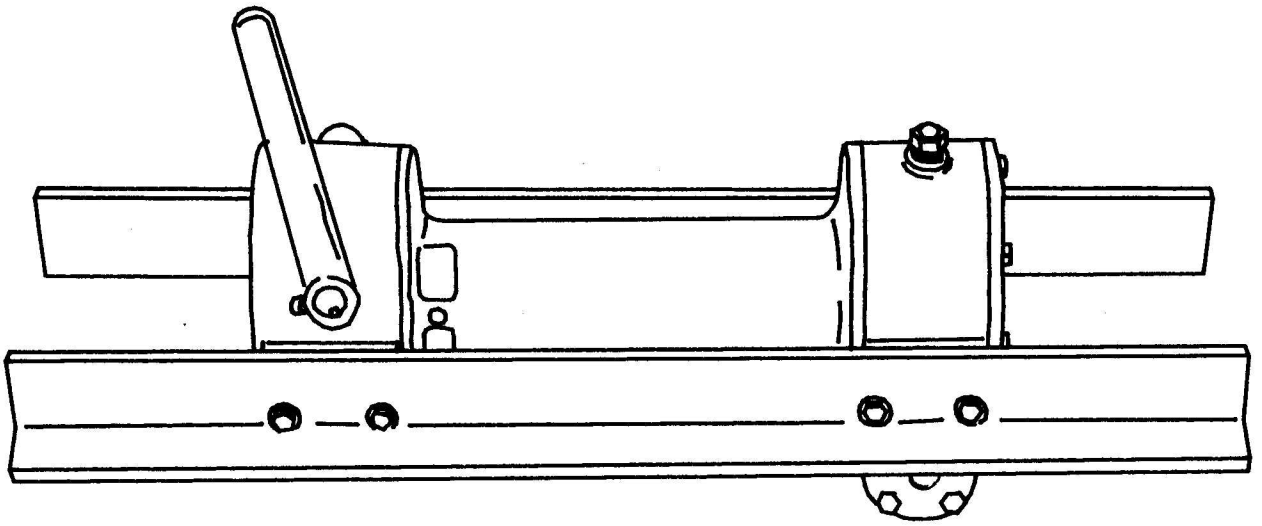
RAMSEY WINCH

OPERATING, SERVICE AND MAINTENANCE MANUAL



MODEL 600 SERIES
MODEL H-600 SERIES
LEVER EQUIPPED INDUSTRIAL LOW-MOUNT WINCHES

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

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RAMSEY WINCH MODEL 600/H-600 SERIES

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.

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: CONFORMS TO SAE J706

Rated Line Pull 1st Layer	(lbs).....12,000
	(kg).....5,430
Gear Reduction: 600/H-600	.....40:1

Shipping Weight:

600..... 160 lbs (73 kg)	H-600.....185 lb (84 kg)
Y-600..... 155 lbs (70 kg)	HY-600.....180 lb (82 kg)
X-600..... 170 lbs (77 kg)	HX-600.....195 lb (88 kg)

Layer of Cable		1	2	3	4	5**
Rated Line Pull per layer for 600/H-600	lbs kg	12,000 5,431	9,800 4,430	8,300 3,750	7,200 3,260	6,300 2,850
*Standard Drum Cable capacity per layer 600/H-600	ft m	20 6	55 16	90 27	130 39	180 54
*Short "Y" Drum Cable capacity per layer Y600/HY-600	ft m	15 4	40 12	65 19	95 28	135 39
*Long Drum Cable capacity per layer X600/HX-600	ft m	30 9	65 19	110 33	165 50	225 68

Line Speed		Worm RPM	1	2	3	4	5
600/H-600 Y-600/HY-600 X-600/HX-600	FPM MPM	870	25 7.6	31 7.6	37 11.2	42 12.7	48 14.5

*These specifications are based on recommended cable of 1/2" (13mm) 6x19 extra improved plow steel cable.

** 5th layer does not conform to SAE J706

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

TECHNIQUES OF 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. 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.

The winch clutch allows rapid unspooling of the cable, from cable drum, for hooking onto a load. The clutch is operated by the handle located on the clutch housing of winch.

1. TO DISENGAGE CLUTCH, run winch in the reverse (reel out) direction until the load is off the cable. Grasp the clutch handle and move it toward the cable drum to the "OUT" position. The cable may now be pulled from the cable drum by hand.
2. TO ENGAGE CLUTCH, move the clutch handle away from the cable drum to the "IN" position, while slowly running the winch in the forward (reel in) direction, until the clutch jaws move into engagement with the drum jaws. When the cable drum starts rotating, stop and make sure that the clutch is engaged and thus that the clutch handle is fully at the "IN" position. The plastic plug in the top of the clutch housing may be removed for inspection of the clutch to assure total engagement. CLUTCH MUST BE TOTALLY ENGAGED DURING WINCHING OPERATIONS. The winch is now ready for pulling in the load.

SAFEGUARDS-WARNINGS:

CLUTCH MUST BE TOTALLY 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 IS NOT DESIGNED TO HOLD LOAD.

WINCH 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 in top of the gear housing. Be sure that it is in good operating condition so that hot oil gasses may escape.
3. Lubricate cable with light oil.

B. MONTHLY

1. Lubricate the various grease fittings located in the cable drum, end bearing, clutch housing or clutch operating linkage. Any good grade of moly-disulfide containing grease is acceptable.
2. In the case of jaw clutch winches, check the action of the sliding clutch, making sure it is fully engaging and disengaging with the cable drum. Remove the plastic plug in the top of the housing and observe if the clutch is fully engaging. Observe the jaws on both the clutch and cable drum, checking for rounding of the driving faces. If rounding has occurred they should be replaced immediately.
3. In the case of Dow-Lok clutches, check the action of the locking ring. Make sure it is spring loaded and free to move fully against the cable drum in the engaged position and that it is pulled fully away from the cable drum and latched when disengaged.
4. Check the winch mounting bolts. If any are missing, replace them and securely tighten any that are loose. Make sure to use only grade 5 bolts or better.
5. Check the torque setting of the oil cooled worm brake. Make any adjustments required, following the procedure described in ADJUSTING THE OIL COOLED WORM BRAKE in the Owner's Manual.
6. Check alignment of chain and sprockets and adjust as required to minimize wear.
7. 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 minutes 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 E.P. 140 gear oil.
4. Inspect frame and surrounding structure for cracks or deformation.
5. Gear wear can be estimated by rocking the drum back and forth and if necessary drain oil and remove cover for closer inspection.

WINCH MOUNTING

It is most important that this winch be mounted securely so that the three major sections (the clutch housing end, the cable drum and the gear housing end) are properly aligned.

All standard model 600/H-600 Series Winches are furnished with recommended mounting angles. Angle size is 3/8 x 2-1/2 x 3 high strength (36,000 PSI min. yield) steel angle.

CABLE INSTALLATION

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. Insert the end of cable, opposite hook end, into the 9/16" dia. hole in drum barrel. Secure cable to drum barrel, using setscrew furnished with winch. TIGHTEN SETSCREW SECURELY.
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.

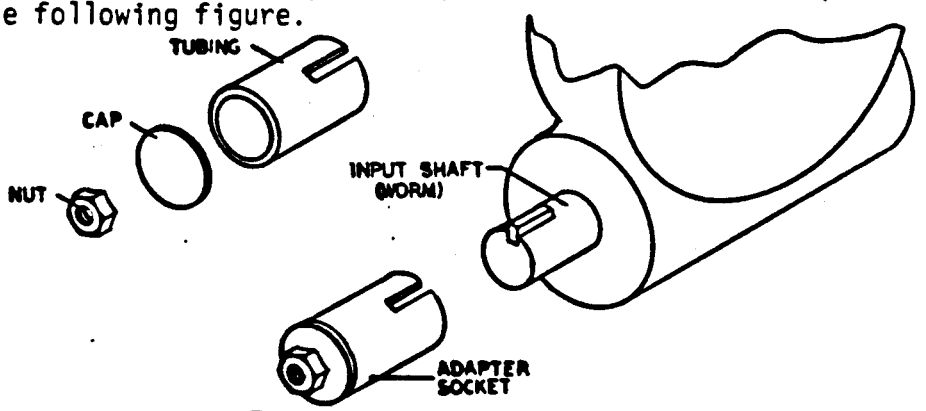
ADJUSTING THE OIL COOLED WORM BRAKE

The oil-cooled, fully adjustable, automatic safety brake operates in the worm housing lubricant, all parts being submerged in oil. When the brake wears to the point that the load begins to drift, the brake can be adjusted as follows:

1. Loosen the lock nut on the adjusting screw.
2. Tighten the brake by turning the adjusting screw clockwise. CAUTION: Only 1/4 turn is usually required to adjust the brake. Over-tightening can cause overheating, and damage to the brake parts. Tighten the lock nut after adjustment is completed.

If the brake does not respond to adjustment then a new leaf spring and brake disc is needed.

A torque wrench can be equipped with a special adapter to fit the input shaft (worm) of the winch. The adapter can be made by welding a nut to the end of a piece of tubing as shown in the following figure.



After welding the cap and nut to the tubing, slot the tubing as shown. This will allow the special adapter to slide over the keyway and will then act as a large socket. A torque wrench can then be used to apply the proper torque. Turn the torque wrench so that the drum turns in the spool out direction or lowering direction. The torque rating for the brake on the Model 600/H-600 should be 20 to 25 ft. lbs. If the torque wrench does not show the proper value as it turns, then the worm brake adjusting bolt should be turned clockwise 1/4 turn. Each time the adjusting bolt is turned, check the torque reading. Continue this procedure until the proper torque reading is achieved. Then tighten the lock nut.

SERVICING OF THE OIL COOLED SAFETY BRAKE

1. Remove the drain plug and drain the worm gear oil from the worm housing.

2. Back off the lock nut, then the adjusting screw, both two turns or more by turning them counter-clockwise.

3. Remove the cover mounting screws.

4. Remove the cover along with coil spring and leaf spring.

5. Remove the retainer plate, composition brake disc, cam plate and balls. Note slots balls are in.

6. Inspect parts as follows:

   a). Composition brake discs are 1/4" thick when new. Replace if thinner than 3/16 or if surfaces are glazed or burnt.

   b). Inspect the flat, ground surface of the cam plate and retainer plate for glazing, warpage, or other damage. Glazing can be removed by scraping carefully.

   c). Inspect the leaf spring. It should be bowed 1/8".

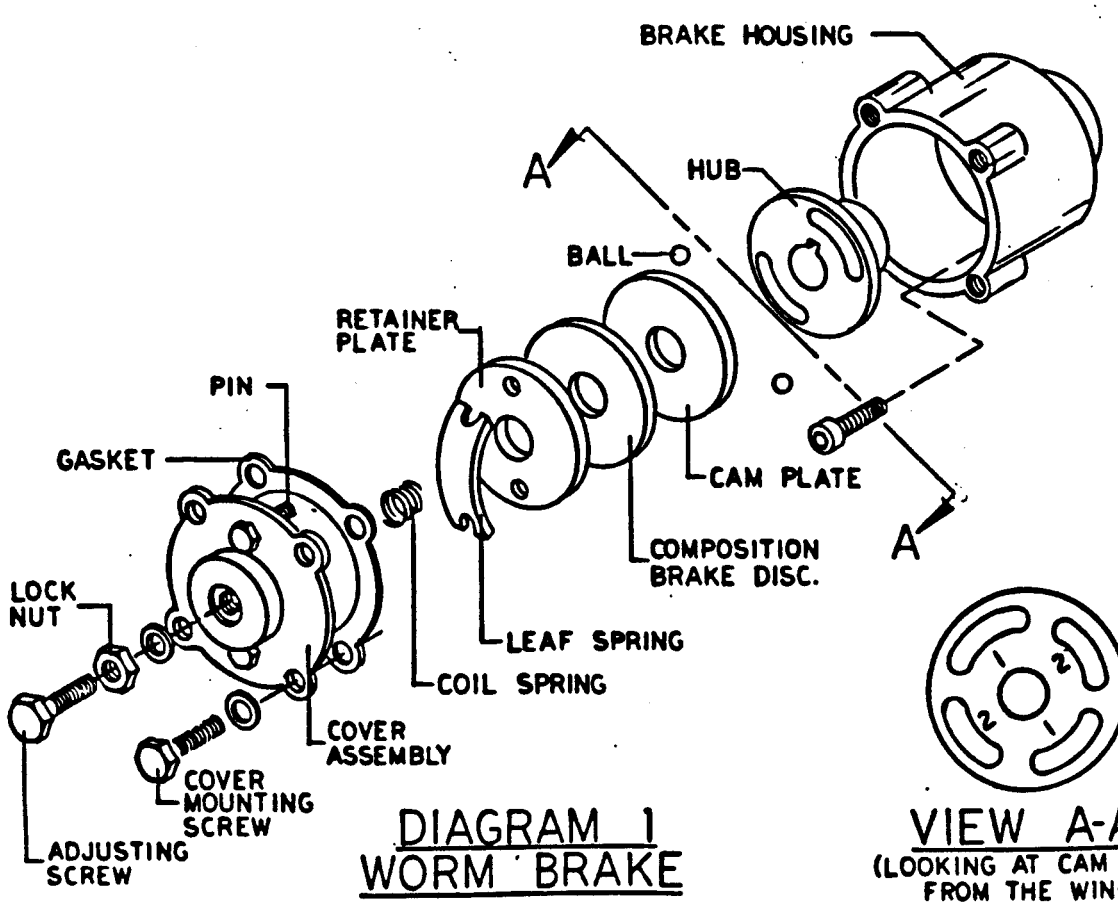


DIAGRAM 1
WORM BRAKE

VIEW A-A
(LOOKING AT CAM PLATE FROM THE WINCH)

RE-ASSEMBLING AND CHECKING THE BRAKE

1. Press brake hub into place over worm shaft and key.

2. Assemble ball into appropriate slots of cam. (Refer to diagram 1, page 5). Use stiff grease to hold balls into place and slide cam over end of worm. Be sure that balls are secure, between cam slots and hub slots. Refer to Page 7 to determine proper ball slot setting.

3. Install brake disc.

4. Install retainer plate, smooth side toward brake disc.

5. Install the gasket on the cover with a small amount of grease or sealer.

6. The coil spring goes over the adjusting screw on the inside of the cover.

7. Install the notches of the leaf spring on the pins protruding through the cover. The hollow side of the leaf spring goes toward the brake.

8. Install brake housing cover, making sure the protruding pins go through the leaf spring and into the holes in the retainer plate.

9. Bolt cover into place with the mounting screws. Install drain plug and add 2 pints all purpose E.P. 140 oil.

10. Turn winch in the hoisting direction at least one turn of the input shaft.

11. Turn the adjusting screw in until it is finger tight.

TEST FOR PROPER BRAKE ASSEMBLY

After the brake has been adjusted to the proper torque setting disengage clutch. Start vehicle engine and run winch in the reel in (hoisting direction). Allow winch to run in this direction for one minute.

Place your hand on the safety brake housing. If housing is <u>not</u> hot to the touch then run winch in the reverse direction (cable out) for one minute. Brake housing should begin to heat.

When these conditions exist, proper installation has been made. If heating becomes noticeable when running the winch in forward rotation (hoisting direction), the brake should be again disassembled. When disassembled, place the brake balls in the alternate set of slots in the cam plate, then carefully follow the instructions for re-assembling and checking the brake.

INSTRUCTIONS FOR CHECKING ASSEMBLY ARRANGEMENT AND SETTING OF WORM BRAKE

When the worm brake is assembled the brake must be set with the balls in the #1 or the #2 set of cam slots. (View A-A, page 5). It is indicated on the name plate whether the balls were installed in the #1 or the #2 slots at the factory.

Three factors determine which slots the balls should be in:

1. Direction cable winds on the drum. It normally **WINDS OVER THE TOP** of the drum barrel.

2. The cut of the gear set, right or left gear. The last letter in the model number of the winch, either R or L, designates right or left gear set. Example: R-20AR, R-30L, 700R, 800L.

3. The side of the winch that the input shaft is on. The **INPUT SHAFT IN NORMALLY TOWARD THE CAB.** Whether the winch has the gear box on the right or on the left side of the winch does not affect the brake setting.

EXAMPLE: When cable winds over the top of the drum, winch has a right cut gear and input shaft is toward the cab (diagram 2), then the balls need to be in the #2 cam slots.

If any one of these three factors differ from those stated above, the balls need to be in the #1 slots in the cam. A second change in these factors requires the original arrangement, and if all three factors are different, the balls need to be in the #1 slots. (See page 5 and 6 for disassembly and assembly instructions).

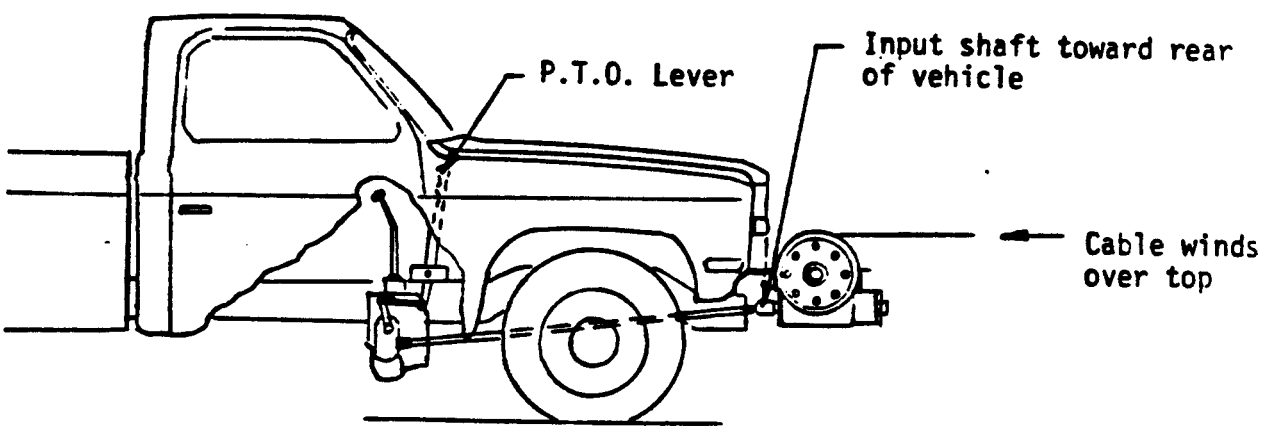


DIAGRAM 2

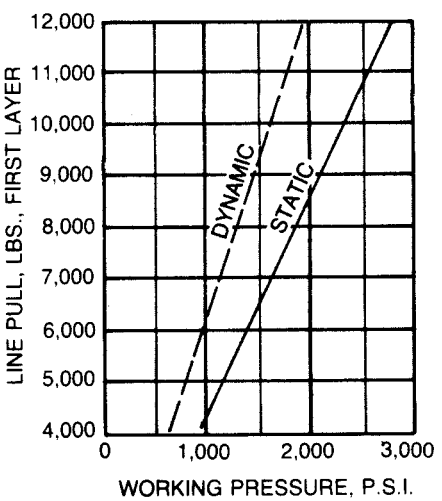
Three factors determine brake assembly arrangement.

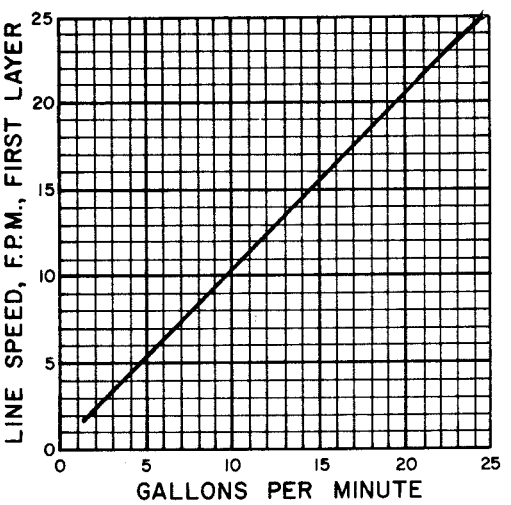
Refer to the performance charts, below, to properly match your hydraulic system to the H-600 Series Winch performance. The charts consist of: (1) Line speed, first layer (F.P.M.) vs. gallons per minute (G.P.M.) and (2) Line pull (lbs.) first layer vs. working pressure (P.S.I.). STATIC (solid line) refers to hoisting a suspended load from rest; DYNAMIC (dotted line) refers to maintaining the motion of a moving load.

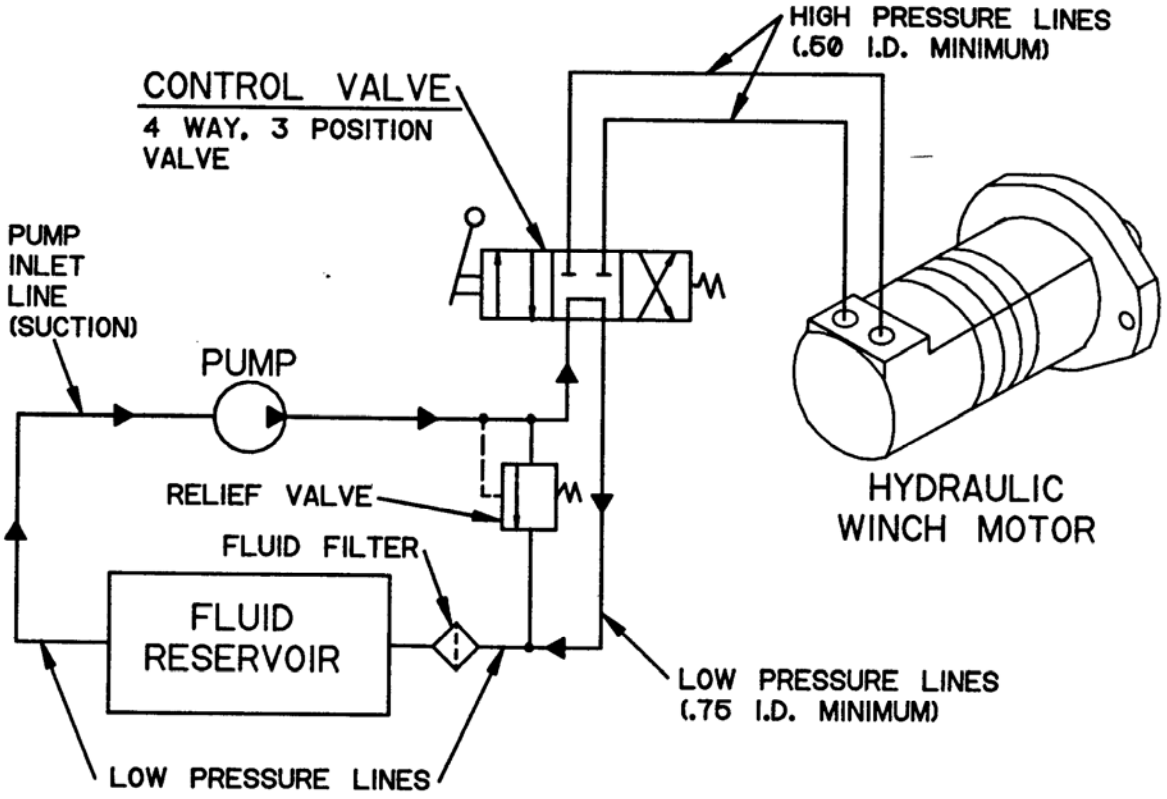
Performance based on a motor displacement of 6.2 cubic inches with 25 GPM maximum flow rate. See page 17 for motor port size.

H-600, HY-600, HX-600 Series Performance

12,000 Lb. Duty Rating
40:1 Gear Ratio





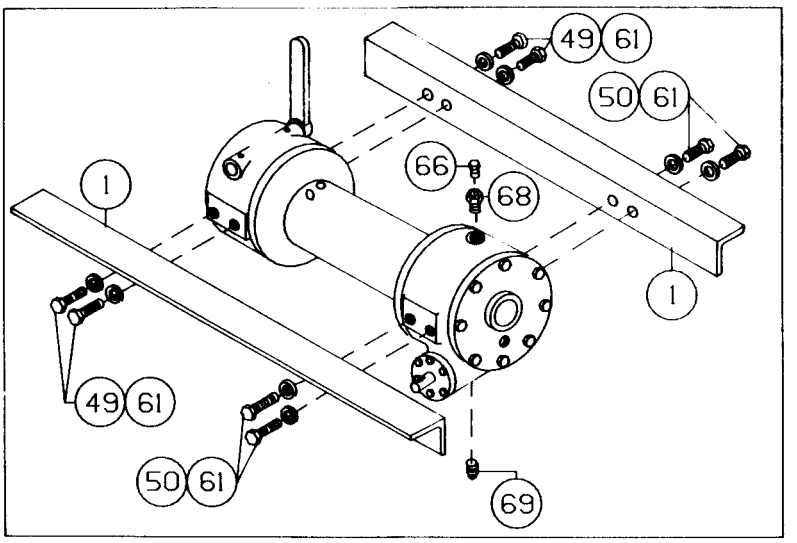


TROUBLE SHOOTING TIPS

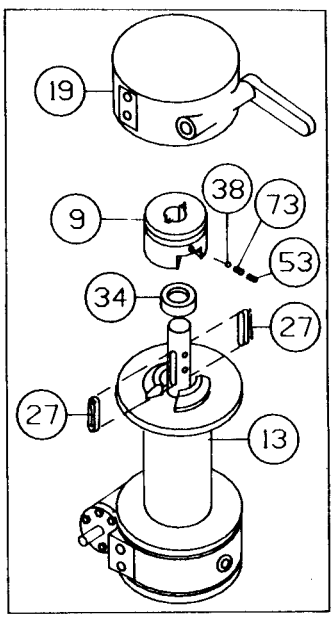
CONDITION	POSSIBLE CAUSE	CORRECTION
CLUTCH INOPERATIVE OR BINDS UP.	1. Dry or rusted shaft. 2. Bent yoke or linkage. 3. Clutch jaws are in contact.	1. Clean and lubricate. 2. Replace yoke or shaft assembly. 3. See TECHNIQUES OF OPERATION.
OIL LEAKS FROM HOUSING.	1. Seal damaged or worn. 2. Too much oil. 3. Damaged gasket.	1. Replace seal. 2. Drain excess oil. Refer to TECHNIQUES OF OPERATION. 3. Replace gasket.
LOAD DRIFTS DOWN.	1. Safety brake has become worn. 2. Safety brake out of adjustment.	1. Replace brake disc. (See Page 5, Diagram 1). 2. Turn adjusting bolt clockwise 1/4 turn or until load does not drift.
WINCH RUNS TOO SLOW.	1. Hydraulic motor worn out. 2. Low flow rate.	1. Replace motor. 2. Check flow rate. Refer to HYDRAULIC SYSTEMS flow chart Page 8.
CABLE DRUM WILL NOT FREE SPOOL.	1. Winch not mounted squarely, causing end bearings to bind drum.	1. Check mounting. Refer to WINCH MOUNTING Page 4.
CABLE BIRDNESTS WHEN CLUTCH IS DISENGAGED.	1. Drag brake disc worn.	1. Replace discs.

INSTRUCTIONS FOR OVERHAUL OF RAMSEY
MODEL 600/H-600 SERIES LEVER STYLE WINCHES
DIS-ASSEMBLY

Refer to parts list and parts drawing pages for actual item numbers and corresponding part numbers.

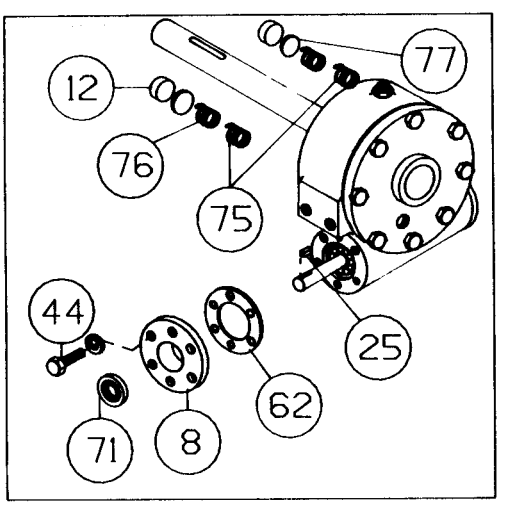


1. Drain oil from gear housing by removing (item #69) plug from bottom of gear housing. Remove relief fittings and reducer (items #66 & #68) from top of gear housing. Remove mounting angles from winch by removing hardware shown.



2. Slide clutch housing (item #19) from end of drum shaft. Remove setscrew, spring and poppet ball (items #53, #73 and #38) from jaw clutch (item #9). Slide jaw clutch from end of drum shaft.

   Remove two keys (item #27) from keyways. Once keys have been removed, drum (item #13) and drum spacer (item #34) can be removed from drum shaft.



3. Remove key (item #25) from worm shaft.

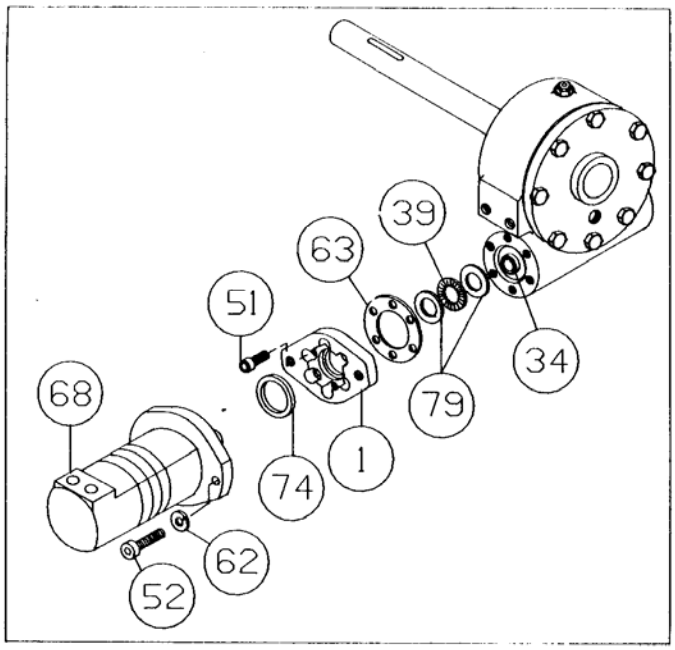
   Remove bearing cap (item #8) and gasket (item #62) by unscrewing six capscrews (item #44) and lockwashers.

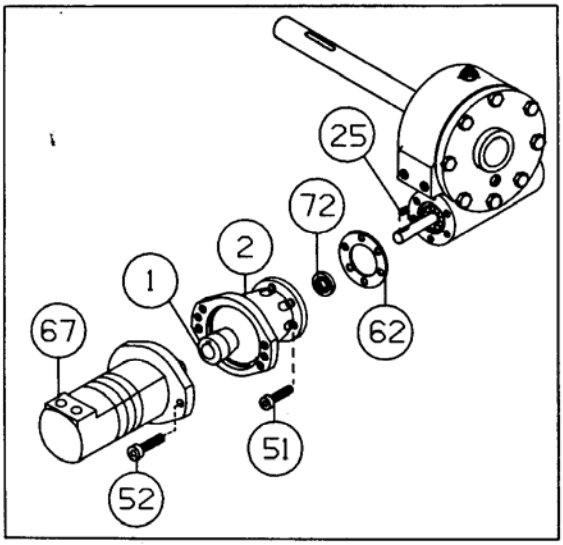
   Remove seal (item #71) from bearing cap and press new seal into place.

   Drag brake disc (item #12), spacer (item #77) and springs (items #75 & #76) should be examined and replaced if necessary.

4. Remove motor (item #67) and coupling assembly (item #1) from (item #2) adapter by unscrewing two (item #52) capscrews.

   Remove key (item #25) from worm shaft. Unscrew six capscrews (item #51) and remove adapter from gear housing. Replace adapter seal (item #72) and gasket (item #62).

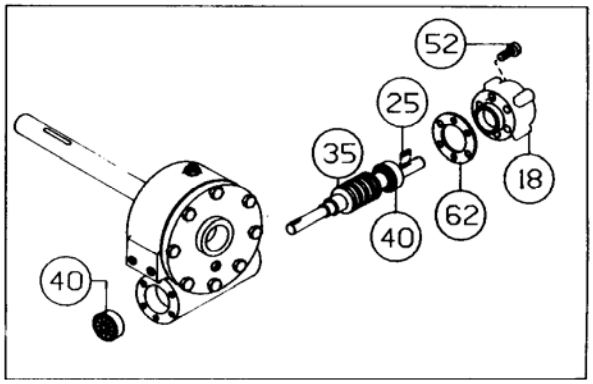


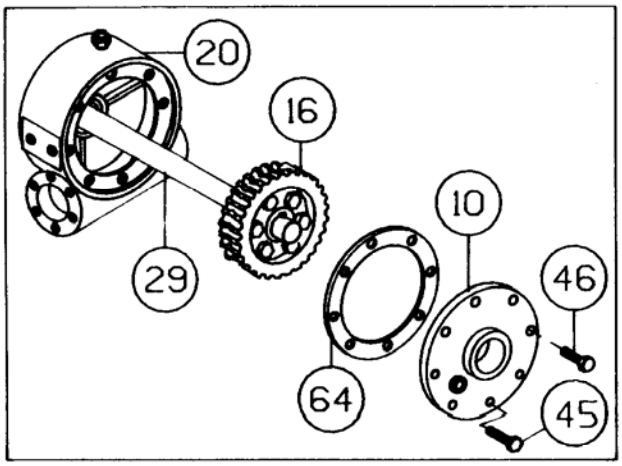


4a. Remove motor (item #68) from adapter (item #1) by removing two capscrews and lockwashers (items #52 & #62). Remove adapter (item #1) from gear housing by removing six (item #51) capscrews. Replace seal (item #74) and gasket (item #63). Remove thrust bearing (item #39) and thrust washer (item #79).

5. Refer to page 3, SERVICING OIL COOLED SAFETY BRAKE. Remove brake housing (item #18) from gear housing by unscrewing six (item #52) capscrews. Remove worm (item #35) and bearings (item #40) from gear housing. Use a soft hammer to gently tap input end of worm and drive worm and bearing from gear housing. Once worm has been removed from housing, bearing can be pressed from end of worm.

   Check for signs of wear or damage to worm (item #35) and bearing (item #40). Replace if necessary.



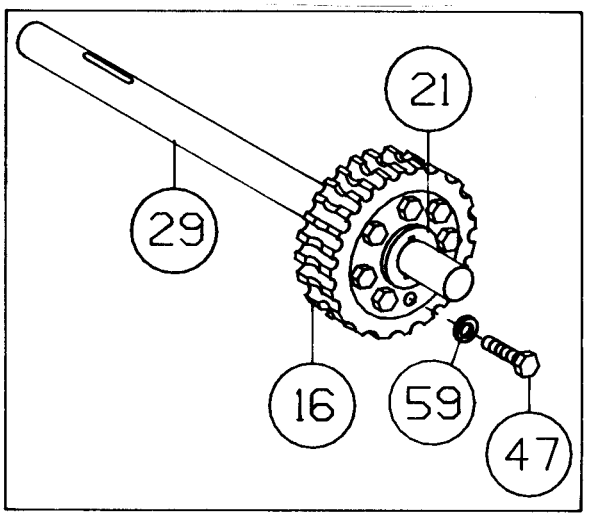


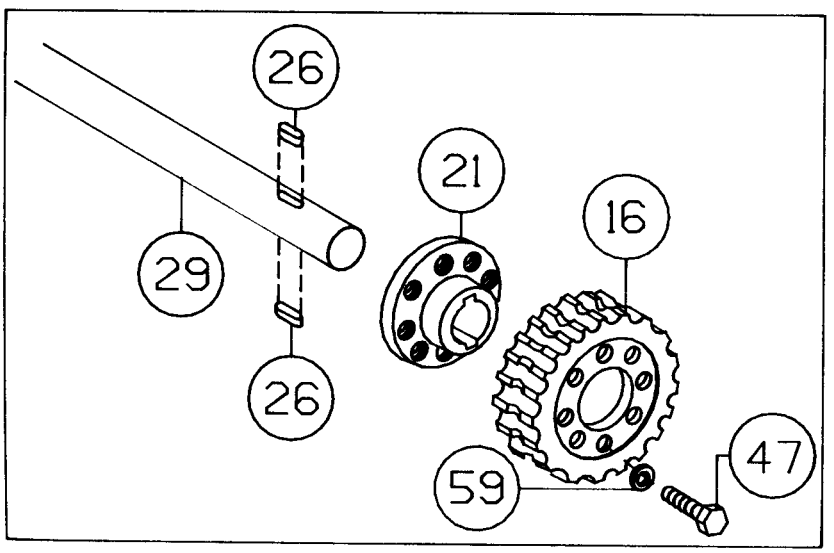
6. Remove gear housing cover (item #10) from gear housing (item #20) by unscrewing capscrews (items #46 & #45). Thread two of the capscrews into the two tapped holes of cover and tighten. This will pull the cover loose from gear housing.

   Remove cover gasket (item #64) and pull shaft (item #29), with gear attached, from gear housing.

7. Check for signs of wear on gear teeth. If necessary, replace gear by removing six capscrews (item #47).

Place new gear (item #16) onto gear hub. Align holes in gear with holes in hub. Press gear onto hub. Be sure gear is seated all the way on the hub. Use six capscrews (item #47) and lockwashers (item #59) to secure gear to hub. Torque to 45 ft. lbs. (61 Nm.) each.





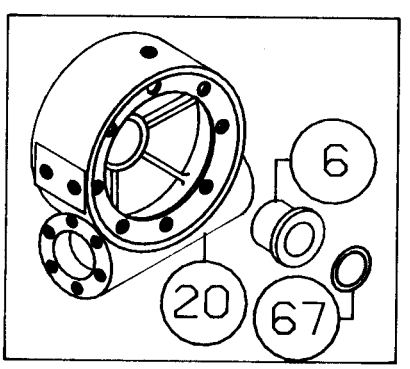
8. If shaft and/or hub is damaged, replace as follows:

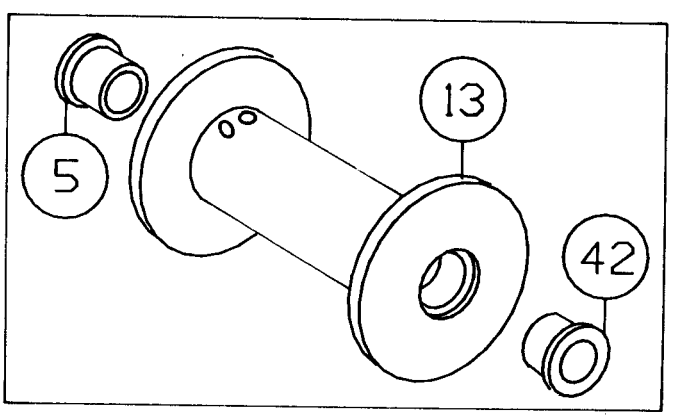
   a. Tap keys (item #26) into short keyways of drum shaft (item #29).

   b. Press shaft (item #29) and keys through gear hub (item #21) until end of keys on long end of shaft are flush with hub.

   c. Secure gear to hub using six (item #47) capscrews with lockwashers (item #59). Torque to 45 ft. lbs. (61 Nm.) each.

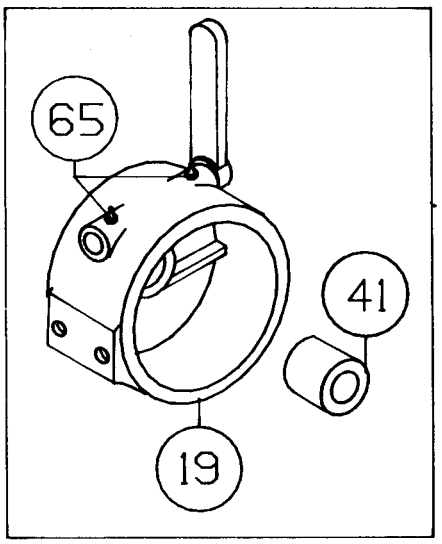
9. Check gear housing bushing (item #6) and quad ring (item #67) for signs of wear. Replace if necessary by pressing old bushing from gear housing. Press new bushing into place and insert new quad ring (item #67) into groove inside of bushing.





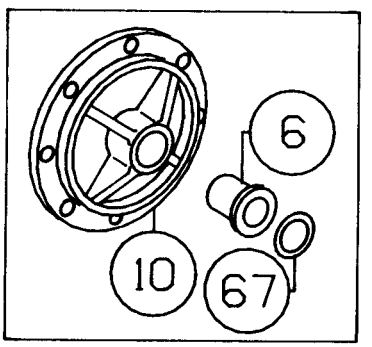
10. Check drum bushings (items #5 & #42) for signs of wear. Replace if necessary by pressing old bushings from drum. Press new ones into place.

NOTE: If bushings are replaced, it will be necessary to run a 9/16 (.56) dia. drill through cable pocket. The following drum assemblies are available with new bushings pressed in place and pre-drilled: #234143 600 Series drum assemblies and #234144 X-600 Series drum assemblies.

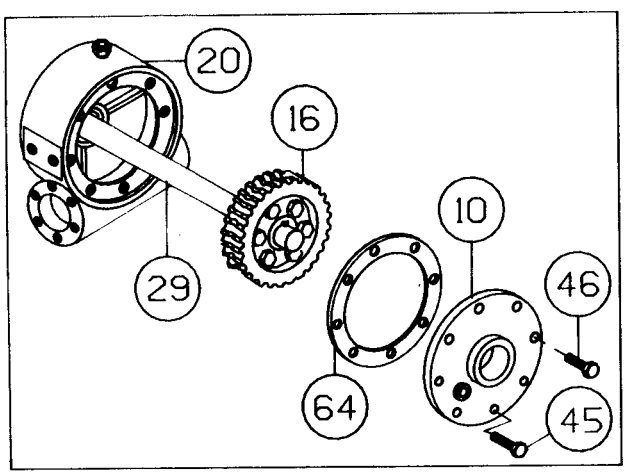


11. Check clutch housing bushing (item #41) for wear. If necessary, remove old bushing and press new bushing into place. Apply grease to lube fittings (item #65) to lubricate clutch shifter shaft.

12. Check cover bushing (item #6) and quad ring (item #67) for signs of wear. Replace if necessary by pressing old bushing from gear housing. Press new bushing into place and insert new quad ring (item #67) into groove inside of bushing.



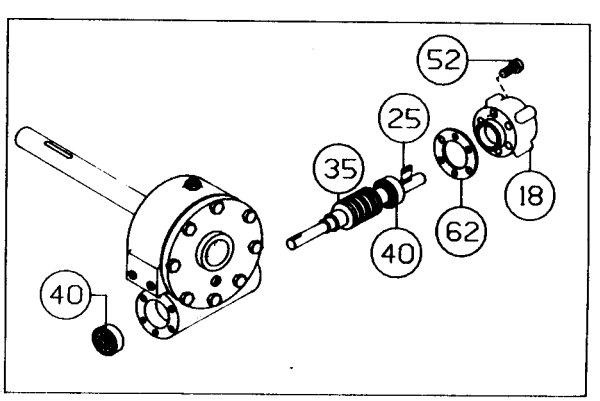
RE-ASSEMBLY



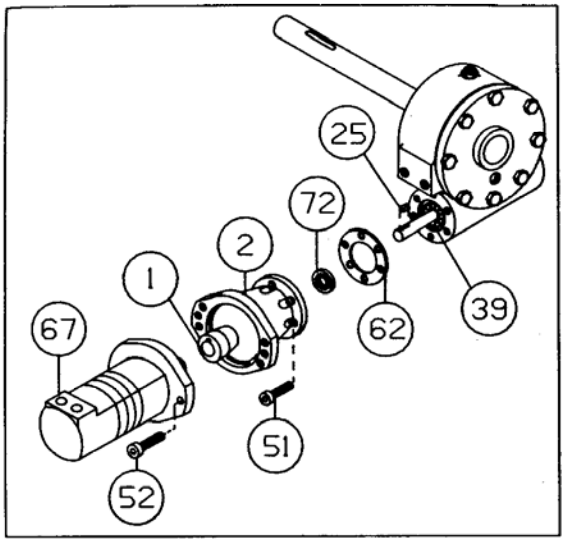
13. Apply grease to end of shaft, opposite gear. Apply grease to bushing in gear housing (item #20). Place greased end of shaft through bushing in gear housing (item #20). Place gasket (item #64) onto gear housing cover (item #10). Apply grease to gear end of shaft and cover bushing. Place cover onto shaft and secure to housing with seven (item #46) and one (item #45) capscrews. Tighten capscrews to 12 ft. lbs. (16.1 Nm.) each.

14. Press bearing (item #40) onto worm (item #35). NOTE: Be sure that thick shoulder of bearings outer race (side with manufacturer's name and part number) is out, away from worm threads. Press bearing and worm into gear housing. Slip gasket (item #62) onto brake housing (item #18). Use six capscrews (item #52) to secure brake housing to gear housing. Tighten capscrews to 12 ft. lbs. (16.1 Nm.) each.

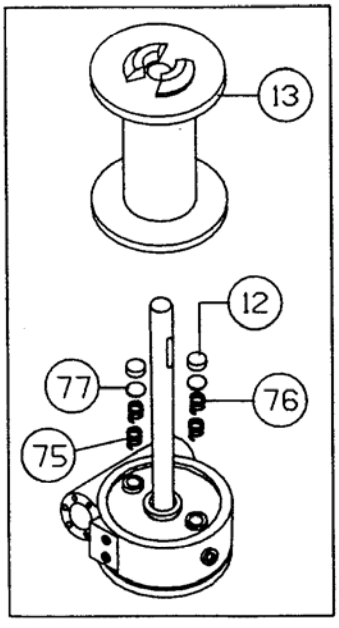
Place key (item #25) into keyway of worm (item #35). Refer to page 6 for reassembly and checking of worm brake.

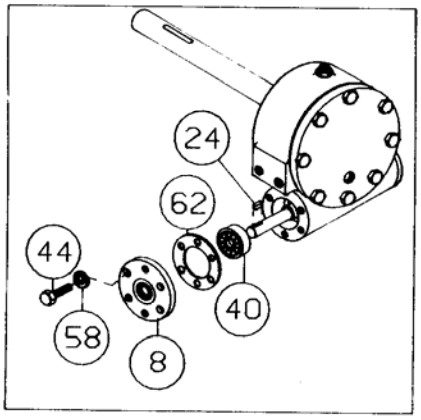


15. Press bearing (item #40) onto worm and into gear housing. NOTE: Be sure that thick shoulder of bearings outer race (side with manufacturer's name and part number) is out, away from worm threads. Attach bearing cap (item #8), to gear housing. Use six (item #44) capscrews to secure. Tighten capscrews to 18 ft. lbs. (24.4 Nm.) each. Tap key (item #25) into keyway.



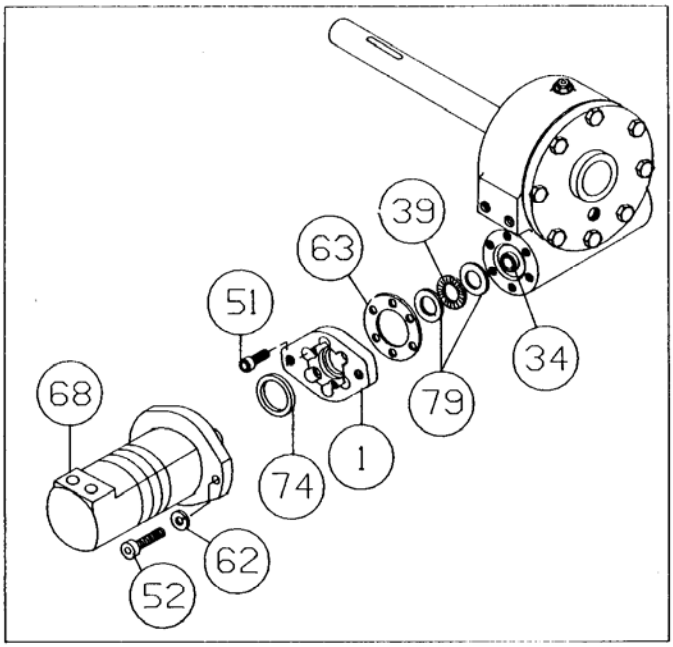
16a. Place thrust washers (item #79) and thrust bearing (item #39) over end of worm (item #34) and into housing. Attach adapter (item #1) with gasket (item #63) to housing, using six (item #51) capscrews. Tighten capscrews to 12 ft. lb. (16 Nm.) each. Insert seal (item #74) into adapter and carefully place motor shaft, with key in keyway, through seal, so as not to damage seal. Insert motor shaft into end of worm (item #34). Secure motor (item #68) to coupling using two (item #52) capscrews with lock-washers (item #62). Tighten capscrews to 39 ft. lb. (53 Nm.) each.





16. Press bearing (item #39) onto worm and into housing. NOTE: Be sure that thick shoulder of bearings outer race (side with manufacturer's name and part number) is out, away from worm threads. Attach adapter (item #2) to gear housing using six capscrews (item #51). Tighten capscrews to 12 ft. lbs. (16.1 Nm.) each. Insert key (item #25) into keyway of worm shaft. Slide tapered end of coupling (item #1) over end of worm shaft.

Place motor shaft, with key in keyway, into coupling. Secure motor (item #67) to adapter, using two capscrews (item #52). Tighten capscrews to 39 ft. lbs. (53 Nm.) each.



17. Place winch with gear housing cover down on work bench. Drum shaft should be in vertical position. Set springs (items #75 & #76) into pockets of gear housing with drag brakes (item #12) on top of disc (item #77) and springs. Slide drum assembly (item #13) onto drum shaft with drum jaws upward.

18. Slide spacer (item #34) over end of drum shaft. Press drum downward to compress drag brake springs in gear housing. Insert keys (item #27) into keyways. A rubber or brass mallet will be needed to gently tap keys into position.

Apply grease to keys and end of shaft. Place jaw clutch (item #9) over end of shaft and slide jaw clutch over keys.

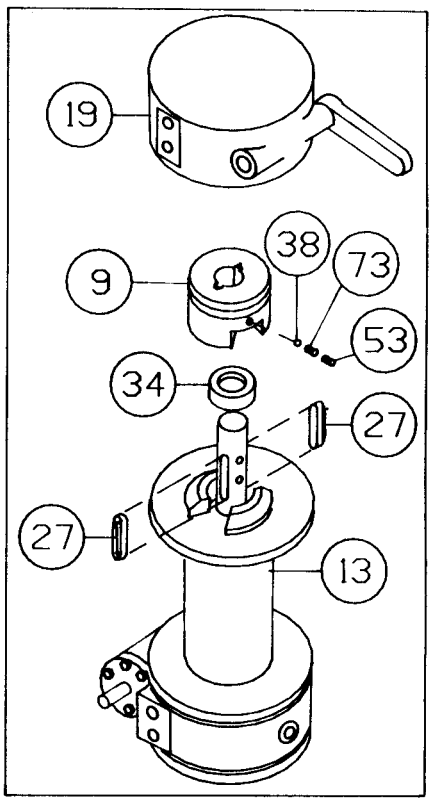
NOTE: Be sure that tapped hole on side of jaw clutch is on same side of shaft as the two ball detents. Insert ball poppet (item #38) spring (item #73) and setscrew (item #53) into tapped hole of jaw clutch.

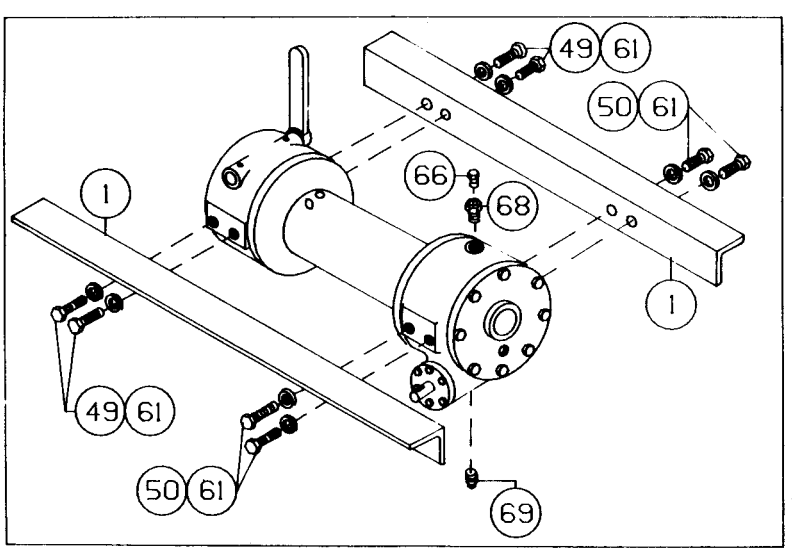
If jaw clutch and/or drum shaft have been replaced two new detents MUST be drilled as follows:

Slide jaw clutch over end of shaft. Engage jaws of clutch with jaws of drum. Use a 3/8" dia. drill, using hole in jaw clutch as a guide, to drill a 1/8" deep detent (as measured to the center of the drill point) in shaft. Slide jaw clutch upward 15/16" and drill 2nd detent.

If only the clutch is replaced, the new detents are to be drilled on the side of the shaft opposite the old detents. Apply grease to bushing in clutch housing assembly (item #19). Set clutch housing onto end of drum shaft. Pull jaw clutch upward, toward clutch housing, enough to allow yoke in clutch housing, to fit properly in groove around jaw clutch. Slide clutch housing assembly and jaw clutch downward into place.

The setscrew should be tightened enough to allow ball, when placed in ball detents, to sufficiently hold jaw clutch "IN" and "OUT".

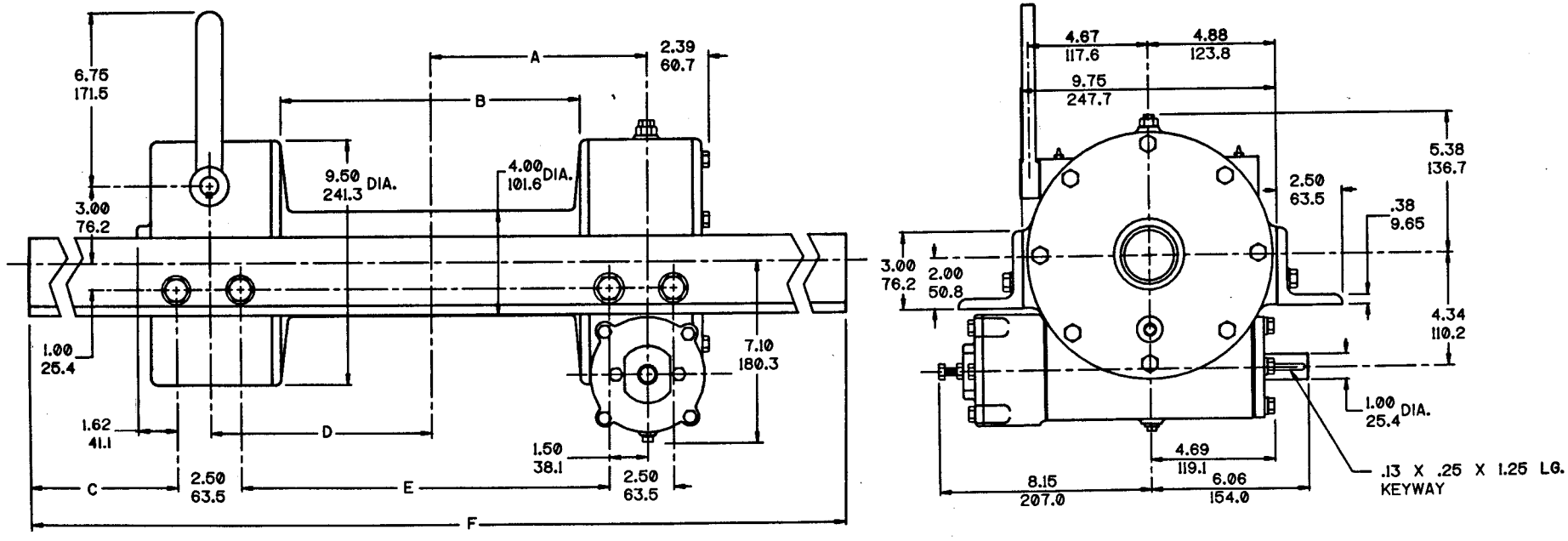




19. Attach two mounting angles (item #1) using four (item #49) capscrews with lockwashers at clutch housing end and four (item #50) capscrews with lockwashers at gear housing end. Torque capscrews to 28 ft. lbs. (37.9 Nm.) each. Insert plug (item #69) into bottom of gear housing. Permatex may be applied to threads to help prevent leakage.

Pour 2 pints of EP 140 gear oil into housing thru hole in top of housing. Insert relief fitting (item #66) into reducer (item #68). Reducer should then be placed into hole on top of gear housing. Tighten fittings and reducer securely.

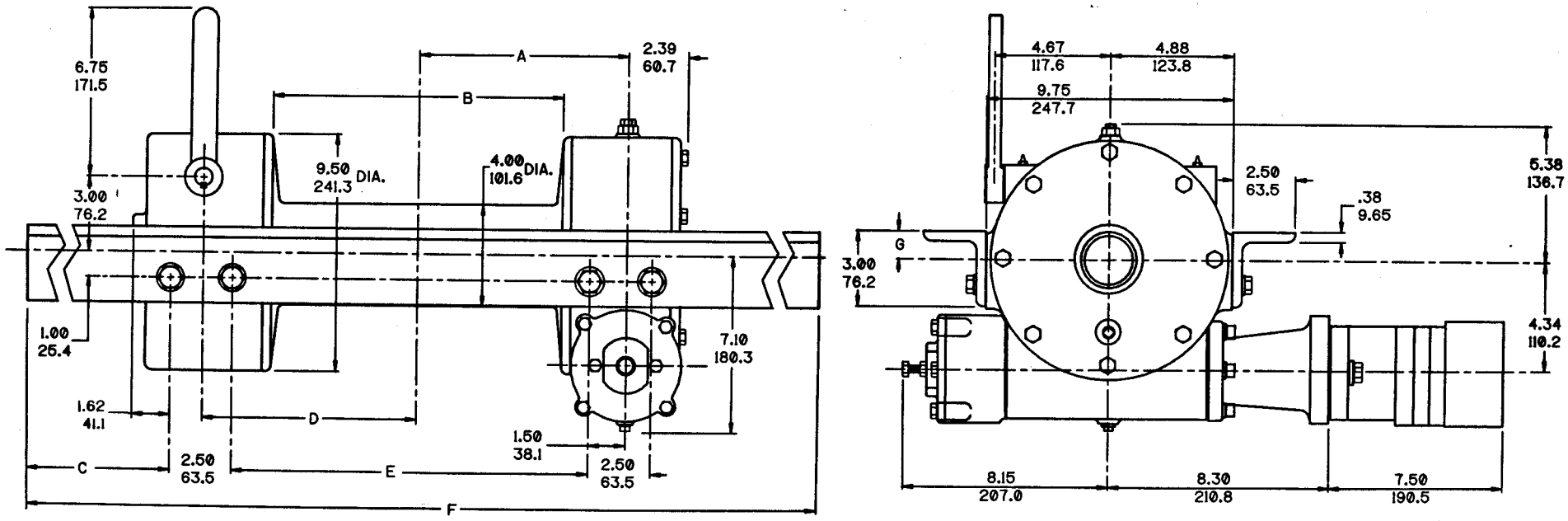
WINCH MODEL	A INCHES MM	B INCHES MM	C INCHES MM	D INCHES MM	E INCHES MM	F INCHES MM
600	8.44 214.3	11.75 298.5	10.31 262.0	8.75 222.3	14.44 366.7	40.00 1016.0
Y-600	7.00 177.8	8.75 222.3	9.72 246.9	7.31 185.7	11.56 293.7	36.00 914.4
X-600	10.12 257.0	14.69 373.1	10.63 270.0	10.41 264.4	17.75 450.9	44.00 1117.6



DIMENSIONS SHOWN ARE INCHES OVER MILLIMETERS

Model 600

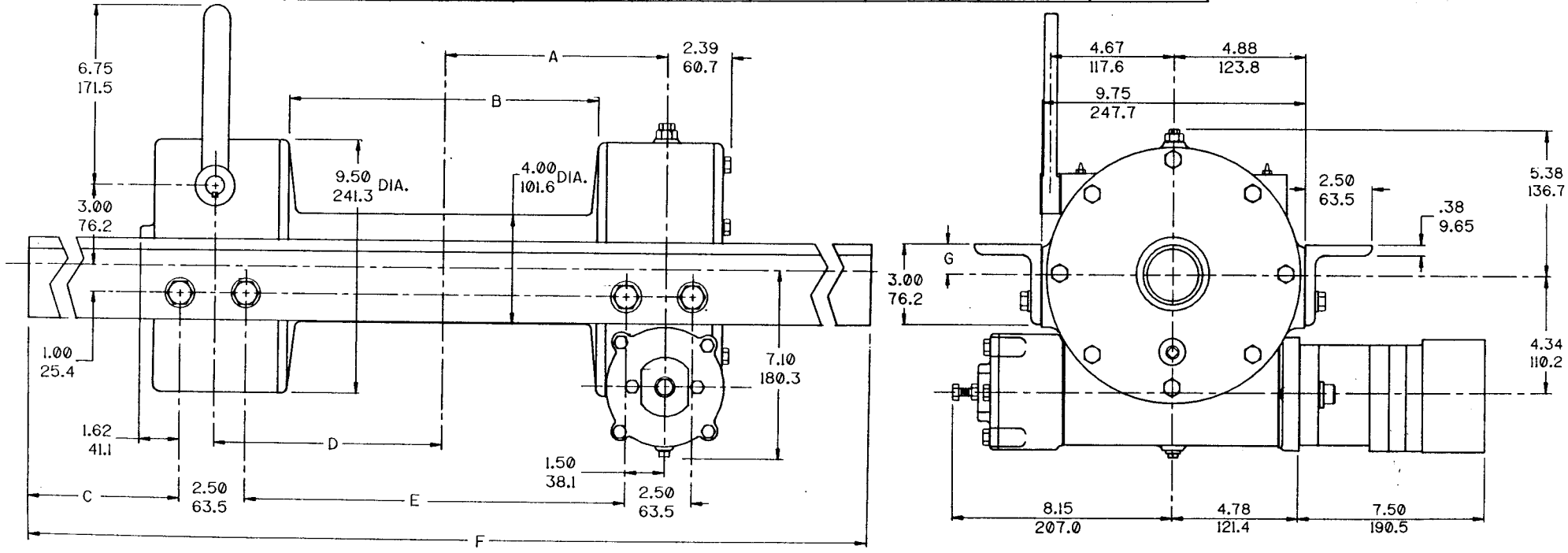
WINCH MODEL	A INCHES MM	B INCHES MM	C INCHES MM	D INCHES MM	E INCHES MM	F INCHES MM	G INCHES MM
H-600	8.44 214.3	11.75 298.5	10.31 262.0	8.75 222.3	14.44 366.7	40.00 1016.0	1.13 28.7
HY-600	7.00 177.8	8.75 222.3	9.72 246.9	7.31 185.7	11.56 293.7	36.00 914.4	1.06 26.9
HX-600	10.12 257.0	14.69 373.1	10.63 270.0	10.41 264.4	17.75 450.9	44.00 1117.6	1.06 26.9



DIMENSIONS SHOWN ARE INCHES OVER MILLIMETERS

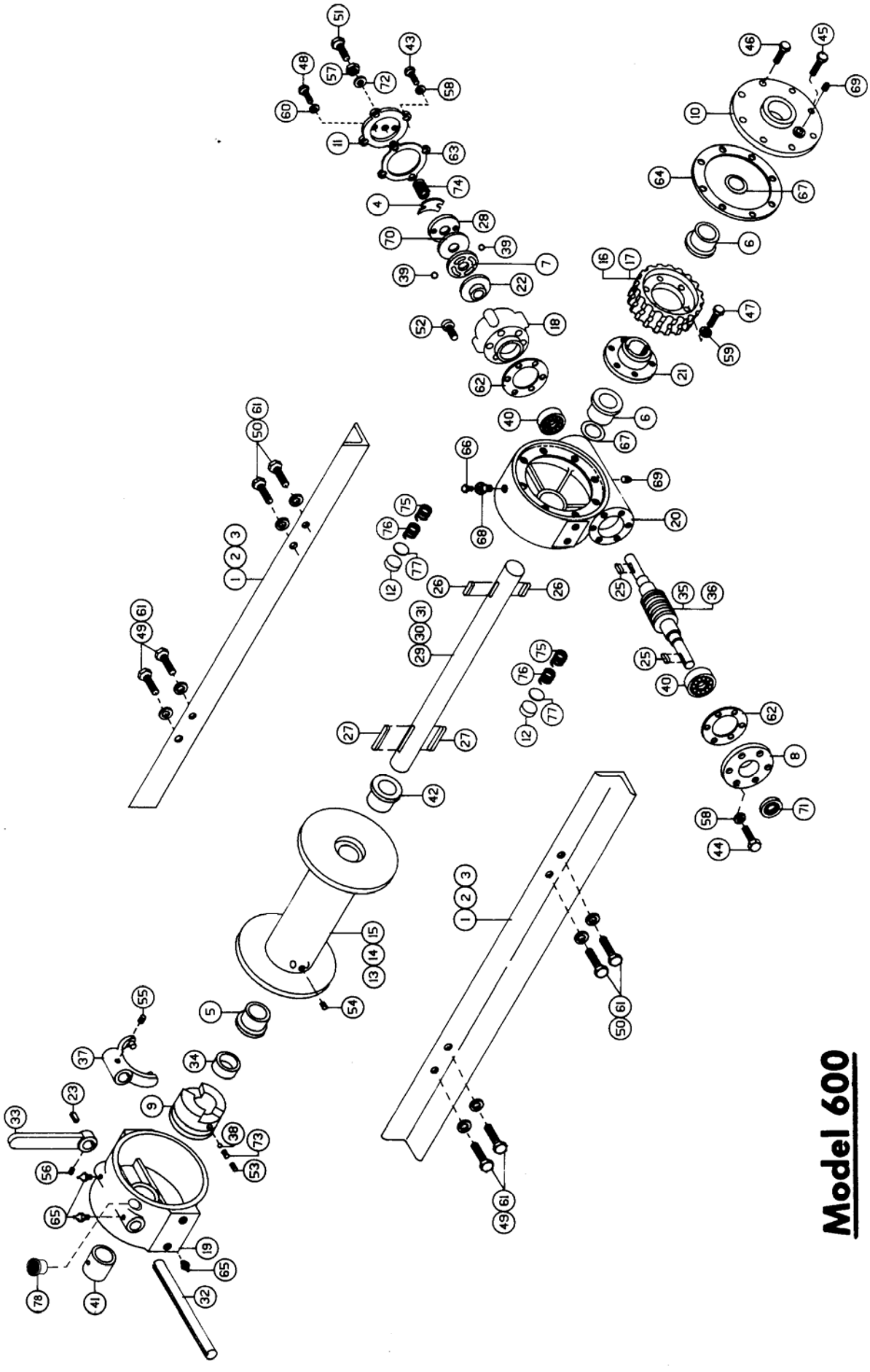
Model H-600

WINCH MODEL	A INCHES MM	B INCHES MM	C INCHES MM	D INCHES MM	E INCHES MM	F INCHES MM	G INCHES MM
H-600	8.44 214.3	11.75 298.5	10.31 262.0	8.75 222.3	14.44 366.7	40.00 1016.0	1.13 28.7
HY-600	7.00 177.8	8.75 222.3	9.72 246.9	7.31 185.7	11.56 293.7	36.00 914.4	1.06 26.9
HX-600	10.12 257.0	14.69 373.1	10.63 270.0	10.41 264.4	17.75 450.9	44.00 1117.6	1.06 26.9



Model H-600

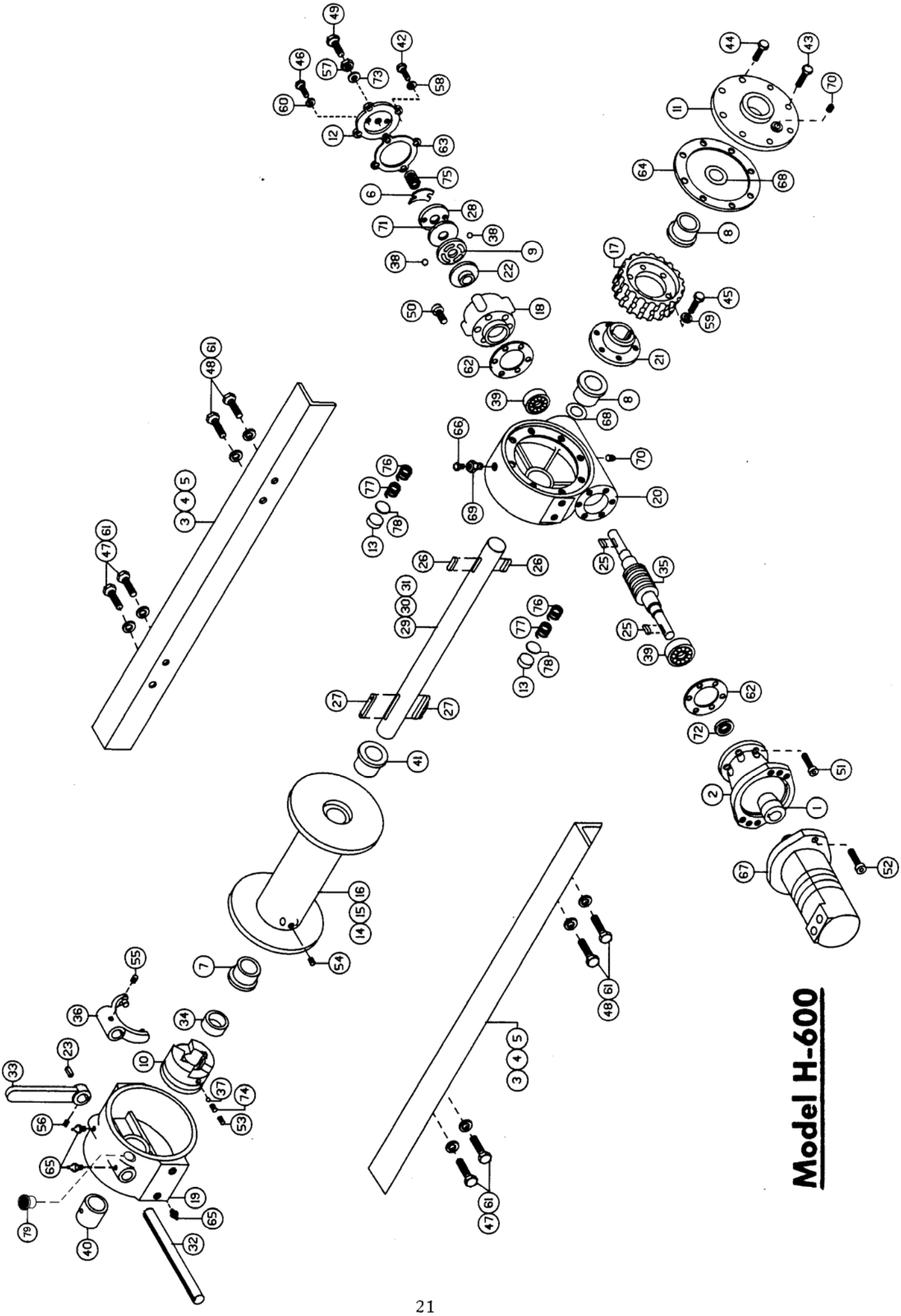
SHORT COUPLING


Model 600

PARTS LIST

Model 600

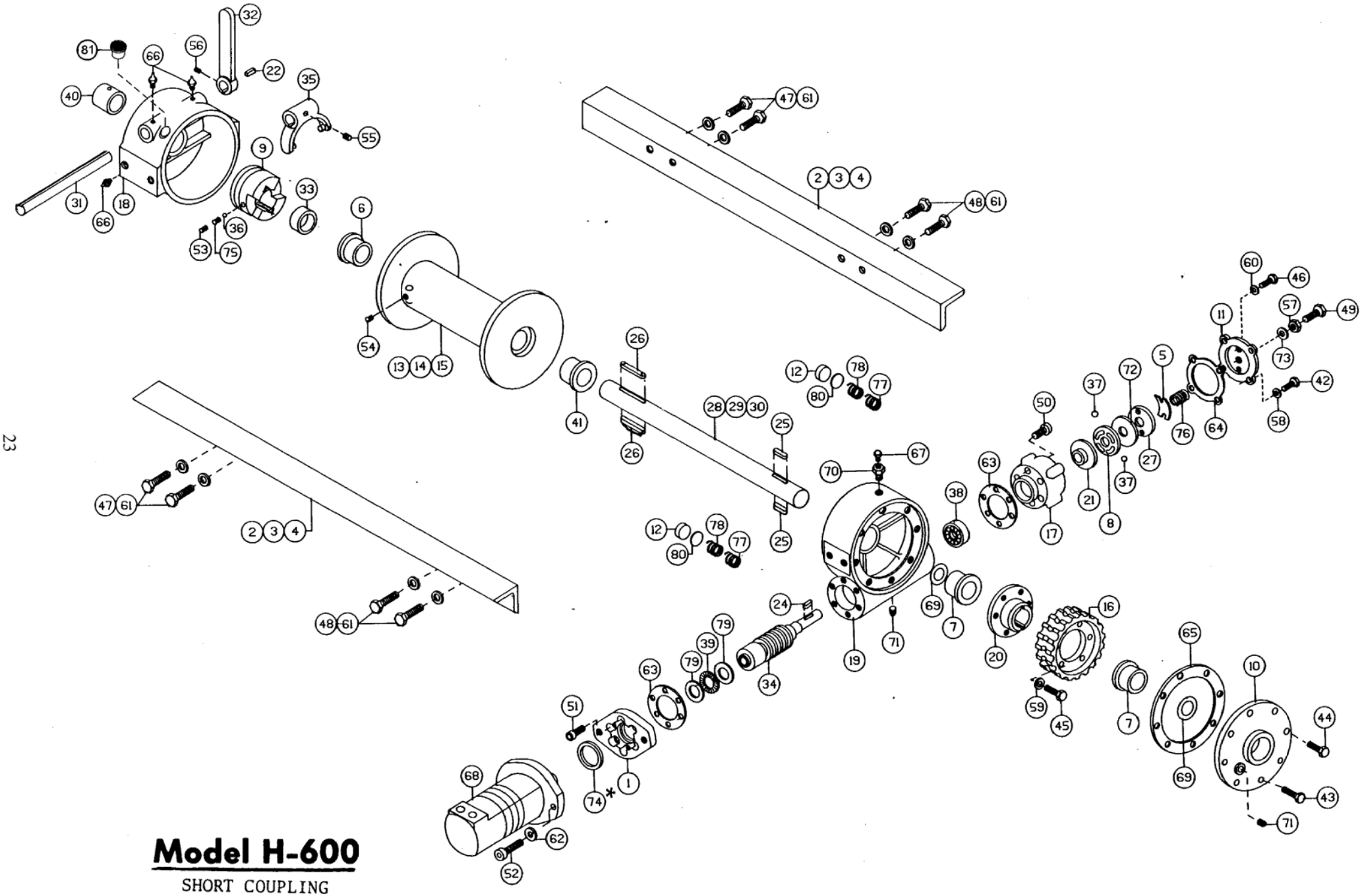
Item No.	Qty.	Part No.	Description
1	2	302116	ANGLE-X600
2	2	302122	ANGLE-Y600
3	2	302234	ANGLE-600
4	1	306036	SPRING-FLAT
5	1	308046	BUSHING
6	2	308048	BUSHING
7	1	314003	PLATE-CAM
8	1	316003	CAP
9	1	324163	CLUTCH-JAW
10	1	328046	COVER
11	1	328057	COVER-BRAKE
12	2	330010	SHOE-DRAG BRAKE
13	1	332074	DRUM-Y600
14	1	332140	DRUM-600
15	1	332141	DRUM-X600
16	1	334050	GEAR-R.H.
17	1	334082	GEAR-L.H.
18	1	338038	HOUSING-BRAKE
19	1	338040	HOUSING-CLUTCH
20	1	338085	HOUSING-GEAR
21	1	340014	HUB-GEAR
22	1	340024	HUB-BRAKE
23	1	342024	KEY-SQ.END
			NOT USED
25	2	342051	KEY-RD.END
26	2	342120	KEY-RD.END
27	2	450017	KEY-BARTH
28	1	352020	PLATE-RETAINER
29	1	356806	SHAFT-DRUM-X600
30	1	357466	SHAFT-DRUM-600
31	1	357468	SHAFT-DRUM-Y600
32	1	356945	SHAFT-SHIFTER
33	1	358001	SHIFTER-HANDLE
34	1	362007	SPACER-DRUM
35	1	368057	WORM-R.H.
36	1	368080	WORM-L.H.
37	1	370057	YOKE
38	1	400003	BALL-POPPET
39	2	400007	BALL-BRAKE
40	2	402044	BEARING-BALL
41	1	412005	BUSHING
42	1	412006	BUSHING-600
43	4	414111	CAPSCREW 5/16-18NCx1 LG. HX.HD. GR.5
44	6	414139	CAPSCREW 5/16-18NCx1-1/4 LG. HX.HD. GR.5
45	1	414140	CAPSCREW 5/16-18NCx3/4 LG. HX.HD. GR.5 NY. HVY.PATCH
46	7	414141	CAPSCREW 5/16-18NCx1 LG. HX.HD. GR.5 NY. HVY.PATCH
47	6	414283	CAPSCREW 3/8-16NCx1-1/4 LG. HX.HD. GR.8
48	2	414398	CAPSCREW 3/8-24NFx1 LG. HX.HD. GR.5 NY. HVY.PATCH
49	4	414457	CAPSCREW 7/16-14NCx1-1/4 LG. HX.HD. GR.5
50	4	414481	CAPSCREW 7/16-14NCx1-1/4 LG. HX.HD. GR.5 NY.HVY.PATCH
51	1	414603	CAPSCREW 1/2-20NFx1-3/4 LG. HX.HD. GR.5 ALL-THD.
52	6	414865	CAPSCREW 5/16-18NCx1 LG. HX.SOC.HD.
53	1	414971	SCREW-POPPET 1/2-20NF HD.-LESS DR. SLOT
54	1	416059	SETSCREW 3/8-16NCx1/2 LG. HX.SOC.HD.
55	1	416109	SETSCREW 5/16-18NCx1/2 LG. SQ.HD.
56	1	416112	SETSCREW 5/16-18NCx3/4 LG. SQ.HD.
57	1	418067	NUT-JAM 1/2-20NF HX.
58	10	418163	LOCKWASHER 5/16 MED.SECT.
59	6	418176	LOCKWASHER 3/8 MED.SECT.
60	2	418184	WASHER-FLAT 3/8 ALUM.
61	8	418198	LOCKWASHER 7/16 MED.SECT.
62	2	442182	GASKET
63	1	442190	GASKET
64	1	442191	GASKET
65	3	456006	FITTING-LUBE
66	1	456008	FITTING-RELIEF
67	2	462003	QUAD-RING
68	1	468002	REDUCER
69	2	468011	PLUG-PIPE
70	1	474004	PLATE
71	1	486067	SEAL-OIL
72	1	486076	THREAD SEAL
73	1	494005	SPRING
74	1	494010	SPRING
75	2	494088	SPRING
76	2	494089	SPRING
77	2	530094	SPACER-BRAKE DISC
78	1	472013	PLUG - PLASTIC


Model H-600

PARTS LIST

Model H-600

Item No.	Qty.	Part No.	Description
1	1	299043	COUPLING
2	1	300043	ADAPTER
3	2	302229	ANGLE-600
4	2	302380	ANGLE-Y600
5	2	302417	ANGLE-X600
6	1	306036	SPRING-FLAT
7	1	308046	BUSHING
8	2	308048	BUSHING
9	1	314003	PLATE-CAM
10	1	324163	CLUTCH-JAW
11	1	328046	COVER-G.HSG.
12	1	328057	COVER-BRAKE
13	2	330010	SHOE-DRAG BRAKE
14	1	332074	DRUM-Y600
15	1	332140	DRUM-600
16	1	332141	DRUM-X600
17	1	334050	GEAR-R.H.
18	1	338038	HOUSING-BRAKE
19	1	338040	HOUSING-CLUTCH
20	1	338085	HOUSING-GEAR
21	1	340014	HUB-GEAR
22	1	340024	HUB-BRAKE
23	1	342024	KEY-SQ. END
			NOT USED
25	2	342051	KEY-RD. END
26	2	342120	KEY-RD. END
27	2	450017	KEY-BARTH
28	1	352020	PLATE-RETAINER
29	1	356806	SHAFT-DRUM-X600
30	1	357466	SHAFT-DRUM-600
31	1	357468	SHAFT-DRUM-Y600
32	1	356945	SHAFT-SHIFTER
33	1	358001	SHIFTER-HANDLE
34	1	362007	SPACER-DRUM
35	1	368057	WORM-R.H.
36	1	370057	YOKE
37	1	400003	BALL-POPPET
38	2	400007	BALL
39	2	402044	BEARING-BALL
40	1	412005	BUSHING
41	1	412006	BUSHING
42	4	414111	CAPSCREW 5/16-18NCx1 LG. HX.HD. GR.5
43	1	414140	CASPCREW 5/16-18NCx3/4 LG. HX.HD. GR.5 HYLOK HVY. PAT
44	7	414141	CAPSCREW 5/16-18NCx1 LG. HX.HD. GR.5 NYLOK HVY.PATCH
45	6	414283	CAPSCREW 3/8-16NCx1-1/4 LG. HX.HD. GR.8
46	2	414398	CAPSCREW 3/8-24NFx1 LG. HX.HD. GR.5 NYLOK HVY.PATCH
47	4	414457	CAPSCREW 7/16-14NCx1-1/4 LG. HX.HD. GR.5
48	4	414481	CAPSCREW 7/16-14NCx1-1/4 LG. HX.HD. GR.5 NYLOK HVY.PAT
49	1	414603	CAPSCREW 1/2-20NFx1-3/4 LG. HX.HD. GR.5 ALL-THD.
50	6	414865	CAPSCREW 5/16-18NCx1 LG. HX.SOC.HD.
51	6	414871	CAPSCREW 5/16-18NCx1-1/4 LG. SOC.HD. LOK-WEL
52	2	414950	CAPSCREW 1/2-13NCx1-3/4 LG. SOC.HD. LOK-WEL
53	1	414971	SCREW-POPPET 1/2-20NF HD.-LESS DR. SLOT
54	1	416059	SETSCREW 3/8-16NCx1/2 LG. HX.SOC.HD.
55	1	416109	SETSCREW 5/16-18NCx1/2 LG. SQ.HD.
56	1	416112	SETSCREW 5/16-18NCx3/4 LG. SQ.HD.
57	1	418067	NUT-JAM 1/2-20NF HX.
58	4	418163	LOCKWASHER 5/16 MED.SECT. C.P.
59	6	418176	LOCKWASHER 3/8 MED.SECT.
60	2	418184	WASHER-FLAT 3/8 ALUM.
61	8	418198	LOCKWASHER 7/16 MED.SECT. C.P.
62	2	442182	GASKET
63	1	442190	GASKET
64	1	442191	GASKET
65	3	456006	FITTING-LUBE
66	1	456008	FITTING-RELIEF
67	1	458025	MOTOR-HYD.
68	2	462003	QUAD-RING
69	1	468002	REDUCER
70	2	468011	PLUG-PIPE
71	1	474004	PLATE
72	1	486067	SEAL-OIL
73	1	486076	THREAD SEAL
74	1	494005	SPRING
75	1	494010	SPRING
76	2	494088	SPRING
77	2	494089	SPRING
78	2	530094	SPACER-BRAKE DISC
79	1	472013	PLUG - PLASTIC



Model H-600

SHORT COUPLING

PARTS LIST

Model H-600 SC

SHORT COUPLING

Item No.	Qty.	Part No.	Description
1	1	300062	ADAPTER
2	2	302229	ANGLE-600
3	2	202380	ANGLE-Y600
4	2	302417	ANGLE-X600
5	1	306036	SPRING-FLAT
6	1	308046	BUSHING
7	2	308048	BUSHING
8	1	314003	PLATE-CAM
9	1	324163	CLUTCH-JAW
10	1	328046	COVER-G.HSG.
11	1	328057	COVER-BRAKE
12	2	330010	SHOE-DRAG BRAKE
13	1	332074	DRUM-Y600
14	1	332140	DRUM-600
15	1	332141	DRUM-X600
16	1	334050	GEAR-R.H.
17	1	338038	HOUSING-BRAKE
18	1	338040	HOUSING-CLUTCH
19	1	338270	HOUSING-GEAR
20	1	340014	HUB-GEAR
21	1	340024	HUB-BRAKE
22	1	342024	KEY-SQ. END
			NOT USED
24	1	342051	KEY-RD. END
25	2	342120	KEY-RD. END
26	2	450017	KEY-BARTH
27	1	352020	PLATE-RETAINER
28	1	356806	SHAFT-DRUM-X600
29	1	357466	SHAFT-DRUM-600
30	1	357468	SHAFT-DRUM-Y600
31	1	356945	SHAFT-SHIFTER
32	1	358001	SHIFTER-HANDLE
33	1	362007	SPACER-DRUM
34	1	368195	WORM-R.H.
35	1	370057	YOKE
36	1	400003	BALL-POPPET
37	2	400007	BALL
38	1	402044	BEARING-BALL
39	1	402107	BEARING-THRUST
40	1	412005	BUSHING
41	1	412006	BUSHING

Item No.	Qty.	Part No.	Description
42	4	414111	CAPSCREW 5/16-18NCx1 LG. HX.HD. GR.5
43	1	414140	CAPSCREW 5/16-18NCx3/4 LG. HX.HD. GR.5 NYLOK HVY.PATCH
44	7	414141	CAPSCREW 5/16-18NCx1 LG. HX.HD. GR.5 NYLOK HVY.PATCH
45	6	414283	CAPSCREW 3/8-16NCx1-1/4 LG. HX.HD. GR.8
46	2	414398	CAPSCREW 3/8-24NFx1 LG. HX.HD. GR.5 NYLOK HVY.PATCH
47	4	414457	CAPSCREW 7/16-14NCx1-1/4 LG. HX.HD. GR.5
48	4	414481	CAPSCREW 7/16-14NCx1-1/4 LG. HX.HD. GR.5 NYLOK HVY.PATCH
49	1	414603	CAPSCREW 1/2-20NFx1-3/4 LG. HX.HD. GR.5 ALL-THD.
50	6	414865	CAPSCREW 5/16-18NCx1 LG. HX.SOC.HD.
51	6	414887	CAPSCREW 5/16-18NCx1 LG. BUTTON HD. LOK-WEL
52	2	414952	CAPSCREW 1/2-13NCx1-1/2 LG. SOC.HD. LOK-WEL
53	1	414971	SCREW-POPPET 1/2-20NF HD.-LESS DR. SLOT
54	1	416059	SETSCREW 3/8-16NCx1/2 LG. HX.SOC.HD.
55	1	416109	SETSCREW 5/16-18NCx1/2 LG. SQ.HD.
56	1	416112	SETSCREW 5/16-18NCx3/4 LG. SQ.HD.
57	1	418067	NUT-JAM 1/2-20NF HX.
58	4	418163	LOCKWASHER 5/16 MED.SECT. C.P.
59	6	418176	LOCKWASHER 3/8 MED.SECT.
60	2	418184	WASHER-FLAT 3/8 ALUM.
61	8	418198	LOCKWASHER 7/16 MED.SECT. C.P.
62	2	418218	LOCKWASHER 1/2 MED.SECT. C.P.
63	2	442182	GASKET
64	1	442190	GASKET
65	1	442191	GASKET
66	3	456006	FITTING-LUBE
67	1	456008	FITTING-RELIEF
68	1	458025	MOTOR-HYD.
69	2	462003	QUAD-RING
70	1	468002	REDUCER
71	2	468011	PLUG-PIPE
72	1	474004	PLATE
73	1	486076	THREAD SEAL
74*	1	486079	SEAL-PILOT
		462029	O-RING
75	1	494005	SPRING
76	1	494010	SPRING
77	2	494088	SPRING
78	2	494089	SPRING
79	2	518026	WASHER THRUST
80	2	530094	SPACER-DRAG BRAKE
81	1	472013	PLUG - PLASTIC

* IF MOTOR PILOT HEIGHT IS .11", USE P/N 486079
IF MOTOR PILOT HEIGHT IS .25", USE P/N 462029

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 the Manufacturer, or for equipment misused, neglected or which has not been installed correctly.

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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