Terex 306H Transfer Case Service Manual

Pro Gear and Transmission presents Terex 306H transfer case service manual to assist in identifying the parts for your Terex unit.

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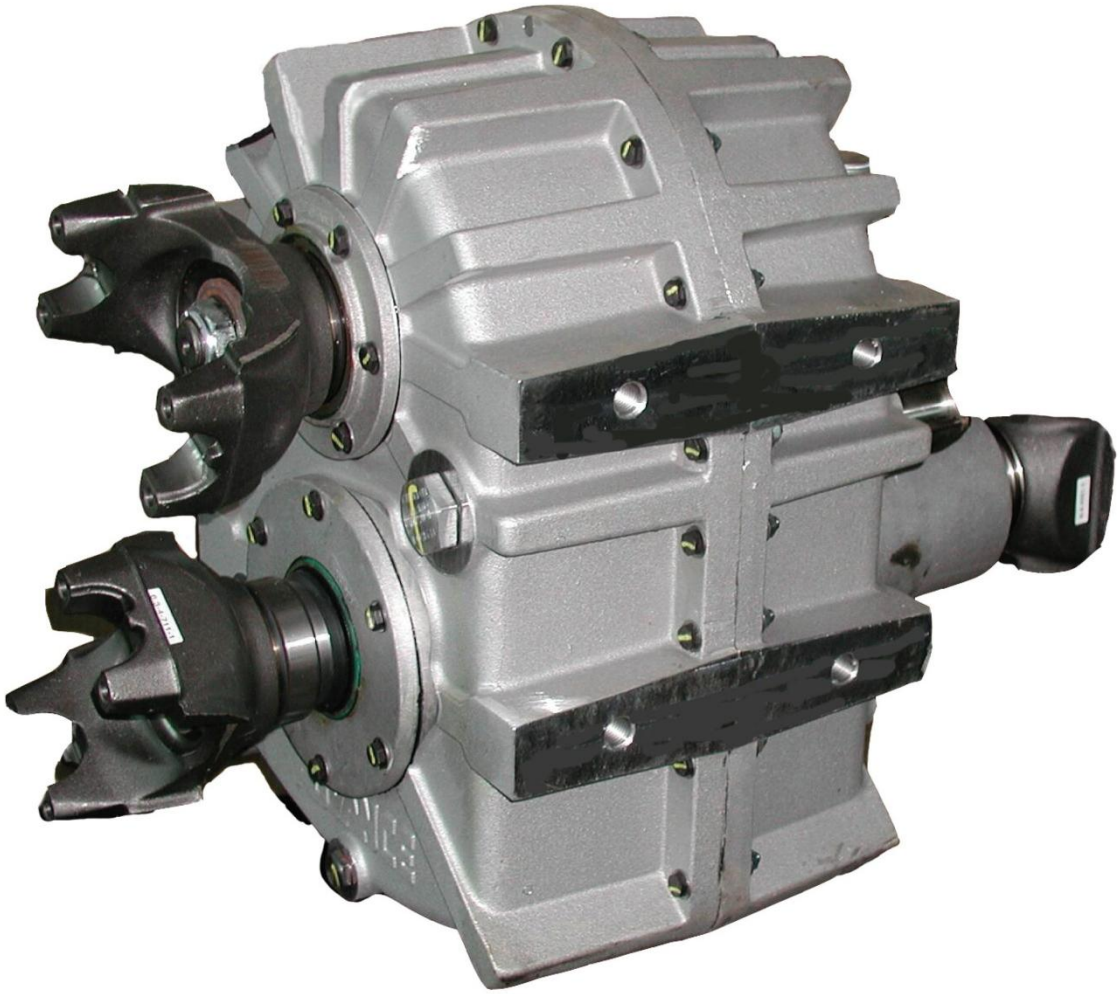
R. Cushman & Associates

Model 306 H & J Transfer Case



Service Manual

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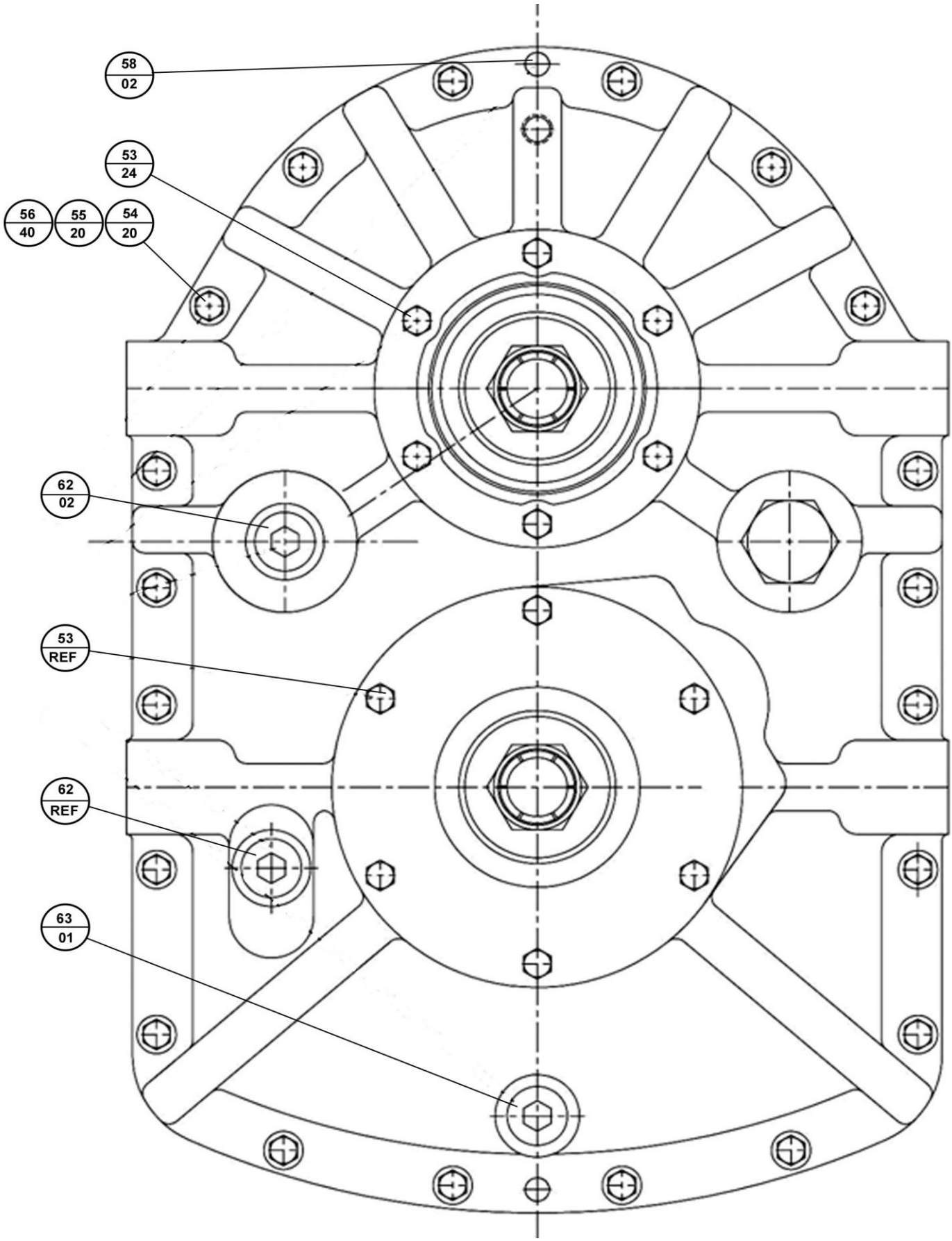
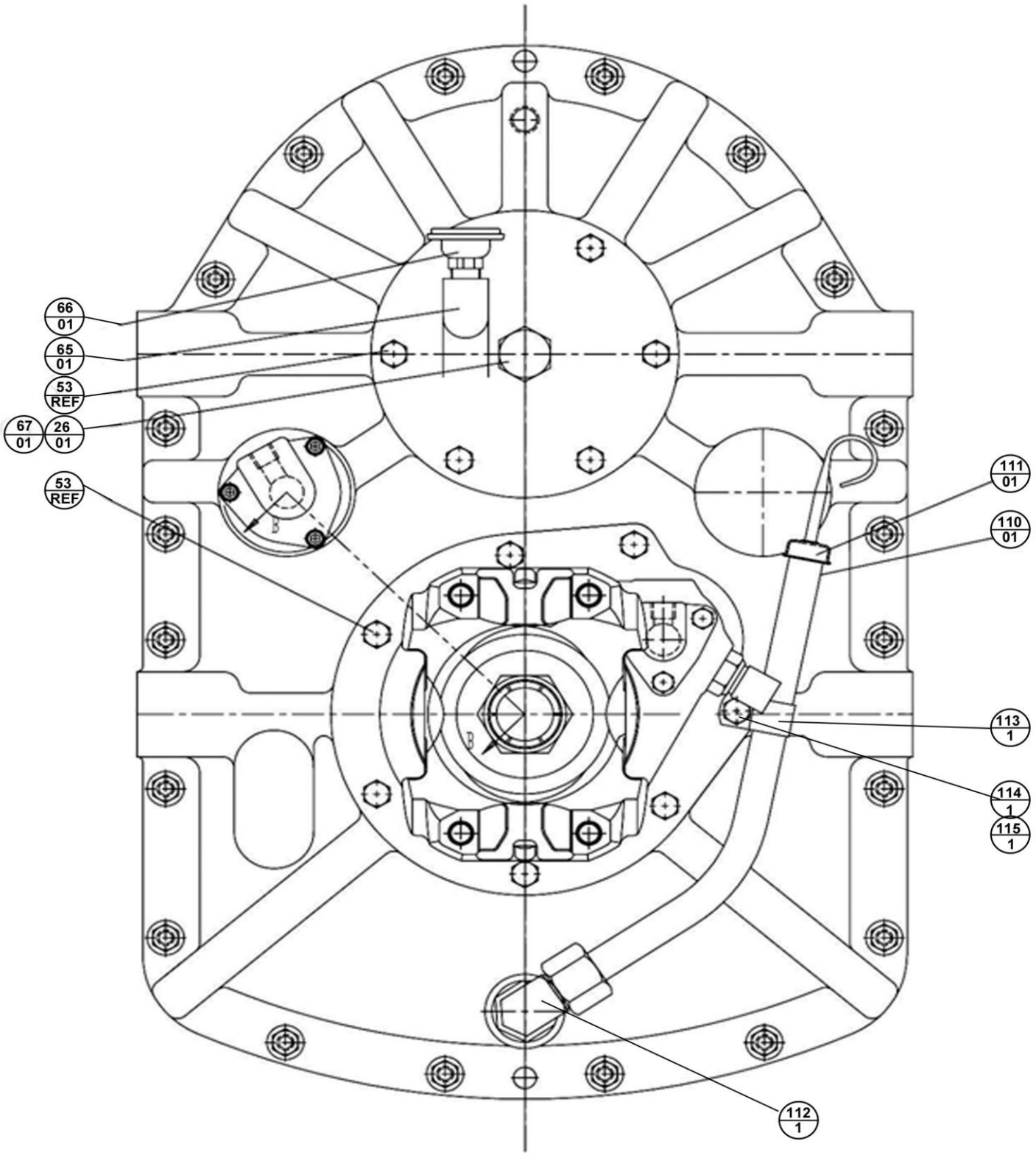
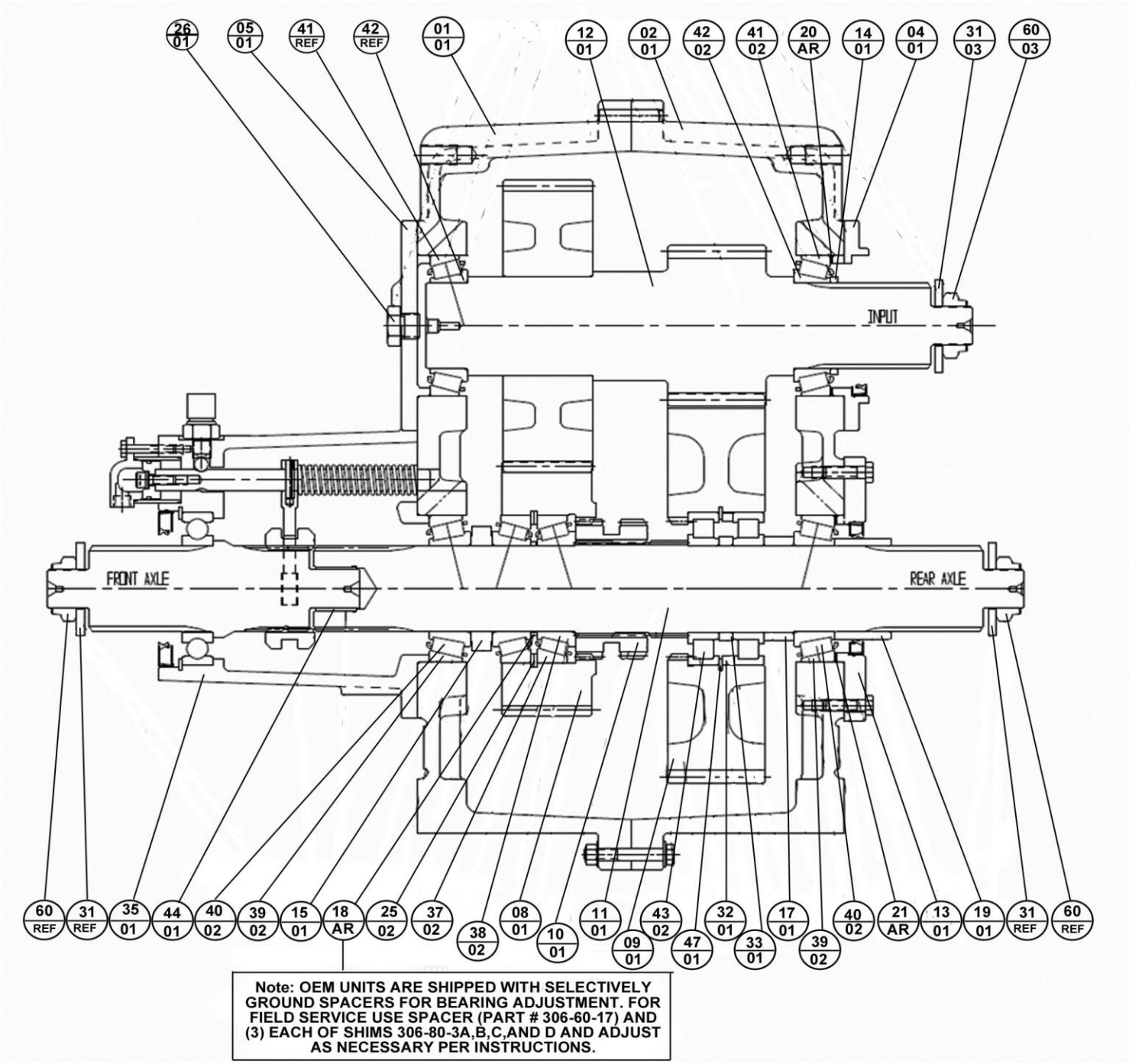


Model 306 Exterior Component Location & Identification

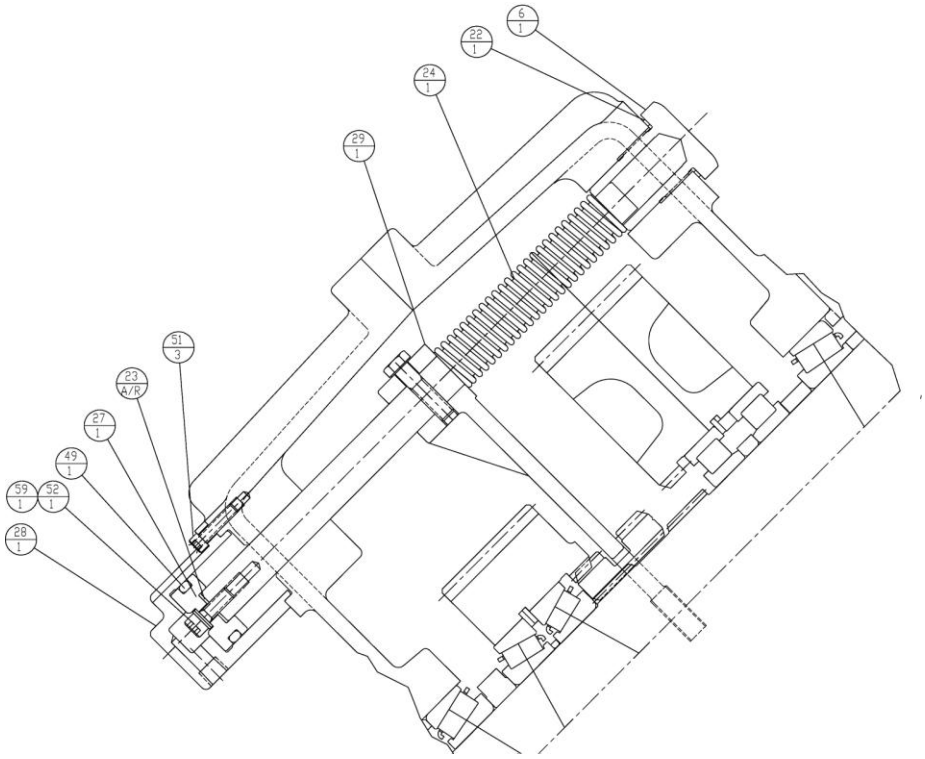


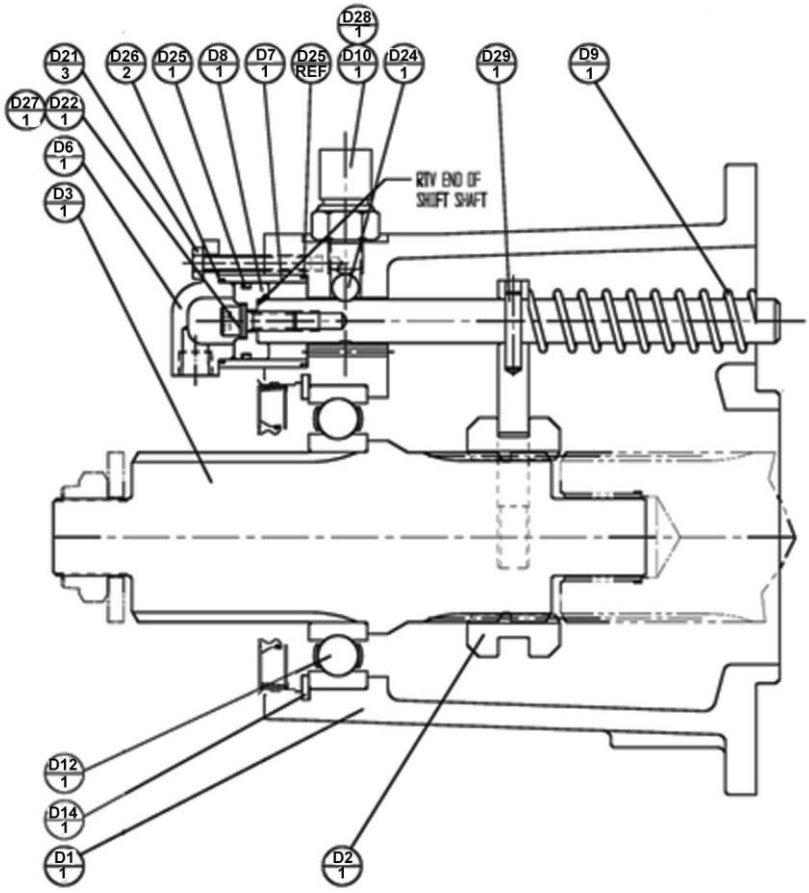
Exterior Component Location & Identification (rear)



Interior Component Location & Identification

Shifter internals





Disconnect Internals

LUBRICATION

LUBRICANT

75W90 Synthetic Lubricant – API MT 1/GL5

LUBRICANT QUANTITY

11.5 quart / 10.9 liter

RECOMMENDED CHANGE FREQUENCY

Initial Flush & Change..... 3,000 mi / 50 hr.

Scheduled Flush & Change…….50,000 mi / 500 hr.

Oil Level Check……2,000 mi / 100 hr.

Note

Since installed angles, front to back and side to side, can vary, it is strongly suggested that the dip stick marking be verified during the initial check to confirm the appropriate lube level during operation.

After draining the used lubricant fully, replace the drain plug and clean the dip stick. Fill the unit with 11.5 qt / 10.9 L of the recommended lubricant. Mark the level on the dipstick if it differs from the original mark.

Do Not mix synthetic and petroleum based lubricants. Early unit failure from foaming and lack of heat transfer will result. Check the level frequently as suggested. You can add many miles to the unit life.

Part Number Identification

Item	Part Number	Qty	Description	Use
1	306-10-1	1	Front Housing Half	306H,J
2	306-10-2	1	Rear Housing Half	306H,J
3	306-20-1	1	Rear Output Bearing Retainer	306H,J
4	306-20-2	1	Rear Input Bearing Retainer	306H,J
5	306-20-3	1	Front Input Bearing Retainer	306H,J
6	306-20-4	1	Shift Rod Housing cap	306H,J
8	306-30-17	1	Output Clutch Gear - Hi	306H
	306-30-19	1	Output Clutch Gear - hi	306J
9	306-30-23	1	Output Clutch Gear - Low	306H,J
10	306-35-3	1	Shift Collar	306H,J
11	306-40-9	1	Output Shaft	306H,J
12	306-45-8	1	Input Shaft, Pinion & Gear	306H
	306-45-9	1	Input Shaft, Pinion & Gear	306J
14	306-60-1	1	Input End Fitting Bearing Spacer	306H,J
15	306-60-7	1	Front Output Bearing Spacer	306H,J
17	306-60-13	1	Rear Output Bearing Spacer	306H,J
18	306-60-17	1	Output Clutch Gear Brg Spacer – Hi (Note: OEM units are shipped with selectively ground spacers for bearing adjustment. For field service use spacer (part # 306-60-17) and 3 each of shims 306-80-3A,B,C,D) and adjust as necessary per instructions.)	306H,J
19	306-78-1	1	Rear Output Shaft Seal Sleeve	306H,J
20	306-80-1A	3	Input Shaft Bearing Shim .005	306H,J
	306-80-1B	3	Input Shaft Bearing Shim .007	306H,J
	306-80-1C	3	Input Shaft Bearing Shim .020	306H,J
21	306-80-2A	3	Output Shaft Bearing Shim .005	306H,J
	306-80-2B	3	Output Shaft Bearing Shim .007	306H,J
	306-80-2C	3	Output Shaft Bearing Shim .020	306H,J
22	306-80-5	1	Shift Rod Housing Cap Gasket	306H,J
23	306-80-7A	3	Shift Piston Position Shim .005	306H,J
	306-80-7B	2	Shift Piston Position Shim .007	306H,J
	306-80-7C	1	Shift Piston Position Shim .020	306H,J
24	306-85-8	1	Shift Return Spring	306H,J
25	306-85-13	2	Bearing Position Snap Ring - High Gear	306H,J
26	306-85-14	1	Speedo Sender Plug	306H,J
27	306-85-24	1	High/Low Shift Piston	306H,J
28	306-85-31	1	High/Low Shift Cylinder	306H,J
29	306-85-32	1	High/Low Shift Fork and Shaft Assy	306H,J
31	208-85-3	3	Yoke/Flange Retention Washer	306H,J
32	358-60-4	1	Low Gear Bearing Outer spacer	306H,J
33	358-60-5	1	Low gear bearing inner spacer	306H,J
35	306-02	1	Front output disconnect assembly	306H,J
37	33475	2	Output gear bearing cup - Hi	306H,J
38	33275	2	Output gear bearing cone - Hi	306H,J
39	47420	2	Output shaft rear bearing cup	306H,J
40	47487	2	Output shaft rear bearing cone	306H,J
41	JM612910	2	Input shaft bearing cup	306H,J
42	JM612949	2	Input shaft bearing cone	306H,J
43	NJ214ECP	2	Output gear bearing - Low	306H,J
44	20DU20	1	Output shaft disconnect bushing	306H,J
47	N5000-500	1	Output gear outer bearing snap ring	306H,J
49	AS324	1	Shift piston o-ring	306H,J
51	1/4-20x1.00	3	Shift cylinder socket head cap screw	306H,J
52	5/16-18x1.00	1	Piston Socket Head cap Screw	306H,J
53	3/8-16x1.25	24	Brg cap & disconnect cap screw	306H,J
54	3/8-16x2.5	20	Housing flange cap screw	306H,J
55	3/8-16LN	20	Housing flange screw lock nut	306H,J
56	3/8FW	40	Housing flange screw lock washer	306H,J

Part Number Identification (cont)

58	1/2x1.25	2	Housing alignment dowel	306H,J
59	NL8G	1	Shift piston retaining lock washer	306H,J
60	1.25-12LN	3	Yoke/Flange retention lock nut	306H,J
62	12HP50N-S	2	Housing fill plug	306H,J
63	22S-S12M	1	Magnetic housing drain plug	306H,J
65	3/NPT	1	Breather ell	306H,J
66	MBGF	1	Breather	306H,J
67	95606A270	1	Speedo sender plug gasket	306H,J
	306-02		**Disconnect Components**	
D1	306-10-3	1	Disconnect housing	
D2	306--35-2	1	Disconnect shift collar	
D3	306-40-2	1	Disconnect output shaft	
D6	306-85-21	1	Disconnect shift cylinder cap	
D7	306-85-5	1	Disconnect shift cylinder	
D8	306-85-23	1	Disconnect shift piston	
D9	306-85-7	1	Disconnect shift return spring	
D10	21-492	1	Disconnect shift signal switch	
D12	6214	1	Disconnect output shaft ball bearing	
D14	N5000-500	1	Disconnect shaft bearing snap ring	
D21	1/4-20x1.50	3	Disconnect cylinder cap screw	
D22	5/16-18x1.00	1	Disconnect piston retention screw	
D24	7/16D	1	Shift signal switch actuation ball	
D25	711080	1	Shift piston v block seal	
D26	AS-026	2	Shift cylinder sealing o-ring	
D27	NL8G	1	Shift piston retaining lock washer	
D28	95601A360	1	Shift signal switch washer	
D29	306-85-18	1	Disconnect shift fork & shaft assy	

306 Application Specific Parts

Item	Part Number	Description	H-1	H-2	H-3	H-4	H-5	H-6	H-7	H-8	J-1	J-2	J-3	J-5	J-7
	6.3-4-711-1	Input & output end yokes	X	X	X	X				X	X	X	X	X	
	6-4-4551-1	Front output end yoke	X	X	X	X	X	X	X	X	X	X	X	X	X
	35083	Front output yoke oil seal			X	X	X	X					X	X	
	37330	Input yoke oil seal			X	X							X	X	
	32397	Rear output yoke oil seal			X	X	X	X					X	X	
	34889	Oil Seal					X	X	X						X
112	6801-12	#12 JIC Ell - dip stick tube	X	X	X	X	X	X	X	X	X	X	X	X	X
110	358-85-14G	Dip stick tube	X	X	X	X	X	X	X	X	X	X	X	X	X
111	358-85-13L	Dipstick	X	X	X	X	X	X	X	X	X	X	X	X	X
113	HK1313	Dipstick tube attachment clamp	X	X	X	X	X	X	X	X	X	X	X	X	X
114	3/8-16x1.75	Dipstick tube clamp screw	X	X	X	X	X	X	X	X	X	X	X	X	X
115	3/8FW	Clamp screw washer	X	X	X	X	X	X	X	X	X	X	X	X	X
	DOS906-1	Oil seal - input seal	X	X						X	X	X			
	DOS906-2	Oil sleeve - mate with DOS906-1	X	X						X	X	X			
	DOS907-1	Oil seal - Rear output seal	X	X					X	X	X	X			X
	DOS907-2	Oil sleeve - Mate with DOS907-1	X	X					X	X	X	X			X
	DOS908-1	Oil seal - front output seal	X	X					X	X	X	X			X
	DOS908-2	Oil sleeve - Mate with DOS908-1	X	X					X	X	X	X			

Assembly / Disassembly Instructions

To Disassemble the Transfer Case

Drain the oil from the case before removing it from the vehicle. Thoroughly inspect the magnetic drain plug for signs of metal debris. Retain a sample of the oil for further testing if required.

Remove the yoke lock nuts (60) and washers (31) from the shaft ends and remove the end fittings (yokes or flanges) from the input and output locations.

Remove the three socket head screws (51) from the air inlet shift cylinder cap (28) and remove the cap. Remove the screw (52) and lock washer (59) holding the piston (27) in place. Rotate and support the unit with wooden blocks (disconnect down). Remove the 12 hex head cap screws (53) securing the bearing retainers (3) & (4) and remove the retainers and the bearing cup shims (20) & (21). Retain the shims for use during the reassembly process. Remove the shift rod cap (6) and washer (22) **being careful of the shift spring pressure.** Remove the lock nuts, washers and screws (54), (55) & (56) from the housing flanges. Drive out the two dowels (58) in the ends and pry the housings apart. Remove the rear housing (2) and tap out the two bearing cups (39) & (41).

Lift the input and output shaft assemblies out of the front housing (1) with shift fork and shaft assembly (37), shift return spring (33) and shift collar (10). Rotate the front housing so that the disconnect assembly (19) can be removed by unscrewing the 6 screws (64). Retain the air shift return spring (9). Tap out the two bearing cups (39) & (41).

Working with the input shaft and gear assembly. Remove the two bearing cones (42), and yoke spacer (14) from the input shaft assembly. The gear cannot be removed. If service of the gear or shaft is required, refer to the parts list for the correct service assembly.

Working with the output shaft (11) & gear assembly (8) & (9) . Remove bearing cones (40), spacers (15) & (17) and drive the gear assemblies (9) & (8) off the shaft through the bearing cones. Remove the shaft collar (10) and the pocket bushing (44) from the shaft. From the high gear assembly (8) remove the bearing cones (38), spacer (18) and snap rings (25). Remove the two bearings (43) with snap ring (47) and spacers (32) & (33).

Flip the remaining housing over flange down and remove the 13 cap screws (64) holding the cover (5) and disconnect assembly (35) in place and remove them. Drive the two remaining bearing cups (39) & (41) from the housing.

To Disassemble the Disconnect

Remove the signal switch (D10) and actuation ball (D24). Remove three hex head screws (D21) from the cylinder cap (D6) and remove the cylinder (D7). Be careful to retain the sealing o-rings (D26). Remove the screw (D22) and the piston (D8). Remove the collar (D2) with fork assembly (D29). Tap the shaft (D3) through bearing (D12) and remove it. Remove the seal, snap ring (D14) and bearing (D12).

Cleaning & Inspection

All components should be thoroughly cleaned and inspected for signs of fatigue or wear. It is suggested all bearings, bushings, o-rings, piston seals and yoke seals be replaced during any disassembly process particularly if metal chips were found in the oil. Make sure all sealing surfaces are completely cleaned of RTV and hicks/nicks.

Reassembly of the Disconnect Assembly

Install bearing (D12), snap ring (D14) and the output seal in the housing (D1). Insert the disconnect shaft (D3) through bearing (D12). Install collar (D2) with fork assembly (D29) onto the shaft. Assemble the o-rings (D26) onto the cylinder (D7) and assemble it to the housing. Install the piston seal (D25) to the piston (D8) being careful to position the open end of the V seal out. Install the piston/seal into the cylinder with care and attach the piston to the fork assembly with screw (D22). To maximize operational life on early units, refer to the updated not found in the disconnect components list.

Place the air cap (D6) in place and attach it to the housing with 3 screws (D21) tightened sequentially to 7ft/lb. Install the shift return spring (D9) on the shift shaft and install switch (D10) and shift ball (D24).

To Reassemble the Transfer Case

With the front housing (1) flange down, install the bearing cups (39) and (41) in their respective bores till they are flush with the housing surface. Install the disconnect assembly (35) with RTV sealant using 7 screws (53). Install cover (5) also with screws (53). Rotate the housing and block it securely disconnect down. Confirm that the bearing cups (39) & (41) in the housing bores are seated securely against the cover and disconnect pilot diameters. Assemble the input shaft (12) with bearing cones (42) on each end seated securely against the shaft shoulders. Drop the shaft into the bearing cup in the front housing half.

Place a bearing cone (38) into the high gear (8) bore and press in a bearing cup (37). Drive it just past the snap ring groove. Install snap rings (25) and spacer (18) and press the remaining cup into the gear seating it completely and solidly. Turn the gear over and reseat the first cup. The cups should be seated securely. This is important to proper operation. Insert the remaining bearing cone and clamp the gear through the cones and spin to seat the bearings properly.

Bearing Adjustment

For high gear (8), install both bearing cones (38) along with spacer (18) and about .045" of shims into the gears. Using a press, clamp the bearings through the cones and spin the gear to seat the bearings. Make sure both cups are seated securely against the snap ring. Use shims (306-80-3A,B,C,D) adjust the end play to .000/.001 when a light pressure is applied to the gear using a pry bar and the gear rotates one half to one rotation when spun. Add an additional .005 to the shim pack to compensate for bearing expansion from heat. For low gear (9), press into the bore the first roller bearing (43) followed by snap ring (47), spacers (32) & (33) and the second bearing (43).

Note: The rear output yoke lock nut must be tightened to 600 ft/lb to maximize bearing life.

Install new pocket bushing (44). Install one of the gears onto the output shaft (11) install the shift collar (10) and install the other gear assembly making sure both seat properly against the spline section. Install spacers (15) & (17) in their appropriate positions on shaft (11) being careful not to damage the ID of the spacers. Add a bearing cone (40) to each end seating it securely.

Place the assembled output shaft with shift fork assembly (29) into the lower bore of housing (1). Place the shift return spring on the shift shaft. Apply sealant to the housing flange sealing surface and install the rear housing (2) aligning it with the shift shaft and two dowels (58). Bolt the two halves together with screws, locknuts and washers (54), (55) & (56).

Tap bearing cups (39) & (41) into housing (2) and seat them against the mating cones. Using screws (53), install bearing retainers (3) & (4) tightening the screws while rotation the shafts to properly seat the bearings until all end play is removed. Remove the retainers and measure the depth form the housing face to the bearing cup shoulder. Subtract that measurement from the depth of the retainer shoulder and add .012 for a bearing preload. Add shims in that amount, strike the housing about the bore to free the cup, apply RTV to the retainer flange and install it with the shims.

Prior to installng the piston (27) with o-ring (49), with the shift shaft fully extended by the shift return spring, measure the distance between the housing surface where the air cylinder mounts and the end of the shift shaft. Deduct that measurement from 1.262 and add the result in shims (23) placed under the piston (27). Add a small amount of RTV to the end of the shift shaft, and attach the piston to the shift shaft with a socket head

cap screw (with Loctite) and washer (52 & (59) tightened to 25 ft/lb. See this procedure graphic later in this manual.

Insert the appropriate oil seals into the retainers. Install o-ring (49) on piston (27), add a small amount of RTV to the end of the shift shaft add the above mentioned shims and attach the piston to the shift shaft with a socket head cap screw and washer (52) & (59).

Install the shift cylinder (29) into the housing and attach it with 3 screws (51) tightened to 12 ft/lb.

Replace the yokes and retain them with washers (31) and lock nuts (60) tightened to **600 ft/lb.** Install all plugs and refill the housing with 11.5 quarts of the recommended lubricant.

Model 306 Seal Update Installation Instructions:

Prepared 6-24-08 JBD

Models covered:

306, 306A, 306B, 306C, 306D, 306E, 306G, 306H, 306J, 309, 309A, 309B, 309C, 309D with the seals listed below

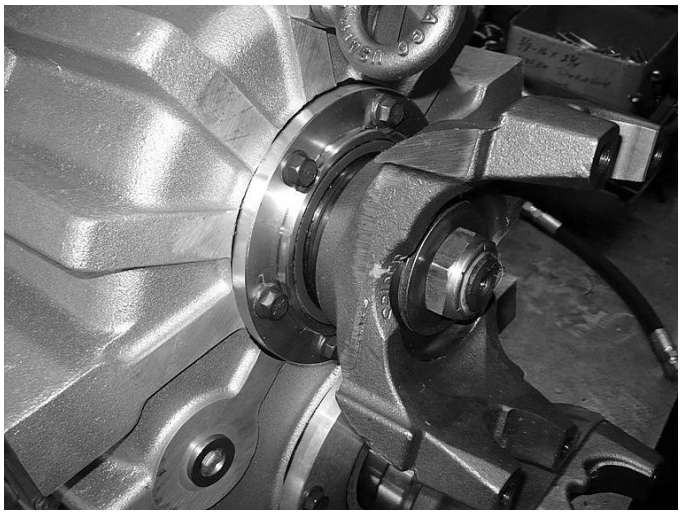
Location	Existing Seal Part Number	Updated Seal Part Number	Inner Sleeve Part Number	Seal Driver	Inner Sleeve Driver
Input (Upper)	37330 (3.75" Seal diameter)	DOS906-1	DOS906-2	306-A-4	306-A-6
Output (Rear)	32397	DOS907-1	DOS907-2	306-A-5	306-A-7
Output (Front Disconnect)	35083 (3.50" seal diameter)	DOS908-1	DOS908-2	306-A-5	306-A-8

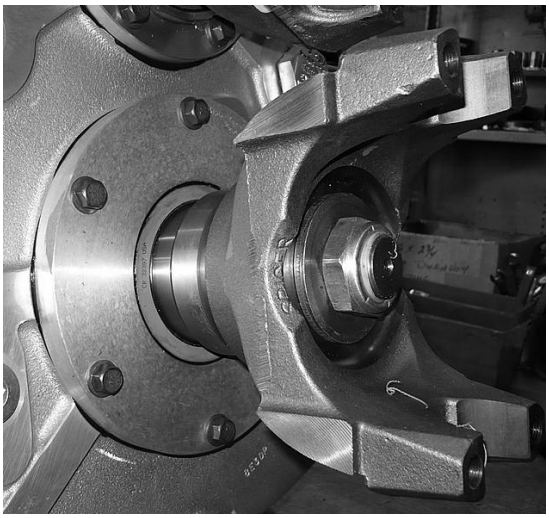
Tools and supplies required:

- Seals and drivers listed above (available from the vehicle manufacturer)
- Heavy hammer or beater bar
- 1 ¼-12 nylon lock nut
- 1 13/16 socket with ¾" Drive
- Impact Gun with ¾" that can produce 600 lbft of torque
- Torque wrench that can produce 600 lbft of torque
- Seal puller
- Denatured Alcohol or Mineral Spirits
- Scraper
- Standard Automotive Grease
- RTV (Silicone) Sealant

Instructions:

1. Identify seal location and select appropriate seal and inner sleeve. The seals are designed to fit the standard yokes, 1760 input and rear, 1710 front axle disconnect. The input seal has a 3.75" seal diameter, the front axle disconnect has a 3.50" diameter. The rear output seal rides on a seal sleeve, so the diameter of the yoke does affect the seal. Contact vehicle manufacturer if other yokes have been used.

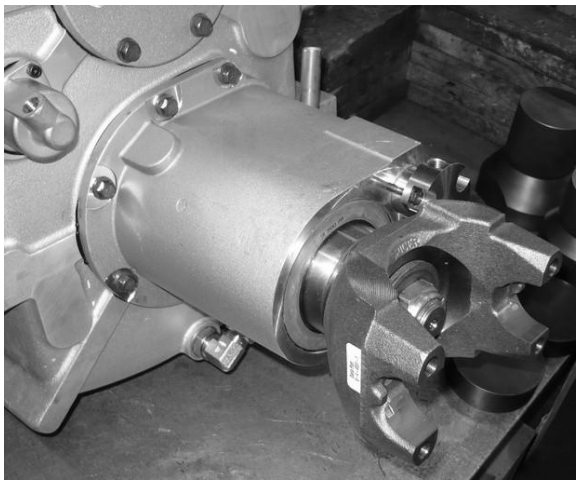




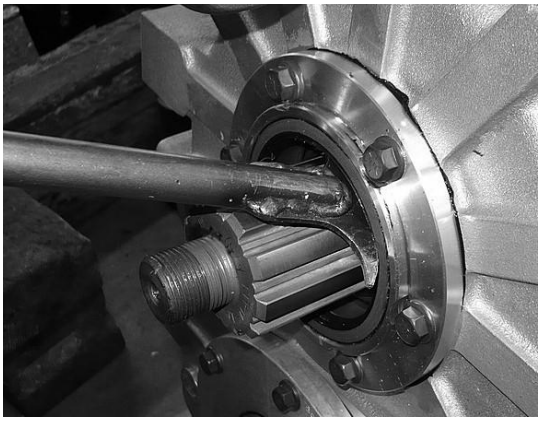
2. Remove yoke nut with impact gun and socket. Discard used yoke nut. A new yoke nut should be installed whenever the yoke nut is removed.

3. Remove yoke washer and yoke. Using scraper remove the RTV on the yoke face, yoke washer, and end of shaft.

4. If the rear output seal is being replaced, also remove the seal sleeve in this location.

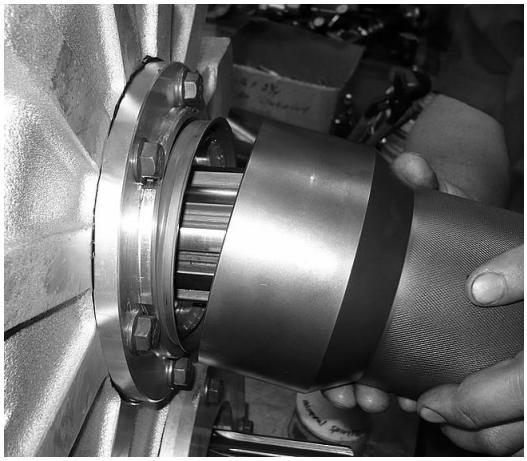


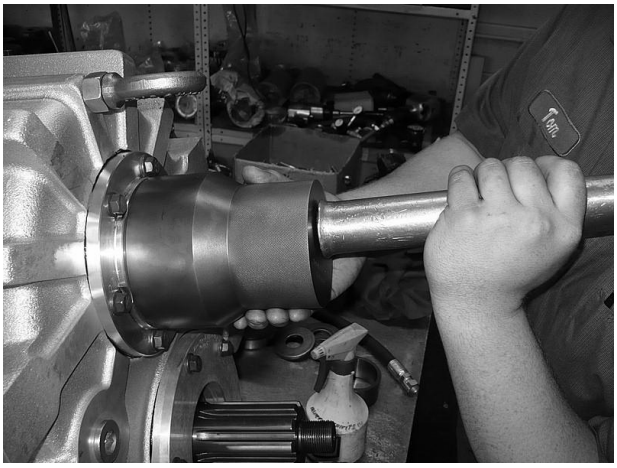
5. Remove the existing seal with a seal puller, taking care not to damage the seal bore



6. Using denatured alcohol or mineral spirits, clean the seal bore so that it is free of dirt, oil, and debris. Similarly, clean the surface of the yoke (or sleeve) on which the inner sleeve will ride.

7. Using the appropriate driver and hammer or beater, drive seal in location until driver hits hard, indicating that the seal is flush against its seating surface. Do not apply sealant to the OD of the seal prior to installation.





8. Inspect the seal to ensure that it is flush and square to the seating surface

9. Similarly, install the inner sleeve on the yoke (or seal sleeve for the rear output seal) using the appropriate driver and hammer or beater. If installing the inner sleeve on the rear output seal sleeve, make sure that the chamfer on the seal sleeve is up when installing the inner sleeve. The driver will bottom on the yoke and locate the inner sleeve in the correct location.



10. Install the yokes and/or seal sleeve onto the shaft.

11. Apply a generous bead of RTV to the outer surface of the yoke at the spline.

12. Install the yoke washer and yoke nut

13. Tighten the yoke nut to 600 lbft . **IT IS CRITICAL TO THE TRANSFER CASE THAT THE YOKE NUT IS TIGHTENED TO 600 LBFT.**

306 High & Low Shifter Shimming Procedure

To shim for the correct shift collar position, refer to *figure 1 on next page.* Assemble air shift per *figure 2.* Place the shims at the end of the shaft and install the piston. Coat the threads of the socket head cap screw with Loctite and liberally apply sealant under the head of the bolt before installing it and the anti-vibration washer. Torque the socket head to 25 *lb. ft.*

Grease the o'ring and insert it in the piston before installing the air inlet cap. Bolt the cap down and torque the (3) socket head cap screws to 12 *lb. ft.*

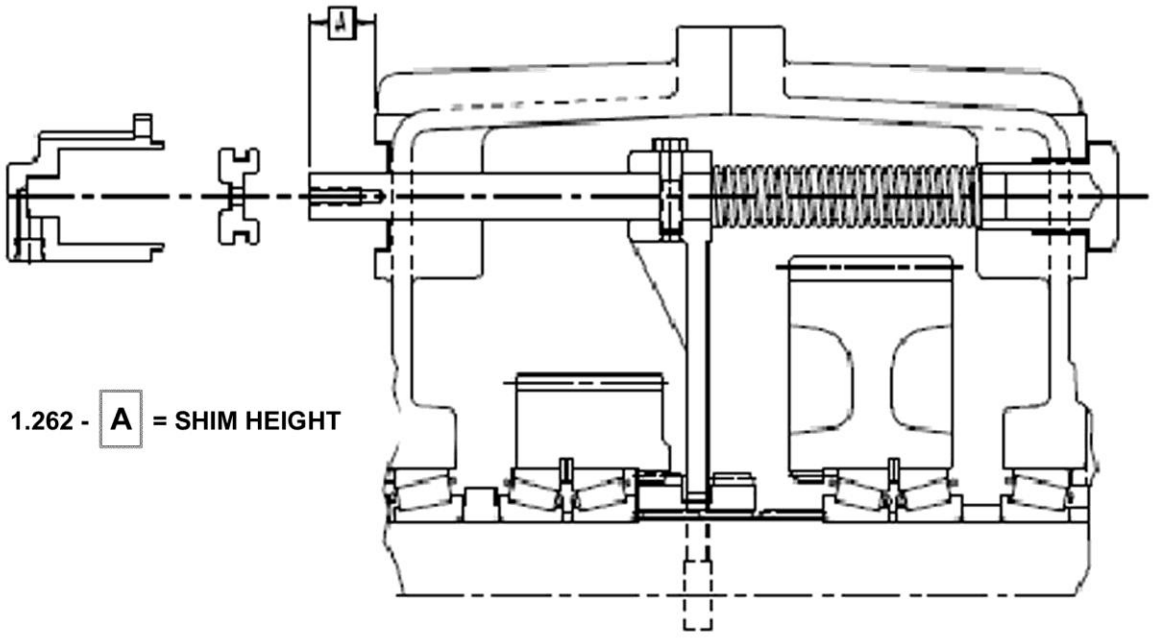


FIGURE 1.

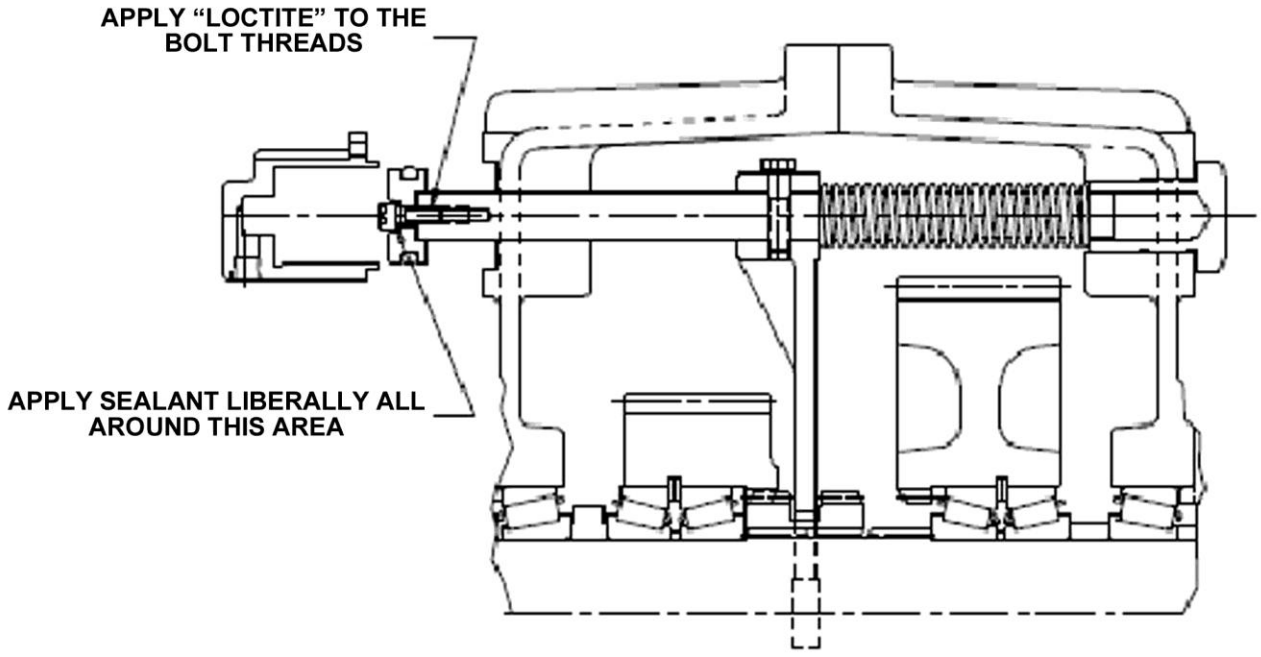


FIGURE 2.