TM 5-8064

WAR DEPARTMENT TECHNICAL MANUAL

CRANE, TRUCK-MOUNTED BRIDGE ERECTOR, HYDRAULIC-OPERATED, HEIL MODEL M-11-A

WAR DEPARTMENT • 6 MAY 1944

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TM 5–8064, Crane, Truck-Mounted, Bridge Erector, Hydraulic Operated, Heil, Model M–11–A, is published for the information and guidance of all concerned.

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For explanation of symbols see FM 21–6.

OPERATIONS SECTION

REPAIR SECTION

PARTS CATALOG

OPERATION SECTION

Figure 1. Hydraulic Bridge Erecting Crane with Typical Load

1. DESCRIPTION OF TRUCK BODY AND HYDRAULIC CRANE M-II-A

a. PRELIMINARY INSTRUCTIONS

(1) This Operating and Maintenance manual has been prepared as a guide to the proper operating and maintenance procedure for the Steel Treadway Bridge Hydraulic Crane, M-II-A. Instructions in this manual do not apply to the truck chassis—consult the truck manual for information applying to the truck itself, and the front-mounted winch.

(2) The use of hydraulic cylinders to operate the crane gives smooth operation with simplified control. With practice and complete mastery of these instructions, this unit can be operated and maintained by anyone who can operate and maintain a truck.

(3) Proper lubrication and proper oil in the hydraulic system in sufficient quantity is vitally important. All oil leaks in the system must be promptly stopped. Before operating this unit be sure that it has been properly lubricated as explained by Figures 33, 34, and 35, Lubrication Charts. These charts show the location and type of lubricating fittings, the correct lubricating intervals, and the proper grade of lubricants for various operating conditions.

(4) The operator should study this manual carefully before attempting to operate a unit so that he is familiar with the operation of the crane.

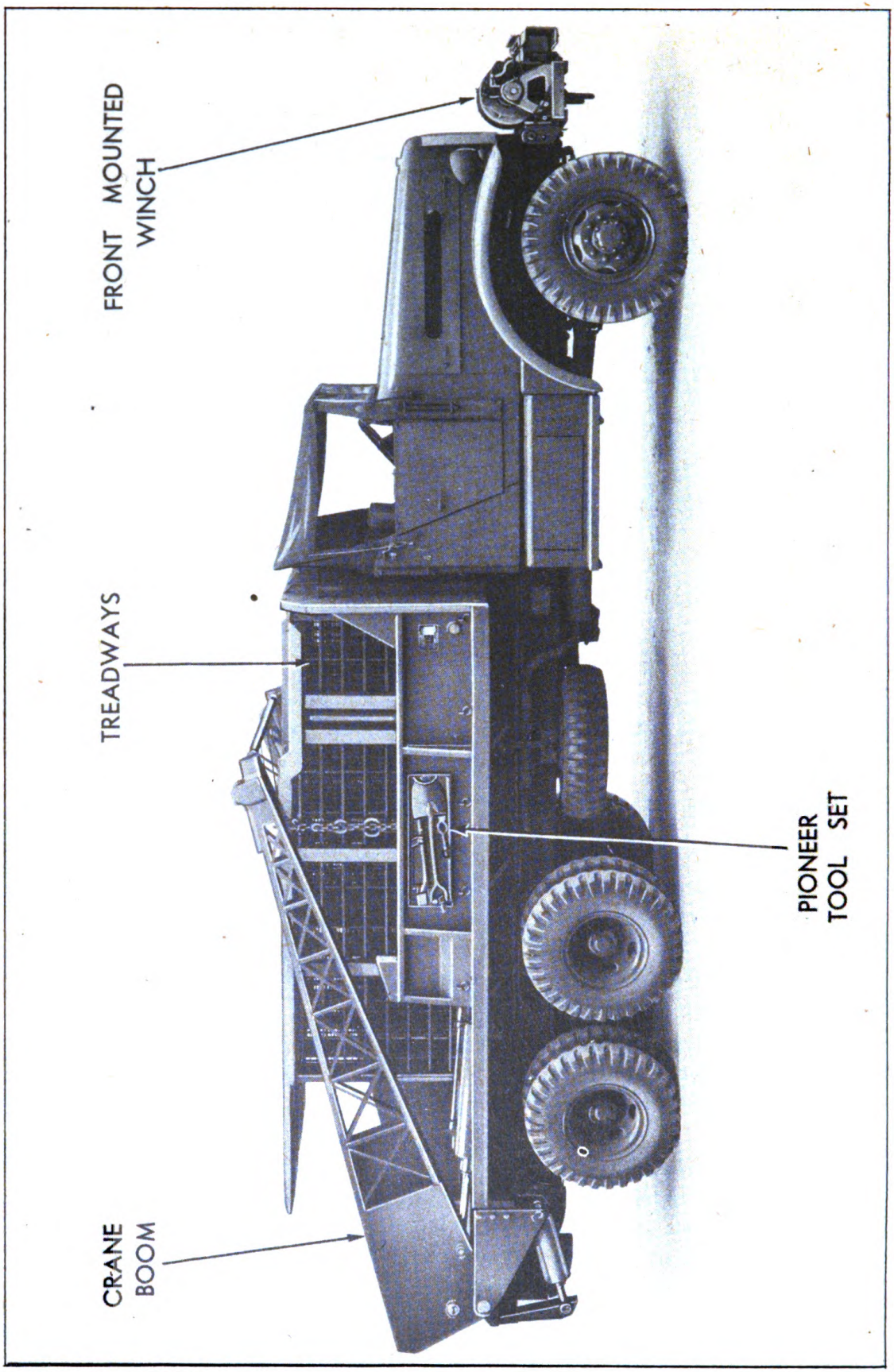


Figure 2. Side View of Hydraulic Bridge Erecting Crane

b. SPECIFICATIONS AND DIMENSIONS:

	Approx.
Gross Vehicle Weight	38,500 Lbs.
Gross Weight on Bogie	26,750 Lbs.
Net Wt.—Body & Crane	6,500 Lbs.
Cargo Capacity	12,000 Lbs.
Crane Capacity Normal	8,000 Lbs.
Weight of One 45" Treadway	2,400 Lbs.
Capacity Hydraulic System	35 Gals.

Use SAE 10 Oil (OE 10)

Overall Truck and Crane: Length 374"; Width 102"; Height 110"

Inside Body: Length 222"; Width 99"; Panel Height 63"

Shipping (Not Boxed) 266 Sq. Ft. or 2,437 Cubic Feet

Wheelbase ..... 220"

Ground Clearance Min. ..... 10¼"

c. GENERAL DESCRIPTION

(1) The M-II-A Truck Body and Hydraulic Crane is designed to carry four steel treadways and their supporting pontons, or 24 ft. of the Steel Treadway Bridge. Each unit is provided with a hydraulically operated crane to unload and position the steel treadways.

(2) A typically loaded unit is shown in Figure 1 and a partially loaded unit in Figure 2. The rubber pontons may be loaded either to the front or to the rear of the truck. For quick unloading of treadways, it is suggested that the pontons be placed at the rear of the truck to facilitate unloading.

(3) A tarpaulin is provided to cover the entire load and is shown, together with a method of fastening, in Figures 4 and 5.

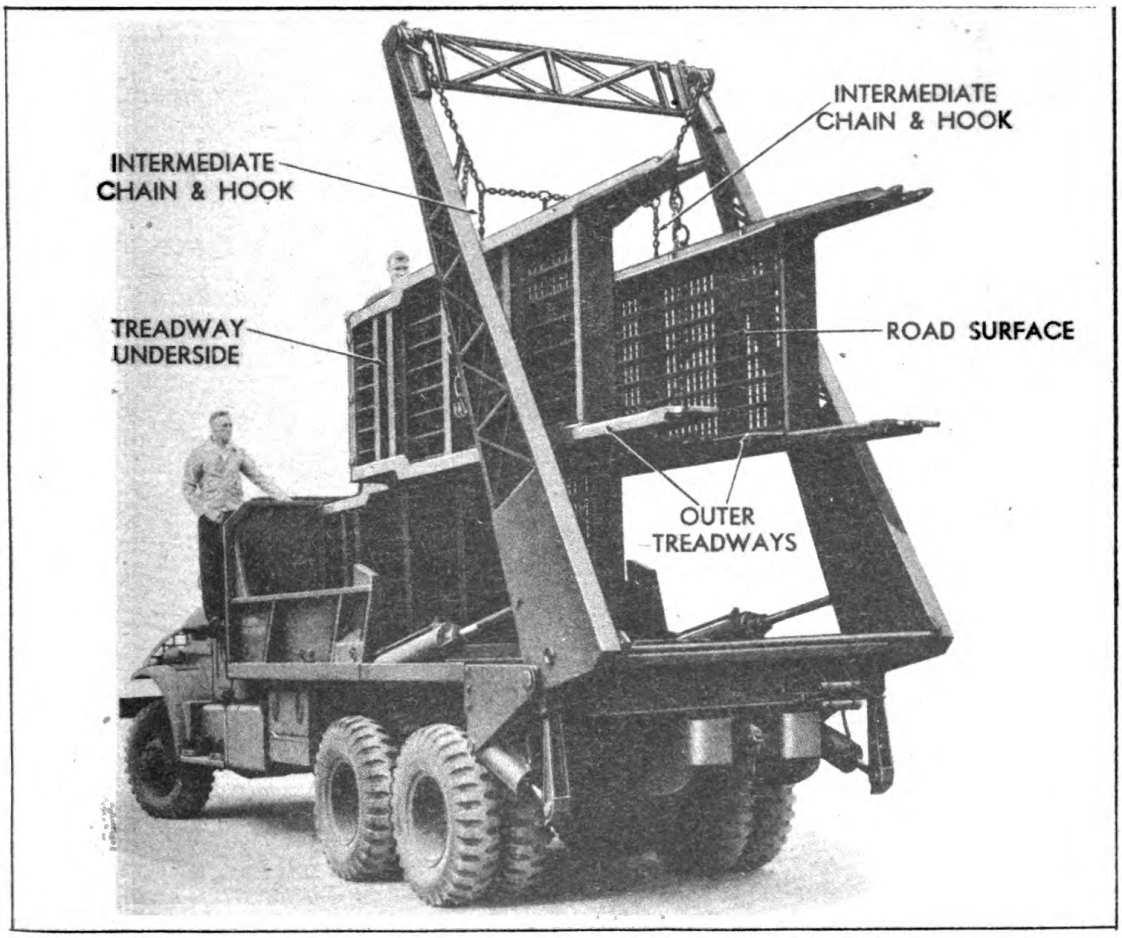


Figure 3. Hydraulic Bridge Erecting Crane in Operation

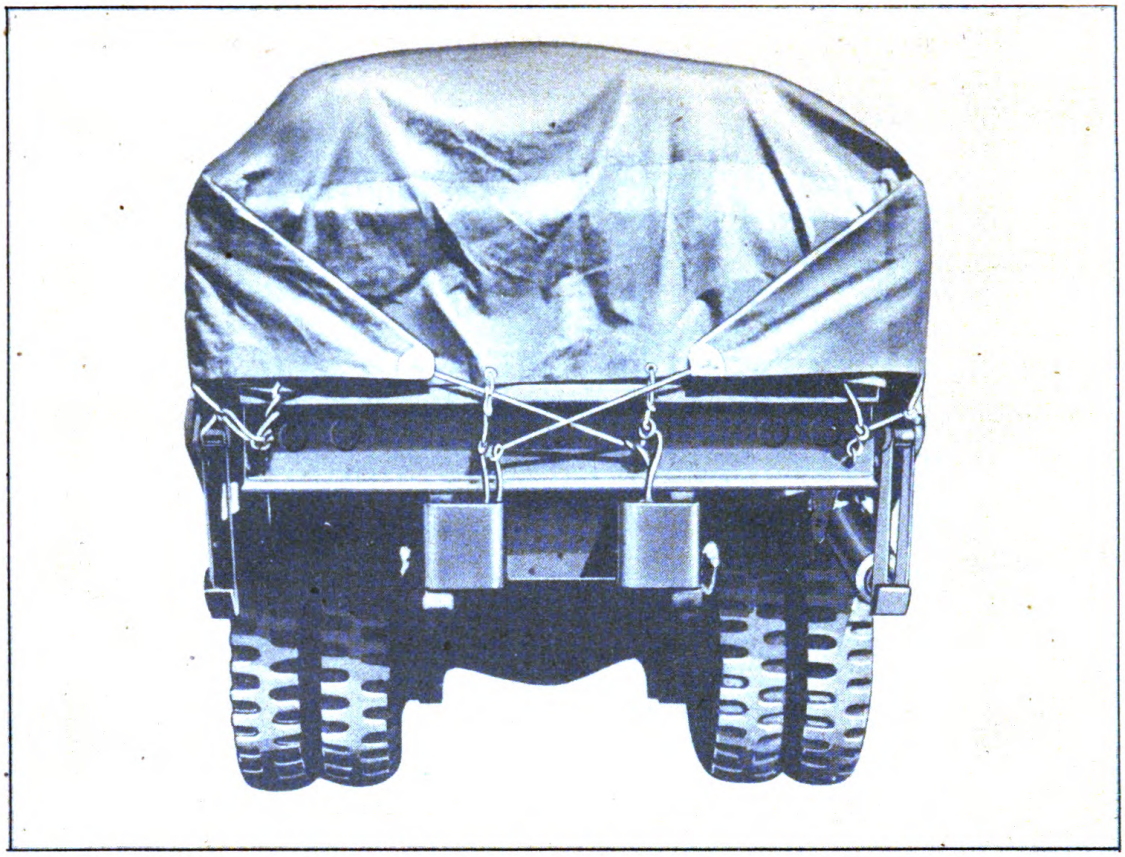


Figure 4. Rear View Showing Method of Attaching Tarpaulin

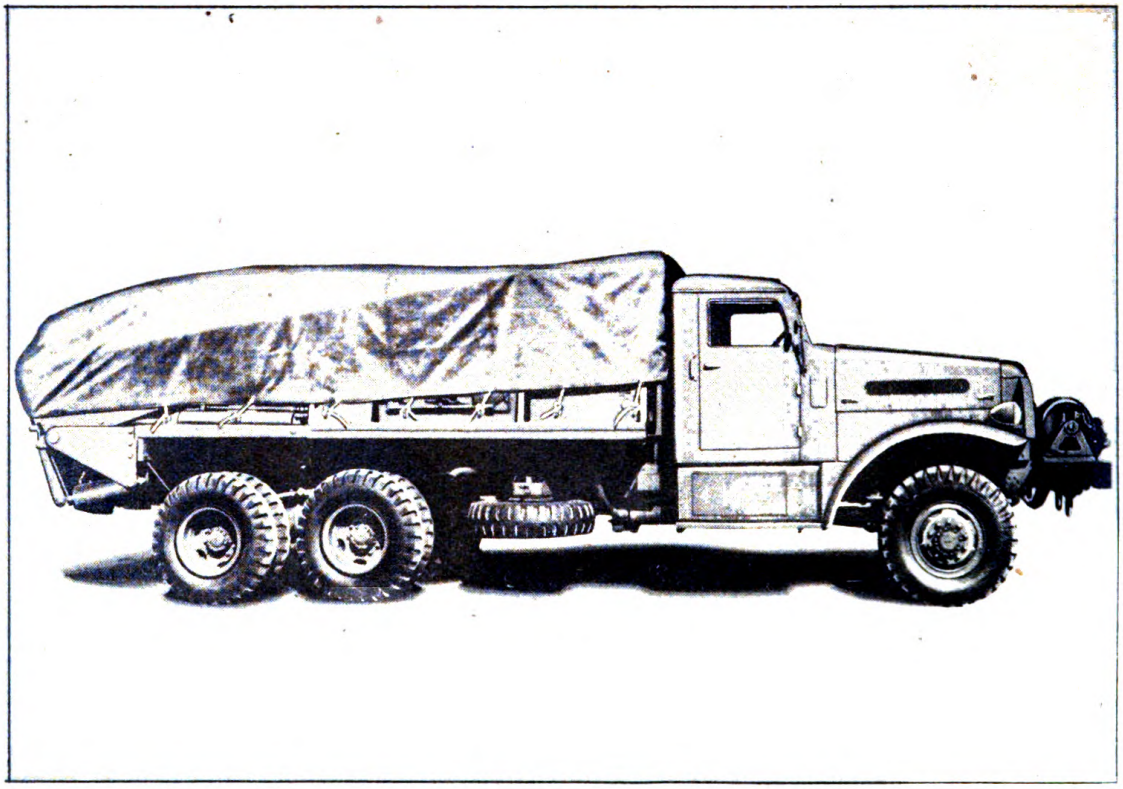


Figure 5. Side View Showing Method of Attaching Tarpaulin

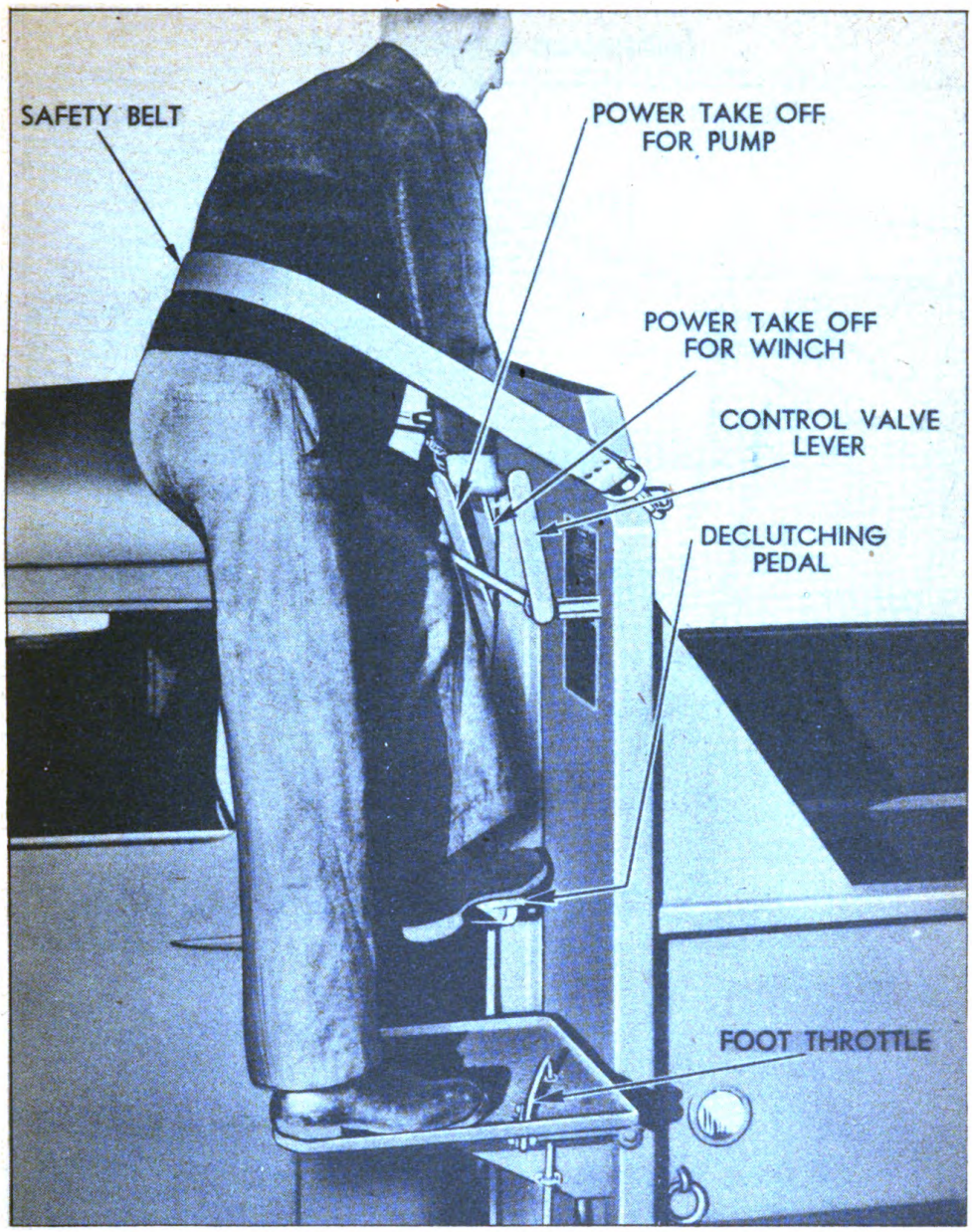


Figure 6. Operating the Crane Controls

(4) The crane is operated from a platform at the front of the body, Figure 6. With the truck engine running, the operator can control the entire operation of the crane from this platform. Arrangement of the controls is shown in Figure 13, Page 14.

(5) The hydraulic system which operates the crane is explained in Figures 7 to 10, inclusive. The hydraulic pump, which is driven by the truck engine through a power takeoff and drive shaft, forces the oil through the system to operate the cylinders. The flow of oil is controlled by one Main Valve and one Auxiliary Diversion Valve. (See Figure 11.) The function of the Diversion Valve is to permit the retraction of the piston rods in the Lower Cylinders. A reservoir (or reserve on tank) provides sufficient oil to replace that displaced by the piston rods when the pistons are retracted. This extra oil is required as the pistons are extended.

OPERATIONS SECTION

HYDRAULIC FLO-DIAGRAMS

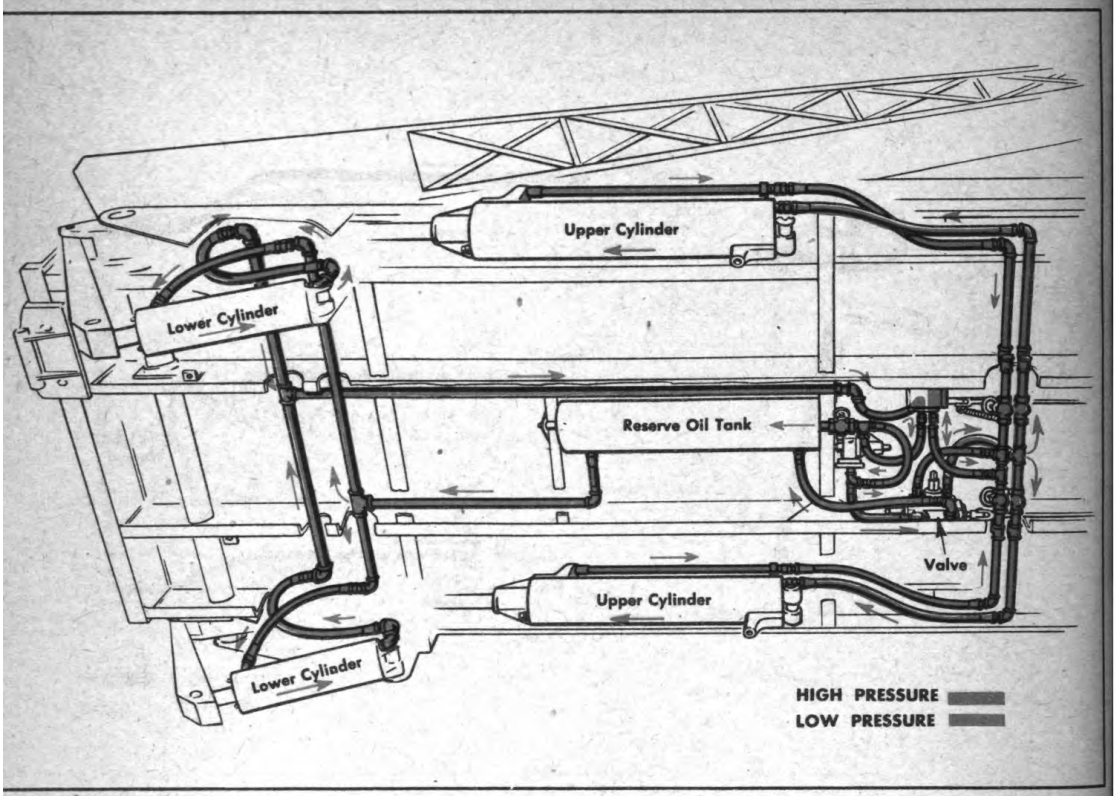


Figure 7. Valve Lever Toward Rear of Truck

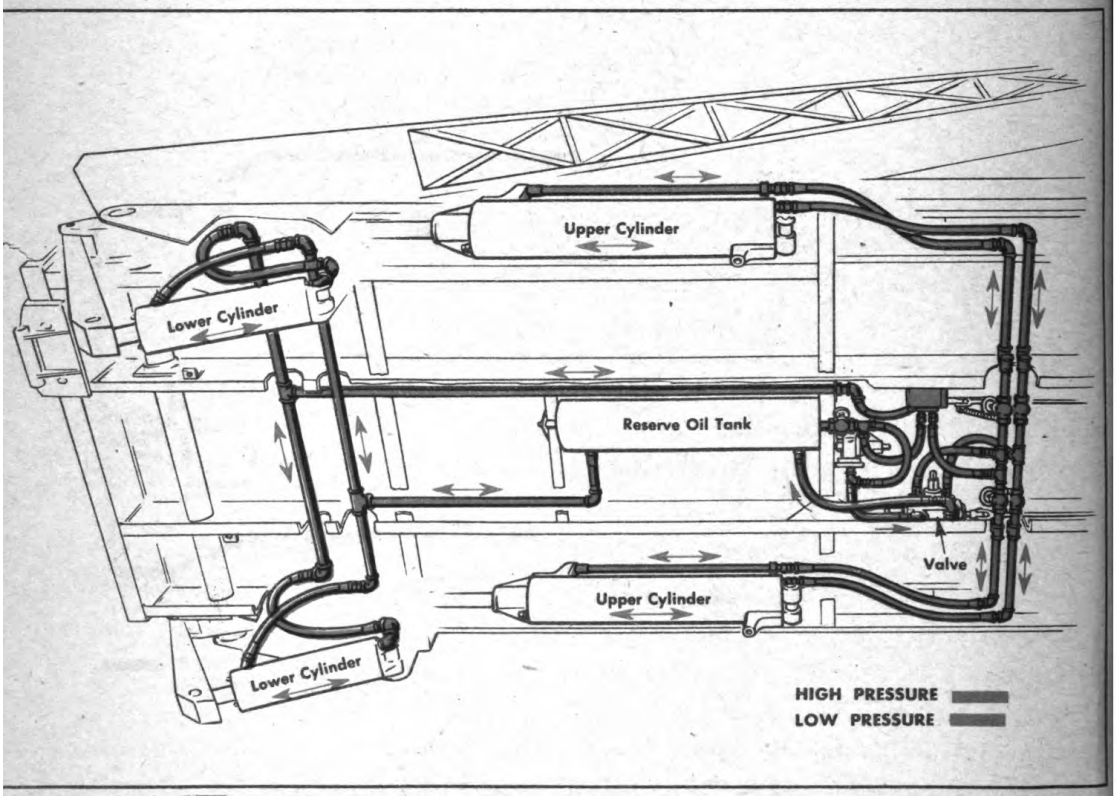


Figure 8. Valve Lever in Center or Neutral

HYDRAULIC FLO-DIAGRAMS

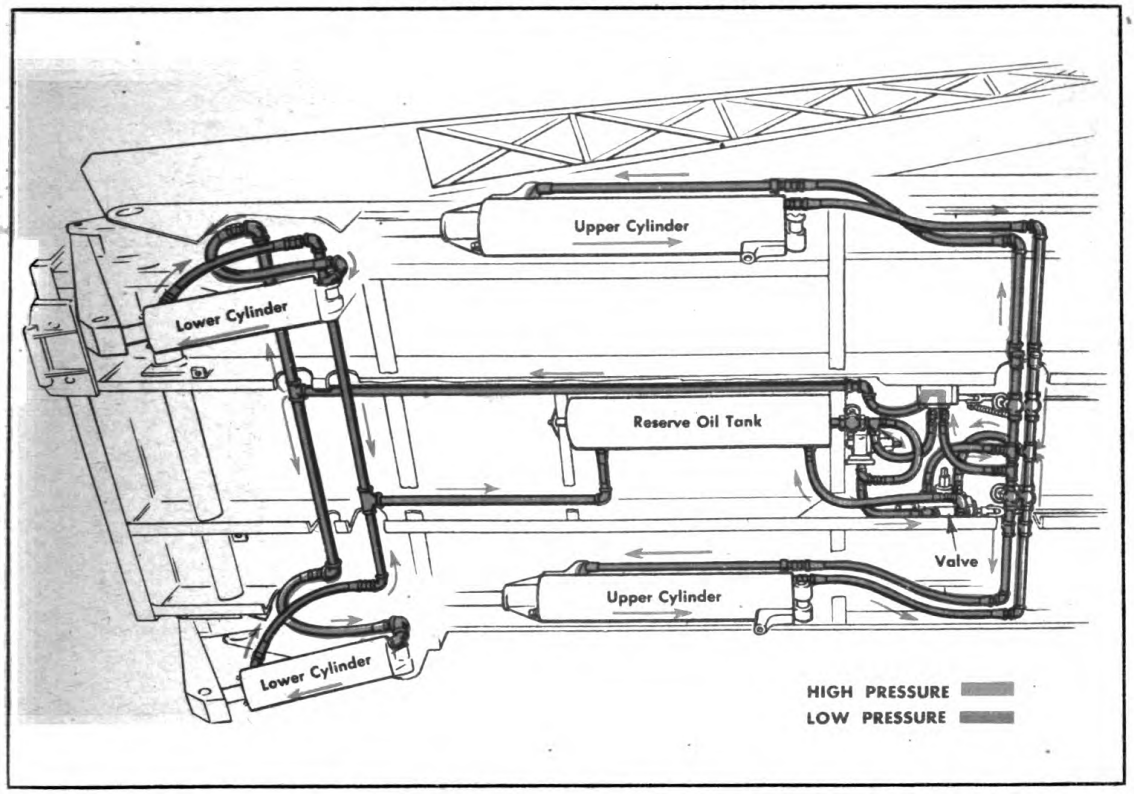


Figure 9. Valve Lever Toward Cab

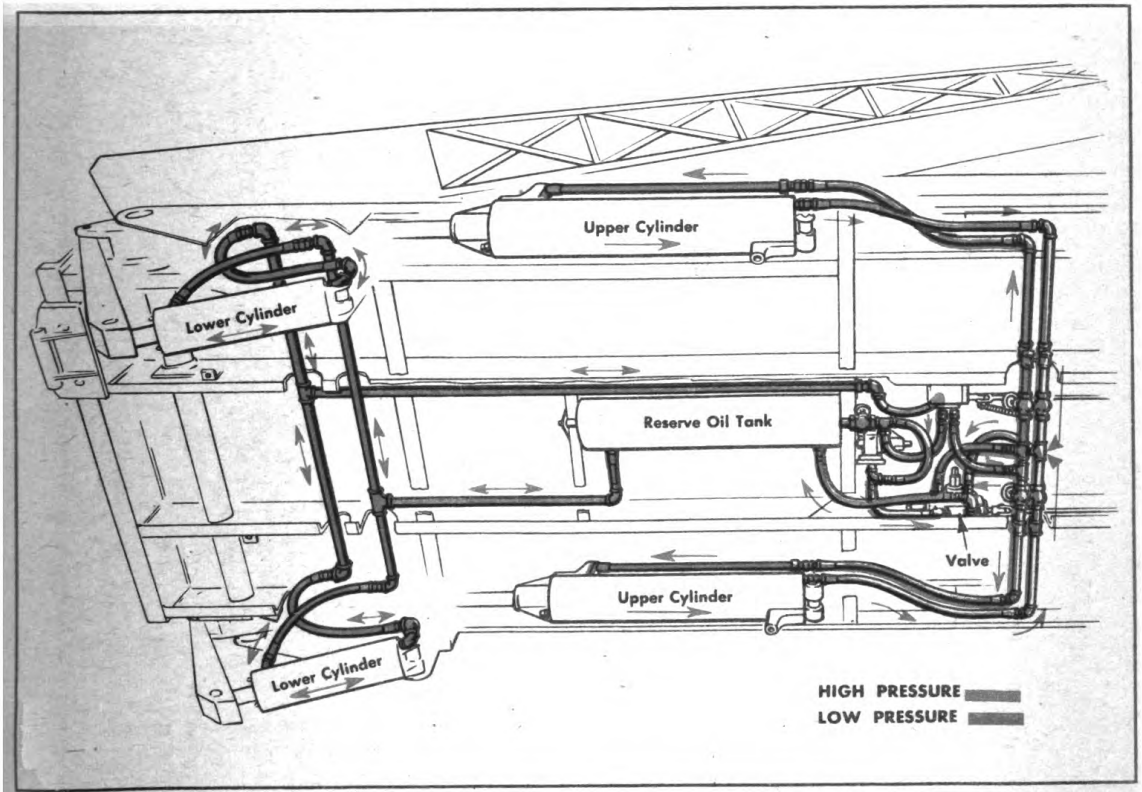


Figure 10. Valve Lever Toward Cab. Lower Cylinder Control Handle Pulled Toward Operator

OPERATIONS SECTION

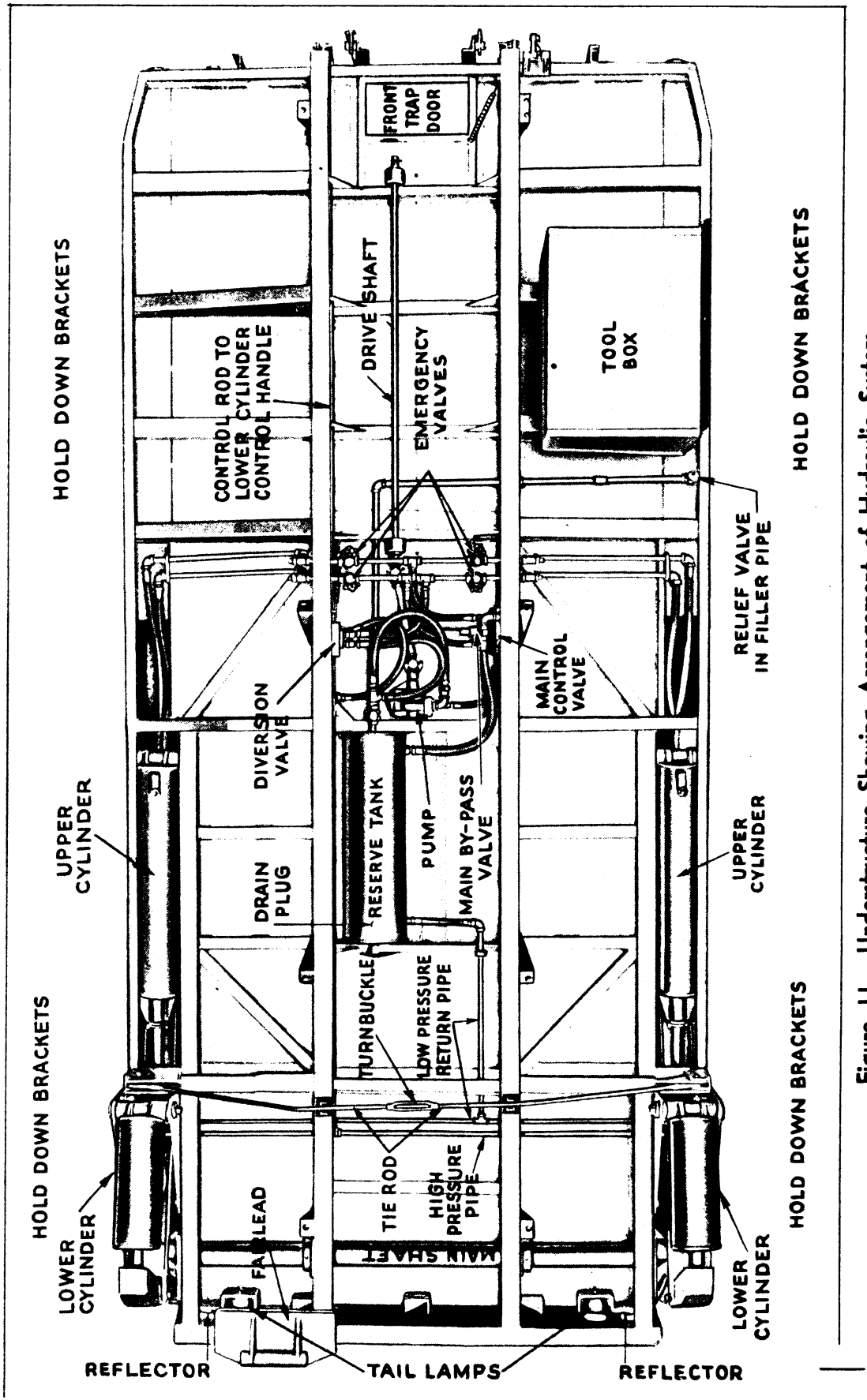


Figure 11. Understructure Showing Arrangement of Hydraulic System

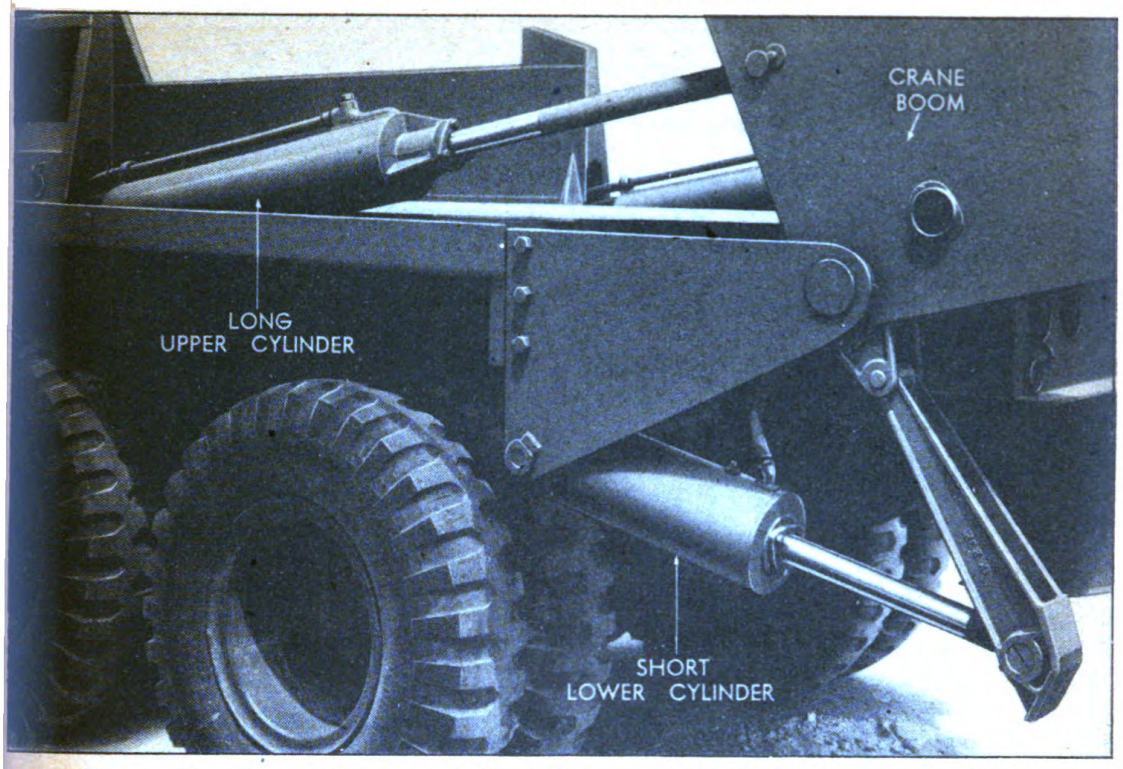


Figure 12. Long Upper and Short Lower Hydraulic Cylinders of Crane

(6) Four hydraulic cylinders operate the crane and are shown in Figure 12. The two long upper hydraulic cylinders control the boom while the two short lower ones act as boosters when the boom is in the extended position. The normal capacity of the crane with all four cylinders operating is 8,000 pounds.

(7) The unit is also provided with a fairlead at the right, rear corner, and a snatch block, so that treadways may be lowered beyond the normal reach of the boom by using the winch mounted on the front of the truck and threading the cable back through the fairlead—See Figure 31, Page 29.

(8) A Pioneer tool set consisting of a shovel, pick mattock and axe are mounted on the side of the body, see Figure 2.

(9) Tire chains, hydraulic jack and tools are carried in the tool box mounted under the left side of the body.

(10) The body and crane unit is held to the chassis with special hold-down brackets. The Repair Section of this manual shows these brackets.

2. GENERAL OPERATION OF UNIT

a. PREPARING THE UNIT FOR USE

(1) The first duty of anyone charged with the care and operation of a bridge erecting unit should be to give a detailed inspection and to lubricate all parts as explained by Figures 33, 34, and 35.

CAUTION: DO NOT use oil drained from these cylinders in the truck engine or for lubricating other machinery.
DO NOT fill the hydraulic system with crankcase drainings or other oil which is not absolutely clean.

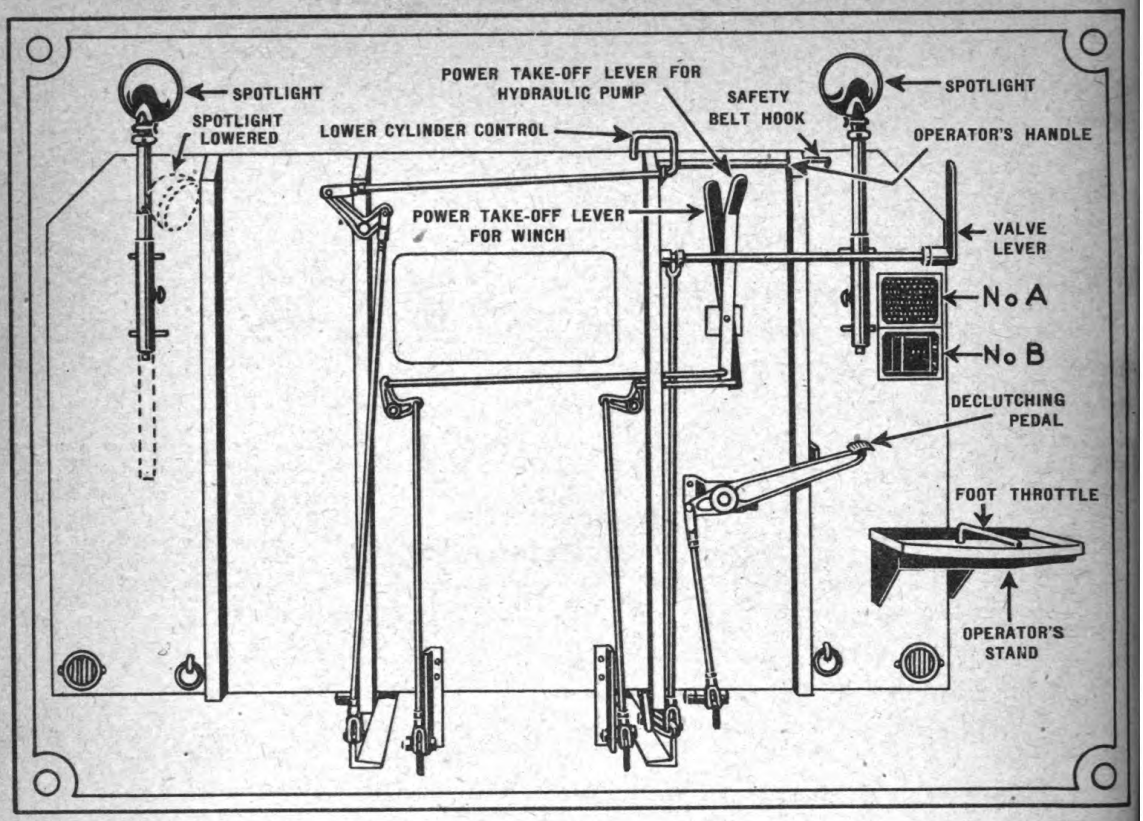
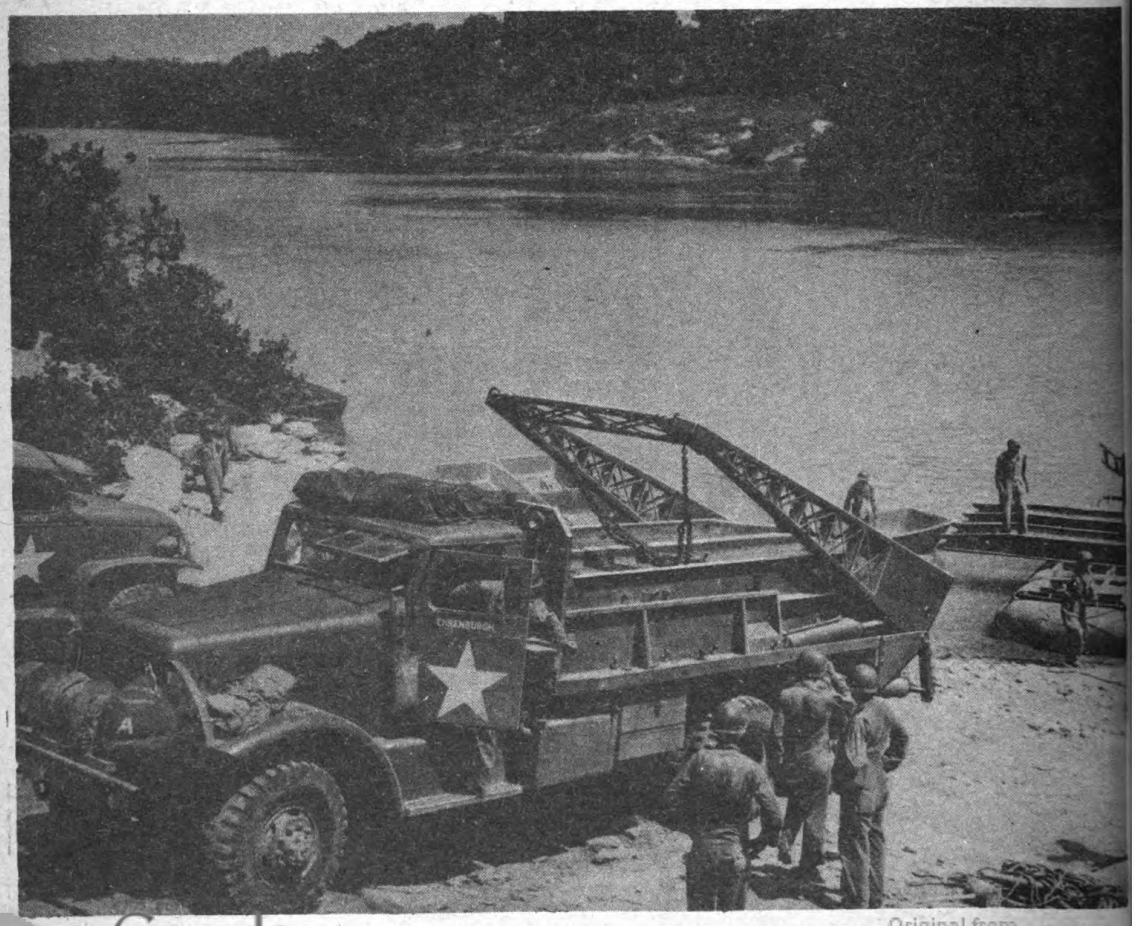


Figure 13. Instruction Plate "B"



(2) Should it be necessary to add oil or refill the hydraulic system, use any good grade of SAE No. 10 oil (OE 10). For operation at temperatures of zero or below, see Instructions on Page 32, Paragraph 5 "a".

b. INSTRUCTION PLATES

On the front of each unit will be found two metal instruction plates as shown in Figure 13 and 14.

Plate "A", a copy of which follows, outlines the complete operating instructions. If these instructions are followed in the sequence given, no difficulty should be encountered in the operation of the hydraulic bridge erecting crane:

HYDRAULIC BRIDGE ERECTING CRANE

OPERATING INSTRUCTIONS

1. Disengage clutch by pressing down on declutching pedal.
2. Engage Power Take-off by pulling outer lever to the right as far as possible.
3. Release clutch pedal which will operate hydraulic pump.
4. Extend piston rods in lower cylinders by pulling Valve Lever forward or toward front. Note: THESE RODS MUST ALWAYS BE EXTENDED BEFORE UNIT IS READY TO OPERATE WITH LOAD.
5. To unload or move boom in rearward direction—push Valve Lever toward rear of truck.
6. To load or return boom toward cab—pull Valve Lever toward front.
7. To hold boom in any position—place Valve Lever in neutral or center. (When released, lever will return to neutral position automatically.)

CAUTION

WHEN BOOM IS NOT BEING OPERATED—Piston Rods in lower cylinders must always be pushed in (or retracted) to prevent rusting.

a. Force lower piston rods in by moving boom, UNDER NO LOAD, to extreme rearward position.

b. Pull Lower Cylinder Control Handle as far as possible to right and hold. Move boom to riding position UNDER NO LOAD.

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Figure 14. Operating Instructions, Plate "A"

Plate "B" is the Diagram of the Front Panel of the Body showing all controls and levers, etc., which are also shown in detail in Figure 13.

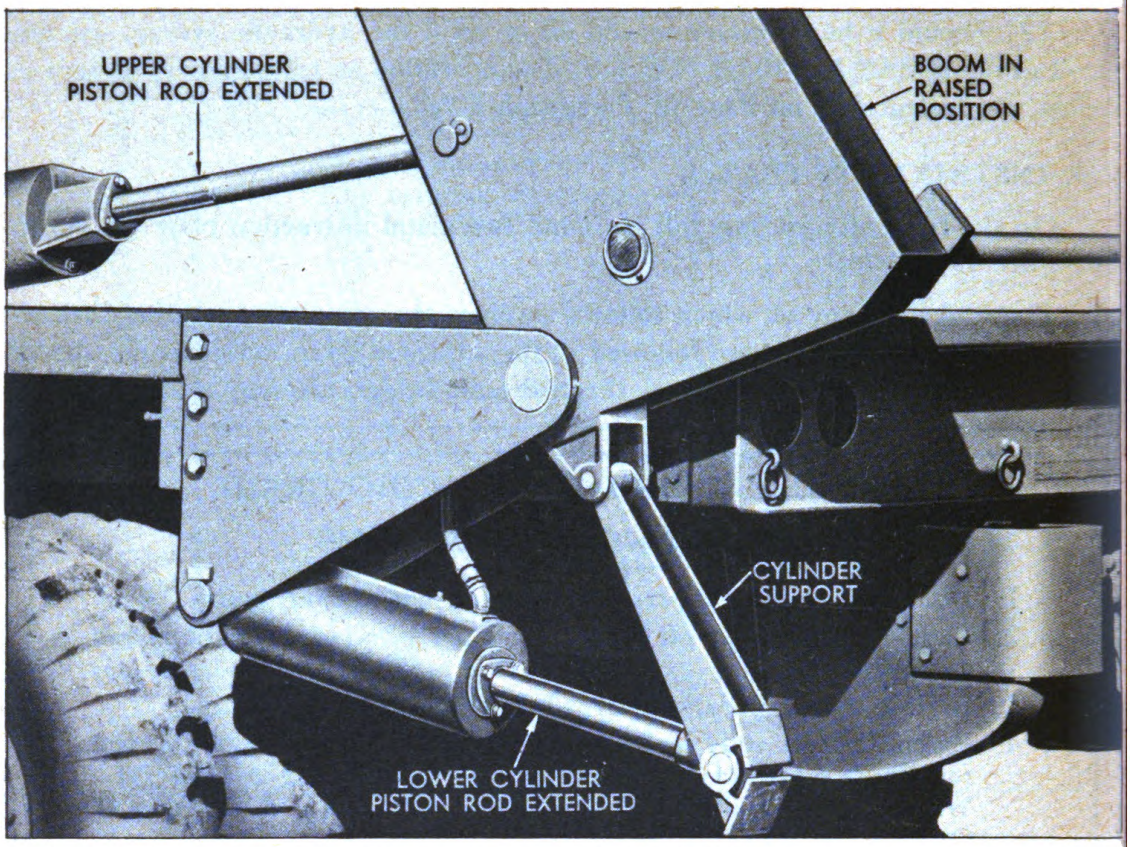


Figure 15. Piston Rods of Lower Cylinders Extended (Unit Ready for Operation)

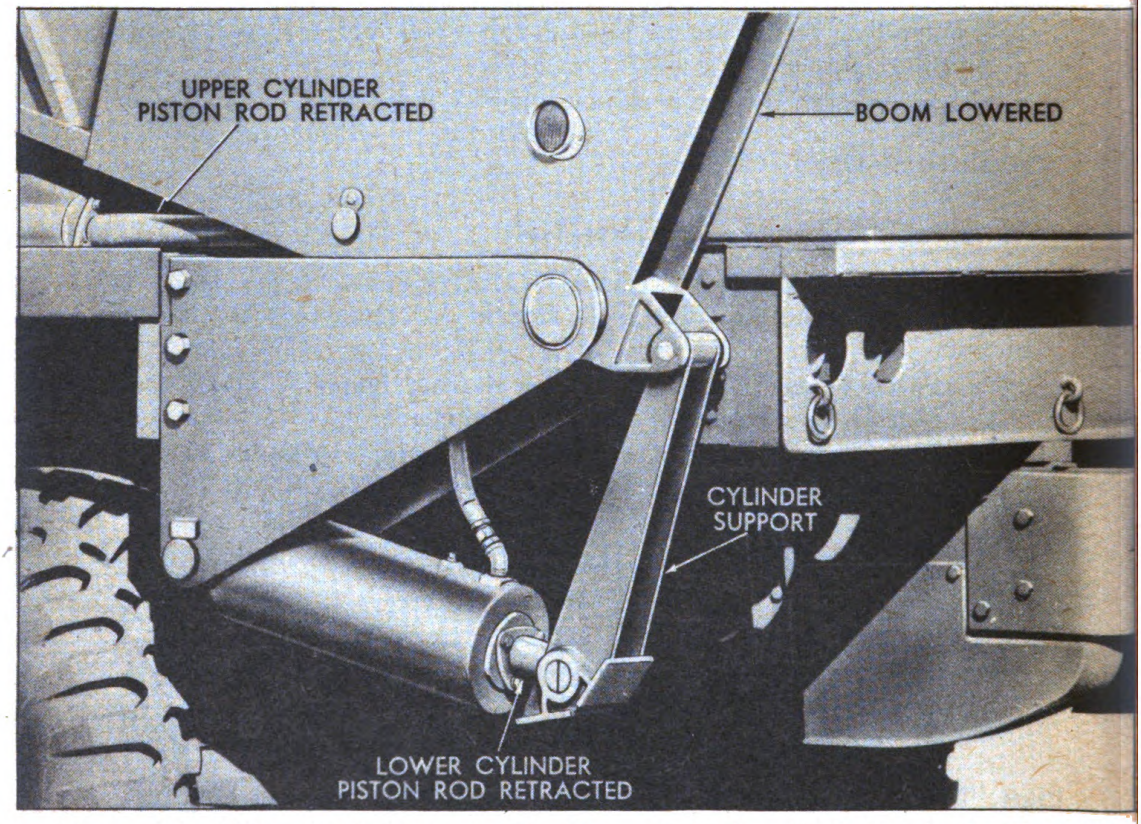


Figure 16. Piston Rods Retracted in Lower Cylinders (Unit Ready for Transit)

c. OPERATING PRECAUTIONS

Extreme caution should be used with regard to Procedure No. 4 to be sure that the piston rods in the lower cylinders are fully extended before lifting a load from the body of the truck. These rods must be extended so that after the boom passes beyond the vertical position, the piston rods of the lower cylinders will be in a position to receive the weight of the load at that point. Figure 15 shows the piston rods in the proper position ready to receive a load.

Figure 16 shows the piston rods fully retracted with the boom in riding position and the unit ready for transit or storage. In this position the piston rods are not exposed to the weather which would cause rusting. See **"CAUTION"** on Instruction Plate.

To retract or return the pistons in the lower cylinders for transit, or storage see Procedure "a" and "b" on Instruction Plate "A" under heading of **"CAUTION"**, see Figure 14 on Page 15.

d. OPERATION OF POWER TAKE-OFF FOR WINCH

Also mounted on the front panel of the body is the power take-off lever for the winch which may be moved to the right as well as to the left, for reversing the direction of the winch. With the power take-off lever in center position, the power take-off will remain in neutral. See Figure 13. The front-mounted winch is used to operate the cable when raising or lowering the treadways with the snatch block.

e. EMERGENCY OPERATION

Provision is made to operate the unit with either of the upper cylinders, (i.e. one upper cylinder may be damaged and the crane may be still operated with a reduced load). To accomplish this, close the two emergency valves (Figures 11 and 17) in the high and low pressure lines on the side which is damaged. Remove the pin of the damaged cylinder, which attaches the end of the piston rod to the boom.

Closing the two valves, directs the flow of oil to the cylinders on the opposite sides, which will enable the boom to be operated with the two lower cylinders and the one upper cylinder.

> **CAUTION:** When operating in this manner, no more than one treadway should ever be handled.

The emergency valves are located under the center trap door of the floor of the body and can be reached from the under side of the truck chassis. Metal caution tags will be found on each of these valves. The valves should NEVER BE CLOSED except in case of emergency. Valves should be checked periodically to see that they have not been closed accidently.

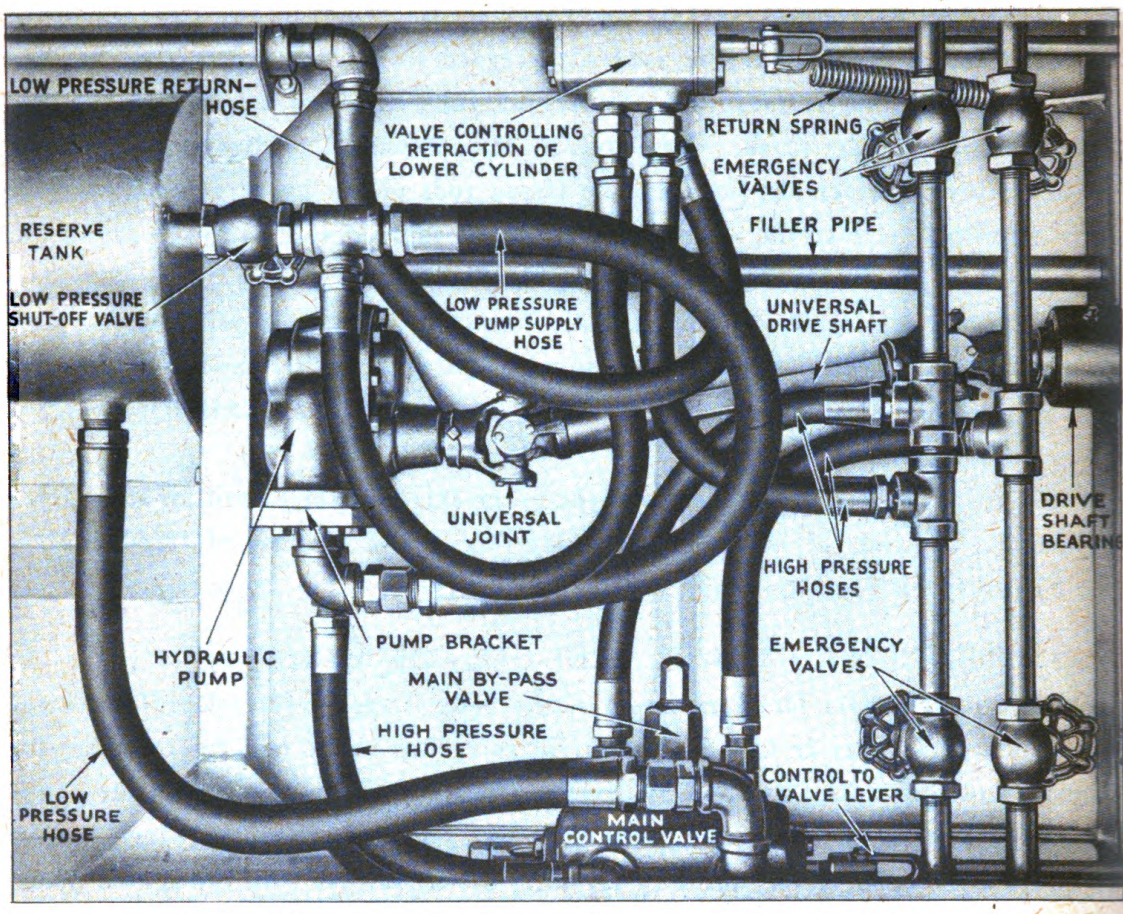


Figure 17. Hydraulic System Showing Emergency Valves

3. PROPER METHOD OF HANDLING 45 inch TREADWAYS

a. DESCRIPTION OF LOAD

Four bridge treadways, two ponton saddles, and two pontons are carried in the body of the bridge truck as shown in Figure 1. The four treadways are placed on edge in the truck body with the road surfaces of the two center treadways facing each other, and the road surfaces of the two outer treadways facing in toward each other. The long open ends of the four treadways face toward the rear so the pontons can be placed at the rear of the truck to facilitate unloading. The ponton saddles are carried on top of the four treadways. The crane boom rests on the saddles during transit.

b. HOW TO UNLOAD ON GROUND

(1) The treadways should be loaded and unloaded two at a time. Unload the outer two treadways first, with the road surfaces toward each other as shown in Figure 18. Use the slip hooks on the intermediate length chain of the upper cross chain assembly. Insert a slip hook in the center eye located on the side surface of each treadway as shown in Figure 19.

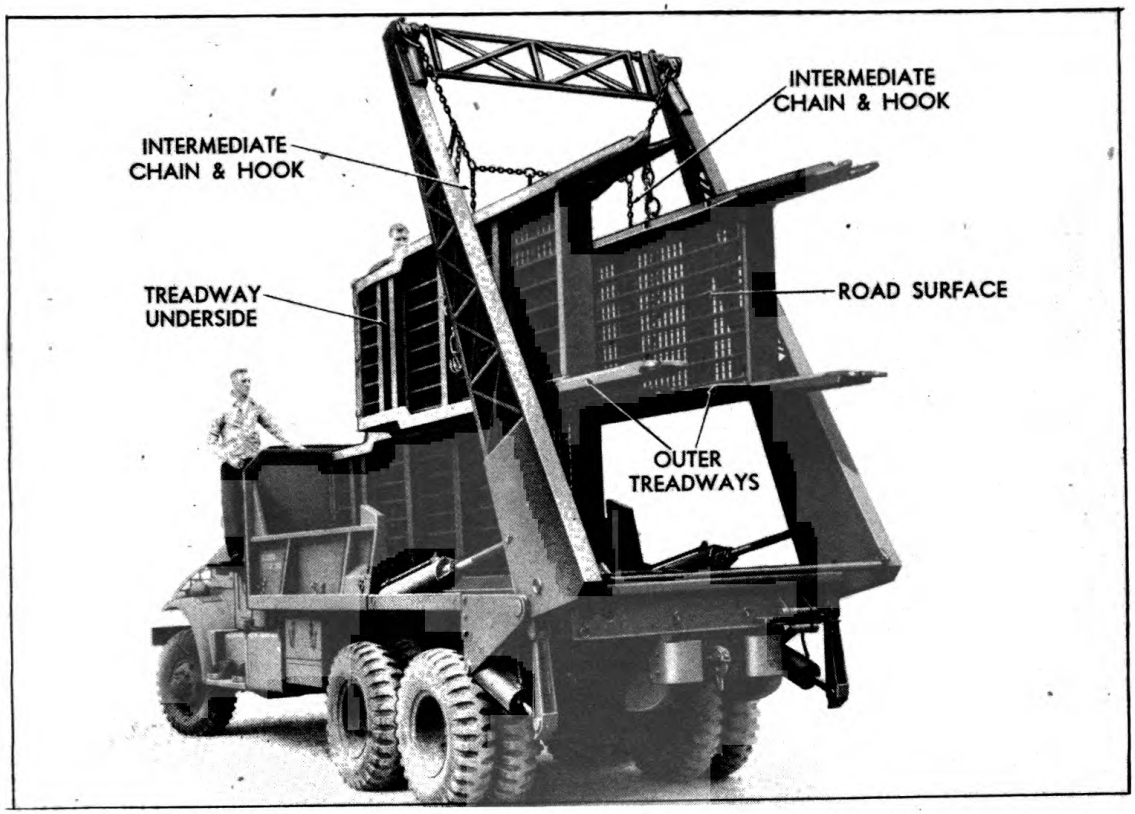


Figure 18. Unloading Two Outer Treadways First. Road Surfaces to Inside

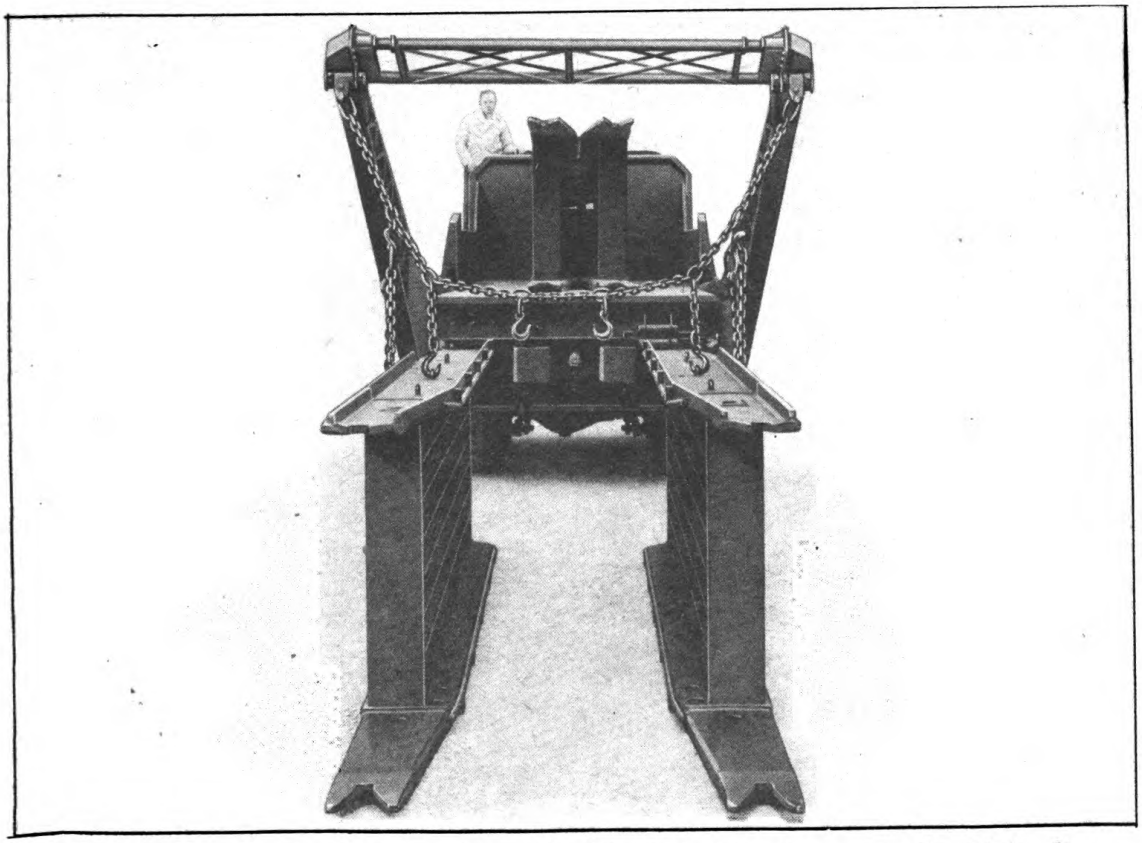


Figure 19. Method of Attaching Slip Hooks to Treadway Eyes for Unloading

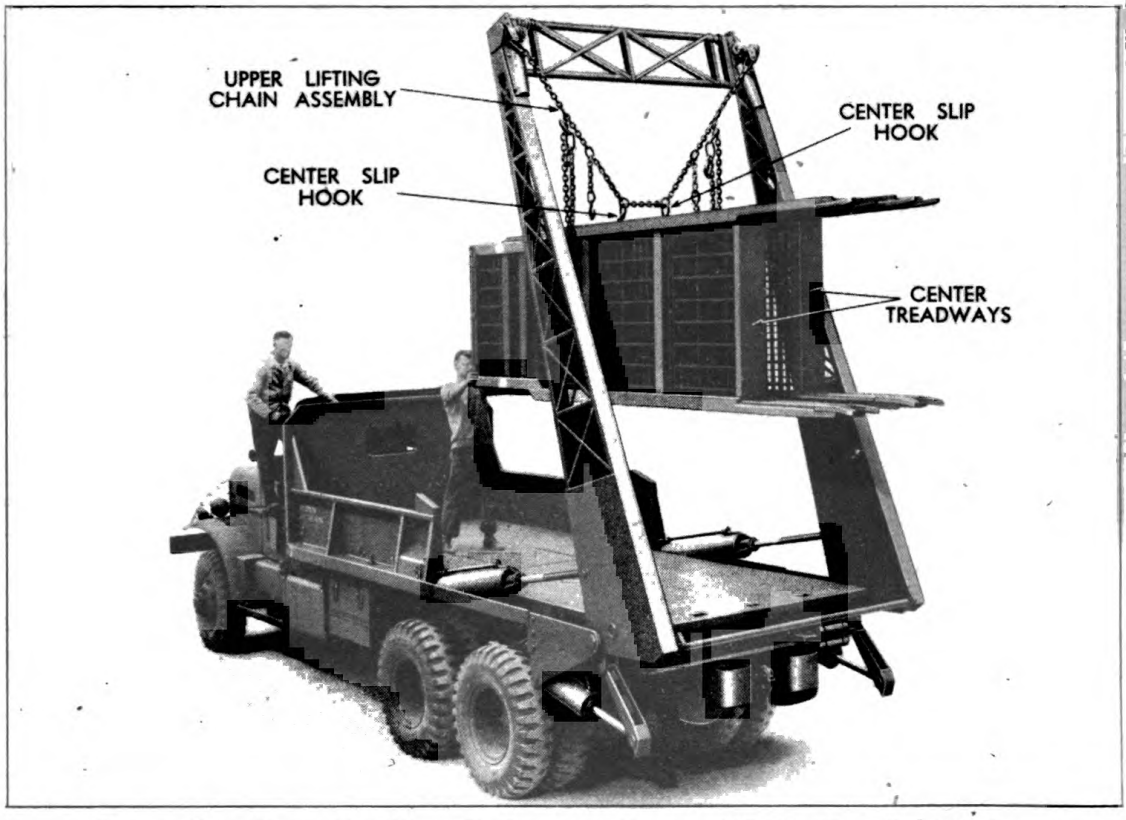


Figure 20. Removing Two Center Treadways with Center Slip Hooks

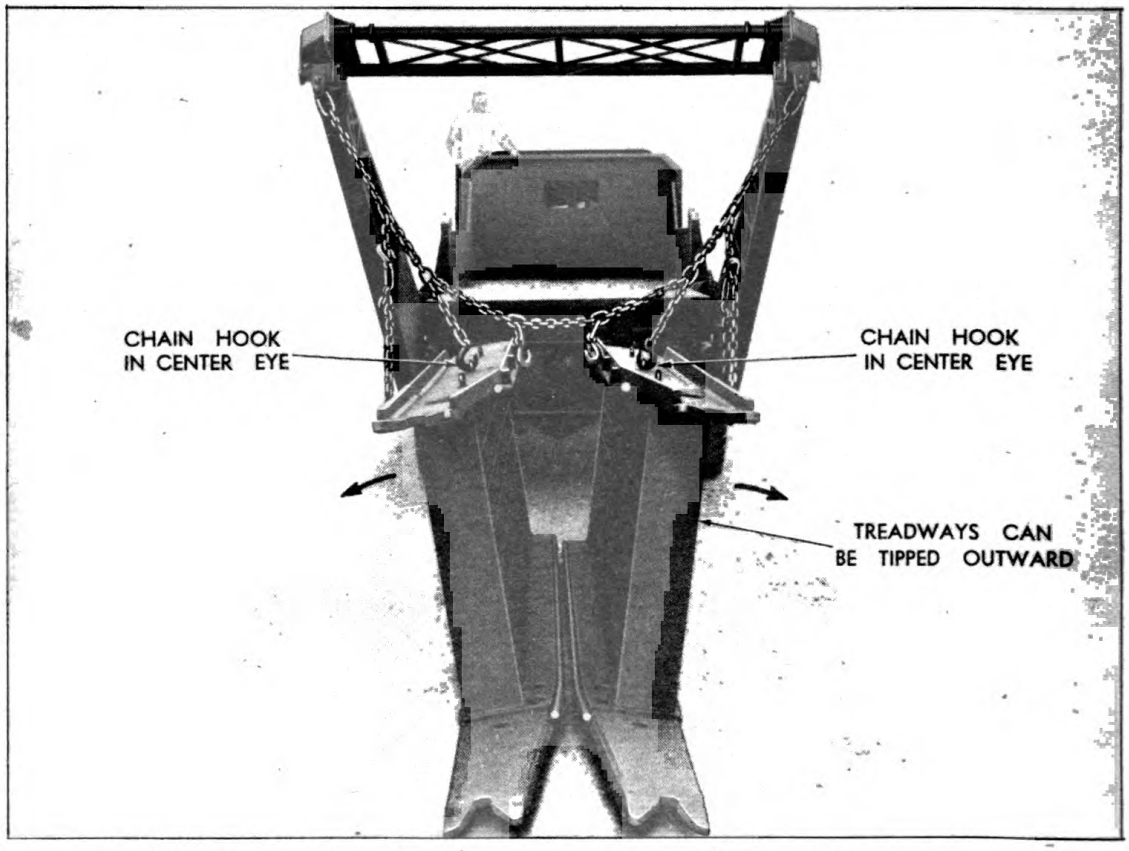


Figure 21. Tipping Center Treadways to Horizontal Position

(2) The inner two treadways are removed from the truck by using the two center slip hooks on the upper cross chain assembly. See Figure 20. The slip hooks are inserted in the center eye on the side of each treadway.

(3) Always load and unload the treadways with the road surfaces toward each other. By handling the treadways in this manner they can easily be laid over to the horizontal position by tipping them away from each other. See Figure 21.

c. HOW TO SPACE TREADWAYS

(1) To properly space the bridge treadways for the spacer bars, first attach the lower treadway hooks through the horizontal holes located about the center of the sides of the treadways. With the lower treadway hook in a horizontal position, insert it through the hole from the inside of the treadway side. Then twist it to the vertical position so the treadway hook bears against the side of the treadway as shown in Figure 22.

(2) Insert the outer lifting chains through the pear-shaped grab links of the lower treadway hook assemblies so the pear-shaped grab links lock on the outer lifting chain just above the large connecting links at the ends of the lifting chains as shown in Figure 22.

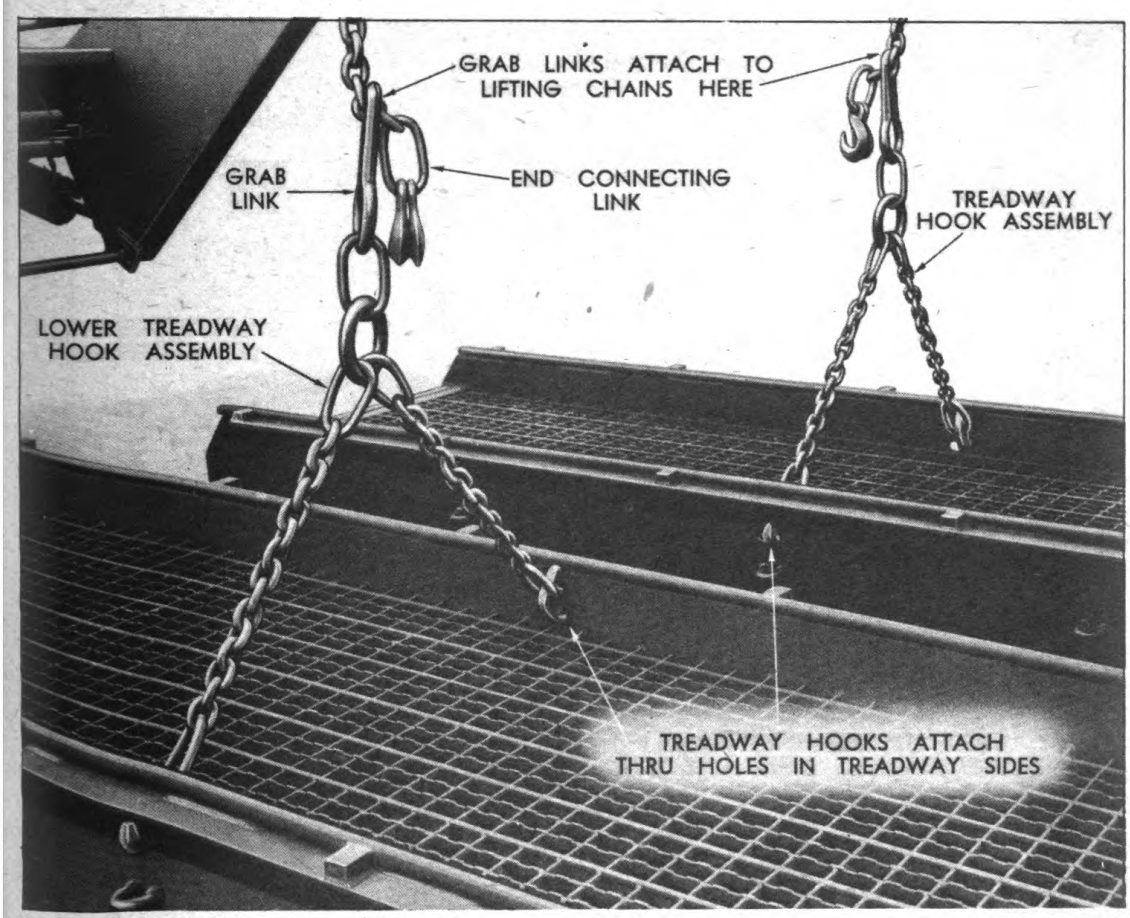


Figure 22. Proper Method of Attaching Lower Treadway Hooks

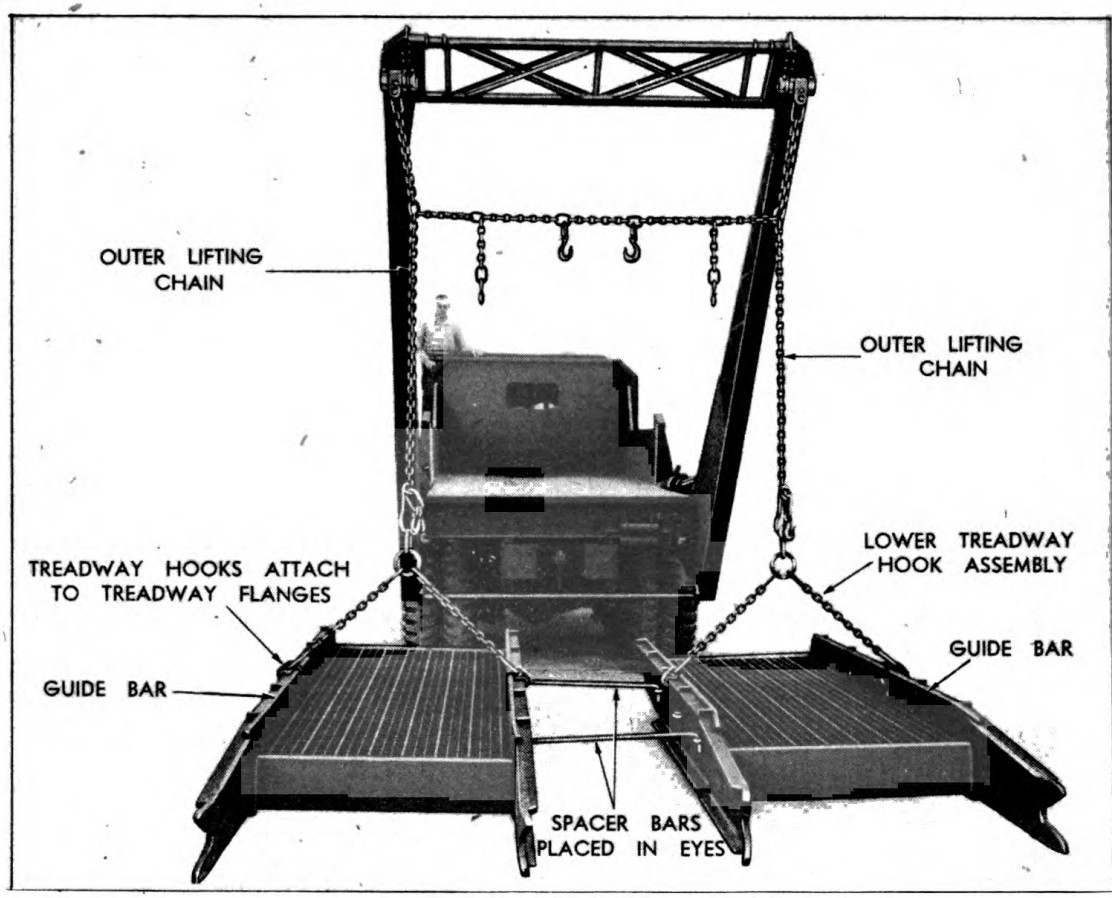


Figure 23. Treadways Properly Spaced with Bars. Note Chain Arrangement

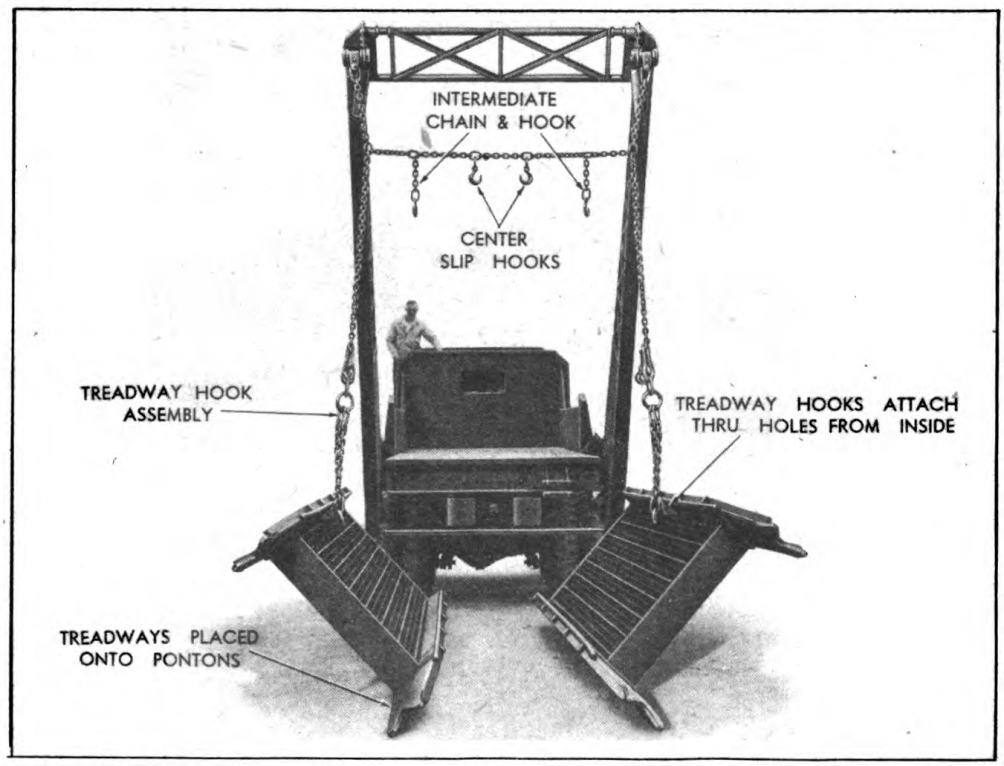


Figure 24. Method of Lowering Treadways onto Pontons

(3) Raise the boom until the treadways swing freely and they will hang in the proper position for inserting the spacer bars. Each pair of treadways are connected by two spacer bars. These bars are inserted through eyes located toward each end of the sides of the treadways. See Figure 23.

d. HOW TO UNLOAD ON PONTONS

(1) To unload the bridge treadways directly to the saddles on the pontons, use the procedure described in Paragraph *b.*, pages 18 and 21, with the following exception. It is necessary to lower the treadways to a horizontal position by ATTACHING THE LOWER TREADWAY HOOKS TO THE INNER SIDES OF THE TREADWAYS as shown in Figure 24. This permits lowering the treadway slowly to the saddle, thus preventing any damage.

(2) For properly spacing the treadways on the pontons, repeat the operation described in Paragraph C, Pages 21 and 23.

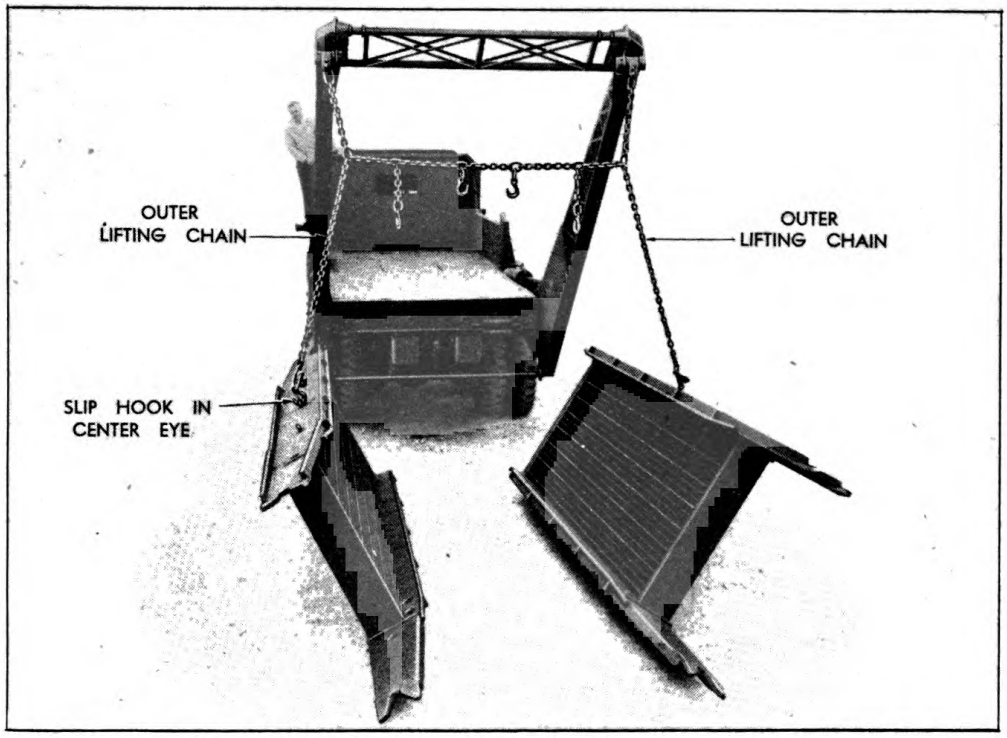


Figure 25. Using Slip Hooks to Stand Treadways on Edge for Loading

e. HOW TO LOAD TREADWAYS

(1) To load the treadways in the truck, remove the spacer bars, Figure 23, and attach the slip hooks on the outer lifting chains to the center eyes located on the outer sides of the treadways. Raise the boom to stand the treadways on edge. See Figure 25. DO NOT use the lower treadway hook assemblies for this operation!

(2) The first two treadways to be loaded should be moved to the extreme center in two operations as follows. First, attach the intermediate slip hooks to the center eyes after the treadways are standing on edge. Raise the boom and they will swing to the center. Secondly, attach the center slip hooks to the eyes and raise the treadways into place on the truck, Figure 20.

(3) Handle the second pair of treadways as in step (1) above, but load them into the truck when the intermediate slip hooks are attached. See Figure 18. Al-raise the treadways into place on the truck, Figure 20.

f. HANDLING THREE TREADWAYS IN LINE

(1) To handle three treadways in line, connect them together with the open ends away from the rear of the truck as shown in Figure 26. Insert the outer lifting chains through the rings of both treadway hook assemblies and fasten the GRAB HOOK on the end of each outer lifting chain to the opposite lifting chain at the position shown in Figure 27. This position permits maximum length of lifting chain.

CAUTION: DO NOT USE THE SLIP HOOKS AT THE END OF THE OUTER LIFTING CHAIN TO PERFORM THIS OPERATION. USE GRAB HOOKS FOR HOOKING TO LIFTING CHAIN.

(2) The hooks of each treadway hook assembly should be attached to the top flanges of the treadway and opposite each other, Figure 27. This prevents twisting of the chains when lifting. Figure 27 shows how the hooks attach just behind the second reinforcing block of the center treadway. Note also how the half-circle notch of the hooks lock over the guide bar on the treadway flange.

(3) The lifting chains are attached for maximum handling length. This permits raising the boom sufficiently to move the treadways forward under the truck so that lifting them will not overbalance the front end of the truck. It is obvious that the three treadways must be located in the center of the truck as in Figure 26. The end of the treadways which is under the truck must bear against the tie bar and frame skids as shown in Figure 28.

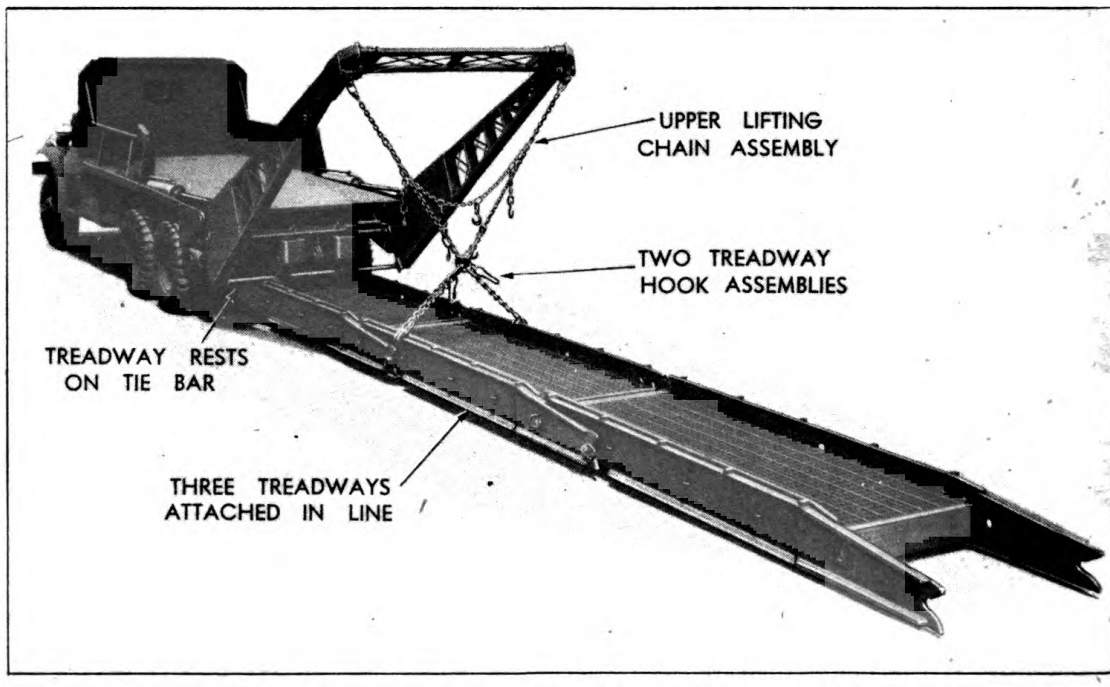


Figure 26. Handling Three Treadways in Line, Centered at Back of Truck

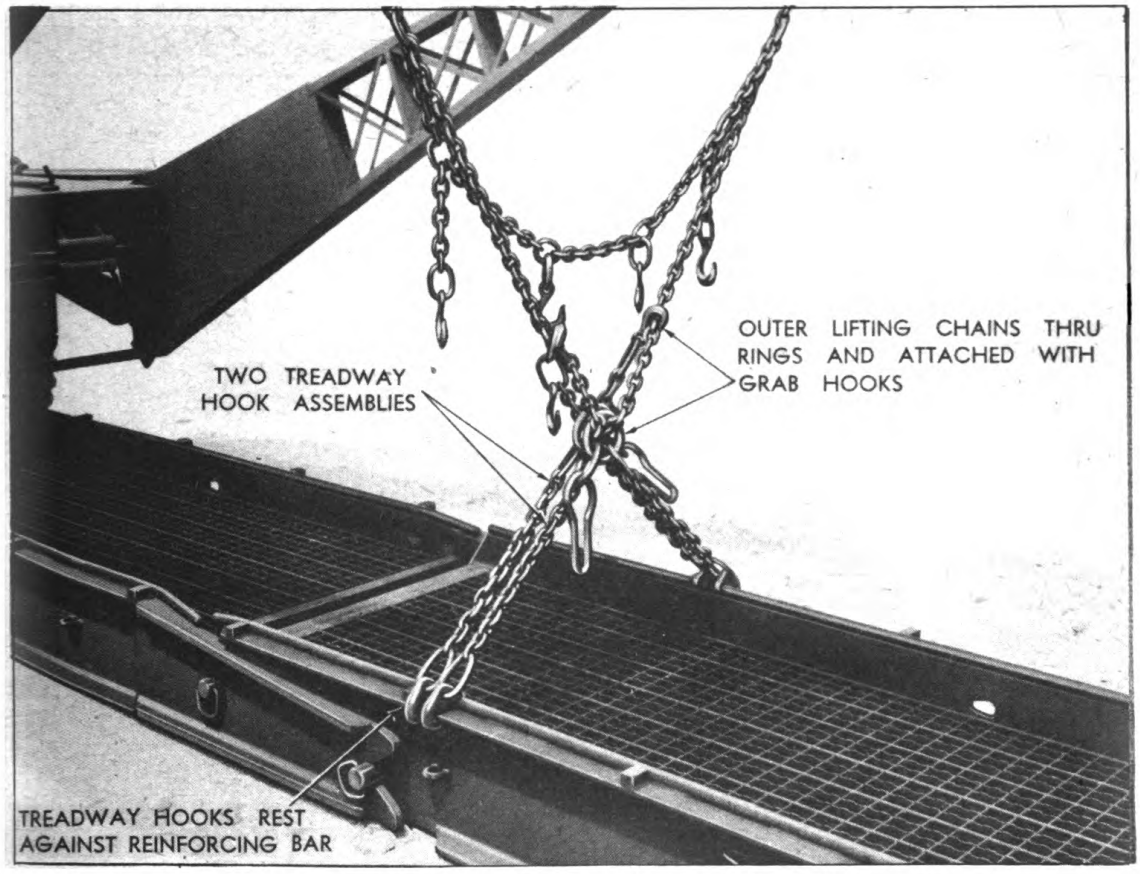


Figure 27. Treadway Hooks Attached to Flanges When Lifting Three in Line

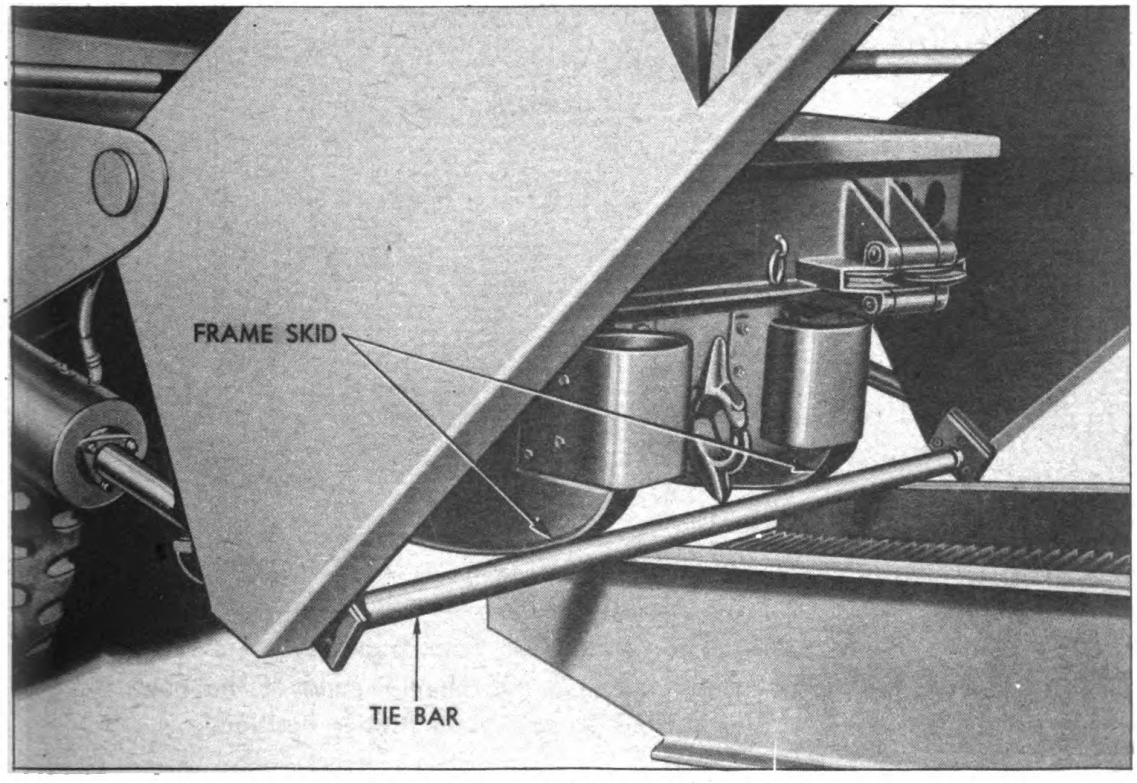


Figure 28. Treadways in Position Under Truck and Bearing Against Tie Bar

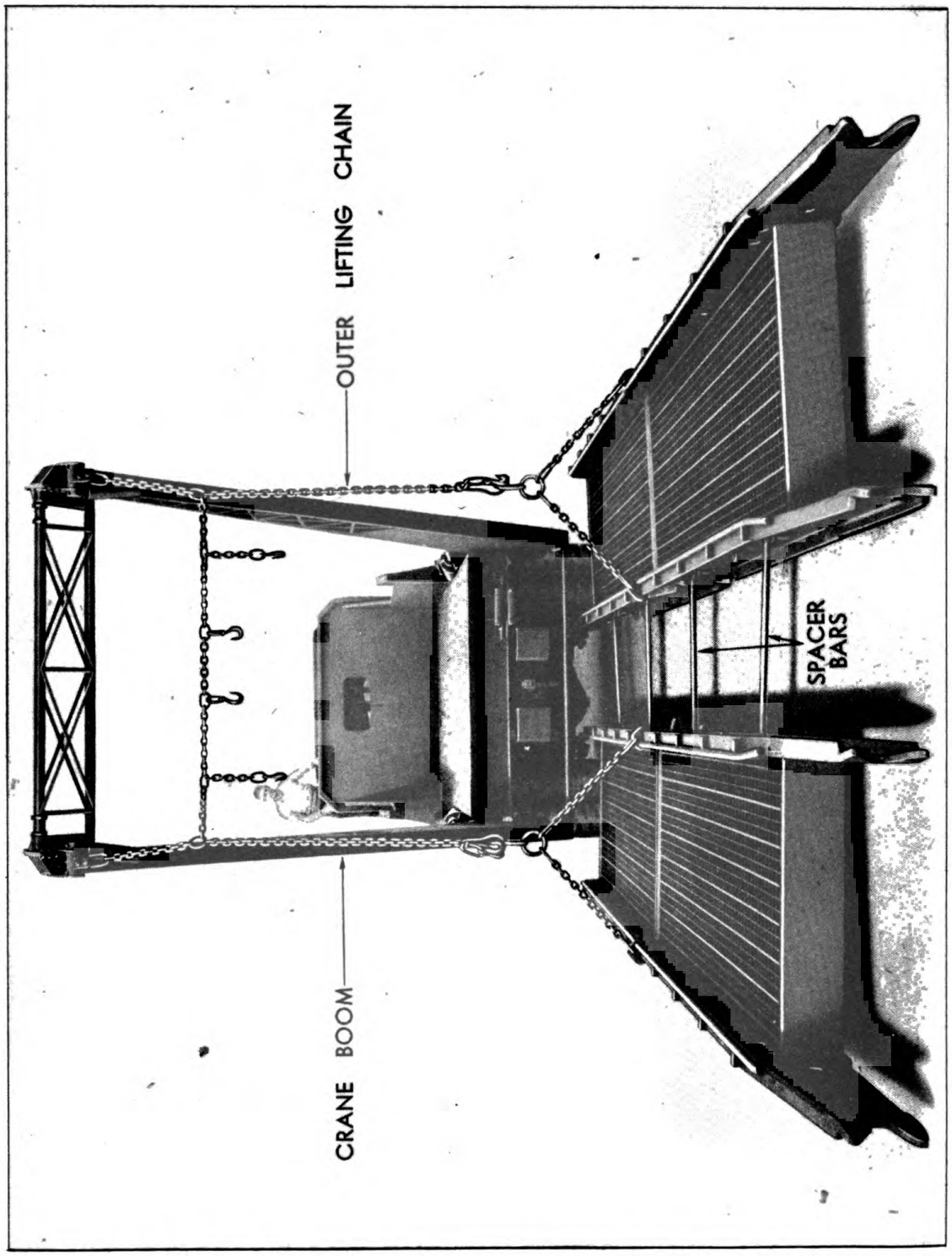


Figure 29. Proper Method of Handling Four Treadways at a Time. Boom Is Lifting at Full Rated Capacity. Note Placing of the Four Spacer Bars Which Hold Treadways in Proper Position.

g. HANDLING FOUR TREADWAYS AT A TIME

(1) To handle four treadways at a time, connected in pairs, attach the treadway hooks to the flanges of the treadways at the balance point as shown in Figures 29 and 30. The hook notches lock over the treadway guide bars. Insert the outer lifting chains through the pear-shaped grab links of the lower treadway hook assemblies. The pear-shaped grab link should attach to the chain just above the large, end-connecting link on the end of the lifting chain, see Figure 30.

CAUTION: DO NOT USE THE SLIP HOOKS AT THE END OF THE OUTER LIFTING CHAINS TO PERFORM THIS OPERATION.

(2) The maximum length of the outer lifting chain will permit the boom to raise to a vertical position sufficiently to prevent the front end of the truck being raised off the ground.

(3) To properly space the four treadways, raise the treadways so they hang freely in the correct position. Four spacer bars are used. Insert the hooked ends of the spacer bars through opposite eyes on the inner sides of the treadways as shown in Figures 29 and 30. Note that the center eyes are not used for spacing.

(4) When handling four treadways, the boom is lifting at its full rated capacity. The load is balanced and there is no appreciable distortion of the boom.

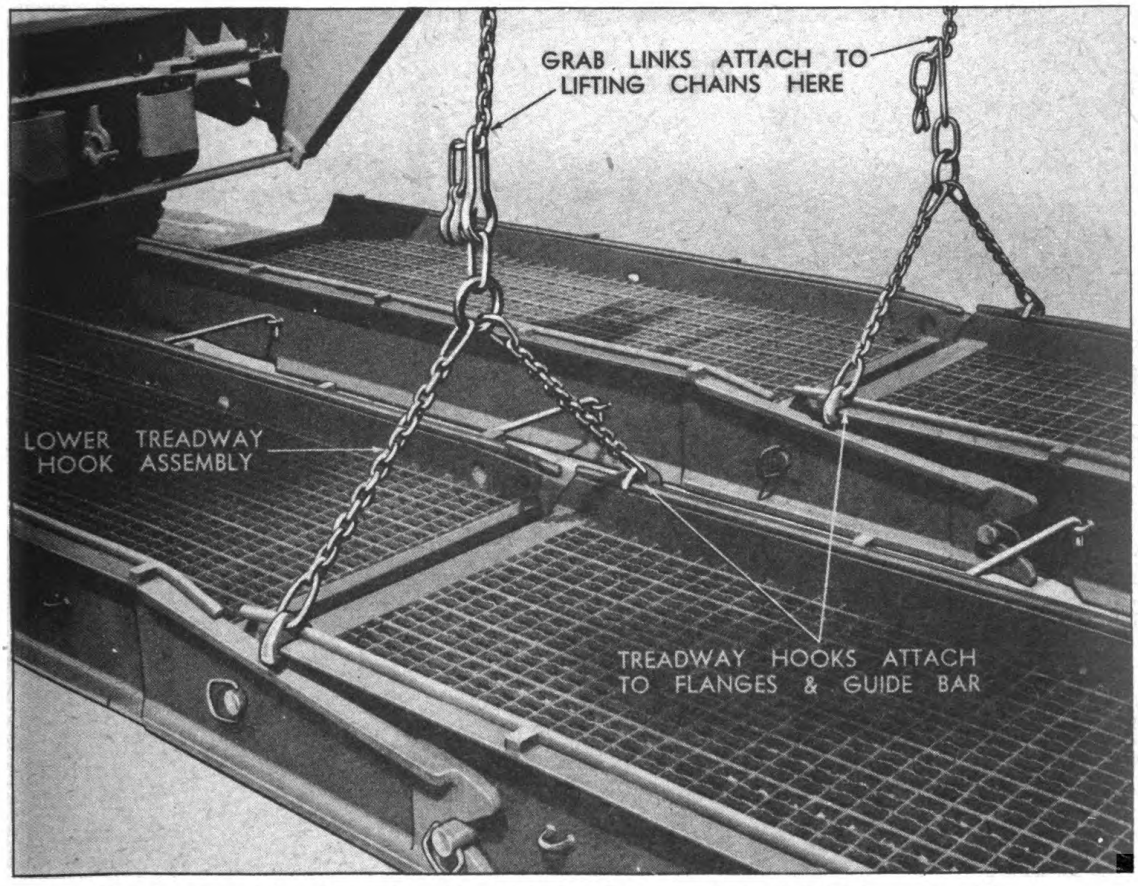


Figure 30. Treadway Hooks Attached Properly to Lift Four Treadways

b. HANDLING TWO TREADWAYS ON ONE SIDE

(1) An unbalanced load is detrimental to both the hydraulic mechanism and the truck chassis, and, it is therefore advisable, wherever practicable to balance the load, even if it is necessary to move the truck to one side or the other to eliminate any undue twisting of the chassis frame itself.

(2) There may be occasions where it will be necessary to handle only two treadways connected, end to end, on one side of the boom as shown in Figure 31. We call your attention to the distortion of the boom under this load when applied to one side of the boom assembly. THIS ABSOLUTELY IS THE MAXIMUM LOAD THAT SHOULD EVER BE APPLIED TO ONE SIDE OF THE BOOM. Any load greater than this may cause the upper boom support to bend or twist beyond its elastic limit and may damage the truck chassis.

(3) The correct chain hook-up for lifting two treadways on one side is shown in Figure 31. Attach a lower treadway hook assembly to the outer lifting chain, fastening it a link above the end connecting link. Attach the treadway hooks to the treadway flanges at the balance point as shown in the figure. Then bring the opposite outer lifting chain over and fasten it to the first lifting chain at the point shown, or about fifteen chain links below the large connecting link. IMPORTANT: Use the GRAB LINK for fastening the opposite chain to the chain lifting the load. The second lifting chain transmits part of the load to the opposite boom and prevents permanent boom distortion. ALWAYS USE BOTH CHAINS.

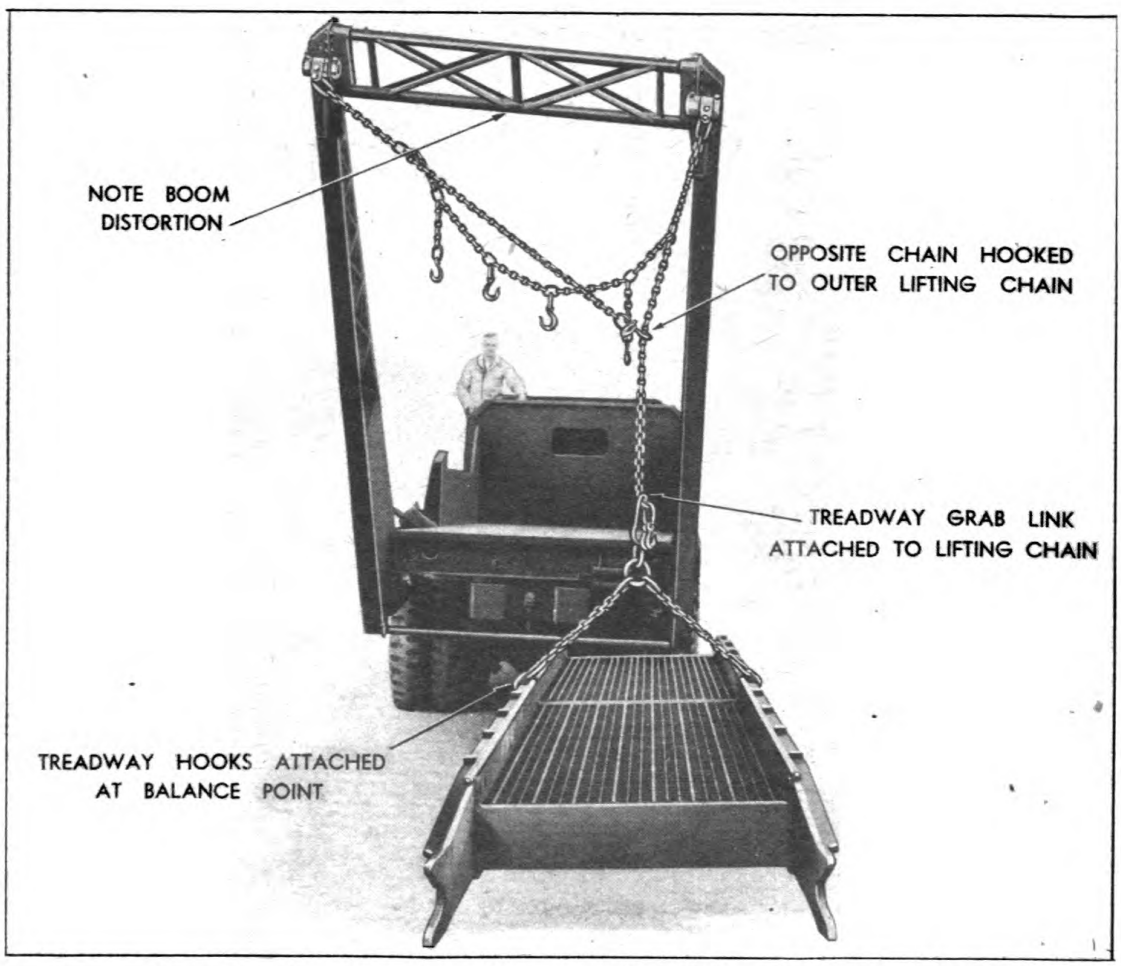


Figure 31. Handling Two Treadways on One Side. Note Boom Distortion

i. USE OF SNATCH BLOCK

(1) When it is necessary to lower treadways to a point lower than that attainable with the chains supplied, it is necessary to use the winch on the front of the truck and the snatch blocks carried in the tool box.

(2) Bring the ends of the outer lifting chains over to their opposite sides so they form an even loop with the center chain section and attach the GRAB HOOKS to the chains as shown in Figure 32. Attach the snatch block to the exact center of the chain loops, as this will distribute the load evenly to both booms.

(3) Install the hooks of the lower treadway hook assembly into the holes on the treadway sidewalls from the inside and lock in the vertical position as shown.

(4) Bring the cable from the small drum of the front-mounted truck winch back through the fairlead at the right rear corner of the truck. Thread the cable over the snatch block pulley as shown in Figure 32 and fasten suitably to the large round ring of the lower treadway hook assembly.

CAUTION: Never Attach Snatch Block Directly to Upper Boom Support

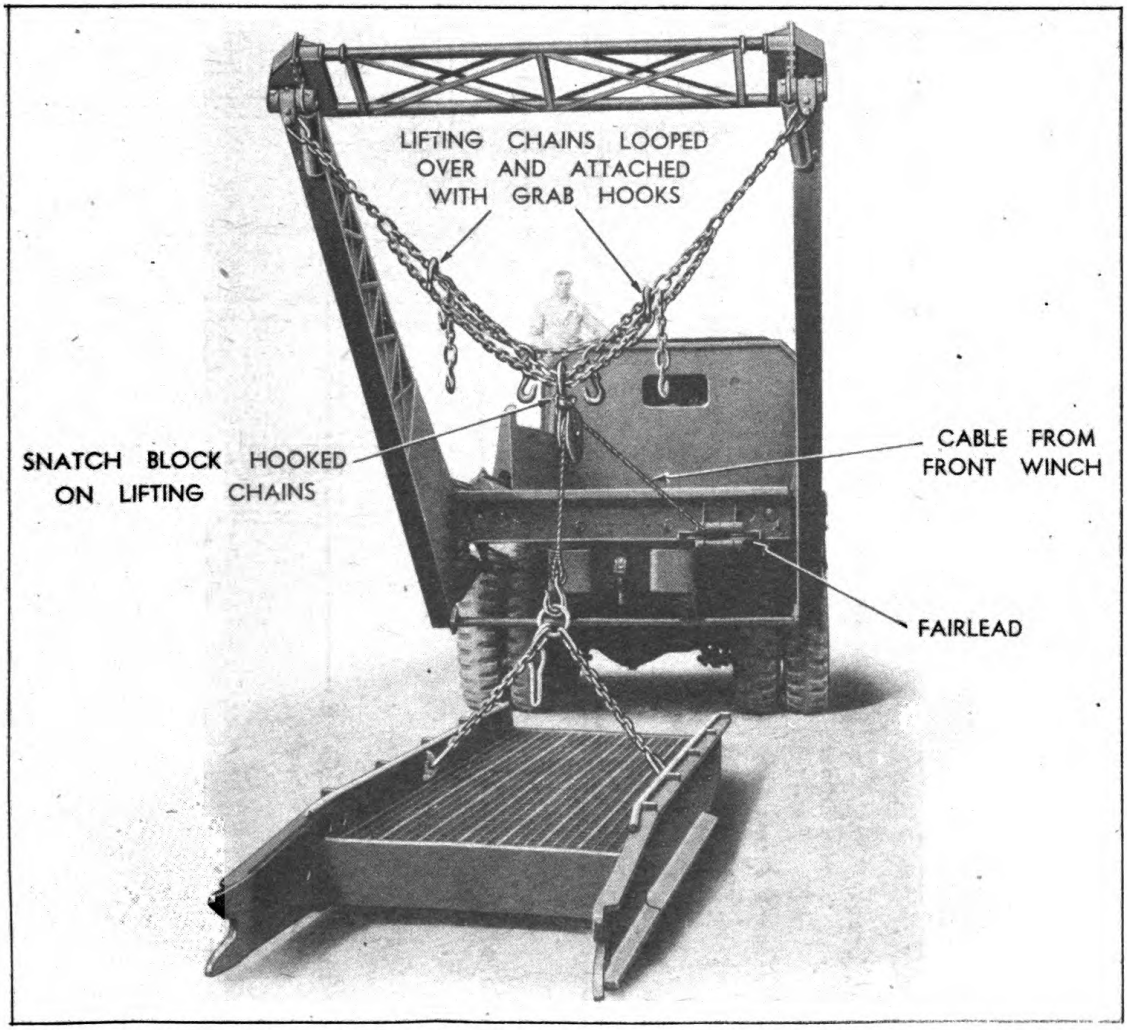


Figure 32. Using Snatch Block and Cable to Handle Treadways.

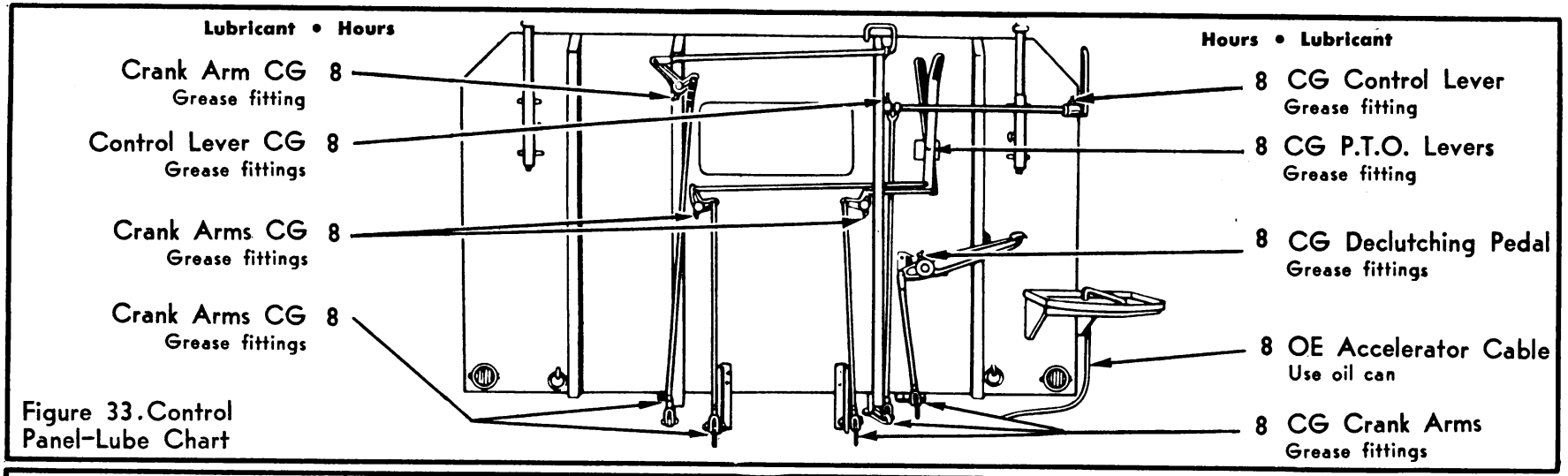
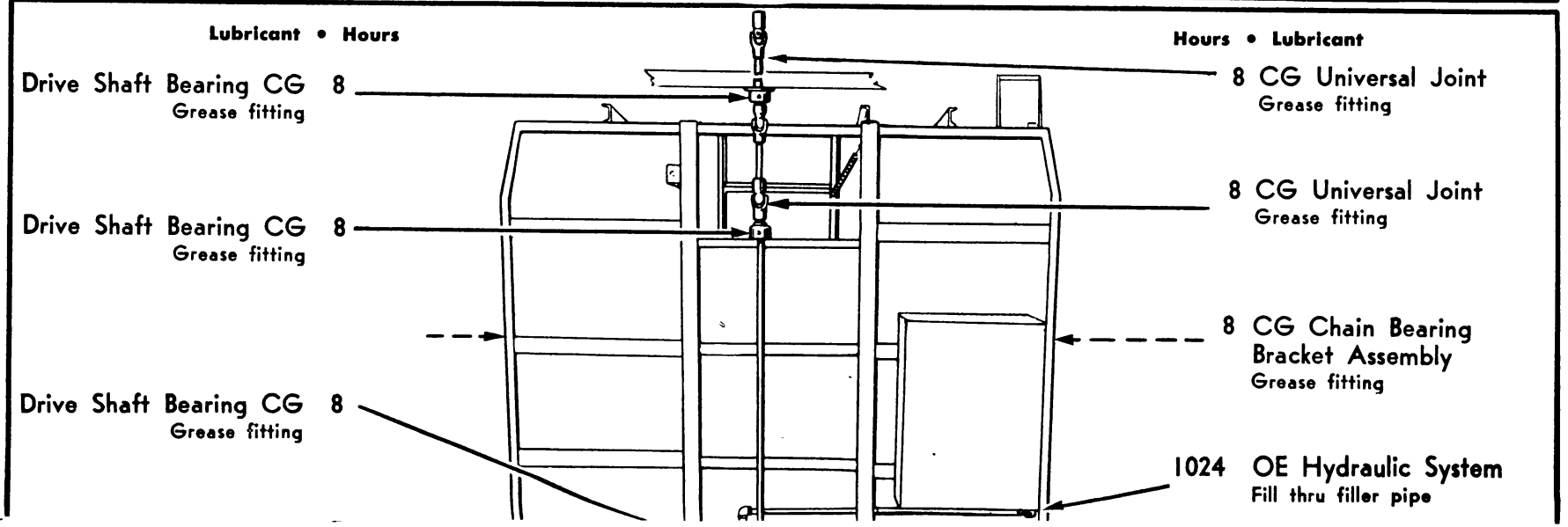
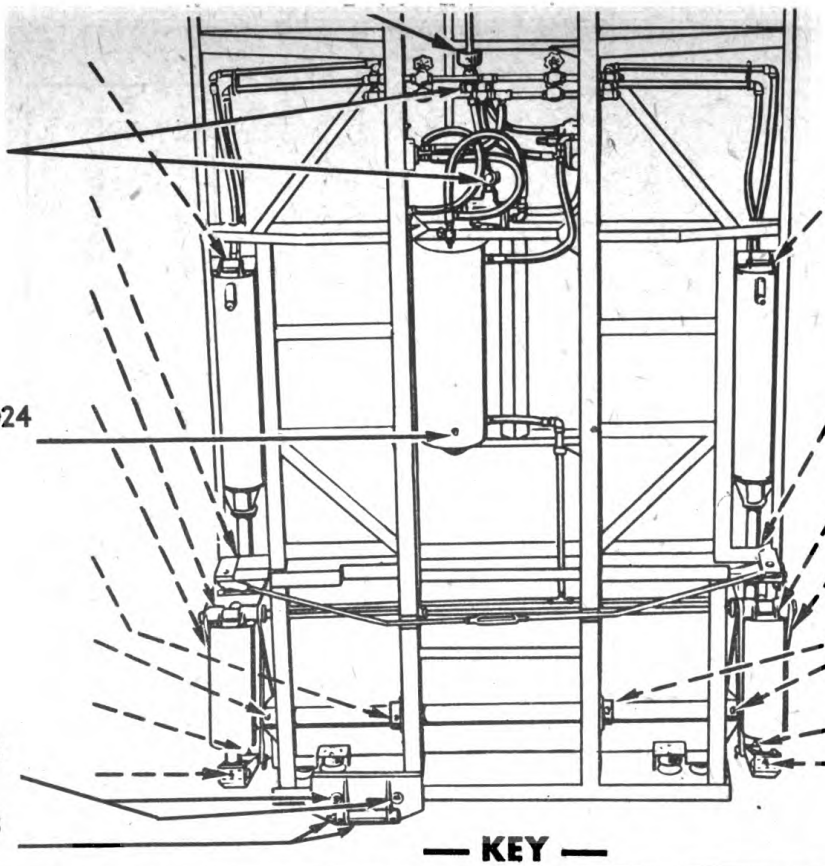


Figure 33. Control Panel-Lube Chart





Universal Joint CG 8
Grease fitting

Hydraulic System OE 1024
Drain reservoir tank

Fairlead Sheave Pin CG 8
Grease fitting

Fairlead Roller Pin CG 8
Grease fitting

8 CG Upper Cylinder Support Pin
Grease fittings

8 CG Upper Cylinder Rod End
Grease fittings

8 CG Lower Cylinder Support Pin
Grease fittings

8 CG Lower Cylinder Support Bracket
Grease fitting

8 CG Inner Main Bearing Bracket
Grease fitting

8 CG Outer Main Bearing Bracket
Grease fitting

8 CG Connecting Link Pin
Grease fitting

8 Lower Cylinder Link Support Pin
Grease fitting

— KEY —

LUBRICANTS	LOWEST ANTICIPATED AIR TEMPERATURE				INTERVALS
	Above +32° F.	+32° F. to 0° F.	0° F. to —20° F.	—20° F. to —40° F.	
CG—GREASE, general purpose	No. 1	No. 0	No. 0	No. 0	8— 8 hr. shift
OE—OIL, engine	SAE-10	SAE-10	Add 4 gals. Oil, fuel, diesel	Add 10 gals. Oil, fuel, diesel	1024—Every 1024 hours

4. LUBRICATION OF MACHINE

a. GENERAL

All grease fittings in the locations indicated on Figures 33 and 34 should be lubricated every 8 hours of operation. The universal joints and steady bearings on the drive line should be lubricated each 8 hours of operation. Use C.G. Grease General Purpose No. 1—(Above Plus 32° F.), No. 0—(Below +32° F.). Also see Figures 33 and 34, Lubrication Chart.

Special attention should be given to the lubrication of the flexible cable accelerator control, shown in Figure 33, Page 30.

> **CAUTION:** DO NOT grease flexible cable accelerator control. Heavy grease will cause the accelerator to stick. Use OE-10 (OIL, engine SAE 10).

b. HYDRAULIC SYSTEM

(1)—Be sure at all times that there is sufficient oil in the reserve tank which is located between the body sills, Figures 11 and 17. Use OE-10 (OIL, engine SAE 10) oil for temperatures above 0° F. For lower temperatures use OE-10 (OIL, engine SAE 10) oil cut with OIL, fuel, diesel according to the following table. Capacity of the system is 35 gallons. The oil should flow freely to the pump at all times.

Minimum Temperature	0° F	—20° F	—40° F
Oil—Gallons	35	31	25
OIL, fuel, diesel—Gallons	0	4	10

> **CAUTION:** DO NOT use oil drained from these cylinders in the truck engine or for lubricating other machinery.
>
> DO NOT fill the hydraulic system with crankcase drainings or other oil which is not absolutely clean.

(2) FILLING THE HYDRAULIC SYSTEM is done through a fill pipe located at about the center of the left running board of the body, see Figure 35. On top of the reserve tank toward the rear is a small plug. If this plug is removed when filling the system, air in the tank will escape and the tank can be filled more quickly. After the tank has been filled, it is well to leave the pipe cap off the filler pipe and operate the boom WITH A LOAD, allowing the boom to lower by gravity. This will force out any excess oil. Be sure to replace the filler cap after operating the boom.

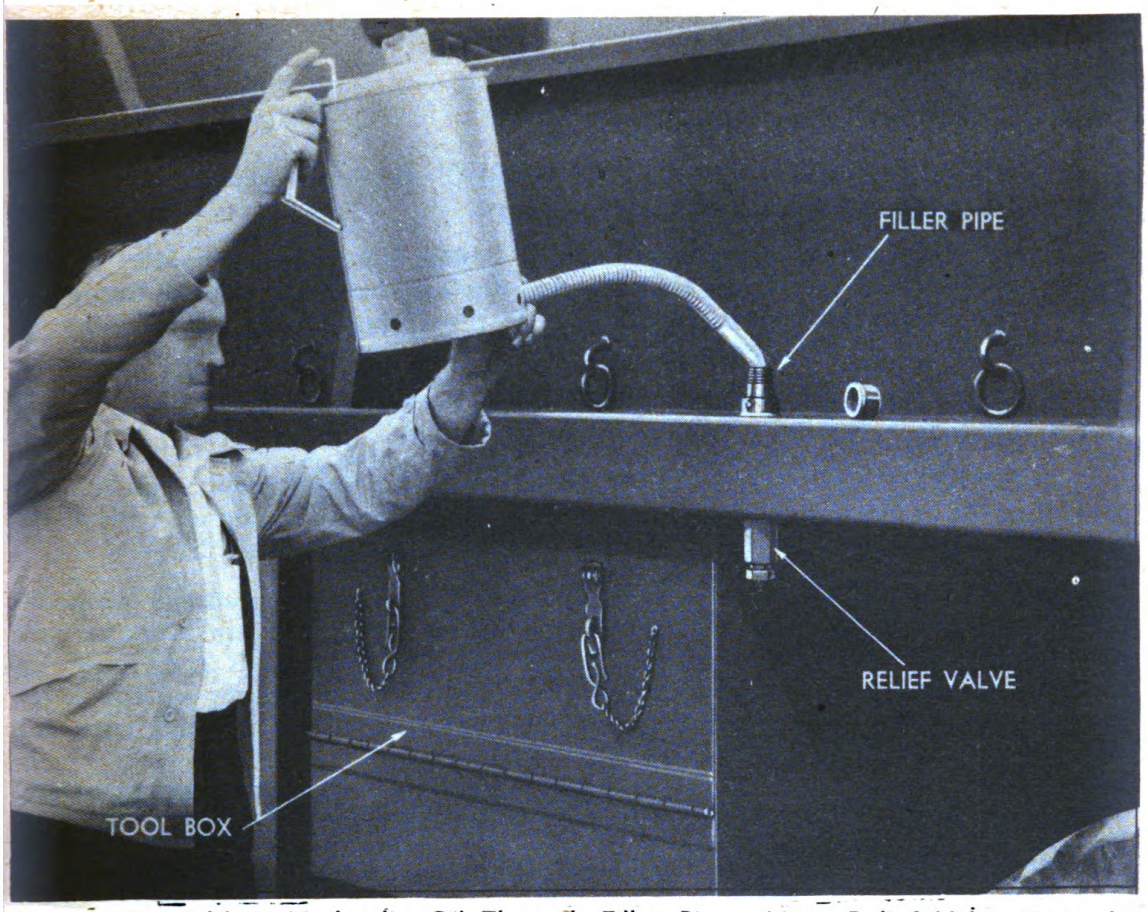


Figure 35. Adding Hydraulic Oil Through Filler Pipe. Note Relief Valve Beneath

(3) RELIEF VALVE—There is a relief valve in the filler pipe directly under the body running board, Figure 35, to relieve any pressure that might build up in the tank due to expansion of oil or excess oil that might be in the system. Pressure greater than this valve can handle, however, may be built up by excess oil in the system when operating under a load. For this reason it is recommended that the fill cap be left off until the operation in above paragraph has been completed.

(4) OVER-SUPPLY OF OIL IN SYSTEM may cause back pressure in the tank when a heavy load is being lowered by gravity to such an extent that the valve lever will not operate. The relief valve should take care of this—but if it should not function properly, carefully remove the filler cap to release the excess pressure. Use extreme care in doing this to prevent the cap flying off and injuring the operator.

(5) SHORTAGE OF OIL IN SYSTEM will cause jerky action. This is caused by air in the cylinder which is compressible. Another indication of oil shortage is the grinding noise created by the pump when it is being starved for oil. The oil shortage should be immediately remedied by adding oil or refilling as explained in paragraph 4 *a*, (2), page 32.

(6) TO DRAIN THE SYSTEM, drain the reserve oil tank first by removing the plug at the bottom of the tank. Drain the upper cylinders by removing the by-pass plugs at the bases of the cylinders. BE CAREFUL NOT TO LOSE THE SPRING AND BALL WHEN REMOVING THE PLUG.

5. Adjustment and Maintenance

a. IF UNIT WILL NOT OPERATE

(1) POWER TAKE-OFF NOT ENGAGED—Be sure lever is all the way over, gears properly meshed and clutch engaged.

(2) Be sure the lower cylinder control handle has returned to the left as far as possible. A spring return is attached to the lower cylinder control handle to place it in proper position for operation. If the spring should fail, it may be pushed to the proper position manually.

(3) OIL BY-PASSING IN PUMP—See Paragraph *d* (1), Page 37, in Repair Section.

b. OPERATING IN COLD WEATHER. The only preparation required for operating the crane unit in cold weather is to dilute the hydraulic oil with OIL, Fuel, Diesel in proportions shown in table, Paragraph 5 *a* (1), Page 32.

c. PREPARING THE UNIT FOR STORAGE. There is no special preparation required for putting the bridge erecting unit into storage except to make sure the lower cylinder rods are retracted as instructed in Paragraph 2, *c*, Page 17. Lubricate as instructed in Paragraph 4, Page 32. Check hydraulic system to be sure it is completely filled (see Paragraph 4, Page 32). Cover the unit with the tarpaulin as shown in Figures 4 and 5.

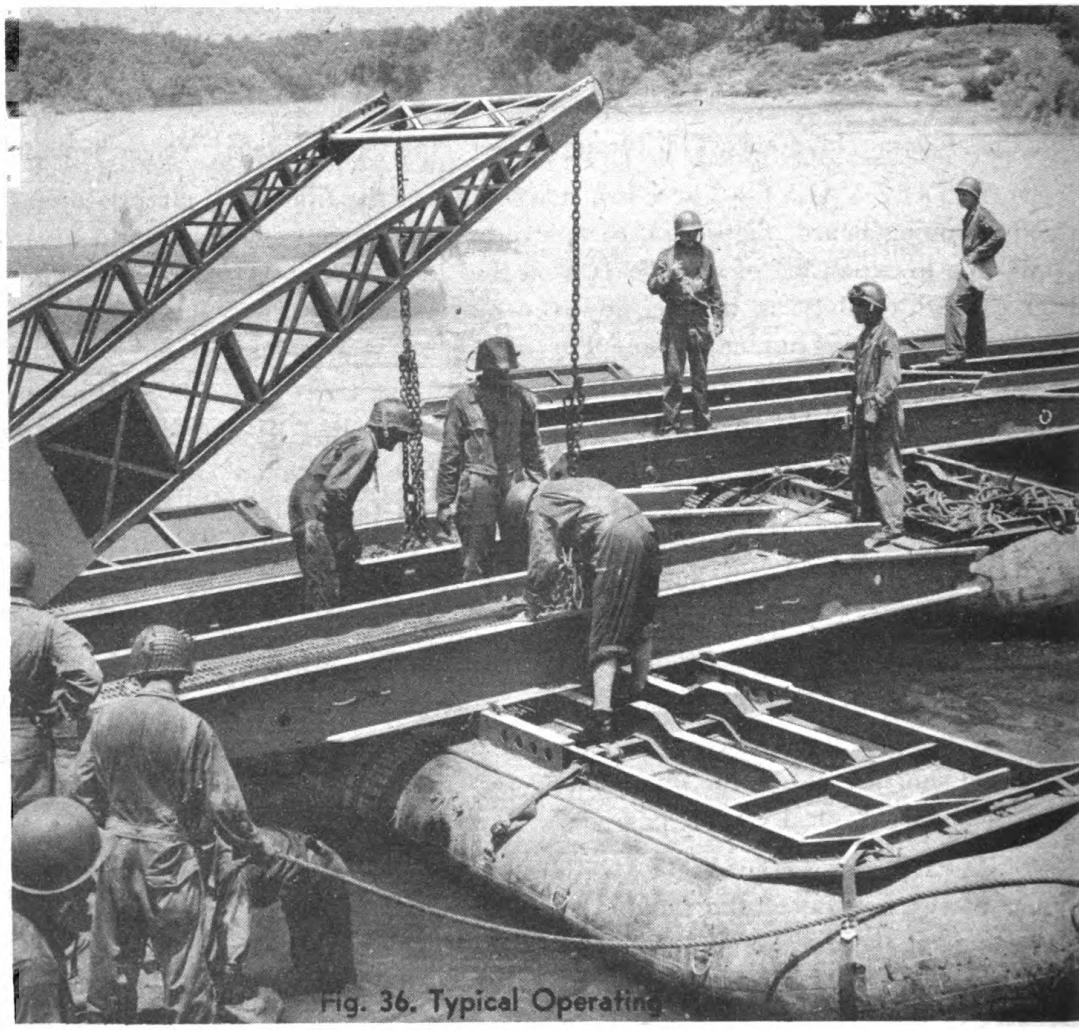


Fig. 36. Typical Operating

REPAIR SECTION

1. REPAIR AND ADJUSTMENT OF UNIT

a. BENT UPPER PISTON RODS

(1) CAUSE AND CORRECTION

(*a*) If it is noted in raising the boom that there is a tendency for the upper piston rods to spring, a careful check should be made to determine that one or more of the four emergency valves under the floor, Figures 11 and 17, may have been accidentally closed. THESE VALVES SHOULD ALWAYS BE OPEN EXCEPT WHEN NECESSARY TO OPERATE AS EXPLAINED UNDER EMERGENCY OPERATION.

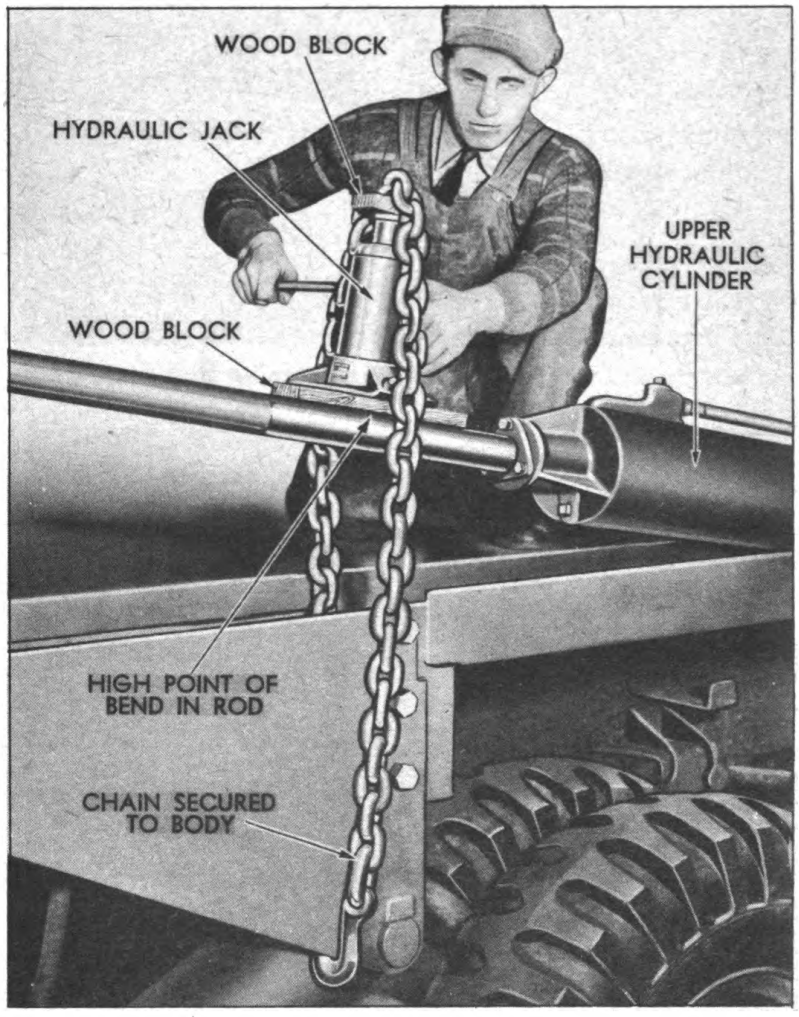


Figure 37. Straightening Rod from Above. Note Position of Wood Block to Prevent Marring the Rod. Method of Securing Chain to Body is Also Shown.

(2) HOW TO STRAIGHTEN UPPER PISTON RODS. Bent piston rods may be straightened by using the hydraulic jack furnished with the unit and chains and blocks as shown in Figures 37 and 38. Pressure is applied to the high point of the bend in the rod with the jack.

Be sure to use a block next to the rod to prevent marring or scoring it. If the rod is bent beyond repair, the entire cylinder assembly must be replaced.

b. SETTING MAIN VALVE BY-PASS. (See Figure 17.) Before leaving the factory, each unit is tested with a load of four treadways. A gauge is inserted in the line and the by-pass is adjusted to operate at 1,000 pounds. Unless the adjust-

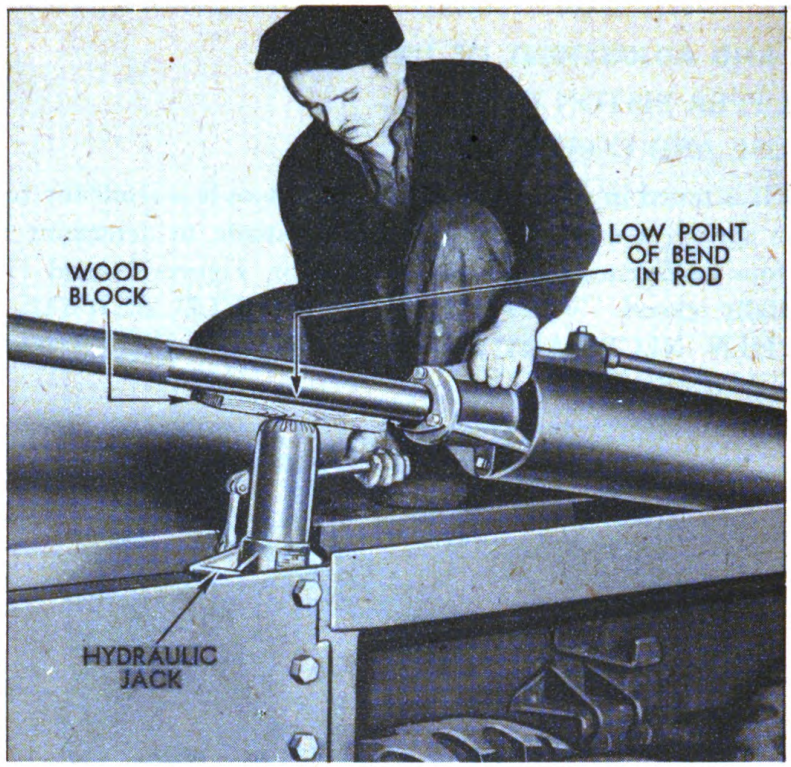


Figure 38. Straightening Rod From Below

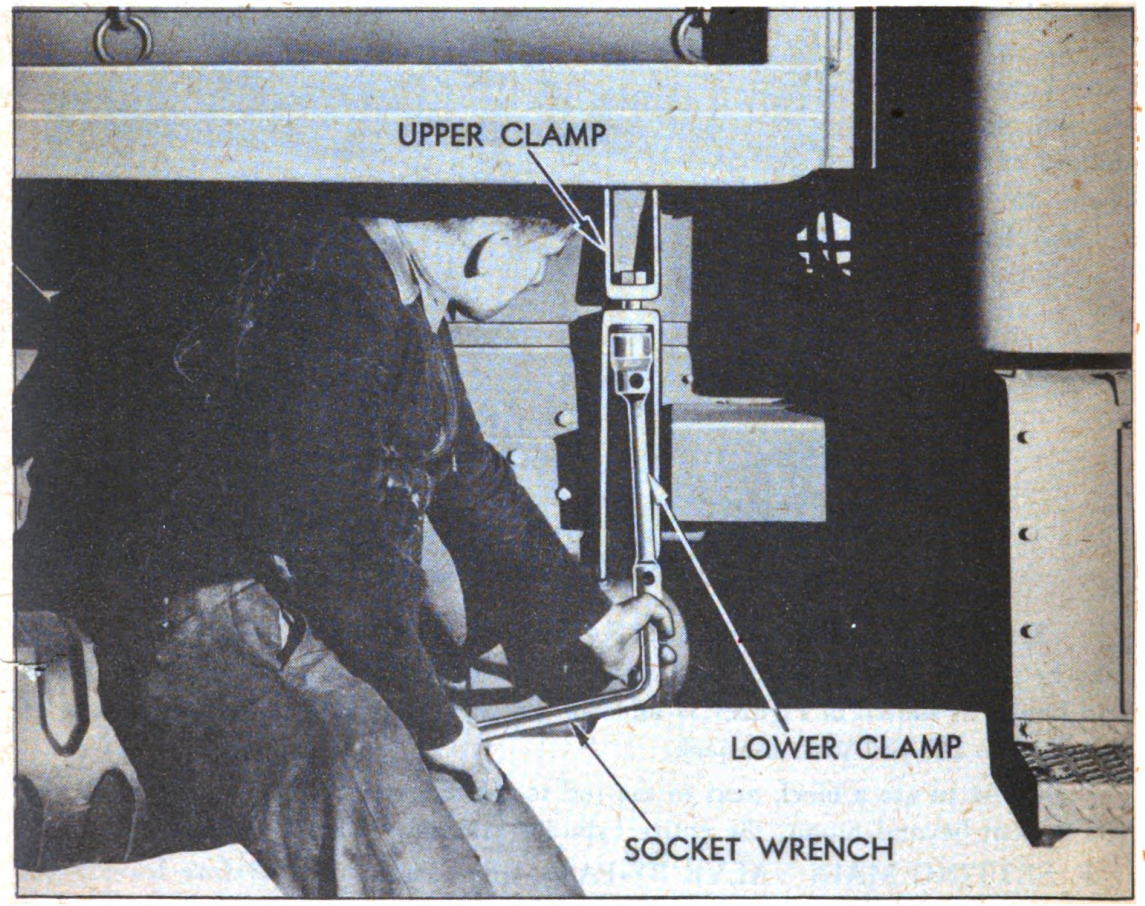


Figure 39. Tightening A Hold-Down Clamp Securing Body to Truck

ing spring breaks, it should not be necessary to readjust this part. If for any reason a new valve is installed in the field the by-pass valve can be adjusted satisfactorily by setting the by-pass spring to lift four treadways, then tightening the spring about two additional turns. This should provide a by-pass pressure of approximately 1,000 pounds.

c. HOLD-DOWN BRACKETS are provided on both sides to hold the body to the chassis frame. These brackets must be kept absolutely tight at all times. At regular intervals tighten the bolts holding the brackets to the chassis frame and also the bolts holding the brackets together as in Figure 39.

d. OIL PUMP AND HYDRAULIC SYSTEM

(1) OIL BY-PASSING IN PUMP

(*a*) Close shut-off valve at the tank, Figure 17.

(*b*) Remove pump cover plate, Figure 40. It is necessary to remove the pump drive shaft connection from the pump shaft first but it is not necessary to remove the pump from the body for minor adjustments.

(*c*) Inspect gears and wear plates for defects or excessive wear. If plates or gears are worn, replace them. If not excessively worn, the excess end play may sometimes be taken up by removing one or two layers of the laminated gasket. Care should be taken when replacing the cover plate that ample clearance is

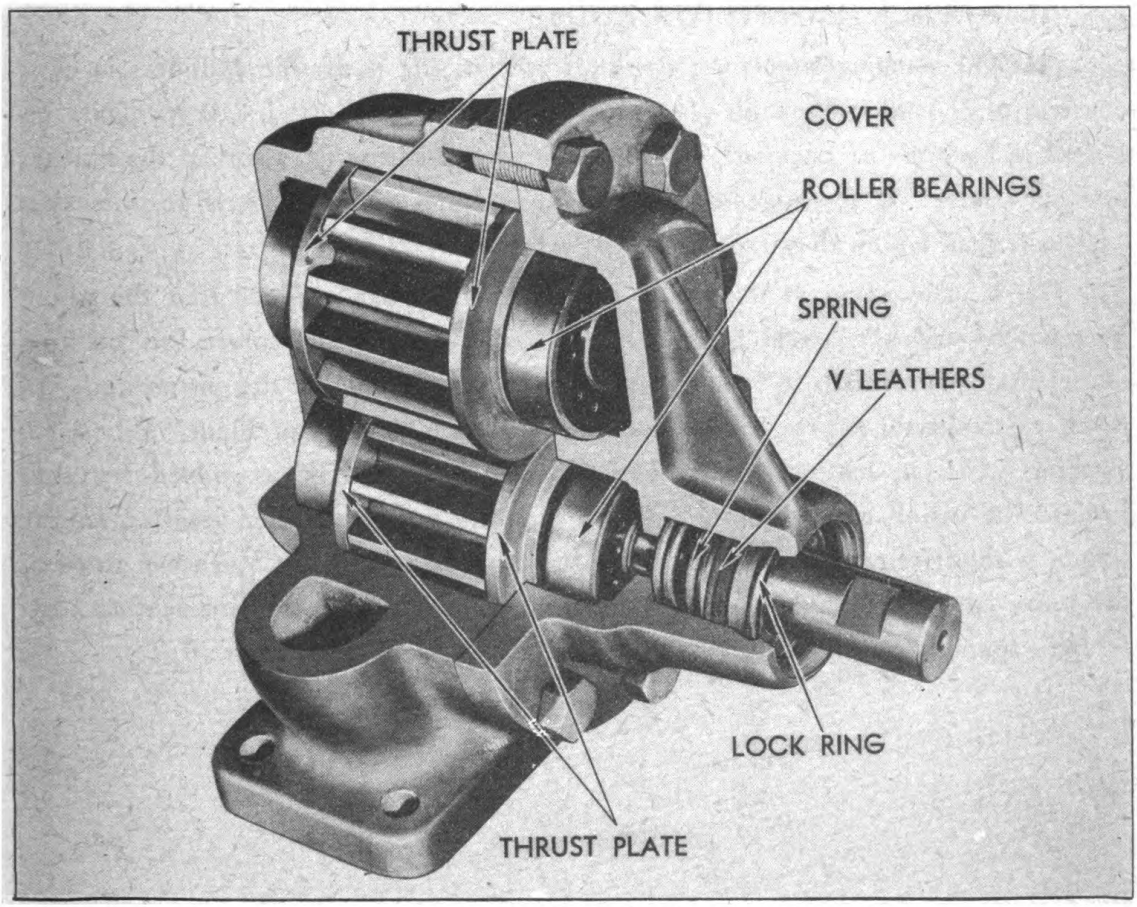


Figure 40. Cutaway View of Hydraulic Pump Showing Parts

allowed for free rotation of the gears which should turn with a very slight drag when the cover bolts are pulled down tight. Add or remove gasket layers until proper pump operation has been obtained.

(*d*) Be sure to open shut-off valve or low pressure line at the tank (Figure 17) when the pump has been reassembled.

(2) ALL EMERGENCY VALVES NOT OPEN—The emergency valves must always all be open except as in Paragraph (*e*), Page 17, Emergency Operation.

(3) LEAKS IN HYDRAULIC SYSTEM—All leaks must be stopped without delay.

(*a*) Leaks at hose coupling: Remove coupling and apply sealing compound, then reassemble.

(*b*) Leaks back of coupling: Replace entire hose assembly.

(*c*) Leaks at piston rod: Replace gland packing in cylinder.

(*d*) Leaks at lower cylinder control valve: Replace oil seals.

(*e*) Leaks at main control valve: Replace oil seals.

(*f*) Leaks at pump: Replace packing.

e. TO REPACK THE PISTON RODS

(1) The packing used on the piston rods in the hydraulic cylinders is of a chevron or V-leather type. It also has an automatic take-up; i.e., a spring is installed in back of the packing. The function of this spring is to spread the leather as wear occurs. If the edges of the leather becomes damaged, it is possible that they may leak before they are completely worn out.

(2) If leaks occur at this point, therefore, it is recommended that the gland be removed and new packing leathers installed. In order to replace this packing as originally furnished, it is necessary to remove the end of the piston rod. In order to avoid this, these V-leathers may be cut with a razor blade. When repacking with cut leathers, at least three leathers should be assembled together around the piston rods with the cuts on opposite sides, and then inserted in the gland, without removing the rod end. Always replace as many V-leather rings as are removed when making repairs of this kind. Always leave the first leather next to the expander ring in place.

PARTS CATALOG

WARNING

SPARE PARTS can be supplied promptly and accurately only if positively identified by correct part number and correct part name.

FURNISH THIS INFORMATION ON A L L REQUISITIONS. WITHOUT FAIL, on all requisitions, give name of machine, name of manufacturer, model or size, manufacturer's serial number of each machine and subassemblies attached to machine, and components and accessories for which spare parts are required.

List spare parts for only one make or kind of machine on each requisition.

Requisitions must be double spaced to provide room for office notations when necessary.

PARTS CATALOG

PREPARATION OF REQUISITIONS

THIS IS WD AGO FORM NO. 445, AS DEVISED BY ALTERING QMC FORM NO. 400 UNTIL SUCH TIME AS NEW PRINTED FORMS NO. 445 ARE AVAILABLE. THIS FORM IS TO BE USED BY POST, CAMP, STATION AND OVERSEAS THEATER DEPOT ENGINEER PROPERTY OFFICERS TO REQUISITION ENGINEER SPARE PARTS FROM THE ENGINEER FIELD MAINTENANCE OFFICE, P. O. BOX 1679, COLUMBUS, OHIO.

The marginal notes give instructions for preparing a requisition for spare parts for Engineer Equipment.

The revised WD AGO Form No. 445 has new column headings as shown below. Under revised heading "Nomenclature and Unit" list the article and the unit (ea. for each; lb. for pound; etc.). Under heading "Maximum or Authorized Level" list the authorized organizational allowances or depot stock levels given in ENG 7 and ENG 8 of the ASF Engineer Supply Catalog (Superseding Part III, Corps of Engineers Supply Catalog). The total number on hand for each item is listed under "On Hand." In column headed "Due In" enter the total quantity previously requisitioned but not delivered. Column headed "Required" is to be changed to read "Quantity Desired" and column headed "Approved" is to read "Remarks." For "Initial" and "Replenishment" requisitions, the sum of "Quantity Desired," "Due In," and "On Hand" should equal "Maximum or Authorized Level."

State TYPE OF ISSUE designation by use of one of the following terms:

(1) "INITIAL"—first requisition of authorized allowances.

(2) "REPLENISHMENT"—subsequent requisitions to maintain authorized allowances. (State period covered, i. e., 1 Apr—31 Apr)

▼(3) "SPECIAL"—requisitions for necessary repairs not covered by allowances, or for repair of deadlined equipmnet.

Type "SPARE PARTS" in upper right hand corner of requisition.

Address requisitions to Engineer Field Maintenance Office, P.O. Box 1679, Columbus, Ohio.

Give complete shipping instructions. Special instructions for packing, marking, routing, etc., should be given at bottom of requisition.

State proper nomenclature of machine, also make, model, machine serial number and U. S. A. registration number.

State OCE stock numbers when available.

Prepare a separate requisition for each different machine.

State basis or authority and date delivery is required, immediately below description of machine. State number of Technical Manual or ASF Supply Catalog to which you referred.

Double Space between items.

Group parts required under group headings as shown in approved WD manuals.

State manufacturer's parts numbers and nomenclature accurately. Do not use abbreviations.

SPARE PARTS

WAR DEPARTMENT

(Sample)

W.L., AGO Form No. 445 **REQUISITION**

May 4, 1944

To: Engineer Field Maintenance Office No. of Sheets 1 Sheet No. 1
P.O. Box 1679, Columbus, Ohio

Requisition No. E-908-4-44 Date May 4, 1944 Period Replenishment

SHIP TO Engineer Property Officer, Fort Lewis, Washington

MARKED FOR: Supply Officer, 150th Engr. Regiment, Fort Lewis, Wash.

~~Requisitioned By (show Signature, Rank, Organization, Destination — If different from "ship to" include address):~~ Indicate Organization and Address of Supply Officer Signing Requisition if Different from "Ship To" Address.

~~Approved By:~~ For the Commanding Officer:

John E. Doe
Major, C.E.
SUPPLY OFFICER

Mfgr. Part No.	Nomenclature and Unit	Auth. Maximum Level	On Hand and Due Out	Due In	Quantity Desired	Remarks
PARTS FOR CRANE, HYDRAULIC, TRUCK MOUNTED, SPECIAL FOR BRIDGE TREADWAY HANDLING, MODEL -II-A - Serial Numbers HE335 and HE834						
	Basis:- Repair of Disabled Equipment.					
	Delivery is requested by May 21, 1944					
	LONG UPPER CYLINDER ASSEMBLY					
A178B	Long Cylinder Assembly, only, including all parts which are assembled and welded at factory ea	-	0	0	4	
X12A92	V-Leather Packing ea	-	0	0	32	
23A187	Bronze Packing Gland ea	-	0	0	2	
	HYDRAULIC PUMP ASSEMBLY					
AA-157	Hydraulic Pump Assembly ea	-	0	0	1	
X12A93	V-Leather Packing ea	-	0	0	8	
	MAIN SHAFT, MAIN BRACKETS AND MAIN BEARINGS					
8B4588	Main shaft-3-15/16" x 98-3/4" ea	-		0	1	
A3A910A	Main Bracket Bearing (Inner) ea	-	0	0	2	
	*					

*Nonexpendable items such as tools must be accounted for, when requisitioned, by a statement that they have been placed on REPORT OF SURVEY or STATEMENT OF CHARGES.

Emergency requisitions sent by telephone, telegraph or radio must be confirmed immediately with requisition marked: "Confirming (state identifying data)."

▼Engineer Supply Officers within the Continental United States will use only this period designation.

PREPARATION OF REQUISITIONS

A sample requisition in the correct form for submission by the Engineer Property Officer is shown on the opposite page.

THIS SHALL BE FOLLOWED IN MAKING OUT REQUISITIONS

In order to eliminate duplication of work, Property Officers may authorize organizations to prepare requisitions in final form, leaving requisition number space blank for completion by Property Officer.

THE FOLLOWING RULES WILL BE OBSERVED CAREFULLY IN PREPARING REQUISITIONS FOR SPARE PARTS:

a. Prepare a separate requisition for each different machine.

b. Type "SPARE PARTS" in upper right hand corner of requisition form.

c. State PERIOD designation by use of one of the following terms:

(1) "INITIAL"—first requisition of authorized allowances.

(2) "REPLENISHMENT"—subsequent requisitions to maintain authorized allowances.

(3) "SPECIAL"—requisitions for necessary repairs not covered by allowances.

d. Give complete shipping instructions.

e. State proper nomenclature of machine, and make, model, serial number and registration number.

f. State basis of authority, and date delivery is required, immediately below description of machine.

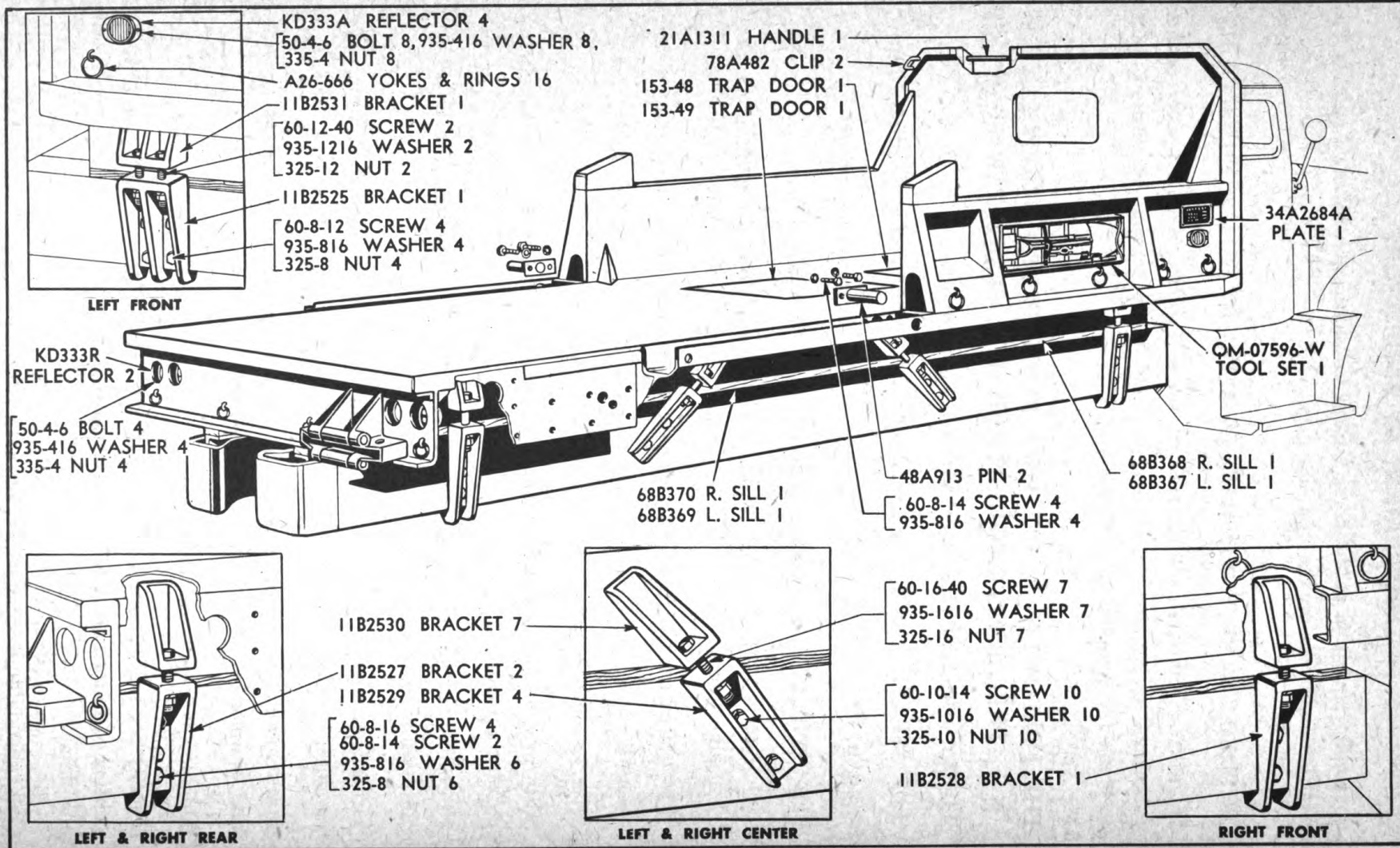
g. Group parts required under group headings as shown in manufacturer's parts catalogs.

h. State manufacturers' parts numbers and nomenclature descriptions accurately and completely. Do not use abbreviations.

i. Double space between items.

j. Emergency requisitions sent by telephone, telegraph, or radio must always be confirmed immediately with requisition marked: "Confirming (state identifying data)."

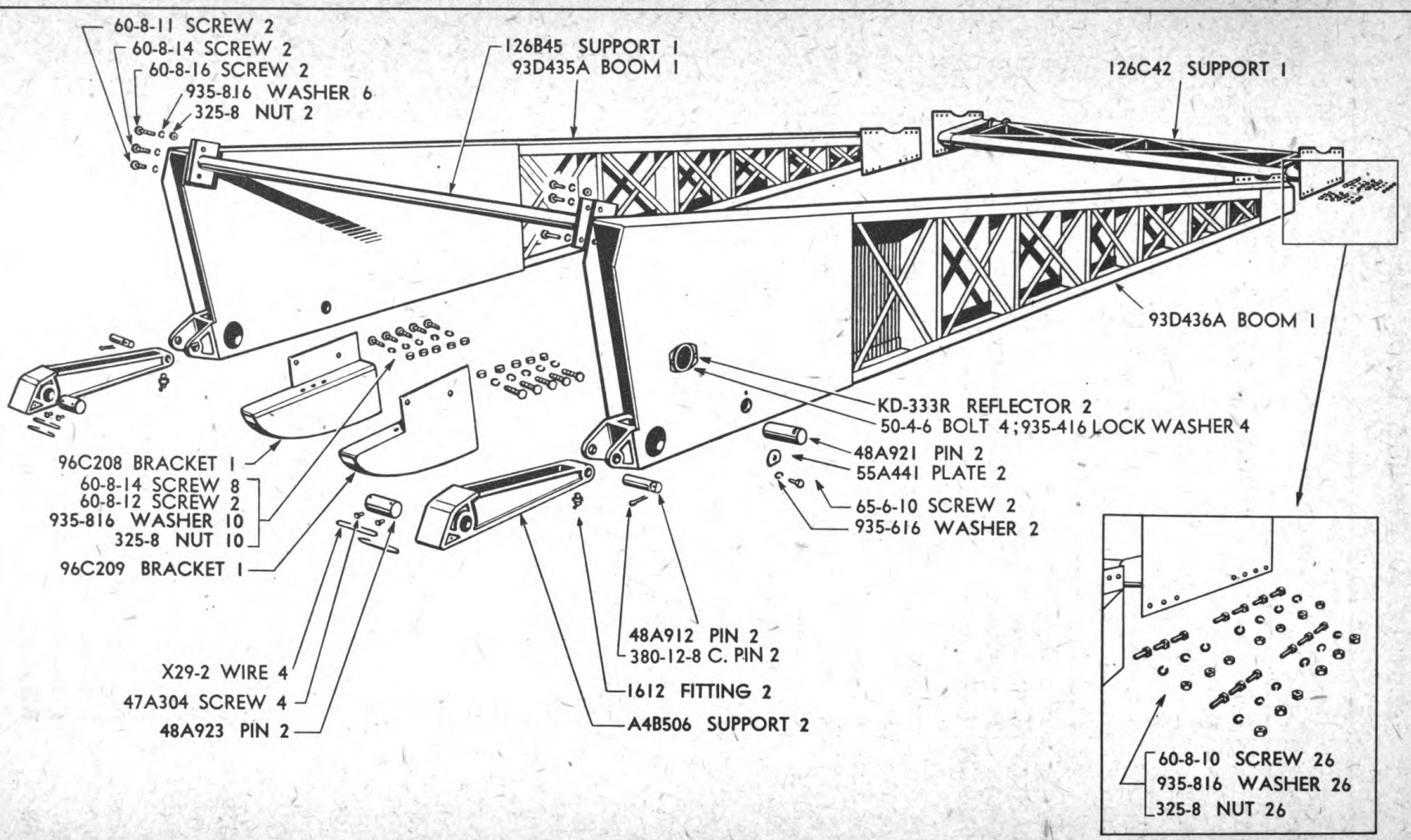
k. Nonexpendable items must be accounted for.



BODY, FRAME, AND HOLD DOWN BRACKETS

BODY, FRAME AND HOLD DOWN BRACKETS

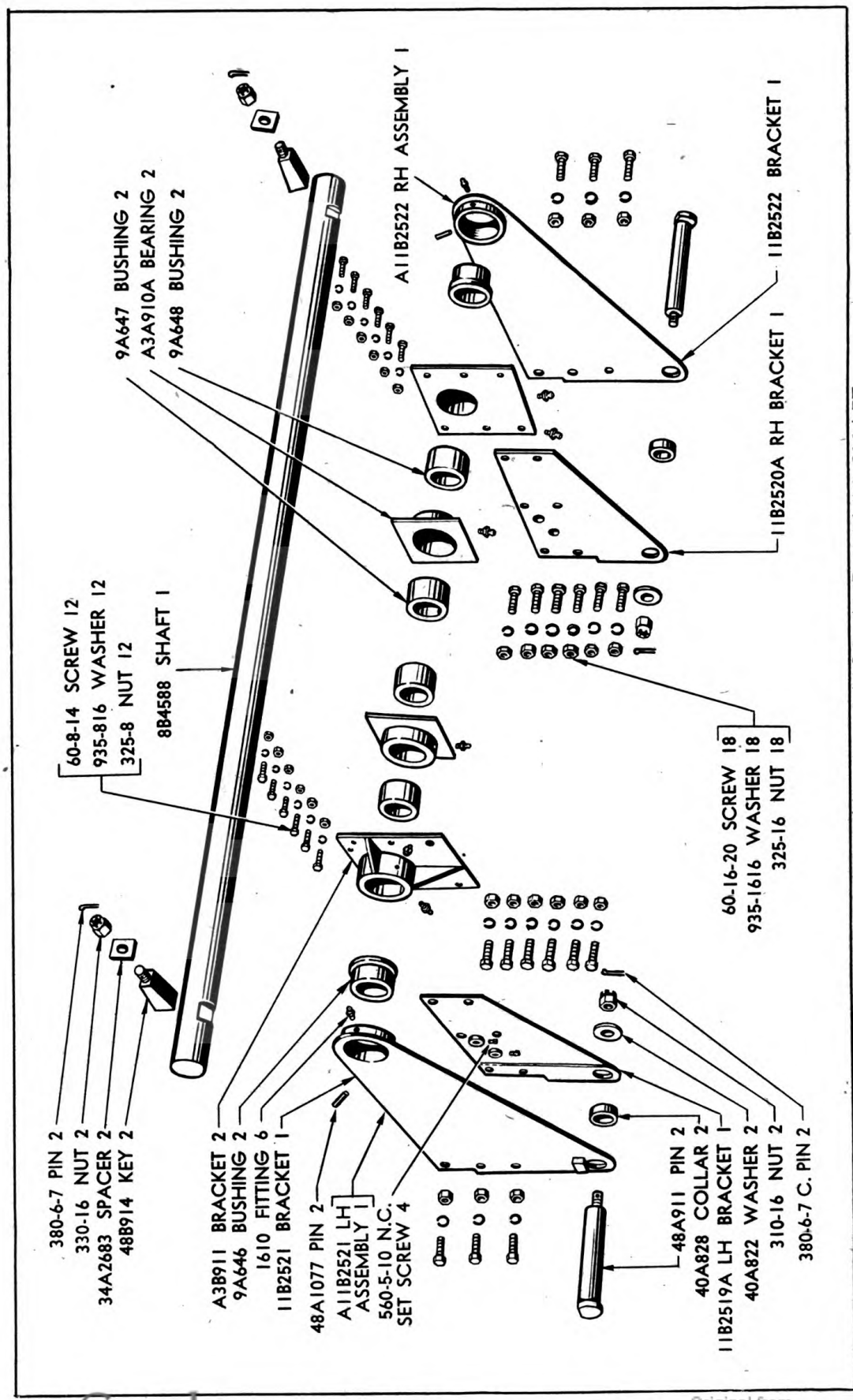
Heil Part Number	Description of Part	No. Per Unit
KD333A	Reflector—Amber, (K-D Lamp Co.)	4
50-4-6	Bolt—Stove, 1/4" x 1/2"	8
935-416	Lockwasher—1/4"	8
335-4	Nut—1/4", USS	8
A26-666	Yoke and Ring—for Tarpaulin (welded to body)	16
21A1311	Handle—Rod (welded to body)	1
78A482	Clip—Belt, Safety (welded to body)	2
153-48	Trap Door—Front	1
153-49	Trap Door—Rear	1
34A2684A	Plate—Name (Corps of Engineers)	1
QM-07596-W	Tool Set—(Furnished by Government complete with Tools) (See Page 90)	1
48A913	Pin—Support, Cylinder, Upper 2 3/16" x 9 7/8"	2
60-8-14	Capscrew—1/2" x 1 1/2", SAE	4
935-816	Lockwasher—1/2"	4
11B2531	Bracket—Hold Down (Upper) (welded to body)	1
60-12-40	Capscrew—3/4" x 4", SAE	2
935-1216	Lockwasher—3/4"	2
325-12	Nut—3/4" SAE	2
11B2525	Bracket—Hold Down (Lower Left Front)	1
60-8-12	Capscrew—1/2" x 1 1/4", SAE	4
935-816	Lockwasher—1/2"	4
325-8	Nut—1/2", SAE	4
11B2527	Bracket—Hold Down (Lower Rear)	2
60-8-16	Capscrew—1/2" x 1 3/4", SAE	4
60-8-14	Capscrew—1/2" x 1 1/2", SAE	2
935-816	Lockwasher—1/2"	6
325-8	Nut—1/2", SAE	6
11B2530	Bracket—Hold Down (Upper) (welded to body)	7
11B2529	Bracket—Hold Down (Lower Diagonal)	4
60-10-14	Capscrew—5/8" x 1 1/2", SAE	10
935-1016	Lockwasher—5/8"	10
325-10	Nut—5/8", SAE	10
11B2528	Bracket—Hold Down (Lower Front)	1
60-16-40	Capscrew—1" x 4", SAE	7
935-1616	Lockwasher—1"	7
325-16	Nut—1", SAE	7
KD333R	Reflector—Red, (K-D Lamp Co.)	2
50-4-6	Bolt—Stove, 1/4" x 1/2"	4
935-416	Lockwasher—1/4"	4
335-4	Nut—1/4", USS	4
68B370	Right Sill—Wood, Rear	1
68B369	Left Sill—Wood, Rear	1
68B367	Left Sill—Wood, Front	1
68B368	Right Sill—Wood, Front	1



BOOM ASSEMBLY

BOOM ASSEMBLY

Heil Part Number	Description of Part	No. Per Unit
93D436A	Boom Assembly—Right	1
93D435A	Boom Assembly—Left	1
126B45	Support—Shaft, Cross, Rear (for crane booms)	1
60-8-11	Capscrew—1/2" x 1 1/8", SAE	2
60-8-12	Capscrew—1/2" x 1 1/4", SAE	2
60-8-16	Capscrew—1/2" x 1 3/4", SAE	2
935-816	Lockwasher—1/2"	6
325-8	Nut—1/2", SAE	2
126C42	Support—Upper Boom	1
60-8-10	Capscrew—1/2" x 1", SAE	26
935-816	Lockwasher—1/2"	26
325-8	Nut—1/2", SAE	26
KD333R	Reflector—Red, (K-D Lamp Co.)	2
50-4-6	Bolt—Stove, 1/4" x 1/2"	4
935-416	Lockwasher—1/4"	4
A4B506	Support—For Lower Cylinders A177	2
1612	Fitting—Alemite, 1/8", 67 1/2°, No. 1612	2
48A923	Pin—for A4B506 Support to Lower Cylinders	2
47A304	Setscrew—3/8" x 1", Drilled Head	4
X29-2	Wire—Locking	4
48A912	Pin—for A4B506 Support to Booms, 1 1/4" x 5 11/16"	2
380-12-8	Pin—Cotter, 3/8" x 2"	2
48A921	Pin—Piston Rod, 2" x 5 13/16" (Upper Cylinders to Booms)	2
55A441	Washer—Retaining, 1 3/4"	2
65-6-10	Capscrew—3/8" x 1", USS	2
935-616	Lockwasher—3/8"	2
96C209	Brackets—Skid, Right	1
96C208	Bracket—Skid, Left	1
60-8-14	Capscrew—1/2" x 1 1/2", SAE	8
60-8-12	Capscrew—1/2" x 1 1/4", SAE	2
935-816	Lockwasher—1/2"	10
325-8	Nut—1/2", SAE	10

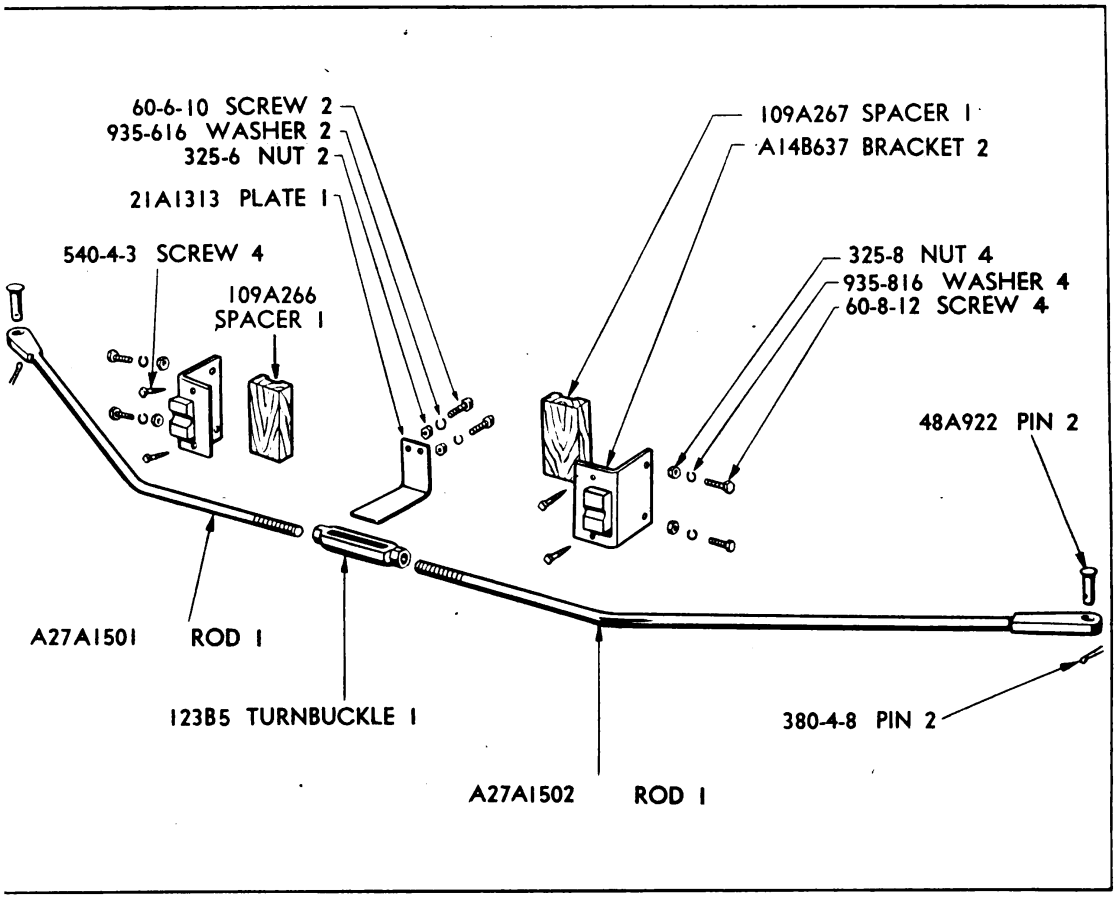


CYLINDER SUPPORT BEARINGS AND MAIN SHAFT

Serial No. HE-335 to HE-834

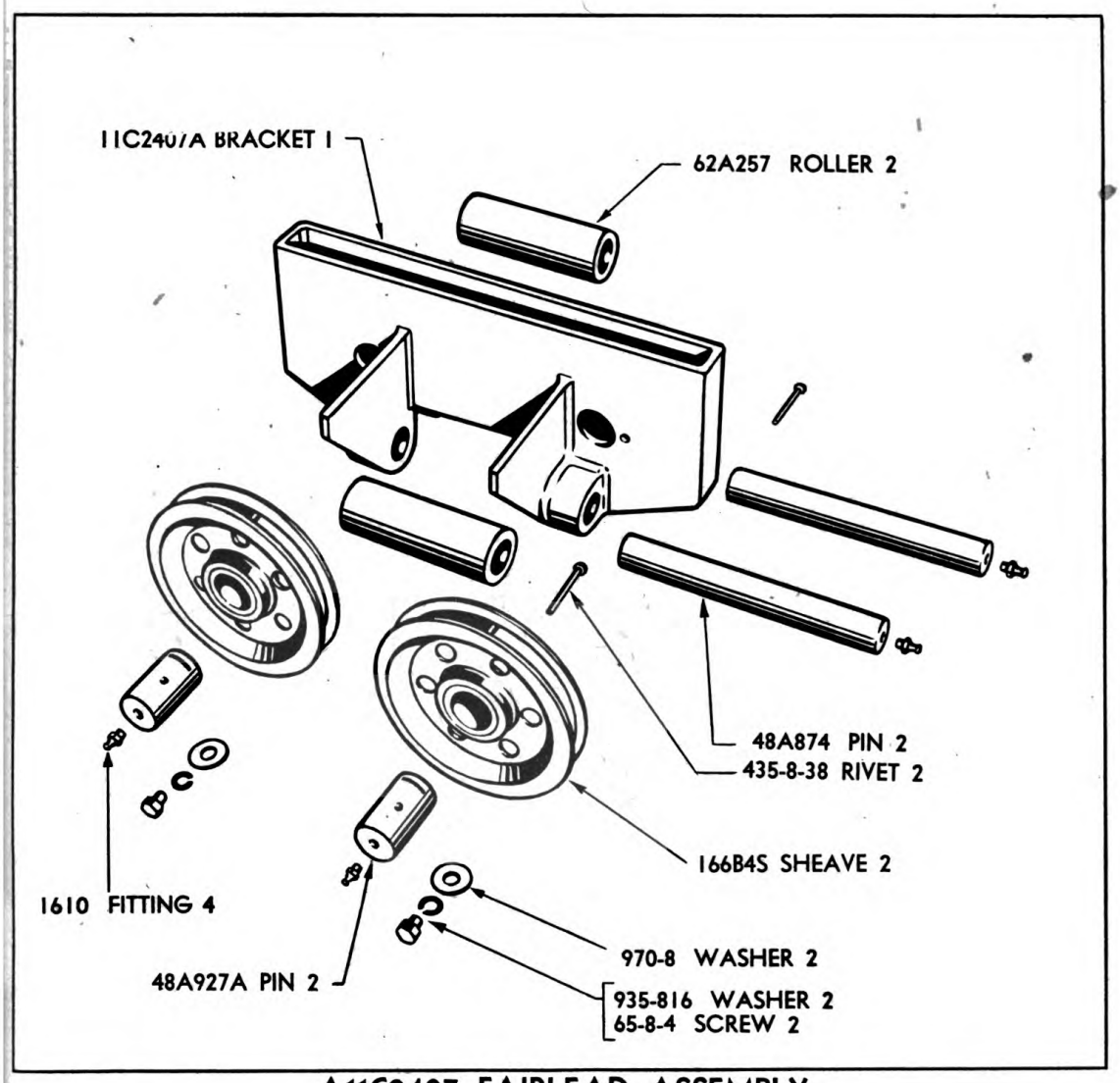
CYLINDER SUPPORT BEARINGS AND MAIN SHAFT

Heil Part Number	Description of Part	No. Per Unit
8B4588	Shaft—Main, $3\frac{5}{16}$" x 98¾"	1
48B914	Key—Wedge, Tapered 1⅝"	2
34A2683	Spacer—for 48B914 Key, 2½" x 3¼"	2
310-16	Nut—Castellated, 1", SAE	2
380-6-7	Pin—Cotter, $\frac{3}{16}$" x 1¾"	2
A3B911	Bracket—Bearing, Main (Outer)	2
1610	Fitting—Alemite, ⅛", Straight, No. 1610	2
9A648	Bushing—Bronze, (for A3B911 Bearing)	2
60-8-14	Capscrew—½" x 1½", SAE	12
935-816	Lockwasher—½"	12
325-8	Nut—½", SAE	12
A3A910A	Bracket—Bearing, Main (Inner)	2
1610	Fitting—Alemite, ⅛", Straight, No. 1610	2
9A647	Bushing—Bronze, (for A3A910A Bearing)	2
11B2520A	Bracket Assembly, RH—for Lower Right Cylinder	1
560-5-10	Setscrew—$\frac{5}{16}$" x ⅝", USS	2
11B2519A	Bracket Assembly, LH—for Lower Left Cylinder	1
560-5-10	Setscrew—$\frac{5}{16}$" x ⅝", USS	2
A11B2522	Assembly, RH—Right Lower Cylinder Support Bracket (Outer)	1
	11B2522—Plate, only (for Lower Cylinder Support) (Right)	1
	9A646—Bushing, Bronze, for 11B2522 Plate	1
	48A1077—Pin, Dowel, $\frac{3}{16}$" x ¾"	1
1610	Fitting—Alemite, ⅛", Straight No. 1610	1
A11B2521	Assembly, LH—Left Lower Cylinder Support Bracket (Outer)	1
	11B2521—Plate, only (for Lower Cylinder Support) (Left)	1
	9A646—Bushing, Bronze (for 11B2521 Plate)	1
	48A1077—Pin, Dowel, $\frac{3}{16}$" x ¾"	1
1610	Fitting—Alemite, ⅛", Straight, No. 1610	1
	Note: Manufacturer Recommends ordering A11B2521 and A11B2522 already assembled.	
60-16-20	Capscrew—1" x 2", SAE	18
935-1616	Lockwasher—1"	18
325-16	Nut—1", SAE	18
48A911	Pin—$2\frac{3}{16}$" x 12", (for Lower Cylinder Support)	2
310-16	Nut—Castellated, 1", SAE	2
380-6-7	Pin—Cotter, $\frac{3}{16}$" x 1¾"	2
40A828	Collar—Spacer, Inner	2
40A822	Washer—3" (for 48A911 Pin)	2



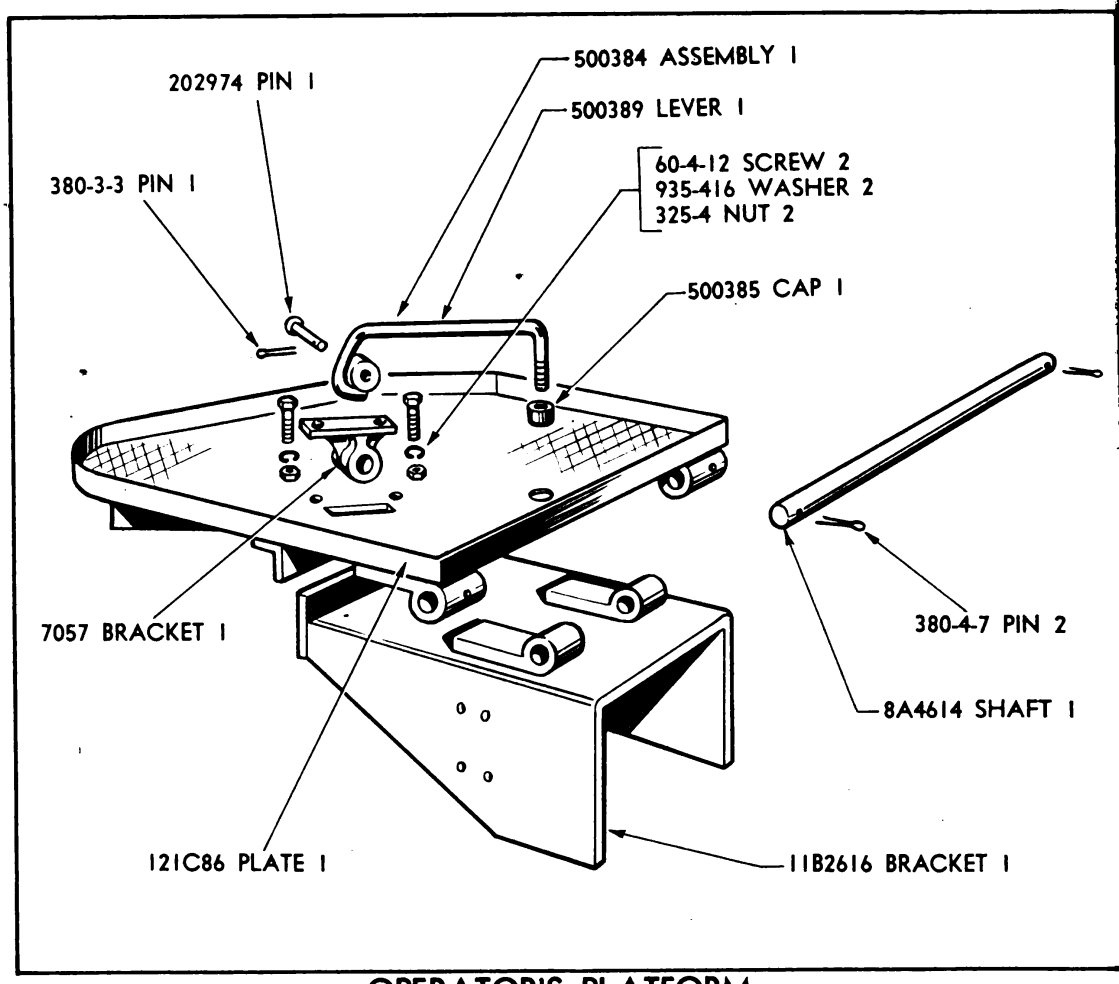
TIE ROD ASSEMBLY

Heil Part Number	Description of Part	No. Per Unit
A27A1502	Rod—Tie (Right)	1
A27A1501	Rod—Tie (Left)	1
123B5	Turnbuckle—7/8", USS	1
48A922	Pin—1" x 3¾" (for A27A1501 and A27A1502 Tie Rods)	2
380-4-8	Pin—Cotter, 1/8" x 2"	2
21A1313	Plate—Lock, Turnbuckle	1
60-6-10	Capscrew—3/8" x 1", SAE	2
935-616	Lockwasher—3/8"	2
325-6	Nut—3/8", SAE	2
A14B637	Bracket	2
109A267	Spacer—Wood, Right	1
109A266	Spacer—Wood, Left	1
540-4-3	Screw—Lag, 1/4" x 1½"	4
60-8-12	Capscrew—½" x 1¼", SAE	4
935-816	Lockwasher—½"	4
325-8	Nut—½", SAE	4



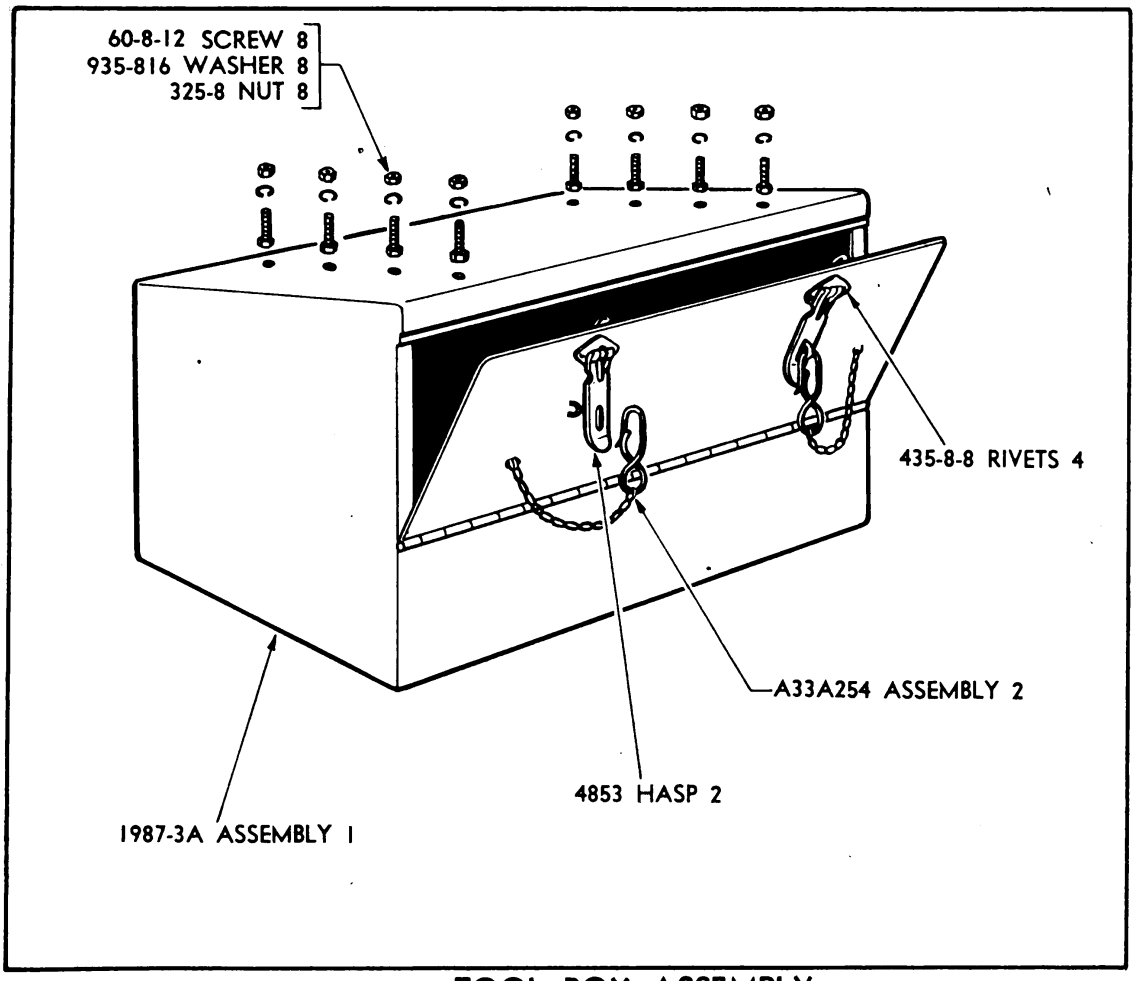
A11C2407 FAIRLEAD ASSEMBLY

Heil Part Number	Description of Part	No. Per Unit
11C2407A	Bracket—Sheave, Fairlead (welded to body)	1
166B4S	Sheave—Fairlead	2
48A927A	Pin—2⅞" x 1¾", (for Fairlead Sheave)	2
48A874	Pin—Roller, 1½" x 11⅛", Drilled	2
62A257	Rollers—Ex. Strong Pipe, 2" x 7"	2
435-8-38	Rivet—Head, Round, ¼" x 2¾"	2
1610	Fitting—Alemite, ⅛", Straight, No. 1610	4
65-8-4	Capscrew—½" x ½", USS	2
935-816	Lockwasher—½"	2
970-8	Washer—Cut, ½"	2



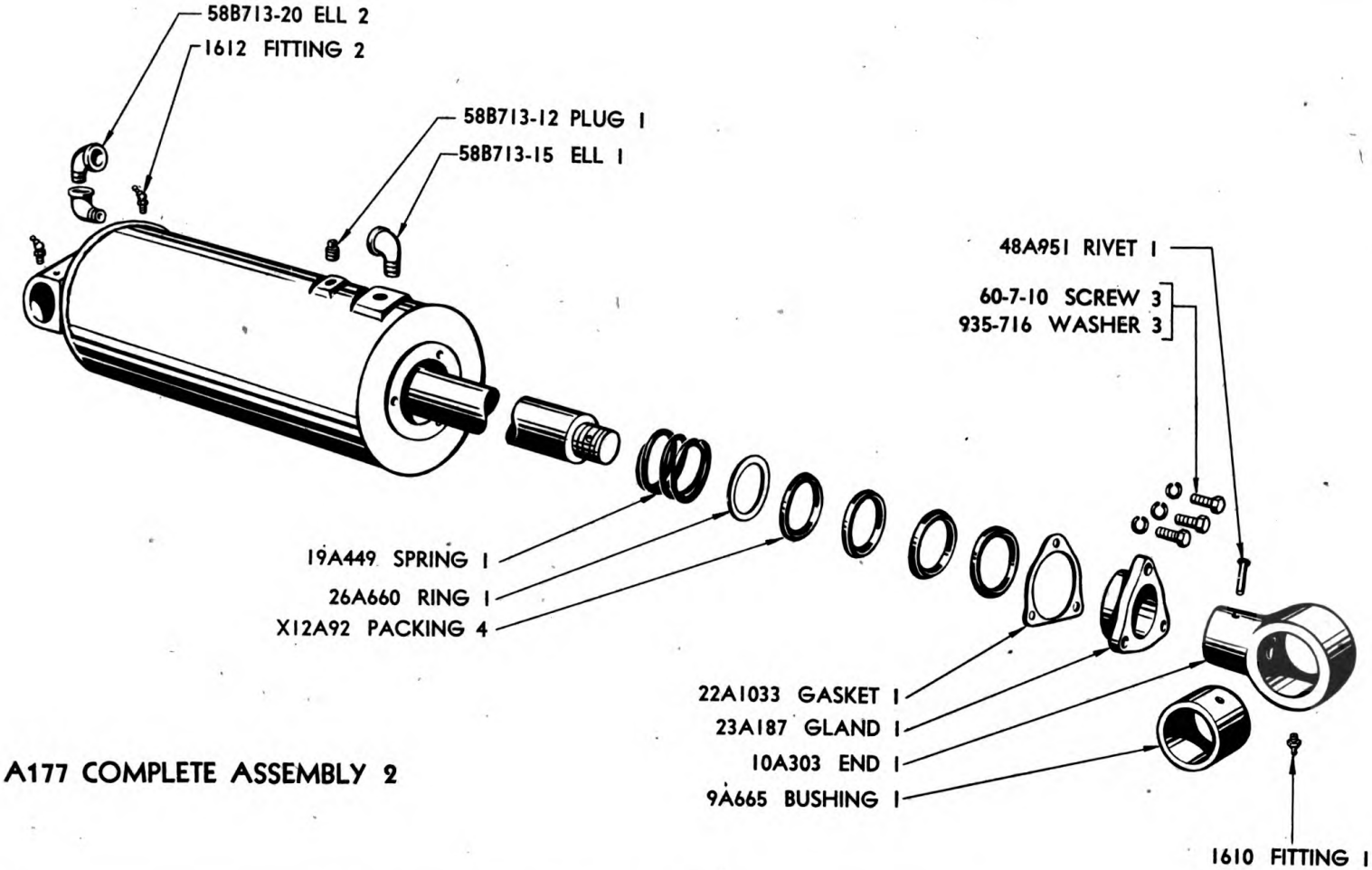
OPERATOR'S PLATFORM FOOT THROTTLE ASSEMBLY

Heil Part Number	Description of Part	No. Per Unit
11B2616	Bracket—Plate, Step (welded to body)	1
121C86	Plate Assembly—Step, Complete	1
8A4614	Shaft—Hinge, 7/8" x 16 1/2"	1
380-4-7	Pin—Cotter, 1/8" x 1 3/4"	2
	Following Parts Manufactured by Brockway Motor Co., Cortland, N. Y.	
500384	Assembly—Throttle, Foot, (Brockway No. 500384)	1
7057	Bracket—Bearing, (Brockway No. 7057)	1
500389	Lever—Throttle, Foot, (Brockway 500389)	1
500385	Cap—Throttle, Foot, (Brock'y 500385)	1
202974	Pin—3/8" x 1 5/8", (Brockway No. 202974)	1
60-4-12	Capscrew—1/4" x 1 1/4", SAE	2
935-416	Lockwasher—1/4"	2
325-4	Nut—1/4", SAE	2
380-3-3	Pin—Cotter, 3/32" x 3/4"	1



TOOL BOX ASSEMBLY

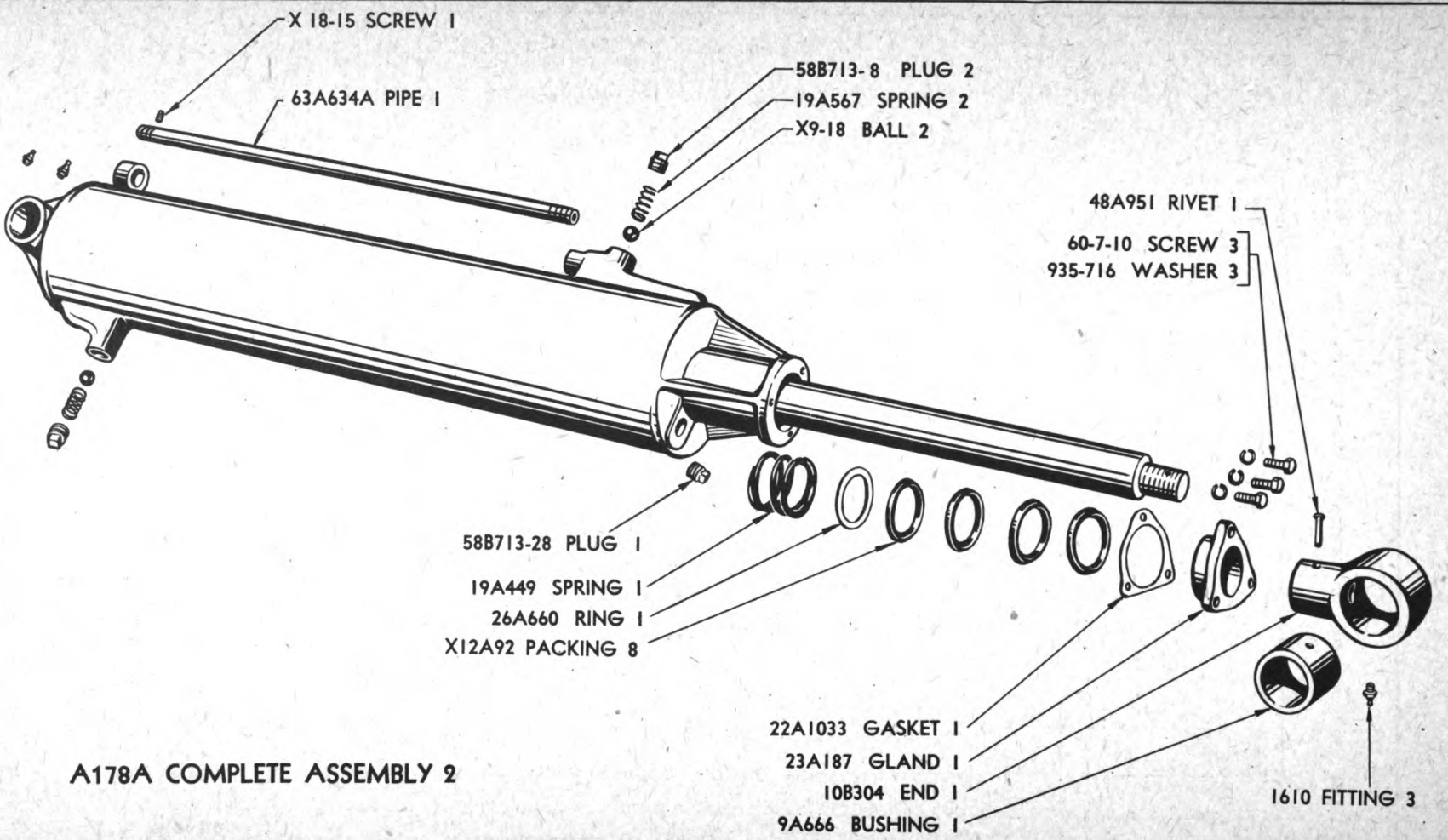
Heil Part Number	Description of Part	No. Per Unit
1987-3A	Assembly—Box, Tool	1
	4853 Hasp—Latch	2
	435-8-8 Rivet —Head, Round, ¼" x ½"	4
	A33A254 Assembly—Chain and Clip (welded to tool box)	2
60-8-12	Capscrew—½" x 1¼", SAE	8
935-816	Lockwasher—½"	8
325-8	Nut—½", SAE	8



A177 SHORT LOWER CYLINDER ASSEMBLY

SHORT LOWER CYLINDER ASSEMBLY

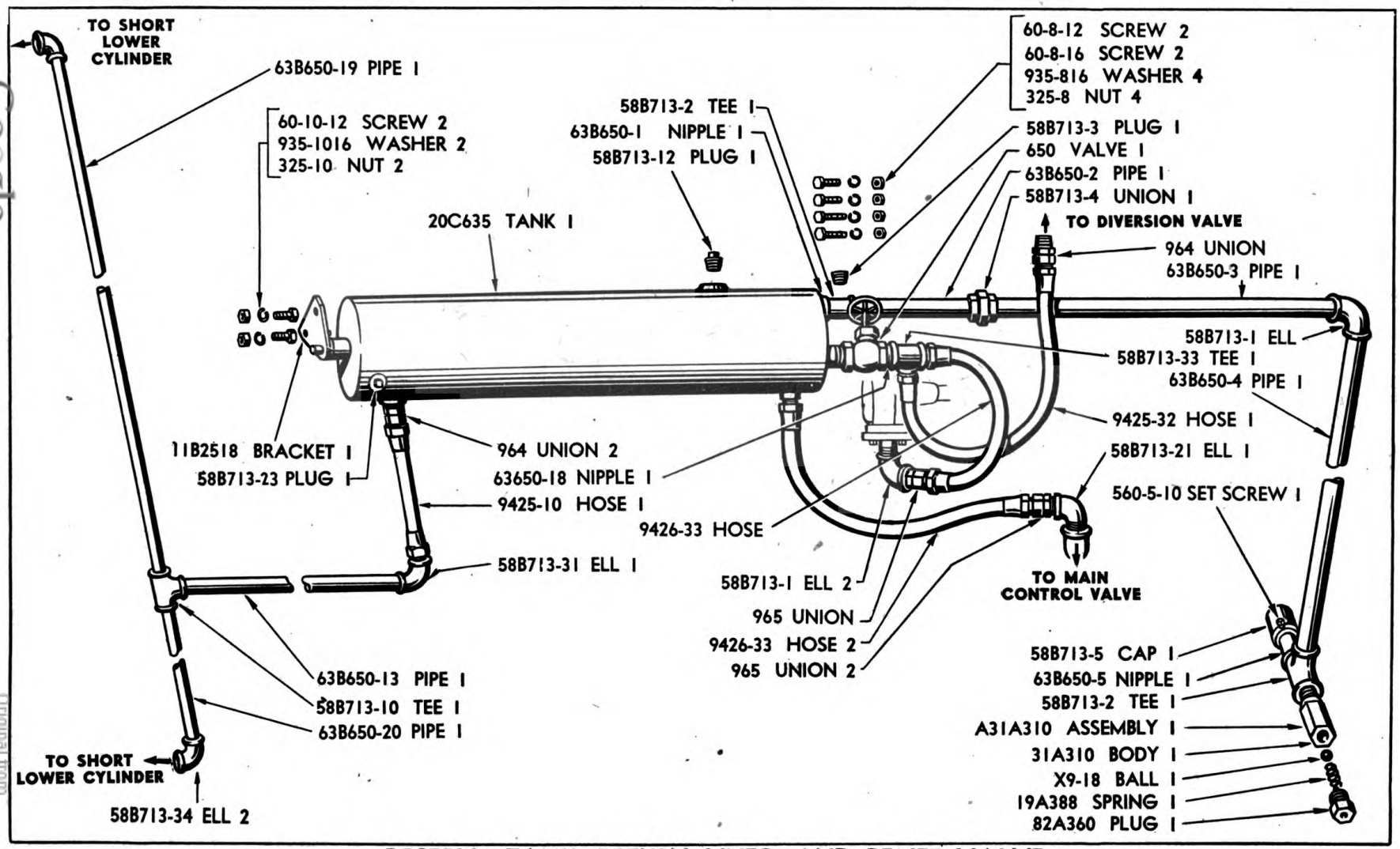
Heil Part Number	Description of Part	No. Per Unit
A177	Complete Assembly—Cylinder, Lower, Short	2
1612	Fitting—Alemite ⅛", 67½° No. 1612	4
19A449	Spring—Cylinder Head	2
26A660	Ring—Packing (for Cylinder Head)	2
X12A92	Packing—V-Leather (for Piston Rod)	8
22A1033	Gasket—Rod, Piston	2
23A187	Gland—Packing, Bronze	2
60-7-10	Capscrew—7/16" x 1", SAE	6
935-716	Lockwasher—$\frac{7}{16}$"	6
10A303	End—Rod, Piston	2
48A951	Rivet—Head, Round 5/16" x 2⅝"	2
9A665	Bushing—Bronze, (for Piston Rod End)	2
1610	Fitting—Alemite, ⅛", Straight, No. 1610	2
58B713-15	Ell—Street, ½", 45°	2
58B713-12	Plug—Pipe, ¼"	2
58B713-20	Ell—Street, ¾", 90°, Ex. Strong	4



A178A LONG UPPER CYLINDER ASSEMBLY

LONG UPPER CYLINDER ASSEMBLY

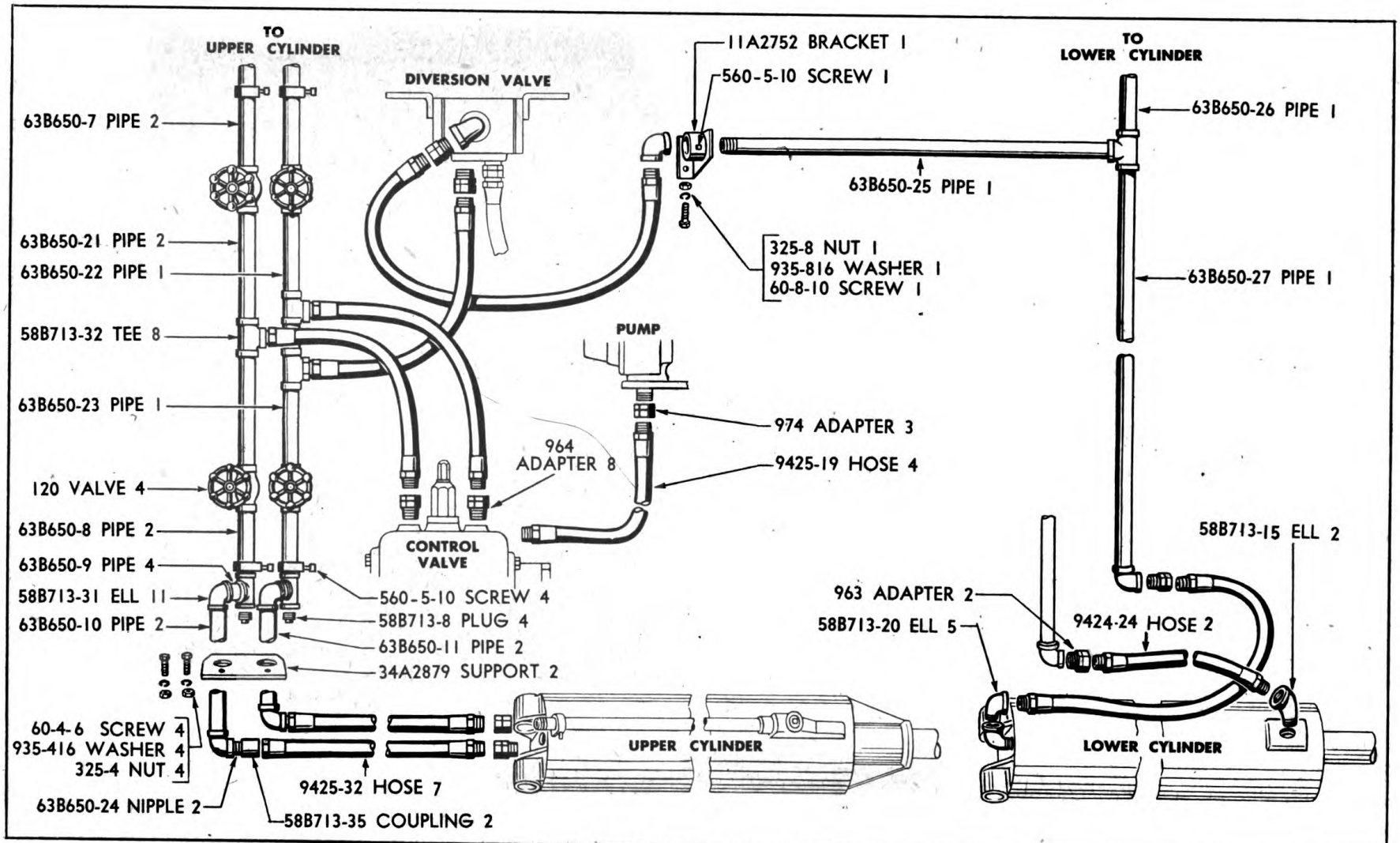
Heil Part Number	Description of Part	No. Per Unit
A178A	Complete Assembly—Cylinder, Upper, Long	2
	58B713-28 Plug—Pipe, ½", Standard	4
	1610 Fitting—Alemite, ⅛", Straight, No. 1610	4
	19A449 Spring—Head, Cylinder	2
	26A660 Ring—Packing (for Cylinder Head)	2
	X12A92 Packing—V-Leather (for Piston Rod)	16
	22A1033 Gasket—Rod, Piston	2
	23A187 Gland—Packing, Bronze	2
	60-7-10 Capscrew—7/16" x 1", SAE	6
	935-716 Lockwasher—7/16"	6
	10B304 End—Rod, Piston	2
	48A951 Rivet—Head, Round, 5/16" x 2⅝"	2
	9A666 Bushing—Bronze, (for Piston Rod End)	2
	1610 Fitting—Alemite, ⅛", Straight, No. 1610	2
	X9-18 Ball—⅞", Steel	4
	19A567 Spring—Ball, Check	4
	58B713-8 Plug—¾", Steel, Forged, Standard	4
	63A634A Pipe—Ex. Strong, Upper Return, ¾" x 32"	2
	X18-15 Setscrew—Allen Head, 5/16" x ⅜", USS	2
44-85	Wrench—Allen Head, 5/16"	1



RESERVE TANK, RETURN LINES, AND RELIEF VALVE

RESERVE TANK, RETURN LINES, AND RELIEF VALVE

Heil Part Number	Description of Part	No. Per Unit
	RESERVE OIL TANK AND BRACKET	
20C635	Tank—Oil, Reserve	1
	58B713-12 Plug—Pipe, 1/4"	1
	58B713-23 Plug—Pipe, 3/4" (Drain)	1
60-8-12	Capscrew—1/2" x 1 1/4", SAE	2
60-8-16	Capscrew—1/2" x 1 3/4", SAE	2
935-816	Lockwasher—1/2"	4
325-8	Nut—1/2", SAE	4
11B2518	Bracket—Tank, Oil, Reserve	1
60-10-12	Capscrew—5/8" x 1 1/4", SAE	2
935-1016	Lockwasher—5/8"	2
325-10	Nut—5/8", SAE	2
	RETURN LINES, VALVE AND FITTINGS	
63B650-20	Pipe—Ex. Strong, 1/2" x 30"	1
63B650-19	Pipe—Ex. Strong, 1/2" x 52 1/4"	1
63B650-13	Pipe—Standard, 3/4" x 32 1/2"	1
63B650-2	Pipe—Standard, 1" x 10"	1
63B650-3	Pipe—Standard, 1" x 27"	1
63B650-4	Pipe—Standard, 1" x 51 1/2"	1
9425-10	Hose—High Pressure, Hydraulic, (with Fittings), 3/4" x 10"	1
9425-32	Hose—High Pressure, Hydraulic, (with Fittings), 3/4" x 32"	1
9426-33	Hose—High Pressure, Hydraulic, (with Fittings), 1" x 33"	2
964	Union—Adapter (Male to Female) 3/4"	2
965	Union—Adapter (Male to Female) 1"	2
58B713-10	Tee—Standard, 1/2" x 1/2" x 3/4"	1
58B713-34	Ell—Standard, 1/2", 90°	2
58B713-31	Ell—Ex. Strong, 3/4", 90°	1
58B713-33	Tee—Standard, 1" x 1" x 3/4"	1
58B713-1	Ell—Standard, 1", 90°	2
58B713-4	Union—Standard, 1"	1
58B713-5	Cap—Pipe, 1"	1
58B713-2	Tee—Standard, 1"	2
63B650-18	Nipple—Ex. Strong, 1" Close	1
58B713-21	Ell—Street, Standard, 1"	1
63B650-5	Nipple—Standard, 1" x 4"	1
58B713-3	Plug—Pipe, Head, Recessed, 1"	1
63B650-1	Nipple—Standard, 1" x 3"	1
650	Valve—Globe, Shut-off, 1", (Powell Co. No. 650)	1
560-5-10	Setscrew—Sq. head, 5/16" x 5/8", USS	7
	RELIEF VALVE ASSEMBLY	
A31A310	Assembly—Valve, Relief	1
	31A310 Body—Valve, Relief (only)	1
	X9-18 Ball—7/8", Steel	1
	19A388 Spring—Check, Ball	1
	82A360 Plug—Pipe, Special, 3/4"	1

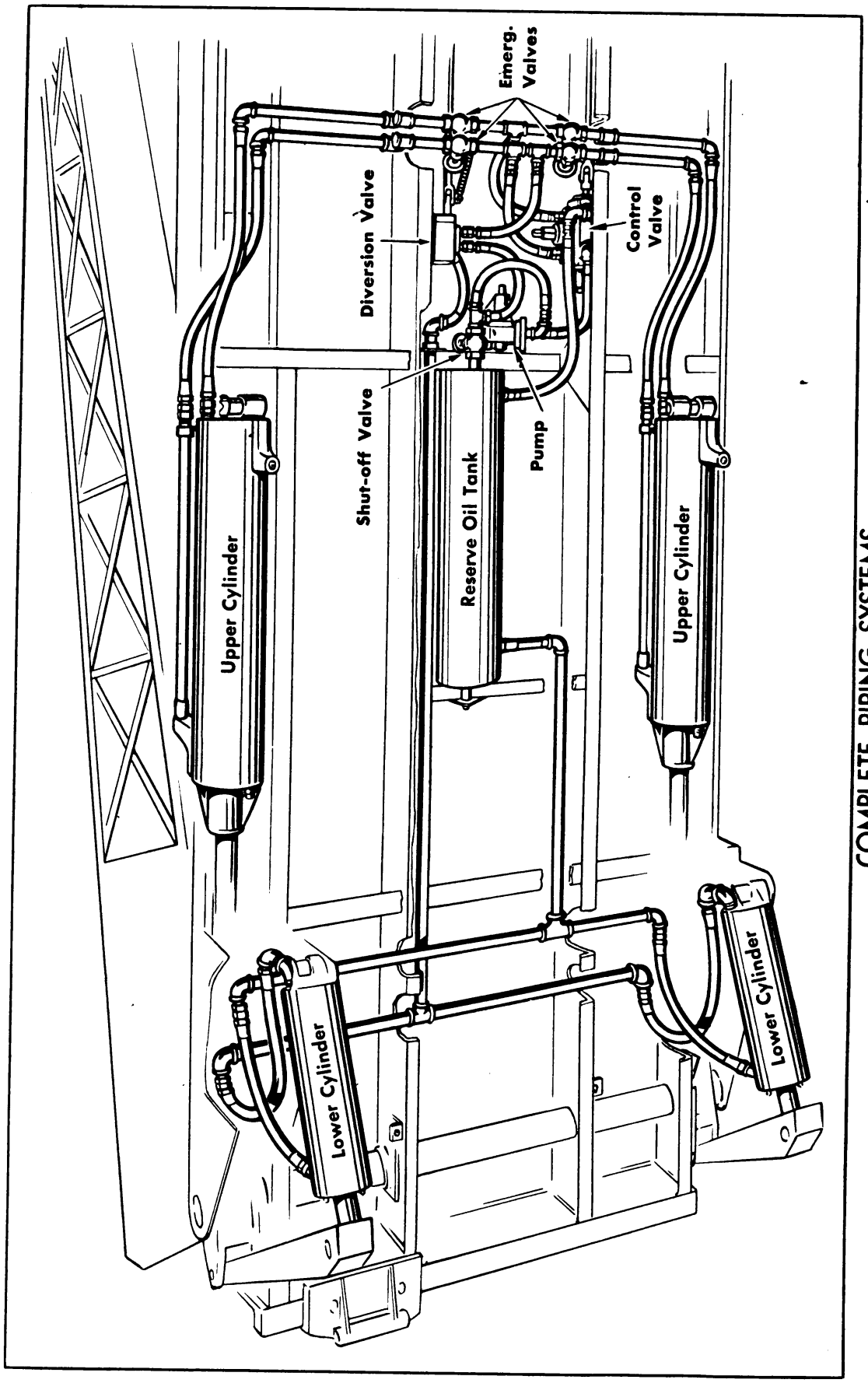


HYDRAULIC SYSTEM

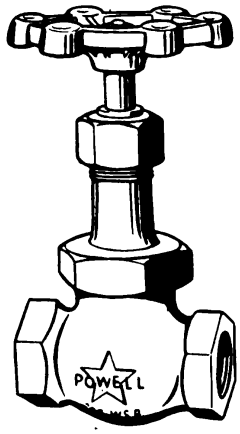
HYDRAULIC SYSTEM

Heil Part Number	Description of Part	No. Per Unit
	HOSE, UNIONS AND VALVES	
9424-24	Hose—High Pressure, (with Fittings), ½" x 24"	2
9425-19	Hose—High Pressure, (with Fittings), ¾" x 19"	4
9425-32	Hose—High Pressure, (with Fittings), ¾" x 32"	7
963	Union—Adapter, ½" (Male to Female)	2
974	Union—Adapter, ¾" (Female to Female)	3
964	Union—Adapter, ¾" (Male to Female)	8
120	Valve—Globe, ¾" (Powell Co. No. 120)	4
	PIPE	
63B650-9	Pipe—Extra Strong, ¾" x 3¼"	4
63B650-7	Pipe—Extra Strong, ¾" x 6"	2
63B650-23	Pipe—Extra Strong, ¾" x 6½"	1
63B650-8	Pipe—Extra Strong, ¾" x 7"	2
63B650-22	Pipe—Extra Strong, ¾" x 7¾"	1
63B650-21	Pipe—Extra Strong, ¾" x 8¾"	2
63B650-11	Pipe—Extra Strong, ¾" x 22¾"	2
63B650-10	Pipe—Extra Strong, ¾" x 24⅞"	2
63B650-26	Pipe—Extra Strong, ¾" x 28"	1
63B650-27	Pipe—Extra Strong, ¾" x 56½"	1
63B650-25	Pipe—Extra Strong, ¾" x 74"	1
	FITTINGS	
58B713-15	Ell—Street, ½", 45°	2
58B713-31	Ell—Extra Strong, ¾", 90°	11
58B713-32	Tee—Extra Strong, ¾"	8
63B650-24	Nipple—Extra Strong, Close, ¾"	2
58B713-35	Coupling—Extra Strong, ¾" x 1⅝"	2
58B713-8	Plug—Pipe, Steel, Forged, ¾"	4
58B713-20	Ell—Street, Extra Strong, ¾"	5
	BRACKETS	
34A2879	Support—Bracket, Pipe (Bolted to Body)	2
60-4-6	Capscrew—¼" x ¾", SAE	4
935-416	Lockwasher—¼"	4
325-4	Nut—¼", SAE	4
560-5-10	Setscrew—$\frac{5}{16}$" x ⅝", USS	4
11A2752	Bracket—Support, Pipe (Bolted to Body)	1
60-8-10	Capscrew—½" x 1", SAE	1
935-816	Lockwasher—½"	1
325-8	Nut—½", SAE	1
560-5-10	Setscrew—Sq. head $\frac{5}{16}$" x ⅝", USS	1

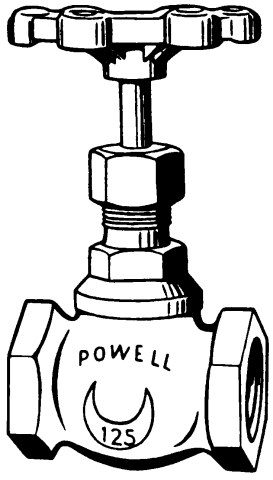
PARTS CATALOG



COMPLETE PIPING SYSTEMS



120 POWELL ¾" VALVE 4



650 POWELL 1" VALVE 1

POWELL VALVES

Heil Part Number	Description of Part	No. Per Unit
120	Valve—Globe, Emergency, ¾", (Powell Co. No. 120)....	4
650	Valve—Globe, Shut-off 1", (Powell Co. No. 650)	1

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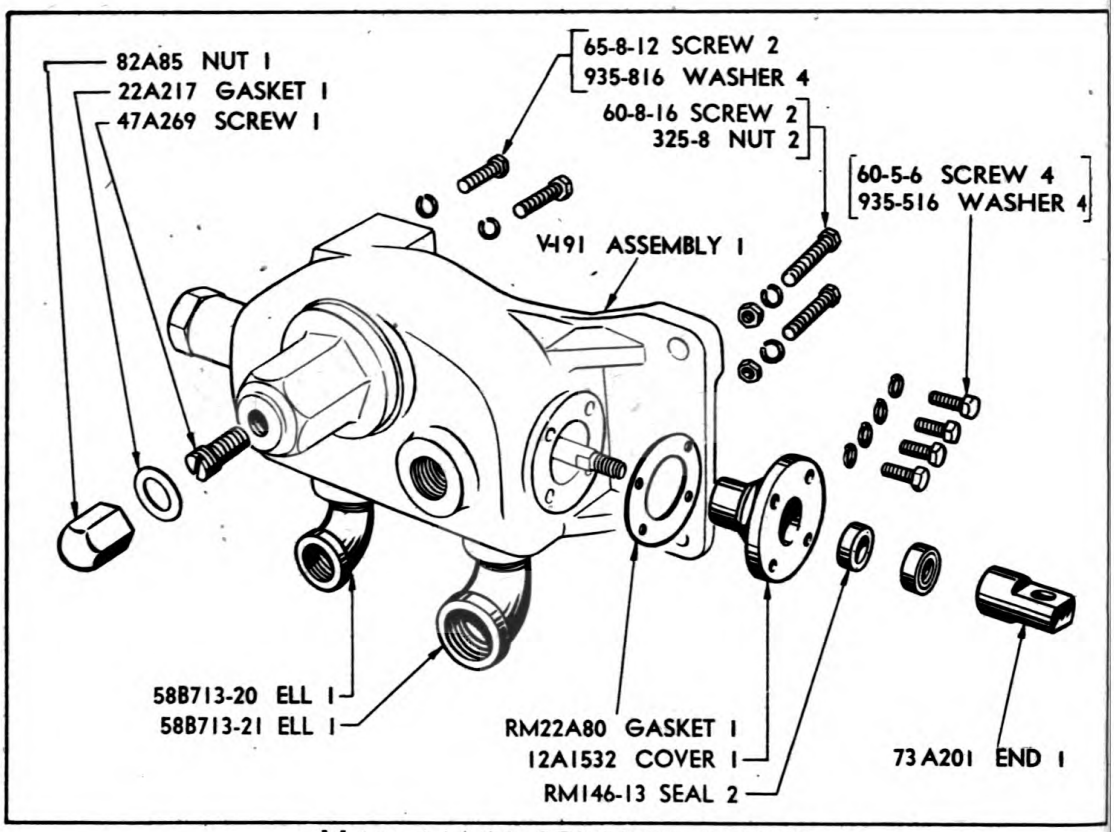
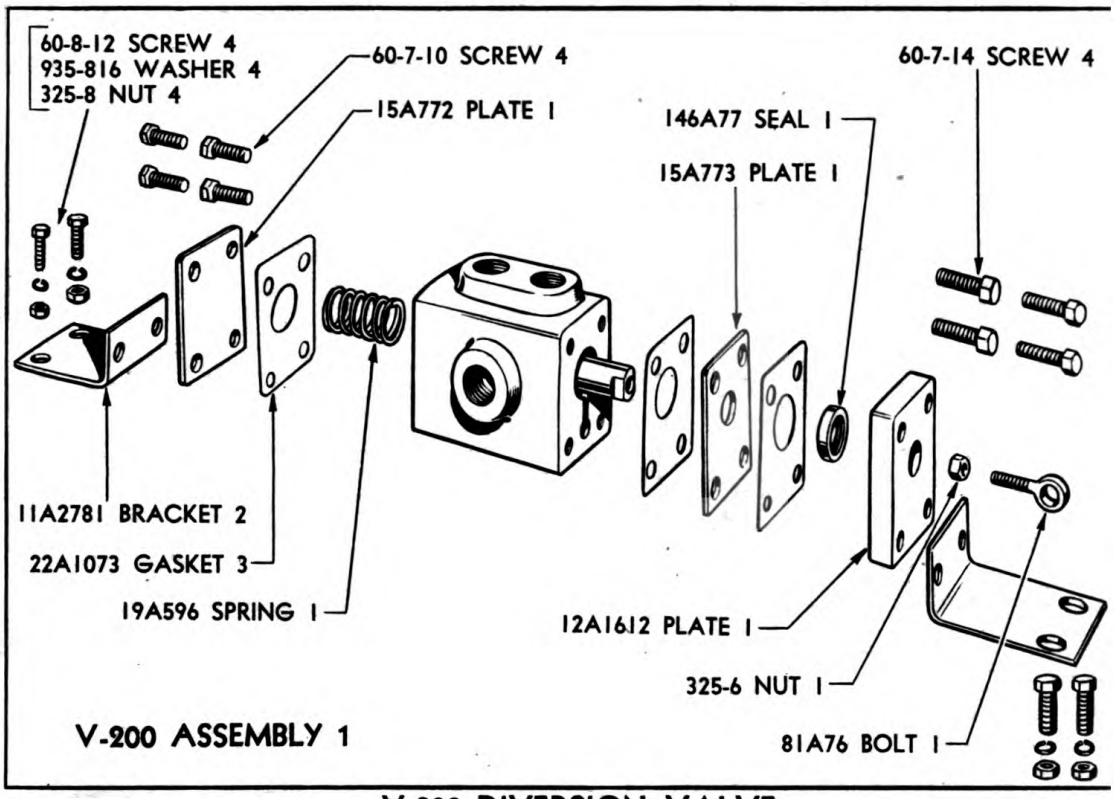


V-191 MAIN CONTROL VALVE

VALVE SPOOL AND VALVE HOUSING ARE NOT SOLD SEPARATELY

Heil Part Number	Description of Part	No. Per Unit
V-191	Valve Assembly—Control, Main	1
	82A85 Nut—Acorn	1
	47A269 Screw—Adjusting	1
	22A217 Gasket—Copper	1
	60-5-6 Capscrew—$\frac{5}{16}$" x ¾", SAE	4
	935-516 Lockwasher—$\frac{5}{16}$"	4
	73A201 End—Rod	1
	RM146-13 Seal—Oil	2
	12A1532 Cover—Gland, Packing	1
	RM22A80 Gasket—Cover	1
	58B713-20 Ell—Street, Extra Strong, ¾"	1
	58B713-21 Ell—Street, Standard 1"	1
65-8-12	Capscrew—½" x 1¼", USS, (To Bolt Valve to Frame)	2
60-8-16	Capscrew—½" x 1¾", SAE, (To Bolt Valve to Frame)	2
935-816	Lockwasher—½"	4
325-8	Nut—½", SAE	2

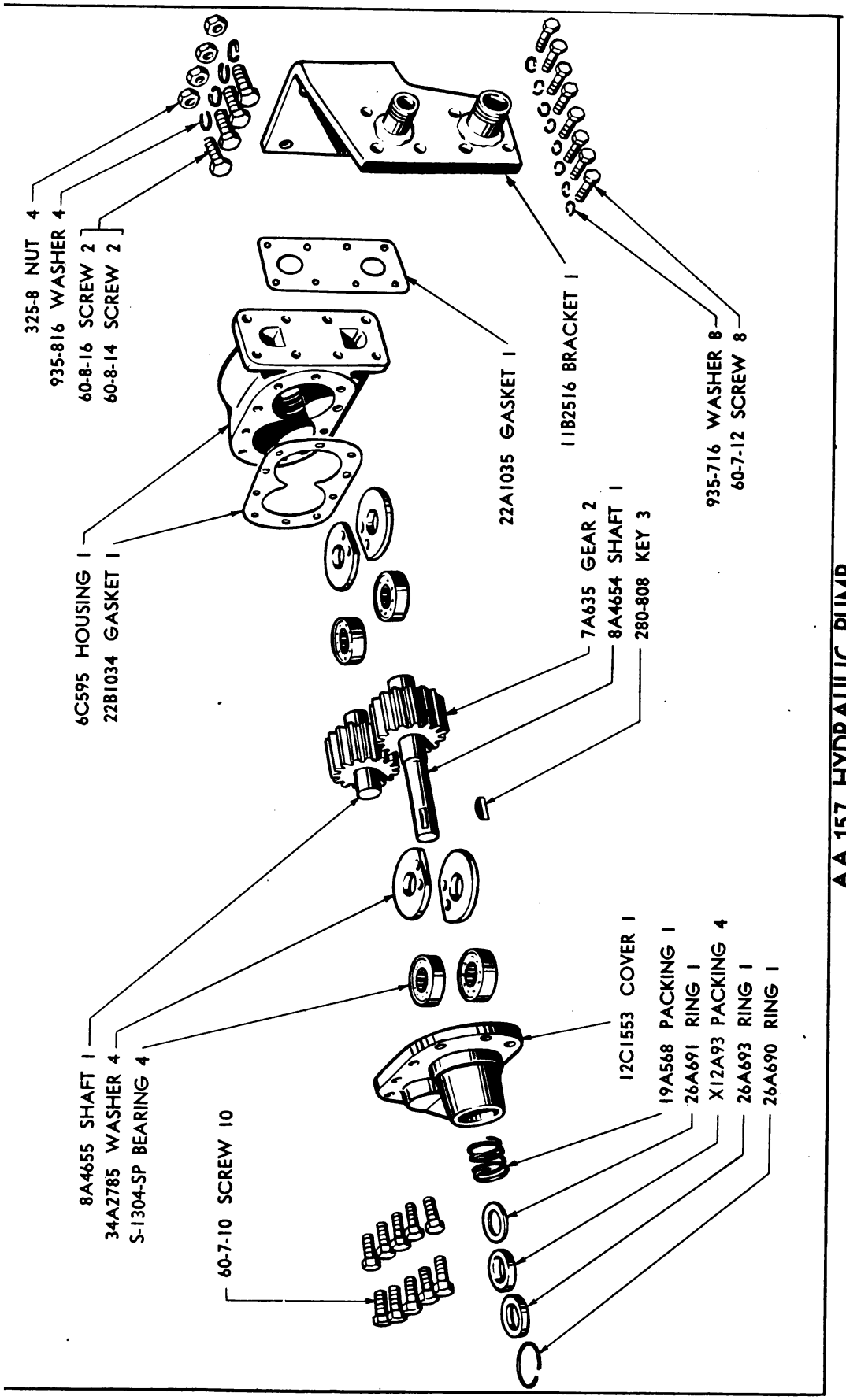


V-200 DIVERSION VALVE

VALVE SPOOL AND VALVE HOUSING ARE NOT SOLD SEPARATELY

Heil Part Number	Description of Part	No. Per Unit
V-200	Valve Assembly—Diversion, (for Lower Cylinders Control) (Port Clinton Marine Garage, No. 15033)	1
	146A77 Seal—Oil	1
	12A1612 Plate—Cover (Outside)	1
	15A773 Plate—Cover (Inside)	1
	15A772 Plate—Cover, Rear	1
	19A596 Spring	1
	22A1073 Gasket	3
	11A2781 Bracket	2
	81A76 Bolt—Eye (with 17/32" Hole)	1
	60-7-10 Capscrew—$\frac{7}{16}$" x 1", SAE	4
	60-7-14 Capscrew—$\frac{7}{16}$" x 1½", SAE	4
	325-6 Nut—⅜", SAE	1
60-8-12	Capscrew—½" x 1¼", SAE (To Bolt to Body)	4
935-816	Lockwasher—½"	4
325-8	Nut—½", SAE	4

PARTS CATALOG

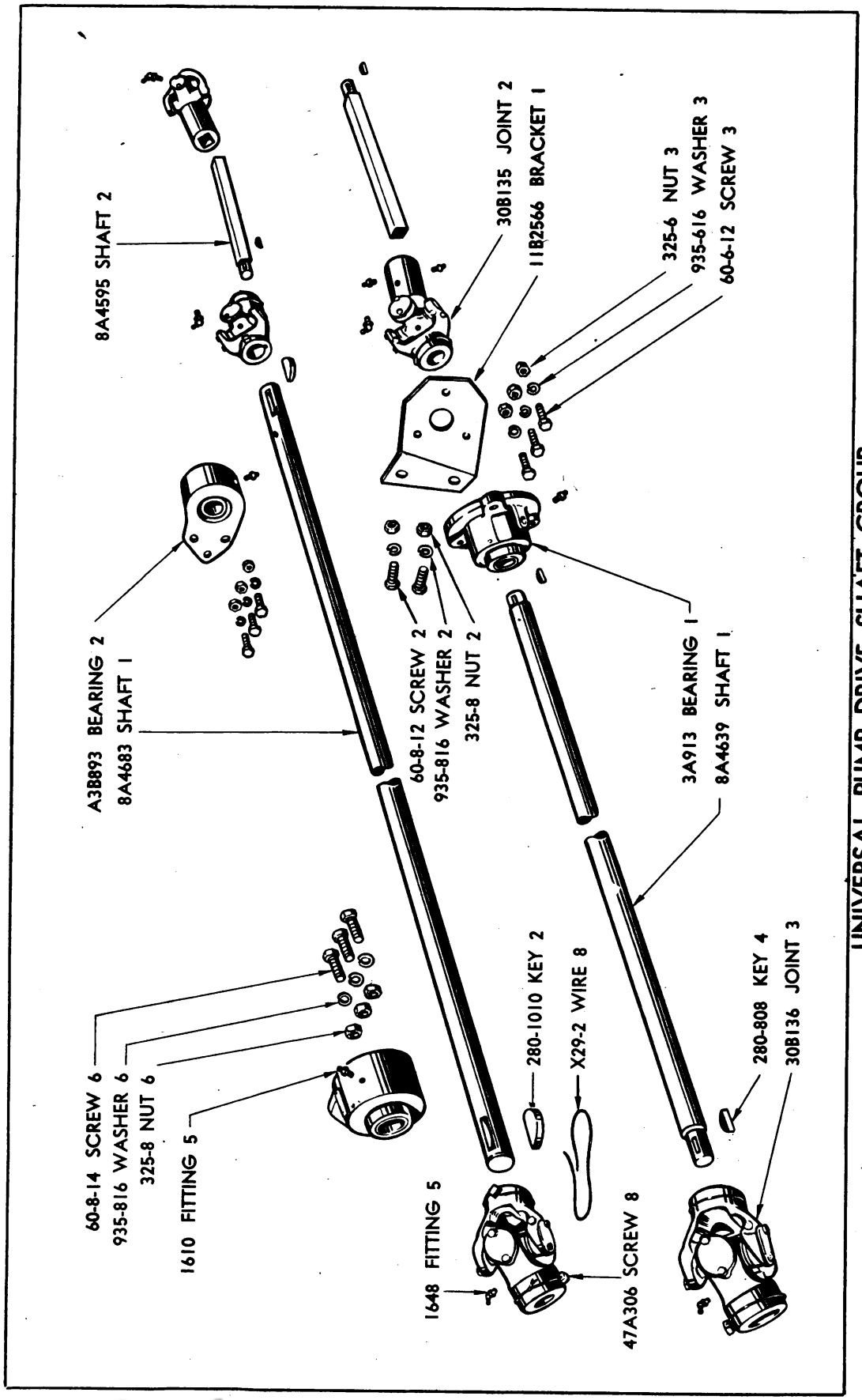


AA-157 HYDRAULIC PUMP
11B2516 PUMP BRACKET

HYDRAULIC PUMP

Heil Part Number	Description of Part	No. Per Unit
AA-157	Pump Assembly—Hydraulic, Complete	1
	6C595 Housing—Pump	1
	12C1553 Cover—Pump	1
	7A635 Gear—Pump	2
	8A4654 Shaft—Pump (Long)	1
	8A4655 Shaft—Pump (Short)	1
	280-808 Key—Woodruff, ¼", No. 15	3
	34A2785 Washer—Thrust	4
	S-1304SP Bearing—Roller (Bower, S-1304SP)	4
	60-7-10 Capscrew—$\frac{7}{16}$" x 1", SAE	10
	19A568 Packing—Spring	1
	26A691 Ring—Packing, Inner (Male)	1
	26A693 Ring—Packing, Outer (Female)	1
	X12A93 Packing—V-Leather	4
	26A690 Ring—Lock	1
	22A1035 Gasket—Pump to Pump Bracket 11B2516	1
	22B1034 Gasket—Pump Cover to Housing	1
	PUMP BRACKET	
11B2516	Bracket—Pump	1
60-7-12	Capscrew—$\frac{7}{16}$" x 1¼", SAE	8
935-716	Lockwasher—$\frac{7}{16}$"	8
60-8-16	Capscrew—½" x 1¾", SAE	2
60-8-14	Capscrew—½" x 1½", SAE	2
935-816	Lockwasher—½"	4
325-8	Nut—½", SAE	4

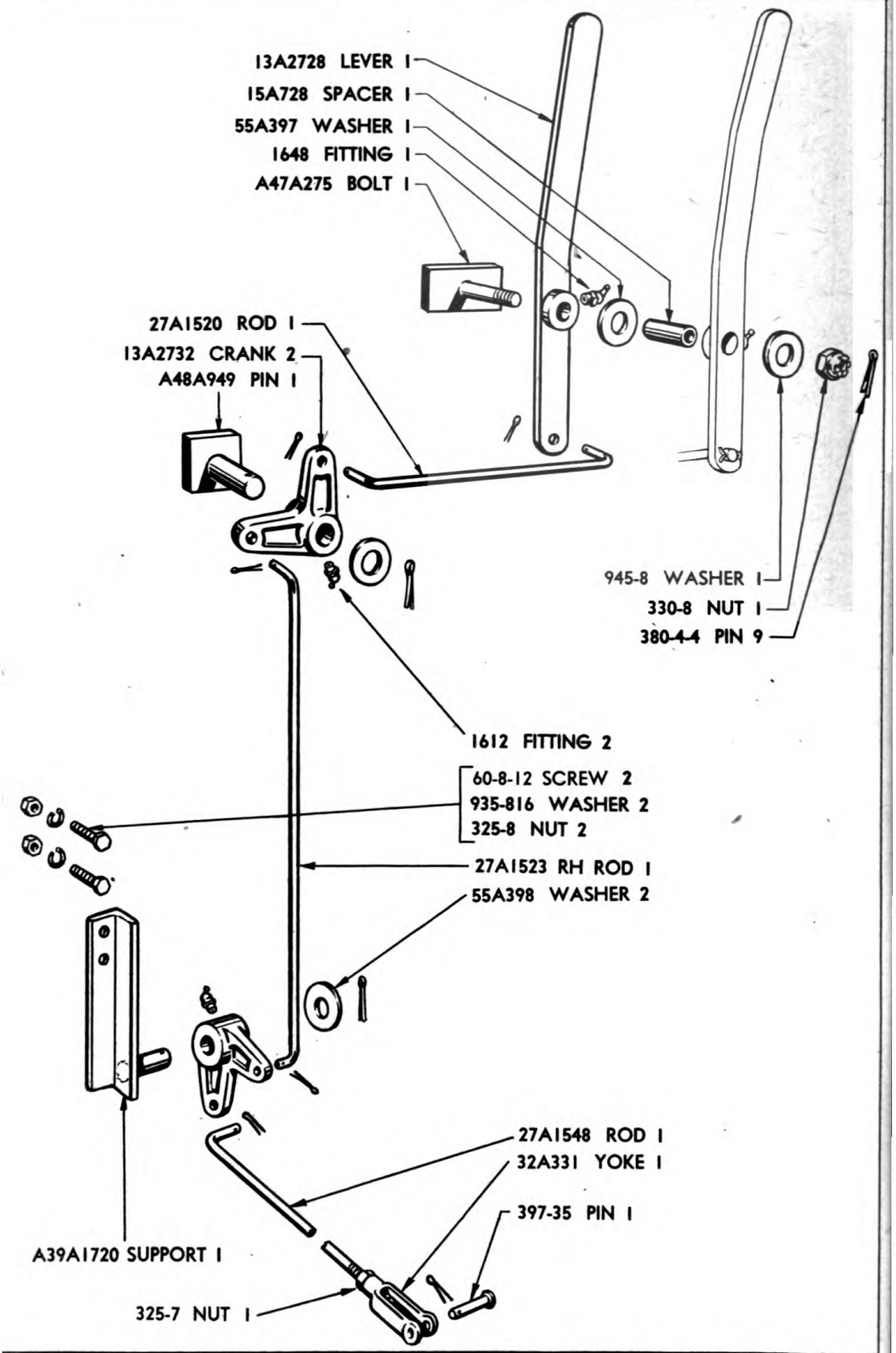
PARTS CATALOG



UNIVERSAL PUMP DRIVE SHAFT GROUP

UNIVERSAL PUMP DRIVE SHAFT GROUP

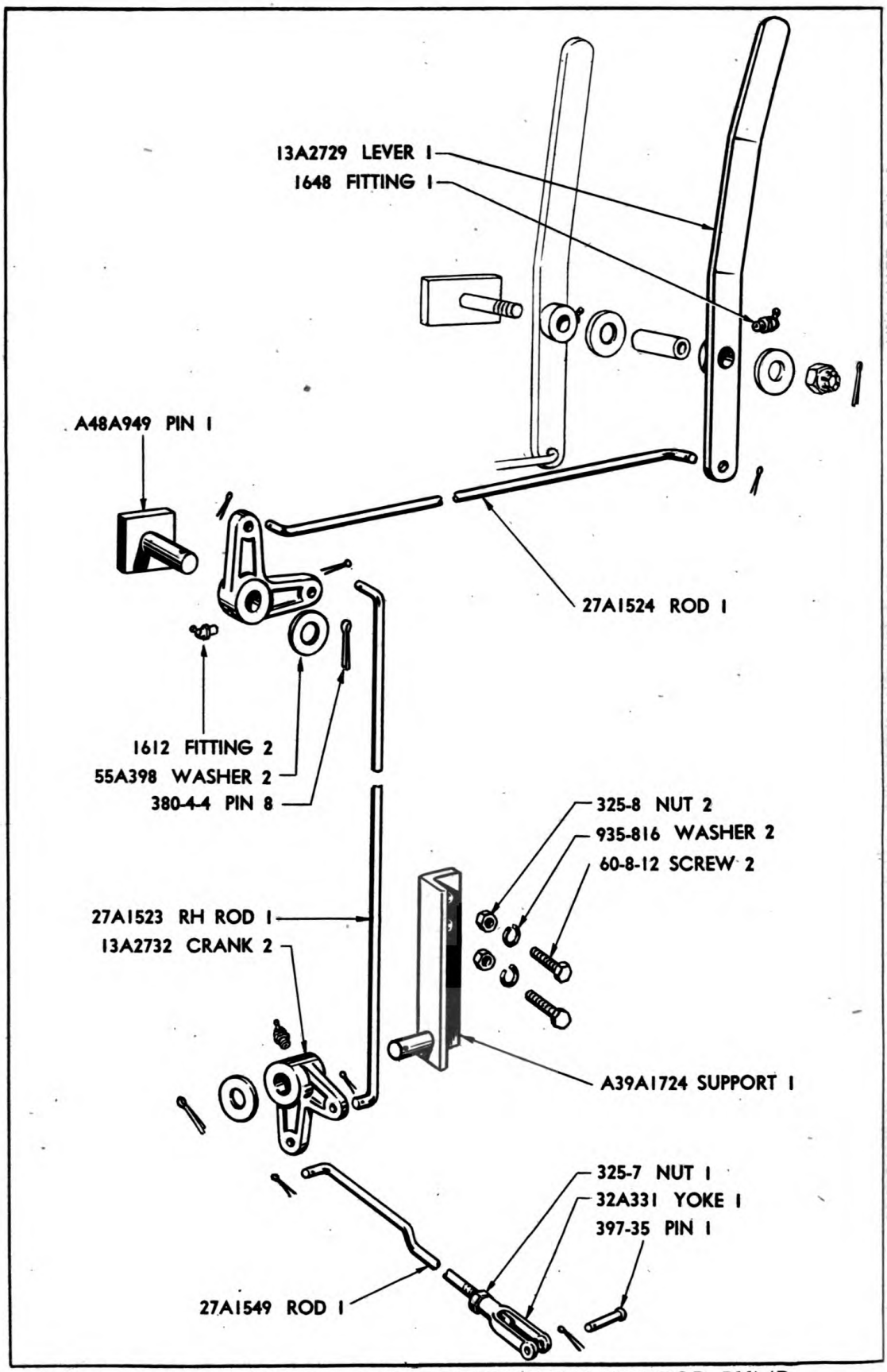
Heil Part Number	Description of Part	No. Per Unit
8A4683	Shaft—Drive, Round, 1¼" x 70¾"	1
280-1010	Key—Woodruff, $\frac{5}{16}$" x 1¼", No. D	2
A3B893	Bearing—Hanger Type (Link-Belt No. S-205973)	2
60-8-14	Capscrew—½" x 1½", SAE	6
935-816	Lockwasher—½"	6
325-8	Nut—½", SAE	6
1610	Fitting—Alemite, ⅛" Straight, No. 1610	2
8A4639	Shaft—Universal, 1" x 36½" (PTO to Bearing)	1
3A913	Bearing—Flanged Type (Link Belt No. F-416)	1
1610	Fitting—Alemite, ⅛", Straight, No. 1610	1
11B2566	Bracket—Support, Shaft, Universal (for 3A913 Bearing)	1
60-6-12	Capscrew—⅜" x 1¼", SAE	3
935-616	Lockwasher—⅜"	3
325-6	Nut—⅜", SAE	3
60-8-12	Capscrew—½" x 1¼", SAE	2
325-8	Nut—½", SAE	2
30B135	Joint—Slip, Universal	2
1610	Fitting—Alemite, ⅛", Straight, No. 1610	2
30B136	Joint—Universal	3
1648	Fitting—Alemite, $\frac{5}{16}$", 67½°, No. 1648	5
47A306	Setscrew—Sq. head ⅜" x ¾", USS, (Drilled for Lock Wire)	8
X29-2	Wire—Locking	8
8A4595	Shaft—Square, ⅞" x 13"	2
280-808	Key—Woodruff, ¼", No. 15	4



LEVER CONTROL FOR POWER TAKE-OFF FOR WINCH

LEVER CONTROL FOR POWER TAKEOFF FOR WINCH

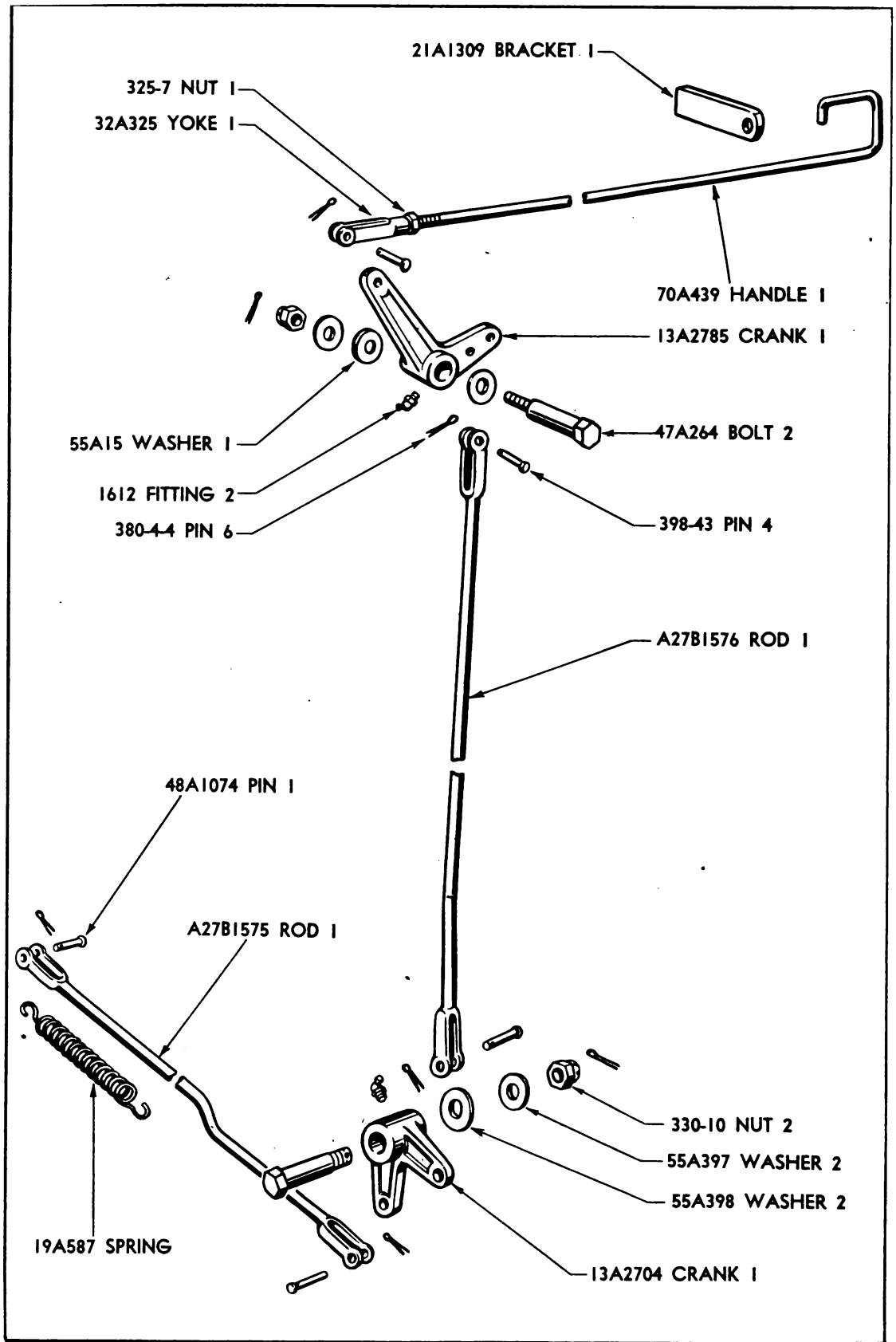
Heil Part Number	Description of Part	No. Per Unit
13A2728	Lever—for Winch (Lever Only)	1
1648	Fitting—Alemite, $\frac{5}{16}$" SAE, 67½°, No. 1648	1
A47A275	Bolt—Bearing	1
55A397	Washer—Special, Drilled to $\frac{11}{16}$", I.D.	1
15A728	Spacer—Pipe, $1\frac{3}{16}$", Long	1
945-8	Washer—Cut, ½"	1
330-8	Nut—Castellated, ½", SAE	1
380-4-4	Pin—Cotter, ⅛" x 1"	1
27A1520	Rod—Control, $\frac{7}{16}$" x 9¾", (for Winch)	1
380-4-4	Pin—Cotter, ⅛" x 1"	2
A48A949	Pin—Bearing, for 13A2732 Bell Cranks (Welded to Body)	1
13A2732	Crank—Bell	2
1612	Fitting—Alemite, ⅛", 67½°, No. 1612	2
55A398	Washer—Special, Drilled to $\frac{25}{32}$" I.D.	2
380-4-4	Pin—Cotter, ⅛" x 1"	1
27A1523	Rod—Control, $\frac{7}{16}$" x 34¼", (for Winch)	1
380-4-4	Pin—Cotter, ⅛" x 1"	2
27A1548	Rod—Control, $\frac{7}{16}$" x 36¼"	1
380-4-4	Pin—Cotter, ⅛" x 1"	1
32A331	Yoke—$\frac{7}{16}$", SAE	1
325-7	Nut—Yoke, $\frac{7}{16}$", SAE	1
397-35	Pin—$\frac{7}{16}$" x 1¼"	1
380-4-4	Pin—Cotter, ⅛" x 1"	1
A39A1720	Support—Angle, Left, (for 13A2732 Bell Crank)	1
380-4-4	Pin—Cotter, ⅛" x 1"	1
60-8-12	Capscrew—½" x 1¼", SAE	2
935-816	Lockwasher—½"	2
325-8	Nut—½", SAE	2



LEVER CONTROL FOR POWER TAKE-OFF FOR PUMP

LEVER CONTROL FOR POWER TAKEOFF FOR PUMP

Heil Part Number	Description of Part	No. Per Unit
13A2729	Lever—for Hydraulic Pump Control	1
1648	Fitting—Alemite, 5/16", 67½°, No. 1648	1
27A1524	Rod—Control, 7/16" x 35", (for Pump)	1
380-4-4	Pin—Cotter, ⅛" x 1"	1
A48A949	Pin—Bearing, for 13A1732 Bell Crank (Welded to Body)	1
13A2732	Crank—Bell	2
1612	Fitting—Alemite, ⅛", 67½°, No. 1612	2
55A398	Washer—Cut, ¾" I. D., 1⅜" O. D.	2
380-4-4	Pin—Cotter, ⅛" x 1"	2
27A1523	Rod—Control, 7/16" x 34¼", (for Pump)	1
380-4-4	Pin—Cotter, ⅛" x 1"	2
27A1549	Rod—Control, 7/16" x 37½"	1
380-4-4	Pin—Cotter, ⅛" x 1"	2
32A331	Yoke—7/16", SAE	1
325-7	Nut—7/16", SAE	1
380-4-4	Pin—Cotter, ⅛" x 1"	1
397-35	Pin—7/16" x 1¼"	1
A39A1724	Support—Angle, Right, (for 13A1732 Bell Crank)	1
60-8-12	Capscrew—½" x 1¼", SAE	2
935-816	Lockwasher—½"	2
325-8	Nut—½", SAE	2

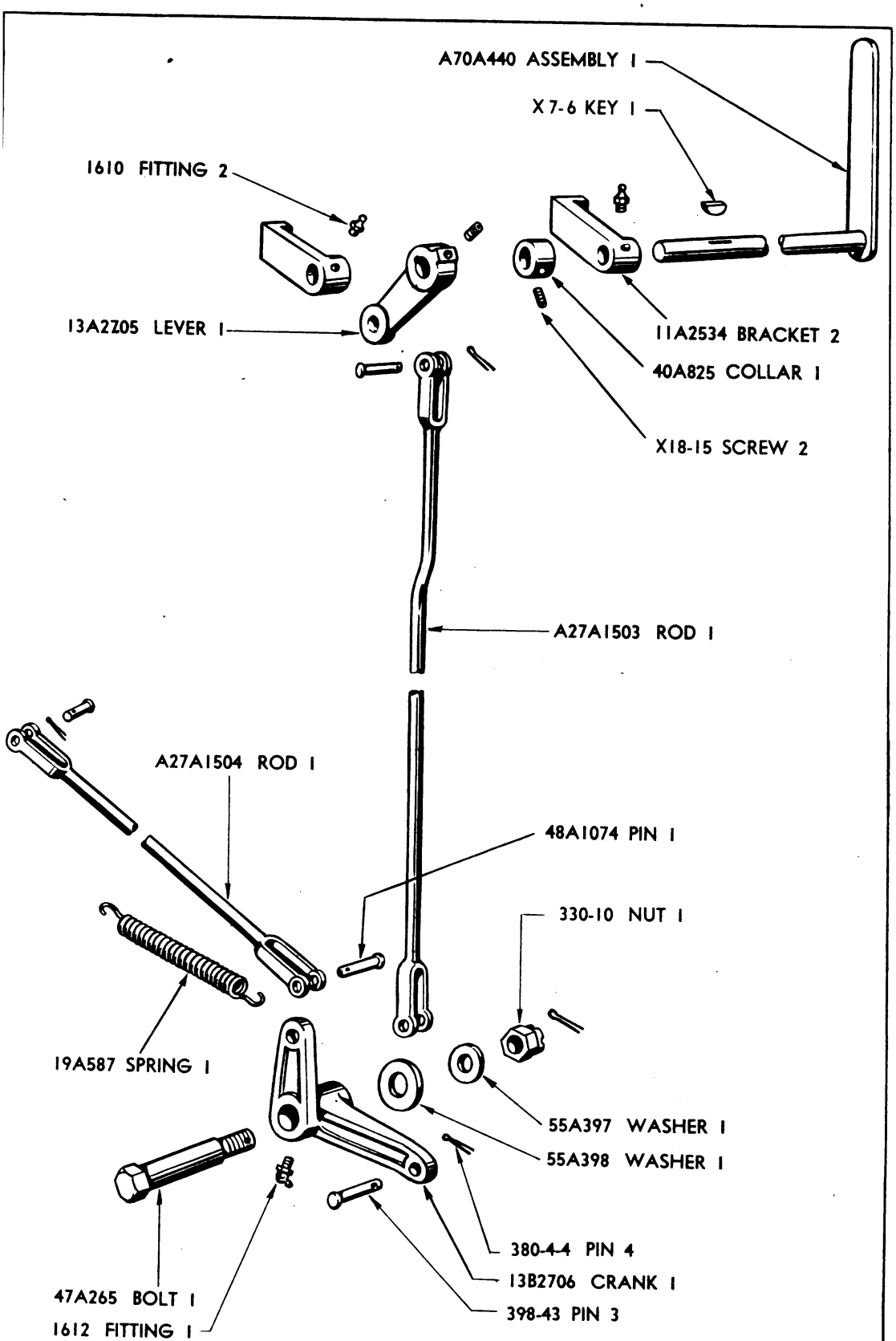


LOWER CYLINDERS CONTROLS

LOWER CYLINDERS CONTROLS

Heil Part Number	Description of Part	No. Per Unit
70A439	Handle—Control, Cylinder, Lower	1
32A325	Yoke—Adjusting, 7/16", (for 1/2" Pin)	1
398-43	Pin—1/2" x 1-27/64", Drilled to 1/8"	1
325-7	Nut—7/16", SAE	1
380-4-4	Pin—Cotter, 1/8" x 1"	1
21A1309	Bracket—Support (Welded to Body)	1
13A2785	Crank—Bell (Upper Front)	1
1612	Fitting—Alemite, 1/8", 67 1/2°, No. 1612	1
47A264	Bolt—Shoulder, 5/8" x 3"	1
330-10	Nut—Castellated, 5/8", SAE	1
55A15	Washer—Beveled, 1/2", Drilled to 5/8"	1
380-4-4	Pin—Cotter, 1/8" x 1"	1
55A398	Washer—Cut, 3/4" I. D., 1 3/8" O. D.	1
55A397	Washer—Cut, 5/8" I. D., 1 3/8" O. D.	1
A27B1576	Rod—Control Assembly (Front)	1
398-43	Pin—1/2" x 1-27/64", Drilled to 1/8"	2
380-4-4	Pin—Cotter, 1/4" x 1"	2
13A2704	Crank—Bell (Lower Front)	1
47A264	Bolt—Shoulder, 5/8" x 3"	1
1612	Fitting—Alemite, 1/8", 67 1/2°, No. 1612	1
55A397	Washer—Cut, 5/8" I. D., 1 3/8" O. D.	1
55A398	Washer—Cut, 3/4" I. D., 1 3/8" O. D.	1
330-10	Nut—Castellated, 5/8", SAE	1
380-4-4	Pin—Cotter, 1/8" x 1"	1
A27B1575	Rod—Control, 97 1/2" Long	1
48A1074	Pin—1/2" x 1-27/64", Drilled to 3/16"	1
398-43	Pin—1/2" x 1-27/64", Drilled to 1/8"	1
380-4-4	Pin—Cotter, 1/8" x 1"	1
19A587	Spring—Return, 1" x 7"	1

PARTS CATALOG

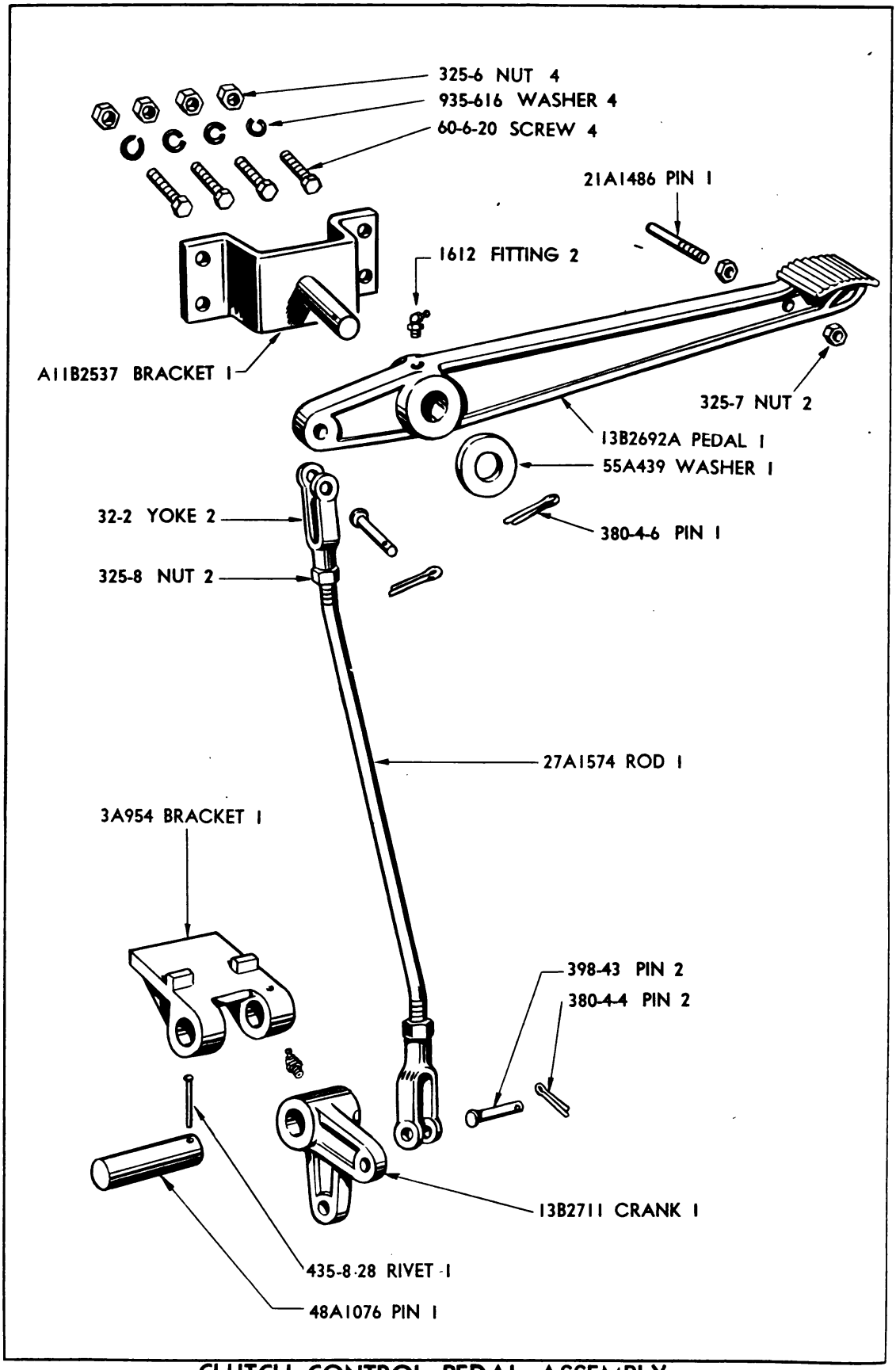


VALVE LEVER AND CONTROLS

VALVE LEVER AND CONTROLS

Heil Part Number	Description of Part	No. Per Unit
A70A440	Lever Assembly—Control, Layshaft, and Valve Lever	1
40A825	Collar—Stop, Layshaft	1
X18-15	Setscrew—Allen Head, 5/16" x 3/8", USS	2
13A2705	Lever—Layshaft, with 1/2" Hole for 398-43 Pin	1
X7-6	Key—Woodruff, No. 6, 5/32"	1
11A2534	Bracket—Bearing, Layshaft (welded to body)	2
1610	Fitting—Alemite, 1/8", Straight, No. 1610	2
A27A1503	Rod—Control, (Bell Crank to Layshaft Lever)	1
398-43	Pin—1/2" x 1-27/64", Drilled to 1/8"	2
380-4-4	Pin—Cotter, 1/8" x 1"	2
13B2706	Crank—Bell, (to Valve V-191)	1
1612	Fitting—Alemite, 1/8", 67 1/2°, No. 1612	1
47A265	Bolt—Shoulder, Bearing, Bell Crank	1
55A397	Washer—Cut, 5/8" I. D., 1 3/8" O. D.	1
55A398	Washer—Cut, 3/4" I. D., 1 3/8" O. D.	1
330-10	Nut—Castellated, 5/8", SAE	1
380-4-4	Pin—Cotter, 1/8" x 1"	1
A27A1504	Rod—Control, (for V-191 Valve to Bell Crank 13B2706)	1
398-43	Pin—1/2" x 1-27/64", Drilled to 1/8"	1
48A1074	Pin—1/2" x 1-27/64", Drilled to 3/16"	1
380-4-4	Pin—Cotter, 1/8" x 1"	1
19A587	Spring—Return, 1" x 7"	1

PARTS CATALOG



CLUTCH CONTROL PEDAL ASSEMBLY

CLUTCH CONTROL PEDAL ASSEMBLY

Heil Part Number	Description of Part	No. Per Unit
13B2692A	Pedal—Control, Clutch	1
1612	Fitting—Alemite, 1/8", 67½°, No. 1612	1
21A1486	Pin—7/16" x 3"	1
325-7	Nut—7/16", SAE	2
A11B2537	Bracket—Pedal, Declutching	1
380-4-6	Pin—Cotter, 1/8" x 1½"	1
55A439	Washer—Cut, ¾", Drilled to 1-1/32"	1
60-6-20	Capscrew—⅜" x 2", SAE	4
935-616	Lockwasher—⅜"	4
325-6	Nut—⅜", SAE	4
27A1574	Rod—Control, ½"	1
325-8	Nut—½", SAE	2
398-43	Pin—½" x 1-27/64", Drilled to 1/8"	2
32-2	Yoke—½", SAE, (for ½" Rod)	2
380-4-4	Pin—Cotter, 1/8" x 1"	2
13B2711	Crank—Bell	1
1612	Fitting—Alemite, 1/8", 67½°, No. 1612	1
3A954	Bracket—Crank, Bell, for 13B2711 (welded to body)	1
48A1076	Pin—1" x 4¼"	1
435-8-28	Rivet—Head, Round, ¼" x 1¾"	1

646024 O - 45 - 6

CORPS OF ENGINEERS
U. S. ARMY
STEEL TREADWAY BRIDGE EQUIPMENT
TRUCK BODY & HYDRAULIC CRANE M-IIA

TOTAL GROSS VEHICLE WT.	38,500 Lbs.
GROSS WT. ON BOGIE	26,750 Lbs.
NET WT. - BODY & CRANE	6,500 Lbs.
CARGO CAPACITY LBS.	12,000 Lbs.
CRANE CAPACITY LBS. - MAX.	8,000 Lbs.
U.S. VEHICLE REGISTRATION NO.	
CONTRACT NO.	
DELIVERY DATE	

MFRS. MODEL NO. MFRS. SERIAL NO.

THE HEIL CO.
MILWAUKEE, WIS. U.S.A. HILLSIDE, NEW JERSEY

34A2684A PLATE 1

CAUTION: DO NOT CLOSE THIS VALVE. IT IS FOR EMERGENCY USE ONLY.

WHEN CLOSED, REMOVE PIN WHICH ATTACHES UPPER CYLINDERS TO THE BOOM ON THE DAMAGED SIDE. BOOM MAY BE OPERATED WITH OPPOSITE CYLINDERS.

CAUTION: WHEN OPERATING IN THIS MANNER, NO MORE THAN ONE TREADWAY SHOULD EVER BE HANDLED.

SEE INSTRUCTION BOOK
The HEIL COMPANY, MILWAUKEE, WIS., U. S. A.

34A3173 PLATE 1

HYDRAULIC BRIDGE ERECTING CRANE

OPERATING INSTRUCTIONS:

1. Disengage clutch by pressing down on declutching pedal.
2. Engage Power Take-Off by pulling outer lever to the right as far as possible.
3. Release clutch pedal which will operate hydraulic pump.
4. Extend piston rods in lower cylinders by pulling Valve Lever forward or toward front. Note: THESE RODS MUST ALWAYS BE EXTENDED BEFORE UNIT IS READY TO OPERATE WITH LOAD.
5. To unload or move boom in rearward direction - - push Valve Lever toward rear of truck.
6. To load or return boom toward cab - - pull Valve Lever toward front.
7. To hold boom in any position - - place Valve Lever in neutral or center. (When released, lever will return to neutral position automatically.)

CAUTION

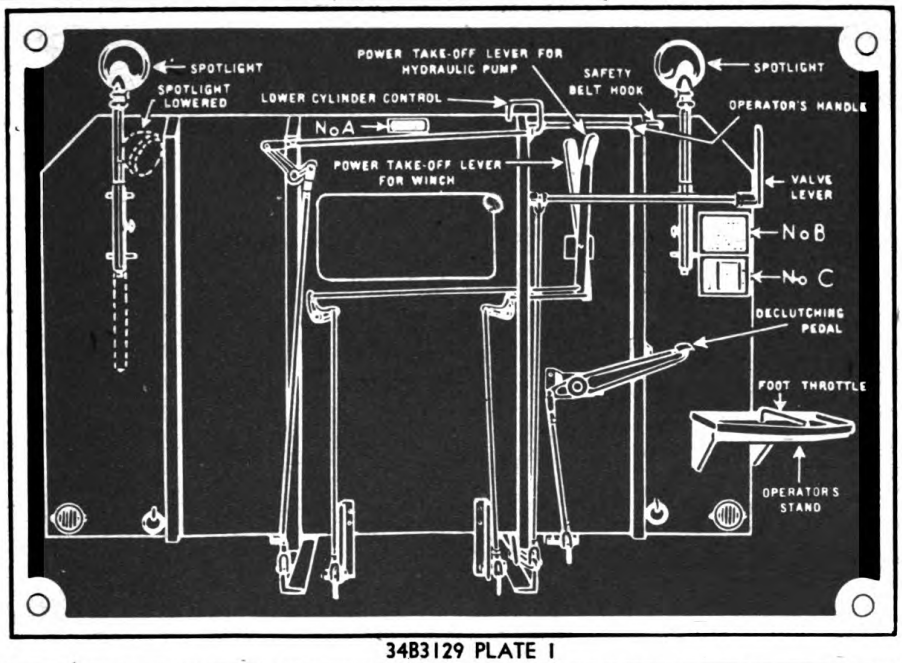
WHEN BOOM IS NOT BEING OPERATED - - Piston Rods in lower cylinders must always be pushed in (or retracted) to prevent rusting.

a. Force lower piston rods in by moving boom, UNDER NO LOAD, to extreme rearward position.

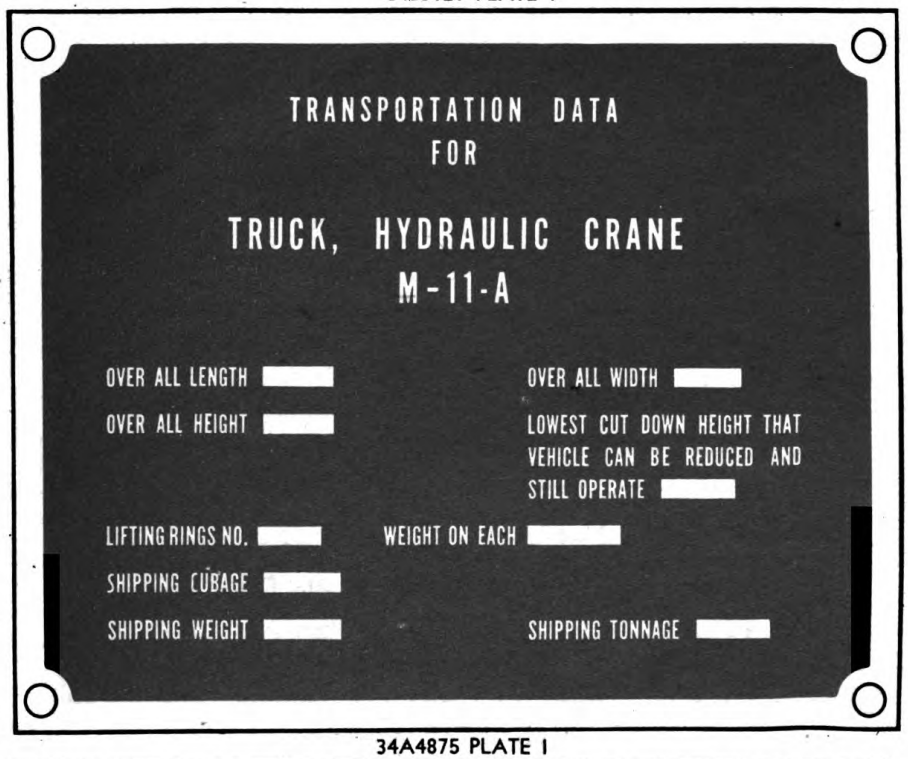
b. Pull lower Cylinder Control Handle as far as possible to right and hold. Move boom to riding position UNDER NO LOAD.

THE HEIL CO.
MILWAUKEE, WIS. U. S. A. HILLSIDE, NEW JERSEY

34B3131 PLATE 1



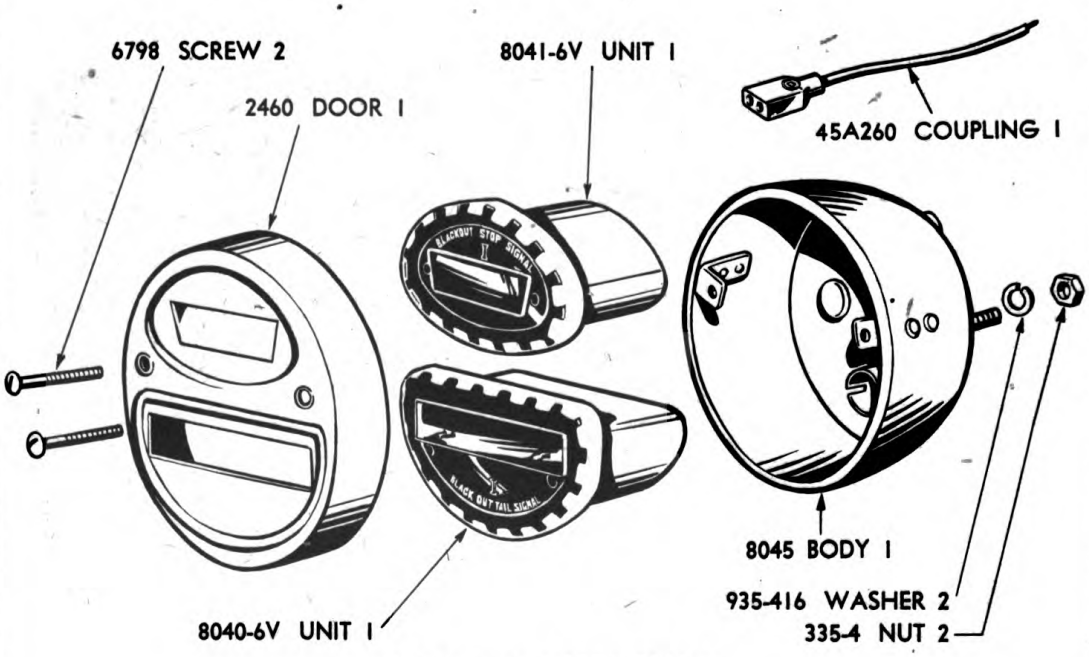
34B3129 PLATE 1



34A4875 PLATE 1

NAME PLATES

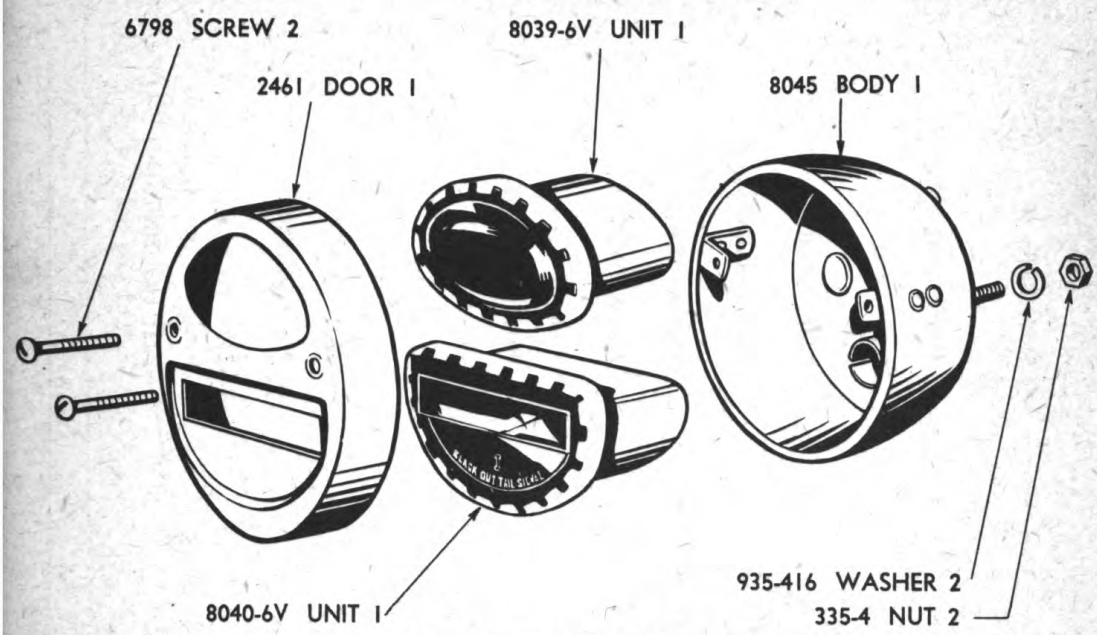
Heil Part Number	Description of Part	No. Per Unit
34A2684A	Plate—Name (Corps of Engineers and Weights)	1
34A3173	Plate—Caution, (for No. 120 Emergency Valves)	4
34B3131	Plate—Instructions, Operating	1
34B3129	Plate—Diagram, control, Front	1
34A4875	Plate—Data, Transportation	1



KD953-I-6 ASSEMBLY 1

BLACKOUT TAIL AND STOP LIGHT

Heil Part Number	Description of Part	No. Per Unit
KD953-I-6	Assembly—Light, Stop, and, Tail, Blackout, (QM No. 08243X)	1
	2460 Door	1
	8041-6V Unit—Lamp, Stop, Blackout, Upper	1
	8040-6V Unit—Lamp, Tail, Blackout, Lower	1
	8045 Body Assembly—Complete With Connector Tubes, Bolts and Inner Pad Clinched Into One Assembly	1
	6798 Screw	2
	935-416 Lockwasher—¼"	2
	335-4 Nut—¼", USS	2
45A260	Coupling—Light, Blackout	1

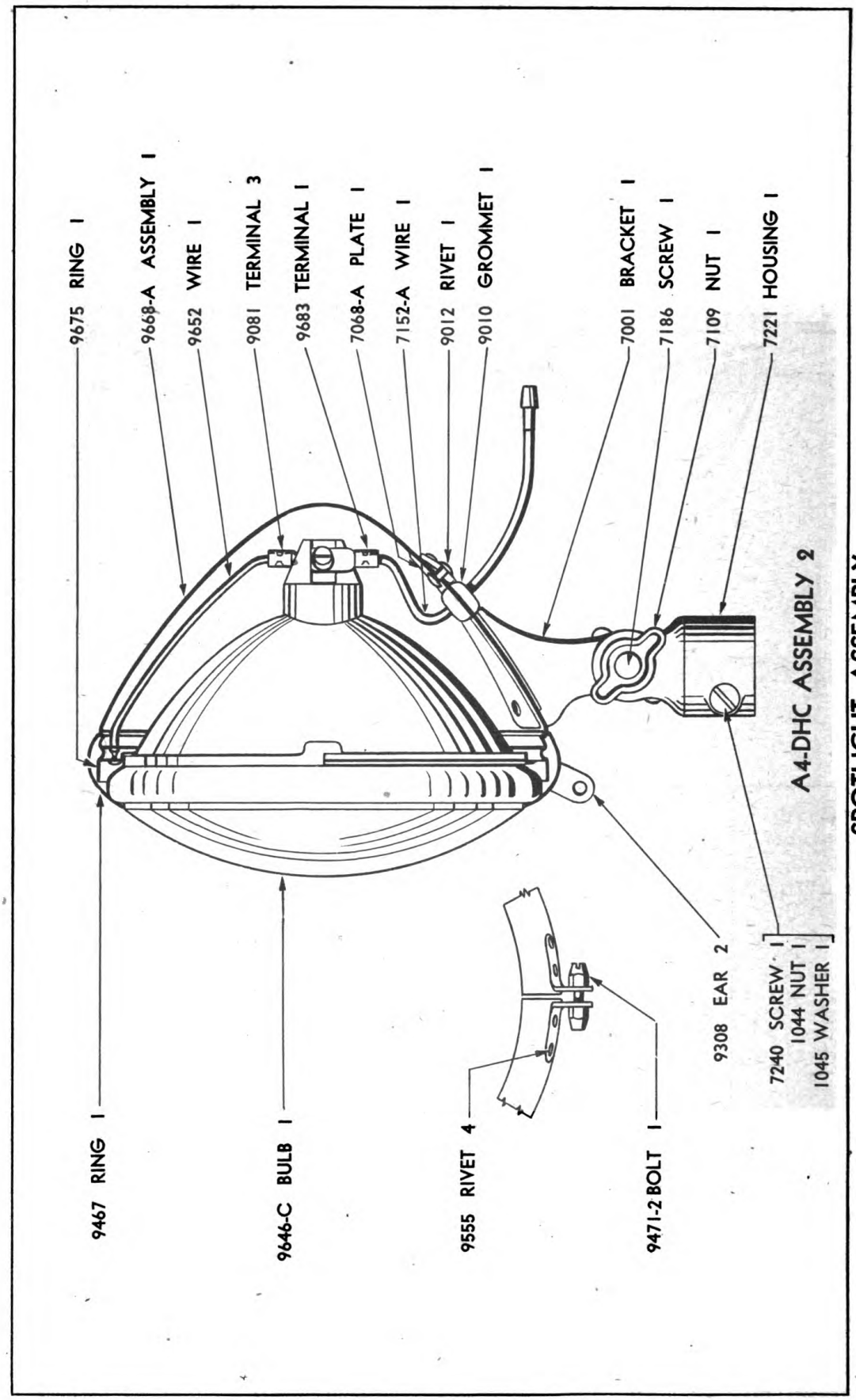


KD952-I-6 ASSEMBLY 1

SERVICE TAIL AND STOPLIGHT AND BLACKOUT TAIL LIGHT

Heil Part Number	Description of Part	No. Per Unit
KD952-I-6	Assembly—Light, Tail, Blackout, and, Light, Stop, and, Tail, Service (QM No. 08242X)	1
	2461 Door	1
	8039-6V Unit—Lamp, Tail, and, Stop, Service, Upper	1
	8040-6V Unit—Lamp, Tail, Blackout, Lower	1
	8045 Body Assembly—Complete With Connector Tubes, Bolts and Inner Pad Clinched Into One Assembly	1
	6798 Screw	2
	935-416 Lockwasher—1/4"	2
	335-4 Nut—1/4", USS	2

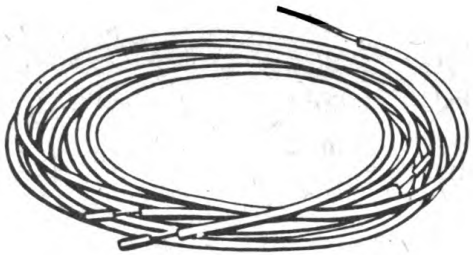
PARTS CATALOG



SPOTLIGHT ASSEMBLY

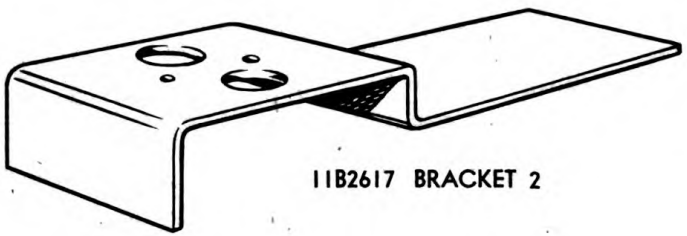
SPOTLIGHT ASSEMBLY

Heil Part Number	Description of Part	No. Per Unit
A4-DHC	Spotlight Assembly—(Unity Mfg. Co.)	2
	9646C Bulb—Mazda Glaseal	2
	9467 Ring—Includes No. 9308, 9555 and 9471-2	2
	9308 Ear—Ring	4
	9555 Rivet—Ring	8
	9471-2—Bolt and Nut	2
	9675 Ring—Adapter	2
	9652 Wire—Ground	2
	9668A Assembly—Shell	2
	7001 Bracket—for Shell	2
	7068A Plate—Reinforcing, for Shell	2
	9012 Rivet—for Shell	2
	9010 Grommet—Rubber	2
	7152A Wire—Shell	2
	9081—Terminal	6
	9683 Terminal—Bulb	2
	7186 Screw—Wing, $\frac{5}{16}$" x 1½"	2
	7109 Nut—Wing, $\frac{5}{16}$"	2
	7221 Housing—Pivot	2
	1044 Nut—$\frac{5}{16}$", SAE	2
	1045 Lockwasher—$\frac{5}{16}$", Shakeproof	2
	7240 Screw—$\frac{5}{16}$" x 1½", SAE	2



7252 ASSEMBLY 1

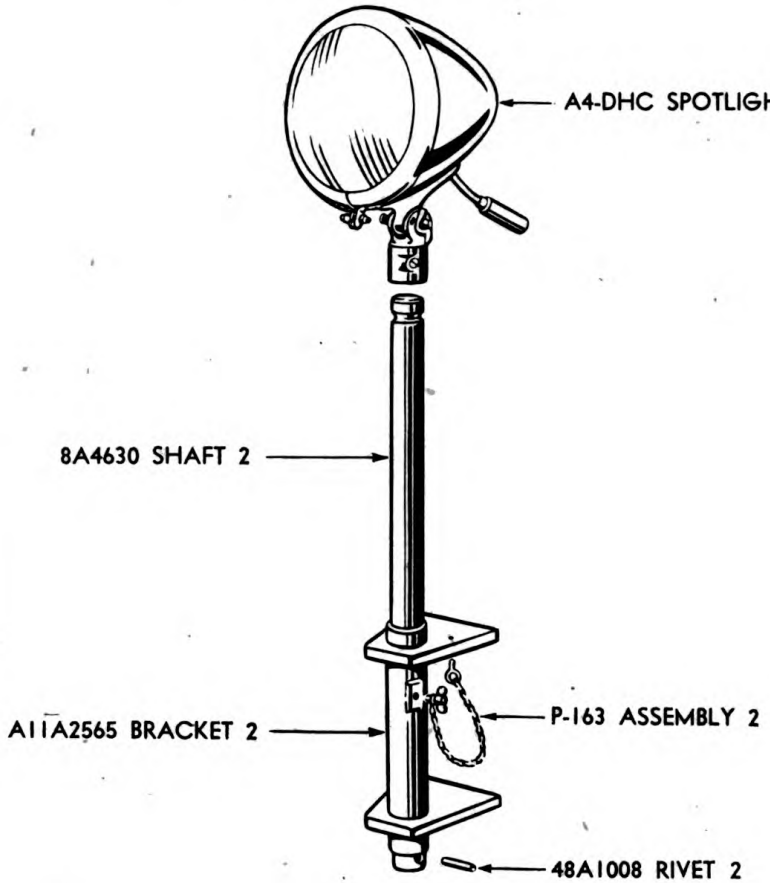
33A256 CLIP 5



11B2617 BRACKET 2

WIRING SYSTEM PARTS

TWO COMPLETE ASSEMBLIES REQUIRED



SPOTLIGHT AND BRACKET

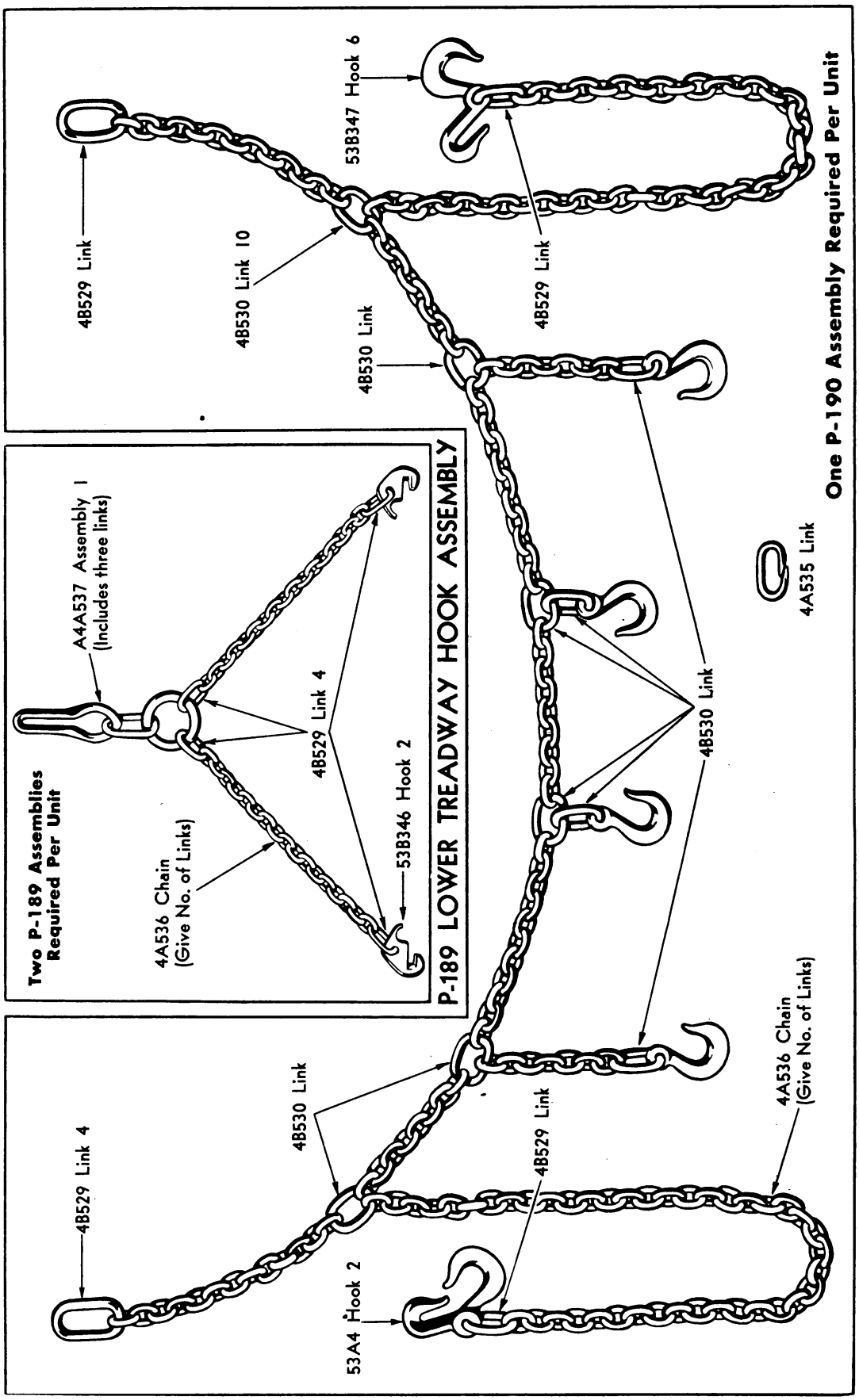
SPOTLIGHT AND BRACKET

Heil Part Number	Description of Part	No. Per Unit
A4-DHC	Spotlight Assembly—Complete (Unity Mfg. Co.)	2
8A4630	Shaft Only	2
A11A2565	Bracket Only—(welded to body)	2
P-163	Assembly—Screw, Winged, and, Chain	2
48A1008	Rivet—Head, Round, 5/32" x 1⅛"	2

WIRING SYSTEM PARTS

Heil Part Number	Description of Part	No. Per Unit
7252	Assembly—Loom, and, Wiring, (for A-4-DHC Spotlights)	1
33A256	Clip—Cable	5
11B2617	Bracket—Reflector, and, Light, Tail	2

PARTS CATALOG

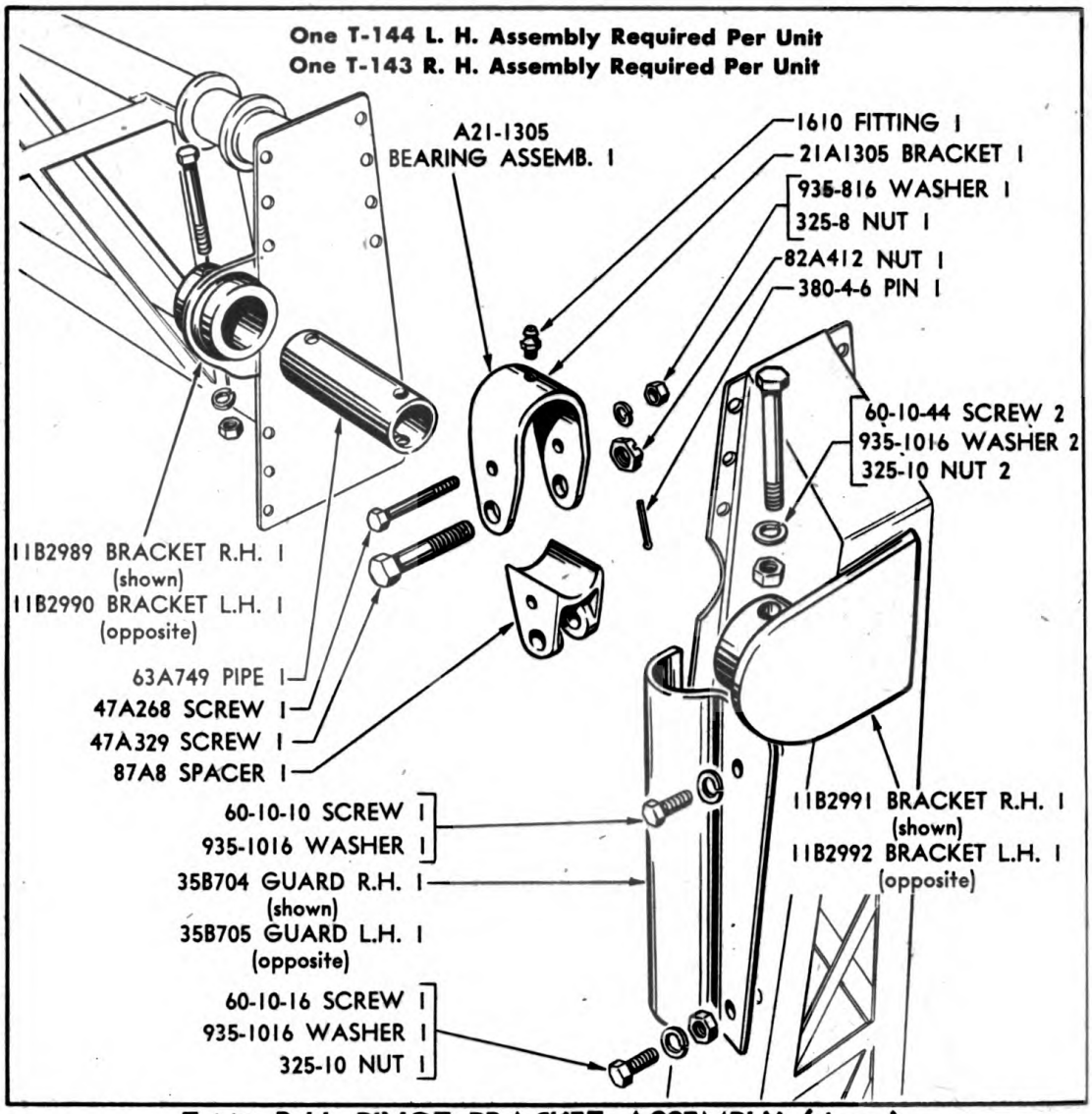


P-190 MAIN CROSS CHAIN ASSEMBLY

Heil Part, Number	Description of Part	No. Per Unit
P-190	Chain Assembly—Cross, Main, Complete (171 links)	1
	4B529 Link—Connecting, 5/8" x 5 1/2"	4
	4B530 Link—Connecting, 5/8" x 3 3/4"	10
	(Note: When repairing 4B529 or 4B530 Connecting Links, use 4A535 Cold Shut Link.)	
	4A535 Link—Repair, or, Shut, Cold	....
	53B347 Hook—Slip, Standard, 1/2"	6
	53A4 Hook—Grab, 1/2"	2
	4A536 Chain—Coil, 1/2" Proof (give number of links)	....

P-189 LOWER TREADWAY HOOK ASSEMBLY

Heil Part Number	Description of Part	No. Per Unit
P-189	Hook Assembly—Treadway, Lower, Complete	2
	A4A537 Link Assembly—Grab (includes three rings)	1
	4B529 Link—Connecting, 5/8" x 5 1/2"	4
	(Note: When repairing 4B529 Links use 4A535 Cold Shut Link.)	
	4A535 Link—Repair, or, Shut, Cold	....
	53B346 Hook—Treadway	2

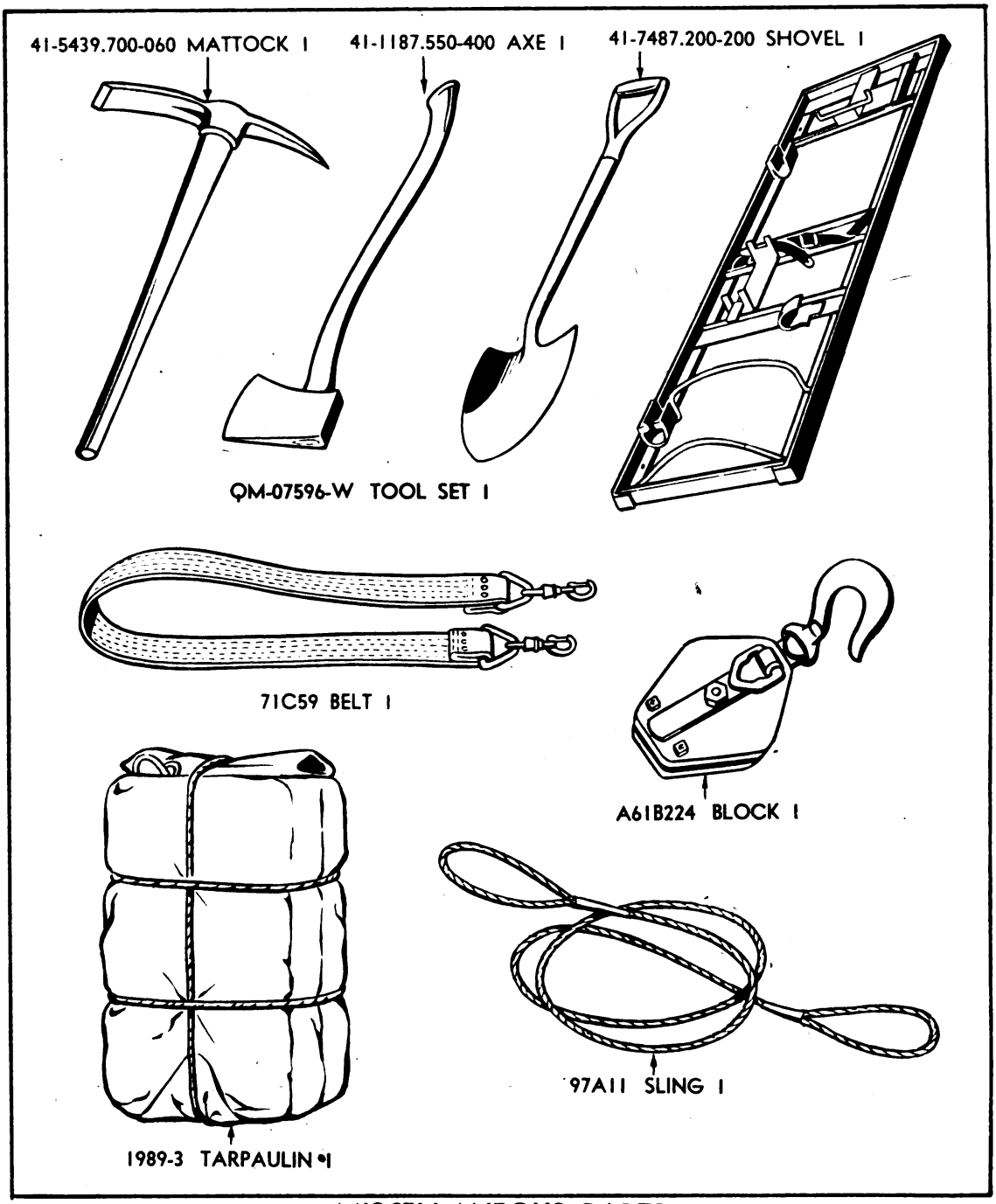


T-143 R.H. PIVOT BRACKET ASSEMBLY (shown)
T-144 L.H. PIVOT BRACKET ASSEMBLY (opposite)

Heil Part Number	Description of Part	No. Per Unit
T-143	Bracket Assembly R.H.—Pivot, Chain (welded to boom) ..... (Note: Right or Left Assembly is your Right or Left when sitting in Cab of Truck.)	1
	11B2989 Bracket R.H.—Support, Inner	1
	11B2991 Bracket R.H.—Support, Outer	1
	63A749 Pipe—Shaft, Support, Ex. Heavy, 2⅜" x 7¾"	1
	60-10-44 Capscrew—⅝" x 4½", SAE	1
	935-1016 Lockwasher—⅝"	1
	325-10 Nut—⅝", SAE	1
	35B704 Guard R.H.—Chain	1

T-143 R.H. ASSEMBLY & T-144 L.H. ASSEMBLY continued

Heil Part Number	Description of Part	No. Per Unit
	60-10-10 Capscrew—5/8" x 1", SAE	1
	60-10-16 Capscrew—5/8" x 1¾", SAE	1
	935-1016 Lockwasher—5/8"	2
	325-10 Nut—5/8", SAE	1
	A21-1305 Bracket Assembly—Bearing, Chain	1
	21A1305 Bracket—Chain, Outer	1
	87A8 Spacer—Bracket, Chain	1
	47A268 Capscrew—½" x 4", SAE, Special	1
	935-816 Lockwasher—½"	1
	325-8 Nut—½", SAE	1
	47A329 Capscrew—7/8" x 4", SAE, Special, (drilled 5/32" hole)	1
	82A412 Nut—Jam, Slotted, 7/8", SAE	1
	380-4-6 Pin—Cotter, 1/8" x 1½"	1
	1610 Fitting—Alemite, Straight, 1/8", No. 1610	1
T-144	Bracket Assembly L.H.—Pivot, Chain (welded to boom)	1
	11B2990 Bracket L.H.—Support, Inner	1
	11B2992 Bracket L.H.—Support, Outer	1
	63B749 Pipe—Shaft, Support, Ex. Heavy, 2 3/8" x 7¾"	1
	60-10-44 Capscrew—5/8" x 4½", SAE	1
	935-1016 Lockwasher—5/8"	1
	325-10 Nut—5/8", SAE	1
	35B705 Guard L.H.—Chain	1
	60-10-10 Capscrew—5/8" x 1", SAE	1
	60-10-16 Capscrew—5/8" x 1¾", SAE	1
	935-1016 Lockwasher—5/8"	2
	325-10 Nut—5/8", SAE	1
	A21-1305 Bracket Assembly—Bearing, Chain	1
	21A1305 Bracket—Chain, Outer	1
	87A8 Spacer—Bracket, Chain	1
	47A268 Capscrew—½" x 4", SAE, Special	1
	935-816 Lockwasher—½"	1
	325-8 Nut—½", SAE	1
	47A329 Capscrew—7/8" x 4", SAE, Special, (drilled 5/32" hole)	1
	82A412 Nut—Jam, Slotted, 7/8", SAE	1
	380-4-6 Pin—Cotter, 1/8" x 1½"	1
	1610 Fitting—Alemite, Straight, 1/8", No. 1610	1



MISCELLANEOUS PARTS

Heil Part Number	Description of Part	No. Per Unit
QM-07596W	Tool Set (Furnished by Government)	1
	41-5439.700-060 Mattock (GFE)	1
	41-1187.550-400 Axe (GFE)	1
	41-7487.200-200 Shovel (GFE)	1
71C59	Belt—Safety	1
A61B224	Block—Snatch	1
97A11	Sling—Cable	1
1989-3	Tarpaulin	1

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Heil Part No.	Description of Part	Quan. Per Unit	Page No.	Daybrook Part No.	Weight Lbs.	Weight Oz.	Price
AA-157	Pump Assembly—Hydraulic, complete	1	64	76	28	....	30.00
A3B893	Bearing—Type, hanger (Link-Belt, Chicago, Ill., No. S-205973)	2	66	X272	6	....	6.80
A3A910A	Bracket—Bearing, main, inner	2	46	X203	12	4	7.00
A3B911	Bracket—Bearing, main, outer	2	46	X205	27	4	8.30
A4-DHC	Spotlight Assembly—(Unity Mfg. Co., Chicago, Ill.)	2	82, 84	A4-DHC	2	8	3.85
A4B506	Support—Cylinder, lower	2	44	X232	21	12	12.00
A4A537	Link Assembly—Grab	2	86	X641	10	....	3.50
A11C2407	Fairlead Assembly—Complete	1	49	X286	78	8	44.00
A11B2521	Bracket Assembly L. H.—Support, cylinder, lower	1	46	X657L	40	8	18.75
A11B2522	Bracket Assembly R. H.—Support, cylinder, lower	1	46	X657R	40	8	18.75
A11B2537	Bracket—Pedal, declutching	1	76	X346	2	12	2.10
A11A2565	Bracket—Shaft, spotlight	2	84	X469	1	12	3.00
A14B637	Bracket—Rod, tie	2	48	X560	4	7⅓	2.20
A21-1305	Bracket Assembly—Bearing, chain, complete	2	88	X276	7	8	4.25
A26-666	Yoke and Ring—(for tarpaulin)	16	42	X367	....	5	.25
A27A1501	Rod—Tie, left	1	48	X229L	9	8	4.00
A27A1502	Rod—Tie, right	1	48	X229R	9	8	4.00
A27A1503	Rod—Control (bell crank to layshaft lever)	1	74	X348	3	10	2.00
A27A1504	Rod—Control (bell crank to V-191 valve)	1	74	X360	5	....	2.50
A27B1575	Rod—Control (bell crank to diversion valve)	1	72	X658	4	14	2.75
A27B1576	Rod—Control, front (for lower cylinders controls)	1	72	X655	3	8	2.00
A31A310	Valve Assembly—Relief	1	56	X490	1	4	3.00
A33A254	Chain and Clip Assembly—Box, tool	2	51	X610	....	2	.25
A39A1720	Support—Angle, left	1	68	X484L	3	....	.25
A39A1724	Support—Angle, right	1	70	X484R	3	....	.25
A47A275	Bolt—Bearing, lever, control	1	68	X466	1	5	.50
A48A949	Pin—Bearing, crank, bell	2	68, 70	X474	....	10	.60
A61B224	Block—Snatch (H. Channon Co., Chicago, Ill.)	1	90	X423	28	....	10.00
A70A440	Lever Assembly—Valve, and, layshaft, control	1	74	X500	3	10	1.35
A177	Cylinder Assembly—Lower, short, complete	2	52	X680	112	....	90.00
A177B	Cylinder Assembly—Lower (welded parts only)	2	52	X642	95	....	68.50
A178A	Cylinder Assembly—Upper, long, complete	2	54	X683	215	....	124.00

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Heil Part No.	Description of Part	Quan. Per Unit	Page No.	Daybrook Part No.	Weight Lbs.	Weight Oz.	Price
A178B	Cylinder Assembly—Upper (welded parts only)	2	54	X643	195	....	101.50
KD333A	Reflector—Amber (K-D Lamp Co., Cincinnati, Ohio)	4	42	KD333A	....	5⅓	.38
KD333R	Reflector—Red (K-D Lamp Co., Cincinnati, Ohio)	4	42, 44	KD333R	....	5⅓	.38
KD952-I-6	Light Assembly—Tail, blackout, and, light, stop, and tail, service (QM-08242X) (K-D Lamp Co., Cincinnati, Ohio)	1	81	952-I-6	1	6	1.75
KD953-I-6	Light Assembly—Stop, and, tail, blackout (QM-08243X) (K-D Lamp Co., Cincinnati, Ohio)	1	80	953-I-6	1	4	2.25
P-163	Chain and Winged Screw Assembly	2	84	X668	....	8	.90
P-189	Hook Assembly—Treadway, lower, complete	2	86	X678	31	....	9.75
P-190	Chain Assembly—Cross, main, complete	1	86	X696	88	....	19.25
QM-07596W	Tool Set—(furnished by Govt.)	1	42, 90	QM-07596W	21	....	....
RM22A80	Gasket—Cover	1	62	X662	....	⅓	.02
RM146-13	Seal—Oil (National, No. 50119)	2	62	X660	....	1	.35
S-1304SP	Bearing—Roller (Bower Roller Bearing Co., Detroit, Mich.)	4	64	93	....	5½	.75
T-143	Bracket Assembly, R. H.—Pivot, chain, complete	1	88	X697R	37	....	13.25
T-144	Bracket Assembly, L. H.—Pivot, chain, complete	1	88	X697L	37	....	13.25
V-191	Valve Assembly—Control, main (The Heil Co., Milwaukee, Wis.)	1	62	X592	40	....	71.00
V-200	Valve Assembly—Diversion (Port Clinton Marine Garage, No. 15033)	1	63	X580	15	8	46.80
X7-6	Key—Woodruff, No. 6, 5/32"	1	74	244	....	¼	.03
X9-18	Ball—Steel, ⅞"	5	54, 56	127	....	1½	.15
X12A92	Packing—V-leather (for piston rod)	24	52, 54	123	....	¼	.15
X12A93	Packing—V-leather (for pump)	4	64	74	....	1/16	.15
X18-15	Setscrew—Head, Allen, USS, 5/16"x⅜"	4	54, 74	X488	....	1/12	.15
X29-2	Wire—Locking	12	44, 66	X636	....	1	.05
3A913	Bearing—Flanged type (Link-Belt Co., Chicago, Ill.; No. F-416)	1	66	X385	4	8	5.00
3A954	Bracket—Crank, bell, lower	1	76	X302	1	12	1.35

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Heil Part No.	Description of Part	Quan. Per Unit	Page No.	Daybrook Part No.	Weight Lbs.	Weight Oz.	Price
4B529	Link—Connecting, ⅝" dia. x 5½"	12	86	X452	1		See 4A535
4B530	Link—Connecting, ⅝" dia. x 3¾"	10	86	X454	....	15	" "
4A535	Link—Repair, shut, cold (use for repairing 4B529 and 4B530 connecting links	13	86	X639	1	1	.55
4A536	Chain—Coil, ½" proof (give number of links)		86	X559	....	....	per link .04 / per foot .40
6C595	Housing—Pump	1	64, 66		12	8	7.00
7A635	Gear—Pump	2	64	70	2	....	4.55
8B4588	Shaft—Pivot, boom, main, 3 15/16"x98¾"	1	46	X209	338	8	32.00
8A4595	Shaft—Square, ⅞"x13"	2	66	X388	2	12	.60
8A4614	Shaft—Hinge, platform, operator's	1	50	X427	2	12	.85
8A4630	Shaft—Spotlight	2	84	X471	4	....	1.50
8A4639	Shaft—Universal, 1"x36½"	1	66	X479	7	12	1.60
8A4654	Shaft—Pump (long)	1	64	68	1	6	3.20
8A4655	Shaft—Pump (short)	1	64	69	....	13½	1.40
8A4683	Shaft—Drive, round	1	66	X459	24	8	3.50
9A646	Bushing—Bronze (for 11B2521 and 11B2522 plates)	2	46	X211	1	4	6.00
9A647	Bushing—Bronze (for A3A910A bearing)	2	46	X204	2	....	6.00
9A648	Bushing—Bronze (for A3B911 bearing)	2	46	X206	2	4	6.00
9A665	Bushing—Bronze (for short cylinder rod end)	2	52	X23	1	5	2.90
9A666	Bushing—Bronze (for long cylinder rod end)	2	54	X12	1	12	3.15
10A303	End—Rod, piston, cylinder, short	2	52	X241	4	3	12.50
10B304	End—Rod, piston, cylinder, long	2	54	X242	7	....	12.50
11C2407A	Bracket—Sheave, fair lead	1	49	X289	40	8	13.50
11B2516	Bracket—Pump	1	64	X50	7	14	8.40
11B2518	Bracket—Tank, oil, reserve	1	56	X215	4	3½	2.20
11B2519A	Bracket Assembly L. H.—Support, cylinder, lower, inner	1	46	X629L	21	....	13.10
11B2520A	Bracket Assembly R. H.—Support, cylinder, lower, inner	1	46	X629R	21	....	13.10
11B2521	Plate L. H.—Bracket, support, cylinder, outer	1	46	X210L	39	....	12.75
11B2522	Plate R. H.—Bracket, support, cylinder, outer	1	46	X210R	39	....	12.75
11B2525	Bracket—Hold-down, front, left, lower	1	42	X340	15	4	3.60

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Heil Part No.	Description of Part	Quan. Per Unit	Page No.	Daybrook Part No.	Weight Lbs.	Weight Oz.	Price
11B2527	Bracket—Hold-down, rear, lower	2	42	X337	9	8	2.55
11B2528	Bracket—Hold-down, front, right, lower	1	42	X336	10	....	2.55
11B2529	Bracket—Hold-down, diagonal, lower	4	42	X338	7	12	2.25
11B2530	Bracket—Hold-down, upper	7	42	X335	5	7	1.90
11B2531	Bracket—Hold-down, front, left, upper	1	42	X339	7	4	2.15
11A2534	Bracket—Bearing, layshaft	2	74	X327	....	14	1.20
11B2566	Bracket—Support, shaft, universal	1	66	X475	2	8	1.50
11B2616	Bracket—Plate, step	1	50	X297	8	....	2.75
11B2617	Bracket—Reflector, and, tail light	2	84	X268	2	8	.80
11A2752	Bracket—Support, pipe	1	58	X614	1	....	1.35
11A2781	Bracket—Support, valve, diversion	2	63	X590	....	10	1.25
11B2989	Bracket, R. H.—Support, bearing, chain, inner	1	88	X698R	8	8	2.55
11B2990	Bracket L. H.—Support, bearing, chain, inner	1	88	X698L	8	8	2.55
11B2991	Bracket R. H.—Support, bearing, chain, outer	1	88	X703R	7	3	2.15
11B2992	Bracket L. H.—Support, bearing, chain, outer	1	88	X703L	7	3	2.15
12A1532	Cover—Gland, packing	1	62	X661	....	12	4.70
12C1553	Cover—Pump	1	64	67	4	8	3.25
12A1612	Plate—Cover, outside, valve, diversion	1	63	X584	1	5	3.20
13B2692A	Pedal—Control, clutch	1	76	X344	5	4½	2.00
13A2704	Crank—Bell, (lower, front)	1	72	X294	1	....	1.60
13A2705	Lever—Layshaft, (with ½" hole)	1	74	X507	....	5	.70
13B2706	Crank—Bell, control, valve	1	74	X278	2	8	1.90
13B2711	Crank—Bell, lower	1	76	X303	1	8	1.75
13A2728	Lever—Control, winch (lever only)	1	68	X465	2	2	1.00
13A2729	Lever—Control, pump, hydraulic	1	70	X464	2	5	1.00
13A2732	Crank—Bell	4	68, 70	X473	1	....	1.50
13A2785	Crank—Bell, (upper, front)	1	72	X593	1	7	2.00
15A728	Spacer—Pipe	1	68	X467	....	3	.10
15A772	Plate—Cover, rear	1	63	X586	....	8	.75
15A773	Plate—Cover, inside, valve, diversion	1	63	X585	....	7	1.60
19A388	Spring—Check, valve, relief (Heil Co. only)	1	56		....	¼	.10
19A449	Spring—Head, cylinder	4	52, 54	114	....	5	.10
19A567	Spring—Ball, check	5	54	X380	....	¼	.10

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Heil Part No.	Description of Part	Quan. Per Unit	Page No.	Daybrook Part No.	Weight Lbs.	Weight Oz.	Price
19A568	Packing—Spring	1	64	71	....	1	.04
19A587	Spring—Return, 1" x 7"	2	72, 74	X499	....	7	.14
19A596	Spring—Valve, diversion	1	63	X587	....	1¾	.10
20C635	Tank—Oil, reserve	1	56	X216	70	....	24.75
21A1305	Bracket—Bearing, chain	2	88	X277	3	11½	2.15
21A1309	Bracket—Support, handle, control	1	72	X353	....	5	.25
21A1311	Handle—Rod, safety	1	42	X433	1	3	.10
21A1313	Plate—Lock, turnbuckle	1	48	X428	1	3	.50
21A1486	Pin—Stop, pedal, clutch, (7/16" x 3")	1	76	X569	....	3	.15
22A217	Gasket—Copper	1	62	X664	....	½	.10
22A1033	Gasket—Gland, cylinder, hydraulic	4	52, 54	169	....	1/12	.02
22B1034	Gasket—Pump cover to housing	1	64	170	....	1/12	.05
22A1035	Gasket—Pump to pump bracket	1	64	168	....	1/12	.02
22A1073	Gasket—Valve, diversion	3	63	X589	....	1	.05
23A187	Gland—Packing, bronze	4	52, 54	X83	1	9	3.60
26A660	Ring—Packing (for cylinder head)	4	52, 54	124	....	2	.42
26A690	Ring—Lock	1	64	75	....	¼	.15
26A691	Ring—Packing, inner (male)	1	64	72	....	½	.15
26A693	Ring—Packing, outer (female)	1	64	73	....	1	.15
27A1520	Rod—Control, upper, (for winch)	1	68	X496	....	7¼	.80
27A1523RH	Rod—Control, (for winch and pump)	2	68, 70	X498	1	7	.90
27A1524	Rod—Control, upper, (for pump)	1	70	X497	1	7½	.90
27A1548	Rod—Yoke, control, to winch	1	68	697	1	9	.99
27A1549	Rod—Yoke, control, 7/16" x 37½", (to pump)	1	70	X633	1	10	.90
27A1574	Rod—Control, pedal, clutch, ½"	1	76	X513	1	....	.60
30B135	Joint—Slip, Universal (Blood Bros. Machine Co., Allegan, Mich., No. 1FS-9023)	2	66	249	4	12	7.35
30B136	Joint—Universal (Blood Bros. Machine Co., Allegan, Mich., No. 1FS-9024)	3	66	X290	3	4	5.25
31A310	Body—Valve, relief (not interchangeable with Daybrook part)	1	56		....	14	2.20
32A325	Yoke—Adjusting, 7/16", SAE	1	72	X354	....	4	.35
32A331	Yoke—7/16", SAE	2	68, 70	257	....	6	.35
33A256	Clip—Cable (Electric Auto-Lite Co., Toledo, Ohio, No. T-183)	5	84	X434	....	⅓	.05

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Heil Part No.	Description of Part	Quan. Per Unit	Page No.	Daybrook Part No.	Weight Lbs.	Weight Oz.	Price
34A2683	Spacer—for 48B914 key	2	46	X429	....	10½	.50
34A2684A	Plate—Name (Corps of Engineers and Weights)	1	42, 78	X673	....	4	.55
34A2785	Washer—Thrust	4	64	80	....	7	1.25
34A2879	Support—Bracket, pipe	2	58	X264	....	9½	.30
34B3129	Plate—Diagram, control, front	1	79	X595	....	3	.55
34B3131	Plate—Instructions, operating	1	78	X596	....	3	.55
34A3173	Plate—Caution (for emergency valves)	4	78	X674	....	½	.18
34A4875	Plate—Data, transportation	1	79	....	....	9	....
35B704	Guard R.H.—Chain	1	88	X705R	9	4	2.50
35B705	Guard L.H.—Chain	1	88	X705L	9	4	2.50
40A822	Washer—3" (for 48A911 pin)	2	46	X37	1	....	1.90
40A825	Collar—Stop, layshaft	1	74	X350	....	4	.60
40A828	Collar—Spacer, inner	2	46	X247	....	7	.50
44-85	Wrench—Allen Head, 5/16"	1	55	X675	....	1½	.05
45A260	Coupling—Light, blackout, and tail	1	80	7252B	....	½	.25
47A264	Bolt—Shoulder	2	72	X296	....	7	.85
47A265	Bolt—Shoulder, bearing, bell-crank	1	74	X324	....	8	.85
47A268	Capscrew—Special, ½" x 4", SAE	2	88	F8-4	....	4	.11
47A269	Screw—Adjusting, valve control, main	1	62	X665	....	2	.75
47A304	Setscrew—Sq. head, ⅜" x 1", drilled	4	44	X638	....	1	.12
47A306	Setscrew—Sq. head, ⅜" x ¾", USS, drilled	8	66	536	....	½	.10
47A329	Capscrew—Special, ⅞" x 4", SAE (drilled 5/32" hole)	2	88	X522	....	13¼	.25
48A1008	Pin—Rivet, rd. head, 5/32" x 1⅛"	2	84	X566	....	½	.02
48A1074	Pin—Yoke, ½" x 1 27/64" (drilled 3/16" hole)	2	72, 74	X527	....	1	.15
48A1077	Pin—Dowel	2	46	X656	....	3/16	.02
48A911	Pin—Pivot, cylinder, lower	2	46	X245	11	4	7.90
48A912	Pin—Pivot (for A4B506 support)	2	44	X304	3	12	2.00
48A913	Pin—Pivot, cylinder, upper	2	42	X221	11	12	7.90
48B914	Key—Wedge, tapered, 1⅝"	2	46	X18	3	12	4.50
48A874	Pin—Roller, fairlead, 1½" x 11⅛"	2	49	X287	5	4	4.00
48A921	Pin—Rod, piston	2	44	X269	5	4	3.00
48A922	Pin—Rod, tie, 1" x 3¾"	2	48	X33	1	14	1.60
48A923	Pin—Pivot (for A4B506 support)	2	44	X233	4	4	3.00
48A927A	Pin—Sheave, fairlead	2	49	X308	1	10	2.50
48A951	Rivet—Head, round	4	52, 54	X413	....	1	.03
48A1076	Pin—Crank, bell	1	76	X421	1	....	.50

NUMERICAL INDEX OF HEIL CO. PART NUMBERS

With Cross Index of Daybrook Part Numbers

All prices subject to change without notice

Heil Part No.	Description of Part	Quan. Per Unit	Page No.	Daybrook Part No.	Weight Lbs.	Weight Oz.
53A4	Hook—Grab, ½"	2	86	X455	1	12
53B346	Hook—Treadway, lower	4	86	X676	2	14
53B347	Hook—Slip, standard, ½"	6	86	X695	1	12
55A15	Washer—Beveled (drilled ⅝" hole)	1	72	X510	....	1
55A397	Washer—Special (drilled 11/16" hole)	4	68, 72 74	X567	....	½
55A398	Washer—Cut (¾" I.D.— 1⅜" O.D.)	7	68, 70 72, 74	X509	....	2/5
55A439	Washer—Cut, ¾" (drilled 1 1/32")	1	76	X514	....	1
55A441	Washer—Retaining	2	44	X270	....	2
58B713-1	Ell—Standard, 1", 90°	2	56	X533	....	9½
58B713-2	Tee—1"	2	56	X528	....	13½
58B713-3	Plug—Pipe, head, recessed, 1"	1	56	X536	....	2½
58B713-4	Union—Standard, 1"	1	56	X534	....	13
58B713-5	Cap—Pipe, 1"	1	56	X461	....	6
58B713-8	Plug—Pipe, forged steel, ¾"	8	54, 58	X551	....	4
58B713-10	Tee—Standard, ½" x ½" x ¾"	1	56	X518	....	7½
58B713-12	Plug—Pipe, ¼"	3	52, 56	X414	....	½
58B713-15	Ell—Street, 45°, ½"	2	58	X486	....	3½
58B713-20	Ell—Street, extra strong, ¾"	10	52, 58 62	X598	....	11
58B713-21	Ell—Street, standard, 1"	2	56, 62	X548	1	10
58B713-23	Plug—Pipe, ¾"	1	56	X419	....	1½
58B713-28	Plug—Pipe, standard, ½"	2	54	X485	....	1
58B713-31	Ell—Extra strong, ¾", 90°	12	56, 58	X599	....	12
58B713-32	Tee—Extra strong, ¾"	8	58	X597	1	....
58B713-33	Tee—Standard, 1" x 1" x ¾"	1	56	X626	....	12
58B713-34	Ell—Standard, ½", 90°	2	56	X637	....	4
58B713-35	Coupling—Extra strong, ¾" x 1⅝"	2	58	X627	....	6
62A257	Rollers—Fairlead	2	49	X288	4	12
63A634A	Pipe—Extra strong, upper return, ¾" x 32"	2	54	X622	3	6
63B650-1	Nipple—Standard, 1" x 3"	1	56	X546	....	5½
63B650-2	Pipe—Standard, 1" x 10"	1	56	X545	....	5½
63B650-3	Pipe—Standard, 1" x 27"	1	56	X538	3	12
63B650-4	Pipe—Standard, 1" x 51½"	1	56	X540	7	10
63B650-5	Nipple—Standard, 1" x 4"	1	56	X544	....	7½
63B650-7	Pipe—Extra strong, ¾" x 6"	2	58	X539	....	11¾
63B650-8	Pipe—Extra strong, ¾" x 7"	2	58	X547	....	13¾
63B650-9	Pipe—Extra strong, ¾" x 3¼"	4	58	X543	....	6¼
63B650-10	Pipe—Extra strong, ¾" x 24⅞"	2	58	X541	3	....

PARTS CATALOG

NUMERICAL INDEX OF HEIL CO. PART NUMBERS

With Cross Index of Daybrook Part Numbers

All prices subject to change without notice

Heil Part No.	Description of Part	Quan. Per Unit	Page No.	Daybrook Part No.	Weight Lbs.	Weight Oz.	Price
63B650-11	Pipe—Extra strong, ¾" x 22¾"	2	58	X542	2	13	.60
63B650-13	Pipe—Standard, ¾" x 32½"	1	56	X517	3	1	1.10
63B650-18	Nipple—Extra strong, 1", close	1	56	X616	1	4	.15
63B650-19	Pipe—Extra strong, ½" x 52¼"	1	56	X621	4	8	.85
63B650-20	Pipe—Extra strong, ½" x 30"	1	56	X620	3	4	.60
63B650-21	Pipe—Extra strong, ¾" x 8¾"	2	58	X623	1	10	.30
63B650-22	Pipe—Extra strong, ¾" x 7¾"	1	58	X625	....	15	.26
63B650-23	Pipe—Extra strong, ¾" x 6½"	1	58	X624	....	12	.24
63B650-24	Nipple—Extra strong, close, ¾"	2	58	X632	....	2½	.12
63B650-25	Pipe—Extra strong, ¾" x 74"	1	58	X607	8	8	1.70
63B650-26	Pipe—Extra strong, ¾" x 28"	1	58	X618	3	2	.75
63B650-27	Pipe—Extra strong, ¾" x 56½"	1	58	X619	6	....	1.40
63A749	Pipe—Shaft, support, 2⅜" x 7¾", ex. heavy	2	88	X704	3	2	.75
68B367	Sill—Wood, front, left	1	42	X603	6	....	1.00
68B368	Sill—Wood, front, right	1	42	X604	6	....	1.00
68B369	Sill—Wood, rear, left	1	42	X602	6	....	1.00
68B370	Sill—Wood, rear, right	1	42	X601	6	....	1.00
70A439	Handle—Control, cylinder, lower	1	72	X359	1	12	.90
71C59	Belt—Safety	1	90	X635	1	6	2.00
73A201	End—Rod, plunger, valve	1	62	X659	....	5	.75
78A482	Clip—Belt, safety	2	42	X431	....	2	.10
81A76	Bolt—Eye, valve, diversion	1	63	X594	....	1¾	.35
82A85	Nut—Acorn, valve, diversion	1	62	X663	....	4	2.00
87A8	Spacer—Bracket, bearing, chain	2	88	X279	2	12	1.40
82A360	Plug—Valve, relief, ¾", special (not interchangeable with Daybrook part)	1	56		....	2	.30
82A412	Nut—Jam, slotted, ⅞", SAE, special	2	88	X524	....	1	.10
93D435A	Boom Assembly—Left	1	44	X207L	550	....	172.00
93D436A	Boom Assembly—Right	1	44	X207R	550	....	172.00
96C208	Bracket—Skid, left	1	44	X237L	28	12	6.50
96C209	Bracket—Skid, right	1	44	X237R	28	12	6.50
97A11	Sling—Cable	1	90	X381	12	12	10.50
109A266	Spacer—Wood, left	1	48	X562L	1	....	.25
109A267	Spacer—Wood, right	1	48	X562R	1	....	.25
121C86	Plate Assembly—Step, complete	1	50	X292	19	8	9.00
123B5	Turnbuckle—⅞", USS	1	48	X246	1	4	1.25
126C42	Support—Boom, upper	1	44	X613	132	....	31.20

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Heil Part No.	Description of Part	Quan. Per Unit	Page No.	Daybrook Part No.	Weight Lbs.	Weight Oz.	Price
126B45	Support—Shaft, cross, rear	1	44	X357	52	....	7.50
146A77	Seal—Oil	1	63	X583	....	1	.40
166B4S	Sheave—Fairlead	2	49	X325	6	14	6.00
32-2	Yoke—½", SAE	2	76	X382	....	4	.35
50-4-6	Bolt—Stove, ¼" x ½"	16	42, 44	X552	....	¼	.01
120	Valve—Globe, emergency, ¾" (Powell Co., Cincinnati, Ohio, No. 120)	4	58, 61	X415	2	12	3.75
153-48	Trap Door—Front	1	42	X447	18	12	3.60
153-49	Trap Door—Rear	1	42	X448	39	12	5.10
280-808	Key—Woodruff, ¼", No. 15	7	64, 66	246	....	¼	.03
280-1010	Key—Woodruff, 5/16" x 1¼", No. D	2	66	X558	....	½	.04
397-35	Pin—7/16" x 1¼" (for 32A331 yoke)	2	68, 70	358	....	⅞	.07
398-43	Pin—½" x 1 27/64" (drilled ⅛")	9	72, 74 76	X281	....	1	.10
435-8-8	Rivet—Head, round, ¼" x ½"	4	51	X521	....	⅓	.01
435-8-28	Rivet—Head, round, ¼" x ¾"	1	76	X512	....	¾	.01
435-8-38	Rivet—Head, round, ¼" x 2¾"	2	49	X561	....	¾	.02
540-4-3	Screw—Lag, ¼" x 1½"	4	48	X489	....	⅓	.02
650	Valve—Globe, shut-off, 1" (Powell Co., Cincinnati, Ohio, No. 650)	1	56, 61	X425	2	2	2.38
963	Union—Adapter (male to female) ½"	2	58	X408	....	3	.40
964	Union—Adapter (male to female) ¾"	10	56, 58	X405	....	7	.50
965	Union—Adapter (male to female) 1"	2	56	X403	....	10½	.80
974	Union—Adapter (female to female) ¾"	3	58	X406	....	7	.55
1044	Nut—5/16", SAE (for A4-DHC spotlight)	2	82	1044	.008	....	.04
1045	Lockwasher—Shakeproof, 5/16"	2	82	1045	.008	....	.02
1610	Fitting—Alemite, ⅛", 100 straight, No. 1610	27	46, 49 52, 54	236	....	¼	.08
1612	Fitting—Alemite, ⅛", 67½°, No. 1612	15	44, 52 68, 70 72, 74 76	237	....	½	.14
1648	Fitting—Alemite 5/16", 67½°, No. 1648	7	66, 68 70	589	....	¼	.21
1987-3A	Box Assembly—Tool	1	51	X284	117	8	22.00

PARTS CATALOG

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Heil Part No.	Description of Part	Quan. Per Unit	Page No.	Daybrook Part No.	Weight Lbs.	Weight Oz.	Price
1989-3	Tarpaulin	1	90	X366	78	12	67.50
2460	Door—Lamp (for 953-1-6 light) (K-D Lamp Co., No. 2460)	1	80	2460	....	4	.21
2461	Door—Lamp (for 952-I-6 light) (K-D Lamp Co., No. 2461)	1	81	2461	....	4	.21
4853	Hasp—Latch, box, tool	2	51	X343	....	10	.60
6798	Screw—For stop lights	4	80, 81	6798	....	¼	.03
7001	Bracket—Shell, spotlight (Unity Mfg. Co., Chicago, Ill., No. 7001)	2	82	7001	.333	....	**
7057	Bracket—Bearing (purchase only Brockway Motor Co., Courtland, N. Y., No. 7057)	1	50	X504	....	3	.30
7068A	Plate—Reinforcing, shell, spotlight (Unity Mfg. Co., Chicago, Ill., No. 7068A)	2	82	7068A	.031	....	**
7109	Nut—Winged, 5/16", spotlight (Unity Mfg. Co., Chicago, Ill., No. 7109)	2	82	7109	.031	....	.04
7152A	Wire—Shell, spotlight (Unity Mfg. Co., Chicago, Ill., No. 7152A)	2	82	7152A	.003	....	.07
7186	Screw—Winged, 5/16", spotlight (Unity Mfg. Co., Chicago, Ill., No. 7186)	2	82	7186	.063	....	.07
7221	Housing—Pivot, spotlight (Unity Mfg. Co., Chicago, Ill., No. 7221)	2	82	7221	.328	....	.56
7240	Screw—5/16" x 1½", spotlight (Unity Mfg. Co., Chicago, Ill., No. 7240)	2	82	7240	.031	....	.07
7252	Wiring Assembly—Loom, spotlight (Unity Mfg. Co., Chicago, Ill., No. 7252)	1	84	7252	.450	....	2.10
8039-6V	Unit—Lamp, tail, and stop, service, upper (K-D Lamp Co., Chicago, Ill., No. 8039-6V)	1	81	8039-6V	....	5	.75
8040-6V	Unit—Lamp, tail, blackout, lower (K-D Lamp Co., Chicago, Ill., No. 8040-6V)	2	80, 81	8040-6V	....	4	.90
8041-6V	Unit—Lamp, stop, blackout, upper (K-D Lamp Co., Chicago, Ill., No. 8041-6 V)	1	80	8041-6V	....	5	.90
8045	Body Assembly—Lamp, tail (K-D Lamp Co., Chicago, Ill., No. 8045)	2	80, 81	8045	....	9	.40

**(Part of Assembly—not sold separately)

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Heil Part No.	Description of Part	Quan. Per Unit	Page No.	Daybrook Part No.	Weight Lbs.	Weight Oz.	Price
9010	Grommet—Rubber, spotlight (Unity Mfg. Co., Chicago, Ill., No. 9010)	2	82	9010	.002	....	**
9012	Rivet—Shell, spotlight (Unity Mfg. Co., Chicago, Ill., No. 9012)	2	82	9012	.001	....	**
9081	Terminal—Wire, bullet (Unity Mfg. Co., Chicago, Ill., No. 9081)	6	82	9081	.002	....	**
9308	Ear—Ring, spotlight (Unity Mfg. Co., Chicago, Ill., No. 9308)	4	82	9308	.006	....	**
9424-24	Hose—Pressure, high, ½" x 24" (with fittings) (Eastman Mfg. Co., Manitowoc, Wis., No. 9424-24)	2	58	X470A	2	3½	2.10
9425-10	Hose—Pressure, high, ¾" x 10" (with fittings) (Eastman Mfg. Co., Manitowoc, Wis., No. 9425-10)	1	56	X404A	1	11	2.00
9425-19	Hose—Pressure, high, ¾" x 19" (with fittings) (Eastman Mfg. Co., Manitowoc, Wis., No. 9425-19)	4	58	X404B	2	....	2.60
9425-32	Hose—Pressure, high, ¾" x 32" (with fittings) (Eastman Mfg. Co., Manitowoc, Wis., No. 9425-32)	8	56, 58	X404C	2	3½	3.50
9426-33	Hose—Pressure, high, 1" x 33" (with fittings) (Eastman Mfg. Co., Manitowoc, Wis., No. 9426-33)	2	56	X402	3	12	4.40
9467	Ring—Spotlight (Unity Mfg. Co., Chicago, Ill., No. 9467)	2	82	9467	.187	....	.70
9471-2	Bolt and Nut—Spotlight (Unity Mfg. Co., Chicago, Ill., Nos. 9471 and 9472)	2	82	9471-2	.007	....	.07
9555	Rivet—Ring, spotlight (Unity Mfg. Co., Chicago, Ill., No. 9555)	8	82	9555	.001	....	**
9646C	Bulb—Crystal, Glaseal, Mazda, G-E (General Electric Co., No. 4012, Mazda)	2	82	9646C	.875	....	.77
9652	Wire—Ground, spotlight (Unity Mfg. Co., Chicago, Ill., No. 9652)	2	82	9652	.003	....	**
9668A	Shell Assembly—Spotlight (Unity Mfg. Co., Chicago, Ill., No. 9668A)	2	82	9668A	.813	....	2.10
9675	Ring—Adapter, spotlight (Unity Mfg. Co., Chicago, Ill., No. 9675)	2	82	9675	.034	....	.35

**(Part of Assembly—not sold separately)

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Heil Part No.	Description of Part	Quan. Per Unit	Page No.	Daybrook Part No.	Weight Lbs.	Weight Oz.	Price
9683	Terminal—Bulb, spotlight (Unity Mfg. Co., Chicago, Ill., No. 9683)	2	82	9683	.002	....	.04
202974	Pin—Pivot, throttle, foot (purchase only Brockway Motor Co., Courtland, N. Y., No. 202974)	1	50	X505	....	¾	.30
500384	Throttle Assembly—Foot (purchase only Brockway Motor Co., Courtland, N. Y., No. 500384)	1	50	X501	....	14½	2.25
500385	Cap—Throttle, foot (purchase only Brockway Motor Co., Courtland, N. Y., No. 500385)	1	50	X503	....	3¾	.75
500389	Lever—Throttle, foot (purchase only Brockway Motor Co., Courtland, N. Y., No. 500389)	1	50	X502	....	7	.75
41-5439.700-060	Mattock (GFE)	1	90	570600-200	7	8	....
41-1187.550-400	Axe (GFE)	1	90	135800-367	5	4	....
41-7487.200-200	Shovel (GFE)	1	90	761700-250	4	8	....
*	Body—Valve, relief (not interchangeable with Heil Co. part)	1		X491	....	14	2.20
	Plug—Pipe, special, ¾" (not interchangeable with Heil Co. part)	1		X515	....	2	.46
	Shield—Valve, relief (not used on Heil Co. type relief valve	1		X492	....	2	.30

NUMERICAL LIST OF COMMON SUPPLIES

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Heil Part No.	Part Name	Total Quan.	Daybrook Number	Weight	Price
	ALEMITE FITTINGS				
1610	Alemite Fitting—⅛", straight, No. 1610	27	236	¼ oz. ea.	.08
1612	Alemite Fitting—⅛", 67½°, No. 1612	15	237	½ oz. ea.	.14
1648	Alemite Fitting—5/16", 67½°, No. 1648	7	589	¼ oz. ea.	.21
	SETSCREWS				
47A306	Setscrew—⅜" x ¾", USS drilled	8	536	½ oz. ea.	.10
X18-15	Setscrew—5/16" x ⅜", USS, Allen head	3	X488	1/12 oz. ea.	.15
47A304	Setscrew—⅜" x 1", drilled	4	X638	1 oz. ea.	.12
560-5-10	Setscrew—5/16" x ⅝", USS	6	CS5-⅝	1/6 oz. ea.	.04
	NUTS, HEX., COARSE THREAD, USS			Per 1000	
335-4	Nut—¼", USS	16	CN4	7.7	.01
	CUT WASHERS—PLAIN				
945-8	Washer—Cut, ½"	1	CW8	¼ oz. ea.	.01
970-8	Washer—Flat, ½"	2		¼ oz. ea.	.01
	CAPSCREWS, HEX. HEAD, COARSE THREAD, USS			Per 100	
65-6-10	Capscrew—⅜" x 1", USS	2	C6-1	4.53 lb.	.03
65-8-4	Capscrew—½" x ½", USS	2	C8-½	7.8	.05
65-8-12	Capscrew—½" x 1¼", USS	2	C8-1¼	10.13	.06
	CAPSCREWS, HEX. HEAD, FINE THREAD, SAE				
60-4-6	Capscrew—¼" x ¾", SAE	4	F4-¾	1.55	.02
60-4-12	Capscrew—¼" x 1¼", SAE	2	F4-1¼	2.18	.03
60-5-6	Capscrew—5/16" x ¾", SAE	4	F5-¾	2.55	.04
60-6-10	Capscrew—⅜" x 1", SAE	2	F6-1	4.53	.03
60-6-12	Capscrew—⅜" x 1¼", SAE	3	F6-1¼	5.31	.03
60-6-20	Capscrew—⅜" x 2", SAE	4	F6-2	7.63	.04
60-7-10	Capscrew—7/16" x 1", SAE	26	F7-1	6.25	.03
60-7-12	Capscrew—7/16" x 1¼", SAE	8	F7-1¼	7.21	.03
60-7-14	Capscrew—7/16" x 1½", SAE	4	F7-1½	8.26	.04
60-8-10	Capscrew—½" x 1", SAE	27	F8-1	9.00	.05
60-8-11	Capscrew—½" x 1⅛", SAE	2	F8-1⅛	9.56	.06
60-8-12	Capscrew—½" x 1¼", SAE	30	F8-1¼	10.13	.06
60-8-14	Capscrew—½" x 1½", SAE	36	F8-1½	11.50	.06
60-8-16	Capscrew—½" x 1¾", SAE	12	F8-1¾	12.88	.07
60-8-40	Capscrew—½" x 4", SAE	2	F8-4	25.25	.11
60-10-10	Capscrew—⅝" x 1", SAE	2	F10-1	16.67	.08
60-10-12	Capscrew—⅝" x 1¼", SAE	2	F10-1¼	17.56	.09
60-10-14	Capscrew—⅝" x 1½", SAE	10	F10-1½	18.45	.10
60-10-16	Capscrew—¾" x 4", SAE	2	F10-1¾	19.34	.11
60-10-44	Capscrew—⅝" x 4½", SAE	2	F10-4½	52.45	.19
60-12-40	Capscrew, ¾" x 4", SAE	2	F12-4	59.65	.23
60-16-20	Capscrew—1" x 2", SAE	18	F16-2	64.25	.36
60-16-40	Capscrew—1" x 4", SAE	7	F16-4	102.85	.33
	NUTS, HEX., FINE THREAD—SAE			Per 1000	
325-4	Nut—¼", SAE	6	FN4	7.2	.01
325-6	Nut—⅜", SAE	10	FN6	15.3	.02
325-7	Nut—7/16", SAE	5	FN7	21.	.02
325-8	Nut—½", SAE	103	FN8	36.	.03
325-10	Nut—⅝", SAE	16	FN10	69.2	.05
325-12	Nut—¾", SAE	2	FN12	99.	.07
325-16	Nut—1", SAE	25	FN16	245.	.14

PARTS CATALOG

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Heil Part No.	Part Name	Total Quan.	Daybrook Number	Weight	Price
	NUTS, HEX., CASTELLATED—SAE			Per 1000	
330-8	Nut—Castellated, ½", SAE	1	FCN8	38.3	.04
330-10	Nut—Castellated, ⅝", SAE	3	FCN10	71.1	.06
330-16	Nut—Castellated, 1", SAE	4	FCN16	253.	.16
	LOCKWASHERS			Per 1000	
935-416	Lockwasher—¼"	26	LW4	1.9	.01
935-516	Lockwasher—5/16"	4	LW5	3.50	.01
935-616	Lockwasher—⅜"	11	LW6	6.	.01
935-716	Lockwasher—7/16"	20	LW7	10.	.01
935-816	Lockwasher—½"	113	LW8	15.	.01
935-1016	Lockwasher—⅝"	18	LW10	25.	.02
935-1216	Lockwasher—¾"	2	LW12	45.	.03
935-1616	Lockwasher—1"	25	LW16	92.	.07
	COTTER PINS			Per 1000	
380-4-4	Pin—Cotter, ⅛" x 1"	29	P4-1	3.77	.01
380-3-3	Pin—Cotter, 3/32" x ¾"	1	P3-¾	1.58	.01
380-4-6	Pin—Cotter, ⅛" x 1½"	3	P4-1½	5.31	.01
380-4-7	Pin—Cotter, ⅛" x 1¾"	2	P4-1¾	6.08	.01
380-4-8	Pin—Cotter, ⅛" x 2"	2	P4-2	6.85	.01
380-6-7	Pin—Cotter, 3/16" x 1¾"	4	P6-1¾	13.86	.02
380-12-8	Pin—Cotter, ⅜" x 2"	2	P12-2	65.4	.03
	WOODRUFF KEYS			Each	
X7-6	Key—Woodruff, 5/32", No. 6	1	244	¼ oz. ea.	.03
280-808	Key—Woodruff, ¼", No. 15	7	246	¼ oz. ea.	.03
280-1010	Key—Woodruff, 5/16" x 1¼", No. D	2	X558	½ oz. ea.	.04
	RIVETS			Each	
435-8-8	Rivets—¼" x ½"	4	X521	⅓ oz. ea.	.01
435-8-28	Rivets—¼" x 1¾"	1	X512	¾ oz. ea.	.01
435-8-38	Rivets—¼" x 2¾"	2	X561	1 oz. ea.	.02
	STOVE BOLTS			Each	
50-4-6	Bolts—Stove, ¼" x ½"	16	X552	¼ oz. ea.	.01

PIONEER TOOL SET

Heil Part No.	Part Name	Total Quan.	Page No.	Daybrook Number	Weight Lbs.	Weight Oz.	Price
QM-07596W	Tool Set (furnished by government complete with tools)	1	39	QM-07596W	21	....	....
41-5439.700-060	Mattock (GFE)	1	39	570600-200	7	8	....
41-1187.550-400	Axe (GFE)	1	39	135800-367	5	4	....
41-7487.200-200	Shovel (GFE)	1	39	761700-250	4	8	....