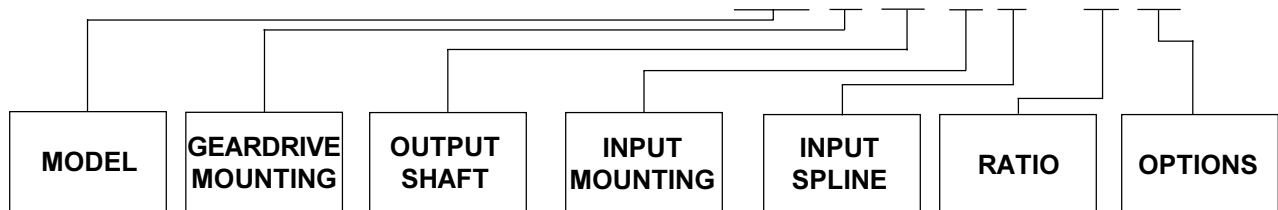


EXAMPLE PART NUMBER: B60 A D1 C 4 - 19 Z



Series B60 Planetary Geardrive Service & Repair Manual

EFFECTIVE FOR:
FROM S/N: 17802 - UP
DATE: 02/15/94 - UP

MODEL B60 SERVICE MANUAL

SINGLE & DOUBLE PLANETARY GEARDRIVE

This manual will assist in disassembly and assembly of the above model planetary geardrives. Item numbers, indicated in parentheses throughout this manual, refer to the exploded parts breakdown drawing. Individual customer specifications (mounting case, output shaft, brake assembly, 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 geardrive 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 & MAINTENANCE

Change the oil after the first 50 hours of operation. Oil should be changed at 500 hour intervals thereafter. Use a GL-5 grade EP **80/90** gear oil (EP = "Extreme Pressure"). The geardrive should be partially disassembled to inspect gears and bearings at 1000 hour intervals.

If your unit was specified "shaft up" or with a "-Z" after the part number, 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 base or general purpose bearing grease sparingly every 50 operating hours or at regular maintenance intervals. Over-greasing the output bearing tends to fill the housing with grease and thicken the oil.

OPERATING POSITION

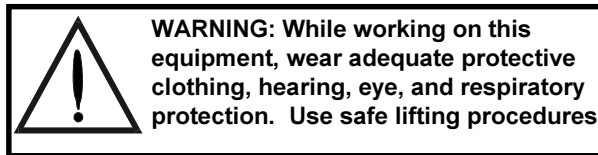
Horizontal shaft
Vertical shaft

OIL CAPACITY

1.75 pints (0,8 liters)
2.00 pints (1,0 liters)

OIL LEVEL

To horizontal centerline of geardrive
To midway on upper/primary gearset



UNIT DISASSEMBLY PROCEDURE

(Refer to exploded view on page 7)

- 1) Scribe a diagonal line across the outside of the unit from cover (6) to case (1) before disassembly to assure proper positioning of pieces during reassembly.
- 2) Remove magnetic pipe plug (32) and drain oil from unit. Maximum drainage occurs when oil is warm.
- 3) Remove eight cover bolts (24) and lockwashers (27).
- 4) Lift off cover (6). The input gear (12) and input thrust washer (17) may now be lifted out of carrier assembly.
- 5) Remove all three shaft retaining locknuts (26).
- 6) The output shaft (13) and planet carrier assembly

may now be removed as follows:

a) The carrier (2) spline is a press fit onto output shaft (13) spline. Case (1) should be set on a plate or table with output shaft protruding downward through hole in table.

NOTE: Care should be taken not to damage output shaft or your feet when shaft falls out of case.

b) Press output shaft out bottom of case by applying press load to top end of studs (25).

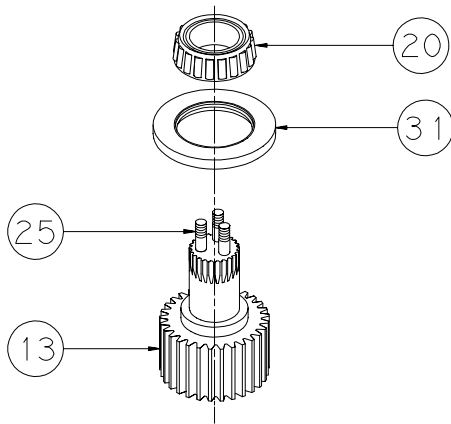
7) Planet carrier assembly (2,5,7,9,15,19,22, & 28) may now be lifted out of case.

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 listed below:

1. Output Shaft subassembly
2. Planet Carrier subassembly
3. Case subassembly

OUTPUT SHAFT SUBASSEMBLY

(ITEMS 13,20,25, & 31)
DISASSEMBLY AND REPAIR



(Also refer to exploded view on page 7)

1) If replacing shaft retaining studs (25), turn so that extended end of new stud is threaded into output shaft first. Screw studs into shaft holes until tight. Note that studs must be below top surface of bearing retainer plate (5) when carrier is installed or they will interfere with input gear (12).

2) Outer tapered bearing cone (20) may be removed using a gear puller. If reusing old bearing cone, do not damage roller cage by pulling on it.

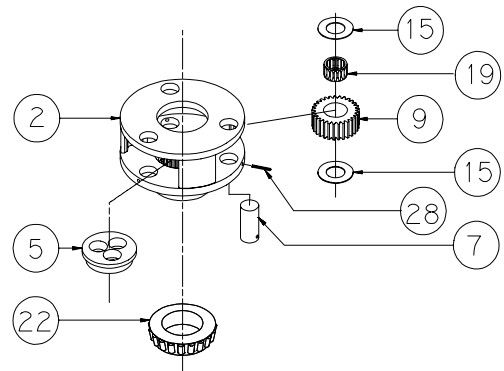
3) To replace shaft seal (31). Lubricate inner lip of new seal and turn so that open side is facing upward. Slide seal down output shaft (13) all the way to gear teeth or until it fits snugly over seal diameter.

NOTE: Press bearing onto shaft by pressing on inner race only. DO NOT press on roller cage or bearing may be damaged.

4) With large end down, press outer bearing cone (20) onto output shaft (13). Be sure it is seated tightly against shoulder of shaft. If old outer bearing cone (20) was removed only to replace shaft seal, it may be reused.

PLANET CARRIER SUBASSEMBLY

(ITEMS 2,5,7,9,15,19,22, & 28)
DISASSEMBLY AND REPAIR



Rotate the planet gears (9) to check for abnormal noise or roughness in bearings (19) or planet shafts (7). If further inspection or replacement is required, proceed as follows:

1) Drive roll pins (28) into planet shafts (7).

2) Supporting carrier (2) only, press or drive planet shafts (7) out of carrier.

3) Slide planet gears (9) along with planet washers (15) out of carrier (2).

4) If planet bearings (19) require replacement, press them out of the planet gears (9) and replace with new ones.

5) Use 1/8 inch pin punch to remove roll pins (28) from planet shafts (7).

6) Check planet shafts (7) for any abnormal wear, especially ones where bearings needed to be replaced. If any abnormal wear is found, replace planet shafts.

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

7) If tapered inner bearing cone (22) on hub of carrier (2) must be replaced, it may be removed using a gear puller. Then, press a new inner bearing cone (22) onto hub making sure bearing shoulder is tight against hub shoulder.

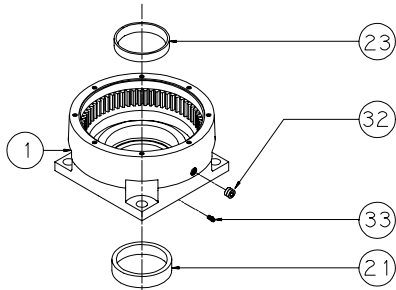
RE-ASSEMBLY

1) With planet washers (15) on both sides of the planet gear (9) and with bearings (19) installed, slide gear into the carrier (5).

2) Planet shafts (7) should be installed with chamfered end of 1/8" hole toward outside diameter of the carrier (2). This will aid in alignment of holes while inserting roll pins (28).

3) Drive three roll pins (27) through holes in carrier and into planet shafts to retain the parts.

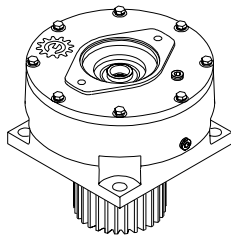
CASE SUBASSEMBLY (ITEMS 1,21,23,32 & 33) DISASSEMBLY AND REPAIR



1) Inspect inner and outer bearing cups (21 & 23). Bearing cups are not removeable. If cups are damaged, **cups and case (1)** may need replacement. Contact Eskridge, Inc. if you have questions.

2) Clean all foreign material from magnetic drain and fill plugs (32).

UNIT ASSEMBLY REASSEMBLING



(Refer to exploded view on page 5)

1) Turn case pinion side up (opposite shown). Apply a layer of lithium or general purpose bearing grease to outer bearing cup (21). Place the shaft (13) into case (1) so the shaft's outer tapered bearing cone (20) is seated in case's outer bearing cup (21). Tap shaft seal (31) into place. A large drift punch may be helpful for seating the seal.

CAUTION: Shaft is not retained at this time.

2) Turn case pinion side down (standing on shaft).

3) Apply a layer of lithium or general purpose grease to inner bearing cup (23).

4) Place shim(s) (14) over studs (25). Use same number

of shims that came out of unit to allow for correct shaft bearing preload.

5) Rotate bearing retainer plate (5) inside carrier assembly so that counter-bored holes are centered between planet gears (9).

6) Install planet carrier assembly (2) into case (1) as follows: Rotate planet carrier assembly back and forth until planet gear teeth (9) mesh with gear teeth in case (1). Let carrier assembly down until carrier spline touches output shaft (13) spline. Align holes in retainer plate directly over shaft studs. Rotate carrier by hand until you are certain carrier spline has started cleanly and squarely onto shaft spline. View down through top of carrier assembly to check centering between planet gears.

NOTE: It is important that the holes in the retainer plate remain centered between planet gears. A certain amount of tool clearance will be necessary in order to install and torque the locknuts.

7) Counter-bored holes in retainer plate (5) should be centered between planet gears (9). Slowly press carrier assembly down tightly against output shaft (13).

8) While secondary carrier (2) assembly is under press load (**approx. 2 tons**), rotate case (1) by hand. If correct number of shims are in unit to give proper shaft bearing preload, rolling torque required to turn case should be 20 to 80 in-lbs (4 to 16 lbs applied to outside of case). If application requires unit to withstand high side loads, stay toward high end of torque range. If application is high speed or continuous use, stay toward low end of torque range.

9) Remove press load from carrier (2). Lubricate threads and install locknuts (26) onto studs (25) and torque to 70-75 ft-lbs. Use of a deepwell shallow-walled 11/16 socket is recommended.

10) Insert input gear (12) into unit so that teeth mesh with planet gears (9).

11) Place input thrust washer (17) over input gear.

NOTE: A simple planetary such as this does not require a gear timing procedure.

12) Replace o-ring (30) on bottom of cover (6).

13) Set cover (6) on top of unit and refer to scribed line for proper orientation. Install and torque eight capscrews (24) with lockwashers (27) to 32 ft-lbs.

14) Check to be sure magnetic plug (32) is securely installed into side of case (1).

15) Add gear oil as specified on page 2. Correct oil level will measure to middle of planet gears (9) in the vertical position.

16) Put pipe sealant o magnetic plug **(32)** and install into oil fill hole in cover **(6)**.

17) insert a shaft, such as an output shaft from a hydraulic motor, into input gear **(12)** and turn by hand to be sure uit turns smoothly and easily.

THE GEARBOX IS NOW READY TO USE.

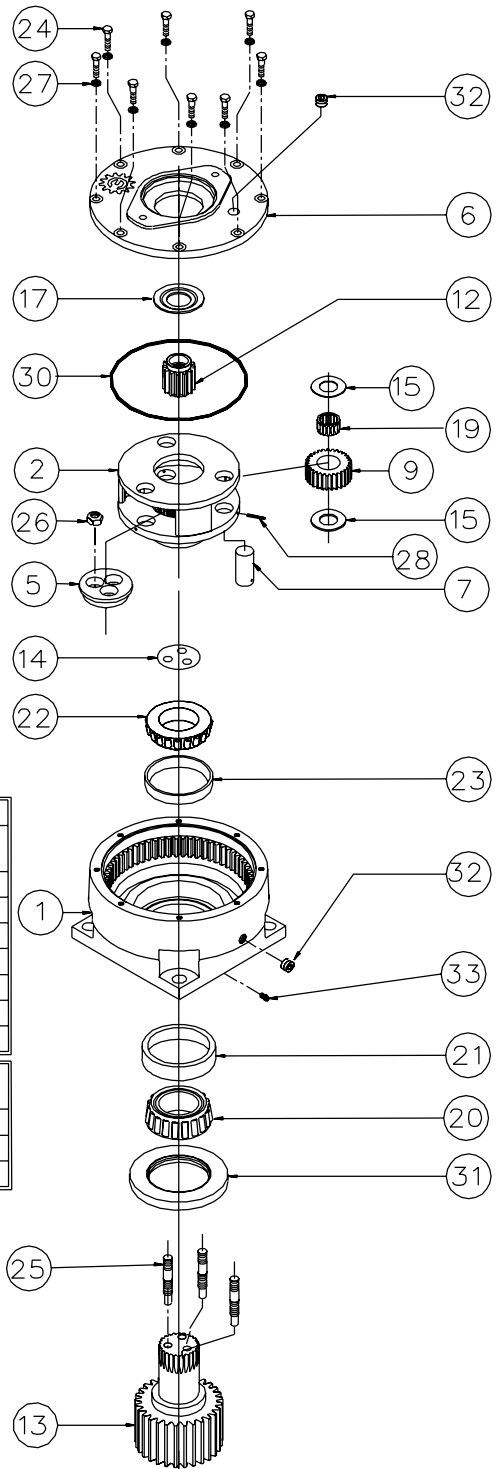


EFFECTIVE DATE: 2-15-94

SERIAL NO. 17802

MODEL B60

| ITEM | DESCRIPTION | PART NUMBER | RATIO 4:1 6:1 |
|------|---------------------------|-------------|---------------------|
| 1 | CASE | 84-004-3012 | 1 |
| 2 | CARRIER - SEC | -A- | 1 |
| 5 | PLATE- BEARING RETAINER | 83-004-1062 | 1 |
| 6 | COVER | -C- | 1 |
| 7 | PLANET SHAFT (SEC) | 83-004-1031 | 3 |
| 9 | PLANET GEAR (SEC) | -D- | 3 |
| 12 | INPUT GEAR | -G- | 1 |
| 13 | OUTPUT SHAFT | -H- | 1 |
| 14 | SHIM | 83-004-1101 | -J- |
| 15 | THRUST WASHER - PLANET | 81-004-1561 | 6 |
| 17 | INPUT THRUST WASHER | 81-004-2701 | - |
| 19 | BEARING - SEC PLANET | 01-105-0420 | 3 |
| 20 | BEARING CONE | 01-102-0090 | 1 |
| 21 | BEARING CUP | 01-103-0080 | 1 |
| 22 | BEARING CONE | 01-102-0100 | 1 |
| 23 | BEARING CUP | 01-103-0090 | 1 |
| 24 | HEX HD CAPSCREW | 01-150-1020 | 8 |
| 25 | STUD 7/16-20 X 2-15/16 | 83-004-1191 | 3 |
| 26 | LOCKNUT | 01-158-0330 | 3 |
| 27 | LOCKWASHER | 01-166-0010 | 8 |
| 28 | ROLL PIN- SEC. PLANET | 01-153-0210 | 3 |
| 30 | O-RING | 01-402-0420 | 1 |
| 31 | SHAFT SEAL | 01-405-0380 | 1 |
| 32 | MAGNETIC PIPE PLUG | 01-207-0070 | 2 |
| 33 | GREASE FITTING (OPTIONAL) | 01-215-0070 | 1 |



| NOTE | CODE | SINGLE PLANETARY DESCRIPTION | PART NUMBER | |
|------|------|---------------------------------|-----------------|-----------------|
| | | | 4.42:1 RATIO | 6.00:1 RATIO |
| -A- | - | CARRIER (SEC) | 83-004-1213 | 83-004-1223 |
| -D- | - | PLANET GEAR (SEC) | 84-004-1042 | 83-004-1042 |
| -G- | 1 | INPUT GEAR - 21 T 20/40 DP | N/A | N/A |
| | 2 | INPUT GEAR - 13 T 16/32 DP | 84-004-1052 | 84-004-1022 |
| | 3 | INPUT GEAR - SAE 1"-6B | 84-004-1032 | 84-004-1062 |
| | 4 | INPUT GEAR - 14 T 12/24 DP | 84-004-1072 | N/A |
| | 5 | INPUT GEAR - 15 T 16/32 DP | N/A | N/A |

| NOTE | CODE | COVER | EXCEPT WITH | WITH CODE 4 |
|------|------|---------------------------|--------------|-------------|
| | | | CODE 4 INPUT | INPUT ONLY |
| -C- | A | SAE 'A' 2 AND MOD. 4 BOLT | 81-004-2803 | 81-004-2813 |
| | B | SAE 'B' 2 BOLT | 81-004-2723 | 81-004-2823 |
| | C | SAE 'C' 2 BOLT AND 4 BOLT | 81-004-2833 | 81-004-2833 |

| NOTE | CODE | OUTPUT SHAFT | PART NUMBER |
|------|------|------------------------|-------------|
| -H- | D1 | 2"DIA 3/8"KEY | 83-004-4023 |
| | D2 | 2"DIA 23T 12/24 DP SPL | 83-004-4043 |
| | D3 | 2-1/4"DIA 1/2 KEY | 84-004-4073 |
| | D4 | 3"DIA 3/4"KEY | 83-004-4233 |
| | D5 | 2"DIA 1/2"KEY | 83-004-4393 |
| | C1 | CUSTOM | |

OPTIONS:

SEAL KIT P/N 83-016-5011
(INCLUDES 1 EACH OF
ITEMS 30 AND 31)

NOTE: -J- BEARING PRELOAD DETERMINES QUANTITY OF SHIMS.

ECN 1803
X60BD1-DB

DATE: 6-26-00

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.

OTHER ESKRIDGE PRODUCTS

PLANETARY GEARBOXES

| MODEL | TORQUE RATING |
|--------------|--|
| 20/28 SERIES | MAX. INTERMITTENT 20,000-28,000 IN-LBS |
| 50 SERIES | 50,000 IN-LBS |
| 60 SERIES | 60,000 IN-LBS |
| 100 SERIES | 100,000 IN-LBS |
| 130 SERIES | 130,000 IN-LBS |
| 150 SERIES | 150,000 IN-LBS |
| 250 SERIES | 250,000 IN-LBS |
| 600 SERIES | 600,000 IN-LBS |
| 1000 SERIES | 1,000,000 IN-LBS |

MULTIPLE DISC BRAKES

| | OUTPUT TORQUE |
|------------------------------|----------------------|
| 90B SAE B | TO 4,800 IN-LBS |
| 90BA SAE B ADJUSTABLE TORQUE | TO 4,800 IN-LBS |
| 92B SAE B LOW PROFILE | TO 2,800 IN-LBS |
| 93 FOR NICHOLS MOTORS | TO 6,100 IN-LBS |
| 95C SAE C | TO 12,000 IN-LBS |
| 95W WHEEL MOUNT | TO 21,000 IN-LBS |
| 98D SAE D | TO 25,000 IN-LBS |

PLANETARY AUGER DRIVES (DIGGERS)

| | TORQUE RATING |
|------------------------------|----------------------|
| D50 MODELS 1600, 2000 & 2800 | 1,500-5,000 FT-LBS |
| 76 MODELS BA & BC, TWO SPEED | 8,000-12,500 FT-LBS |
| 77 MODELS BA, BC & BD | 6,000-12,500 FT-LBS |
| 78 MODELS 35 & 48, TWO SPEED | 9,000-12,500 FT-LBS |
| 75 MODELS 38 & 51, TWO SPEED | 16,500-20,000 FT-LBS |



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Your nearest Eskridge Distributor is:

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