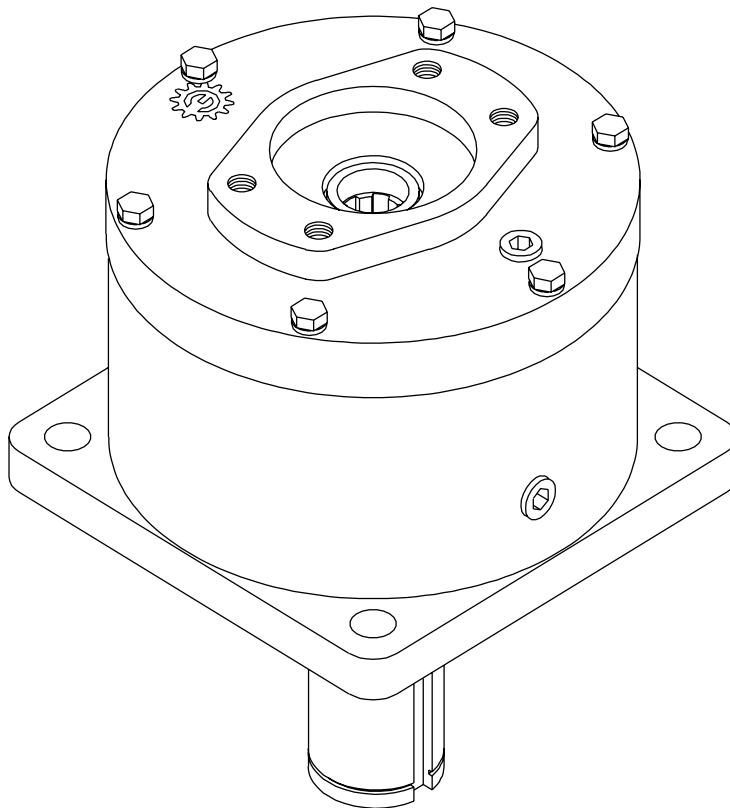
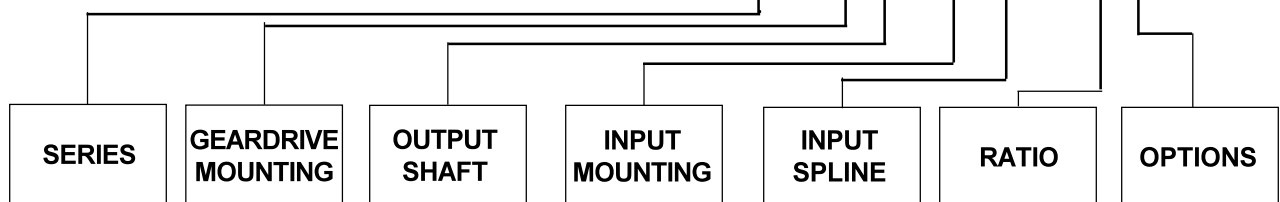




EXAMPLE PART NUMBER: 20L B D1 A 3 - 25 Z



Series 20LB/20LP Planetary Service & Repair Manual

Equipped with Patented Load-N-Lock™
Shaft Retention System (U.S. Patent no. 5746517)

EFFECTIVE FOR:
S/N: 16401 - UP
DATE: 07/01/93 - UP

SM20BLD1-C

A Ramsey Industries Brand

MODEL 20LB/20LP SERVICE MANUAL

SINGLE & DOUBLE PLANETARY

GEARDRIVES

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 (Single)

Vertical shaft (Single)

Horizontal shaft (Double)

Vertical shaft (Double)

OIL CAPACITY

.75 pints (0,4 liters)

1.00 pints (0,5 liters)

1.00 pints (0,5 liters)

1.25 pints (0,6 liters)

OIL LEVEL

To horizontal centerline of geardrive

To midway on upper/primary gearset

To horizontal centerline of geardrive

To midway on upper/primary gearset

BEFORE DISASSEMBLY

In the 20LB/20LP series, there are two types of units: single planetaries without a primary carrier, and double planetaries which have a primary planet carrier. Steps with an asterisk (*) apply only to the double planetary model.

DISASSEMBLY PROCEDURE

All parts should be carefully inspected as they are removed from unit. Scribe across mounting case (1) and cover (2) joint on outside of gearbox to assure proper orientation of oil fill and drain plugs, motor mounting, etc., as unit is reassembled.

1) Remove hydraulic motor and Eskridge Brake from gearbox. Drain oil.

2) Remove the six 5/16 x 1 1/2" hex cap screws (22) and 5/16 lockwashers (26), which retain cover (2) to mounting case (1).

3) Lift cover (2) off of unit and remove input gear (11) and input thrust washer (21).

*4) Primary planetary assembly is now ready for removal (**includes items 5,7,13,16,20 & 24**). Secondary sun gear (10) is splined to primary carrier (5) and may come out when removing planetary assembly. If not, remove sun gear.

5) The secondary planetary assembly (**includes items 4,6,12,14,15,19, & 23**) is splined to the output shaft (3). It may now be lifted, by hand, from output shaft spline.

6) Place unit on a press table with the output shaft (3) protruding downward through a hole in the table. Unit should be supported only by mounting case (1). The only thing retaining output shaft (3) is the Load-N-Lock™ (8 & 25). Remove lock ring (25) from output shaft, followed by split ring (8) and bearing shims (9).

CAUTION: Retaining ring is no longer retaining output shaft. Take precautions if moving unit. Shaft may fall out.

7) With output shaft down through centerhole in press table and unit supported by case, press shaft out by applying press load to top end of shaft (**internal end**) until it passes through inner bearing cone (17). Outer bearing cone (17) will come out of unit attached to shaft.

CAUTION: Care should be taken not to injure feet or damage output shaft during this procedure. Once shaft has been pressed through inner shaft bearing, it will drop from unit.

The unit is now disassembled into groups of parts and/or subassemblies. The area requiring repair or service should be identified by thorough inspection of the parts after they have been washed in solvent. If repair is necessary, refer to the individual repair section to follow.

OUTPUT SHAFT SUBASSEMBLY (ITEMS 3,17,30) DISASSEMBLY AND REPAIR

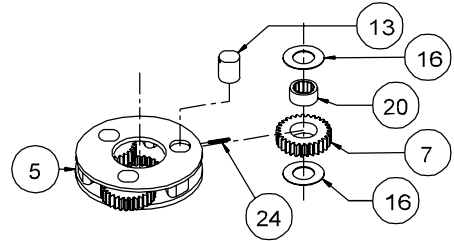
1) If outer bearing cone (17) needs replacing, it will need to be pressed off of output shaft (3). Also inspect inner bearing cone (17). Shaft was pressed through inner bearing cone during shaft removal procedure, so find bearing in mounting case seated inside the inner bearing cup (18). In some instances, outer bearing cone (17) may need to be removed if shaft seal (30) is to be replaced. If outside diameter of output shaft (**external end opposite bearing**) is smaller than inside diameter of seal, then shaft seal may be replaced without removing bearing cone.

2) Lubricate inner lip of new shaft seal (30) and turn so that open side of seal is up. Slide seal onto output shaft until it fits snug over shaft seal diameter.

3) With small end of outer bearing cone (17) pointed upward, place it onto the internal end of the output shaft (3). Press until bearing is seated tightly against shoulder. If the original bearing was removed only to replace shaft seal, it may be reused.

NOTE: Press only on inner race of bearing cone. **DO NOT** press on outer roller cage of bearing or it will damage bearing.

*PRIMARY PLANETARY SUBASSEMBLY (ITEMS 5,7,13,16,20 & 24) DISASSEMBLY AND REPAIR



Rotate primary planet gears (7) to check for any abnormal noises or roughness in the primary planet bearings (20). At the same time, inspect planet gears for any damage or worn teeth. If replacement or further inspection is required, proceed as follows.

1) Drive the spring pins (or roll pins) (24) completely into the planet shafts (13) using a pin punch. Press planet shafts out of carrier (5).

NOTE: Only support primary carrier (5) while pressing planet shafts out.

2) Remove planet gears (7) and primary planet washers (16) from carrier (5).

3) If any of the primary planet bearings (20) need replacing, press them out of planet gears.

4) Check primary planet shafts (13) for any abnormal wear, especially ones in which bearings needed to be replaced. If any abnormal wear is found, replace planet shaft.

5) Using a punch, drive roll pins out of planet shafts.

6) If required, press new primary planet bearings (20) into planet gears.

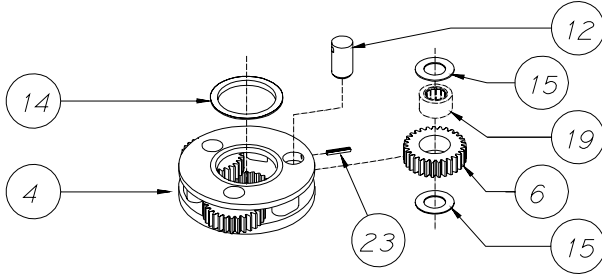
7) With a primary planet washer (16) on both sides of planet gear, with bearing installed, slide gear into carrier (5). Insert primary planet shaft (13) through the carrier, planet gear, and washers. During planet shaft installation, align roll pin hole in planet shaft, to the roll pin hole in outside diameter of carrier.

NOTE: Inserting a 1/8" diameter punch in the roll pin hole of planet shaft will help in the alignment of holes between planet shaft and carrier during step #7.

Once holes are properly aligned, drive a roll pin (24) through primary carrier and into planet shaft to retain parts. Use a drift to drive roll pin flush to carrier and to prevent striking planet gear teeth.

8) Repeat the same process for remaining gears.

SECONDARY PLANETARY SUBASSEMBLY (ITEMS 4,6,12,14,15,19 & 23) DISASSEMBLY AND REPAIR



Follow same procedures as that for the Primary Planetary Subassembly, only substitute item numbers as indicated; Secondary carrier (4), secondary planet gear (6), secondary planet shaft (12), carrier thrust washer (14), secondary planet washer (15), secondary planet bearing (19), secondary roll pin (23).

CASE SUBASSEMBLY (ITEMS 1,18,27, & 28) DISASSEMBLY AND REPAIR

1) Inspect inner and outer bearing cups (18). If cups are damaged, the cups **and** case (1) may need replacement. Contact Eskridge, inc. if you have questions.

2) Clean all foreign material from magnetic oil plug (27) located inside of mounting case (1). Add a small amount of pipe thread compound to pipe plug before installing back into case.

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

UNIT ASSEMBLY

1) Start with case assembly (1). Turn case upside down and position it so that the side with the threaded holes is resting on the press table. Case pilot diameter should be pointed upward with outer bearing cup (18) exposed. Apply a layer of lithium bearing grease to outer bearing cup surface.

2) Invert the output shaft assembly (3) (**retaining ring groove down**) and carefully lower into the case (1) until the shaft's outer bearing cone (17) is seated against the outer bearing cup (18).

3) Press shaft seal (30) into case until it is flush with bottom of pilot diameter. Use a press fixture, if possible, to eliminate distorting seal. If press fixture is not available, a hammer and flat-ended drift may be used by tapping outer edge of seal lightly and alternating sides.

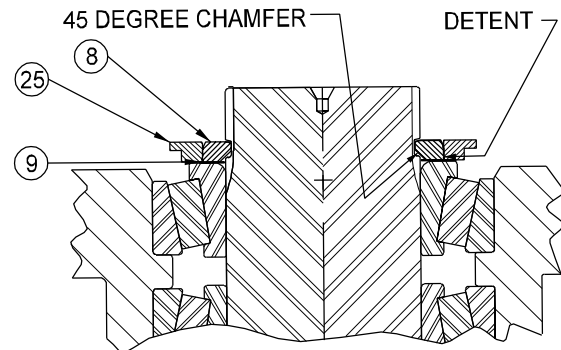
4) Stand unit assembly upright on output shaft (3).

CAUTION: The only thing retaining output shaft and case together at this point is the tightness in fit of the shaft seal. Securely and cautiously turn unit upright, not allowing case and shaft to separate.

5) While holding output shaft (3) with one hand, rotate case (1) to be certain it turns freely and smoothly. The slight resistance felt, if any, is due to shaft seal load (drag) on output shaft.

6) Apply a layer of lithium grease to inner bearing cup (18) and surface.

7) Install inner bearing cone (17) (**small end down**) over internal end of output shaft. Press bearing down slowly until it is just seated against inner bearing cup (18). With a slight press load still applied, rotate case (1) by hand to ensure that the roller bearings are rotating evenly and smoothly. Slide bearing shims (9) over output shaft and down onto inner bearing cone (17). The same number (quantity) of shims which were removed from unit during Disassembly Procedure should be returned.



8) Lubricate Load-N-Lock™ lock ring (25) and split ring segments (8). Press split ring segments (45° chamfer side down) into the groove in shaft (4) directly on top of shims (9) (see detail). This can be done with a soft drift punch & hammer or a C-clamp or adjustable pliers across both segments of split ring. Drive lock ring (25) over outside of split ring segments until the detent engages between split and lock rings. The lock ring should then be seated against the shims. This may require a firm blow with a soft mallet.

NOTE: Proper positioning of Load-N-Lock™ split ring (8) and lock ring (25) is critical to proper assembly of unit. Do not use steel hammer or hydraulic press to install split or lock ring or damage may result.

NOTE: Quantity of shims (9) may vary from unit to unit. Always use the same quantity of shims when reassembling.

9) Install secondary carrier (4) assembly into unit. Carrier assembly should be installed with hub side down (24 tooth spline). Rotate carrier assembly back and forth to mesh secondary planet gear teeth (6) with case (1) teeth. Once teeth mesh, let secondary carrier slide down until it makes contact with the output shaft spline. The carrier splined hub (4) should spline onto output shaft (3). Carrier hub will rest on top of retaining ring (25) when splines are fully engaged. Install carrier thrust washer (14).

*10) Turn primary carrier assembly upside down so that splined end of carrier (5) is up. Insert splined end of secondary sun gear (10) into carrier spline until fully engaged. Install carrier assembly into unit, sun gear down. Sun gear teeth will mesh with the secondary planet gears, and the primary planet gear teeth (7) will mesh with the mounting case (1).

11) Put input thrust washer (21) over step of input gear (11). Insert input gear into unit so that teeth mesh with planet gears.

12) Fill unit with proper level (see page 2) of a GL-5 grade EP 80/90 gear oil. Proper oil level will measure to middle of primary planet gears (7).

13) Grease a new o-ring (29) and install into bottom of cover (2). Refer back to scribe marks made across external joint prior to Disassembly Procedure. Line up scribe marks between cover and case (1) so that orientation of motor mount holes and oil plugs are back to their original positions.

NOTE: Be certain o-ring (29) stays seated in cover during step #12.

14) Install all six of the 5/16 lockwashers (26) and the 5/16 hex capscrews (22) and torque them to 20 ft-lbs.

THE GEARBOX IS NOW READY FOR USE.

RATIO'S	
4:1 4.08	5:1 5.05

MODEL B20L

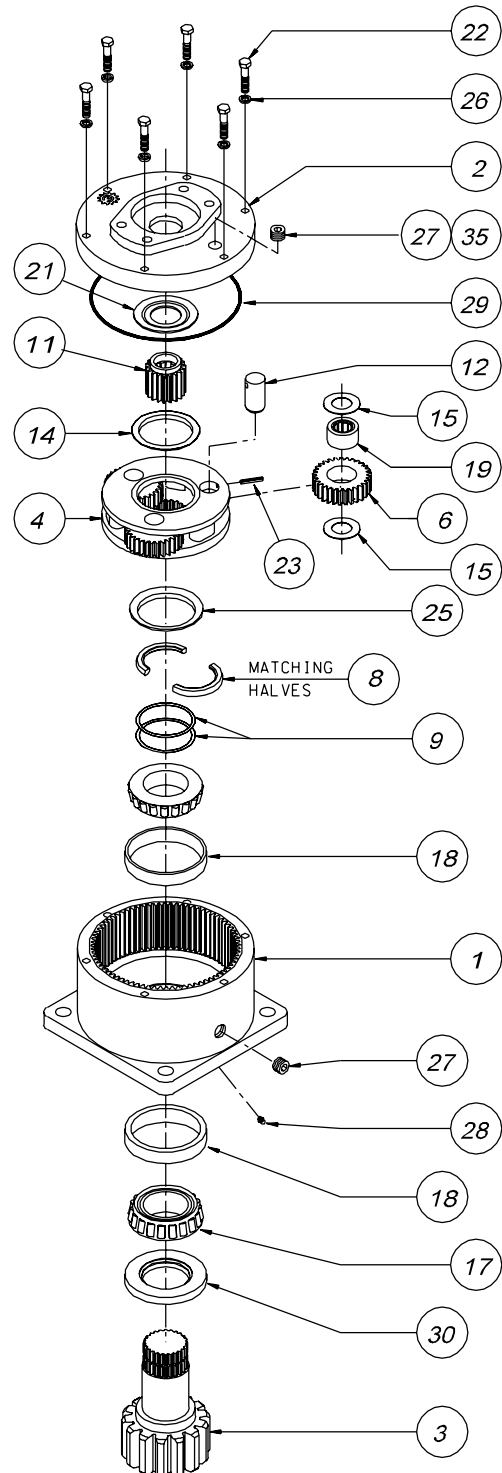
SINGLE PLANETARY



EFFECTIVE
FROM: S/N 16401 07-01-93
TO: (CURRENT)

PART NUMBER	PART NUMBER	QTY.	ITEM	C O D E	DESCRIPTION
←	20-004-3024	1	1		B20 CASE-SQUARE- (NO ZERK)
←	20-004-3024Z				B20 CASE-SQUARE- W/ZERK
-	-				CB20 CASE-CUSTOM PER CUSTOMER SPECS.
←	85-004-1513	1	2	A	COVER-SAE 'A'
←	85-004-1503			B	COVER-SAE 'B' 2-BOLT
←	28-004-1013			C	COVER-SAE 'C' 4-BOLT
←	20-004-4022L	1	3	D1	2"DIA SHAFT-3/8" KEYWAY
←	20-004-4032L			D2	SHAFT 23T, 16/32 D.P. SPLINE
←	20-004-4042L			D3	2" DIA.SHAFT-1/2"KEYWAY
←	28-004-4202L			D4	2.25"D.SHAFT-1/2"KEYWAY
-	-			C1	SHAFT-CUSTOM PER CUSTOMER SPECS.
20-004-1282	20-004-1292	1	4		CARRIER-SECONDARY
20-004-1041	20-004-1051	3	6		PLANET GEAR-SEC.
←	20-004-1362	1	8		SPLIT RING (MATCHING HALVES)
←	20-004-1091	*	9		SHIM
20-004-1302	N/A	1	11	1	INPUT GEAR 21T,20/40 D.P.SPLINE
20-004-1122	20-004-1132			2	INPUT GEAR 13T,16/32 D.P.SPLINE
20-004-1102	20-004-1112			3	INPUT GEAR SAE 1"-6B SPLINE
20-004-1192	N/A			4	INPUT GEAR 14T,12/24 D.P.SPLINE
20-004-1322	20-004-1312			5	INPUT GEAR 15T,16/32 D.P.SPLINE
20-004-1142	N/A			6	INPUT GEAR 1"DIA X .25" KEY
←	20-004-1081	3	12		PLANET SHAFT-SECONDARY
←	50-004-1011	1	14		THRUST WASHER-SEC.CUP
←	85-004-1181	6	15		THRUST WASHER - (SEC. PLANET GEAR)
←	01-102-0160	2	17		BEARING CONE
←	01-103-0160	2	18		BEARING CUP
←	01-105-0010	3	19		BEARING-SEC.PLANET
←	50-004-1091	1	21		THRUST WASHER-INPUT
←	01-150-1400	6	22		HEX CAPSCREW 5/16-18 X 1.5, GR8
←	01-153-0210	3	23		ROLLPIN-SECONDARY 3/16 X 7/8
←	20-004-1372	1	25		LOCK RING
←	01-166-0110	6	26		LOCKWASHER 5/16 MED
←	01-207-0070	2	27		PIPE PLUG-MAG. 3/8 NPT-SOC HD
←	01-215-0050	(1)	28		GREASE FITTING (OPTIONAL)
←	01-402-0560	1	29		O-RING 167 MM X 3 MM
←	01-405-0550	1	30		SEAL-SHAFT
←	01-216-0070	(1)	35		AIR VENT 3/8 NPT (OPTIONAL)
-	-	-	-	-	-

NOTE * BEARING PRELOAD DETERMINES QUANTITY OF SHIMS.
SEAL KIT: P/N 20-016-0501; INCLUDES ITEMS 29 AND 30.



 MODEL P20L EQUIPPED WITH PATENTED "LOAD-LOCK"™ SHAFT RETENTION SYSTEM. (U.S. PATENT NO. 5746517).			
SINGLE PLANETARY			
4:1 4.08	5:1 5.05	 RATIO	
EFFECTIVE		FROM: S/N 16401 07-01-93	
		TO: (CURRENT)	
PART NUMBER	PART NUMBER	QTY.	ITEM
20-004-3074	20-004-3074Z	1	1
-	-	-	-
85-004-1513	85-004-1503	1	2
28-004-1013	20-004-4122L	1	3
20-004-4112L	-	-	-
20-004-1282	20-004-1292	1	4
-	-	-	5
20-004-1041	20-004-1051	3	6
-	-	-	7
20-004-1362	20-004-1091	1	8
20-004-1091	-	*	9
-	-	-	10
20-004-1302	N/A	-	-
20-004-1122	20-004-1132	-	-
20-004-1102	20-004-1112	1	11
20-004-1192	N/A	-	-
20-004-1322	20-004-1312	-	-
20-004-1142	N/A	-	-
20-004-1081	-	3	12
-	-	-	13
50-004-1011	-	1	14
85-004-1181	-	6	15
-	-	-	16
01-102-0160	-	2	17
01-103-0160	-	2	18
01-105-0010	-	3	19
-	-	-	20
50-004-1091	-	1	21
01-150-1400	-	6	22
01-153-0210	-	3	23
-	-	-	24
20-004-1372	-	1	25
01-166-0110	-	6	26
01-207-0070	-	2	27
01-215-0050	-	(1)	28
01-402-0560	-	1	29
01-405-0610	-	1	30
01-216-0070	-	(1)	35
-	-	-	-

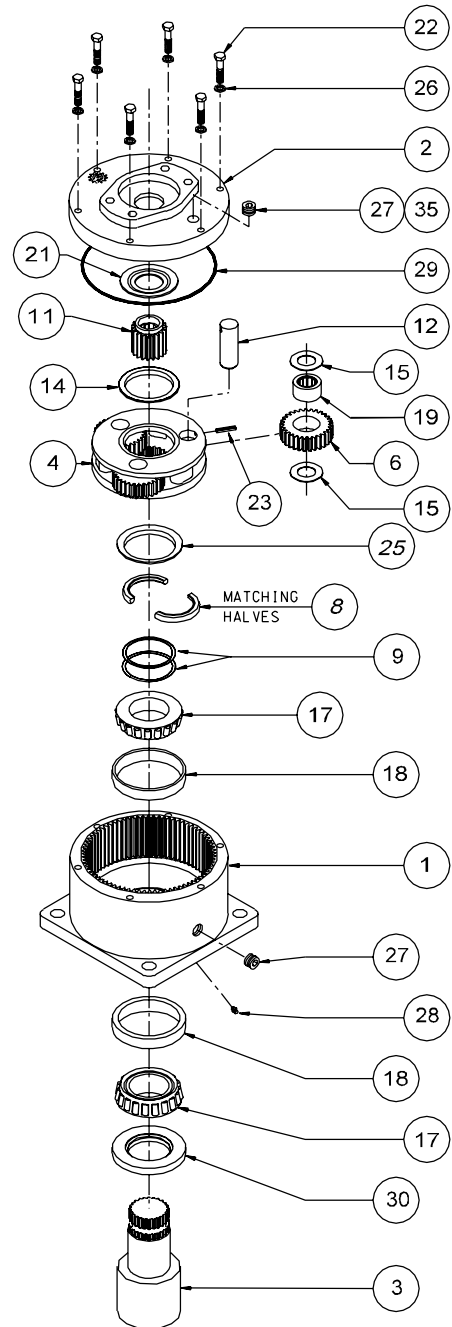
CODE	DESCRIPTION
	P20 CASE-SQUARE- (NO ZERK)
	P20 CASE-SQUARE W/ZERK
	CP20 CASE-CUST.MTG PER CUSTOMER SPECS.
A	COVER-SAE 'A'
B	COVER-SAE 'B' 2-BOLT
C	COVER-SAE 'C' 4-BOLT
F1	SHAFT-1.5" KEYED
F2	SHAFT-2" KEYED
C1	SHAFT-CUSTOM PER CUSTOMER SPECS.
	CARRIER-SECONDARY
	CARRIER-PRIMARY
	PLANET GEAR-SEC.
	PLANET GEAR-PRI.
	SPLIT RING (MATCHING HALVES)
	SHIM
	SUN GEAR-SECONDARY
1	INPUT GEAR 21T,20/40 D.P.SPLINE
2	INPUT GEAR 13T,16/32 D.P.SPLINE
3	INPUT GEAR SAE 1"X6B SPLINE
4	INPUT GEAR 14T,12/24 D.P.SPLINE
5	INPUT GEAR 15T,16/32 D.P.SPLINE
6	INPUT GEAR 1"DIA X .25" KEY
	PLANET SHAFT-SECONDARY
	PLANET SHAFT-PRIMARY
	THRUST WASHER-SEC.CUP
	THRUST WASHER-(SEC.PLANET GEAR)
	THRUST WASHER-(PRI.PLANET GEAR)
	BEARING CONE
	BEARING CUP
	BEARING-SEC.PLANET
	BEARING-PRI.PLANET
	THRUST WASHER-INPUT
	HEX CAPSCREW 5/16-18 X 1.5, GR8
	ROLLPIN-SECONDARY 3/16 X 7/8
	ROLLPIN-PRIMARY 1/8 X 1
	LOCK RING
	LOCKWASHER 5/16 MED
	PIPE PLUG-MAG. 3/8 NPT-SOC HD
	GREASE FITTING (OPTIONAL)
	O-RING 167 MM X 3 MM
	SEAL-SHAFT
	AIR VENT 3/8 NPT (OPTIONAL)
	-

▶ INVERTED RATIO SUNGEAR IS NOT COUNTERBORED FOR CODE 4 INPUT. MOTOR COMPATIBILITY MUST BE VERIFIED.

NOTES:

★ BEARING PRELOAD DETERMINES QUANTITY OF SHIMS.

SEAL KIT (P/N 20-016-0511) INCLUDES (1 EA.) O-RINGS AND (1 EA.) SEAL.
AND (1 EA.) SEAL.



X20LPD1-BA DATE 06-12-00



MODEL B20L

EQUIPPED WITH PATENTED "LOAD-N-LOCK"™
SHAFT RETENTION SYSTEM. (U.S. PATENT NO. 5746517).

EFFECTIVE
FROM: S/N 16401 07-01-93
TO: (CURRENT)

C
O
D
E

DESCRIPTION

	B20 CASE-SQUARE- (NO ZERK)
	B20 CASE-SQUARE- W/ZERK
	C20 CASE-CUSTOM PER CUSTOMER SPECS.
A	COVER-SAE 'A'
B	COVER-SAE 'B' 2-BOLT
C	COVER-SAE 'C' 4-BOLT
D1	2" DIA. SHAFT-3/8" KEYWAY
D2	SHAFT 23T, 16/32 D.P. SPLINE
D3	2" DIA. SHAFT-1/2" KEYWAY
D4	2.25" D. SHAFT-1/2" KEYWAY
C1	SHAFT-CUSTOM PER CUSTOMER SPECS.
	CARRIER-SECONDARY
	CARRIER-PRIMARY
	PLANET GEAR-SEC.
	PLANET GEAR-PRI.
	SPLIT RING (MATCHING HALVES)
	SHIM
	SUN GEAR-SECONDARY
1	INPUT GEAR 21T, 20/40 D.P. SPLINE
2	INPUT GEAR 13T, 16/32 D.P. SPLINE
3	INPUT GEAR SAE 1" X .68 SPLINE
4	INPUT GEAR 14T, 12/24 D.P. SPLINE
5	INPUT GEAR 15T, 16/32 D.P. SPLINE
6	INPUT GEAR 1" DIA X .25" KEY
	PLANET SHAFT-SECONDARY
	PLANET SHAFT-PRIMARY
	THRUST WASHER-SEC. CUP
	THRUST WASHER-(SEC. PLANET GEAR)
	THRUST WASHER-(PRI. PLANET GEAR)
	BEARING CONE
	BEARING CUP
	BEARING-SEC. PLANET
	BEARING-PRI. PLANET
	THRUST WASHER-INPUT
	HEX CAPSCREW 5/16-18 X 1.5, GR8
	ROLLPIN-SECONDARY 3/16 X 7/8
	ROLLPIN-PRIMARY 1/8 X 1
	LOCK RING
	LOCKWASHER 5/16 MED
	PIPE PLUG-MAG. 3/8 NPT-SOC HD
	GREASE FITTING (OPTIONAL)
	O-RING 167 MM X 3 MM
	SEAL-SHAFT
	AIR VENT 3/8 NPT (OPTIONAL)

DOUBLE PLANETARY

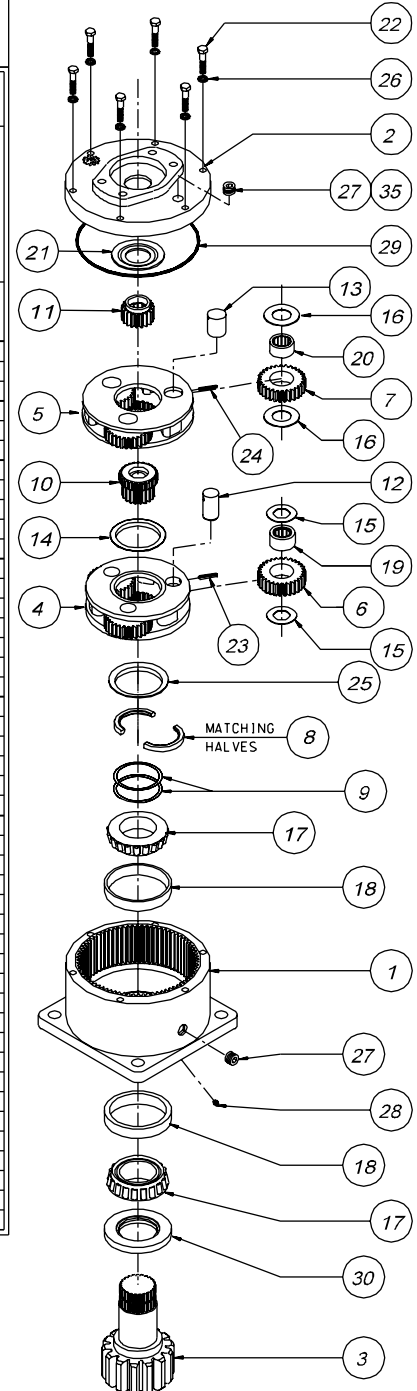
RATIO	ITEM	QTY.	16.65:1	20.62:1	20.62:1	25.53:1
			4.08 4.08	5.05 4.08	4.08 5.05 INVERTED	5.05 5.05
	1	1	20-004-3014	20-004-3014Z		
	2	1	85-004-1513	85-004-1503		
	3	1	28-004-1013	20-004-4022L	20-004-4032L	20-004-4042L
	4	1	20-004-1282	20-004-1282	20-004-1292	20-004-1292
	5	1	50-004-1082	50-004-1072	50-004-1082	50-004-1072
	6	3	20-004-1041	20-004-1041	20-004-1051	20-004-1051
	7	3	85-004-1031	85-004-1021	85-004-1031	85-004-1021
	8	1	20-004-1362			
	9	★	20-004-1091			
	10	1	20-004-1332	20-004-1062	20-004-1072	20-004-1072
	11	1	85-004-1402	85-004-1102	85-004-1402	N/A
			85-004-1102	85-004-1062		85-004-1062
			85-004-1122	85-004-1112		85-004-1112
			85-004-1533		85-004-1533	N/A
			85-004-1542	85-004-1422		85-004-1422
			85-004-1582		85-004-1582	N/A
	12	3	20-004-1081			
	13	3	81-004-0071			
	14	1	50-004-1011			
	15	6	85-004-1181			
	16	8	81-004-1561			
	17	2	01-102-0160			
	18	2	01-103-0160			
	19	3	01-105-0010			
	20	3	01-105-0410			
	21	1	50-004-1091			
	22	6	01-150-1400			
	23	3	01-153-0210			
	24	3	01-153-0080			
	25	1	20-004-1372			
	26	6	01-166-0110			
	27	2	01-207-0070			
	28	(1)	01-215-0050			
	29	1	01-402-0560			
	30	1	01-405-0550			
	35	(1)	01-216-0070			

▶ INVERTED RATIO SUNGEAR IS NOT COUNTERBORED FOR CODE 4 INPUT. MOTOR COMPATIBILITY MUST BE VERIFIED.

NOTES:

★ BEARING PRELOAD DETERMINES QUANTITY OF SHIMS.

SEAL KIT (P/N 20-016-0501) INCLUDES (1 EA.) O-RINGS AND (1 EA.) SEAL.
AND (1 EA.) SEAL.



X20LB02-BA DATE 06-08-00



MODEL P20L

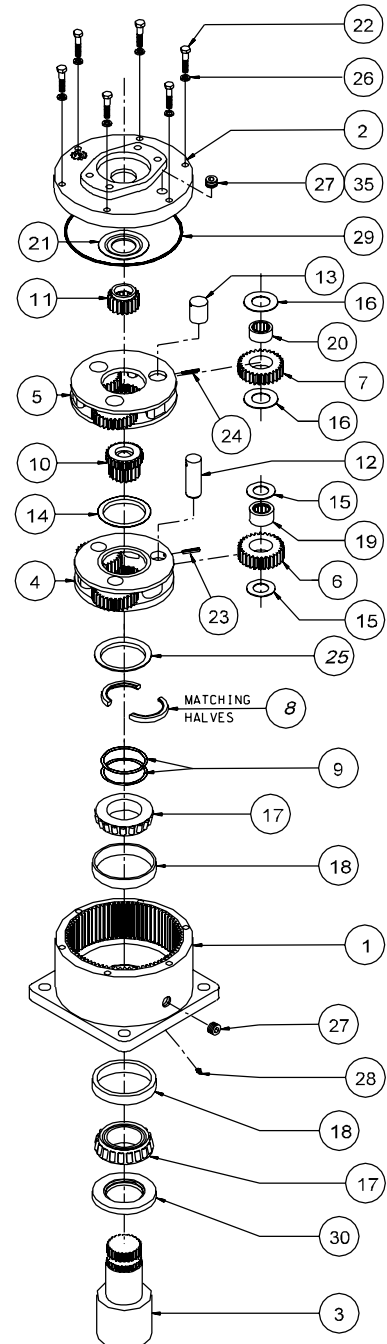
EQUIPPED WITH PATENTED "LOAD-N-LOCK"™
SHAFT RETENTION SYSTEM. (U.S. PATENT NO. 5746517).

EFFECTIVE
FROM: S/N 16401 07-01-93
TO: (CURRENT)

C O D E	DESCRIPTION
	P20 CASE-SQUARE-(NO ZERK)
	P20 CASE-SQUARE W/ZERK
	CP20 CASE-CUST.MTG PER CUSTOMER SPECS.
A	COVER-SAE 'A'
B	COVER-SAE 'B' 2-BOLT
C	COVER-SAE 'C' 4-BOLT
F1	SHAFT-1.5" KEYED
F2	SHAFT-2" KEYED
C1	SHAFT-CUSTOM PER CUSTOMER SPECS.
	CARRIER-SECONDARY
	CARRIER-PRIMARY
	PLANET GEAR-SEC.
	PLANET GEAR-PRI.
	SPLIT RING (MATCHING HALVES)
	SHIM
	SUN GEAR-SECONDARY
1	INPUT GEAR 21T,20/40 D.P.SPLINE
2	INPUT GEAR 13T,16/32 D.P.SPLINE
3	INPUT GEAR SAE 1"-68 SPLINE
4	INPUT GEAR 14T,12/24 D.P.SPLINE
5	INPUT GEAR 15T,16/32 D.P.SPLINE
6	INPUT GEAR 1"DIA X .25" KEY
	PLANET SHAFT-SECONDARY
	PLANET SHAFT-PRIMARY
	THRUST WASHER-SEC.CUP
	THRUST WASHER-(SEC.PLANET GEAR)
	THRUST WASHER-(PRI.PLANET GEAR)
	BEARING CONE (NTN NO.28584)
	BEARING CUP (NTN NO.28521)
	BEARING-SEC.PLANET (TOR.NO.HJ142212)
	BEARING-PRI.PLANET (BH NO. 1610)
	THRUST WASHER-INPUT
	HEX CAPSCREW 5/16-18 X 1.5, GR8
	ROLLPIN-SECONDARY 3/16 X 7/8
	ROLLPIN-PRIMARY 1/8 X 1
	LOCK RING
	LOCKWASHER 5/16 MED
	PIPE PLUG-MAG. 3/8 NPT-SOC HD
	GREASE FITTING (OPTIONAL)
	O-RING 167 MM X 3 MM
	SEAL-SHAFT (NAT. NO. 416404)
	AIR VENT 3/8 NPT (OPTIONAL) (ALEMITE #313650)
-	-

DOUBLE PLANETARY

RATIO			16.65:1 4.08 4.08	20.62:1 5.05 4.08	20.62:1 4.08 5.05 INVERTED	25.53:1 5.05 5.05
ITEM	QTY.	PART NUMBER	PART NUMBER	PART NUMBER	PART NUMBER	PART NUMBER
1	1	20-004-3064				
		20-004-3064Z				
2	1	85-004-1513				
		85-004-1503				
		28-004-1013				
		20-004-4122L				
3	1	20-004-4112L				
		-				
4	1	20-004-1282	20-004-1282	20-004-1292	20-004-1292	
5	1	50-004-1082	50-004-1072	50-004-1082	50-004-1072	
6	3	20-004-1041	20-004-1041	20-004-1051	20-004-1051	
7	3	85-004-1031	85-004-1021	85-004-1031	85-004-1021	
8	1	20-004-1362				
9	*	20-004-1091				
10	1	20-004-1332	20-004-1062	20-004-1072	20-004-1072	
11	1	85-004-1402		85-004-1402	N/A	
		85-004-1102	85-004-1062		85-004-1062	
		85-004-1122	85-004-1112		85-004-1112	
		85-004-1533		85-004-1533	N/A	
		85-004-1542	85-004-1422		85-004-1422	
		85-004-1582		85-004-1582	N/A	
12	3	20-004-1081				
13	3	81-004-0071				
14	1	50-004-1011				
15	6	85-004-1181				
16	6	81-004-1561				
17	2	01-102-0160				
18	2	01-103-0160				
19	3	01-105-0010				
20	3	01-105-0410				
21	1	50-004-1091				
22	6	01-150-1400				
23	3	01-153-0210				
24	3	01-153-0080				
25	1	20-004-1372				
26	6	01-166-0110				
27	2	01-207-0070				
28	(1)	01-215-0050				
29	1	01-402-0560				
30	1	01-405-0610				
35	(1)	01-216-0070				
-	-	-	-	-	-	-



▶ INVERTED RATIO SUNGEAR IS NOT COUNTERBORED FOR CODE 4 INPUT. MOTOR COMPATIBILITY MUST BE VERIFIED.

NOTES:

* BEARING PRELOAD DETERMINES QUANTITY OF SHIMS.

SEAL KIT (P/N 20-016-0511) INCLUDES (1 EA.) O-RINGS AND (1 EA.) SEAL.
AND (1 EA.) SEAL.

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.

(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.

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.