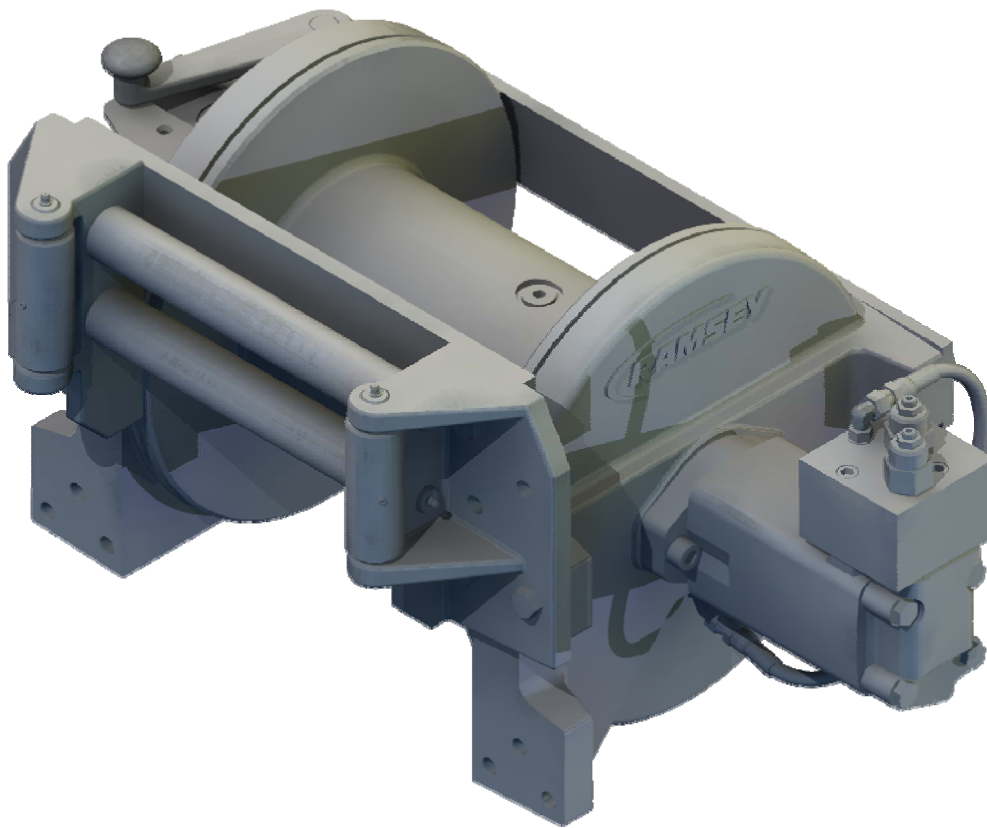




# OPERATING, SERVICE AND MAINTENANCE MANUAL



## 20,000 LB INDUSTRIAL WINCH



***CAUTION: READ AND UNDERSTAND THIS MANUAL BEFORE INSTALLATION AND OPERATION OF WINCH. SEE WARNINGS!***

## TABLE OF CONTENTS

<b>WARRANTY INFORMATION .....</b>	<b>1</b>
<b>SPECIFICATIONS.....</b>	<b>1</b>
<b>WARNINGS.....</b>	<b>1</b>
<b>CABLE INSTALLATION .....</b>	<b>2</b>
<b>HYDRAULIC SYSTEM REQUIREMENTS.....</b>	<b>3</b>
<b>PERFORMANCE CHARTS .....</b>	<b>3</b>
<b>CLUTCH OPERATION .....</b>	<b>4</b>
<b>WINCH OPERATION.....</b>	<b>4</b>
<b>MAINTENANCE.....</b>	<b>4</b>
<b>TROUBLE SHOOTING GUIDE.....</b>	<b>5</b>
<b>INSTRUCTIONS FOR OVERHAUL.....</b>	<b>6</b>
<b>TORQUE CHART .....</b>	<b>13</b>
<b>20K DIMENSIONAL DRAWING .....</b>	<b>15</b>
<b>20K WINCH PARTS DRAWING.....</b>	<b>16</b>
<b>PARTS LIST – 20K WINCH .....</b>	<b>17</b>
<b>LIMITED WARRANTY .....</b>	<b>18</b>

# RAMSEY HYDRAULIC PLANETARY WINCH MODEL 20K

## PLEASE READ THIS MANUAL CAREFULLY

This manual contains useful ideas in obtaining the most efficient operation from your Ramsey Winch, and safety procedures one needs to know before operating a Ramsey Winch. Do not operate this winch until you have carefully read and understand the "WARNINGS" and "OPERATION" sections of this manual.

## WARRANTY INFORMATION

Ramsey Winches are designed and built to exacting specifications. Great care and skill go into every winch we make. If the need should arise, warranty procedure is outlined on the back of your self-addressed postage paid warranty card. Please read and fill out the enclosed warranty card and send it to Ramsey Winch Company. If you have any problems with your winch, please follow instructions for prompt service on all warranty claims. Refer to back page for limited warranty.

## SPECIFICATIONS\*

Rated Line Pull	(lbs.)	.....	20,000			
	(Kg.)	.....	9070			
Gear Reduction		.....	21:1			
Weight (without cable)	20K Winch.....		337 lbs			
<b>LAYER OF CABLE</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
*Rated line pull per layer	lbs.	20,000	17,300	15,200	13,600	12,300
	Kg.	9,070	7,840	6,890	6,160	5,570
<b>* Cable Capacity per Layer</b>						
20K Winch	ft.	30	70	115	165	220
	m	9	21	35	20	67
* Line Speed (at 30 GPM)	FPM	42	47	53	59	65
	MPM	12.1	13.6	15.5	17	18.8
* These specifications are based on recommended wire rope of 9/16" Extra Improved Plow Steel cable and a 14.9 cu. in. / Rev. motor.						

**NOTE:** The rated line pulls shown are for the winch only. Consult the wire rope manufacturer for wire rope ratings

## WARNINGS:

**CLUTCH MUST BE FULLY ENGAGED BEFORE STARTING THE WINCHING OPERATION.**

**DO NOT START WINCH MOTOR BEFORE ENGAGING CLUTCH.**

**DO NOT DISENGAGE CLUTCH UNDER LOAD.**

**STAY OUT FROM UNDER AND AWAY FROM RAISED LOADS.**

**STAND CLEAR OF CABLE WHILE PULLING. DO NOT TRY TO GUIDE CABLE.**

**DO NOT EXCEED MAXIMUM LINE PULL RATINGS SHOWN IN TABLE.**

**DO NOT USE WINCH TO LIFT, SUPPORT, OR OTHERWISE TRANSPORT PEOPLE.**

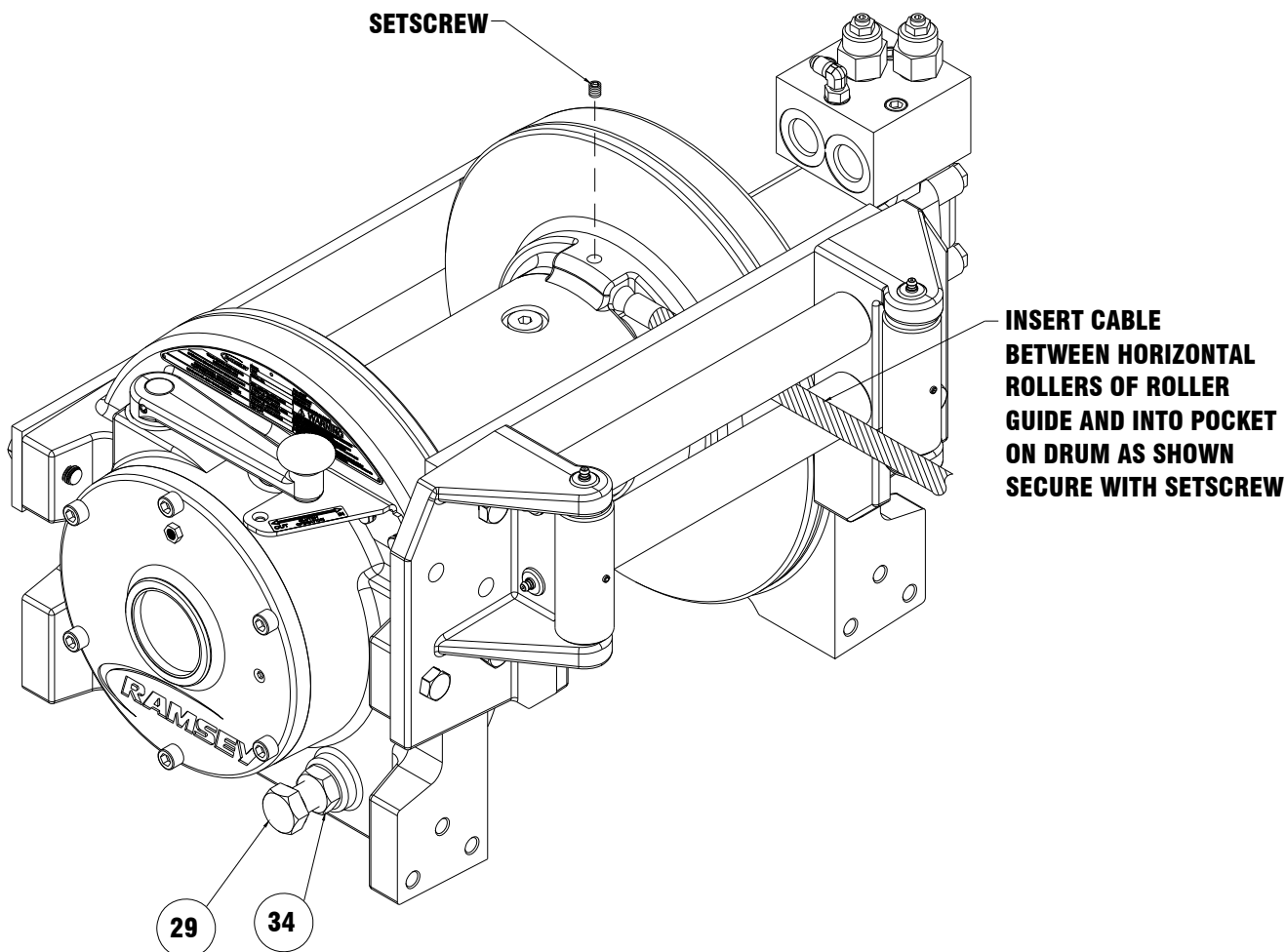
**A MINIMUM OF 5 WRAPS OF CABLE AROUND THE DRUM BARREL IS NECESSARY TO HOLD THE LOAD.**

**CABLE ANCHOR IS NOT DESIGNED TO HOLD LOAD.**

## CABLE INSTALLATION

1. Unwind cable by rolling it out along the ground to prevent kinking. Securely wrap end of wire rope, opposite hook, with plastic or similar tape to prevent fraying.
2. Place taped end of cable through roller guide and into hole in cable drum as shown below. Use 3/8"-16NC X 3/8" Lg. Hex socket drive setscrew to secure cable to drum.
3. Carefully run the winch in the "reel-in" direction. Keeping tension on end of cable, spool all the cable onto the cable drum, taking care to form neatly wrapped layers.

After installing cable, check freespool operation. Disengage clutch and pull on cable at walking speed. If cable "birdnests", loosen jam nut #34 and turn 3/8"-16NC capscrew #29 clockwise to increase drag on drum. If cable pull is excessive, loosen 3/8"-16NC capscrew #29 by turning counterclockwise. Tighten jam nut when proper setting is obtained.



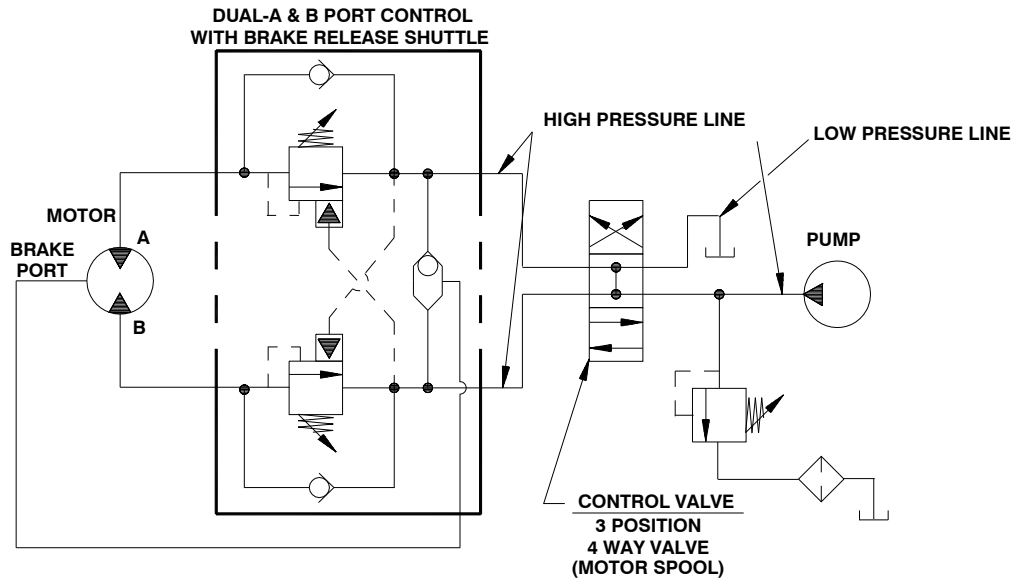
## HYDRAULIC SYSTEM REQUIREMENTS

Refer to the performance charts, below, to properly match your hydraulic system to Linemaster 20K winch performance. The charts consist of:

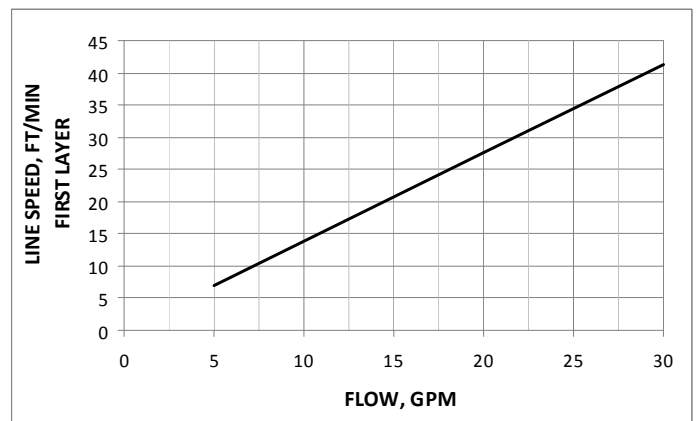
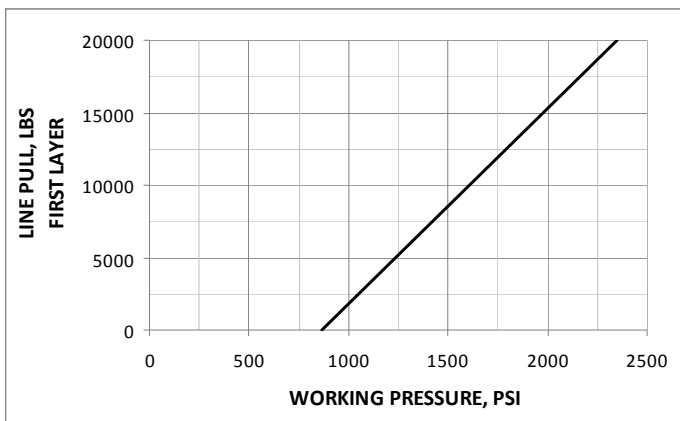
- (1) Line pull (lb.) first layer vs. working pressure (PSI) and (2) Line speed, first layer (FPM) vs. gallons per minute (GPM). Performance based on a motor displacement of 14.9 cubic inches with 30 GPM maximum flow rate. Motor has (2) 1.062-12 SAE straight thread o-ring ports.

**Note: A motor spool (open center) directional control valve is required for brake operation.**

## TYPICAL LAYOUT



## PERFORMANCE CHARTS



**BASED ON 14.9 CU IN/REV MOTOR**

## **CLUTCH OPERATION**

**WARNING: CLUTCH MUST BE FULLY ENGAGED BEFORE STARTING THE WINCHING OPERATION.**

### **To engage clutch:**

1. Grasp shift lever and push toward drum to the "In" position.
2. If shift lever detent does not engage to the detent hole, then the clutch is not fully engaged. The cable drum may need to be manually rotated slightly while pushing on the shift lever to align the clutch splines.

**WARNING: DO NOT DISENGAGE CLUTCH UNDER LOAD.**

### **To disengage clutch:**

1. Run the winch in the "cable out" direction until the load is off the cable.
2. Grasp the shift lever and pull away from drum to the "Out" position until shift lever detent engages in detent hole. If there is resistance in moving the shift lever, the cable drum may be manually rotated in the cable "Out" direction thereby relieving the preload and allowing the lever to shift. The cable may now be pulled off by hand.

## **WINCH OPERATION**

The best way to get acquainted with how your winch operates is to make test runs before you use it. Plan your test in advance. Remember, you hear your winch, as well as see it operate; learn to recognize the sounds of a light steady pull, a heavy pull, and sounds caused by load jerking or shifting. Gain confidence in operating your winch and its use will become second nature with you.

The uneven spooling of cable, while pulling a load, is not a problem, unless there is a cable pileup on one end of drum. If this happens reverse the winch to relieve the load and move your anchor point further to the center of the vehicle. After the job is done you can unspool and rewind for a neat lay of the cable.

## **MAINTENANCE**

Adhering to the following maintenance schedule will keep your winch in top condition and performing as it should with a minimum of repair.

### **A. WEEKLY**

1. Check the oil level and maintain it to the oil level plug. If oil is leaking out, determine location and repair.
2. Check the pressure relief plug on the gear housing cover. Be sure that it is not plugged. Lubricate cable with light oil.

### **B. MONTHLY**

1. Check the winch mounting bolts. If any are missing, replace them and securely tighten any that are loose. Use grade 8 or better bolts.
2. Inspect the cable. If the cable has become frayed with broken strands, replace immediately.

## C. ANNUALLY

1. Drain the oil from the winch annually or more often if winch is used frequently.
2. Fill the winch to the oil level plug with clean kerosene. Run the winch a few seconds with no load in the reel in direction. Drain the kerosene from the winch.
3. Refill the winch to the oil level plug with all purpose SAE 80W-140 gear oil.
4. Inspect bumper and surrounding structure for cracks or deformation.

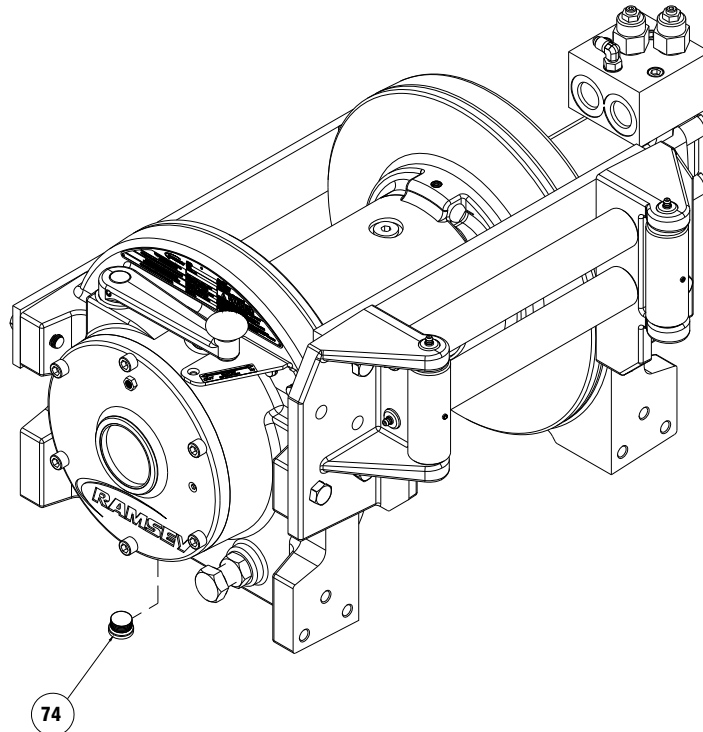
## TROUBLE SHOOTING GUIDE

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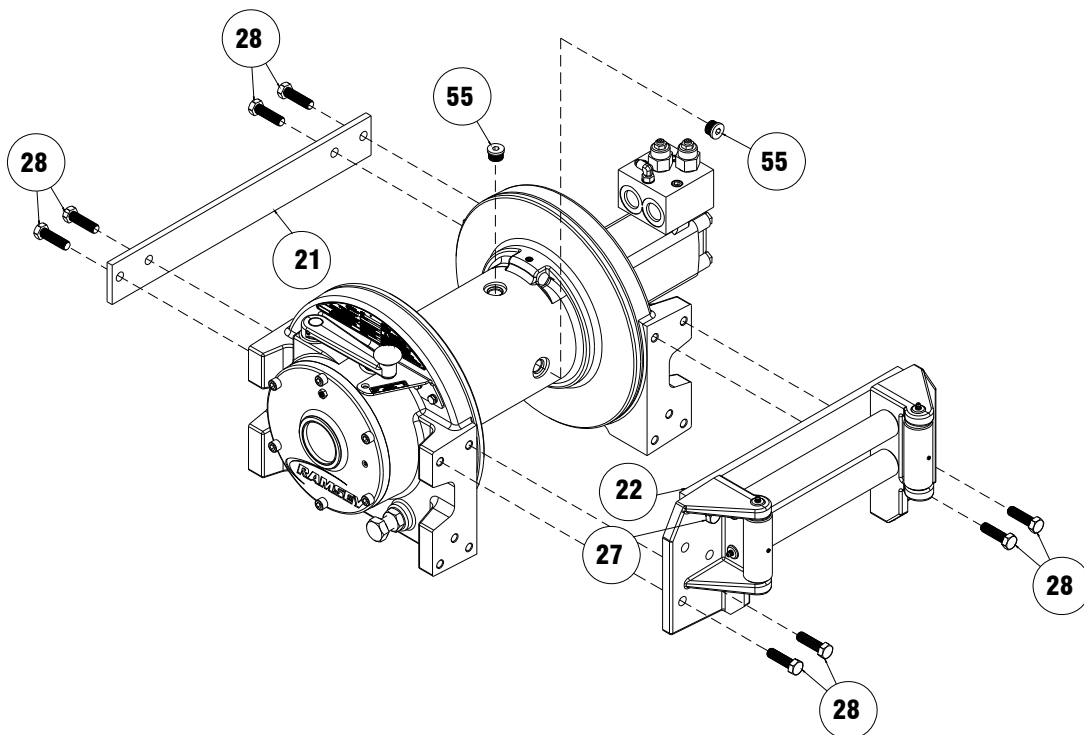
CONDITIONS	POSSIBLE CAUSE	CORRECTION
<b>OIL LEAKS FROM WINCH</b>	1. Seals damaged or worn.	1. Replace seal.
	2. Too much oil.	2. Drain excess oil. Refer to OPERATION.
	3. Damaged gaskets.	3. Replace gaskets.
	4. Damaged o-rings.	4. Replace o-rings.
<b>WINCH RUNS TOO SLOW</b>	1. Low flow rate	1. Check flow rate. Refer to HYDRAULIC SYSTEMS performance chart page 3.
	2. Hydraulic motor worn out.	2. Replace motor.
<b>CABLE DRUM WILL NOT FREESPOOL</b>	1. Clutch not disengaged	1. Check operation, refer to page 4.
<b>BRAKE WILL NOT HOLD</b>	1. Incorrect directional control valve. (Cylinder spool, closed center).	1. Use only a motor spool (open center) directional control valve.

## INSTRUCTIONS FOR OVERHAUL

1. Drain oil from gear housing by removing plug #74 from drain hole in end bearing.

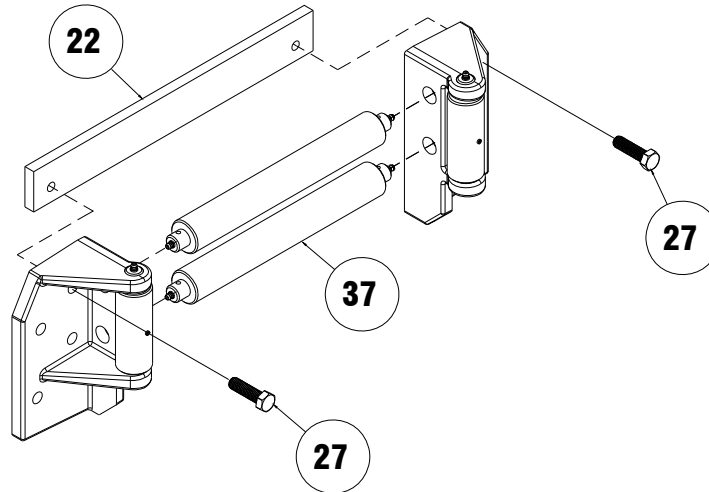


2. Freespool drum to locate drain hole in bottom. Remove plugs #55 from barrel of drum. Drain oil from drum barrel. Remove tie plate #21 by loosening (2) capscrews #28 each side. Loosen but do not remove (2) capscrews #27 on roller guide tie plate #22. Remove (4) capscrews #28 and roller guide.

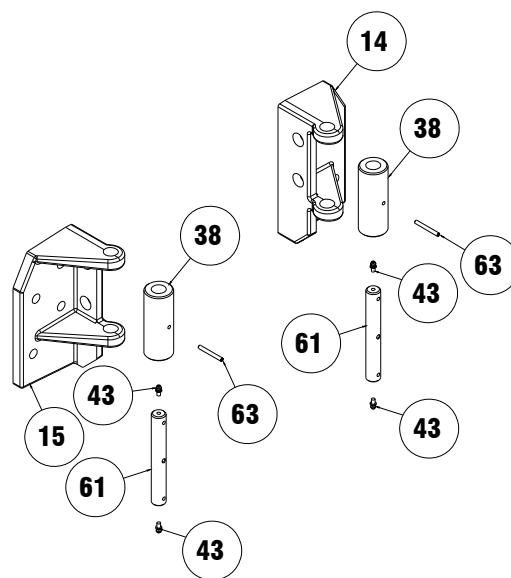




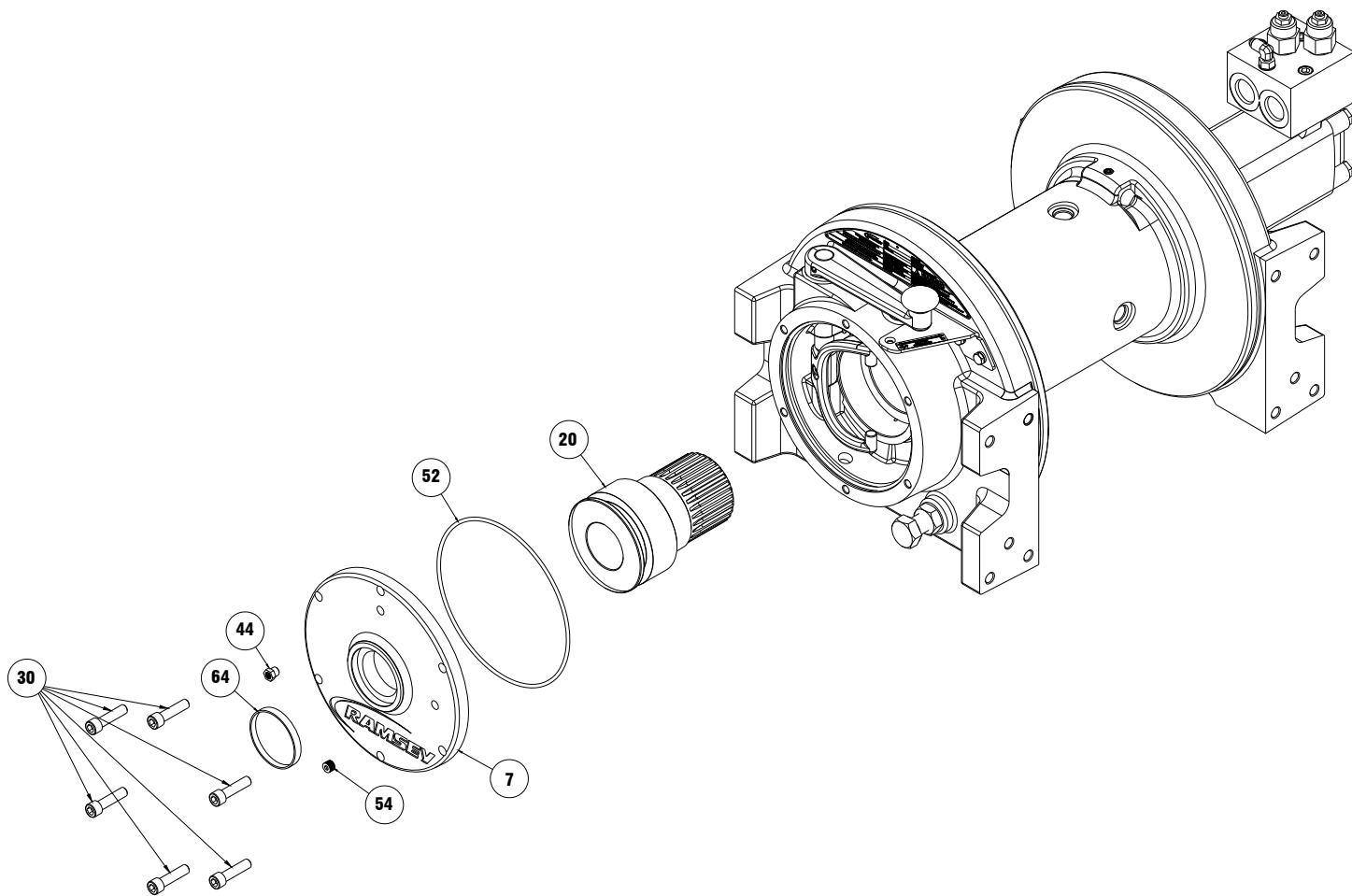
3. Position roller guide face down on a level surface and (2) capscrews #27 and roller guide tie bar #22. Horizontal rollers #37 can be removed from the left and right hand roller guides once the tie bar has been removed. Horizontal rollers #37 have (2) lube fittings #43, one located at either end of the roller.



4. Remove vertical roller pin #61 from right hand side of roller guide #14 by removing spring pin #63. Spring pins should be removed by driving inward through the roller. Vertical roller pin #61 has (2) lube fittings #43, one located at either end of the roller pin. Once the vertical roller pin is removed from right hand side of roller guide, vertical roller #38 can be removed. Remove vertical roller from left hand side of roller guide #15 in the same way.



5. Remove (6) capscrews #30 and clutch housing cover #7. Remove relief fitting #44 and plug #54 from clutch housing cover #7 as shown. Remove clutch housing o-ring #52 and plug #64. Pull shifter lever away from drum and slide clutch yoke #20 from shaft.

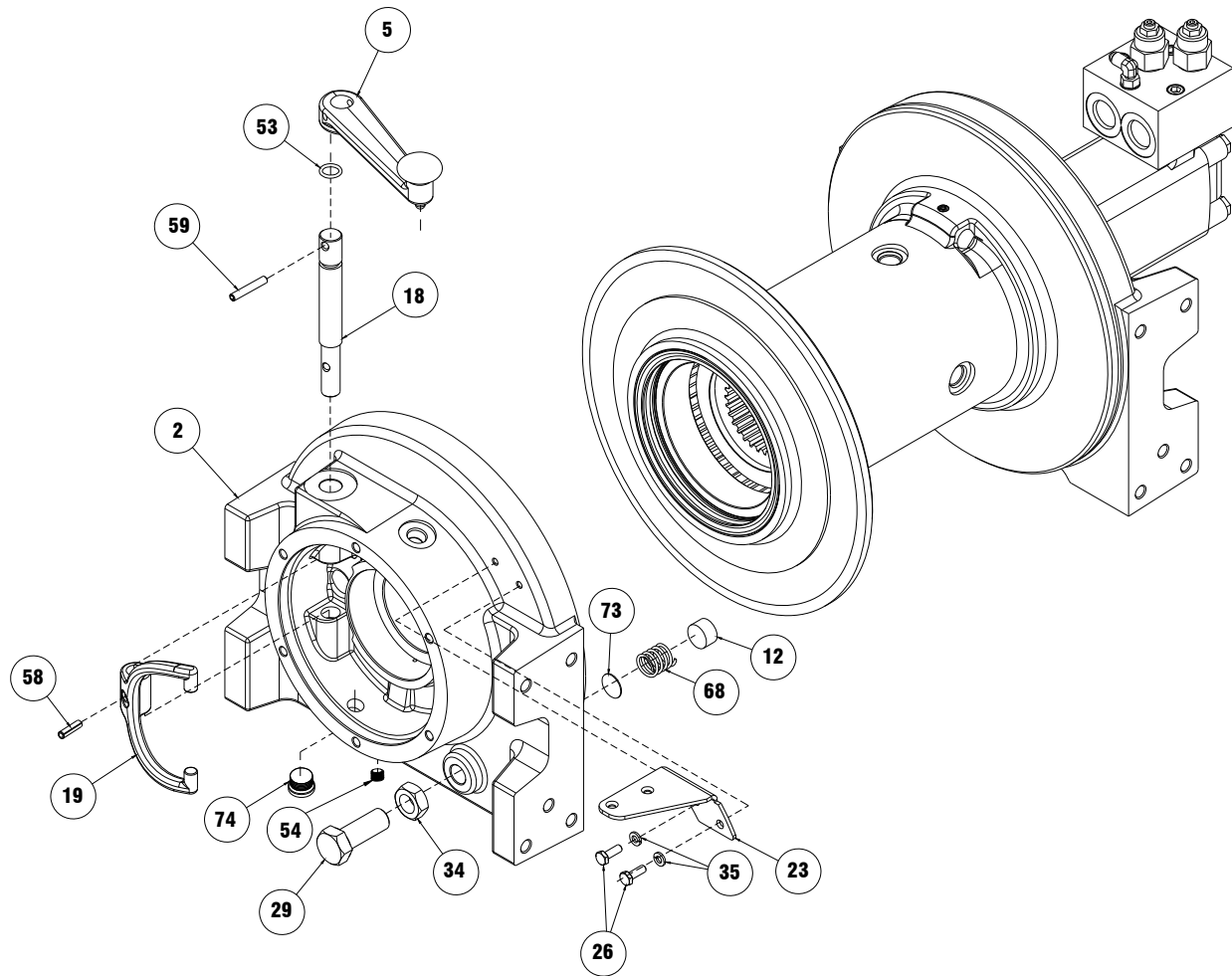


6. Slide clutch end bearing #2 from drum. Drum freespool drag puck #12, drum freespool spring # 68, and brake disc spacer # 73 will fall out when end bearing is removed from drum. Retain these items for re-assembly.

To remove shifter yoke #19, drive spring pin #59 inward through shifter yoke. Lift shifter assembly out by pulling up on shifter handle assembly #5 until shifter shaft #18 is clear of shifter yoke #19. Yoke can then be lifted out of end bearing.

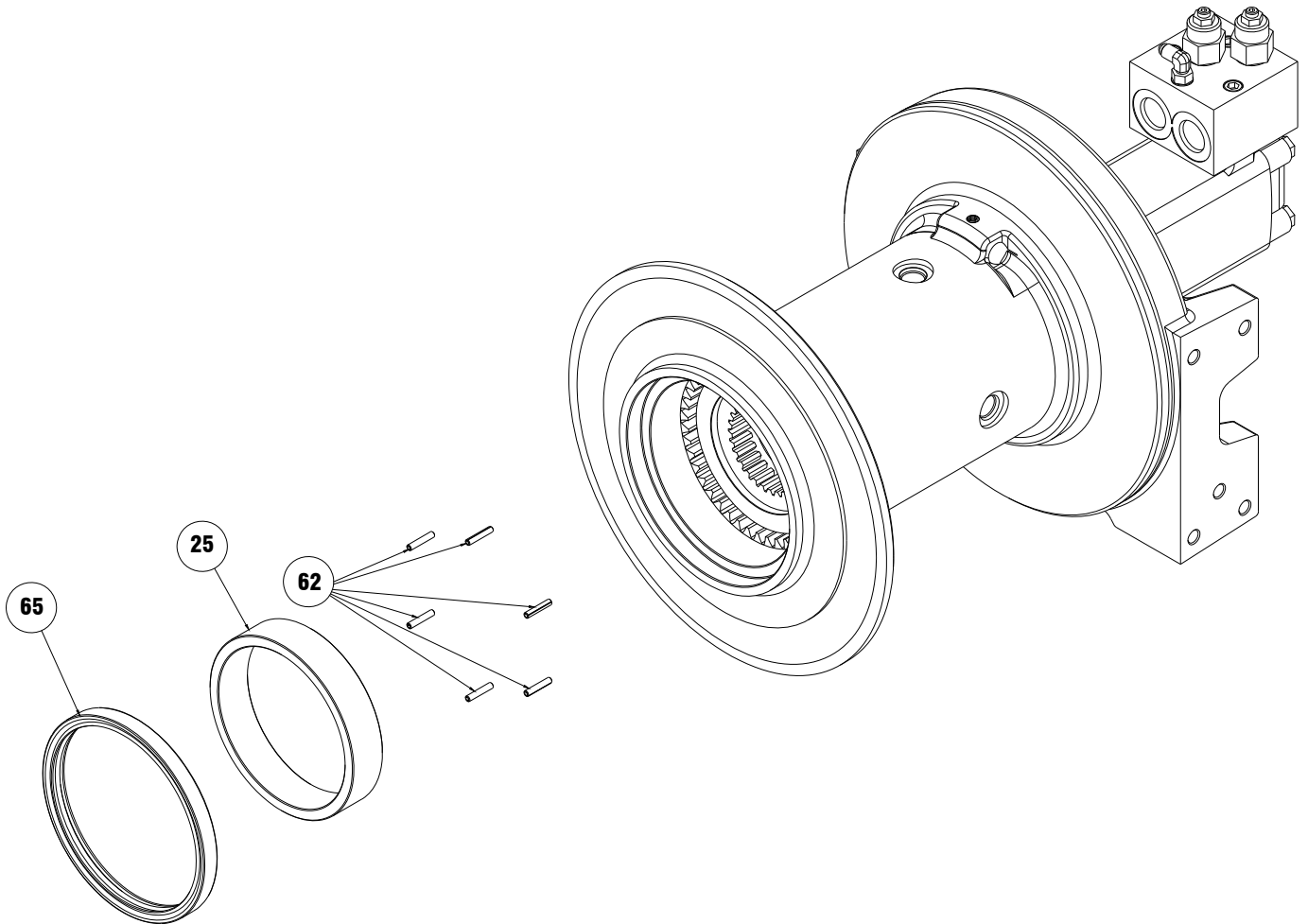
To replace handle #5 on shifter shaft #18, first remove spring pin #59, then slide handle assembly #5 from shifter shaft #18. O-ring #53 can be replaced at this time.

To replace shifter detent bracket #23, first remove (2) ¼ x 20 capscrews #26 and (2) ¼ lockwashers # 35, then remove shifter detent bracket #23 and replace.



7. Remove drum bushing assembly #25. Note that the (6) spring pins #62 are pressed into the bushing and cannot be removed. To replace the drum bushing, first press in the (6) spring pins #62, and then replace the bushing on the shaft. Drum seal #65 can also be replaced at this time if needed.

**Note: Replacement bushings do not include the pins so you will need to order them separately.**

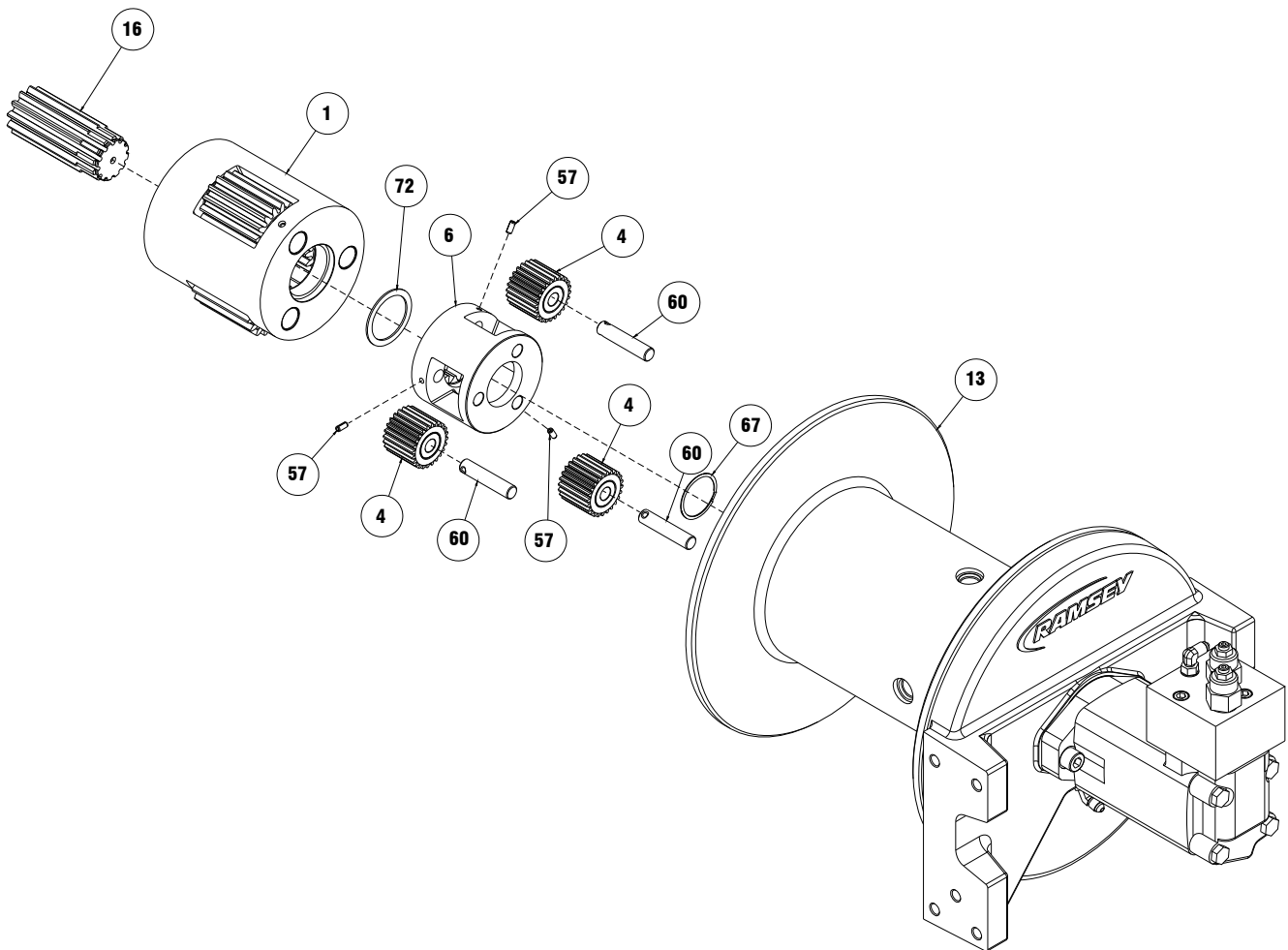


8. Remove output shaft #16, output carrier assembly #1, and input carrier assembly #6 from drum #13. Disassemble in the following order:

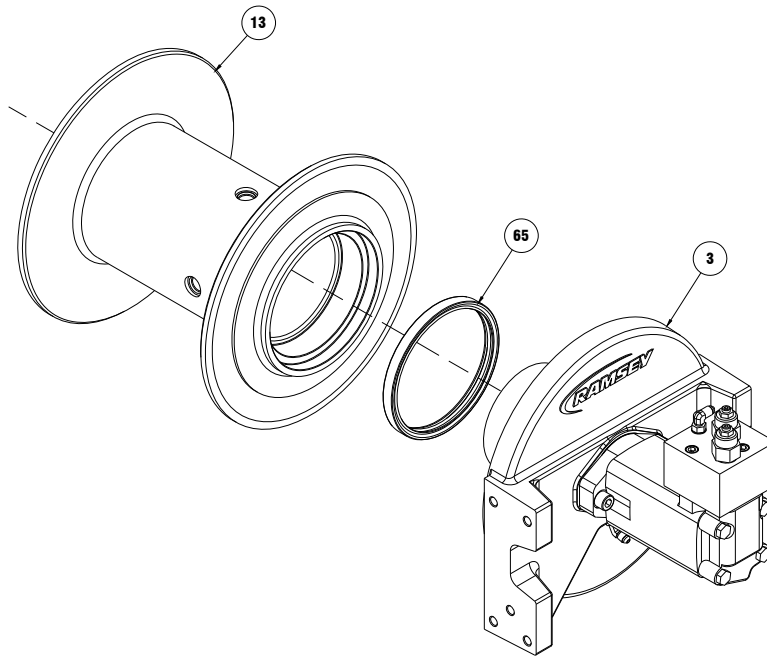
Knock (3) spring pins #57 inward to center of input carrier assembly #6. Remove (3) input planet pins #60 from input carrier assembly #6. Remove (3) input planet gears #4 from input carrier assembly #6.

Remove output shaft external retaining ring #67 from output shaft #16. Slide input carrier #6 from output shaft #16.

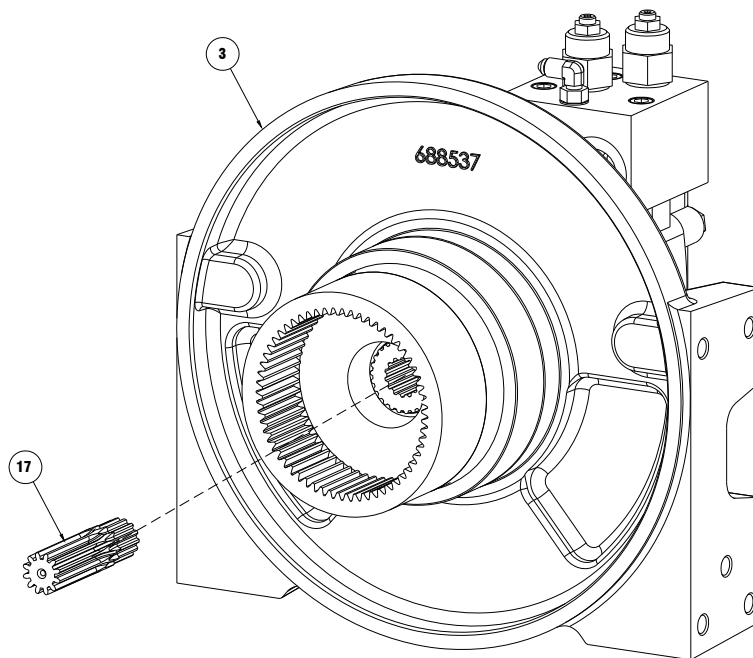
Remove thrust washer #72 from output shaft #16. Slide output carrier assembly #1 from output shaft #16. Output carrier assembly #1 must be purchased as an assembly. Replacement gears are not available.



9. Remove drum #13 from motor end bearing #3. Remove drum seal #65. Check for signs of wear and replace if necessary.



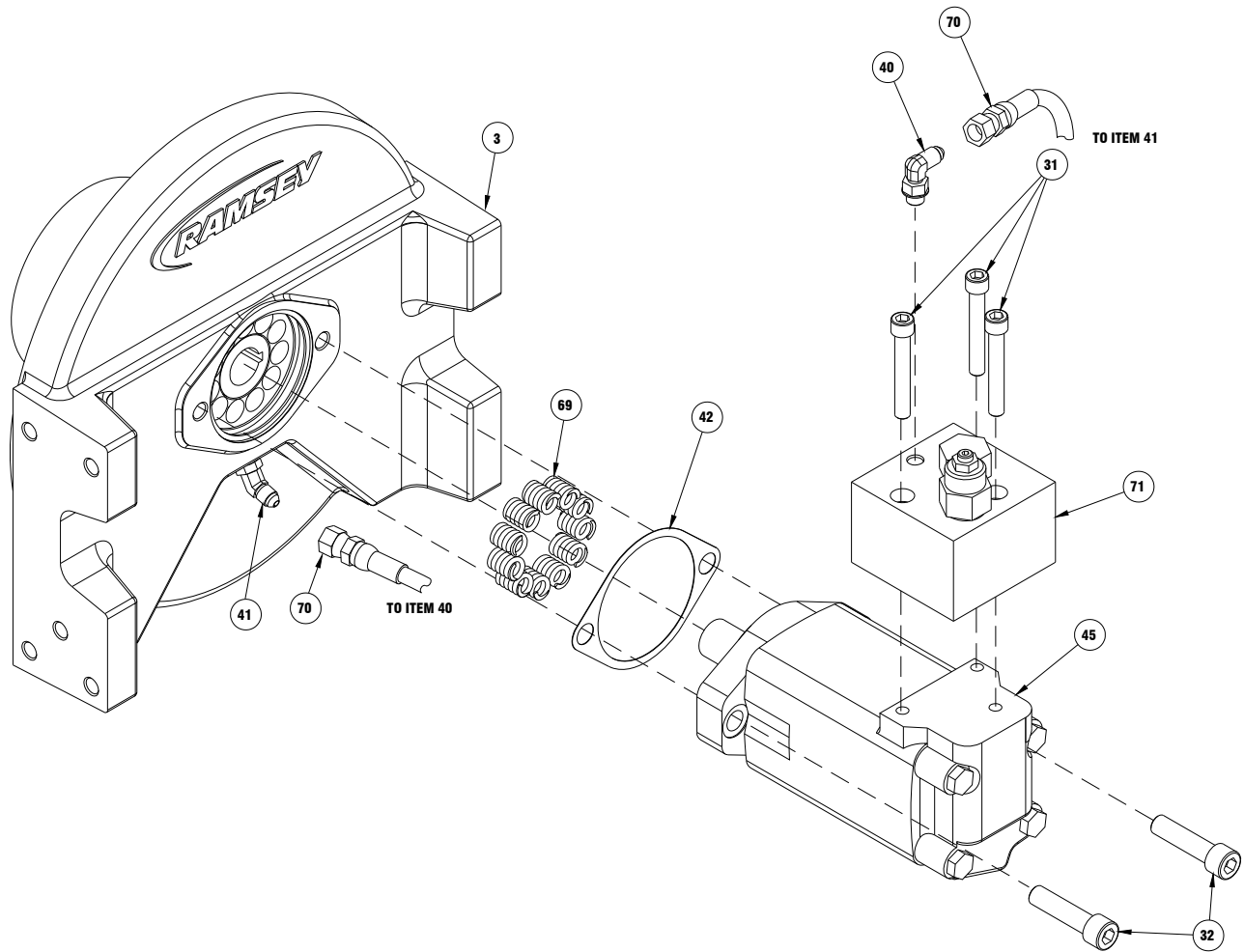
10. Remove input shaft #17 from motor end bearing #3.



11. To remove motor #45 from motor end bearing #3, first detach hydraulic brake release hose assembly #70 from elbow fitting #40. Loosen (2) 1/2-13 capscrews #32. Remove motor gasket #42, and (11) brake springs #69.

To remove motor control valve #71, loosen (3) 3/8-16 NC capscrews #31, lift motor control valve #71 from motor #45.

**Note: Do not run winch with hydraulic brake release hose assembly disconnected.**



## TORQUE CHART

### GRADE 5

SIZE	TORQUE VALUE
1/4-20	76 IN LBS
3/4-16	223 FT LBS
3/8-16	23 FT LBS
1/2-13	57 FT LBS

### GRADE 8

SIZE	TORQUE VALUE
1/2-13	80 FT LBS
5/8-11	159 FT LBS

12. Remove (2) retaining rings #66. Remove motor coupling #39 from end bearing #3. Remove roll pin #56 from motor coupling #39. Remove brake piston #10 and backup brake piston #11.

Remove o-ring #47, o-ring #46, backup ring #49, and backup ring #51 from brake piston #10.

Remove o-ring #48 and backup ring #50 from backup brake piston #11. Remove (7) stators #8 and (6) brake discs #9 from end bearing #3.

**To re-install brake,** set gear housing end down on work surface.

Install well-oiled o-rings and backup rings into grooves on outside of brake piston and backup brake piston as shown in cross-section A-A below.

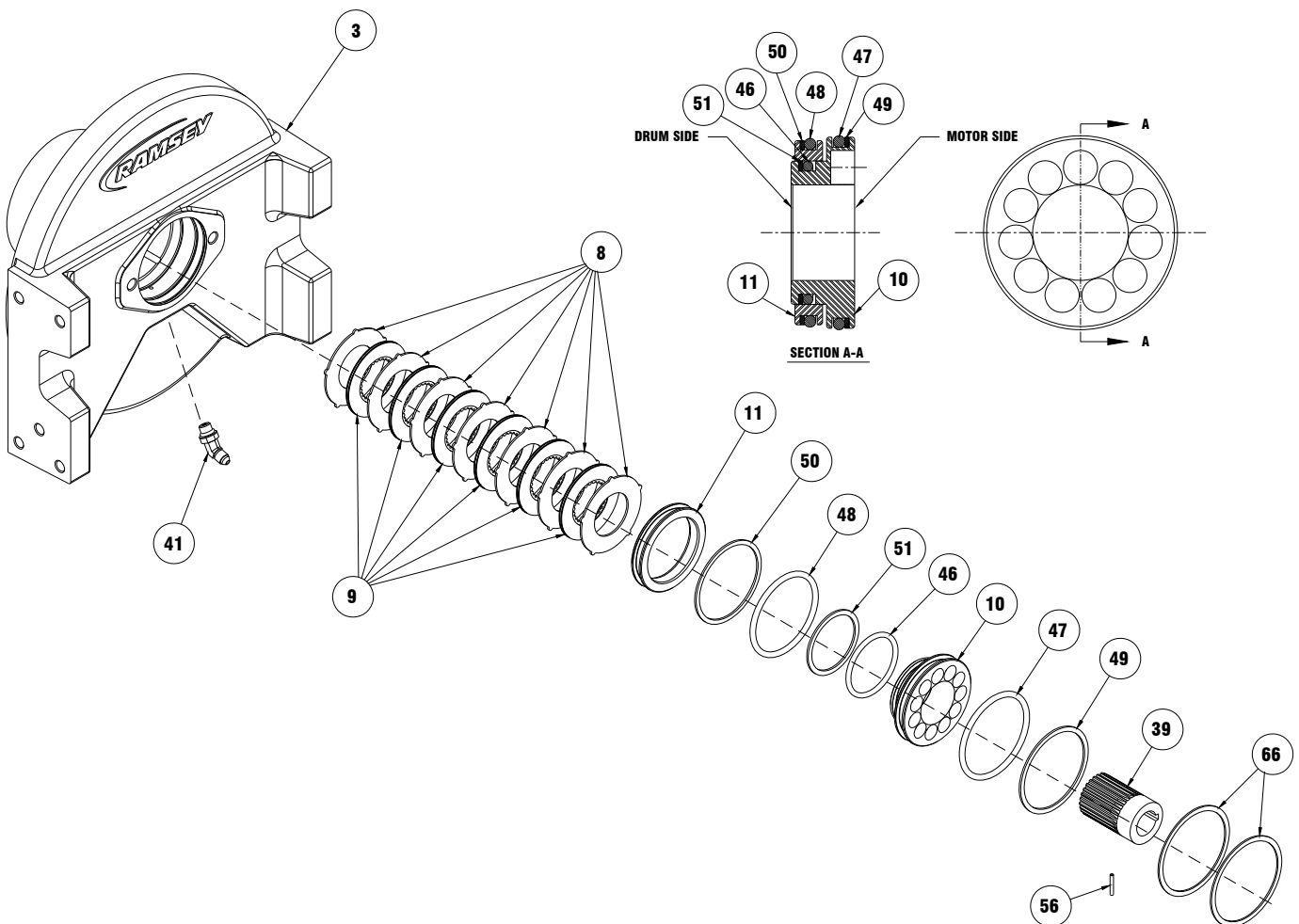
Piston, backup piston, brake discs and stators must be clean and well lubed with 80W-140 oil.

Insert (7) stators #8 and (6) brake discs #9 into gear end alternating, with stators first and last.

Insert backup brake piston #11 on to brake piston #10. Insert brake piston assembly into motor end bearing #3. Apply even pressure on piston when installing.

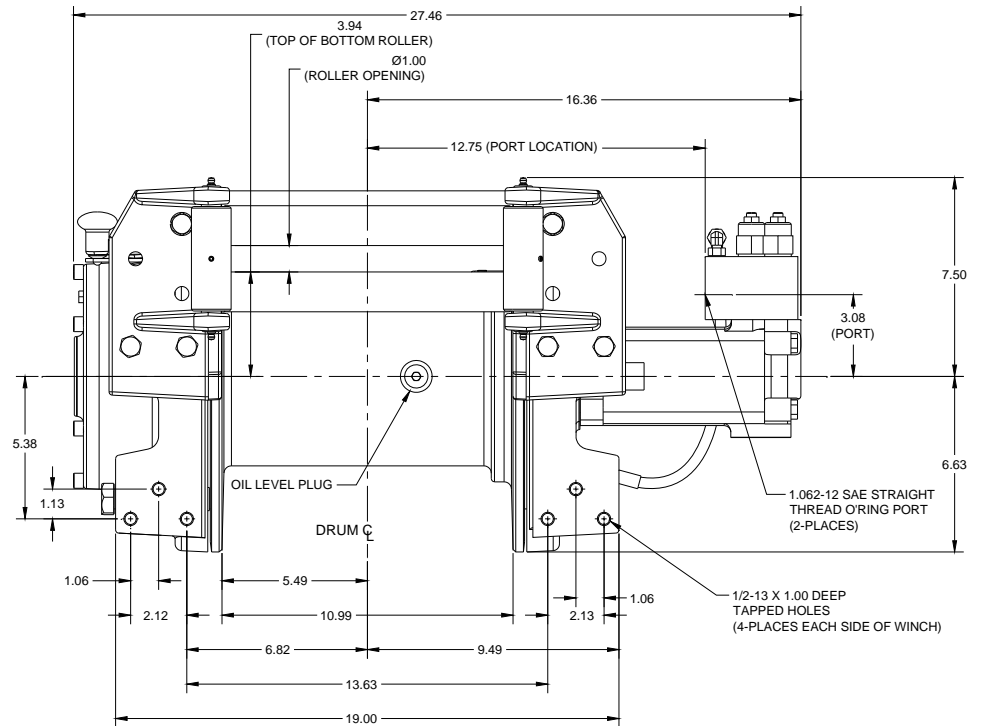
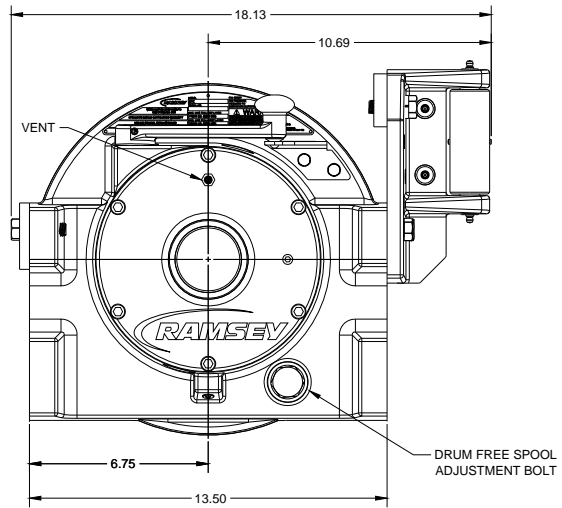
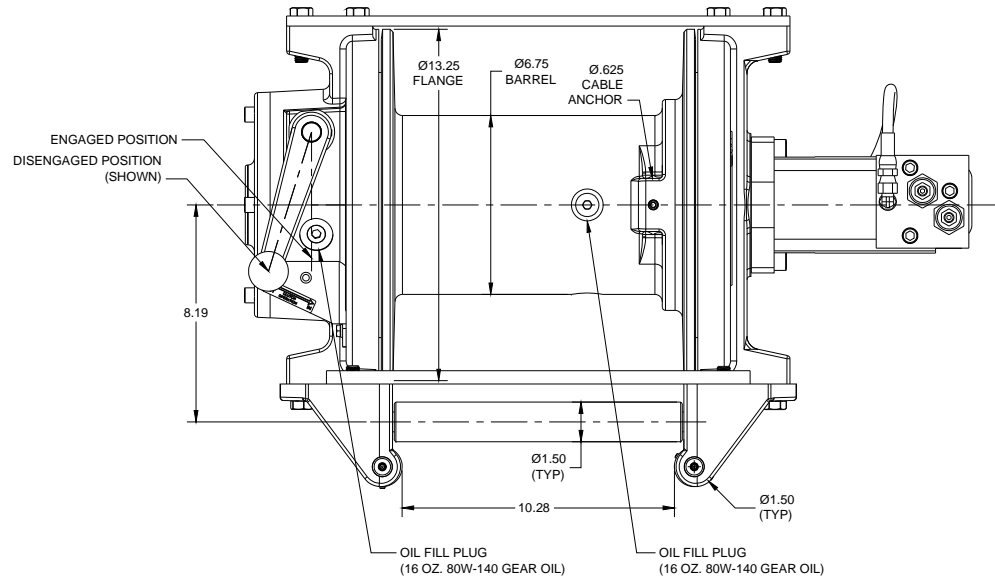
Insert roll pin #56 into motor coupling #39 below bottom of spline teeth. Insert motor coupling #39 into end bearing #3.

Install (2) retaining rings #66 into grooves in motor end housing.

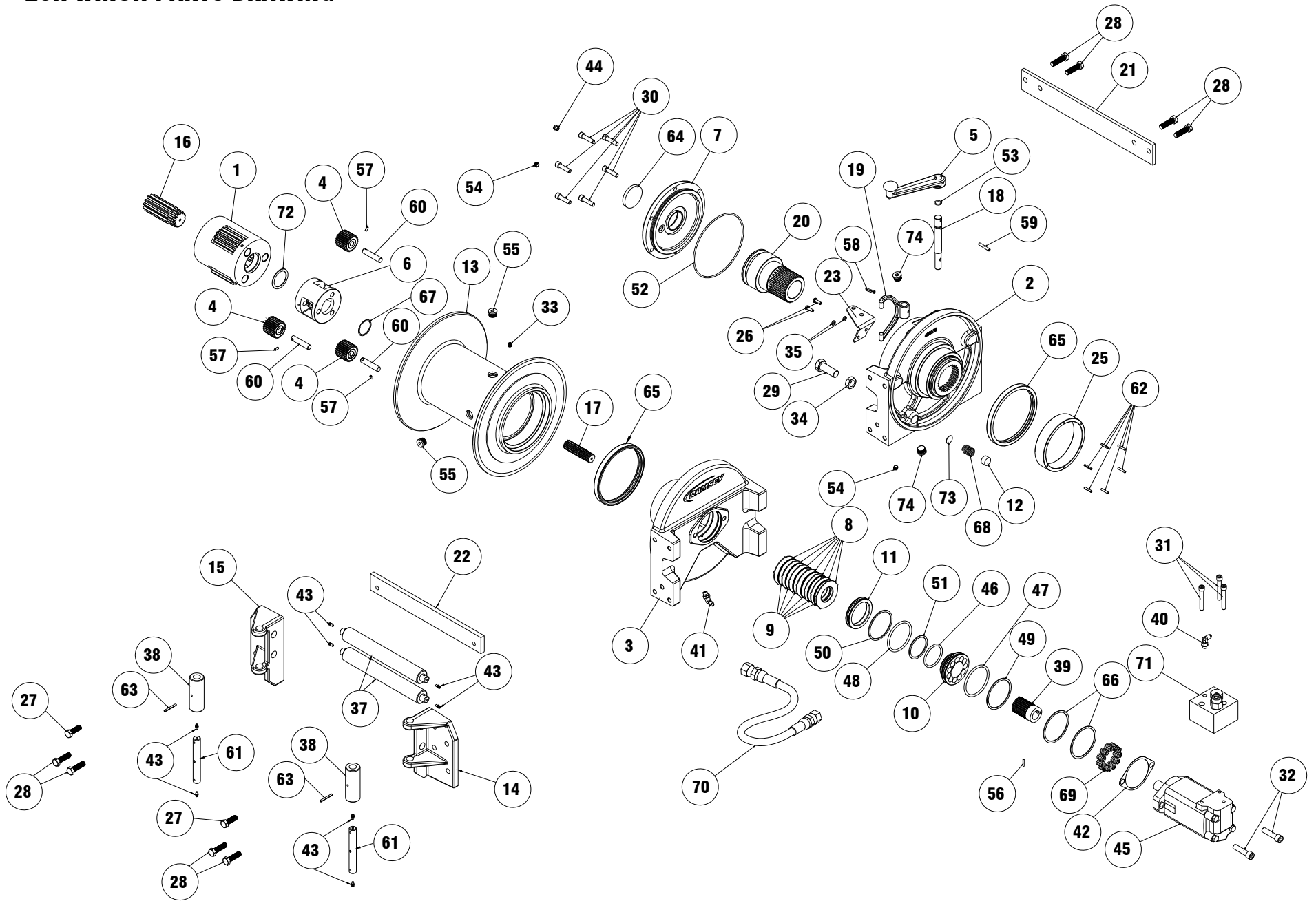




# 20K DIMENSIONAL DRAWING



# 20K WINCH PARTS DRAWING



**PARTS LIST – 20K WINCH**

ITEM	QTY.	PART NO	DESCRIPTION
1	1	247040	OUTPUT CARRIER
2	1	296673	CLUTCH END BEARING
3	1	296674	MOTOR END BEARING
4	1	296675	INPUT PLANET GEAR ASSEMBLY
5	1	296682	SHIFT LEVER ASSEMBLY
6	1	317015	CARRIER-INPUT
7	1	328166	COVER-CLUTCH HOUSING
8	7	330011	STATOR-BRAKE
9	6	330012	DISC-BRAKE FRICTION
10	1	330013	PISTON-BRAKE
11	1	330014	PISTON-BACKUP BRAKE
12	1	330015	PUCK-DRAG, DRUM FREESPOOL
13	1	332231	DRUM-MACHINED
14	1	333026	ROLLER GUIDE-RH SIDE
15	1	333027	ROLLER GUIDE-LH
16	1	334207	OUTPUT SUN GEAR
17	1	355139	SHAFT-INPUT
18	1	355141	SHAFT-SHIFTER
19	1	370061	YOKE-SHIFTER
20	1	370065	CLUTCH-YOKE
21	1	395428	TIE PLATE
22	1	395429	ROLLER GUIDE TIE PLATE
23	1	408364	BRACKET-SHIFTER DETENT
25	1	412132	BUSHING-DRUM
26	2	414038	CAPSCREW-1/4-20NC X .75 LG HX HD GR5 Z/P
27	2	414512	CAPSCREW 1/2-13X1.5 LG HX HD GR 8 ZP
28	8	414515	CAPSCREW 1/2-13X1.75 LG HX HD GR 8 ZP
29	1	414772	CAPSCREW-3/4-16 X 2.0 LG HX HD GR5
30	6	414906	CAPSCREW-3/8-16 X 1.5 LG SOC HD F/B
31	3	414935	CAPSCREW-3/8-16NC X 2.5 LG SOC HD
32	2	414945	CAPSCREW 1/2-13 X 1.5 LG SOC HD ZP, NY-LOK
33	1	416057	SETSCREW-3/8-16NCX3/8LG,HX SOCHD CU
34	1	418098	NUT-3/4-16NF HEX JAM
35	2	418149	LOCKWASHER-1/4 MED SECTION ZP
37	2	424033	ROLLER-HORIZONTAL
38	2	424034	ROLLER-VERTICAL

ITEM	QTY.	PART NO	DESCRIPTION
39	1	431023	COUPLING-MOTOR
40	1	432018	FITTING-90° ELBOW, -4 SAE ORING TO -4 JIC
41	1	432044	FITTING-45° ELBOW, -4 SAE ORING TO -4 JIC
42	1	442223	GASKET-MOTOR
43	8	456001	LUBE FITTING
44	1	456008	RELIEF FITTING ZP
45	1	458144	HYD MOTOR 14.9 CU IN
46	1	462067	O-RING-2.225 ID X .210 THK, 2-331
47	1	462068	O-RING-3.10 ID X .210 THK, 2-338
48	1	462069	O-RING-2.975 ID X .210 THK, 2-337
49	1	462070	RING-BACKUP, 3.143 ID X .076 THK, 8-338
50	1	462071	RING-BACKUP, 3.018 ID X .076 THK, 8-337
51	1	462072	RING-BACKUP, 2.268 ID X .076 THK, 8-331
52	1	462077	O-RING-6.984 ID X .139 THK, 2-262, CLUTCH HSG CVR
53	1	462078	O-RING-.549 ID X .103 THK, 2-113, SHIFTER SHAFT
54	2	468016	PLUG-PIPE 1/8-27NPTF SOC HD
55	2	468041	PLUG, -8 SAE, 3/4"-16 UNF
56	1	470033	SPIROL PIN
57	3	470060	SPRING PIN-3/16 X 1/2 LG
58	1	470103	PIN-SPRING, .25 DIA X 1.0 LG
59	1	470104	PIN-SPRING, .25 DIA X 1.5 LG
60	3	470107	PIN-INPUT PLANET
61	2	470109	VERTICAL ROLLER PIN
62	6	470123	PIN-SPRING, .188 DIA X 1.00 LG
63	2	470128	PIN-SPRING .188 DIA X 1.5 LG
64	1	472081	PLUG, GEAR HOUSING COVER
65	2	486093	SEAL-DRUM
66	2	490049	RING-INTERNAL RETAINING, SMALLEY #WH-350
67	1	490061	RING-EXTERNAL RETAINING, SMALLEY #WSM-150, OUTPUT SHAFT
68	1	494002	SPRING-DRUM FREESPOOL
69	11	494124	SPRING-BRAKE
70	1	509142	HOSE ASSY- PORTS UP
71	1	516011	VALVE-MOTOR CONTROL
72	1	518071	THRUST WASHER
73	1	530094	SPACER-BRAKE DISC
74	2	468018	PLUG - 3/8-18 HX SOC

## LIMITED WARRANTY

RAMSEY WINCH warrants each new RAMSEY WINCH to be free from defects in material and workmanship for a period of one (1) year from date of purchase.

The obligation under this warranty, statutory or otherwise, is limited to the replacement or repair at the Manufacturer's factory, or at a point designated by the Manufacturer, of such part that shall appear to the Manufacturer, upon inspection of such part, to have been defective in material or workmanship.

This warranty does not obligate RAMSEY WINCH to bear the cost of labor or transportation charges in connection with the replacement or repair of defective parts, nor shall it apply to a product upon which repair or alterations have been made, unless authorized by Manufacturer, or for equipment misused, neglected or which has not been installed correctly.

RAMSEY WINCH shall in no event be liable for special or consequential damages. RAMSEY WINCH makes no warranty in respect to accessories such as being subject to the warranties of their respective manufacturers.

RAMSEY WINCH, whose policy is one of continuous improvement, reserves the right to improve its products through changes in design or materials as it may deem desirable without being obligated to incorporate such changes in products of prior manufacture.

If field service at the request of the Buyer is rendered and the fault is found not to be with RAMSEY WINCH's product, the Buyer shall pay the time and expense to the field representative. Bills for service, labor or other expenses that have been incurred by the Buyer without approval or authorization by RAMSEY WINCH will not be accepted.

*See warranty card for details.*



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OM-914209-0508-A