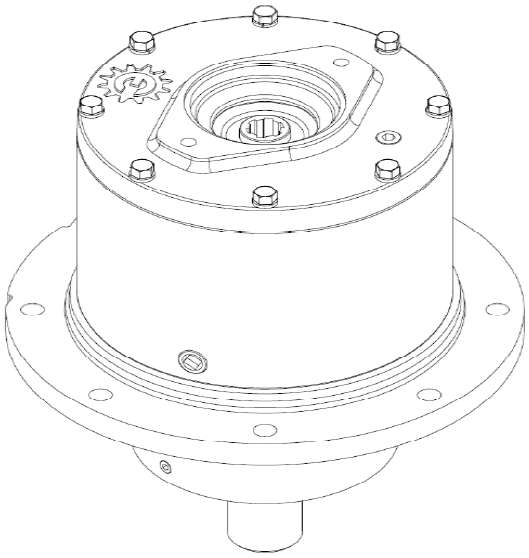
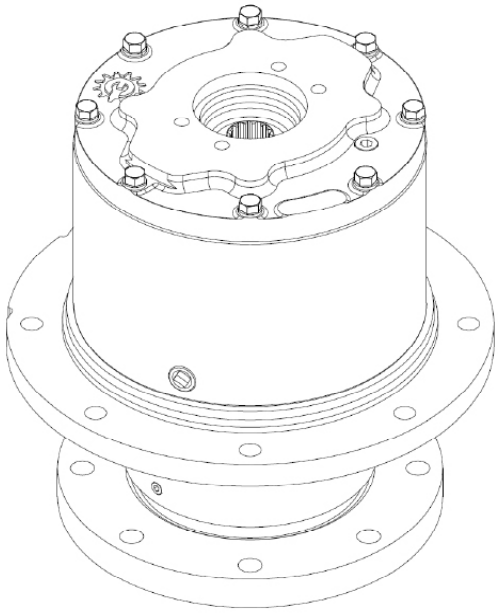
MODEL 100L PLANETARY GEAR DRIVE SERVICE MANUAL





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

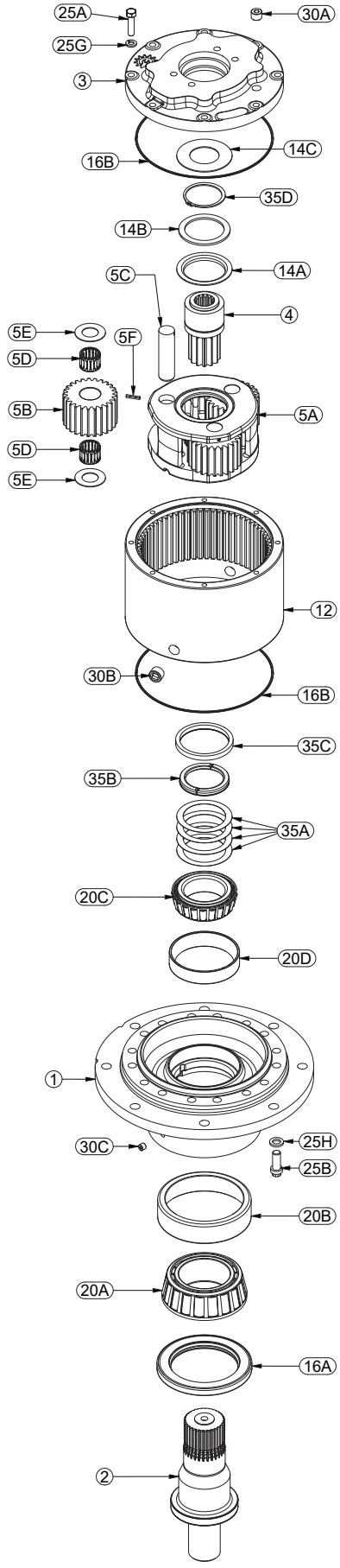
THIS SERVICE MANUAL IS EFFECTIVE:
S/N: 351373 TO CURRENT
DATE: 09/25/2024 TO CURRENT
VERSION: SM100LA2-AA

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.

ESKRIDGE

100L SINGLE STAGE GEAR DRIVE

	GROUP	QTY	MODEL 100L DESCRIPTION	RATIOS 4:01 (4.42:1)	RATIOS 6:1 (6.00:1)
BASE	1	1	A2 - ROUND FLANGE	13-004-3268	
			C- CUSTOM		
OUTPUT SHAFT	2	1	D7 - Ø2.00 X 1/2" KEY	13-004-4681M	
			D8 - Ø3.00 X 5/8" KEY	13-004-4680M	
			D9 - 23T 12/24DP SPLINE X 1.87" LONG	13-004-4679M	
			D10 - 20T 8/16DP SPLINE X 2.12" LONG	13-004-4678M	
			D11 - 23T 8/16DP SPLINE X 2.25" LONG	13-004-4682M	
			S1 - 8X 3/4-16 UNF ON Ø9.500 B.C.	13-004-4202M	
			S2 - 8X Ø.666-.654 ON Ø8.500 B.C.	13-040-4683M	
			S3 - 8X 5/8-11 UNC ON Ø9.500 B.C.	13-004-4666M	
			S4 - 8X 5/8-11 UNC ON Ø7.250 B.C.	13-004-4685M	
			C1 - CUSTOM SHAFT		
COVER	3	1	SAE 'A' 2 & 4 BOLT W/CODE 4	13-004-1252	
			SAE 'B' 2 & 4 BOLT W/ CODE 4	13-004-1202	
			SAE 'C' 2 & 4 BOLT	13-004-1212	
			SAE 'D' 4 BOLT W/ CODE 9	13-004-1412	
INPUT GEAR	4	1	CODE 4 - INPUT 14T 12/24DP	13-004-1372	13-004-1382
			CODE 7 - INPUT 17T 12/24 DP	13-004-1482	13-004-1392
			CODE 9 ** - INPUT 13T 8/16DP	13-004-1402	13-004-1462
	5	(1)	CARRIER ASSEMBLY	13-005-2001	13-005-2011
	5A	1	CARRIER	13-004-1062	13-004-1072
	5B	3	PLANET GEAR	13-004-1082	13-004-1092
	5C	3	PLANET SHAFT	81-004-0061	
	5D	6	PLANET BEARING	01-105-0500	
	5E	6	PLANET THRUST WASHER	81-004-1561	
	5F	3	ROLL PIN	01-153-0210	
	12	1	RING GEAR	81-004-2362	
	14		THRUST WASHERS	----	
	14A	1	CARRIER THRUST WASHER **	81-004-2711	
	14B	1	THRUST RACE **	01-112-0030	
	14C	1	INPUT THRUST WASHER **	81-004-2883	
	16		SEAL KIT	13-016-2101	
	16A	1	SHAFT SEAL	01-405-0690	
	16B	2	O-RING	01-402-0420	
	20		OUTPUT SHAFT BEARINGS	----	
	20A	1	OUTER CONE	01-102-0260	
	20B	1	OUTER CUP	01-103-0260	
	20C	1	INNER CONE	01-102-0030	
	20D	1	INNER CUP	01-103-0030	
	25		HARDWARE	----	
	25A	8	HHCS (3/8 X 1 1/2) **	01-150-1670	
	25B	16	12PT CBORE (1/2 X 1.25)	01-150-1460	
	25G	8	LOCK WASHER **	01-166-0010	
	25H	16	HARD WASHERS	01-166-0120	
	30		PLUGS/GREASE ZERK	----	
	30A	1	PIPE PLUG (3/8 NPT MAGNETIC) **	01-207-0070	
	30B	2	PIPE PLUG (1/2 NPT MAGNETIC)	01-207-0041	
	30C	1	PIPE PLUG (1/8 NPT HOLLOW HEX)	01-207-0030	
			GREASE ZERK 1/8 NPT	01-215-0070	
	35		MISCELLANEOUS	----	
	35A	*	SHIMS	80-004-1151	
	35B	1	SPLIT RING	81-004-8101	
	35C	1	LOCK RING	81-004-8111	
	35D	1	RETAINING RING **	01-160-0040	



GENERIC 100L SINGLE STAGE GEAR DRIVE ECN: - REV: A 02/25/2025 JH

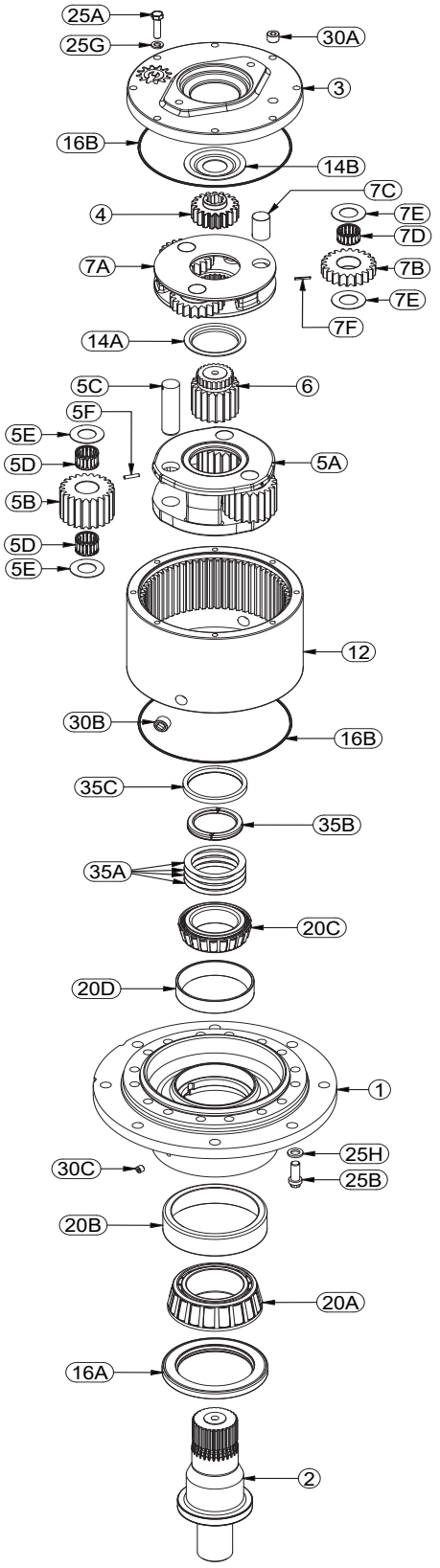
NOTES:

1. *QUANTITY DEPENDANT UPON DESIRED BEARING PRELOAD

2. ** 'D' COVER IS SOLD ONLY W/CODE 9 INPUT AS A SINGLE. REPLACE 14C WITH 01-112-0030, 14B WITH 01-112-0400, 30A WITH 01-207-0041, 25A & 25G WITH (8) 01-150-1710. REMOVE 35D & 14A

100L DOUBLE STAGE GEAR DRIVE

	GROUP	QTY	MODEL 100L DESCRIPTION	RATIOS 19:1 (19.54:1)	26:1 (26.52:1)	33:1 (33.15:)	W/O CODE 4 36:1 (36.00:1)	W/ CODE 4 36:1 (36.00:1)	45:1 (45.00:1)
BASE	1	1	A2 - ROUND FLANGE	13-004-3268					
			C- CUSTOM						
OUTPUT SHAFT	2	1	D7 - Ø2.00 X 1/2" KEY	13-004-4681M					
			D8 - Ø3.00 X 5/8" KEY	13-004-4680M					
			D9 - 23T 12/24DP SPLINE X 1.87" LONG	13-004-4679M					
			D10 - 20T 8/16DP SPLINE X 2.12" LONG	13-004-4678M					
			D11 - 23T 8/16DP SPLINE X 2.25" LONG	13-004-4682M					
			S1 - 8X 3/4-16 UNF ON Ø9.500 B.C.	13-004-4202M					
			S2 - 8X Ø.666-.654 ON Ø8.500 B.C.	13-004-4683M					
			S3 - 8X 5/8-11 UNC ON Ø9.500 B.C.	13-004-4666M					
			S4 - 8X 5/8-11 UNC ON Ø7.250 B.C.	13-004-4685M					
			C1 - CUSTOM SHAFT						
COVER	3	1	SAE 'A' 2 & MOD 4 BOLT	13-004-1192		13-004-1222	13-004-1192	----	13-004-1222
			SAE 'A' 2 & MOD 4 BOLT W/CODE 4	13-004-1252		13-004-1222	----	13-004-1222	
			SAE 'B' 2 BOLT	13-004-1182		13-004-1232	13-004-1182	----	13-004-1232
			SAE 'B' 2 & 4 BOLT W/ CODE 4	13-004-1202		13-004-1232	----	13-004-1232	
			SAE 'C' 2 & 4 BOLT	13-004-1212		13-004-1242	13-004-1212	13-004-1242	
INPUT GEAR	4	1	CODE 2 - INPUT 13T 16/32 DP SPLINE	13-004-1292		13-004-1312	13-004-1302	----	13-004-1312
			CODE 3 - INPUT 1-6" B SPLINE	13-004-1322		13-004-1472	13-004-1332	----	13-004-1472
			CODE 4 - INPUT 14T 12/24 DP SPLINE	13-004-1342		13-004-1362	----	13-004-1352	13-004-1362
			CODE 5 - INPUT 15T 16/32 DP SPLINE	13-004-1452		13-004-1802	13-004-1442	----	13-004-1802
	5	(1)	CARRIER ASSEMBLY - SECONDARY	13-005-2001	13-005-2011	13-005-2001	13-005-2011		
	5A	1	CARRIER - SECONDARY	13-004-1062	13-004-1072	13-004-1062	13-004-1072		
	5B	3	PLANET GEAR - SECONDARY	13-004-1082	13-004-1092	13-004-1082	13-004-1092		
	5C	3	PLANET SHAFT - SECONDARY	81-004-0061					
	5D	6	PLANET BEARING	01-105-0500					
	5E	6	PLANET THRUST WASHER	81-004-1561					
	5F	3	ROLL PIN	01-153-0210					
	6	1	SUN GEAR	13-004-1142	13-004-1152	13-004-1142	13-004-1152		
	7	(1)	CARRIER ASSEMBLY - PRIMARY	13-005-2021		13-005-2041	13-005-2031		13-005-2041
	7A	1	CARRIER - PRIMARY	13-004-1032		13-004-1052	13-004-1042		13-004-1052
	7B	3	PLANET GEAR - PRIMARY	13-004-1102		13-004-1122	13-004-1112		13-004-1122
	7C	3	PLANET SHAFT - PRIMARY	13-004-1021					
	7D	6	PLANET BEARING	01-105-0590					
	7E	6	PLANET THRUST WASHER	81-004-1561					
	7F	3	ROLL PIN	01-153-0180					
	12	1	RING GEAR	81-004-2362					
	14		THRUST WASHERS	----					
	14A	1	CARRIER THRUST WASHER	81-004-2711					
	14B	1	CARRIER THRUST WASHER	----		81-004-2711	----		81-004-2711
	14C	1	CUP WASHER	81-004-2701		----	81-004-2701		----
	14G	2	THRUST RACE	----		01-112-0230	----		01-112-0230
	14L	1	THRUST BEARING	----		01-112-0220	----		01-112-0220
	16	(1)	SEAL KIT	13-016-2101					
	16A	1	SHAFT SEAL	01-405-0690					
	16B	2	O-RING	01-402-0420					
	20		OUTPUT SHAFT BEARINGS	----					
	20A	1	OUTER CONE	01-102-0260					
	20B	1	OUTER CUP	01-103-0260					
	20C	1	INNER CONE	01-102-0030					
	20D	1	INNER CUP	01-103-0030					
	25		HARDWARE	----					
	25A	8	HHCS (3/8 X 1 1/2)	01-150-1670					
	25B	16	12PT CBORE (1/2 X 1.25)	01-150-1460					
	25G	8	LOCK WASHER	01-166-0010					
	25H	16	HARD WASHERS	01-166-0120					
	30		PLUGS/GREASE ZERK	----					
	30A	1	PIPE PLUG (3/8 NPT MAGNETIC)	01-207-0070					
	30B	2	PIPE PLUG (1/2 NPT MAGNETIC)	01-207-0041					
	30C	1	PIPE PLUG (1/8 NPT HOLLOW HEX)	01-207-0030					
			GREASE ZERK 1/8 NPT	01-215-0010					
	35		MISCELLANEOUS	----					
	35A	*	SHIMS	80-004-1151					
	35B	1	SPLIT RING	81-004-8101					
	35C	1	LOCK RING	81-004-8111					

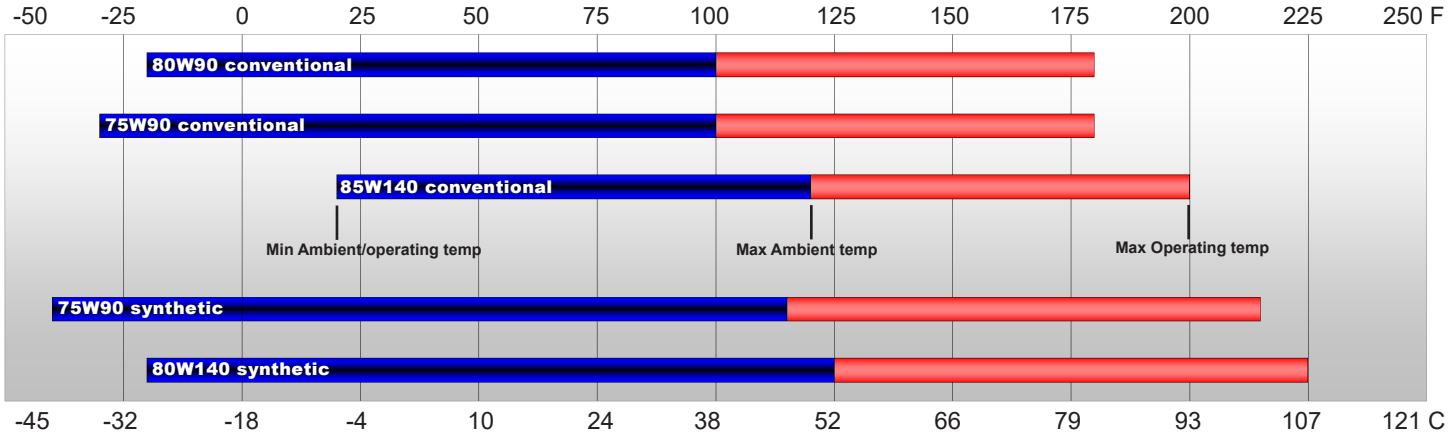


*QUANTITY DEPENDANT UPON DESIRED BEARING PRELOAD
GENERIC 100L DOUBLE STAGE GEAR DRIVE ECN: - REV: A JH

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 100LA2 OIL CAPACITIES

Operating Position	Oil Capacity			Oil Level
	Single stage	Double stage	Triple stage	
Horizontal Shaft	3.0 pt / 1.42 L	3.0 pt / 1.42 L	4.1 pt / 1.94 L	To horizontal centerline of gear drive
Vertical Shaft (Pinion Up)	5.0 pt / 2.37 L	5.0 pt / 2.37 L	6.9 pt / 1.5 L	To side port on gear drive base
Vertical Shaft (Pinion Down)	5.0 pt / 2.37 L	5.0 pt / 2.37 L	6.9 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 eight 3/8-16 capscrews **(25A)** and lockwashers **(25G)** securing the cover **(3)**.

4) Remove the cover **(3)**, thrust washer **(14B or 14G, 14L)**, 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) Only if the ring gear **(12)** needs to be replaced remove the sixteen 1/2-13 capscrews **(25B)** and lockwashers **(25H)** securing the ring gear **(12)**. Remove ring gear **(12)**

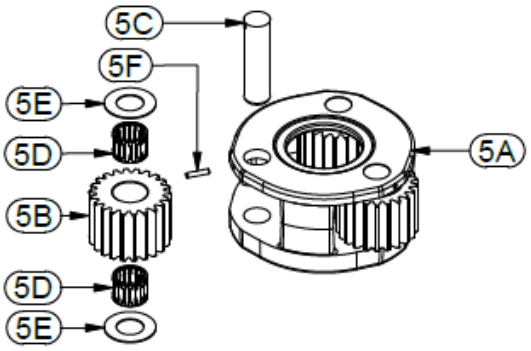
7) For double stage remove sun gear **(6)**.

7) Remove secondary carrier assembly **(5)**, and thrust washer **(14B, or 14A)**. Inspect o-ring **(16B)**, and discard if damaged or deformed.

8) 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.

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. 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)**

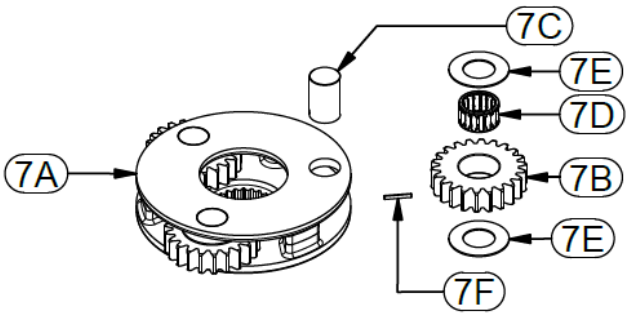
3) Drive roll pin **(5F)** into the carrier **(5A)** hole and into the planet shaft **(5C)** until flush to the outside diameter of the carrier. Repeat for remaining planet gears.

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).

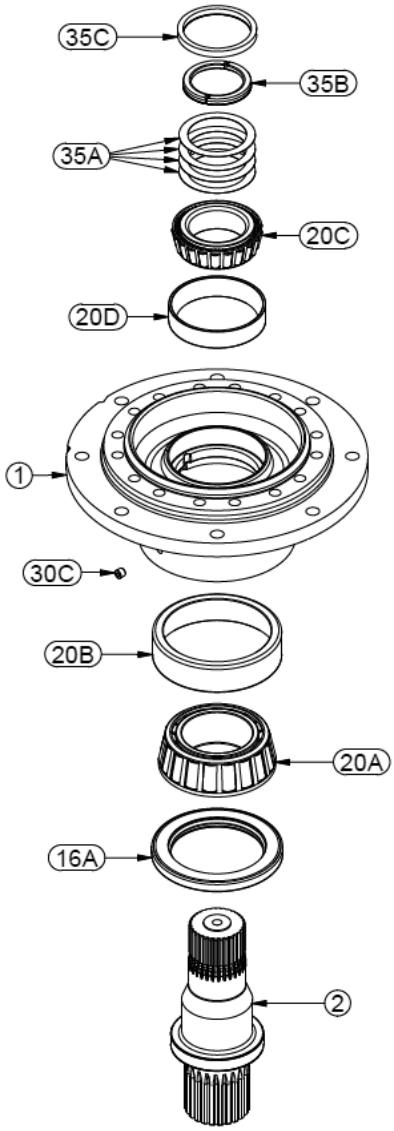
NOTE: This does not apply to single-stage units.



Base Subassembly

(Items 1, 2, 16A, 20A, 20B, 20C, 20D,

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.

Note: Removing the shaft from the base assembly damages the shaft seal (16A) and the seal will need to be replaced.

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 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 **(2)** 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 100 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, press 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..

Caution: Hold ring gear(s) (12) by outside diameter or use lifting device to prevent injury

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 the sixteen 1/2-13 capscrews **(25B)** and lockwashers **(25H)** and torque to **110 ft-lb dry, 80 ft-lb if the fasteners are lubricated.**

5) For two stage install sun gear **(6)** into carrier assembly **(5)** and thrust washer **(14B or 14A, 14B, 14C, 35D if equipped)** 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 **(14B, or 14G, 14L if equipped)** on top of carrier **(7A)**. For single stage install retaining ring **(35D)** and washer and input thrust was **(14C)**.

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 45 ft-lb dry or 35 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.