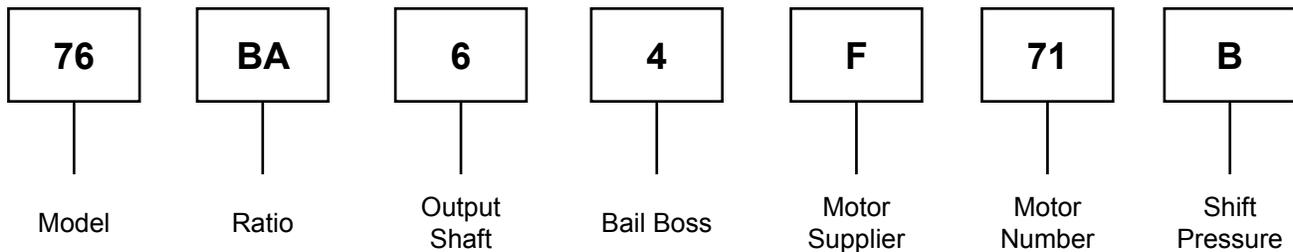




SERVICE MANUAL 76 SERIES DRIVE HEADS



Example Part Number



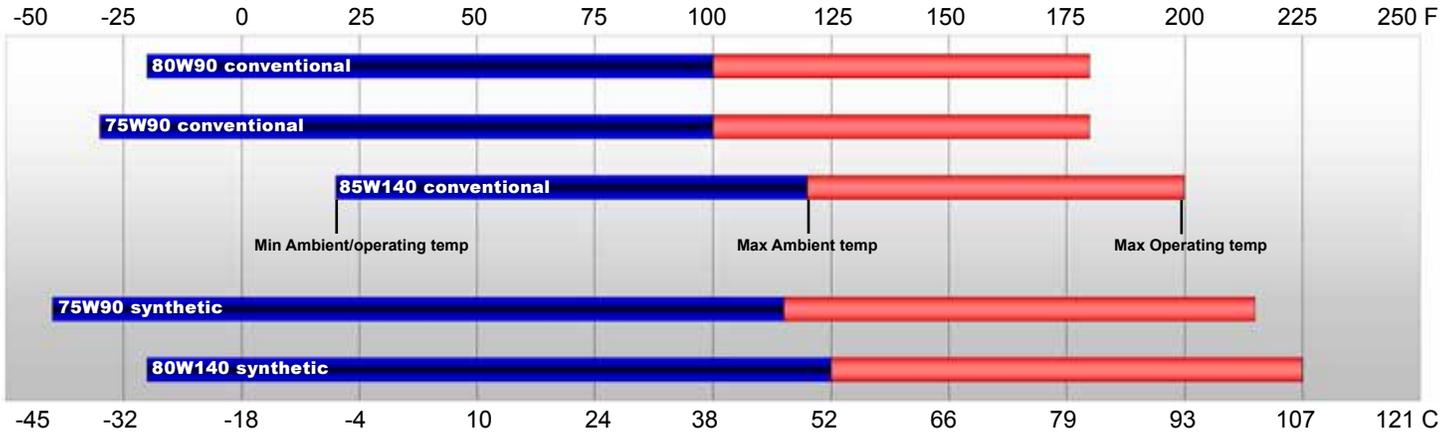
THIS SERVICE MANUAL IS EFFECTIVE:
S/N: 126302 TO CURRENT
DATE: 7-29-2014 TO CURRENT
VERSION: SM76_0714

NOTE: Individual customer specifications may vary from exploded drawing and standard part numbers shown. If applicable, refer to customer drawing for details.

LUBRICATION & MAINTENANCE

Using the chart below, determine an appropriate lubricant viscosity. Use only EP (extreme pressure) or API GL-5 designated lubricants. Change the lubricant after the first 50 hours of operation and at 500 hour intervals thereafter. The drive head should be partially disassembled to inspect gears and bearings at 1000 hour intervals.

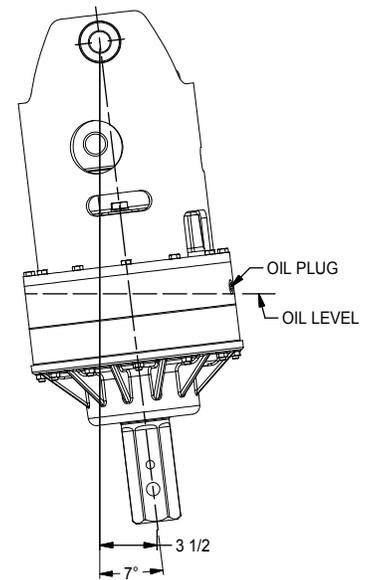
Recommended Ambient and Operating Temperatures for Conventional and Synthetic Gear Lubricants



Note: Ambient temperature is the air temperature measured in the immediate vicinity of the drive head. A drive head exposed to the direct rays of the sun or other radiant heat sources will operate at higher temperatures and therefore must be given special consideration. The maximum operating temperature must not be exceeded under any circumstances, regardless of ambient temperature.

ESKRIDGE MODEL 76 OIL CAPACITY: 6.5 pints (3.06 liters)

Proper oil level will measure to middle of primary cluster gears when drive head is in the vertical position. With the drive head leaning approximately 3-1/2 inches away from the fill plug in the top case (about 7°), oil will be level with the bottom of the plug hole when full.



ESKRIDGE PART NUMBER INTERPRETATION

Note: All non custom Eskridge Geardrives are issued a descriptive part number. For a detailed breakdown of this information, please refer to Eskridge product specification sheets found at: <http://www.eskridgeinc.com/en-us/documents/product-specification-sheets>



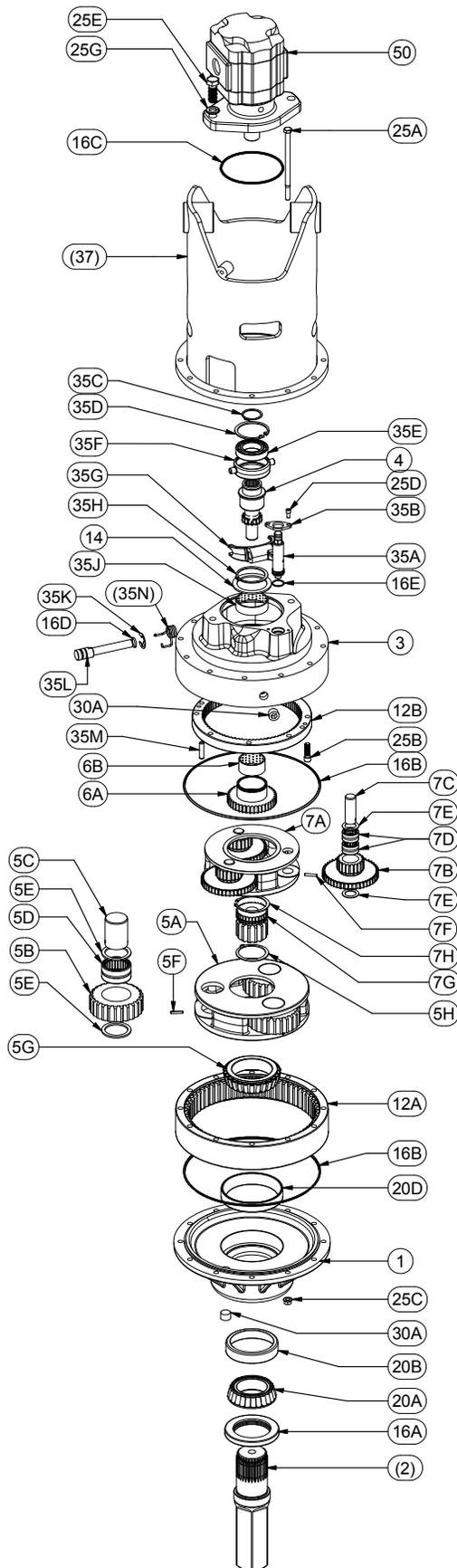
WARNING: While working on this equipment, use safe lifting procedures, wear adequate clothing and wear hearing, eye and respiratory protection.

Exploded View Drawing



76BA & 76BC (TWO SPEED) WITH INTEGRAL SHIFT CYLINDER
EFFECTIVE: 07-29-14 SN: 126302
TO: CURRENT

PARTS LIST					
GROUP	ITEM	QTY	DESCRIPTION	PART NUMBER 76BA	PART NUMBER 76BC
1	1	1	BEARING CARRIER	71-004-2144	71-004-2144
2	-	(1)	OUTPUT SHAFT	-	-
(2)	1	1	OUTPUT SHAFT 2-1/2" HEX	71-004-0513	71-004-0513
(2)	1	1	OUTPUT SHAFT 2-5/8" HEX	71-004-1383	71-004-1383
3	1	1	CASE: STD (2 SPEED) INTEGRATED SHIFTER	71-004-1014	71-004-1014
4	1	1	SHIFTER GEAR	71-004-0562	71-004-0572
5	-	1	CARRIER ASSEMBLY - SECONDARY	71-005-2171	71-005-2171
5A	1	1	CARRIER - SEC	71-004-0073	71-004-0073
5B	3	3	PLANET GEAR - SEC	71-004-0092	71-004-0092
5C	3	3	PLANET SHAFT	71-004-0081	71-004-0081
5D	3	3	BEARING	01-105-0020	01-105-0020
5E	6	6	THRUST WASHER - SEC PLANET	71-004-0871	71-004-0871
5F	3	3	ROLL PIN	01-153-0020	01-153-0020
5G	1	1	BEARING CONE	01-102-0100P	01-102-0100P
5H	1	1	RETAINING RING EXTERNAL	01-160-0020	01-160-0020
6	-	1	SUN GEAR ASSEMBLY	71-005-1800	71-005-1810
6A	1	1	SUN GEAR PRIMARY	71-004-0172	71-004-0402
6B	1	1	BUSHING	01-127-0010	01-127-0010
7	-	1	CARRIER ASSEMBLY - PRIMARY	71-005-1891	71-005-1701
7A	1	1	CARRIER - PRI	71-004-0113	71-004-0433
7B	3	3	CLUSTER GEAR	71-004-0132	71-004-0412
7C	3	3	PLANET SHAFT (PRIMARY)	71-004-0121	71-004-0121
7D	6	6	BEARING	01-105-0010	01-105-0010
7E	6	6	PLANET WASHER	71-004-0861	71-004-0861
7F	3	3	ROLL PIN	01-153-0020	01-153-0020
7G	1	1	SUN GEAR - SECONDARY	71-004-0102	71-004-0102
7H	1	1	RETAINING RING	01-160-0030	01-160-0030
12	-	-	RING GEARS	-	-
12A	1	1	RING GEAR	71-004-0042	71-004-0042
12B	1	1	RING GEAR	71-004-0142	71-004-0142
14	1	1	THRUST RACE	01-112-0030	01-112-0030
16	-	-	SEAL KIT	76-016-2011	76-016-2011
16A	1	1	SEAL	01-405-0540	01-405-0540
16B	2	2	O-RING	01-402-0020	01-402-0020
16C	1	1	O-RING	01-402-0010	01-402-0010
16D	1	1	O-RING - SHIFTER SHAFT	01-402-0040	01-402-0040
16E	1	1	O-RING	01-402-1013	01-402-1013
20	-	-	OUTPUT SHAFT BEARINGS	-	-
20A	1	1	BEARING CONE	01-102-0080P	01-102-0080P
20B	1	1	BEARING CUP	01-103-0080P	01-103-0080P
20D	1	1	BEARING CUP	01-103-0090P	01-103-0090P
25	-	-	HARDWARE	-	-
25A	12	12	HHCS (3/8-16X-1/2 GR5)	01-150-0020	01-150-0020
25B	8	8	SHCS (3/8-16 X 1-1/4 GR8)	01-150-0520	01-150-0520
25C	12	12	HEX FLANGE NUT	01-158-0360	01-158-0360
25D	2	2	SOCKET HEAD CAP SCREW	01-150-0560	01-150-0560
25E	2	2	HHCS (5/8-11 X 1-3/4)	01-150-0110	01-150-0110
25G	2	2	LOCKWASHER - 5/8 ZINC PLATED	01-166-0040	01-166-0040
30	-	-	PLUGS AND ZERKS	-	-
30A	2	2	PIPE PLUG (1/2 NPT MAGNETIC)	01-207-0010	01-207-0010
35	-	-	MISCELLANEOUS	-	-
35A	1	1	SHIFT CYLINDER ASSEMBLY	71-005-0802	71-005-0802
35B	1	1	RETAINER - INTEGRATED CYLINDER	71-004-1018	71-004-1018
35C	1	1	RETAINING RING	01-160-0110	01-160-0110
35D	1	1	RETAINING RING	01-160-0100	01-160-0100
35E	1	1	BEARING	01-100-0040	01-100-0040
35F	1	1	SHIFT COLLAR	71-004-0772	71-004-0772
35G	1	1	SHIFTER FORK & LEVER	71-004-1019	71-004-1019
35H	1	1	RETAINING RING	01-160-0040	01-160-0040
35J	1	1	BEARING - TOP CASE	71-004-0151	71-004-0151
35K	1	1	SNAP RING	01-160-0330	01-160-0330
35L	1	1	SHIFTER SHAFT	71-004-1020	71-004-1020
35M	2	2	DOWEL	01-152-0070	01-152-0070
(35N)	1	1	76 TORSION SPRING - STANDARD	01-261-0561	01-261-0561
(35N)	1	1	76 TORSION SPRING - LIGHT DUTY	01-261-0562	01-261-0562
37	-	(1)	BAIL ASSEMBLY	-	-
37	1	1	BAIL ASSEMBLY 1-1/4 BOSS	71-005-0252	71-005-0252
37	1	1	BAIL ASSEMBLY 1-1/2 BOSS	71-005-0932	71-005-0932
50	1	1	MOTOR	**	**



** PART SPECIFIED BY CUSTOMER
X76BA & 76BC ECN 3690 REV: B 06-04-14 HWP

Unit Disassembly Procedure

- 1) Scribe a diagonal line across the outside of the unit from the bail (37) to the bearing carrier (1) before disassembly to aid in the proper positioning of pieces during reassembly.
- 2) To drain oil, position unit on its side and remove oil plug (30A) located in the top case (3). The oil will drain out faster and more completely if warm.

NOTE: Particular care should be taken when placing the unit in a position for servicing. Unit should be blocked up so that weight of the unit is resting on the bearing carrier (1). This fixture must be secure so that the unit will not tip over during disassembly and assembly procedures.

- 3) Remove the twelve hex-head capscrews (25A) and hex flange nuts (25C). Lift bail (37) from unit. Replacing two of the capscrews at this point will help keep everything together until top case (3) is removed.

NOTE: There are no bolts retaining the major components together; proceed with caution when moving the unit.

- 4) Remove the two socket-head capscrews (25D) that retain the shift cylinder assembly (35A). The cylinder assembly will be pushed out of its pocket as the capscrews are removed, so it is best to hold the cylinder assembly in place while removing the capscrews. Remove cylinder assembly. Inspect o-ring (16E) for damage.
- 5) Remove hex-head capscrews (25E) and lockwashers (25G) from the hydraulic motor (50). Notice that the motor is larger on one side. It must be replaced in the same position as it was removed. Remove motor from unit. Check o-ring (16C) for damage.
- 6) Observe location of shifter fork & lever (35G), shifter gear assembly (4, 35C, 35D, 35E, 35F), and top case (3). Check for binding or interference by pushing down on shifter lever (part of Item 35G) to move shifter gear between high and low speeds. Use a tool that will not damage the shifter lever contact surface, and push it into the hole where the cylinder assembly was mounted.
- 7) Press down on shifter lever (part of Item 35G) and remove shifter gear assembly (4, 35C, 35D, 35E, 35F). If entire assembly cannot be removed, remove retaining ring (35C) and pull collar (35F) and bearing (35E) off of shifter gear (4) and out of fork (part of Item 35G). Shifter gear should be free of nicks, burrs, or gouges.
- 8) If necessary, use a screwdriver, wood chisel, or similar flat strong tool ground flat to insert between the aluminum top case (3) and the ring gear (12A). Tap lightly on tool. Do not drive into top case. Heavy prying will damage the o-ring contact surfaces in the top case. Remove the top case assembly (3, 6A, 6B, 12B, 14, 16D, 25B, 30A, 35G, 35H, 35J, 35K, 35L, 35M, 35N). Inspect o-ring for damage (16B).
- 9) Lift the primary planet carrier subassembly (7) out of the unit.
- 10) If sun gear (7G, 7H) has not been removed, do so now. It sometimes sticks to the primary carrier (7A).
- 11) Remove secondary ring gear (12A). Inspect o-ring (16B) for damage.
- 12) The output shaft (2) and secondary planet carrier assembly (5) may now be removed as follows:

a) The secondary planet carrier (5A) spline is a press fit onto the output shaft (2) spline. Bearing carrier (1) should be set on a plate or table with the output shaft protruding downward through a hole in the table that is large enough for the shaft seal (16A) to pass through.

b) Remove retaining ring (5H) from end of output shaft (2).

NOTE: Care should be taken not to damage output shaft or injure your feet when shaft falls out of bearing carrier.

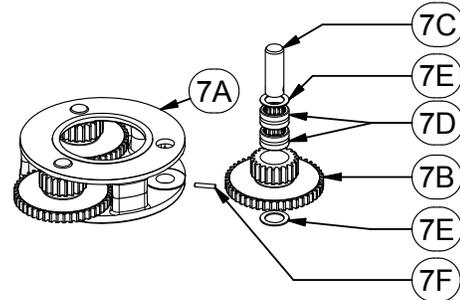
c) Press output shaft (2) out bottom of bearing carrier (1) by applying press load to the top end of the shaft. The output shaft, shaft seal (16A), and outer bearing cone (20A) will fall out of bearing carrier.

- 13) Lift secondary planet carrier subassembly (5) out of unit.

The unit is now separated into subassemblies. The area(s) requiring repair or service should be identified by thorough inspection of the parts after they have been cleaned and dried.

Primary Planet Carrier Subassembly

(Items 7A, 7B, 7C, 7D, 7E, 7F)



Disassembly

- 1) Rotate cluster gears (7B) to check for abnormal noise or roughness in bearings (7D) or planet shafts (7C). If further inspection or replacement is required, proceed as follows.
- 2) Drive roll pins (7F) completely into the planet shafts (7C).

NOTE: Support only the carrier (7A) while pressing out planet shafts.

- 3) Press or drive planet shafts (7C) out of carrier (7A).
- 4) Remove cluster gears (7B), thrust washers (7E), and bearings (7D) from the carrier (7A). The cluster gears are a matched set, and all three should be replaced if damaged.
- 5) Inspect the cluster gear bearings (7D). If any need replaced, press them out of the cluster gears (7B) and replace with new bearings.
- 6) Check planet shafts (7C) for any abnormal wear, especially ones where bearings needed to be replaced. If any abnormal wear is found, replace planet shafts.
- 7) Use a 3/16 inch pin punch to remove roll pins (7F) from planet shafts (7C).

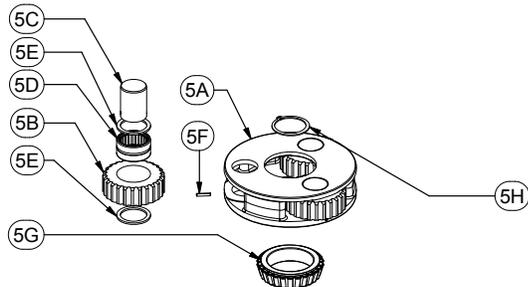
Reassembly

- 1) Install bearings (7D) and thrust washers (7E) into cluster gears (7B). Thrust washers should be approximately flush with faces of cluster gears. Install this assembly into carrier (7A).

- 2) Planet shafts (7C) should be installed with chamfered end of 3/16 inch hole toward outside diameter of the carrier (7A). This will aid in alignment of holes while inserting roll pins (7F).
- 3) Drive a roll pin (7F) through the carrier (7A) hole and into the planet shaft (7C) to retain the parts. Repeat for other planet gears.

Secondary Planet Carrier Subassembly

(Items 5A, 5B, 5C, 5D, 5E, 5F, 5G, 5H)



Disassembly

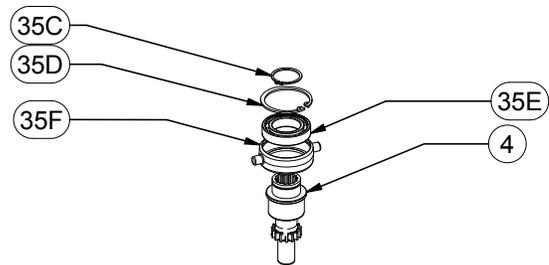
- 1) Rotate planet gears (5B) to check for abnormal noise or roughness in bearings (5D). Inspect edge of carrier (5A) spline adjacent to retaining ring (5H). This edge should be a sharp corner to ensure that the retaining ring will stay in place. If it is worn to a beveled or rounded off corner, the carrier should be replaced. If further inspection or replacement is required, proceed as follows.
- 2) Drive roll pins (5F) completely into the planet shafts (5C).
- 3) Slide planet shafts (5C) out of carrier (5A).
- 4) Remove planet gears (5B), thrust washers (5E), and bearings (5D) from carrier (5A).
- 5) Inspect the planet gear bearings (5D). If any need replaced, press them out of the planet gears (5B) and replace with new bearings.
- 6) Check planet shafts (5C) for any abnormal wear, especially ones where bearings needed to be replaced. If any abnormal wear is found, replace planet shafts.
- 7) Remove roll pins (5F) from planet shafts (5C) using a 3/16 inch pin punch.
- 8) Inner bearing cone (5G) cannot be removed from secondary carrier (5A) without destroying the bearing. If the bearing needs replaced, the carrier must be replaced, as well.

Reassembly

- 1) Install bearing (5D) and thrust washers (5E) into planet gear (5B). Thrust washers should be approximately flush with faces of planet gears. Install this assembly into carrier (5A).
- 2) Planet shafts (5C) should be installed with the chamfered end of the 3/16 inch hole toward the outside diameter of the carrier (5A). This will aid in alignment of holes while inserting roll pins (5F).
- 3) Drive roll pin (5F) into the carrier (5A) hole and into the planet shaft (5C) to retain the parts. Repeat for remaining planet gears.

Shifter Gear Subassembly

(Items 4, 35C, 35D, 35E, 35F)



Disassembly

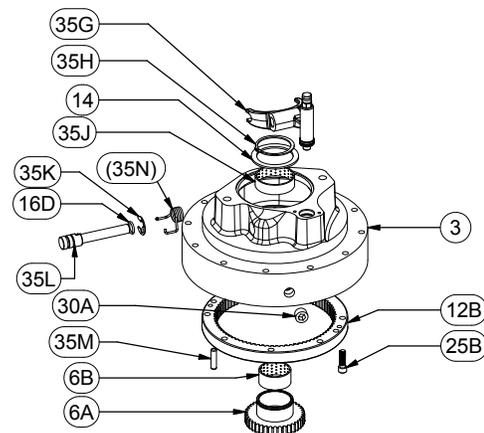
- 1) Remove retaining rings (35C, 35D) and pull pieces apart. The bearing (35E) may need to be pressed lightly out of the collar (35F).
- 2) Check for worn parts and replace as necessary.

Reassembly

- 1) Reassemble in reverse order.

Top Case Subassembly

(Items 3, 6A, 6B, 12B, 14, 16D, 25B, 30A, 35G, 35H, 35J, 35K, 35L, 35M, 35N)



Disassembly

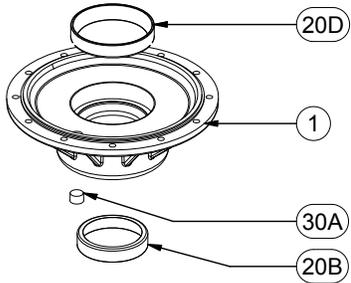
- 1) Inspect primary ring gear (12B) for abnormal wear or damaged teeth. If replacement is required, remove eight socket head capscrews (25B) from ring gear. Ring gear is doweled into top case (3). Thread two 3/8-16 bolts into threaded holes in ring gear until ring gear is separated from top case.
- 2) Inspect sun gear (6A) for abnormal wear or damage. If replacement is required, remove retaining ring (35H) and thrust race (14) and remove sun gear.
- 3) It is not recommended to remove the shifter mechanism (16D, 35G, 35K, 35L, 35N) unless an item needs replaced. The torsion spring (35N) can be difficult to re-install once removed. If the shifter shaft o-ring (16D) requires replacement, remove the snap ring (35K) and carefully slide shifter shaft (35L) out of top case just far enough to replace o-ring. Lubricate new o-ring with grease before reinstalling shifter shaft and snap ring.

Reassembly

- 1) When replacing primary ring gear (12B), always install new dowel pins (35M) into ring gear before reassembling. Use medium-strength thread locking compound (blue Loctite or equivalent) on the eight socket head capscrews (25B) and torque them to 35 lb-ft.
- 2) To install a new sun gear (6A), place sun gear subassembly (6) into top case. Install thrust race (14) and retaining ring (35H).

Bearing Carrier Subassembly

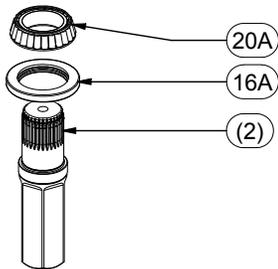
(Items 1, 20B, 20D, 30A)



- 1) Inspect inner and outer bearing cups (20D, 20B). If necessary, they may be removed with a bearing puller.
- 2) Clean all foreign material from magnetic plug (30A). Reinstall using pipe thread sealant on plug threads.

Output Shaft Subassembly

(Items 2, 16A, 20A)



Disassembly

- 1) Remove the shaft seal (16A) for inspection or replacement.
- 2) Inspect outer bearing cone (20A) and output shaft (2). If either needs replaced, a gear puller may be used to remove the outer bearing cone from the shaft. If reusing old bearing cone, do not pull on or damage roller cage.

Reassembly

Note: Press bearing cone onto output shaft by pressing on inner race only. Do not press on roller cage, or it may damage bearing.

- 1) Press outer bearing cone (20A) onto the shaft (2) until it seats against the shoulder.
- 2) See Unit Assembly for shaft seal installation instructions.

All subassembly service or repairs should be complete at this time. Continue to Unit Assembly to complete unit buildup.

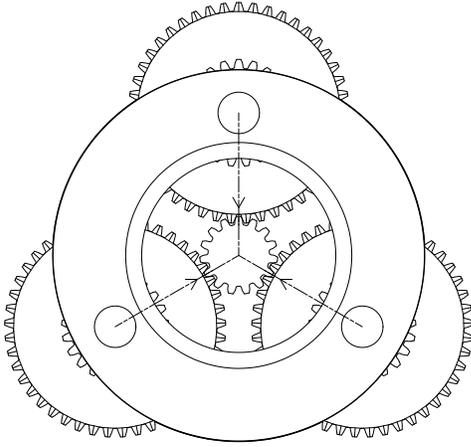
Unit Assembly

(Refer to Exploded View Drawing on Page 3)

- 1) When all subassemblies are complete, the unit is ready to be assembled.
- 2) Place bearing carrier subassembly with output side up (opposite shown) on assembly table.
- 3) Apply a layer of lithium or general purpose bearing grease to contact surface of outer bearing cup (20B). Place the output shaft (2), assembled with outer bearing cone (20A), in bearing carrier subassembly.
- 4) Lubricate inner lip of shaft seal (16A) and slide it onto the output shaft (2) and over the shaft seal diameter. Press the seal into the bearing carrier (1) bore.

Caution: Output shaft is not retained.

- 5) Flip this assembly over and rest it on the press table, balanced on the end of the output shaft (2).
- 6) Place retaining ring (5H) inside secondary planet assembly (5). Place this assembly on top of output shaft (2) and line up the carrier (5A) spline teeth to the shaft spline teeth.
- 7) Press secondary planet carrier assembly (5) onto shaft (2). Before it is fully seated, install retaining ring (5H) onto end of output shaft. Fully seat the carrier assembly and check that the retaining ring is fully engaged in shaft groove.
- 8) You may now place this assembly back on the fixture that was used during disassembly, with the unit's weight resting on the bearing carrier (1).
- 9) Install o-ring (16B) on secondary ring gear (12A). You may use grease to help the o-ring stick to the ring gear. Using alignment marks made during disassembly, install secondary ring gear with o-ring between it and the bearing carrier (1). Be careful not to pinch o-ring.
- 10) Install another o-ring (16B) on top side of secondary ring gear (12A).
- 11) Making sure retaining ring (7H) is installed on secondary sun gear (7G), place secondary sun gear in secondary planet carrier assembly (5).
- 12) Install primary carrier assembly (7) onto secondary sun gear (7G) by aligning spline in primary carrier (7A) to spline on secondary sun gear.



13) Timing Procedure:

Caution: If unit is not properly timed, the gearing will be severely damaged.

- a) There are machinist's marks on each of the three cluster gears (7B). These marks should be aligned so that each points toward the center of the primary planet carrier. See diagram above.
 - b) A special tool should be made to keep the cluster gears (7B) aligned properly. An old shifter gear (4), cut off just above the gear and welded to a 6" long bolt, works well.
 - c) Align the cluster gears (7B). Insert alignment tool. Using alignment marks made during disassembly, install top case assembly. You may need to use the alignment tool to turn the cluster gears until top case (3) is fully seated on ring gear (12A). Remove alignment tool.
- 14) Install shifter gear assembly (4, 35C, 35D, 35E, 35F) by pushing pushing down on shifter lever (part of Item 35G), using a tool that will not damage its contact surface.
 - 15) Place o-ring (16E) onto shift cylinder assembly (35A). Push cylinder assembly into its pilot in the top case (3) and install retainer plate (35B) and socket head capscrews (25D). Use medium-strength thread locking compound (blue Loctite or equivalent) on the socket head capscrews and torque them to 8 lb-ft.
 - 16) Install o-ring (16C) onto hydraulic motor (50).
 - 17) Install hydraulic motor (50) onto top case with two capscrews (25E) and lockwashers (25G). Torque capscrews to 130 lb-ft.
 - 18) Using alignment marks made during disassembly, lower bail (37) over hydraulic motor (50) and align with top case (3).
 - 19) Install twelve capscrews (25A) and hex flange nuts (25C) and torque them to 30 lb-ft.
 - 20) Fill the unit to the proper level, as specified, with gear oil.

The drive head is now ready to use.