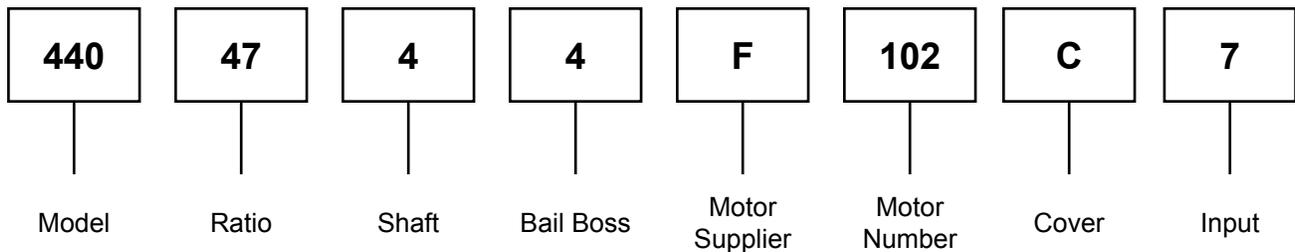




SERVICE MANUAL 440 SERIES DIGGER MODELS



Example Part Number



THIS SERVICE MANUAL IS EFFECTIVE:
S/N: 110000 TO CURRENT
DATE: 3-2013 TO CURRENT
VERSION: SMD44047-44F102C7

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

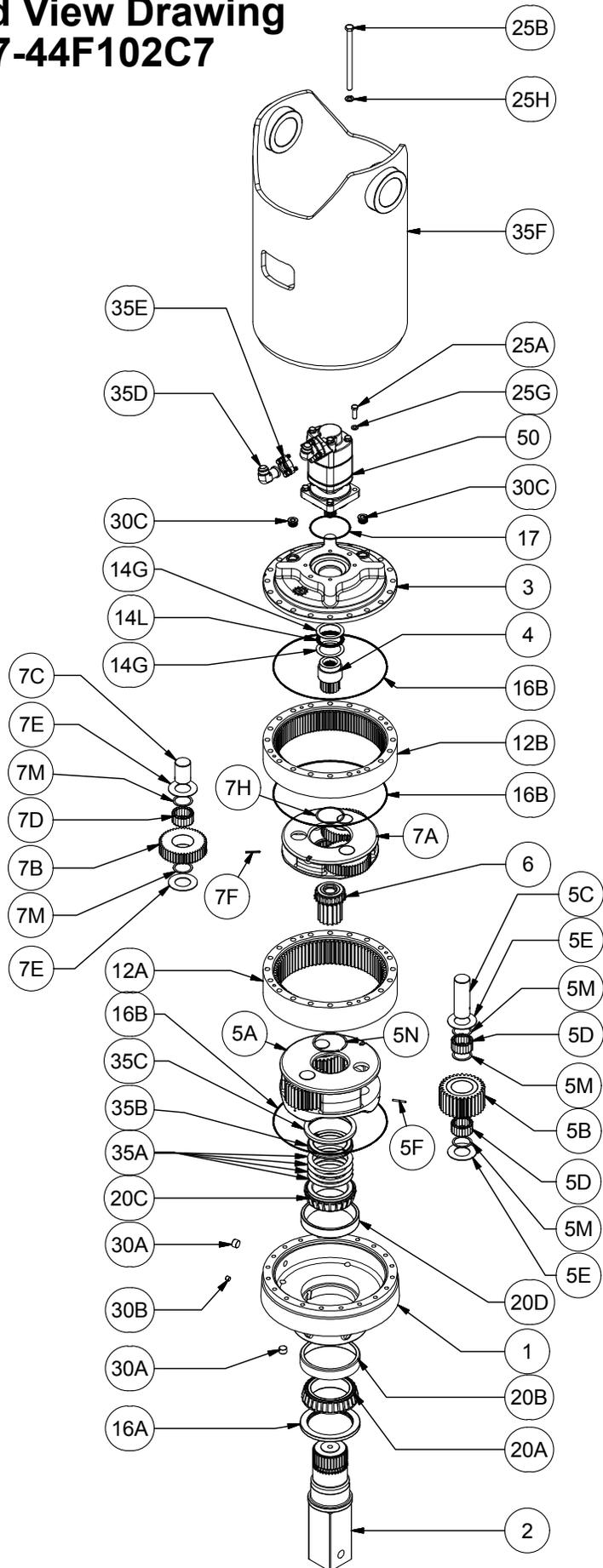
Exploded View Drawing 44047-44F102C7



EFFECTIVE FROM: 02/01/2013 TO: PRESENT

PARTS LIST FOR 44047-44F102C7				
GROUP	ITEM	QTY	PART NUMBER	DESCRIPTION
	1	1	42-004-3022	BASE
	2	1	42-004-4102	D440 SHAFT - 4" SQUARE
	3	1	42-004-2012	COVER-440 (SAE 'C')
	4	1	42-004-1614	INPUT GEAR
5	-	(1)	42-005-0141	CARRIER ASSEMBLY - SECONDARY
	5A	1	42-004-1392	CARRIER - SEC
	5B	3	42-004-1242	PLANET GEAR - SEC (440/6.19:1)
	5C	3	42-004-1332	PLANET SHAFT - SEC (440)
	5D	120	01-106-0040	PLANET ROLLER
	5E	6	42-004-1362	WASHER - PRI & SEC PLANET 440
	5F	3	01-153-0220	ROLL PIN
	5M	9	42-004-1352	SPACER - LOOSE ROLLER 440
	5N	1	01-160-0680	RETAINING RING (SMALLEY VS-412)
	6	1	42-004-1292	SUN GEAR
7	-	(1)	42-005-0121	CARRIER ASSEMBLY - PRIMARY
	7A	1	42-004-1282	CARRIER - PRI, 7.59:1 440
	7B	3	42-004-1272	PLANET GEAR - PRI (440/7.59:1)
	7C	3	42-004-1342	PLANET SHAFT - PRI (440)
	7D	60	01-106-0040	PLANET ROLLER
	7E	6	42-004-1362	THRUST WASHER
	7F	3	01-153-0220	ROLL PIN
	7M	6	42-004-1352	SPACER - LOOSE ROLLER 440
	7H	1	01-160-0690	RETAINING RING, SUN (SMALLEY VS-337)
12	-	-	-	RING GEARS
	12A	1	42-004-1032	RING GEAR - SEC (440)
	12B	1	42-004-1042	RING GEAR - PRI (440)
14	-	-	-	THRUST WASHERS & BEARINGS
	14G	2	01-112-0400	THRUST WASHER
	14L	1	01-112-0410	THRUST BEARING
16	-	(1)	42-016-2011	SEAL KIT
	16A	1	01-405-0770	OUTPUT SHAFT SEAL
	16B	3	01-402-0840	O-RING (PARKER #280)
	17	1	01-402-0010	O-RING
20	-	-	-	OUTPUT SHAFT BEARINGS
	20A	1	01-102-0290	BEARING CONE
	20B	1	01-103-0290	BEARING CUP
	20C	1	01-102-0280	BEARING CONE
	20D	1	01-103-0280	BEARING CUP
25	-	-	-	HARDWARE
	25A	4	01-150-0090	HHCS 1/2-13 X 1.5
	25B	20	01-150-1950	HHCS 5/8-11 X 9.5
	25C	4	01-166-0030	1/2" LOCKWASHER
	25H	20	01-166-0040	LOCKWASHER - 5/8 ZINC PLATED
30	-	-	-	PLUGS AND FITTINGS
	30A	3	01-207-0100	PIPE PLUG 3/4 NPT MAGNETIC
	30B	1	01-207-0020	PIPE PLUG (1/4 NPT - HOLLOW HEX)
	30C	2	01-208-0030	HOLLOW HEX PLUG (05HP-12)
35	-	-	-	MISCELLANEOUS
	35A	*	42-004-1202	SHIM - OUTPUT SHAFT (440)
	35B	1	42-004-1222	SPLIT RING (440)
	35C	1	42-004-1212	LOCK RING (440)
	35D	2	01-201-0776	ADAPTER: #16JIC X #12SF 90°
	35E	2	01-201-0775	SPLIT FLANGE KIT
	35F	1	42-005-0171	BAIL ASSEMBLY
	50	1	01-304-1020	MOTOR

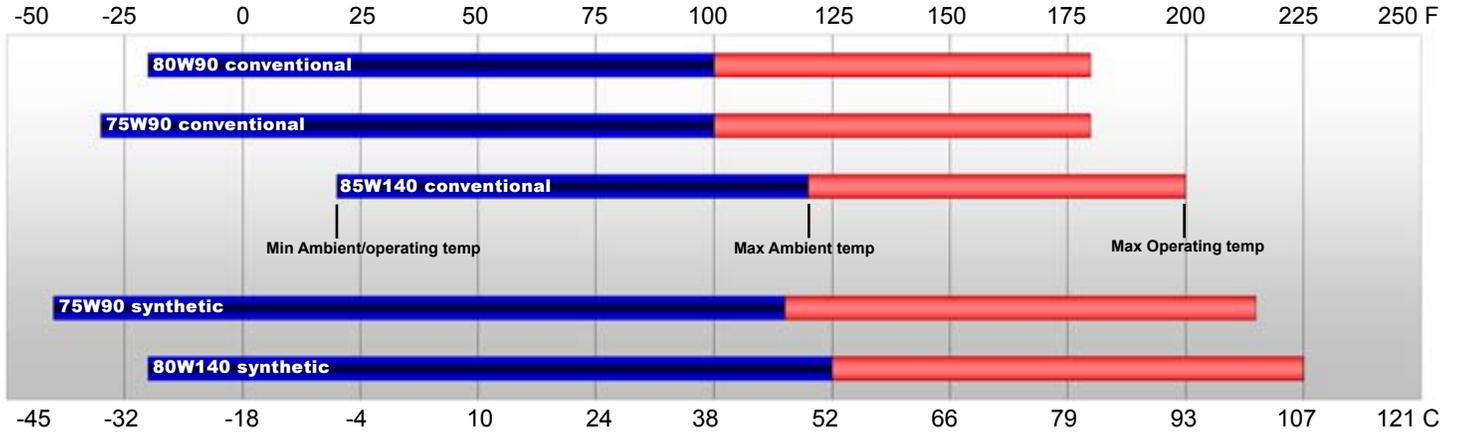
*NUMBER OF SHIMS DEPENDANT UPON DESIRED BEARING PRELOAD.
X44047-44F102C7aa 02-12-13 ECN- HWP



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 auger 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 D440 OIL CAPACITIES

Operating Position	Oil Capacity			Oil Level
	Single stage	Double stage	Triple stage	
 Horizontal Shaft	-	-	-	To horizontal centerline of auger drive 
 Vertical Shaft (Pinion Down)	-	2.75 Gal / 10.4 L	-	To midway on upper/primary gear set 



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

ESKRIDGE PART NUMBER INTERPRETATION

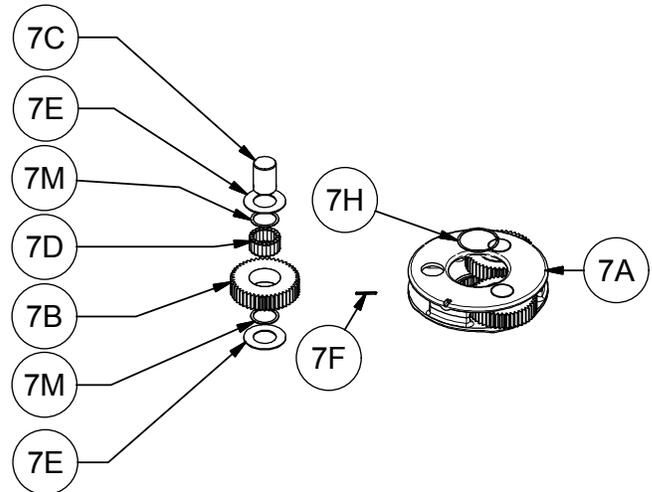
Note: All non custom Eskridge Geardrives are issued a descriptive part number which includes information regarding the Model, means of shaft retention, base style, shaft style, input mounting, input shaft size, overall ratio and various available options. For a detailed breakdown of this information,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

Unit Disassembly Procedure

- 1) Scribe a diagonal line across the outside of the unit from the bail (35F) to the base (1) before disassembly to aid in the proper positioning of pieces during reassembly.
- 2) Remove magnetic drain plugs (30A) and drain oil from unit. The oil will drain faster and more completely if warm.
- 3) Remove the twenty hex-head capscrews (25B) and lockwashers (25H).
- 4) Separate bail (35F) from cover (3) and remove from digger assembly.
- 5) Remove hex-head capscrews (25A) and lockwashers (25G), and remove motor (50) from cover (3).
- 6) Remove cover (3), thrust bearing (14G & 14L), and input gear (4). Inspect o-ring (16B); discard if damaged or deformed.
- 7) Using a screwdriver, seal pick or similar tool remove the retaining ring (7H), which retains the primary carrier assembly (7) to the secondary sun gear (6). The retaining ring can be left in the carrier. Lift primary carrier assembly out of the unit.
- 8) Remove secondary sun gear (6) and primary ring gear (12B) and inspect o-ring (16B); discard if damaged.
- 9) Using a screwdriver, seal pick or similar tool remove the retaining ring (5N), which retains the secondary carrier assembly (5) to the output shaft (2). The retaining ring can be left in the carrier. Lift secondary carrier assembly out of the unit.
- 10) Remove secondary ring gear (12A). Inspect o-ring (16B); discard if damaged or deformed.
- 11) 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.

Primary Carrier Subassembly

(Items 7A, 7B, 7C, 7D, 7E, 7F, 7H & 7M)



Disassembly

- 1) Rotate planet gears (7B) to check for abnormal noise or roughness in rollers (7D) or planet shafts (7C). If further inspection or replacement is required, proceed as follows.
- 2) Drive roll pins (7F) completely into the planet shafts (7C).
- 3) Slide planet shafts (7C) out of carrier (7A).
- 4) Remove planet gears (7B), thrust washers (7E), spacers (7M), and rollers (7D) from the carrier (7A).
- 5) Inspect the planet gear (7B) bearing bores, planet shafts (7C) and rollers (7D). Check for spalling, bruising or other damage. Replace components as necessary; rollers should be replaced only as a set of 20.
- 6) Check planet shafts (7C) for any abnormal wear, especially ones where rollers (7D) needed to be replaced. If any abnormal wear is found, replace planet shafts.
- 7) Use 3/16 inch pin punch to remove roll pins (7F) from planet shafts (7C).

NOTE: If either the rollers or the planet shafts (pins) are damaged, both components should be replaced.

Reassembly

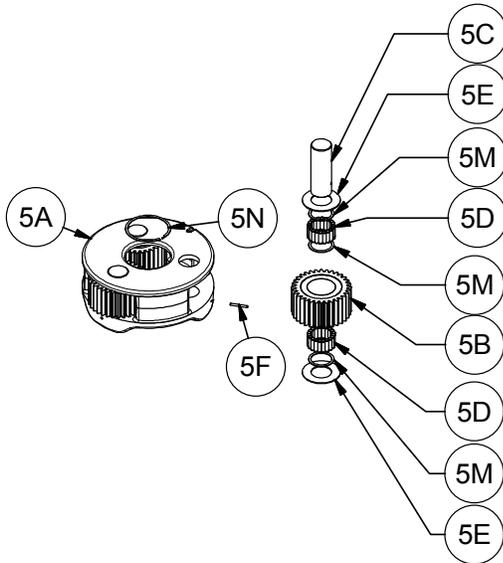
- 1) To install rollers in planet gear bore:
 - a) Set thrust washer (7E) on work table. Insert planet shaft (7C) in washer. Slide spacer (7M) over shaft.
 - b) Place planet gear (7B) centered over planet shaft (7C).
 - c) Install 20 rollers (7D) into planet gear (7B) bore. Slide spacer (7M) over planet shaft and rest on top of rollers. Slide thrust washer (7E) onto planet shaft and rest on top of planet gear.
 - d) Slide this assembly off the work table, holding the lower thrust washer (7E) and planet gear (7B).
 - e) Carefully remove planet shaft (7C) from this assembly and slide the gear (7B) with rollers (7D), thrust washers

(7E) and spacers (7M) into place in the carrier.

- 2) Carefully install planet shafts (7C) with chamfered end of 3/16 inch hole toward outside diameter of the carrier (7A). This will aid in alignment of holes while inserting roll pins (7F). Rotating planet shaft back and forth while sliding it into carrier will help align rollers (7D).
- 3) Drive a roll pin (7F) through the carrier (7A) hole and into the planet shaft (7C) to retain the parts. Repeat for other planet gears (7B). Place retaining ring (7H) in center of carrier before installing last planet gear.

Secondary Carrier Subassembly

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



Disassembly

- 1) Rotate planet gears (5B) to check for abnormal noise or roughness in rollers (5D) or planet shafts (5C). If further inspection or replacement is required, proceed as follows.
- 2) Drive roll pins (5F) completely into the planet shafts (5C).
- 3) Slide planet shafts (5C) out of carrier (5A).
- 4) Remove planet gears (5B), thrust washers (5E), spacers (5M), and rollers (5D) from the carrier (5A).
- 5) Inspect the planet gear (5B) bearing bores, planet shafts (5C) and rollers (5D). Check for spalling, bruising or other damage. Replace components as necessary; rollers should be replaced only as a set of 40.
- 6) Check planet shafts (5C) for any abnormal wear, especially ones where rollers (5D) needed to be replaced. If any abnormal wear is found, replace planet shafts.
- 7) Use 3/16 inch pin punch to remove roll pins (5F) from planet shafts (5C).

NOTE: If either the rollers or the planet shafts (pins) are damaged, both components should be replaced.

Reassembly

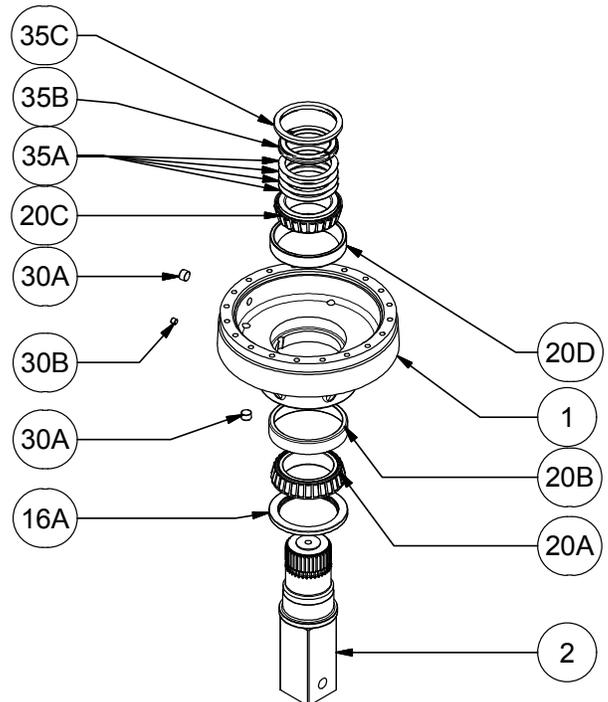
- 1) To install rollers in planet gear bore:
 - a) Set thrust washer (5E) on work table. Insert planet shaft (5C) in washer. Slide spacer (5M) over shaft.

- b) Place planet gear (5B) centered over planet shaft (5C).
- c) Install 20 rollers (5D) into planet gear (5B) bore. Slide spacer (5M) over planet shaft and rest on top of first row of rollers.
- d) Install another 20 rollers (5D) into planet gear (5B) bore. Slide another spacer (5M) over planet shaft (5C) and rest on top of second row of rollers. Slide thrust washer (5E) onto planet shaft and rest on top of planet gear.
- e) Slide this assembly off the table, holding the lower thrust washer (5E) and planet gear (5B).
- f) Carefully remove planet shaft (5C) from this assembly and slide the gear (5B) with rollers (5D), thrust washers (5E) and spacers (5M) into place in the carrier.

- 2) Carefully install planet shafts (5C) with chamfered end of 3/16 inch hole toward outside diameter of the carrier (5A). This will aid in alignment of holes while inserting roll pins (5F). Rotating planet shaft back and forth while sliding it into carrier will help align rollers (5D).
- 3) Drive a roll pin (5F) through the carrier (5A) hole and into the planet shaft (5C) to retain the parts. Repeat for other planet gears (5B). Place retaining ring (5N) in center of carrier before installing last planet gear.

Base Subassembly

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



Disassembly

- 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 output shaft is no longer retained, care should be taken to avoid personal injury. Care should also be taken not to damage it when it is pressed through base.

- 2) Base (1) should be set pinion 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 shaft bearing cone (20C).

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

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

Reassembly

- 1) Clean all foreign material from magnetic oil plugs (30A) located in the base (1).
- 2) Place base (1) (output side up, opposite shown) on the 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) (large end down as shown) onto the output 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.

- 5) Place the shaft (2) with the bearing cone (20A) into the base (1).
- 6) Flip this assembly, resting the base (1) on the end of the output shaft (2).
- 7) Apply a layer of lithium or general purpose bearing grease to the roller contact surface of the inner 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).
- 8) Without the shaft seal (16A) installed, the preload may result in a rolling torque that varies between 50 to 300 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™ split ring segments (35B) over the shims (35A) and into the groove in the shaft (2). Install the lock ring (35C) over the split ring segments (35B).
- 9) Lubricate inner lip of new shaft seal (16A) and slide it onto the shaft (2) and over the shaft seal diameter then press the seal into the base (1) until flush.

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) Install the secondary carrier assembly (5) onto the output shaft (2); align the splines of the carrier (5A) with the splines of the output shaft and slide the carrier onto the output shaft.
- 3) Install retaining ring (5N) into the groove of the output shaft (2), using a spiraling motion.
- 4) Lubricate o-ring (16B) and install on the pilot of the secondary ring gear (12A).

Caution: Hold ring gear by outside or use lifting device to prevent injury.

- 5) Install secondary sun gear (6) into secondary carrier assembly (5).
- 6) Align gear teeth of secondary ring gear (12A) with the gear teeth of the secondary planet gears (5B) and place on base (1). Align mounting holes of ring gear with holes in base. Use the scribed line made during disassembly for reference.
- 7) Install the primary carrier assembly (7) onto secondary sun gear (6); align the splines of the carrier (7A) with the splines of the secondary sun gear and slide the carrier onto the sun gear.
- 8) Install retaining ring (7H) into secondary sun gear groove using a spiraling motion.
- 9) Lubricate o-ring (16B) and install on the pilot of the primary ring gear (12B).
- 10) Align gear teeth of primary ring gear (12B) with those of the primary planet gears (7B) and place on secondary ring gear (12A). Align mounting holes of ring gear with holes in base (1). Use the scribed line made during disassembly for reference.
- 11) Install the input gear (4) into primary carrier assembly (7). Install thrust bearing (14G & 14L) on top of input gear.
- 12) Lubricate o-ring (16B) and install on the pilot of the cover (3).
- 13) Noting the scribed line made during disassembly, install the cover (3). Temporarily install two hex-head capscrews (25B) to hold assembly together.
- 14) Ensure the unit spins freely by using a splined shaft to drive the input gear (4).
- 15) Install motor (50) onto cover (3) with hex-head capscrews (25A) and lockwashers (25G). **Torque the capscrews to 110 ft-lbs dry, or 80 ft-lbs if fasteners are lubricated.**
- 16) Remove two temporary capscrews installed in step 13. Place bail (35F) onto assembly, aligning holes in bail and cover using scribed line made during disassembly as a reference. Install and torque the twenty 5/8-11 hex-head capscrews (25B) with lockwashers (25H). **Torque the capscrews to 220 ft-lbs dry, or 170 ft-lbs if fasteners are lubricated.**
- 17) Fill the unit to the proper level, as specified, with GL5 EP 80/90 gear oil after it is sealed with a brake and/or motor.

The digger is now ready to use.