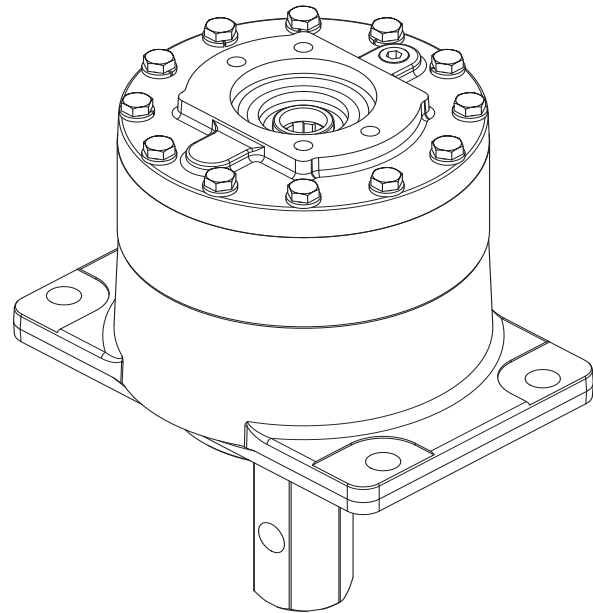
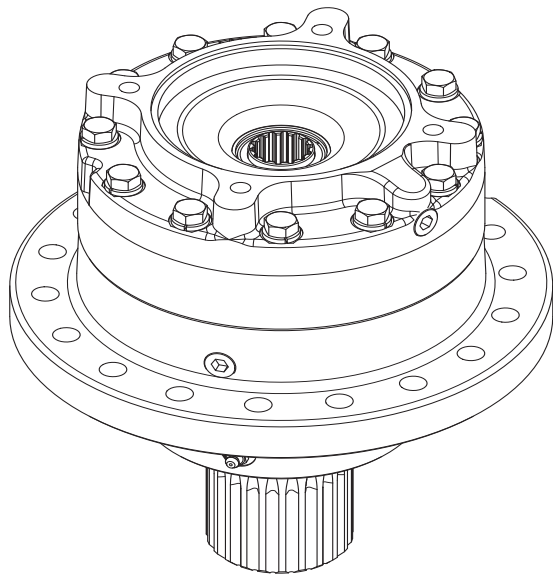




## MODEL 70L PLANETARY GEAR DRIVE SERVICE MANUAL



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

**THIS SERVICE MANUAL IS EFFECTIVE:**  
**S/N: 150499 TO CURRENT**  
**DATE: 08/12/2016 TO CURRENT**  
**VERSION: SM70L-BC**

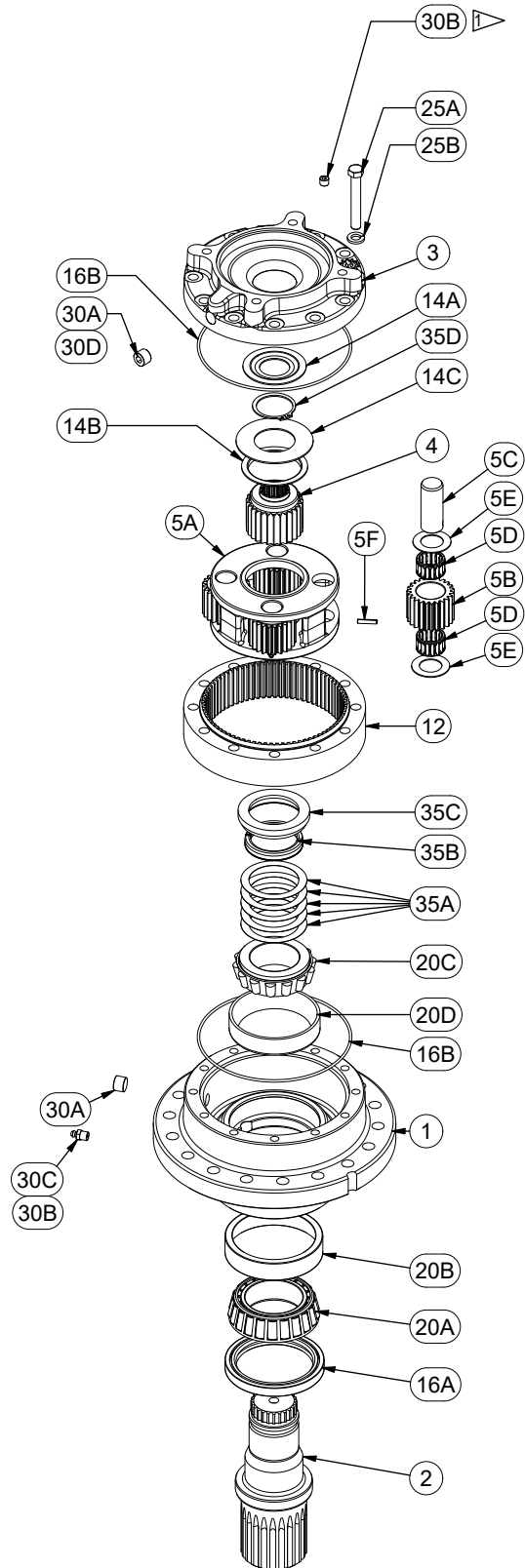
**NOTE:** Individual customer specifications (mounting case, output shaft, brake assembly, etc.) may vary from exploded drawing and standard part numbers shown. If applicable, refer to customer drawing for details.



MODEL 70L SINGLE PLANETARY  
EFFECTIVE FROM: SN-150499 DATE 08-12-2016

PARTS LIST						
CODE	DESCRIPTION	ITEM	QTY	RATIO CODE 4 (3.85:1)	RATIO CODE 5 (5.05:1)	RATIO CODE 5 (5.05:1) WITH CODE 4 INPUT
BASE						
A	BASE - ROUND FLANGE	1	1	50-004-3379	50-004-3379	50-004-3379
AQ	BASE - ROUND ECCENTRIC	1	1	50-004-3381	50-004-3381	50-004-3381
E	BASE - RECTANGULAR FLANGE	1	1	50-004-3380	50-004-3380	50-004-3380
F	BASE - FLANGELESS	1	1	50-004-3382	50-004-3382	50-004-3382
R	BASE - REVERSE MOUNT	1	1	50-004-3396	50-004-3396	50-004-3396
OUTPUT SHAFT						
D1	SHAFT - 23T 8/16 DP SPLINE	2	1	50-004-4682	50-004-4682	50-004-4682
D2	SHAFT - Ø3", 5/8" KEY	2	1	50-004-4683	50-004-4683	50-004-4683
D3	SHAFT - Ø2.25", 1/2" KEY	2	1	50-004-4686	50-004-4686	50-004-4686
H2	SHAFT - 2" HEX Ø.81 HOLE	2	1	50-004-4684	50-004-4684	50-004-4684
H3	SHAFT - 2.5" HEX Ø.81 HOLE	2	1	50-004-4706	50-004-4706	50-004-4706
S1	SPINDLE - Ø4.50" PILOT Ø6.00" BC	2	1	50-004-4685	50-004-4685	50-004-4685
C1	SHAFT - CUSTOM	2	1			
COVER						
A	COVER - SAE 'A' 2 & MOD 4-BOLT	3	1	50-004-1173	50-004-1173	50-004-1173
B	COVER - SAE 'B' 2-BOLT	3	1	50-004-1183	50-004-1183	50-004-1183
C	COVER - SAE 'C' 4-BOLT	3	1	50-004-1233	50-004-1233	50-004-1233
F	COVER - SAE 'A' 4-BOLT DANFOSS	3	1	50-004-1687	50-004-1687	50-004-1687
K	COVER - SAE 'C' 2-BOLT	3	1	50-004-1333	50-004-1333	50-004-1333
INPUT GEAR						
2	INPUT GEAR 13T 16/32 DP SPLINE	4	1	85-004-1708	PNNYA	-
3	INPUT GEAR 1"-.6B SPLINE	4	1	85-004-1682	85-004-1687	-
4	INPUT GEAR 14T 12/24 DP SPLINE	4	1	85-004-1674	-	85-004-1676
5	INPUT GEAR 15T 16/32 DP SPLINE	4	1	PNNYA	PNNYA	-
6	INPUT GEAR Ø1.00 1/4" KEY	4	1	PNNYA	-	-
7	INPUT GEAR 17T 12/24 DP SPLINE	4	1	85-004-1675	-	-
CARRIER ASSY - SECONDARY						
	CARRIER - SECONDARY	5A	1	50-004-1646	50-004-1640	50-004-1640
	PLANET GEAR - SEC.	5B	4	85-004-1677	85-004-1670	85-004-1670
	PLANET SHAFT	5C	4	25-004-1031	25-004-1031	25-004-1031
	BEARING	5D	8	01-105-0590	01-105-0590	01-105-0590
	THRUST WASHER - PLANETS	5E	8	50-004-1644	50-004-1644	50-004-1644
	ROLL PIN (Ø3/16 X 7/8)	5F	4	01-153-0210	01-153-0210	01-153-0210
	RING GEAR	12	1	50-004-1033	50-004-1033	50-004-1023
THRUST WASHERS						
	THRUST WASHER-INPUT	14A	1	50-004-1091	50-004-1091	50-004-1091
	THRUST WASHER SEC. CUP	14B	1	50-004-1011	50-004-1011	50-004-1011
	THRUST WASHER	14C	1	-	-	81-004-2883
SEAL KIT						
	SEAL	16A	1	01-405-0841	01-405-0841	01-405-0841
	O-RING (167MM X 3MM)	16B	2	01-402-0560	01-402-0560	01-402-0560
OUTPUT SHAFT BEARINGS						
	BRG CONE	20A	1	01-102-0030	01-102-0030	01-102-0030
	BRG CUP	20B	1	01-103-0030	01-103-0030	01-103-0030
	BEARING CONE	20C	1	01-102-0370	01-102-0370	01-102-0370
	BEARING CUP	20D	1	01-103-0370	01-103-0370	01-103-0370
HARDWARE						
	HHCS	25A	12	01-150-1540	01-150-1540	01-150-1550
	LOCKWASHER- 7/16"	25B	12	01-166-0340	01-166-0340	01-166-0340
PLUGS AND FIXTURES						
	PIPE PLUG (3/8 MAGNETIC)	30A	2	01-207-0070	01-207-0070	01-207-0070
	PIPE PLUG 1/8 NPT HOLLOW HEX	30B	1	01-207-0030	01-207-0030	01-207-0030
	GREASE FITTING (OPTIONAL)	30C	1	01-215-0010	01-215-0010	01-215-0010
	AIR VENT (OPTIONAL)	30D	1	01-216-0070	01-216-0070	01-216-0070
MISCELLANEOUS						
	SHIM	35A	*	50-004-1521	50-004-1521	50-004-1521
	SPLIT RING	35B	1	50-004-1452	50-004-1452	50-004-1452
	LOCK RING	35C	1	50-004-1462	50-004-1462	50-004-1462
	RETAINING RING	35D	1	-	-	01-160-0350

\*QUANTITY DEPENDANT UPON DESIRED BEARING PRELOAD  
X70LD1 ECN: 5152 REV: C 02/05/2024 JH



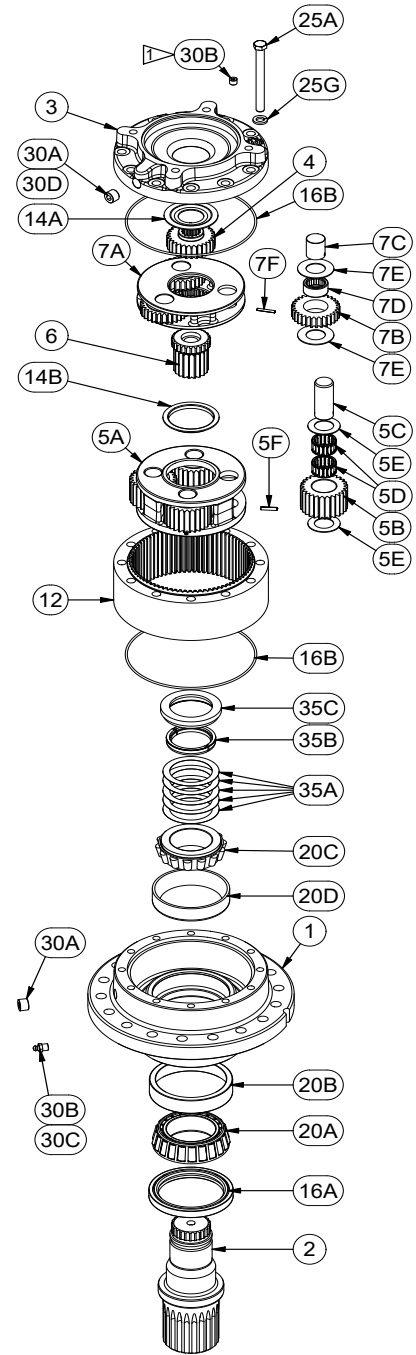
**NOTES:** ▷

1. USED ONLY WITH 'C' AND 'K' COVERS.



MODEL 70L DOUBLE PLANETARY  
EFFECTIVE FROM: SN-150499 08-12-2016

PARTS LIST								
CODE	DESCRIPTION	ITEM	QTY	RATIO CODE 14 (14.44:1)	RATIO CODE 19 (18.95:1)	RATIO CODE 21 (20.61:1)	RATIO CODE 26 (25.53:1)	RATIO CODE 29 (29.37:1)
BASE								
A	BASE - ROUND FLANGE	1	1	50-004-3379	50-004-3379	50-004-3379	50-004-3379	50-004-3379
AQ	BASE - ROUND ECCENTRIC - (70AQ)	1	1	50-004-3381	50-004-3381	50-004-3381	50-004-3381	50-004-3381
E	BASE - RECTANGULAR FLANGE	1	1	50-004-3380	50-004-3380	50-004-3380	50-004-3380	50-004-3380
F	BASE - FLANGELESS	1	1	50-004-3382	50-004-3382	50-004-3382	50-004-3382	50-004-3382
R	BASE - REVERSE MOUNT	1	1	50-004-3396	50-004-3396	50-004-3396	50-004-3396	50-004-3396
SHAFT								
D1	SHAFT - 23T 8/16 DP SPLINE	2	1	50-004-4682	50-004-4682	50-004-4682	50-004-4682	50-004-4682
D2	SHAFT - Ø3" 5/8" KEY	2	1	50-004-4683	50-004-4683	50-004-4683	50-004-4683	50-004-4683
D3	SHAFT - Ø2.25" 1/2" KEY	2	1	50-004-4686	50-004-4686	50-004-4686	50-004-4686	50-004-4686
H2	SHAFT - 2" HEX Ø.81 HOLE	2	1	50-004-4684	50-004-4684	50-004-4684	50-004-4684	50-004-4684
H3	SHAFT - 2.5" HEX Ø.81 HOLE	2	1	50-004-4706	50-004-4706	50-004-4706	50-004-4706	50-004-4706
S1	SPINDLE - Ø4.50" PILOT, Ø6.00" BC	2	1	50-004-4685	50-004-4685	50-004-4685	50-004-4685	50-004-4685
C1 CUSTOM SHAFT								
COVER								
A	COVER - SAE 'A' 2 & MOD 4-BOLT	3	1	50-004-1173	50-004-1173	50-004-1173	50-004-1173	50-004-1173
B	COVER - SAE 'B' 2-BOLT	3	1	50-004-1183	50-004-1183	50-004-1183	50-004-1183	50-004-1183
C	COVER - SAE 'C' 4-BOLT	3	1	50-004-1233	50-004-1233	50-004-1233	50-004-1233	50-004-1233
F	COVER - SAE 'A' 4-BOLT DANFOSS	3	1	50-004-1687	50-004-1687	50-004-1687	50-004-1687	50-004-1687
K	COVER - SAE 'C' 2-BOLT	3	1	50-004-1333	50-004-1333	50-004-1333	50-004-1333	50-004-1333
INPUT GEAR								
2	INPUT GEAR 13T 16/32 DP SPLINE	4	1	85-004-1671	85-004-1671	85-004-1102	85-004-1062	85-004-1696
3	INPUT GEAR 1"Ø 6B SPLINE	4	1	85-004-1672	85-004-1672	85-004-1122	85-004-1112	-
4	INPUT GEAR 14T 12/24 DP SPLINE	4	1	85-004-1652	85-004-1652	85-004-1533	-	-
5	INPUT GEAR-15T 16/32 DP SPLINE	4	1	85-004-1673	85-004-1673	85-004-1542	85-004-1422	-
6	INPUT GEAR - Ø1.00", 1/4" KEY	4	1	PNNYA	PNNYA	PNNYA	-	-
7	INPUT GEAR - 17T 12/24 DP SPLINE	4	1	PNNYA	PNNYA	PNNYA	-	-
SECONDARY CARRIER ASSY								
5A	CARRIER - SECONDARY	5A	1	50-004-1646	50-004-1640	50-004-1640	50-004-1640	50-004-1640
5B	PLANET GEAR - SEC.	5B	4	85-004-1677	85-004-1670	85-004-1670	85-004-1670	85-004-1670
5C	PLANET SHAFT	5C	4	25-004-1031	25-004-1031	25-004-1031	25-004-1031	25-004-1031
5D	BEARING	5D	8	01-105-0590	01-105-0590	01-105-0590	01-105-0590	01-105-0590
5E	THRUST WASHER - PLANETS	5E	8	50-004-1644	50-004-1644	50-004-1644	50-004-1644	50-004-1644
5F	ROLL PIN (Ø3/16 X 7/8)	5F	4	01-153-0210	01-153-0210	01-153-0210	01-153-0210	01-153-0210
6	SUN GEAR - 70	6	1	85-004-1668	85-004-1669	85-004-1669	85-004-1669	85-004-1669
7	CARRIER ASSY	7	1	50-005-2151	50-005-2151	50-005-2011	50-005-2021	50-005-2195
7A	CARRIER - PRI	7A	1	50-004-1622	50-004-1622	50-004-1082	50-004-1072	50-004-1710
7B	PLANET GEAR - PRI.	7B	3	85-004-1611	85-004-1611	85-004-1031	85-004-1021	85-004-1700
7C	PLANET SHAFT	7C	3	85-004-1664	85-004-1664	81-004-0071	81-004-0071	81-004-0071
7D	PLANET BEARING	7D		01-106-0060 (QTY 57)	01-106-0060 (QTY 57)	01-105-0410 (QTY 3)	01-105-0410 (QTY 3)	01-105-0410 (QTY 3)
7E	THRUST WASHER-PLANET.	7E	6	85-004-1667	85-004-1667	81-004-1561	81-004-1561	81-004-1561
7F	ROLL PIN (1/8 X 1)	7F	3	01-153-0240	01-153-0240	01-153-0080	01-153-0080	01-153-0080
12	RING GEAR	12	1	50-004-1023	50-004-1023	50-004-1023	50-004-1023	50-004-1023
THRUST WASHERS								
14A	THRUST WASHER-INPUT	14A	1	50-004-1091	50-004-1091	50-004-1091	50-004-1091	50-004-1091
14B	THRUST WASHER SEC. CUP	14B	1	50-004-1011	50-004-1011	50-004-1011	50-004-1011	50-004-1011
SEAL KIT								
16A	SEAL	16A	1	70-016-2001 (1)	70-016-2001 (1)	70-016-2001 (1)	70-016-2001 (1)	70-016-2001 (1)
16B	O-RING (167MM X 3MM)	16B	2	01-402-0560	01-402-0560	01-402-0560	01-402-0560	01-402-0560
OUTPUT SHAFT BEARINGS								
20A	BRG CONE	20A	1	01-102-0030	01-102-0030	01-102-0030	01-102-0030	01-102-0030
20B	BRG CUP	20B	1	01-103-0030	01-103-0030	01-103-0030	01-103-0030	01-103-0030
20C	BEARING CONE	20C	1	01-102-0370	01-102-0370	01-102-0370	01-102-0370	01-102-0370
20D	BEARING CUP	20D	1	01-103-0370	01-103-0370	01-103-0370	01-103-0370	01-103-0370
HARDWARE								
25A	HEX HEAD CAP SCREW	25A	12	01-150-1550	01-150-1550	01-150-1550	01-150-1550	01-150-1550
25G	LOCKWASHER- 7/16"	25G	12	01-166-0340	01-166-0340	01-166-0340	01-166-0340	01-166-0340
PLUGS AND FITTINGS								
30A	PIPE PLUG (3/8 MAGNETIC)	30A	2	01-207-0070	01-207-0070	01-207-0070	01-207-0070	01-207-0070
30B	PIPE PLUG 1/8 NPT HOLLOW HEX	30B	1	01-207-0030	01-207-0030	01-207-0030	01-207-0030	01-207-0030
Z	GREASE FITTING (OPTIONAL)	30C	1	01-215-0010	01-215-0010	01-215-0010	01-215-0010	01-215-0010
V	AIR VENT (OPTIONAL)	30D	1	01-216-0070	01-216-0070	01-216-0070	01-216-0070	01-216-0070
MISCELLANEOUS								
35A	SHIM	35A	*	50-004-1521	50-004-1521	50-004-1521	50-004-1521	50-004-1521
35B	SPLIT RING	35B	1	50-004-1452	50-004-1452	50-004-1452	50-004-1452	50-004-1452
35C	LOCK RING	35C	1	50-004-1462	50-004-1462	50-004-1462	50-004-1462	50-004-1462



**NOTES:** ▷

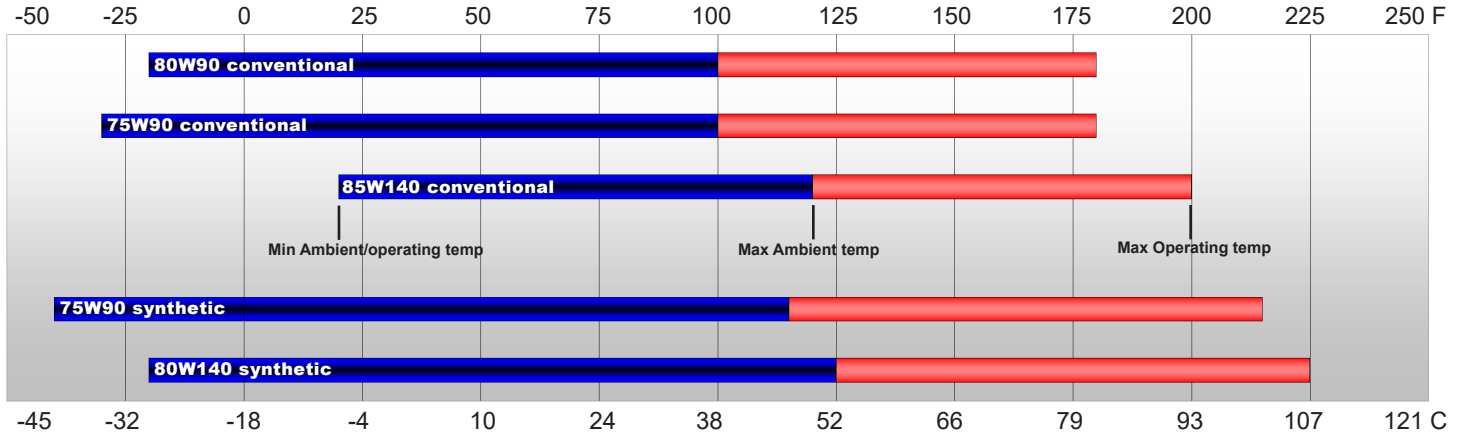
1. USED ONLY WITH 'C' AND 'K' COVERS.

\*QUANTITY DEPENDANT UPON DESIRED BEARING PRELOAD  
X70LD2 ECN: 5152 REV: C 02/05/2024 JH

# 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 gear drive 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 gearbox. A Gearbox 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 max operating temp must not be exceeded under any circumstances, regardless of ambient temperature.

If your unit was specified “shaft up” or with a “-Z” option, a grease zerk was provided in the base housing. For shaft-up operation, the output bearing will not run in oil and must be grease lubricated. Use a lithium based or general purpose bearing grease sparingly every 50 operating hours or at regular maintenance intervals. Over-greasing the output bearing should be avoided as it tends to fill the housing with grease and thicken the oil

## ESKRIDGE MODEL 70 OIL CAPACITIES

Operating Position	Oil Capacity			Oil Level
	Single stage	Double stage	Triple stage	
 Horizontal Shaft 1.25 pt / 0.6 L	1.50 pt / 0.7 L	1.75 pt / 0.8 L	To horizontal centerline of gear drive	
 Vertical Shaft (Pinion Up) 1.75 pt / 0.8 L	2.75 pt / 1.3 L	3.25 pt / 1.5 L	To side port on gear drive base	
 Vertical Shaft (Pinion Down) 1.75 pt / 0.8 L	2.75 pt / 1.3 L	3.25 pt / 1.5 L	To midway on upper/primary gear set	

## ESKRIDGE PART NUMBER INTERPRETATION

**Note:** All non-custom Eskridge Geardrives are issued a descriptive part number which includes information regarding the Model, means of shaft retention, base style, shaft style, input mounting, input shaft size, overall ratio and various available options. For a detailed breakdown of this information, please refer to Eskridge product specification sheets found at: <http://www.eskridgeinc.com/geardrives/gearprodspecs.html>

# Unit Teardown

- 1) Scribe a diagonal line across the outside of the unit from the cover (3) to the base (1) before disassembly to aid in the proper positioning of pieces during reassembly.
- 2) Remove drain plugs (30A, 30B) and drain oil from unit. The oil will drain out more quickly and completely if warm.
- 3) Remove the 12 7/16-20 capscrews (25A) and lockwashers (25G) securing the cover (3).
- 4) Remove the cover (3), thrust washer (14A), and input gear (4). Inspect o-ring (16B); discard if damaged or deformed.
- 5) Lift the primary planet carrier assembly (7) out of the unit. For a single stage unit remove retaining ring (35D) and thrust washer (14C).
- 6) Remove ring gear (12), secondary carrier assembly (5), and thrustwasher (14B). Inspect o-ring (16B), and discard if damaged or deformed.
- 7) The unit is now separated into subassemblies. The area(s) requiring repair should be identified by thorough inspection of the individual components after they have been cleaned and dried.

Replace components as necessary.

- 6) Use pin punch to remove roll pins (5F) from planet shafts (5C).

## Reassembly

- 1) Insert bearings (5D) into planet gear (5B). Place a planet washer (5E) on top and bottom of planet gear and slide into carrier (5A).
- 2) Install planet shaft (5C) with chamfered end of roll pin hole toward outside diameter of the carrier (5A). This will aid in alignment of holes while inserting roll pin (5F)
- 3) Drive roll pin (5F) into the carrier (5A) hole and into the planet shaft (5C) until flush to the outside diameter of the carrier. Repeat for remaining planet gears. Primary Carrier

## Subassembly

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

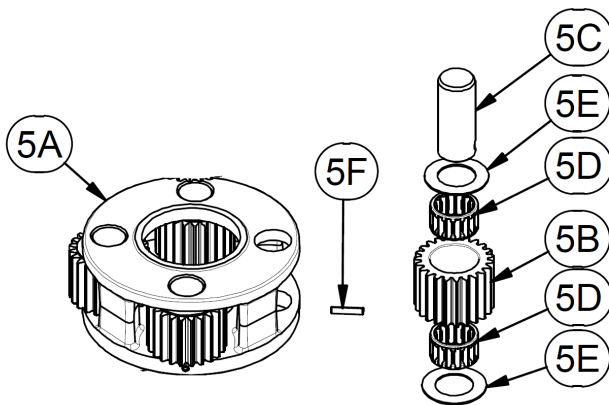
Follow the same procedure as for the secondary carrier assembly. Substitute items as indicated: carrier (7A), planet gears (7B), planet shafts (7C), bearings (7D), thrust washers (7E), and roll pins (7F).

**NOTE:** This does not apply to single-stage units.

## Secondary Carrier

### Subassembly

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

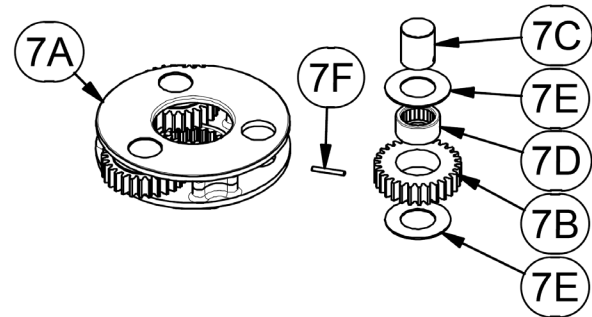


#### Disassembly

- 1) Rotate planet gears (5B) to check for abnormal noise or roughness in bearings (5D) or planet shafts (5C). If further inspection or replacement is required, proceed as follows.

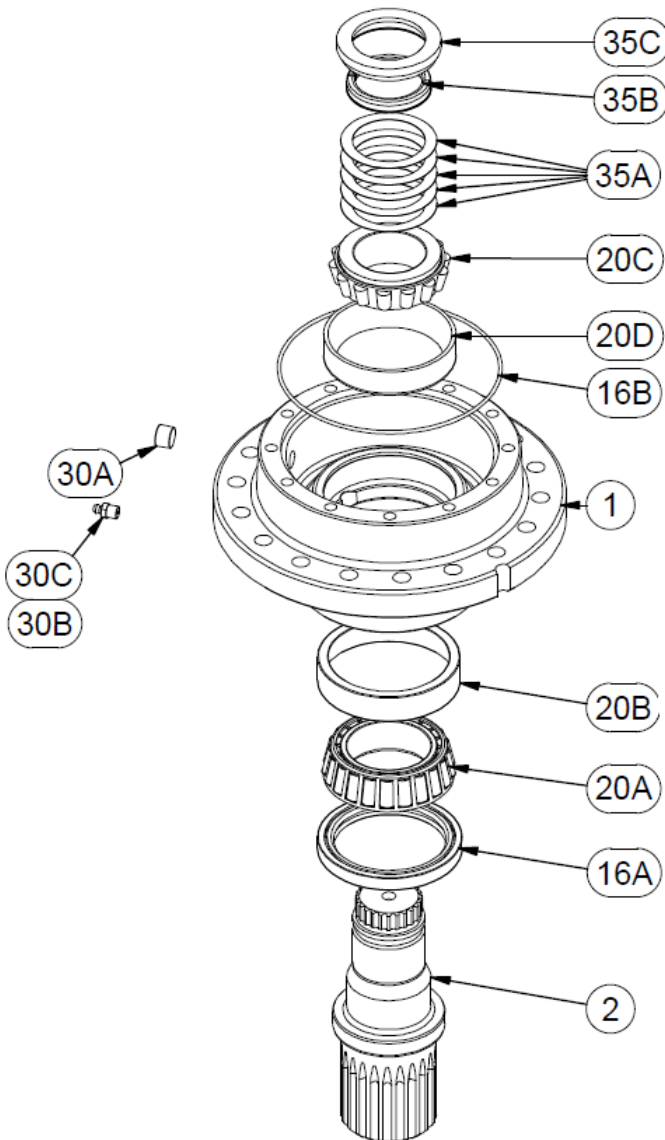
**NOTE:** Support only the carrier (5A) while pressing out planet shafts (5C).

- 2) Drive roll pins (5F) completely into the planet shafts (5C).
- 3) Press or drive planet shafts (5C) out of carrier (5A).
- 4) Remove planet gears (5B), thrust washers (5E), and bearings (5D) from the carrier (5A).
- 5) Inspect the planet gear (5B) bearing bores, planet shafts (5C) and bearings (5D). Check for spalling, bruising or other damage.



# Base Subassembly

(Items 1, 2, 16A, 20A, 20B, 20C, 20D,  
30A, 30B, 30C, 35A, 35B, 35C,)



## Disassembly

- 1) Remove the lock ring (35C) using a heel bar or puller. Be careful not to pry against the bearing cage (20C). Remove split ring segments (35B) and shims (35A).

**Caution:** Since the output shaft is no longer retained, care should be taken to avoid personal injury. Care should also be taken not to damage the shaft while pressing through base.

- 2) Base (1) should be set shaft side down, as shown, on a plate or table. Press output shaft (2) through the bottom of base by applying a load to top end (internal end) of shaft until it passes through inner bearing cone (20C).

- 3) A gear puller or bearing splitter may be used to remove the outer bearing cone (20A) from the shaft (2). If reusing old bearing cone, do not pull on or damage roller cage. Remove the shaft seal (16A) for inspection or replacement.
- 4) Inspect inner and outer bearing cups (20D & 20B). If cups are damaged, drive them out using a brass drift or remove with a puller.

## Reassembly

- 1) Place base (1) (output side up, opposite shown) on the table.
- 2) Apply a layer of lithium or general purpose bearing grease to the roller contact surface of outer bearing cup (20B).
- 3) Press outer bearing cone (20A) (large end down as shown) onto the shaft until it seats against the shoulder.

**Note:** Press bearing cone onto output shaft by pressing on inner race only. DO NOT press on roller cage, as it may damage bearing.

- 4) Place shaft (2) with the outer bearing cone (20A) into base (1).
- 5) Flip this assembly, resting it on the end of the output shaft (2).
- 6) Apply a layer of lithium or general purpose bearing grease to the roller contact surface of the inner bearing cup (20D). Press the inner bearing cone (20C) (large end up as shown) onto the shaft (2) until it is seated against inner bearing cup (20D).
- 7) Prior to installation of the shaft seal (16A), the bearing preload may result in a rolling torque that varies between 50 and 80 in-lb. The bearing preload should be tailored to your application; a low-speed application may require a high pre-load, high-speed applications usually benefit from low pre-load. Adding shims (35A) will increase the pre-load on the bearing set. Determine your pre-load requirement and install shims to obtain this pre-load. Install the Load-N-Lock segments (35B) over the shims and into the groove in the output shaft. With the Load-N-Lock segments firmly installed, place lock ring (35C) over the segments.
- 8) Flip the assembly over. Lubricate inner lip of shaft seal (16A). Use a soft hammer or press tool to install shaft seal until it is flush with the base (1). It should be installed with the open side of the seal toward the inside of the unit.

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

# Unit Assembly

- 1) When all subassemblies are complete, the unit is ready to be assembled.
- 2) Lubricate o-ring **(16B)** and install on the pilot of the base **(1)**.
- 3) Install the secondary carrier assembly **(5)** onto the output shaft **(2)**. Align the splines of the carrier **(5A)** with the splines of the shaft and slide the carrier onto the shaft.
- 4) Align teeth of ring gear **(12)** with planet gear **(5B)** teeth. Place ring gear on base **(1)** and align mounting holes. Use the scribed line made during disassembly for reference.
- 5) Install sun gear **(6)** into carrier assembly **(5)** and thrust washer **(14B)** on top of carrier.
- 6) Install primary carrier assembly **(7)**. Align carrier **(7A)** spline teeth with sun gear **(6)** spline teeth. For single stage install retaining ring **(35D)** and thrust washer **(14C)**.
- 7) Install input gear **(4)** into primary carrier assembly **(7)** and thrust washer **(14A)** on top of carrier **(7A)** and input gear. For single stage install input gear **(4)**.
- 8) Lubricate o-ring **(16B)** and install on cover **(3)** pilot. Noting the scribed line made during disassembly, install the cover.
- 9) Install the hex-head capscrews **(25A)** with lockwashers **(25G)**. **Torque the capscrews to 80 ft-lb dry or 60 ft-lb if the fasteners are lubricated.**
- 10) Ensure the unit spins freely by using a splined shaft to drive the input gear **(4)**.
- 11) Install drain plugs **(30A, 30B)**, using pipe sealant on threads.
- 12) Fill the unit with GL5 EP 80/90 gear oil to the proper level, as specified, using the oil fill hole in the cover **(3)**.

**The gearbox is now ready to use.**