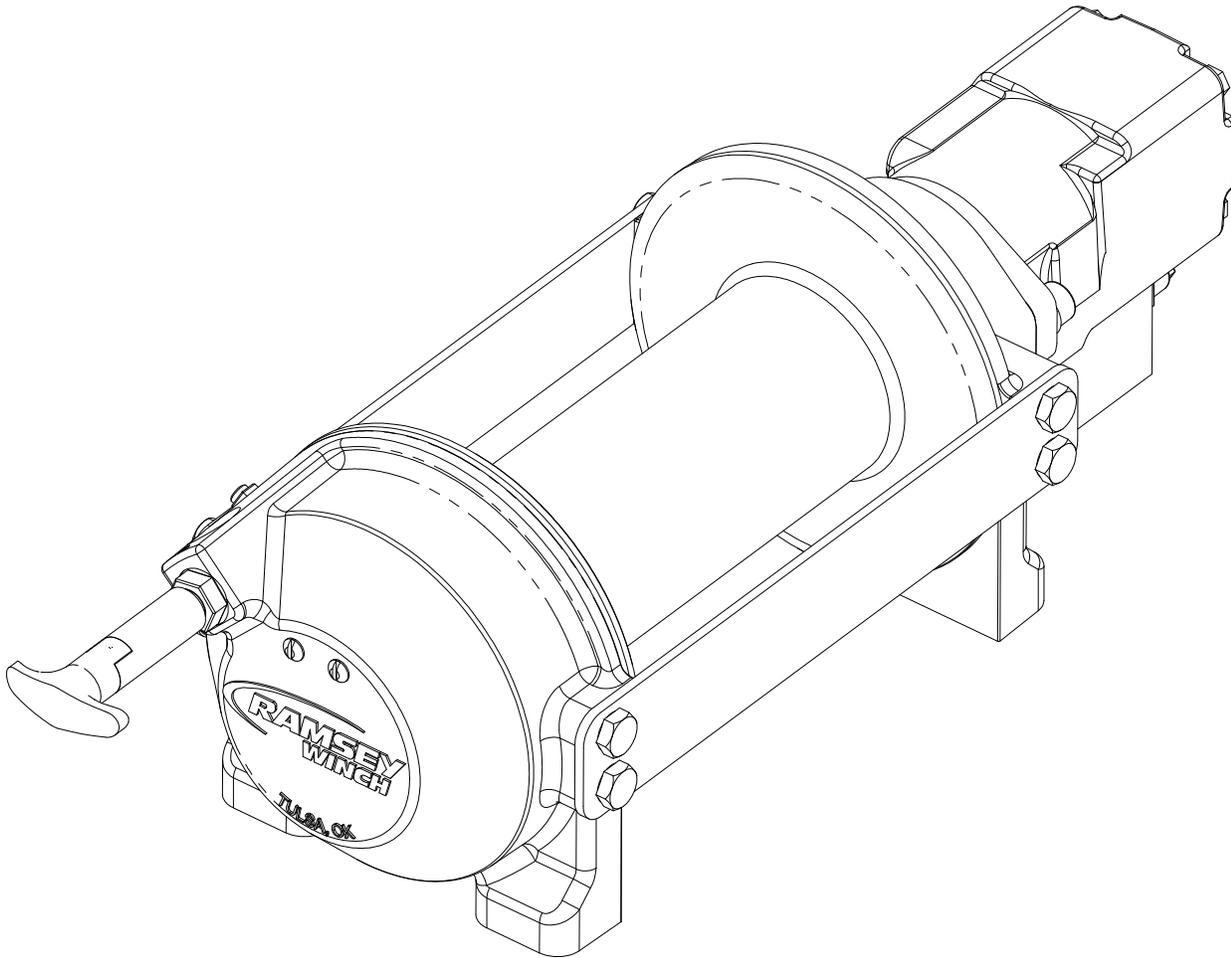




# OPERATING, SERVICE AND MAINTENANCE MANUAL



## MODEL HD-P8000 PLANETARY WINCH



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

**TABLE OF CONTENTS**

INTRODUCTIONS .....1

WARRANTY INFORMATION .....1

SPECIFICATIONS .....1

WARNINGS .....1

WINCH MOUNTING .....2

CABLE INSTALLATION .....3

HYDRAULIC SYSTEM REQUIREMENTS .....4

TYPICAL LAYOUT .....4

PERFORMANCE CHARTS .....4

OPERATION .....5

MAINTENANCE .....5

TROUBLE SHOOTING GUIDE .....6

OVERHAUL INSTRUCTIONS .....7-12

DIMENSIONAL DRAWINGS .....14-15

PARTS LIST AND PARTS DRAWINGS .....16-19

LIMITED WARRANTY .....BACK COVER

## PLEASE READ THIS MANUAL CAREFULLY

This manual contains useful ideas for 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 "WARNING" 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.) .....	8,000					
(Kg.) .....	3,620					
Gear Reduction .....	5.1:1					
Weight (without cable) HD-P8000 STD. ....	82 lbs. (37.2 Kg)					
HD-P8000 "Y" .....	76 lbs. (34.5 Kg)					
LAYER OF CABLE	1	2	3	4	5	
*Rated line pull lbs.	8,000	6,800	5,900	5,200	4,700	
per layer Kg.	3,620	3,080	2,670	2,350	2,120	
* Cable Capacity per Layer						
HD-P8000 (STD. DRUM)	ft.	25	55	90	130	170
	m	7	16	27	39	51
HD-P8000 ("Y" DRUM)	ft.	15	35	60	85	115
	m	4	10	18	25	34
* Line Speed (at 15 GPM)	FPM	50	58	67	76	84
	MPM	15.2	17.6	20.3	23.1	25.5
* These specifications are based on recommended wire rope of 3/8" (10mm) galvanized aircraft cable, or EIPS 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:

**A MOTOR SPOOL (OPEN CENTER) DIRECTIONAL CONTROL VALVE IS REQUIRED FOR BRAKE OPERATION.**

**CLUTCH MUST BE FULLY ENGAGED BEFORE STARTING THE WINCH.**

**DO NOT DISENGAGE CLUTCH UNDER LOAD.**

**DO NOT LEAVE CLUTCH ENGAGED WHEN WINCH IS NOT IN USE.**

**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 PERSONNEL.**

**A MINIMUM OF 5 WRAPS OF CABLE AROUND THE DRUM BARREL IS NECESSARY TO HOLD THE LOAD. CABLE CLAMP (SETSCREW) IS NOT DESIGNED TO HOLD LOAD.**

**IN CAR CARRIER APPLICATIONS, AFTER PULLING VEHICLE ON CARRIER, BE SURE TO SECURE VEHICLE TO CARRIER BED. DO NOT MAINTAIN LOAD ON WINCH CABLE WHILE TRANSPORTING VEHICLE. DO NOT USE WINCH AS A TIEDOWN.**

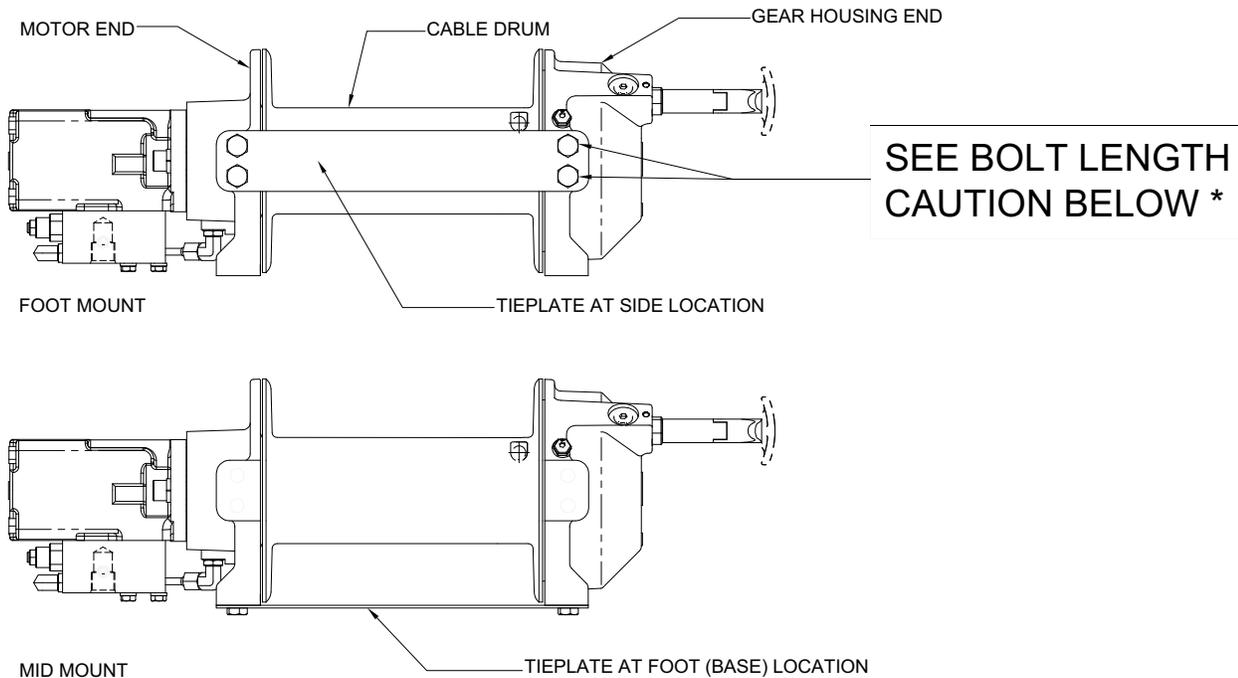
**WHEN PULLING A HEAVY LOAD PLACE A BLANKET, JACKET, OR TARPULIN OVER THE CABLE FIVE OR SIX FEET FROM THE HOOK.**

**AVOID CONDITIONS WHERE LOAD SHIFTS OR JERKS OCCUR, AS THEY MAY INDICATE A DANGEROUS SITUATION.**

## WINCH MOUNTING

### ESSENTIAL MOUNTING INSTRUCTIONS TO MAINTAIN ALIGNMENT OF PLANETARY WINCH COMPONENTS:

It is most important that this winch be mounted securely so that the three major sections (the motor end, the cable drum, and the gear housing end) are properly aligned. Excessive bushing wear and difficulty in freespooling are usually symptoms of misalignment.



In the as-installed condition, if the winch is mid-mounted, then at least one tie-plate must be attached to the mounting feet at the bottom of the winch to maintain alignment. If the winch is foot mounted then at least one tie-plate must remain mounted at midpoint of winch to maintain alignment. It is always preferred to use BOTH tie-plates in the final installed configuration.

Angle Mounting Kit, P/N 251006 (for Std. Drum) or 251007 (for “Y” drum), is recommended for maximum ease in mounting the winch. The angle kit will allow the winch to be mounted in upright or midmount applications and will meet the criteria of serving as a solid and true mounting surface.

When mounting the winch with other than the recommended Ramsey Angle Kit, the mounting hole patterns described in the Dimensional drawings on pages 14-15 should be used. The mounting surface must be flat within .015 inch and sufficiently stiff to resist flexing. If a steel plate is used for foot mounting, it should be .750 inch thick. For this mounting application eight (8) 1/2-13NC x 1-1/2” long grade 5 capscrews with lockwashers will be needed to mount winch. Capscrews should be tightened to 55 ft-lb (75 Nm) torque.

**NOTE:** If angles or a steel plate are used in mounting winch, tie-plates provided with winch are to be attached to the remaining mounting pads, whether they be side or foot.

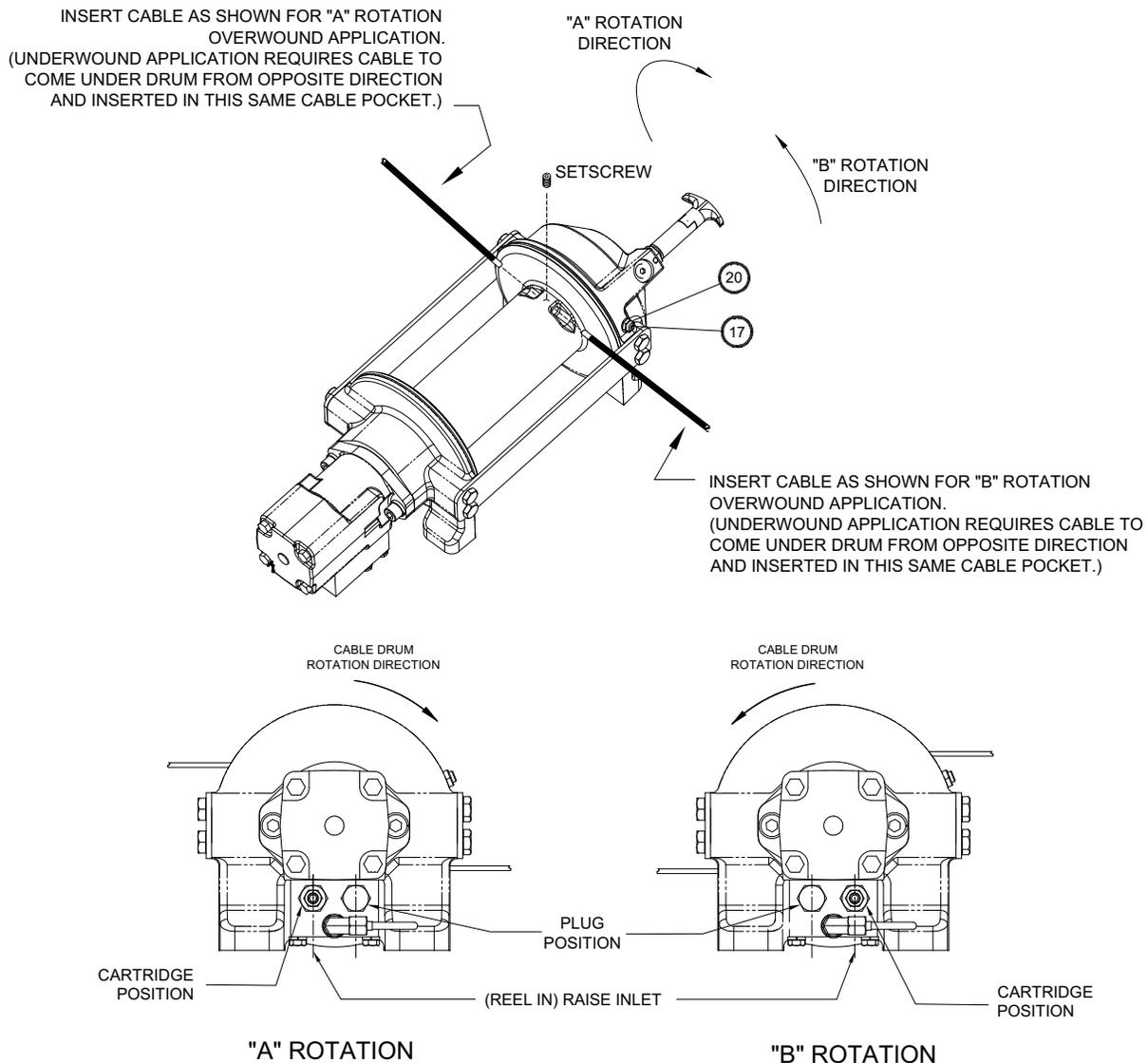
**\* CAUTION:** If longer bolts (minimum grade 5) are substituted to mount winch or to mount a roller guide at the side mount pads, bolt length must be such as to allow a minimum of .50 inch thread length engagement in the tapped holes in side of each end bearing. Refer to pages 14-15. Use of excessive length bolts will damage the winch and prevent freespool of the drum. Torque bolts to 55 ft-lbs. (75 Nm).

## CABLE INSTALLATION

An "A" or "B" decal on the clutch end bearing indicates the spooling direction of the cable. Also, a letter "A" or "B" is stamped in the end bearing on the clutch end indicating rotation direction. If the decal is damaged or unreadable, contact Customer Service for additional instructions to determine proper direction. **To reverse the rotation direction, exchange positions of the cartridge and plug shown below.**

1. Unwind cable by rolling it out along the ground to prevent kinking. Securely wrap end of cable, opposite hook, with plastic or similar tape to prevent fraying.
2. Place taped end of cable into hole in cable drum as shown below. Use the 3/8-16NC x 1/2" long hex socket drive setscrew (included with drum assembly item #1) to secure cable to drum.
3. Carefully run 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 a walking speed. If cable "birdnests", loosen jam nut (item #20) and turn nylon setscrew (item #17) clockwise to increase drag on drum. If cable pull is excessive, loosen nylon setscrew by turning counterclockwise. Tighten jam nut when proper setting is obtained. **CAUTION: OVER-TIGHTENING OF JAM NUT MAY STRIP NYLON SETSCREW.**



# HYDRAULIC SYSTEM REQUIREMENTS

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

- (1) Line Pull first layer (lb.) vs. Working Pressure (PSI)
- (2) Line Speed, first layer (FPM) vs. flow (GPM)

**SYSTEM REQUIREMENTS**

**MOTOR SPOOL (OPEN CENTER) CONTROL VALVE REQUIRED**

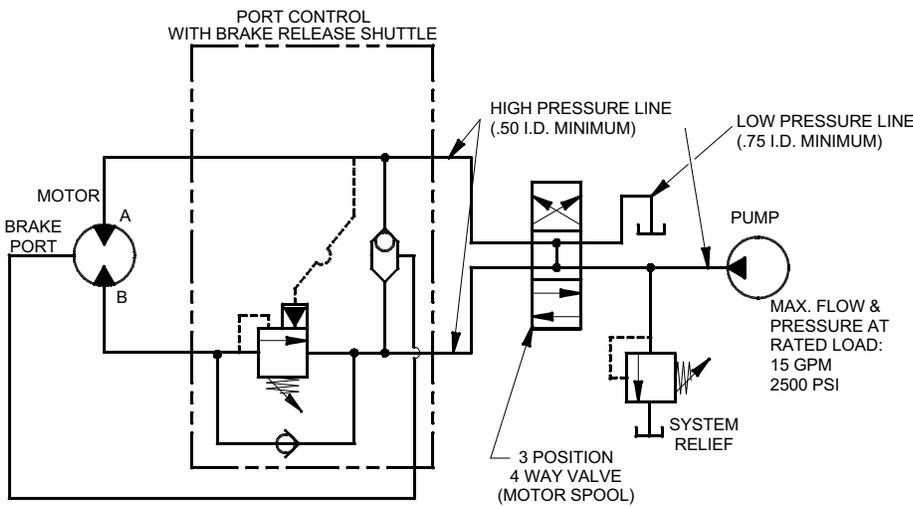
2500 PSI RELIEF VALVE SETTING

15 GPM FLOW RATE

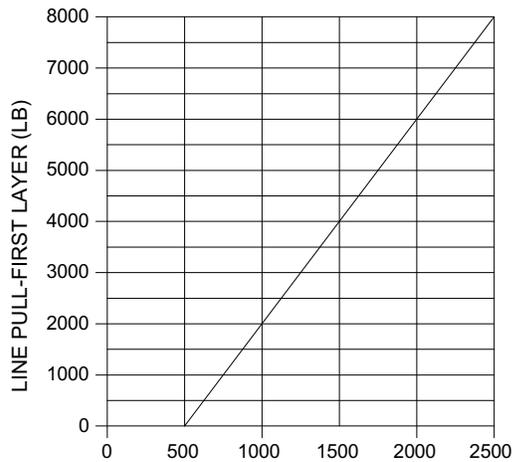
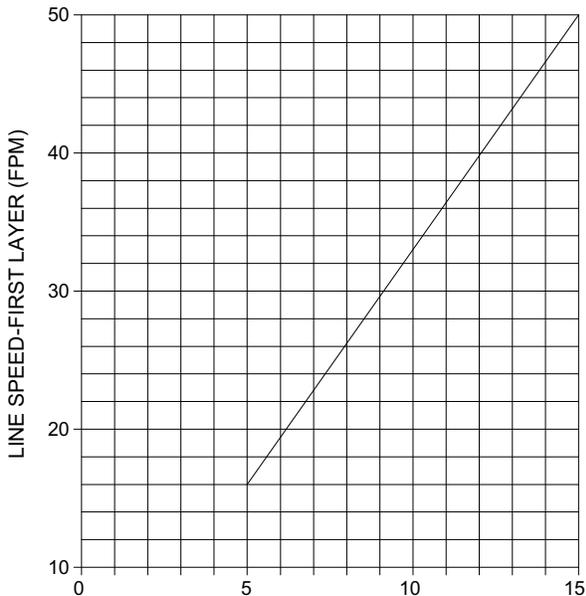
**DO NOT EXCEED 20 GPM--MOTOR AND WINCH MAY BE DAMAGED**

10 MICRON NOMINAL FILTRATION

## TYPICAL LAYOUT



## PERFORMANCE CHARTS



## OPERATION

The best way to get acquainted with how your winch operates is to make test runs before you actually use it. Plan your test in advance. Remember, you hear your winch as well as see it operate. Get to recognize the sounds of a light steady pull, a heavy pull, and sounds caused by load jerking or shifting. Avoid conditions where load shifts or jerks occur, as they may indicate a dangerous situation.

The uneven spooling of cable, while pulling the load, is not a problem, unless there is a cable pileup on one end of the 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.

When pulling a heavy load, place a blanket, jacket, and tarpaulin over the cable about five or six feet behind the hook. In the event of a broken cable, this will slow the snap back of the cable and could prevent serious injury.

The winch clutch allows rapid unspooling of the cable, from the cable drum, for hooking onto the load. The clutch is operated by the clutch shifter lever or air shifter.

### **WARNING: DO NOT DISENGAGE CLUTCH UNDER LOAD!**

#### **MANUAL CLUTCH SHIFTER** (Refer to dimensional drawing page 14):

**TO DISENGAGE CLUTCH:** Run the winch in the reverse (reel out) direction until the load is off the cable. Pull handle out and rotate 90°. With handle in the “DISENGAGED” position, cable may now be free-spoiled from the drum.

**TO ENGAGE CLUTCH:** Pull handle out, rotate 90° and release handle. Run the winch in reverse until the clutch handle snaps fully into the “ENGAGED” position. **DO NOT** attempt to pull a load unless the handle is fully at the “ENGAGED” position. If manual shift indicator light is present, the green light is lit when clutch is fully “ENGAGED”. **DO NOT** attempt to pull a load unless the green light is lit. To install light to the vehicle electrical system refer to the Electrical Schematic on page 15.

#### **AIR CYLINDER CLUTCH SHIFTER** (Refer to the dimensional drawing page 15):

**TO DISENGAGE CLUTCH:** Run the winch in the reverse (reel out) direction until load is off the cable. Apply air pressure to the .125-27 NPT port: 80 PSI (min.)-150 PSI (max.). **CAUTION:** PRESSURE MUST NOT EXCEED 150 PSI.

**TO ENGAGE CLUTCH:** Remove air pressure from the cylinder (a return spring engages the plunger). Run winch in reverse until the clutch engagement indicator light (green light) is lit. To install light to the vehicle electrical system refer to the Electrical Schematic on page 15.

## MAINTENANCE

1. Inspect the cable for damage and lubricate frequently. If the cable becomes frayed with broken strands, replace immediately. Cable and hook assembly (100' long cable) P/N 524118 (“Y” drum) or (150' long cable) P/N 524119 (STD drum) may be purchased from a Ramsey distributor.
2. Check that the clutch is fully engaging. See OPERATION instructions, above, for the appropriate clutch shifter. **FOR MANUAL CLUTCH ONLY:** Monthly, disengage clutch, put several drops of oil on the clutch handle shaft and work clutch handle IN and OUT several times to lubricate inside the shifter assembly.
3. Check to see that the drum cable does not overrun (“birdnest”) when freespooling. Refer to page 3 if it does.
4. Replace drum bushings and seals if seals begin to seep grease. Refer to the Overhaul Instructions, pages 7-12. Add additional lubricant, Mobilith SHC 007, to gears and drum bearings if required.

## TROUBLESHOOTING GUIDE

CONDITIONS	POSSIBLE CAUSE	CORRECTION/ACTION
DRUM WILL NOT ROTATE AT NO LOAD	Winch not mounted squarely, causing end bearing to bind up	Check mounting. Refer to Winch Mounting, page 2.
	Gears damaged	Inspect and replace damaged gears
DRUM WILL NOT ROTATE UNDER LOAD	Winch not mounted squarely, causing end bearing to bind up	Check mounting. Refer to Winch Mounting, page 2.
	Load greater than rated capacity of winch	Refer to Specifications page 1 for line pull rating.
	Low hydraulic system pressure	Check pressure. Refer to Hydraulic Systems performance charts page 4.
WINCH RUNS TOO SLOW	Low hydraulic system flow rate	Check flow rate. Refer to System Requirements and Typical Layout page 4.
	Motor worn out	Replace motor
DRUM WILL NOT FREESPOOL	Clutch not disengaged. Check Adjustment of Manual Shifter, page 10.	Check Operation, page 5.
	Winch not mounted squarely, causing end bearing to bind up	Check mounting. Refer to Winch Mounting, page 2.
	Side mounted bolts too long, causing binding of ring gear (Item #15, page 16).	Check bolt length. Bolt thread MUST NOT engage threaded holes in sides of end bearing more than the .50 inch thread depth in the end bearing.
BRAKE WILL NOT HOLD	Incorrect directional control valve (cylinder spool-closed center)	Use only a motor spool (open center) control valve.
LOAD DRIFTS	Excessive Backpressure (100 PSI Max.)	Check for restrictions in hydraulic system. Refer to System Requirements and Typical Layout page 4.
CABLE BIRDNESTS WHEN CLUTCH IS DISENGAGED	Drag screw improperly adjusted	Adjust nylon drag screw. Refer to Cable Installation, page 3.
EXCESSIVE NOISE	Hydraulic system flow too high	Check flow rate. Refer to Typical Layout page 4.
	Drum in bind, winch not mounted squarely	Check mounting. Refer to Winch Mounting, page 2.
DRUM CHATTERS IN "REEL IN" DIRECTION	Low hydraulic system flow rate	Check flow rate. Refer to Typical Layout page 4.
	Low hydraulic system relief pressure setting	Check relief valve setting.
OIL LEAKS FROM BREATHER VENT UNDER MOTOR END BEARING	Damaged brake o-rings, backup rings, or sealing surfaces	Disassemble brake and inspect. See Overhaul Instructions, pg. 8.

## INSTRUCTIONS FOR OVERHAUL HD-P8000 SERIES WINCH

**Take note of mounting configurations for proper mounting of parts during re-assembly. Replace all gaskets, o-rings, and seals during re-assembly.**

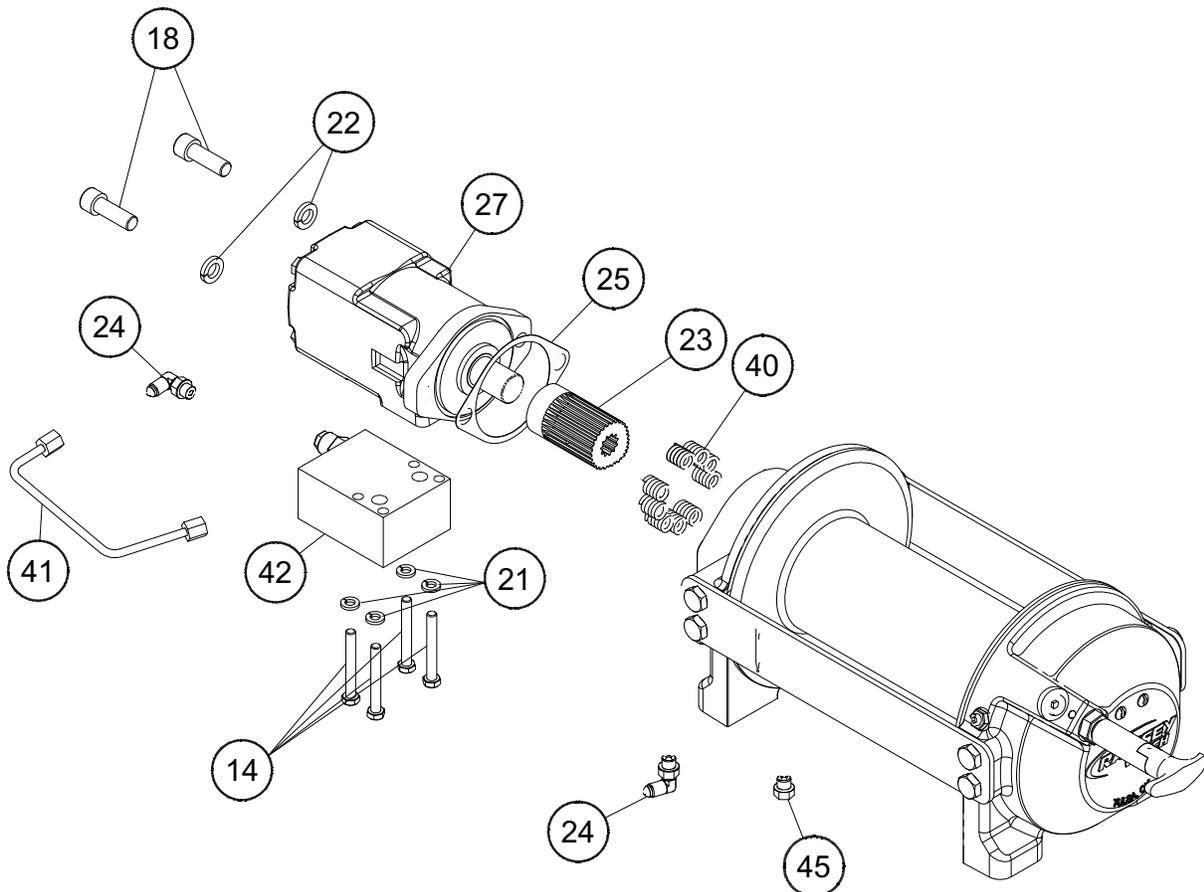
Disconnect tube (item #41) from elbow fittings (items #24) on bottom of end bearing and counterbalance valve (item #42). Remove motor (item #27) from end bearing by slowly unscrewing capscrews (items #18). **CAUTION: MOTOR IS UNDER SPRING PRESSURE.**

Check breather vent (item #45). Make sure it is not clogged. If oil is leaking from vent, check brake o-rings, backup rings, and sealing surfaces (see page 8).

Remove springs (items #40) from pockets and inspect for damage.

Replace gasket (item #25).

Remove coupling (item #23) from end bearing. Examine coupling for signs of wear, replace if necessary. If necessary, remove counterbalance valve from motor by removing capscrews (items #14).

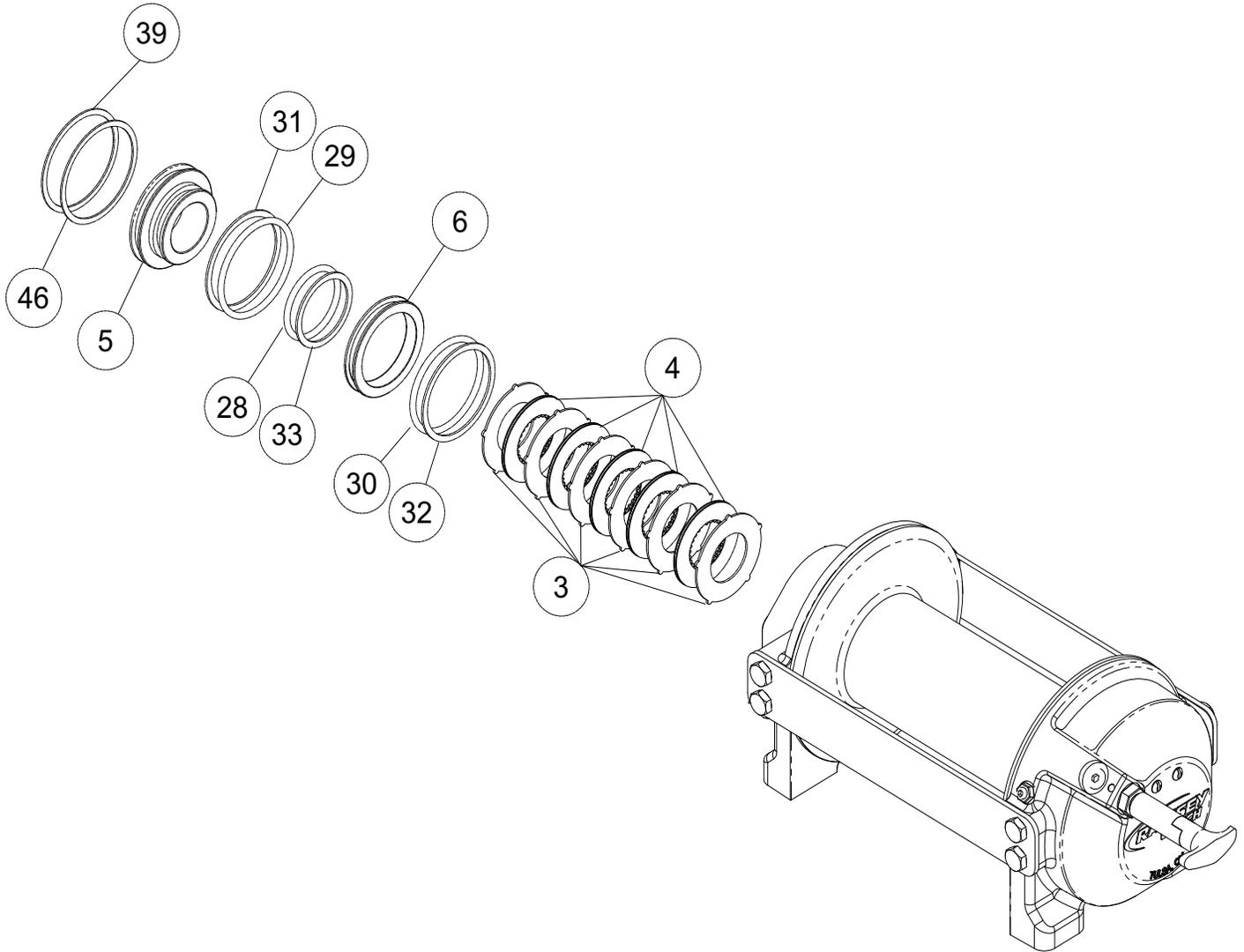


Remove retaining rings (items #39 & 46) with screwdriver.

Remove brake parts from end bearing. NOTE POSITION OF O-RINGS AND BACKUP RINGS BEFORE REMOVAL.

Examine brake discs (items #4) and stators (items #3) for signs of wear, and replace if necessary.

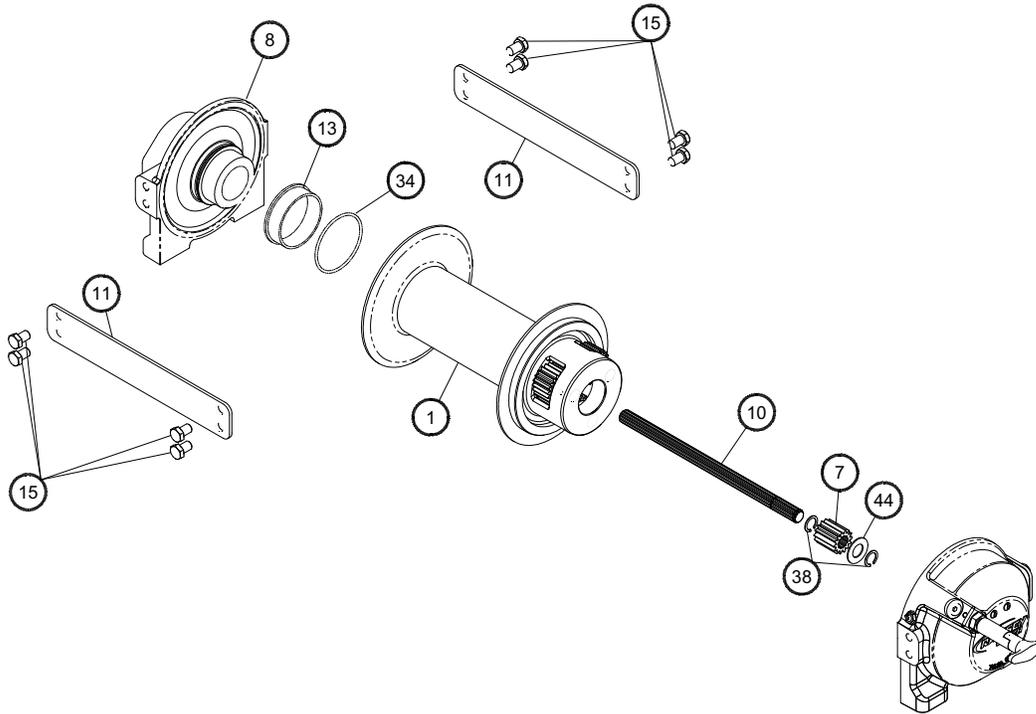
Examine o-rings (items #28 and 29) and backup rings (items #31 and 33) in brake piston (item #5), as well as o-ring (item #30) and backup ring (item #32) in backup brake piston (item #6) for signs of wear. Remove o-rings and backup rings from grooves in brake piston or backup brake piston and replace if necessary.



Remove tie plates (items #11) from end bearings by unscrewing capscrews (items #15). Slide motor end bearing (item #8) and drum (item #1) from gear housing end bearing.

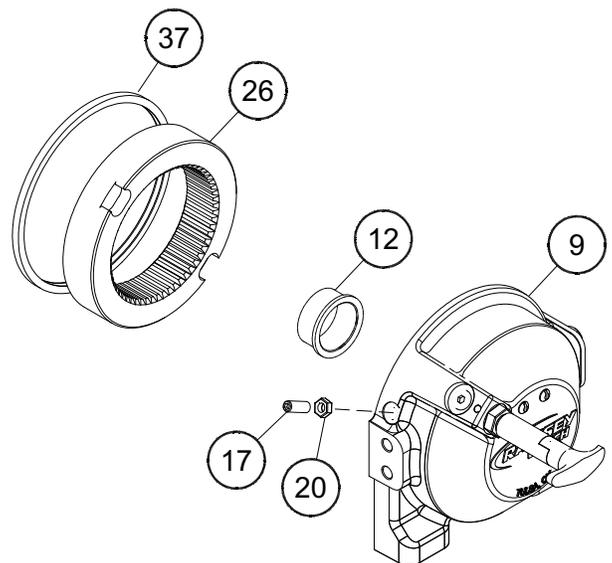
Remove input shaft (item #10) from end bearing. Inspect shaft and output sun gear (item #7) for damage and replace if necessary. To remove the output sun gear, remove the snap rings (items #38) and thrust washer (item #44) and pull off the end of the shaft.

Remove bushing (item #13) and o-ring (item #34) from motor end bearing. Place new, well-oiled o-ring into groove inside of end bearing and press new bushing onto end bearing.



Remove seal (item #37) from gear housing end bearing (item #9). Loosen nut (item #20) and remove nylon setscrew (item #17). Remove ring gear from gear housing end bearing, if necessary. Remove bushing (item #12) from end bearing.

Press new bushing into end bearing. Install ring gear, then nylon setscrew and nut. Ring gear must be fully seated in end bearing and slot in ring gear MUST NOT be aligned with clutch shifter hole. Install new seal in end bearing, with sharp edge of seal outward.



Generously apply grease (MOBILITH SHC 007) to teeth of ring gear (item #26), teeth of planet gears in drum (item #1), and to bushing (item #12) in gear housing end bearing. Apply a small amount of grease to base of bushing (item #13) on motor end bearing. Apply grease to teeth of output sun gear (item #7) and input shaft (item #10).

Place end of shaft with output sun gear on it into drum (item #2). Rotate shaft to engage planet gears with output sun gear. Place Gear End Bearing on Drum and engage planet gears with ring gear.

Assemble motor end bearing (item #8) to drum assembly and use tie plates (items #11) and capscrews (items #15) to hold both end bearings together. Tighten capscrews to 55 ft-lbs (75 Nm).

If necessary, remove and replace the shifter assembly (manual, item #2, or air-cylinder, item #3), as follows:

### MANUAL CLUTCH SHIFTER ASSEMBLY

Loosen setscrew (item #19) and jam nut, then unscrew shifter assembly (item #2). Be sure slot in ring gear is not aligned with clutch shifter hole. Rotate drum, if necessary, to ensure hole and slot are not aligned.

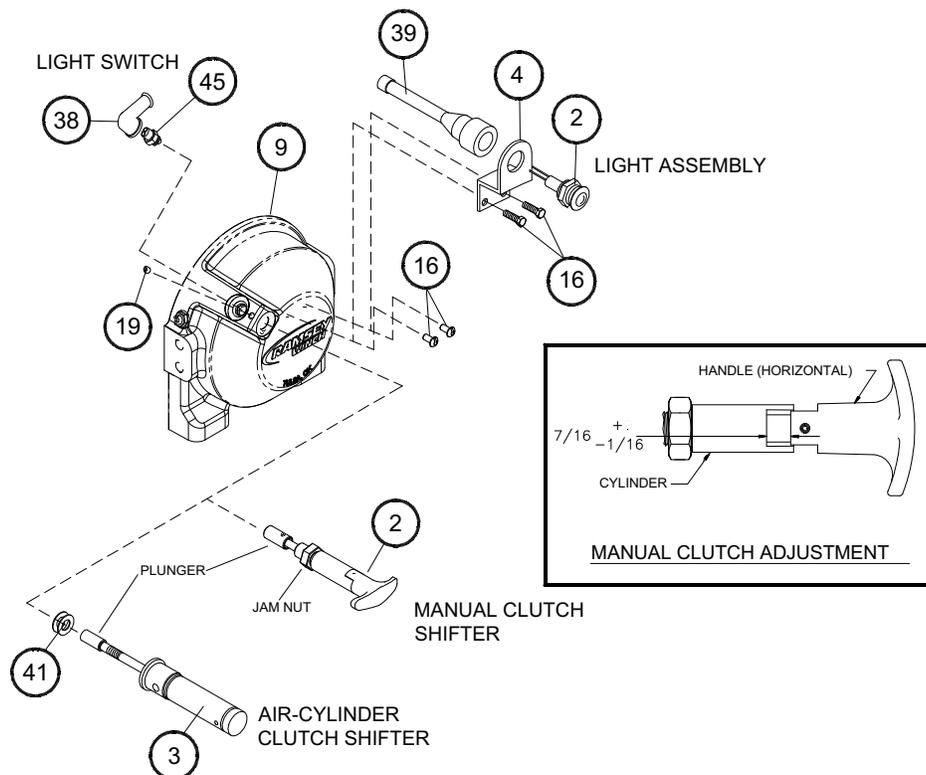
Reinstall shifter assembly with plunger, jam nut, and handle positioned in gear housing as shown below. Thread assembly (with handle engaged in cylinder slot) into the gear housing. Pull drum toward the gear end bearing housing to remove play. Hold drum in position and continue threading the shifter assembly in until the gap between the end of the handle and cylinder is  $7/16 +0 -1/16$  inch and handle is in the horizontal position (see below). **Note:** This gap will vary with drum endplay. With the drum pulled against the motor end housing, the gap should be 3/8 inch.

Lightly tighten jam nut. Rotate drum until handle snaps fully into the engaged position. Pull handle out and rotate 90°. Verify that drum can be rotated freely (at least one full revolution) with clutch shifter at the DISENGAGED position. Securely tighten jam nut while holding the handle. Tighten setscrew (item #19) securely. Re-check clutch operation as described on page 5.

### AIR CYLINDER SHIFTER ASSEMBLY

Loosen set screw (item #19) to remove shifter assembly (item #3). To reinstall, place 1 or 2 shims (items #41) over plunger and thread shifter assembly into gear end housing. Add or remove shims to orient ports for pneumatic connections. Ports should point down (below horizontal). Tighten setscrew. Check for clutch operation as described on page 5.

If the light assembly (item #2) or light switch (item #45) needs to be replaced, refer to the schematic on page 15 for electrical connections and disassemble and reassemble as shown below.



Set winch with gear housing end down on work surface.

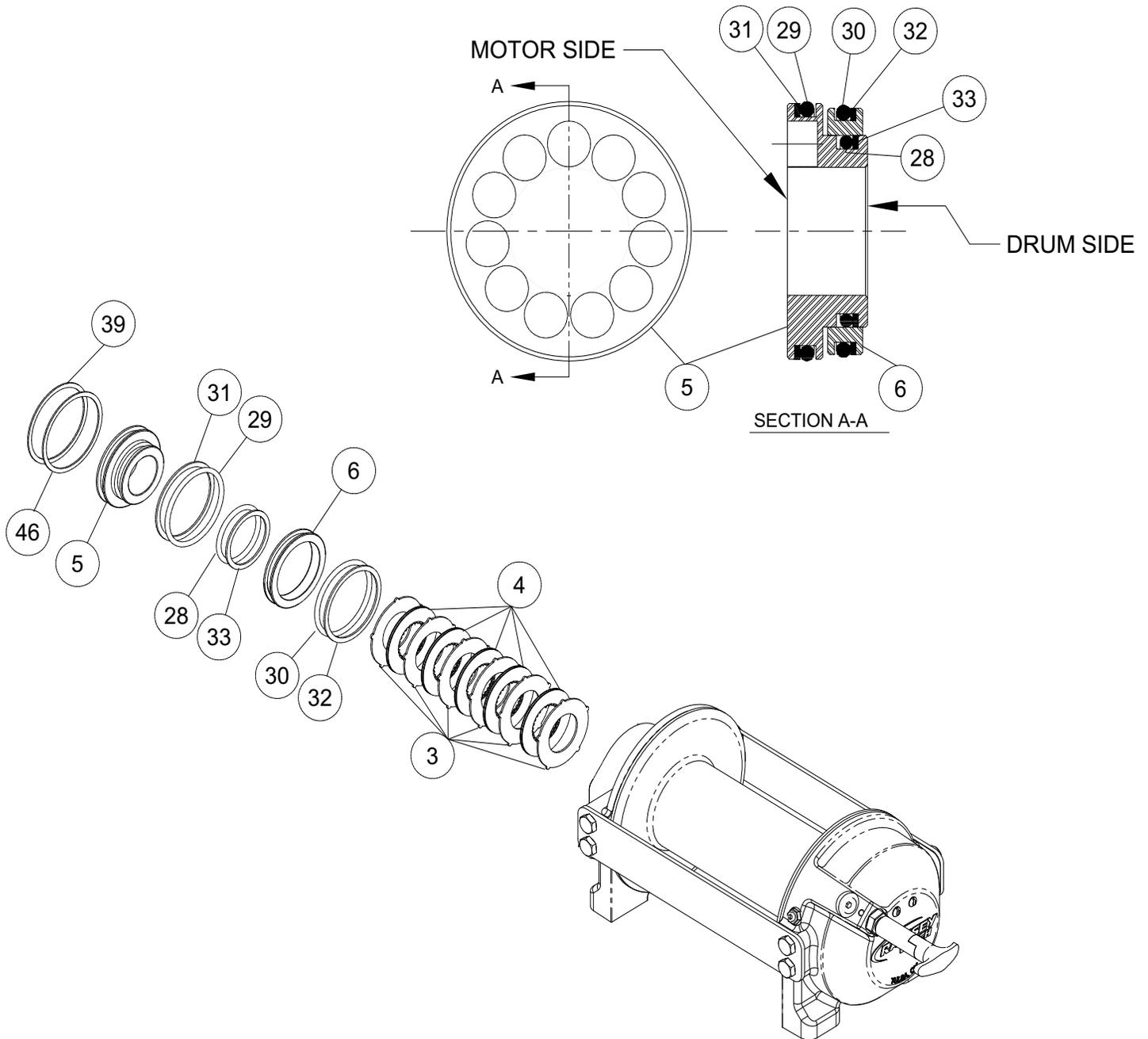
Install well-oiled o-rings and backup rings into grooves on outside of brake piston and backup brake piston as shown in cross-section A-A below.

Piston, backup piston, brake discs and stators must be clean and free of grease and oil.

Insert brake discs (item #4) and stators (item #3) into gear end alternating, with stators first and last.

Insert backup brake piston (item #6) into motor end and insert brake piston (item #5) into it. **Apply even pressure on piston when installing.**

Install retaining rings (items #39 & 46) into grooves in motor end housing.



Insert springs (item #40) into pockets in back of brake piston. The two empty pockets should be on opposite sides.

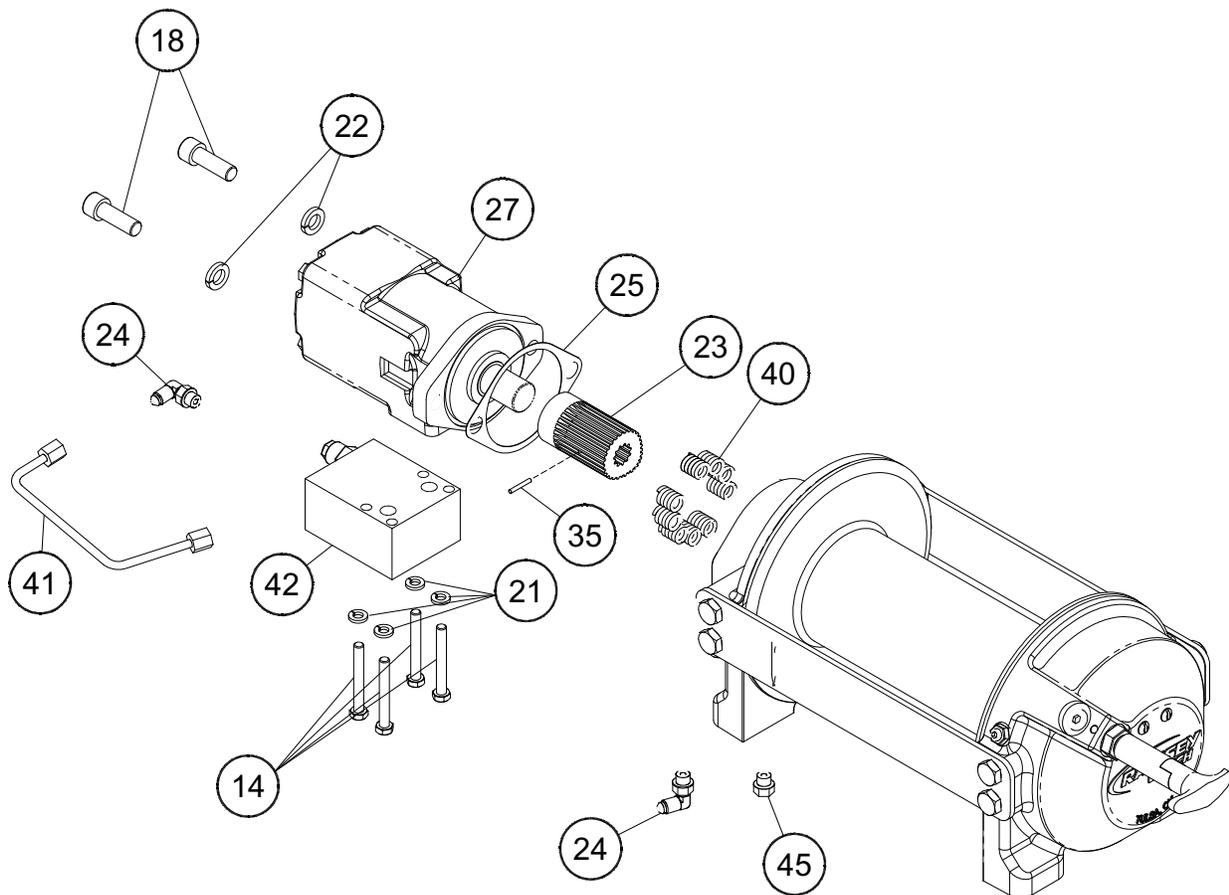
**Install roll pin (item #35) into new motor coupling below bottom of spline teeth.** Insert motor coupling (item #23), engaging it with the discs and the input shaft.

Place gasket (item #25) on mounting surface of motor (item #27). Slide motor shaft into coupling. Attach motor to motor end bearing housing using (2) capscrews (item #18) and (2) lockwashers (item #22). Evenly tighten to 49 ft-lbs. (66 Nm) torque.

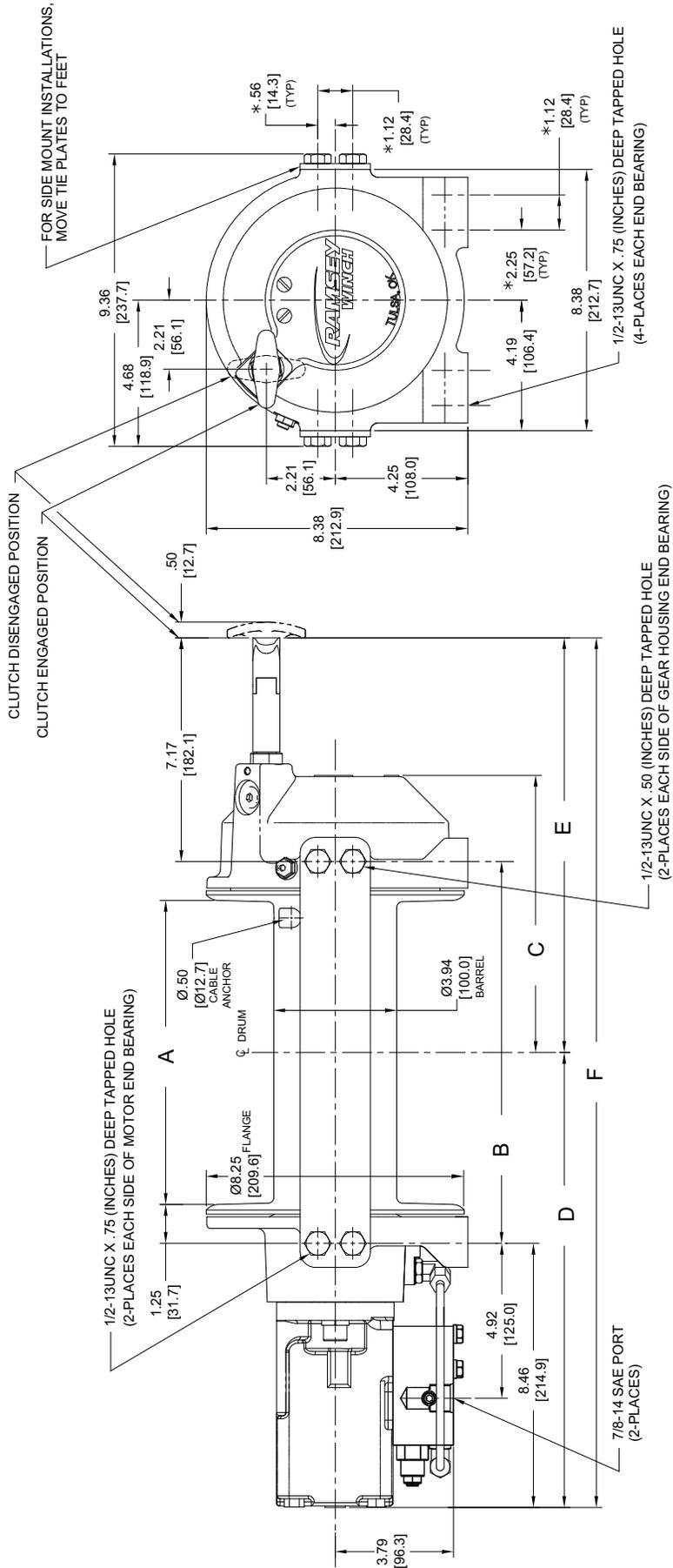
Install the counterbalance valve (item #42) to the motor using (4) capscrews (item #14) and (4) lockwashers (item #21). Tighten to 17 ft-lbs (23 Nm).

Securely connect fittings (item #24) to motor end housing and counterbalance valve, and connect tube assembly (item #41) to fittings.

Apply at least 550 PSI hydraulic system pressure to brake and verify that brake releases (winch drum will rotate).



## NOTES

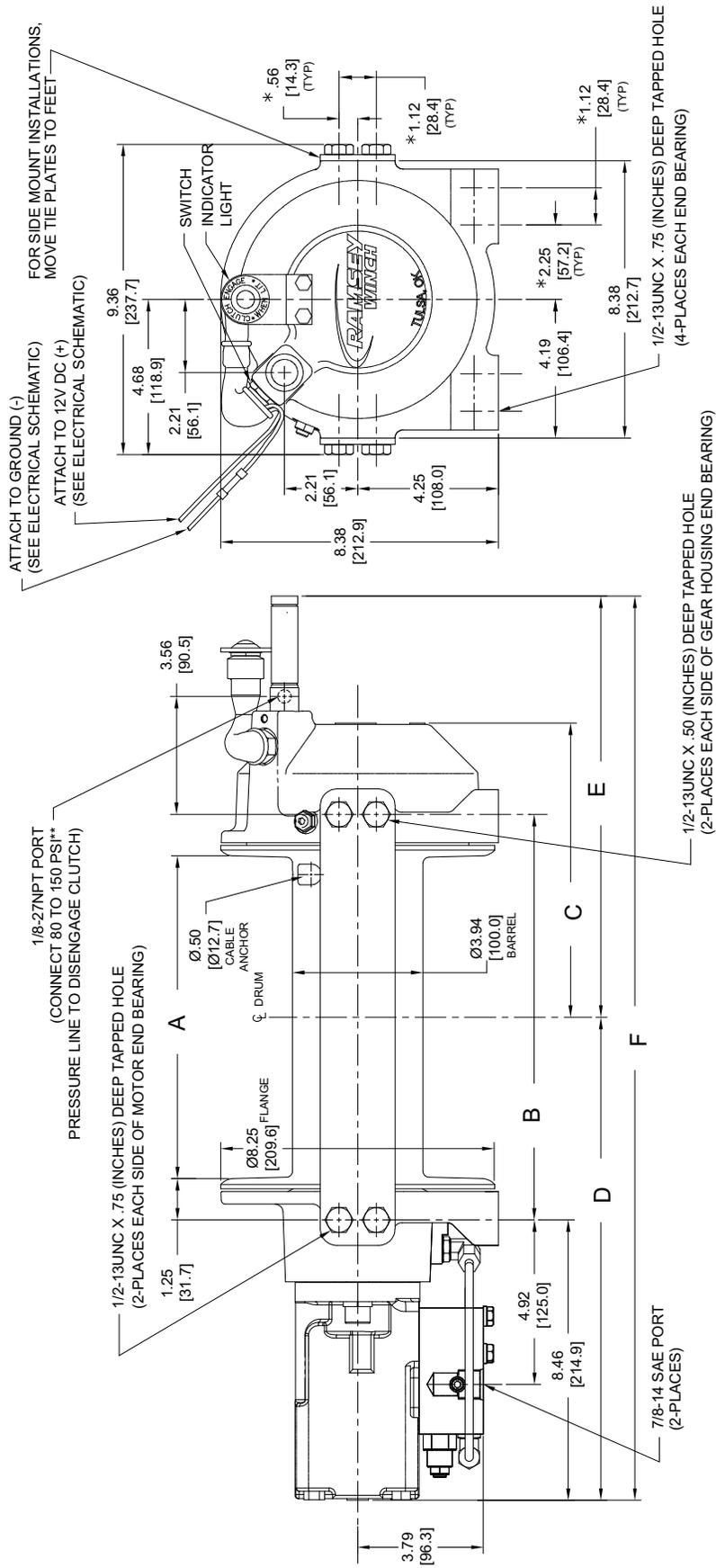


NOTES:

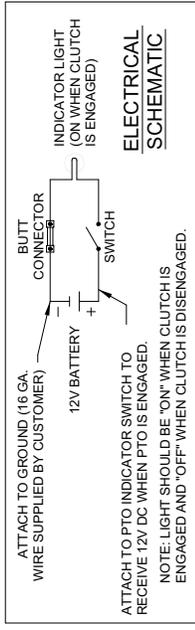
1. DIMENSIONS SHOWN ARE INCHES OVER MILLIMETERS.
2. WINCH MOUNTING CAPSCREWS MUST MEET OR EXCEED SAE GRADE 5 SPECIFICATION.
- \* 3. THESE HOLE LOCATIONS MUST BE HELD WITHIN ±.03 (0.8mm) OF TRUE POSITION. RECOMMENDED MOUNTING HOLE DIAMETER IS .53 (13.5mm).
4. "A" ROTATION SHOWN.

WINCH MODEL	A INCHES MM	B INCHES MM	C INCHES MM	D INCHES MM	E INCHES MM	F INCHES MM
HD-P8000	9.75	12.25	8.87	14.60	13.28	27.89
STD. DRUM	247.7	311.2	225.3	370.9	337.4	708.3
HD-P8000 "Y" DRUM	6.50	9.00	7.24	12.98	11.66	24.64
	165.1	228.6	184.0	329.6	296.2	625.8

# HD-P8000 MANUAL SHIFT

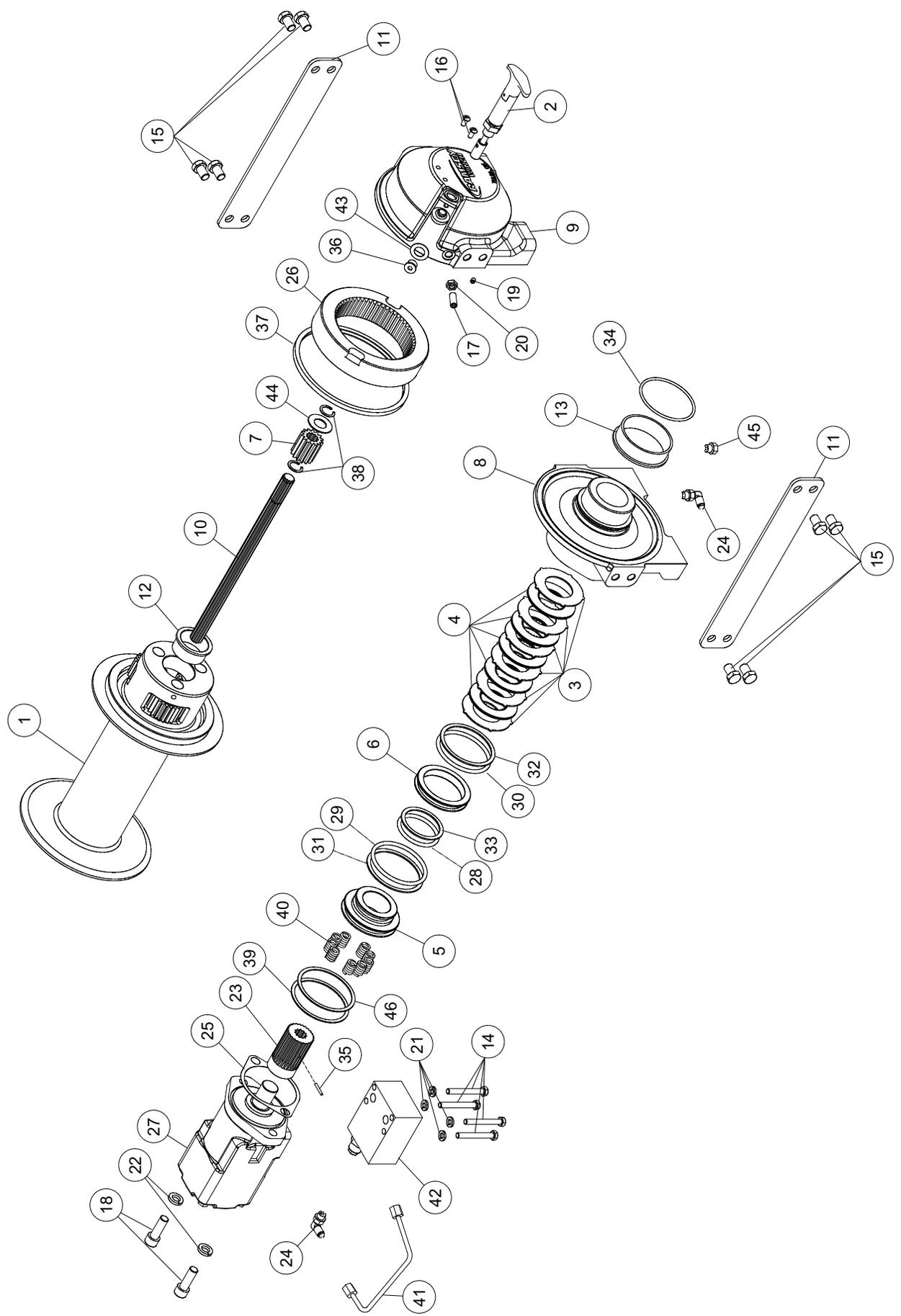


- NOTES:
1. DIMENSIONS SHOWN ARE INCHES OVER MILLIMETERS.
  2. WINCH MOUNTING CAPSCREWS MUST MEET OR EXCEED SAE GRADE 5 SPECIFICATION.
  - \* 3. THESE HOLE LOCATIONS MUST BE HELD WITHIN ±.03 (0.8mm) OF TRUE POSITION. RECOMMENDED MOUNTING HOLE DIAMETER IS .53 (13.5mm).
  - \*\* 4. CAUTION: PRESSURE MUST NOT EXCEED 150 PSI.
  5. "A" ROTATION SHOWN.



WINCH MODEL	A INCHES MM	B INCHES MM	C INCHES MM	D INCHES MM	E INCHES MM	F INCHES MM
HD-P8000	9.75 247.7	12.25 311.2	8.87 225.3	14.60 370.9	12.72 323.1	27.31 693.7
STD. DRUM	6.50 165.1	9.00 228.6	7.24 184.0	12.98 329.6	9.47 240.6	24.06 611.1
HD-P8000 "Y" DRUM						

# HD-P8000 AIR SHIFT







# PARTS LIST - AIR SHIFT

Item No.	Quantity	Part No.	Description	Item No.	Quantity	Part No.	Description
1	1	234205	DRUM ASSY STD	26	2	432018	FITTING
2	1	234204	DRUM ASSY "Y"	27	1	442223	GASKET-MOTOR FLANGE
3	1	236020	LIGHT ASSY	28	1	444084	GEAR-RING
4	1	276058	SHIFTER ASSY	29	1	458074	MOTOR-HYD.
5	1	312529	BRACKET - LIGHT ASSY	30	1	462067	O-RING PISTON-SM.
6	6	330011	STATOR-BRAKE	31	1	462068	O-RING PISTON-LG
7	5	330012	DISC-BRAKE	32	1	462069	O-RING BACKUP PISTON
8	1	330013	PISTON-BRAKE	33	1	462070	RING-BACKUP PISTON-LG
9	1	330014	PISTON-BACKUP BRAKE	34	1	462071	RING-BACKUP BACKUP PISTON
10	1	334174	GEAR-OUTPUT, SUN	35	1	462072	RING-BACKUP PISTON-SM
11	1	338358	END BEARING-MOTOR	36	1	462073	O-RING
12	1	338359	END BEARING-GEAR HOUSING	37	1	470033	SPIROL PIN
13	1	357177	SHAFT-INPUT STD DRUM	38	1	482013	RUBBER BOOT
14	2	395427	SHAFT-INPUT "Y" DRUM	39	1	482045	RUBBER BOOT
15	2	395426	PLATE-TIE STD DRUM	40	1	486080	SEAL
16	2	412085	PLATE-TIE "Y" DRUM	41	2	488007	SHIM
17	1	412109	BUSHING-DRUM	42	2	490003	SNAP RING
18	1	414036	BUSHING-DRUM, MOTOR END	43	1	490044	RING-INTERNAL RETAINING
19	2	414036	CAPSCREW-1/4-20NC X 1/2", HEX HEAD, ZINC	44	9	494124	SPRING-BRAKE
20	4	414159	CAPSCREW-5/16-18UNC X 2 1/2", HEX HEAD, ZINC, GR5	45	1	504021	SWITCH
21	8	414581	CAPSCREW-1/2-13NC X 3/4", HEX HEAD, ZINC, GR5	46	1	509132	TUBE-BRAKE RELEASE (PORTS DOWN)
22	1	414926	SETSCREW-3/8-16NC X 1", SOCKET HEAD, NYLON	47	1	509131	TUBE-BRAKE RELEASE (PORTS UP)
23	2	414954	CAPSCREW-1/2-13NC X 1 3/4", SOCKET HEAD, ZINC	48	1	516041	VALVE-MOTOR CONTROL A ROTATION
24	1	416016	SETSCREW-1/4-20NC X 1/4" HEX SOCKET HEAD CUP	49	1	516042	VALVE-MOTOR CONTROL B ROTATION
25	1	418036	NUT-3/8-16 NC, HEX JAM, ZINC	50	1	518047	THRUST WASHER
	4	418163	LOCKWASHER-5/16 MED SECT, ZINC		1	456038	BREATHER VENT
	2	418218	LOCKWASHER-1/2 ID MED SECT, ZINC		1	490066	RING-INTERNAL RETAINING
	1	431019	COUPLING-MOTOR				





## 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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