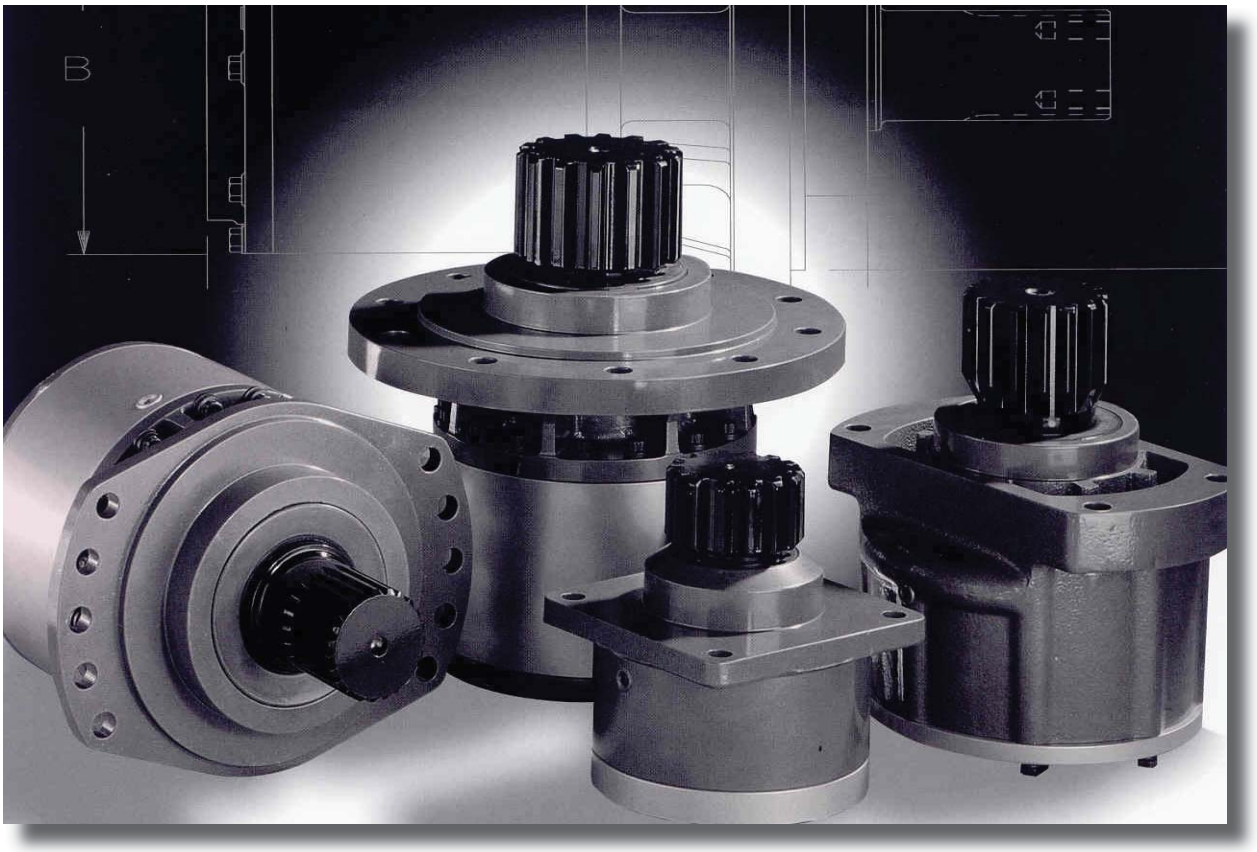
ESKRIDGE

MODEL 50LG 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: 38489# TO CURRENT
DATE: 12-16-98 TO CURRENT
VERSION: SM50LGD2-AE

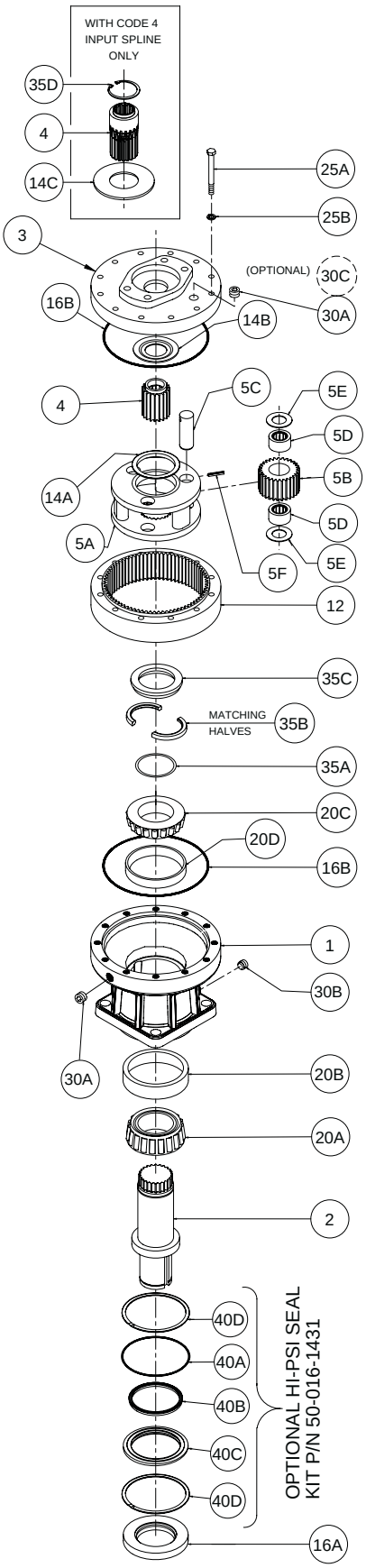
NOTE: Individual customer specifications (mounting case, output shaft, brake assembly, etc.) may vary from exploded drawing and standard part numbers shown. If applicable, refer to customer drawing for details.

ESKRIDGE MODEL 50LG

SINGLE PLANETARY

EFFECTIVE
FROM: S/N 16130 07-01-93
TO: (CURRENT)

	4:1 RATIO 4.08	5:1 RATIO 5.05 WITHOUT CODE 4 INPUT SPLINE	5:1 RATIO 5.05 WITH CODE 4 INPUT SPLINE	QTY.	ITEM	CODE	DESCRIPTION
	50-004-3213			1	1		"G" BASE- SAE 'C' MNT
							CUSTOM
SHAFTS	50-004-4272L			1	2	D1	2"DIA SHAFT-3/8" KEYWAY
	50-004-4282L					D2	23T 12/24 D.P. SPLINE
	50-004-4242L					D3	2-1/4"DIA SHAFT-1/2" KEYWAY
	50-004-4252L					D4	16T 8/16 D.P. SPLINE
	50-004-4262L					D5	17T 12/24 D.P. SPLINE
	50-004-4302L					D6	17T 12/24 D.P. SPLINE- LONG DROP (3")
	50-004-4322L					D7	2" DIA SHAFT-1/2" KEYWAY
	50-004-4512L					D8	16T 8/16 D.P. SPLINE
						C1	CUSTOM
COVERS	50-004-1173			1	3	A	COVER-SAE 'A'
	50-004-1183					B	COVER-SAE 'B' 2-BOLT
	50-004-1233					C	COVER-SAE 'C' 4-BOLT
	50-004-1333					K	COVER-SAE 'C' 2-BOLT
INPUT GEARS	85-004-1382	85-004-1392		1	4	2	INPUT GEAR 13T 16/32 DP SPLINE
	85-004-1272	85-004-1262				3	INPUT GEAR SAE 1"-6B SPLINE
	85-004-1292		50-004-1112			4	INPUT GEAR14T 12/24 DP SPLINE
	85-004-1562	85-004-1572				5	INPUT GEAR 15T 16/32 DP SPLINE
	85-004-1592					6	INPUT GEAR 1" DIA X .25 KEY
	50-005-2041	50-005-2031		1	5	CARRIER ASSEMBLY	
	50-004-1062	50-004-1052		1	5A		PLANET THRUST WASHER
	85-004-1051	85-004-1041		3	5B		PLANET GEAR
	71-004-0121	71-004-0121		3	5C		PLANET SHAFT
	01-105-0010	01-105-0010		6	5D		PLANET BEARING
	85-004-1181	85-004-1181		6	5E		PLANET THRUST WASHER
	01-153-0210	01-153-0210		3	5F		ROLL PIN 3/16 X 7/8
	50-004-1033		50-004-1023	1	12		RING GEAR
	50-004-1011	50-004-1011		1	14A		CARRIER THRUST WASHER
	50-004-1091	50-004-1091		1	14B		INPUT THRUST WASHER
			81-004-2883	1	14C		THRUST WASHER
	85-016-0601			-	16		SEAL KIT (1 SEAL, 2 O-RINGS)
	01-405-0530			1	16A		SEAL
	01-402-0560			2	16B		O-RING
	01-102-0140			1	20A		BEARING CONE (OUTER)
	01-103-0130			1	20B		BEARING CUP (OUTER)
	01-102-0150			1	20C		BEARING CONE (INNER)
	01-103-0140			1	20D		BEARING CUP (INNER)
	01-150-1540		01-150-1550	12	25A		HEX CAPSCREW 7/16-20 GR8
	01-166-0340			12	25B		LOCKWASHER 7/16 MED
	01-207-0070			2	30A		PIPE PLUG-MAGNETIC 3/8 NPT-SOC HD
	01-207-0020			1	30B		PIPE PLUG 1/4 NPT-SOC HD
	01-215-0040			(1)	30B		GREASE FITTING (OPTIONAL)
	01-216-0070			(1)	30C		AIR VENT 3/8 NPT (OPTIONAL)
	01-207-0030			(1)	30D		PIPE PLUG (C AND K COVER ONLY) 1/8 NPT
	50-004-1521			*	35A		SHIM(S)
	50-004-1452			1	35B		SPLIT RING (MATCHING HALVES)
	50-004-1462			1	35C		LOCK RING
			01-160-0350	1	35D		RETAINING RING (5:1 W/ CODE 4 INPUT)
	50-016-1431			-	40		HIGH PSI SEAL KIT (INCLUDES 40A, B, C, D)
	01-402-0720			(1)	40A		O-RING
	01-412-0050			(1)	40B		SEAL - HIGH PRESSURE
	50-004-1422			(1)	40C		CARRIER - HIGH PRESSURE SEAL
	01-160-0630			(2)	40D		HELICAL RETAINING RING



NOTES:
* BEARING PRELOAD DETERMINES QUANTITY OF SHIMS.

X50LGD1-AE,

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Effective date 12-16-98

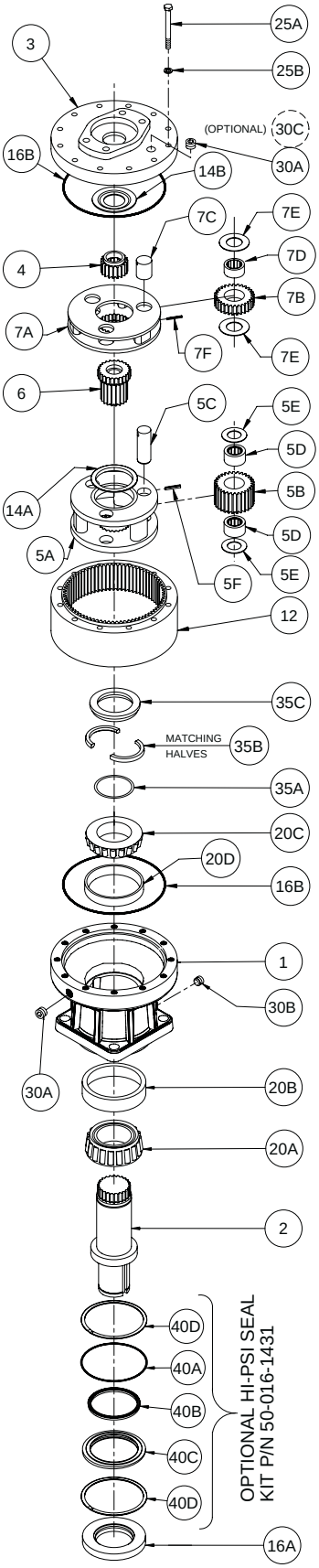
Effective serial # 38489

ESKRIDGE MODEL 50LG

DOUBLE PLANETARY

EFFECTIVE
FROM: S/N 38000 11-01-98
TO: (CURRENT)

	16.65:1 (4.08 / 4.08) PART NUMBER	20.62:1 (5.05 / 4.08) PART NUMBER	25.53:1 (5.05 / 5.05) PART NUMBER	20.62:1 (4.08 / 5.05) INVERTED PART NUMBER	QTY.	ITEM	CODE	DESCRIPTION
	50-004-3213				1	1	A	"G" BASE- SAE 'C' MNT
							C	CUSTOM
SHAFTS	50-004-4272L				1	2	D1	2"DIA SHAFT-3/8" KEYWAY
SHAFTS	50-004-4282L						D2	23T 12/24 D.P. SPLINE
SHAFTS	50-004-4242L						D3	2-1/4"DIA SHAFT-1/2" KEYWAY
SHAFTS	50-004-4252L						D4	16T 8/16 D.P. SPLINE
SHAFTS	50-004-4262L						D5	17T 12/24 D.P. SPLINE
SHAFTS	50-004-4302L						D6	17T 12/24 D.P. SPLINE- LONG DROP (3")
SHAFTS	50-004-4322L						D7	2" DIA SHAFT-1/2" KEYWAY
SHAFTS	50-004-4512L						D8	16T 8/16 D.P. SPLINE
SHAFTS							C1	SHAFT-CUSTOM
COVERS	50-004-1173				1	3	A	COVER-SAE 'A'
COVERS	50-004-1183						B	COVER-SAE 'B' 2-BOLT
COVERS	50-004-1233						C	COVER-SAE 'C' 4-BOLT
COVERS	50-004-1333						K	COVER-SAE 'C' 2-BOLT
INPUT GEARS	85-004-1102	85-004-1062		-	1	4	2	INPUT GEAR 13T 16/32 DP SPLINE
INPUT GEARS	85-004-1122	85-004-1112		-			3	INPUT GEAR SAE 1"-6B SPLINE
INPUT GEARS	85-004-1533			85-004-1533			4	INPUT GEAR14T 12/24 DP SPLINE
INPUT GEARS	85-004-1542	85-004-1422		-			5	INPUT GEAR 15T 16/32 DP SPLINE
INPUT GEARS	85-004-1582			85-004-1582			6	INPUT GEAR 1" DIA X .25 KEY
	50-005-2041		50-005-2031		1	5	CARRIER ASSEMBLY	
	50-004-1062		50-004-1052		1	5A		CARRIER
	85-004-1051		85-004-1041		3	5B		PLANET GEAR
	71-004-0121				3	5C		PLANET SHAFT
	01-105-0010				6	5D		PLANET BEARING
	85-004-1181				6	5E		PLANET THRUST WASHER
	01-153-0210				3	5F		ROLL PIN 3/16 X 7/8
85-004-1412	85-004-1092		85-004-1072		1	6		SUN GEAR
50-005-2011	50-005-2021		50-005-2011		1	7	CARRIER ASSEMBLY	
50-004-1082	50-004-1072		50-004-1082		1	7A		CARRIER
85-004-1031	85-004-1021		85-004-1031		3	7B		PLANET GEAR
	81-004-0071				3	7C		PLANET SHAFT
	01-105-0410				3	7D		PLANET BEARING
	81-004-1561				6	7E		PLANET THRUST WASHER
	01-153-0080				3	7F		ROLL PIN 1/8 X 1
	50-004-1023				1	12		RING GEAR
	50-004-1011				1	14A		CARRIER THRUST WASHER
	50-004-1091				1	14B		INPUT THRUST WASHER
	85-016-0601				-	16		SEAL KIT (1 SEAL, 2 O-RINGS)
	01-405-0530				1	16A		SEAL-SHAFT
	01-402-0560				2	16B		O-RING
	01-102-0140				1	20A		BEARING CONE (OUTER)
	01-103-0130				1	20B		BEARING CUP (OUTER)
	01-102-0150				1	20C		BEARING CONE (INNER)
	01-103-0140				1	20D		BEARING CUP (INNER)
	01-150-1550				12	25A		HEX CAPSCREW 7/16-20 GR8
	01-166-0340				12	25B		LOCKWASHER 7/16 MED
	01-207-0070				2	30A		PIPE PLUG-MAGNETIC 3/8 NPT-SOC HD
	01-207-0020				1	30B		PIPE PLUG 1/4 NPT-SOC HD
	01-215-0040				(1)	30B		GREASE FITTING (OPTIONAL)
	01-216-0070				(1)	30C		AIR VENT 3/8 NPT (OPTIONAL)
	01-207-0030				(1)	30D		PIPE PLUG (C AND K COVER ONLY) 1/8 NPT
	50-004-1521				*	35A		SHIM(S)
	50-004-1452				1	35B		SPLIT RING (MATCHING HALVES)
	50-004-1462				1	35C		LOCK RING
	50-016-1431				-	40		HIGH PSI SEAL KIT (INCLUDES 40A, B, C, D)
	01-402-0720				(1)	40A		O-RING
	01-412-0050				(1)	40B		SEAL - HIGH PRESSURE
	50-004-1422				(1)	40C		CARRIER - HIGH PRESSURE SEAL
	01-160-0630				(2)	40D		HELICAL RETAINING RING



NOTES:

1 INVERTED RATIO SUNGEAR IS NOT COUNTERBORED FOR CODE 4 INPUT. MOTOR COMPATIBILITY MUST BE VERIFIED.

* BEARING PRELOAD DETERMINES QUANTITY OF SHIMS.

X50LGD2-AD,

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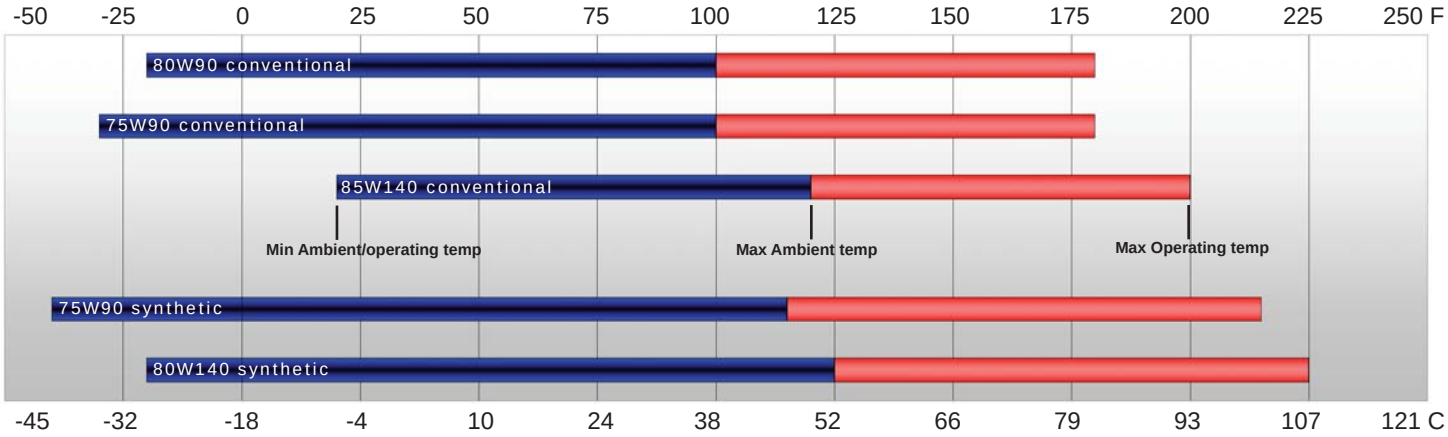
Effective date 12-16-98

Effective serial # 38489

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 vicintiy 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 50 OIL CAPACITIES

Operating Position	Oil Capacity			Oil Level	
	Single stage	Double stage	Triple stage		
Horizontal Shaft	1.4 pt / 0.7 l	1.6 pt / 0.8 l	1.8 pt / 0.9 l	To horizontal centerline of gear drive	
Vertical Shaft (Pinion Up)	1.7pt / 0.8 l	2.2 pt /1.0 l	2.7 pt /1.3 l	To side port on gear drive base	
Vertical Shaft (Pinion Down)	2.2pt / 1.0 l	2.7 pt /1.3 l	3.2 pt /1.6 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)** 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 **(25B)** securing the cover.

4) Remove the cover **(3)**, thrust washer **(14B)**, 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 ring gear(s) **(12)** and subsequent carrier assemblies and thrustwashers **(14A)**. Inspect O-ring(s) **(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/5A)**.

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 1/8” (pri) or 3/16” (sec) pin punch.

Carrier Reassembly

1) Planet shafts **(7C pri/5C sec)** should be installed with chamfered end of 1/8”(pri), or 3/16”(sec) roll pin hole towards outside diameter of carrier **(7A pri/5A sec)**; this will ease alignment of holes while inserting roll pins **(7F pri/5F sec)**.

2) 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 shaft retainer 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. The seal will need to be replaced.

2) Place base **(1)** external side down, supported at the case perimeter. 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. If shaft bearings show evidence of wear or damage they should be replaced at this time. Remove the shaft seal **(16A)** for inspection or replacement.

Note: When installing new shaft bearings. press the bearing cone onto output shaft by pressing on inner race only. DO NOT press on roller cage, as it will damage the bearing.

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 interior of the gear drive.

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 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 cone **(20A)** into the base.

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 until it seats against inner bearing cup **(20D)**.

7) Prior to installation of the shaft seal **(16A)**, the preload may result in a rolling torque which varies between 50 to 80 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 preload.

8) Install the Load-N-Lock™ segments **(35B)** over the shims

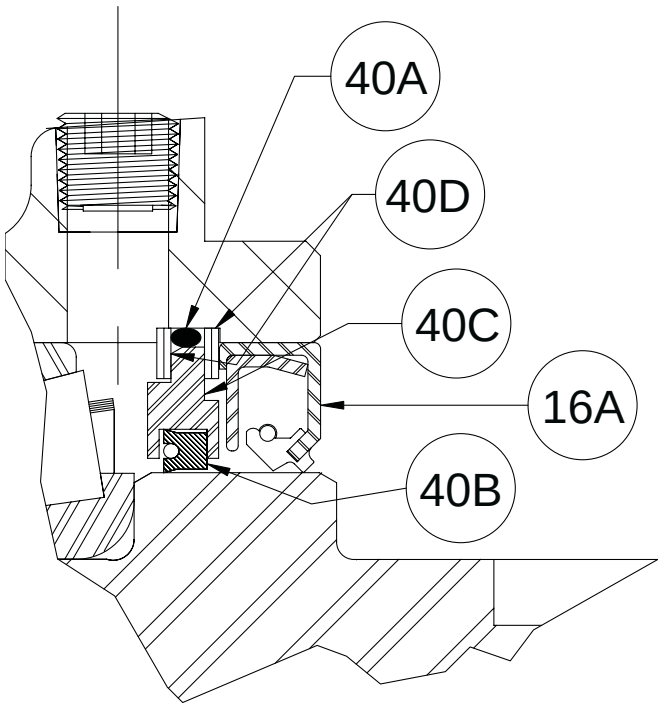
(35A) and into the groove in the shaft **(2)**. Then, install the lock ring **(35C)** over the segments **(35B)**.

9) Once proper shaft preload is achieved, install the shaft seal(s). If the unit is equipped with the optional high pressure seal it must be installed prior to installation of the standard shaft seal **(16A)**

High pressure seal installation procedure:

Install one helical retaining ring (40D) and o-ring (40A). Install seal element (40B) in carrier (40C). (See detail at right for proper orientation). Slide carrier and seal (40B & 40C) into case (1) and over shaft (2). The chamfered O.D. of carrier (40C) must be toward o-ring (40A). (See detail for proper orientation). Install second helical retaining ring (40D) into case groove. If retaining ring will not install easily, the carrier (40C) may be backwards.

High pressure seal installation detail



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

Unit Reassembly

1) Install the secondary carrier assembly **(5)** onto the output shaft **(2)**; align the splines of the carrier **(5A)** with the output shaft **(2)** splines and slide the carrier onto the shaft.

2) Lubricate o-rings **(16B)** and install into the corresponding base **(1)** and cover **(3)** pilot(s).

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

3) Align gear teeth of the ring gear **(12)** with the gear teeth of the planet gears **(5B)** and place on base **(1)**, then align mounting holes of ring gear **(12)** with holes in base **(1)**. Use the scribed line made during disassembly for reference.

4) Install the carrier thrust washer **(14A)** and sun gear **(6)** into the secondary carrier **(5A)**.

5) Install the primary carrier assembly **(7)**.

6) Install the input gear **(4)**.

7) Install the input thrust washer **(14B)** 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)**.

9) Install and torque the 12 7/16-20 hex-head cap-screws **(25A)** with lockwashers **(25B)**. The torque for the cap-screws: 80 ft-lb dry, 60 ft-lb if lubricated.

10) Using a splined shaft to drive the input gear **(4)** ensure that the unit spins freely.

11) Fill the unit to the proper level, as specified, with recommended gear oil (refer to chart, page 2) after unit is sealed with brake and/or motor.

The gearbox is now ready to use.