PARTS BOOK
AND
INSTRUCTION MANUAL
for
HYSTER®
D9A TOWING WINCH

EFFECTIVE WITH
HYSTER SERIAL No. JRA- or JRA-T-96064

HYSTER COMPANY
PORTLAND 8, OREGON PEORIA 1, ILLINOIS
DANVILLE, ILLINOIS
U. S. A.

FORM NO. 839C PRINTED IN U.S.A. 2M-1256

599290W

INSTRUCTIONS FOR ORDERING
HYSTER
REPAIR PARTS

1. Always give the serial number of machine, which is found on name plate.

2. Always specify name, number and letter of part required.

3. Always specify shipping destination and definite shipping instructions such as Parcel Post, Express, Air Express, Auto Freight or Rail Freight.

Note: The oil for the transmission shall be a straight mineral type, stable, properly refined, free from fatty acids, resins, abrasives or other non-petroleum material and shall meet the following requirements.

1. Viscosity at 210° F. ..... 80 - 90 Seconds Saybolt Universal
2. Viscosity Index, Minimum 85
3. Pour Point, Maximum ..... Minus 10° F.
4. B. S. & W., Maximum ..... .05%
5. Color, Maximum 8

Black oils or residuum materials will NOT be considered as satisfactory for this specification.

PARTS BOOK
AND
INSTRUCTION MANUAL
FOR
HYSTER
D9A TOWING WINCH

FOR "CATERPILLAR" D9 TRACTORS
SERIES "D" STANDARD AND TORQUE CONVERTER

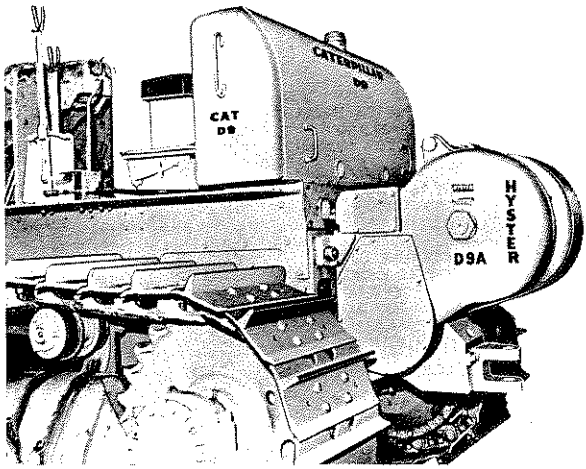
FOR "CATERPILLAR" D8 TRACTORS
SERIES "D" TORQUE CONVERTER, SERIES "E" STANDARD

OIL STEERING CLUTCH

SERIES "F" STANDARD, SERIES "G" TORQUE CONVERTER

ALSO FOR 583 PIPELAYER

FOR D9 AND D8 TORQUE CONVERTER TRACTOR
USE WINCH WITH SUFFIX JRA-T



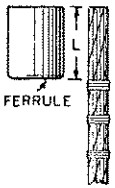
Including

Installation, Lubrication and
Servicing Instructions

HYSTER COMPANY

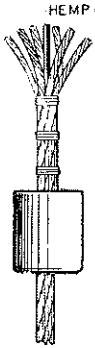
PORTLAND 8, OREGON • PEORIA 1, ILLINOIS • DANVILLE, ILLINOIS
U. S. A.

METHOD OF ATTACHING FERRULES



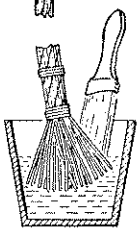
1 MEASURE FROM END OF CABLE A LENGTH EQUAL TO LENGTH OF FERRULE. SERVE WITH NOT LESS THAN THREE SEIZINGS.

2 SLIP FERRULE OVER CABLE AND PUSH DOWN OVER SEIZINGS.

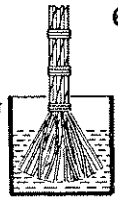


3 CUT OUT HEMP CENTER.
IF CABLE HAS A WIRE ROPE OR STEEL STRAND CENTER, DO NOT CUT OUT.

4 SEPARATE WIRES OF STRANDS AND STRAIGHTEN TO FORM A BRUSH.



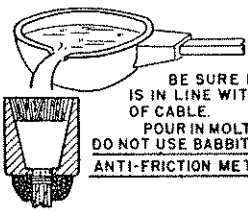
5 IF WIRES ARE VERY GREASY. CLEAN WITH SOLVENT
A CHEAP PAINT BRUSH DIPPED IN THE SOLVENT CAN BE USED TO REMOVE THE SURPLUS GREASE.
DRY THOROLY.



6 DIP WIRES FOR 3/4 OF THE DISTANCE TO FIRST SERVING INTO ACID BATH CONSISTING OF NOT OVER ONE PART OF MURIATIC AND ONE PART WATER.
TAKE CARE THAT ACID DOES NOT GET ON ANY OTHER PART OF CABLE.
KEEP IN LONG ENOUGH TO BE THOROLY CLEANED.
DRY THOROLY.

7 SLIP FERRULE UP. DISTRIBUTE WIRES EVENLY IN RECESS AND FLUSH WITH TOP OF FERRULE
DO NOT CRIMP OVER ENDS OF WIRES.
PLACE MUD SEAL AROUND BOTTOM OF FERRULE AS AT "A"

8 HEAT THE ZINC TO THE POINT WHERE A SMALL STICK OF SOFT WOOD DIPPED INTO THE ZINC AND QUICKLY WITHDRAWN WILL BE SCORCHED BUT NOT IGNITED.



9 BE SURE FERRULE IS IN LINE WITH AXIS OF CABLE.
POUR IN MOLTEN ZINC.
DO NOT USE BABBITT OR OTHER ANTI-FRICTION METAL.

10 REMOVE SEIZINGS EXCEPT THE ONE UNDER THE FERRULE.
COOL SLOWLY.

INDEX

SECTION A
Operation

This section, in addition to instructions for operating, contains illustrations and instructions pertaining to certain simple adjustments.

Lubrication instructions are provided and should be carefully studied. The lubricant recommended should be used.

Keep all bolts and nuts tight and check all other connections.

TRACTOR OPERATOR PRECAUTIONS

1. While the tractor is in motion, extreme care should be taken to prevent accidents and personal injuries.
2. Before stopping the engine and dismounting from the tractor
   A. Stop the motion of the tractor.
   B. Disengage the master clutch.
   C. Place the tractor transmission gear shift lever in neutral.
   D. Set and lock the brakes. (When parking on a hill, the tractor should be chocked.)
3. At the start of the shift, check to be sure that all steps under Instruction 2 have been carried out. If these instructions are not followed there is danger of the tractor moving when the operator is starting the engine, and he may be dragged under the tractor or otherwise seriously injured.

Do not operate tractor while the winch is being operated under load as damage to winch or tractor may result from accidently pulling rigging around winch drum.

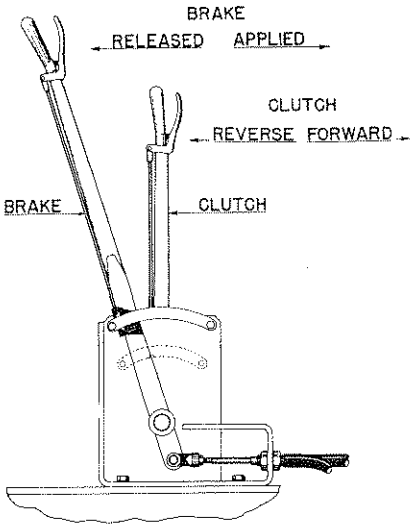
Be sure winch gear shift lever is in neutral position BEFORE MOVING THE TRACTOR

THE TRACTOR MASTER CLUTCH SHOULD BE DISENGAGED BEFORE SHIFTING GEARS IN THE WINCH

Right and Left Hand Side of Towing Winch

The part of the towing winch on the right-hand side of the tractor whei the driver is sitting in the tractor seat is known as the right-hand side.

LOCATION AND OPERATION OF LEVERS



The brake and shifter levers are located on the left-hand side of operator. A pawl and ratchet are provided to hold the brake handlever in applied position and the clutch shifter handlever in the neutral position.

CAUTION: The brake should always be released before attempting to operate the winch, otherwise serious damage will result.

The brake handlever is the longer lever. When lever is in the forward position the brake is released. When lever is pulled back toward the operator the brake is applied.

The brake is an external contracting band type. Care should be exercised in applying the brake ONLY when the tractor master clutch is disengaged. Otherwise the tractor motor will be stalled and damage could result to the winch mechanism.

NOTE: When an automatic brake is used the brake may be applied when pulling in a load, and *must* be released to pay out line.

Overwinding

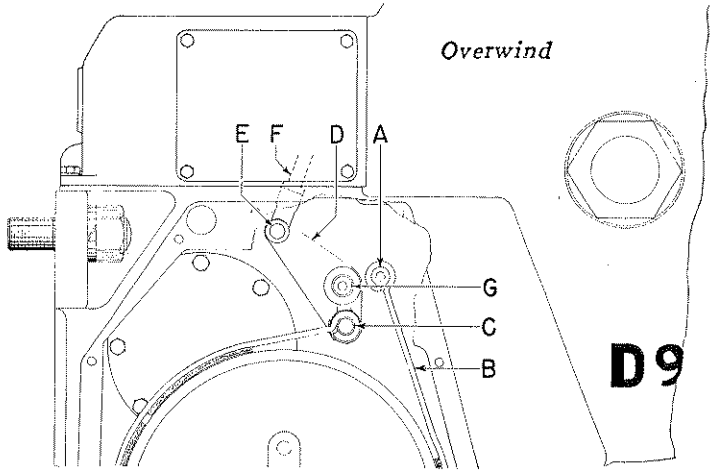
When the winch is used with the cable leading from the top of the drum, the drum is OVERWINDING. To wrap the cable around the drum or pull in a load the shifter lever should be pulled back toward the operator. Center location is neutral. To pay out line, shift lever forward.

NOTE: If not otherwise specified, all winches are shipped with the brake set up for drum to be pulling cable in OVERWINDING (over the top of the drum barrel).

Underwinding

When the winch is used with the cable leading from the bottom of the drum, it is said to be UNDERWINDING. To wrap the cable around the drum or pull in a load the shifter lever should be pushed away from the operator. Center location is neutral. To pay out line, shift lever backward.

OPERATING INSTRUCTIONS

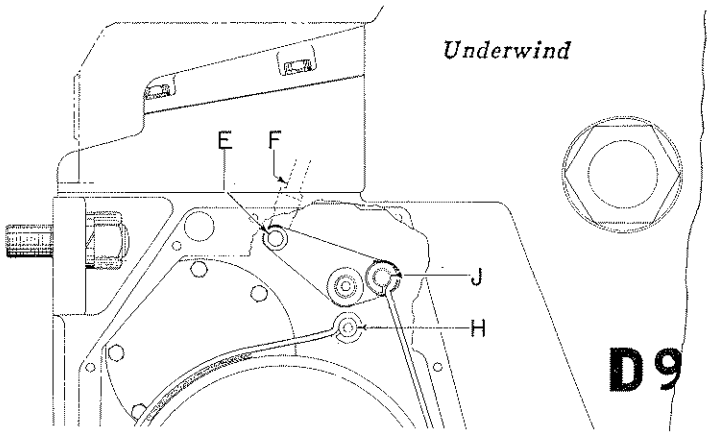


For underwind operation the following changes must be made.

Remove pin "A" at anchored end of brake band assembly "B" and pin "C" from loose end where it is connected to crank "D." Remove pin "E," disconnecting crank "D" from link "F." Remove pin "G," turn crank "D" over, and reinsert pin "G."

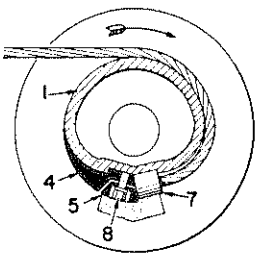
The end of the band, which was the loose end for overwind, now becomes the anchored end at "H" by inserting the pin "A" in its new location. Fasten the loose end of the band to the crank at "J," and reinsert the pin "E" through the crank "D" and link "F."

Readjust link "F" so there is approximately 1/32" clearance between brake lining and drum, with brake handlever in fully released position. Change cable groove filler in drum barrel as shown.

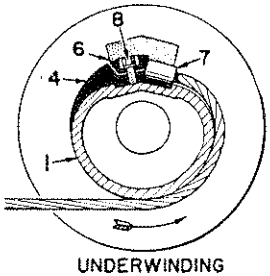


OPERATING INSTRUCTIONS—Continued

Method of Attaching Cable for Overwinding Or Underwinding Drum



OVERWINDING

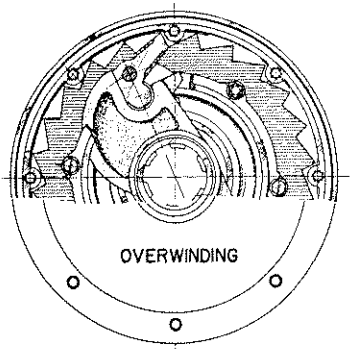


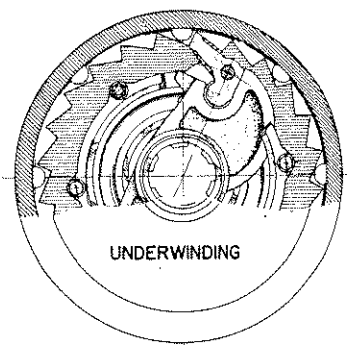
UNDERWINDING

OVERWINDING—Place ferrule (7) in pocket and lock into place with filler (4) and ferrule lock (5), using capscrew (8) and lockwasher.

UNDERWINDING—Place ferrule (7) in pocket and lock into place with filler (4) and ferrule lock (6), using capscrew (8) and lockwasher.

Special Automatic Brake (Optional Equipment)





If the winch is equipped with an automatic brake, it will be noted that one side is marked "overwinding" and the other side marked "underwinding".

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 regular brake apply also to the special automatic brake.

SECTION B
Servicing Instructions

LUBRICATION INSTRUCTIONS

Refer to chart shown on opposite page.

The lubrication chart shows the location of the various filler, level and drain plugs on the transmission case and lubrication fitting at the drawbar swivel.

On a new winch the oil should be drained from both compartments of gear housings at the end of one week, flushed and refilled with fresh oil.

Transmission Case Lubrication

The bearings in the transmission, intermediate and drum gear train are lubricated from the oil in the transmission case. The filler plug "A" is located in the right-hand side frame top cover plate. Oil reaches both compartments through this one filler. The oil level in the case should be checked weekly, keeping the case filled up to the oil level plug "B" which is located on the outside of the right-hand side frame.

The two drain plugs "C" are located in the bottom section of transmission case and the bottom section of the right-hand frame. These drain plugs are of the magnetic type which attract and hold any metal particles settling out of the oil.

In normal operation of winch, drain, flush and refill with fresh oil every 60 days depending on operating conditions. For refilling, use SAE 90 under ordinary use and weather conditions. In general use the same gravity oil as is required in the "Caterpillar" transmission. Approximately 17 gallons of oil is required.

Built-in Drawbar

If the Hyster built-in drawbar is used in the swiveling set-up, it should be lubricated through the grease fitting "E" provided on bracket.

Fairlead

Grease fittings "F" in fairlead roll shafts should be serviced daily.

Handling Gear Lubrication

Shifter rods, lever fulcrums, pin connections and other moving parts should be kept working freely by oiling once every day with a few drops of oil from an ordinary oil can.

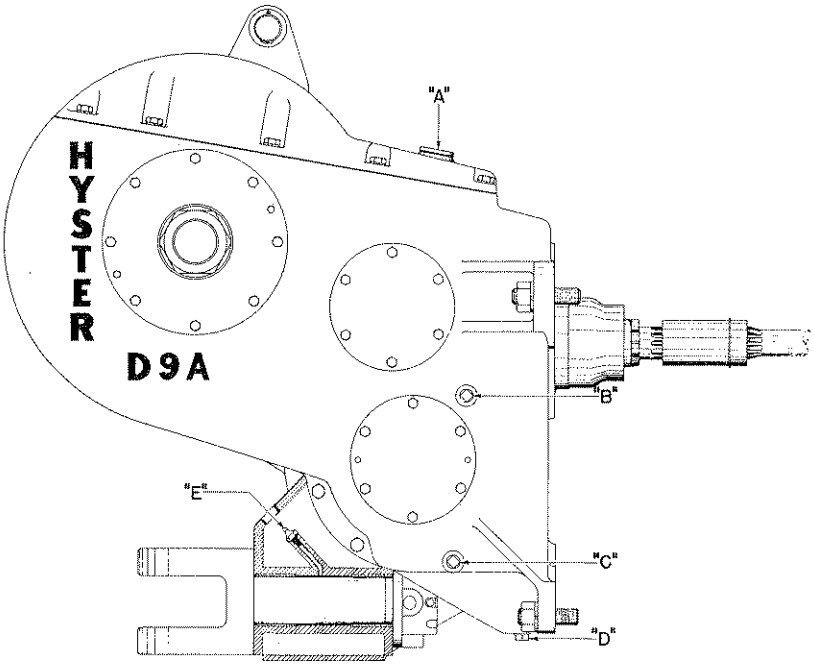
Note: Although equipped with grease fittings at each end, control cables should not be lubricated unless they become stiff or inoperative. Use Lubriplate 105V or Aero, or equivalent only if grease is required. If this is not available do not lubricate at all. Too much lubricant will blow out seals and permit foreign matter to enter.

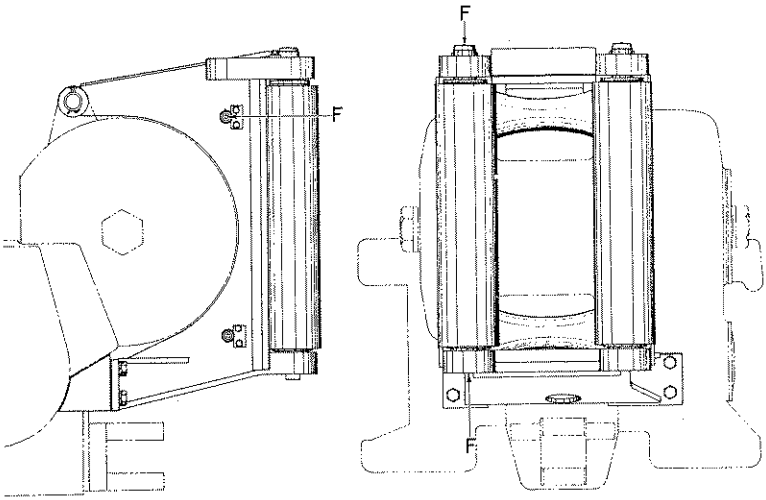
Brake Compartment Drain

Pipe plug "D" should in no case be discarded, and should be removed at least twice each month to drain the brake compartment of water accumulated by condensation.

SERVICING INSTRUCTIONS—Continued

LUBRICATION CHART





Fairlead Assembly Optional

LUBRICATION INSTRUCTIONS—Continued

Automatic Brake (Optional)

Every 1000 hours of service the brake should be cleaned and repacked with a high melting point (HMP) grease. To prepare the wheel for inspection and servicing, follow the steps given below.

1. The cover plate on the left-hand side frame brake compartment must be removed to gain access to the brake.

2. Pull pins in ends of brake band and remove brake band assembly from winch to provide ample clearance in removing brake wheel. This also makes the installation of wheel assembly after servicing much easier.

3. Remove cotter and flange nut from end of shaft.

4. Assembled wheel can then be pulled from shaft. If wheel is tight, an appropriate puller may have to be used. Two ½" NF tapped holes on each side of brake, plugged with vent plug (5) and ½" capscrews (8) with copper washers, are provided for using an appropriate puller. Remove two of these, taking care not to lose the copper washers as they prevent leakage of the lubricant when reassembled.

5. Remove eight capscrews (6).

6. Remove cover with appropriate puller, using the holes in cover from which the capscrew (8) and vent plug (5) with copper gasket washers were removed. Take care not to damage oil seal.

7. After brake is open, pull out center (2), assembled with pawl (1) and drag rings (11).

8. Clean all parts thoroughly and repack brake with about ¾ pound of grease of a high melting point. Apply carefully to bearings and all rubbing surfaces.

   CAUTION: Do not fill brake completely with grease.

LUBRICATION INSTRUCTIONS—Continued

9. After servicing brake, replace center (2) assembled with pawl (1) and drag rings (11). Check to see that seal is in good condition.

10. NOTE: Install oil seals so that lips of both are pointing in as shown.

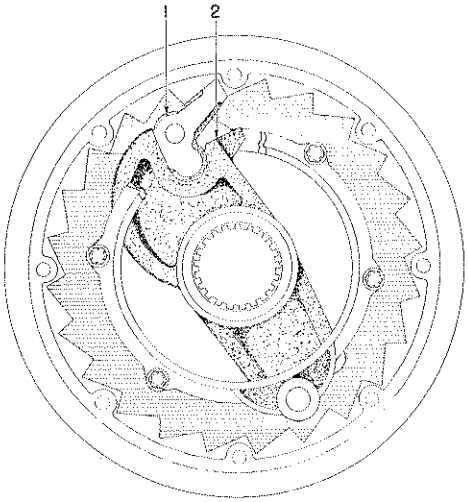
11. Clean gasket surfaces making certain that no grease remains. Use new gasket (3). Coat both sides of the gasket with Permatex Gasket cement. Carefully assemble cover (4) onto case. With side cover in place, squeeze a liberal amount of Permatex No. 1 gasket cement into each capscrew hole. (Use enough so that when the capscrew is tightened, the cement will squeeze out all around the head.) Fasten securely with eight capscrews provided.

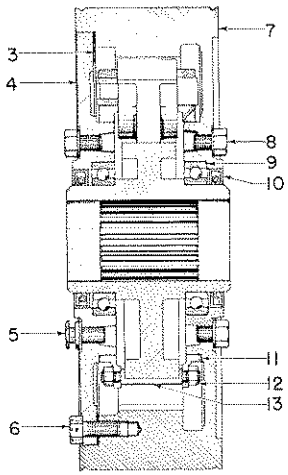
12. Be sure to replace the vent plug (5) and capscrew (8) with copper washers, removed in Instruction 4.

13. Install assembled brake wheel on shaft in winch and lock in place with flange nut and cotter removed in Instruction 3.
NOTE: Install brake with letters "Overwind" toward the outside for overwind operation.

14. Release brake handlever and install brake band over brake wheel, anchoring with pins removed in Instruction 2.

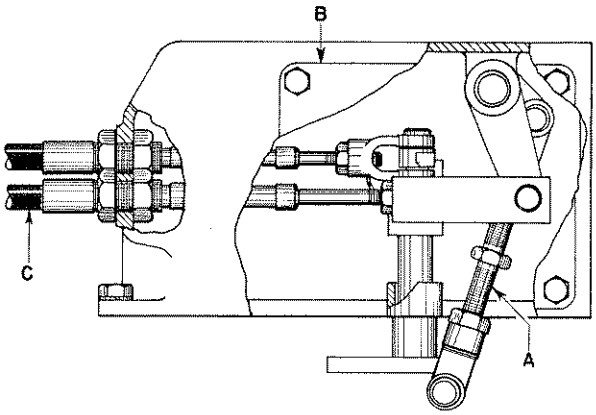
15. Replace cover removed in Instruction 1.





SERVICING INSTRUCTIONS—Continued

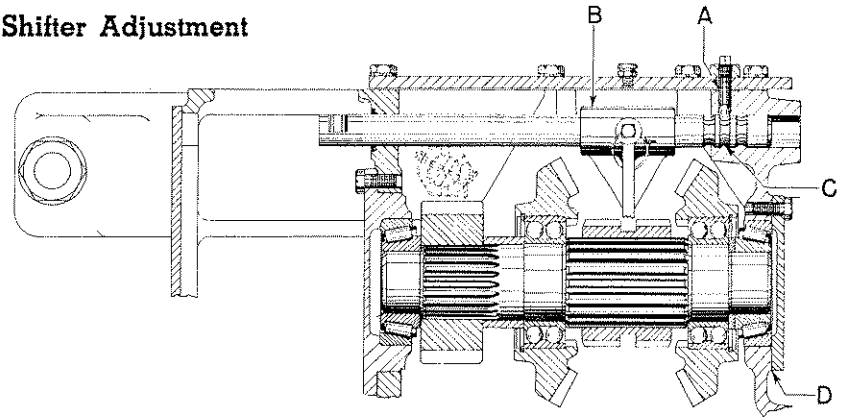
Brake Adjustment



Remove access cover "B," loosen jam nut on link "A" and adjust as required. With the brake handlever in fully released position, there should be approximately 1/32" clearance between brake lining and brake drum. Ordinarily no pins or connections need be disturbed.

CAUTION: Release the brake handlever after each adjustment and check to see if brake band is sufficiently free to keep the brake from "dragging" and burning up the lining.

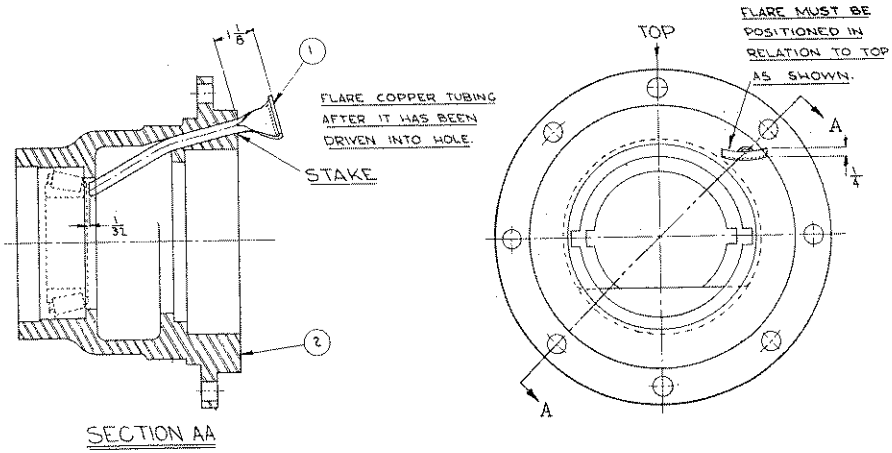
Shifter Adjustment



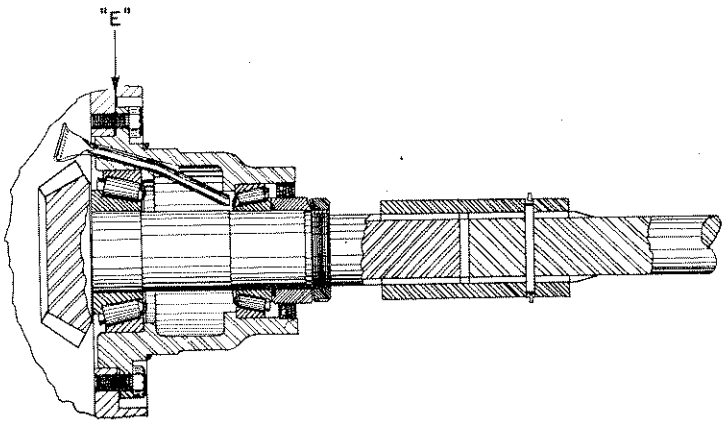
No adjustment inside the winch is required. The ball and spring "A" holds the shifter fork "B" in one of the three locations, for forward, neutral or reverse. With the ball in the center (neutral) position "C" adjust rod ends on cable until the pawl on shifter handlever is in the notch on the quadrant bar.

SERVICING INSTRUCTIONS—Continued

Reassembly of P.T.O. Shaft and Bevel Gear Adjustment

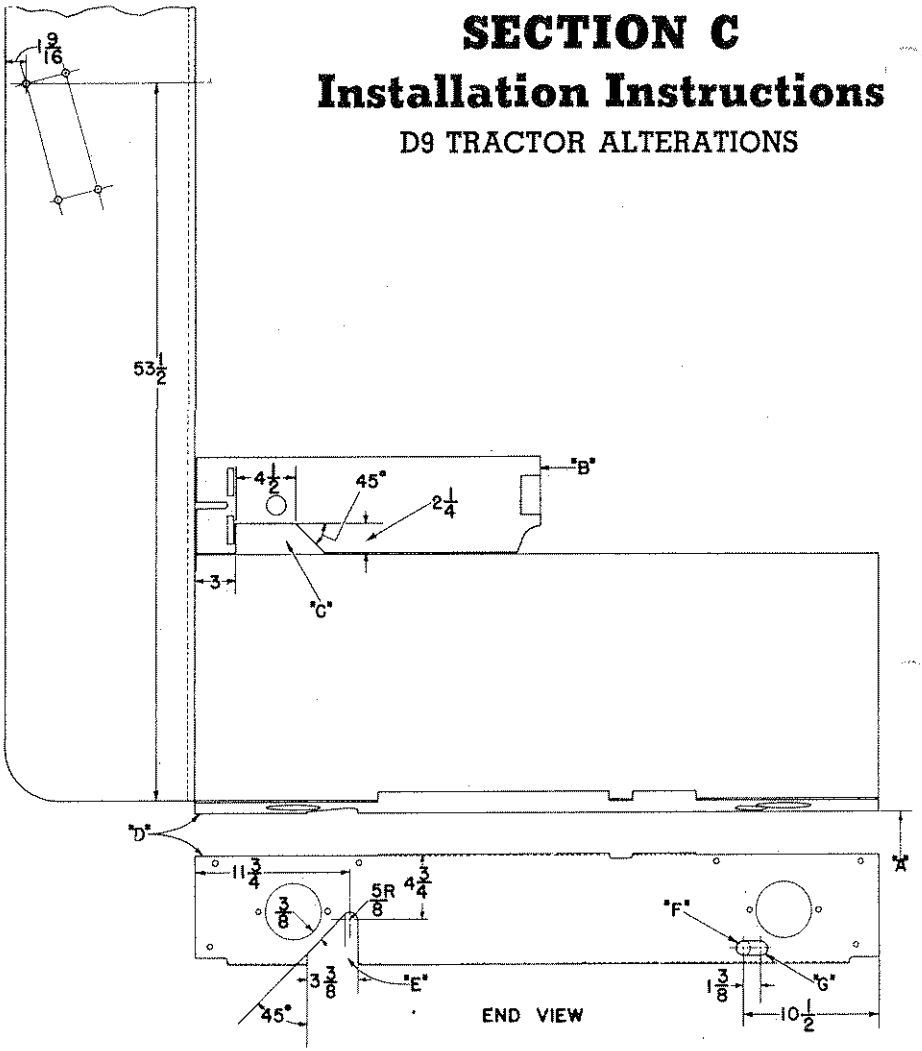


When reassembling the P.T.O. shaft to the winch care must be taken to see that the oil tube (1) is at the hole next to the top of the housing (2). Install the tube (1), bend to fit, flare end as shown, and stake in place. *Note:* End of tube should be approximately 1/32" from bearing as shown.



Adjust bevel gear with shims "D" (shifter cut) and "E" (P.T.O. cut) to produce .006 - .008 total backlash.

SECTION C
Installation Instructions
D9 TRACTOR ALTERATIONS



D9 Tractor Alterations

"A" represents the rear face of the tractor transmission.

1. Cut or burn the tractor floor plate "B," "Caterpillar" No. 5H-6758, as shown at "C," to clear Hyster control cables.

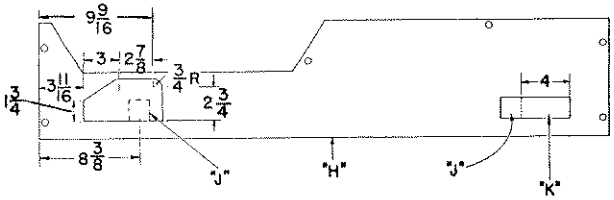
2. Cut or burn the tractor rear cross sheet "D," "Caterpillar" No. 5H-6604, as shown at "E," also to clear Hyster control cables. On R. H. side of rear cross sheet, starting with original grease fitting hole "F," cut slot as shown at "G."

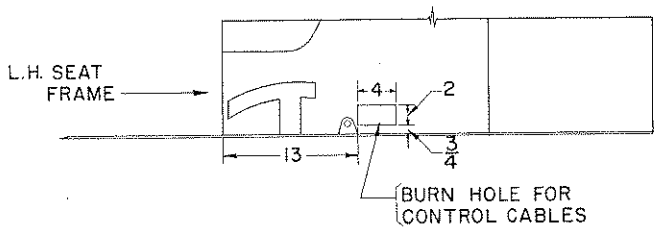
INSTALLATION INSTRUCTIONS—Continued

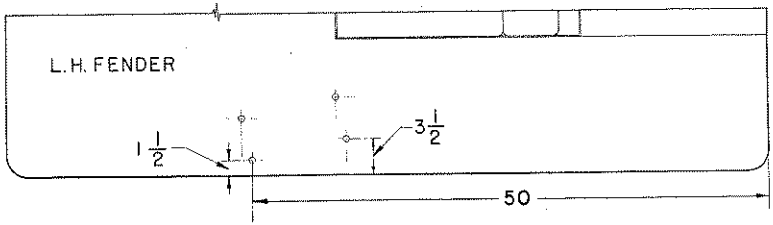
D8 Tractor Alterations, Series D, E, F and G

D8 Tractor Alterations

To mount winch on a D8 tractor, cut the tractor cross sheet "H," as shown. On the right-hand side, starting with grease fitting opening "J," cut slot four inches long. On the left-hand side cut as shown, for Hyster control cable clearance. After alteration, turn grease fittings on tractor transmission so they point to access slots cut in cross sheet.



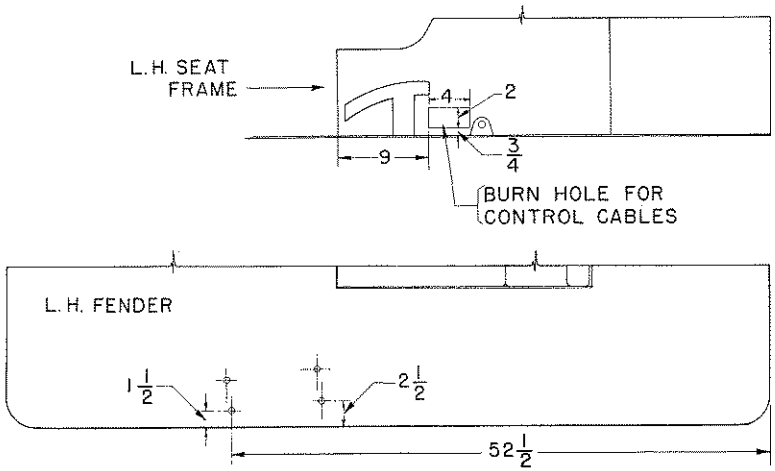




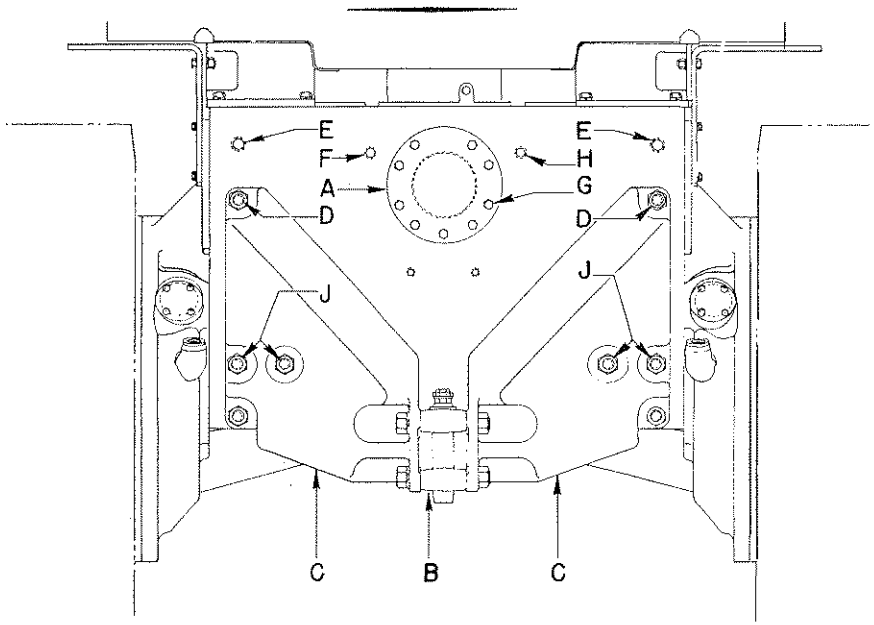
Cut or burn opening in left-hand seat frame for Hyster cables. Drill 17/32" holes in left-hand fender for handlever bracket.

INSTALLATION INSTRUCTIONS—Continued

583 Pipe Layer Alterations



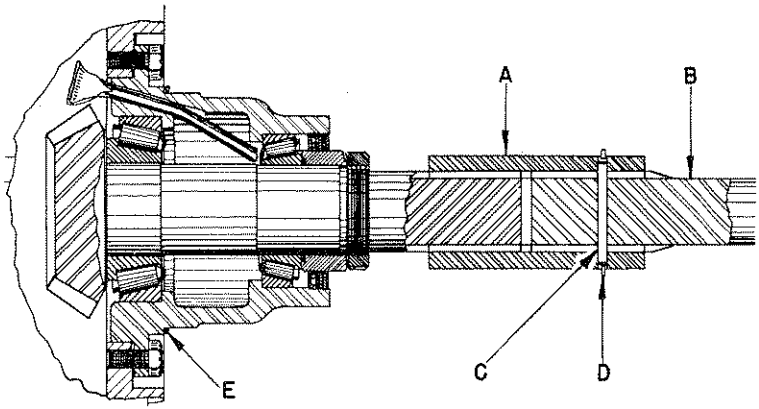
Cut or burn opening in left-hand seat frame for Hyster cables. Drill 17/32" holes in left-hand fender for handlever bracket.



INSTALLATION INSTRUCTIONS—Continued

1. See page 16. Remove "Caterpillar" power take-off cover "A," drawbar "B," drawbar brackets "C," studs "D" and discard. (Save one stud "D.")

2. Install one stud "D" at "H" and install a total of three Hyster studs; two No. 93348 (1½ x 5⅝) at "E," and one No. 93346 (1¼ x 3⅞) at "F." Plug holes from which studs and capscrews were removed, with corks furnished for this purpose.



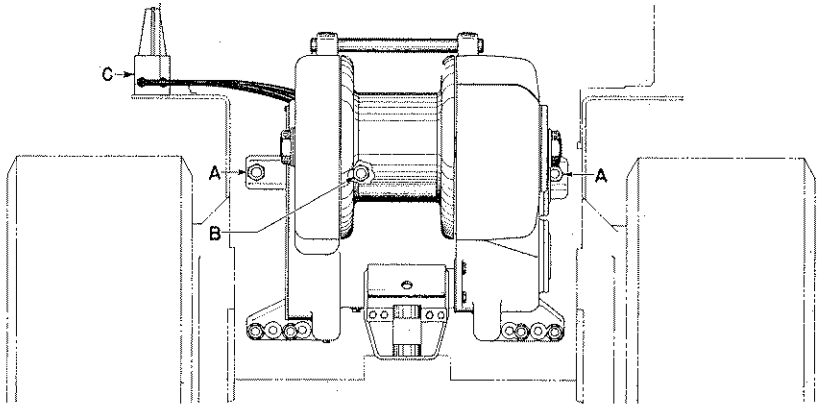
4. Install couplings "A" on extension shaft "B" and lock couplings in place on extension shaft with pins "C" and lock rings "D" provided. The assembled couplings and extension shaft then are placed on the power take-off shaft in the "Caterpillar" transmission.

5. Swing Hyster winch by means of a sling so that the unit will hang with the mounting pads square with the rear face of the tractor transmission housing. At least a two-ton block should be used. Wipe all mounting pads and transmission face so that they are clean and free of any foreign matter.

6. NO GASKET USED. Winch is equipped with a sealing ring "E."

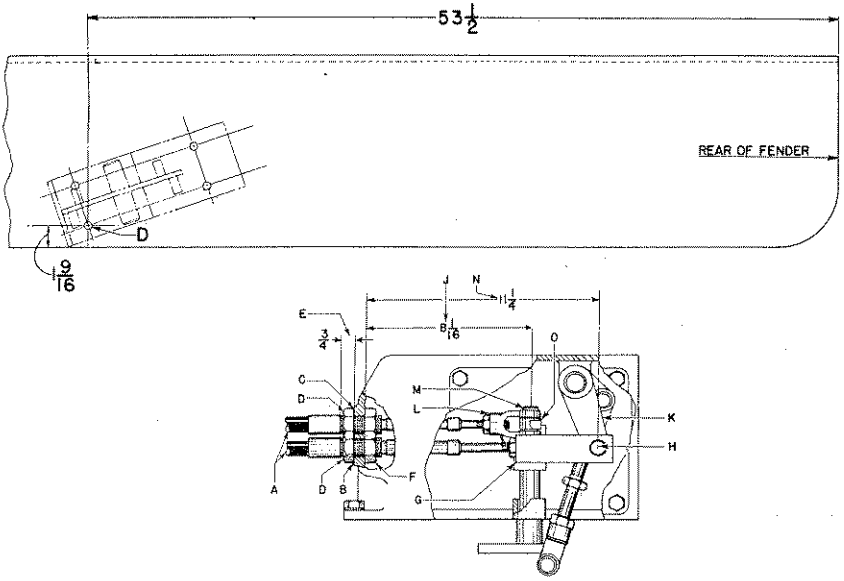
7. Swing hoist unit toward tractor and turn the tractor power take-off shaft to line up splines on coupling with winch power take-off shaft splines. When splines have entered line up holes in winch side frames to match studs.

INSTALLATION INSTRUCTIONS—Continued



8. After winch is in position, hold in place with nuts on two upper feet at "A," proceed to bolt winch to tractor using nut and lockwasher on the stud "B." Place hex nuts, 1½ NF and lockwashers on studs holding side frames, and fasten securely.

9. For D9 Tractors: (See cut below.) Install handlever bracket "C" on left-hand fender with the outside front bolt hole "D" 53½ inches from rear end of fender and 1-9/16 inches from outside edge of fender, with angle of bracket in most convenient location for operator. Use bracket for template and drill 17/32" holes in tractor fender.



INSTALLATION INSTRUCTIONS—Continued

10. See page 18. Install cables "A" as follows:

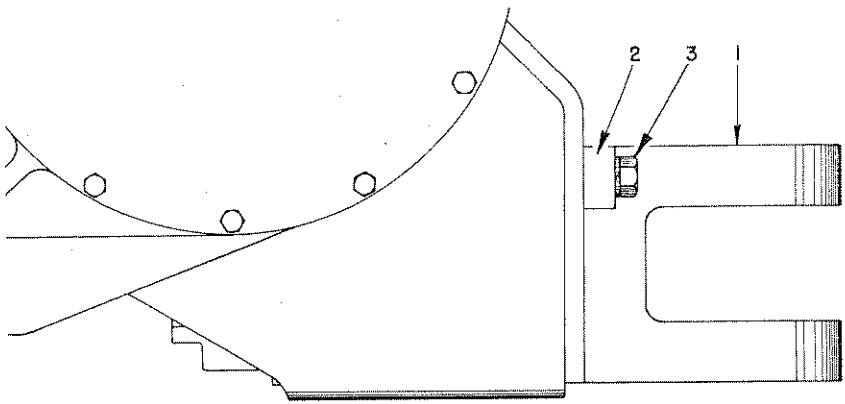
    For the brake, connect one end of cable to brake handlever (longer), run the other end through the lower hole in case at "B." For the shifter, connect one end of cable to the shifter handlever (shorter), run the other end through the upper hole in case at "C." Set both outer jam nuts "D" ¾" from end of threads as shown at "E" and tighten inner jam nuts "F." Adjust rod end "G" on brake cable until the center of pin hole "H" is 11¼" from inside edge of case, as shown at "N" (with brake in released position). Attach rod end "G" to crank "K." Adjust rod end "L" on clutch cable until center of pin hole "M" is 8-1/16" from inside edge of case, as shown at "J" (with clutch in neutral position). Attach rod end "L" to crank "O."

11. Check and adjust the clutch shifter as given on page 12.

12. Check and adjust the brake lining clearance as given under brake adjustment on page 12.

13. Check all bolts, nuts, and other connections.

    Install fairlead as directed on page 34. (Optional)



NOTE: All towing winches have Hyster built-in drawbar (1). This drawbar has two lock plates (2) held in place with two capscrews (3) each, to keep it from swiveling, and MUST BE USED AS FOLLOWS:

Rule 1. If coupler in towed unit is swiveling, the drawbar in towing winch has to be locked.

Rule 2. If coupler in towed unit is locked, the drawbar in towing winch has to be swiveling. This is accomplished by removing lock plates (2).

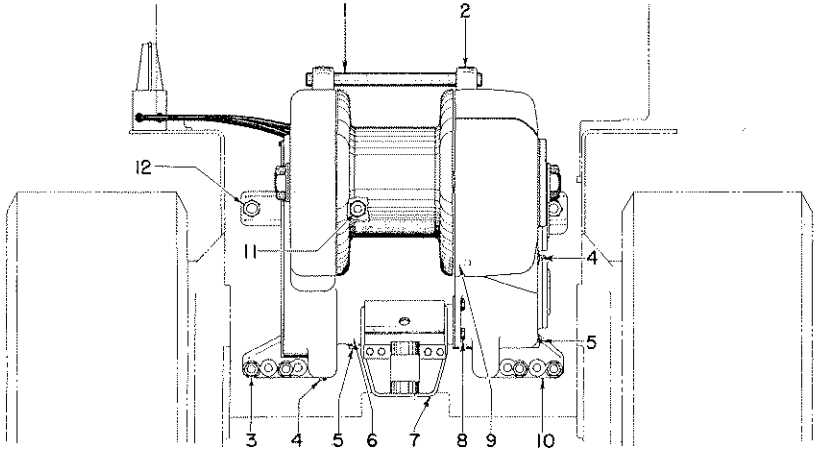
Failure to observe these rules will result in broken drawbar and coupler parts. A special Hyster drawbar bolt is provided to connect the towed unit to the towing winch.

SECTION D

LIST OF PARTS AND ILLUSTRATIONS

(See Page 40 for Gear Train Arrangement)

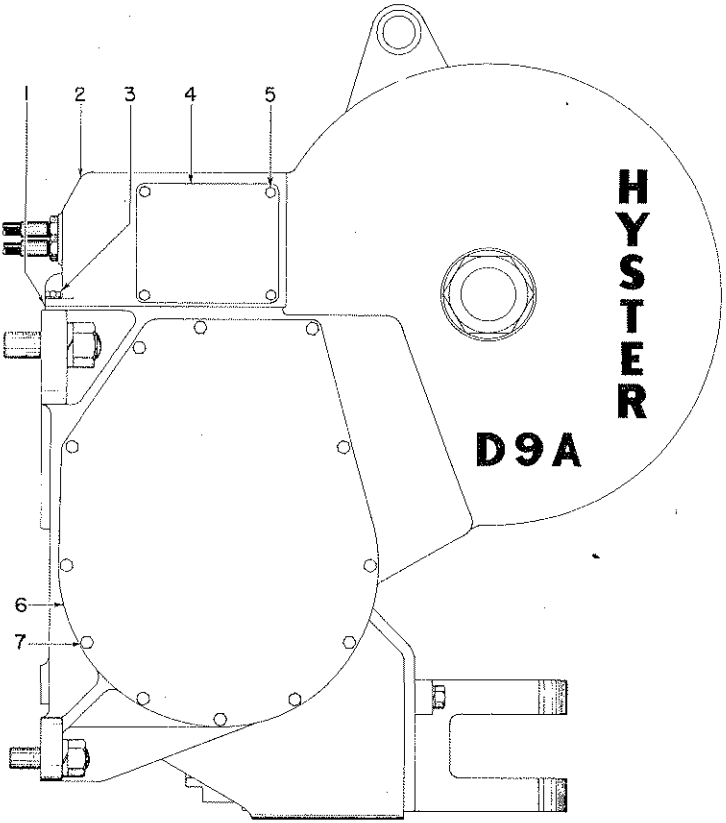
REAR ELEVATION (Without Fairlead)



Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	93278	Rod—Tie	1
	15266	Cotter—5/16 x 3½	2
2	93771	Bracket—Tie Rod (Weld if ordered separately)	2
3	.....	Stud (For D9 Tractors Series D use Tractor Studs)	5
	6694B	Stud (For D8 Tractors Series D, E, F and G)	1
	15018	Nut—Hex, 1¼ UNF (5 required for D9 Tractors)	7
	15168	Lockwasher—1¼ (5 required for D9 Tractors)	7
4	15316	Pipe Plug—¾, Countersunk	2
5	35503	Pipe Plug—Magnetic, ¾	2
6	94215A	Housing—Transmission	1
7	* 93245A	Bracket—Drawbar (Weld if ordered separately)	1
8	12482	Capscrew—Hardened, ¾ UNF x 2¼	5
	15162	Lockwasher—¾	5
9	16320	Capscrew—Socket Head, ¾ UNF x 2	1
	15162B	Lockwasher—¾, Hi Collar	1
10	93219	Frame—Side, R. H.	1
11	94371	Stud (For D9 Tractors, Series D)	1
	6694	Stud (For D8 Tractors, Series D, E, F and G)	1
	15018	Nut—Hex, 1¼ UNF	1
	16088	Lockwasher	1
12	93348	Stud (For D9 Tractors, Series D)	2
	5792	Nut—Hex, 1½ UNF (For D9 Tractors, Series D)	2
	15170	Lockwasher—1½ (For D9 Tractors, Series D)	2
Parts not illustrated:			
	94462A	Complete Gasket Set	1
	18001	Cork—No. 17 (Used to plug holes in Tractor)	4
	18000	Cork—No. 5 (Used to plug holes in Tractor)	9

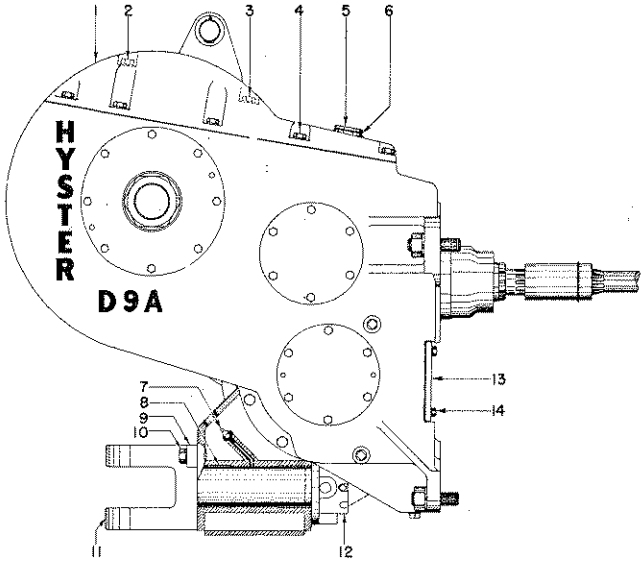
**Included in assembly under which listed.*

LEFT HAND SIDE ELEVATION (Without Fairlead)



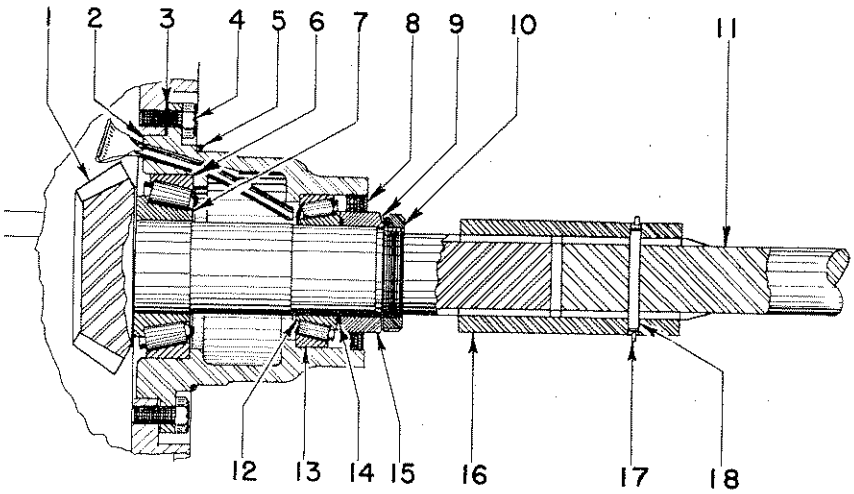
Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	93349	Gasket—Cover	1
2	93240	Cover (See page 36 for D8 Series F & G)	1
3	16807	Capscrew—Hardened, ½ UNF x 1½	6
	15158	Lockwasher—½	6
4	93307	Plate—Cover	1
	93308	Gasket	1
5	16820	Capscrew—Hardened, ½ UNF x 1	4
	15158	Lockwasher—½	4
6	93293	Cover	1
	93294	Gasket	1
7	37562	Capscrew—Hardened, ½ UNF x 1¼	12
	15158	Lockwasher—½	12

RIGHT HAND SIDE ELEVATION



Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	93342A	Cover—Top	1
	93331	Gasket	1
2	12488	Capscrew—Hardened, 5/8 UNF x 5 1/2	1
	15160	Lockwasher—5/8	1
3	12487	Capscrew—Hardened, 5/8 UNF x 4	1
	15160	Lockwasher—5/8	1
4	12479	Capscrew—Hardened, 5/8 UNF x 1 3/4	14
	15160	Lockwasher—5/8	14
5	93279	Plug	1
6	93280	Gasket	1
7	16002	Grease Fitting	1
8	92671	Bushing	2
9	92670	Keeper	2
10	16800	Capscrew—Hardened, 3/4 UNF x 2	4
	15162	Lockwasher—3/4	4
11	93352	Drawbar	1
	94370	Pin—Drawbar (For D9 Tractors Series D)	1
	15272	Cotter—3/8 x 3	1
11	33787	Drawbar	1
	94369	Pin—Drawbar (For D8 Tractors Series D, E, F, G)	1
	15273	Cotter—3/8 x 2 1/2	1
12	33618	Nut	1
	15295	Cotter—1/2 x 5	1
13	94201	Cover	1
	94202	Gasket	1
14	37562	Capscrew—Hardened, 1/2 UNF x 1 1/4	4
	15158	Lockwasher—1/2	4

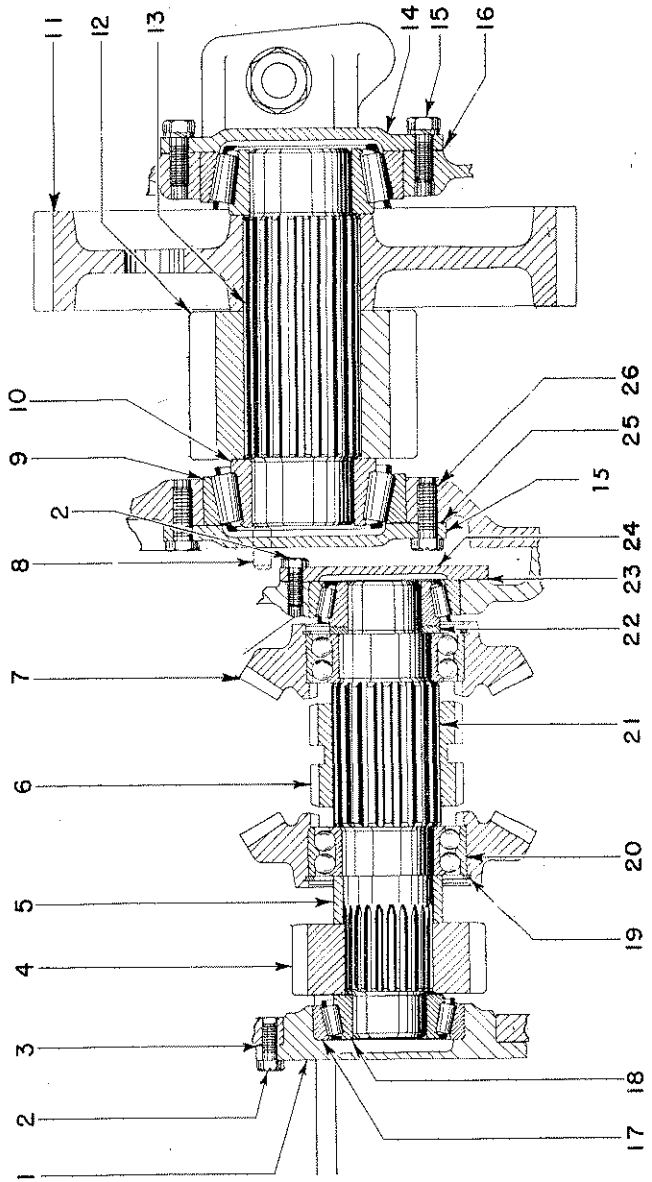
POWER TAKE-OFF GROUP



Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	93223	Gear Shaft	1
2	94419A	Carrier—Bearing	1
	* 94420	Tube—Oil	1
3	93270	Shim Set	1
4	93260	Place Bolt—½ UNF x 1¼	8
5	90937	"O" Ring	1
6	30290	Bearing Cup	1
7	30291	Bearing Cone	1
8	44487	Oil Seal	1
9	34055	Washer	1
10	34056	Locknut	1
11	59825	Shaft Extension (For D9 Tractors, Series D)	1
	93763	Shaft Extension (For D8 Tractors, Series D, E, F, G)	1
12	230325	Bearing Cone	1
13	230324	Bearing Cup	1
14	15879	"O" Ring	1
15	93269	Spacer	1
16	6327	Coupling ("Caterpillar" No. 1B-7852)	2
17	90202	Lock Ring ("Caterpillar" No. 8F-737)	2
18	9450	Pin ("Caterpillar" No. 1A-4599)	2

**Included in assembly under which listed.*

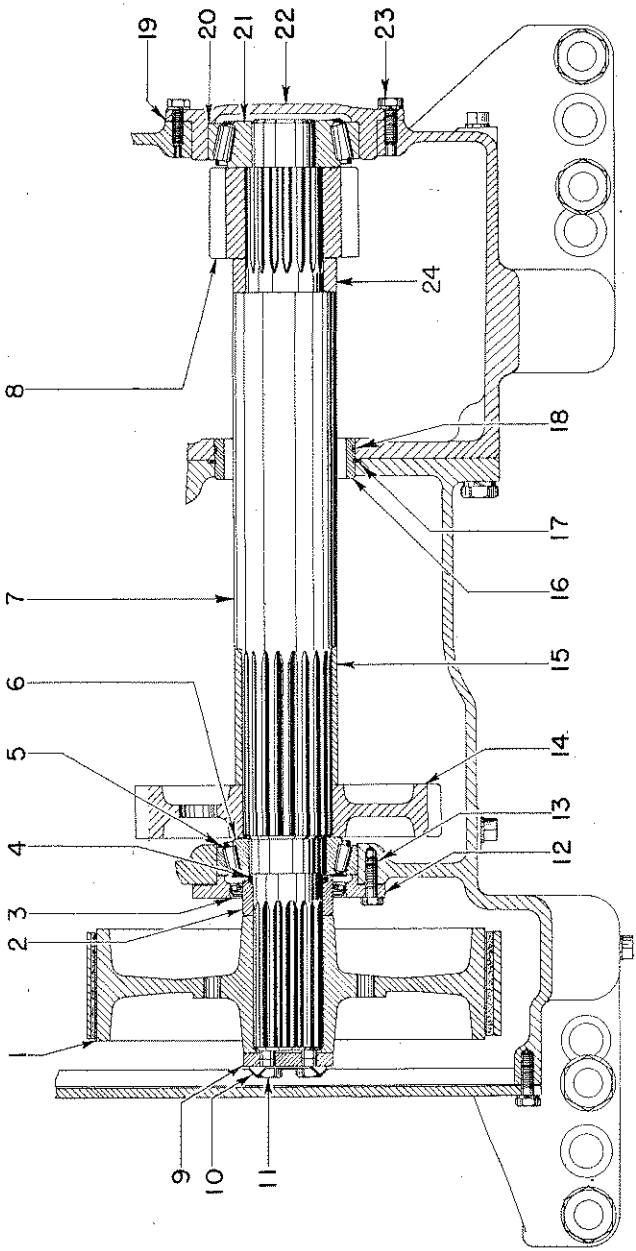
SHIFTER—INTERMEDIATE GEAR GROUP



SHIFTER—INTERMEDIATE GEAR GROUP

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	93235	Carrier	1
2	93260	Place Bolt—½ UNF x 1¼	13
3	93259	Shim Set	1
4	93252	Gear—Pinion (23 teeth) (For D9 Tractors and D8 Series D & G)	1
	93840	Gear—Pinion (18 teeth) (For D8 Series E & F)	1
5	93257	Spacer	1
6	93253	Dental Clutch	1
7	93224	Gear—Spiral Bevel (37 teeth)	2
8	46224	Pin—Dowel	1
9	230327	Bearing Cup	2
10	230328	Bearing Cone	2
11	93226	Gear (52 teeth, for JRA Serial No. Winches)	1
	93327	Gear (48 teeth, for JRA-T Serial No. Winches)	1
12	93272	Pinion	1
13	93274	Shaft	1
14	93287	Retainer	2
15	12479	Capscrew—Hardened, ⅝ UNF x 1¾	6
	15160	Lockwasher—⅝	6
16	93283A	Shim Set	1
17	30059	Bearing Cup	2
18	30080	Bearing Cone	2
19	12925	Snap Ring	2
20	45215P	Bearing	2
21	93255	Shaft	1
22	93256	Washer	1
23	93258	Shim Set	1
24	93254	Retainer	1
25	93765	Gasket	1
26	93261	Place Bolt—⅝ UNF x 1¾	6

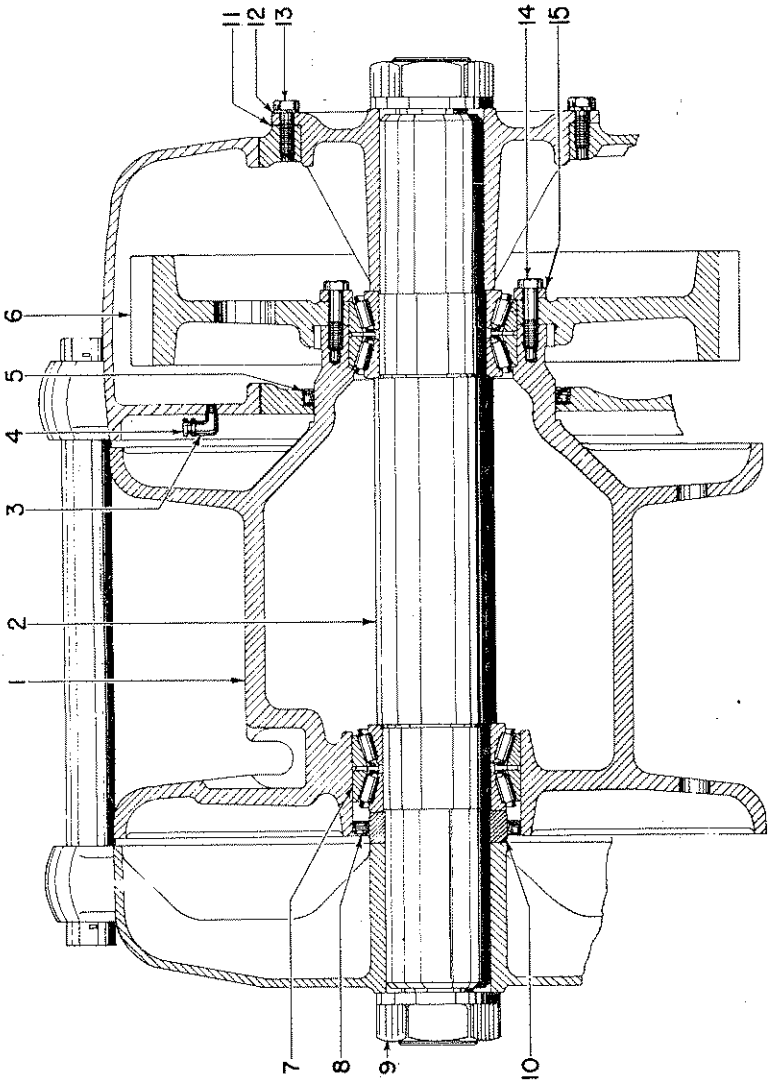
BRAKE SHAFT GROUP



BRAKE SHAFT GROUP

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	93233	Wheel—Brake (Standard, see page 37 for Optional Automatic Brake)	1
2	93264	Spacer	1
3	44487	Oil Seal	1
4	33716	"O" Ring	1
5	30100	Bearing Cup	1
6	30101	Bearing Cone	1
7	93273	Shaft	1
8	94445	Pinion (15 teeth, for JRA Serial No. Winches) (To replace gear with Integral Collar, include one Spacer, item 24)	1
	94446	Pinion (19 teeth, for JRA-T Serial No. Winches)	1
9	93263	Retainer	1
10	93262	Lock Plate	1
11	16823	Capscrew—Hardened, $\frac{5}{8}$ UNF x $1\frac{1}{2}$	2
12	93265	Retainer	1
	93791	Gasket	1
13	93260	Place Bolt—$\frac{1}{2}$ UNF x $1\frac{1}{4}$	6
14	93225	Gear (45 teeth) (For D9 Tractors and D8 Series D, G)	1
	93335	Gear (50 teeth) (For D8 Tractors Series E & F)	1
15	93428	Spacer	1
16	93268	Spacer	1
17	35829	Snap Ring	1
18	57697	"O" Ring	1
19	93267	Shim Set	1
20	30104	Bearing Cup	1
21	230326	Bearing Cone	1
22	93236	Carrier	1
23	16807	Capscrew—Hardened, $\frac{1}{2}$ UNF x $1\frac{1}{2}$	6
	15158	Lockwasher—$\frac{1}{2}$	6
24	94447	Spacer	1

DRUM UNIT

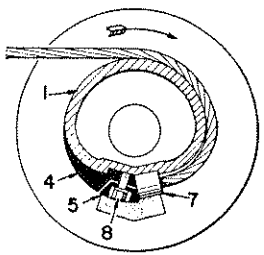


DRUM UNIT

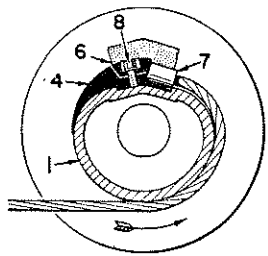
Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	93220	Drum	1
2	93275	Shaft	1
3	15378	Street Elbow—1/8 x 90°	1
4	21420	Plug—Breather	1
5	35030	Oil Seal	1
6	93227	Gear	1
7	230329A	Roller Bearing	2
8	44460	Oil Seal	1
9	46398	Nut	2
10	93276	Spacer	1
11	93277	Shim Set	1
12	93232	Retainer	1
13	12480	Capscrew—Hardened, 5/8 UNF x 2	8
	15160	Lockwasher—5/8	8
14	92590	Place Bolt—5/8 UNF x 2 1/2	8
15	93339	Retainer	1

Note: Add two quarts oil, SAE 90, to drum at assembly

CABLE-LOCK GROUP



OVERWINDING



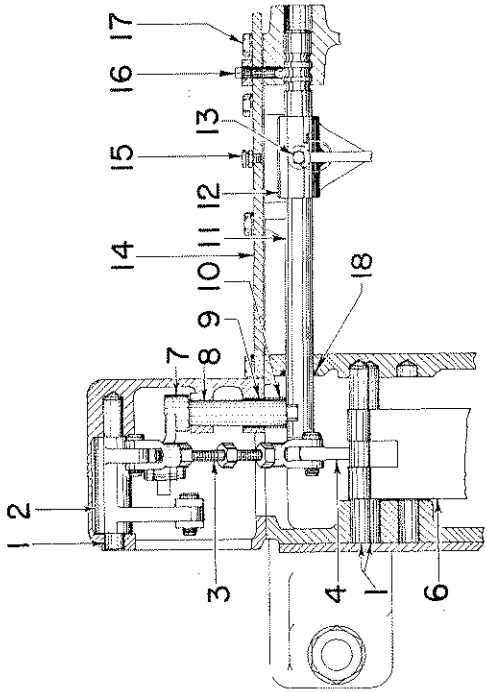
UNDERWINDING

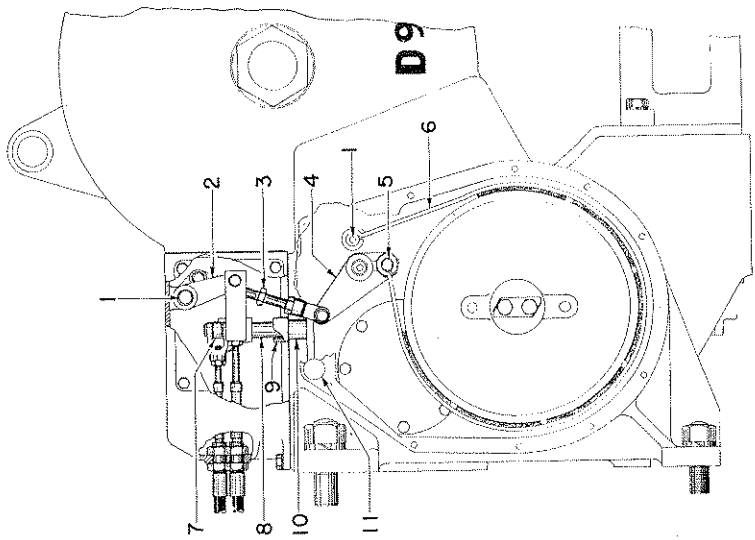
Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	.....	Drum	1
4	93343	Filer—Cable Groove	1
5	93344	Lock—Ferrule, Overwind	1
6	93345	Lock—Ferrule, Underwind	1
7	30509	Ferrule—1 1/4 Cable	1
8	15505	Capscrew—5/8 UNF x 1 1/2	1
	15160	Lockwasher—5/8	1

BRAKE AND SHIFTER MECHANISM

For D9 Tractors and D8 Series D and E

(For D8 Tractors Series F and G see Page 36)





BRAKE AND SHIFTER MECHANISM

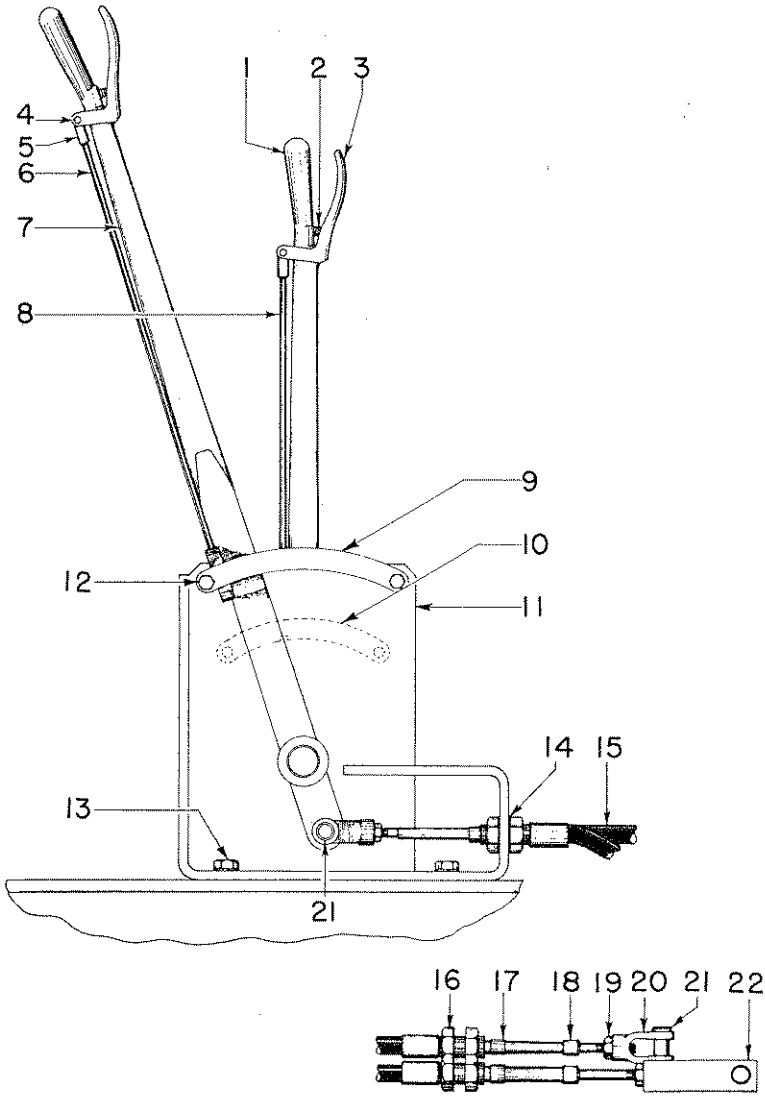
For D9 Tractors and D8 Series D and E

(For D8 Tractors Series F and G see Page 36)

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	93305	Pin	3
2	93300A	Crank Assembly—Brake	1
	* 92768	Bushing	2
	93298A	Link Assembly—Brake Adjustment	1
	* 93297	Link—Adjusting	1
	* 91629	Rod End—R. H. Thread	1
3	* 15030	Nut—Jam, 5/8 UNF, R. H. Thread	1
	* 91630	Rod End—L. H. Thread	1
	* 32414	Nut—Jam, 5/8 UNF, L. H. Thread	1
	* 159	Pin—Rod End	2
	* 15223	Cotter—1/8 x 1	2
4	93299A	Crank Assembly—Brake	1
	* 92768	Bushing	2
5	93306	Pin	1
	15246	Cotter—3/16 x 2	1
6	93311A	Brake Band Assembly	1
	* 93417A NRS	Lining and Rivet Set 6-93309 linings @ 24 - 9/16" rivets	1
	93241	Crank—Clutch	1
7	15514	Capscrew—1/2 UNF x 1 1/4	1
	15158	Lockwasher—1/2	1
8	93291A	Crank	1
9	93296	Bushing—Split	1
10	93288	Spacer	1
11	93282	Shaft—Shifter	1
12	93239	Fork—Shifter	1
13	27936	Lockscrew	1
	67355	Lockwire—18 ga. x 4" long	1
14	94402	Cover (Serial No. 115441 and before, include 9 Capscrews No. 16397)	1
	93292	Gasket	1
15	21420	Plug—Breather	1
	6348	Ball—1/2, Steel	1
16	6347C	Spring	1
	15302	Pipe Plug	1
17	16397	Capscrew—Hardened, 1/2 UNF x 1 3/4	9
	15158	Lockwasher—1/2	9
18	44494	Oil Seal	1

**Included in assembly under which listed.*

HANDLEVER GROUP — 93663A

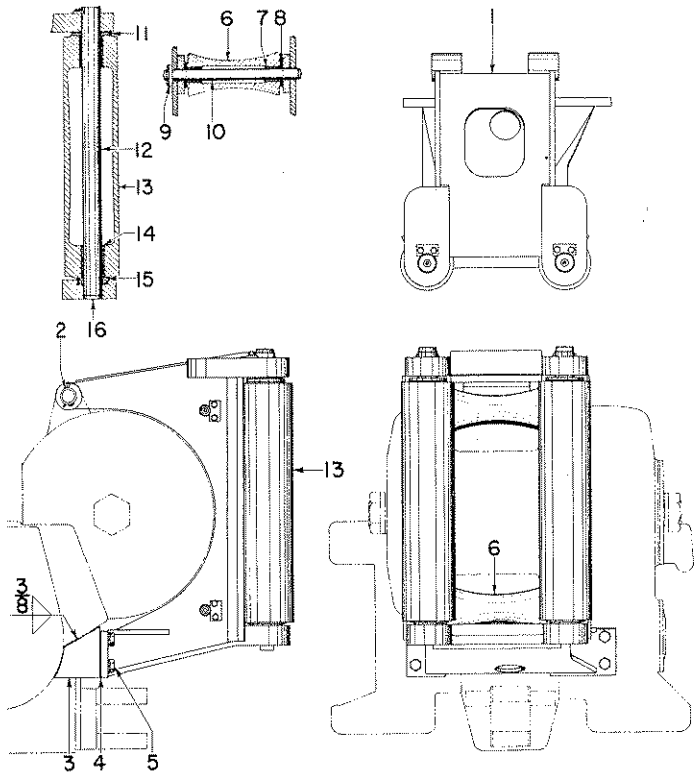


HANDLEVER GROUP — 93663A

Ref. No.		Hyster Part No.	NAME OF PART	Qty. Reqd.
1		32659AB	Handlever—Clutch	1
2	*	32695	Spring	1
3	*	32694	Handle	1
4	*	37476	Capscrew—Special	2
	*	15052	Nut—Hex, No. 10-24	2
5	*	32693	Rod End	1
6		92561	Rod—Pawl (included with Item 7)	1
7		92557A	Handlever—Brake (includes items 2, 3, 4, 5, and 6)	1
8		92568	Rod—Pawl (included with Item 1)	1
9		92564	Quadrant—Ratchet, Brake	1
10		32657	Quadrant—Clutch	1
11		93251A	Bracket	1
12		15518	Capscrew—3/8 UNF x 7/8	4
		15156	Lockwasher—3/8	4
13		15509	Capscrew—1/2 UNF x 1 1/2	4
		15008	Nut—Hex, 1/2 UNF	4
		15158	Lockwasher—1/2	4
14		15934	Lockwasher—Shakeproof, 7/8	4
15		93340	Cable	2
	*	16040	Grease Fitting	4
16	*	15034	Nut—Jam, 7/8 UNF	8
	*	15934	Lockwasher—Shakeproof, 7/8	4
17	*	94381	Grommet	4
18	*	94380	Grommet	4
19		15026	Nut—Jam, 3/8 UNF	4
20		92683	Rod End	3
21		159	Pin—Rod End	4
		15223	Cotter—1/8 x 1	4
22		93312	Rod End—Brake	1

Included in assembly under which listed

FAIRLEAD ASSEMBLY



INSTALLATION INSTRUCTIONS

1. Remove winch tie rod (2). NOTE: If bent, discard and replace with new one. This part is not included with fairlead assembly and must be ordered separately if required.
2. Swing fairlead in position in back of winch.
3. Insert tie rod (2) through ears of winch and fairlead frame, securing it with cotters $\frac{3}{8}$ x $2\frac{3}{4}$).
4. Bolt brackets (3) to left hand and right sides of fairlead frame as shown.
5. Check for clearance of fairlead frame as shown.
5. Check for clerance of fairlead frame around towing winch drum. There should be approximately $\frac{1}{8}$" clearance all around drum. Use shims (4) as needed. If there is not sufficient clearance, burn as required.
6. Weld brackets (3) securely to towing winch frame using $\frac{3}{8}$" fillet weld. both sides.
   Avoid overheating the winch side.
   Frame as too much heat will distort the transmission.

FAIRLEAD ASSEMBLY — 93987A

(Optional)

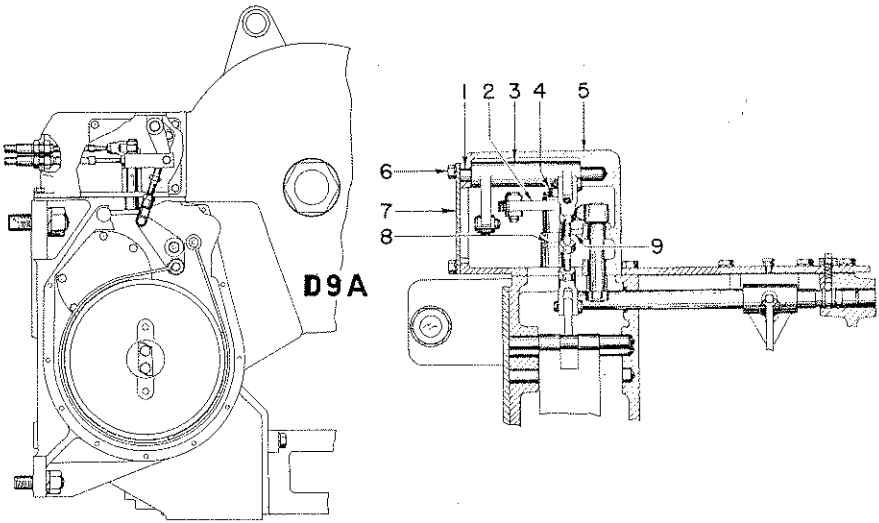
Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	93977W	Frame—Fairlead	1
2	93278	Rod—Tie } Not included in	1
	15266	Cotter—5/16 x 3½ } Fairlead Assembly	2
3	93984	Bracket—R. H.	1
	93983	Bracket—L. H.	1
4	93985	Shim Set	2
5	15571	Capscrew—1" NF x 2¾	4
	15166	Lockwasher—1"	4
6	92212A	Roller Assembly—Horizontal	2
7	* 59419	Bushing	4
8	92720	Washer	4
9	93166	Keeper	4
	15511	Capscrew—½ NF x 1	8
	15158	Lockwasher—½	8
10	93658	Shaft—Horizontal	2
11	38672	Washer	2
12	93981	Shaft—Vertical	2
13	93980A	Roller Assembly—Vertical	2
14	* 93979	Bushing	4
15	230353	Bearing—Thrust	2
16	16001	Grease Fitting	8

**Included in assembly under which listed.*

BRAKE AND SHIFTER MECHANISM

For D8 Tractors Series F and G (Optional)

(For Parts Not Listed See Page 31)

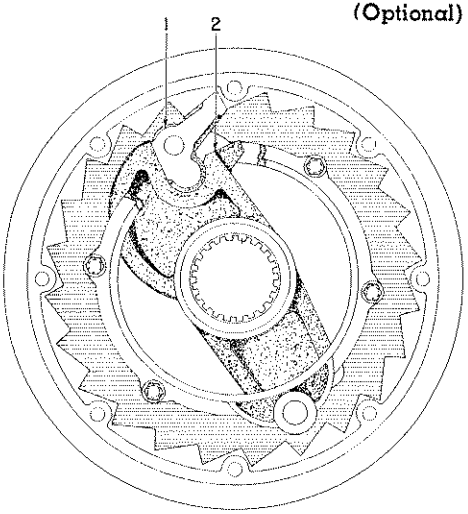


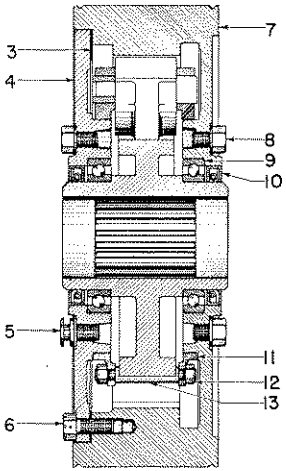
Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	94537	Pin	1
2	94538A	Crank Assembly	1
	* 92768	Bushing	2
3	94541A	Crank	1
	* 92768	Bushing	2
4	94519	Pin	1
	15244	Cotter—3/16 x 1½	1
5	94533	Cover	1
	93349	Gasket	1
	16807	Capscrew—Hardened, ½ UNF x 1½	6
	15158	Lockwasher—½	6
6	16820	Capscrew—Hardened, ½ UNF x 1	4
	15158	Lockwasher—½	4
7	93307	Plate—Cover	1
	93308	Gasket	1
8	19909	Roll Pin—¼ x 1¾	1
9	94540	Link—Shifter	2
	159	Pin—Rod End	2
	15223	Cotter—⅛ x 1	2

**Included in assembly under which listed.*

AUTOMATIC BRAKE — 93316A

(Optional)





Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
	35880A	Pawl Assembly	1
1	* 35880	Pawl	1
	* 35877B	Pin	1
	* 36478	Bushing	1
2	93247	Hub ..... 21. splines	4
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	93228A	Wheel—Brake	1
8	35159	Gasket	4
	15515	Capscrew—½ NF x ¾	3
9	35148	Bearing	2
10	31970	Oil Seal	2
11	35876B	Ring—Drag	2
12	† 15079	Nut—Slotted, ⅜ UNF	8
	15212	Cotter—3/32 x ¾	8
13	† 94600	Link—Shoulder	4
	58700	Grease—3 lb. can (High Melting Point)	

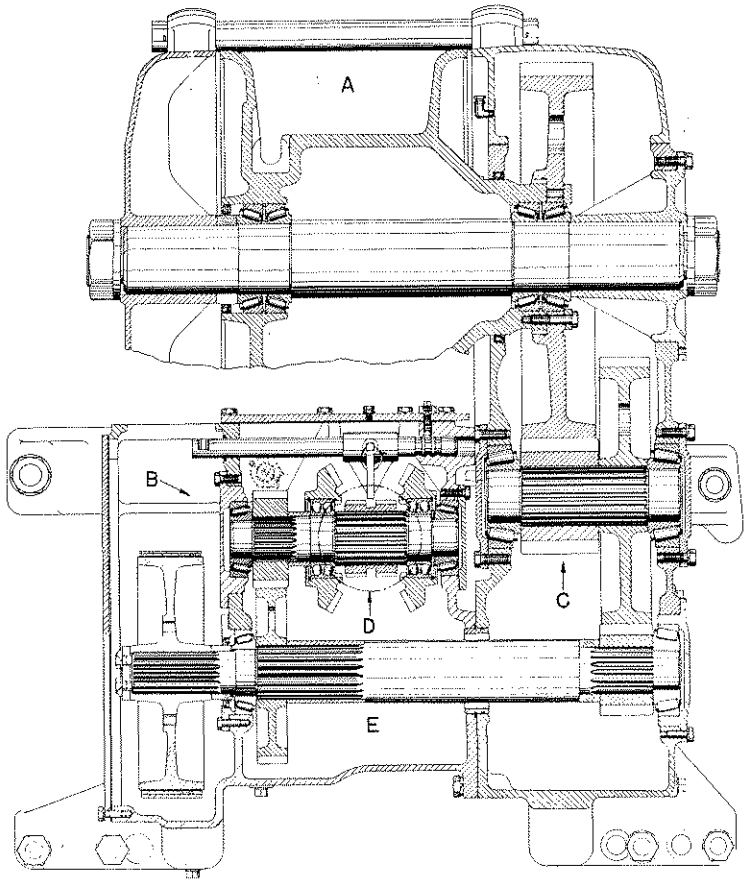
**Included in assembly under which listed*

†*Note:* For units having capscrews and links that are not drilled, replace with a complete set of capscrews, links, nuts and cotters.

NUMERICAL INDEX

NUMERICAL INDEX—Continued

GEAR TRAIN ARRANGEMENT



Ref.	*Description*	*Page*
A	Drum Shaft Group	29
B	Shifter Gear Group	25
C	Intermediate Gear Group	25
D	Power Take-off Group	23
E	Brake Shaft Group	27

SPECIFICATIONS

Hyster Model ..... D9A Towing Winch

Drum Size:	With Std. Drum
Barrel Diameter	16"
Flange Diameter	27"
Barrel Length	11"

Cable Capacity, Maximum Line ..... 340 ft.—1 "
269 ft.—1 1/8"
217 ft.—1 1/4"

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

Available Line Pulls:

Bare Drum, 1 1/8" Line	82,800 lbs.
Full Drum, 1 1/8" Line	54,600 lbs.

Line Speeds:

Bare Drum, 1 1/8" Line	128 f.p.m.
Full Drum, 1 1/8" Line	193 f.p.m.

(Line Speeds and Pulls are the same when Overwinding or Underwinding)

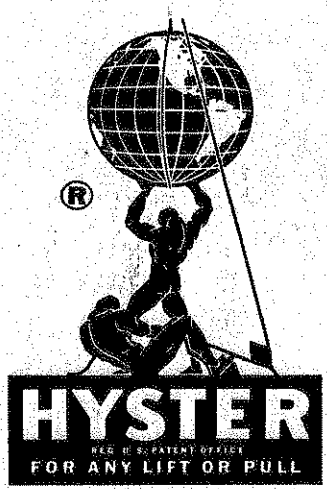
Above figures based on 320 H.P. @ 1240 R.P.M.

NOTE: IMPORTANT

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

Net Weight, less Cable, approximately ..... 3450 lbs.

Subject to Improvements and Changes in Specifications Without Notice.


HYSTER
REG. U.S. PATENT OFFICE
FOR ANY LIFT OR PULL