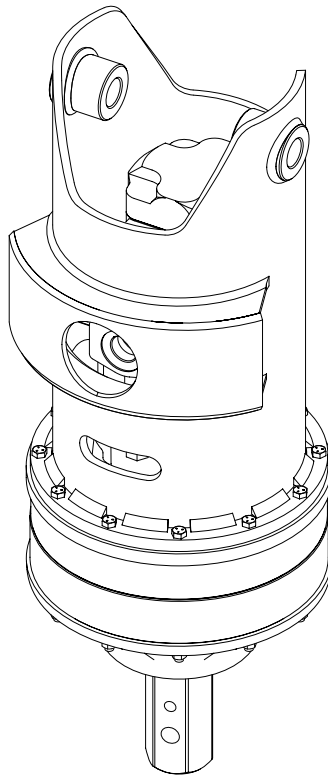
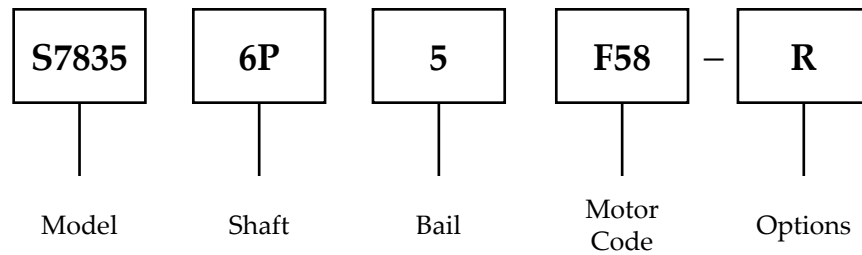


ESKRIDGE

S78 PLANETARY AUGER DRIVE SERVICE AND REPAIR MANUAL



Example Part Number



THIS SERVICE MANUAL IS EFFECTIVE
FROM: S/N 00001, APRIL 1986
TO: CURRENT
REF: SMS78P-BA

S78 SERVICE MANUAL

SINGLE SPEED PLANETARY AUGER DRIVE

This manual will assist in disassembly and assembly of major components for all Model S78 Planetary Auger Drives. Item numbers, indicated in parentheses throughout this manual, refer to the Eskridge Model S78 exploded parts breakdown drawings. 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 drawings for details.

LUBRICATION & MAINTENANCE

Change the oil after the first 50 hours of use and at 500 hour intervals thereafter. Gear drives in auger drives require GL-5 grade AP 80/90 gear oil for lubrication. The manufacturer recommends that the unit be partially disassembled to inspect gears, spines and bearings at 1000 hour intervals.

The oil capacity of this unit is 6.5 pints. Proper oil level will measure to middle of primary cluster gears when auger drive is in vertical position.



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

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Unit Disassembly Procedure

(Refer to exploded view drawing on Page 6)

- 1) Scribe a diagonal line across the outside of the auger drive, from the bail assembly (35) to the bearing carrier (4), to assure proper orientation of parts as they are reassembled.
- 2) To drain oil, position unit vertically and remove oil plug (28) located in the bearing carrier (4). To help ventilate oil while draining, loosen or remove oil plug (37) located in cover (1). 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 (22) and hex-flange nuts (24) from bail assembly (35). Lift bail assembly from unit.

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

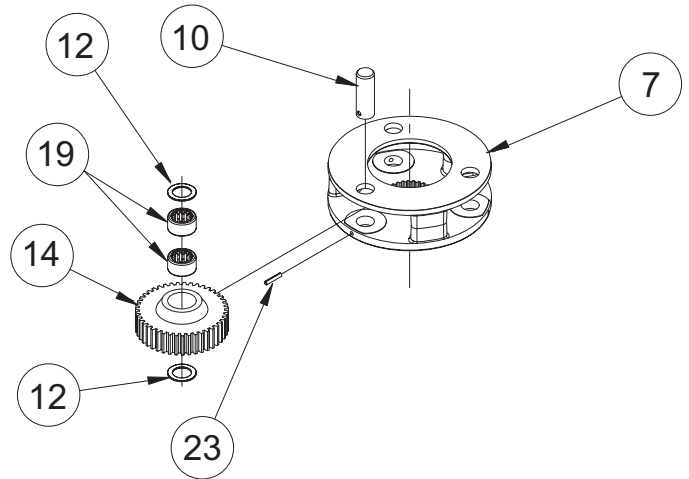
- 4) Remove the two cap screws (32) and lock washers (33) from hydraulic motor (34). Remove motor from unit. Check o-ring (31) for damage.
- 5) Remove cover (1), input gear (9) and o-ring (30).
- 6) Lift the primary planet carrier assembly out of the unit (includes Items 7, 10, 12, 14, 19 & 23).
- 7) If sun gear (16) has not been removed from auger drive, do so now. (Sometimes the sun gear remains in the primary carrier (7).)
- 8) Remove primary ring gear (6).
- 9) Remove secondary ring gear (5) and o-ring (30).
- 10) The output shaft (2) and secondary planet carrier assembly may now be removed as follows:
 - a) The secondary planet carrier (8) spline is a press fit onto output shaft (2) spline. Bearing carrier (4) should be set on plate or table with output shaft protruding downward through hole in table.
 - b) Loosen, but do not remove, shaft retaining cap screws (29).

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

- c) Press output shaft out bottom of case by applying press load to top end of cap screws (29). Remove cap screws to allow shaft to pass through case.
- 11) Lift the secondary planet assembly out of the unit (includes Items 8, 11, 13, 15, 17, 18, 21 & 23). Use a puller, if needed.
 - 12) The unit is now disassembled into subassemblies. The area(s) requiring repair should be identified by thorough inspection of the parts after they have been cleaned and dried.

Primary Planet Carrier Subassembly

(Items 7, 10, 12, 14, 19 & 23)



Disassembly

- 1) Rotate planet gears (14) to check for abnormal noise or roughness in bearings (19) or planet pins (10). If further inspection or replacement is required, proceed as follows.
- 2) Drive roll pins (23) completely into planet pins (10).
- 3) Press or drive planet pins (10) out of carrier (7).
- 4) Remove planet gears (14) and washers (12) from the carrier (7).

Reassembly

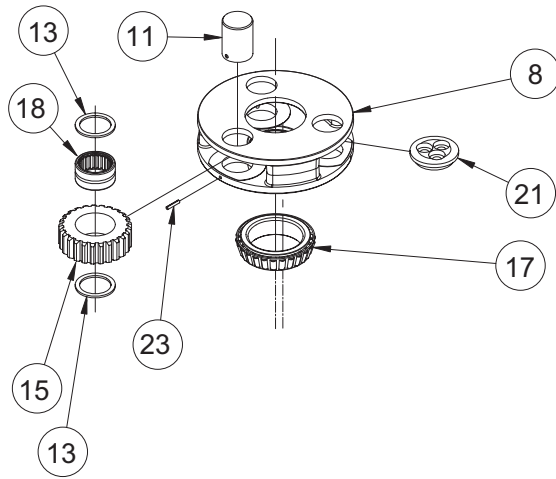
- 1) If the planet bearings (19) require replacement, press them out of the planet gears (14) and replace with new ones.

NOTE: If necessary to replace planet pins or bearings, then both components should be replaced.

- 2) Check primary planet pins (10) for any abnormal wear, especially ones where bearings needed to be replaced. If any abnormal wear is found, replace planet shafts.
- 3) Remove the roll pins (23) from planet pins (10).
- 4) With washers (12) on both sides of the planet gear (14) and with bearings (19) installed, slide gear into the carrier (7). Be sure the hub side of gear is away from the splined side of carrier. Insert the planet pin (10) through the carrier, washers and planet gear.
- 5) Planet pins (10) 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 (23).
- 6) Drive three roll pins (23) through the carrier holes and into the planet shafts to retain the parts.

Secondary Planet Carrier Subassembly

(Items 8, 11, 13, 15, 17, 18, 21 & 23)



Disassembly

- 1) Rotate the secondary planet gear (15) to check for abnormal noise or roughness in planet bearings (18) or secondary planet shafts (11). If further inspection or replacement is required, proceed as follows.
- 2) Drive roll pins (23) into secondary planet shafts (11).
- 3) Press or drive secondary planet shafts out of secondary carrier (8).
- 4) Slide secondary planet gears (15) along with planet washers (13) out of secondary carrier (8).

Reassembly

- 1) If the planet bearings (19) require replacement, press them out of the planet gears (14) and replace with new ones.

NOTE: If replacing planet pins or bearings, then both components should be replaced.

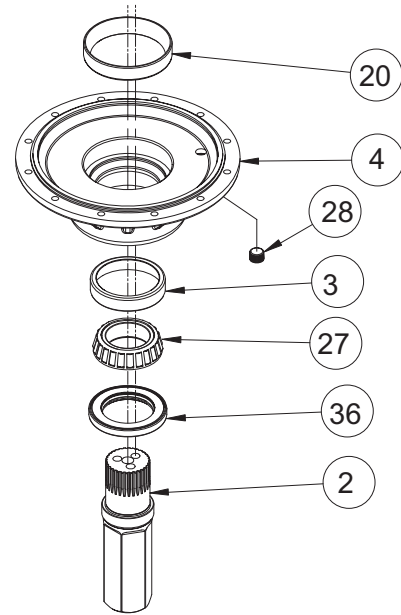
- 2) Check primary planet pins (10) for any abnormal wear, especially ones where bearings needed to be replaced. If any abnormal wear is found, replace planet shafts.
- 3) Remove the roll pins (23) from planet pins (10).
- 4) With washers (12) on both sides of the planet gear (14) and with bearings (19) installed, slide gear into the carrier (7). Insert planet retainer. Insert the planet pin (10) through the carrier, washers and planet gear.
- 5) Planet pins (10) 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 (23).
- 6) Drive three roll pins (23) through the carrier holes and into the planet shafts to retain the parts.

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

- 7) If tapered inner bearing cone (17) on secondary carrier (8) hub must be replaced, it may be removed using a gear puller. Then, press a new bearing cone onto the hub, making sure bearing shoulder is tight against the hub shoulder.

Bearing Carrier Subassembly

(Items 2, 3, 4, 20, 27, 28 & 36)



Disassembly

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

- 1) If outer bearing cone (27) needs to be replaced a puller may be used.
- 2) Inspect inner and outer bearing cups and bearing (3, 20 & 27); replace if necessary.

Reassembly

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 (27) 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 (4) (output shaft 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 (2) into the bearing carrier (4) (bearing cone down) and use a soft hammer to install the shaft seal (36), with the open side toward the inside of the auger drive, 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).

Unit Reassembly Procedure

(Refer to exploded drawing on Page 6)

- 1) Install secondary carrier assembly **(8)** onto bearing carrier **(4)** as follows.
 - a) Set carrier assembly down onto output shaft **(2)** spline.
 - b) Rotate carrier by hand until you are certain carrier spline has started cleanly and squarely onto shaft spline. View down through top of secondary carrier assembly through counter-bored holes in retainer plate **(21)**.
 - c) Counter-bored holes in retainer plate should be centered between planet gears and must line up with holes in shaft. Slowly press secondary carrier assembly down tightly against the output shaft **(2)**.
- 2) Install cap screws **(29)** and tighten to a torque of 120 ft-lbs if dry, 90 ft-lbs if lubed.
- 3) Install a new o-ring **(30)** on the bearing carrier **(4)**.
- 4) Referring to scribe marks for proper orientation, install the secondary ring gear **(5)** by rotating until ring gear teeth line up with planet gears.
- 5) Check to be sure retaining ring **(25)** is installed on sun gear **(16)**. Slide the sun gear into the secondary planet carrier.
- 6) Install a new o-ring **(30)** on the primary ring gear **(6)** and install ring gear, referring the scribe marks for alignment.
- 7) Install the primary carrier **(7)** by rotating until spline lines up with sun gear. It may be easier to install the sun gear **(16)** into the bottom of the primary carrier and then install primary carrier.
- 8) Install input gear **(9)**.
- 9) Install a new o-ring **(30)** on the cover and install cover **(1)**, again referring to scribe marks for alignment.
- 10) Install o-ring **(31)** onto the hydraulic motor **(34)**.
- 11) Attach hydraulic motor **(34)** to mounting pad on cover **(1)** with two cap screws **(32)** and lock washers **(33)**; tighten to a torque of 150 ft-lbs.
- 12) Line up scribe mark on bail assembly **(35)** with scribe mark on cover **(1)** and place bail over hydraulic motor **(34)**. Install twelve cap screws **(22)** with hex-flange nuts **(24)** and torque to 65 ft-lbs.
- 13) Fill to proper level with EP 80/90 gear oil, as specified on Page 2.

THE AUGER DRIVE IS NOW READY TO USE

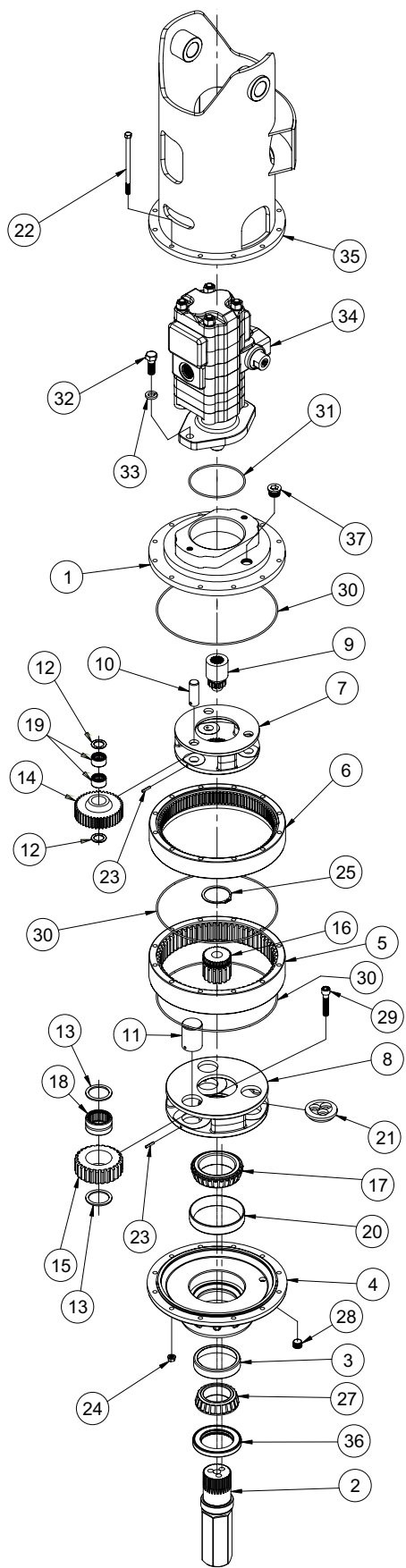
Exploded View Drawing



HYDRASYNC MODELS S78-35 & S78-48 PLATE RETAINED SHAFT

EFFECTIVE:
FROM: S/N 26207 09-15-99
TO: CURRENT

ITEM	QTY	DESCRIPTION	S78-35	S78-48
1	1	COVER - 'C' MOUNT	80-004-1174	80-004-1174
2	1	OUTPUT SHAFT 2-1/2" HEX	71-004-4022	71-004-4022
		OUTPUT SHAFT 2-5/8" HEX	71-004-4032	71-004-4032
3	1	BEARING CUP - LOWER	01-103-0080	01-103-0080
4	1	BEARING CARRIER	71-004-2144	71-004-2144
5	1	RING GEAR, SEC.	71-004-0042	71-004-0042
6	1	RING GEAR, PRI.	73-004-1063	73-004-1063
7	1	CARRIER-PRI.	73-004-1043	73-004-1053
8	1	CARRIER-SEC.	71-004-0073	71-004-0073
9	1	INPUT GEAR	73-004-1012	73-004-1002
10	3	PLANET SHAFT-PRI.	71-004-0121	71-004-0121
11	3	PLANET SHAFT-SEC.	71-004-0081	71-004-0081
12	6	WASHER-PRI.	71-004-0861	71-004-0861
13	6	WASHER-SEC.	71-004-0871	71-004-0871
14	3	PLANET GEAR-PRI.	73-004-1032	73-004-1022
15	3	PLANET GEAR-SEC.	71-004-0092	71-004-0092
16	1	SUN GEAR	71-004-0102	71-004-0102
17	1	BEARING CONE - UPPER SHAFT	01-102-0100	01-102-0100
18	3	BEARING - PLANET SEC.	01-105-0020	01-105-0020
19	6	BEARING - PLANET PRI.	01-105-0010	01-105-0010
20	1	BEARING CUP - UPPER	01-103-0090	01-103-0090
21	1	PLATE-BRG RETAINER	71-004-2322	71-004-2322
22	12	H.H.C.S. 3/8-16 X 6-1/2	01-150-0020	01-150-0020
23	6	ROLL PIN (3/16 X 1)	01-153-0020	01-153-0020
24	12	HEX FLANGE NUT (3/8-16)	01-158-0360	01-158-0360
25	1	RETAINING RING	01-160-0030	01-160-0030
27	1	BEARING CONE - LOWER	01-102-0090	01-102-0090
28	1	HOLLOW HEX PLUG (1/2 NPT)	01-207-0010	01-207-0010
29	3	SOCKET HD CAPSCREW	01-150-1480	01-150-1480
30	3	O-RING	01-402-0020	01-402-0020
31	1	O-RING	01-402-0010	01-402-0010
32	2	H.H.C.S. (5/8-11 X 1-3/4)	01-150-0110	01-150-0110
33	2	LOCKWASHER (5/8)	01-166-0040	01-166-0040
34	1	MOTOR	PER CUSTOMER SPEC.	
35	1	BAIL ASSY (1-1/4" BAIL BOSS DIA)	S73-005-0142	S73-005-0142
		BAIL ASSY (1-1/2" BAIL BOSS DIA)	S73-005-0152	S73-005-0152
36	1	SEAL	01-405-0540	01-405-0540
37	1	HOLLOW HEX PLUG NO 12 SAE	01-208-0030	01-208-0030



OPTIONS
SEAL KIT P/N 76-016-2011
INCLUDES 3 OF ITEM 30, AND
1 EA. OF ITEMS 31 AND 36

DATE: 11-07-02
FILENAME: XS78P-AA.dgn

Eskridge Product Warranty

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

1. Prior to placing Units in service, the Customer shall provide proper storage such that foreign objects (e.g., rain or debris) cannot enter any Units via entry ports which are normally closed during operation.
2. The Customer must notify Eskridge in writing of any claim for breach of this warranty promptly after discovery of a defect. The warranty period shall commence when a unit is placed in service and shall expire upon the earlier of
 - a. the expiration of twelve (12) months from the date of Commencement of Service (as defined in Paragraph 4)
 - b. the completion of one thousand (1000) hours of service of the Units
 - c. 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 Units are installed or on which it is mounted, or
 - d. the installation or mounting of the Units in or on an item of machinery or equipment other than the first such item in which the Units are installed or on which the Units are mounted.
3. Units 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 Units are installed or on which the Units are mounted is delivered to the Customer's dealer or the original end-user, which ever receives such machinery or equipment first.
4. This warranty shall not apply with respect to Units which, upon inspection by Eskridge, show signs of disassembly, rework, modifications, lack of lubrication or improper installation, mounting, use or maintenance.
5. Eskridge makes no warranty in respect to hydraulic motors mounted on any Units. Failure of any such motor will be referred to the motor manufacturer.
6. 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 Units or any defective component thereof. No cash payment or credit will be made for defective materials, workmanship, labor or travel. IN NO EVENT SHALL ESKRIDGE BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND OR NATURE, FOR WHICH DAMAGES ARE HEREBY EXPRESSLY DISCLAIMED.
7. From time to time, Eskridge may make design changes in the component Units manufactured by it without incorporating such changes in the component Units previously shipped. Such design changes shall not constitute an admission by Eskridge of any defects or problems in the design of previously manufactured component Units.
8. All freight charges on Units returned for warranty service are the responsibility of the Customer.

Warranty Return Policy

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

NOTE: Any order of Units 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 Units.

The foregoing warranty is the sole warranty made by Eskridge with respect to any Units 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 Units for the customer's intended use, application or purpose and the proper method of installation or mounting must be determined by the customer.

ESKRIDGE PRODUCT LINE

Planetary Gear Drives

<u>Series</u>	<u>Features</u>	<u>Torque Rating (in-lb)</u> <i>Maximum Intermittent</i>
20	Shaft Output	20,000
28	Shaft Output	50,000
50	Shaft or Spindle Output	50,000
65	Shaft Output	65,000
105	Shaft Output	105,000
130/133	Shaft or Spindle Output	130,000
150	Shaft Output	150,000
250/252/254	Shaft or Spindle Output	250,000
440	Shaft or Spindle Output, Wheel Drive	440,000
600	Shaft or Spindle Output, Wheel Drive	600,000
1000	Shaft or Spindle Output, Wheel Drive	1,000,000

Multiple Disc Brakes

<u>Series</u>	<u>Features</u>	<u>Torque Rating (in-lb)</u>
10"–Integral Brake <i>(Available on Series 65, 105 & 130 Gear Drives)</i>	SAE A Input	to 4,800
90B	SAE B Output	to 4,800
90BA	SAE B Output, Adjustable Torque	to 4,800
92B	SAE B Output, Low Profile	to 2,100
93 (931 or 921)	For Nichols Motors	to 6,200
95C	SAE C Output	to 12,000
98D	SAE D Output	to 25,000

Planetary Auger, Anchor & Digger Drives

<u>Series</u>	<u>Features</u>	<u>Torque Rating (ft-lb)</u> <i>Maximum Intermittent</i>
75	38 & 51, 2-Speed	14,000—20,000
76	BA & BC, 2-Speed	8,000—12,500
77	BA, BC & BD	6,000—12,500
78	35 & 48, 2-Speed	9,000—12,500
D50	1500, 2500 & 5000	1,500—5,000
D440	D440	35,000
D600	D600	50,000
D1000	D1000	83,000

