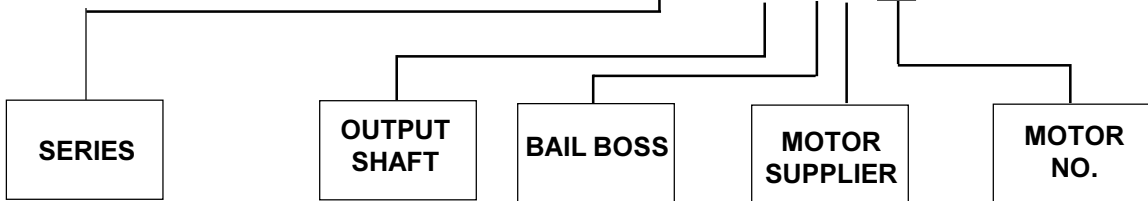


PART NUMBER EXAMPLE: 77BA - 3 2 F 59



Series 77 Planetary Digger Drive Service & Repair Manual

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

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.

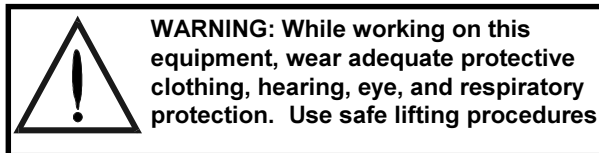
LUBRICATION AND MAINTENANCE

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).

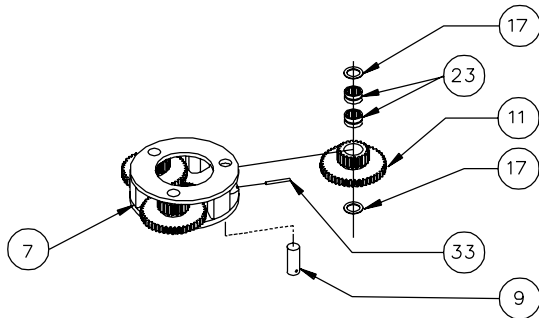
10) Lift the secondary planetary assembly out of the unit (includes items 6,8,10,18,24, & 33). Use a puller if needed.

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



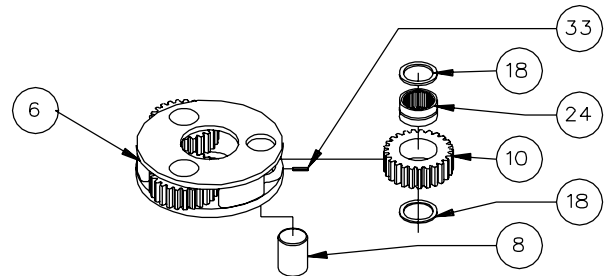
Rotate cluster gears (11) to check for abnormal noise or roughness in bearings (23) or planet pins (9). If further inspection or replacement is required, proceed as follows.

- 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

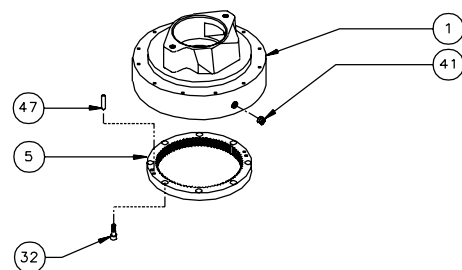


Follow the same procedure as that for the PRIMARY PLANET CARRIER SUBASSEMBLY. Substitute items as indicated: planet gears (10), planet bearings (24), planet pins (8), washers (18), and carrier (6).

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.

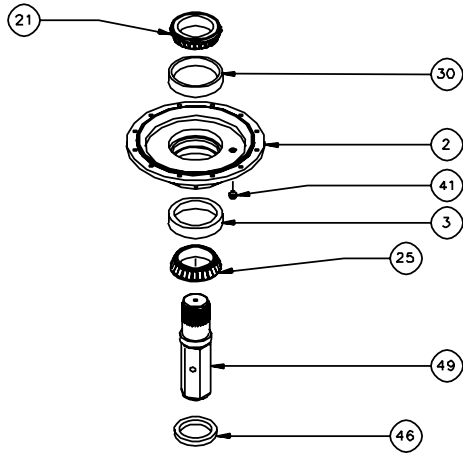
TOP CASE SUBASSEMBLY (ITEMS 1,5,32,41, & 47) DISASSEMBLY AND REPAIR



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.

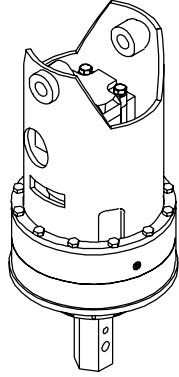
4) Invert this assembly so it is standing on the shaft (**on the press table**).

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.

PRODUCT WARRANTY

ESKRIDGE, INC. ("Eskridge") warrants to its original purchaser ("Customer") that new component parts ("Parts") sold by Eskridge to the Customer will be free of defects in material and workmanship and will conform to standard specifications set forth in current Eskridge sales literature or to any custom specifications of the Customer acknowledged in writing by Eskridge, **SUBJECT TO THE FOLLOWING QUALIFICATIONS AND LIMITATIONS:**

- 1) Prior to placing warranted Parts in service, the Customer shall provide proper storage such that foreign objects (e.g., rain or debris) cannot enter any Parts via entry ports which are normally closed during operation.
- 2) If Parts requiring motorized power for operation are received from Eskridge without a motor, documentation must be available indicating proper lubrication upon placement of the Parts in service.
- 3) The Customer must notify Eskridge in writing of any claim for breach of this warranty promptly after discovery of a defect and in any event prior to the termination of the warranty period, which shall commence when a unit is placed in service and shall expire upon the earlier of (i) the expiration of twelve (12) months from the date of Commencement of Service (as defined in Paragraph 4) (ii) the completion of one thousand (1,000) hours of service of the Parts (iii) the expiration of six (6) months after the expiration of any express warranty relating to the first item of machinery or equipment in which the Parts are installed or on which it is mounted, or (iv) the installation or mounting of the Parts in or on an item of machinery or equipment other than the first such item in which the Parts are installed or on which the Parts are mounted.
- 4) Parts shall be deemed to have been placed in service (the "Commencement of Service") at the time the machinery or equipment manufactured or assembled by the Customer and in which the Parts are installed or on which the Parts are mounted is delivered to the Customer's dealer or the original end-user, whichever ever receives such machinery or equipment first.
- 5) This warranty shall not apply with respect to Parts which, upon inspection by Eskridge, show signs of disassembly, rework, modifications or improper installation, mounting, use or maintenance.
- 6) Eskridge makes no warranty in respect to hydraulic motors mounted on any Parts. Failure of any such motor will be referred to the motor manufacturer.
- 7) Claims under this warranty will be satisfied only by repair of any defect(s) or, if repair is determined by Eskridge in its sole, absolute and uncontrolled discretion to be impossible or impractical, by replacement of the Parts or any defective component thereof. No cash payment or credit will be made for defective materials or workmanship. **IN NO EVENT SHALL ESKRIDGE BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND OR NATURE, WHICH DAMAGES ARE HEREBY EXPRESSLY DISCLAIMED.**
- 8) From time to time, Eskridge may make changes in the component parts manufactured by it without incorporating such changes in the component parts previously shipped. Such changes shall not constitute an admission by Eskridge of any defects or problems with previously manufactured component parts.
- 9) All freight charges on Parts returned for warranty service are the responsibility of the Customer.

THE FOREGOING WARRANTY IS THE SOLE WARRANTY MADE BY ESKRIDGE WITH RESPECT TO ANY PARTS, AND IS IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, ESKRIDGE EXPRESSLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, REGARDLESS OF ANY KNOWLEDGE ESKRIDGE MAY HAVE OF ANY PARTICULAR USE OR APPLICATION INTENDED BY THE PURCHASER. THE SUITABILITY OR FITNESS OF THE PARTS FOR THE CUSTOMER'S INTENDED USE, APPLICATION OR PURPOSE AND THE PROPER METHOD OF INSTALLATION OR MOUNTING MUST BE DETERMINED BY THE CUSTOMER.

WARRANTY RETURN POLICY

- 1) All Parts shall be returned freight prepaid.
- 2) Any Parts qualifying for warranty will be repaired with new Parts free of charge (except for freight charges as provided above).
- 3) If parts are found to be operable, you have two options:
 - a. The Parts can be returned to you with a service charge for inspection, cleaning, and routine replacement of all rubber components and any other parts that show wear; or
 - b. We can dispose of the Parts at the factory if you do not wish it to be returned.

NOTE: Any order of Parts by customer shall only be accepted by Eskridge subject to the terms stated herein. Any purchase order forms used by Customer (to accept this offer to sell) which contain terms contrary to, different from, or in addition to the terms herein shall be without effect, and such terms shall constitute material alteration of the offer contained herein under K.S.A 84-2-207 (2)(b), and shall not become part of the contract regarding the sale of the Parts.

| 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 |
|-----|---|-------------------|--|--|-----------------|

OPTIONS
SEAL KIT P/N 76-016-2011
INCLUDES ITEMS 43,44 AND 46

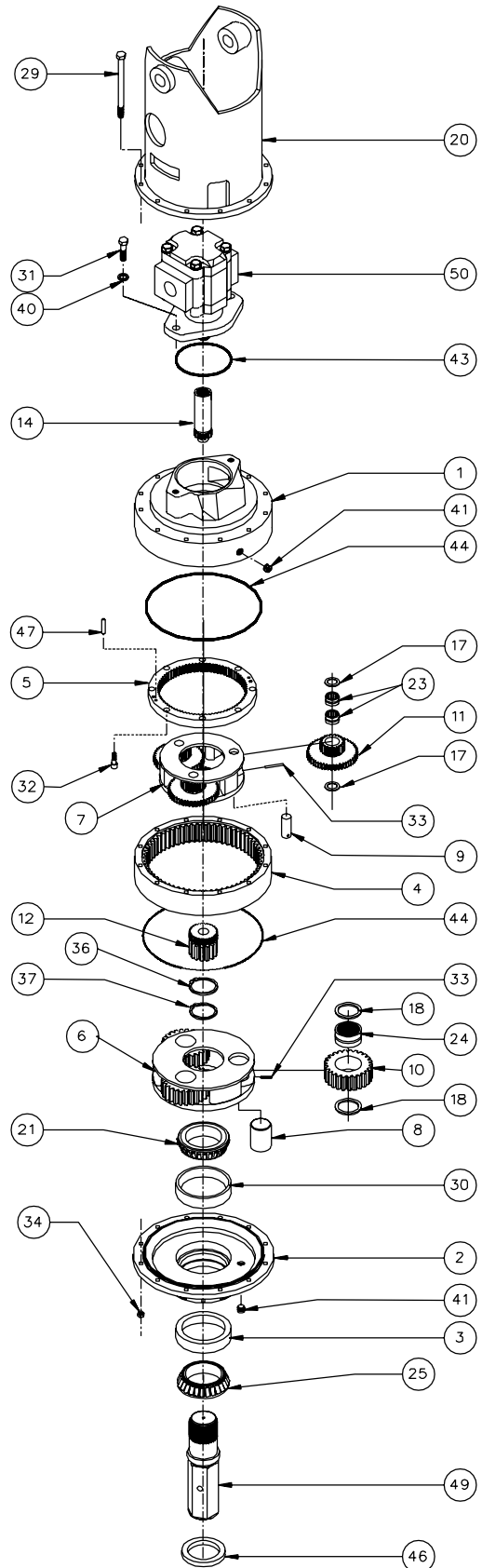
EFFECTIVE DATE:
08/01/92
SERAL NO. 17000

(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

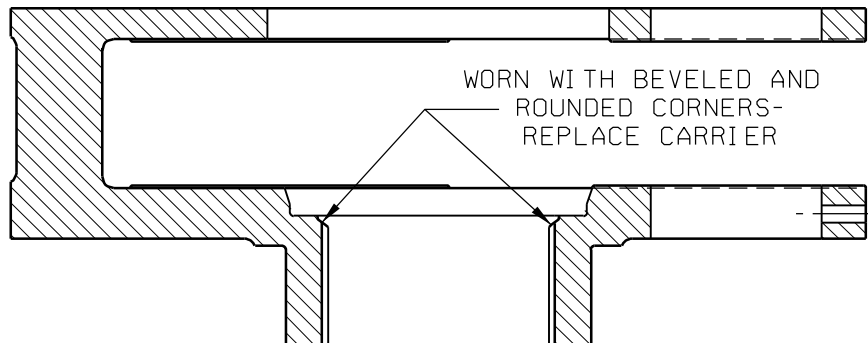
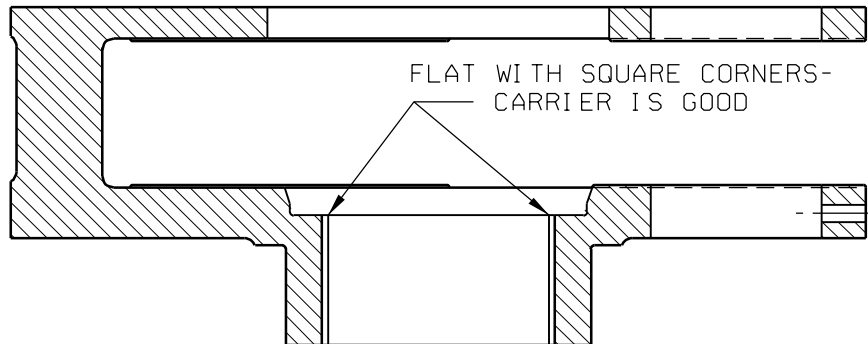
DATE: 06/01/87

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

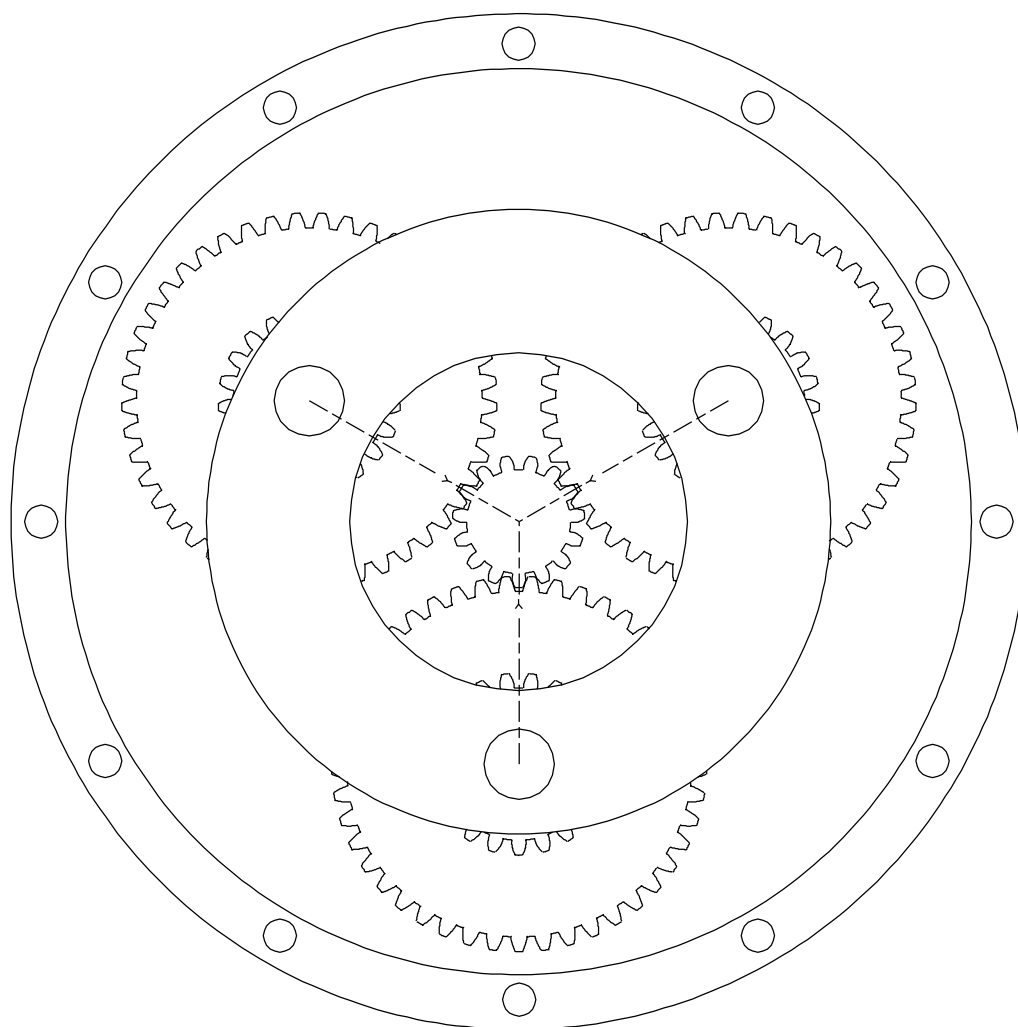
SUBJECT: Inspection of Secondary Carriers

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.

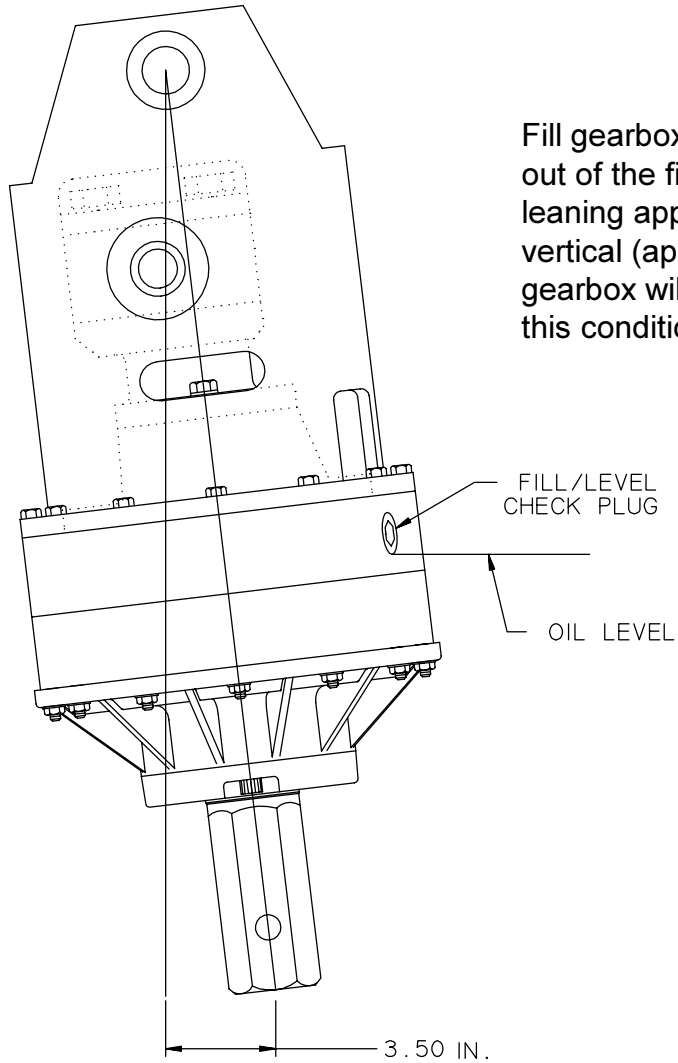
If when inspected, the carrier is found to be worn to a bevel shape, the carrier should be replaced with carrier part number 71-004-0073. Units with serial numbers prior to 4900 should also have the hex output shaft replaced with the current production revision, part number 71-004-0513.



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.

OTHER ESKRIDGE PRODUCTS

PLANETARY GEARDRIVES

SERIES

20/28 SERIES
50 SERIES
60 SERIES
100 SERIES
130 SERIES
150 SERIES
250 SERIES
600 SERIES
1000 SERIES

TORQUE RATING
MAX. INTERMITTENT
20,000-28,000 IN-LB
50,000 IN-LB
60,000 IN-LB
100,000 IN-LB
130,000 IN-LB
150,000 IN-LB
250,000 IN-LB
600,000 IN-LB
1,000,000 IN-LB

MULTIPLE DISC BRAKES

SERIES

90B SAE B
90BA SAE B ADJUSTABLE TORQUE
92B SAE B LOW PROFILE
93 FOR NICHOLS MOTORS
95C SAE C
95W SAE C WHEEL MOUNT
98D SAE D

TORQUE RATING
TO 4,800 IN-LB
TO 4,800 IN-LB
TO 2,800 IN-LB
TO 6,100 IN-LB
TO 12,000 IN-LB
TO 21,000 IN-LB
TO 25,000 IN-LB

PLANETARY DIGGERDRIVES

SERIES

D50 MODELS 1500, 2500 & 5000
76 MODELS BA & BC, TWO SPEED
77 MODELS BA, BC & BD
78 MODELS 35 & 48, TWO SPEED
75 MODELS TWO SPEED

TORQUE RATING
1,500-5,000 FT-LB
8,000-12,500 FT-LB
6,000-12,500 FT-LB
9,000-12,500 FT-LB
16,500-20,000 FT-LB



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Your nearest Eskridge Distributor is:

