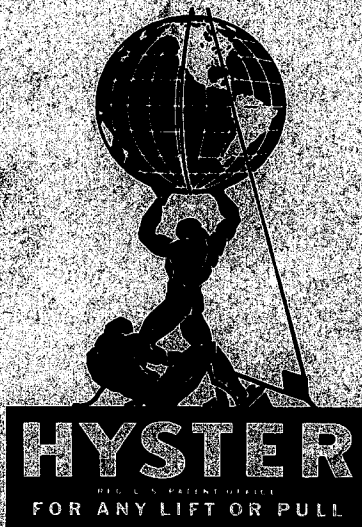


PARTS BOOK
and
INSTRUCTION MANUAL
for
HYSTER
D4 Towing Winch



EFFECTIVE WITH
HYSTER NO. BW-3525 TO BW-32477

HYSTER COMPANY

PORTLAND 8, OREGON

PEORIA 4, ILLINOIS

DANVILLE, ILLINOIS
U. S. A.

FORM NO. 194E

LITHO IN U.S.A.

1500-5-53

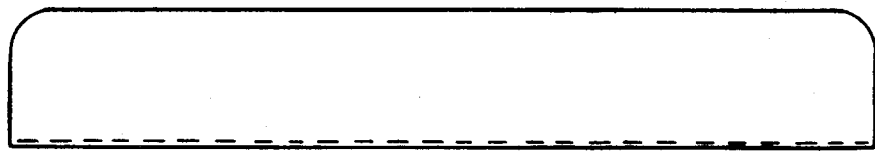
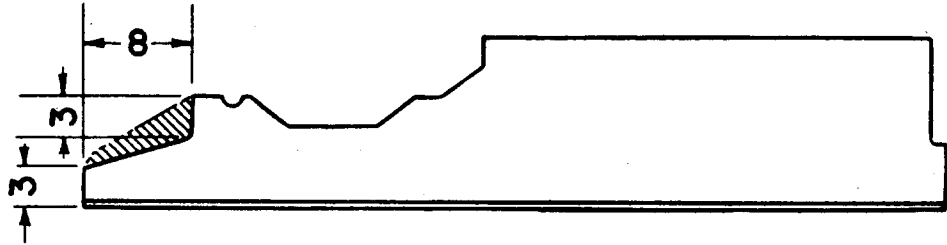
INSTRUCTIONS FOR ORDERING HYSTER REPAIR PARTS

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.
-

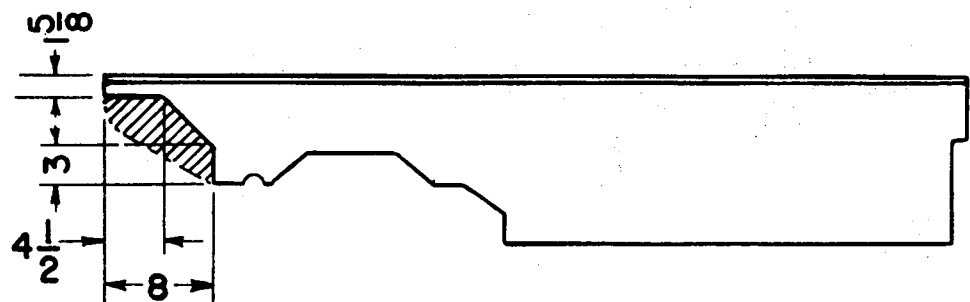
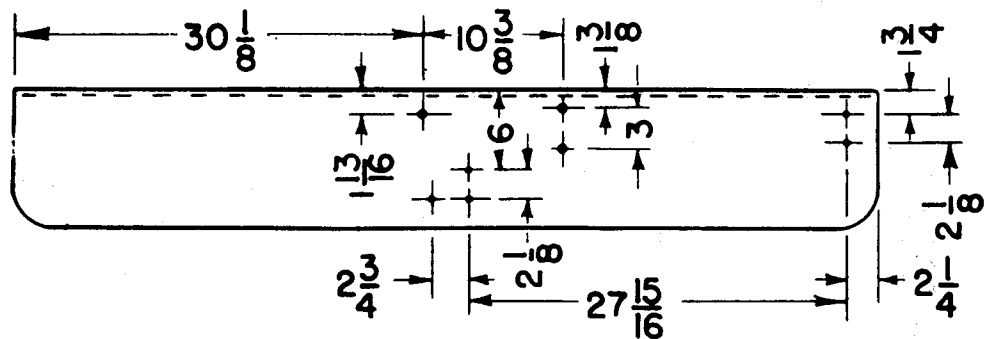
The illustrations shown in this parts book may not accurately show all the details of your machine. If the picture does not correspond exactly to the machine, please give a **COMPLETE DESCRIPTION** of the part required and the reference number of the part nearest to its location including also the page number. Then, by reference to the **SERIAL NUMBER** of your machine, we can send you the correct part.

TRACTOR FENDER ALTERATIONS

For Tractors with Seat-mounted Fuel Tank



LEFT HAND FENDER ALTERATION

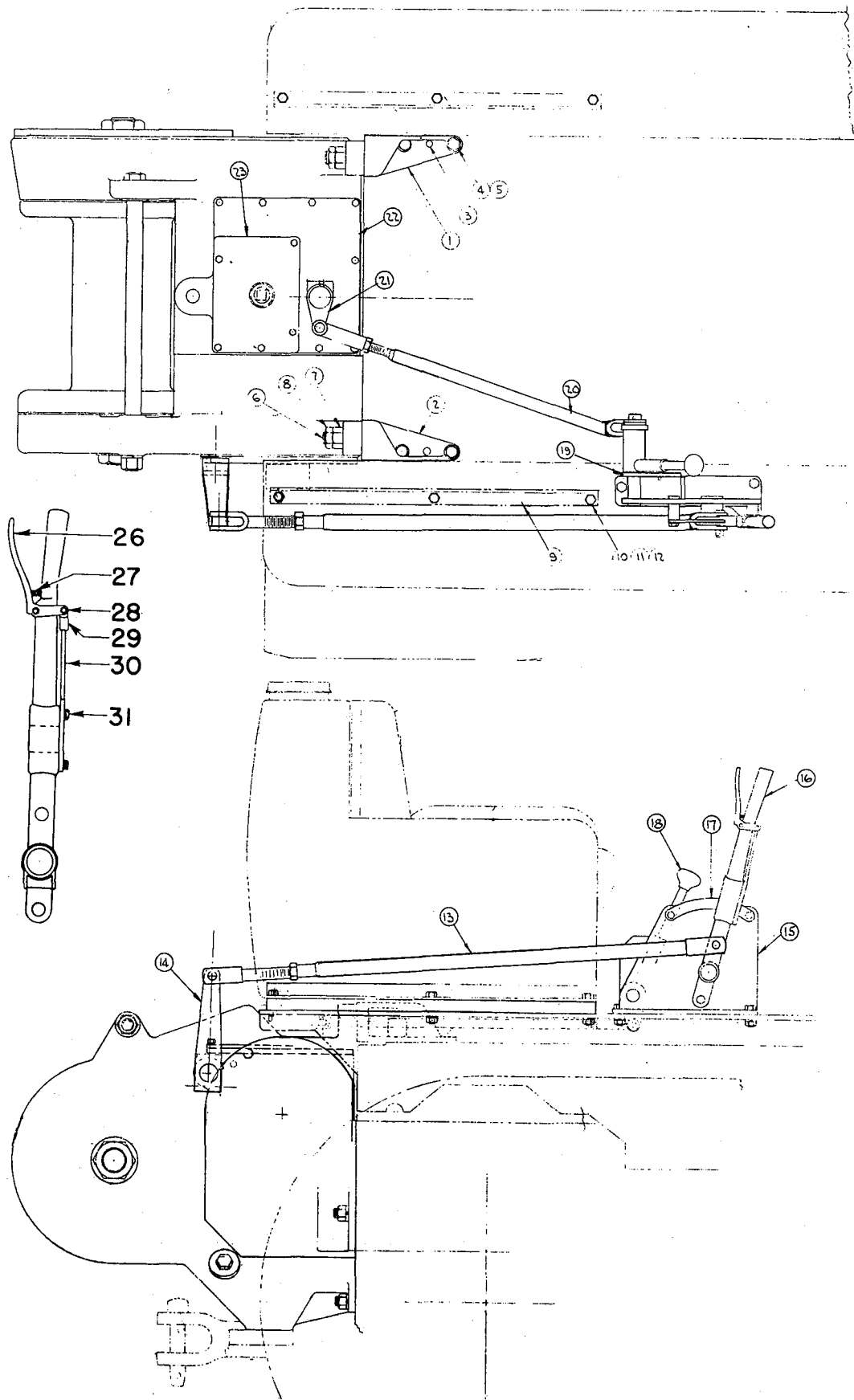


RIGHT HAND FENDER ALTERATION

NOTE: BURN OUT CROSS HATCHED AREAS OF FENDERS FOR WINCH CLEARANCE

CONVERSION GROUP No. 92407A

For Seat-Tank Type Tractors



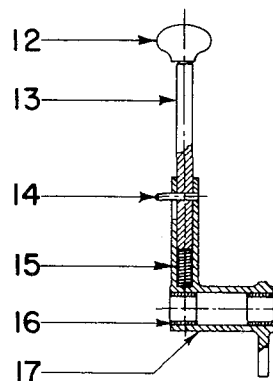
HYSTER COMPANY
PORTLAND, OREGON

CONVERSION GROUP No. 92407A

For Seat-Tank Type Tractors

Ref. No.	Hyster Part No.	Name of Part	Qty. Reqd.	Ref. No.	Hyster Part No.	Name of Part	Qty. Reqd.
1	90739	Bracket—L.H.	1	17	59035	Quadrant—Ratchet ..	1
2	90740	Bracket—R.H.	1	18	.....	Handlever Assembly (includes details 11-17, this page) ...	1
3	38454	Pin—Dowel	2	19	91451	Quadrant—Shifter ..	1
4	15531	Capscrew— $\frac{5}{8}$ NCx1 $\frac{1}{4}$	4	20	91886AB	Link Assembly	1
5	15160	Lockwasher— $\frac{5}{8}$	4		*15010	Nut—Hex, $\frac{5}{8}$ NF	1
6	15530	Capscrew—1" NF x 4.	2		*92016A	Pin—Rod End (Spec.)	1
7	15016	Nut—Hex, 1" NF ...	2		* 150	Pin (Std. Rod End) ..	2
8	15036	Nut—Jam, 1" NF ...	2	21	*15212	Cotter— $\frac{3}{32}$ x $\frac{3}{4}$...	2
9	90649	Bar	2		91888A	Crank Assembly (see page 7, Ref. 5) ..	1
10	15510	Capscrew— $\frac{1}{2}$ NFx2 $\frac{1}{4}$	6	22	91435A	Cover	1
11	15158	Lockwasher— $\frac{1}{2}$	6	23	90720A	Cover	1
12	15008	Nut—Hex, $\frac{1}{2}$ NF ...	6	24	15338	Pipe Fitting—Std. Ell, (not illustrated)	1
13	33770A	Link Assembly	1	25	59034A	Handlever Assembly.	1
	*15016	Nut—Hex, 1" NF ...	1	26	*32694	Handle	1
	*33771A	Rod End Assembly ..	1	27	*32695	Spring	1
	* 159	Pin—Rod End	2	28	*37476	Mach. Screw—Hex Head, 10-24 x $\frac{7}{8}$	2
14	*15223	Cotter— $\frac{1}{8}$ x 1	2		*15052	Nut—Hex, 10-24	2
	41857A	Crank Assembly	1	29	*32693	Rod End	1
	*15503	Capscrew— $\frac{1}{2}$ NFx2 $\frac{3}{4}$	1	30	*59033	Rod—Pawl	1
	*15158	Lockwasher— $\frac{1}{2}$	1	31	*32692	Bolt—Drilled Head ..	2
15	*15008	Nut—Hex, $\frac{1}{2}$ NF ...	1				
	128	Key	1				
16	91426A	Bracket	1				
	.....	Handlever Assembly (includes items 25 to 31 incl.)	1				

DETAIL OF HANDLEVER, ITEM 18 ABOVE

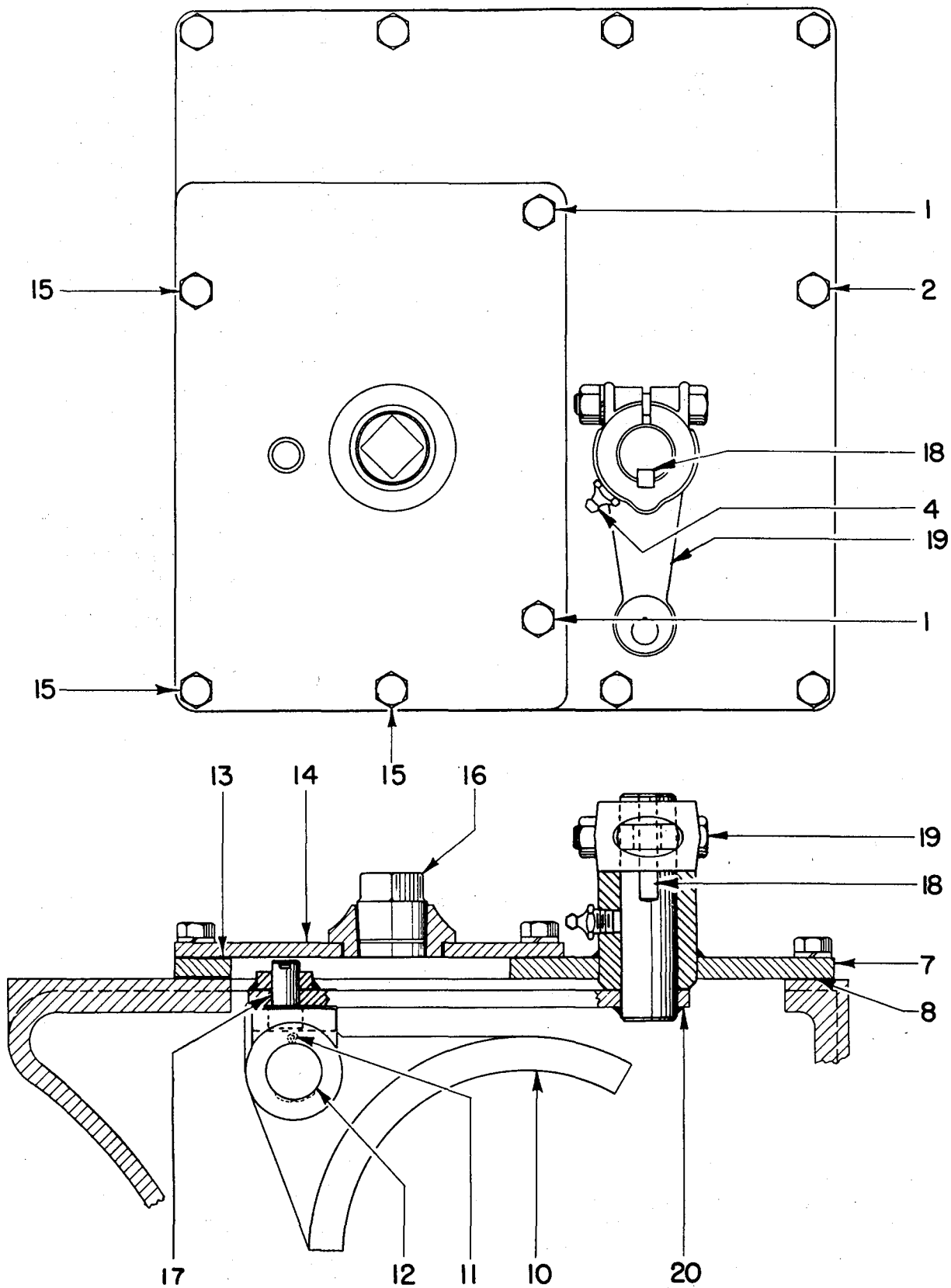


Ref. No.	Hyster Part No.	Name of Part	Qty. Reqd.	Ref. No.	Hyster Part No.	Name of Part	Qty. Reqd.
11	91434AB	Handlever Assembly.	1	14	*19909	Pin	1
12	* 809	Knob	1	15	* 5782	Spring	1
13	*32906	Rod—Lever Stem ...	1	16	*29603	Bushing	2
				17	*91430AB	Lever	1

**Included in assembly under which listed.*

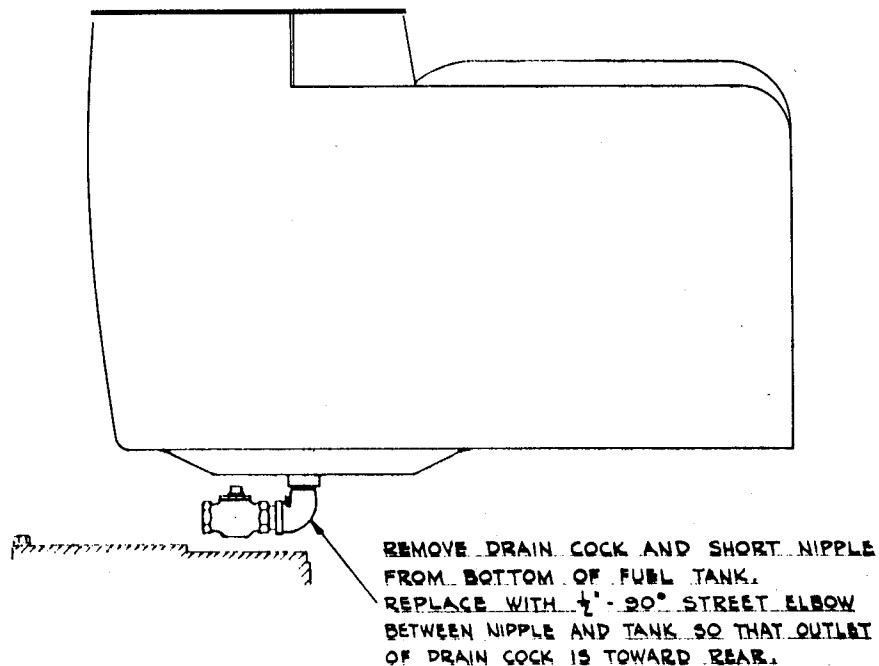
SHIFTER PARTS

For Tractors with Seat-mounted Fuel Tank



Ref. No.	Hyster Part No.	NAME OF PART	Ref. No.	Hyster Part No.	NAME OF PART
1	15513	Capscrew— $\frac{3}{8}$ NF x $\frac{3}{4}$ (2)	12	45052	Pin
	15156	Lockwasher— $\frac{3}{8}$ (2)	13	90722	Gasket
2	15508	Capscrew— $\frac{3}{8}$ NF x 1 (7)	14	90720A	Cover
	15156	Lockwasher— $\frac{3}{8}$ (7)	15	15532	Capscrew— $\frac{3}{8}$ NF x $1\frac{1}{4}$ (3)
3	58933	Snap Ring	16	32411	Plug—Vent
4	16001	Grease Fitting	17	91893	Shoe—Shifter
6	9413	Key		15213	Cotter
7	91435A	Cover	18	9415	Key
8	32828	Gasket		91888A	Crank
10	90723	Fork—Shifter	19	*15528	Capscrew— $\frac{3}{8}$ NF x 2
11	15244	Cotter— $\frac{3}{16}$ x $1\frac{1}{2}$ (2)		*15156	Lockwasher— $\frac{3}{8}$
				*15006	Nut—Hex, $\frac{3}{8}$ NF
			20	91892A	Lever

ALTERATION OF FUEL TANK DRAIN



PARTS BOOK AND INSTRUCTION MANUAL FOR

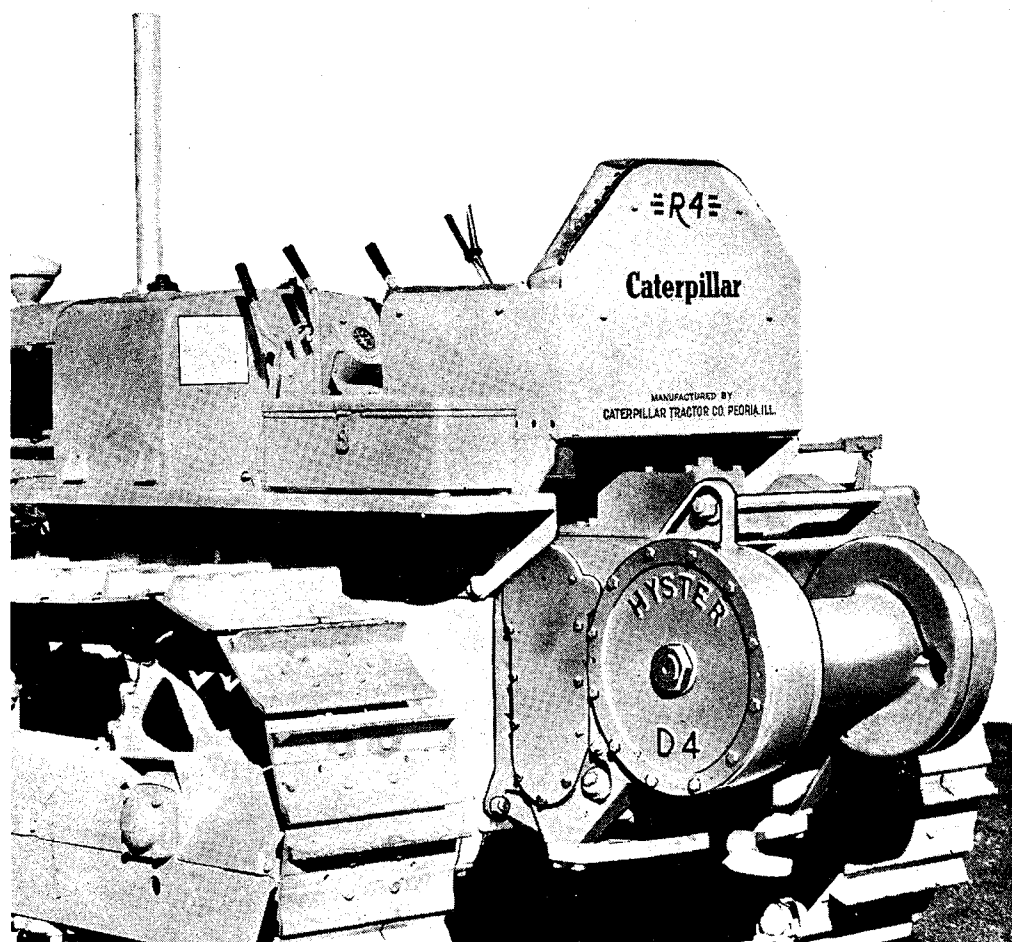
"HYSTER" D4 TOWING WINCH

BEGINNING WITH HOIST SERIAL NUMBER BW-3525 to BW-32477 INCLUSIVE

For "Caterpillar" D4 And R4 Tractors

TRACTOR MODEL SERIAL NUMBERS 6G-4G-7J-2T-5T

(Not recommended for Tractor Models 6U or 7U)



Including
Installation, Lubrication and
Servicing Instructions

HYSTER COMPANY

PORTLAND 8, OREGON ■ PEORIA 1, ILLINOIS ■ DANVILLE, ILLINOIS

U. S. A.

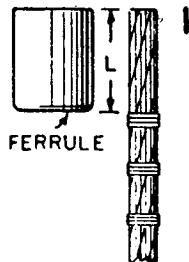
TRACTOR OPERATOR PRECAUTIONS

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 tractor master clutch.
 - C. Place the tractor transmission gearshift lever in neutral.
 - D. Set and lock the tractor 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.

INDEX

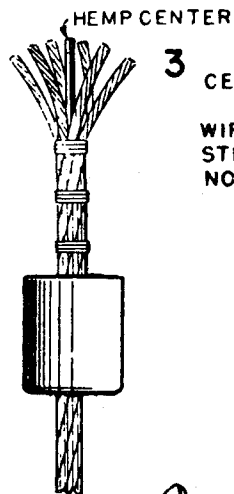
Attaching Ferrules	4
SECTION A—Operating Instructions	5-6-7-8-9
SECTION B—Servicing Instructions	9-10-11-13
Lubrication Instructions	10-11
SECTION C—Mounting Instructions	14-15-16-17-18-19
SECTION D—List of Parts and Illustrations	20 to 40 incl.
Bracket Attachment Group	38
Brake Arrangement	34
Brake Lever and Links	40
Brake Shaft and Drum Idler Gear	28
Drum and Drum Shaft	32
General Arrangement	22
Intermediate Shaft and Reverse Idler Gear	26
Power Take-Off and Bevel Gear Shaft	24
Power Take-Off Transmission-Brake Assembly	21
Side Frame Group	30-31
Top Cover and Shifter Group	36
SECTION E—Optional Parts	42-44
Adapter Plate	52-59
(To adapt D4 Winch to D6 Tractor)	
L. H. Brake Handling Gear Group	44
(When mounted in conjunction with Athey W-4 Mobiloader)	
Non-Current Vertical Shifter Lever Assembly	42
Power Control Adaptation	42
Pump Drive Adapter Unit	46-51
Tie Plate Attachment Group	43
SECTION F—Auxiliary Drum Unit	60-85
SECTION G—Numerical Index	86-88
Specifications	Inside Rear Cover

METHOD OF ATTACHING FERRULES

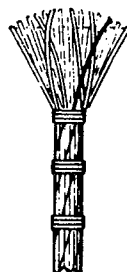


1 MEASURE FROM END OF CABLE A LENGTH EQUAL TO LENGTH OF FERRULE. SERVE WITH NOT LESS THAN THREE SEIZINGS.

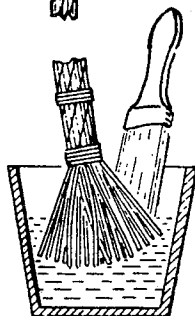
2 SLIP FERRULE OVER CABLE AND PUSH DOWN OVER SEIZINGS.



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

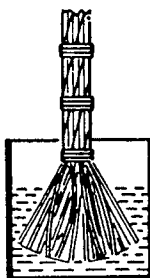


4 SEPARATE WIRES OF STRANDS AND STRAIGHTEN TO FORM A BRUSH.

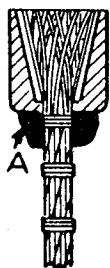


5 IF WIRES ARE VERY GREASY. CLEAN WITH SOLVENT
A CHEAP PAINT BRUSH DIPPED IN THE SOLVENT CAN BE USED TO REMOVE THE SURPLUS GREASE.

DRY THOROLY.



6 DIP WIRES FOR $\frac{3}{4}$ 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.

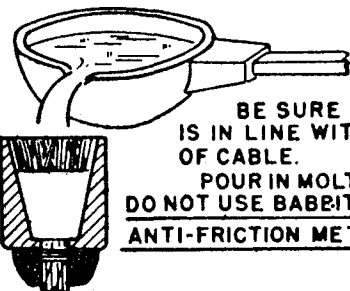


7 SLIP FERRULE UP
DISTRIBUTE WIRES EVENLY IN RECESS AND FLUSH WITH TOP OF FERRULE

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.

Section A

OPERATION

This section, in addition to instructions for operating, contains illustrations and instructions pertaining to certain simple adjustments and replacements which can readily be made.

Lubrication instructions are provided on pages 10 and 11 and should be carefully studied. The lubricant recommended should be used.

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

DO NOT OPERATE WINCH AND TRACTOR AT THE SAME TIME

Be sure winch gear shift lever is in neutral position "B" as shown in figure 1, page 8, **BEFORE MOVING THE TRACTOR.**

THE TRACTOR MASTER CLUTCH MUST BE DISENGAGED BEFORE CHANGING GEARS IN THE WINCH.

The following instructions are taken from the TRACTOR parts book and are especially applicable to tractors equipped with winches, as the transmission shaft bearings receive oil only *when transmission gears are revolving*. When winch-equipped tractors remain stationary for a period of three hours or more, it is necessary to take the following steps to *insure* lubrication of the *tractor* upper transmission shaft bearings:

- A. Disengage main clutch and shift gears into high.
- B. Release both steering clutches and engage the main clutch for a minute or two, to allow oil to be well splashed about in case.
- C. Disengage main clutch, let go of steering clutch levers, and shift the tractor gears to neutral.
- D. **WARNING: DO NOT** let go of steering clutch levers until main clutch has been disengaged.

BRAKE

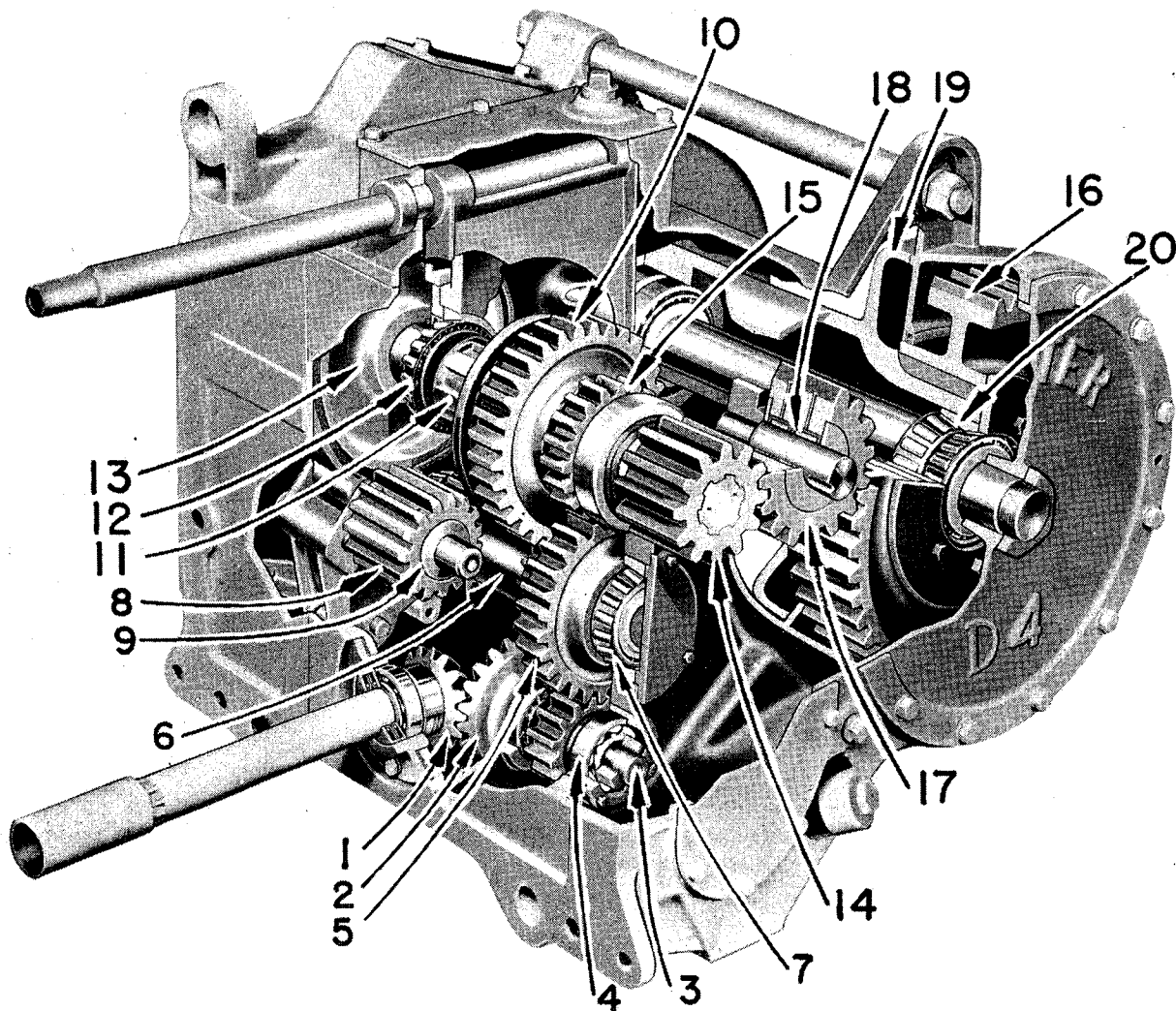
The brake lever is located on the right-hand side of the operator. A pawl and ratchet are provided to hold the brake in the applied position.

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

RIGHT AND LEFT HAND SIDE OF TOWING WINCH.

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

CUTAWAY VIEW OF HYSTER D4 TOWING WINCH



Working Principles

When the tractor engine is running with the master clutch engaged, the engine turns the take-off shaft (clockwise) with bevel pinion (1) which in turn rotates the bevel gear (2) assembled to pinion and shaft (3). This shaft, revolving on ball bearing (4) has a 13-tooth pinion integral with the shaft, which meshes with driving gear (5) mounted on the intermediate shaft (6). The intermediate shaft rotating on Timken roller bearings (7) has two 15-tooth pinions integral with shaft, one of which meshes with the reverse idler gear (8). The reverse idler gear runs on needle bearings (9).

With the shifter lever in the neutral position the drum would be stationary while the above mentioned gears and shafts would be constantly revolving when the engine is running with the master clutch engaged.

To operate UNDERWINDING and pull in cable (explanation given on page 8) the HYSTER winch brake must be released and the tractor clutch be disengaged while shifting gears.

Depress HYSTER shifter lever stem and push shifter lever downwards into locked position. This causes the shifter mechanism to move the sliding gear (10) to the left-hand side and in mesh with the 15-tooth pinion on the intermediate shaft. This sliding gear slides on a spline shaft (11), which revolves on Timken roller bearings (12). Assembled on one end of this shaft is the brake drum (13), on the other end the 12-tooth drum pinion (14).

Also located on this shaft is an idler gear (15) running on bronze bushings and in constant mesh with the driving gear (5). This idler gear is the power take-off for the auxiliary drum on "Power Control Unit" on those winches so equipped.

The 12-tooth drum pinion (14) does not mesh directly with the drum gear (16) but rather with a 16-tooth intermediate idler gear (17) that runs on needle bearings (18). The drum gear is assembled to the drum (19) which revolves on Timken non-adjustable roller bearing (20).

After shifting gears as above with shifter lever in the lower locked position, engage tractor master clutch causing the drum to rotate in an underwinding direction and spool in cable. To stop drum rotation, disengage master clutch and apply winch brake.

To reverse drum rotation and pay out cable (underwinding) tractor master clutch still being disengaged, depress shifter lever stem and pull shifter lever upwards through neutral until lever locks in upper position. Release brake and engage tractor master clutch allowing drum to rotate and pay out line.

To operate OVERWINDING and pull in cable the winch brake must be released and the tractor master clutch be disengaged while shifting gears.

With shifter lever in upper locked position, the shifter mechanism has moved the sliding gear (10) to the right-hand side and in mesh with the reverse idler gear (8) and thereby connecting through the same train of gears as described previously to the cable drum. Engage the master clutch which will cause the drum to rotate in an overwinding direction and spool in the cable over the top of drum. To stop drum rotation disengage tractor clutch and apply winch brake.

To reverse drum rotation and pay out cable (overwinding) tractor clutch still being disengaged, depress winch shifter lever stem, push lever downward through neutral and lock in lower position. Release brake and engage tractor master clutch allowing drum to rotate and pay out line.

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).

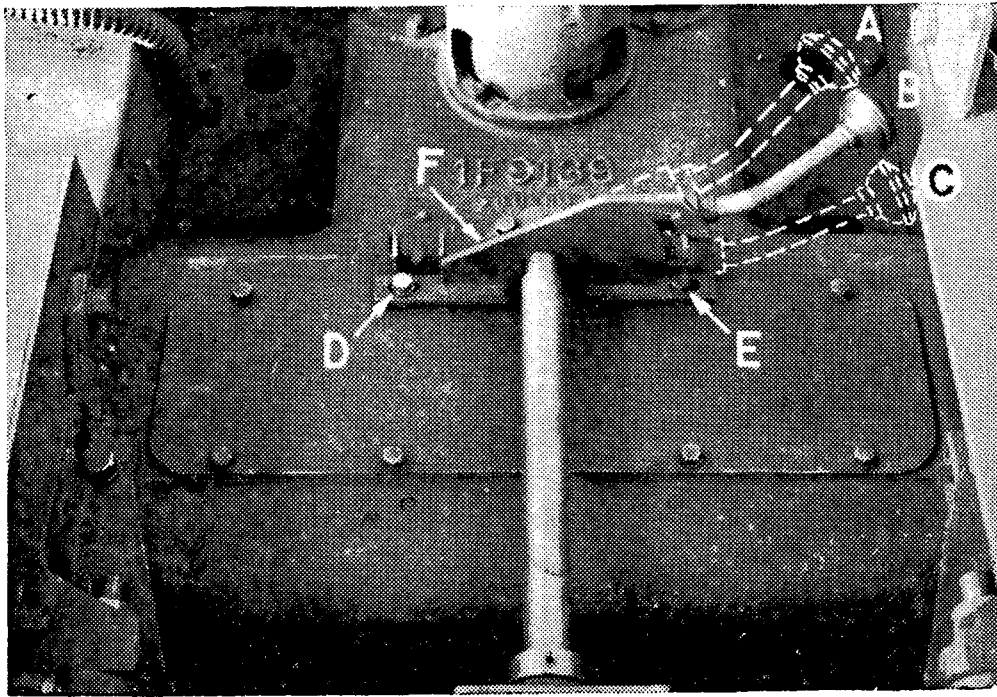


Figure 1

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, Figure 1 (page 8) should be in position "A;" to pay out line the shifter lever should be in position "C." Position "B" is the neutral position.

UNDERWINDING

When the winch is used with the cable leading from the bottom of the drum, the drum is underwinding. To wrap the cable around the drum or pull in a load, the gear shift lever, Figure 1 (page 8), should be in position "C;" to pay out the line, in position "A." Position "B" is neutral.

BRAKE LINKAGE

1. The brake link "A" should be connected to the LOWER HOLE in the handlever as at "B," Figure 2, page 9, when the DRUM IS UNDERWINDING.
2. The brake link "A" should be connected to the UPPER HOLE in the handlever as at "C," Fig. 3, page 9, when the DRUM IS OVERWINDING.
3. Before connecting up the horizontal link "A" make the following adjustments. First, shove the handlever all the way forward against solid stop (which is the fully released position).

4. Next, shove the brake crank "H" on winch all the way forward, then reverse the action and shove the crank "H" all the way backward. Note the two positions and then move the crank "H" FORWARD AGAIN TO A POINT MIDWAY OF THE TWO POSITIONS just tried.
5. Adjust the length of the brake link "A" with the adjusting screw to meet the brake crank "H" in the midway position with the handlever still in the forward position.
6. Insert pin and cotter, and tighten jam nuts on link. This will give the maximum clearance of brake band to drum and keep the brake from dragging and heating up.

SECTION B

Servicing Instructions

Brake Adjustment

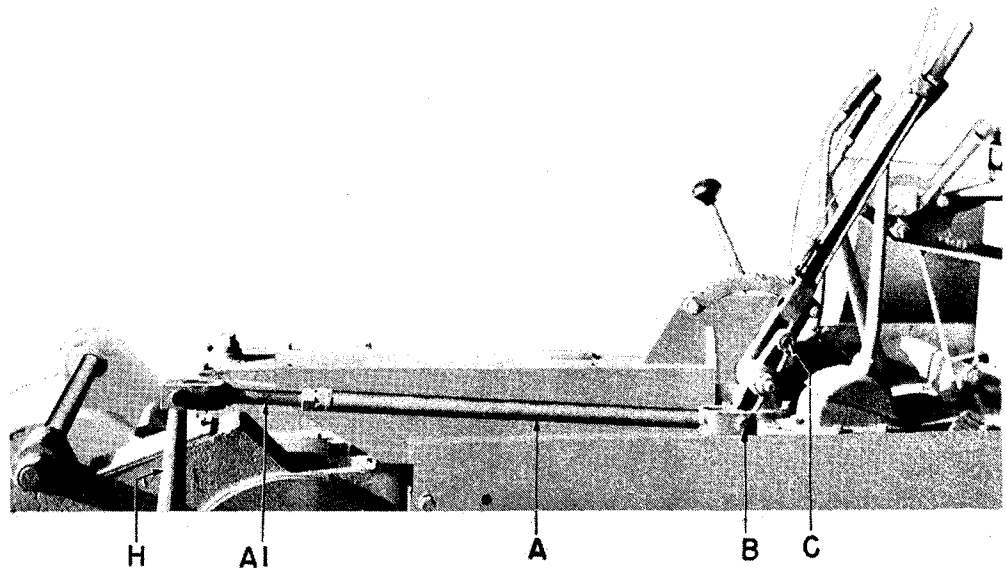


Figure 2 (Underwinding)

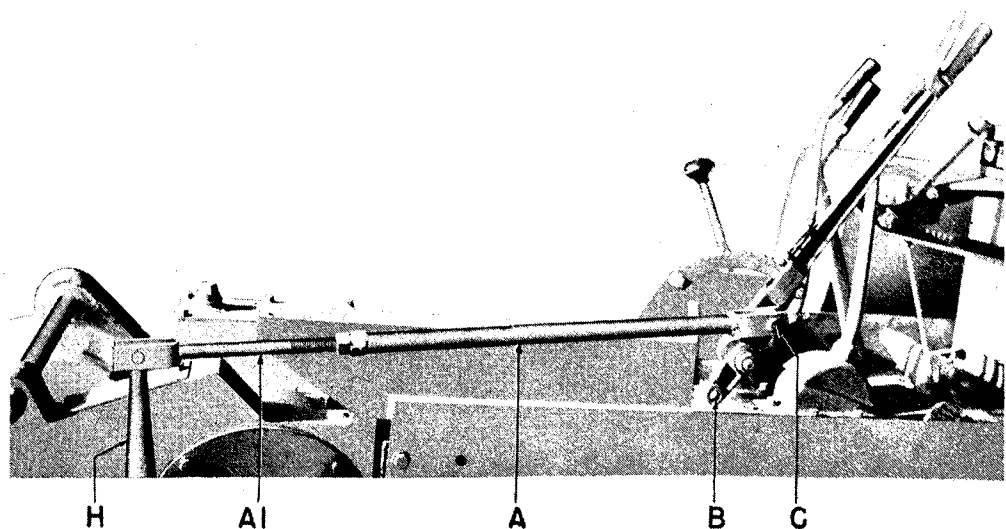


Figure 3 (Overwinding)

A new brake lining will require several adjustments until the lining becomes glazed. Close brake adjustment may then be obtained by means of the threaded rod end "A1", Figures 2 and 3. Loosen jam nut and remove rod end pin connecting link to brake lever. Screw the threaded end of link in until hand lever comes to proper position on quadrant, then tighten jam nut. When this adjustment has been exhausted, additional adjustment is provided on a vertical link within the brake compartment on the right hand side frame as shown in Figure 5A, item 147, on page 13.

Remove the brake compartment cover plate and gasket. Remove rod end pins in link (147), Figure 5A. Loosen jam nut, and if overwinding drum, **SHORTEN** link (147); if underwinding drum, **LENGTHEN** link (147). When link (147) is altered in length, it should be changed sufficiently to allow the outside adjustment to be restored to its original position when the lining was new.

The brake is operated by a two-way cam and must be relined when the cam slips over the rollers on the brake operating cranks.

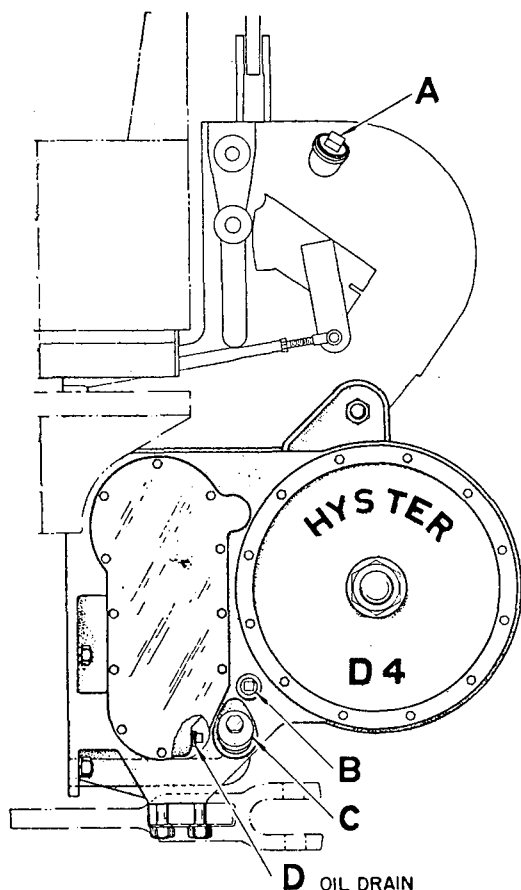


Figure 4

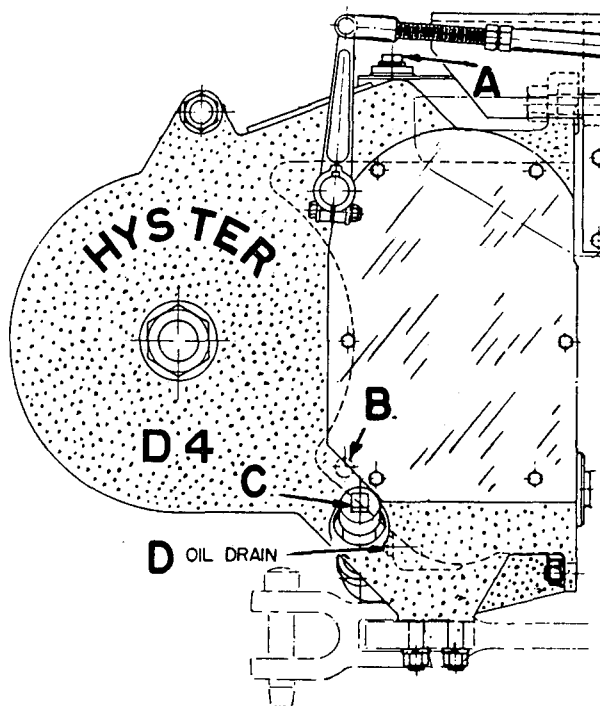


Figure 5

LUBRICATION INSTRUCTIONS

Refer to chart shown.

The lubrication chart shows the location of the filler, drain, and oil level plugs on the transmission case.

NOTE: When checking oil level, if the tractor motor is running, throw out the master clutch so that hoist gears are stationary; otherwise, a false reading will result.

On a new winch the oil should be drained from transmission case at the end of about 10 days, flushed out and refilled with fresh oil.

TRANSMISSION CASE LUBRICATION

The bearings in the transmission, intermediate and drum gear train, including the drum bearings, are lubricated by a splash system from the oil in the transmission case. The oil level in the case should be checked daily, keeping the case filled up to the oil level plug "B" which is located on the outside of the left-hand side frame.

The filler plug "A" is located in the transmission case top cover plate. Oil reaches both compartments through this one filler.

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

If the oil level drops below the plug "B," the upper transmission gears and drum bearings will not receive proper lubrication.

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 four gallons of oil are required for both compartments.

Oil may be added through the oil filler hole in the top cover at "A" if unit is a standard winch as shown in Figure 5. If winch is installed in combination with LeTourneau Model HN Power Control Unit, as shown in Figure 4, then oil is added through oil filler plug "A" on left-hand side of gear case of LeTourneau Power Control Unit.

Periodic inspection should be made for condensation, particularly after long periods of idleness. Loosen drain plug "D" and allow the water to drain off. When oil begins to appear, tighten drain plug and check oil level.

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.

All brake rigging and brake shafts in the winch are equipped with "Oilite" bronze bushings and need only occasional lubrication. It is helpful, however, to lubricate lightly all moving parts whenever the brake compartment is opened.

Disassembly

Certain groups of parts may be removed from the Model D4 Winch without the necessity of removing the entire winch from the tractor. All brake parts, the drum gear, drum pinion, drum idler gear, brake shaft and all parts thereon may be removed without dismounting the winch.

The winch must be removed from the tractor to disassemble the side frame, or to remove the drum, drum shaft, bearings, etc. Winch removal is also necessary to disassemble the intermediate shaft and pinion, reverse idler gear assembly bevel gear shaft and power take-off shaft assembly.

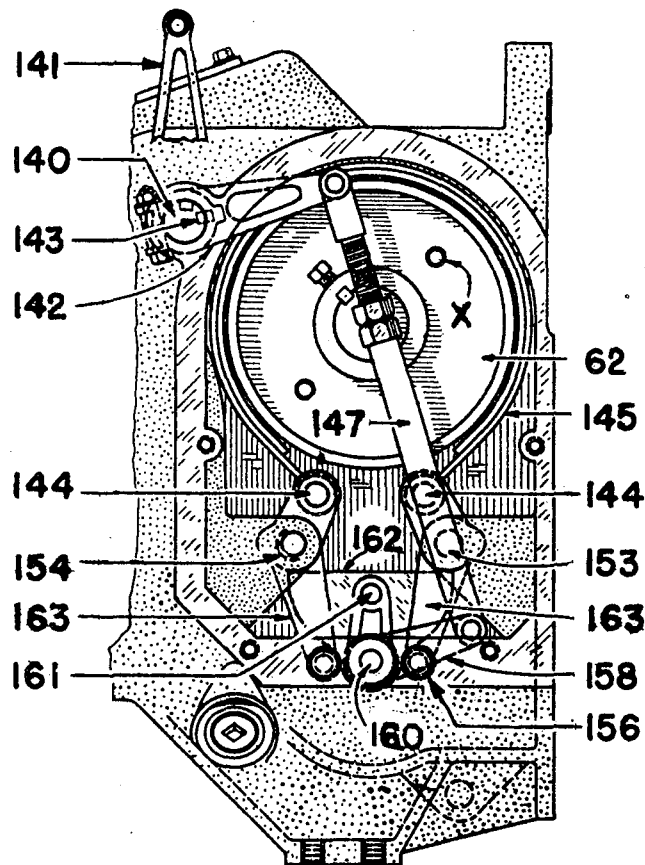


Figure 5A

Brake Disassembly

Refer to Figure 5A.

- A. Remove brake compartment cover and gasket.
- B. Remove brake link (147).
- C. Pull brake band pins (144) and fulcrum pins (153) after which the brake band (145) and cranks (163) may be removed.
- D. Removal of the shaft (160) will permit the crank (158) and cam (162) to be taken out.
- E. Loosen setscrew in brake drum hub and use puller to remove the brake drum (62)—two $\frac{1}{2}$ "-13 NC tapped holes are provided to aid in attaching a puller.
- F. When removing the brake drum (62) move brake lever (142) up to clear.

SECTION C

Installation Instructions

**FOR INSTALLING HYSTER D4 TOWING WINCH,
SERIAL NO. BW-3525 TO BW-32477 ON D4 TRACTOR**

**THERE ARE SEVERAL STEPS NECESSARY TO PREPARE THE
TRACTOR FOR INSTALLING A WINCH:**

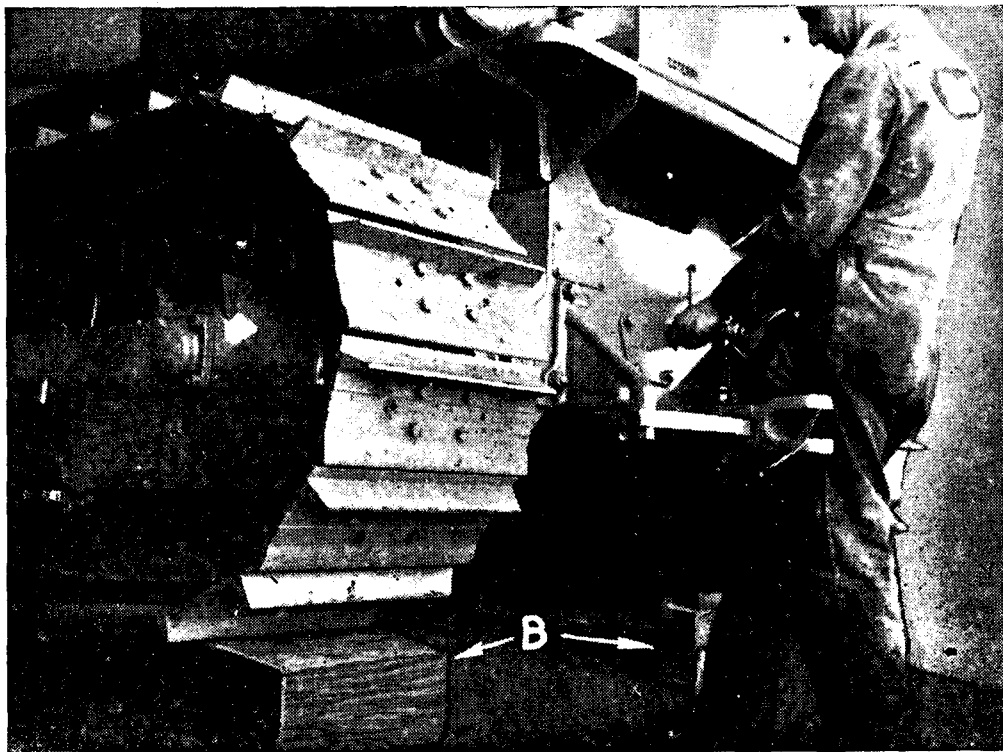


Figure 6

1. Block up rear of tractor on blocks (B), Figure 6, at least ten inches high, to prevent oil from running out of transmission case when covers are removed.
2. Remove tractor seat, inspection covers, power take-off cover, drawbar brackets, and final drive filler cups. See Figure 7A, page 15.
3. DO NOT remove tractor fenders. Burn a $6\frac{3}{8}$ " radius arc in both right and left-hand fenders as shown in Figure 7C, page 15. Pivot point $5\frac{7}{8}$ " from tractor face and 8" down from top of fender.
4. Remove studs from lower face of drawbar brackets for installation later in pads on bottom of winch frames.
5. Place gasket No. 32841 in position on rear face of tractor transmission. See figure 7B.
6. Remove brake compartment cover ("N," page 18) on right-hand side frame.

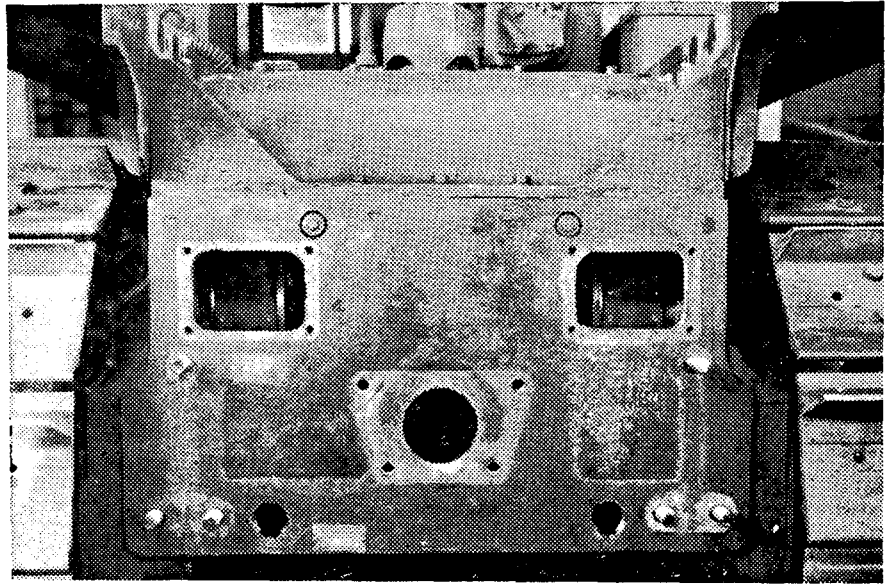


Figure 7A

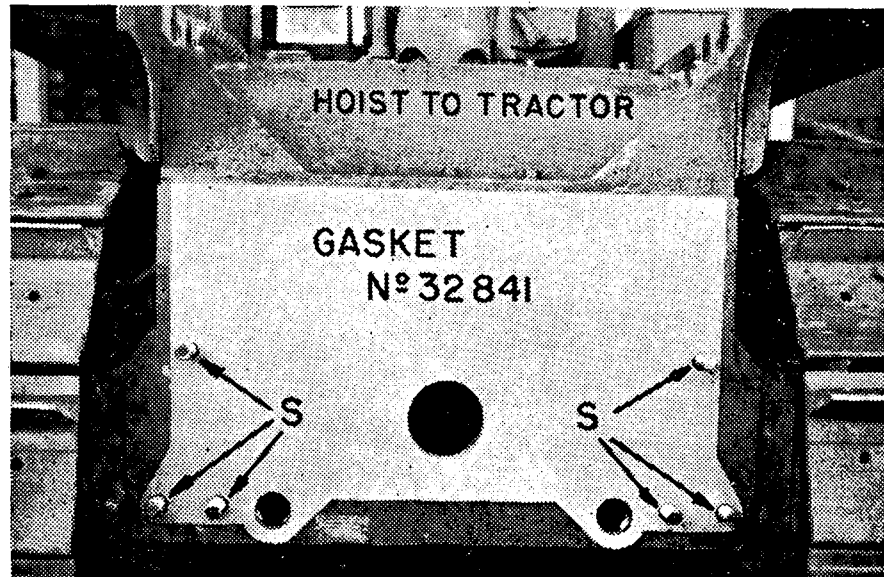


Figure 7B

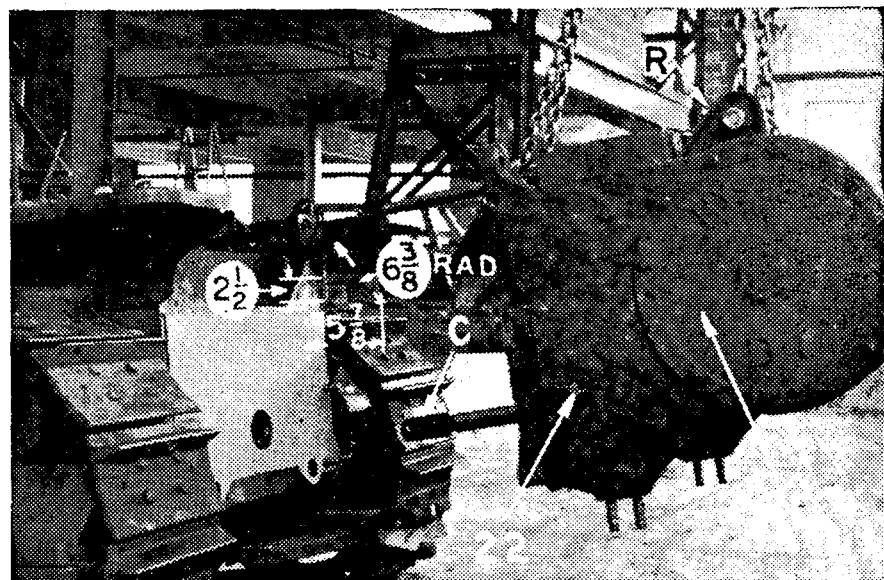


Figure 7C

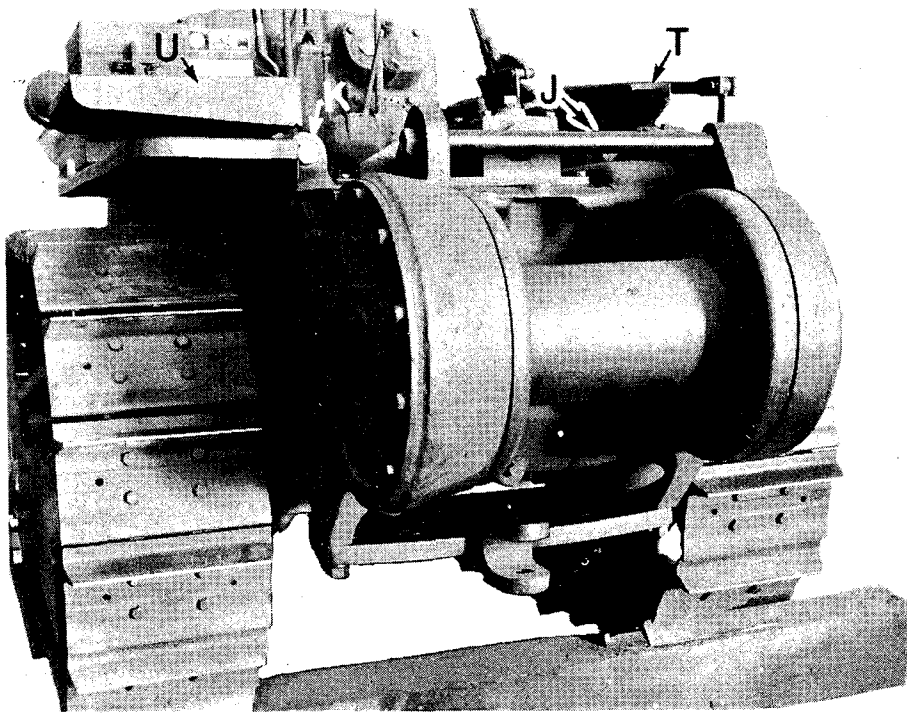


Figure 8
Wide Seat Supports

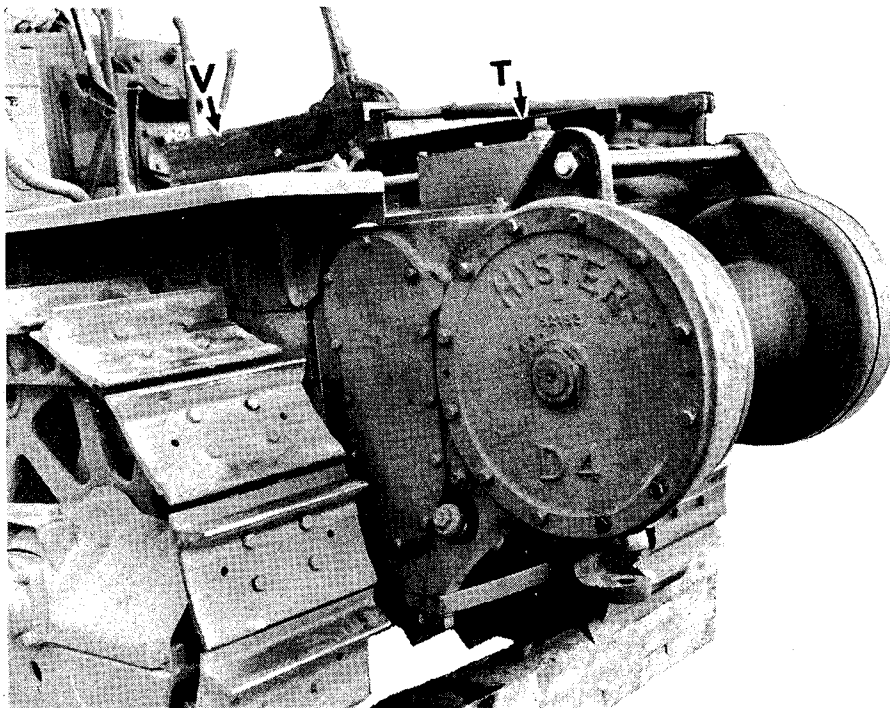


Figure 9
Standard Seat Supports

See instruction 15, page 19, for installation.

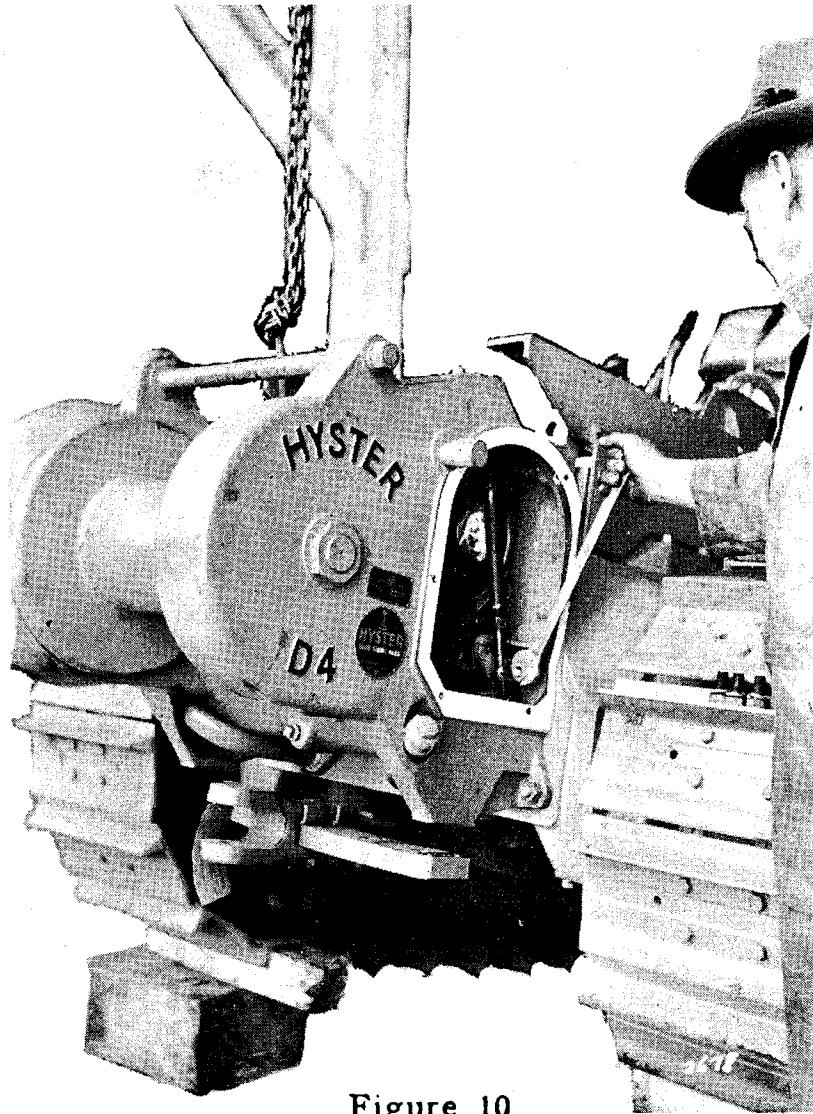


Figure 10

8. With the aid of a ring bolt "R" (Figure 7C) through the hole provided in the winch frame, swing the winch into place on the rear face of the tractor. Make sure the splines on the power take-off shaft enter those of the coupling "C". See Figure 7C, page 15.
9. When the winch is in place, place nuts and lockwashers on the six studs "S" in Figure 7B. Tighten all nuts (Figure 10, page 17) so that winch is securely fastened to tractor.
10. Before mounting brackets "J" and "K" (Figure 11, page 18) on top of tractor transmission cover, insert capscrews in end of brackets at point "B." Fasten brackets, with one dowel pin and two capscrews with lockwashers, securely to transmission cover at point "A."
11. Fasten the winch securely to brackets with capscrews (15530) (installed under instruction 10 above) and nuts as shown at "B," Figure 11. Fasten tractor drawbar to winch as shown at "G," Figure 11, using the studs and nuts which were removed from tractor drawbar brackets. (See instruction 4, page 14.)

NOTE: For Part Numbers of Brackets and Fastenings, see page 38.

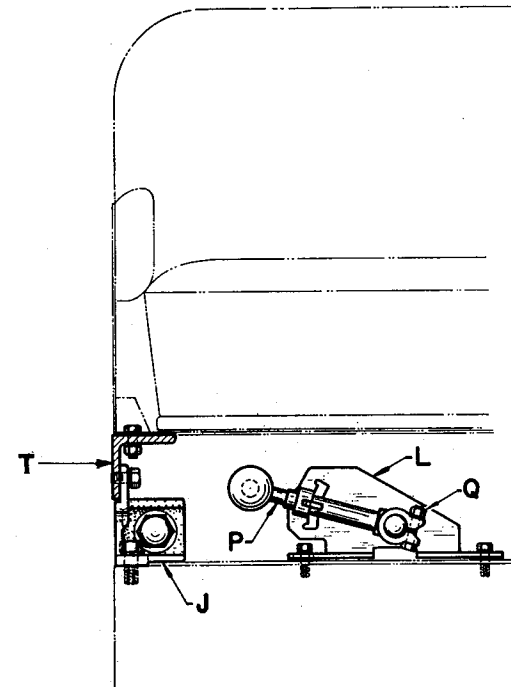
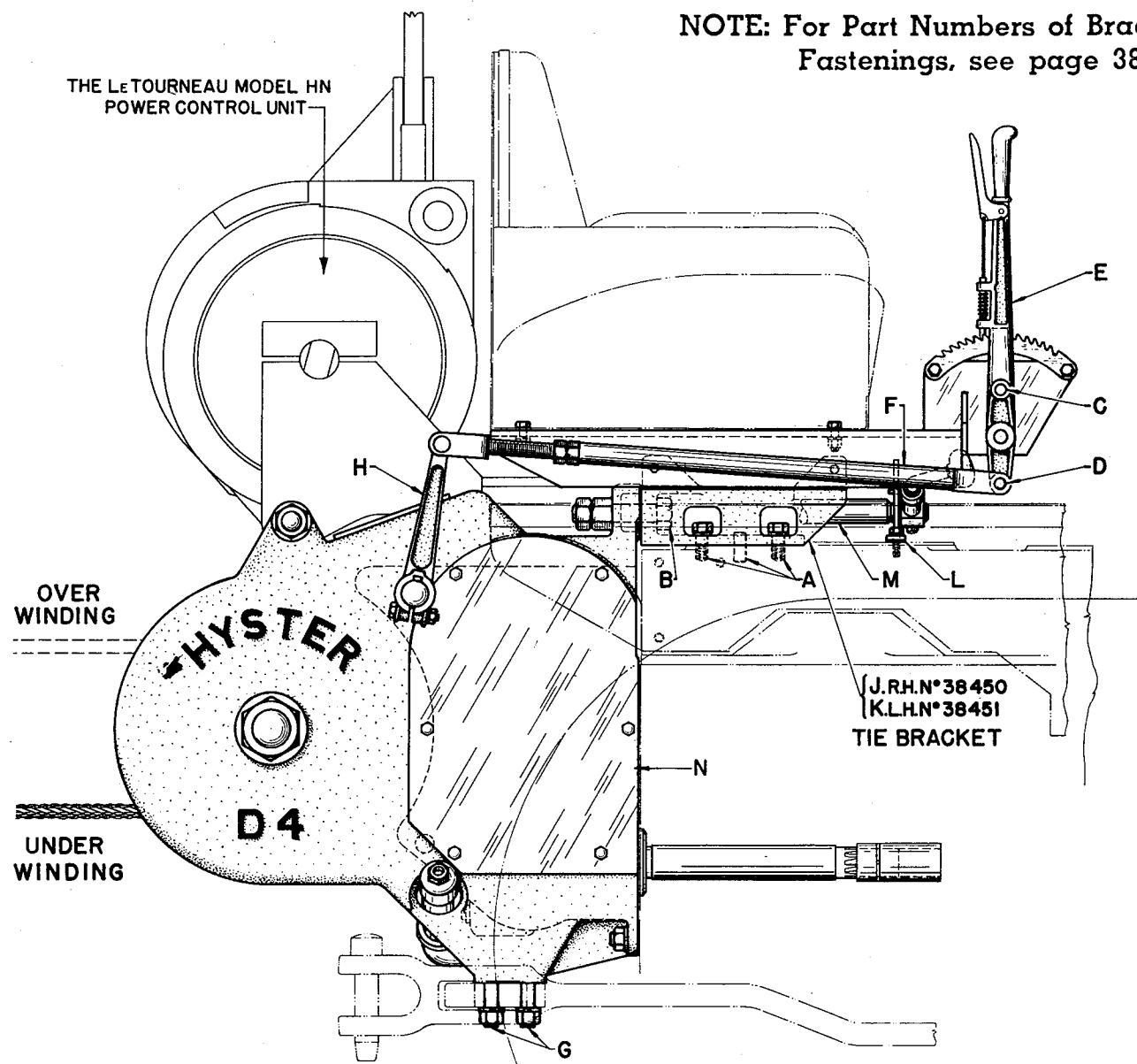


Figure 11

12. Install horizontal adjustable brake link "F" (Figure 11) as follows: connect link "F" to handlever "E" with $\frac{5}{8}$ " rod end pin; connect at "D" for UNDERWINDING DRUM; connect at "C" for OVERWINDING DRUM. Place the handlever "E" in the extreme forward or released position. See that lever "H" is in its central or released position and adjust brake link "F" to connect between lever "H" and handlever "E," which should still be in the released position. This procedure will give maximum brake band clearance.
13. Slide shifter bracket "L" (Figure 11) over end of shifter shaft "M," and fasten securely with capscrews provided, to transmission cover. Shaft "M" should turn easy and not bind in bracket hole.
14. Install shifter lever "P" with key on shaft "M" and securely clamp to shaft with bolt "Q."
15. Install seat support angle "T" on R. H. bracket "J" and fasten securely with two capscrews with lockwashers. Fasten seat support angle securely to L. H. bracket with two capscrews, lockwashers and nuts. Now place tractor seat on these brackets and fasten securely with capscrews, lockwashers and nuts.
16. Figure 8, page 16, shows winch assembled to tractor with seat support brackets for *wide seat*.
Figure 9, page 16, shows winch assembled to tractor with seat support brackets for *standard seat*.

Removal

1. Raise rear end of tractor, placing blocks at least 10 inches high under the tracks as shown in Figure 6 (page 14). This will prevent oil running out of transmission case when winch is removed.
2. Place a ring bolt through the hole provided in the winch housing and attach to a suitable hoist.
3. Disconnect brake link "F" in Figure 11 (page 18).
4. Remove gear shift lever shown at "P" in Figure 11.
5. Remove brake compartment cover and take nut and lockwasher from stud holding winch to tractor. (See Figure 10, page 17.)
6. Unfasten drawbar plate from bottom of winch side frames shown at "G" in Figure 11.
7. Remove two capscrews connecting winch frames to tie bracket lugs at "B," Figure 11.
8. Take remaining nuts and lockwashers from studs holding winch to tractor. (See "S," Figure 7B, page 15.)
9. Swing winch away from tractor.
10. When removing parts during disassembly, provide a clean storage place. Dirt and grit are the "5th columns" for bearings and moving parts.

SECTION D

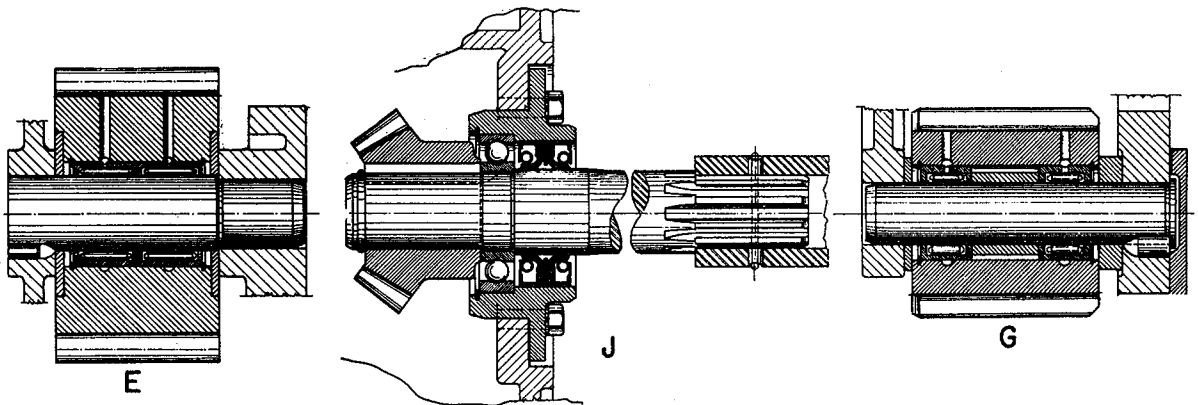
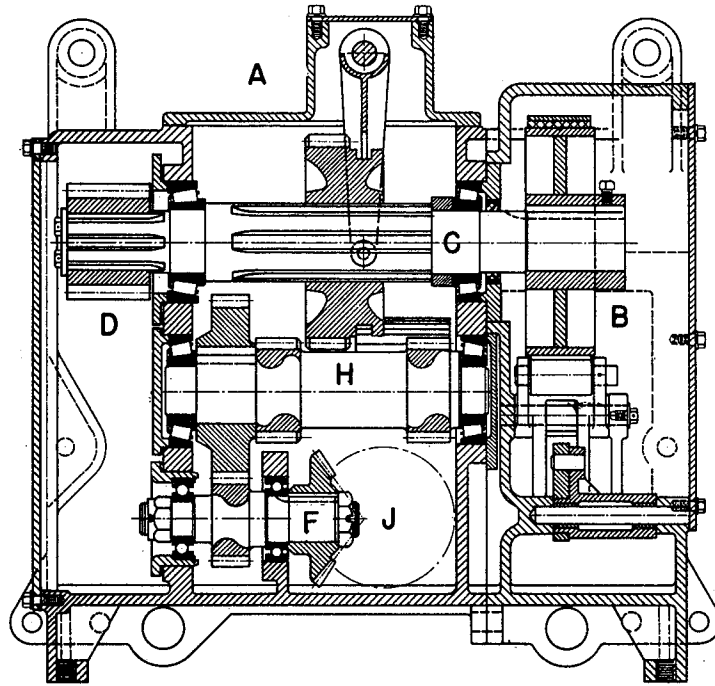
List of Parts and Illustrations

The information consolidated into this Parts List Section includes unit assemblies and exploded views showing the part name and number.

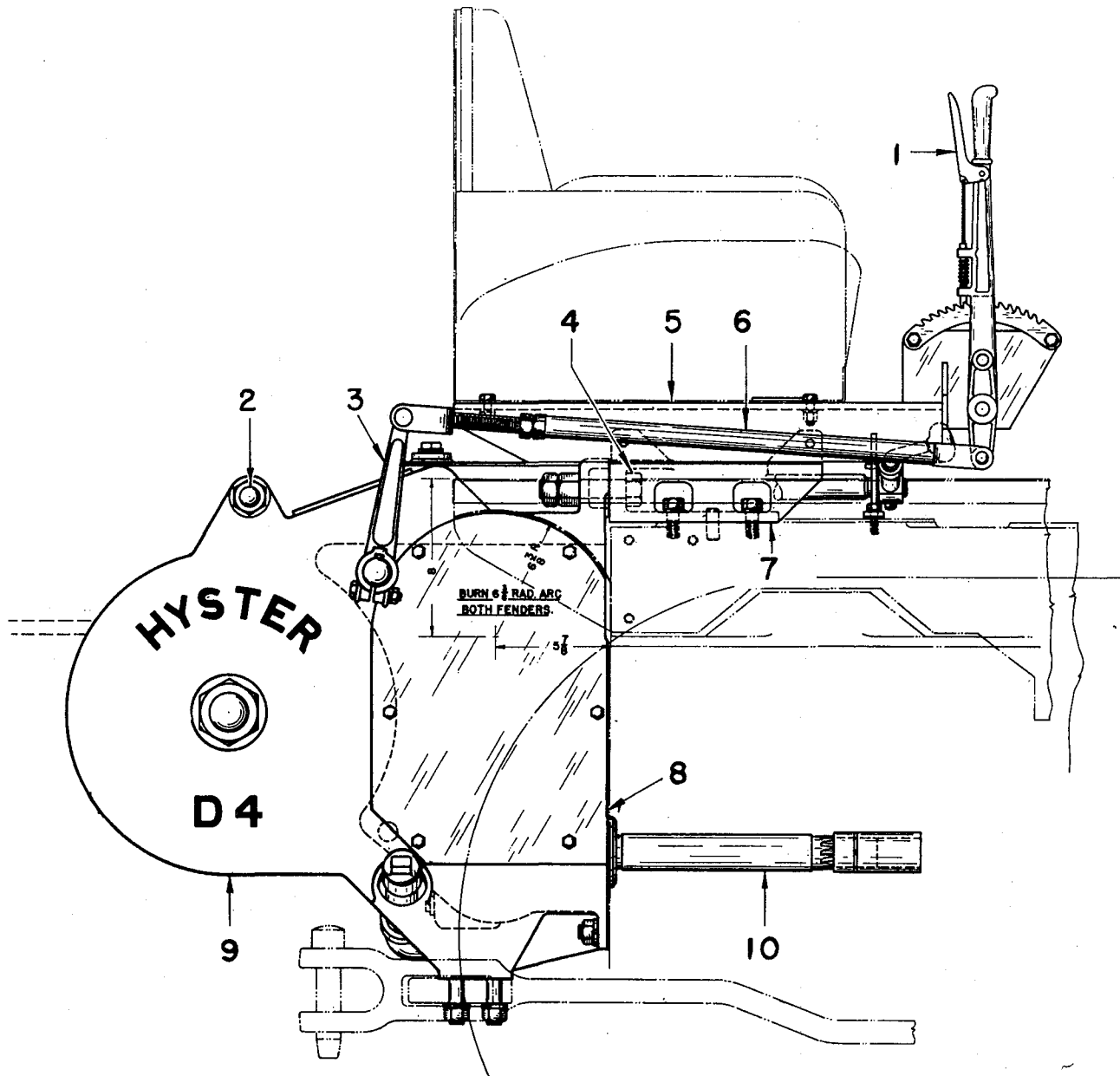
The numerical index in the back of the book lists all parts in numerical sequence and shows the page number, on which they are illustrated. The quantity shown in the tables indicate the number of parts required for one winch.

Note: Unnumbered parts in the illustrations are the same as corresponding parts shown with number. Particular attention should be given to the location of bolts, capscrews, washers, etc., so that they are replaced in the holes from which they were removed.

For Ref. Letters, see Opposite Page	Assembly Name	Location of Parts
A	Gear Shift Assembly	36
B	Brake Assembly	34
C	Brake Shaft Assembly	28
D	Drum Pinion	28
	(For Drum Gear and Drum Assembly)	32
E	Drum Idler Assembly	28
F	Bevel Gear Shaft Assembly	24
G	Reverse Idler Gear Assembly	26
H	Intermediate Shaft Assembly	26
J	Power Take-Off Shaft Assembly	24

POWER TAKE-OFF — TRANSMISSION — BRAKE ASSEMBLY

GENERAL ARRANGEMENT



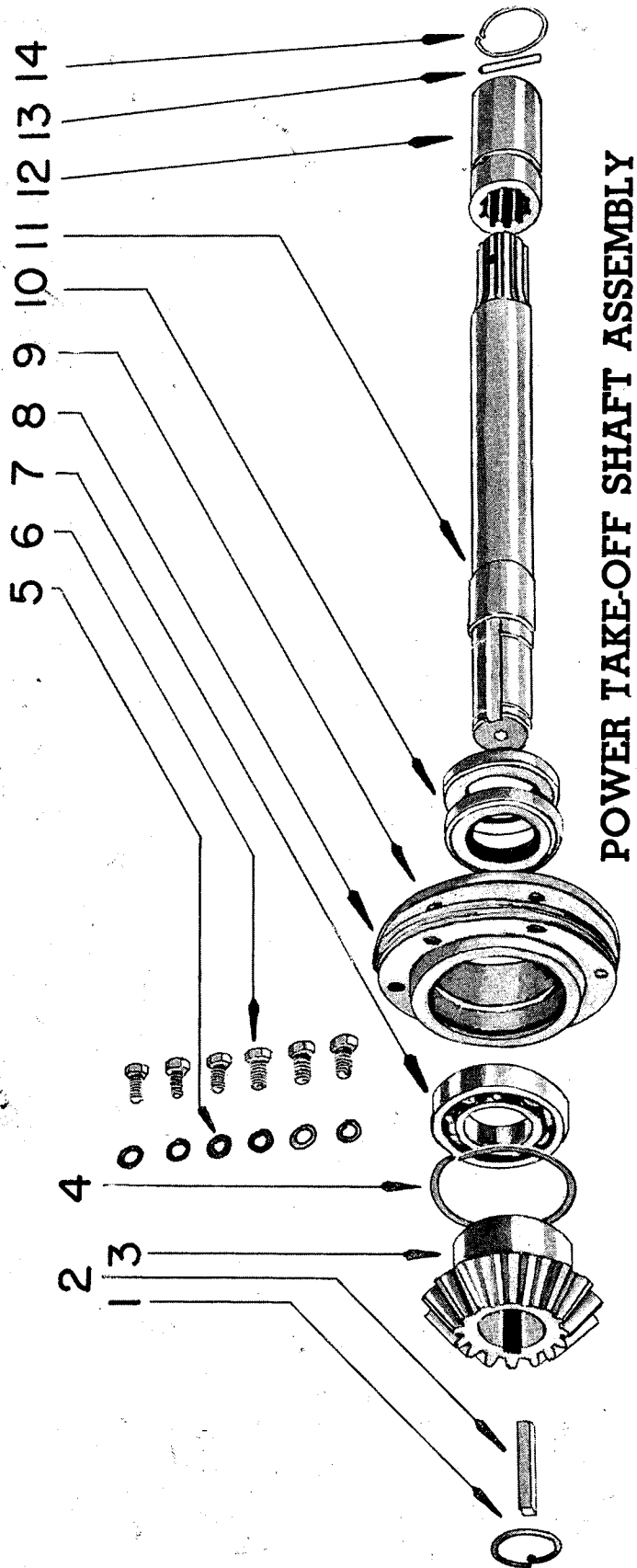
HYSTER COMPANY
PORTLAND, OREGON

GENERAL ARRANGEMENT

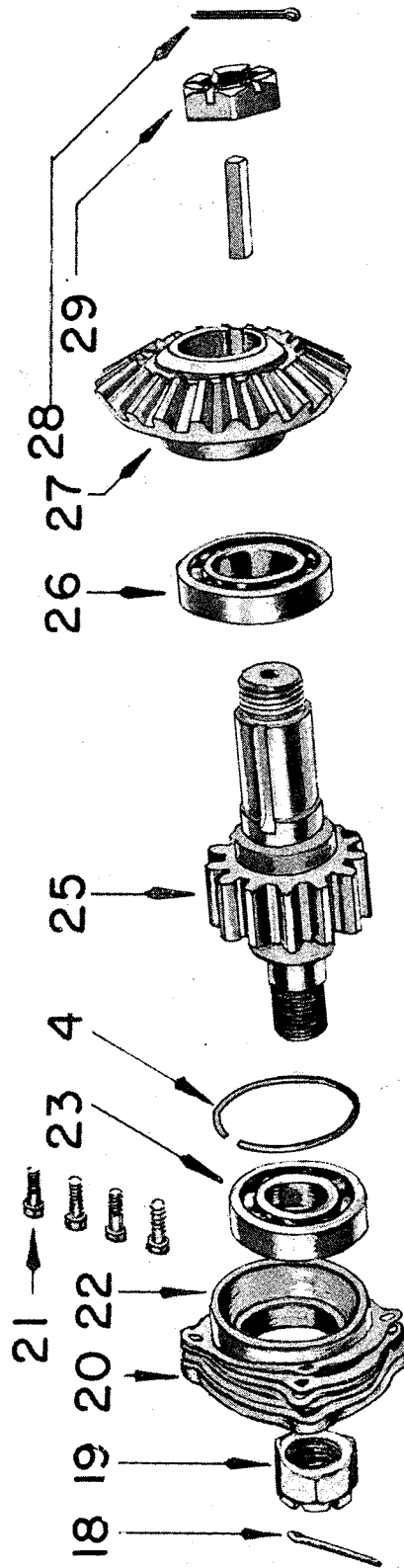
Ref. No.	Hyster Part No.	NAME OF PART
1	Hand Lever (see page 41, Ref. 7)
2	Tie Rod (see page 31)
3	Brake Crank (see page 35)
4	Capscrew (see page 39, Ref. 19)
5	Seat Support (see page 39, Ref. 4)
6	Brake Link (see page 41, Ref. 1)
7	Tie Bracket (see page 39, Ref. 8)
8	Gasket (see page 31)
9	Side Frame (see page 30)
10	Power Take-off Shaft (see page 25)
	{	$\frac{1}{8}$ Close Pipe Nipple (2) } Not illustrated. For oiling
	{	$\frac{1}{8}$ Pipe Coupling } Tractor Transmission

For a complete set of gaskets for the D4 Towing Winch, order Gasket Set No. 92003A.

BEVEL GEAR SHAFT AND POWER TAKE-OFF SHAFT GROUP (TRANSMISSION)



POWER TAKE-OFF SHAFT ASSEMBLY



BEVEL GEAR SHAFT ASSEMBLY

BEVEL GEAR SHAFT AND POWER TAKE-OFF SHAFT GROUP (TRANSMISSION)

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	32846	Snap Ring	1
2	7653	Key	2
3	†32845	Gear—Bevel (15 teeth)	1
4	9109	Snap Ring	2
5	15156	Lockwasher— $\frac{3}{8}$ Std.	6
6	15508	Capscrew— $\frac{3}{8}$ NF x 1	6
7	43208	Bearing	1
8	32843	Shim Set	1
9	32842	Carrier—Bearing	1
10	3362	Oil Seal	2
11	32844B	Shaft—Power Take-off	1
12	6852	Coupling ("Caterpillar" No. 3B-1042)	1
13	9563	Pin ("Caterpillar" No. L-2124)	1
14	9554	Lock Ring ("Caterpillar" No. 3B-1224)	1
18	15237	Cotter— $\frac{5}{32}$ x 2	1
19	2674	Nut—Castellated, $1\frac{1}{4}$ NF	1
20	32851	Shim Set	1
21	31414	Capscrew	4
22	32850	Carrier—Bearing	1
23	43307	Bearing	1
25	{ 32847B	Gear Shaft	1
	{ 9432	Key	1
26	43209	Bearing	1
27	†32848	Gear—Bevel (21 teeth)	1
28	15235	Cotter— $\frac{5}{32}$ x $1\frac{1}{2}$	1
29	32849	Nut—Castellated	1

†Note:

32845 Bevel Pinion

32848 Bevel Gear

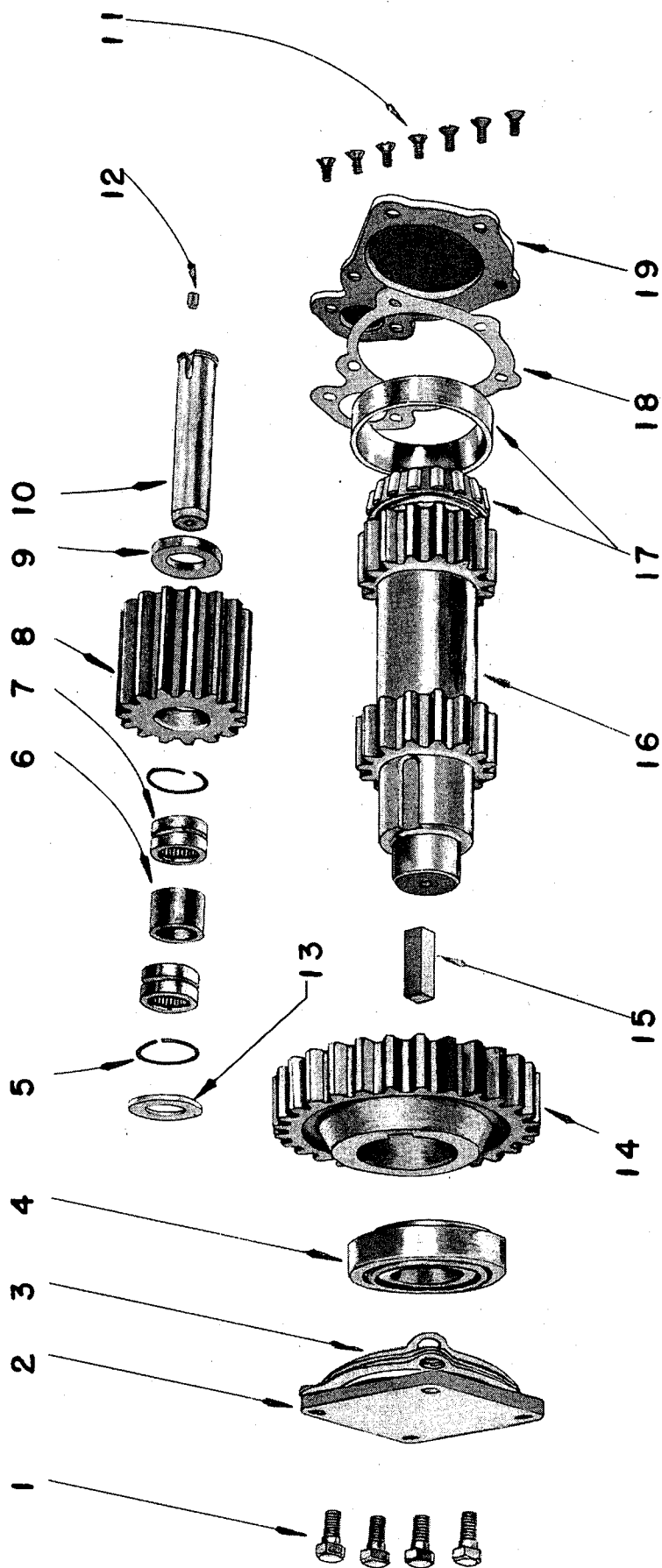
May be replaced in pairs only with:

32845C Bevel Pinion

32848B Bevel Gear

46545 Spacer

INTERMEDIATE SHAFT AND REVERSE IDLER GEAR GROUP (TRANSMISSION)

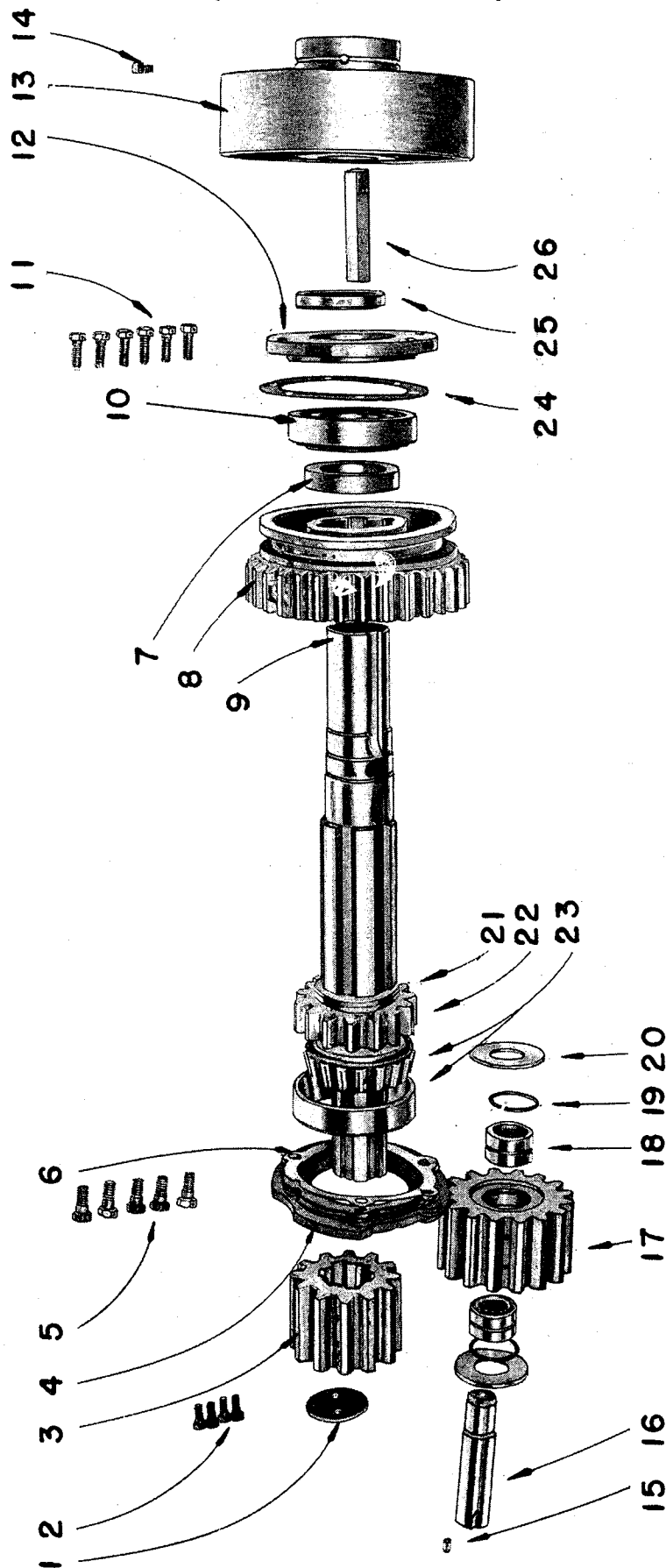


HYSTER COMPANY
PORTLAND, OREGON

INTERMEDIATE SHAFT AND REVERSE IDLER GEAR GROUP (TRANSMISSION)

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	32863	Capscrew	4
2	32861	Retainer—Bearing	1
3	32862	Shim Set	1
4	{ 32855	Roller Bearing Cone	1
	{ 32856	Roller Bearing Cup	1
5	46102	Snap Ring (First used on Serial No. 3775)	2
6	{ 32866B	Spacer (First used on Serial No. 3785)	1
	{ 32866	Spacer (last used on Serial No. 3784)	1
7	30956	Roller Bearing	2
8	{ 32865B	Gear—Reverse (15 teeth) (First used on Ser. No. 3785)	1
	{ 32865	Gear—Reverse (15 teeth) (Last used on Ser. No. 3784)	1
Replace with following parts:			
		1-32865B Idler Pinion	
		1-32866B Spacer	
		2-33990 Snap Rings	
9	32867	Washer	1
10	32864	Shaft	1
11	32687	Capscrew—Flathead	7
12	33100	Pin—Dowel	1
13	33352	Washer (First used on Serial No. 3775)	1
14	32853B	Gear (28 teeth)	1
15	9410	Key	1
16	32852B	Gear Shaft	1
17	{ 32855	Roller Bearing Cone	1
	{ 32858	Roller Bearing Cup	1
18	32860	Gasket	1
19	32859	Cover—Bearing	1

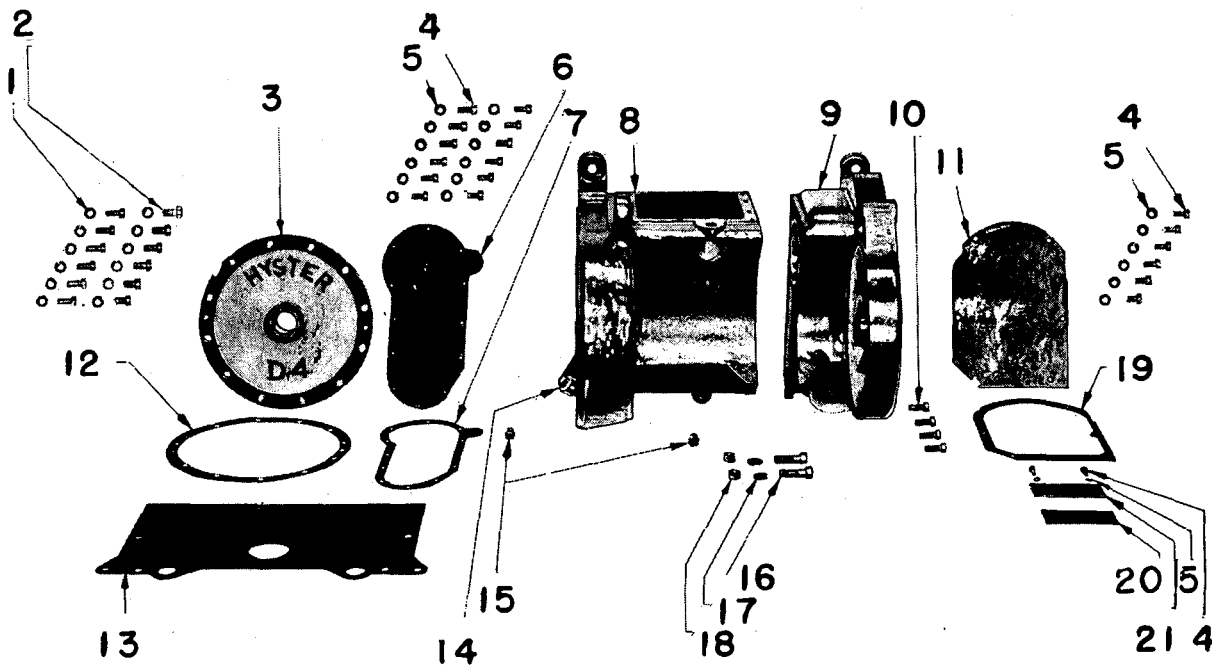
BRAKE SHAFT AND DRUM IDLER GEAR GROUP (TRANSMISSION)



BRAKE SHAFT AND DRUM IDLER GEAR GROUP (TRANSMISSION)

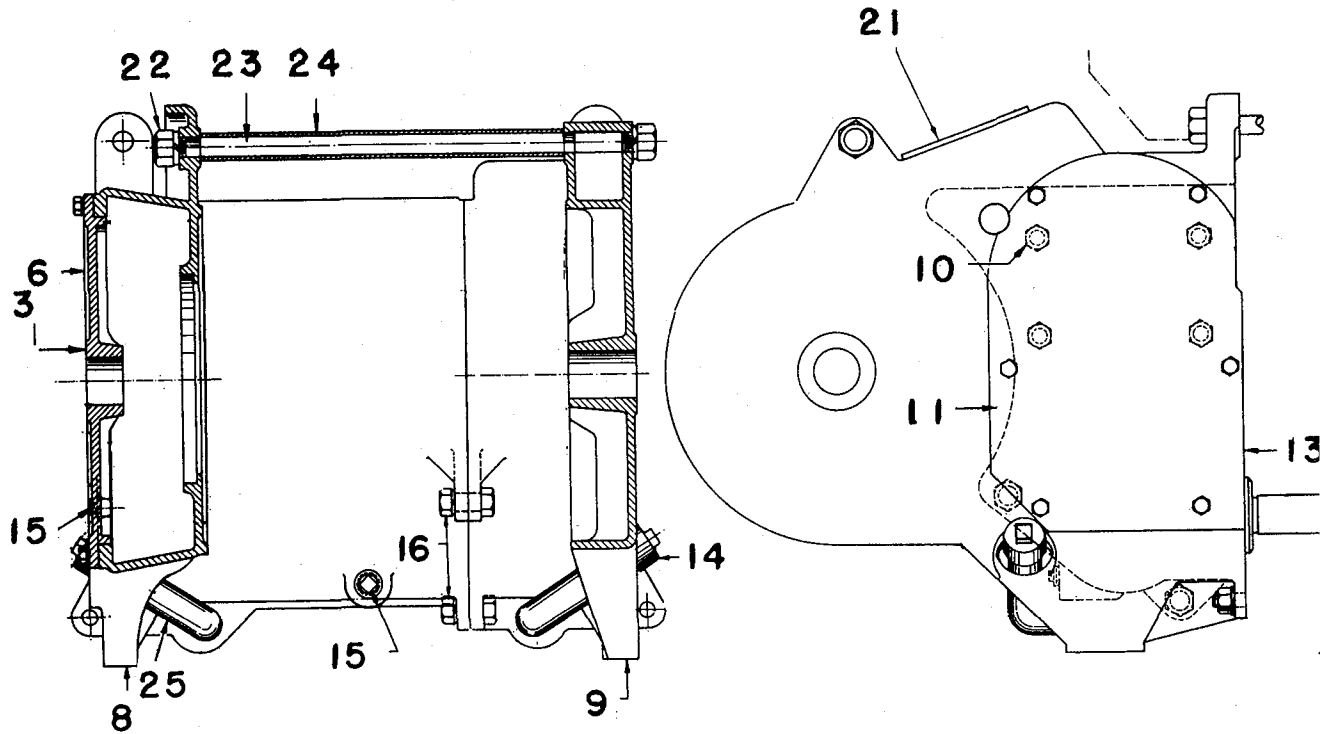
Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	32201	Washer	1
2	{ 798	Capscrew (First used on Serial No. 3775)	2
	{ 30836	Capscrew (Last used on Serial No. 3687)	2
3	32878B	Gear—Drum (12 teeth) (Prior to Serial No. 3775 Include 2 Capscrews No. 798)	1
4	32877	Retainer—Bearing	1
5	32863	Capscrew	5
6	10114B	Shim Set	1
7	32870	Spacer	1
8	32869	Gear—Sliding	1
	{ 32868	Shaft } Last used on Ser. No. 7805. Replace with 32868D	
	{ 32868B	Shaft } Shaft, 41041 Spacer, 32878B Pinion	
		{ First on Serial No. 7806; last on Serial No. 29666	
9	{ 32911B	Shaft } First on Serial No. 29734; last on Serial No. 29737	
		{ Replace with 32868D Shaft and 32878B Pinion	
	{ 32868C	Shaft } Was Optional. Replace with 32868D Shaft and	
		{ 41041 Spacer	
	{ 32868D	Shaft—Pinion (First used on Serial No. 7806)	1
10	{ 30083	Roller Bearing Cone	1
	{ 32872	Roller Bearing Cup	1
11	31414	Capscrew	6
12	32873	Retainer—Bearing	1
13	32876B	Drum—Brake	1
14	33302	Setscrew	1
15	33100	Pin—Dowel	1
16	32879-	Shaft—Idler	1
	{ 32880B	Idler Gear	
		Replace with following parts:	
		1-32880D Idler Gear	{ Used on BW-3525,
		1-32882C Spacer	{ BW-3572, BW-3593 incl.
17		2-33991 Snap Rings	{ BW-3596, BW-3667 incl.
			{ BW-3669, BW-3680 incl.
			{ BW-3682, BW-3687 incl.
	{ 32880C	Idler Gear	BW-3775, BW-3784
		Replace with following parts:	
		1-32880D Idler Gear	{ Used on
		Snap Rings	{ BW-3526, BW-3594
	{ 32880D	Idler Gear	{ BW-3595, BW-3668
			{ BW-3681
			{ BW-3785, BW-32477
			incl.
18	32881B	Needle Bearing	2
19	45642	Snap Ring (First used on Serial No. 3775)	2
20	33350	Washer (First used on Serial No. 3775)	2
21	32912	Bushing	2
22	32913B	Gear—Idler (19 teeth) Optional (41041 Spacer is Std.)	
23	{ 30084	Roller Bearing Cone	1
	{ 30059	Roller Bearing Cup	1
24	32874	Gasket	1
25	32875	Oil Seal	1
26	32416	Key	1

SIDE FRAME GROUP



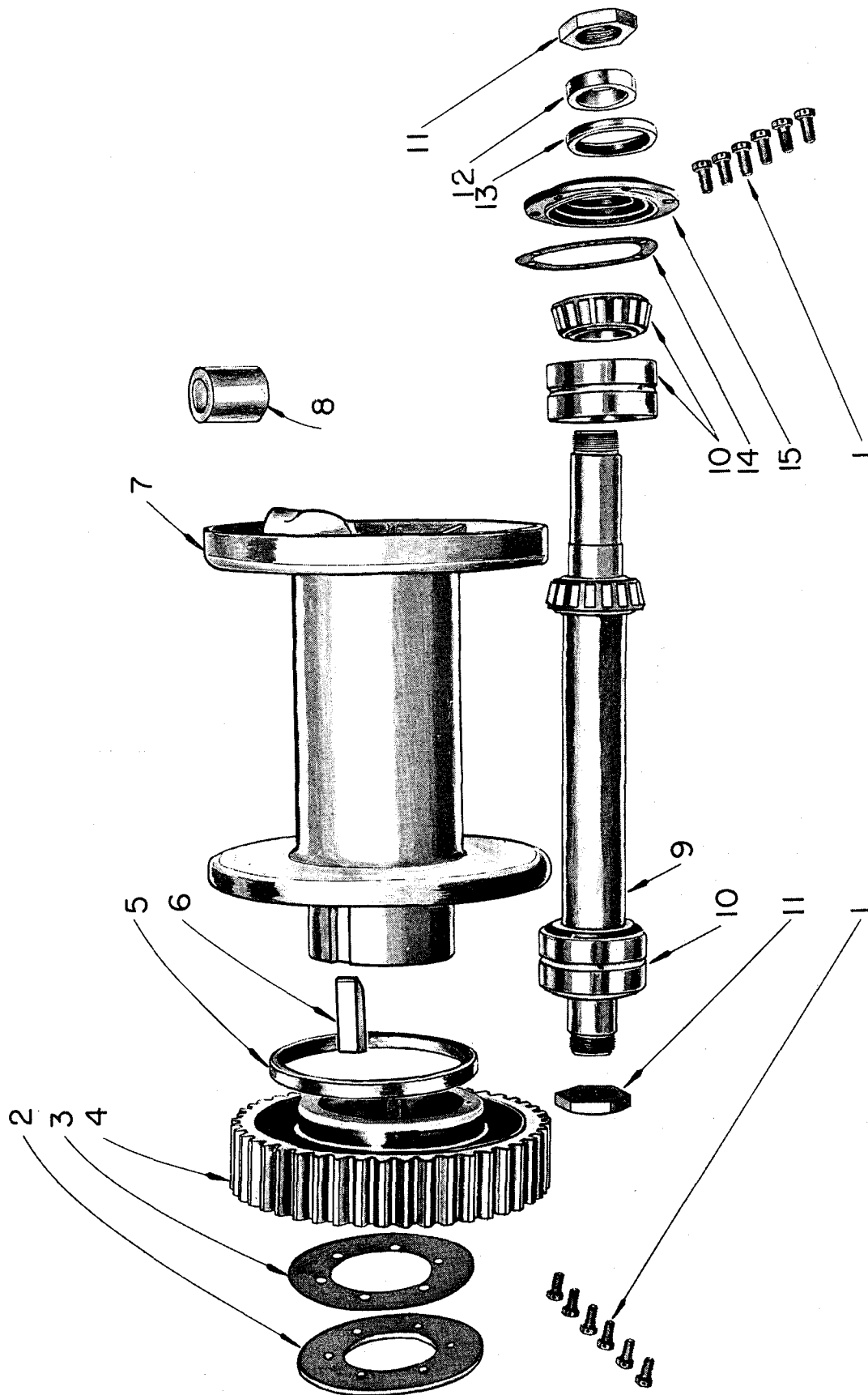
Ref. No.	Hyster Part No.	NAME OF PART	Qty. Req'd.
1	15158	Lockwasher— $\frac{1}{2}$	12
2	15511	Capscrew— $\frac{1}{2}$ NF x 1	12
3	32823	Cover (Drum Gear)	1
4	15513	Capscrew— $\frac{3}{8}$ NF x $\frac{3}{4}$	18
5	15156	Lockwasher— $\frac{3}{8}$	20
6	32825	Cover (Drum Pinion)	1
7	32826	Gasket (Drum Pinion Cover)	1
8	{ 32821C	Frame—L. H. (First used on Serial No. 3775)	1
	{ 32821	Frame—L. H. (Last used on 3687. Replace with 32821C and 33352 Washer	1
9	32833	Frame—R. H.	1
10	9455	Capscrew	1
11	32835	Cover (Brake Compartment)	1
12	32824	Gasket (Drum Gear Cover)	1
13	32841	Gasket (Winch to Tractor)	1

SIDE FRAME GROUP ASSEMBLY



Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
14	33052	Pipe Cap	2
15	15304	Pipe Plug	2
16	15522	Capscrew— $\frac{3}{4}$ NF x 2	2
17	15162	Lockwasher— $\frac{3}{4}$	2
18	15012	Nut— $\frac{3}{4}$ NF	2
19	32836	Gasket (Brake Compartment Cover)	1
20	32840	Gasket (R. H. Frame Top Cover)	1
21	32839	Cover (R. H. Frame)	1
22	{ 15016	Nut—1" NF	2
	{ 15166	Lockwasher—1"	2
23	32837	Tie Rod	1
24	32838	Spacer	1
25	33349	Pipe Elbow (First used on Serial No. 3775)	2
May be used on older units by drilling side frames to 1-11/16" holes and welding pipe in place			

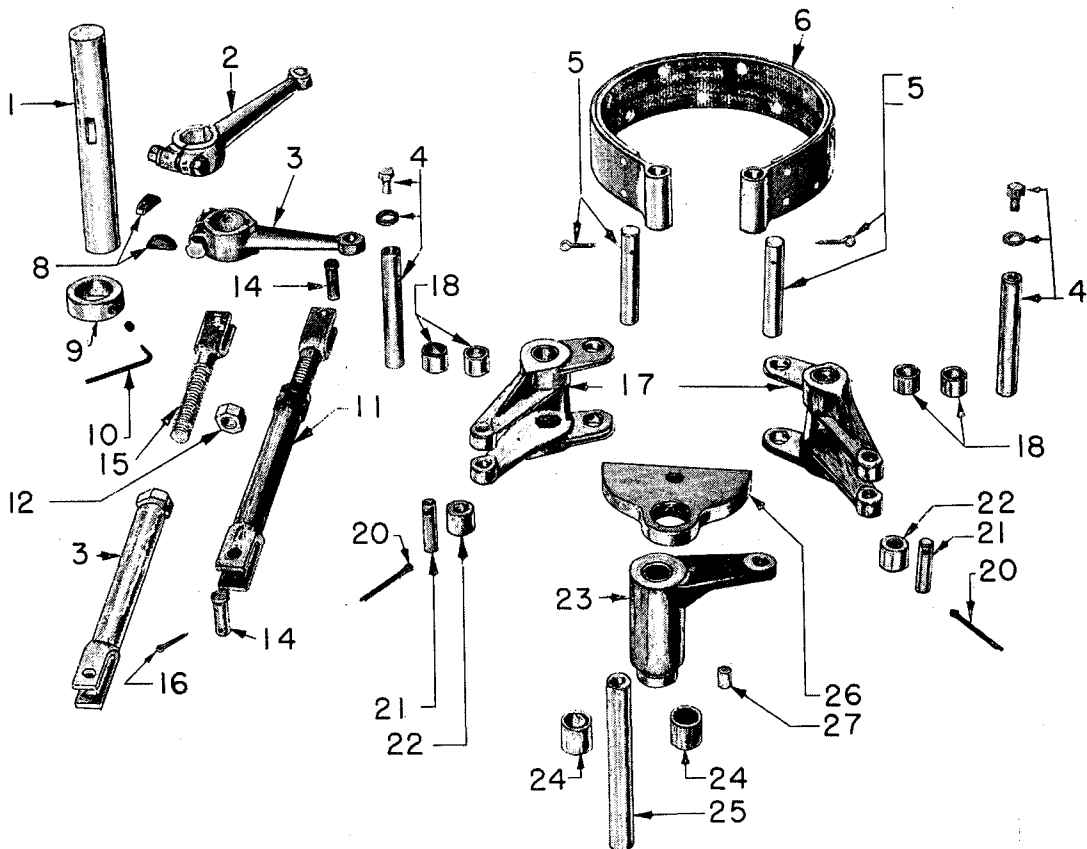
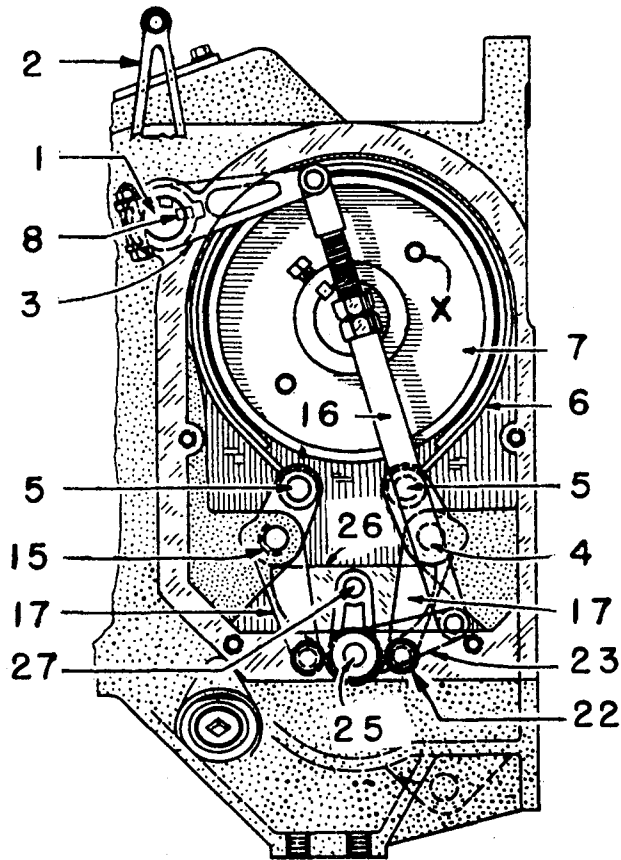
DRUM AND DRUM SHAFT GROUP



DRUM AND DRUM SHAFT GROUP

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	{ 32863	Capscrew—Drilled Head	2
	{ 32863	Lock Wire, 18 ga. x 27"	1
2	32888	Retainer—Bearing	1
3	33307	Gasket	1
4		Gear—Drum (45 teeth)	1
5	32822B	Oil Seal	1
6	32887	Key	1
7	32885	Drum	1
8	{ 8126	Ferrule Plug— $\frac{5}{8}$ Cable	1
	{ 7622	Ferrule Plug— $\frac{3}{4}$ Cable	1
9	32883	Shaft—Drum	1
10	32884	Roller Bearing	2
11	59058	Nut	2
12	32889	Spacer	1
13	8238	Oil Seal	1
14	32891	Gasket	1
15	32890	Retainer—Bearing	1

BRAKE ARRANGEMENT GROUP

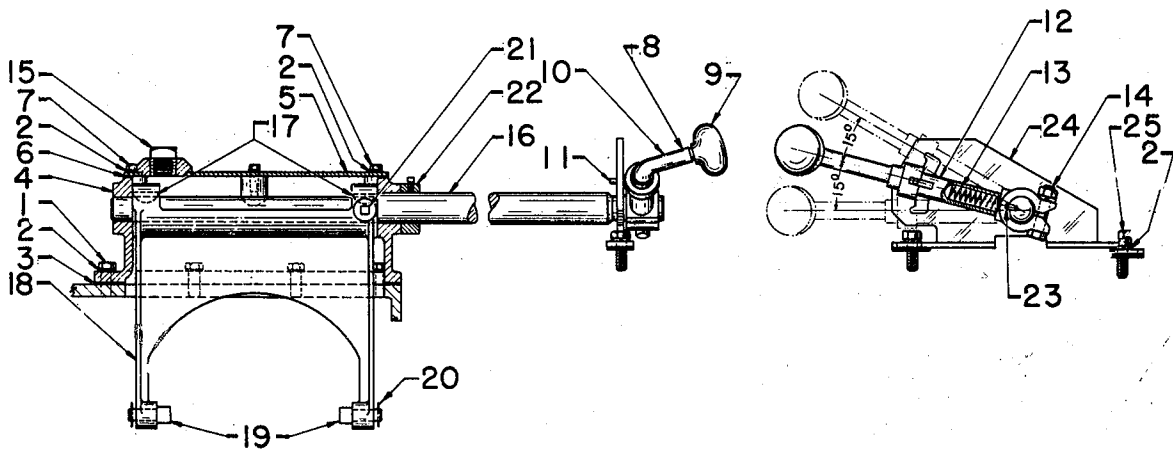
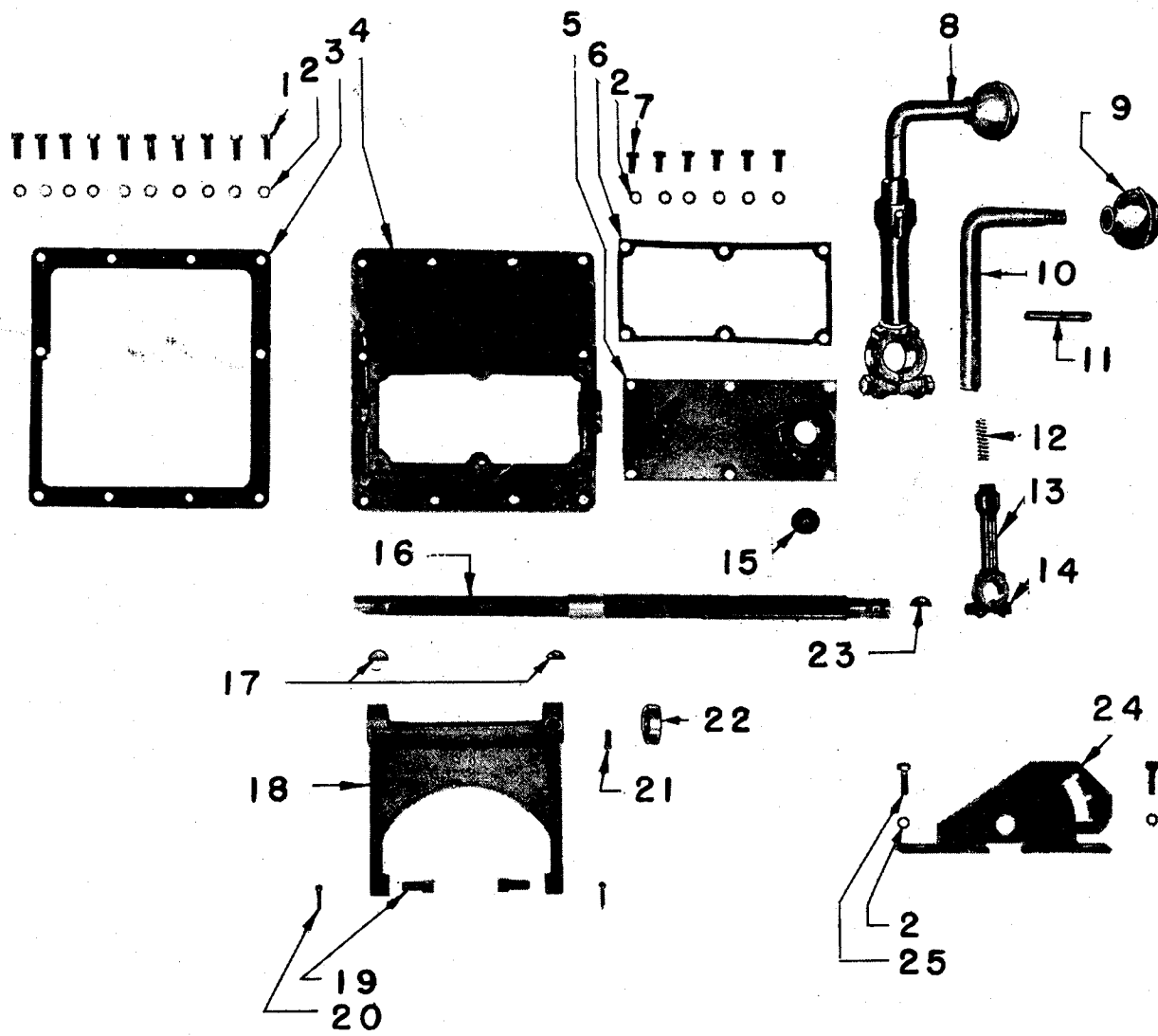


BRAKE ARRANGEMENT GROUP

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	32902	Shaft	1
2	32903A	Crank	1
	*15510	Capscrew— $\frac{1}{2}$ NF x $2\frac{1}{4}$	1
	*15008	Nut— $\frac{1}{2}$ NF	1
	*15158	Lockwasher— $\frac{1}{2}$	1
3	33074A	Crank	1
	*15510	Capscrew— $\frac{1}{2}$ NF x $2\frac{1}{4}$	1
	*15008	Nut— $\frac{1}{2}$ NF	1
	*15158	Lockwasher— $\frac{1}{2}$	1
4	32896	Shaft	2
	32608	Capscrew	2
	15176	Washer	2
5	32894	Pin	2
	15227	Cotter— $\frac{1}{8}$ x 2	2
6	32892AB	Brake Band complete	1
	*32893A	Lining and Rivet Set	1
7	.....	Drum—Brake (see page 29, Ref. 13)	
8	128	Key	2
9	9490	Collar	1
10	38976	Wrench (for $\frac{3}{8}$ " Hollowhead Setscrew)	1
11	32901A	Link Assembly	1
12	*15012	Nut— $\frac{3}{4}$ NF	1
13	*41039A	Link	1
14	* 153	Rod End Pin	2
15	*41037A	Rod End	1
16	*15300	Cotter— $\frac{1}{8}$ x $\frac{7}{8}$	2
17	32895A	Crank	2
18	40577	Bushing	4
20	15225	Cotter— $\frac{1}{8}$ x $1\frac{1}{2}$	2
21	32230	Pin	2
22	32229	Roller	2
23	32897A	Crank	1
24	32232	Bushing	2
25	32900	Shaft	1
26	32899	Cam	1
27	32898	Dowel	1

*Included in assembly under which listed.

TOP COVER AND GEAR SHIFTER GROUP — TRANSMISSION



TRANSMISSION TOP AND GEAR SHIFTER GROUP

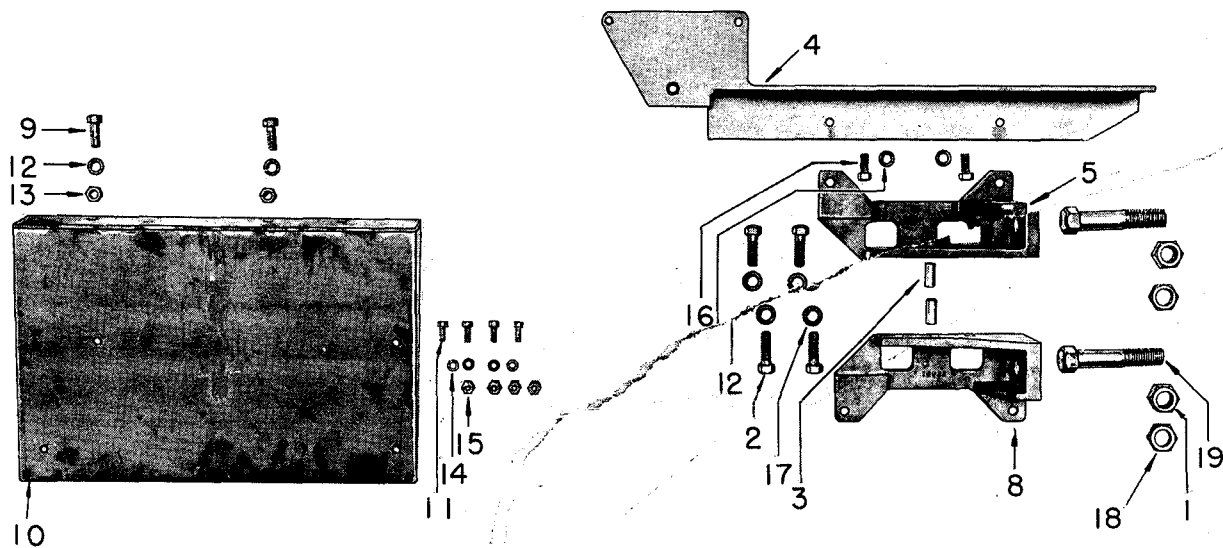
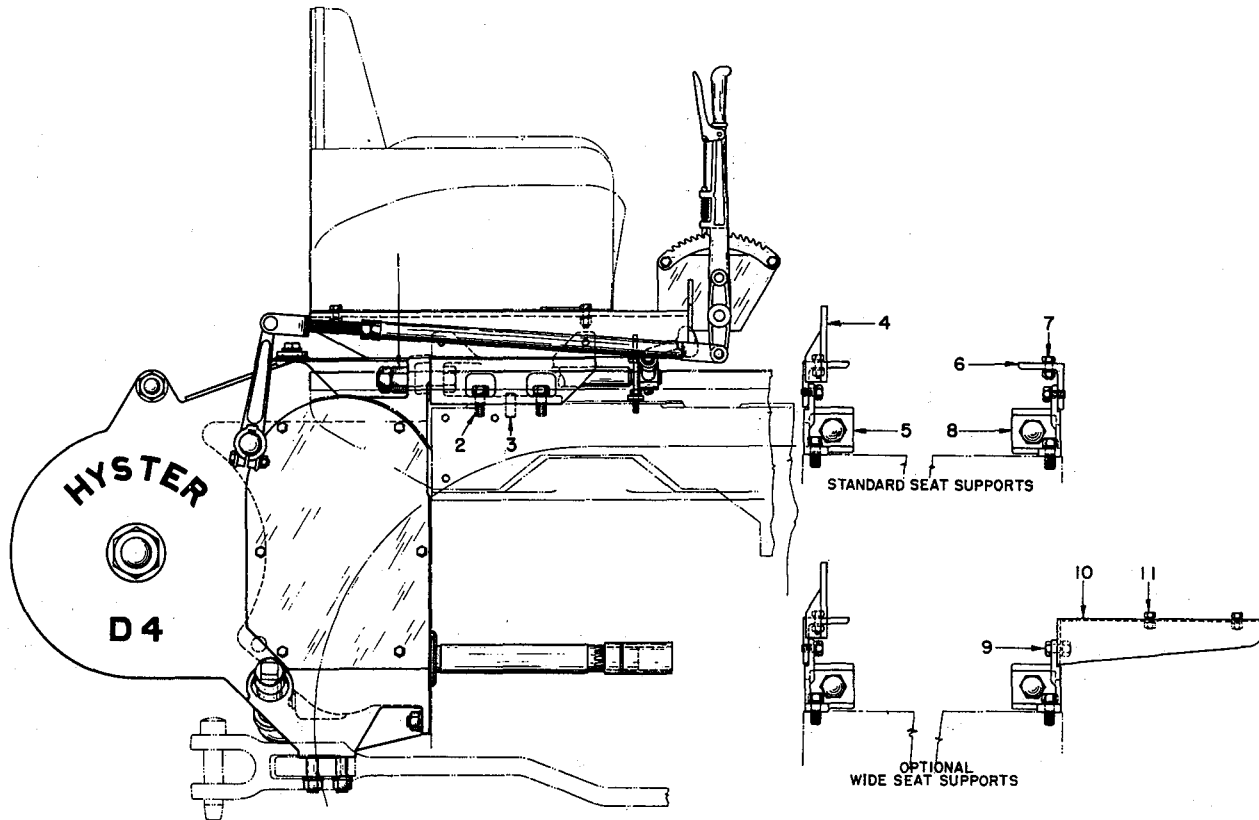
Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	15508	Capscrew— $\frac{3}{8}$ NF x 1	10
2	15156	Lockwasher— $\frac{3}{8}$	18
3	32828	Gasket (Transmission Case Cover)	1
4	32827	Cover (Transmission Case)	1
5	32829AB	Cover (Shifter Opening)	1
6	32830	Gasket (Shifter Opening)	1
7	15525	Capscrew— $\frac{3}{8}$ NC x $\frac{3}{4}$	6
8	32905AC	Lever Assembly—Shifter	1
9	* 809	Knob	1
10	*38465B	Lever (First used on Serial No. 7806)	1
11	*36407	Pin	1
12	* 5782	Spring	1
13	*32353A	Socket	1
14	*15528	Capscrew— $\frac{3}{8}$ NF x 2	1
	*15006	Nut— $\frac{3}{8}$ NF	1
	*15156	Lockwasher— $\frac{3}{8}$	1
22	9444	Collar	1
21	*33302	Setscrew	1
24	32907B	Bracket—Shifter (First used on Serial No. 7806)	1
25	15529	Capscrew— $\frac{3}{8}$ NC x 1	2

**Included in assembly under which listed.*

BRACKET ATTACHMENT GROUP

For Tractors with Serial No. 7J-9215 or 6G-2076 and up

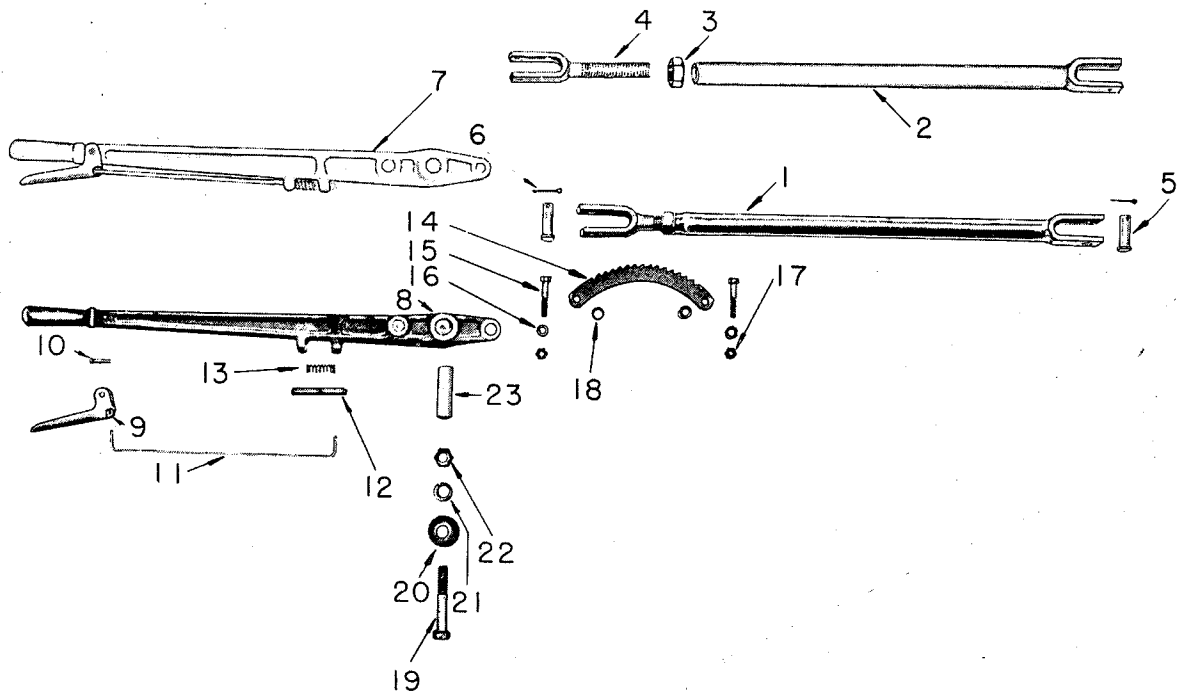
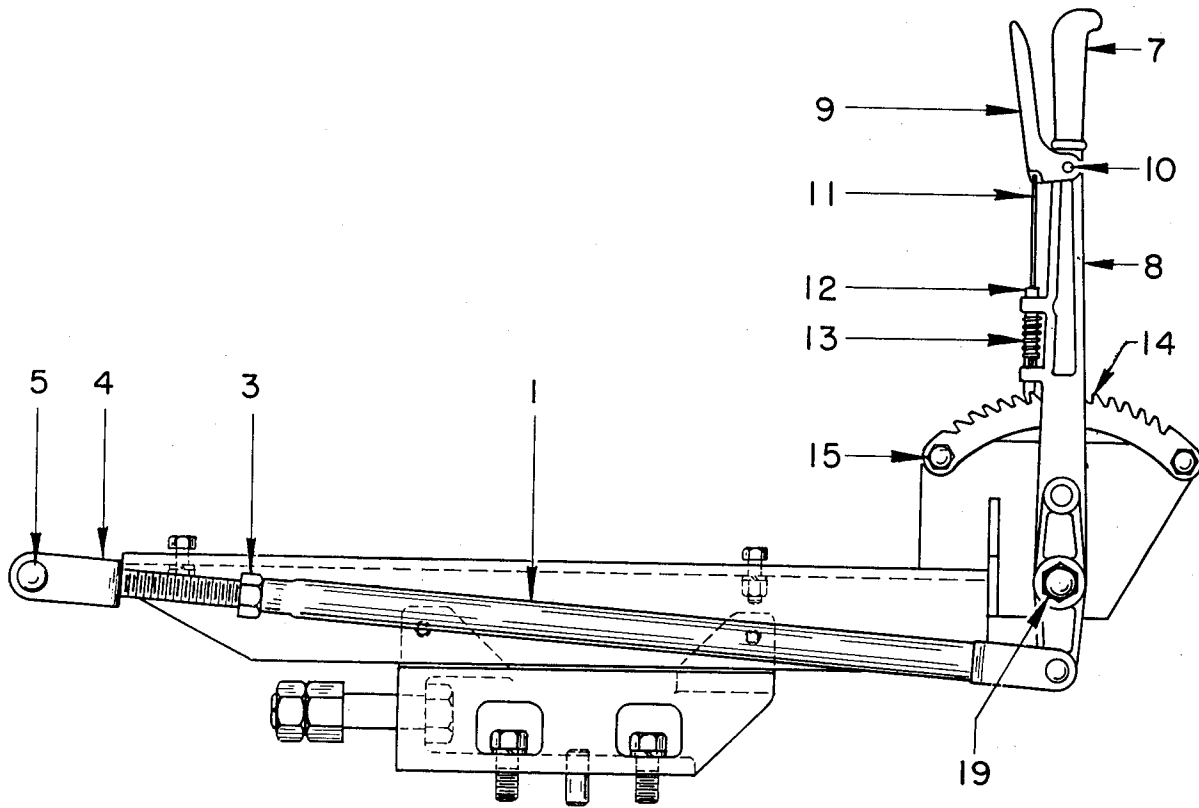
(For Attachment Parts for Older Tractors, see page 42)



BRACKET ATTACHMENT GROUP

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	15016	Nut—Hex, 1" NF	2
2	15531	Capscrew— $\frac{5}{8}$ NC x $1\frac{1}{4}$	4
3	38454	Pin—Dowel	2
4	38452	Bracket—Seat Support, R. H.	1
5	38450	Bracket—Tie, R. H.	1
6	38453	Bracket—Seat Support, L. H.	1
7	15532	Capscrew— $\frac{3}{8}$ NF x $1\frac{1}{4}$	4
8	38451	Bracket—Tie, L. H.	1
9	15514	Capscrew— $\frac{1}{2}$ NF x $1\frac{1}{4}$	2
10	38471	Bracket—Seat Support (Optional)	1
11	15513	Capscrew— $\frac{3}{8}$ NF x $\frac{3}{4}$	4
12	15158	Lockwasher— $\frac{1}{2}$	6
13	15008	Nut—Hex, $\frac{1}{2}$ NF	2
14	15156	Lockwasher— $\frac{3}{8}$	4
15	15006	Nut—Hex, $\frac{3}{8}$ NF	4
16	15511	Capscrew— $\frac{1}{2}$ NF x 1	4
17	15160	Lockwasher— $\frac{5}{8}$	4
18	15036	Nut—Jam, 1" NF	2
19	15530	Capscrew—1" NF x 4	2

BRAKE LEVER AND LINK GROUP



BRAKE LEVER AND LINK GROUP

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	32904A	Link Assembly	1
2	*41043A	Rod—Link	1
3	*15012	Nut—Hex, $\frac{3}{4}$ NF	1
4	41045A	Rod End	1
5	* 159	Pin—Rod End	2
6	*15223	Cotter— $\frac{1}{8}$ x 1	2
7	38022A	Hand Lever Assembly	1
8	*38025	Hand Lever	1
9	*59486	Handle	1
10	*15825	Rivet— $\frac{1}{4}$ x 1	1
11	*38023	Rod—Pawl	1
12	* 6823	Pawl	1
13	*59487	Spring	1
14	6818C	Quadrant	1
15	15527	Capscrew— $\frac{3}{8}$ NF x $1\frac{3}{4}$	2
16	15156	Lockwasher— $\frac{3}{8}$	2
17	15006	Nut— $\frac{3}{8}$ NF	2
18	32243	Spacer	2
19	15526	Capscrew— $\frac{5}{8}$ NF x $3\frac{1}{2}$	1
20	15180	Washer— $\frac{5}{8}$	2
22	15030	Nut—Jam, $\frac{5}{8}$ NF	1

**Included in assembly under which listed.*

SECTION E

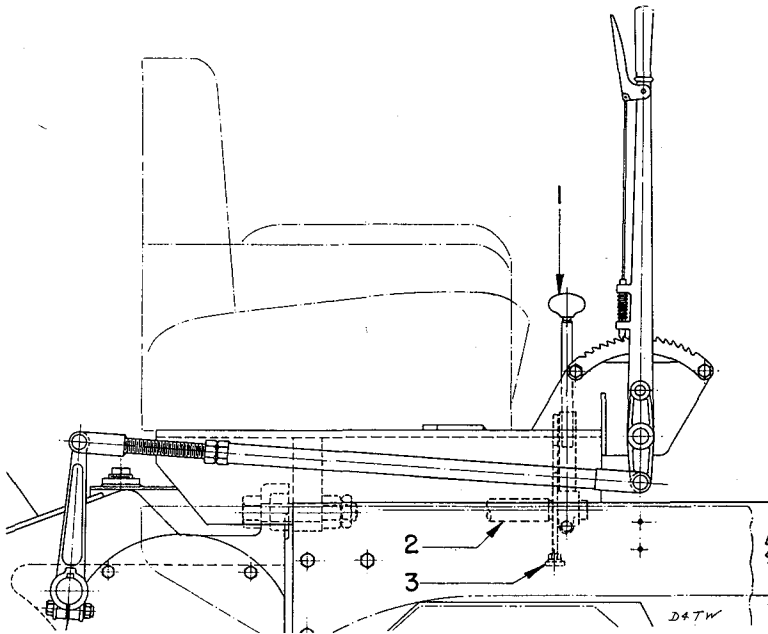
Optional Parts and Parts Used on Older Winches and Tractors

LETOURNEAU POWER CONTROL ADAPTATION

Winch Transmission Top Cover 32827 and 32829AB with Gaskets and Fastenings are not used when Hyster Winches are Equipped with Power Control Unit.

TRANSMISSION VERTICAL SHIFTER LEVER ASSEMBLY

(Last used on Winch Serial No. BW-7805)



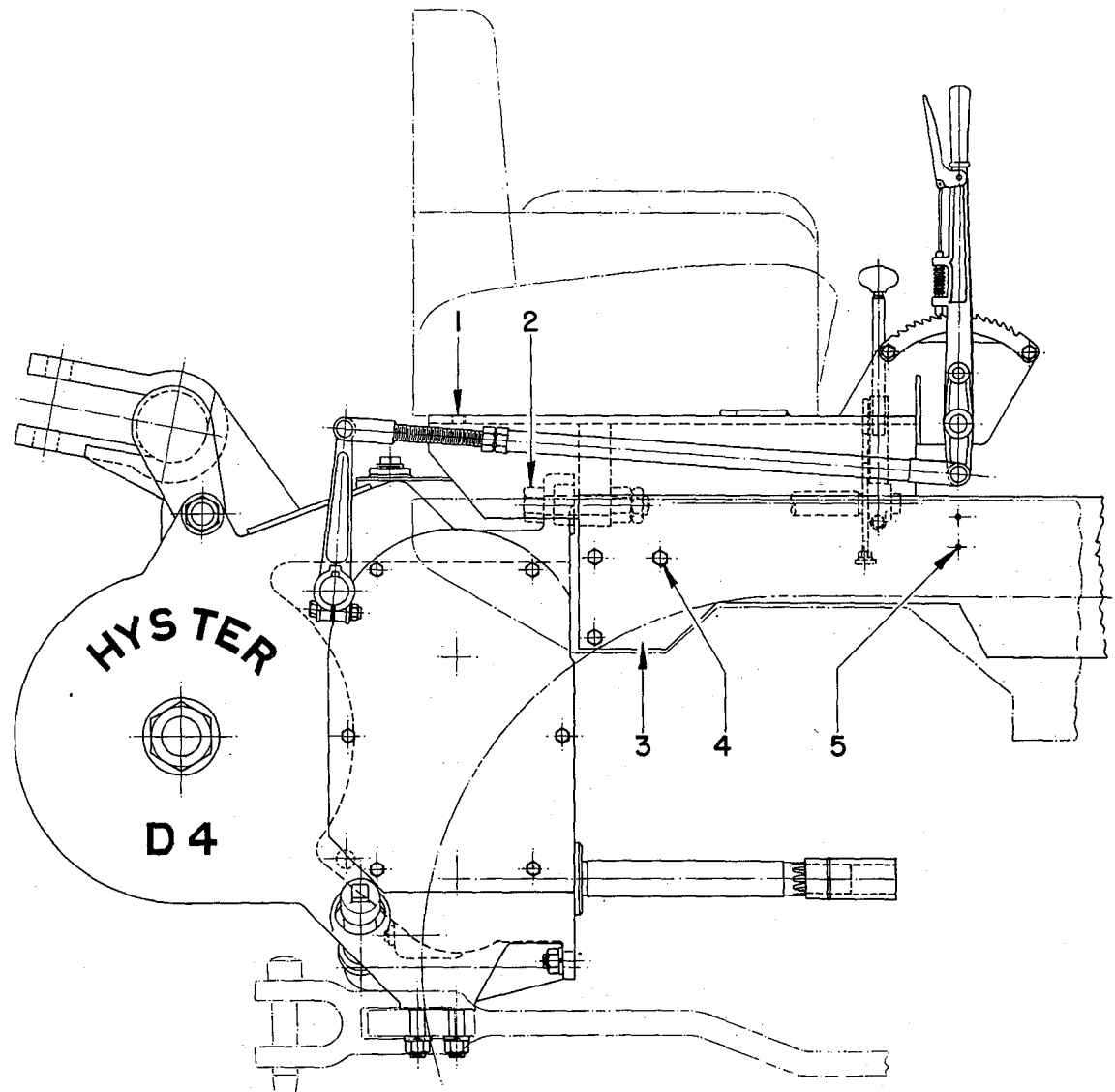
Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	32905A	Shifter Lever Assembly	Last used on Winch Serial No. BW-7805
	*32906	Lever Stem	
	* 809	Handle Ball	
	*36407	Pin	
	* 5782	Spring	
	*32353A	Lever Socket	
	*15528	Capscrew— $\frac{3}{8}$ NF x 2	
	*15006	Nut— $\frac{3}{8}$ NF	
2	*15156	Lockwasher— $\frac{3}{8}$	
	32831	Shifter Shaft	
3	32907	Bracket	
	25062	Capscrew— $\frac{3}{8}$ NC x $1\frac{1}{4}$ (2)	
	15156	Lockwasher— $\frac{3}{8}$ (2)	

Above shifter mechanism may be replaced with new horizontal shifter assembly replacement set 59812A. (Winches prior to BW-7806)

*Included in assembly under which listed.

TIE PLATE ATTACHMENT GROUP

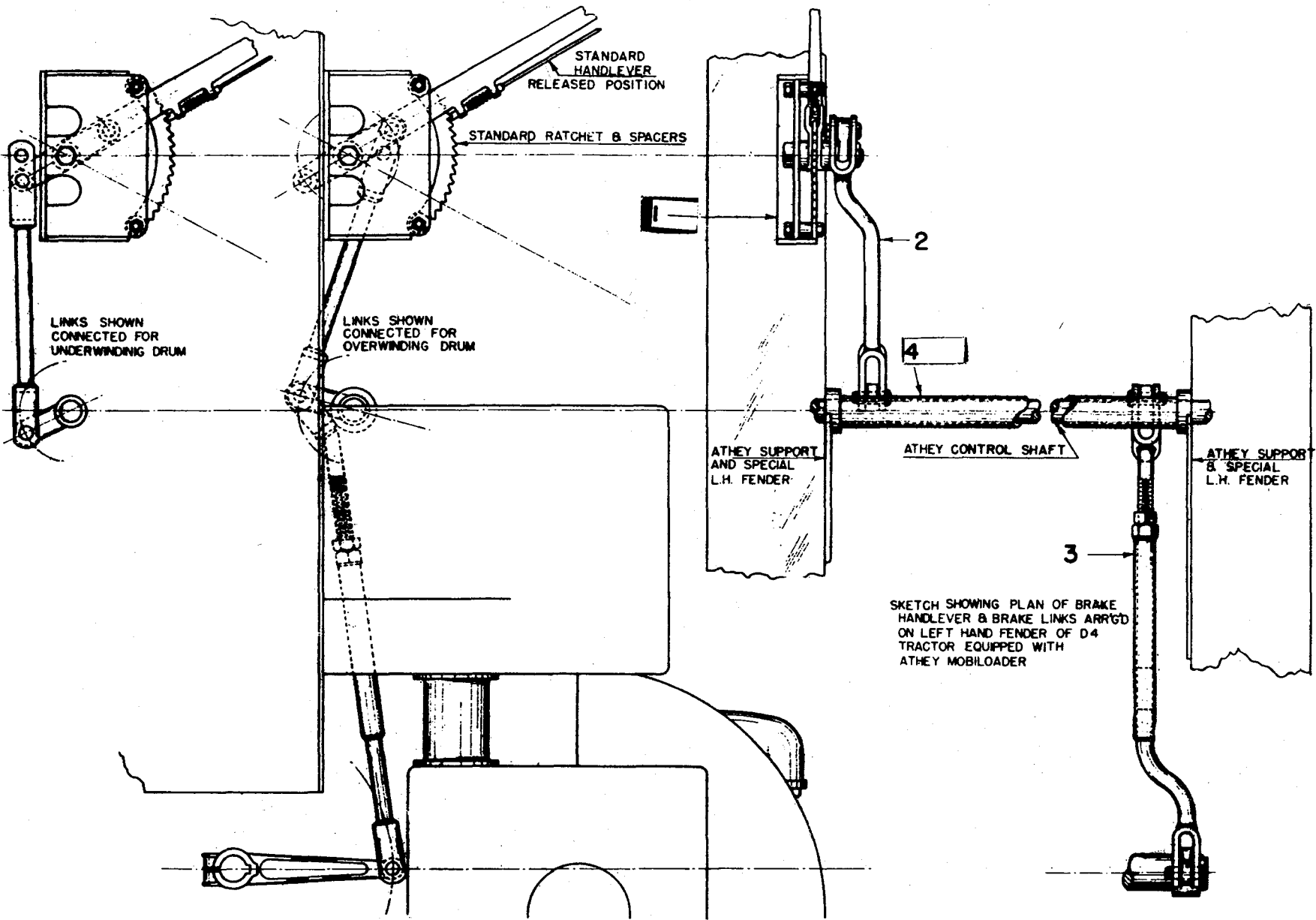
(Used on Installations of Winch to older tractors up to and including Tractor Serial No. 7J-9214 and 6G-2075.)



Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	15508	Capscrew— $\frac{3}{8}$ NF x 1	1
	15006	Nut— $\frac{3}{8}$ NF	1
	15156	Lockwasher— $\frac{3}{8}$	18
2	15548	Capscrew—1" NF x 5	18
	15015	Nut—1" NF	4
	15036	Jam Nut—1" NF	4
3	32908	Tie Plate—R. H.	For use with tractors
	32909	Tie Plate—L. H.	with Serial Nos. prior
4	15547	Capscrew— $\frac{1}{2}$ NC x $1\frac{1}{2}$	to 7J9215 or 6G2076
	15158	Lockwasher— $\frac{1}{2}$	2
	15549	Capscrew— $\frac{1}{4}$ NF x $\frac{7}{8}$	2
5	15004	Nut— $\frac{1}{4}$ NF	4
	15154	Lockwasher— $\frac{1}{4}$	4

OPTIONAL L.H. BRAKE HANDLING GEAR GROUP

For Left-Hand Mounting — When mounted in conjunction with
Athey W-4 Mobiloader.



HYSTER COMPANY
PORTLAND, OREGON

OPTIONAL L.H. BRAKE HANDLING GEAR GROUP

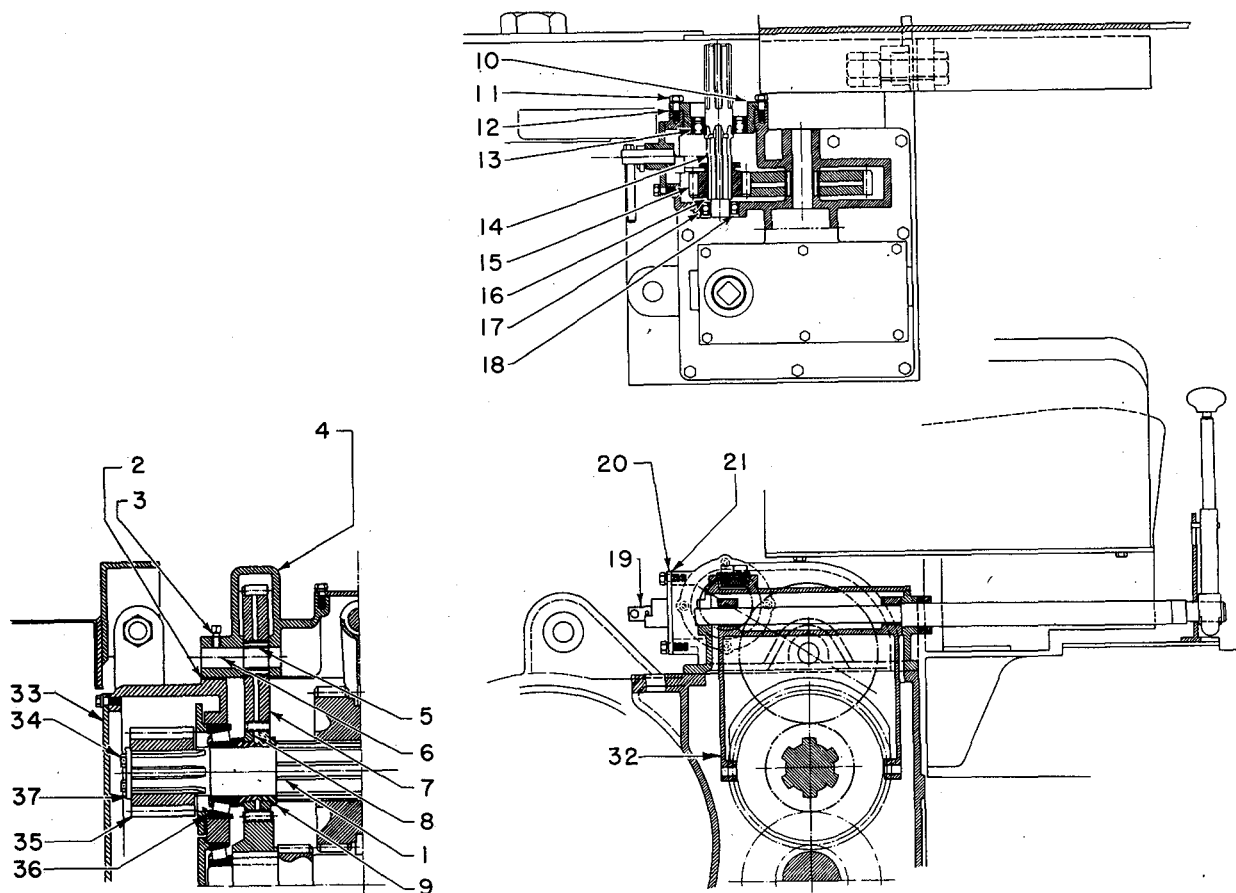
For Left-Hand Mounting — When mounted in conjunction with
Athey W-4 Mobiloader.

The "Hyster" D4 Towing Winch, when mounted, normally has its handling gear on the right-hand tractor fender. If the tractor is to carry an Athey Mobiloader as well as a towing winch, then special brake handling gear for the left-hand fender is needed.

A quadrant bracket (280) mounts on the Athey support and "Caterpillar" left-hand fender. The ratchet bar and the hand lever assembly are carried on this bracket. Link (281) connects with hand lever and cross shaft (282). The cross shaft (282) is hollow and turns on Athey's control shaft. Brake link assembly (283) connects between the cross shaft and the brake crank on the winch.

Ref. No.	Hyster Part No.	Name of Part	
1	37544	Bracket—Quadrant	1
	15514	Capscrew— $\frac{1}{2}$ NF x $1\frac{1}{4}$	2
	15008	Nut— $\frac{1}{2}$ NF	2
	15158	Lockwasher— $\frac{1}{2}$	2
2	37542A	Link	1
	159	Pin—Rod End	2
	15223	Cotter— $\frac{1}{8}$ x 1	2
3	37541A	Link Assembly—Brake	1
	159	Pin—Rod End	2
	15223	Cotter— $\frac{1}{8}$ x 1	2
4	37543	Shaft—Cross	1
	38024	Bracket—Support	Bolted to Athey Member as 1 shown on drawing MLX-G-112 .. 4 in file. Not illustrated 4
	38026	Shims	
	38027	Shims	

INSTRUCTIONS FOR MOUNTING PUMP DRIVE ADAPTER UNIT ON D4 TOWING WINCH



INSTRUCTIONS FOR MOUNTING PUMP DRIVE ADAPTER UNIT ON D4 TOWING WINCH

For Tractors with Fender-mounted Fuel Tank

Refer to the drawings on the opposite page.

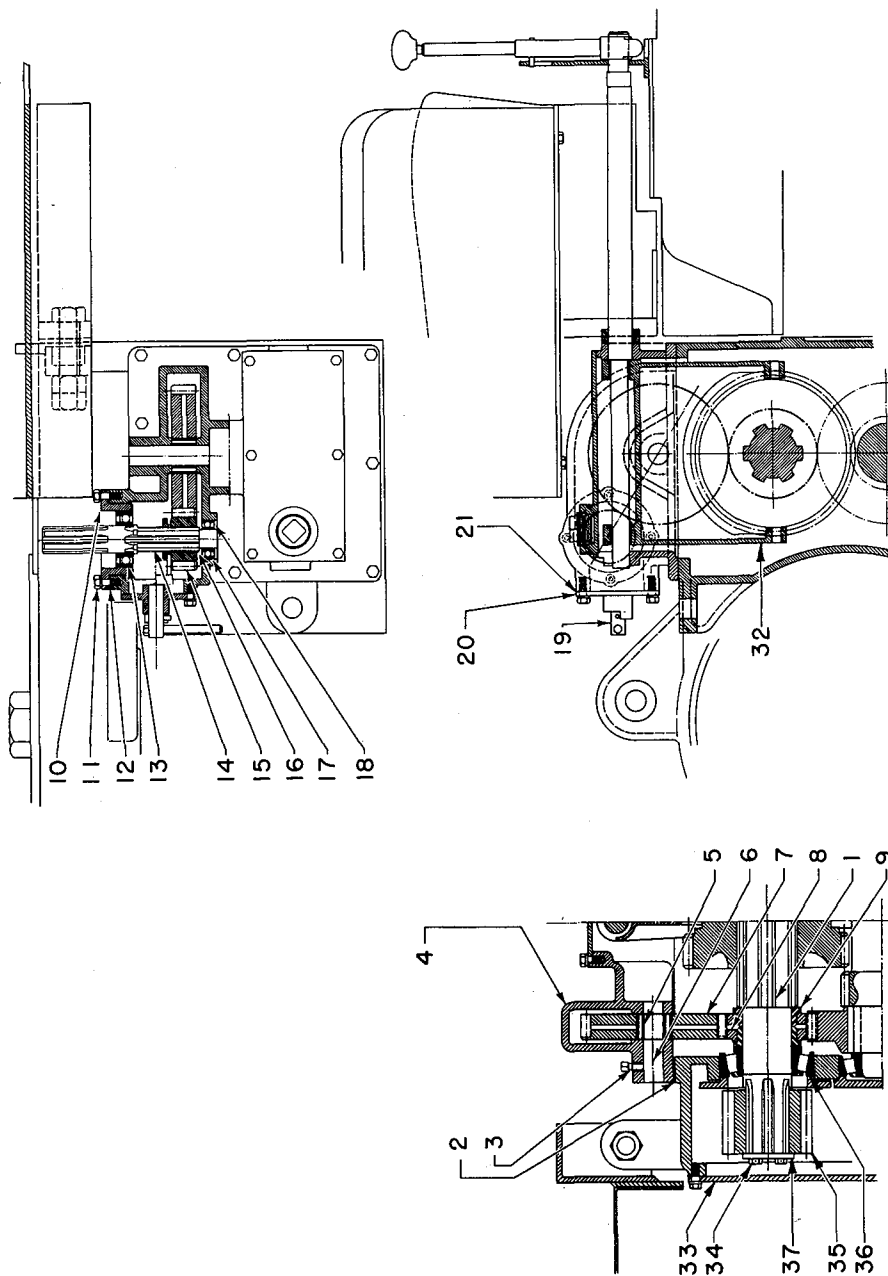
1. Remove "Caterpillar" seat.
2. Disconnect shifter shaft from shifter lever and bracket.
3. Remove transmission top cover and check to see if winch is equipped with idler gear (8). If this gear *is* in place, proceed according to Instruction 5. If this gear is *not* in place, proceed as follows:
4. Remove side cover (33), capscrews (34), washer (37), drum pinion (35) and bearing (36). Remove spacer in back of bearing (36) and discard.
5. Install idler gear (8), with bushing (9), on drum pinion shaft (1) where spacer has been removed. Re-install bearing (36), drum pinion (35), washer (37), capscrews (34), and side cover (33).
6. Disconnect shifter fork (32) and remove shifter shaft from transmission top cover. Discard transmission top cover after first removing hand hole cover.
7. Hold shifter fork (32) in place in adapter housing (4) and install shifter shaft.
8. Place housing (4) with gaskets (2) on top of winch transmission. Place capscrews, without lockwashers, in holes and tighten.

CAUTION: The backlash (clearance between teeth in mesh) between the gears (7) and (8) is determined by the thickness of the above gaskets. This adjustment is very important. If no backlash is found, damage may result if unit is operated in this condition. The backlash, or clearance between teeth, should be about .010" to .015" on the pitch line. Too close an adjustment will cause the gears to run noisely. The gear (7) may be rocked back and forth sharply with some suitable bar or screw driver through top hand hole, and the correct backlash is that which is barely perceptible to the feel of the hand.

9. If the gears need readjustment, remove capscrews and lift adapter unit free of winch. Either remove or add another gasket (2) to obtain the proper backlash. Test again with bar or screwdriver, as directed above. After the proper adjustment is obtained, tighten capscrews with lockwashers.
10. Install hand hole cover (29).
11. Connect shifter shaft to the shifter lever.
12. Reinstall seat removed in Instruction 1.

PUMP DRIVE ADAPTER ASSEMBLY FOR D4 TOWING WINCH

For LaPlant Choate or Kay-Brunner Pump



PUMP DRIVE ADAPTER ASSEMBLY NO. 35204AD
(LaPlant Choate Pump)
FOR D4 TOWING WINCH S. N. 7806 & Up

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	.....	Shaft (Winch Transmission) (See Ref. 9, page 29) ...	
2	32828	Gasket	1
3	16205	Setscrew— $\frac{3}{8}$ NC x $\frac{3}{4}$	1
4	32914	Housing—Pump Drive	1
5	32917	Bearing	1
6	32916	Pin Shaft	1
7	32915	Gear—Idler (28 teeth)	1
8	32913	Gear—Idler (19 teeth)	1
9	32912	Bushing	2
10	32920	Carrier—Bearing	1
11	{ 15529	Capscrew— $\frac{3}{8}$ NC x 1	4
	{ 15156	Lockwasher— $\frac{3}{8}$	4
12	32921	Gasket	1
13	{ 32615	Bearing	1
	{ 31868	Snap Ring	1
14	32918B	Shaft—Drive	1
15	32919	Gear—Sliding	1
16	32623	Spacer	1
17	32614	Bearing	1
18	32622	Snap Ring	1
	{ 32923A	Handlever—Shifter	1
19	{ *46098	Handle	1
	{ *15004	Nut—Hex, $\frac{1}{4}$ NF	1
	{ 32922	Hub—Shifter	1
20	{ 15529	Capscrew— $\frac{3}{8}$ NC x 1	3
	{ 15156	Lockwasher— $\frac{3}{8}$	3
21	33306	Gasket	1
32		} Numbers 32 and up are for instructions only. (For part numbers see page 29)	

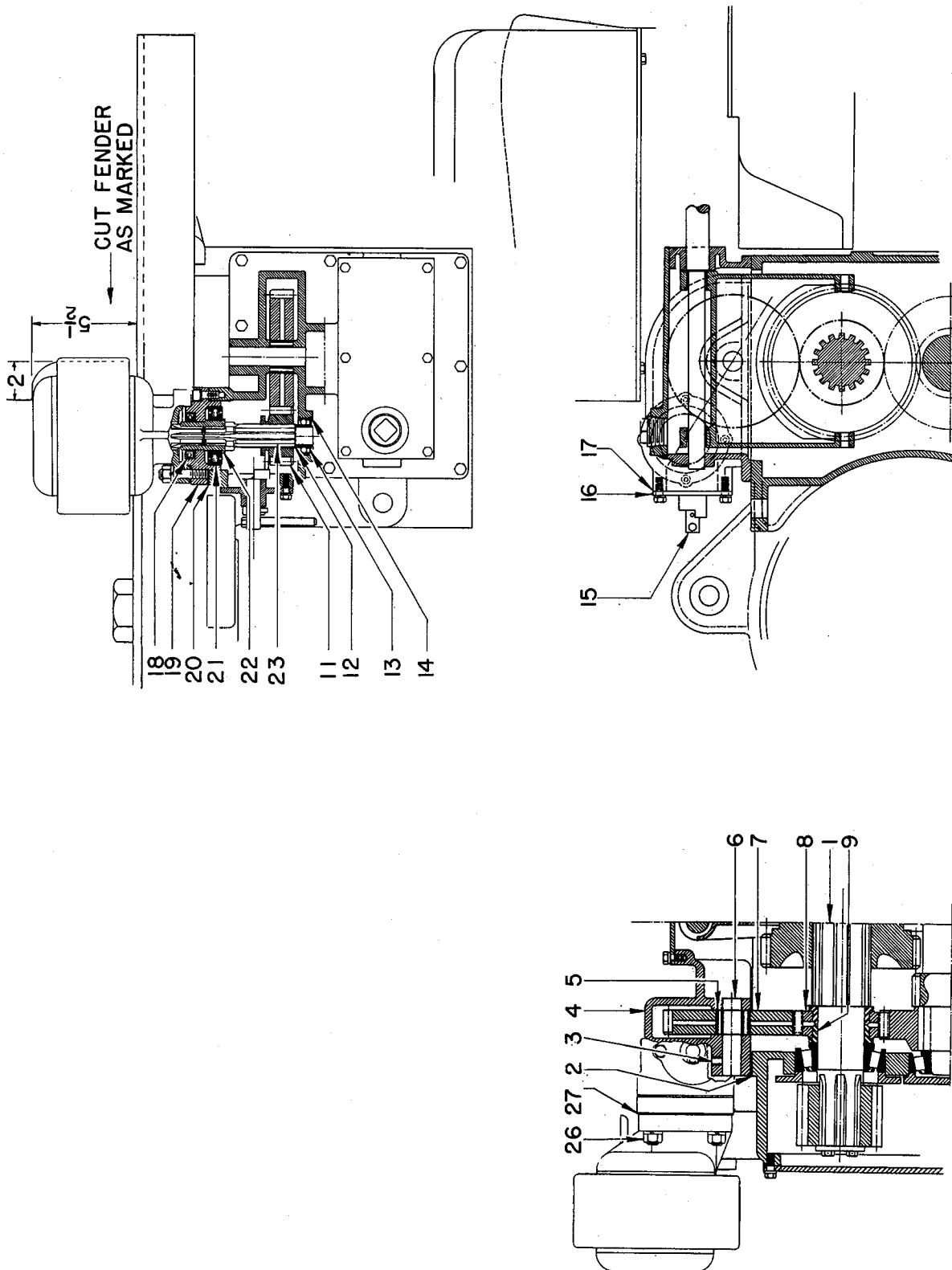
**Included in assembly under which listed.*

PUMP DRIVE ASSEMBLY NO. 35204AC
(Kay-Brunner Pump)
FOR D4 TOWING WINCH S. N. 7806 & Up

Parts are the same as above, except as follows:

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
14	32918	Shaft—Drive	1

PUMP DRIVE ADAPTER ASSEMBLY **(Isaacson 'Dozer Pump)** **FOR D4 TOWING WINCH**

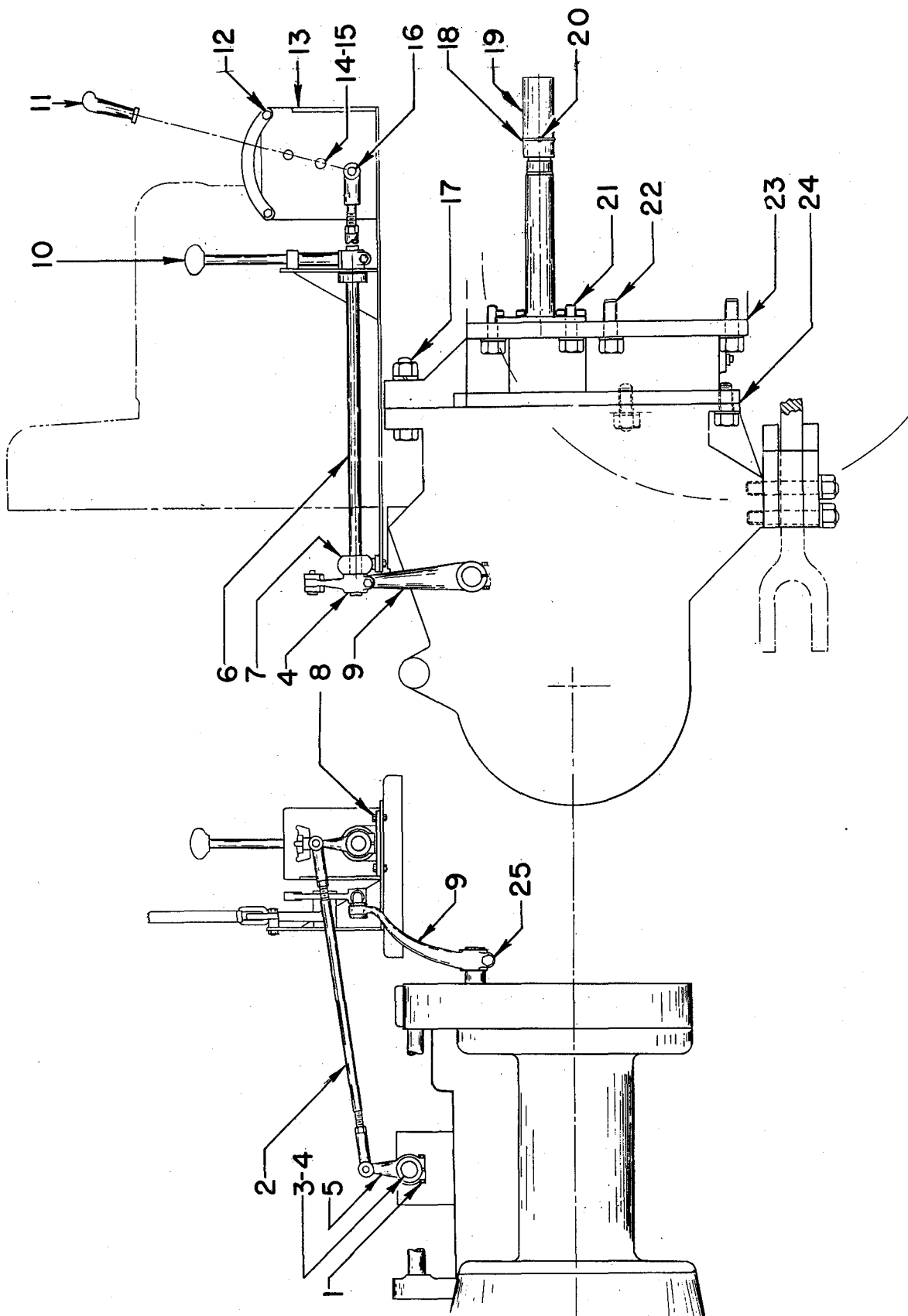


PUMP DRIVE ADAPTER ASSEMBLY No. 46100AB
(Isaacson 'Dozer Pump)
FOR D4 TOWING WINCH S. N. 7806 & Up

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	.....	Shaft (Winch Transmission) (See Ref. 9, page 29)	1
2	32828	Gasket	1
3	16205	Setscrew— $\frac{3}{8}$ NC x $\frac{3}{4}$	1
4	32914	Housing—Pump Drive	1
5	32917	Bearing	1
6	32916	Pin Shaft	1
7	32915	Gear—Idler (28 teeth)	1
8	32913	Gear—Idler (19 teeth)	1
9	32912	Bushing	1
11	32919	Gear—Sliding	1
12	32623	Spacer	1
13	32614	Bearing	1
14	32622	Snap Ring	1
15	32923A	Handlever—Shifter	1
	*46098	Handle	1
	*15004	Nut—Hex, $\frac{1}{4}$ NF	1
16	32922	Hub—Shifter	1
	15529	Capscrew— $\frac{3}{8}$ NC x 1	3
	15156	Lockwasher— $\frac{3}{8}$	3
17	33306	Gasket	1
18	5579	Oil Seal	1
19	46087	Retainer—Bearing	1
	16215	Setscrew—Hex Socket, $\frac{3}{8}$ NC x 1	4
	15156	Lockwasher— $\frac{3}{8}$	4
20	46096	Shim Set	1
21	43208	Bearing	1
22	46088	Coupling	1
32	32918C	Shaft—Drive	1
26	{ Special Stud (Isaacson B1906) (4) }		} Parts to be supplied by Isaacson Iron Works for connecting pump to adapter unit.
	{ Hex Nut, $\frac{1}{2}$ NF (4) }		
	{ Lockwasher— $\frac{1}{2}$ (4) }		
27	.....	Pump Gasket (Isaacson 356-A5)	1

*Included in assembly under which listed.

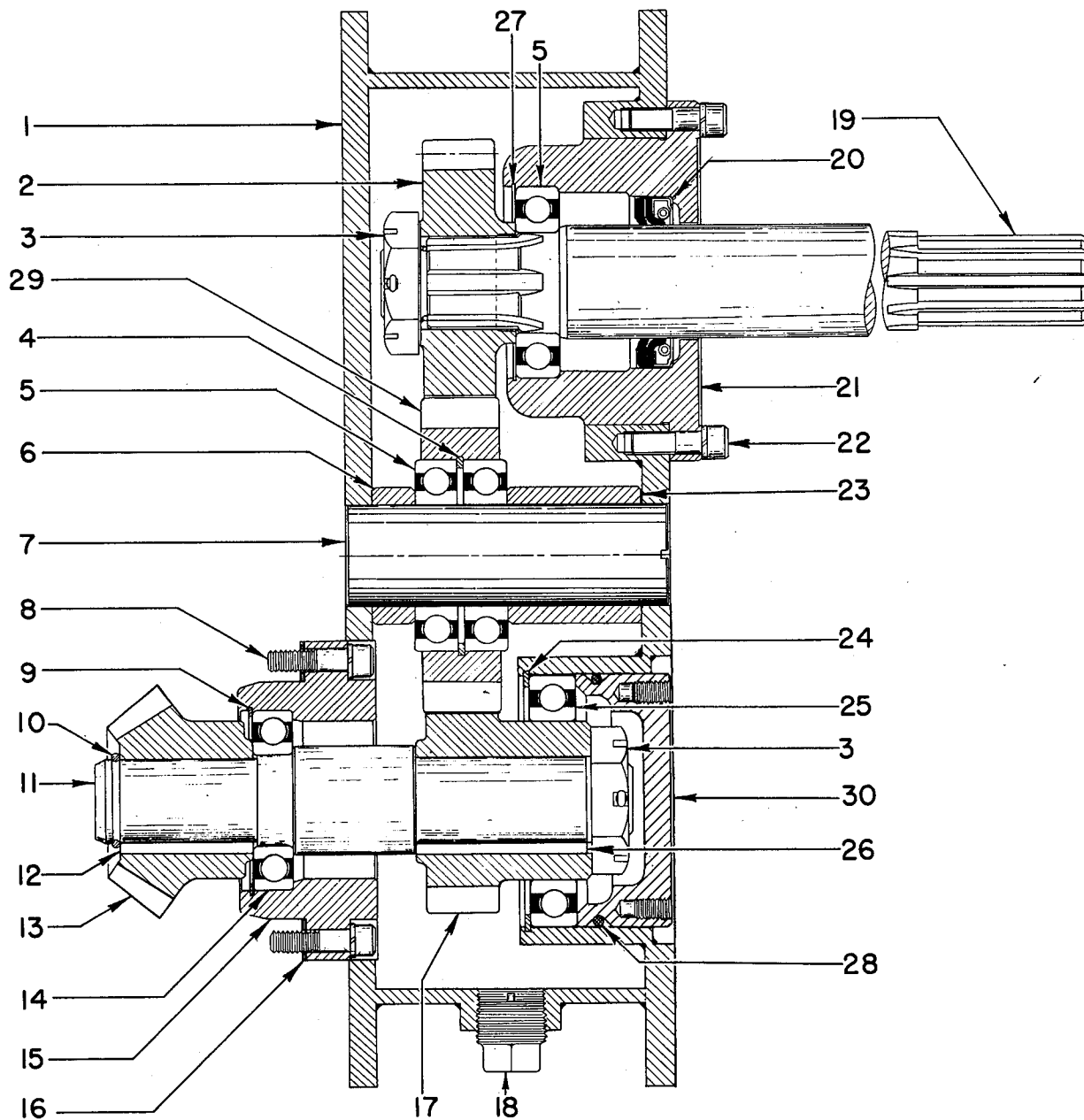
HANDLING GEAR FOR D4 ADAPTER PLATE (To Adapt a D4 Winch to D6 Tractor)



HANDLING GEAR FOR D4 ADAPTER PLATE (To Adapt a D4 Winch to D6 Tractor)

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	15528	Capscrew— $\frac{3}{8}$ NF x 2	2
	15156	Lockwasher— $\frac{3}{8}$	2
	15006	Nut—Hex, $\frac{3}{8}$ NF	2
2	9359A	Link—Adjustable	1
3	41858	Shaft	1
4	206	Key	3
5	1512A	Crank	2
6	41859	Shaft	1
7	41855A	Bearing Assembly	1
8	15514	Capscrew— $\frac{1}{2}$ NF x $1\frac{1}{4}$	2
	15158	Lockwasher— $\frac{1}{2}$	2
	15008	Nut—Hex, $\frac{1}{2}$ NF	2
9	41857A	Brake—Crank	1
10	32905A	Shifter Lever Assembly	1
11	38022A	Handlever Assembly—Brake	1
12	15527	Capscrew— $\frac{3}{8}$ NF x $1\frac{3}{4}$	2
	15156	Lockwasher— $\frac{3}{8}$	2
	15006	Nut—Hex, $\frac{3}{8}$ NF	2
13	41847A	Bracket Assembly—Control	1
14	15526	Capscrew— $\frac{5}{8}$ NF x $3\frac{1}{2}$	1
	15125	Washer— $\frac{5}{8}$	1
	15160	Lockwasher— $\frac{5}{8}$	1
	15010	Nut—Hex, $\frac{5}{8}$ NF	1
15	32242	Spacer	1
16	41852A	Link Assembly	1
17	15548	Capscrew—1" NF x 5	2
	15166	Lockwasher—1"	2
	15016	Nut—Hex, 1" NF	2
18	7704	Snap Ring	1
19	6702	Coupling	1
20	7703	Pin	1
21	9227	Stud— $\frac{3}{4}$ NF x $3\frac{1}{2}$	10
	15162	Lockwasher— $\frac{3}{4}$	10
	15012	Nut—Hex, $\frac{3}{4}$ NF	10
23	41845	Gasket (Adapter to Tractor)	1
24	41864	Gasket (Winch to Adapter)	1
25	15503	Capscrew— $\frac{1}{2}$ NF x $2\frac{3}{4}$	1
	15158	Lockwasher— $\frac{1}{2}$	1
	15008	Nut—Hex, $\frac{1}{2}$ NF	1

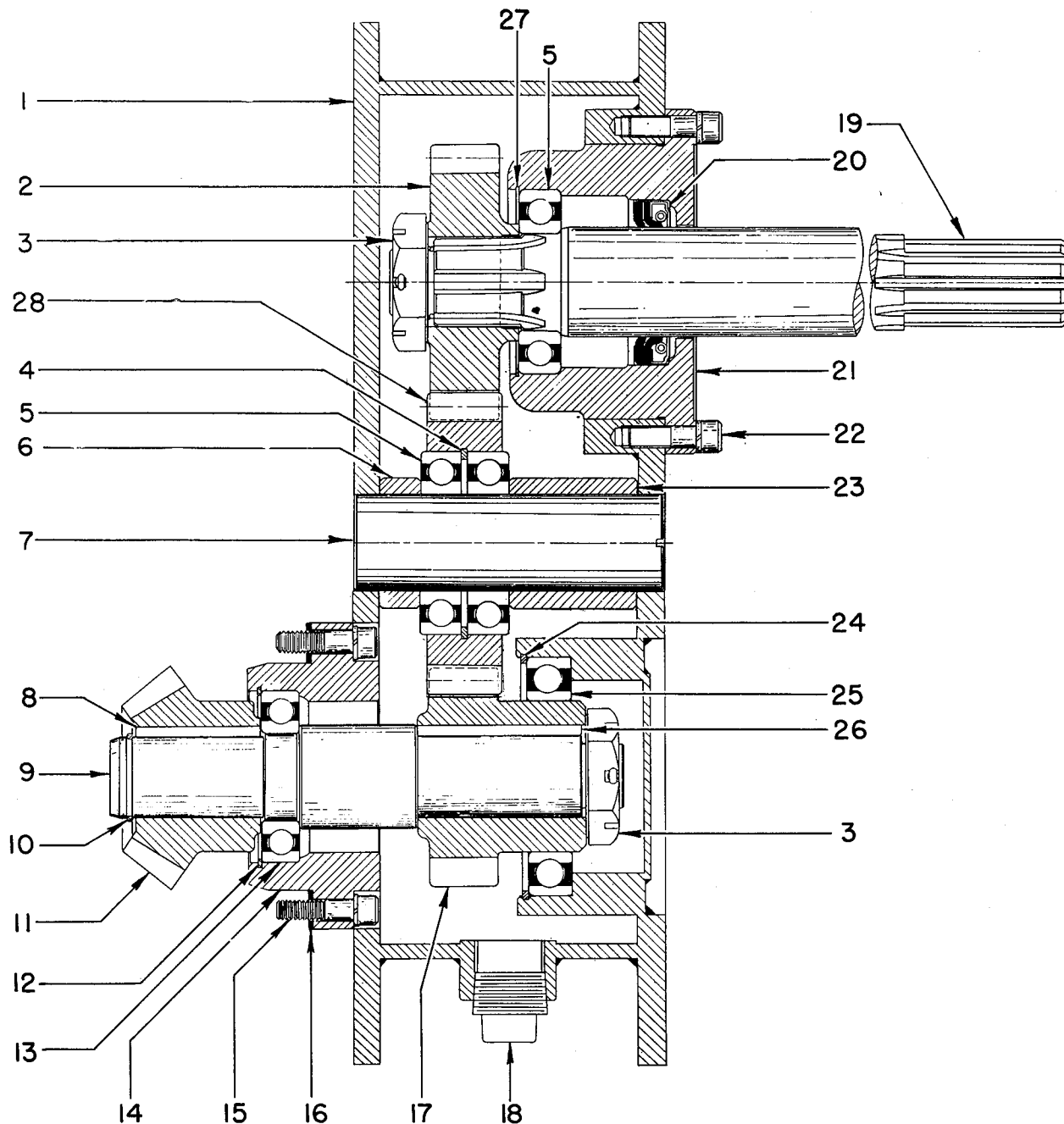
ADAPTER ASSEMBLY — No. 59484AB
With Bearing-Supported Pinion—Access Type
(To Adapt a D4 T. W. to D6 Tractor)



ADAPTER ASSEMBLY — No. 59484AB
With Bearing-Supported Pinion—Access Type
(To Adapt a D4 T. W. to D6 Tractor)

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	90210A	Housing—Adapter	1
2	41834	Gear (18 teeth)	1
3	{ 6373	Nut—Special	2
	{ 15240	Cotter—5/32 x 2½	2
4	46093	Snap Ring	2
5	43209	Bearing	3
6	41837	Spacer	1
7	41838	Shaft—Idler	1
8	{ 38123	Capscrew—3/8 NF x 1½	6
	{ 15156B	Lockwasher—3/8	6
9	41531	Snap Ring	1
10	32846	Snap Ring	1
11	41840B	Shaft	1
12	7653	Key	1
13	32845	Gear—Bevel (15 teeth)	1
14	43208	Bearing	1
15	41842B	Carrier—Bearing	1
16	32843	Shim Set	1
17	41841B	Gear	1
18	35504	Pipe Plug	1
19	41832	Shaft	1
20	41833C	Oil Seal	1
21	41835	Carrier—Bearing	1
22	{ 46698	Capscrew—3/8 NC x 1¼	6
	{ 15156B	Lockwasher—3/8	6
23	41836	Spacer	1
24	33655	Snap Ring	1
25	44314	Bearing	1
26	19321	Key	1
27	28176	Snap Ring	1
28	90849	“O” Ring	1
29	90849	Gear—Idler (20 teeth)	1
30	90208	Retainer—Bearing	1

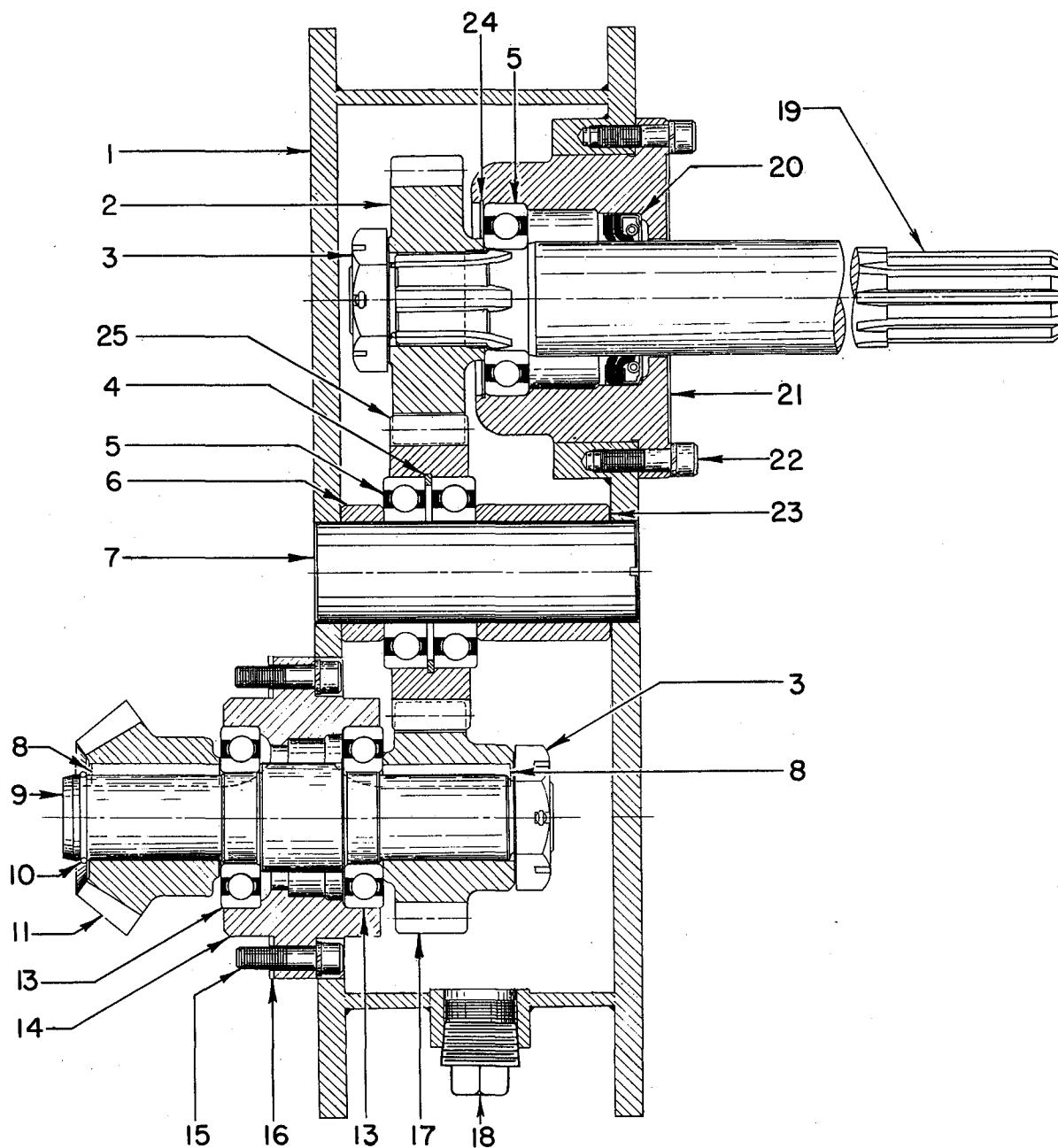
ADAPTER ASSEMBLY — No. 59484A
With Bearing-Supported Pinion — Non-Access Type
(To Adapt a D4 T. W. to D6 Tractor)



ADAPTER ASSEMBLY — No. 59484A
With Bearing-Supported Pinion — Non-Access Type
(To Adapt a D4 T. W. to D6 Tractor)

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	41828AB	Housing—Adapter	1
2	41834	Gear (18 teeth)	1
3	{ 6373	Nut—Special	2
	{ 15240	Cotter—5/32 x 2½	2
4	46093	Snap Ring	2
5	43209	Bearing	3
6	41837	Spacer	1
7	41838	Shaft—Idler	1
8	7653	Key	1
9	41840B	Shaft	1
10	32846	Snap Ring	1
11	32845	Gear—Bevel (15 teeth)	1
12	41531	Snap Ring	1
13	43208	Bearing	1
14	41842B	Carrier—Bearing	1
15	{ 38123	Capscrew—Socket Head, 3/8 NF x 1½	6
	{ 15156B	Lockwasher—3/8	6
16	32843	Shim Set	1
17	41841B	Gear—14 teeth	1
18	35504	Plug	1
19	41832	Shaft—Drive	1
20	41833C	Oil Seal	1
21	41835	Carrier—Bearing	1
22	{ 46698	Capscrew—Socket Head, 3/8 NC x 1¼	6
	{ 15156B	Lockwasher—3/8	6
23	41836	Spacer	1
24	33655	Snap Ring	1
25	44314	Bearing	1
26	8337	Key	1
27	28176	Snap Ring	1
28	41839	Gear—Idler (20 teeth)	1

ADAPTER ASSEMBLY — No. 41843A
Without Bearing-Supported Pinion
(To Adapt a D4 T. W. to D6 Tractor)



ADAPTER ASSEMBLY — No. 41843A
Without Bearing-Supported Pinion
(To Adapt a D4 T. W. to D6 Tractor)

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	41828A	Housing—Adapter	1
2	41834	Gear (18 teeth)	1
3	{ 6373	Nut	2
	{ 15240	Cotter—5/32 x 2½	2
4	46093	Snap Ring	1
5	43209	Bearing	3
6	41837	Spacer	1
7	41838	Shaft—Idler	1
8	7653	Key	2
9	41840	Shaft	1
10	32846	Snap Ring	1
11	32845	Gear—Bevel (15 teeth)	1
13	43208	Bearing	2
14	41842	Carrier—Bearing	1
15	{ 38123	Capscrew—Socket Head (3/8 NF x 1½)	6
	{ 15156B	Lockwasher—3/8	6
16	32843	Shim Set	1
17	41841	Gear (14 teeth)	1
18	35504	Pipe Plug	1
19	41832	Shaft	1
20	41833C	Oil Seal	1
21	41835	Carrier—Bearing	1
22	{ 46698	Capscrew—Socket Head, 3/8 NC x 1¼	6
	{ 15156B	Lockwasher—3/8	6
23	41836	Spacer	1
24	28176	Snap Ring	1
25	41839	Gear—Idler (20 teeth)	1

SECTION F

AUXILIARY DRUM UNIT

**PARTS BOOK
AND INSTRUCTION MANUAL
for
HYSTER
D4 Auxiliary Drum Unit**



**EFFECTIVE WITH
HYSTER No. BAU-27505 To 31670 Incl.**

HYSTER COMPANY

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

INSTRUCTIONS FOR ORDERING

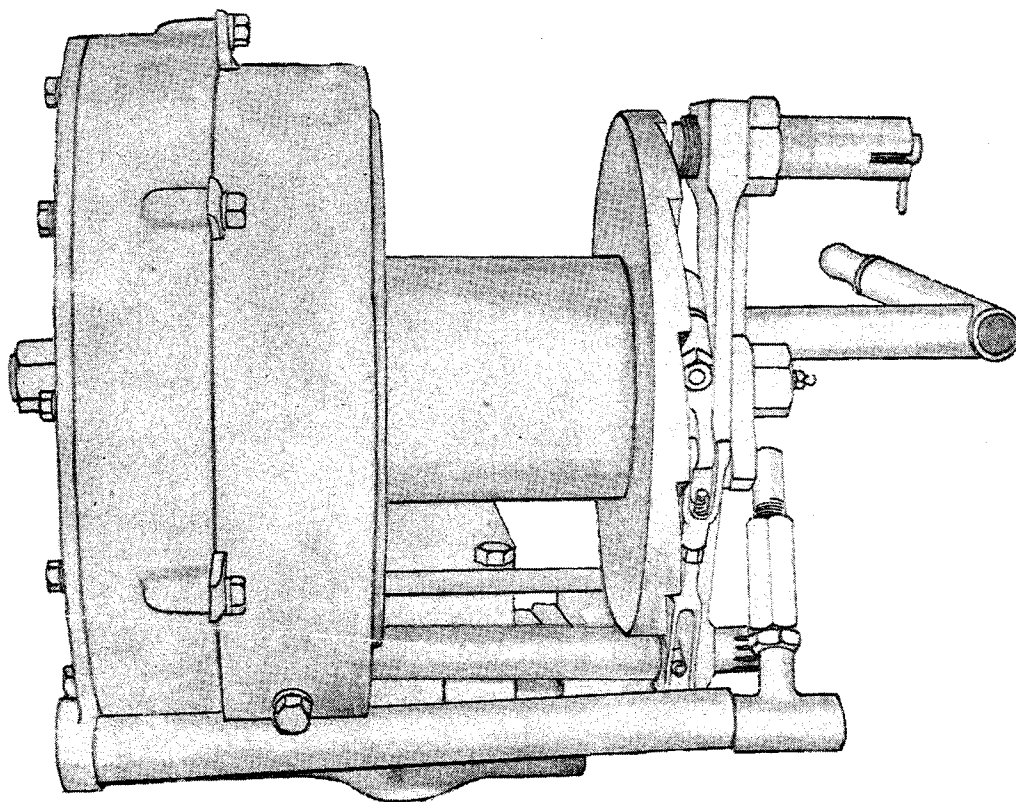
HYSTER REPAIR PARTS

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.

D4 AUXILIARY DRUM

The illustrations shown in this parts book may not accurately show all the details of your machine. If the picture does not correspond exactly to the machine, please give a **COMPLETE DESCRIPTION** of the part required and the reference number of the part nearest to its location including also the page number. Then, by reference to the **SERIAL NUMBER** of your machine, we can send you the correct part.

**PARTS BOOK
AND INSTRUCTION MANUAL
FOR MODEL BAU
HYSTER D4 AUXILIARY DRUM UNIT
for
HYSTER D4 TOWING WINCH**



HYSTER COMPANY

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

INDEX

BRAKE ASSEMBLY	82
DRUM UNIT	80
FRAMES, CASE AND COVERS	78
HANDLING GEAR	84
LUBRICATION CHART	72
LUBRICATION INSTRUCTIONS	73
MOUNTING INSTRUCTIONS	74
OPERATING INSTRUCTIONS	65
SERVICING INSTRUCTIONS	69
SPECIFICATIONS	85
TRANSMISSION GEAR TRAIN	79

OPERATION

This section, in addition to instructions for operating, contains illustrations pertaining to certain simple adjustments and replacements which can readily be made.

Lubrication instructions are provided on pages 12 and 13 and should be carefully studied. The lubricant recommended should be used.

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

DO NOT OPERATE WINCH AND TRACTOR AT THE SAME TIME

BE SURE WINCH GEAR SHIFT LEVER IS IN NEUTRAL POSITION BEFORE MOVING THE TRACTOR

THE TRACTOR MASTER CLUTCH MUST BE DISENGAGED BEFORE CHANGING GEARS IN THE WINCH.

The following instructions are taken from the TRACTOR parts book and are especially applicable to tractors equipped with winches, as the transmission shaft bearings receive oil only *when transmission gears are revolving*. When winch-equipped tractors remain stationary for a period of three hours or more, it is necessary to take the following steps to *insure* lubrication of the *tractor* upper transmission shaft bearings:

- A. Disengage main clutch and shift gears into high.
- B. Release both steering clutches and engage the main clutch for a minute or two, to allow oil to be well splashed about in case.
- C. Disengage main clutch, let go of steering clutch levers, and shift the tractor gears to neutral.
- D. **WARNING: DO NOT** let go of steering clutch levers until main clutch has been disengaged.

Brake

The brake lever is located on the right-hand side of the operator. A pawl and ratchet are provided to hold the brake in the applied position.

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

Right and Left-hand Side of Towing Winch

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

Safety Caution

When servicing or lubricating the auxiliary unit, always check to be sure that no load is attached, and that the line is slack.

If the auxiliary unit is with a "DOZER" allow the blade to drop until the line is slack before working on unit.

Do not secure cable to drum or work around the machine when the tractor engine is running unless you are positive that the tractor master clutch is disengaged.

The auxiliary unit must be kept in correct adjustment to give satisfactory results. Proper clutch and brake adjustments have been made at the factory for average conditions. Any of these adjustments, however, may be varied to suit the individual job or operator. See the adjustments and instructions given on the following pages.

Operating Principles

A. With the auxiliary drum unit in place on the Hyster Winch, the unit's idler gear (7, page 79) is in mesh with the winch auxiliary idler pinion (9) installed in winch on drum pinion shaft (13) at the time of the installation of the auxiliary unit. Thus, when tractor engine is running and master clutch engaged, this idler gear is constantly turning.

B. The clutch is the cone-type sufficiently large to transmit the required power with little effort on the part of the operator. The clutch is activated by the turning of the thrust nut, on the thread cut into the drum shaft. The thrust nut is operated by the clutch operating crank (22, page 80) by means of the friction lever (2, page 84).

To engage the drum clutch, pull up on the control friction lever (2). This causes the crank (22, page 80) to turn the sleeve (21) on the threaded section of the drum shaft (9). This movement brings the clutch cone in contact with the drum causing it to rotate.

C. To disengage the clutch and stop the cable, the operations and movements described in the previous paragraph (B) take place in the reverse order. The cable is kept from unspooling by the drum brake (1, page 82).

D. To release the brake and allow the line to reel off the drum, the control lever is pushed down by the operator. The continued movement of the lever will cause the clutch operating crank (22, page 80) and (2, page 82), to apply tension on the link assembly (11, page 82) causing the crank (9) to rotate the brake shaft and thus fully release the brake, allowing the brake wheel to turn free of the brake band.

E. To stop the unreeling of the line, pull the control lever back to the neutral position which allows the spring-loaded brake to take hold and prevent any further movement of the brake drum.

F. *Note:* With mechanism in position as described in paragraph (D), and with no tension on the rope, one should be able to turn the drum in either direction by hand.

Control Lever

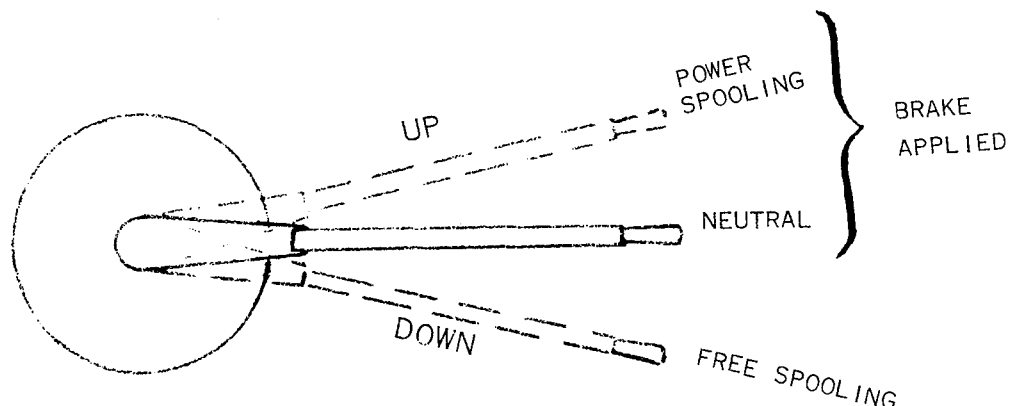
Operation of the auxiliary unit by the single friction lever (2), (located on the right-hand side of the tractor seat). (See page 84.)

A. To engage the clutch, reach out to the side and pull the lever up, spooling the cable onto the drum.

B. To declutch the drum, push the control lever down to the neutral position, and stop spooling in the line.

C. To release the brake, continue to move the friction lever down from the operator or neutral position, which releases the brake band, allowing the line to free spool off the drum.

D. To stop the free spooling of the line, move the lever back to the neutral position, which allows the spring loaded brake to take hold.



Brake Application

The spring-loaded brake band (1, page 84) is always applied on the brake except when releasing the brake to allow the line to free-spool.

The brake band is held against the brake drum by a spring load. The operating lever is pulled up, engaging the clutch. The brake band remains applied, and the line is spooled in against the brake drag. When the operating lever (2, page 84) is returned to the neutral position, disengaging the clutch, the brake remains applied, causing the drum and load to be held by the brake band.

Drum Lock

A positive drum lock (ratchet lock assembly 1, page 84) is provided at the top of the side plate (right-hand side). This includes a spring-loaded pawl ratchet-lock housing and locking pin. To lock drum, rotate locking pin 90° allowing locking pin to pass into the slots in the ratchet-lock housing.

SERVICING INSTRUCTIONS

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.

Brake Adjustment

Adjustment for brake lining wear is made on the brake band end, page 22. The locknuts on adjustable rod end are loosened or tightened to give the proper adjustment.

To Reline Brake

When the brake lining is worn down to the rivet heads, it should be replaced. The steps outlined below should be followed:

- A. Remove guard (5, page 78) from auxiliary unit side frame.
- B. Push down on lever (2, page 84) to the free spooling position, and hold in this position.
- C. Remove brake adjusting rod end pin (5, page 82) by pulling cotter and pushing the pin clear of the brake rod end.
- D. Remove from the brake anchor pin (8), the cotter pin located just inside of the side plate assembly (10) on right-hand side of the unit.
- E. Remove the anchor pin (8), leaving the band free. Move the brake band (1) off the brake flange into the drum barrel space. From this position the brake band can easily be removed for relining.
- F. To replace, reverse procedure outlined above, making sure all pins and cotters are in place. Replace capscrews and lockwashers holding guard in proper position.

To Adjust Clutch

A. Adjustment of the clutch can be made by loosening the clamping capscrew until clutch operating crank (22, page 80) is free of sleeve (21).

B. Push down on the friction lever (2), page 84, rotating on sleeve (21, page 80, which is held stationary until the desired adjustment is attained. Then tighten securely the clamping capscrew which locks the clutch operating crank (22) onto the sleeve (21).

C. Brake link assembly (4, page 84) will have to be readjusted to bring the friction lever (2) into the neutral position.

To Reline Clutch

A. Follow steps given on page 69 for removing brake band.

B. Remove drum R. H. nut (11, page 80) and take off R. H. nut from winch tie rod. Loosen adjustment on link (6, page 84) to allow the tie rod to slide freely to the left through the winch frame. This will leave the adjusting link free to be removed from the drum shaft.

C. Take out four $\frac{1}{2}$ NF x $1\frac{1}{4}$ capscrews from the R. H. side frame (1, page 78). Pull side frame free of drum unit. If unit is equipped with optional auxiliary brake release handle (15, page 82) it must first be removed before removing side frame.

D. Loosen clamping capscrew until clutch operating crank (22, page 80) is free of sleeve (21). Remove pin from upper end of brake link assembly (4, page 84) allowing link to drop.

E. Drum and bearings may be taken off as a unit by rotating sleeve (21) in clockwise direction until nut is free of shaft threads. Then pull drum assembly from drum shaft.

CAUTION: Keep drum centered on shaft while removing to keep the oil seal from fouling on shaft threads, otherwise seal will be damaged and must be replaced.

F. With the cable drum removed, remove eight wired capscrews. Pull clutch disk (23, page 80) free of gear hub and remove from unit, being careful not to damage oil seal. Clutch can now be relined.

NOTE: Relined clutch may be secured on an exchange basis. See your dealer for prices.

G. To reassemble, reverse the procedure outlined above, being sure to rewire the capscrews in the clutch. Inspect oil seals in drum and clutch, making sure that they are in perfect condition. If in doubt, replace them with new oil seals.

Be very careful to guide the clutch disc and the drum assembly oil seals over the threaded portion of shaft, making sure that the lip does not catch on the shaft threads and become damaged.

CABLE INSTALLATION

The Auxiliary Unit is designed for use with $\frac{1}{2}$ " diameter 6 x 19 wire rope Tru Lay preformed plow steel (or cable of other equivalent construction).

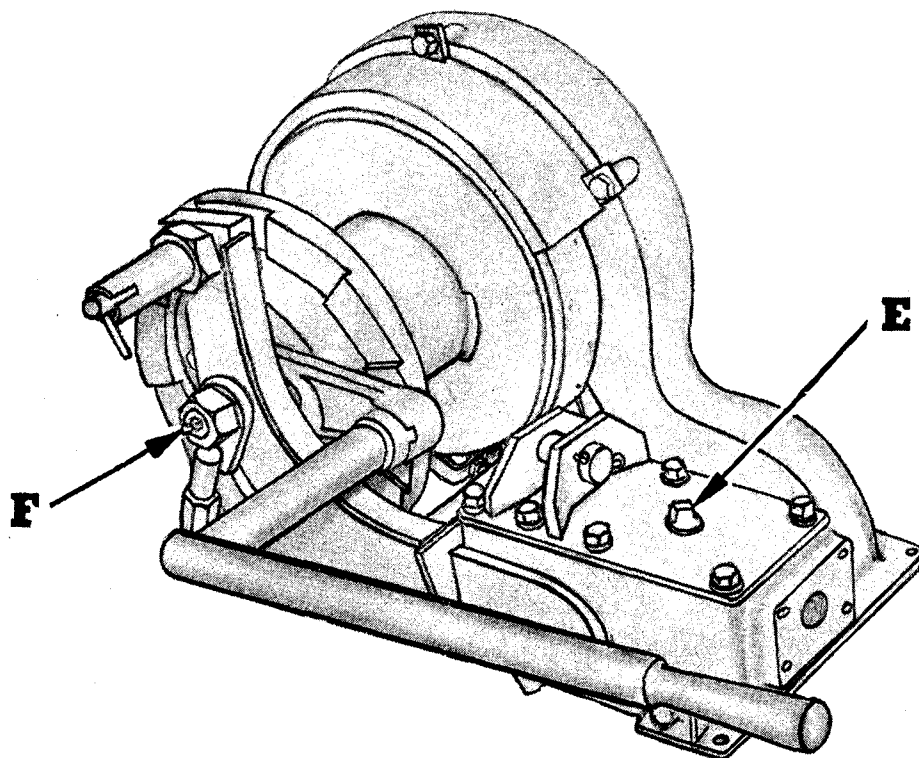
Roll the line out on the ground to remove the kinks before installing. Some "Caterpillar" Manuals recommend that the rope be untwisted about one turn for every 20 feet in length before dead ending the new cable. This will eliminate the reverse twisting tendency (which causes cable kinks) of a new cable when put to use.

If used with a "Bulldozer," thread the cable first through the 'dozer frame. After making sure that the tractor master clutch is in a disengaged position, anchor one end of the line to drum.

Place end of cable under keeper (17, page 80) and tighten capscrew (18) securely.

Spool the slack cable evenly onto the drum slowly. Idle the tractor at a slow speed in order that the cable drum will rotate slowly. Be sure that other end of rope is fastened to 'dozer (or other unit) as this spooling operation is continued.

LUBRICATION INSTRUCTIONS



Refer to illustration above which shows the location of the various lubrication fittings and pipe plugs on the Transmission Case, Drum Shaft, etc.

Note: When checking oil level, if the Tractor Engine is running, throw out master clutch so that hoist gears are stationary; otherwise, a false reading will result.

A new hoist, after about one weeks' operation, should have the oil changed in all the cases.

Winch Transmission Case Lubrication

(See winch parts book for Lubricating Instructions.)

The oil level in the case should be checked weekly, keeping the case filled up to the oil level plug in the winch. Since this auxiliary unit is installed in combination with the winch, additional oil is added to the winch transmission through the oil filler plug "E" on the center gear case containing winch shifter shaft.

AUXILIARY TRANSMISSION CASE LUBRICATION

(Lower Gear Train)

Idler gears and bearings in lower transmission compartment of gear housing receive lubrication by the splash system from the oil in the lower part of the D4N Hyster Winch. The oil is carried up from the winch compartment into the auxiliary unit gear case by the gears. The churning action of the lower submerged gears of winch causes a constant spray of oil to be thrown up into the gear compartment which provides ample lubrication of these parts.

Drum Unit Lubrication

Grease Drum Bearings at "F" once every 30 days with a high grade grease. Take care not to use too much grease, as the resulting pressure developed may force the grease through the seal.

Handling Gear Lubrication

All pin fulcrums should be kept working freely by oiling with oilcan about twice weekly.

MOUNTING INSTRUCTIONS FOR INSTALLING D4 AUXILIARY DRUM UNIT BAU 27505 AND UP ON D4 TOWING WINCH

Last Winch Serial No. BW32477

Proceed as follows:

Refer to page 31.

1. Assuming that the D4 Hyster Winch is mounted on the tractor, it will be necessary to remove the driver's seat from the tractor to gain access to the winch transmission case. Remove winch tie rod (23) and spacer (24), discard spacer, but retain tie rod for later use. Then remove the winch top hand hole cover and discard.

See page 38.

2. Disconnect horizontal brake link from handlever. Remove capscrews (16) which fasten seat supports to tie bracket (5 and 8). Seat with support angles may then be lifted clear of the winch and tractor.

See page 36.

Remove two capscrews (25) that hold the shifter bracket (24) to the tractor transmission cover plate.

3. Remove capscrews fastening standard transmission top cover (4, page 36) after which the cover and shifter assembly may be lifted off.

4. Turn cover and shifter assembly upside down and remove wire from setscrew (21), then remove setscrew.

5. Pull or tap shifter shaft (16) out of shifter fork (18), and transmission cover (4). Remove keys from keyways in shaft as it moves out of forks. Discard transmission cover (4) after shifter fork and shaft have been removed.

CAUTION: *Do not strike, spring, or drop the fork.*

Clean case openings thoroughly and with a large file remove burrs from each opening. Place a cloth in the openings of cases so that the filings will not fall in them.

6. Make sure the shifter shoes (19) are in the fork and locked in place with cotter pins.

7. Proceed now to assemble shifter fork in bottom compartment of auxiliary drum unit. To install shifter assembly, hold shifter fork (18) in position in case with setscrew (21) toward the front of unit. Push shaft (16) through hole in front of lower case compartment of auxiliary unit and through fork. Put keys (17) in place in key-ways in shaft during this operation. Continue pushing shaft through fork until shoulder on shaft comes against fork.

8. Tighten setscrew (21), then insert wire through hole in head of setscrew, and wire setscrew to shifter fork to prevent screw from backing out and dropping into gear case.

See page 79.

9. Idler gear (9), washer (11) and bushing (10) must now be installed on the drum pinion shaft (13). This is done by removing capscrews which hold cover plate (6, page 30) to left-hand side frame of winch. See page 28. Remove the two capscrews (2) and retainer plate (1) from the end of the drum pinion shaft. By reaching in from the top through opening of transmission case, push the sliding gear (8) to the right side out of the way. With the use of a soft hammer or suitable punch, drive the gear (3) and bearing (23) out to the left and off the shaft. After this has been done, the spacer may be slipped free of the brake shaft and discarded.

To reassemble, insert bushing (21) into bore of gear (22) and slide this assembly on drum pinion shaft to take the place of the discarded spacer, making sure they are up snug against the shoulder on the shaft. Replace bearing (23) and gear (3) in their original position and hold in place by retainer plate (1) and capscrews (2).

10. Place gasket which replaces gasket removed with top cover in Instruction 6, on winch transmission case.

CAUTION: The backlash between the idler gear (9) which is now part of the winch transmission, and the auxiliary drum unit first idler gear (7) is determined by the thickness of the above gaskets. (See Instruction 16.)

11. Lift the auxiliary drum assembled with the shifter fork, by use of crane or hoist, and swing over until directly above the winch.

See page 36.

12. Lower unit slowly into position on top of winch, lining up shoes (19), on shifter fork with groove in sliding gear (8, page 28.) It may be necessary to turn over the tractor engine slightly to permit the winch idler gear (9) to mesh properly with the auxiliary drum first idler gear (7), thus allowing the auxiliary assembly to drop into the correct position.

13. Insert enough capscrews, without lockwashers, in holes around edge of mounting flange of auxiliary unit to line up all the holes, but do not tighten securely until after tie rod, large anchor bolt, and link (6, page 84) have been installed at rear of unit. See Instructions 18 and 20.)

14. Tighten the four capscrews (without lockwashers) near the center axis of the idler gear as a preliminary to checking the backlash. Remove the cover plate (5, page 36) and through this opening, check to see that the proper backlash (clearance between teeth in mesh) has been obtained between the winch idler gear (9) and auxiliary first idler gear (7).

This adjustment is very important and is accomplished by use of the proper amount of gaskets between the auxiliary drum unit and the top of winch transmission case. (See Instruction 10.) If no backlash is found, damage may result if unit is operated in this condition. The backlash or clearance between teeth, should be about .010" to .015" on the pitch line. Too close an adjustment will cause the gears to run noisely. If no feeler gauge is available, the idler gear may be rocked back and forth sharply with some suitable bar, and the correct backlash is that which is barely perceptible to the feel of the hand.

15. If the gear mesh needs readjustment, remove capscrews and lift auxiliary unit free of winch. Either remove or add another gasket on winch transmission top, as required, to obtain the proper backlash. Then repeat operations given in Instructions 12, 13, and 14.

16. With the assembly progressed to this point, the next item will be the installation of the winch tie rod through the rear of the unit. As the tie rod is pushed through from one side, assemble with new frame spacer (5, page 84) and adjustable link assembly (6), tightening the unit securely.

17. Add lockwashers to capscrews temporarily tightened, and insert remaining capscrews with lockwashers, in mounting flange holes. These are the 10 new capscrews, $\frac{3}{8}$ NF x $1\frac{1}{4}$, and all should have washers when in place. Insert the large 1" NF x $2\frac{1}{2}$ capscrew into the hole located at the center rear over drum in the winch transmission case, and through the hole in the auxiliary unit and tighten with nut and lockwasher.

18. Replace the two capscrews in shifter bracket (removed in Instruction 2) and tighten securely against tractor transmission cover plate, using washers to line up bracket with shaft.

19. After final inspection of backlash, replace cover plate (5, page 36) with its gasket in place and fasten securely with the capscrews previously removed.

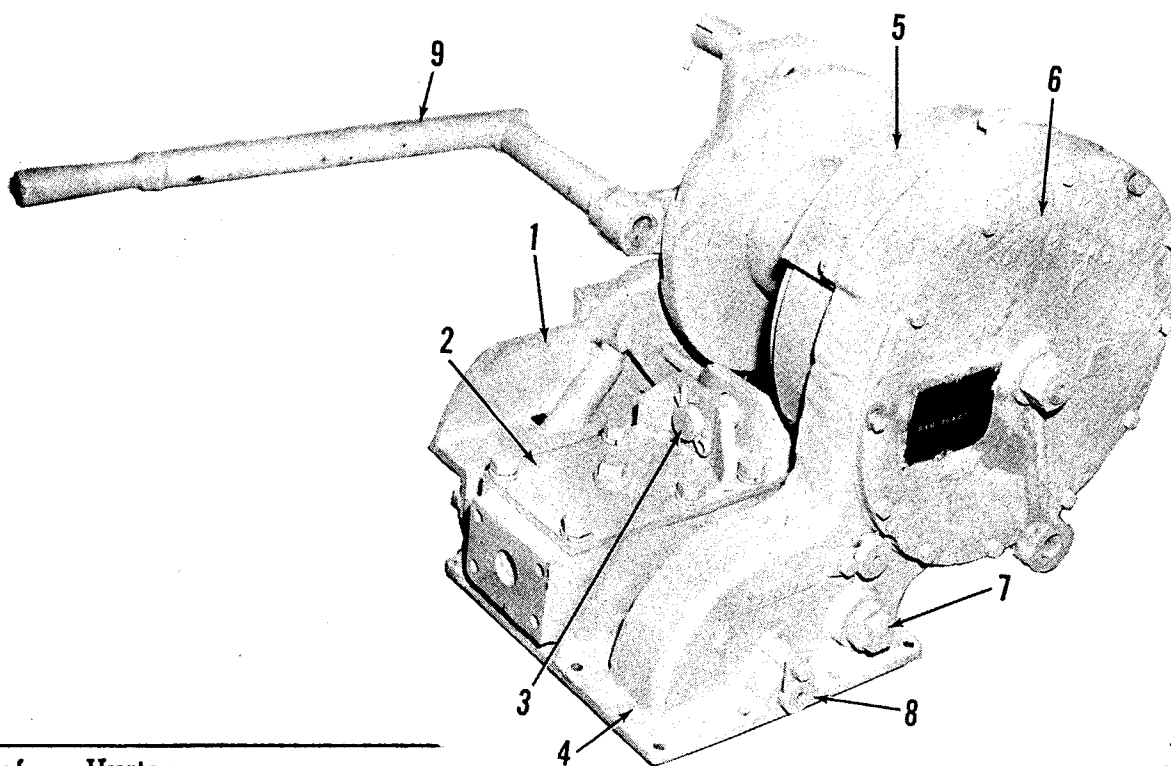
20. With all fastenings drawn down securely, make final adjustment on adjustable link assembly (6) and lock with jam nut.

21. Reinstall tractor seat and fasten to tie bracket with capscrews previously removed. Connect horizontal brake link to handlever.

22. Check all bolts and connections and be sure that all nuts and lockwashers are in place and drawn up securely.

List of Parts and Illustrations

FRAMES, CASE AND COVERS

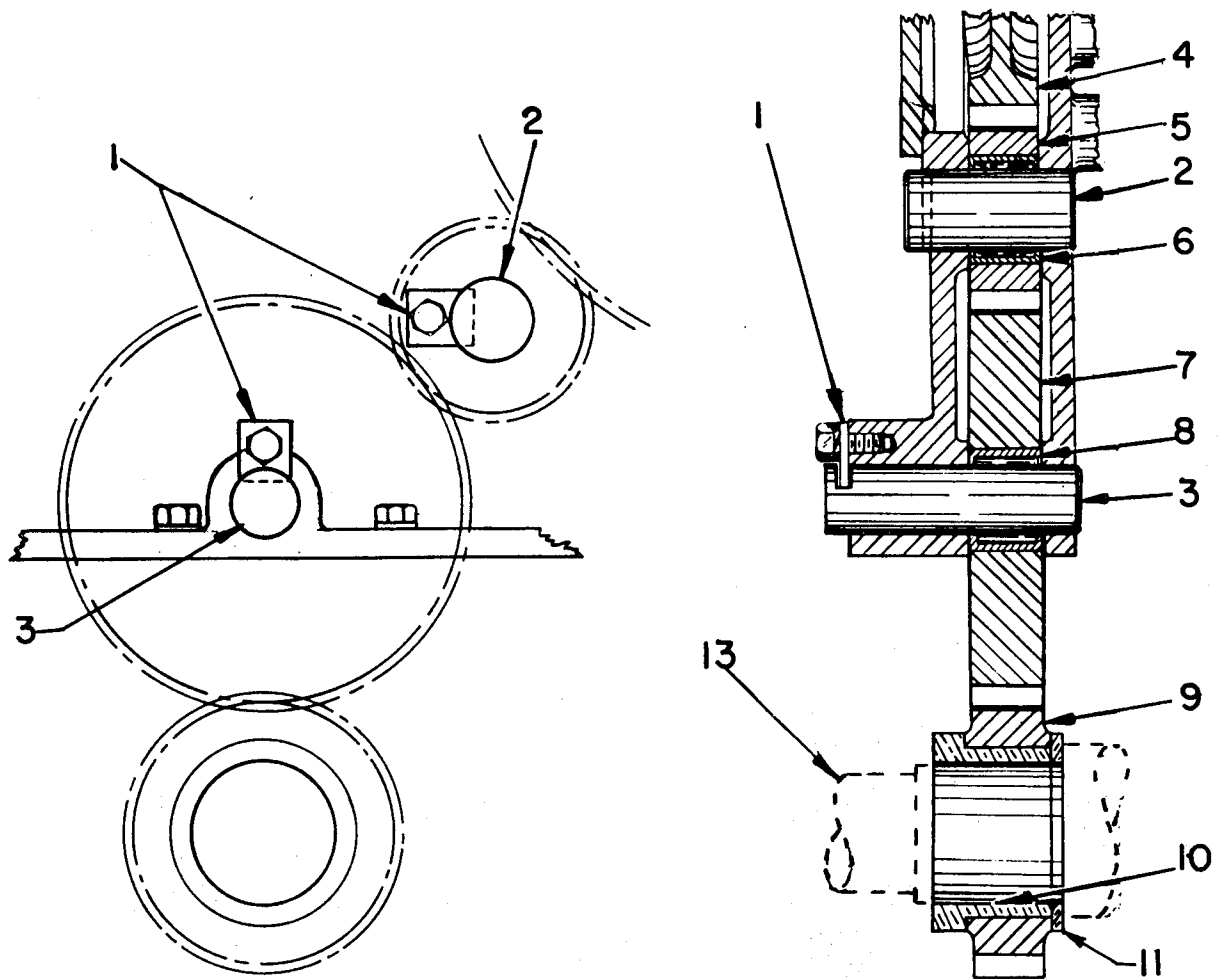


Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	37555AC	Plate Assembly—Side } First used on	1
	*46861	Bushing } Serial No. 27505	1
	37555AB	Plate Assembly—Side } Last used on	1
	*32232	Bushing } Serial No. 21437	1
	15514	Capscrew— $\frac{1}{2}$ NF x $1\frac{1}{4}$	4
2	15158	Lockwasher— $\frac{1}{2}$	4
	37568	Cover	1
	37569	Gasket	1
	15504	Capscrew— $\frac{5}{8}$ NF x $1\frac{1}{4}$	1
	15160	Lockwasher— $\frac{5}{8}$	1
3	15775	Capscrew—Flathead, $\frac{5}{8}$ NC x $1\frac{1}{4}$	2
	37538	Pin	1
4	15265	Cotter— $\frac{5}{16}$ x 2	2
	37534A	Housing Assembly	1
	37558	Pin—Dowel	2
	37565	Gasket	4
	15532	Capscrew— $\frac{3}{8}$ NF x $1\frac{1}{4}$	10
	15156	Lockwasher— $\frac{3}{8}$	10
	15598	Capscrew—1" NF x $2\frac{1}{2}$ with Nut and Lockwasher	1
	15016	Nut—Hex, 1" NF	1
	15166	Lockwasher—1"	1
5	37907B	Guard—Drum	1
	15511	Capscrew— $\frac{1}{2}$ NF x 1"	5
	15158	Lockwasher— $\frac{1}{2}$	5
6	37525	Cover—Gear	1
7	5308	$1\frac{1}{4}$ Std. Pipe Plug (for inspection)	1
8	.....	Shaft—Idler Gear (see page 79, Ref. 3)	
9	.....	Handlever (see page 84, Ref. 2)	

*Included in assembly under which listed.

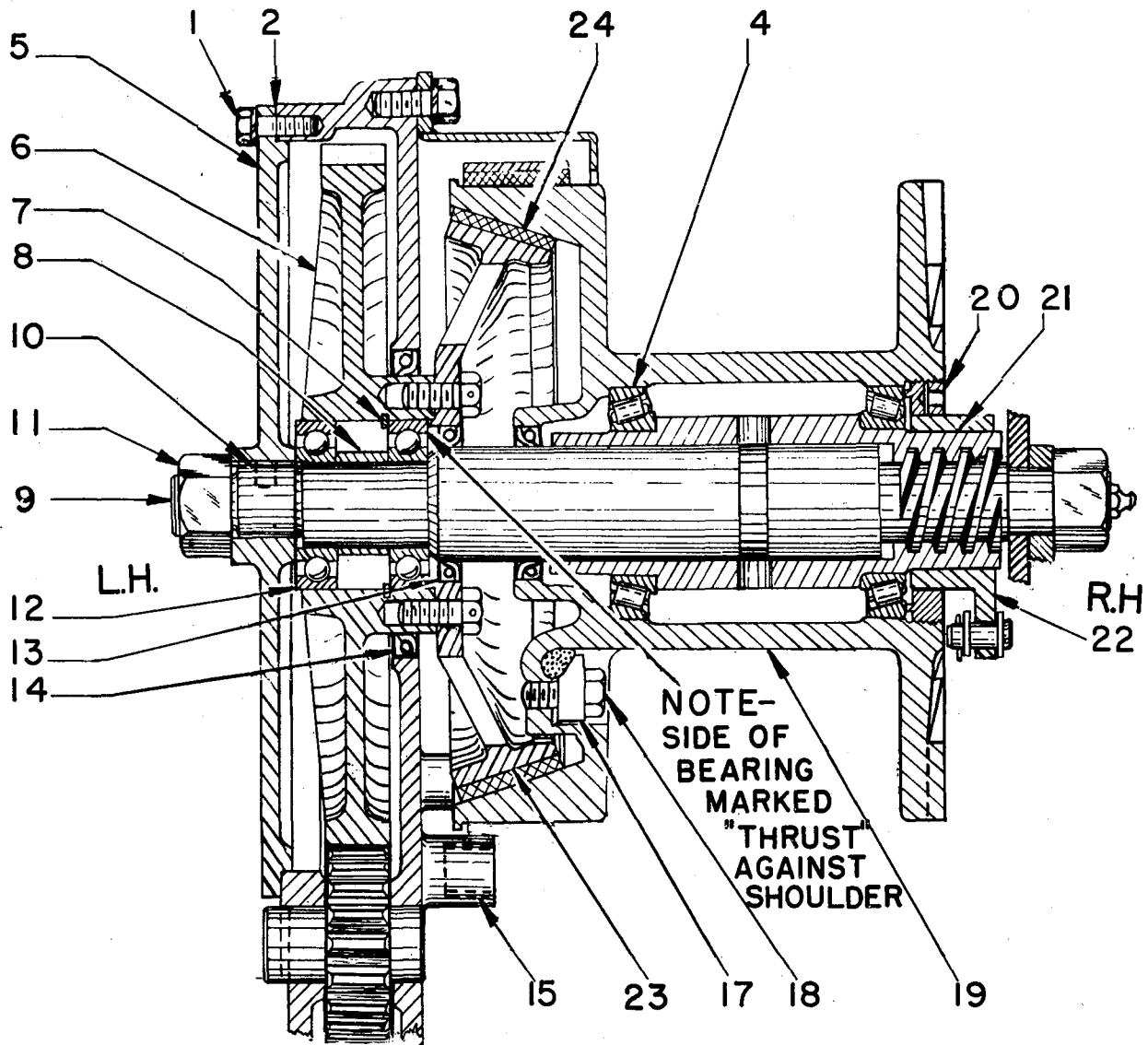
HYSTER COMPANY
PORTLAND, OREGON

TRANSMISSION GEAR TRAIN



Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	37537	Keeper	2
	15508	Capscrew— $\frac{3}{8}$ NF x 1"	2
	15156	Lockwasher— $\frac{3}{8}$	2
2	37536	Pin—Second Idler	1
3	37535	Pin—First Idler	1
4	37522	Gear—Friction (53 teeth)	1
5	37564	Gear—Second Idler (13 teeth)	1
6	37557	Needle Bearing	1
7	32915B	Gear—First Idler (28 teeth)	1
8	9354	Needle Bearing	1
9	32913B	Gear—Idler (19 teeth)	1
10	59055	Bushing	1
11	59056	Washer	1
13	.....	Shaft—Drum Pinion (page 28, Ref. 9)	

DRUM UNIT

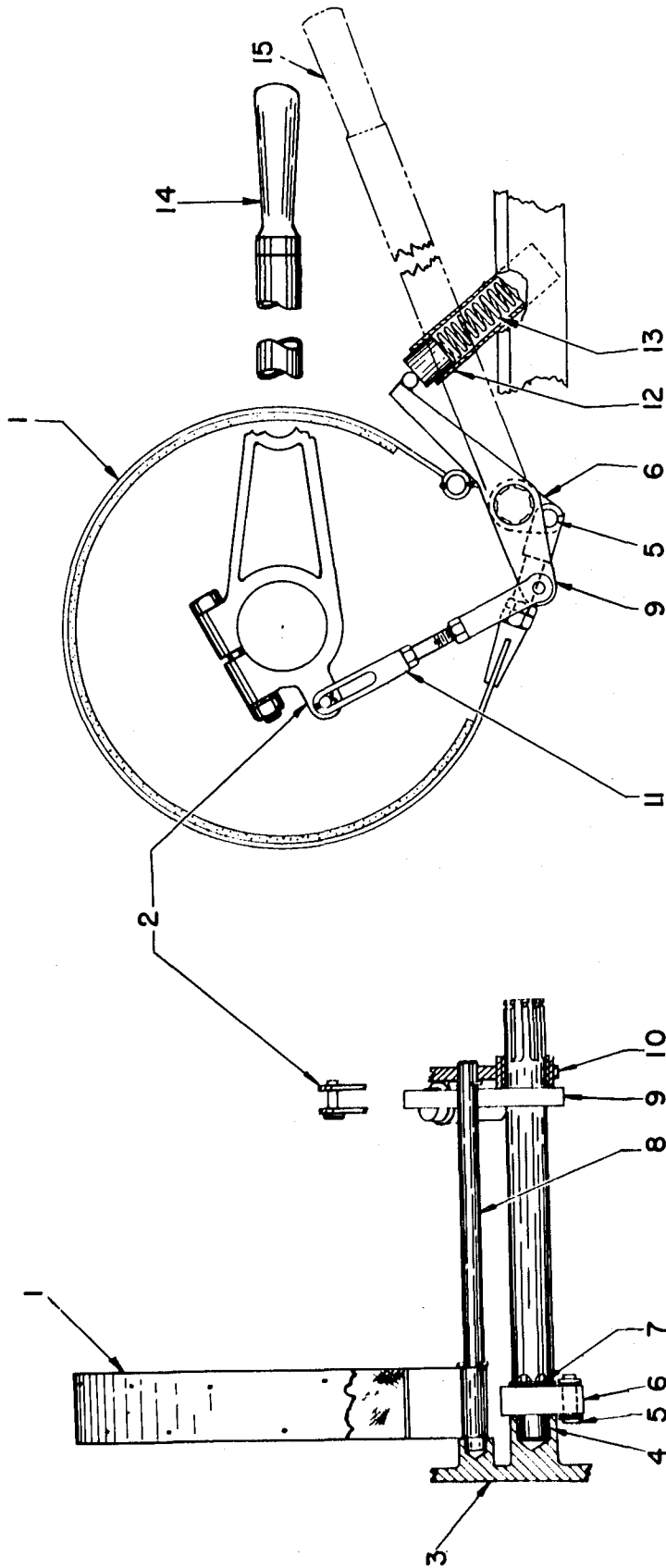


DRUM UNIT

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	{ 15508	Capscrew— $\frac{3}{8}$ NF x 1	12
	{ 15156	Lockwasher— $\frac{3}{8}$	12
2	37556	Gasket	1
4	{ 30178	Bearing Cup	2
	{ 30177	Bearing Cone	2
5	.....	Cover—Gear (see page 78, Ref. 6)	
6	.....	Gear (see page 79, Ref. 4)	
7	9109	Snap Ring	1
8	37549	Pipe—Spacer	1
9	37528AB	Shaft—Drum	1
10	*33100	Pin	1
11	{ 15017	Nut—Hex, $1\frac{1}{8}$ NF	2
	{ 16001	Grease Fitting	1
12	37559	Bearing	2
13	37561	Oil Seal	2
14	37560	Oil Seal	1
15	32232	Bushing	1
17	37566	Clamp (Cable)	1
18	37562	Capscrew (Heat-treated)	1
19	37521B	Drum	1
20	{ 37529	Retainer	1
	{ 16202	Setscrew—Sockethead, 5/16 NC x $\frac{3}{8}$, Cup Point	1
21	37520B	Sleeve—Drum Shaft	1
	{ 37524B	Crank—Clutch Operating	1
22	{ 15536	Capscrew— $\frac{1}{2}$ NF x $3\frac{1}{4}$	1
	{ 15008	Nut—Hex, $\frac{1}{2}$ NF	1
	{ 15158	Lockwasher— $\frac{1}{2}$	1
23	{ 37523AD	Clutch Assembly	1
	{ 9718	Capscrew—Drilled Head	8
24	{ *37526AD	Lining Set—Clutch (Standard) } Redrill clutch	1
	{ *37526AB	Lining Set—Clutch, Velvetouch (opt.) } disc if necessary	1

**Included in Assembly under which listed.*

BRAKE ASSEMBLY



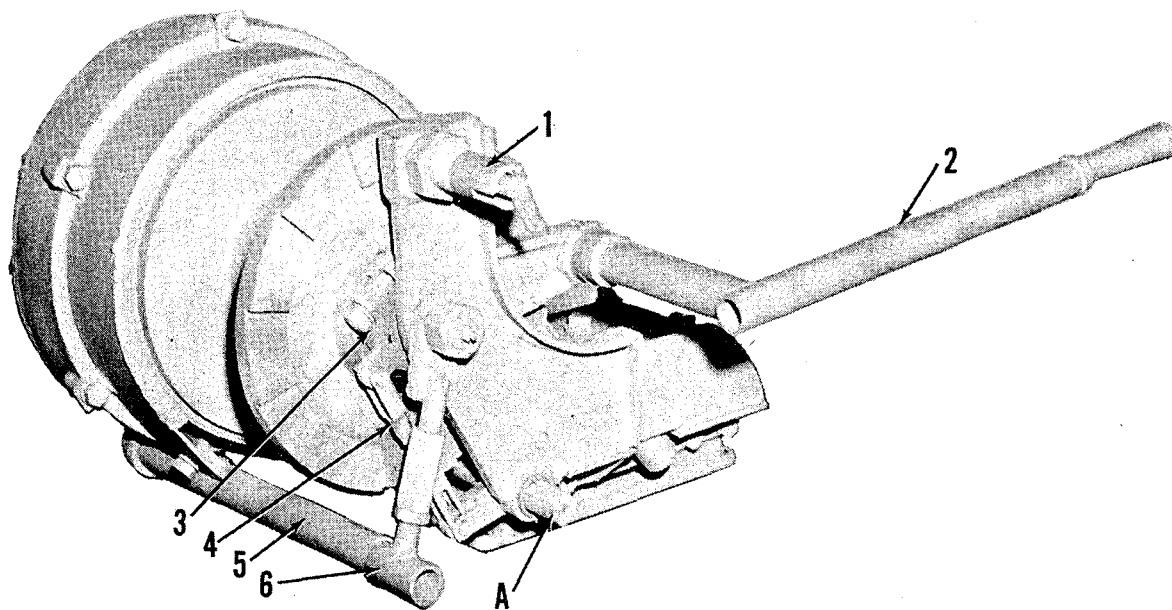
HYSTER COMPANY
PORTLAND, OREGON

BRAKE ASSEMBLY

Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
	37532AB	Band Assembly—Brake	1
	*37533A	Lining Set	1
	*37531B	Rod End—Adjusting	1
1	*15008	Nut—Hex, $\frac{1}{2}$ NF } First used on Ser. No. 27505 ..	1
	*15028	Nut—Hex Jam, $\frac{1}{2}$ NF }	1
	37531	Rod End—Adjusting	1
	15058	Nut—Hex, $\frac{1}{2}$ NC } Last used on Serial No. 21437 ..	1
	15011	Nut—Hex Jam, $\frac{1}{2}$ NC }	1
2	.....	Crank—Clutch Operating (see page 81, Ref. 22)	
3	.....	Housing (see page 78, Ref. 4)	
4	.....	Bushing (see page 81, Ref. 15)	
5	{ 59618	Pin	1
	{ 15223	Cotter— $\frac{1}{8}$ x 1	2
6	{ 37551B	Crank—Brake (First used on Serial No. 27505)	1
	{ 37551	Crank—Brake (Last used on Serial No. 21437)	1
7	46222	Snap Ring	1
8	{ 37550B	Pin—Brake Anchor	1
	{ 15223	Cotter— $\frac{1}{8}$ x 1	2
9	{ 37554AC	Shaft—Brake (First used on Serial No. 27505)	1
	{ 37554AB	Shaft—Brake (Last used on Serial No. 21437)	1
10	.....	Plate Assembly—Side (see page 78, Ref. 1)	
11	.....	Link Assembly (see page 84, Ref. 4)	
12	37552	Seat—Spring	1
13	37567	Spring	1
14	.....	Lever Assembly (see page 84, Ref. 2)	
15	{ 46496AB	Handlever—Aux. Brake Release (Opt.) } First used on ..	1
	{ 46222	Snap Ring } Ser. No. 27505 ..	1
	{ 46496A	Handlever } Last used on	1
	{ 9413	Key } Serial No. 21437	1

*Included in Assembly under which listed.

HANDLING GEAR



Ref. No.	Hyster Part No.	NAME OF PART	Qty. Reqd.
1	41699A	Pawl Assembly	1
	*41698A	Sleeve—Spring	1
	*41693	Pawl	1
	*41694	Rod	1
	*41695	Spring	1
	*41697	Pin—Dowel	1
	*32745	Nut—Hex Jam, 13/8 NF	1
2	37553AC	Handlever (For units up to 31670 inclusive, include Crank 37524B	1
	15519	Capscrew—3/8 NF x 2 1/2	1
	15006	Nut—Hex, 3/8 NF	1
	15156	Lockwasher—3/8	1
3	.....	Crank—Clutch Operating (see page 81, Ref. 22)	1
4	37548AB	Link Assembly—Brake	1
	*37548B	Rod End—Slotted	1
	* 141	Rod End (Standard)	1
	* 142	Pin—Rod End	2
	15006	Nut—Hex, 3/8 NF	1
5	15212	Cotter—3/32 x 3/4	2
	37539B	Pipe—Frame Spacer	1
6	41692A	Link Assembly—Adjusting	1
	*41689	Bolt—Anchor	1
	*41690	Bolt—Eye	1
	*41691	Nut—Adjusting	1
	*15032	Nut—Jam, 3/4 NF	1

*Included in Assembly under which listed.

HYSTER COMPANY
PORTLAND, OREGON

SPECIFICATIONS

HYSTER MODEL D4 AUXILIARY DRUM UNIT

Drum Size:

Barrel Diameter 5½"
Flange Diameter 12 "
Barrel Length 5½"

Cable Capacity, Maximum Line 165 ft. ½", 290 ft. ⅜"
Allowance should be made for loose or unevenly
spooled line in towing service.

Available Line Pulls:

Bare Drum 4,060 lbs.
Full Drum 2,087 lbs.

Line Speeds:

Bare Drum 260 f.p.m.
Full Drum 500 f.p.m.

Net Weight (without cable) 200 lbs.

Domestic Shipping Weight, Approx. 325 lbs.

SECTION F

NUMERICAL INDEX

Part No.	Page	Part No.	Page	Part No.	Page	Part No.	Page
128	35	15016	31, 39, 53, 78	15528	37, 42, 53	32824	30
141	84	15017	81	15529	37, 49, 51	32825	30
142	84	15028	83	15530	39	32826	30
153	35	15030	41	15531	39	32827	37, 42
159	41, 45	15032	84	15532	39, 78	32828	37
206	37, 53	15036	39, 43	15536	81	32829AB	37, 42
798	29	15058	83	15547	43	32830	37
809	37, 42	15125	53	15548	43, 53	32831	42
1512A	53	15154	43	15549	43	32831B	37
2674	25	15156	25, 30, 37	15575	78	32832C	37
3362	25		39, 41, 42, 43	15598	78	32833	30
			49, 51, 53, 78	15825	41	32835	30
5579	49, 51		79, 81, 84	16001	81	32836	31
5782	37, 42	15156B	49, 51, 55	16002	81	32837	31
6373	55, 57, 59		57, 59	16205	49, 51	32838	31
6818C	41	15158	30, 35, 43	19321	55	32839	31
			45, 53, 78, 81				
6823	41			25062	42	32840	31
6852	25	15160	39, 41, 53, 78	28176	55, 57, 59	32841	30
7622	33	15162	31, 53	30059	29	32842	25
7653	25, 55, 57, 59	15166	31, 53, 78	30083	29	32843	25, 55, 57, 59
7704	53	15176	35	30084	29	32844B	25
8238	33	15180	41	30177	81	32845	25, 55, 57, 59
8337	57	15212	84	30178	81	32845C	25
9109	25, 81	15214	37	30836	29	32846	25, 55, 57, 59
9227	53	15223	41, 42, 45, 83	30956	27	32847B	25
9354	79	15225	35	31414	25, 29	32848	25
9359A	53	15227	35	31868	49, 51	32848B	27
9410	27	15235	25	32201	29	32849	25
9413	83	15237	25	32229	35	32850	25
9432	25	15240	55, 57, 59	32230	35	32851	25
9444	37	15265	78	32232	35, 78, 71	32852B	27
9445	30	15300	35	32242	41, 53	32853B	27
9490	35	15304	31	32243	41	32855	27
9554	25	15503	53	32307D	37	32856	27
9563	25	15504	78	32353A	37, 42	32858	27
9718	81	15508	25, 37, 43	32411	37	32859	27
10114B	29		79, 81	32416	29	32860	27
15004	43, 49, 51	15510	35	32608	35	32861	27
15006	37, 39, 41	15511	30, 39, 78	32622	49, 51	32862	27
	42, 43, 53, 84	15513	30, 39	32623	49, 51	32863	27, 29, 33
15008	35, 39, 45	15514	39, 45, 53, 78	32687	27	32864	27
	53, 81, 83	15519	84	32745	84	32865	27
15010	53	15522	31	32821	30	32865B	27
15011	83	15525	37	32821C	30	32866	27
15012	31, 35, 41, 53	15526	41, 53	32822B	33	32866B	27
15015	43	15527	41, 53	32823	30	32867	27

NUMERICAL INDEX — Continued

Part No.	Page	Part No.	Page	Part No.	Page	Part No.	Page
32868	29	32908	43	37532A B	83	38450	39
32868B	29	32909	43	37533A	83	38451	39
32868C	29			37534A B	78	38452	39
32868D	29			37535	79	38453	39
32869	29	32911B	29	37536	79	38454	39
32870	29	32912	29	37537	79	38465B	37
32872	29	32913B	29, 49, 51	37538	78	38471	39
32873	29		79			38976	35
				37539B	84		
32874	29	32914B	49, 51	37541A	45	40577	35
32875	29	32915B	49, 51, 79	37542A	45	41037A	35
32876B	29	32916	49, 51	37543	45	41039A	35
32877	29	32917	49, 51	37544	45	41041	29
32878B	29	32918B	49, 51	37548B	84	41043A	41
32879	29	32918C	49, 51	37548A B	84	41045A	41
32880B	29	32919	49, 51	37549	81	41531	55, 57
32880C	29	32920	49, 51			41689	84
				37550B	83		
32880D	29	32921	49, 51	37551	83	41690	84
32881B	29	32922	49, 51	37551B	83	41691	84
32882C	29	32923A	49, 51	37552	83	41692A	84
32883	33	33052	31	37553AC	84	41693	84
32884	33	33074A	35	37554A B	83	41694	84
32885	33	33100	27, 29, 81	37554AC	83	41695	84
32886	33	33302	29, 37	37555A B	78	41697	84
32887	33	33306	49, 51			41698A	84
				37555AC	78		
32888	33	33307	33	37556	81	41699A	84
32889	33	33349	31	37557	79	41828A	59
32890	33	33350	29	37558	78	48128A B	57
32891	33	33352	27	37559	81	41832	55, 57, 59
32892A B	35	33655	55, 57	37560	81	41833C	55, 57, 59
32893A	35	33991	29	37561	81	41834	55, 57, 59
32894	35			37562	81	41835	55, 57, 59
32895A	35	35504	55, 57, 59			41836	55, 57, 59
				37564	79		
32896	35			37565	78	41837	55, 57, 59
32897A	35	36407	37, 42	37566	81	41838	55, 57, 59
32898	35	37520B	81	37567	83	41839	55, 57, 59
32899	35	37521B	81	37568	78	41840	59
32900	35	37522	79	37569	78	41840B	55, 57
32901A	35	37523AD	81	37907B	78	41841	59
32902	35	37524B	81	38022A	41, 53	41841B	55, 57
32903A	35	37525	78			41842	59
				38023	41	41842B	55, 57
32904A	41	37526A B	81	38024	45	41843A	59
32905A	42, 53	37526AD	81	38025	41	41845	53
32905AC	37	37528A B	81	38026	45	41847A	53
32906	42	37529	81	38027	45	41852A	53
32907	42	37531	83	38123	55, 57, 59	41855A	53
32907B	37	37531B	83				

NUMERICAL INDEX — Continued

<i>Part No.</i>	<i>Page</i>	<i>Part No.</i>	<i>Page</i>	<i>Part No.</i>	<i>Page</i>	<i>Part No.</i>	<i>Page</i>
41857A	53	45642	29	46496AB	83	59484A	57
41858	53	46087	49, 51	46545	25	59484AB	55
41859	53	46088	49, 51	46698	55, 57, 59	59486	41
41864	53	46093	55, 57, 59	46861	78	59487	41
43208	25, 49, 51	46096	49, 51	49505	49, 51	59618	83
	53, 57, 59	46098	49, 51	49507	49, 51	90208	55
43209	25, 53, 57, 59	46102	27	59055	49, 51, 79	90210A	55
43307	25	46222	83	59056	49, 51, 79	90849	55
44314	55, 57	46496A	83	59058	33	92003A	23

SPECIFICATIONS

HYSTER MODEL **D4 TOWING WINCH**

Drum Size:

Barrel Diameter	8 "
Flange Diameter	16 $\frac{1}{2}$ "
Barrel Length	14 "

Cable Capacity, Maximum Line	485 ft. $\frac{5}{8}$ "
Allowance should be made for loose and unevenly spooled line in towing service.	335 ft. $\frac{3}{4}$ "

AVAILABLE LINE PULLS:

Bare Drum	15,400 lbs.
Full Drum	8,580 lbs.

Line Speeds:

Bare Drum	91 f.p.m.
Full Drum	164 f.p.m.

(Line Speeds and Pulls are the same when overwinding or underwinding)

**Net Weight, including Transmission and Controls,
(without cable)**

1,225 lbs.

Domestic Shipping Weight, Approx.

1,350 lbs.

Code Word

FHDTW

