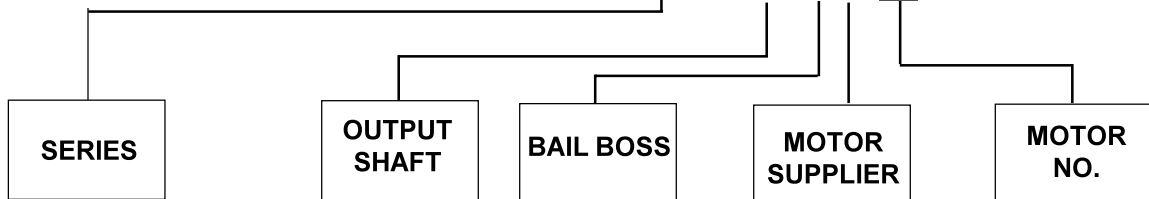


PART NUMBER EXAMPLE: 77BA - 3 2 F 59



## Series 77 Planetary Digger Drive Service & Repair Manual

EFFECTIVE FOR:  
S/N: 17000 - UP  
DATE: 08/01/92 - UP  
77BABCBD-012026

# SERIES 77 SERVICE MANUAL

## SINGLE SPEED

### PLANETARY DIGGERDRIVE

This manual will assist in disassembly and assembly of the above series planetary Auger Drive. Item numbers, indicated in parentheses throughout this manual, refer to the exploded parts breakdown drawing. Individual customer specifications (bail assembly, output shaft, hydraulic motor, etc.) may vary from exploded drawing and standard part numbers shown. If applicable, refer to individual customer drawing for details.

For any spare or replacement parts, contact your distributor or equipment manufacturer. Always try to have available the auger unit part number, serial number and date code on the serial tag. This information may be necessary for verification of any component part numbers. Component part numbers and/or manufacturing lot numbers may be stamped on individual parts. This information may also be helpful in identifying replacement components.

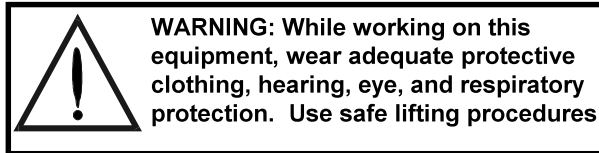
## LUBRICATION AND MAINTENANCE

Change the oil after the first 50 hrs. of operation. Oil should be changed at 500 hr. intervals thereafter. Gearboxes in auger drives require GL-5 grade EP 80/90 gear oil for lubrication. The manufacturer recommends that the unit be partially disassembled to inspect gears, splines, and bearings at 1000 hour intervals.

### OIL CAPACITY: 6.5 pints

Proper oil level will measure to middle of primary cluster gears when auger drive is in vertical position.

For checking the oil in fully assembled units, see instructions on page 11.



## UNIT DISASSEMBLY

(Refer to exploded view drawing on page 7)

1) Scribe a diagonal line, from the bail assembly (20) to the bearing carrier (2), across the outside of the auger drive to assure proper orientation of parts as they are re-assembled.

2) To drain oil, position unit on its side and remove oil plug (41) located in the top case (1). To help ventilate oil while draining, loosen hydraulic motor bolts (31). Maximum drainage occurs when oil is warm.

**NOTE:** Particular care should be taken when placing the unit in a position for servicing. Unit should be blocked up so that weight of the unit is resting on the bearing carrier (2). This fixture must be secure so that the auger drive will not tip over during disassembly and assembly procedures.

3) Remove the twelve hex head cap screws (29) and hex flange nuts (34) from bail assembly (20). Lift bail assembly from unit.

**NOTE:** There are no bolts retaining the major components together. Proceed with caution when moving the unit.

4) Remove the two cap screws (31) and lock washers (40) from hydraulic motor (50). Remove motor from unit. Check o-ring (43) for damage.

5) Remove top case (1), input gear (14), and o-ring (44).

6) Lift the primary planet carrier assembly out of the unit (includes items 7,9,11,17,23, & 33).

7) If sun gear (12) has not been removed from auger drive, do so now. (Sometimes the sun gear remains in the primary carrier (7).)

8) Remove secondary ring gear (4) and o-ring (44).

9) Remove retaining ring (37) from end of output shaft (49).

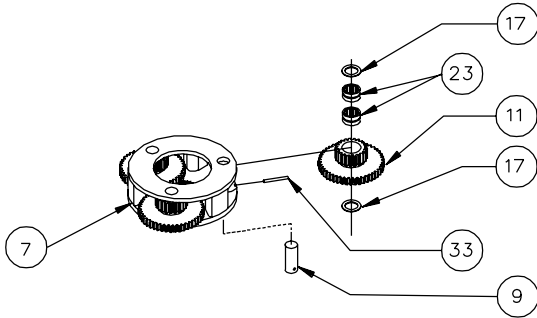
10) Lift the secondary planetary assembly out of the unit (includes items 6,8,10,18,24, & 33). Use a puller if needed.

11) The unit is now disassembled into groups of parts. The area(s) requiring repair should be identified by thorough inspection of the parts after they have been cleaned and dried. Then refer to the appropriate group repair section below.

**CAUTION:** Output shaft is not retained at this point.

1. Primary Planet Carrier subassembly
2. Secondary Planet Carrier subassembly
3. Top case subassembly
4. Base subassembly

## PRIMARY PLANET CARRIER SUBASSEMBLY (ITEMS 7,9,11,17,23, & 33) DISASSEMBLY AND REPAIR



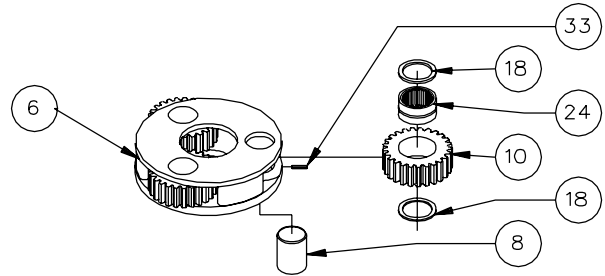
Rotate cluster gears (11) to check for abnormal noise or roughness in bearings (23) or planet pins (9). If further inspection or replacement is required, proceed as follows.

- 1) Drive roll pins (33) completely into planet pins (9).
- 2) Press or drive planet pins (9) out of carrier (7).
- 3) Remove cluster gears (11) and washers (17) from the carrier (7).
- 4) If the planet bearings (23) require replacement, press them out of the cluster gears (11) and replace with new ones.
- 5) Check primary planet pins (9) for any abnormal wear, especially ones where bearings needed to be replaced. If any abnormal wear is found, replace planet shafts.
- 6) Remove the roll pins (33) from planet pins (9).

### RE-ASSEMBLY

- 1) With washers (17) on both sides of the cluster gear (11) and with bearings (23) installed, slide gear into the carrier (7). Be sure the large gear side of cluster gear is toward the splined side of carrier. Insert the planet pin (9) through the carrier, washers, and planet gear.
- 2) Planet pins (9) should be installed with chamfered end of 1/8 inch hole toward outside diameter of the carrier (7). This will aid in alignment of holes while inserting roll pins (33).
- 3) Drive three roll pins (33) through the carrier holes and into the planet shafts to retain the parts.

## SECONDARY PLANET CARRIER SUBASSEMBLY (ITEMS 6,8,10,18,24, & 33) DISASSEMBLY AND REPAIR

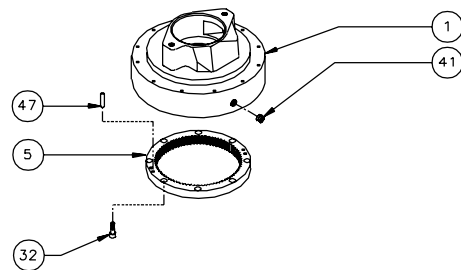


Follow the same procedure as that for the PRIMARY PLANET CARRIER SUBASSEMBLY. Substitute items as indicated: planet gears (10), planet bearings (24), planet pins (8), washers (18), and carrier (6).

**NOTE 1:** See page 8 service bulletin concerning the wear of secondary planet carriers (6).

**NOTE 2:** Retaining ring (37) (not shown here) must be inserted into carrier (6) before it is installed in unit, as described in step number 2 of UNIT ASSEMBLY.

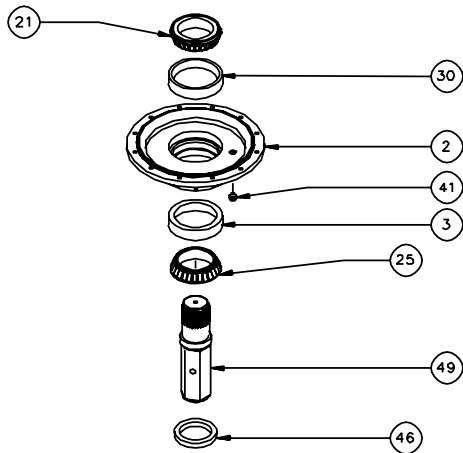
## TOP CASE SUBASSEMBLY (ITEMS 1,5,32,41, & 47) DISASSEMBLY AND REPAIR



1) Inspect primary ring gear (5) for abnormal wear or damaged teeth. If replacement is required, remove eight socket head cap screws (32) from ring gear. Primary ring gear (5) is doweled into top case (1). Use puller holes provided to thread two 3/8-16 bolts into ring gear (5) until part has completely separated from top case (1).

2) If installing a new primary ring gear (5), always install new dowel pins (47) into ring gear before re-assembling into top case (1).

## (ITEMS 2,3,21,25,30,46, & 49)



## DISASSEMBLY AND REPAIR

**CAUTION:** Output shaft is no longer retained. Care should be taken not to injure feet because output shaft can fall out. Care should also be taken not to damage output shaft when shaft is pressed through base.

1) Output shaft removal. Bearing carrier (2) should be set pinion side down, as shown, on a plate or table with output shaft (49) protruding through a hole in table. Press output shaft out bottom of base by applying a load to top end (**internal end**) of shaft until it passes through inner shaft bearing cone (21).

**NOTE:** If reusing old bearing cone, do not damage roller cage by pulling on it.

2) If outer bearing cone (25) needs to be replaced a gear puller may be used.

3) Remove the shaft seal (46) for inspection or replacement. Lubricate inner lip of new shaft seal (46) and slide the seal onto the shaft (49) until it fits snugly over shaft seal diameter with the open side toward the inside of the auger drive.

4) Inspect inner and outer bearing cups (30 & 3) and replace if necessary.

## BASE ASSEMBLY

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

1) If outer bearing cone (25) was removed for replacement, press a new bearing cone (**large end down as shown**) onto the shaft until it seats against the shoulder.

2) Place the bearing carrier (2) (**output side up, opposite shown**) on the press table.

3) Apply a layer of lithium or general purpose bearing grease to surface of outer bearing cup (3). Insert the shaft (49) into the bearing carrier (2) (**bearing cone down**) and use a soft hammer to install the shaft seal (46) into the bearing carrier.

**CAUTION:** Output shaft is not retained at this point.

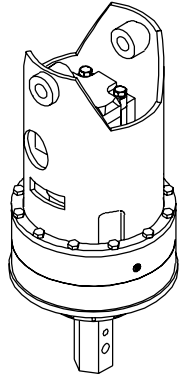
4) Invert this assembly so it is standing on the shaft (**on the press table**).

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

5) Apply a layer of lithium or general purpose bearing grease to surface of inner bearing cup (30). Press the inner bearing cone (21) (**large end up as shown**) onto the shaft (49) until it is seated against inner bearing cup (30).

All subassembly service or repairs should be complete at this time. Continue on through UNIT ASSEMBLY to complete unit buildup.

# UNIT ASSEMBLY REASSEMBLING



(Refer to exploded drawing on page 7)

1) When all subassemblies are complete, unit is ready to be assembled. Place lower assembly back on blocks, which were used during the initial UNIT DISASSEMBLY procedures, for remaining unit build-up.

2) Push retaining ring (37) into center of secondary planet carrier (6).

3) Install the secondary planet carrier (6) assembly by rotating it until carrier spline lines up with shaft spline. Begin pressing carrier onto shaft.

4) Before secondary carrier is fully seated, install retaining ring (37) onto end of output shaft (49).

5) Continue pressing secondary carrier until fully seated. Check retaining ring (37) to be sure it is in the ring groove.

6) Install a new o-ring (44) on the bearing carrier (2).

7) Referring to scribe marks for proper orientation, install the secondary ring gear (4) by rotating until ring gear teeth line up with planet gears.

8) Check to be sure retaining ring (36) is installed on sun gear (12). Slide the sun gear into the secondary planet carrier.

9) Install the primary carrier (7) by rotating until spline lines up with sun gear. It may be easier to install the sun gear (12) into the bottom of the primary carrier and then install primary carrier.

10) Timing procedure: There are machinist's marks on each of the three cluster gears (11). These marks should be aligned so that each points toward the center of the primary planet carrier. See diagram on page 9.

11) While keeping the timing marks aligned, slide the input gear (14) into the primary planetary carrier.

12) Install a new o-ring (44) on top case (1). Position the top case (1) with the proper orientation to scribed line on outside of unit and hold in position with two of the capscrews (29).

13) Twist the input gear (14) to allow the top case (1) to drop down into place.

14) Install o-ring (43) onto the hydraulic motor (50).

15) Attach hydraulic motor (50) to mounting pad on top case (1) with two capscrews (31) and lock washers (40). Torque to 130 ft-lbs.

16) Line up scribe mark on bail assembly (20) with scribe mark on top case (1) and place bail over hydraulic motor (50). Install twelve cap screws (29) with hex flange nuts (34) and torque to 30 ft-lbs.

17) Fill to proper level, as specified on page 2, with EP 80/90 gear oil.

**THE DIGGER DRIVE IS NOW READY TO USE.**

ITEM	QTY	77BA	77BC	77BD	DESCRIPTION
1.	1	72-004-3154	→	→	TOP CASE
2.	1	71-004-2144	→	→	BEARING CARRIER
3.	1	01-103-0080	→	→	BRG CUP - LOWER SHAFT CUP
4.	1	71-004-0042	→	→	RING GEAR, SEC.
5.	1	71-004-0142	→	→	RING GEAR, PRI.
6.	1	71-004-0073	→	→	PLANET CARRIER, SEC.
7.	1	71-004-0113	71-004-0433	71-004-0433	PLANET CARRIER, PRI.
8.	3	71-004-0081	→	→	PLANET PIN, SEC.
9.	3	71-004-0121	→	→	PLANET PIN, PRI.
10.	3	71-004-0092	→	→	PLANET GEAR, SEC.
11.	3	71-004-0132	71-004-0412	72-004-0182	CLUSTER GEAR, PRI.
12.	1	71-004-0102	→	→	SUN GEAR, SEC.
14.	1	72-004-0132	72-004-0122	72-004-0082	INPUT GEAR
17.	6	71-004-0861	→	→	WASHER, PRI.
18.	6	71-004-0871	→	→	WASHER, SEC.
20.	1	PER CUSTOMER SPEC			BAIL ASSY
21.	1	01-102-0100	→	→	BRG CONE - UPPER SHAFT CONE
23.	6	01-105-0010	→	→	BRG - PRI. PLANET
24.	3	01-105-0020	→	→	BRG - SEC. PLANET
25.	1	01-102-0090	→	→	BRG CONE - LOWER SHAFT CONE
29.	12	01-150-0020	→	→	HEX CAP SCREW 3/8-16
30.	1	01-103-0090	→	→	BRG CUP - UPPER SHAFT CUP
31.	2	01-150-0110	→	→	HEX CAP SCREW 5/8-11 X 1 1/2
32.	8	01-150-0520	→	→	S.H.C.S 3/8-16
33.	6	01-153-0020	→	→	ROLL PIN, 3/16
34.	12	01-158-0360	→	→	HEX. FLANGE NUT, 3/8-16
36.	1	01-160-0030	→	→	RETAINING RING EXT NO.255
37.	1	01-160-0020	→	→	RETAINING RING EXT NO.237
40.	2	01-166-0040	→	→	LOCKWASHER, 5/8
41.	2	01-207-0010	→	→	PIPE PLUG, 1/2 NPT
43.	1	01-402-0010	→	→	O-RING, NO. 250
44.	2	01-402-0020	→	→	O-RING, NO. 276
46.	1	01-405-0540	→	→	OIL SEAL
47.	2	01-152-0070	→	→	DOWEL PIN

OUTPUT SHAFT					
49.	1	71-004-0513	→	→	2-1/2" HEX. (STEEL)
	1	71-004-1383	→	→	2-5/8" HEX. (STEEL)

50.	1	PER CUSTOMER SPEC			HYDRAULIC MOTOR
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OPTIONS  
SEAL KIT P/N 76-016-2011  
INCLUDES ITEMS 43,44 AND 46

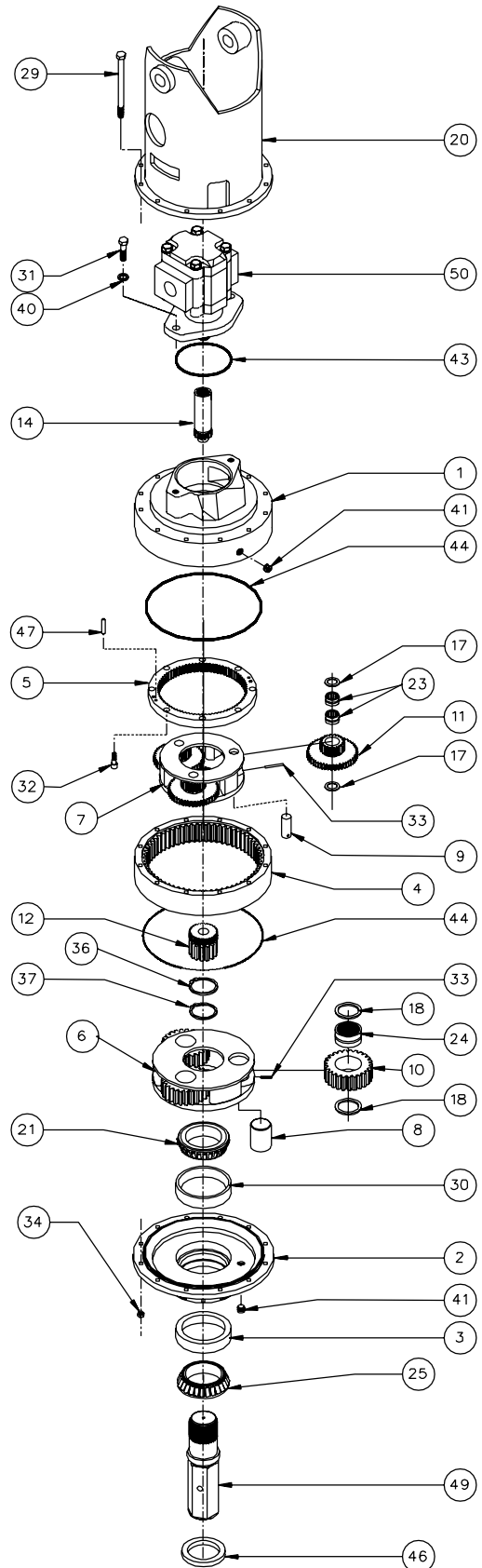
EFFECTIVE DATE:  
08/01/92  
SERAL NO. 17000

**(77BA, 77BC & 77BD (SINGLE SPEED))**

E.C.N. 1228  
77BABCBD

REV. A

DATE: 08-26-98



## SERVICE DIVISION BULLETIN #013

Revision 1 supersedes bulletin dated 01/14/86

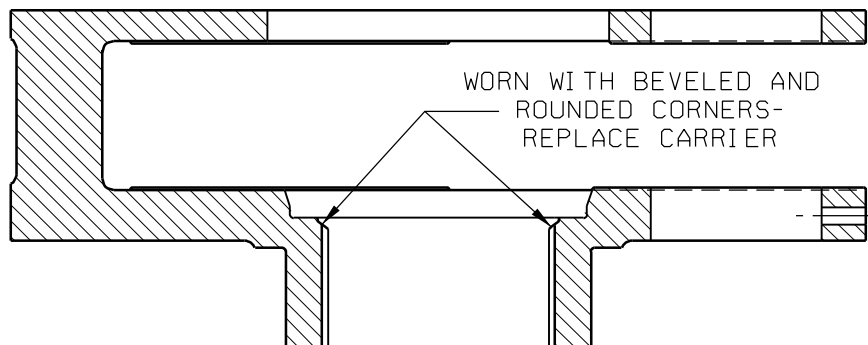
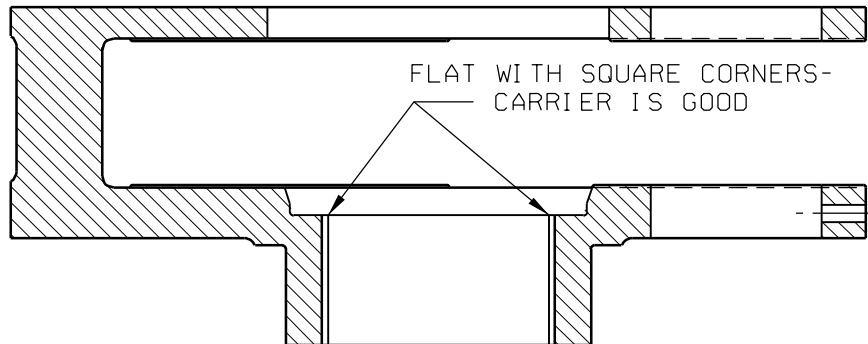
DATE: 06/01/87

REFERENCE: All Series 71/76, 72/77, and 73/78 Auger drive units

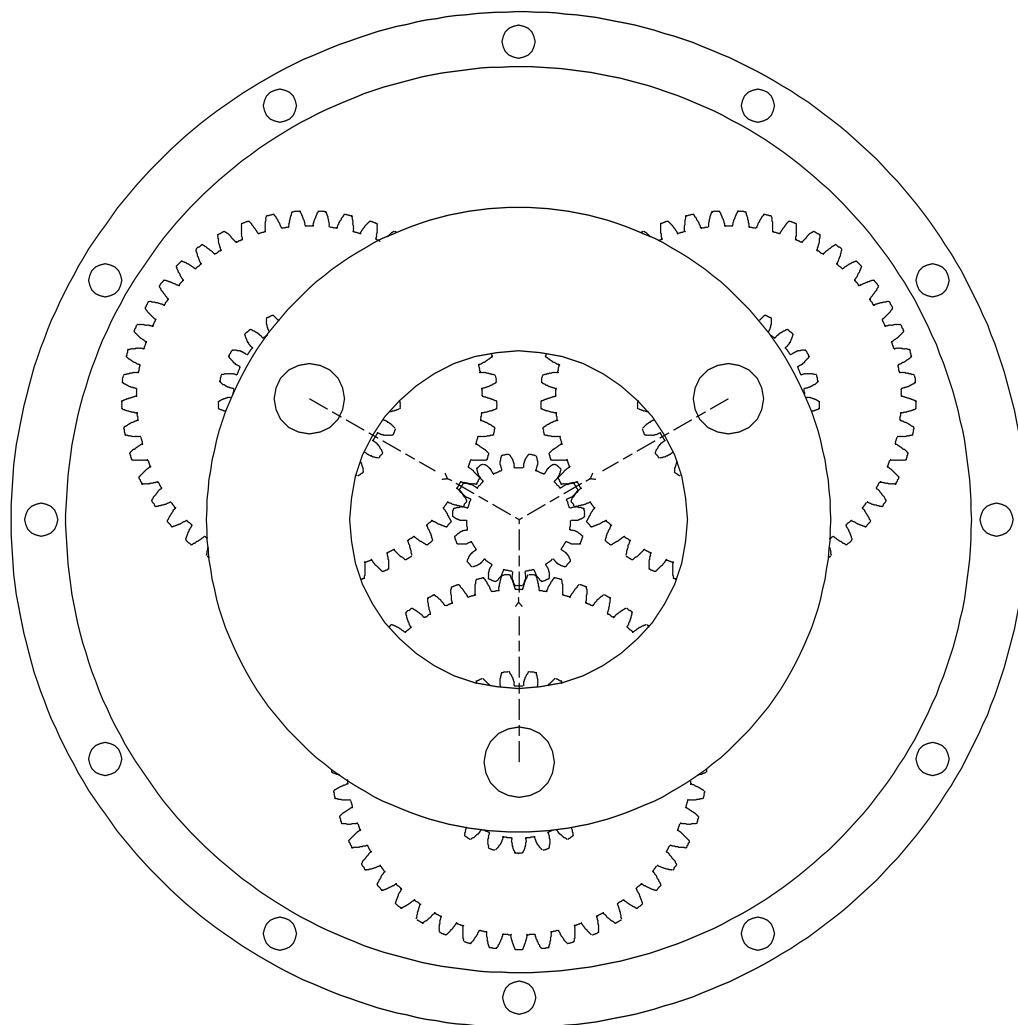
SUBJECT: Inspection of Secondary Carriers

When repairing, updating or inspecting an auger drive, the secondary carrier should be inspected for possible wear around the spline where it contacts the shaft retaining ring. Under heavy use and / or in rocky regions, continual impacting of the retaining ring against the carrier may cause wear in this area. If it wears to a beveled shape, high loading in the pullout direction could cause the shaft retaining ring to dislodge from its groove allowing the hex shaft to pull out of the unit.

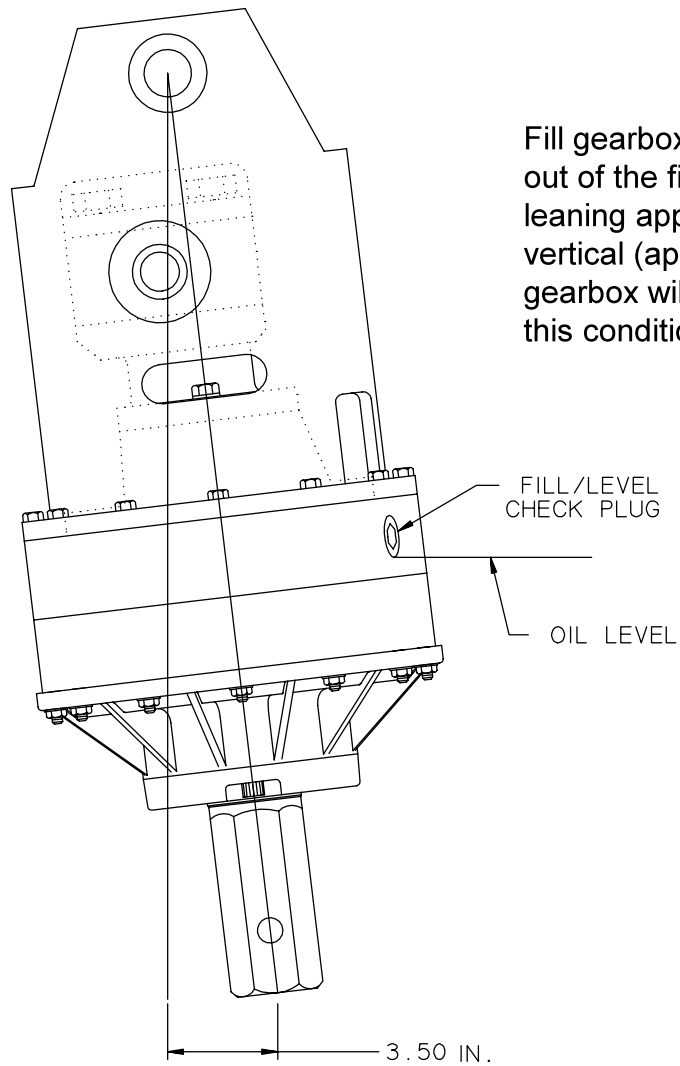
If when inspected, the carrier is found to be worn to a bevel shape, the carrier should be replaced with carrier part number 71-004-0073. Units with serial numbers prior to 4900 should also have the hex output shaft replaced with the current production revision, part number 71-004-0513.



# Timing diagram:



## ESKRIDGE MODEL 76 AND 77 AUGER DRIVES



Fill gearbox with EP 80/90 gear oil until it runs out of the fill plug while the auger drive is leaning approximately 3 1/2 inches from vertical (approximately 7 degrees). A dry gearbox will hold about 6 1/2 pints of oil in this condition.

## ESKRIDGE FINISHED PRODUCT LIMITED WARRANTY

### 1.1 **Scope of Warranty Coverage.** Upon the terms and subject to the conditions set forth in this limited warranty:

(a) ESKRIDGE (referred to herein as “**ESKRIDGE**” or the “**Manufacturer**”) warrants to each initial end user customer (a “**Purchaser**”) of a new finished product together with any accessories manufactured and sold directly from ESKRIDGE (the “**Product**”) that the Product shall be free from defects in material and workmanship, under normal working and service conditions, for a period of eighteen (18) months from the date the Product is shipped from ESKRIDGE. (the “**Warranty Term**”). A Purchaser shall be eligible for an additional eighteen (18) months of coverage in addition to the Warranty Term (also referred to as the “**Standard (+) PLUS benefit**”) only if the Purchaser (i) complies with Section 1.2(a) and (ii) registers the Product during the Warranty Term at [myproduct.eskridgeinc.com](http://myproduct.eskridgeinc.com).

(b) Notwithstanding the foregoing, this warranty does not cover components damaged by accident, abuse, misuse, neglect, untrained operators, collision, overloading, modification, disassembly, rework, misapplication, improper installation, lack of lubrication or maintenance, or improper service. This warranty does not cover the paint or material finish, removal or reinstallation of the Product, or normal wear and tear and loss of functionality due to aging of the Product (which may include but is not limited to bearings, bushings, seals, O-rings, gaskets, brake material, motor brushes, electrical cables and more).

### 1.2 **Eligibility of Warranty Coverage.**

(a) A Purchaser shall be eligible for warranty coverage under this Limited Warranty during the Warranty Term only if:

(i) Prior to placing a Product in service, and throughout use of the Product during the Warranty Term, the Purchaser provides (or causes to be provided) proper storage such that foreign objects (e.g. rain or debris) cannot enter any Product through entry ports which are normally closed during operation.; and

(ii) The Purchaser maintains, or causes to be maintained, the Product according to commercially reasonable standards and utilizes the Product for the purposes for which it was created; and

(iii) No repairs or alterations have been made by any party other than ESKRIDGE, including Purchaser, unless otherwise authorized in writing by ESKRIDGE.

### 1.3 **Transferability of Warranty.**

(a) This warranty is transferable only from the Purchaser to the first subsequent transferee (the “**Transferee**”) of the Product from Purchaser upon (i) written notification to ESKRIDGE and (ii) registration of the transfer, both within 30 days of such Product transfer.

(b) Upon satisfaction of transfer requirements set forth in Section 1.3(a), the Transferee shall succeed to all the rights and obligations of the Purchaser set forth in this Limited Warranty.

### 1.4 **Certain Limitations on Scope of Warranty Service.**

(a) Any obligation of ESKRIDGE under this warranty, statutory or otherwise, is limited to the repair of the Product, at its factory or Authorized Service Centers. Notwithstanding the foregoing, if field service or repair is performed by ESKRIDGE at the request of the Purchaser and no defect is found with material or workmanship of the Product, the Purchaser shall compensate ESKRIDGE for its time and expenses within thirty (30) days of delivery of an invoice relating to the same. If repair is determined by ESKRIDGE in its sole, absolute and uncontrolled discretion to be impossible or impractical, then ESKRIDGE may satisfy this warranty by replacing the Product. ESKRIDGE will not provide any cash payment or credits for defective materials or workmanship.

(b) Purchaser shall be responsible for any and all freight charges for any Product receiving warranty service under this limited warranty. Any travel time, transportation charges, freight charges, or similar costs incurred by ESKRIDGE in connection with the replacement or repair of defective parts, shall, be the responsibility of the Purchaser. If applicable, ESKRIDGE shall invoice Purchaser for the total amount of such charges within sixty (60) days of fulfilling its duties under this warranty, payable within thirty (30) days of delivery of such invoice. In no event shall ESKRIDGE be liable for bills for service, labor or other expenses that have been incurred by the Purchaser without approval or prior authorization by ESKRIDGE for inspection, maintenance, or repair of the Product.

(c) If a Product is found to be operable upon inspection, the Product, at Purchaser's election, may be either (1) returned to the Purchaser with a service charge from ESKRIDGE for inspection, cleaning, and routine replacement of all rubber components and any other parts that show wear; or (2) ESKRIDGE can dispose of the product safely.

1.5 **Limitations of Liability.** ESKRIDGE shall in no event be liable for punitive, special or consequential damages relating to the Product or this Warranty. ESKRIDGE makes no warranty in respect to third-party accessories, upgrades, or additions to the Product.

1.6 **Improving Product.** ESKRIDGE reserves the right to improve the Product through changes in design or materials as it may deem desirable or necessary without being obligated to incorporate, upgrade, or otherwise modify previously manufactured products.

1.7 **Limitations of Warranty.**

(a) THE WARRANTY SET FORTH ABOVE IS THE ONLY EXPRESS WARRANTY. ESKRIDGE HEREBY DISCLAIMS AND EXCLUDES ANY OTHER EXPRESS, IMPLIED, OR STATUTORY WARRANTIES, ARISING BY OPERATION OF LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE, OF TRADE, OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY.

(b) ANY IMPLIED WARRANTY WHICH BY LAW MAY NOT BE EXCLUDED IS LIMITED IN DURATION TO ONE (1) YEAR FROM THE DATE OF ORIGINAL RETAIL PURCHASE OF THE PRODUCT.

(c) This warranty gives you specific legal rights, and you may also have other rights which vary from jurisdiction to jurisdiction.

(d) This warranty is valid only in the U.S.A. and Canada. For warranty outside the U.S.A. and Canada contact your nearest Eskridge Distributor.

1.8 **No Modifications to Warranty.** No ESKRIDGE dealer, distributor, agent or employee is authorized to make any modification, extension or addition to this warranty.

1.9 **How to Apply for Warranty Coverage.**

All claims are handled by contacting your nearest Eskridge Distributor. For questions, please contact customer support: [eskcustomersupport@ramseyindustries.com](mailto:eskcustomersupport@ramseyindustries.com).

Visit [Dealer Locator - Eskridge](#) for Eskridge Distributor locations and contact information.

Additional warranty, service support, product information, and parts information can be found on [www.eskridgeinc.com](http://www.eskridgeinc.com).