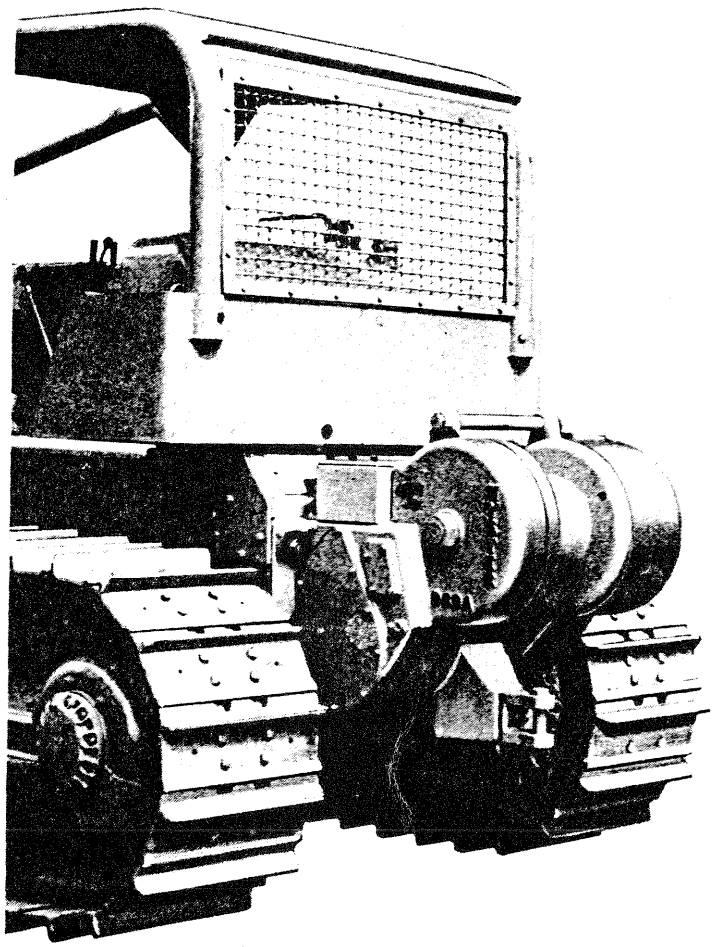
PARTS BOOK AND INSTRUCTION MANUAL

HYSTER®

D89A TOWING WINCH
AND
D89A POWER CONTROLLED TOWING WINCH



HYSTER COMPANY

TRACTOR EQUIPMENT DIVISION

Portland, Oregon ▪ Danville, Illinois ▪ Peoria, Illinois
Nijmegen, The Netherlands ▪ Sao Paulo, Brazil ▪ Irvine, Scotland
Kewanee, Illinois ▪ Sydney, Australia

LITHO IN U.S.A.

Form No. 599206 6/74

FOR PARTS AND SERVICE CONTACT

Date Purchased _____

Model Number _____

Serial Number _____

LIST OTHER SPECIAL EQUIPMENT

_____

_____

_____

_____

HOW TO USE YOUR PARTS BOOK

This parts book contains a complete listing of all parts used since the first model. When ordering parts give the model number, serial number, catalog form number, quantity and name of part.

To find any part needed for replacement, start with the index shown on the right. Determine which section contains the part desired. By bending the book back slightly to the right, the heavy arrows on the right hand side of the index page will line up with a black tab on the edge of the index page of the section desired. Proceed then to locate the part in this section.

Service, Operating, and Lubrication Instructions will be found in Section "A."

Quantities shown are quantities per assembly unless otherwise stated.

Assembly number at the top of a page contain all of the parts listed on that page; exceptions are noted.

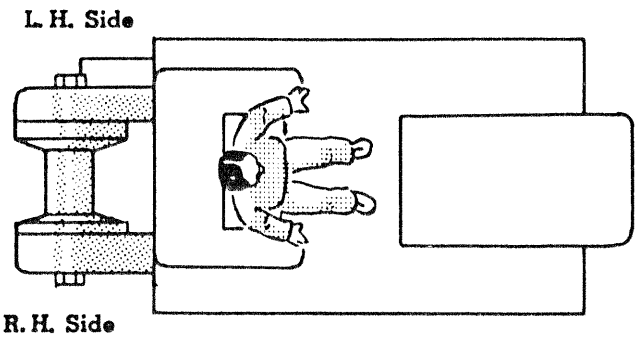
Be sure to read all foot notes at the bottom of any page from which parts are being ordered. Foot notes are indicated by an asterisk or other symbol preceding a part number.

For any further information on parts, service, or ordering, consult your local Hyster dealer.

We reserve the right to make changes in design or add improvements without incurring the obligation to make such changes in Winches previously manufactured.

INDEX

Parts Referred to in This Book as Right or Left Hand Parts
Are in Accordance with the Sketch Below



CAUTION!

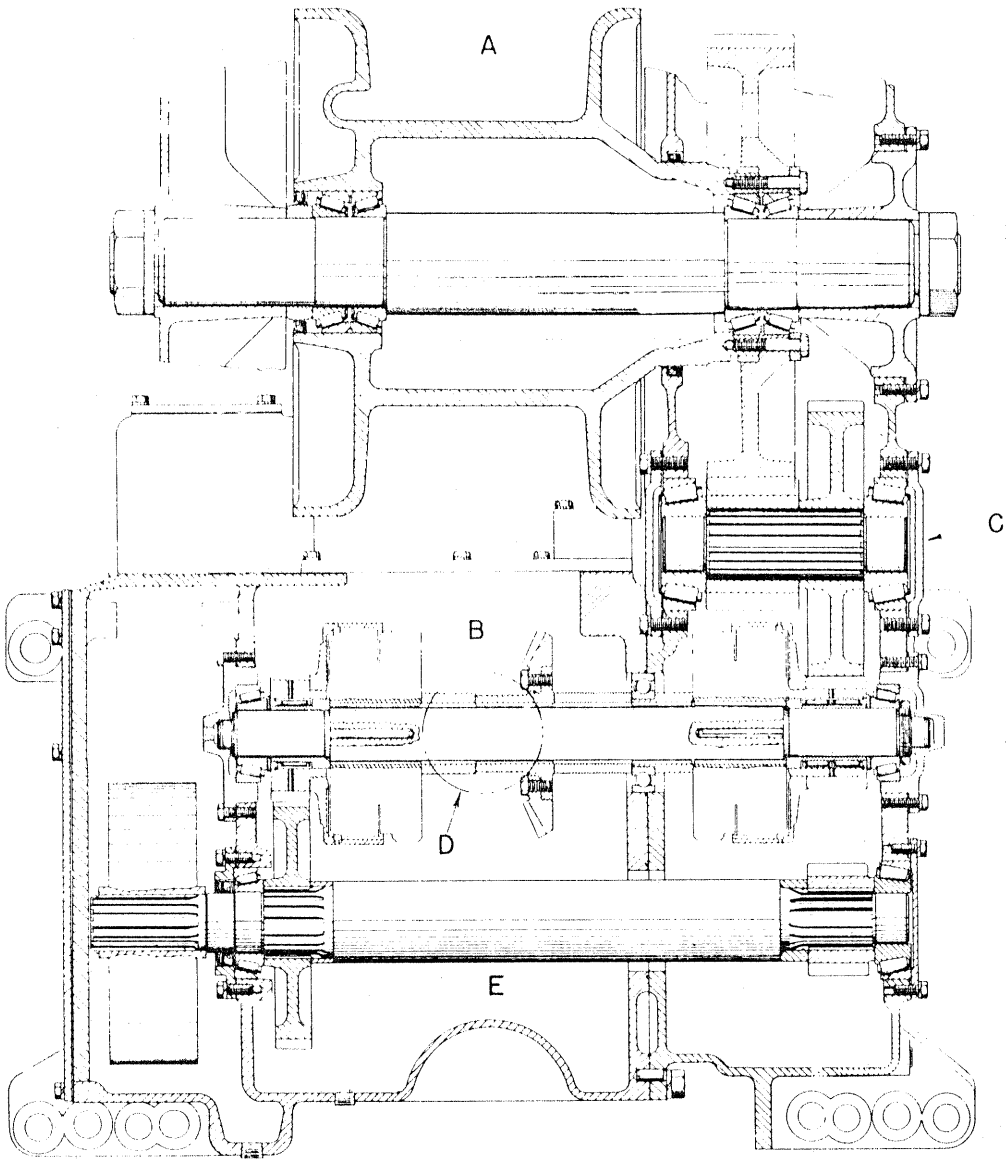
Never Attempt to Clean, Oil or Adjust a Machine
While it is in Motion

Strict Observance of this Rule will Prevent Accidents

NOTE: All Studs and Capscrews used in this Winch are Heat-treated.

GEAR TRAIN

(Power Controlled Winch)



A—DRUM SHAFT GROUP

B—BEVEL GEAR SHAFT GROUP

C—INTERMEDIATE GEAR GROUP

D—POWER TAKE-OFF GROUP

E—BRAKE SHAFT GROUP

Section A

SERVICE, OPERATION AND INSTALLATION INSTRUCTIONS

INDEX

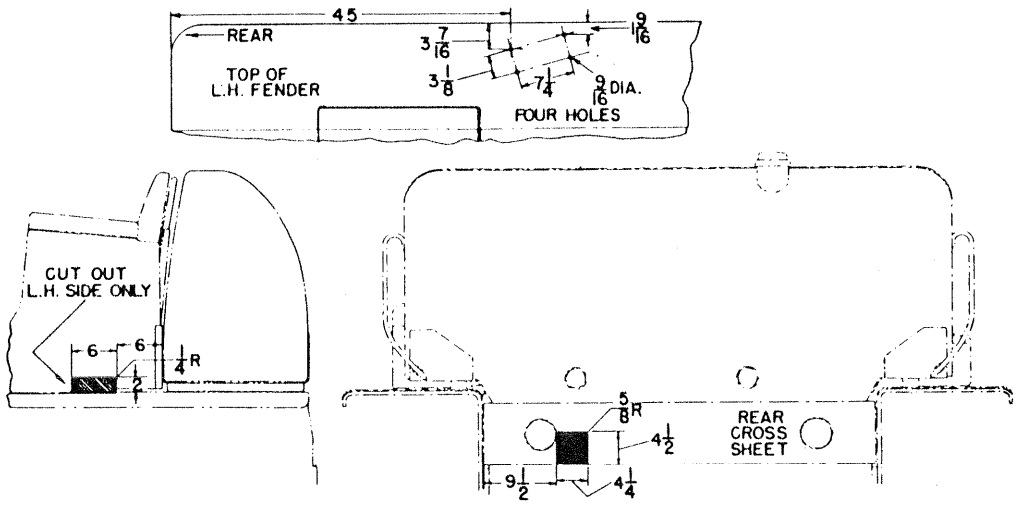
INSTALLATION INSTRUCTIONS
TRACTOR ALTERATIONS

For Mounting Direct Drive Winch

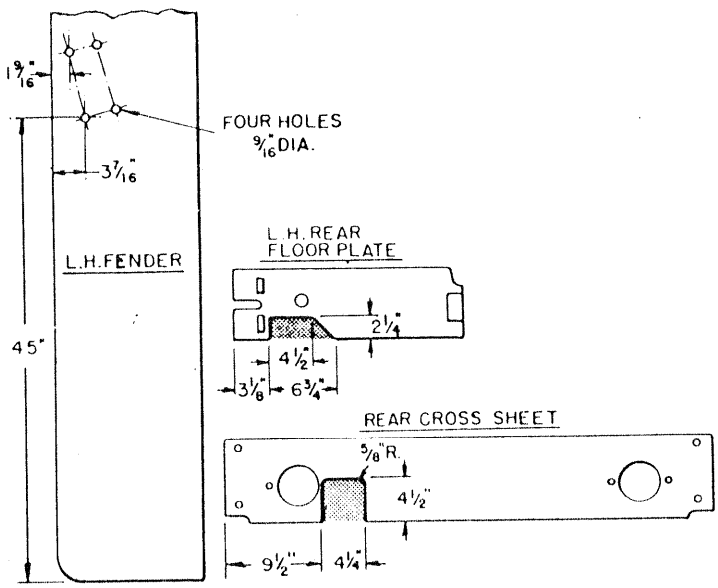
Note: Burn out Shaded Areas

1. Remove rear cross sheet and alter as shown.
2. Drill four 9/16" holes for handlever bracket as shown. (Or in most convenient location for operator.)

D9 Tractors Serial No. 49A1 and Up.
50A1 and Up.

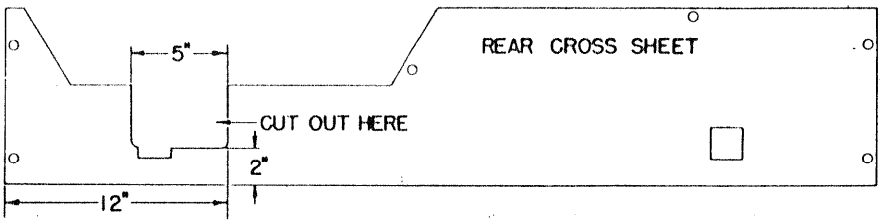


D9 Tractors Serial No. 18A1 and Up.
19A1 and Up.

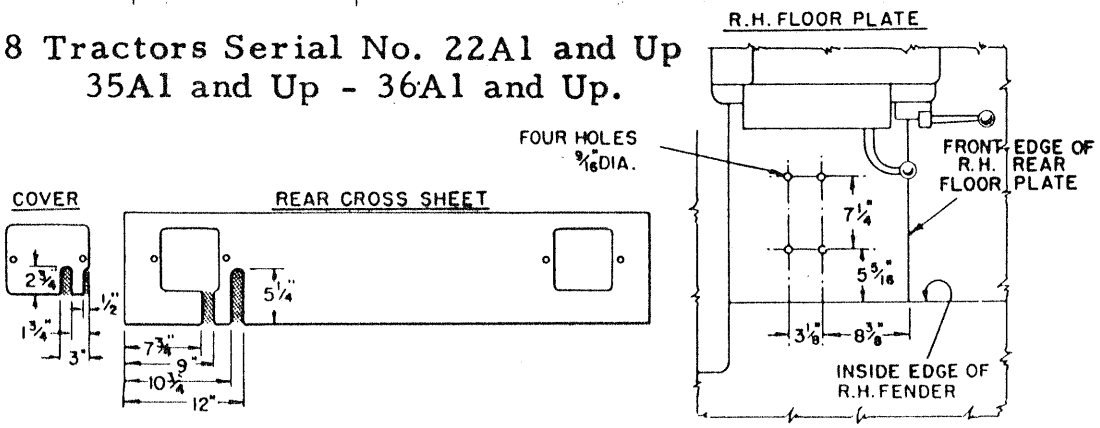


INSTALLATION INSTRUCTIONS
TRACTOR ALTERATIONS — Continued

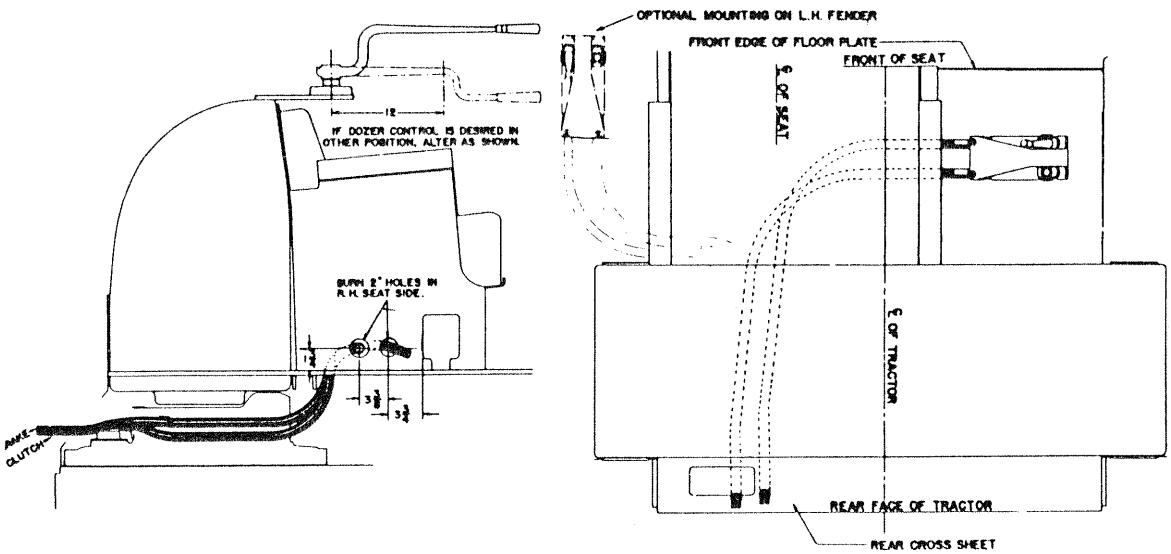
D8 Tractors Serial No. 14A1 and Up.
15A1 and Up.



D8 Tractors Serial No. 22A1 and Up
35A1 and Up - 36A1 and Up.



1. Burn two 2" Dia. holes in R. H. seat side as shown.
2. If dozer control is desired in other position, alter as shown.
3. Handlever bracket may be mounted on L. H. fender if desired. (Shown in Phantom in plan view.)



INSTALLATION INSTRUCTIONS

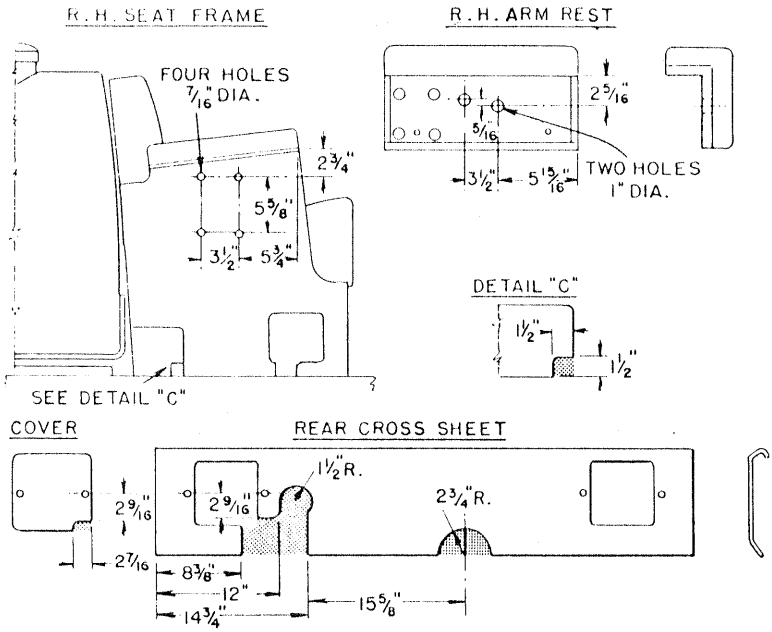
TRACTOR ALTERATIONS — Continued

For Mounting Power Controlled Winch

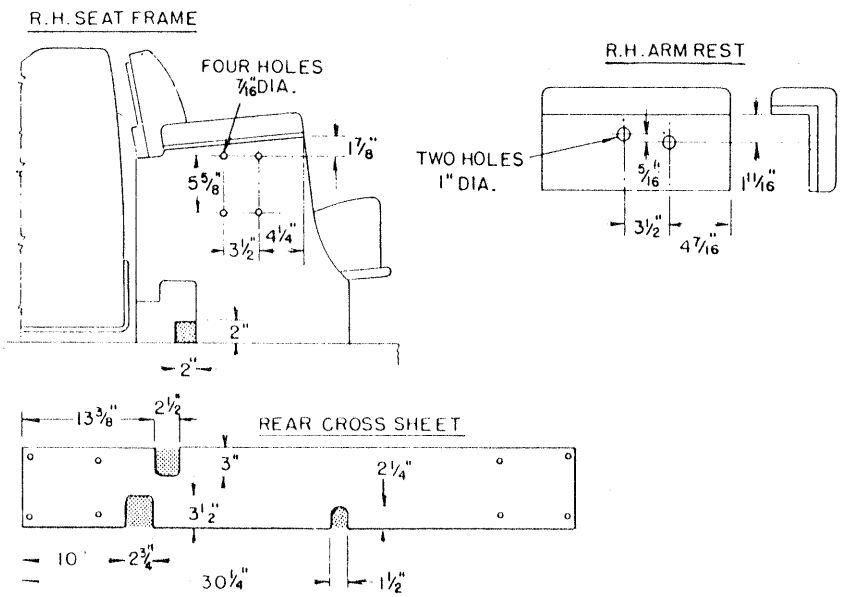
NOTE: Burn out shaded areas.

1. Remove rear cross sheet and alter as shown.
2. Remove arm rest from R. H. side of seat and alter as shown.
3. Drill four 7/16 holes in R. H. seat side as shown.

D8 Tractors S. N. 22A1 and Up.
35A1 and Up - 36A1 and Up. -46A1 And Up

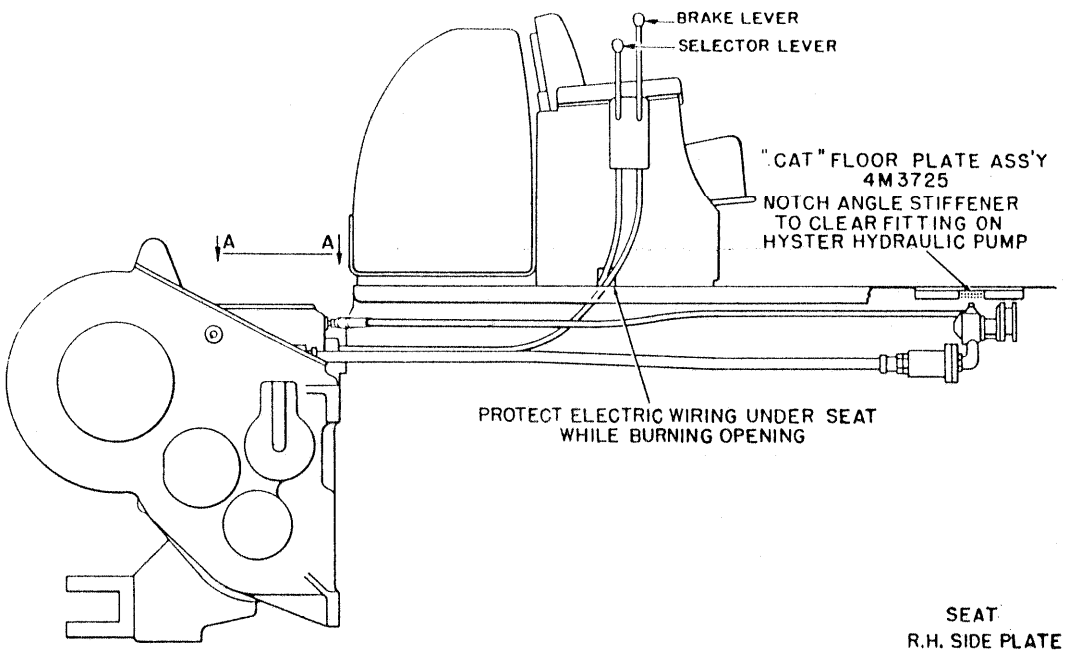


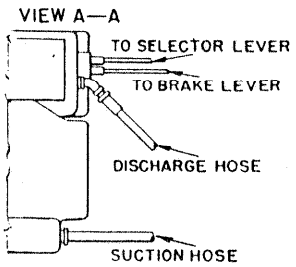
D9 Tractors Serial No. 34A1 and up - 49A1 and up - 50 A1 and up.

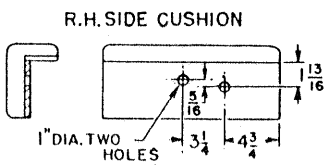


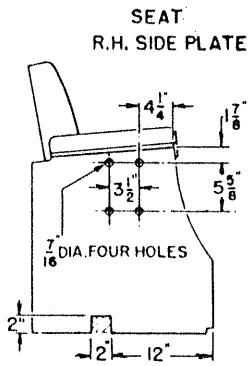
INSTALLATION INSTRUCTIONS
TRACTOR ALTERATIONS — Continued

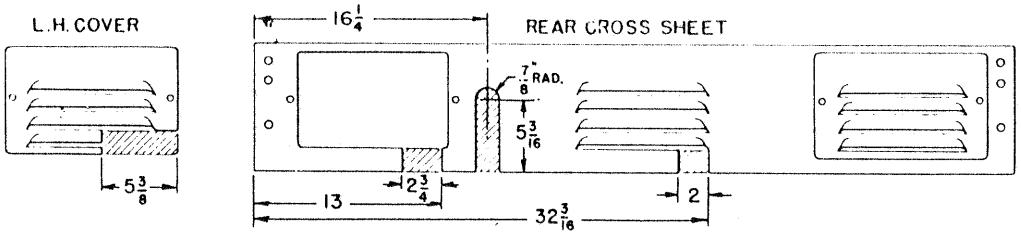
D9 Tractors Serial No. 66A1 and Up











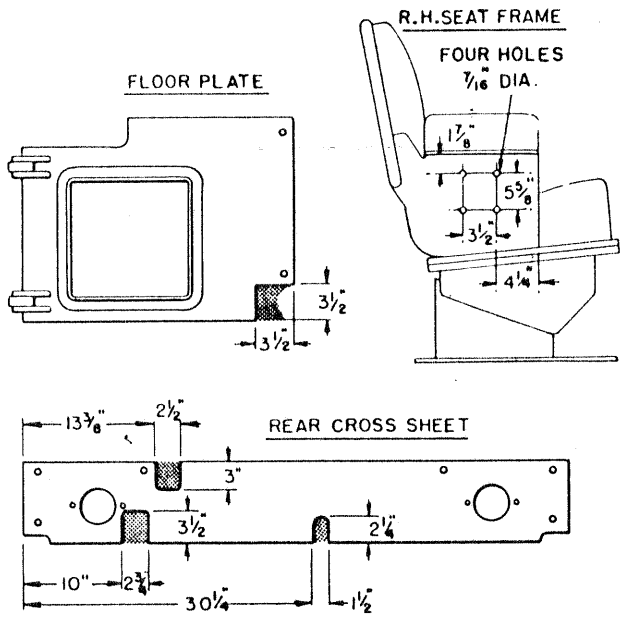
1. Remove floor plates on R.H. side of tractor.
2. Notch angle stiffener on under side of floor plate to clear fitting on Hyster hydraulic pump.
3. Replace floor plates and side cushion assembly.

NOTE: Be careful not to damage electric wiring when burning section from bottom of R.H. seat side plate.

INSTALLATION INSTRUCTIONS
TRACTOR ALTERATIONS — Continued

TRACTOR ALTERATIONS

D9 Tractors Serial No. 18A1 and Up.
19A1 and Up.



*NOTE: Dimensions for mounting the handlever bracket are approximate.
Be sure the following is accomplished:

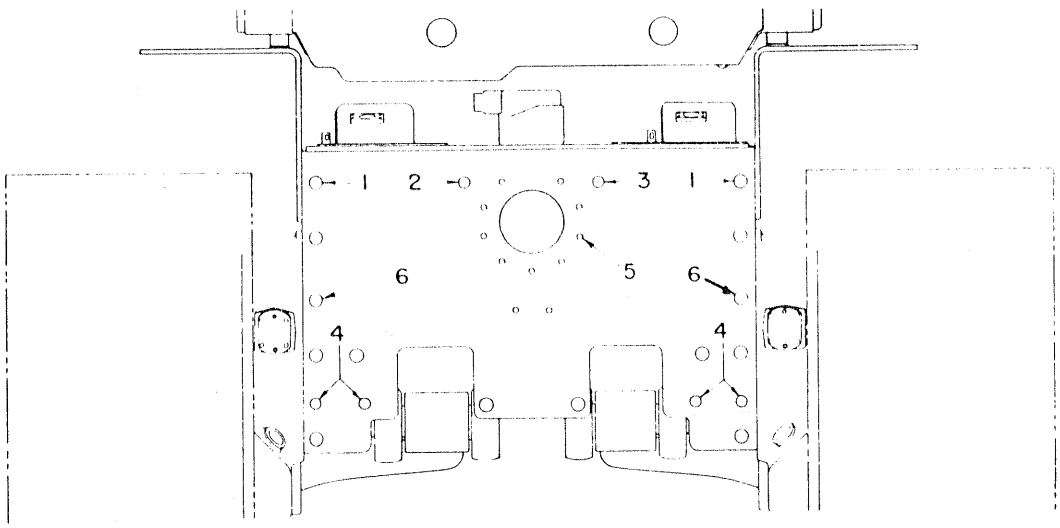
A. No interference with dozer blade control lever.
B. Good protection of Hyster control levers.

INSTALLATION INSTRUCTIONS
TRACTOR PREPARATION FOR ALL TRACTORS

1. Remove drawbar brackets.
2. Remove "Caterpillar" power take-off cover.
3. Smooth out the bevel edge of the P.T.O. bore. Remove all burrs and nicks.
4. Smooth out machining marks on the surface of the bore. Use a round back and emery.
5. Check rear face of transmission case for high spots, particularly of welds near mounting studs where winch pads are to make contact. Grind or file to insure proper fit.
6. If required, remove drawbar studs not used for winch installation and plug holes with corks.

Mounting Stud Installation

D8 Tractors Serial No. 22A1 and Up — 35A1 and Up
36A1 and Up — 46A1 and Up

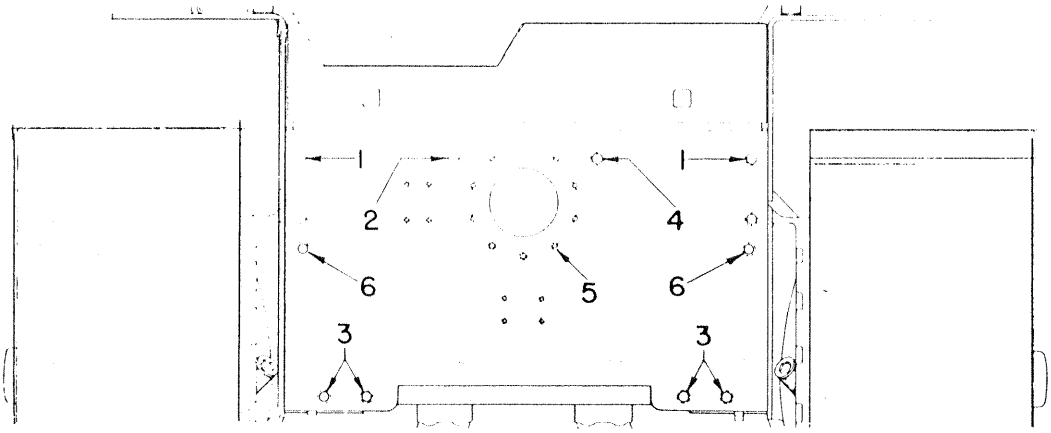


1. Install one Hyster stud (2) (1-¼ x 3-13/16, drilled), one Hyster stud (3) (1-¼ x 4-1/16) and four Hyster studs (4) (1-¼ x 4-11/16).
2. Remove two drawbar studs (6) and install at (1). Plug nine tapped holes at (5) with corks. Also plug two tapped holes at (6) with corks.
3. Assembly Torque:
   Studs (2, 3 and 4) 170±20 Ft. Lbs. Dry.
   Studs (1) 250±20 Ft. Lbs. Dry.

INSTALLATION INSTRUCTIONS

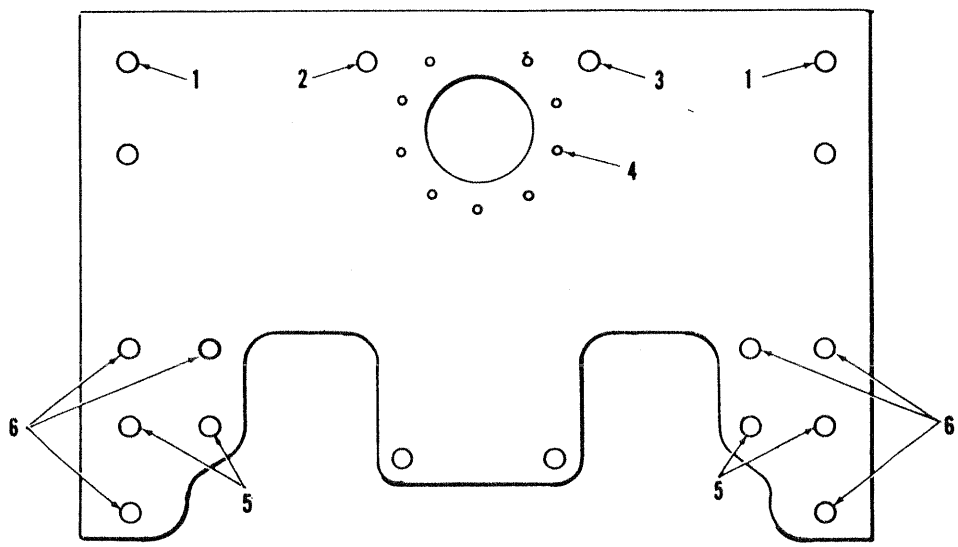
Mounting Stud Installation — Continued

D8 Tractors Serial No. 14A1 and Up — 15A1 and Up



1. Install one Hyster stud (2) (1-¼ x 3-19/32, drilled), and one Hyst. stud (4) (1-¼ x 3-½).
2. Use six "Caterpillar" drawbar studs at locations (1) and (3).
3. Plug two holes (6) with Hyster plugs No. 93193 for Series D and E and with corks for Series F and G.
4. Plug nine tapped holes at (5) with corks.

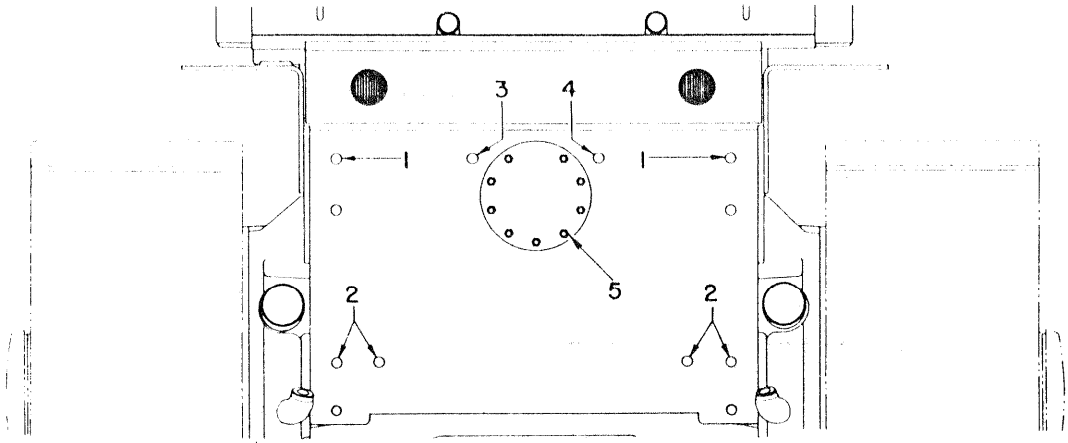
D9 Tractors Serial No. 66A1 and Up



1. Remove drawbar studs (6) and plug holes with corks furnished.
2. Install one Hyster drilled taperlock stud (1-¼ x 3-13/16) at (2) and one Hyster taperlock stud (1-¼ x 4-1/16) at (3). Torque to 170±20 Lb. Ft. Dry.
3. Install two drawbar studs at (1) and torque to 250±20 Lb. Ft. Dry. Drawbar studs (5) are used for winch mounting.
4. Plug nine holes (4) with corks furnished.

INSTALLATION INSTRUCTIONS

Mounting Stud Installation — Continued



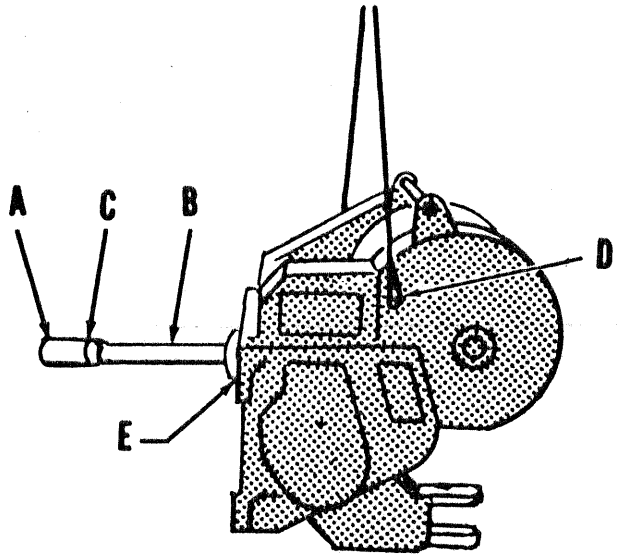
D9 Tractors Serial No. 34A1 and Up 49A1 and Up — 50A1 and Up

1. Install one Hyster stud (3) (1-1/4 x 3-13/16, drilled), and one Hyster stud (4) (1-1/4 x 4-1/16). Use drawbar studs at (1) and (2).
2. Plug nine tapped holes at (5) with corks.
3. Assembly Torque:
   Studs (1) 250±20 Ft. Lbs. Dry.
   Studs (3 and 4) 170±20 Ft. Lbs. Dry.

D9 Tractors Serial No. 18A1 and Up — 19A1 and Up

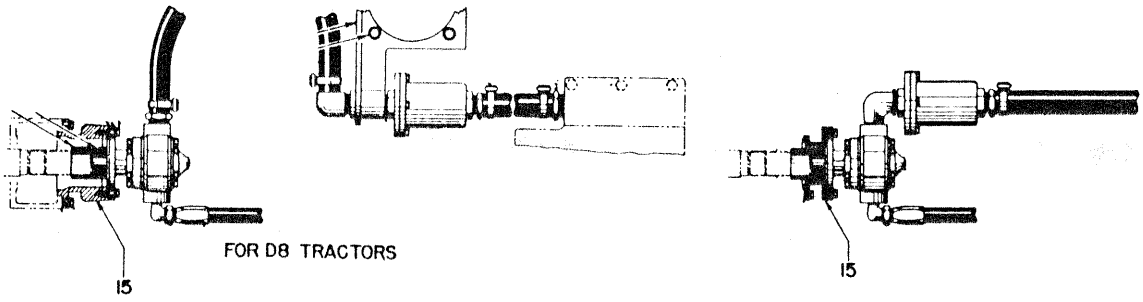
1. Install one Hyster stud (3) (1-1/4 x 3-19/32, drilled), one Hyster stud (4) (1-1/4 x 3-7/8) and two Hyster studs (1) (1-1/2 x 5-1/4). Use four drawbar studs at (2).
2. Plug nine tapped holes at (5) with corks.

INSTALLATION INSTRUCTIONS
DIRECT DRIVE WINCH INSTALLATION



1. Remove winch transmission cover and remove plugs from winch mounting face.
2. Be sure that coupling "A" is secured to shaft "B" at "C" with pin and lock ring.
3. Install P.T.O. shaft assembly in winch. (Be sure bevel pinion is in place and snap ring is properly installed.)
4. Apply a liberal coat of heavy type sealant to "O" Ring seal and install on bearing carrier at "E."
5. Install 7/8" UNF capscrews in side frames at "D" and attach sling as illustrated.
6. Clean mounting surfaces and be sure that tractor P.T.O. cover bolt holes are plugged.
7. Move winch toward tractor and line up splines on tractor P.T.O. with splines on coupling "A." Route push-pull cables as winch moves in.
8. When winch is in place, install nuts and lockwashers on the two upper mounting studs first. *Note:* Coat the stud that is inside the winch with Permatex, Plastic Lead Seal or comparable sealant. Install nuts and lockwashers on the remaining mounting studs and tighten all mounting nuts securely. Be sure cotter is installed in drilled stud inside winch.
9. Install handlever bracket, cross cables and connect to handlevers. (Brake cable goes to longer handlever.)
10. Check and adjust clutch shifter and brake lining.
11. Replace winch transmission cover.
12. Recheck to see that all fastenings are tight.
13. Replace altered rear cross sheet.

INSTALLATION INSTRUCTIONS
POWER CONTROLLED WINCH

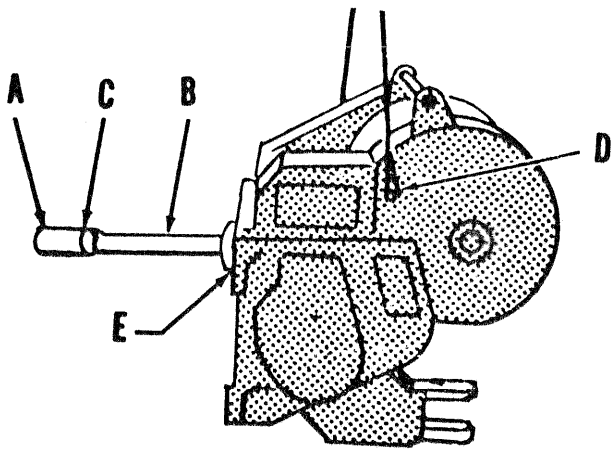


Hydraulic Pump Installation

1. Preassemble pump with all parts required for particular tractor.
2. Remove tractor L.H. floor plates. Remove cover over auxiliary P.T.O. shaft and install Hyster pump. Use cover capscrews to support Hyster bracket (15).
3. *(For D8 Tractors only.)* Remove four capscrews holding tractor oil filter, place Hyster filter bracket on top of tractor filter and fasten with Hyster capscrews.
4. Install Hyster in-line filter.
5. Connect short 1-¼ I.D. suction line (Hyster 96267) to pump, route and connect it to the in-line filter.
6. Connect long 1-¼ I.D. suction line (Hyster 96284) to filter and route to rear of tractor.
7. Connect ⅝ I.D. discharge line to pump and route to rear of tractor.

   NOTE: If pump fittings interfere with tractor floor plate, heat and alter plate as required.
8. Replace floor plates and seat side cushion assembly.

Power Controlled Winch Installation



1. Remove winch transmission cover and remove plugs, one in P.T.O. shaft opening, two in cable openings and one in stud hole in winch mounting face.

INSTALLATION INSTRUCTIONS

Power Controlled Winch Installation — Continued

2. Assemble coupling "A" and P.T.O. shaft "B," with pin and lock ring at "C."
3. Install P.T.O. shaft assembly in winch. (Be sure bevel pinion is in place and snap is properly installed.)
4. Apply a liberal coat of heavy type sealant to "O" Ring and install in groove in P.T.O. bearing carrier "E."
5. Install 7/8" UNF capscrews in side frames "D" and attach sling as illustrated.
6. Clean mounting surfaces and be sure that tractor P.T.O. cover bolt holes are plugged.
7. Remove cover and loosen attached block on handling gear control box.
8. Route control cables from rear toward front of tractor.
9. Hoist winch and hold about a foot from tractor.
10. Remove large grommets from push-pull cables, route cables through attached block and winch openings and replace grommets. Install cable ends in valve spools with approximately 5/16" of thread showing behind locknut. (Do not tighten block capscrews.)

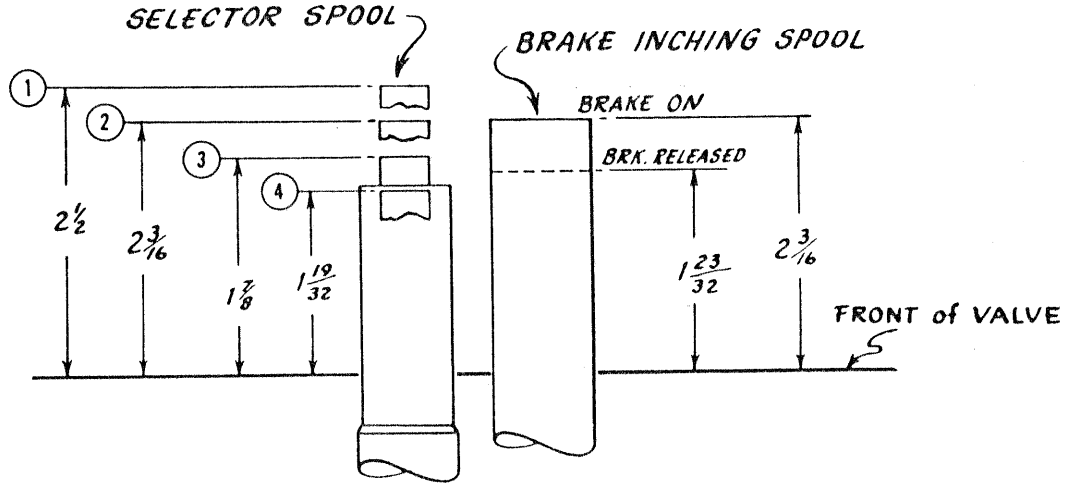
    MAKE SURE—That setscrews in block are in cable grooves and are tight. Replace cover.
11. Move winch toward tractor and line up splines on tractor P.T.O. with splines on coupling "A."
12. When winch is in place, install nuts and lockwashers on the two upper mounting studs first. *Note:* Coat the stud that is inside the winch with Permatex, Plastic Lead Seal or comparable sealant. Install nuts and lockwashers on the remaining mounting studs and tighten all mounting nuts securely. Be sure cotter is installed in drilled stud inside winch.
13. Replace transmission case cover.
14. Remove plugs from suction and discharge fittings and connect the lines to their respective fittings in the winch.
15. Install handlevers and bracket. Cross push-pull cables and attach to handlevers. *Note:* Remove handlevers from bracket to attach cables, if required. Adjust cable ends so that the handlevers just clear the bottom of the slot in the bracket when the handlevers are pushed all the way away from the operator. Tighten capscrews that hold block to handling gear control box. Check to make sure push-pull cables are not binding.
16. Replace rear cross sheet.
17. Check and adjust brake lining clearance.
18. Check and tighten all bolts, nuts and other connections.

INSTALLATION INSTRUCTIONS

Power Controlled Winch Installation — Continued

Control Valve Spool Positions

After installation, the control cable adjustment should be checked by measuring the control valve spool positions at each position of the control levers. The spool positions must be equal to the dimensions shown. If the spool positions do not check with these dimensions, the push-pull cables must be readjusted until the spools are in the correct positions as indicated.



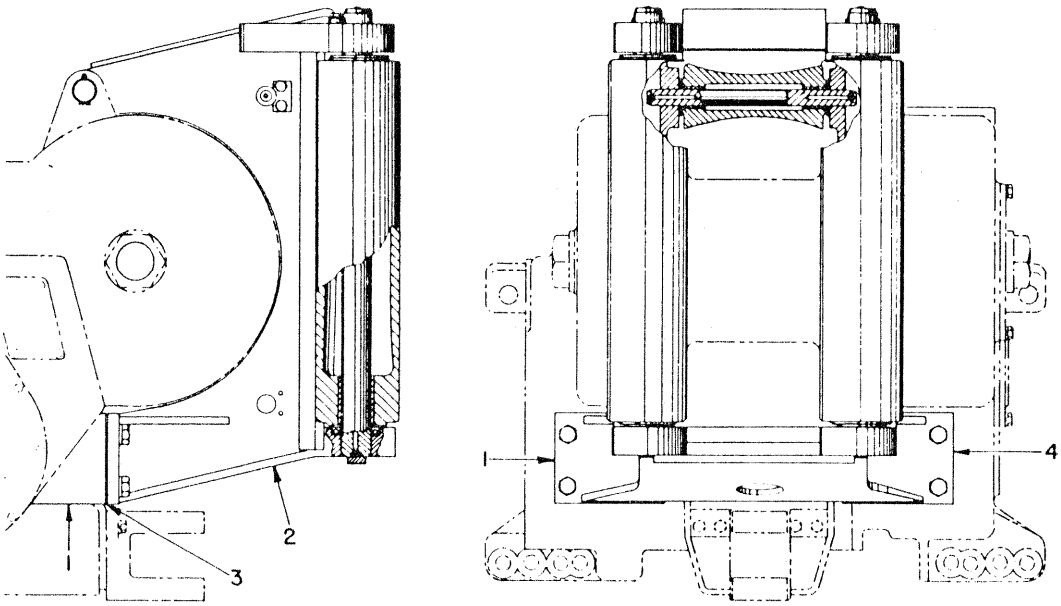
1 Reverse Clutch Engaged
2 Brake Release
3 Neutral
4 Forward Clutch Engaged

Hose Adjustment

If the hose (No. 95733) which leads from the valve to the bevel gear shaft bearing retainer, interferes with spool action, loosen hose fitting to valve, twist the hose so that it lays next to the side of the valve housing cover, and retighten the connection.

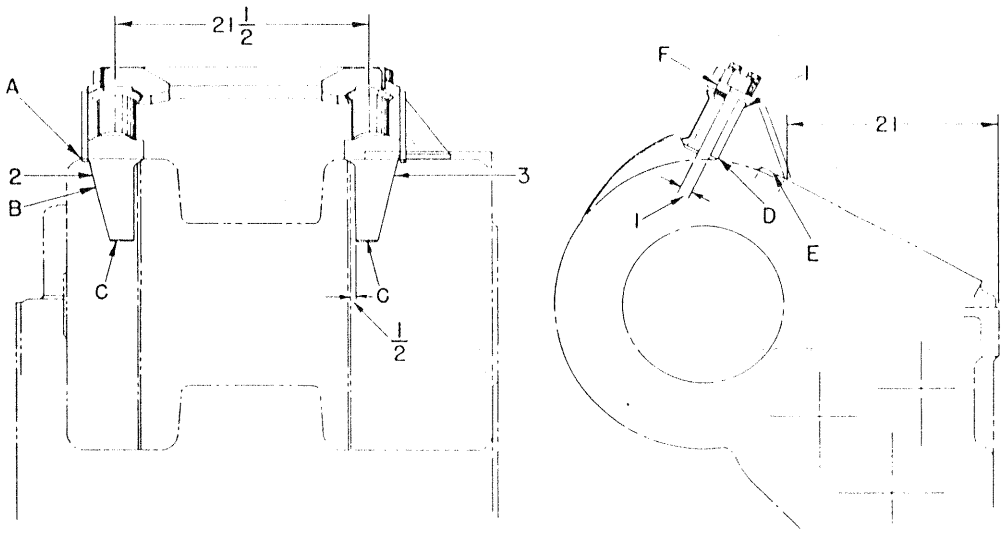
INSTALLATION INSTRUCTIONS

OPTIONAL FAIRLEAD



1. Remove winch tie rod for later use. If rod is bent and damaged it should be replaced.
2. Fasten L. H. bracket (1) to fairlead frame (2) with shims (3) in place. Fasten R. H. bracket (4) using same number of shims.
3. Swing frame (2) into position and install tie rod, removed in instruction 1. **Note: Do not allow frame to hang from tie rod.**
4. Check clearance of frame (2) around winch drum and add or remove shims (3) to allow 1/16" minimum clearance.
5. Spot weld brackets (1 and 4) to winch frame then alternate welding from one bracket to another to prevent overheating and distorting winch frames. Use 3/8 fillet weld.

INSTALLATION INSTRUCTIONS
OPTIONAL CABLE GUIDE ROLLS



1. Remove standard tie bar and ears from winch.
2. Assemble all parts except gusset (1).
3. Tack weld brackets (2 and 3) and gusset (1) in place.
4. Weld securely to winch as follows:
   3/8 fillet weld at "A", 5/16 fillet weld at "B", 3/8 x 3/4 fillet weld at "C". 5/16 fillet weld at "D". No weld at "E" and "F".
   NOTE: To avoid distorting side frames, weld intermittently. Do not complete welding of one part at one time but alternate back and forth to opposite sides of winch.

OPERATING INSTRUCTIONS

DIRECT DRIVE WINCH

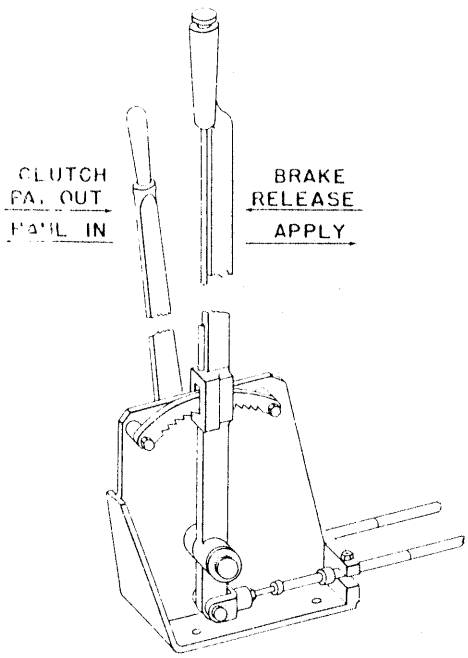
Do Not Operate Winch While Tractor Is In Motion

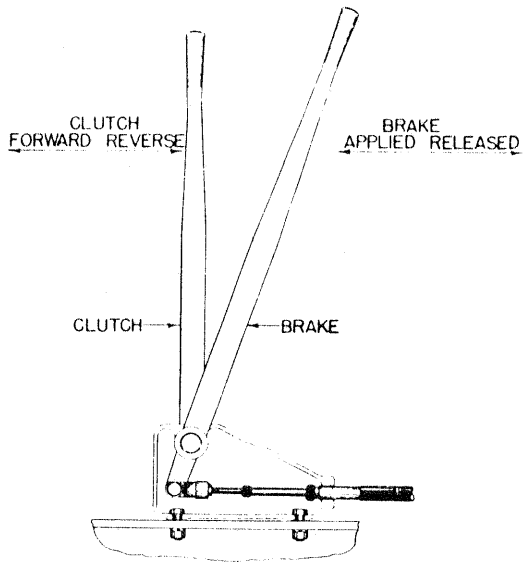
FOR WINCHES SER. NO. A67P-1945 AND UP

To Apply the Brake PULL THE HANDLEVER BACK.
PUSH FORWARD to release.

FOR WINCHES PRIOR TO SER. NO. A67P-1945

To Apply the Brake PUSH THE HANDLEVER FORWARD.
PULL BACK to release.





CAUTION: With a standard brake, the brake handlever must be released *before* operating the winch. The tractor master clutch must be disengaged *before* the winch brake is applied to avoid stalling the tractor motor or burning the winch brake lining.

The optional automatic brake should be applied while hauling in a load, but *must* be released to pay out cable.

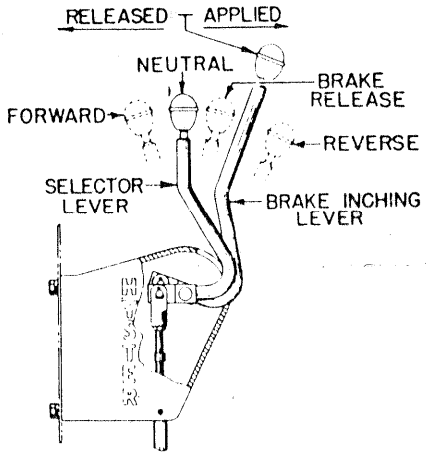
Disengage the tractor master clutch before shifting gears in the winch.

To haul in a load push the clutch lever forward. Pull back to pay out cable.

CAUTION: DO NOT APPLY MORE HANDLEVER EFFORT THAN NECESSARY TO OPERATE BRAKE OR SHIFTER

OPERATING INSTRUCTIONS
POWER CONTROLLED WINCH

One advantage of the Power Controlled Winch is that the winch may be operated while the tractor is in motion.



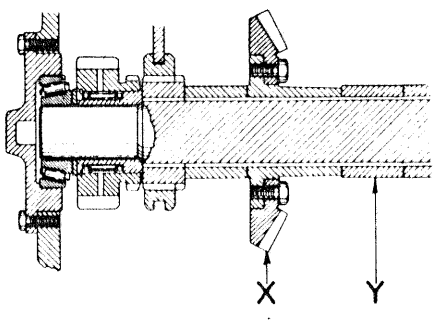
For normal operation the selector lever only is used; push for reverse and pull for forward. The brake is automatically released when the clutches are engaged and applied when the clutches are disengaged. For inching a load pull on the brake lever. It will automatically return to the applied position.

CAUTION: Do not operate winch if clutches slip. Investigate cause.

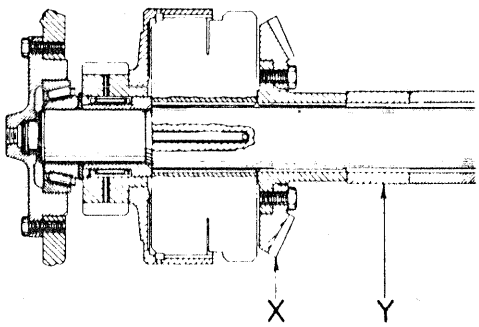
OVERWIND — UNDERWIND

Unless otherwise specified, all winches are set to wind the cable over the top of the drum barrel.

BEVEL GEAR OVERWIND TO UNDERWIND CHANGE



Direct Drive

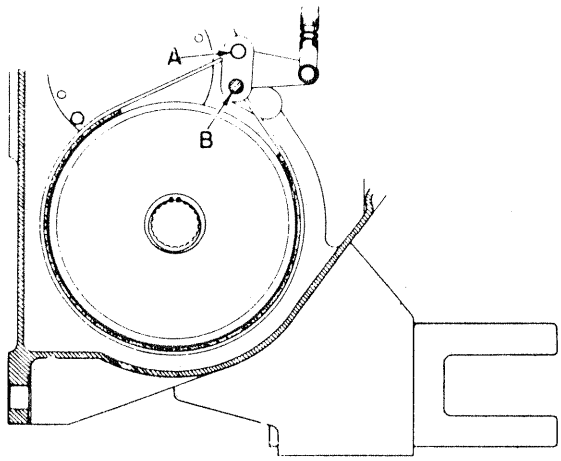


Power Controlled

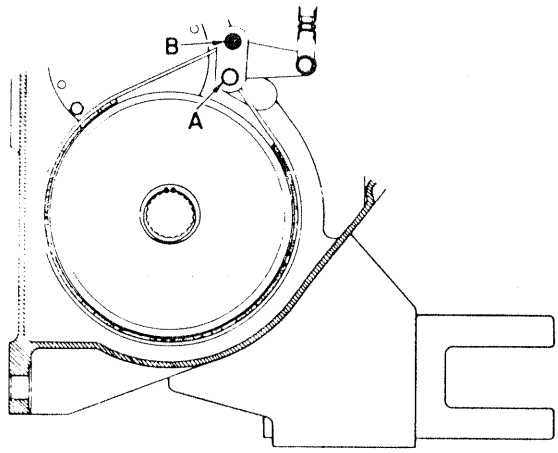
For underwind operation remove bevel gear "X" and spacer "Y" and replace them as shown.

OPERATING INSTRUCTIONS
BRAKE BAND CHANGE FROM OVERWIND TO UNDERWIND

For Winches Serial No. A68P-1777 and Up — A67P-1765 and Up



OVERWINDING



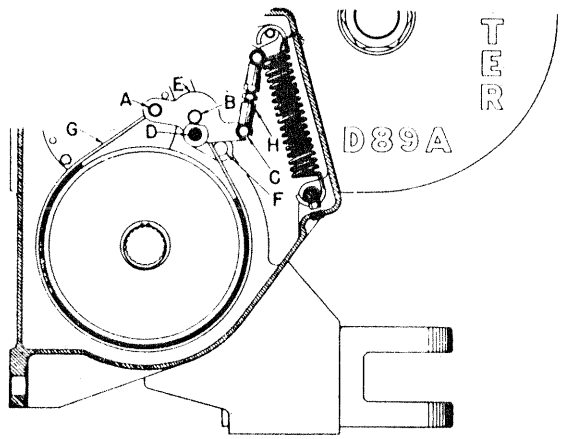
UNDERWINDING

Pin "A," 4 5/8" long, with cotter hole in center, holds the moveable end of the brake band.

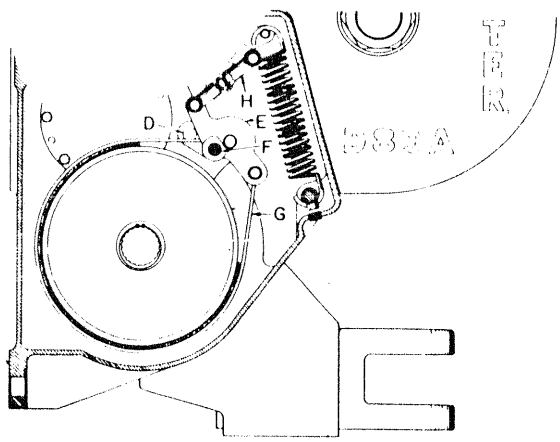
Pin "B," 6 3/8" long, with tapped hole in end, is the anchor pin.

To change from overwind to underwind, remove pins "A" and "B" from positions shown in illustration marked "overwinding" and insert them in positions shown in illustration marked "underwinding."

For Winches Prior to Serial No. A68P-1777—A67P-1765



OVERWINDING

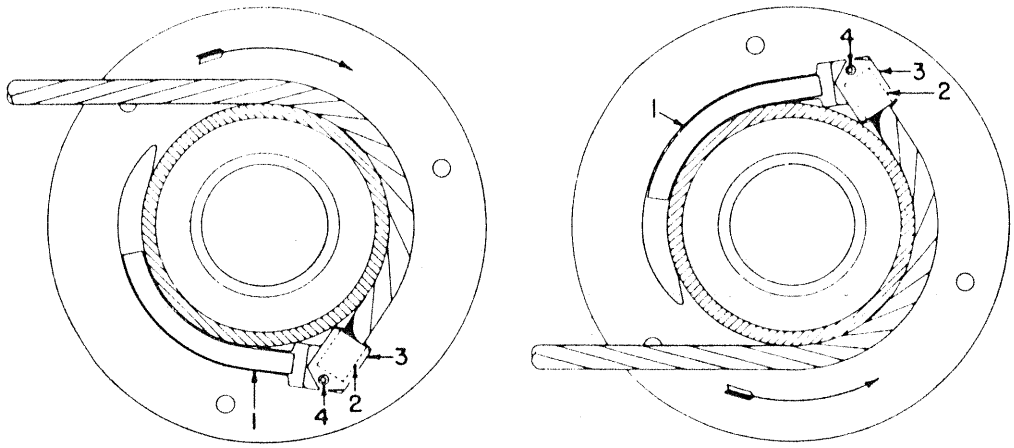


UNDERWINDING

Remove pins, "C" and "D." (Pins "A" and "B" need not be removed.) Turn crank "E" over (along with brake band "G") and replace pin "D" in new location at "F."

OPERATING INSTRUCTIONS

Attaching Cable to Drum—Overwind or Underwind

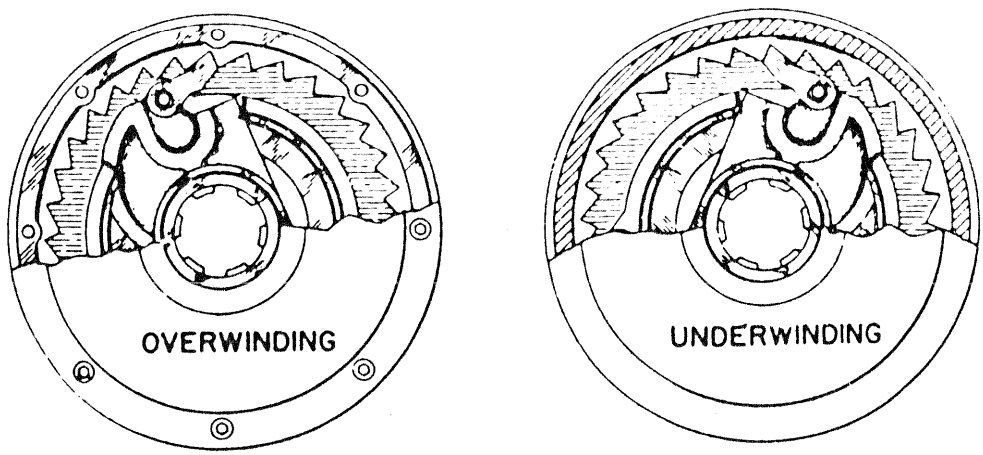


OVERWINDING UNDERWINDING

Place cable groove filler (1) in drum barrel as shown and tack weld in place.

Place ferrule (2) in pocket and lock in place with ferrule lock (3), using capscrew (4).

Automatic Brake—Optional (For Direct Drive Winch only)



When cable is to be used "overwinding" the side of brake which is marked overwinding should face outwardly. When cable is to be used "underwinding," the automatic brake should be removed and re-installed in the reverse position with the side marked "underwinding" facing outward.

Instructions covering brake linkage and adjustments on standard brake apply also to the optional automatic brake.

SERVICING INSTRUCTIONS

Troubleshooting—Direct Drive Winch

A. Brake Not Holding

1. Drain water from brake compartment.
2. Check brake lining for oil saturation and wear.
3. Check brake band adjustment.
4. Check push-pull cable for proper adjustment.

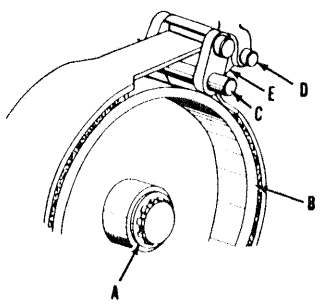
B. Hard Shifting:

1. Check push-pull cable for freeness.
2. Check clutch handlever for binding due to rust, dirt, etc.
3. Disconnect push-pull cable and check the shifter shaft for binding in the transmission case and R.H. side frame bores.

For Winches Serial No. A67P-1765 and Up—A68P-1777 and Up

Brake Band Adjustment

1. Remove both covers on L.H. side of winch.
2. Release brake by moving brake handlever forward on the Direct Drive winch or moving the selector lever to "Brake Release" on the Power Controlled winch.
3. Loosen the jam nut on the adjusting link assembly.
4. Turn the adjusting link in or out to shorten or lengthen as required.
5. Be sure to allow sufficient clearance (approximately 1/32") between the drum and lining to prevent lining "drag."
6. Tighten jam nut on adjusting link.



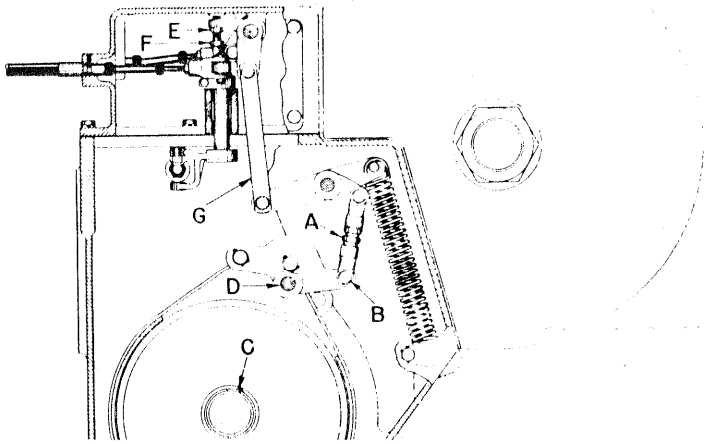
Brake Band Removal

For Winches Serial No. A67P-1765—A68P-1777 and Up

1. With brake band in released position, remove snap ring "A."
2. Remove pins "C" and "D" and slide the drum "B" (with brake band) from shaft.

SERVICING INSTRUCTIONS
FOR DIRECT DRIVE WINCH

For Winches Prior to Serial No. A67P-1765—A68P-1777



Brake Band Adjustment

1. Remove both covers on the L. H. side of winch.
2. Pull brake handlever back into the "release" position.
3. Loosen jam nut on link "A" and turn link to the right to tighten or to the left to loosen brake band. Allow sufficient clearance between drum and lining to prevent "dragging."

Brake Band Removal

1. With brake in the "release" position, remove pin "B."
2. Remove pin "D" and snap ring "C."
3. Slide drum from shaft and remove brake band.

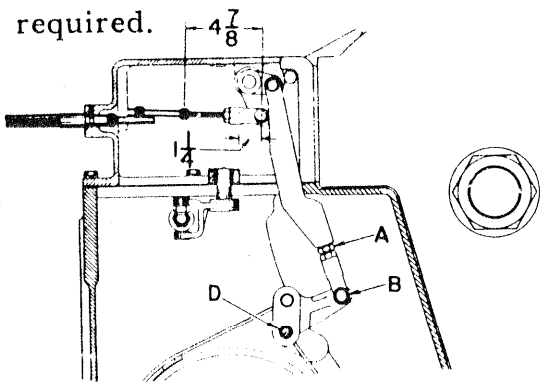
Resetting Brake Linkage (After Removal for Servicing)

1. Pull brake handlever back into the "Release" position.
2. Loosen jam nut "E" and turn capscrew "F" slowly until link "G" will just hold brake band in "Release" position. Over toggling will prevent brake from being applied.
3. Tighten jam nut "E."

Shifter Clutch

No internal adjustment is required.

PUSH-PULL CABLES



When installing new brake cable, adjust to dimensions shown.

NOTE: Remove large grommets to insert cables in winch openings, then replace.

SERVICING INSTRUCTIONS
TROUBLESHOOTING FOR POWER CONTROLLED WINCH

A. Winch fails to operate or is sluggish in its operation:

1. Check filter for leaks or excessively plugged.
2. Check all connections in suction line to see if they are tight.
3. Check winch oil level.
4. Check pump for proper flow output.
5. Check relief valve (part of control valve) for proper setting.
6. Check all hoses inside of winch case for leaks.
7. Check push-pull cables for proper adjustment. The push-pull cables should have one inch of travel with the valve spools and handlevers connected to the cables. If the cable does not have the specified travel, adjust valve spool and handlever adjustment until the one inch travel is obtained.

If the trouble is not eliminated with the above check, some internal parts are probably broken. Check the following:

A. Low Operating Pressure: Check Control Valve for:

1. Broken relief valve spring.
2. Dirt jammed in relief valve port.
3. Adjusting washers left out by mistake.

B. Brake Not Holding Propertly

1. Water in brake compartment.
2. Improper brake band adjustment.
3. Oil on brake band.
4. Broken brake spring.
5. Sticky piston in brake cylinder due to dirt, chips or damaged piston.
6. Worn poppet on control valve selector spool allowing spool to shift to "Brake Release Position."

C. Low Clutch Pressure:

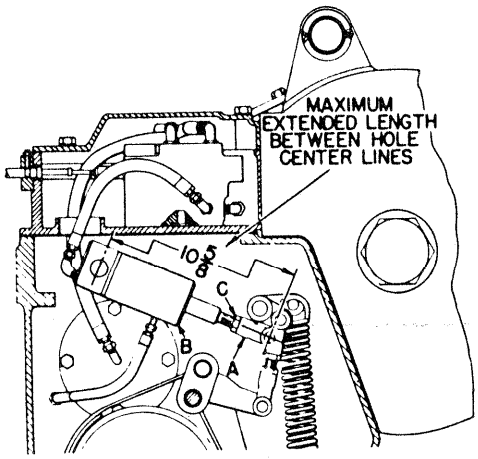
1. Improper stroke adjustment on push-pull cable to selector spool.
2. Broken seal ring on bevel gear shaft.
3. Damaged "O" Ring in clutch pack.
4. Damaged or badly worn pump.
5. Plugged filter

D. Slow Response:

1. Cold temperature operation with warm weather oil.
2. Improper stroke adjustment on push-pull cable to selector spool.
3. Filter plugged
4. Tractor engine idled too low.

SERVICING INSTRUCTIONS
FOR POWER CONTROLLED WINCHES

Brake Cylinder Adjustment



Adjust rod end "A" on cylinder "B" to maximum extended length of 10⅝" between center lines of pin hole in rod end and pin hole in cylinder. After adjustment be sure to tighten jam nut "C."

Brake Band Adjustment (See Direct Drive Winch)

Brake Band Removal (See Direct Drive Winch)

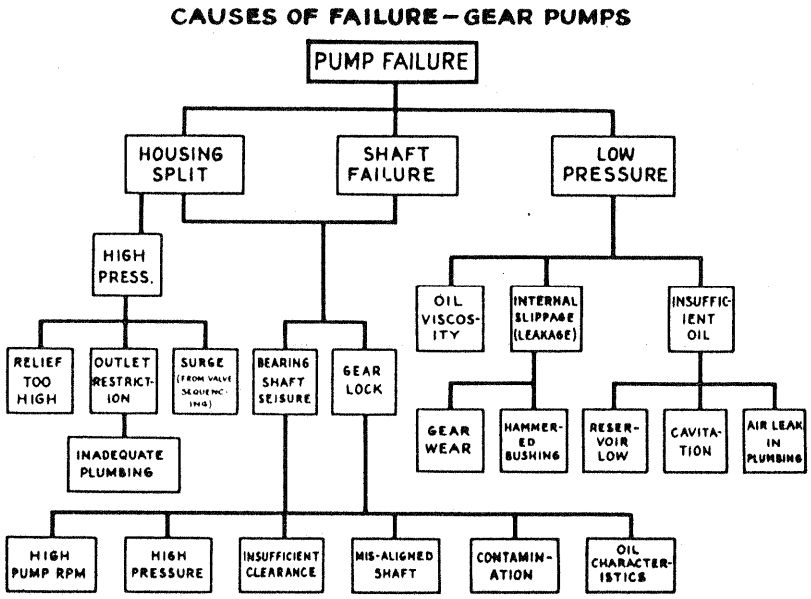
Clutch Adjustment

No adjustment of clutches is required.

CAUTION: Do not operate winch if clutches slip. Slipping will cause clutch plate failure. If clutches slip, check hydraulic system for: Plugged filter, faulty pump operation, incorrect relief valve setting, leaking lines, etc. If this caution is observed, the clutches will give years of satisfactory operation without overhaul.

SERVICING INSTRUCTIONS — POWER CONTROLLED WINCH

Servicing Pump



The pump contains two steel gears, a drive and driven shaft, and four bearing assemblies. The machined housings support the gear shafts and are provided with oil seal rings.

When servicing the pump, extreme care must be taken to prevent foreign matter from entering the unit and causing damage to the machined surfaces.

DISASSEMBLY

a. Remove the eight screws and washers and lift cover from body. If cover sticks, tap lightly with raw-hide mallet.
b. Cover bearings may remain in either the body or cover, but should be match marked in their respective locations for reassembly.
c. Remove relief valve spring and ball from cover.
d. Identify gears with match marks for correct reassembly.
e. Remove oil seal from body assembly using an arbor press and suitable dowel rod.

Cleaning

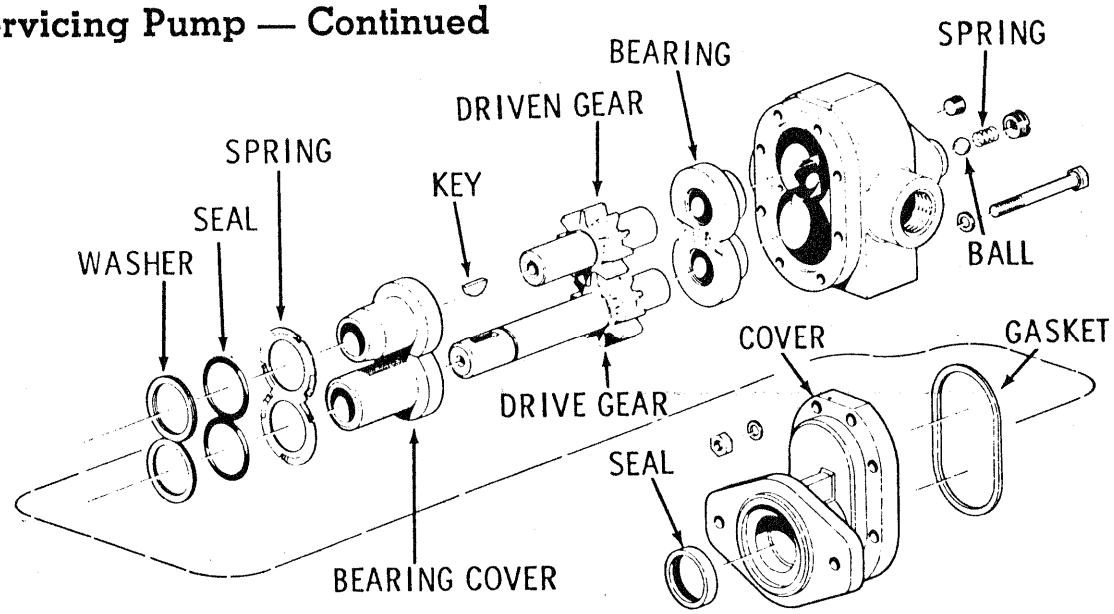
a. Wash all parts in a suitable cleaning solvent and dry with filtered compressed air.

Inspection and Repair

a. Inspect gears for chipping or evidence of wear.
b. Inspect bearing bore for scoring or wear.
c. Inspect bearing surfaces for deep grooving or scoring and refinish if necessary. Bearing surfaces may be dressed on a piece of fine abrasive paper held to a true flat surface plate. Do not dress enough to remove oil groove.

SERVICING INSTRUCTIONS — POWER CONTROLLED WINCH

Servicing Pump — Continued



d. Check bearing flats and bearing for wedging in their respective housings. If bearings wedge in the housings or new bearings are installed, proceed as follows: Hold the bearings at extreme ends of a discarded gear shaft from which the teeth have been removed and dress the flats lightly against a piece of fine abrasive paper held to a true flat surface plate. Dress a little at a time and repeat. Check in the housing until the bearings slide into place freely. The clearance between the flats, when assembled in their housing, should not exceed .005 to prevent turning of the bearing, resulting in lowering the pump efficiency.
e. Inspect relief valve ball and seat in cover for grooving.

LUBRICATION

a. Lubricate drive gear journal with SAE No. 10 oil before installing through shaft seal.

REASSEMBLY

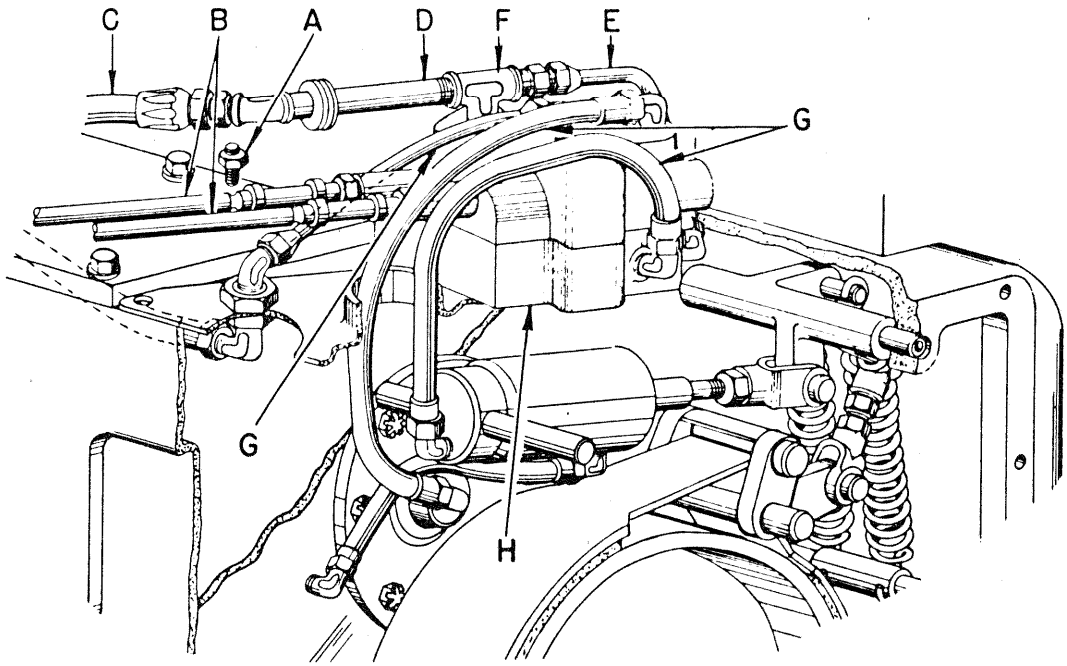
a. Discard all rubber seal rings and replace at time of overhaul.
b. Press a new seal assembly into the body with an arbor press, taking care that seal enters at right angles to the body recess and does not damage the body.
c. Insert body bearings in their previously match-marked positions.
d. Insert drive gear into body bearing.
e. Insert driven gear into body bearing in the same position from which it was removed. (Do not invert driven gear.)
f. Slide cover bearings onto gear journals in their previously match-marked positions.
g. Insert seal ring in body recess.
h. Insert relief valve ball and spring into body, tapping lightly to insure seating.
i. Secure cover to body with the eight screws torqued to 28-32 foot pounds.

SERVICING INSTRUCTIONS — POWER CONTROLLED WINCH

Servicing Control Valve

Remove valve for servicing. Clean thoroughly and place on a clean work area. The internal parts of the valve have finely ground finishes and any nicks or scratches may cause irrepairable damage.

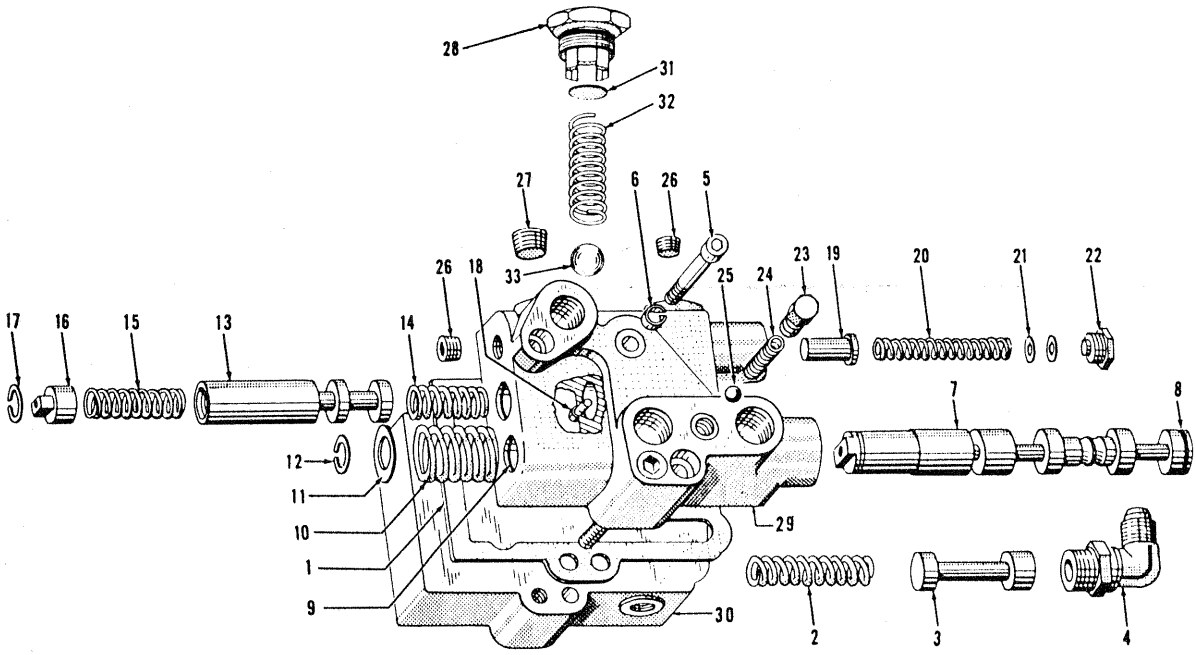
Removal of Valve From Winch



1. Remove valve housing cover set screws "A" and loosen push-pull cable lock nuts on the valve spools.
2. Remove cables from handlever bracket on tractor and unscrew the cable ends from the valve spools by turning the free ends of the cables "B."
3. Remove the pump supply hose "C" and nipple "D."
4. Remove the valve housing.
5. Detach tube assembly "E" and remove tee "F."
6. Disconnect the clutch and brake hoses "G."
7. Remove socket head capscrews attaching valve "H" to winch.
8. Remove valve "H" from winch. Remove or secure the "O" Ring that seals between the valve and the winch. Be sure "O" Ring is replaced when reinstalling valve on winch to avoid seepage around base of control valve.
9. Reverse above procedure for valve installation and check for proper stroke adjustment between the push-pull cables and spools.

SERVICING INSTRUCTIONS — POWER CONTROLLED WINCH

Control Valve



Selector Spool Removal

This may be accomplished without removing the valve body (29) from the support (30).

1. Remove the snap ring (12), washer (11), and spring (10).
2. Remove the plug (23), spring (24), and ball (25).
3. Remove the spool (7), by pushing the rod end through the valve body as shown.
   CAUTION: Do not pull the rod end of the spool after the ball (25), has been removed or the "O" Ring (8), on the spool will come in contact with a dump port and be damaged.

Selector Spool Inspection and Reinstallation

1. Inspect for nicks on the spool. Light nicks may be removed by lapping but if there are deep nicks spool must be replaced.
2. Replace "O" Rings (8) and (9) with new parts.
3. Use a light oil on all parts before reassembly. Install "O" Ring (9) and install spool in reverse manner from removal. "O" Ring (8) is replaced last and does not pass over port.
   CAUTION: Do not pull on spool (7) to get "O" Ring (8) compressed into spool bore. Tap end of spool to accomplish this, and avoid over-travel causing damage to "O" Ring (8) in internal ports.

SERVICING INSTRUCTIONS — POWER CONTROLLED WINCH

Control Valve—Continued

Brake Inching Spool Removal

1. Plug (16) or spring (15) may be removed without removing the inching spool (13) by removing snap ring (17).
2. To remove spool (13) remove capscrews (5) and detach the valve body (29) from the support (30).
3. Remove the spool stop capscrew (18) on the under side of the valve body while pressing gently on the inching spool to take the load off the stop.
4. Remove the spool and return spring (14).

Inching Spool Inspection and Assembly

1. Check bore and spool (13) for dirt or nicks. Remove light nicks by lapping. Deep nicks necessitate new parts.
2. Oil all parts generously. Place new "O" Ring firmly in groove and install spring (14) and spool. Tap spool gently to pass over "O" Ring, and while holding in position, replace spool stop capscrew (18).
3. Clean out socket for travel spring (15), grease lightly and replace spring and cable plug (16).

Relief Valve and Quick Release Valve

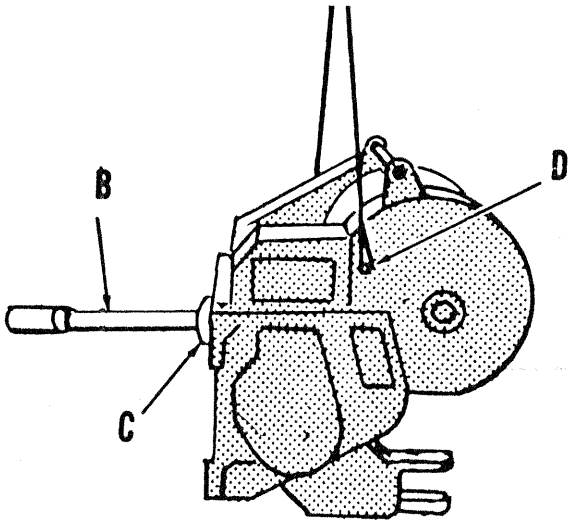
1. Remove retainer (22), washers (21), spring (20) and piston (19). The washers (21) regulate relief valve pressure. Add washers to increase pressure, remove washers to decrease pressure. The relief valve setting is as follows: 225 PSI at 6-½ GPM—1,000 RPM—Oil Temperature 70°.
2. To check quick release valve spring (2), remove fitting (4) and piston (3).
3. After checking and cleaning all parts thoroughly, lubricate with SAE No. 10 engine oil and assemble in the reverse order of disassembly. Replace pistons (19) and (3) with new parts if there are deep nicks, and remove light nicks by lapping.

Servicing Filter

After cleaning filter screen, care should be taken when reassembling filter to prevent stripping threads of capscrews holding cap to body. Only slight pressure will give a good oil seal.

SERVICING INSTRUCTIONS

Removal of Winch and Disassembly

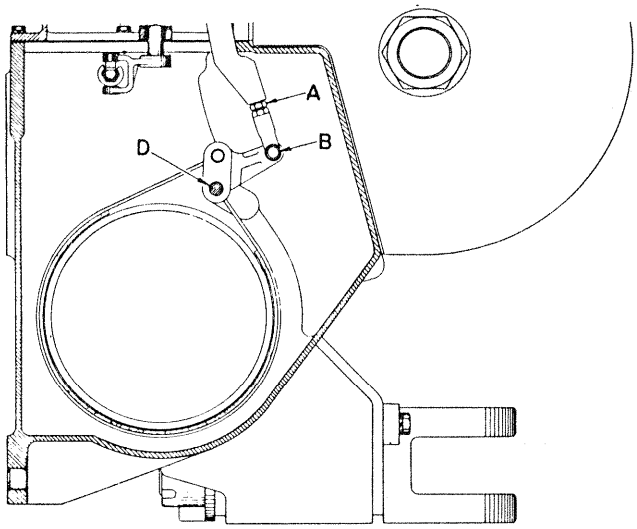


1. Disconnect all control linkage.
2. Install two 7/8" UNC capscrews in the winch side frames at "D" and mount a sling as shown.
3. Remove transmission cover and remove cotter and nut from mounting stud inside winch..
4. Remove winch and drain the oil from both transmission compartments.

P.T.O. Assembly Removal

Unbolt the P.T.O. bearing carrier and remove the complete P.T.O. assembly. Be careful not to damage shims behind bearing carrier.

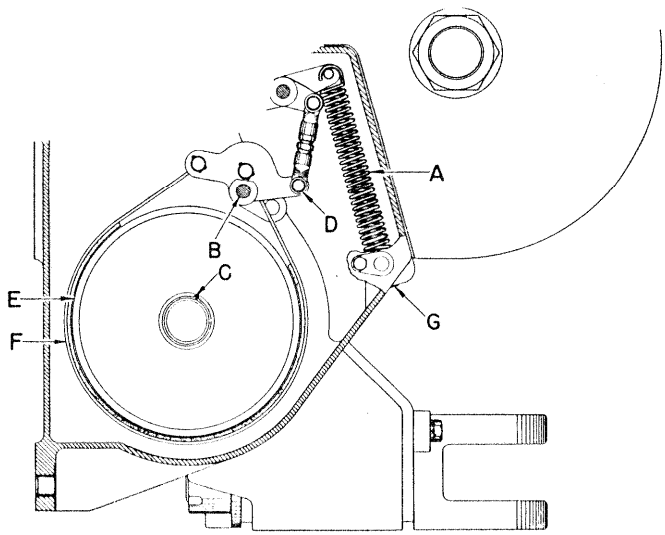
DISASSEMBLY OF WINCH



FOR DIRECT DRIVE WINCHES SERIAL NO. A67P-1945 AND UP

Brake Shaft Removal

1. Set brake in "Released" position and remove pins "B" and "D" and snap ring holding brake drum to shaft.
2. Slide brake drum from shaft and remove band.
3. Remove bearing retainers from both ends of shaft and remove shaft through opening in R.H. side frame.



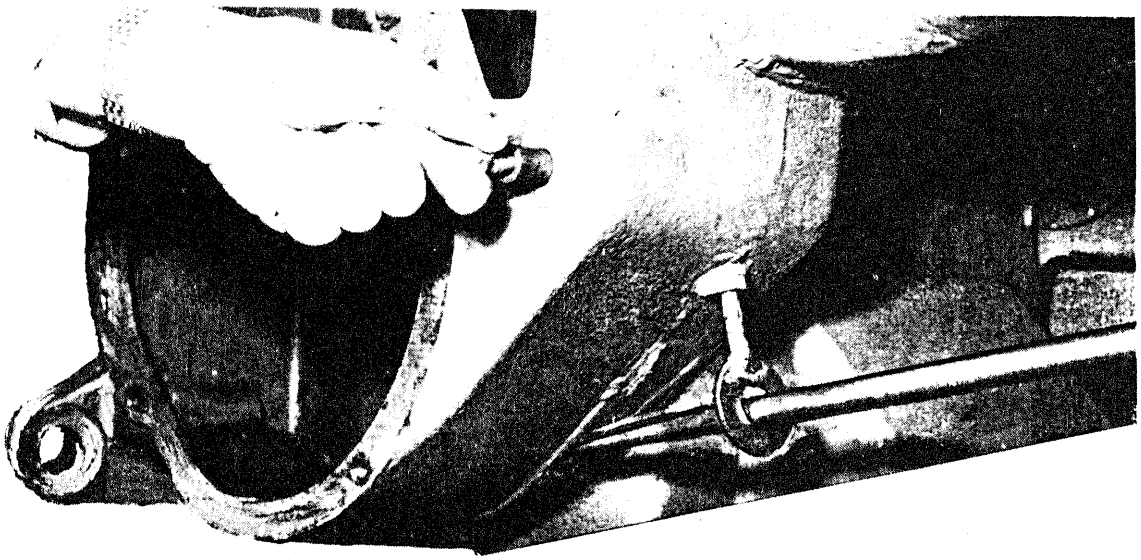
FOR DIRECT DRIVE WINCHES PRIOR TO SERIAL NO. A67P-1945 AND ALL POWER CONTROLLED WINCHES

Brake Shaft Removal

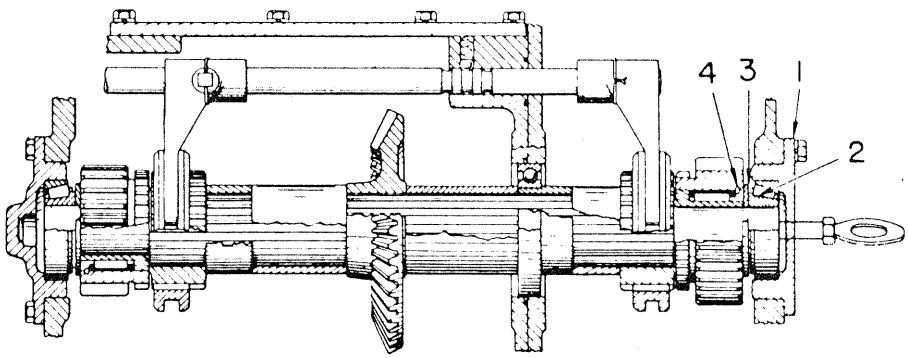
1. Set brake in "Released" position and remove pin "B," pin "D" and snap ring "C."
2. Slide brake drum "E" from shaft and remove brake band assembly "F."
3. To remove brake springs "A" take out pipe plug at "G." Thread eye bolt "H" into tapped hole in spring anchor sleeve and using pry bar as shown, relieve tension on spring "A" and remove anchor pin "J." Eye bolt "H" can be made by welding a cut washer to a ½" UNF x 4" capscrew.
4. Remove bearing retainers from both ends of shaft and remove shaft through opening in R. H. side frame.

DISASSEMBLY OF WINCH

Brake Shaft Removal — Continued



Bevel Gear Shaft Removal — Direct Drive Winch



1. Remove the brake drum and linkage as instructed.
2. Remove nut from L. H. end of drum shaft (if drum shaft is to be removed).
3. Turn winch so that R. H. side is up.
4. Remove bearing carrier "1," bearing cone "2," washer "3" and snap ring "4."

WINCH DISASSEMBLY

Bevel Gear Shaft Removal — Power Controlled Winch

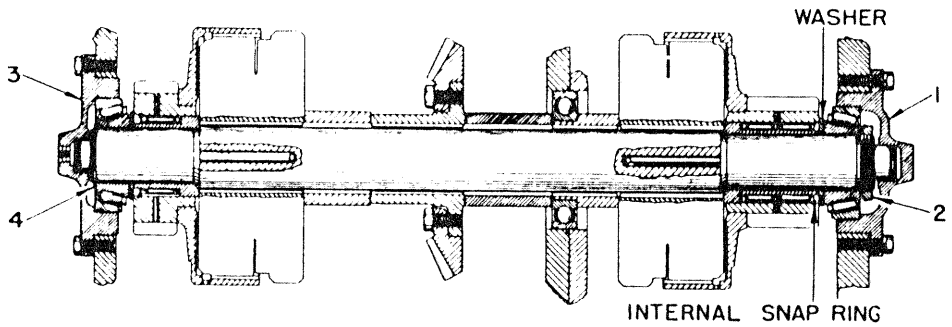


Figure 7

1. Remove brake drum and linkage as instructed.
2. Disconnect the hydraulic line to bearing retainer (3) Figure 7.
3. Remove bearing retainer taking care to protect shims.
4. Remove the R. H. bearing retainer (1) Figure 7.
5. Loosen bearing nut (2) enough to permit removal of snap ring (4).
6. Replace bearing retainer (3), Figure 7, for support. (If drum is to be removed, remove L. H. drum shaft nut.)

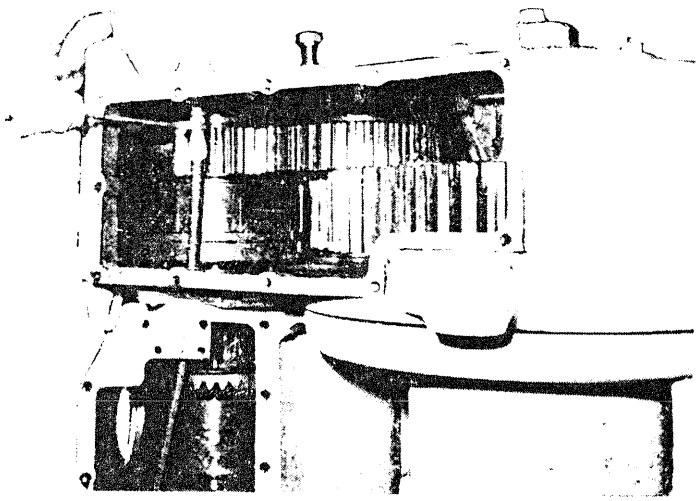


Figure 9

8. Remove the top side frame cover and disconnect the hydraulic line as shown in Figure 9.
9. Remove bearing nut (2) Figure 7.
10. Slide roller bearing and the spacer washer from the shaft.
11. Remove the internal snap ring retaining the bearing and clutch drive gear as shown in Figure 10.

WINCH DISASSEMBLY

Bevel Gear Shaft Removal—Continued

For Direct Drive and Power Controlled Winches

1. Insert a 5/8 UNF bolt (with a ring or washer welded to it) into the threaded end of the shaft.
2. Pull shaft slowly as shown in Figure 11.
3. DO NOT pound or drive on the ends of the bevel gear shaft.
4. Slide the shaft completely away from the unit freeing all component parts on the shaft, Figure 13.

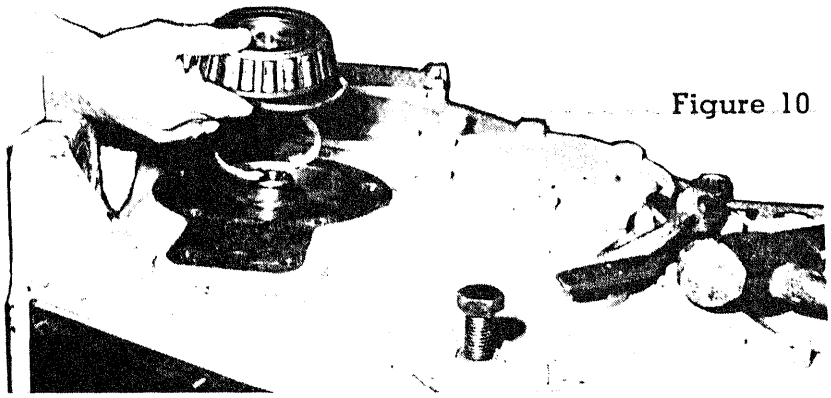


Figure 10

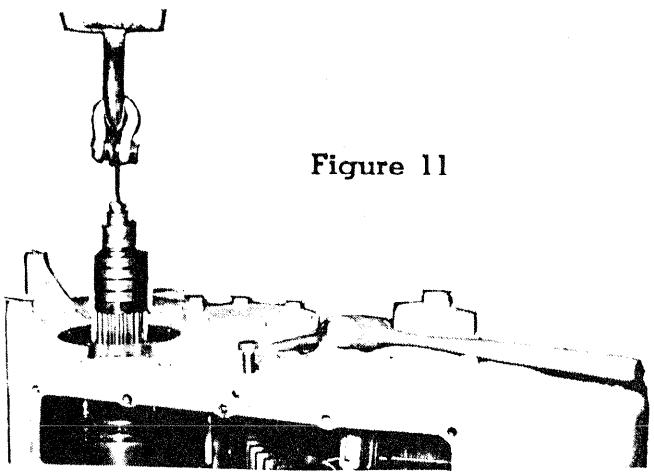


Figure 11

Figure 12

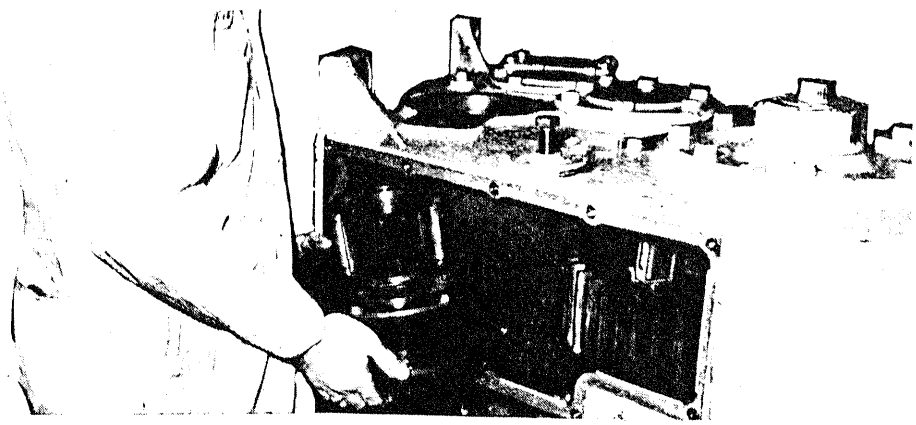


Figure 13

WINCH DISASSEMBLY

Intermediate Gear Shaft Removal

1. Remove bearing retainer.
2. Insert puller screw in shaft.
3. Pull shaft as shown in Figure 15.
4. Remove intermediate gear and drum pinion as shown in Figure 16.

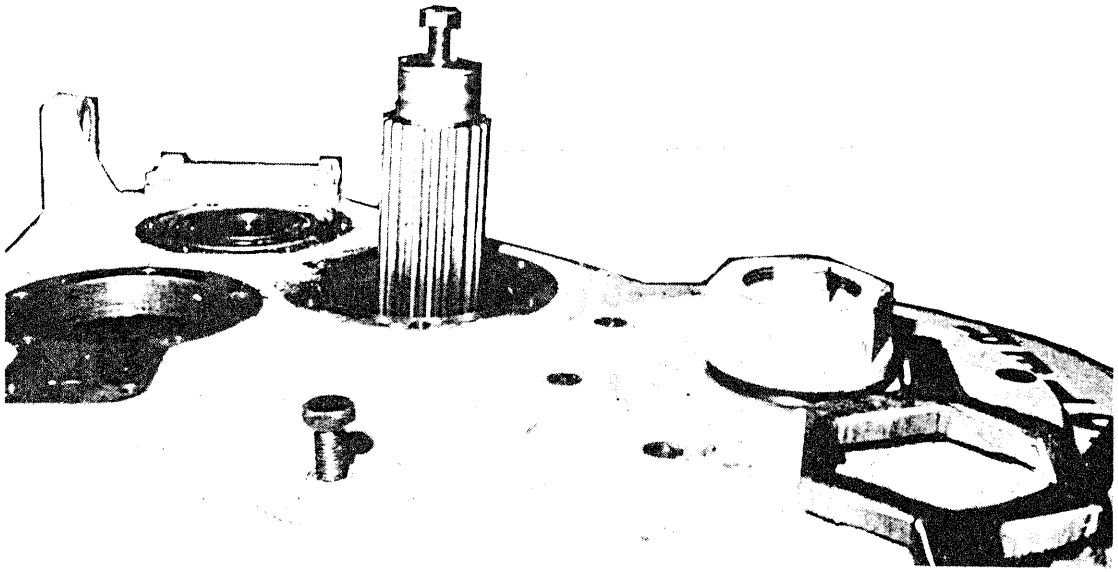


Figure 15

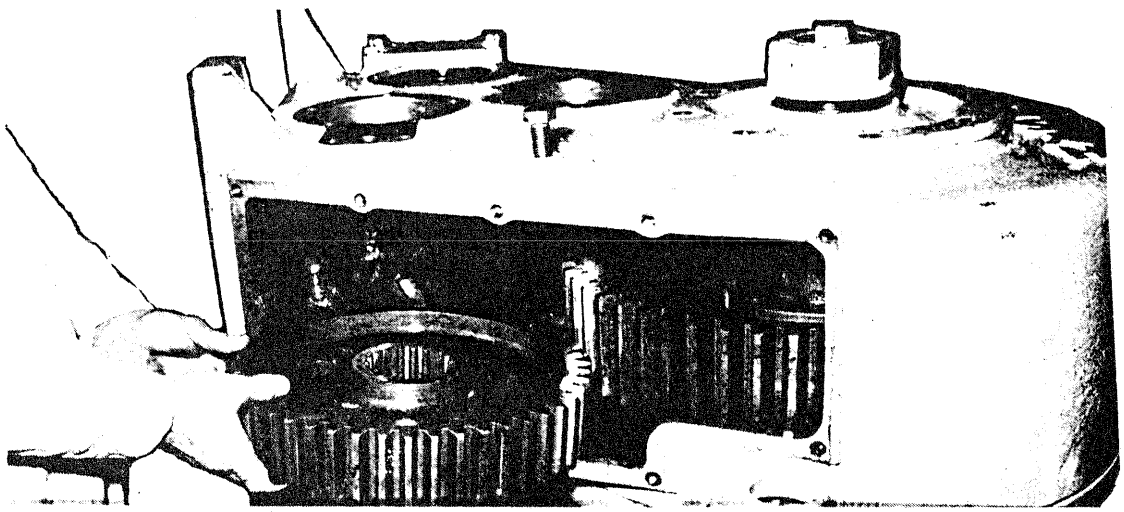


Figure 16

WINCH DISASSEMBLY

Drum Shaft Removal

1. Unscrew drum shaft nut.
2. Remove bearing retainer as shown in Figure 17.
3. Remove place bolts in drum gear.
4. Rethread nut on shaft.
5. Sling shaft using nut.
6. Pull shaft straight up as shown in Figure 18.

NOTE: Place pan under drum shaft to catch oil that is in the drum. Be sure to add two quarts of oil to drum at reassembly.

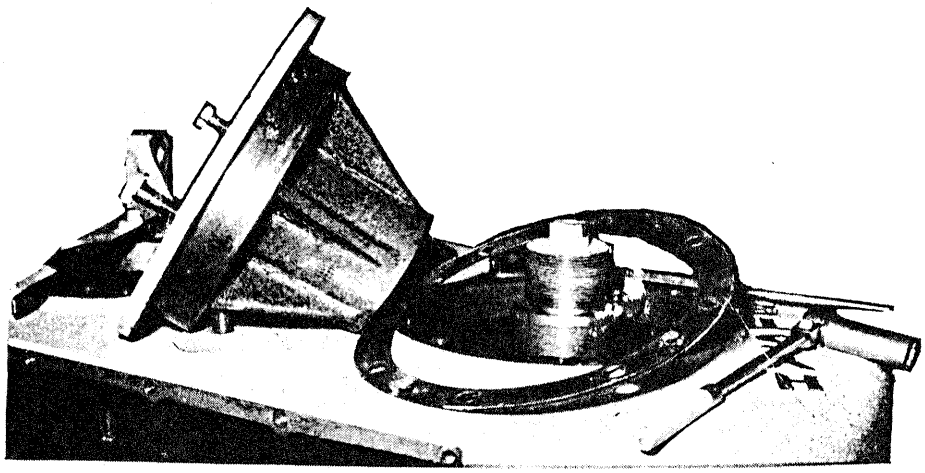


Figure 17

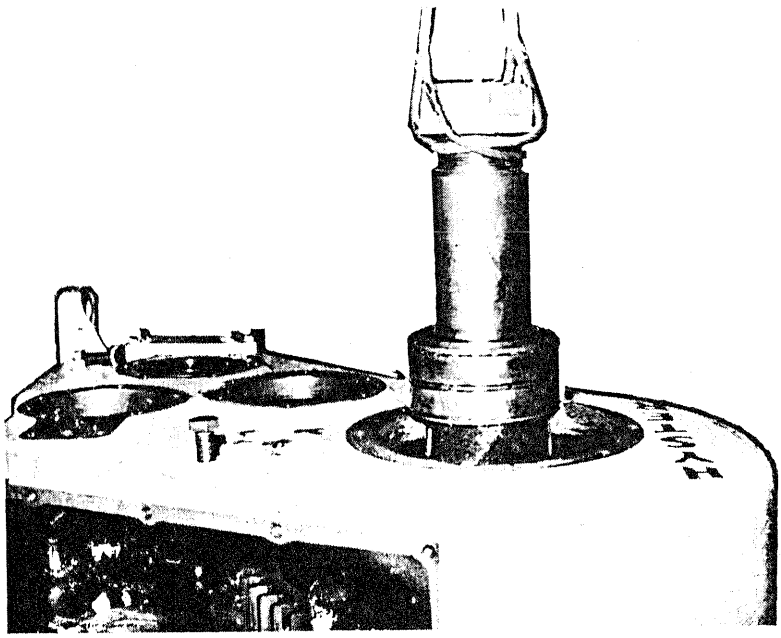


Figure 18.

WINCH DISASSEMBLY

Side Frame Removal

1. Remove securing capscrews as shown in Figure 19.
2. Sling side frame and lift straight up as shown in Figure 20.

CAUTION: Use care when lifting side frame to protect oil seals around drum.

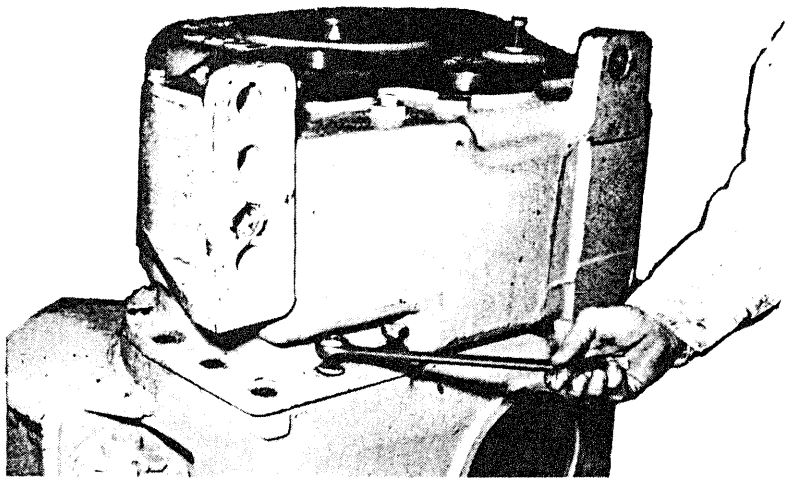


Figure 19

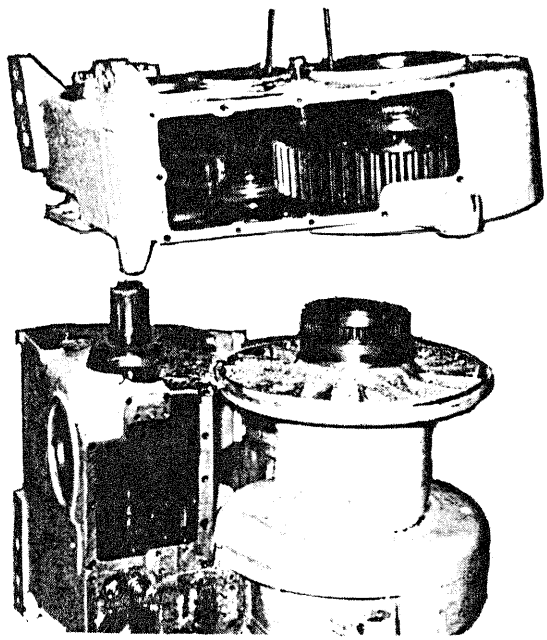


Figure 20

WINCH DISASSEMBLY
POWER CONTROLLED WINCHES ONLY

Clutch Disassembly

NOTE: It is unlikely that the clutch discs and separator plates will have to be replaced because of wear. Overheating due to slipping or lack of cooling oil will cause most damage to the discs and separator plates. Over heating causes both parts to warp which causes clutch drag. The clutch discs are flat. The separators are hardened steel with a slight dish built into them as shown in Figure 27.

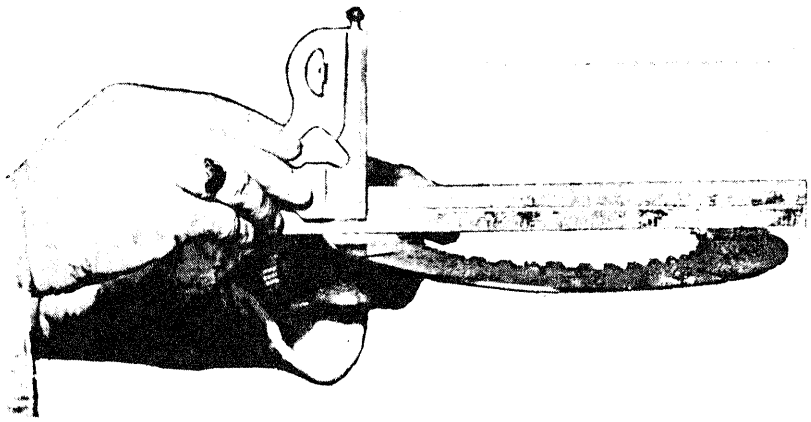


Figure 27

THE HYDRAULIC CLUTCH MUST BE SERVICED IN A CLEAN AREA. The clutch pack contains two parts: The clutch (1), Figure 21, contains friction discs and separator plates, and the clutch spider (2). The two parts are not fastened together and may be separated by sliding them apart as shown. The clutch is held together by six flat head capscrews that are locked on the back side by six allen head set screws.

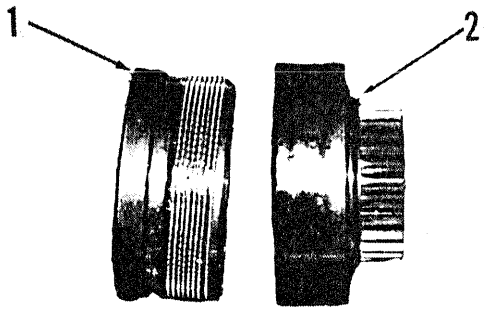


Figure 21

1. Remove the allen head set screws (17) Figure 23.
2. Turn clutch over and remove flat head capscrews (1), remove end plate (2) Figure 23, exposing the clutch discs (10) and return springs (4).
3. Lift discs (10) and separator plates (11) from the drive hub (3).
4. Lift drive hub (3) and clutch piston (12) from retainer plate (15).

WINCH DISASSEMBLY — POWER CONTROLLED

Clutch Disassembly — Continued

5. The cross drilled stud with three holes is the cooling valve (5). Remove by unscrewing to the left and disassemble for cleaning.

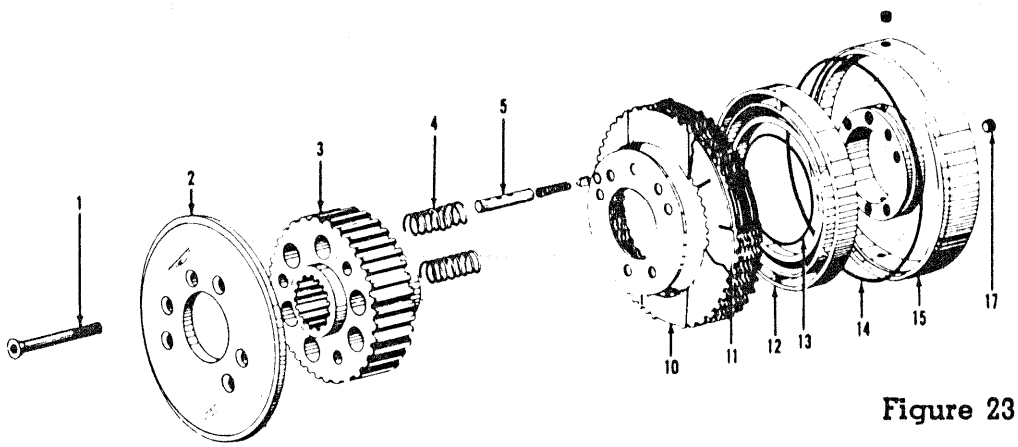


Figure 23

Clutch Reassembly

Reassembly is opposite of disassembly.

Observe the following precautions during reassembly.

1. Dish in separator plates MUST all face same way as a unit. The direction of the unit is unimportant.
2. The forward and reverse clutch packs are interchangeable but the spiders are not.
3. NEVER assemble a clutch pack dry. Presoak all parts in oil.
4. Small parts and passages must be free of dirt and foreign matter.
5. When sliding the clutch piston into the retainer plate, be certain that the "O" rings (13 and 14) are well lubricated and are seated in their respective grooves.
6. When assembled, the holes "A" in the clutch hub will be in line with the oil cooling valve "B" as shown in Figure 28.
7. Blanked out teeth on friction discs (10) must be in line.
8. Assembled clearance to be from .040 to .070 Use shims as required.
9. Torque capscrews (1) with 70 ft. lbs., set screws (17) with 40 ft. lbs.

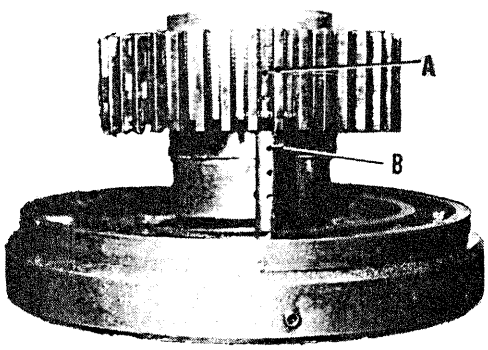


Figure 28

WINCH REASSEMBLY

Assemble winch in reverse order of disassembly.

Drum Shaft Assembly

1. Check all oil seals and install drum and drum shaft.
2. Add two quarts of oil to drum cavity before installing R. H. bearings (SAE 90 for Direct Drive—SAE 30 Series E for Power Controlled).
3. Bolt drum gear to drum torquing the place bolts to 146 ft. lbs. lubed or 225 ft. lbs. dry.

Intermediate Shaft Assembly

1. Install intermediate shaft with .004 to .007 end play in bearings.
2. Torque place bolts on inside retainer to 146 ft. lbs. lubed or 225 ft. lbs. dry.

Bevel Gear Shaft Assembly — Direct Drive Winch

1. Place all of the parts into the winch case in the same manner as they were removed.
2. Lower the bevel gear shaft into the stacked parts. DO NOT use a hammer to drive the shaft through the component parts. Fix the shaft in place and revolve the winch to an upright position. Bearing adjustment is made by shims under each bearing retainer. Set the bearing end play at .000 to .004.

WINCH REASSEMBLY

Bevel Gear Shaft Assembly — Power Controlled Winch

1. Place all parts into winch case in the same order they were removed.
2. Line up the marked pipe plugs in the outer diameter of the retainer plate in the clutch packs, with holes in the bevel gear shaft splines. (Only one of the plugs will be correct as cross hole goes through one major diameter and one minor diameter of spline.)
3. Sling the bevel gear shaft.

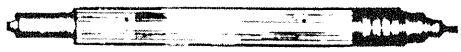


Figure 12

4. Lower the shaft through side frame, being certain that the match marks on the shaft line up with the match marks on the clutches. The two holes in the shaft (for hydraulic oil to the clutches) shown in Figure 12 will then line up with the holes in the clutch retainer plate.
   DO NOT use a hammer to drive the shaft through the component parts.
   NOTE: Coat side and top of seals (37 and 38, Page D5) with Lubriplate before inserting in shaft.
5. Fix the shaft in place and revolve winch to upright position.
6. Lock the bearings on the end of the shaft that is toward brake compartment, with snap rings provided.
7. Install the bearing nut on the opposite end and lock it with lockwasher provided. (Always use new lockwasher.) DO NOT install metal seal rings on ends of shaft.
8. Adjust end play to .000 - .004 by use of shims under each bearing retainer.
9. Remove bearing retainers and install metal seal rings on ends of shafts. Be sure these seal rings are not broken or damaged when reinstalling bearing retainers.

Brake Shaft Assembly—Direct Drive and Power Controlled

1. Install brake shaft with .006 to .009 end play.
2. Apply Plastic Lead Seal No. 2 or equivalent to threads of capscrews holding oil seal retainer at brake end of shaft.

WINCH REASSEMBLY

Power Take-Off Assembly

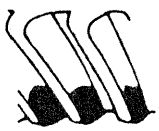
1. Install the P.T.O. shaft. Be sure the bevel pinion is in place and snap ring properly installed.
2. Recheck the backlash and gear mesh of the bevel gear set. This is best done by painting the gears with white lead and obtaining a gear pattern as shown in Figure 30.
3. After the correct gear pattern is obtained, move the bevel ring gear away from the pinion to obtain .006 - .012 backlash.

The following diagrams show the results of too little or too much pinion depth as determined from the impression of the tooth bearing on the white lead.

a. Check adjustments at driveside of bevel gear tooth.

b. Shows correct tooth contact.

c. Shows short contact at heel. To correct, move gear toward pinion. Then move pinion away from gear to again secure correct backlash.



d. Shows short contact at toe. To correct, move gear way from pinion. Then move pinion toward gear to again secure correct backlash.

e. Shows heavy contact on flank or lower portion of tooth. To correct, move pinion away from gear until contact comes to full working depth of tooth without breaking contact at flank. Then move gear toward pinion to secure correct backlash.

f. Shows heavy contact on face or upper portion of tooth. To correct, move pinion toward gear until contact covers flank of tooth without breaking contact at face. Then move gear away from pinion to secure correct backlash.

Figure 30

SPECIFICATIONS

DRUM SIZE:	Standard Speed Winch	Lo-Speed Winch
Barrel Diameter	14″	9¼″
Flange Diameter	25″	25″
Barrel Length	10¾″	10¾″
CABLE CAPACITY		
1⅛″ LINE (Recommended)	239 ft.	300 ft.
1¼″ LINE	192 ft.	242 ft.

Allowance should be made for loose or unevenly spooled line in towing service.

NOTE: *Important*

Available line pulls may be greater than the breaking point of cable used. Line pulls should be limited by the operator to comply with all safety laws applicable where the equipment is being used.

FERRULE SIZE ..... for 1⅛ in. line, J9; for 1¼ in. line, J10

HYDRAULIC SYSTEM (For Power Controlled Winch)

Pump ..... Gear-Type, 9.5 GPM at 1450 RPM
Maximum operating pressure ..... 225 P.S.I.
Valve ..... Special two spool
Filter ..... Full flow, 50 mesh screen cartridge

WEIGHT, Approximate (without cable) (Power Controlled Winch)

Net ‡ ..... 3470 lbs.

WEIGHT, Approximate (without cable) (Direct Drive Winch)

Net ‡ ..... 3400 lbs.

AUTOMATIC BRAKE—For Direct Drive Winch (Optional) ..... 110 lbs.

FAIRLEAD ASSEMBLY (Optional) ..... 730 lbs.

GUIDE ROLLS (Optional) ..... 150 lbs.

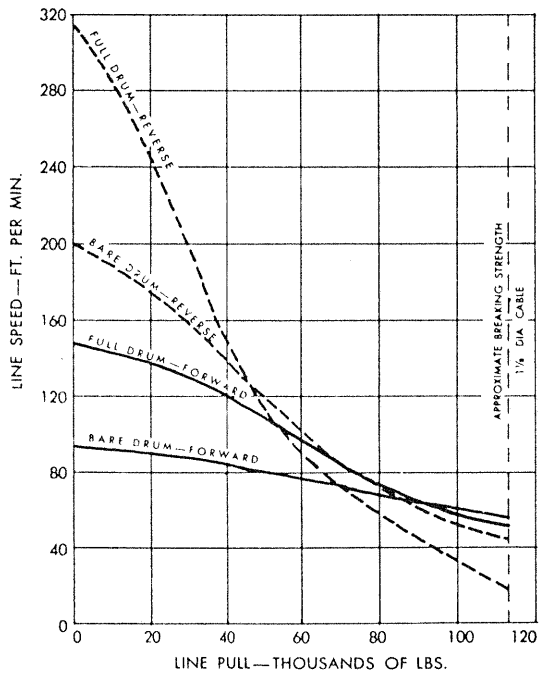
SWIVELING DRAWBAR (Optional) ..... 130 lbs.

‡The Caterpillar drawbar group, weighing approximately 645 pounds for the D9 and 500 pounds for the D8, cannot be used, thus decreasing the Net Applied weight on the tractor.

SPECIFICATIONS

D89A DIRECT DRIVE STANDARD SPEED WINCH

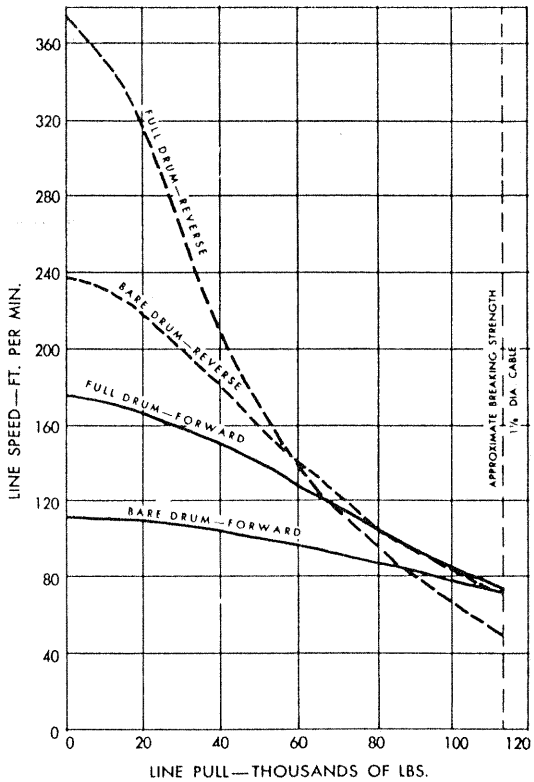
Winch performance on Caterpillar D8, Series H, Torque, Converter Drive Tractor, 235 HP (at flywheel) at 1200 RPM, using 1⅛" cable.



Winch performance on Caterpillar D8, series H, Direct Drive Tractor, 235 HP (at flywheel) at 1200 RPM using 1⅛" cable.

LINE PULLS:	Forward	Reverse
Bare drum . .	75,800 lbs.	35,600 lbs.
Full drum . . .	47,400 lbs.	22,400 lbs.
LINE SPEEDS:		
Bare drum . . .	103 f.p.m.	218 f.p.m.
Full drum	164 f.p.m.	348 f.p.m.

Winch performance on Caterpillar D9, Series E, Torque Converter Drive Tractor, 335 HP (at flywheel) at 1250 RPM, using 1⅛" cable.

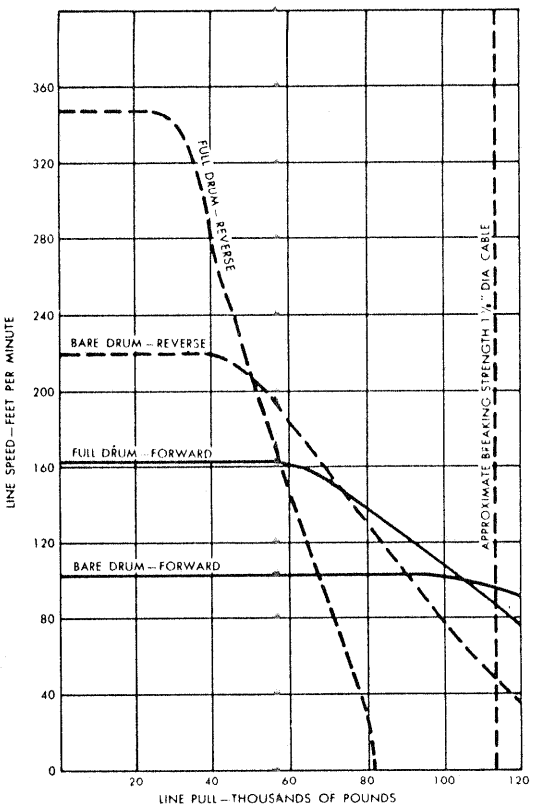


Winch performance on Caterpillar D9, Series E, Direct Drive Tractor, 335 HP (at flywheel) at 1250 RPM using 1⅛" cable.

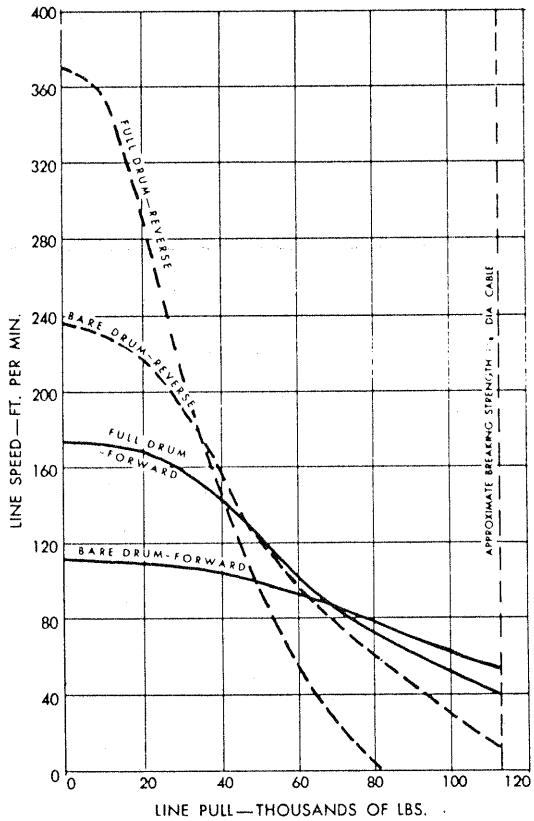
LINE PULLS:	Forward	Reverse
Bare drum . .	103,000 lbs.	48,600 lbs.
Full drum . . .	64,500 lbs.	30,400 lbs.
LINE SPEEDS:		
Bare drum . . .	107 f.p.m.	226 f.p.m.
Full drum . . .	171 f.p.m.	362 f.p.m.

SPECIFICATIONS

D89A POWER CONTROLLED STANDARD SPEED WINCH



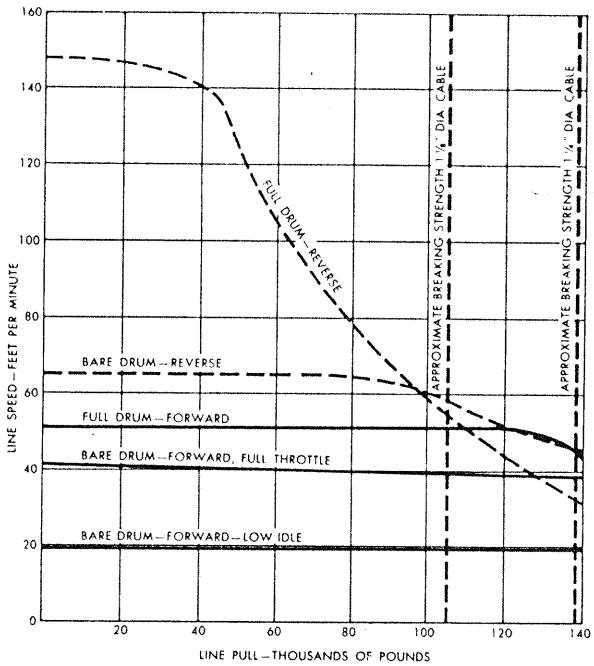
Winch performance on Caterpillar D9, Series G, Power Shift Tractor, 385 HP (at flywheel) at 1330 RPM using 1⅛" cable.



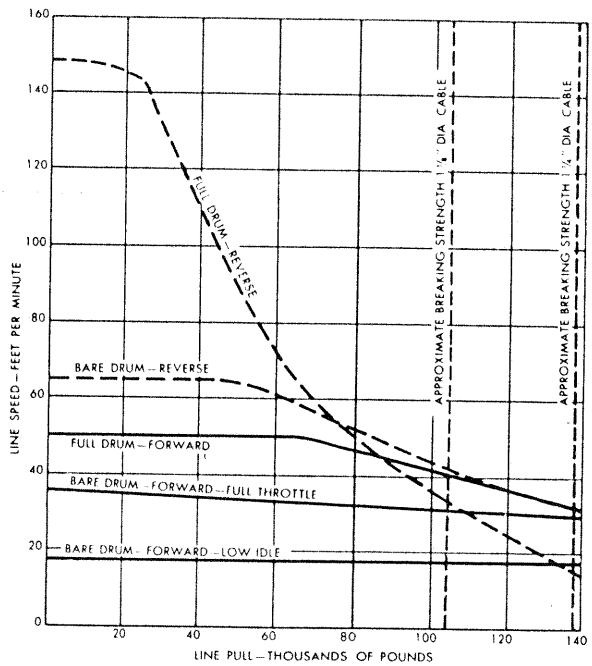
Winch performance on Caterpillar D8 Series H, Power-Shift Tractor, and 583 pipe layer, 235 HP (at flywheel) at 1200 RPM, using 1⅛" cable.

SPECIFICATIONS
D89A DIRECT DRIVE LO-SPEED WINCH

Winch performance on Caterpillar D9, Series E, Torque Converter Drive Tractor, 335 HP (at flywheel) at 1250 RPM using 1⅛" cable.



Winch performance on Caterpillar D8, Series H, Torque Converter Drive Tractor, and 583 Pipelayer, 235 HP (at flywheel) at 1200 RPM using 1⅛" cable.



Winch performance on Caterpillar D9, Series E, Direct Drive Tractor, 335 HP (at flywheel) at max. engine torque speed of 900 RPM using 1⅛" cable.

LINE PULLS:	Forward	Reverse
Bare drum	113,000 lbs.	104,000 lbs.
Full drum	94,800 lbs.	44,200 lbs.

LINE SPEEDS:		
Bare drum	26 f.p.m.	76 f.p.m.
Full drum	60 f.p.m.	177 f.p.m.

Winch performance on Caterpillar D8, Series H, Direct Drive Tractor, 235 HP (at flywheel) at max. engine torque speed of 900 RPM using 1⅛" cable.

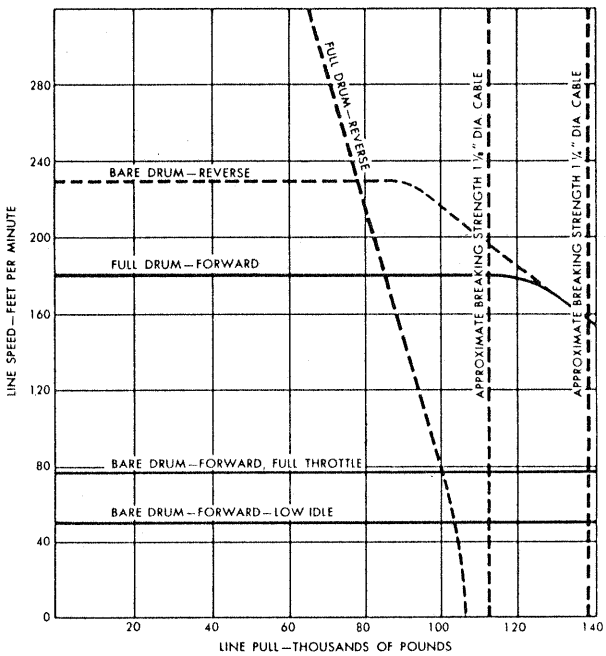
LINE PULLS:	Forward	Reverse
Bare drum	113,000 lbs.	78,900 lbs.
Full drum	94,800 lbs.	33,600 lbs.

LINE SPEEDS		
Bare drum	26 f.p.m.	76 f.p.m.
Full drum	60 f.p.m.	177 f.p.m.

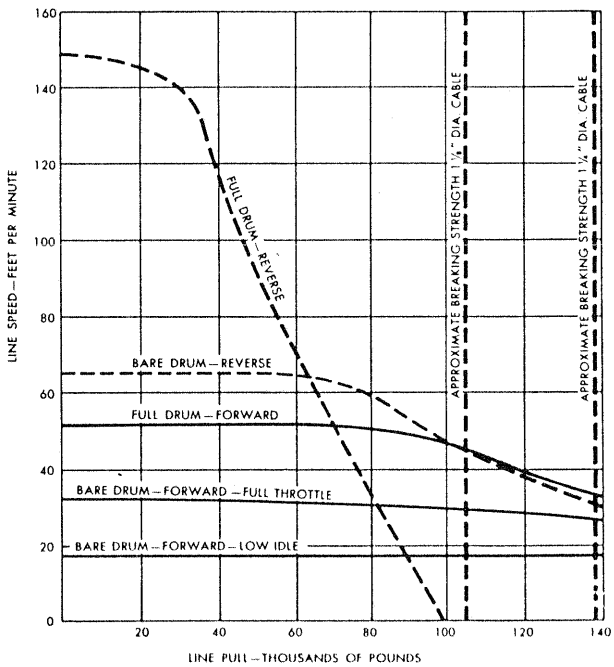
SPECIFICATIONS

D89A POWER CONTROLLED LO-SPEED WINCH

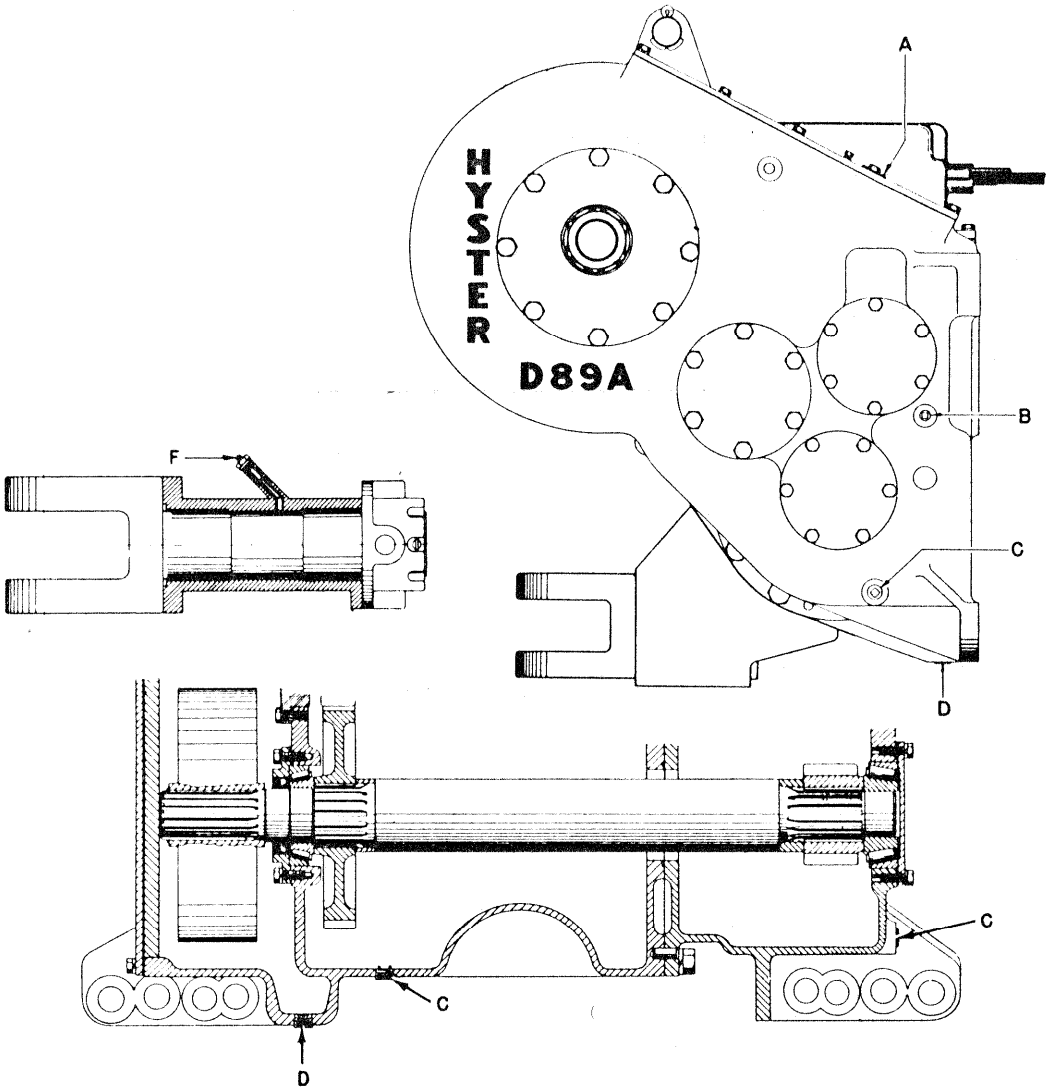
Winch performance on Caterpillar D9, Series G, Power Shift Tractor 385 HP (at flywheel) at 1330 RPM using 1⅛" cable.

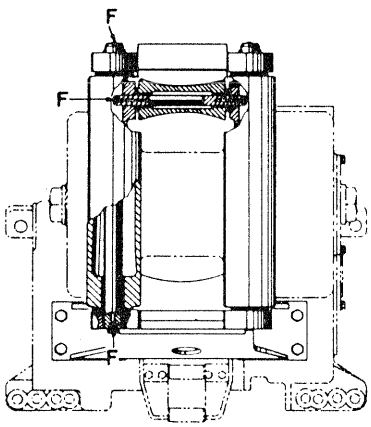


Winch performance on Caterpillar D8, Series H, Power Shift Tractor, and 583 Pipelayer, 235 HP (at flywheel) at 1200 RPM using 1⅛" cable.

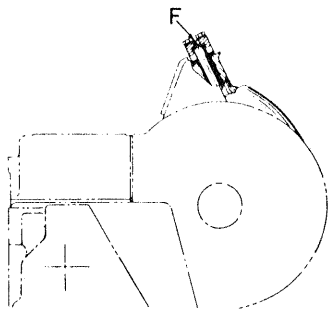


LUBRICATION CHART





FAIRLEAD



CABLE GUIDE ROLLS

LUBRICATION INSTRUCTIONS

Every Eight Hours or Daily

Swiveling Drawbar, Fairlead and Cable Guide Rolls (optional):

Lubricate with pressure gun grease.

Rod End Pins:

Rod end pins, shifter rods, lever fulcrums, pin connections and other moving parts should be lubricated with SAE 30 engine oil at the end of each shift.

Every 50 Hours or Weekly

Transmission:

Check oil level at plug "B"; add oil if necessary.
If winch is new, drain, flush and refill with new oil.

NOTE: When checking oil level in winches mounted on powershift tractors, stop tractor engine to obtain a correct reading. On winches mounted on direct drive tractors, disengage the tractor master clutch to obtain a correct reading.

Every 200 Hours or Four Weeks

Loosen plugs "C" and drain any accumulation of water in the transmission. Tighten plugs when oil appears, and check oil level.

Remove plug "D" and drain any water which may have accumulated in the brake compartment. Replace plug and tighten securely.

Every 500 Hours or When Tractor Engine Oil Filter Is Changed

Power Controlled Winch Only

Filter:

Remove cartridge, clean thoroughly and replace.

Every 1000 Hours or Six Months (Under Normal Conditions)

Transmission

Drain, flush and refill with new oil. At the factory the winch is filled to proper level with SAE 90 oil in Direct Drive winch and SAE 30 Series 3 oil in Power Controlled winch.

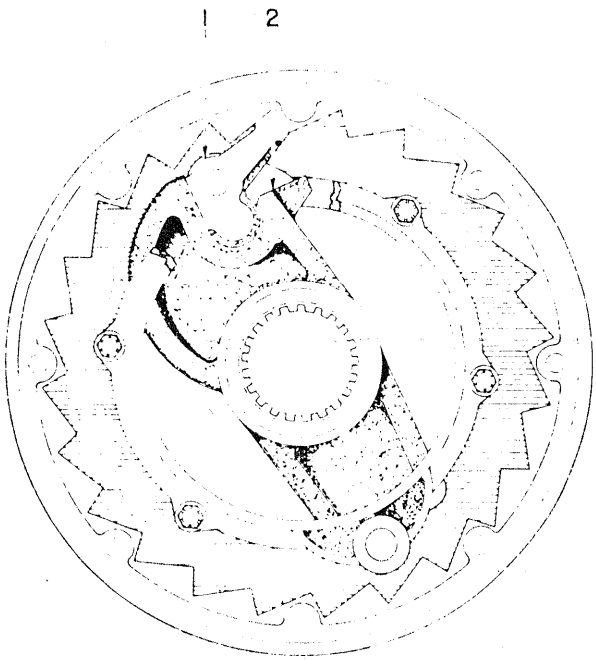
To simplify maintenance, use of identical oil as used in tractor transmission is recommended for all weather conditions.

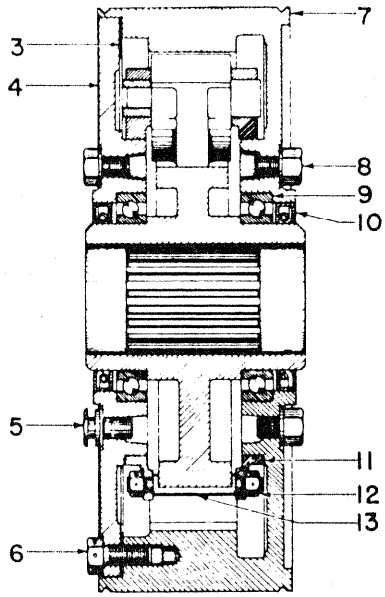
Drain through plugs "C." Refill through plug "A" up to level plug "B."

CAPACITY—Direct Drive Winch .....22 Gallons
CAPACITY—Power Controlled Winch .....15 Gallons

LUBRICATING INSTRUCTIONS - Continued

AUTOMATIC BRAKE (OPTIONAL)





Every 1000 hours the brake should be cleaned and repacked with a high melting point grease. Proceed as follows:

1. Remove the cover plate on the L. H. side frame brake compartment.
2. Remove pins in the ends of brake band and remove brake band.
3. Remove snap ring from the end of the brake shaft and pull the brake assembly out.
4. Remove lockwire and the eight drilled head cover capscrews (6).
5. Remove the cover (4) with appropriate puller being careful not to damage oil seals (10).
   NOTE: Capscrews (8) fill puller holes. Be sure to replace copper gaskets.
6. Pull out center (2) assembled with pawl (1) and drag rings (11). Remove slotted nuts (12) and links (13) to replace drag rings (11).

LUBRICATION INSTRUCTIONS—Continued

Automatic Brake (Optional)

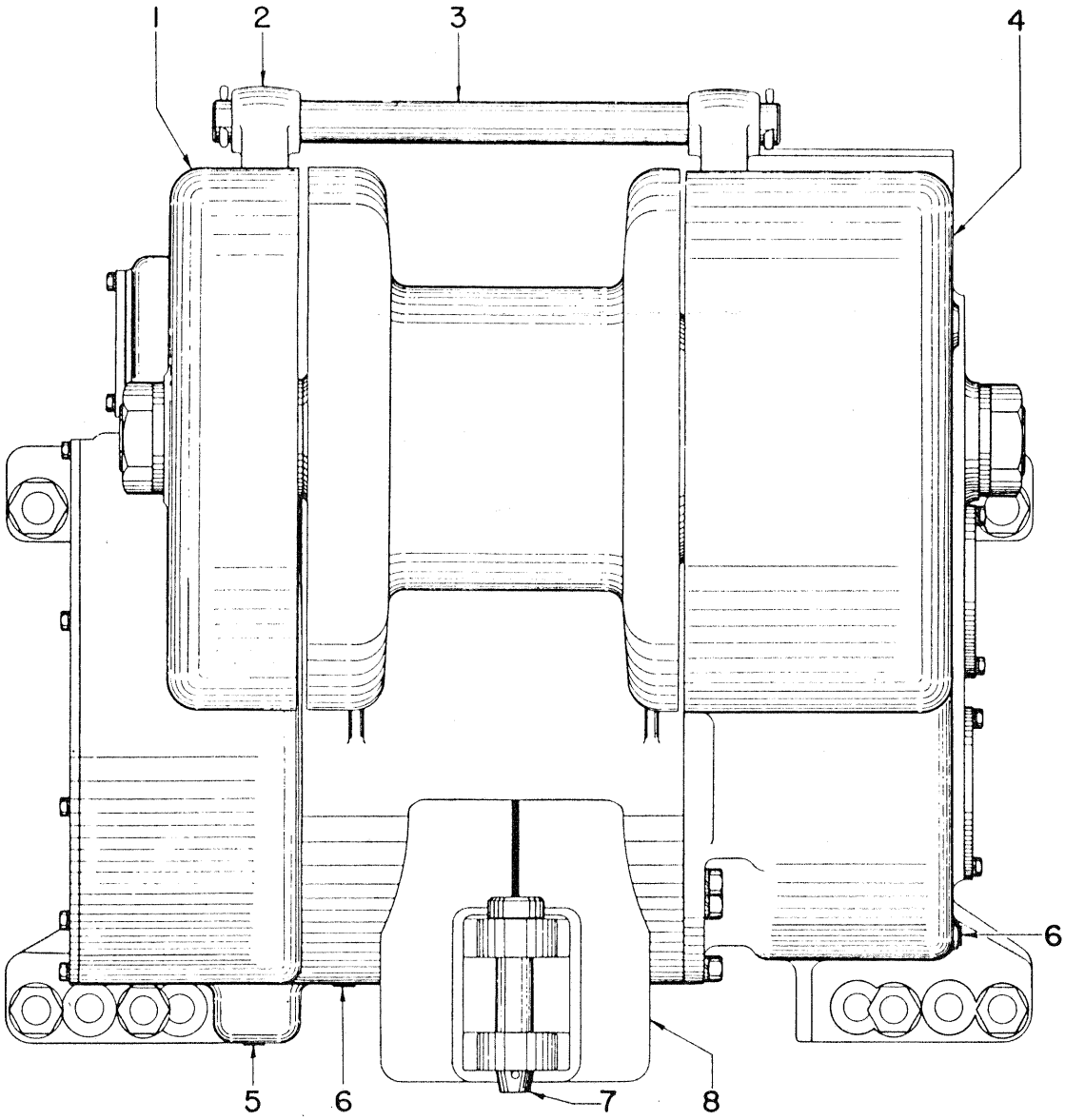
7. Clean all parts thoroughly and repack brake with one and a half pounds of high melting point grease. Apply carefully to bearings (9) and all wearing surfaces.
   CAUTION! DO NOT FILL BRAKE COMPLETELY WITH GREASE. ITEM (5) IS A VENT PLUG. DO NOT ATTEMPT TO GREASE THROUGH THIS FITTING.
8. After servicing, replace center assembly removed in instruction 6.
9. Clean gasket surfaces thoroughly and use new gasket (3). Install oil seals (10) with lips turned in as shown.
10. Coat both sides of gasket (3) with Plastic Lead Seal No. 2 and assemble cover (4) onto case being careful not to damage oil seals (10).
11. Use a liberal amount of Plastic Lead Seal No. 2 in each cover capscrew hole. Install capscrews (6) and tighten securely. Replace lockwire through capscrew heads.
12. Install assembled brake wheel on shaft with word "overwind" to the outside for overwind operation. Lock in place with snap ring.
13. Install brake band on brake wheel, anchoring with pins removed in instruction 2.
14. Replace cover removed in instruction 1.

Section B

FRAMES, COVERS AND MOUNTING STUDS

INDEX

REAR ELEVATION



REAR ELEVATION

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Req.
1	† 96577W	Housing—Transmission	1
	‡ 78301W	Housing—Transmission	1
2	* 93771	Bracket—Tie Rod	2
3	92606	Rod—Tie	1
	15272	Cotter—3/8 x 3	2
4	95441W	Frame—Side, R.H. (Power Controlled)	1
	95682W	Frame—Side, R.H. (Direct Drive)	1
5	15316	Fitting—Pipe Plug, 3/4"	1
6	10389	Fitting—Pipe Plug, Magnetic, 3/4"	2
7	94369	Pin—Drawbar	1
	15273	Cotter—3/8 x 2 1/2	1
8	* 95844W	Bracket—Drawbar	1

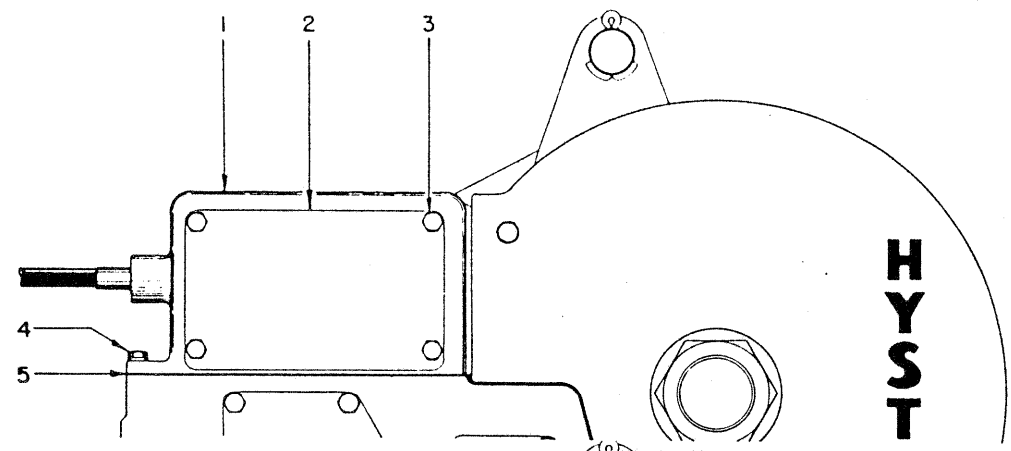
**Included with Side Frame.*

96301A Gasket Kit (includes one each of all gaskets required for Power Controlled Winch).
96282A Gasket Kit (includes one each of all gaskets required for Direct Drive Winch).

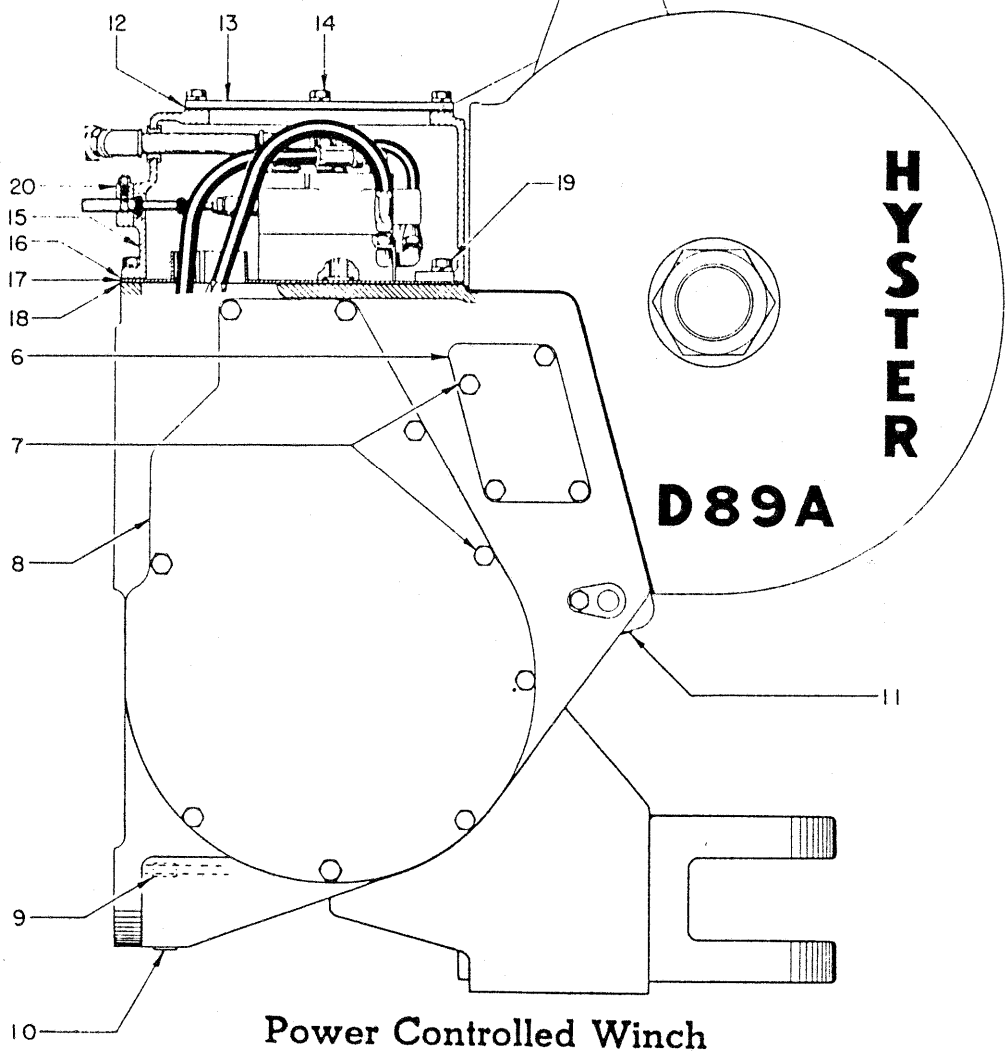
†*For Power Controlled Winches prior to S.N. A68P-1647, include cover plate 96579.*

‡*For Direct Drive Winches.*
First used on S.N. A67P-1945.
For S.N. prior to A67P-1765 with original differential brake arrangement, include Kit No. 87420A.
For S.N. prior to A67P-1765 with Conversion Kit 96728, and all S.N. A67P-1765 to A67P-1944 incl., include Kit No. 78396A.

COVERS — L.H. SIDE



Direct Drive Winch



Power Controlled Winch

COVERS — L.H. SIDE

REF. NO.		HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1		95613	Cover	1
2		(~~95639~~	Plate - Cover	1
		(95640	Gasket	1
3		(16830	Capscrew - 1/2 UNC x 1-1/4	4
		(15158	Lockwasher - 1/2	4
4		(16807	Capscrew - 1/2 UNF x 1-1/2	6
		(15158	Lockwasher - 1/2	6
5		95614	Gasket	1
6		(95446	Plate - Cover	1
		(95447	Gasket - Cover Plate	1
7		(37562	Capscrew - 1/2 UNF x 1-1/4	13
		(15158	Lockwasher - 1/2	13
8	*	(96579	Plate - Cover, Brake	1
	+	(95444	Plate - Cover, Brake	1
		(95445	Gasket	1
9		10389	Pipe Plug - 3/4 Magnetic	1
10		15316	Pipe Plug - 3/4	1
11		15315	Pipe Plug - 1/2	1
12		95451	Gasket	1
13		95450	Cover - Valve Housing	1
14		(16829	Capscrew - 1/2 UNC x 1	1
		(15158	Lockwasher - 1/2	1
15	x	96623	Housing - Valve	1
16		95449	Gasket	1
17		95757W	Cover	1
18		95760	Gasket	1
19		(37562	Capscrew - 1/2 UNF x 1-1/4	6
		(15158	Lockwasher - 1/2	6
20		96624	Block	1
		16807	Capscrew - 1/2 UNF x 1-1/2	2
		15158	Lockwasher - 1/2	2

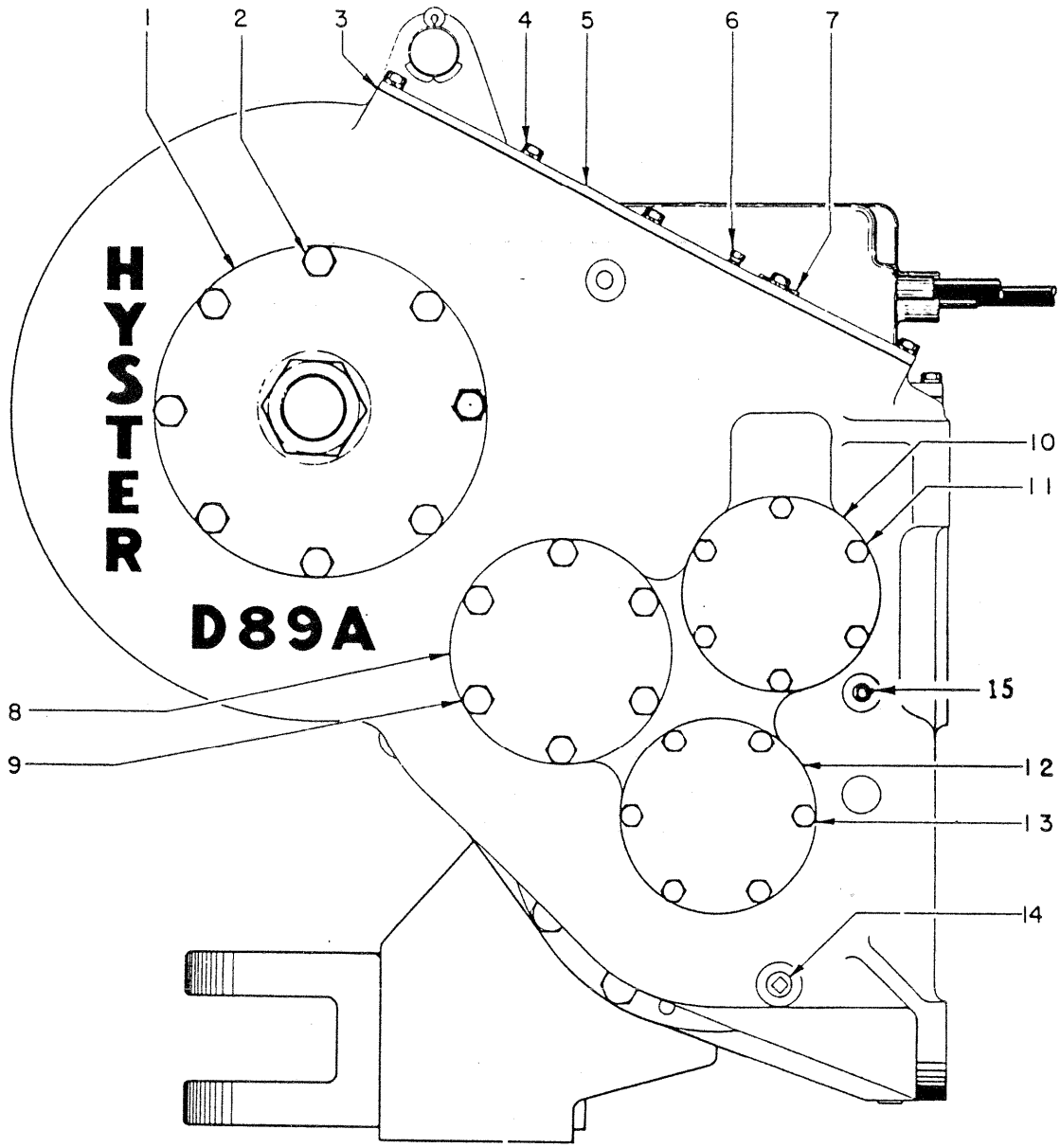
NOTE—Items 6 to 11 inclusive are the same for both winches.

**First used on S.N. A68P-1647*) *Power*
†*Used prior to S.N. A68P-1647* (*Controlled*

**First used on S.N. 67P-1760*) *Direct*
†*Used prior to S.N. 67P-1760* (*Drive*

x *When ordering Valve Housing, include items 20, Block and Capscrews, if your unit does not have these parts.*

COVERS — R.H. SIDE

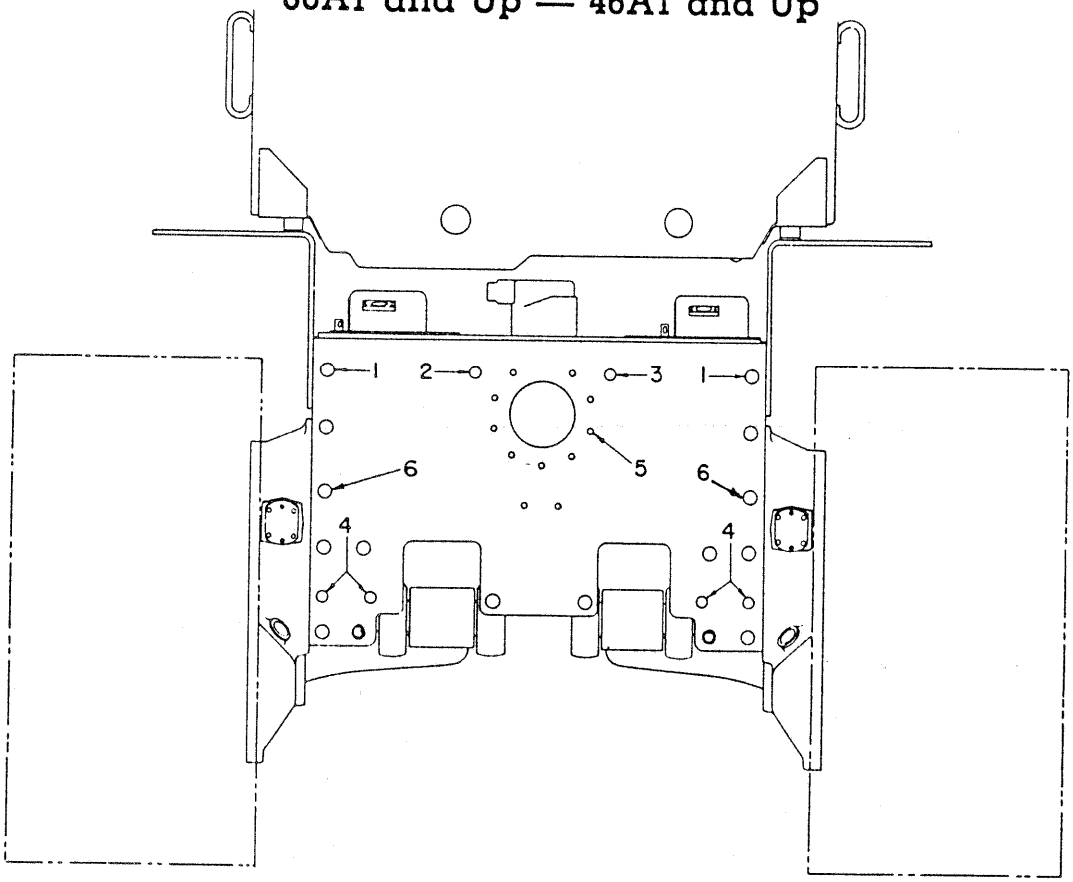


COVERS — R.H. SIDE

REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY REQ.
1	(93232	Retainer	1
	(93277	Shim Set	1
2	(12480	Capscrew-Hardened, 5/8 UNF x 2	8
	(15160	Lockwasher - 5/8	8
3	95455	Gasket	1
4	(37562	Capscrew-Hardened, 1/2UNF x 1-1/4	11
	(15158	Lockwasher - 1/2	11
5	95454	Cover	1
6	21420	Plug - Vent	1
7	15319	Pipe Plug - 1-1/2	1
8	(93287	Retainer	1
	(93284	Shim - .005 Thick	3
	(93285	Shim - .007 Thick	2
	(93286	Shim - .020 Thick	1
9	(12479	Capscrew-Hardened, 5/8UNF x 1-3/4	12
	(15160	Lockwasher - 5/8	12
10	(95691	Retainer - Bearing	1
	(95033	Shim - .005 Thick	4
	(95166	Shim - .007 Thick	4
	(95034	Shim - .020 Thick	1
11	(16807	Capscrew-Hardened, 1/2UNF x 1-1/2	6
	(15158	Lockwasher - 1/2	6
12	(95490	Retainer - Bearing	1
	(95033	Shim - .005 Thick	2
	(95166	Shim - .007 Thick	2
	(95034	Shim - .020 Thick	3
13	(16807	Capscrew-Hardened, 1/2UNF x 1-1/2	6
	(15158	Lockwasher - 1/2	6
14	10389	Fitting - Pipe Plug, Magnetic	1
15	15303	Fitting - Pipe Plug, 1/2	1

MOUNTING STUDS

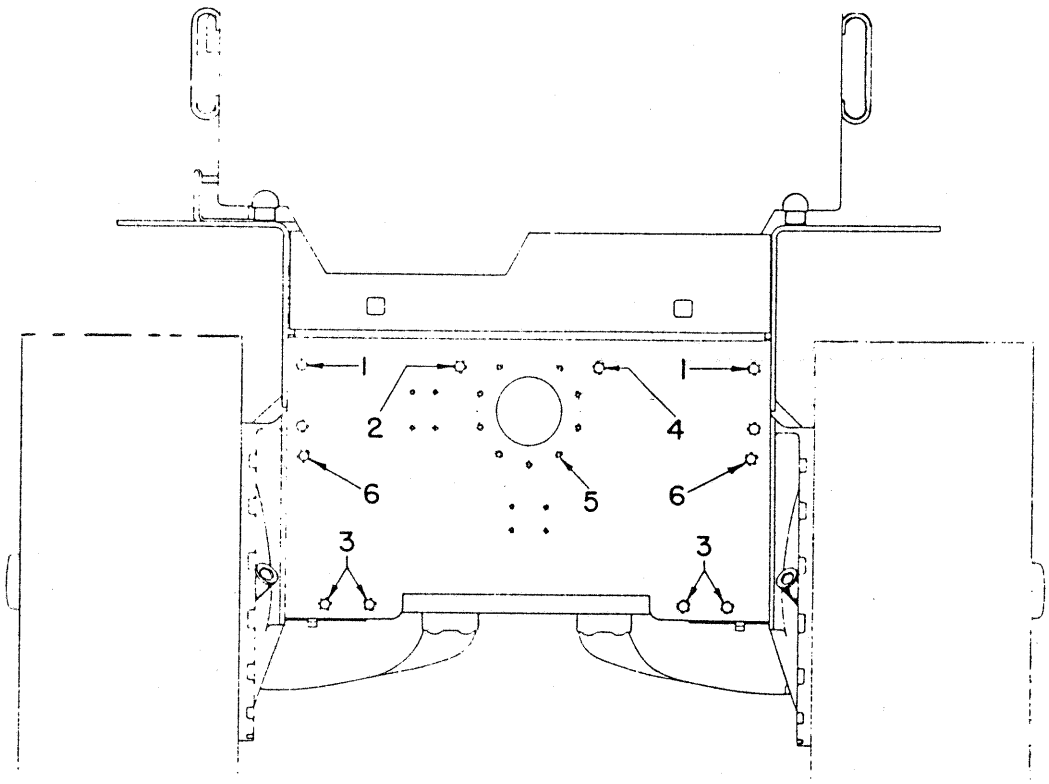
For D8 Tractors Serial No. 22A1 and Up — 35A1 and Up 36A1 and Up — 46A1 and Up



REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	(-----	Stud (Furnished with Tractor)	2
	(5792B	Nut - Hex, 1-1/2 UNF	2
	(15170	Lockwasher - 1-1/2	2
2	(95835	Stud - Taper Lock, 1-1/4 x 3-13/16, Drilled	1
	(31262	Nut - Slotted	1
	(15240	Cotter - 5/32 x 2-1/2	1
3	(95836	Stud - Taper Lock, 1-1/4 x 4-1/16	1
	(32796	Nut - Jam, 1-1/4 UNF	1
	(16088	Lockwasher - 1-5/16	1
4	(95837	Stud - Taper Lock, 1-1/4 x 4-11/16	4
	(15018	Nut - Hex, 1-1/4 UNF	4
	(15168	Lockwasher - 1-1/4	4
5	18000	Cork	9
6	18849	Cork	6

MOUNTING STUDS

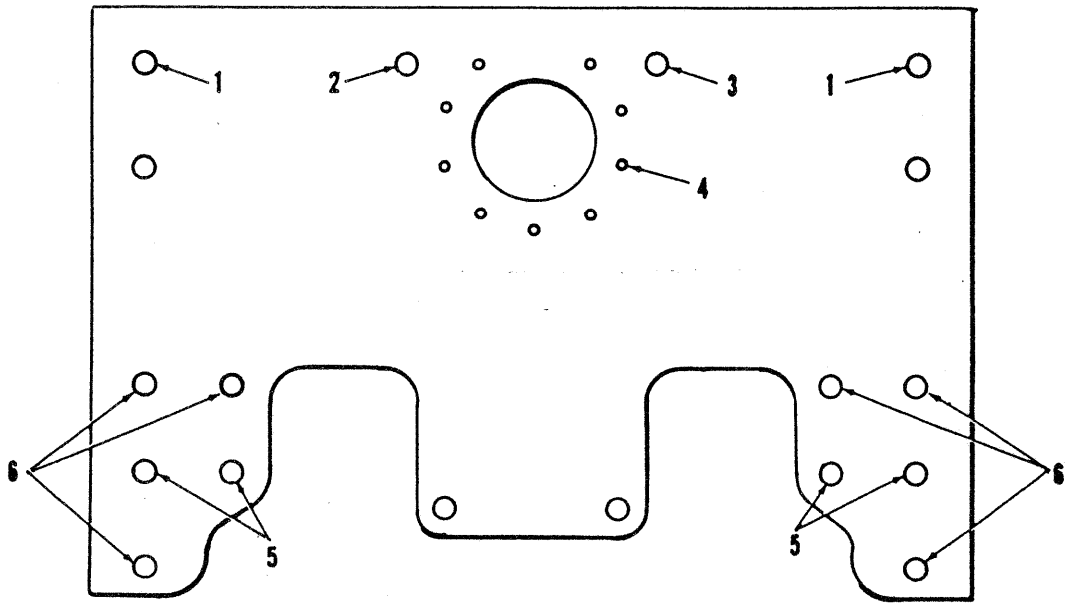
For D8 Tractors Serial No. 14A1 and Up — 15A1 and Up



REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	(-----	Stud (Furnished with Tractor)	2
	(15018	Nut - Hex, 1-1/4 UNF	2
	(15168	Lockwasher - 1-1/4	2
2	(95501	Stud - 1-1/4 x 3-19/32, Drilled	1
	(31262	Nut - Slotted	1
	(15240	Cotter - 5/32 x 2-1/2	1
3	(-----	Stud (Furnished with Tractor)	2
	(15018	Nut - Hex, 1-1/4 UNF	4
	(15168	Lockwasher - 1-1/4	4
4	(92672	Stud - 1-1/4 x 3-1/2	1
	(32796	Nut - Jam, 1-1/4 UNF	1
	(16088	Lockwasher - 1-5/16	1
5	18000	Cork	9
6	(93193	Plug - For Tractors Prior to Serial No. 14A3861-15A1673	2
	(18849	Cork - For Tractors Serial No. 14A3861 and up-15A1673 and up.	6

MOUNTING STUDS

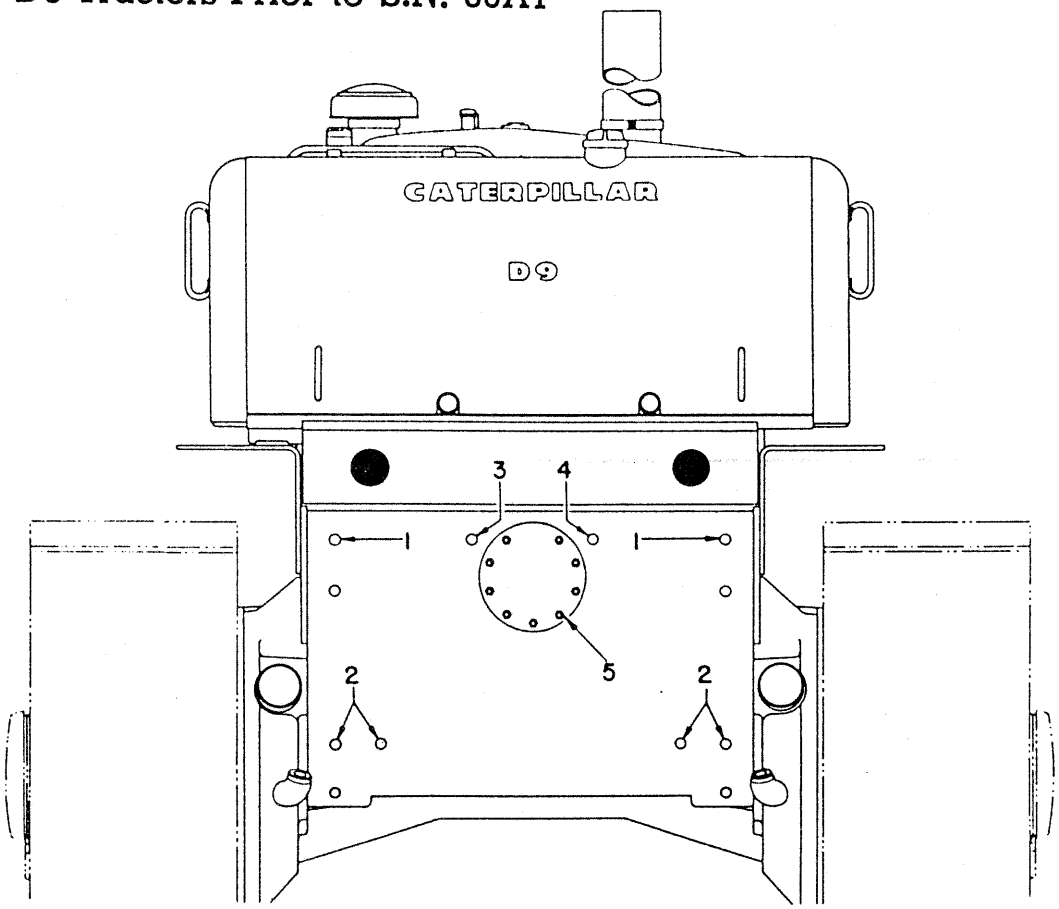
For D9 Tractors Serial No. 66A1 and Up



REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	(-----	Stud - Drawbar	2
	(5792B	Nut - 1-1/2 UNF	2
	(15170	Lockwasher - 1-1/2	2
2	(95835	Stud - Taperlock, Drilled 1-1/4 x 3-13/16	1
	(31262	Nut - Slotted	1
	(15240	Cotter - 5/32 x 2-1/2	1
3	95836	Stud - Taperlock 1-1/4 x 4-1/16	1
	32796	Nut - Jam, 1-1/4 UNF	1
	16088	Lockwasher - 1-1/4	1
4	18000	Cork - #5	9
5	(-----	Stud - Drawbar	4
	(5792B	Nut - 1-1/2 UNF	4
	(15170	Lockwasher - 1-1/2	4
6	18849	Cork - #20	6

MOUNTING STUDS

For D9 Tractors Prior to S.N. 66A1



REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	*(-----	Use Drawbar Studs	2
	+(93348	Stud - 1-1/2 x 5-1/4	2
	(5792B	Nut - 1-1/2-UNF	2
	(15170	Lockwasher - 1-1/2	2
2	(-----	Stud (Furnished with Tractor)	4
	(15018	Nut - 1-1/4 UNF	4
	(15168	Lockwasher - 1-1/4	4
3	*(95835	Stud - 1-1/4 x 3-13/16, Drilled	1
	+(95841	Stud - 1-1/4x3-19/32, Drilled	1
	(31262	Nut - Slotted	1
	(15240	Cotter - 5/32 x 2-1/2	1
4	*(95836	Stud - 1-1/4 x 4-1/16	1
	+(94371	Stud - 1-1/4 x 3-7/8	1
	(32796	Nut - Jam, 1-1/4 UNF	1
	(16088	Lockwasher - 1-5/16	1
5	18000	Cork	9

* For D9 Tractors S. N. 34A1 and up - 49A1 and Up-50A1 and Up.

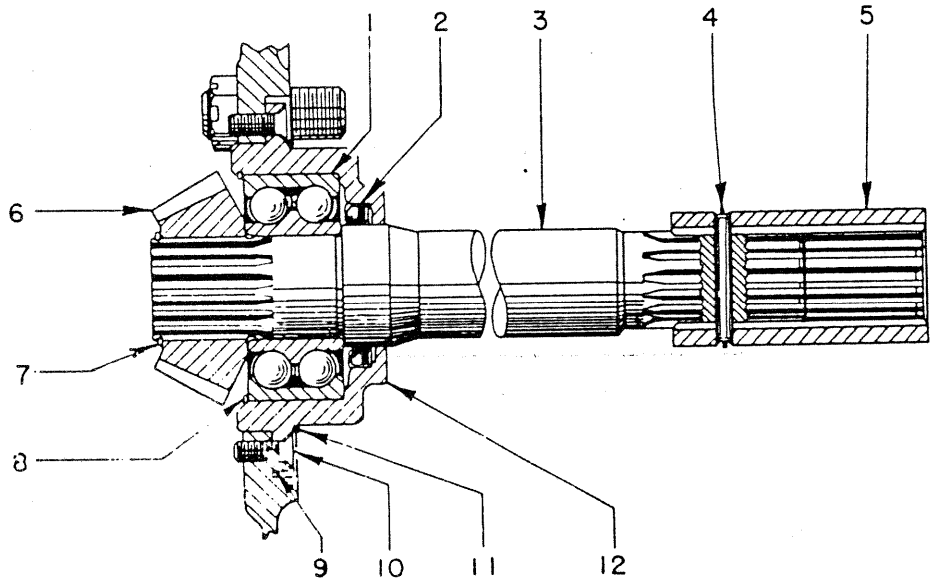
\+ For D9 Tractors S. N. 18A1 and Up-19A1 and Up.

Section D

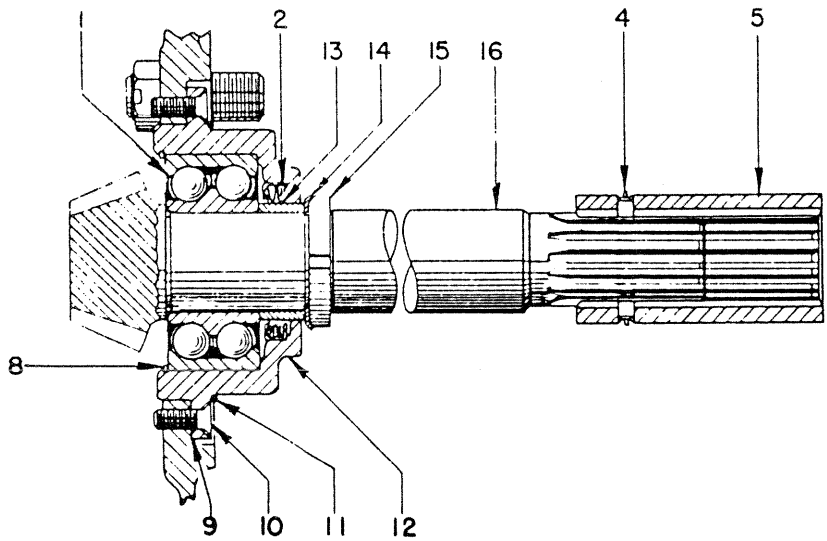
POWER TAKE-OFF, GEAR TRAIN AND DRUM

INDEX

POWER TAKE-OFF



STANDARD SPEED WINCH



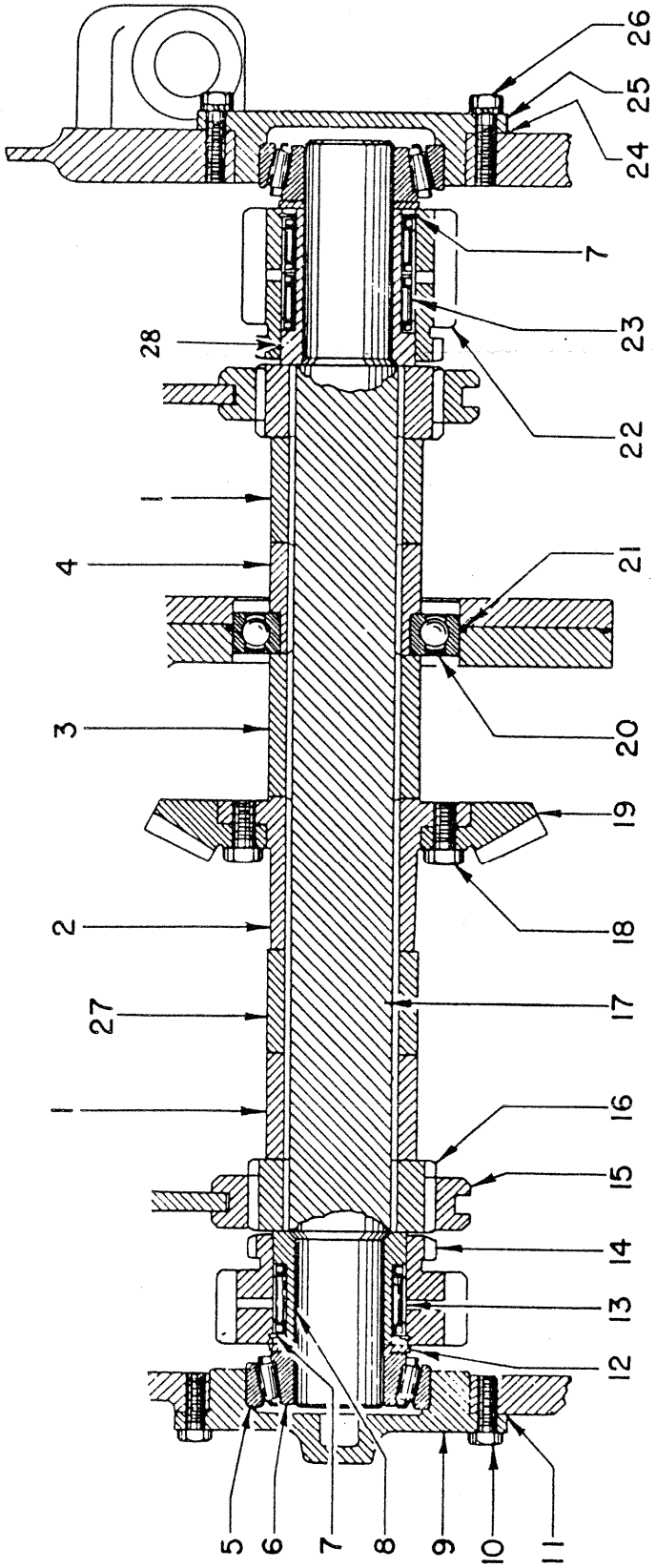
LO-SPEED WINCH

POWER TAKE-OFF

REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	45313W	Bearing	1
2	87355	Oil Seal	1
3	(95585	Shaft - P. T. O., 26-31/32" Long	1
	(	Standard Speed Winch For D8 Direct	
	(	Drive and Torque Converter Tractor	
	(95674	Shaft - P. T. O., 29-9/32" Long	1
	(	Standard Speed Winch For D8	
	(	Power Shift Tractor	
	(95586	Shaft - P. T. O., 30-31/32" Long	1
	(	Standard Speed Winch for D9 Direct	
	(	Drive and Torque Converter Tractor	
	(95587	Shaft - P. T. O., 33-27/32" Long	1
	(	Standard Speed Winch For D9	
	(	Power Shift Tractor	
4	(9450	Pin ("Caterpillar"No. 1A-4599)	1
	(90202	Ring-Lock("Caterpillar"No. 8F-737)	1
5	6327	Coupling("Caterpillar"No. 1B-7852)	1
6	95601	Gear-Spiral)Standard Transmission-	1
7	12940	Snap Ring Only	1
8	12981	Snap Ring	1
9	95459	Shim Set	1
10	(16352	Capscrew-Flathead, 1/2UNFx1-1/4	8
	(15929	Lockwasher - Countersunk, 1/2	8
11	90937	"O" Ring	1
12	95458	Carrier - Bearing	1
13	95813	Spacer) For Lo-Speed	1
14	34055	Lockwasher) Winch	1
15	34056	Locknut) Only	1
16	(95821	Shaft - P. T. O., 27-9/32"Long	1
	(	Lo-Speed Winch for D8 Direct Drive	
	(	And Torque Converter Tractor	
	(95824	Shaft-P. T. O., 29-19/32"Long	1
	(	Lo-Speed Winch for D8 Power Shift	
	(	Tractor	
	(95823	Shaft - P. T. O., 31-9/32"Long	1
	(	Lo-Speed Winch for D9 Direct Drive	
	(	And Torque Converter Tractor	
	(95825	Shaft - P. T. O., 34-5/32"Long	1
	(	Lo-Speed Winch for D9 Power Shift	
	(	Tractor	

BEVEL GEAR SHAFT

(For Direct Drive Winch)

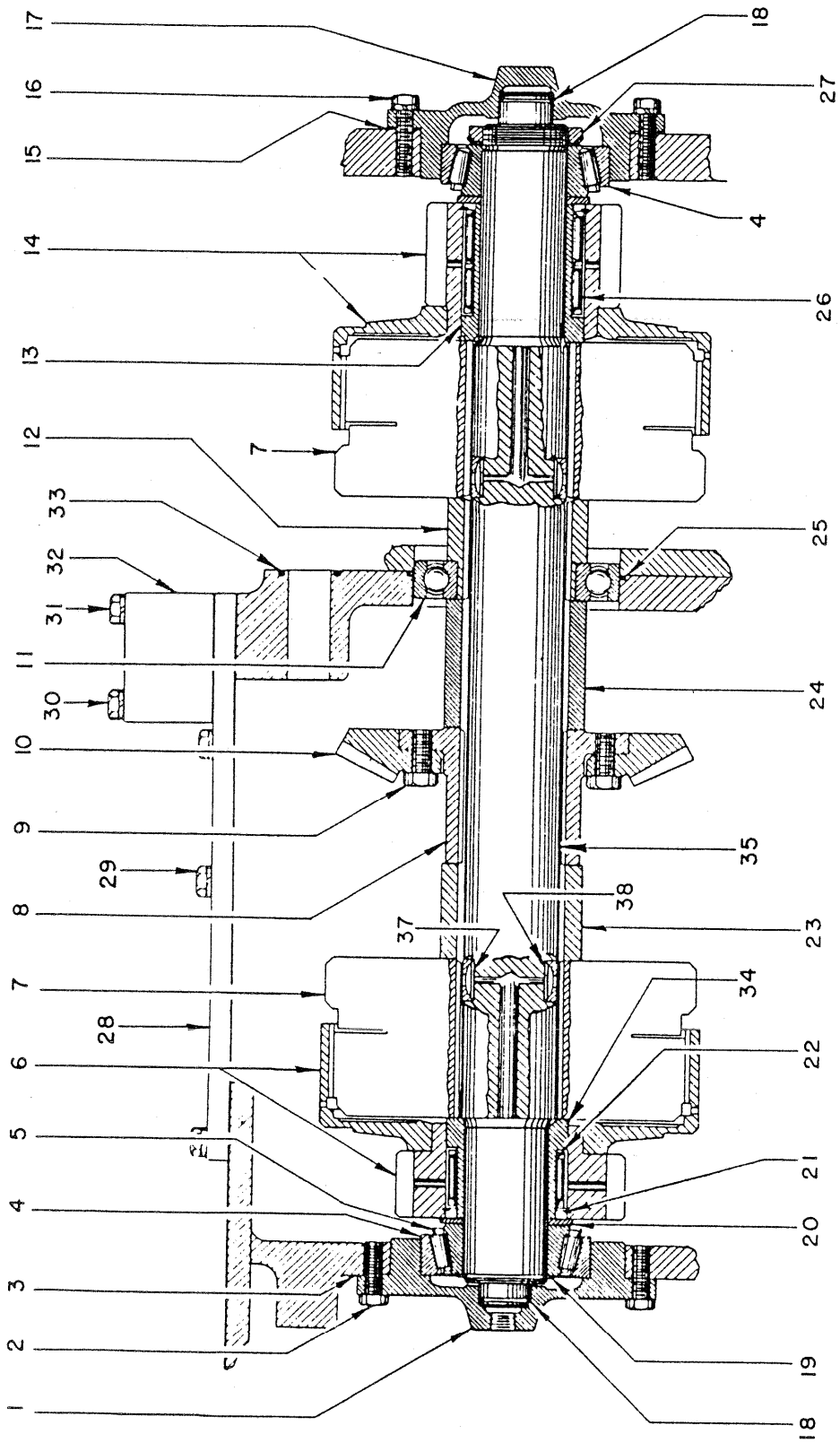


BEVEL GEAR SHAFT

(For Direct Drive Winch)

REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	95689	Spacer	2
2	95761	Hub - Bevel Gear	1
3	95476	Spacer	1
4	95477	Spacer	1
5	30059	Cup - Bearing	2
6	30080	Cone - Bearing	2
7	12990	Snap Ring	2
8	95464	Carrier - Bearing	1
9	95685	Retainer - Bearing	1
10	92816	Place Bolt - 1/2 UNF x 1-1/2	7
11	95461	Shim Set	1
12	95463	Washer	2
13	230393	Bearing - Roller	1
14	(95603	Gear-2nd Reduction (24 Teeth-	
	(	Standard Winch)	1
	(95815	Gear-2nd Reduction (19 Teeth-	
	(	Lo Speed Winch)	1
15	95688	Clutch - Dental	2
16	95687	Hub - Dental Clutch	2
17	95686	Shaft - Clutch	1
18	86079	Capscrew - Drilled Head	8
19	(95762	Gear-Spiral Bevel (41 Teeth -	
	(	Standard Winch)	1
	(95814	Gear-Spiral Bevel (41 Teeth -	
	(	Lo Speed Winch)	1
20	41217	Bearing - Ball	1
21	60988	"O" Ring	1
22	95690	Gear-Reverse Pinion	1
23	230394	Bearing - Roller	2
24	(95033	Shim - .005 Thick	4
	(95166	Shim - .007 Thick	4
	(95034	Shim - .020 Thick	1
25	95691	Retainer - Bearing	1
26	(16807	Capscrew-Hardened, 1/2UNF x	6
	(	1-1/2	
	(15158	Lockwasher - 1/2	6
27	95689	Spacer	1
28	95478	Carrier - Bearing	1

BEVEL GEAR SHAFT
(For Power Controlled Winch)

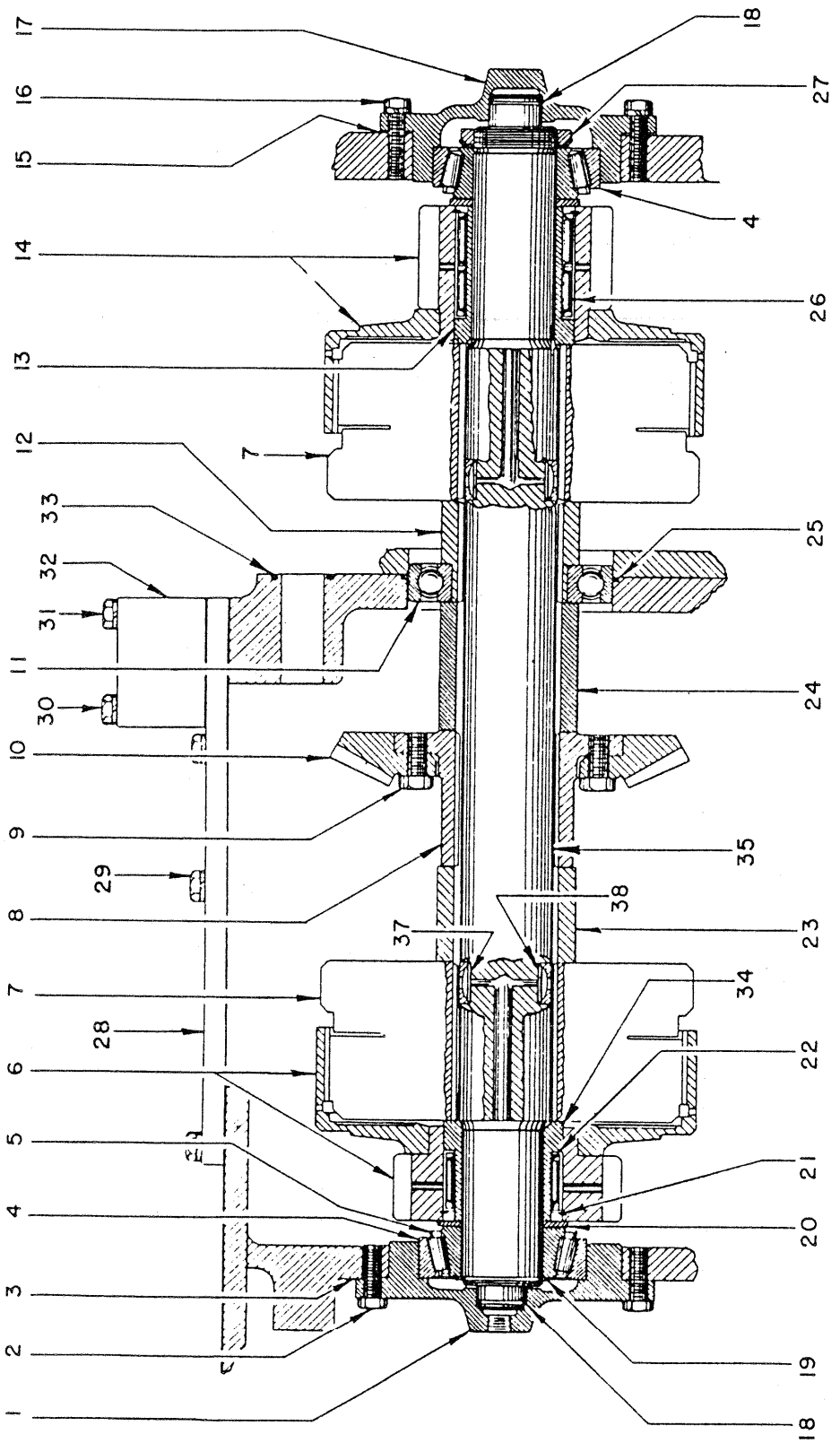


BEVEL GEAR SHAFT

(For Direct Drive Winch)

REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	95689	Spacer	2
2	95761	Hub - Bevel Gear	1
3	95476	Spacer	1
4	95477	Spacer	1
5	30059	Cup - Bearing	2
6	30080	Cone - Bearing	2
7	12990	Snap Ring	2
8	95464	Carrier - Bearing	1
9	95685	Retainer - Bearing	1
10	92816	Place Bolt - 1/2 UNF x 1-1/2	7
11	95461	Shim Set	1
12	95463	Washer	2
13	230393	Bearing - Roller	1
14	(95603	Gear-2nd Reduction (24 Teeth-	
	(	Standard Winch)	1
	(95815	Gear-2nd Reduction (19 Teeth-	
	(	Lo Speed Winch)	1
15	95688	Clutch - Dental	2
16	95687	Hub - Dental Clutch	2
17	95686	Shaft - Clutch	1
18	86079	Capscrew - Drilled Head	8
19	(95762	Gear-Spiral Bevel (41 Teeth -	
	(	Standard Winch)	1
	(95814	Gear-Spiral Bevel (41 Teeth -	
	(	Lo Speed Winch)	1
20	41217	Bearing - Ball	1
21	60988	"O" Ring	1
22	95690	Gear-Reverse Pinion	1
23	230394	Bearing - Roller	2
24	(95033	Shim - .005 Thick	4
	(95166	Shim - .007 Thick	4
	(95034	Shim - .020 Thick	1
25	95691	Retainer - Bearing	1
26	(16807	Capscrew-Hardened, 1/2UNF x	6
	(	1-1/2	
	(15158	Lockwasher - 1/2	6
27	95689	Spacer	1
28	95478	Carrier - Bearing	1

BEVEL GEAR SHAFT
(For Power Controlled Winch)



... A1-A-12 R1
*Bevel Gear ... A1-A-12

BEVEL GEA[illegible]AFT

(For Power Co[illegible]ed Winch)

REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	95460	Carr[illegible]ing	1
2	(16807	Cap[illegible] UNF x 1-1/2	7
	(15158	Loc[illegible] 1/2	7
3	95461	Shi[illegible]	1
4	30059	Cup[illegible]g	2
5	30080	Co[illegible]ing	2
6	* ~~(95678W~~	Sp[illegible]rward (Standard Trans-	
	(	mi[illegible]	1
	* ~~(95818W~~	Sp[illegible] (Lo-Speed	
	(	T[illegible]ssion)	1
7	# 89774A	C[illegible]Assembly (See Page D8	
		F[illegible]rts)	2
8	95761	H[illegible]evel Gear	1
9	86079	Ca[illegible]w - Drilled Head	8
10	(95762	G[illegible]Spiral Bevel (Standard	
	(	T[illegible]ission)	1
	(95814	G[illegible]Spiral Bevel (Lo -Speed	
	(	T[illegible]ission)	1
11	41217	Bea[illegible]g - Ball	1
12	* 95477	Spacer	1
13	95478	Carrier - Bearing	1
14	* 95480W	Spider - Reverse	1
15	95484	Shim Set	1
16	(16397	Capscrew - 1/2 UNF x 1 3/4	7
	(15158	Lockwasher - 1/2	7
17	(95483	Retainer - Bearing	1
	(15302	Fitting - Pipe Plug, 3/8	1
18	95581	Ring - Seal	2
19	# 12917	Snap Ring	1
20	# 95463	Washer	2
21	12990	Snap Ring	2
22	230393	Bearing - Roller	1
23	* 95689	Spacer	1
24	* 95476	Spacer	1
25	60988	"O" Ring	1
26	230394	Bearing - Roller	2
27	# (32966	Lockwasher	1
	(32967	Locknut	1

Continued on next page

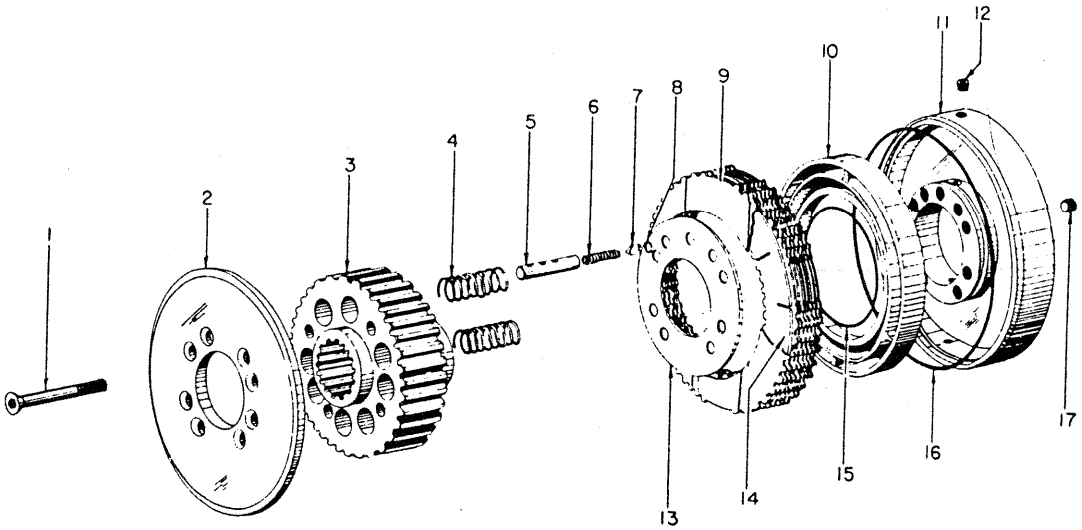
BEVEL GEAR SHAFT — Continued
(For Power Controlled Winch)

REF. NO.	HYSTER PART NO.	NAME OF PART	QTY. REQ.
28	(95740	Cover-Transmission	1
	(95453	Gasket	1
29	(16397	Capscrew-Hardened, 1/2 UNF x 1-3/4	8
	(15158	Lockwasher - 1/2	8
30	(17114	Capscrew-Hardened, 1/2UNF x 3-1/4	3
	(15158	Lockwasher - 1/2	3
31	(18453	Capscrew-Hardened, 1/2UNF x 4	3
	(15158	Lockwasher - 1/2	3
32	(95756W	Block - Intake	1
	(95744	Gasket	1
33	55287	"O" Ring	1
34	95464	Carrier - Bearing	1
35	#*95462	Shaft - Bevel Gear	1
36	15302	Fitting - Pipe Plug, 3/8	1
37	96736	Seal (Two Teeth) -(First Used On	2
38	96737	Seal (Three Teeth)(S. N. 68P1777	2

see A1-A-12.R1
* see A1-A-12

CLUTCH ASSEMBLY — 89774A

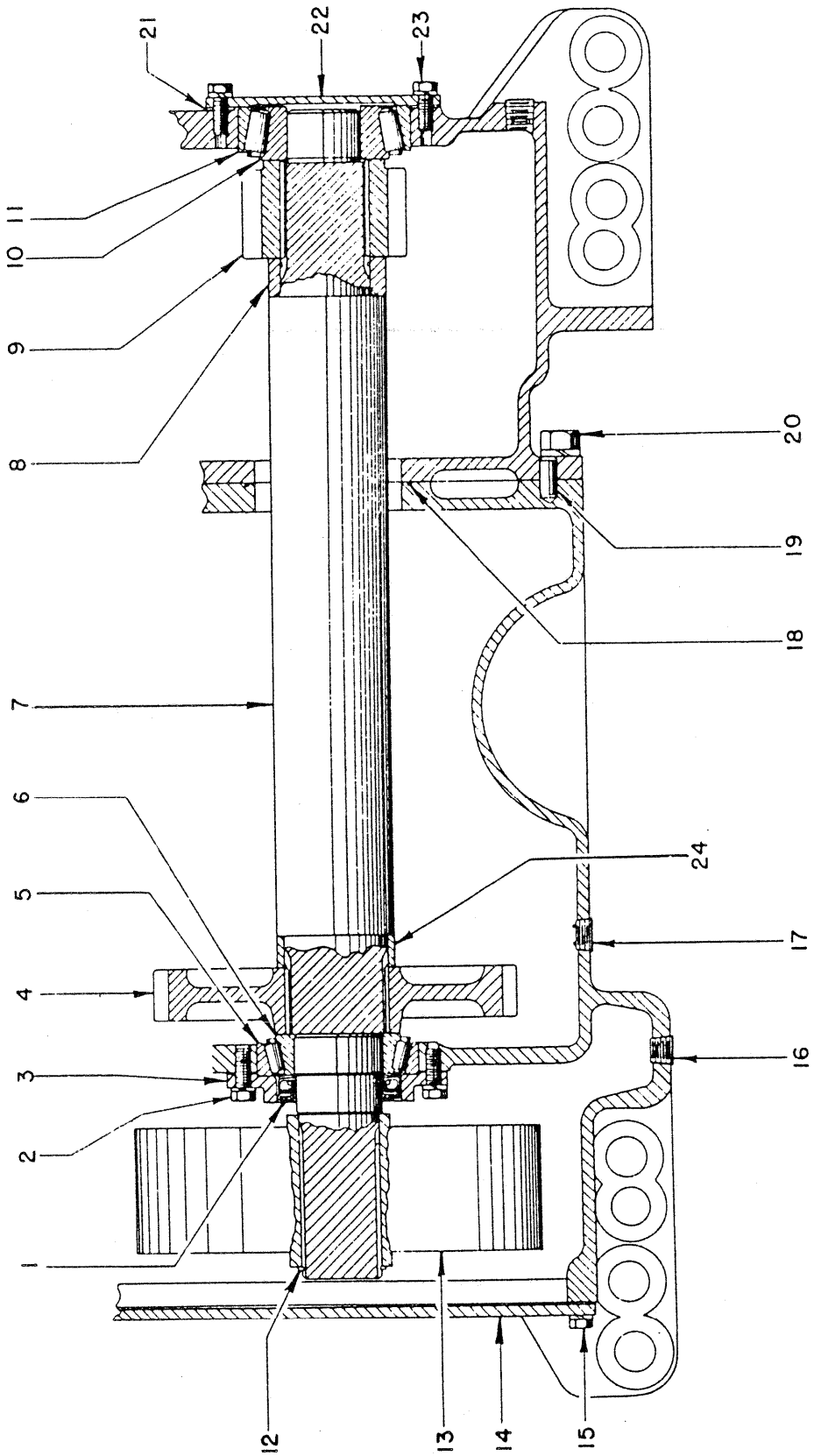
(Quantities Listed Are For One Clutch, Two Clutches Required)



REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	95474	Capscrew - Special	8
2	95473	Plate	1
3	# (95466	Hub - Clutch	1
	*(96735	Shim	3
4	95472	Spring	8
5	+ 89772	Body - Valve	1
6	95833	Spring	1
7	+ 89771	Plunger	1
8	+ 89770	Snap Ring	1
9	95470	Disc - Friction 7" ID 10 7/16" OD	8
10	95469	Piston - Clutch	1
11	* 95468	Plate - Retainer	1
12	15961	Pipe Plug - 1/16	1
13	95467	Retainer - Spring	1
14	95471	Plate - Separator	8
15	89776	"O" Ring	1
16	89775	"O" Ring	1
17	17118	Setscrew - 1/2 UNF x 1/2	8

* First Used on S. N. 68P1777
\+ First Used on S. N. 68P2007.
Prior to this S. N. replace Item 5, 7 or 8 with all three items.

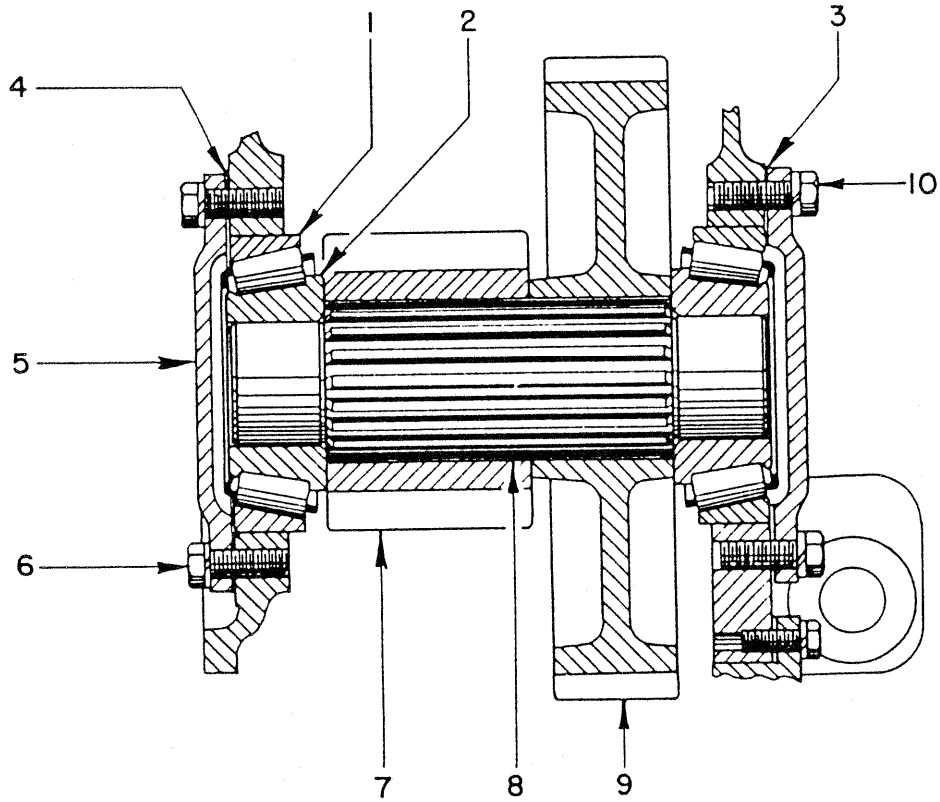
BRAKE SHAFT



BRAKE SHAFT

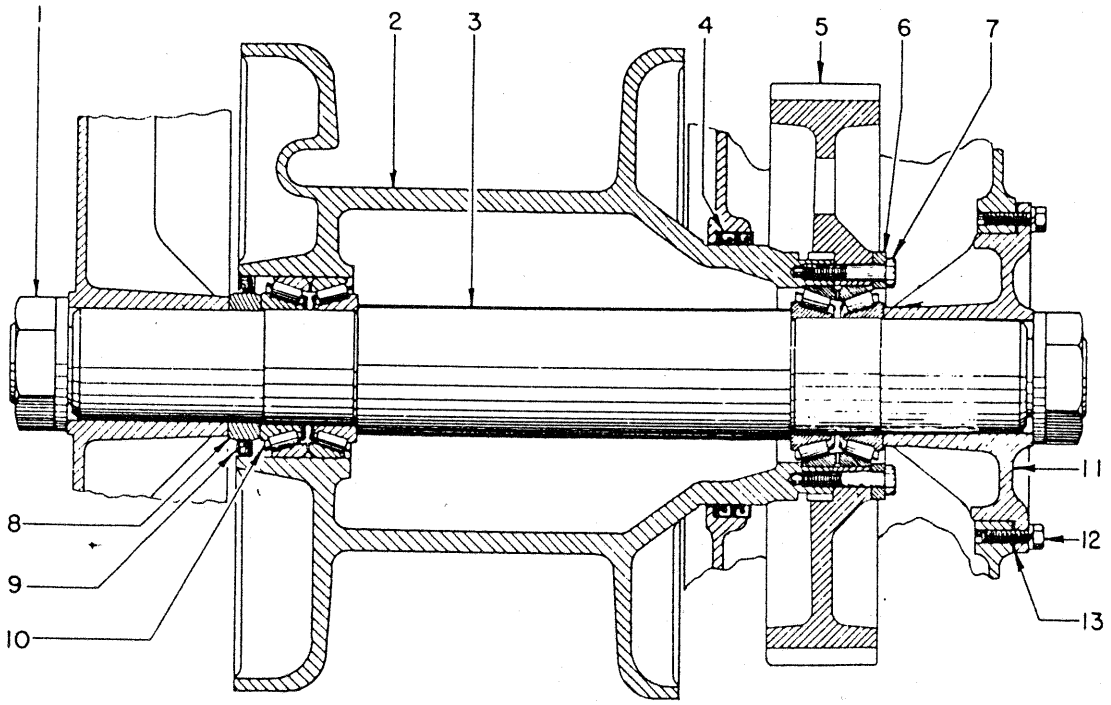
REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	44536	Oil Seal	1
2	16807	Capscrew - 1/2 UNF x 1-1/2	6
3	(89728	Retainer - Bearing	1
	(93791	Gasket	1
4	(95604	Gear - Standard Transmission,	
	(	(51 Teeth)	1
	(95816	Gear - Lo-Speed Transmission,	
	(	(56 Teeth)	1
5	30100	Cup - Bearing	1
6	30101	Cone - Bearing	1
7	95487	Shaft - Brake	1
8	94447	Spacer	1
9	95489	Gear (17 Teeth)	1
10	230326	Cone - Bearing	1
11	30104	Cup - Bearing	1
12	58905	Snap Ring	1
13	95600	Wheel - Brake	1
14	(95444	Plate - Cover, Brake	1
	(95445	Gasket - Cover	1
15	(37562	Capscrew - Hardened, 1/2 UNF	
	(	x 1-1/4	10
	(15158	Lockwasher - 1/2	10
16	15316	Pipe Plug - 3/4	1
17	10389	Pipe Plug - Magnetic, 3/4	2
18	90207	"O" Ring AR3211253	1
19	95440	Pin - Dowel	1
20	(16831	Capscrew - Hardened, 3/4 UNF x	7
	(	1-3/4	
	(15162	Lockwasher - 3/4	7
21	(95033	Shim - .005 Thick	2
	(95166	Shim - .007 Thick	2
	(95034	Shim - .020 Thick	3
22	95490	Retainer - Bearing	1
23	(16807	Capscrew - Hardened, 1/2 UNF	
	(	x 1-1/2	6
	(15158	Lockwasher - 1/2	6
24	95488	Spacer	1

INTERMEDIATE GEAR



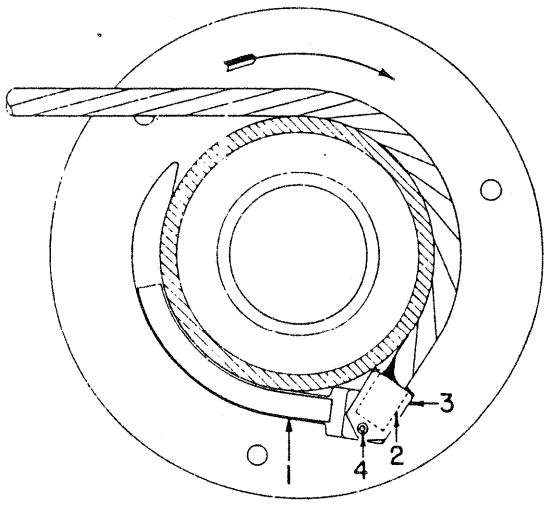
REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	230327	Cup - Bearing	2
2	231011	Cone - Bearing	2
3	(93284	Shim - .005 Thick	3
	(93285	Shim - .007 Thick	2
	(93286	Shim - .020 Thick	1
4	93765	Gasket	1
5	93287	Retainer	2
6	93261	Place Bolt-5/8 UNF x 1-3/4	6
7	95493	Gear - Drum Pinion (14 Teeth)	1
8	95492	Shaft - Intermediate	1
9	95494	Gear-Intermediate (48 Teeth)	1
10	(12479	Capscrew-Hardened, 5/8UNF x	6
	(	1-3/4	
	(15160	Lockwasher - 5/8	6

DRUM ASSEMBLY

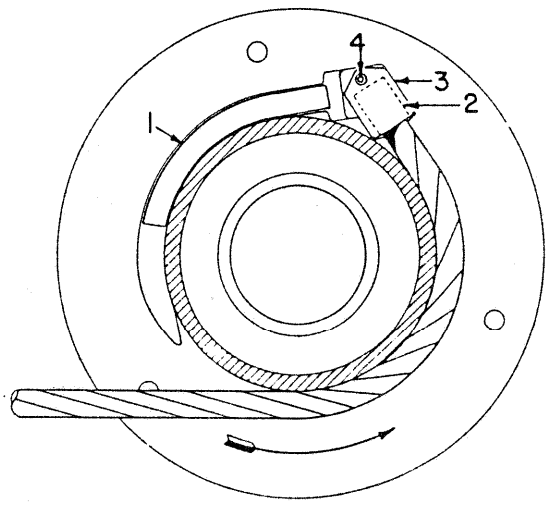


REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	46398	Nut	2
2	(95430	Drum - Standard (Shown)	1
	(95826	Drum - Lo Speed	1
3	95495	Shaft - Drum	1
4	~~35030~~	Oil Seal	1
5	95496	Gear - Drum	1
6	95497	Retainer	1
7	18807	Place Bolt - 5/8 UNF x 3	8
8	93276	Spacer	1
9	44460	Oil Seal	1
10	230329A	Bearing	2
11	95858	Retainer	1
12	(12480	Capscrew-Hardened, 5/8UNF x 2	8
	(15160	Lockwasher - 5/8	8
13	93277	Shim Set	1

CABLE — LOCK



OVERWINDING



UNDERWINDING

REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	(95763	Filler-Cable Groove (Standard	1
	(	Winch)	
	(95822	Filler-Cable Groove (Lo Speed	1
	(	Winch)	
2	30509	Ferrule - Junior	1
3	95499	Lock - Ferrule	1
4	(18850	Capscrew-1/2 UNF x 3	1
	(15158B	Lockwasher-Hi Collar, 1/2	1

Section E

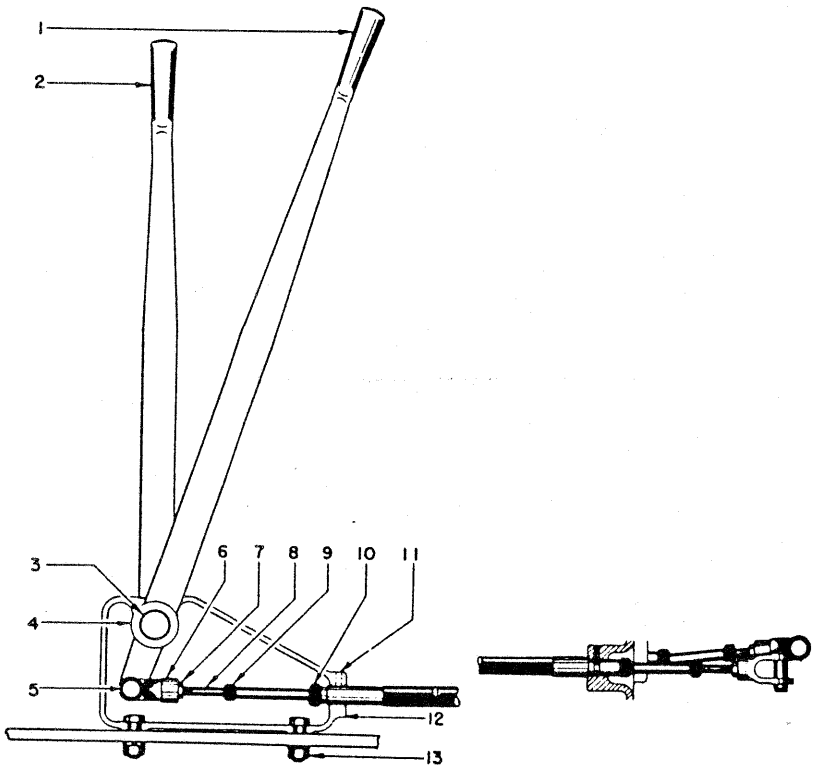
BRAKE AND SHIFTER MECHANISM

(FOR DIRECT DRIVE WINCH)

INDEX

HANDLEVER GROUP — 95904A

(Last Used on Serial No. A67P-1944)

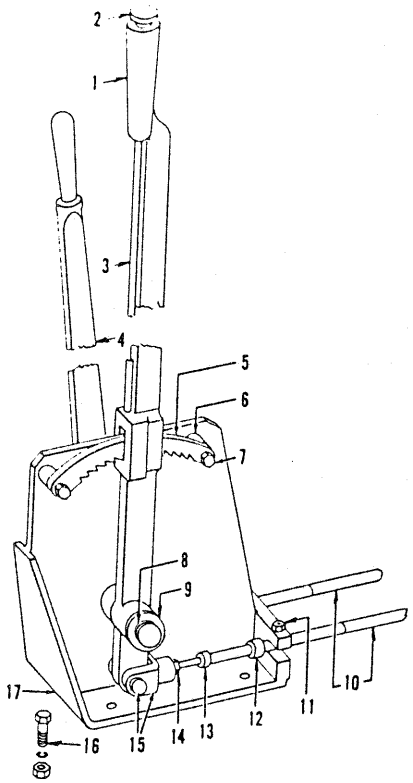


REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	95749	Handlever - Brake	1
2	95750	Handlever - Clutch	1
3	(95606	Shaft	1
	(58907	Snap Ring	2
4	90267	Washer	2
5	(159	Pin - Rod End	4
	(15223	Cotter - 1/8 x 1	4
6	92683	Rod End	4
7	15026	Nut - Jam, 3/8 UNF	4
8	95751	Cable - Push Pull	2
9	* 95905	Grommet - Small	4
10	* 94381	Grommet - Large	4
11	(16212	Setscrew-3/8 UNC x 1-1/4	4
	(15086	Nut-Jam, 3/8 UNC	4
12	95605	Bracket - Handling Gear	1
13	(16807	Capscrew-Hardened, 1/2 UNF x 1-1/2	4
	(15158	Lockwasher - 1/2	4
	(15008	Nut - Hex, 1/2 UNF	4

* Included With Cable 95751.

HANDLEVER GEAR GROUP — 87343A

(First Used on Winch Serial No. A67P-1945)

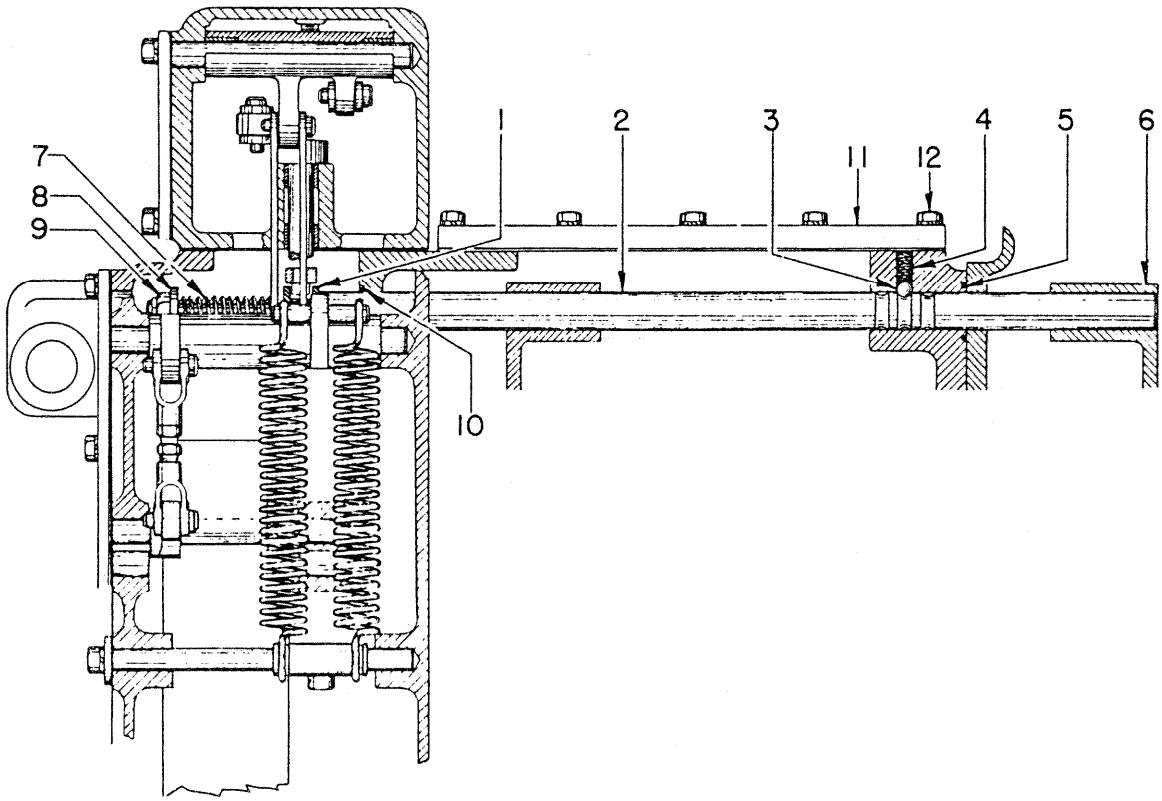


REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	77187A	Handlever Assembly (Brake)	1
2	*(79418	Button	1
	*(79417	Spring	1
3	* 79416	Pawl and Rod	1
4	95750	Handlever (Clutch)	1
5	77188	Bar - Quadrant	1
6	94891	Spacer	2
	(18451	Capscrew - 3/8 UNF x 2	2
7	(15006	Nut - 3/8 UNF	2
	(15156	Lockwasher - 3/8	2
8	58907	Snap Ring	2
9	90267	Washer	2
10	95751	Cable - Control	2
11	(16212	Setscrew - 3/8 UNC x 1-1/4	2
	(15086	Nut - Jam, 3/8 UNC	2
12	+ 94381	Grommet - Large	4
13	+ 95905	Grommet - Small	4
14	15026	Nut - Jam, 3/8 UNF	2
	(92683	Rod End	2
15	(159	Pin - Rod End	2
	(15223	Cotter - 1/8 x 1"	2
	(16807	Capscrew - 1/2 UNF x 1-1/2	4
16	(15158	Lockwasher - 1/2	4
	(15008	Nut - 1/2 UNF	4
17	76706W	Bracket	1

* Part of Handlever 77187A

\+ Part of Control Cable 95751

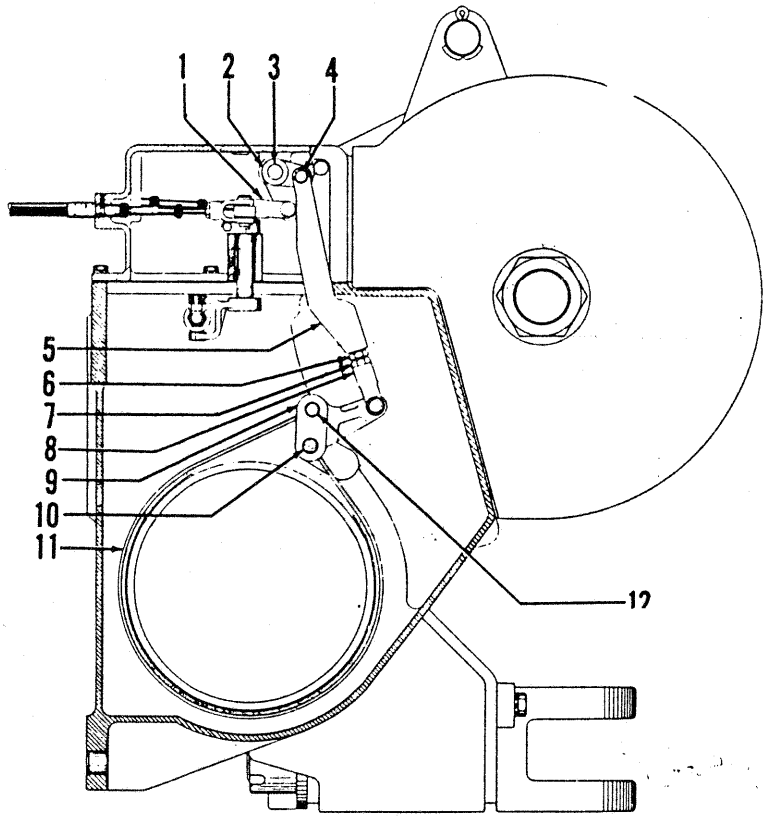
SHIFTER MECHANISM



Ref. No.	Hyster Part No.	NAME OF PART	Qty. Req.
1	33681	Washer	1
2	96509	Shaft—Shifter	1
3	6348	Ball—Steel	1
4	95746	Spring	1
5	55287	"O" Ring	1
6	95694	Fork—Shifter	2
	27936	Lockscrew	2
	67355	Lockwire	2
7	94655	Spring	1
8	33682	Washer	2
9	63085	Nut—Lock, 5/8 UNF	1
0	44494	Oil Seal	1
11	95683	Plate—Cover, Transmission	1
	95684	Gasket	1
12	16397	Capscrew—1/2 UNF x 1 3/4	11
	15158	Lockwasher—1/2	11

BRAKE MECHANISM

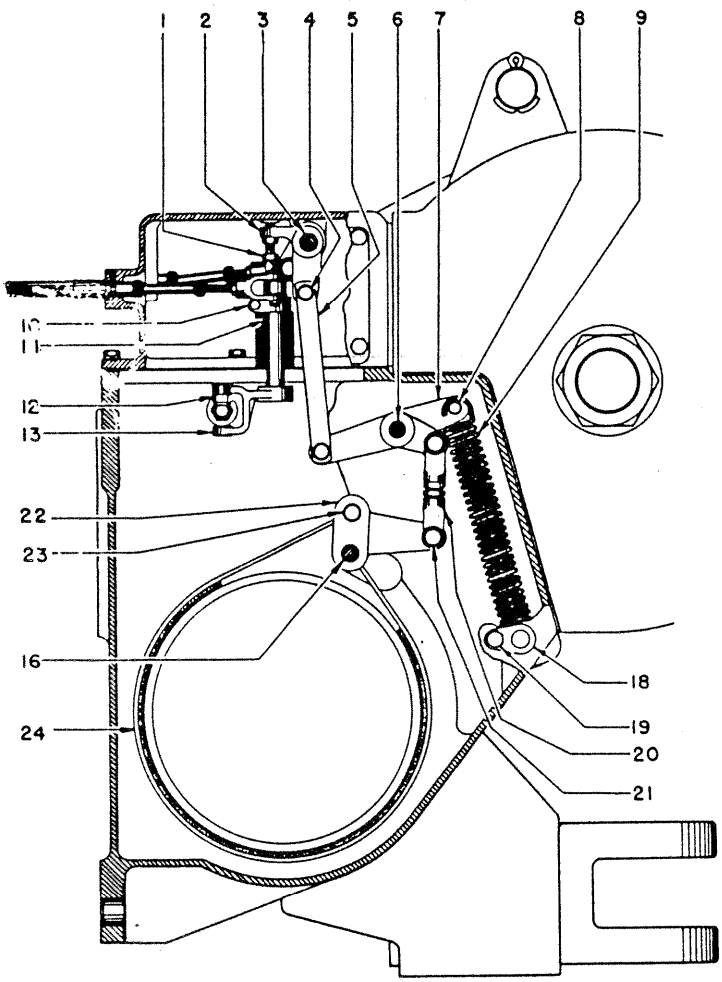
(First Used on Winch Serial No. A67P-1945)

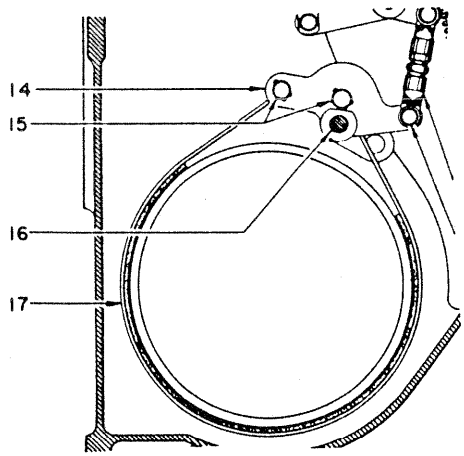


Ref. No.	Hyster Part No.	NAME OF PART	Qty. Req.
1	92683	Rod End	1
	15026	Nut—Jam, 3/8 UNF	1
2	78280A	Crank Assembly (Includes Bushing)	1
	92768	Bushing	2
3	95618	Pin—Brake	1
4	159	Pin—Rod End	3
	15223	Cotter—1/8 x 1	3
5	78281	Link—Brake	1
6	76696	Link—Adjusting	1
7	15030	Nut—Jam, 5/8 UNF	1
8	91629	Rod End—R.H.	1
9	78283A	Lever Assembly—Brake (Includes Bushing)	1
	104607	Bushing	2
10	128393	Pin	1
11	128404	Band Assembly—Brake (Includes Lining Set)	1
	95423A	Lining Set—Brake (Drill at Assembly)	1
12	96725	Pin	1
	15225	Cotter—1/8 x 1/2	1

BRAKE MECHANISM

(For Winches Prior to S.N. A67P-1945)





BRAKE MECHANISM

(For Winches Prior to S.N. A67P-1945)

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Req.
1	* 16807	Capscrew—½ UNF x 1½	1
	* 15028	Nut—Jam, ½ UNF	1
2	* 95616A	Crank Assembly—Brake (Includes Bushing)	1
	92768	Bushing	2
3	95618	Pin—Brake Crank	1
4	* 159	Pin—Rod End	2
	* 15223	Cotter—⅛ x 1	2
5	* 95619	Plate—Link	2
6	* 95623	Pin—Brake Crank	1
7	* 95620A	Crank Assembly—Brake (Includes Bushing)	1
	92768	Bushing	2
8	95622	Pin	1
9	* 95624	Spring	2
10	95635	Crank	1
	15580	Capscrew—⅜ UNC x 1½	1
	15156	Lockwasher—⅜	1
11	95615	Bushing	2
12	33717	Shoe—Shifter	2
13	95636W	Crank—Shifter	1
14	‡ 95630A	Lever Assembly—Brake (Includes Bushing)	1
	104607	Bushing	4
15	‡ 95634	Pin	2
	15244	Cotter—3/16 x 1½	4
16	95618	Pin—Brake	1
17	‡ 95632A	Brake Band Assembly (Includes Lining)	1
	95423A	Lining Set (Drill at Assembly)	1
18	* 95625W	Pin—Brake	1
	* 95696W	Spacer—Spring	1
19	* 16820	Capscrew—½ UNF x 1	1
	15158	Lockwasher—½	1
20	* 95628A	Link Assembly—Adjustment	1
	⁂ 95629	Link	1
	⁂ 92689	Rod End—R.H. Thread	1
	⁂ 15030	Nut—Hex, ⅝ UNF	1
	⁂ 92688	Rod End—L.H. Thread	1
21	⁂ 159	Pin—Rod End	2
	⁂ 15223	Cotter—⅛ x 1	2
22	*† 96722A	Lever Assembly Brake—(Includes Bushing 104607)	1
23	96725	Pin	1
	15225	Cotter—⅛ x 1½	1
24	† 96723A	Brake Band Assembly (Includes Lining Set) 128404	1
	95423A	Lining Set—Brake (Drill at Assembly) ok	1

‡*Last used on S.N. A67P-1764.*

⁂*Included in Link Assembly 95628A.*

†*First used on S.N. A67P-1765.*

**Last used on S.N. A67P-1944.*

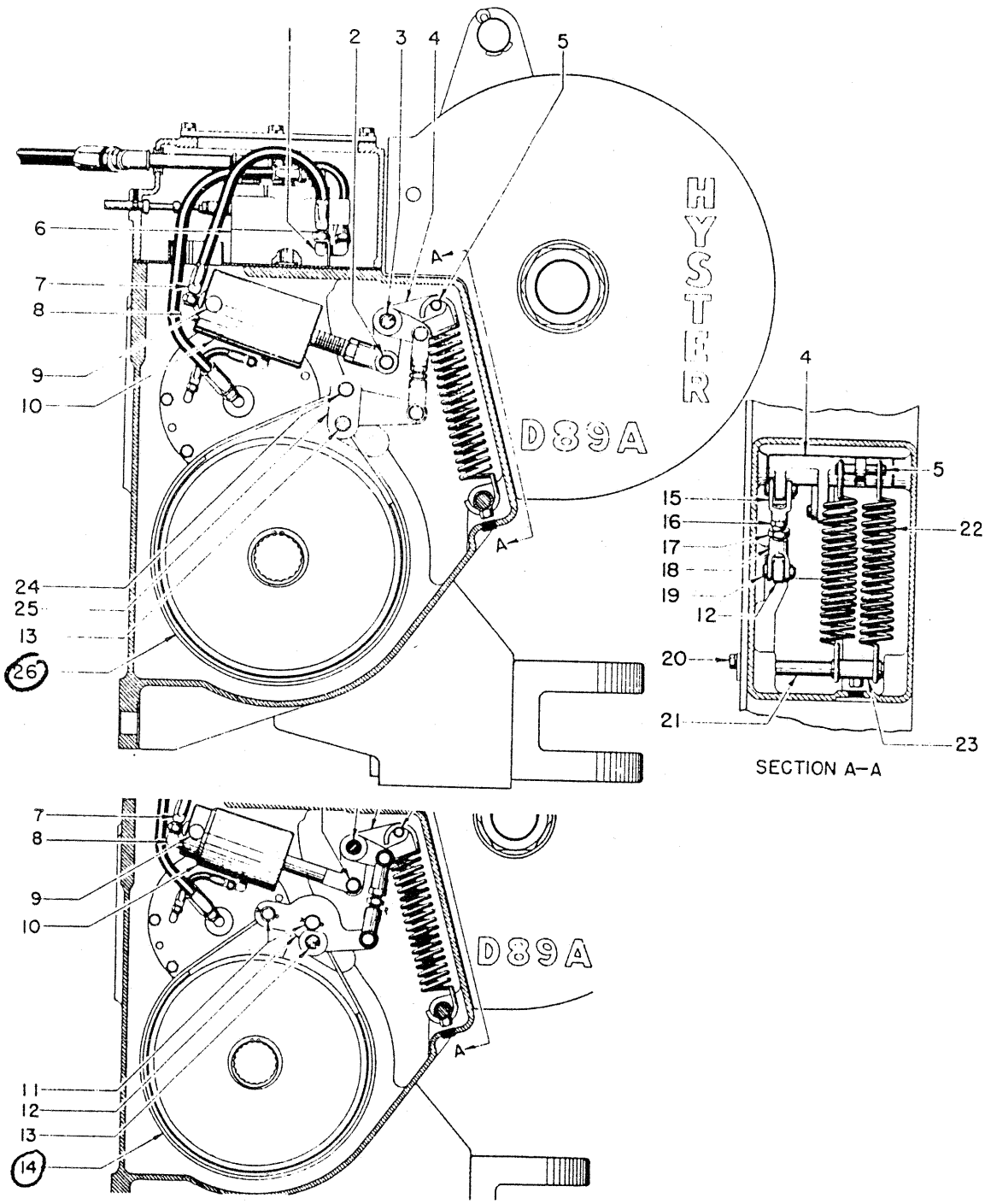
Section F

BRAKE AND HYDRAULIC SYSTEM

(FOR POWER CONTROLLED WINCH)

INDEX

BRAKE MECHANISM



Ref. No.	Hyster Part No.	NAME OF PART	Qty. Req.
1	16558	Tube Fitting—Male Elbow	1
2	† 92689	Rod End	1
	† 15030	Nut—Jam, 5/8 UNF	1
	159	Pin—Rod End	1
	15223	Cotter—1/8 x 1	1
3	95623	Pin—Brake Crank	1

BRAKE MECHANISM

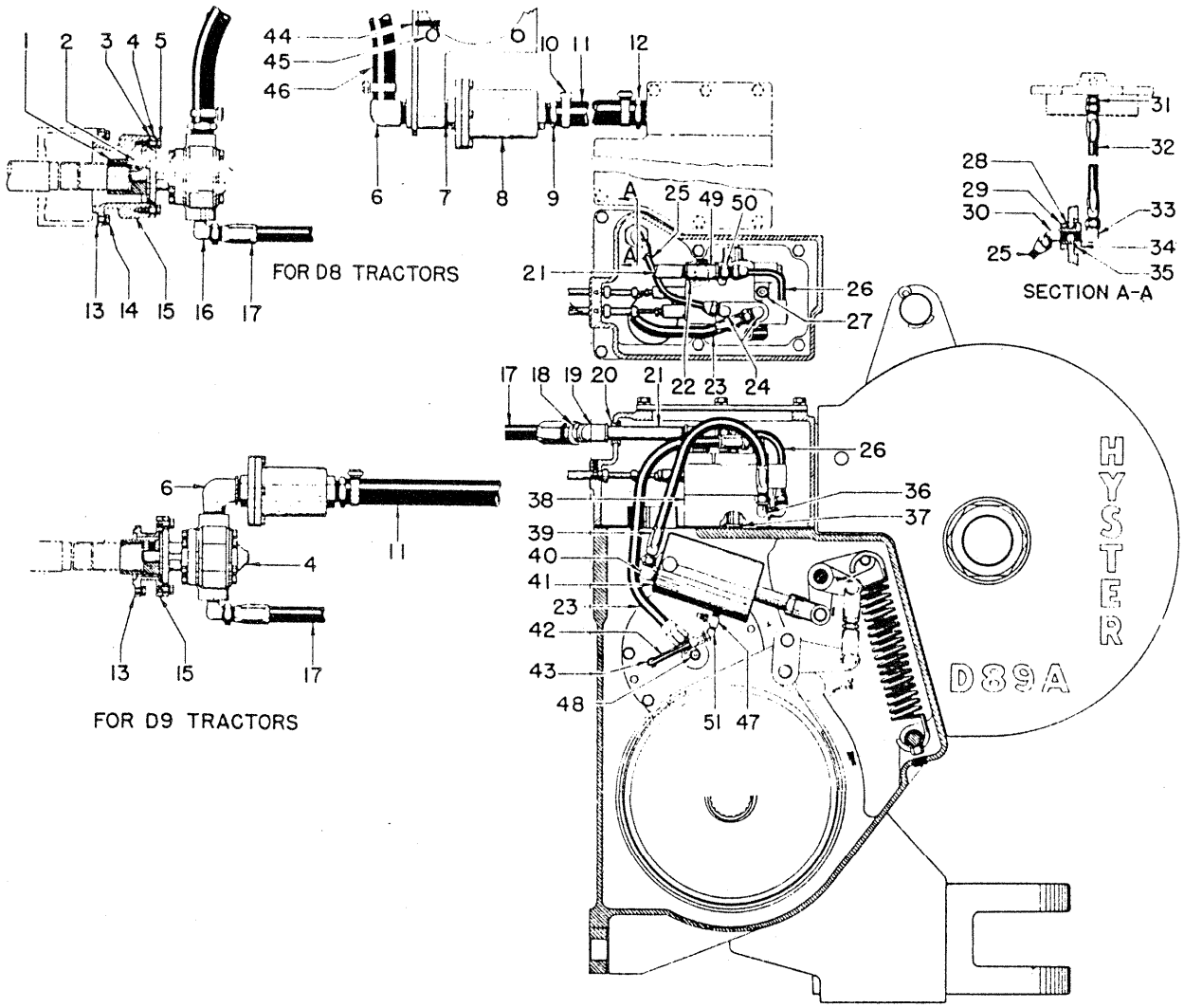
Ref. No.	Hyster Part No.	NAME OF PART	Qty. Req.
4	128392	Crank Assy.—Brake (Incl. Bushing 92768 and Pin)	1
	92768	Bushing	2
5	.....	Pin—Brake Spring—N.S.S.	1
6	.....	Valve Assy. (See Page F8 for Parts)	1
7	95728	Hose—Hydraulic	1
8	14505	Tube Fitting—Male Elbow	1
9	128393	Pin—Brake	1
10	.....	Cylinder—Brake—(See Page F10 for Parts)	1
11	‡ 95634	Pin	2
	‡ 15244	Cotter—3/16 x 1½	2
12	‡ 95630A	Lever Assembly (Includes Bushing)	1
	104607	Bushing	2
13	128393	Pin—Brake Lever	1
14	‡ 95632A	Brake Band Assembly (Includes Lining Set)	1
	95423A	Lining Set (Drill at Assembly)	1
15	95628A	Link Assembly	1
	* 92689	Rod End—R.H. Thread	1
16	* 15030	Nut—Jam, ⅝ UNF	1
17	* 95629	Link—Adjusting	2
18	* 92688	Rod End—L.H. Thread	1
19	* 159	Pin—Rod End	1
	* 15223	Cotter—⅛ x 1	2
20	16820	Capscrew—½ UNF x 1	1
	15158	Lockwasher—½	1
21	95625W	Pin—Brake Spring	1
22	95624	Spring	2
23	95696W	Spacer—Spring	1
24	† 96725	Pin	1
	† 15225	Cotter—⅛ x 1½	1
25	† 96722A	Lever Assembly (Includes Bushing)	1
	104607	Bushing	2
26	†128404	Brake Band Assembly (Includes Lining Set)	1
	95423A	Lining Set (Drill at Assembly)	1

**Included in Link Assembly 95628A.*

†*First used on Serial No. A68P-1777.*

‡*Used Prior to Serial No. A68P-1777.*

HYDRAULIC SYSTEM



HYDRAULIC SYSTEM

REF. NO.		HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1		95701	Coupling - Pump	1
2	(	16200	Setscrew - Socket Head 3/8 UNC x 3/8	2
	(	54112	Snap Ring	1
3		95710	Gasket - Pump	1
4		110171A	Pump (See Page F7 For Parts)	1
5	(	16805	Capscrew - 3/8 UNC x 1	2
	(	15156	Lockwasher - 3/8	2
6	(	17121	Nipple - Hose (For D8 Tractors)	1
	(	15339	Fitting - Street Ell (For D9 Tractors)	1
7		19567	Close Nipple	1
8		95752A	Filter (See Page F11 For Parts)	1
9		17247	Nipple - Hose	2
10		89781	Clamp - Hose	4
11	(	96284	Hose (For D8 Tractors)	1
	(	77988	Hose (For D9 Tractors S. N. 66A1 &Up	1
	(	95452	Hose (For D9 Tractors Prior To S. N. 66A1)	1
12		17241	Nipple - Hose	1
13	(	95610	Gasket - (For D9 Tractors)	1
	(	95486	Gasket - (For D8 Tractors)	1
14		-----	Capscrew (Furnished with Tractor)	1
15	(	95580W	Bracket - Pump (For D9 Tractors)	1
	(	95479	Bracket - Pump (For D8 Tractors)	1
16		14509	Fitting - Tube, Male Elbow	1
17	(	95578	Hose - (For D8 Tractors)	1
	(	77987	Hose - (For D9 Tractors S. N. 66A1 and Up	1
	(	96305	Hose (For D9 Tractors Prior To S. N. 66A1)	1
18		14683	Fitting - Tube, Male Connector	1
19		19512	Fitting - Pipe, 45° Elbow	1
20		95737	Grommet	1
21		15367	Fitting - Pipe, Long Nipple	1
22	(	18789	Capscrew - Hex Socket 3/8 UNC x 5	2
	(	15156B	Lockwasher - 3/8, High Collar	2
23		95733	Hose - Hydraulic	1
24	*	16559	Fitting - Tube, Male Elbow	2
25		95735	Tube Assembly	1
26	(	95727	Tube Assembly	1
	(	17302	Fitting - Male Connector	1
27	(	18889	Capscrew - 3/8 UNC x 3-1/2	1
	(	15156B	Lockwasher - 3/8, High Collar	1

* Includes "O" Ring 16484

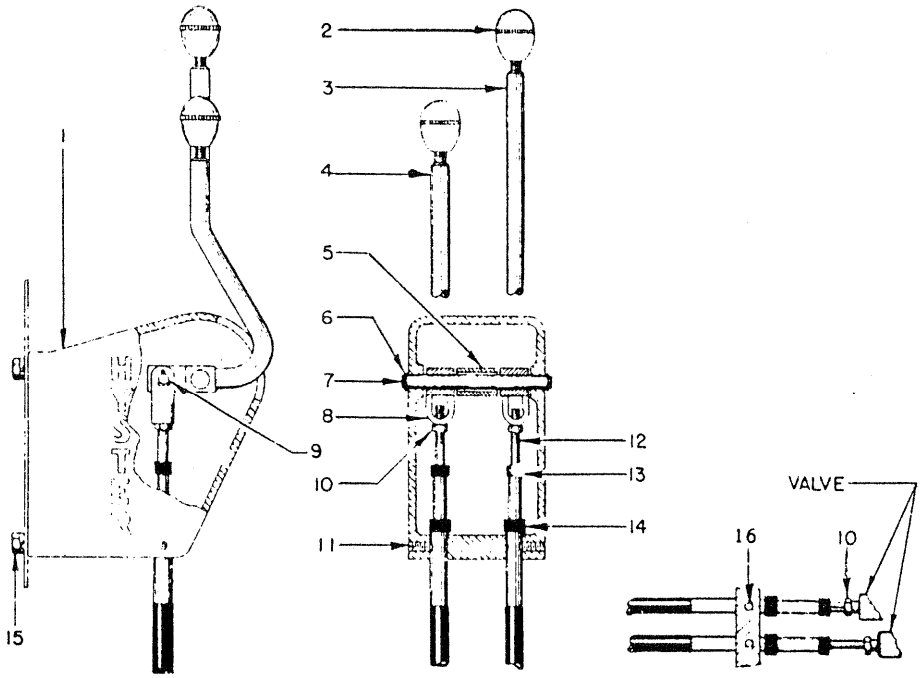
HYDRAULIC SYSTEM — Continued

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Req.
28	15936	Lockwasher—1″ Special	1
29	15036	Nut—Jam, 1″—14 NF	1
30	17344	Fitting—Tube, 45° Male Elbow	1
31	17315	Fitting—Tube, Male Connector	1
32	~~95736~~	Hose—Hydraulic	1
33	17309	Fitting—Tube, Male Elbow	2
34	95583	Fitting—Special	1
35	61056	"O" Ring	1
36	* 96521	Fitting—Tube, Male Elbow First used on S.N. A68P-1531	1
	* 16558	Fitting—Tube, Male Elbow Last used on S.N. A68P-1530	1
37	61142	"O" Ring	1
38	.....	Valve Assembly (See Page F8 for Parts)	1
39	96522	Hose—Hydraulic (Prior to S.N. A68P-1531 include Fittings 96521 and 17309)	1
40	17309	Fitting—Tube, Male Elbow First used on S.N. A68P-1531	1
	14505	Fitting—Tube, Male Elbow Last used on S.N. A68P-1530	1
41	.....	Cylinder Assy.—Brake (See Page F10 for Parts)	1
42	95731	Hose—Hydraulic	1
43	128002	Ball Check Connector	2
44	† 96266W	Bracket—Filter	1
45	† 16816	Capscrew—3/8 UNC x 1 3/4	4
	† 15156	Lockwasher—3/8	4
46	† 96267	Hose—Suction	1
47	16186	Fitting—Tee	1
48	17315	Fitting—Tube, Male Connector	1
	19535	Fitting—Tee	1
	12877	Fitting—Plug	1
49	15455	Fitting—Tee	1
	15334	Fitting—Close Nipple	1
50	17302	Fitting—Male Connector	1
51	14538	Fitting—45° Elbow	1

**Includes "O" Ring—No. 16483.*

†*Used on D8 Tractors only.*

HANDLEVERS

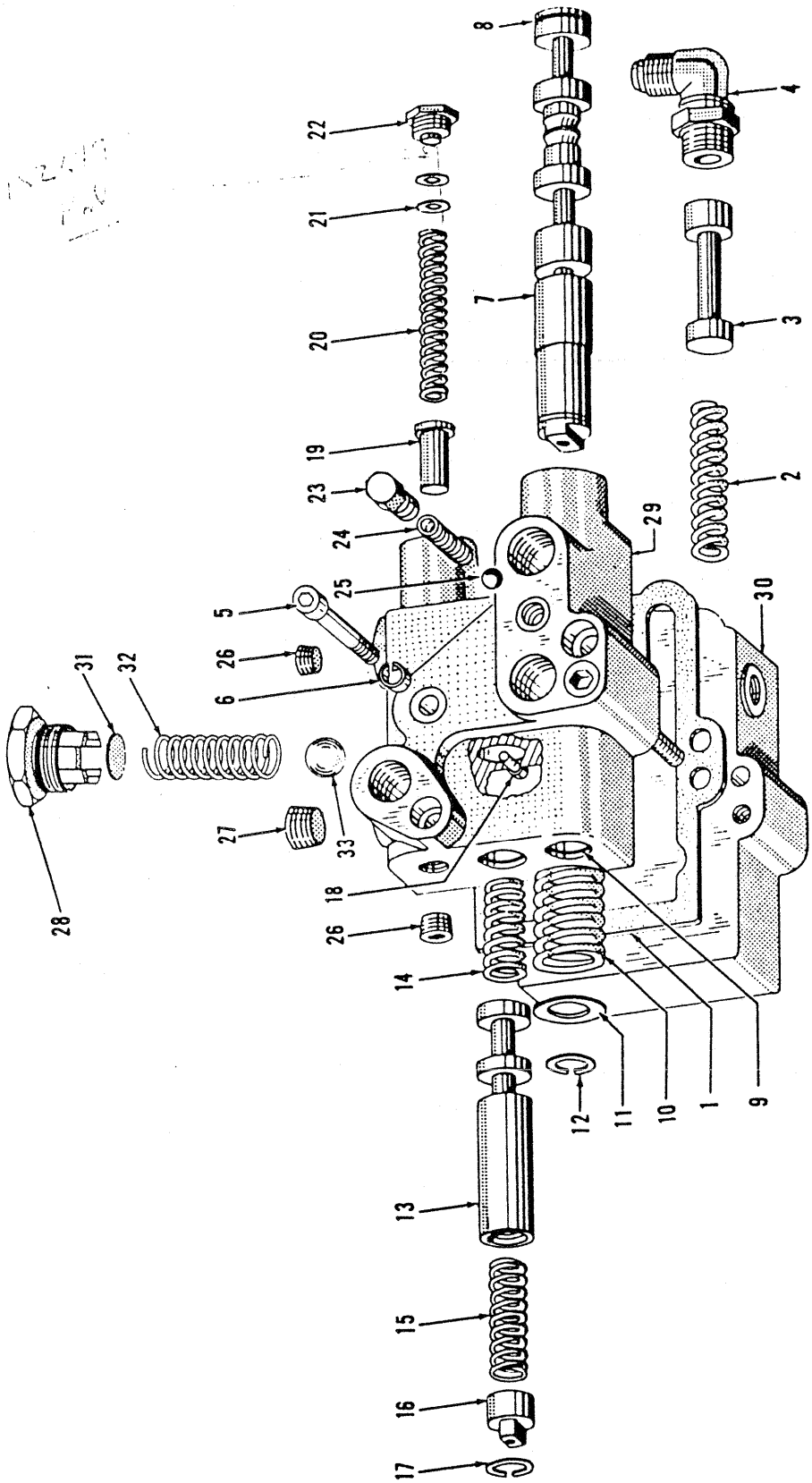


REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
	95703A	Bracket Assembly - Handlever	1
1	* 95704	Bracket - Handlever	1
2	* 66716	Knob	2
3	* 95705	Lever - Brake	1
4	* 95706	Lever - Selector	1
5	* 95707	Spacer	1
6	* 58951	Snap Ring	2
7	* 95708	Pin	1
8	* 95709	Rod End	2
9	*(142	Pin - Rod End	2
	*(15212	Cotter - 3/32 x 3/4	2
10	* 15025	Nut-Jam, 5/16 UNF (Two inc. with 95703A)	4
11	* 16202	Setscrew - Cup Point, 5/16 UNC x 3/8	4
12	(96474	Cable - Push-Pull (For D9 Tractors S. N. 66A1 And Up)	2
	(95611	Cable - Push-Pull (For D9 Tractors Prior to S. N. 66A1)	2
	(95491	Cable - Push-Pull (For D8 Tractors)	2
13	¶ 95876	Grommet - Small	4
14	¶ 94380	Grommet - Large	4
15	(16597	Capscrew - 3/8 UNC x 3/4	4
	(15156	Lockwasher - 3/8	4
16	(18853	Setscrew - Cup Point, 5/16 UNC x 1-1/4	2
	(15001	Nut - Jam, 5/16 UNC	2

* Included in bracket assembly 95703A

¶ Grommets included with cables

VALVE ASSEMBLY



VALVE ASSEMBLY — 89764A

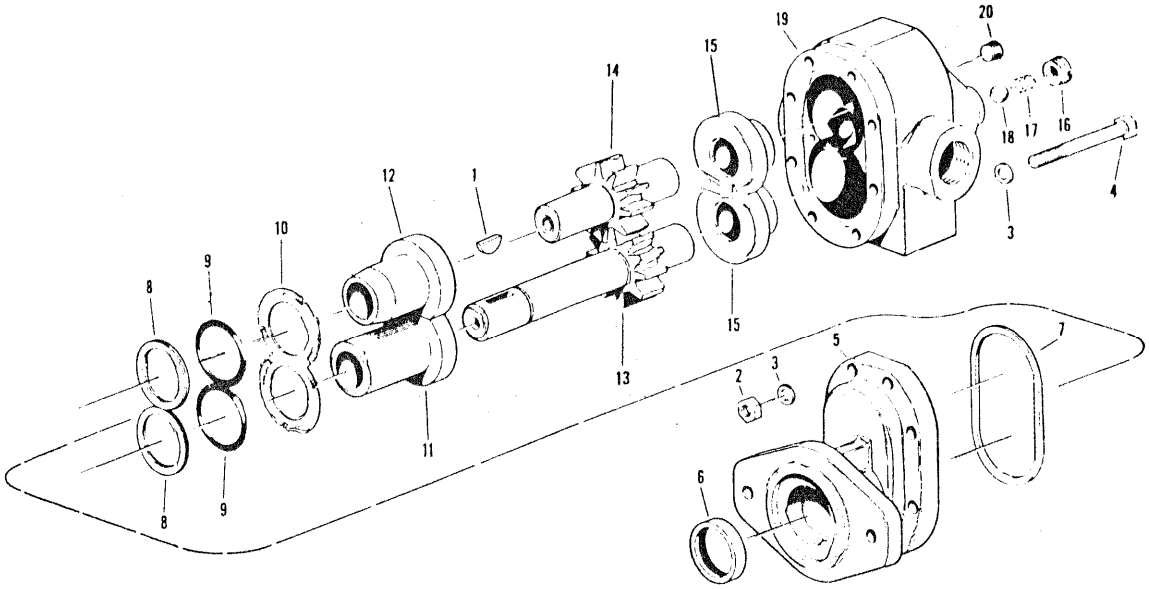
(First used on S.N. A68P-2007)

(For Winches Prior to S.N. A68P-2007 use Valve 89780A)

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Req.
1	95725	Gasket	1
2	95675	Spring	1
3	129198	Piston	1
4	16559	Fitting—Elbow	1
	16484	"O" Ring } Included	1
	16586	Locknut } With Fitting	1
5	17138	Capscrew—Socket Head, 3/8 UNC x 3	2
6	15156B	Lockwasher—3/8	2
7	77975	Spool	1
8	95721	"O" Ring	1
9	95716	"O" Ring	2
10	95612	Spring	1
11	95676	Washer	1
12	58950	Snap Ring	1
13	95718	Spool	1
14	95717	Spring	1
15	95719	Spring	1
16	95720	Plug	1
17	12992	Snap Ring	1
18	15551	Capscrew—1/4 UNC x 1/2	1
	15154	Lockwasher—1/4	1
19	95714	Piston	1
20	95715	Spring	1
21	108408	Washer	2
22	108407	Retainer—Spring	1
	29582	Gasket—Copper	1
23	77736	Fitting—Plug	1
	16482	"O" Ring	1
24	* 96234	Spring	1
25	* 55280	Ball—Steel, 5/16	1
26	15347	Fitting—Pipe Plug, 1/4	1
27	15315	Fitting—Pipe Plug, 1/2	1
28	89766	Fitting—Special	1
	16982	"O" Ring	1
29	89778	Body—Valve	1
30	89765	Support—Valve	1
31	89768	Shim	As req.
32	89767	Spring	1
33	89769	Ball—Steel, 13/16 Diameter	1

**First used on S.N. A68P-1912, to replace Spring or Poppet on prior units, include both Spring 96234 and Steel Ball 55280.*

PUMP ASSEMBLY — H017AB



Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	‡.....	Key	1
2	†.....	Nut—3/8 UNF	8
3	†.....	Washer	6
4	†.....	Screw	8
5	232568	Cover	1
6	‡.....	Seal—Shaft	1
7	‡.....	Seal—Gasket	1
8	‡.....	Washer—Back-up	2
9	‡.....	Seal Ring	2
10	†.....	Spring	1
11	†.....	Bearing—Cover	1
12	†.....	Bearing—Cover	1
13	*.....	Gear—Drive	1
14	*.....	Gear—Driven	1
15	†.....	Bearing—Body	2
16	232579	Pipe Plug—Retainer	1
17	†.....	Spring	1
18	†.....	Ball	1
19	232582	Body	1
20	14349	Pipe Plug—1/8	1

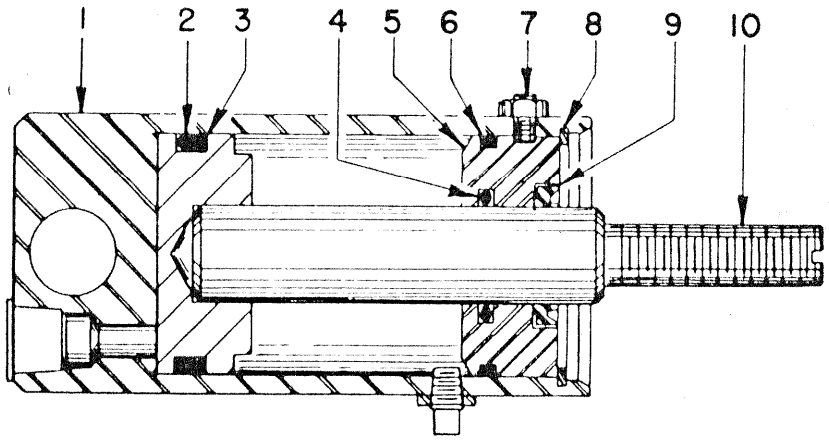
**Included in Gear Repair Kit 233795.*
‡Included in Minor Repair Kit 233793.
†Included in Major Repair Kit 233794.

Note: Major Repair includes Minor Repair Kit.

CYLINDER ASSEMBLY — 97978A

(First Used on S.N. A68P-2007)

(Replace All Prior Cylinders with 97978A.)



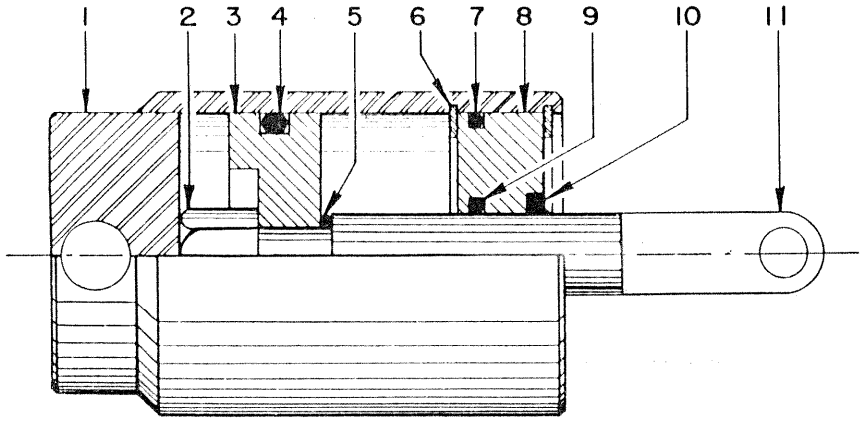
Ref. No.	Hyster Part No.	DESCRIPTION	Qty. Req.
1	76982	Tube and Head Assembly	1
2	63655	"O" Ring	1
3	63654	Back-Up Ring	1
4	61056	"O" Ring	1
5	+ 98359A	Guide Assembly	1
6	57664	"O" Ring	1
7	(16246	Setscrew - 1/4 UNC x 1/2	1
	(15000	Nut - Jam 1/4 UNC	1
8	54129	Snap Ring	1
9	* 44573	Oil Seal	1
10	76984	Rod Assembly	1

* Included in Guide Assembly 98359A

\+ Prior to S.N. A68P2007, include "O" ring 61056 (item 4).

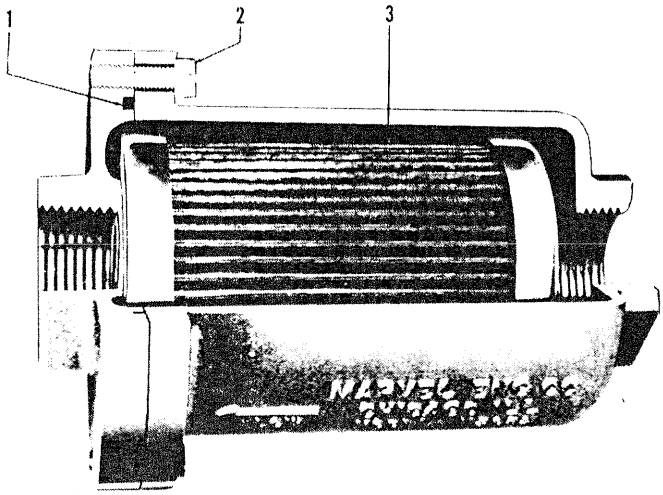
CYLINDER ASSEMBLY — 95729A

(Used Prior to S.N. 68P-1777)



REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	200918	Barrel and Back Assembly	1
2	200919	Nut	1
3	200920	Piston	1
4	57541	"O" Ring	1
5	200921	Gasket	1
6	12896	Snap Ring	2
7	55468	"O" Ring	1
8	200922	Head	1
9	61056	"O" Ring	1
10	44550	Wiper	1
11	200923	Shaft and Clevis Assembly	1

FILTER ASSEMBLY - NO. 95752A



REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	15881	"O" Ring	1
2	18810	Place Bolt - 1/4 UNC x 3/4	4
3	95893	Cartridge	1

Section G

OPTIONAL EQUIPMENT

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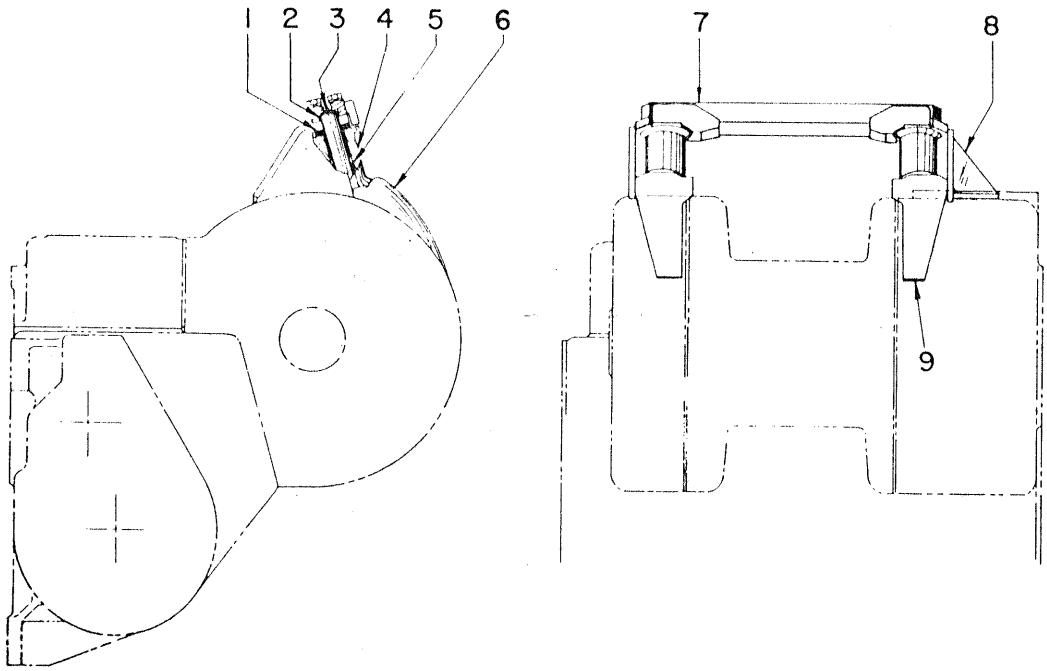
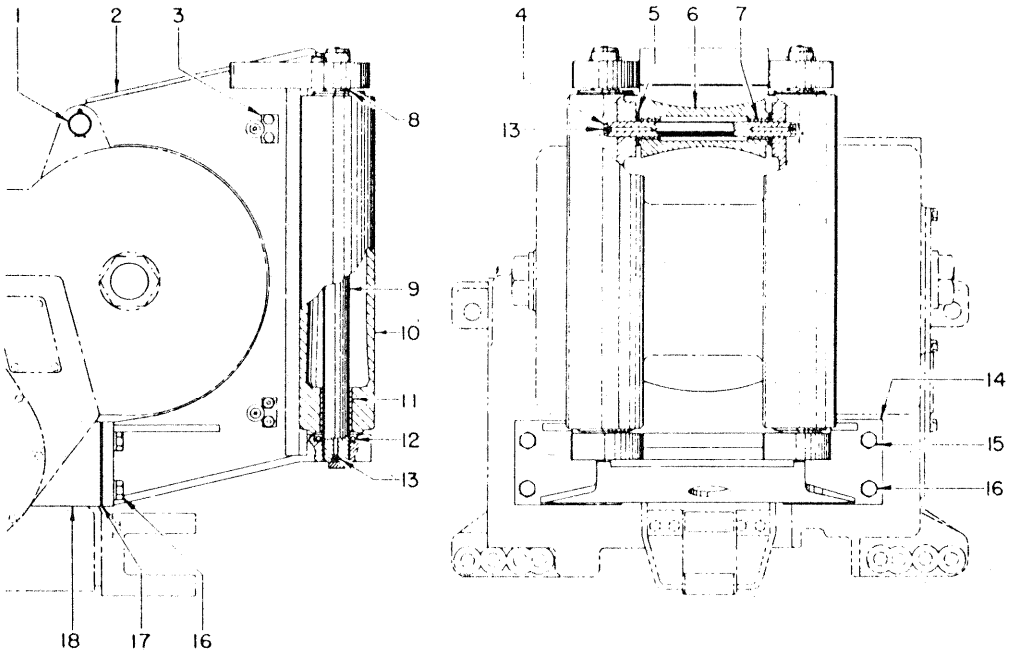
CABLE GUIDE ROLLS — 95850A



REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	95668	Washer	6
2	95669	Pin - Roller	2
3	16006	Fitting - Lubrication	2
4	95666A	Roller Assembly (Includes Bushing)	2
5	35135	Bushing	4
6	95656W	Bracket - L. H.	1
7	(95888W	Guard - Tie	1
	(16645	Capscrew - Hardened 5/8 UNF x 2-1/4	4
	(15160	Lockwasher - 5/8	4
8	95665	Gusset	1
9	95662W	Bracket - R. H.	1

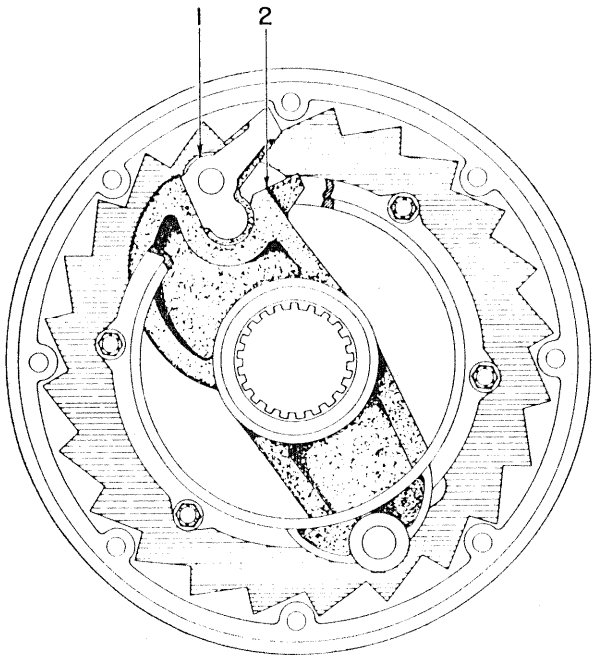
FAIRLEAD ASSEMBLY — 95798A

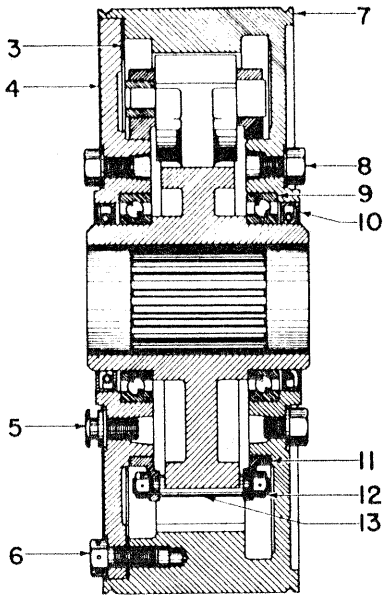


REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	(92606	Rod - Tie (Not Included In	
	(	Assembly No. 95798A)	1
	(15272	Cotter - 3/8 x 3	2
2	95801W	Frame - Fairlead	1
3	(93166	Keeper	4
	(16820	Capscrew - 1/2 UNF x 1	8
	(15158	Lockwasher - 1/2	8
4	93658	Shaft - Horizontal	2
5	92720	Washer	4
6	92212A	Roller Assembly (Includes Bushing)	2
7	59419	Bushing	4
8	38672	Washer - Wearing	2
9	93981	Shaft - Vertical	2
10	93980A	Roller Assembly (Includes Bushing)	2
11	93979	Bushing	4
12	230353	Ball Bearing - Thrust	2
13	16001	Fitting - Lubrication	8
14	95810	Bracket - R. H.	1
15	(18457	Capscrew - 1" N. F. x2-1/4	1
	(15166	Lockwasher - 1"	1
16	(18671	Capscrew - 1" NF x 2-3/4	3
	(15166	Lockwasher - 1"	3
17	96504	Shim	6
18	95811	Bracket - L. H.	1

AUTOMATIC BRAKE — 95431A

(For Direct Drive Winch)

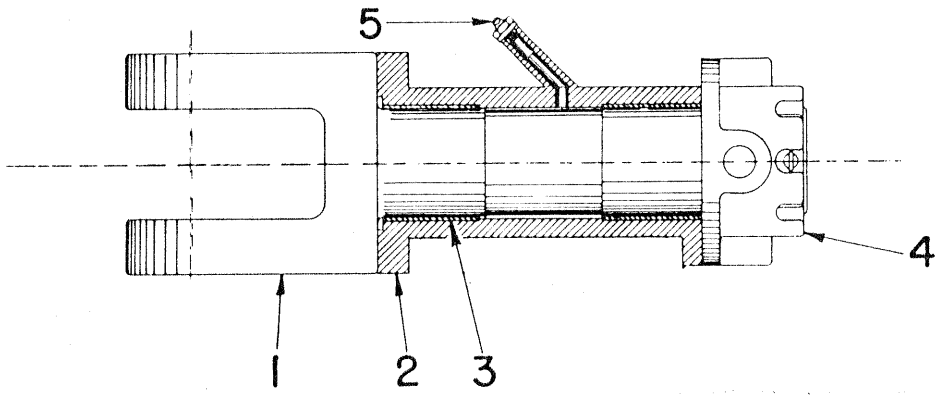




REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	(35880A	Pawl Assembly	1
	*(35880	Pawl	1
	*(35877B	Pin	1
	*(36478	Bushing	1
2	93247	Hub	1
3	92940	Gasket	1
4	92941	Cover	1
5	59370	Plug - Vent	1
6	(9718	Capscrew-Drilled Head	8
	(67355	Lockwire-18 Ga. x 42" Long	1
7	92938A	Wheel - Brake	1
8	(35159	Gasket	4
	(15515	Capscrew-1/2 NF x 3/4	3
9	35148	Bearing	2
10	31970	Seal	2
11	35876B	Ring - Drag	2
12	(15079	Nut-Slotted, 3/8 UNF	8
	(15212	Cotter-3/32 x 3/4	8
13	94600	Link - Shoulder	4
	58700	Grease-3 Lb. Can (High Melting Point)	

* Included In Pawl Assembly 35880A.

SWIVELING DRAWBAR - NO. 96309A



REF. NO.	HYSTER PART NO.	DESCRIPTION	QTY. REQ.
1	33787	Drawbar	1
2	96318A	Adapter Assembly (Includes Bushings)	1
3	92671	Bushing	2
4	(33618	Nut	1
	(15295	Cotter - 1/2 x 5	1
5	16002	Fitting - Lubrication	1

Section Q

NUMERICAL

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