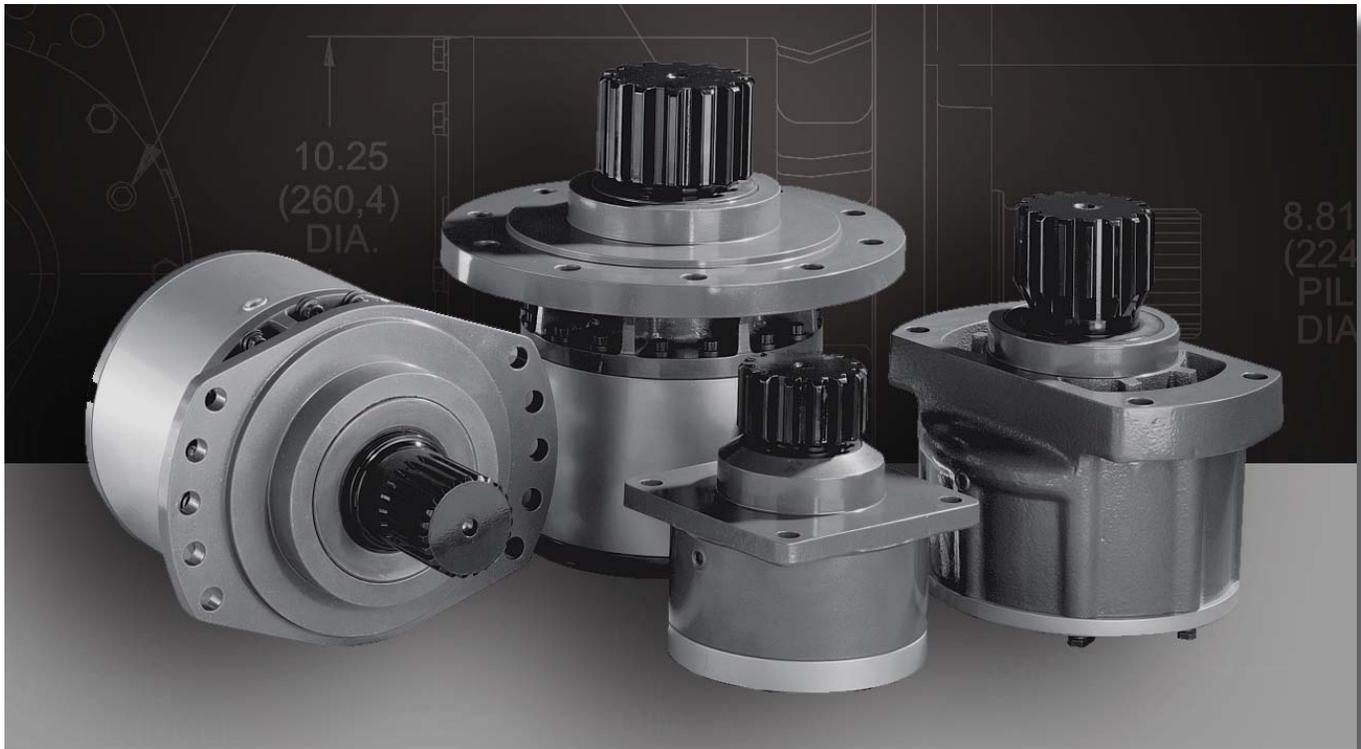




MODEL 120K TRIPLE PLANETARY GEAR DRIVE SERVICE MANUAL



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

THIS SERVICE MANUAL IS EFFECTIVE:
S/N: 17802 TO CURRENT
DATE: 2/15/94 TO CURRENT
VERSION: SM120KD3_0307

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



MODEL 120K TRIPLE

EFFECTIVE FOR:
FROM: S/N 17802 02/15/94
TO: (CURRENT)

ITEM	DESCRIPTION	PART NUMBER	QTY
1	BASE	-A-	1
2	CARRIER (SEC)	-B-	1
3	CARRIER (PRI)	-C-	1
4	COVER	-D-	1
5	RING GEAR	81-004-2362	1
6	PLANET SHAFT (SEC)	81-004-0061	3
7	PLANET SHAFT (PRI)	81-004-0071	6
8	PLANET GEAR (SEC)	-E-	3
9	PLANET GEAR (PRI)	-F-	3
10	SUN GEAR - (SEC)	-G-	1
11	INPUT GEAR	-H-	1
12	OUTPUT SHAFT	-I-	1
15	THRUST WASHER - PLANET	81-004-1561	18
16	THRUST WASHER - SECONDARY	81-004-2711	2
17	BEARING CONE	01-102-0030	1
18	BEARING CONE	01-102-0020	1
19	BEARING CUP	01-103-0030	1
20	BEARING CUP	01-103-0020	1
21	RETAINING RING	01-160-0030	1
22	BEARING - SEC. PLANET	01-105-0500	6
23	BEARING - PRI. PLANET	01-105-0460	6
24	BEARING RACE - PRI. PLANET	01-105-0470	6
26	INPUT THRUST WASHER	81-004-2701	1
27	HEX HD CAPSCREW	01-150-1300	8
28	FLANGE 12-PT SCREW	01-150-1460	16
29	ROLL PIN - SEC. PLANET	01-153-0210	3
30	ROLL PIN - PRI. PLANET	01-153-0180	6
31	LOCKWASHER	01-166-0010	8
32	FLAT WASHER - HARDENED	01-166-0120	16
33	MAGNETIC PIPE PLUG	01-207-0041	2
34	MAGNETIC PIPE PLUG	01-207-0070	1
35	PIPE PLUG * NPT (SOC. HD.)	01-207-0020	1
36	O-RING	01-402-0420	3
37	SHAFT SEAL - OUTER	01-405-0270	1
38	SPACER	00-004-1111	1
39	SHIMS	81-004-2061	*
41	RING GEAR - MULTIPLE	81-004-2902	1
42	CARRIER PRI - MULTIPLE	-CC-	1
43	PLANET GEAR PRI. MULTIPLE	-FF-	3
44	SUN GEAR - MULTIPLE	-GG-	1

NOTE	CODE	BASE	PART NUMBER
	A120	ROUND FLANGE	81-004-0342
	B120	SQUARE FLANGE	81-004-0592
-A-	E120	RECTANGULAR FLANGE	81-004-3072
	F120	FLANGELESS	81-004-1142
	C120	CUSTOM	

NOTE	CODE	TRIPLE PLANETARY DESCRIPTION	PART NUMBER			
			86:1 RATIO	117:1 RATIO	159:1 RATIO	216:1 RATIO
-B-	-	CARRIER (SEC)	81-004-2763	81-004-2763	81-004-2763	81-004-2773
-C-	-	CARRIER (PRI)	81-004-2732	81-004-2732	81-004-2742	81-004-2742
-CC-	-	CARRIER (PRI) - MULTIPLE	81-004-2732	81-004-2742	81-004-2742	81-004-2742
-E-	-	PLANET GEAR (SEC)	81-004-2472	81-004-2472	81-004-2472	81-004-2462
-F-	-	PLANET GEAR (PRI)	81-004-1752	81-004-1752	81-004-1762	81-004-1762
-FF-	-	PLANET GEAR (PRI) MULTIPLE	81-004-1752	81-004-1762	81-004-1762	81-004-1762
-G-	-	SUN GEAR (SEC)	81-004-0712	81-004-0712	81-004-0712	81-004-0122
-GG-	-	SUN GEAR - MULTIPLE	81-004-0132	81-004-0142	81-004-0142	81-004-0142
-H-	1	INPUT GEAR - 21 T 20/40 DP	81-004-2342	81-004-2342	N/A	N/A
	2	INPUT GEAR - 13 T * DP	81-004-0652	81-004-0652	81-004-0482	81-004-0482
	3	INPUT GEAR - SAE 1" * 6B	83-004-1112	83-004-1112	83-004-1082	83-004-1082
	4	INPUT GEAR - 14 T 12/24 DP	81-004-1342	81-004-1342	N/A	81-004-2792
	5	INPUT GEAR - 15 T * DP	81-004-1892	81-004-1892	81-004-2552	81-004-2552

NOTE	CODE	COVER	ALL EXCEPT CODE 4 INPUT	WITH CODE 4 INPUT ONLY		
				86:1 OR 117:1	159:1 OR 216:1	
	A	SAE 'A' 2 AND MOD. 4 BOLT	81-004-2803	81-004-2813	81-004-2923	
-D-	B	SAE 'B' 2 BOLT	81-004-2723	81-004-2823	81-004-2913	
	C	SAE 'C' 2 BOLT AND 4 BOLT	81-004-2833	81-004-2833	81-004-2893	

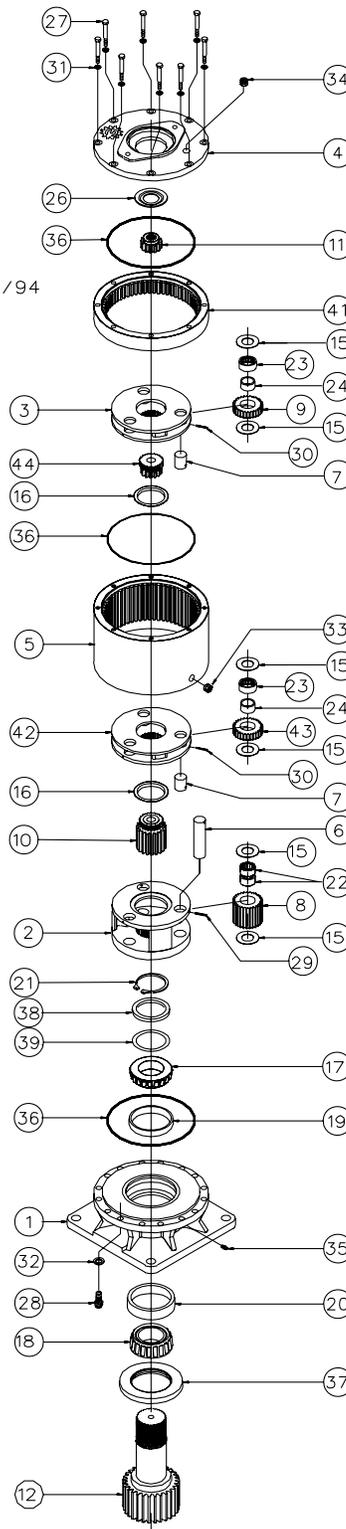
NOTE	CODE	OUTPUT SHAFT	PART NUMBER
	D1	23 T * DP SPL 2.25" LG	81-004-1392K
	D2	3.000" DIA., ** SQ KEY	81-004-0992K
-I-	D3	23 T * DP SPL 1.22" LG	81-004-1412K
	D4	23 T * DP SPL 2.72" LG	81-004-0942K
	D5	3.500" DIA., ** SQ KEY	81-004-1152K
	C1	CUSTOM	

▷ 01-215-0040 GREASE FITTING (OPTIONAL) REPLACES ITEM NO. 35.

OPTIONS:

SEAL KIT P/N 81-016-2941
(INCLUDES 2 OF ITEM 36 AND
1 EACH OF ITEMS 37,
FOR TRIPLE PLANETARY ORDER
(1) EXTRA O-RING ITEM 36 WITH ABOVE KIT.

(*) QUANTITY DETERMINED FROM BEARING PRELOAD.



ECN 1803
X120KD3-ND DATE 5-1-00

MODEL 120K SERVICE MANUAL

TRIPLE PLANETARY

This manual will assist in disassembly and assembly of major components for Model 120K Triple Planetary Gearboxes. Item numbers, indicated in parentheses throughout this manual, refer to the Eskridge Model 120K exploded parts breakdown drawings. 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.

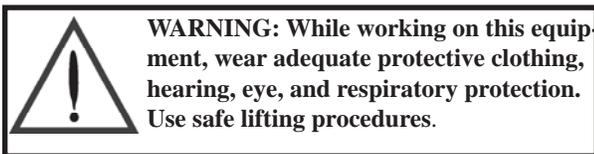
LUBRICATION AND MAINTENANCE

The manufacturer recommends changing oil after the first 50 hours of operation. Oil should be changed at 500 hour intervals thereafter. All gearboxes require GL-5 grade EP 80/90 gear oil for lubrication. The manufacturer also recommends that the unit be partially disassembled to inspect gears and bearings at 1000 hour intervals. The standard base for the Model 120K is furnished with a 1/4" NPT hole at the output bearings. This hole has a pipe plug in it for horizontal or pinion-down applications, where oil lubrication of the output bearings is sufficient. If your unit was specified "pinion up" a grease zerk was provided. For pinion-up operation, the output bearings will not run in oil and must be grease lubricated. Use lithium base or general purpose bearing grease **sparingly** every 50 operating hours or at regular maintenance intervals. Over-greasing the output bearings in a pinion-up application tends to fill the gearbox with grease and thicken the oil.

OIL CAPACITIES:

Horizontal shaft operating position: 3.0 pints

Vertical shaft operating position: 4.75 pints



UNIT DISASSEMBLY PROCEDURE

- 1) Scribe a diagonal line across the outside of the unit from the cover (4) to the base (1) before disassembly to aid in the proper positioning of pieces during reassembly.
- 2) Remove magnetic drain plugs (33,34) and drain oil from unit. Maximum drainage occurs when oil is warm.
- 3) Remove 8 cover bolts (27) and lockwashers (31).
- 4) Lift off cover (4). Remove input thrust washer (26) and input gear (11).
- 5) Slide primary planet carrier assembly (items 3,7,9,15,23,24 & 30) out of unit by lifting up on planet carrier (3).
- 6) Remove multiple ring gear (41), multiple sun gear (44) and secondary thrust washer (16).
- 7) It is not necessary to remove ring gear (5).
- 8) Remove multiple primary planet carrier assembly (items 7,15,23,24,30,42 & 43).

9) Remove sun gear (10) and secondary thrust washer (16).

10) Remove secondary planet carrier assembly (items 2,6,8,15,22 & 29), similarly to previous steps.

11) Remove retaining ring (21) from output shaft (12). Remove spacer (38) and shim(s) (39).

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

12) Output shaft removal. Base (1) should be set pinion side down on a plate or table with output shaft (12) 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 (17).

13) 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.

1. Output Shaft subassembly
2. Primary or Multiple Planet Carrier subassembly
3. Secondary Planet Carrier subassembly
4. Base subassembly

OUTPUT SHAFT SUBASSEMBLY (ITEMS 12,18 & 37) DISASSEMBLY AND REPAIR

1) Tapered bearing cone **(18)** may be removed using a gear puller. If reusing old bearing cone, do not pull on or damage roller cage.

2) Remove old seal **(37)** and discard. Lubricate inner lip of new seal **(37)** and turn so open side is upward. Slide seal down output shaft **(12)** all the way to gear teeth or until it fits snug over shaft seal diameter.

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

3) Press bearing cone **(18)**(**large end down**) onto output shaft **(12)**. Be sure bearing cone is seated tightly against shoulder of output shaft. If old bearing cone **(18)** was removed only to replace seal, it may be reused.

PRIMARY OR MULTIPLE PLANET CARRIER SUBASSEMBLY (ITEMS 3or42,7,9or43,15,23,24 & 30) DISASSEMBLY AND REPAIR

1) Drive roll pins **(30)** into planet shafts **(7)**.

2) Press or drive planet shafts out of the carrier **(3)**.

3) Before sliding planet gears **(9)** or **(43)** and planet thrust washers **(15)** out of carrier **(3)** or **(42)**, hold hand under planet gear to catch inner bearing race **(24)** as it drops out of planet bearing **(23)**.

4) If planet bearings **(23)** must be replaced, they may now be pressed out of planet gears **(9)** or **(43)**.

5) Use a 1/8 inch pin punch to remove roll pins **(30)** from planet shafts **(7)**.

6) Rebuild planet carrier assembly in reverse order using any needed new parts.

7) Planet shafts **(7)** should be installed with chamfered end of 1/8 inch hole toward outside diameter of the carrier **(3)** or **(42)**. This will aid in alignment of holes while inserting roll pins **(30)**.

SECONDARY PLANET CARRIER SUBASSEMBLY (ITEMS 2,6,8,15,22 & 29) DISASSEMBLY AND REPAIR

1) Drive roll pins **(29)** into planet shafts **(6)**.

2) Press or drive planet shafts out of the carrier **(2)**.

3) Slide planet gears **(8)** and planet washers **(15)** out of carrier **(2)**.

4) Use a 1/8 inch pin punch to remove roll pins **(29)** from the planet shafts **(6)**.

5) If planet bearings **(22)** must be replaced, they may now be pressed out of planet gears **(8)**.

6) Rebuild planet carrier assembly using any needed new parts.

7) **To reassemble:** With a planet washer **(15)** on both sides of the planet gear and with bearings **(22)** installed, slide planet gear **(8)** into carrier **(2)**. Insert planet shaft **(6)** through carrier, planet gear, and washers. Planet shafts **(6)** should be installed with chamfered end of 1/8 inch hole toward outside diameter of carrier **(2)**. This will aid in alignment of holes while inserting roll pins **(29)**.

BASE SUBASSEMBLY (ITEMS 1,19,20,35 & 36) DISASSEMBLY AND REPAIR

1) Inspect inner and outer bearing cups **(19,20)**. Bearing cups are not removeable. If cups are damaged, cups **and base (1)** may need replacement. Contact Eskridge, Inc. if you have questions.

2) If ring gear **(5)** was removed, replace o-ring **(36)**.

UNIT ASSEMBLY REASSEMBLING

(Refer to exploded drawing on page 7)

1) When all the subassemblies are complete, unit is ready to be assembled. Start with base **(1)** with internal end down (end with 16 holes) on the press table. Apply a thick layer of lithium or general purpose bearing grease to surface of bearing cup **(20)**.

2) Invert output shaft assembly (retaining ring end down) and carefully lower it into base **(1)** until bearing cone **(18)** is seated.

3) Press outer shaft seal (37) into base until it is flush using a press fixture or a hammer and a large flat-ended bar or rod.

CAUTION: Output shaft is not retained at this point.

4) Invert unit and stand it on end of output shaft (12) (pinion down, shaft should be supporting base assembly).

5) While holding end of output shaft (12) with one hand, rotate base (1) to be sure it moves freely. The slight resistance you feel is due to seal load on output shaft.

6) Grease inner bearing cup (19) using lithium or general purpose grease.

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

7) Slide bearing cone (17) (small end down) over internal end of output shaft. Press bearing on slowly until it is just seated.

NOTE 1: Torque at proper bearing preload will vary according to the application. At output speeds of greater than 25 RPM, preload torque (including seal drag) should be in the range of 20 to 50 in-lbs. At less than 25 RPM, torque should be 50 to 80 in-lbs.

NOTE 2: Bearing preload is achieved by adjusting the number of shims (39) between inner bearing cone (17) and retaining ring (21).

NOTE 3: Bearing preload will be determined by measuring bearing rolling resistance which is the torque required to turn shaft (or to turn base with shaft stationary). Torque can be measured with a spring scale attached to the base. For example, with shaft stationary, if a scale is attached to the base, measuring 5 inches from the center of the gearbox and it takes 10 lb. force to rotate base, then preload torque is 5 inch x 10 lb. = 50 in-lbs.

8) Install shim(s) (39), spacer (38), and retaining ring (21). Then measure preload torque between base (1) and shaft (12). If torque is not correct, add or remove 1 shim as required and try again.

9) Install secondary carrier assembly.

If ring gear (5) was not removed during disassembly, skip to step number 13.

10) Lubricate a new o-ring (36) with general purpose grease and place over pilot on base (1).

CAUTION: Hold ring gear by outside diameter to avoid injuring fingers.

11) Place ring gear (5) over secondary carrier assembly. Rotate until bolt holes line up with holes in case and one of the two drain holes in ring gear as near as possible to pipe plug or grease fitting (35) in base, or to customer specifications.

12) Apply thread locking compound and install 16 flange screws (28) and washers (32) and torque to 110 ft-lbs.

13) Put pipe sealant on magnetic pipe plugs (33) and install into drain holes on ring gear (5) if they were removed.

14) Install sun gear (10) into center of secondary planet carrier and thrust washer (16) on top of carrier.

15) Install multiple planet carrier assembly by rotating it until planet gears line up with ring gear teeth and sun gear spline. Assembly should drop into place.

16) Install multiple sun gear (44) into center of multiple planet carrier and thrust washer (16) on top of carrier.

17) Install new o-ring (36) over pilot of multiple ring gear (41).

18) Install multiple ring gear (41).

19) Install primary planet carrier assembly.

NOTE: This model does not require a gear timing procedure.

20) Install input gear (11).

21) Place input thrust washer (26) over input gear.

22) Add gear oil as specified on page 2. Correct oil level will measure to middle of primary planet gears with unit in the vertical shaft position.

23) Install new o-ring (36) over pilot of cover (4).

24) Place cover (4) on top of unit and refer to scribed line for proper orientation. Install and torque eight capscrews (27) with lockwashers (31) to 32 ft-lbs.

25) Put pipe sealant on magnetic plug (34) and install into oil fill hole in cover.

26) Insert a shaft, such as an output shaft from a hydraulic motor, into input gear (11) and rotate by hand to be sure unit turns smoothly and easily.

THE GEARBOX IS NOW READY TO USE.