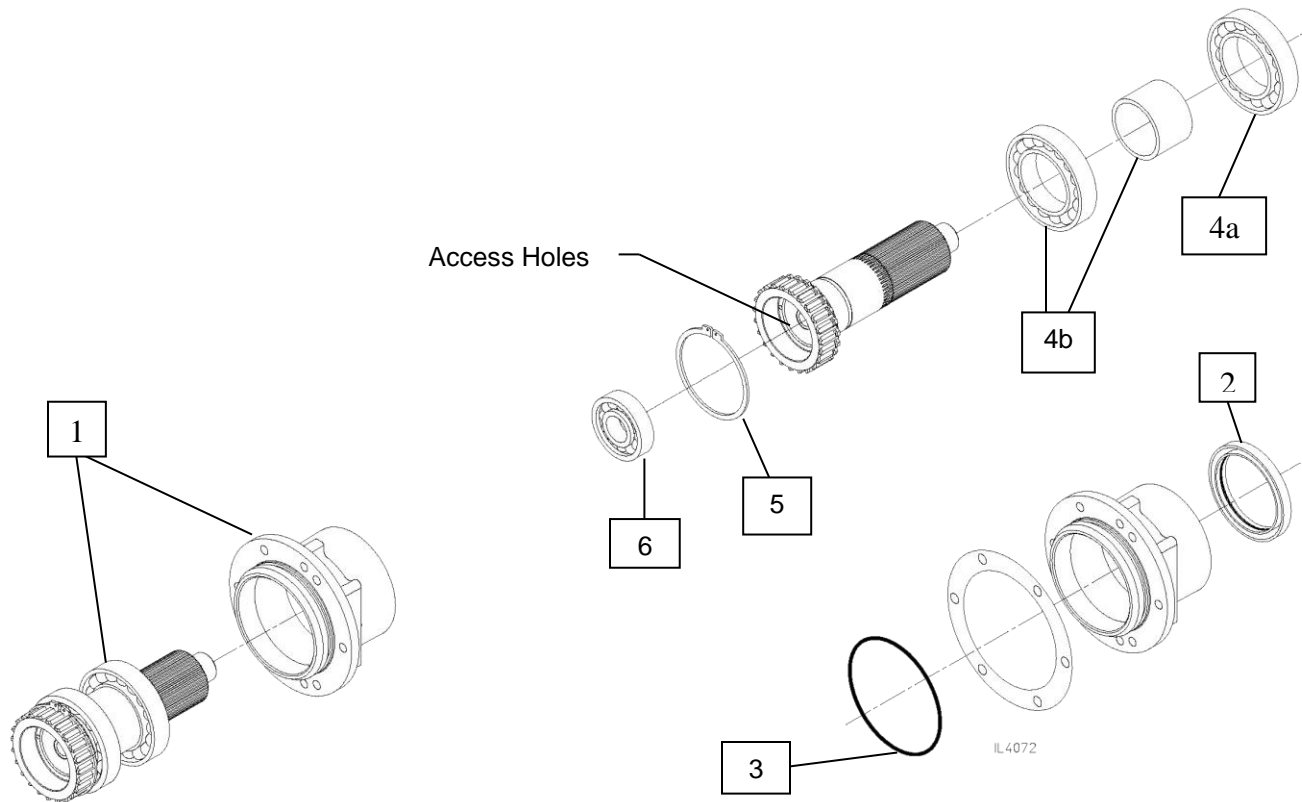
1. Remove shift shoes from fork.



Disassemble Driveline Components (Continued)

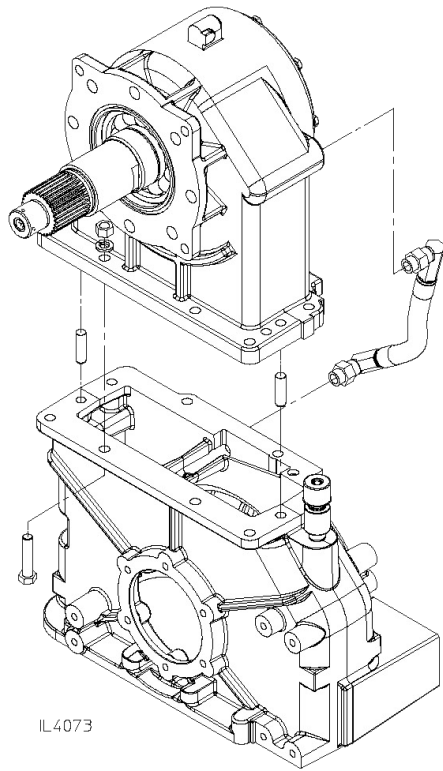
Coupling (Output) Shaft

1. Press shaft out of housing.
2. Remove oil seal from housing.
3. Remove O-ring from housing.
4. Remove outer bearing and spacer from shaft.
 - 4a. Pull outer ball bearing from the shaft.
 - 4b. Remove the spacer and pull inner ball bearing from the shaft.
Note that due to the closeness of the ball bearing to the hub end of the shaft, a split-plate type puller may be necessary.
5. Remove retaining ring from shaft
6. The pilot bearing normally remains in the drive shaft, however, if it remains in the coupling shaft, tap out using a punch through the two access holes in the shaft bore.

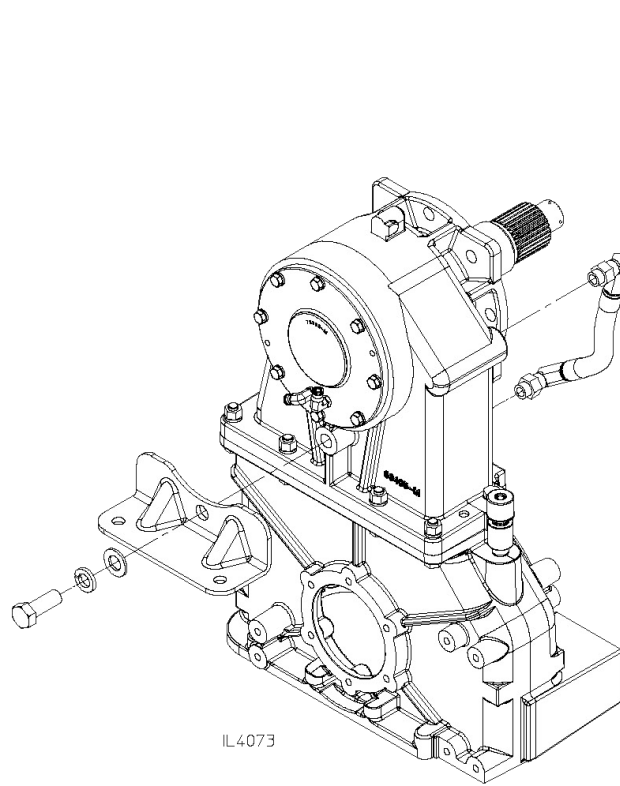


Disassembly - Remove Driven (Impeller) Shaft

Remove Cap from Case



FRONT FACING SHOWN

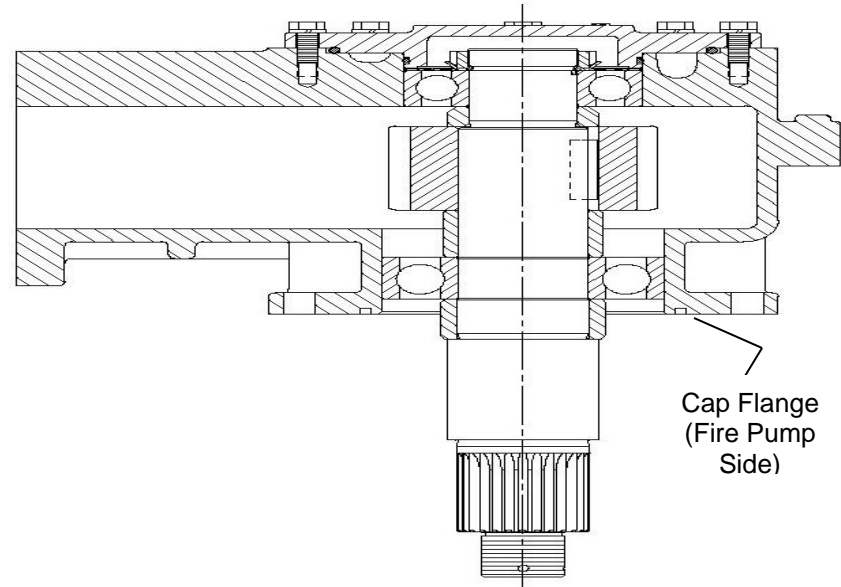
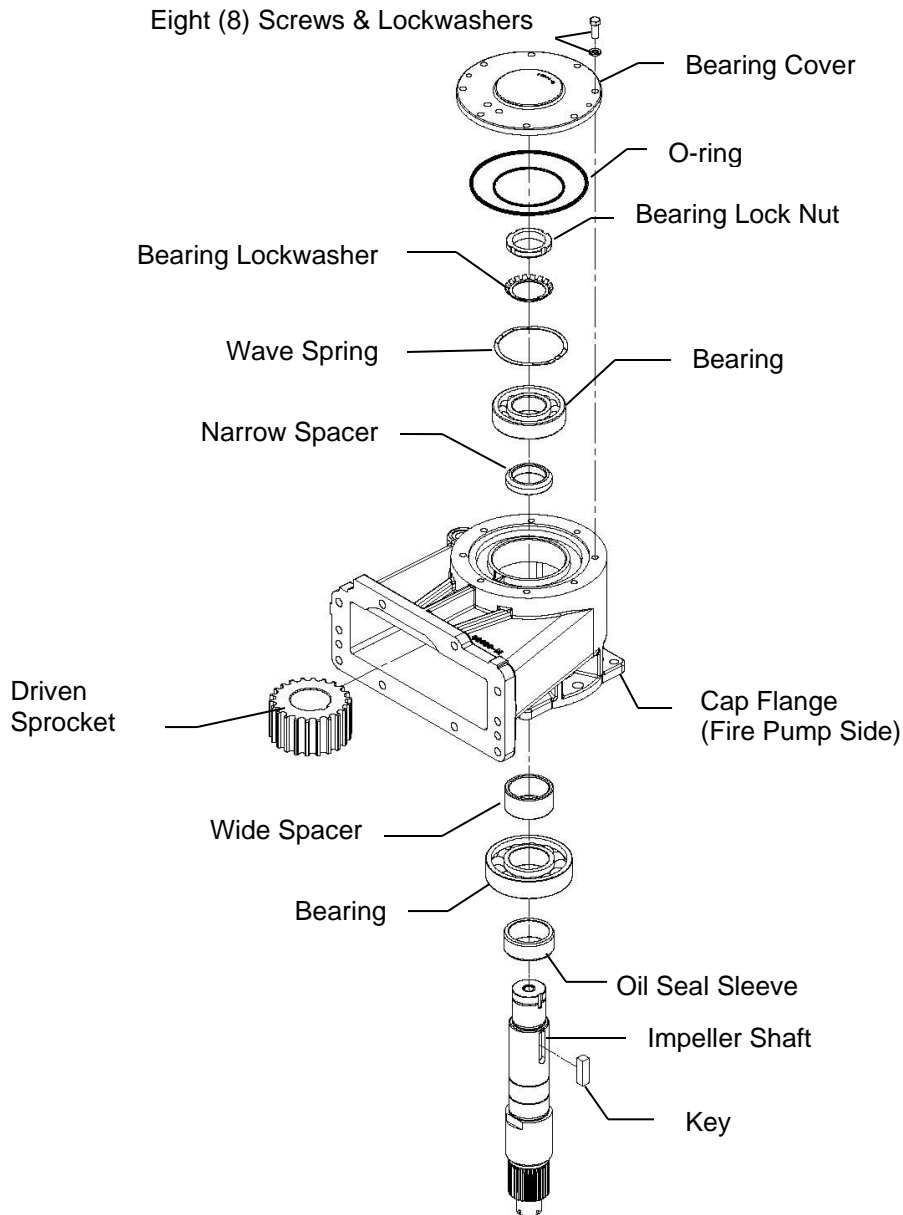


REAR FACING SHOWN

Note: Slots on each side of the case may be used to help separate the cap from the case.

Disassembly - Disassemble Cap

Front and Rear Facing Pump

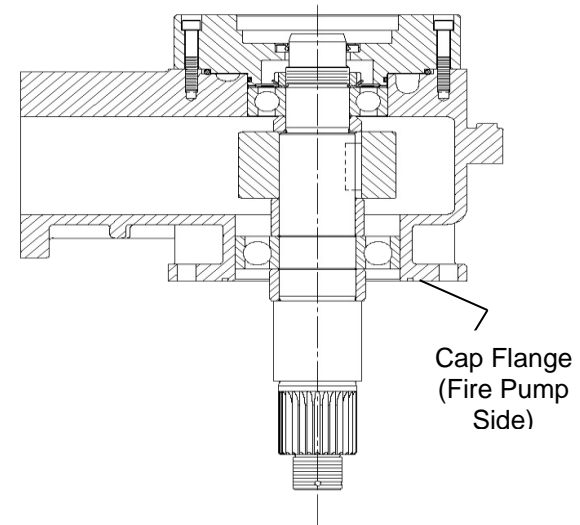
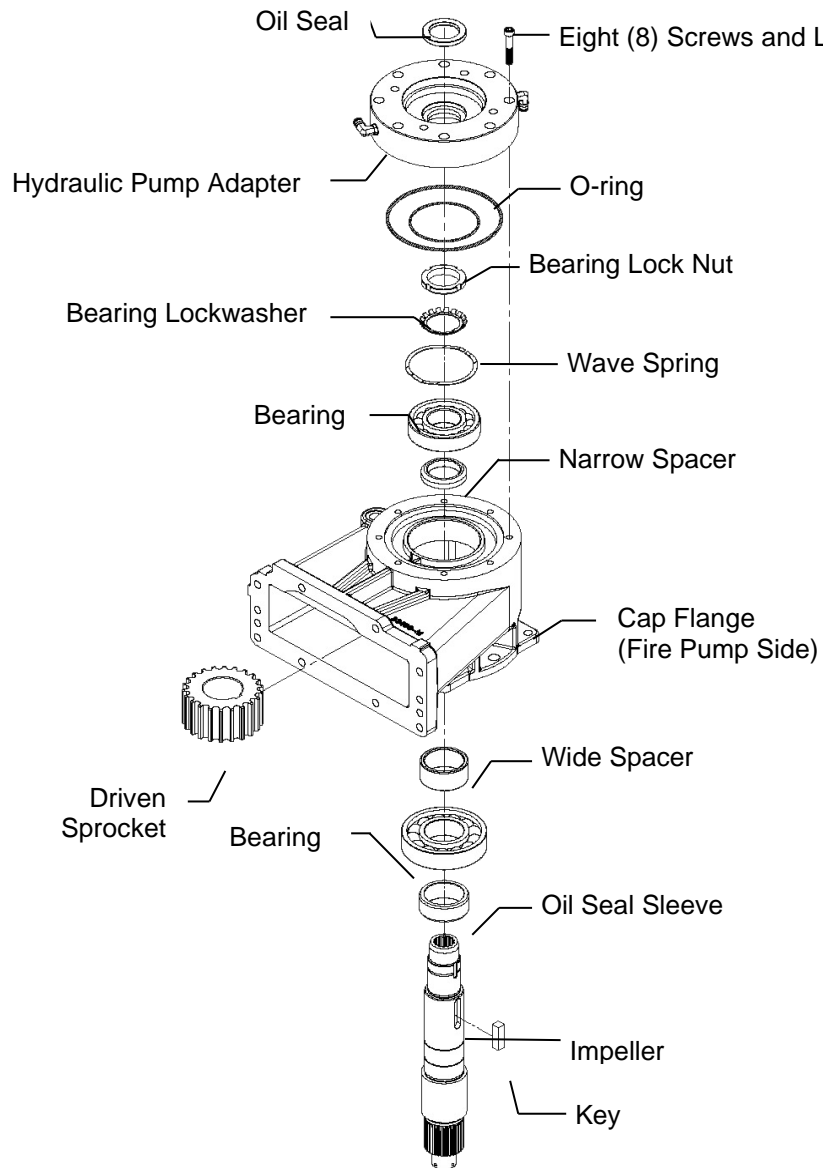


1. Remove the eight (8) screws from the bearing cover.
2. Straighten tab of the bearing lockwasher from slot in bearing lock nut and then remove the lock nut, lockwasher and wave spring.
NOTE: To remove nut, tap nut with a punch and hammer.
3. Under a press, support the assembly on the cap flange (fire pump side) and apply a press load to the end of the impeller shaft to press the shaft out of the ball bearing, spacers and sprocket.
4. Remove the ball bearing, spacers and sprocket.
5. Remove bearing and spacer from the impeller shaft.

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Disassembly - Disassemble Cap

Front and Rear Facing Pump with Hydraulic Pump Adapter



1. Remove the eight (8) screws from the hydraulic pump adapter.
2. Straighten tab of the bearing lockwasher from slot in bearing lock nut and then remove the lock nut, lockwasher and wave spring.
NOTE: To remove nut, tap nut with a punch and hammer..
3. Under a press, support the assembly on the cap flange (fire pump side) and apply a press load to the end of the impeller shaft to press the shaft out of the ball bearing, spacers and sprocket.
4. Remove the ball bearing, spacers and sprocket.
5. Remove oil seal and O-ring from hydraulic pump adapter and discard.
6. Remove bearing and spacer from the impeller shaft and discard the bearing.

IL4105

Reassembly

Inspection and Repair

Before reassembly, check for the following:

Shift Components:

- Damage to the shift fork and shift shoes.
- Damage to the clevis end on the shift unit.
- Damage to the engaging teeth on the drive sprocket, coupling shaft and shift collar.

Note that minor burrs found on the teeth of the shift collar, drive sprocket or coupling shaft may be filed clean. If excessive damage is found on any component it should be replaced.

Sprockets:

- Worn sprocket teeth.

Chain:

- Worn flanks on inner links.
- Outside guide links not retained by riveted over pins.
- Wear on inner faces of outside guide links.

Shafts:

- Damaged splines.

Bearings:

- Ensure that all bearings turn freely.

NOTES:

1. Before reassembly, make sure all reusable parts have been cleaned and kept free of dirt during reassembly.
2. All O-rings, gaskets, bearings, oil seals, etc. required for overhaul of the transmission are available in gasket kit.

Ball Bearings and Oil Seals, O-rings

Installing Ball Bearings

Keep new ball bearings wrapped until they are to be installed. When pressing the ball bearing on a shaft or into a bore, coat appropriate surfaces with grease.

Shaft - grease shaft and ball bearing bore.

Bore - grease bore and outside of diameter of ball bearing.

Always apply force to the inner race of a ball bearing when pressing it on a shaft and to the outer race if pressing into a bore. Press evenly with a piece of pipe or tube which just clears the shaft.

Installing Oil Seals

Before installing a new oil seal in its housing, apply a thin coat of silicone sealant to housing oil seal seat. Be sure that the seal, shaft and housing are clean. Always install a seal with the seal lip facing in. Lubricate seal lip with light oil before installing shaft. Apply force to the outer edge of the seal and press in evenly.

Installing O-Rings

Grease new O-rings prior to installation. This will aid in the installation as well as prevent damage to the O-ring.

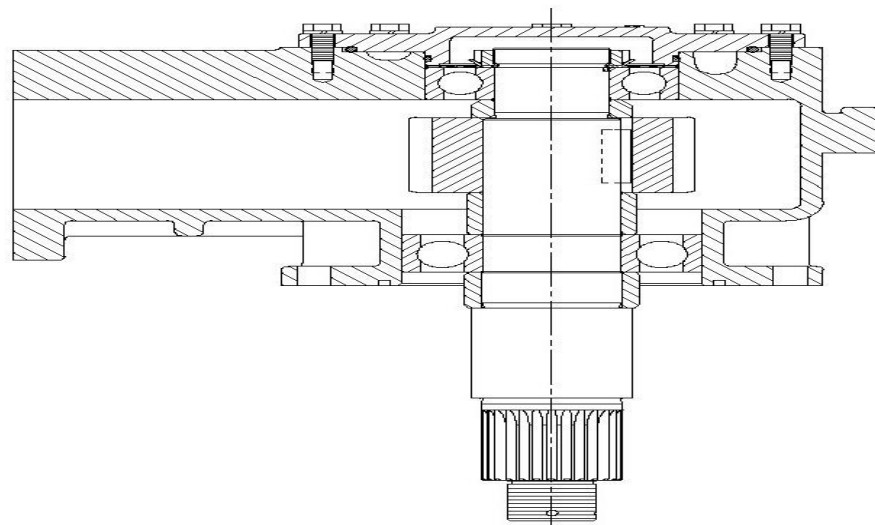
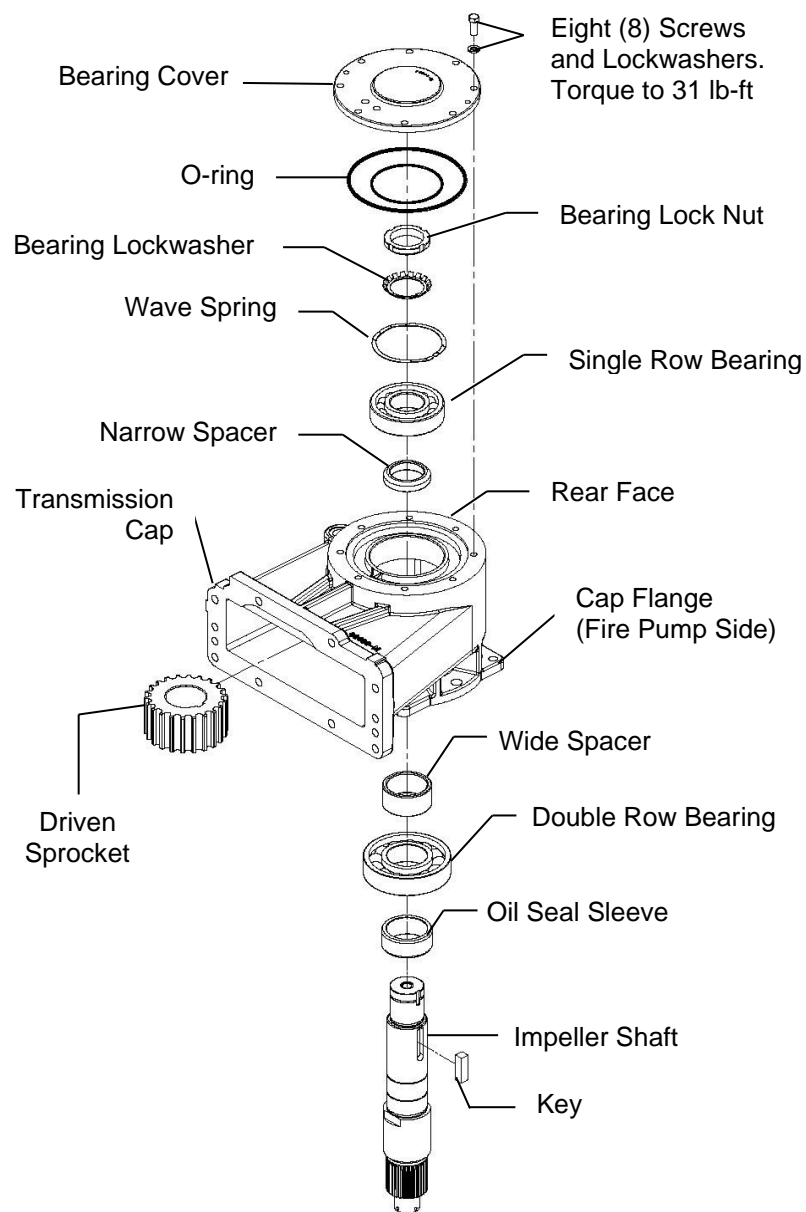
NOTES:

1. Wherever silicone or sealant is referenced, use Loctite 518 Gasket Eliminator or equivalent, unless otherwise specified.
2. Torque hardware to the values specified in the individual reassembly details.

Reassembly - Assemble Driven (Impeller) Shaft

Assemble Cap

Front Facing Pump



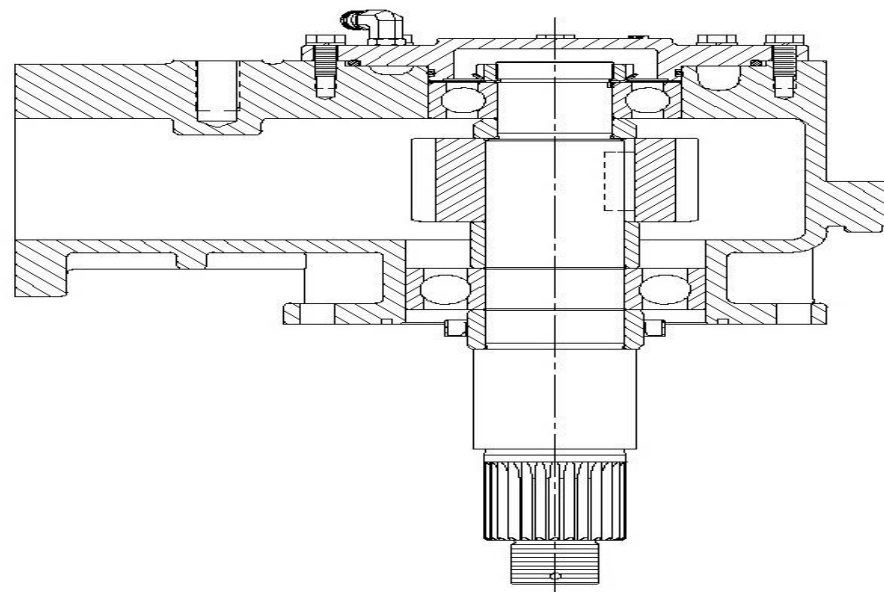
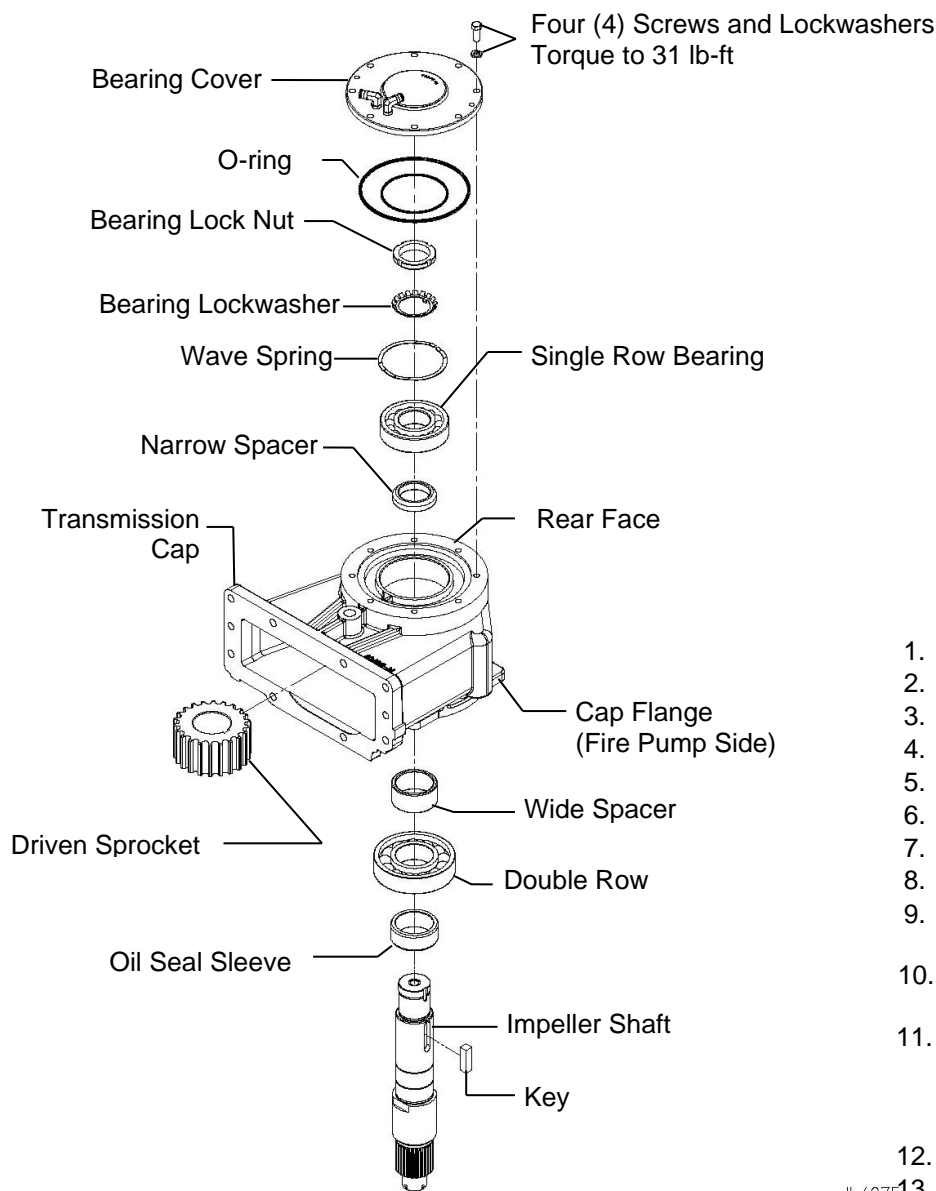
1. Remove the snap ring from the double row ball bearing and discard.
2. Use high pressure grease to coat the impeller shaft.
3. Press the oil seal sleeve
4. Press the double row bearing onto the shaft.
5. Install the wide spacer next to the bearing.
6. Tap the key into place.
7. Place high pressure grease in the rear bore of the cap.
8. Tap the bearing into place.
9. Set bearing cover on the rear face and secure with four screws and lock washers. Hand tighten only at this stage of reassembly.
10. With the cap resting on its rear face, position the narrow spacer and driven sprocket inside the cap.
11. Take the impeller shaft, double row bearing, spacer and key assembled previously and slide the shaft through the bore in the cap flange into the bore of the driven sprocket, narrow spacer and ball bearing lining up the key in the shaft with the keyway in the sprocket.
12. Tap into place until the shaft seats.
13. Remove the bearing cover and install the bearing lock washer and lock nut. Make sure the tang of the washer aligns with the keyway in the shaft.
14. Tighten nut 1/4 turn from finger tight and bend one of the locking tangs on the washer into one of the slots in the locknut.
15. Install wave spring and bearing cover.

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Reassembly - Assemble Driven (Impeller) Shaft

Assemble Cap

Rear Facing Pump



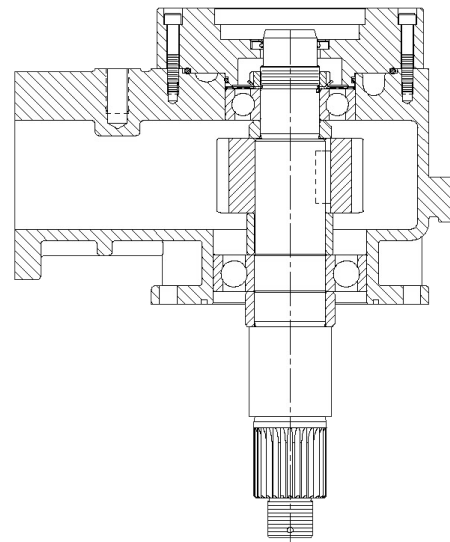
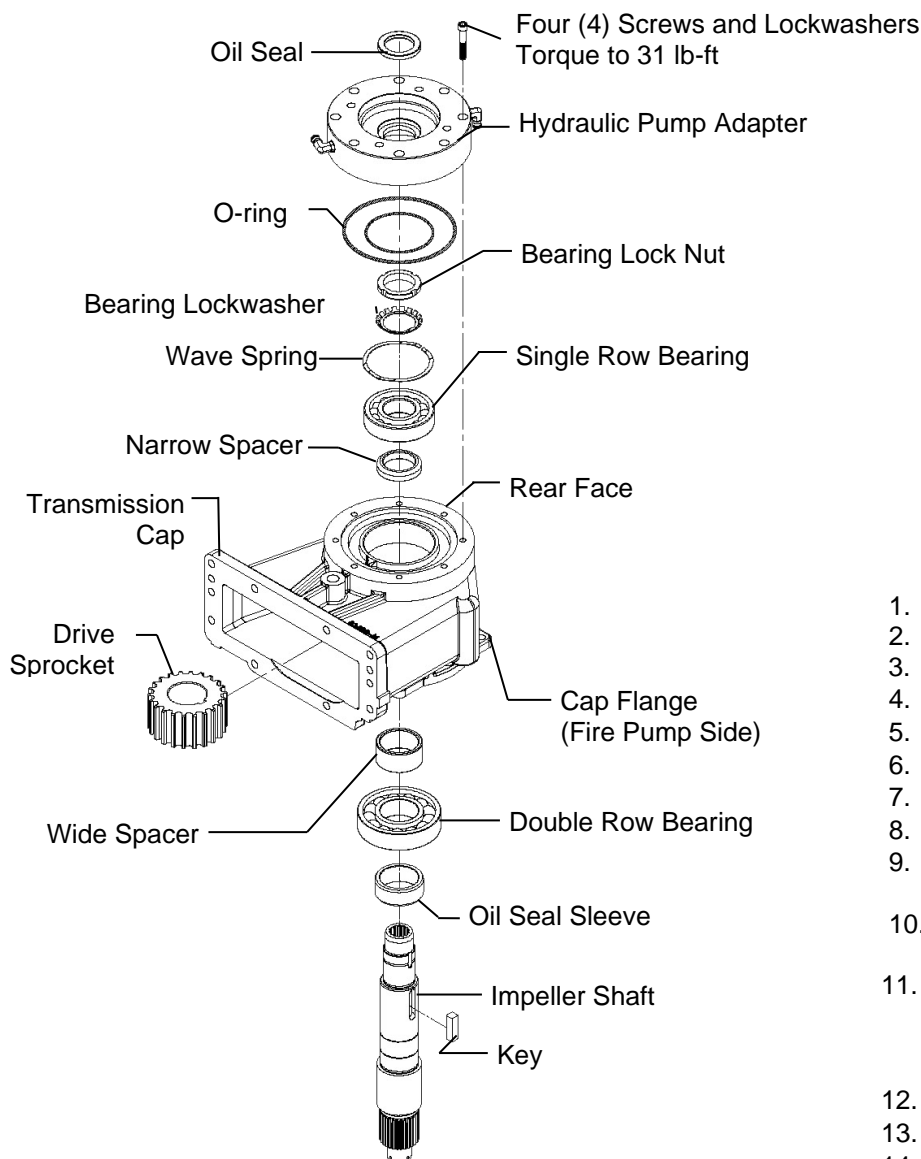
1. Remove the snap ring from the double row ball bearing and discard.
2. Use high pressure grease to coat the impeller shaft.
3. Press the oil seal sleeve onto the shaft.
4. Press the double row bearing onto the shaft.
5. Install the wide spacer next to the bearing.
6. Tap the key into place.
7. Place high pressure grease in the rear bore of the cap.
8. Tap the bearing into place.
9. Set hydraulic pump adapter on the rear face and secure with four screws and lock washers. Hand tighten only at this stage of reassembly.
10. With the cap resting on its rear face, position the narrow spacer and driven sprocket inside the cap.
11. Take the impeller shaft, bearing, spacer and key assembled previously and slide the shaft through the bore in the cap flange into the bore of the driven sprocket, narrow spacer and ball bearing lining up the key in the shaft with the keyway in the sprocket.
12. Tap into place until the shaft seats.
13. Remove the bearing cover and install the retaining ring.
14. Install O-ring and oil seal in bearing cover.
15. Install wave spring and bearing cover.

IL4075

Reassembly - Assemble Driven (Impeller) Shaft

Assemble Cap

With Hydraulic Pump Adapter

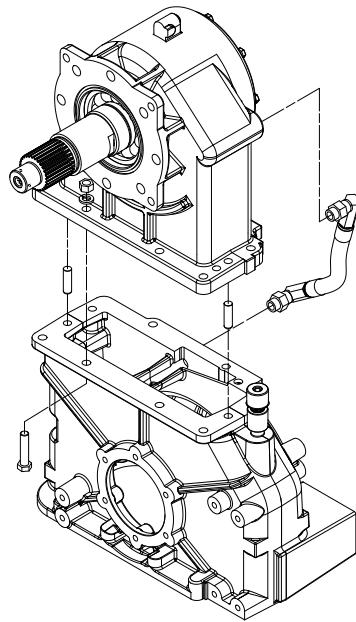


1. Remove the snap ring from the double row ball bearing and discard.
2. Use high pressure grease to coat the impeller shaft.
3. Press the oil seal sleeve onto the shaft.
4. Press the double row bearing onto the shaft.
5. Install the wide spacer next to the bearing.
6. Tap the key into place.
7. Place high pressure grease in the rear bore of the cap.
8. Tap the bearing into place.
9. Set hydraulic pump adapter on the rear face and secure with four screws and lock washers. Hand tighten only at this stage of reassembly.
10. With the cap resting on its rear face, position the narrow spacer and driven sprocket inside the cap.
11. Take the impeller shaft, bearing, spacer and key assembled previously and slide the shaft through the bore in the cap flange into the bore of the driven sprocket, narrow spacer and ball bearing lining up the key in the shaft with the keyway in the sprocket.
12. Tap into place until the shaft seats.
13. Remove the hydraulic pump adapter and install the retaining ring.
14. Tighten nut $\frac{1}{4}$ turn from finger tight and bend one of the locking tangs on the washer into one of the slots in the locknut.
15. Install O-ring and oil seal in hydraulic pump adapter.
16. Install wave spring and hydraulic pump adapter.

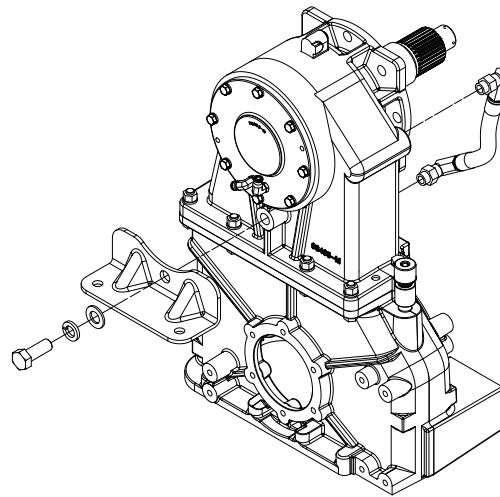
IL4106

Reassembly - Attach Cap to Case

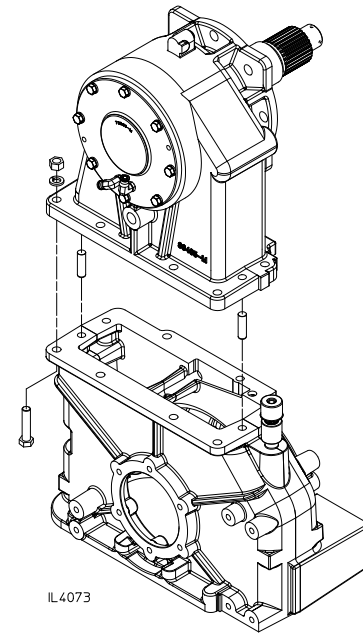
NOTE: Apply Sealant to Flange between Cap and Case.



FRONT FACING SHOWN

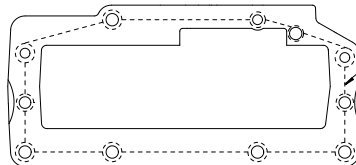


REAR FACING SHOWN



IL4073

APPLY LOCTITE 518 SEALANT OR EQUIVALENT TO MATING FLANGES

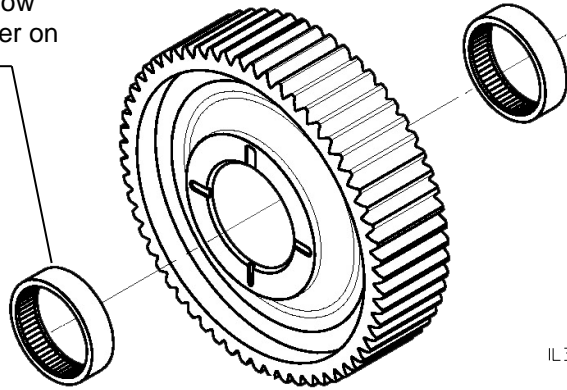


APPLY A THIN BEAD OF SEALANT AS SHOWN BY DASHED LINE (CASE FLANGE SHOWN).

Reassembly - Assemble Driveline Components

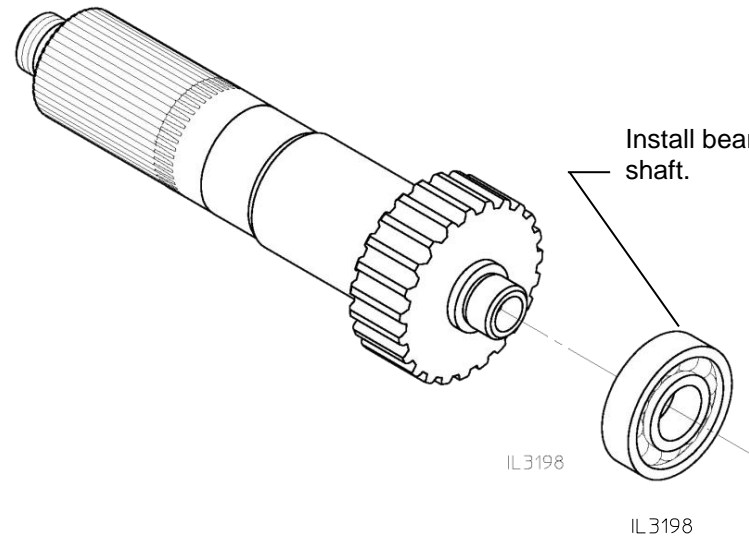
Drive Sprocket

Install one needle bearing (larger radius first) in each end of the drive sprocket. Seat bearings just below bottom of chamfer on sprocket bore.



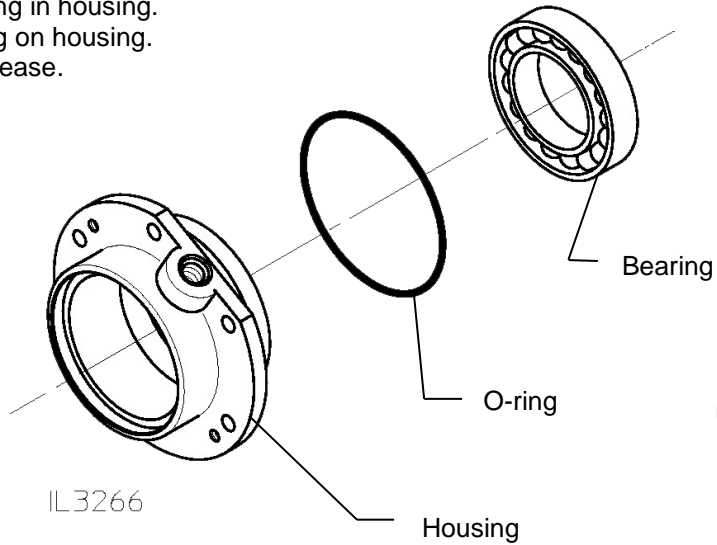
Drive Shaft

Install bearing on shaft.



Drive Shaft Housing

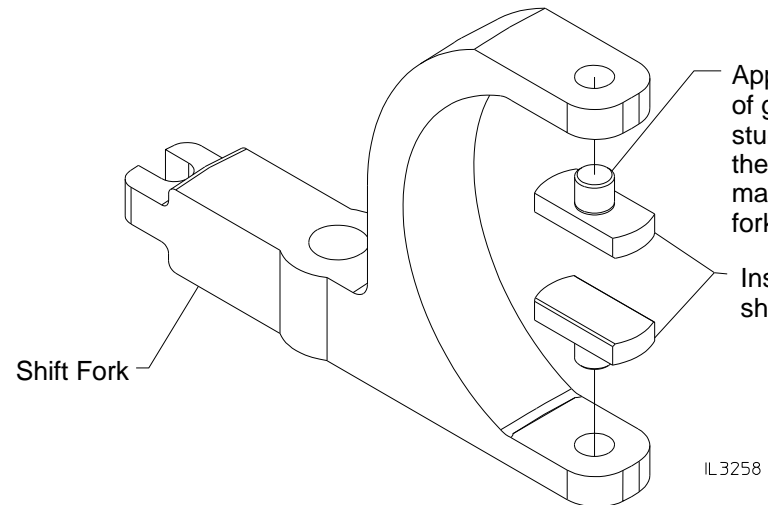
1. Install bearing in housing.
2. Install O-ring on housing.
3. Coat with grease.



Shift Fork Shoes

Applying a dab of grease to the studs will help the shoes remain in the fork.

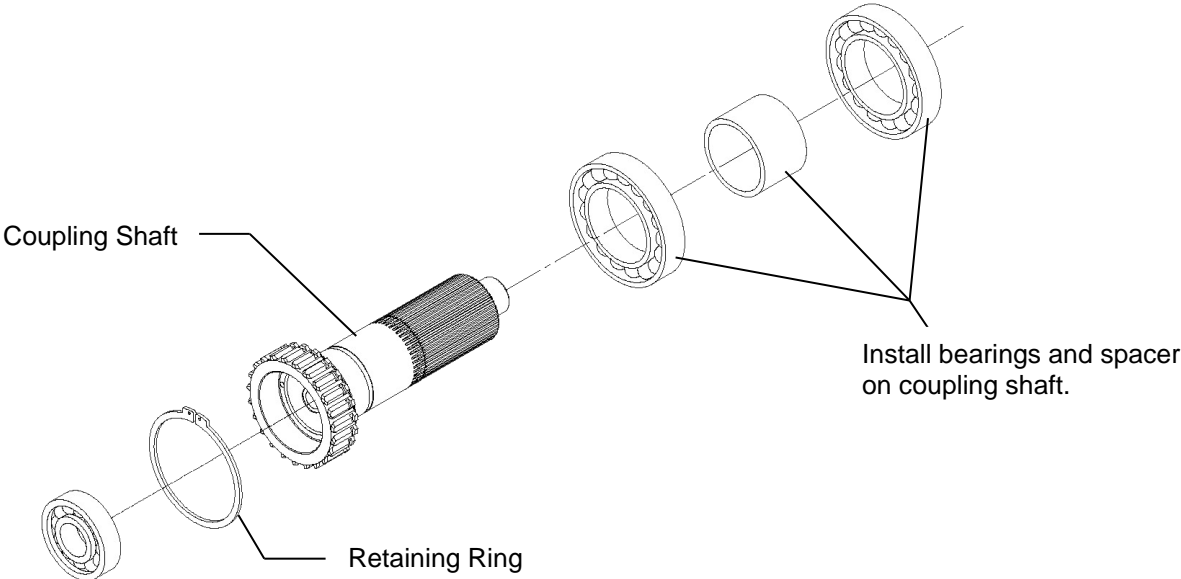
Install shoes in shift fork.



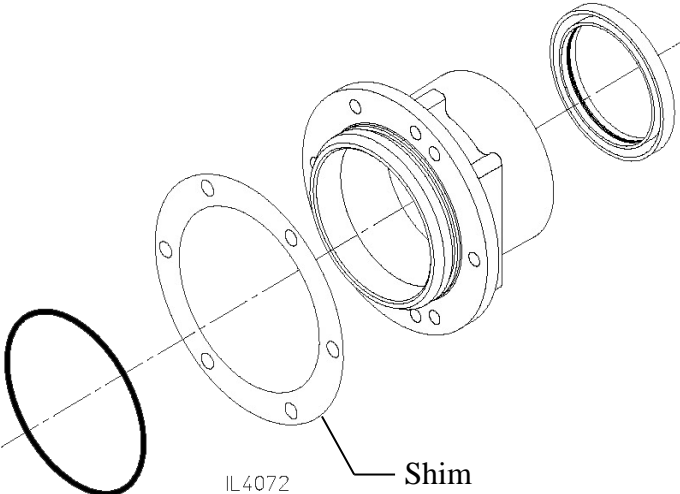
Reassembly - Assemble Driveline Components (Continued)

Coupling Shaft

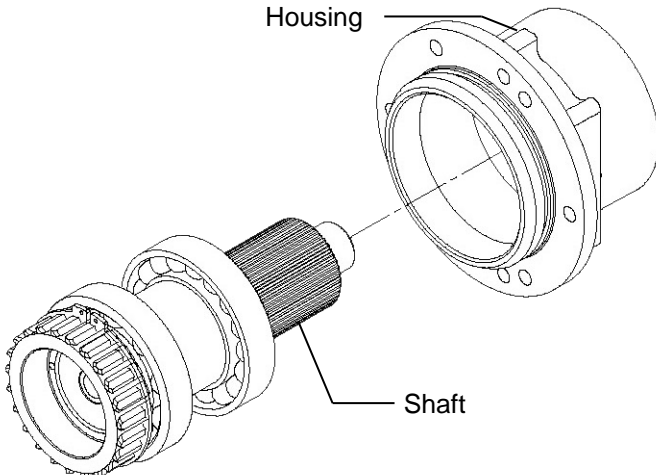
Step 1. Sub-Assembly Shaft



Step 2. Sub-Assembly Housing



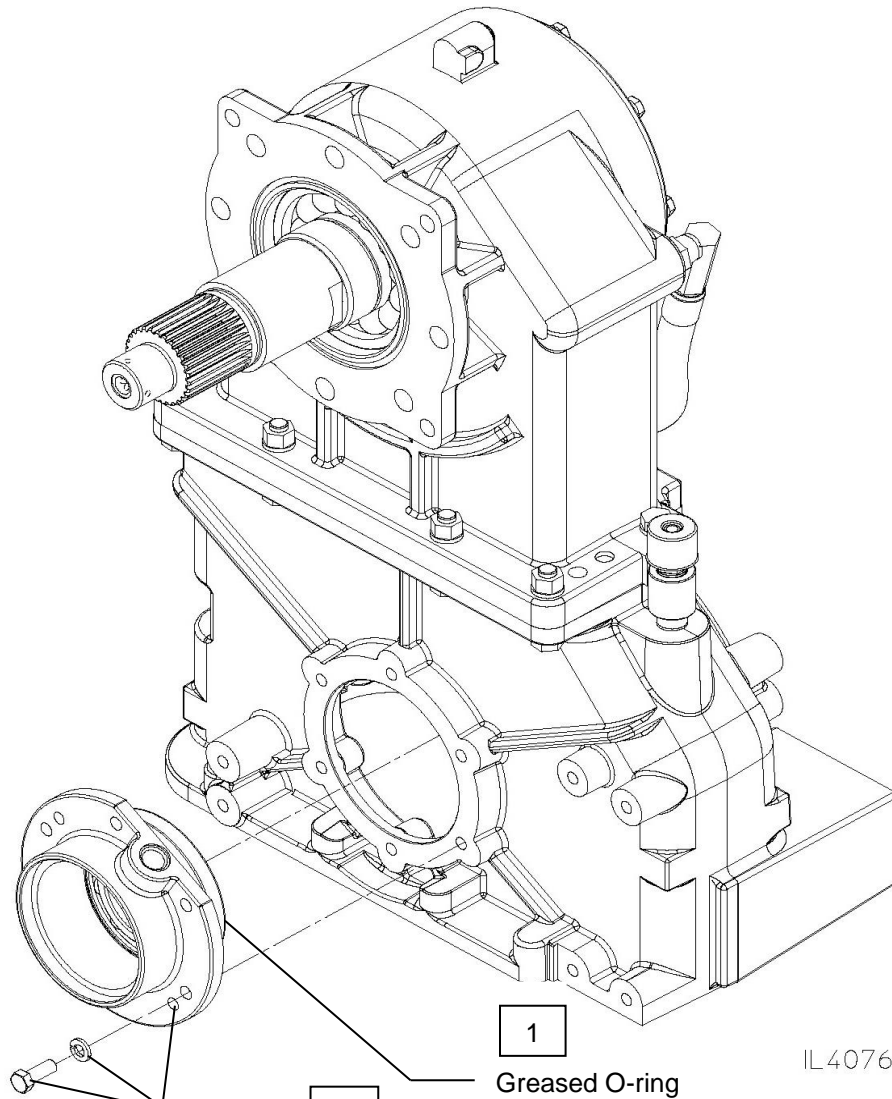
Step 3. Install Shaft in Housing



Reassembly - Installation of Driveline in Case

Drive (Input) Shaft

Install Drive Shaft Housing on Case

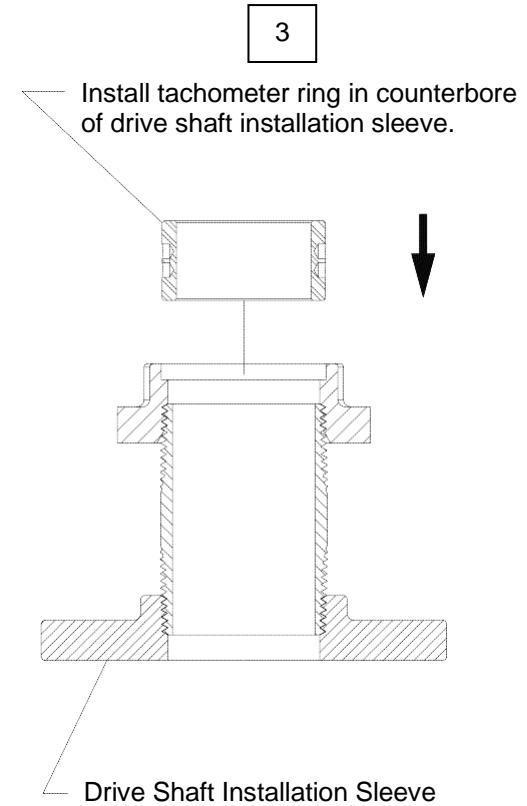


1
Greased O-ring

2
Install drive shaft assembly on case with six (6) screws and lockwashers. Torque to 31 lb-ft.

IL 4076

Install Tachometer Ring in Installation Tool



3
Install tachometer ring in counterbore of drive shaft installation sleeve.

Drive Shaft Installation Sleeve

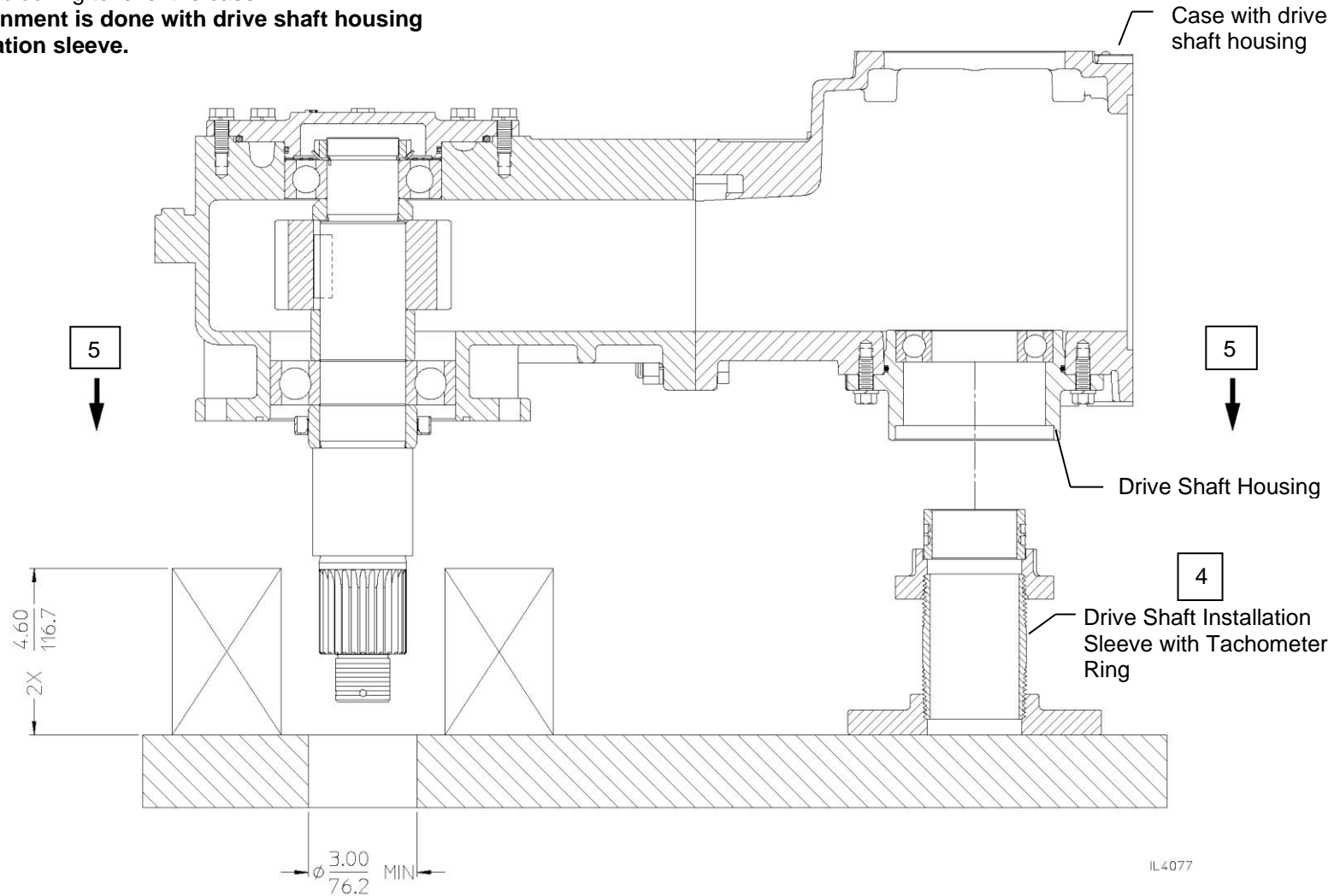
Reassembly - Installation of Driveline in Case (Continued)

Drive (Input) Shaft

Install Case on Installation Tool

4. Place drive shaft installation sleeve on an arbor press.
5. Place case on drive shaft installation sleeve. Use appropriate blocking to level the case.

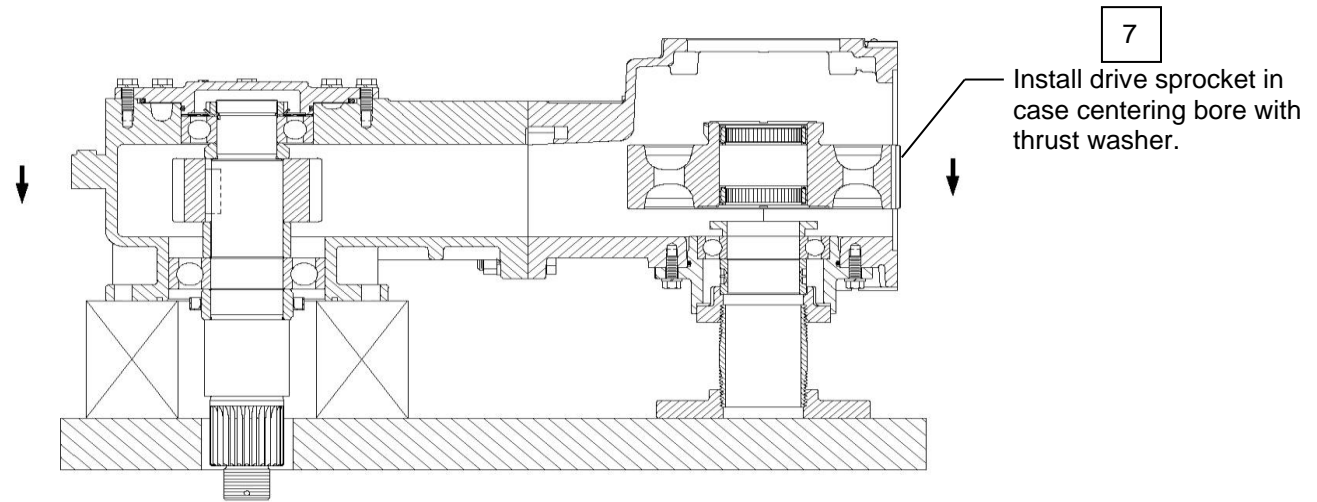
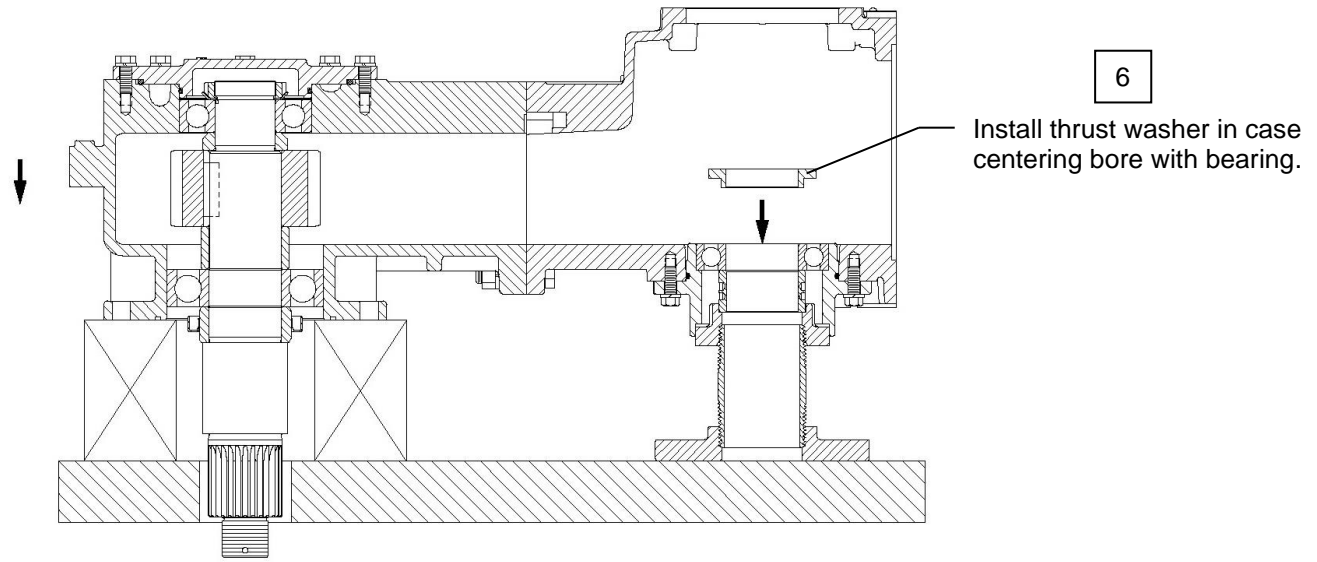
NOTE: Alignment is done with drive shaft housing and installation sleeve.



Reassembly - Installation of Driveline in Case (Continued)

Drive (Input) Shaft

Install Drive Sprocket

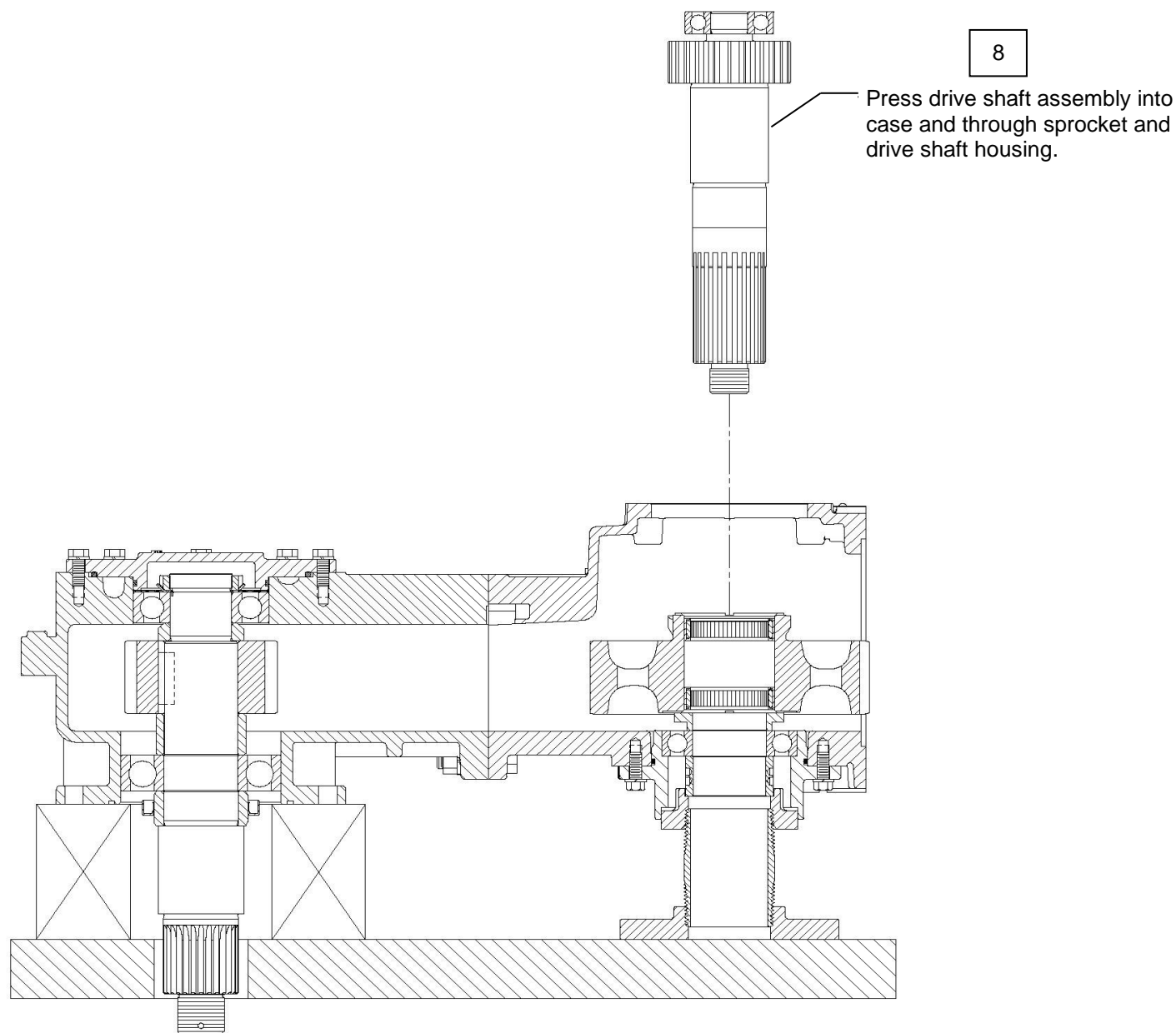


IL4078

Reassembly - Installation of Driveline in Case (Continued)

Drive (Input) Shaft

Install Drive Shaft in Case



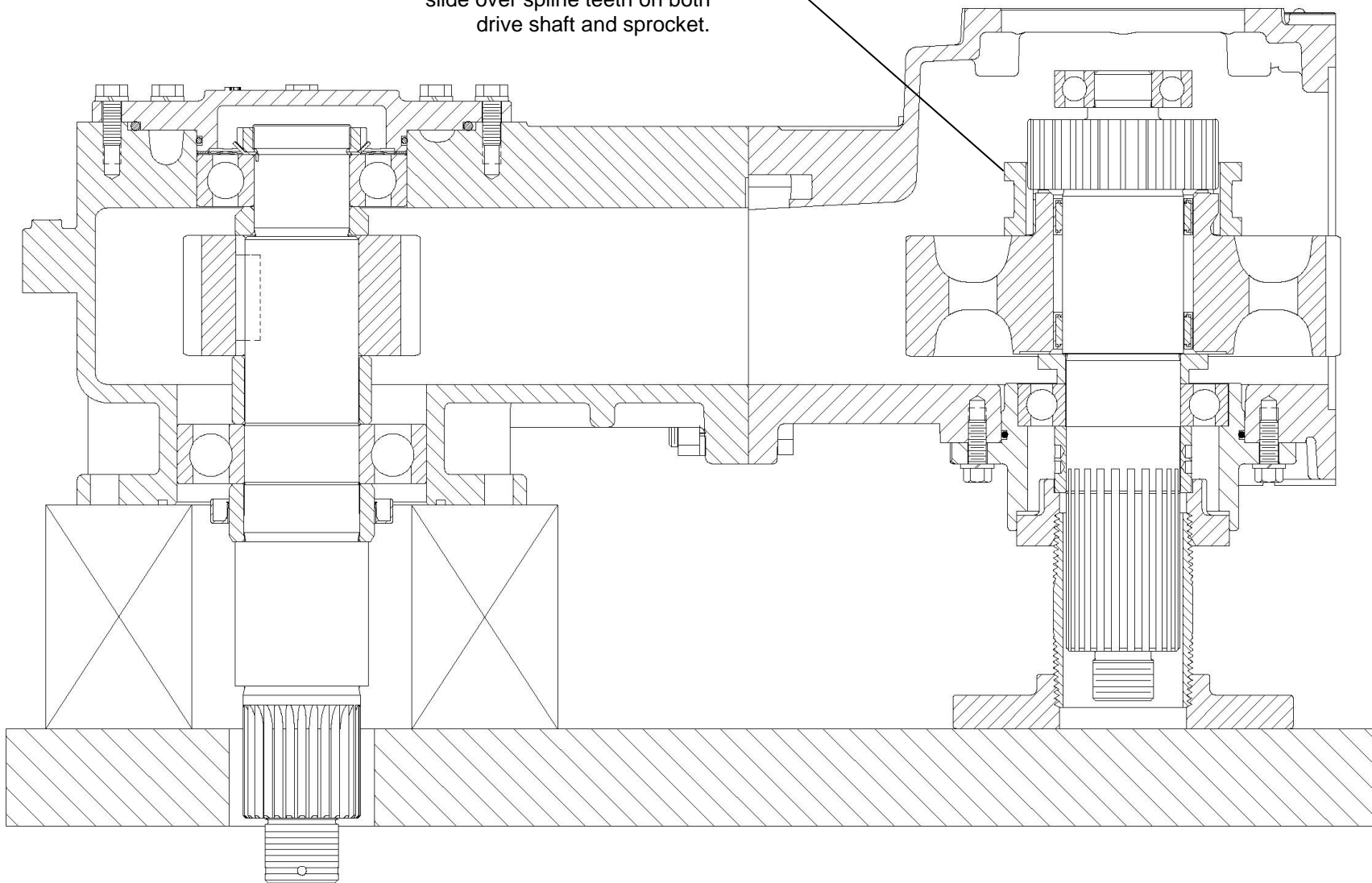
IL4079

Reassembly - Installation of Driveline in Case (Continued)

Shift Collar

9

Install shift collar on drive shaft,
slide over spline teeth on both
drive shaft and sprocket.



IL4080

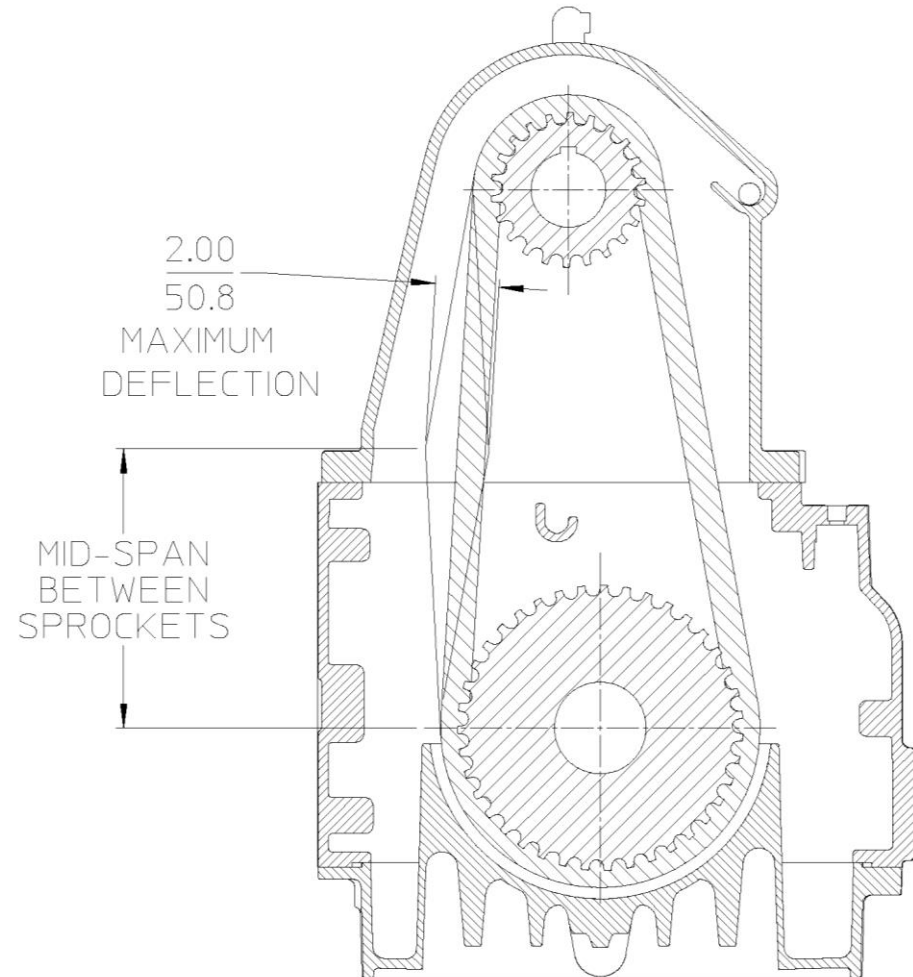
Reassembly - Installation of Driveline in Case (Continued)

Chain

1. Wrap the chain around the drive and driven sprockets making sure everything meshes and then lace the joining ends together using the connecting pin set.

NOTE: Move collar to PUMP position. Retain drive shaft / sprocket to prevent rotation. Pull chain ends together.

2. Insert the connecting rocker partway through the holes in the joining end links being careful of orientation. The connecting rocker must be on the side of the guide link opposite the joining end with the connecting rockers wide curved surface towards the center of the hole.

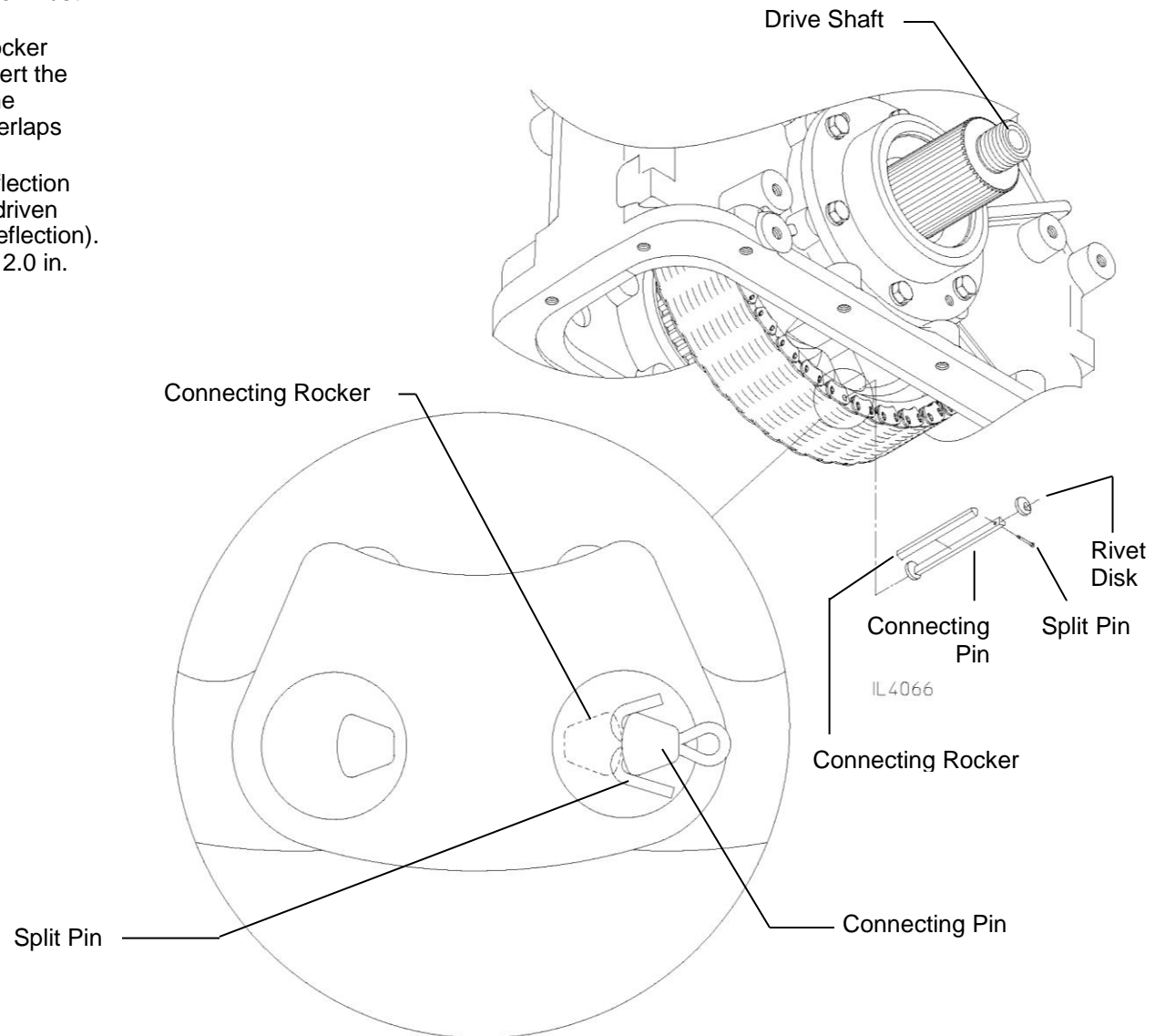


IL4081

Reassembly - Installation of Driveline in Case (Continued)

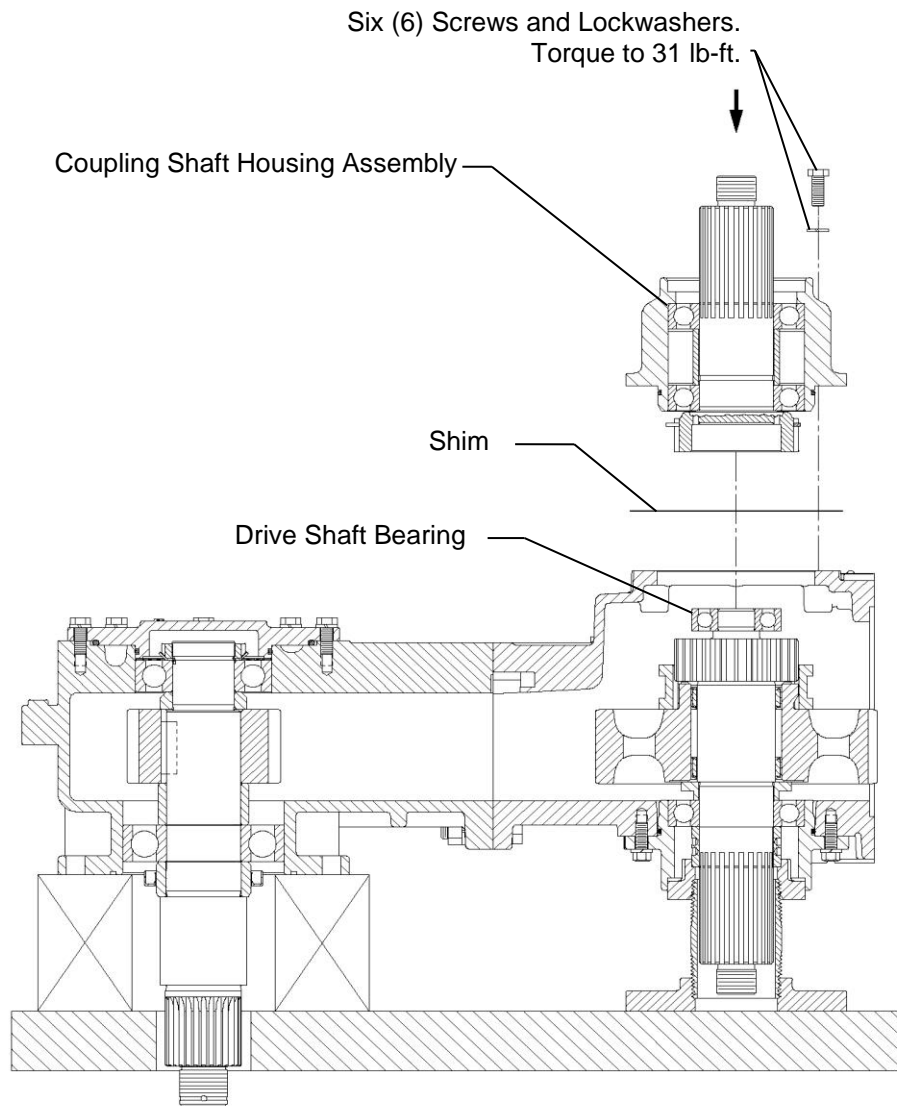
Chain

3. Insert the connecting pin along side the connecting rocker. The two wide curved surfaces of the connecting pin and connecting rocker must face each other.
4. After the connecting pin and connecting rocker have been pushed all the way through insert the split pin into the open hole at the end of the connecting pin. Make sure the split pin overlaps the connecting rocker.
5. Check chain for proper tension. Check deflection half-way between the drive sprocket and driven sprocket (see chart below for maximum deflection). Replace chain if deflection is greater than 2.0 in.



Reassembly - Installation of Driveline in Case (Continued)

Coupling (Output) Shaft



The driveline assembly was factory shimmed to limit the axial float of the driveline. If any of the driveline parts have been changed, it may be necessary to change the total thickness of shims between the coupling shaft housing and the transmission case. Shims are color coded for thickness as follows:

.005" Blue

.007" Natural Aluminum

.010" Brown

The correct amount of shims can be determined as follows:

1. Install coupling shaft and housing assembly with no O-ring or shims between the housing and case. Lightly tighten the cap screws evenly and tap the end of the coupling shaft with a soft mallet to force the driveline all the way forward. Do not overtighten causing bending or breakage of the coupling shaft housing.
2. Measure the gaps between the housing and case in several places to assure a uniform gap and add .005 in. This will be the total thickness of shims needed to provide the recommended axial float of .005 to .010 inch.
3. Remove the coupling shaft housing from the case after measuring the gap.

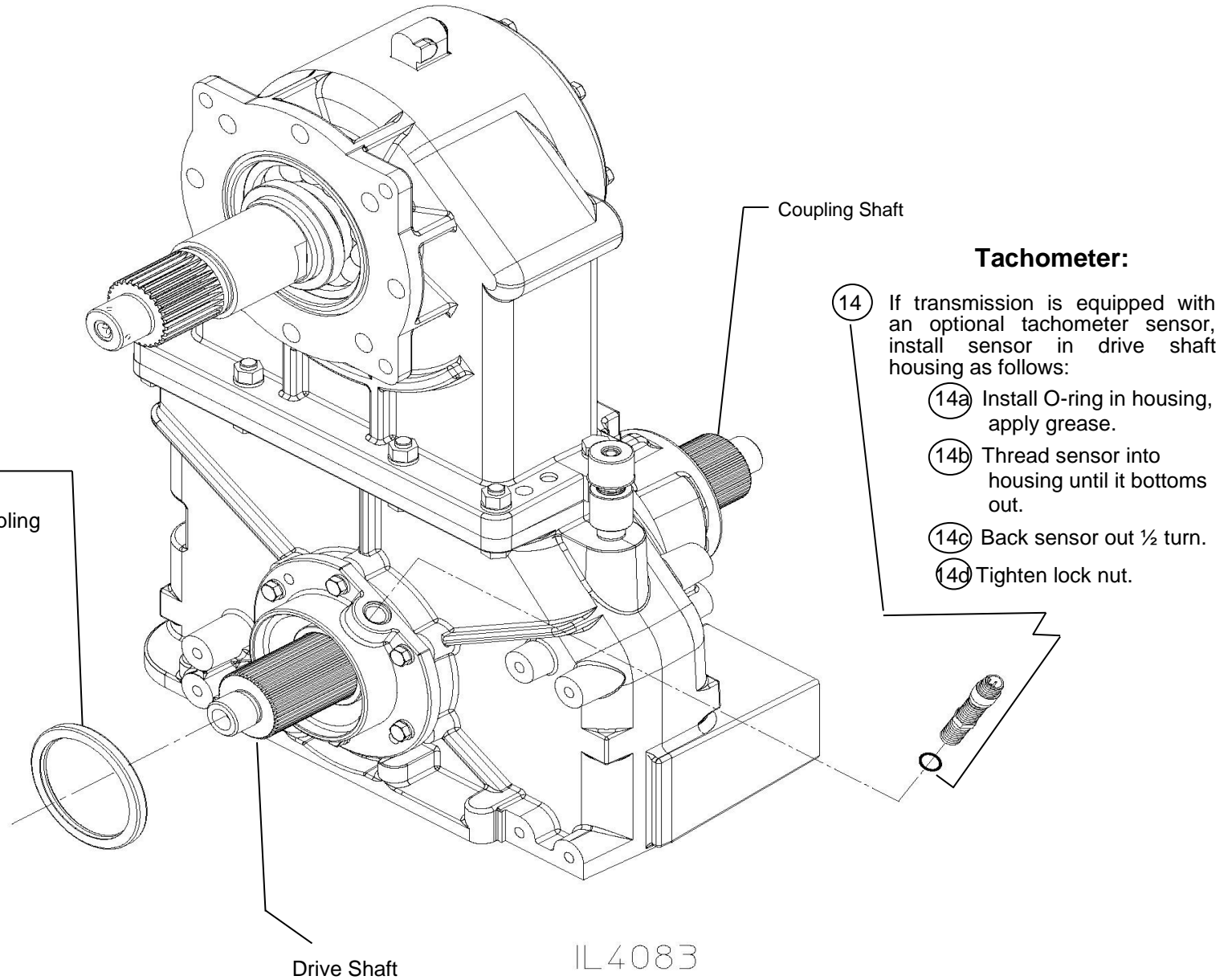
Note: Field conditions may make it difficult to determine the correct amount of shims. If in doubt, add another .005 in. shim. No harm will result from a small amount of additional axial float but bearing life will be shortened if bearings are excessively preloaded.

4. Install the correct amount of shims on the coupling shaft housing or if all original parts are being used, reinstall original shims on coupling shaft.
5. Install O-ring on housing and coat O-ring with grease.
6. Install the housing over the bearings on the coupling shaft.
7. Mount housing to the case with fasteners.

IL4082

Reassembly - Installation of Driveline in Case (Continued)

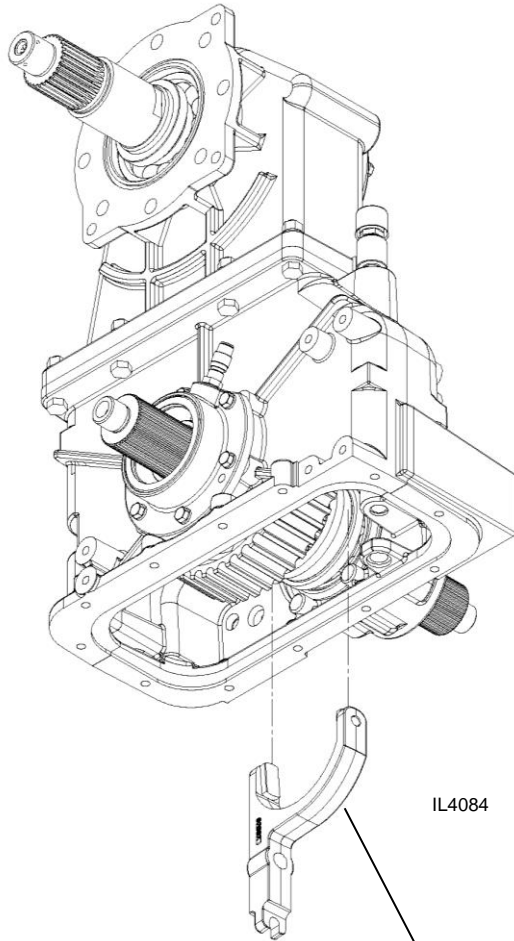
Oil Seals and Tachometer



Reassembly - Installation of Driveline in Case (Continued)

Shift Fork

Step 1

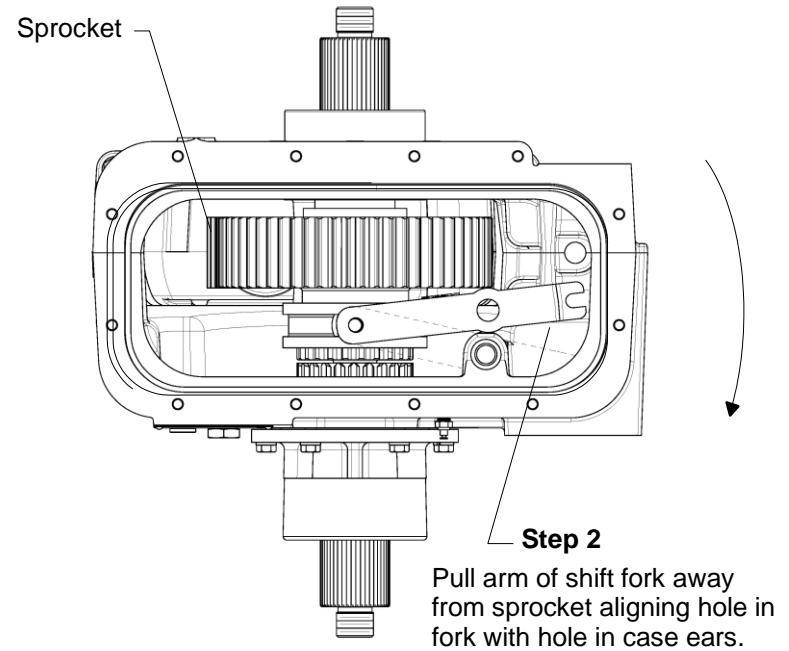


IL4084

Step 1

Place collar in PUMP position.
Slide shift fork onto shift collar in case.
(Ensure shift shoes are installed, see
Page 69.)

Step 2



Sprocket

Step 2

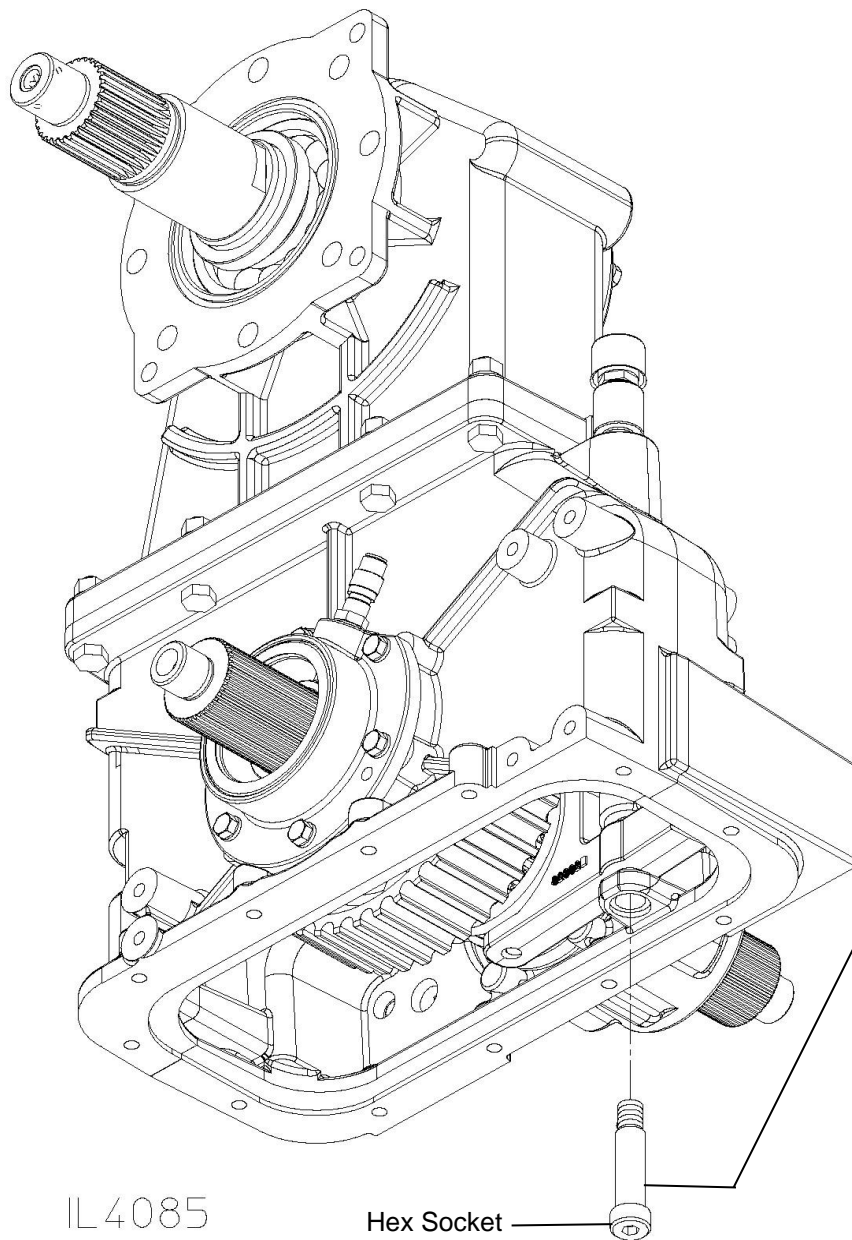
Pull arm of shift fork away from sprocket aligning hole in fork with hole in case ears.

IL 3196

Reassembly - Installation of Driveline in Case (Continued)

Shift Fork / Shift Unit

Step 3



IL4085

Hex Socket

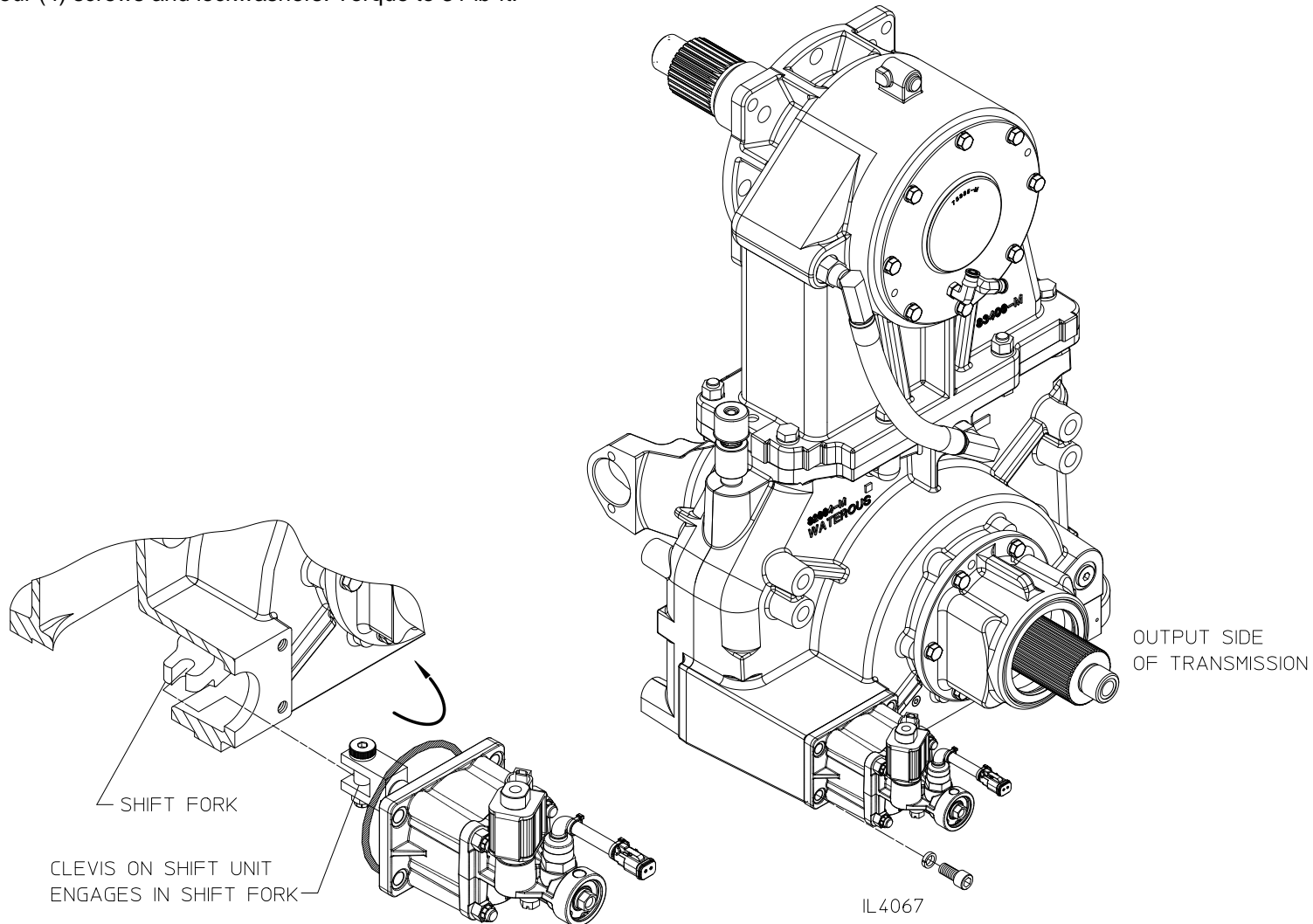
Step 3

Install shoulder screw through hold in case ears and hole in shift fork. Torque to 75 lb-ft. Note that the shoulder screw is self-locking. Do not re-use original screw, a new screw must be installed.

Reassembly - Installation of Driveline in Case (Continued)

Shift Unit

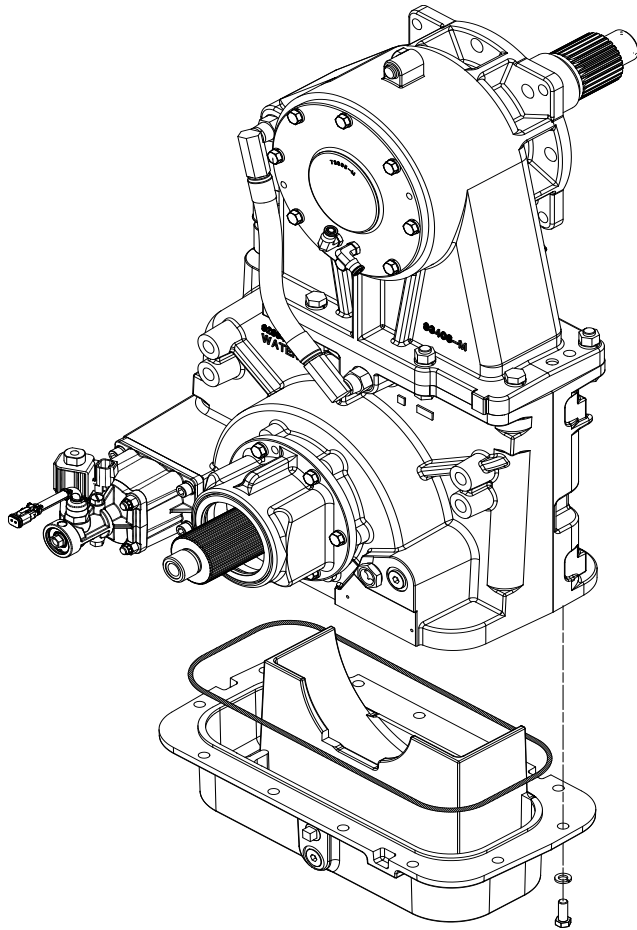
1. Install a new O-ring on shift unit. Coat O-ring with grease.
2. Place shift unit in ROAD Mode by pushing override rod in.
3. Place shift fork in PUMP Mode by pushing fork arm towards end of case where the shift unit mounts.
4. Rotate shift unit towards case and engage clevis in shift fork slot.
5. Push shift unit straight back in until flange contacts case.
6. Install four (4) screws and lockwashers. Torque to 31 lb-ft.



Reassembly - Installation of Driveline in Case (Continued)

Oil Pan

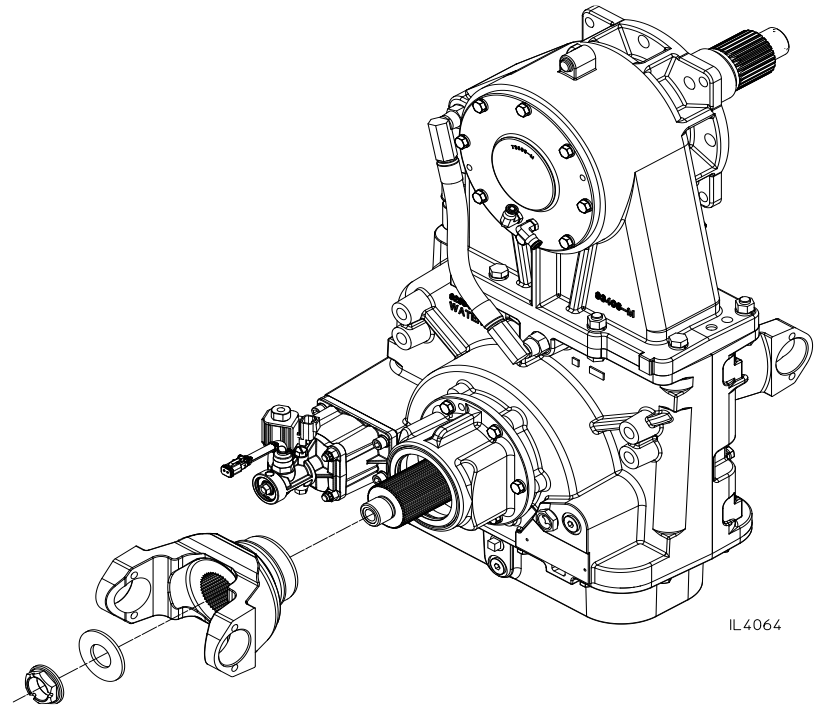
1. Install gasket on oil pan.
2. Attach oil pan to case with twelve (12) screws and lockwashers. Torque to 31 lb-ft



IL4065

End Yokes or Companion Flanges

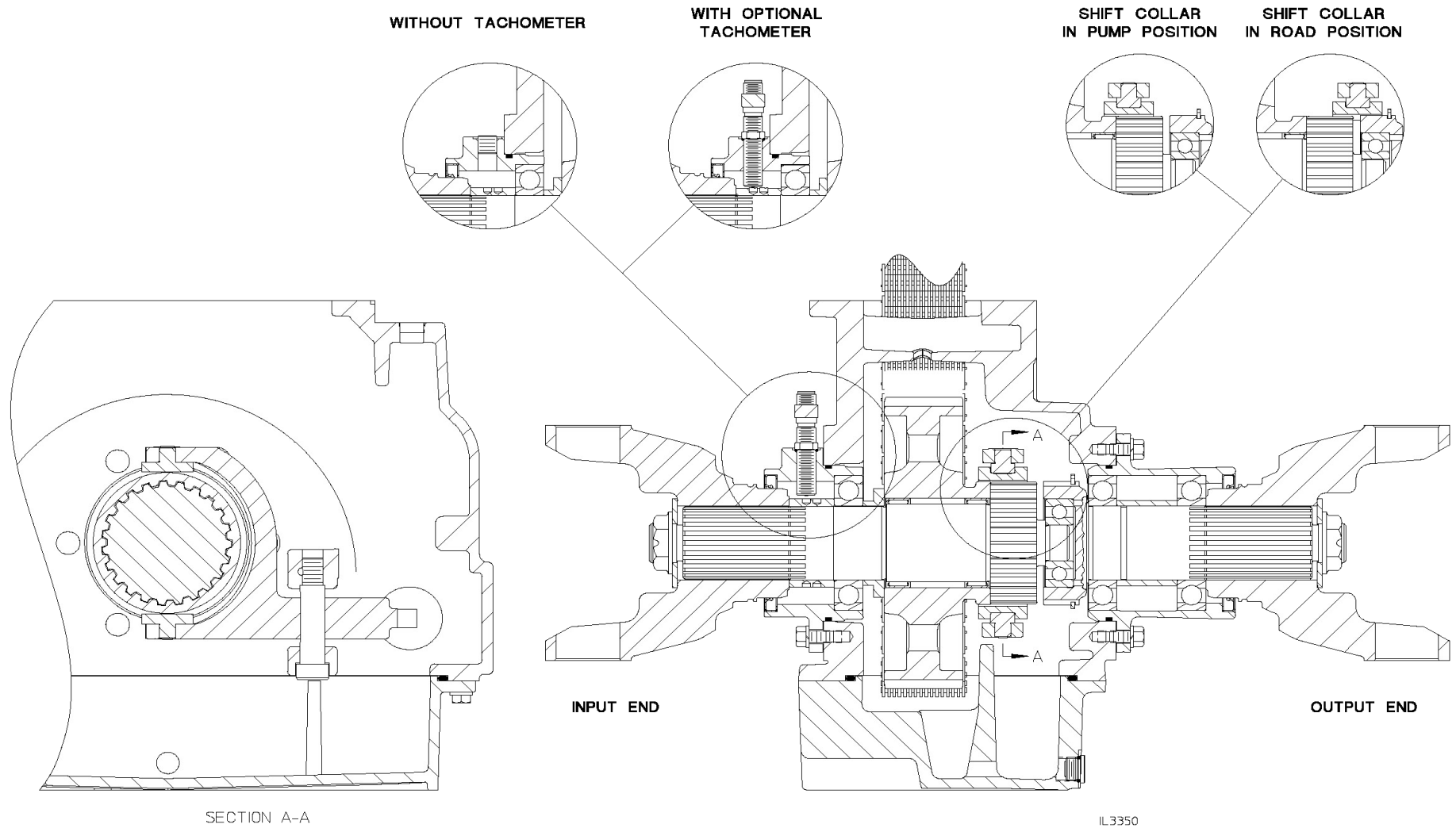
1. Lubricate oil seal in housing.
2. Install end yoke or companion flange on shaft.
3. Install lock nuts.
 - a. Install washer.
 - b. Install a new self-locking nut. Torque to 475-525 lb-ft



IL4064

Reassembly - Installation of Driveline in Case (Continued)

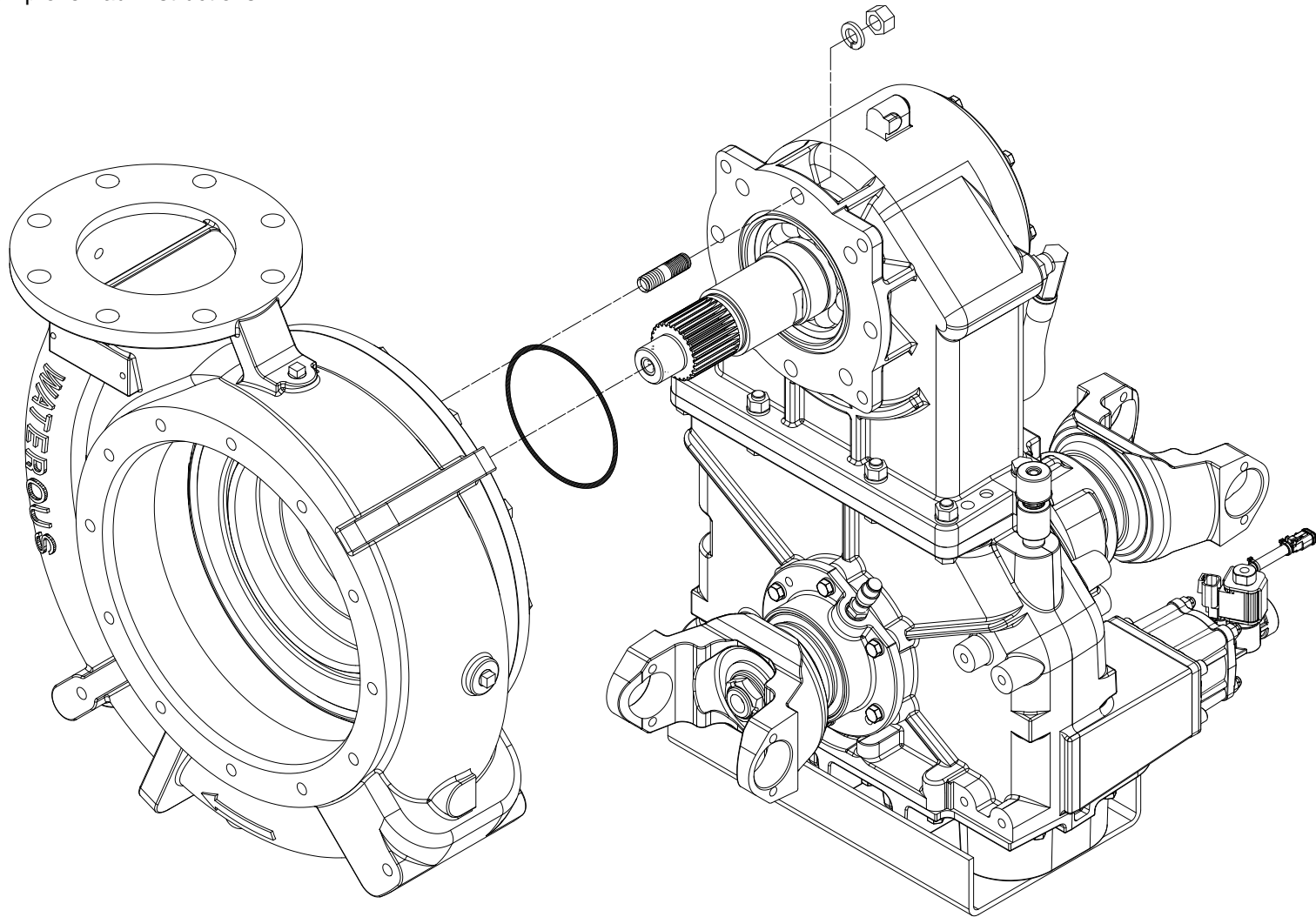
Cross-Section Diagram of Driveline



Reassembly

Installation of Transmission on Pump

1. Install pump body on transmission using twelve (12) threaded studs, lock washers and nuts. Torque to 75 lb-ft.
2. Install pump mechanical seal, impeller and intake adapter. See pump overhaul instructions.



IL4063

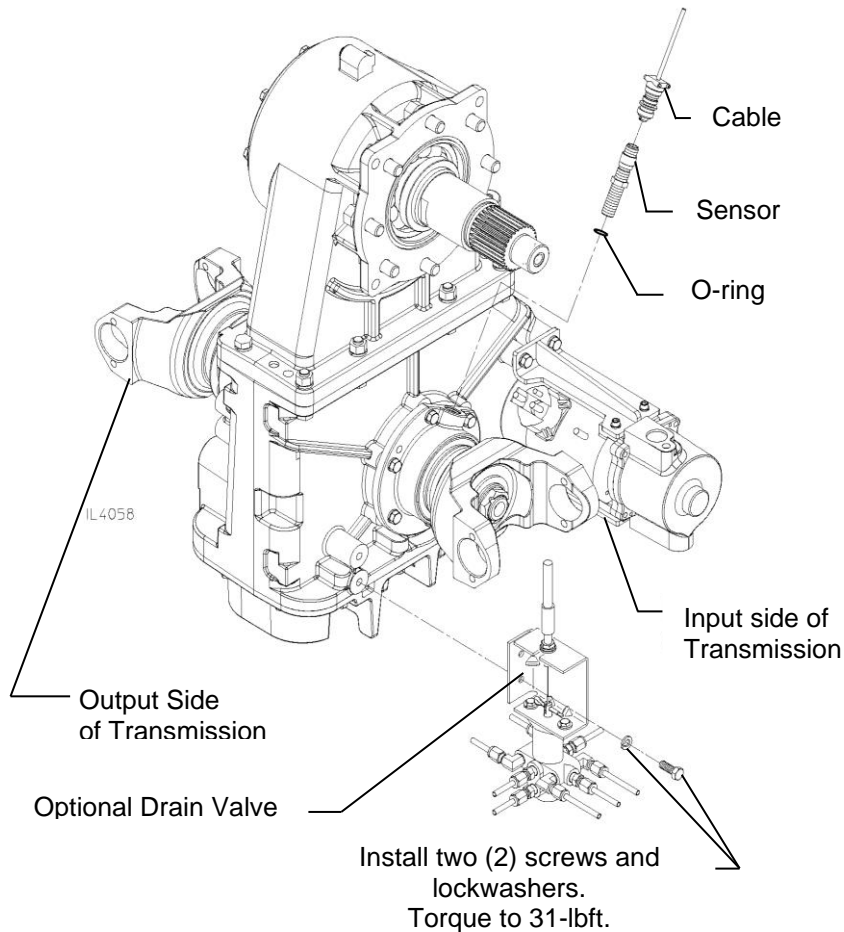
Reassembly - Installation of Transmission in Vehicle

Connection of Optional Accessories

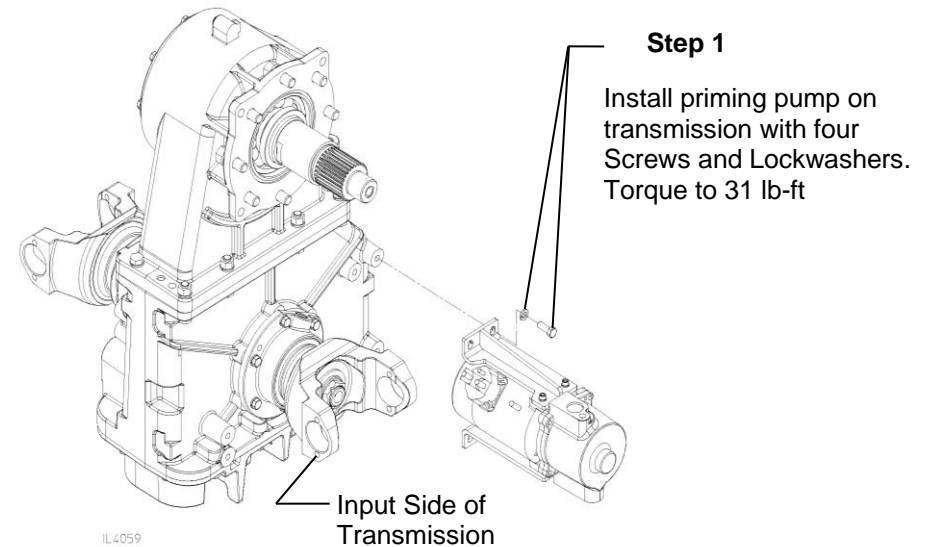
Tachometer Cable and Drain Valve

Optional Tachometer:

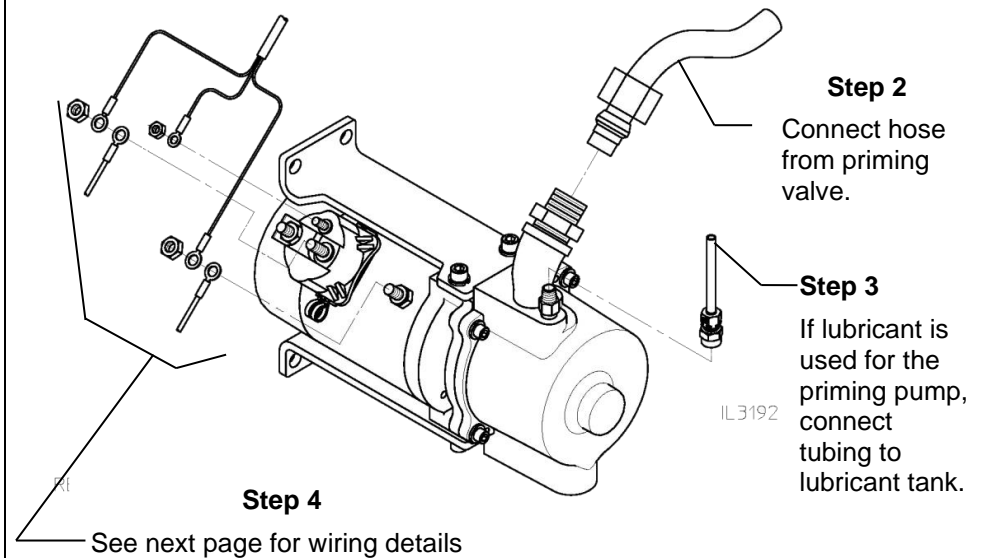
- Step 1 – Install O-ring on sensor.
- Step 2 – Thread sensor into housing until it bottoms out.
- Step 3 – Unscrew sensor ½ turn and tighten locknut.
- Step 4 – Install cable on sensor.



Priming Pump - Mounting on Transmission



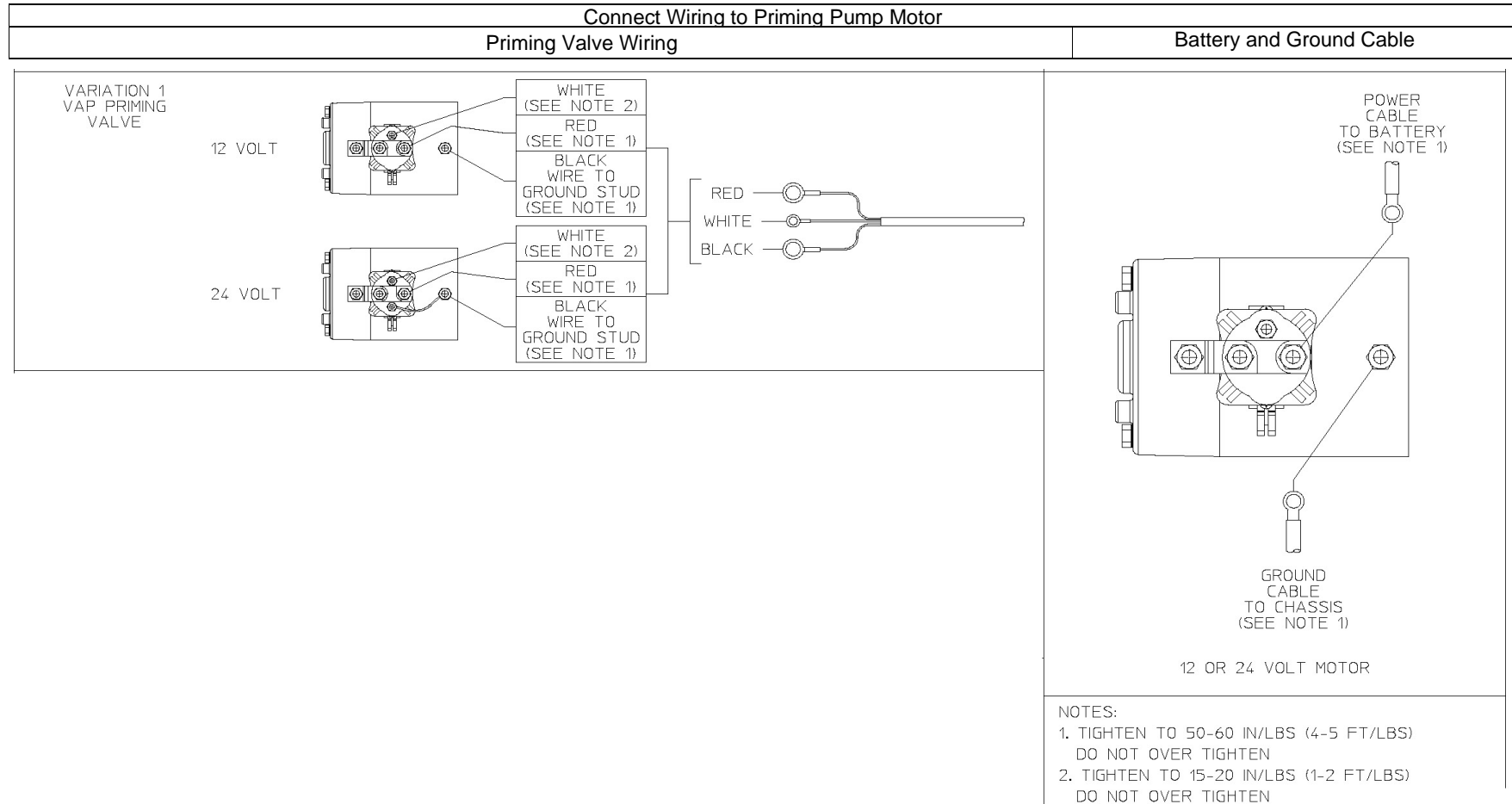
Priming Pump - Hose Connections



Reassembly - Installation of Transmission in Vehicle

Connection of Optional Accessories

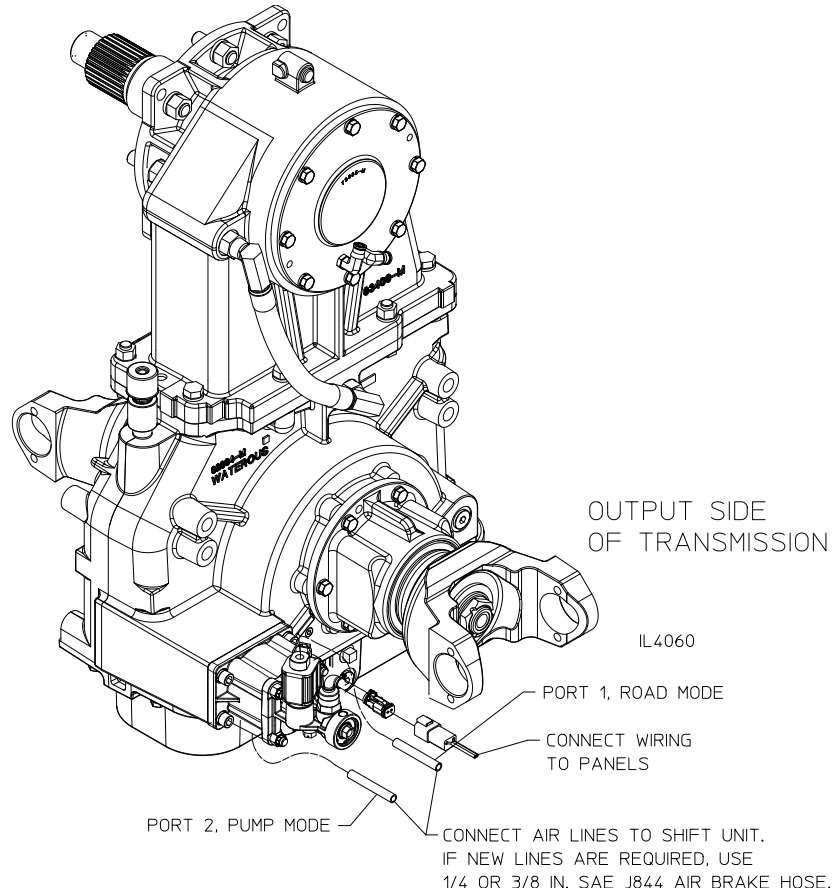
Priming Pump - Wiring Connections



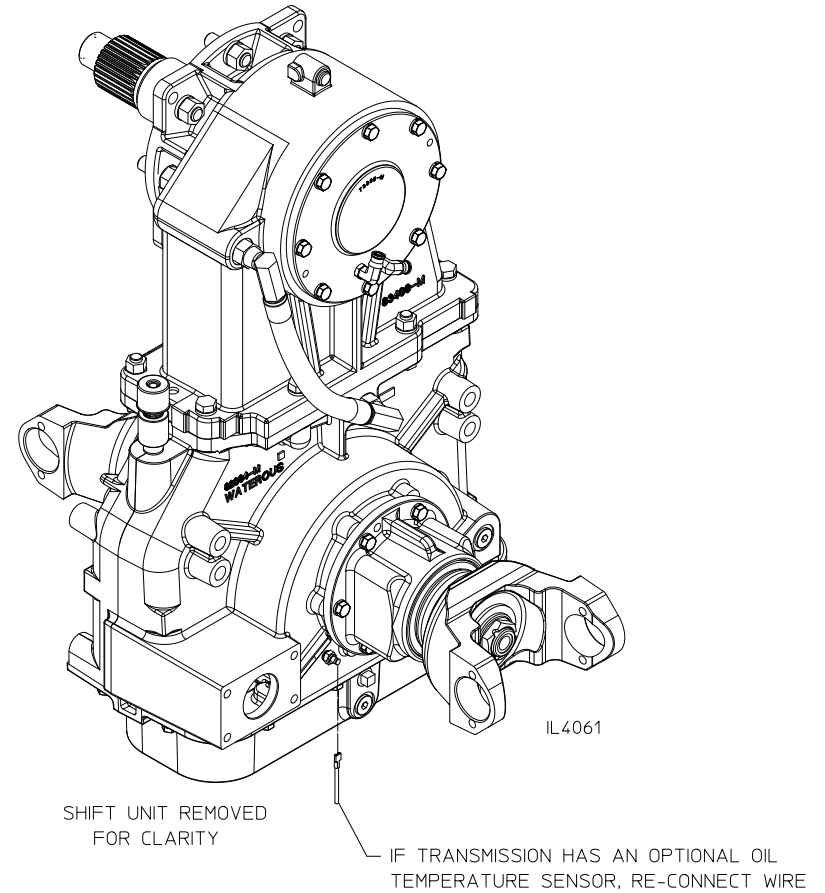
Reassembly - Installation of Transmission in Vehicle

Connection of Optional Accessories

Shift Unit

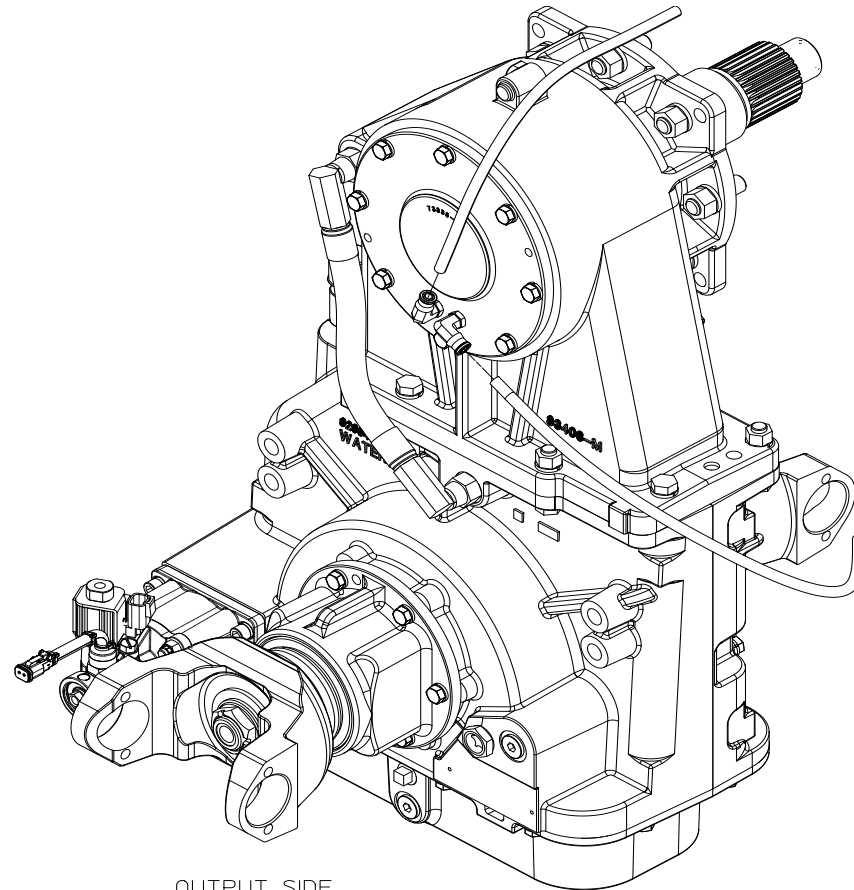


Oil Temperature Sensor



Reassembly - Installation of Transmission in Vehicle

Connection of Optional Accessories



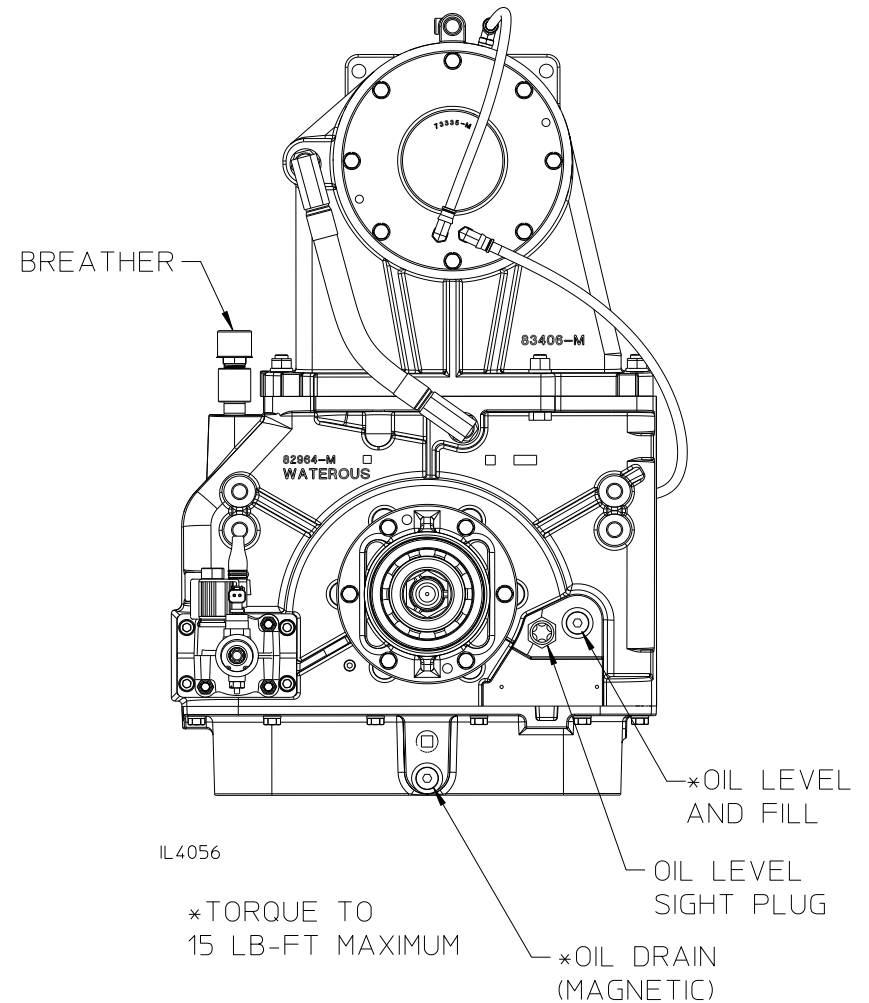
OUTPUT SIDE
OF TRANSMISSION

IL4062

Reassembly - Lubrication

C21 Transmission

1. Fill the transmission through the oil level hole or by removing the breather and adding fluid through the opening. Any type of automatic transmission fluid (ATF) may be used for ambient temperatures over 90° F, SAE 20 oil 300 SSU @ 100° F with service classification SA, SB or SC should be used.
2. Re-check all fasteners for tightness.
3. Check for fluid leaks.



Reassembly - Final Checks

Shift Indication Light Operation

Re-check for proper operation of shift mechanism and that the shift indicator light system is functioning properly.

Check the operation of the pump shift indicating lights at least once weekly as follows:

NOTE: Block wheels with wheel chocks before beginning.

1. With the pump in the ROAD position, truck transmission in NEUTRAL and the parking brake engaged, ensure that the PUMP ENGAGED and OK TO PUMP lights in the cab are off.
2. Shift to PUMP
 - a. Ensure that the green PUMP ENGAGED and OK TO PUMP lights in the cab are on.
 - b. Ensure that the green THROTTLE READY light on the operator's panel is on.
3. Apply the service (foot) brake and release the parking brake.
 - a. Ensure that the green OK TO PUMP light in the cab is off.
 - b. Ensure that the green THROTTLE READY light on the operator's panel is off.
4. Engage the parking brake and shift truck transmission to NEUTRAL.
 - a. Ensure that the green OK TO PUMP light in the cab is off (automatic truck transmission only).
5. Shift to ROAD
 - a. Ensure that the green PUMP ENGAGED and OK TO PUMP lights in the cab are off.
 - b. Ensure that the green THROTTLE READY light on the operator's panel is off.