



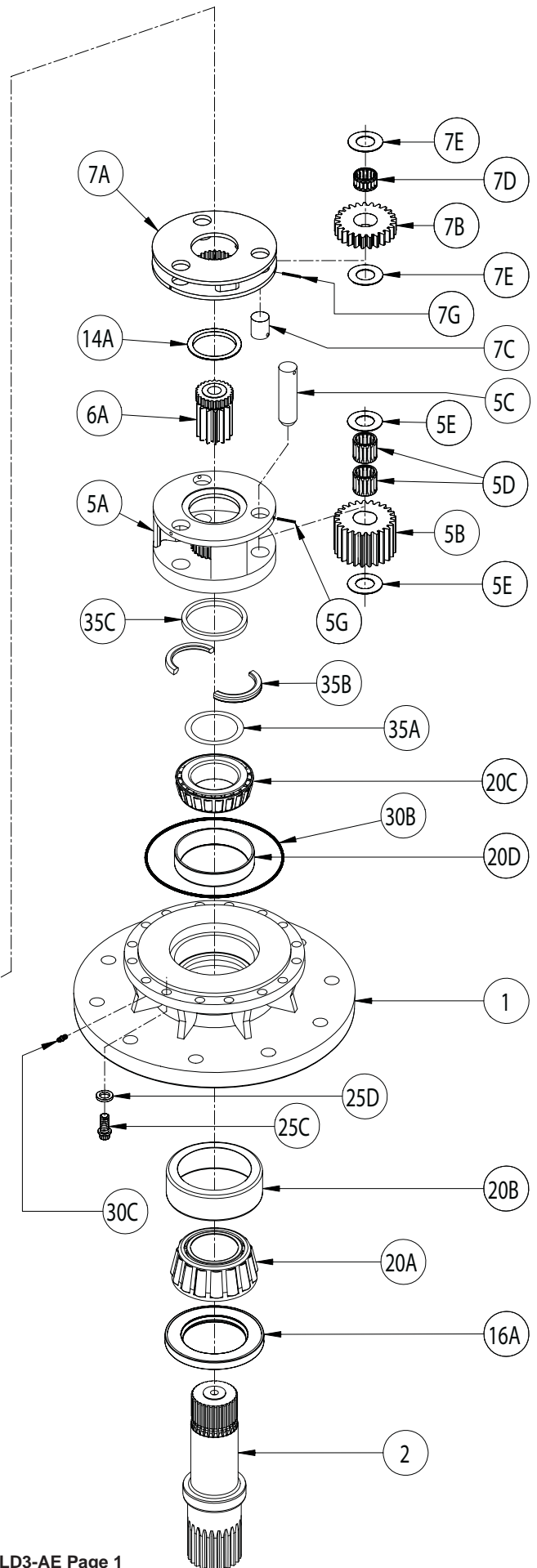
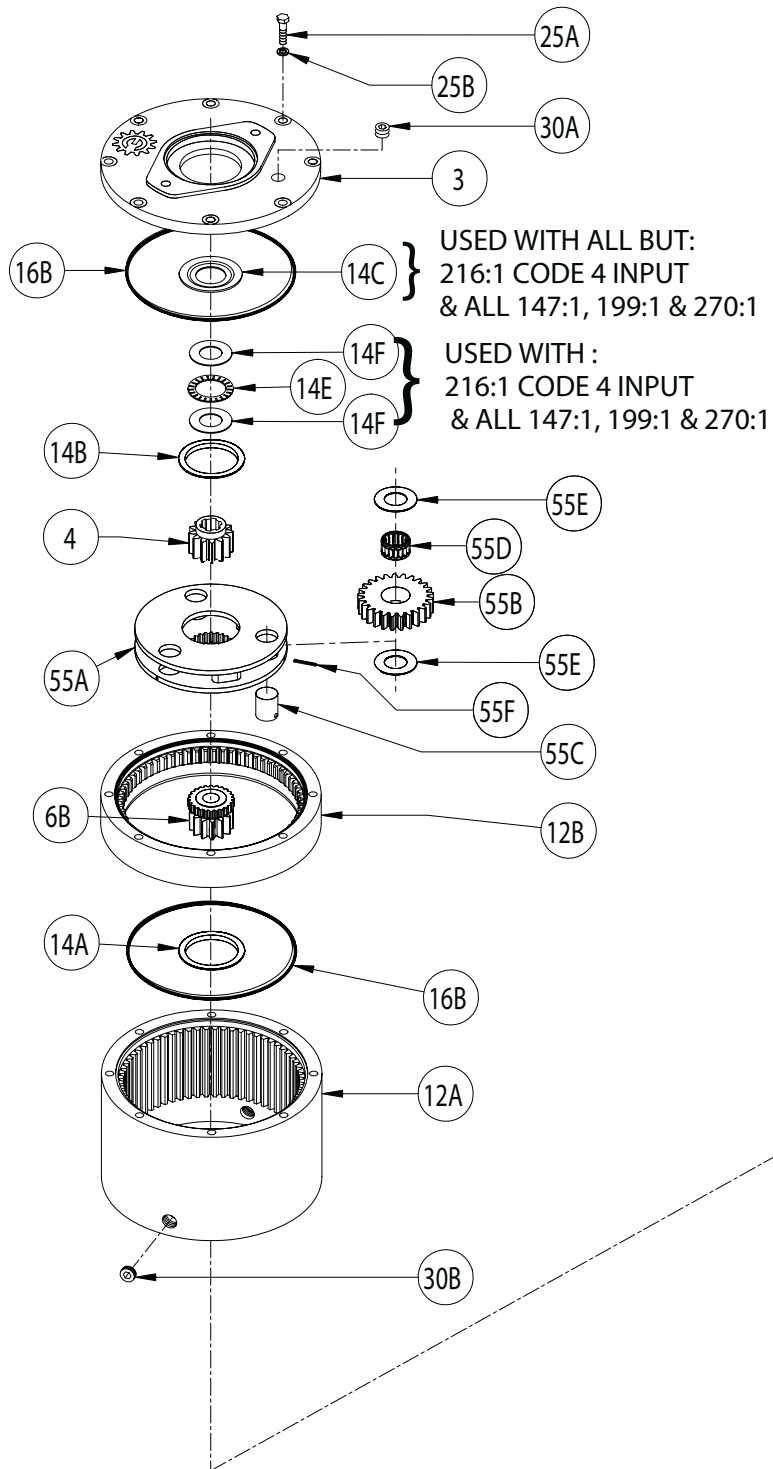
## MODEL 130L TRIPLE PLANETARY GEAR DRIVE SERVICE MANUAL



**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: 43176 TO CURRENT  
DATE: 10/01/99 TO CURRENT  
VERSION: SM130LD3-AE

**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.



**X130LD3-AD,**

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**Effective date 10/01/99**

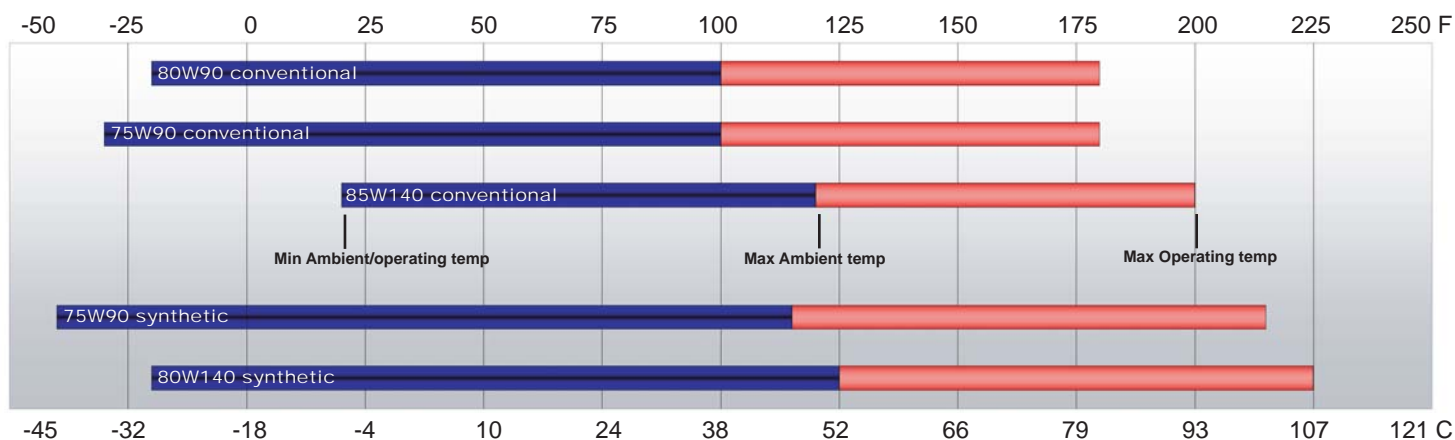
**Effective serial # 43176**

ITEM	QTY	DESCRIPTION	86:1 4.42 4.42 4.42	117.2:1 4.42 6.00 4.42	147:1 7.50 4.42 4.42	159:1 4.42 6.00 6.00	199:1 7.50 6.00 4.42	216:1 6.00 6.00 6.00 W/CODE 4	216:1 6.00 6.00 6.00 W/O CODE 4	270:1 7.50 6.00 6.00
BASE	1	A - ROUND FLANGE				81-004-0342				
		B - SQUARE FLANGE				81-004-0592				
		E - RECTANGULAR FLANGE				81-004-3072				
		F - FLANGELESS				81-004-1142				
		Q - ECCENTRIC				13-004-3072				
OUTPUT SHAFT	2	C1- CUSTOM								
		D1 23 T 8/16 DP SPL 2.25" LG				81-004-1392L				
		D2 3.000" DIA, 5/8" SQ KEY				81-004-0992L				
		D3 23 T 8/16 DP SPL 1.22" LG				81-004-1412L				
		D4 23 T 8/16 DP SPL 2.72" LG				81-004-0942L				
COVER	3	D5 3.500" DIA, 7/8" SQ KEY				81-004-1152L				
		C1 CUSTOM								
		SAE 'A' 2 & MOD. 4 BOLT	13-004-1192	13-004-1222	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	13-004-1252	13-004-1222	13-004-1222		13-004-1222	
		SAE 'B' 2 BOLT	13-004-1182	13-004-1232	13-004-1182	13-004-1232		13-004-1182	13-004-1232	
INPUT GEAR	4	SAE 'B' 2 & 4 BOLT W/ CODE 4	13-004-1202	13-004-1322	13-004-1202	13-004-1232	13-004-1232		13-004-1232	
		SAE 'C' 2 BOLT & 4 BOLT	-----	13-004-1242	13-004-1212	13-004-1242		13-004-1212	13-004-1242	
		CODE 2 - INPUT 13 T 16/32 DP	13-004-1292	13-004-1312	13-004-1292	13-004-1312		13-004-1302	13-004-1312	
		CODE 3 - INPUT SAE 1"-6B	13-004-1322	13-004-1472	13-004-1322	13-004-1472		13-004-1332	13-004-1472	
		CODE 4 - INPUT 14 T 12/24 DP	13-004-1372	13-004-1382	13-004-1342	13-004-1342	13-004-1362	13-004-1352	13-004-1362	
	5	CODE 5 - INPUT 15 T 16/32 DP	-----	13-004-1452	13-004-1452	13-004-1802		13-004-1442	13-004-1802	
		(1) CARRIER ASSY-SECONDARY	13-005-2001		13-005-2011	13-005-2001		13-005-2011		
		5A 1 CARRIER (SEC)	13-004-1062		13-004-1072	13-004-1062		13-004-1072		
		5B 3 PLANET GEAR (SEC)	13-004-1082		13-004-1092	13-004-1082		13-004-1092		
		5C 3 PLANET SHAFT (SEC)			81-004-0061					
	5D	5D 6 BEARING - CAGE & ROLLER			01-105-0500					
		5E 6 THRUST WASHER - PLANET			81-004-1561					
		5G 3 ROLL PIN - SEC. PL. 3/16 X 7/8			01-153-0210					
		6 - SUN GEARS			-----					
		6A 1 SUN GEAR	13-004-1142	13-004-1142	13-004-1142	13-004-1152	13-004-1142	13-004-1152	13-004-1152	
	6B	6B 1 MULTI SUN GEAR	13-004-1162	13-004-1172	13-004-1162	13-004-1172	13-004-1172	13-004-1172	13-004-1172	
		7 (1) CARRIER ASSY-PRIMARY	13-005-2021		13-005-2041	13-005-2041		13-005-2031	13-005-2041	
		7A 1 CARRIER (PRI)	13-004-1032	13-004-1052	13-004-1032	13-004-1052		13-004-1042	13-004-1052	
		7B 3 PLANET GEAR (PRI)	13-004-1102	13-004-1122	13-004-1102	13-004-1122		13-004-1112	13-004-1122	
		7C 3 PLANET SHAFT (PRI)			13-004-1021					
	7D	7D 3 BEARING - CAGE & ROLLER			01-105-0590					
		7E 6 THRUST WASHER - PLANET			81-004-1561					
		7G 3 ROLL PIN - PRI. PL. 1/8 X 7/8			01-153-0180					
		12 - RING GEARS			-----					
		12A 1 PRI RING GEAR			81-004-2362					
	12B	12B 1 MULTI RING GEAR			13-004-1132					
		14 - THRUST WASHERS & THRUST BRGS			-----					
		14A 2 CARRIER THRUST WASHER			81-004-2711					
		14B 1 CARRIER THRUST WASHER	-----	81-004-2711	-----	81-004-2711	81-004-2711	-----	81-004-2711	
		14C 1 INPUT FORM WASHER	81-004-2701	-----	81-004-2701	-----	-----	81-004-2701	-----	
	14D	14D 1 THRUST WASHER SGL PL	01-112-0030							
		14E 1 BEARING	-----		01-112-0220	-----	01-112-0220	01-112-0220	-----	01-112-0220
		14F 2 THRUST RACE	-----		01-112-0230	-----	01-112-0230	01-112-0230	-----	01-112-0230
		16 (1) SEAL KIT			13-016-2061	CONTAINS ITEMS 16A, 16B				
		16A 1 SHAFT SEAL			01-405-0270					
	16B	16B 3 O-RING			01-402-0420					
		20 - OUTPUT SHAFT BEARINGS			-----					
		20A 1 OUTER CONE			01-102-0020					
		20B 1 OUTER CUP			01-103-0020					
		20C 1 INNER CONE			01-102-0030					
	20D	20D 1 INNER CUP			01-103-0030					
		25 - HARDWARE			-----					
		25A 8 BOLTS - COVER			01-150-1670					
		25B 8 LOCKWASHERS - COVER			01-166-0010					
		25C 16 BOLTS - RING			01-150-1460					
	25D	25D 16 HARD WASHERS - RING			01-166-0120					
		30 - PLUGS /GREASE ZERK			-----					
		30A 1 PLUG - COVER			01-207-0070					
		30B 2 PLUG - RING			01-207-0041					
		30C 1 1/4 NPT (SOC. HD.)			01-207-0020					
	35	GREASE FITTING			01-215-0040					
		MISCELLANEOUS			-----					
		35A * SHIMS	80-004-1151	( * QUANTITY DETERMINED BY PRELOAD REQUIRED AND PART STACK-UP)						
		35B 1 SPLIT RING			81-004-8101					
		35C 1 LOCK RING			81-004-8111					
	55	(1) CARRIER ASSY-(PRI)-MULTIPLE	13-005-2021	13-005-2021	13-005-2041	13-005-2021	13-005-2041	13-005-2031	13-005-2031	13-005-2041
		55A 1 CARRIER (PRI)	13-004-1032	13-004-1032	13-004-1052	13-004-1032	13-004-1052	13-004-1042	13-004-1042	13-004-1052
		55B 3 PLANET GEAR (PRI)	13-004-1102	13-004-1102	13-004-1122	13-004-1102	13-004-1122	13-004-1112	13-004-1112	13-004-1122
		55C 3 PLANET SHAFT (PRI)			13-004-1021					
		55D 3 BEARING - PRI. PL. ROLLER			01-105-0590					
	55E	55E 6 SPACER WASHER - PLANET			13-004-1592					
		55F 3 ROLL PIN - PRI. PL. 1/8 X 7/8			01-153-0180					

## 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 130L OIL CAPACITIES

Operating Position		Oil Capacity	Oil Level	
		Single/Double stage		
	Horizontal Shaft	4.1 pints / 1.9 l	To horizontal centerline of gear drive	
	Vertical Shaft (Pinion Up)	6.9 pints / 3.25 l	To side port on gear drive base	
	Vertical Shaft (Pinion Down)	6.9 pints / 3.25 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 (30B) and drain oil from unit. The oil will drain out more quickly and completely if warm.
- 3) Remove the 8 3/8-16 cap-screws (25A) and lockwashers (25B).
- 4) Remove the cover (3), thrust washer(s)/bearing(s) (14C or 14E & 14F OR 14B, 14C, 14D & 35D), and input gear (4). Inspect o-ring (16B); discard if damaged or deformed.
- 5) Lift the top planet carrier (55) assembly out of the unit.
- 6) Remove the multi-ring gear (12B) and inspect O-ring (16B). Again, replace if damaged or deformed.
- 7) Remove the cup washer (14A) and the middle planet carrier assembly (7).
- 8) Remove the cup washer (14A) and the secondary carrier assembly (5). Remove ring gear (12A), if necessary by removing the 16 1/2-13 12-point cap-screws (25C & 25D). Inspect the gear to base O-ring (16B); as before, discard if damaged or deformed.
- 9) The unit is now disassembled into groups of parts. The area(s) requiring repair should be identified by thorough inspection of the individual components after they have been cleaned and dried.

## Carrier Assembly Teardown

**Note for the carrier sets, Stage I refers to the top-most carrier set (nearest the motor), Stage II refers to the next lower and Stage III refers to the "bottom" (nearest the output shaft).**

Rotate planet gears (55F Stg I/7B Stg II/5B Stg III) to check for abnormal noise or roughness in bearings (55D Stg I/7D Stg II/5D Stg III). If further inspection or replacement is required, proceed as follows.

- 1) Drive roll pins (55F Stg I/7F Stg II/5F Stg III) completely into the planet shafts (55C Stg I/7C Stg II/5C Stg III).
- 2) Slide planet shafts (55C Stg I/7C Stg II/5C Stg III) out of carrier (55A Stg I/7A Stg II/5A Stg III).
- 3) Remove planet gears (55B Stg I/7B Stg II/5B Stg III), washers (55E Stg I/7E Stg II/5E Stg III) and bearings (55D Stg I/7D Stg II/5D Stg III) from carrier (55A Stg I/7A Stg II/5A Stg III).
- 4) Inspect the planet gear (55B Stg I/7B Stg II/5B Stg III), bearing bore and planet shaft (55C Stg I/7C Stg II/5C Stg III) and bearings (55D Stg I/7D Stg II/5D Stg III). Check for spalling, bruising or other damage and replace components as necessary.
- 5) Remove roll pins (55F Stg I/7F Stg II/5F Stg III) from planet shafts (55C Stg I/7C Stg II/5C Stg III) using a 1/16 pri/ 3/16 sec inch pin punch.

## Carrier Reassembly

- 1) Insert the bearings (55D Stg I/7D Stg II/5D Stg III) into the planet gears (55B Stg I/7B Stg II/5B Stg III). Place a planet washer (55E Stg I/7E Stg II/5E Stg III) on top and bottom of planet gear and slide into carrier (55A Stg I/7A Stg II/5A Stg III).
- 2) Planet shafts (55C Stg I/7C Stg II/5C Stg III) should be installed with chamfered end of 1/16 pri/3/16 sec inch roll pin hole towards out-side diameter of carrier (55A Stg I/7A Stg II/5A Stg III); this will ease alignment of holes while inserting roll pins (55F Stg I/7F Stg II/5F Stg III).
- 3) Drive roll pin (55F Stg I/7F Stg II/5F Stg III) into the carrier hole and into planet shaft to retain parts. Repeat for remaining planet gears.

## Base Subassembly Teardown

- 1) Remove the lock ring (35C) using a heel bar or puller; if using a heel bar, be sure not to pry against the cage of the inner output shaft bearing (20C). Remove the split ring segments (35B) and shims (35A).

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

**Note: Removing the shaft from the base assembly damages the shaft seal and the seal will need to be replaced.**

- 2) Place base (1) external side down, on a plate or table. Press output shaft out bottom of base by applying a load to internal end of shaft until it passes through inner shaft bearing cone (20C).
- 3) A gear puller 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) Lubricate inner lip of new shaft seal (16A) and slide it onto the shaft (2) until it fits snugly over the shaft seal diameter with the open side toward the inside of the gear drive.

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

- 5) Inspect inner and outer bearing cups (20D & 20B). If cups are damaged, drive them out using a brass drift and utilizing the bearing knock-out notches in the base (1)

## Base Reassembly

- 1) Clean all foreign material from any magnetic oil plugs located on base (1).
- 2) Place base (1) exterior side up on work table.
- 3) Apply a layer of lithium or general purpose bearing grease to the roller contact surface of outer bearing cup (20B).



- 4) Press outer bearing cone **(20A)** onto the shaft until it seats against the shoulder.
- 5) Place the shaft **(2)** with the bearing **(20A)** into the base **(1)**.
- 6) Flip shaft/base assembly, and apply lithium or general purpose bearing grease to roller contact surface of the inner cup **(20D)**., then press inner bearing cone **(20C)** onto shaft **(2)** until it seats against inner bearing cup **(20D)**.
- 7) Prior to installation of the shaft seal **(16A)**, the pre-load may result in a rolling torque which varies between 50 to 350 in-lb. The bearing preload should be tailored to your application; a low-speed application may require a high pre-load, while 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 (35A) and into the groove in the shaft (2). Finally, install the lock ring (35C) over the segments (35B).**

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

## Unit Reassembly

- 1) Install the secondary carrier assembly onto the output shaft; align the splines of the carrier **(5A)** with the output shaft **(2)** splines and slide the carrier onto the shaft.
- 2) Lubricate O-ring(s) **(16B)** and install on the base **(1)** pilot and cover **(3)**.

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

- 3) Align gear teeth of secondary ring gear **(12A)** with the gear teeth of the planet gears **(5B)** and place on base., then align mounting holes of ring gear with holes in base **(1)**. Use the scribed line made during disassembly for reference.
- 4) Install and torque the 16 1/2-13 12-point-head cap-screws **(25C)** with hard washers **(25B)**. The torque for the cap-screws: **110 ft-lb dry, 90 ft-lb** if the fasteners are lubricated.
- 5) Install the sun gear **(6A)** into the secondary carrier assembly and insert one of the cup washers **(14A)** into the center of the carrier. Install the mid-primary carrier assembly **(7)** onto the sun **(6A)** splines.
- 6) Install the multi-sun gear **(6B)** into the mid-primary carrier assembly **(7)** and install a cup washer **(14A)** into the center of the carrier **(7A)**.
- 7) Lubricate O-ring **(16B)** and install on the multi-primary ring gear **(12B)**.
- 8) Install the input gear **(4)** into the top primary carrier assembly **(55)**.
- 9) Install the thrust bearing set **(Either 14C or 14E & 14F or 14B,**

**14C, 14D & 35D)** Refer to exploded view for details.

- 10) Noting the scribed line made during disassembly, (with lubricated o-ring in place) align and install the cover **(3)**. Install the 8 3/8-16 hex-head cap-screws and lockwashers **(25A and 25B)**. Tighten to a torque of **45 ft-lb dry, 35 ft-lb** if the fasteners are lubricated.
- 11) Using a splined shaft to drive the input gear **(4)** ensure that the unit spins freely.
- 12) Fill the unit to the proper level, as specified, with recommended gear oil (refer to chart, page 3) after unit is sealed with brake and/or motor.

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