



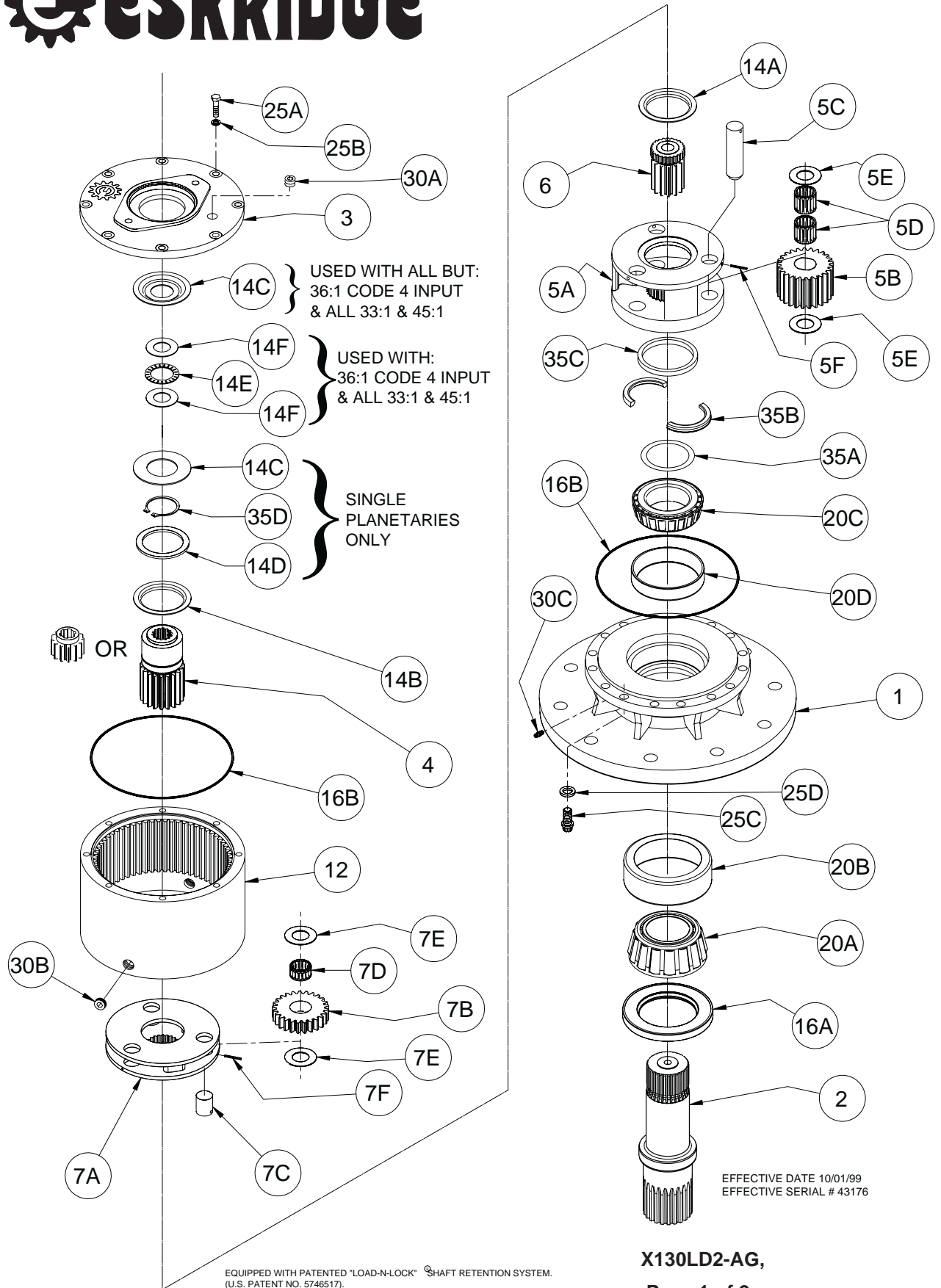
## MODEL 130L PLANETARY GEAR DRIVE SERVICE MANUAL



**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: SM130LD2-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.



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







**Effective date 10/01/99**

**Effective serial # 43176**

X130LD2-AG DATE 11-05-07

ECN 2781

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ITEM	QTY	DESCRIPTION	RATIO'S		SGL PLANETARY		DOUBLE PLANETARY							
														
BASE	1	1	A130 - ROUND FLANGE											81-004-0342
			B130 - SQUARE FLANGE											81-004-0592
			E130 - RECTANGULAR											81-004-3072
			F130 - FLANGELESS											81-004-1142
			C130 - CUSTOM											
OUTPUT SHAFT	2	1	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
			D5 3.500" DIA, 7/8" SQ KEY											81-004-1152L
COVER	3	1	SAE 'A' 2 & MOD. 4 BOLT				13-004-1192	13-004-1192	13-004-1222		13-004-1222	13-004-1192	13-004-1222	
			SAE 'A' 2 & MOD. 4 BOLT W/ CODE 4	13-004-1252			13-004-1252	13-004-1252	13-004-1222	13-004-1222		13-004-1192	13-004-1222	
			SAE 'B' 2 BOLT				13-004-1182	13-004-1182	13-004-1232		13-004-1182	13-004-1232	13-004-1182	13-004-1232
			SAE 'B' 2 & 4 BOLT W/ CODE 4	13-004-1202			13-004-1202	13-004-1202	13-004-1232	13-004-1232		13-004-1232	13-004-1232	13-004-1232
			SAE 'C' 2 BOLT & 4 BOLT	13-004-1212			13-004-1212	13-004-1212	13-004-1242	13-004-1242	13-004-1212	13-004-1242	13-004-1212	13-004-1242
INPUT GEAR	4	1	SAE 'D' 4 BOLT W/ CODE 9 **	13-004-1412										
			CODE 2 - INPUT - 13 T 16/32 DP				13-004-1292	13-004-1292	13-004-1312		13-004-1302	13-004-1312	13-004-1302	13-004-1312
			CODE 3 - INPUT - SAE 1"-6B				13-004-1322	13-004-1322	13-004-1472		13-004-1332	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	13-004-1352	13-004-1362
			CODE 5 - INPUT - 15 T 16/32 DP				13-004-1452	13-004-1452	13-004-1802		13-004-1442	13-004-1802	13-004-1442	13-004-1802
	5	(1)	CARRIER ASSEMBLY-SECONDARY	13-005-2001	13-005-2011		13-005-2001	13-005-2001	13-005-2001	13-005-2011	13-005-2011	13-005-2011	13-005-2011	13-005-2011
			5A 1 CARRIER (SEC)	13-004-1062	13-004-1072		13-004-1062	13-004-1072	13-004-1062	13-004-1072	13-004-1072	13-004-1072	13-004-1072	13-004-1072
			5B 3 PLANET GEAR (SEC)	13-004-1082	13-004-1092		13-004-1082	13-004-1092	13-004-1082	13-004-1092	13-004-1092	13-004-1092	13-004-1092	13-004-1092
			5C 3 PLANET SHAFT (SEC)											81-004-0061
			5D 6 BRG - SEC. PL.											01-105-0500
	6	1	THRUST WASHER - PLANET											81-004-1561
			5E 6 THRUST WASHER - PLANET											01-153-0210
			5F 3 ROLL PIN - SEC. PL. 3/16 X 7/8											01-153-0210
			SUN GEAR				13-004-1142	13-004-1152	13-004-1142	13-004-1152	13-004-1152	13-004-1152	13-004-1152	13-004-1152
			(1) CARRIER ASSEMBLY-PRIMARY				13-005-2021	13-005-2021	13-005-2041	13-005-2031	13-005-2031	13-005-2031	13-005-2041	13-005-2041
	7	1	CARRIER (PRI)				13-004-1032	13-004-1032	13-004-1052	13-004-1042	13-004-1042	13-004-1042	13-004-1052	13-004-1052
			7B 3 PLANET GEAR (PRI)				13-004-1102	13-004-1102	13-004-1122	13-004-1112	13-004-1112	13-004-1112	13-004-1122	13-004-1122
			7C 3 PLANET SHAFT (PRI)											13-004-1021
			7D 3 BRG - PRI. PL.											01-105-0590
			7E 6 THRUST WASHER - PLANET											81-004-1561
	7	3	ROLL PIN - PRI. PL. 1/8 X 7/8											01-153-0180
			RING GEAR											81-004-2362
			12 1 RING GEAR											81-004-2362
			14 -- THRUST WASHERS & THRUST BRGS											----
			14A 1 CARRIER THRUST WASHER											81-004-2711
	14	1	CARRIER THRUST WASHER	81-004-2711					81-004-2711	81-004-2711			81-004-2711	81-004-2711
			14B 1 CARRIER THRUST WASHER	81-004-2711					81-004-2711	81-004-2711			81-004-2711	81-004-2711
			14C 1 INPUT THRUST WASHER	81-004-2883			81-004-2701	81-004-2701				81-004-2701		81-004-2701
			14D 1 THRUST WASHER SGL PL	01-112-0030										01-112-0030
			14E 1 BEARING						01-112-0220	01-112-0220			01-112-0220	01-112-0220
	14	2	THRUST RACE						01-112-0230	01-112-0230			01-112-0230	01-112-0230
			16 (1) SEAL KIT											81-016-2941
			16A 1 SHAFT SEAL -											01-405-0270
			16B 2 O-RING											01-402-0420
			20 --- OUTPUT SHAFT BEARINGS											-----
	20	1	OUTER CONE											01-102-0020
			20B 1 OUTER CUP											01-103-0020
			20C 1 INNER CONE											01-102-0030
			20D 1 INNER CUP											01-103-0030
			25 --- HARDWARE											-----
	25	8	BOLTS - COVER				01-150-1670							(FOR 13-004-1402 COVER, USE 01-150-1710 SHCS)
			25B 8 LOCKWASHERS - COVER				01-166-0010							(FOR 13-004-1402 COVER, DO NOT USE LOCKWASHERS)
			25C 16 BOLTS - RING											01-150-1460
			25D 16 HARD WASHERS - RING											01-166-0120
			30 --- PLUGS/GREASE ZERK											-----
	30	1	PLUG - COVER											01-207-0070
			30B 2 PLUG - RING											01-207-0041
			30C 1 1/4 NPT (SOC. HD.)											01-207-0020
			GREASE FITTING											01-215-0040
			35 MISCELLANEOUS											-----
	35	★	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
			35D 1 RETAINING RING	01-160-0040										-----
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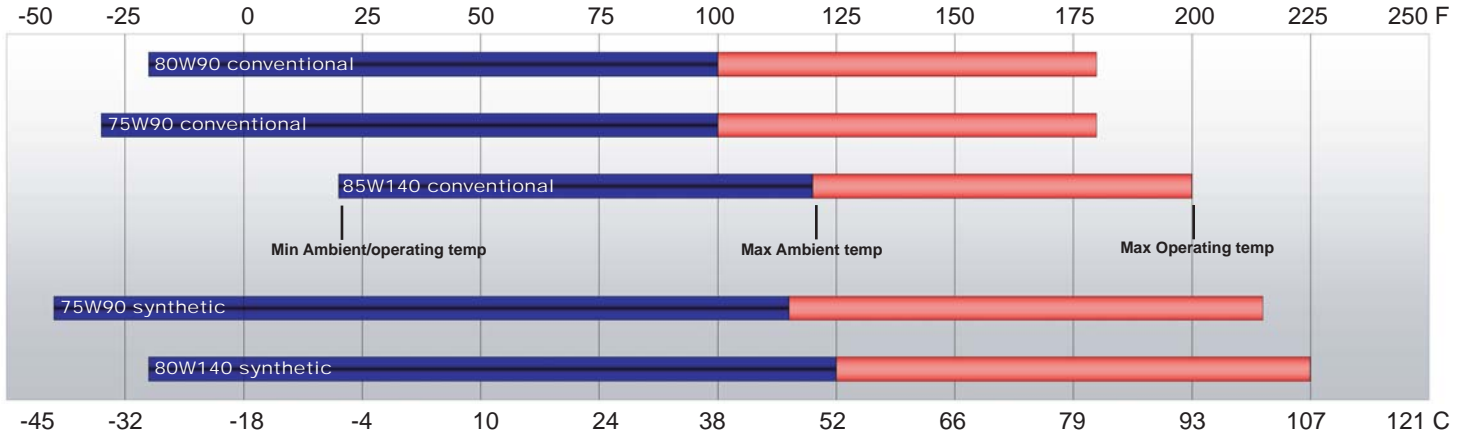
★ ★ SAE "D" COVER IS SOLD ONLY WITH A CODE 9, 13 T- 8/16 INPUT GEAR.

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## 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	3.0 pints / 1.4 l	To horizontal centerline of gear drive	
	Vertical Shaft (Pinion Up)	5.0 pints / 2.4 l	To side port on gear drive base	
	Vertical Shaft (Pinion Down)	5.0 pints / 2.4 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 planet carrier assembly out of the unit .
- 6) Remove secondary carrier assemblie. Remove ring gear (12), 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.
- 7) 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

Rotate planet gears (7B pri/5B sec) to check for abnormal noise or roughness in bearings (7D pri/5D sec). If further inspection or replacement is required, proceed as follows.

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

## Carrier Reassembly

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

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

- 3) Align gear teeth of secondary ring gear (12) with the gear teeth of the planet gears (5B) and place on base., then align mounting holes of ring gear with holes in base. Use the scribed line made during disassembly for reference.
- 4) Install and torque the 16 1/2-13 12-point counter-sunk 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 primary carrier assembly and sun gear (6) into the secondary carrier.
- 6) Install the input gear (4).
- 7) Install the thrust bearing set (**Either 14C or 14E & 14F or 14B, 14C, 14D & 35D**) Refer to exploded view for details.
- 8) 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.
- 9) Using a splined shaft to drive the input gear (4) ensure that the unit spins freely.
- 10) 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.**