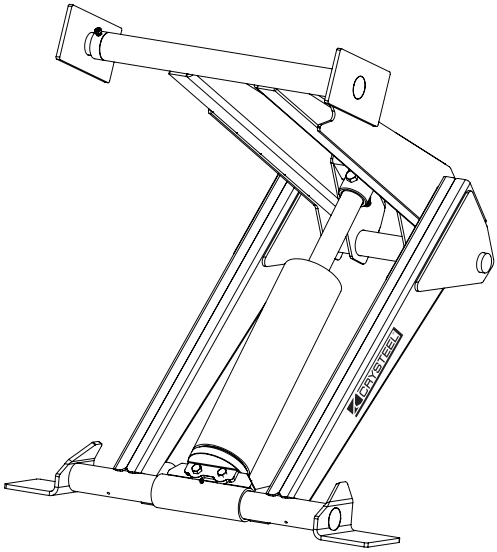
Subsidiary of Federal Signal Corporation

INSTALLATION AND OPERATION MANUAL
LB-SERIES HOIST
2472245A



Serial Number: _____

In-Service Date: _____

Read this manual thoroughly prior to installation and operation. This manual outlines the installation and operation of an LB Series Hoist & Sub-frame manufactured by Crysteel Manufacturing Inc. This manual should be kept readily accessible for any potential operator at all times.
Contact your dealer or a Crysteel Manufacturing customer service representative at 800-533-0494 or www.crysteel.com with any questions or concerns.

Table of Contents

Section 1: Safety

This manual provides guidelines and instructions for correctly operating and maintaining your Crysteel Manufacturing Inc. product. Any and all people that own and operate a Crysteel Manufacturing dump bodies are recommended to read and fully understand each section in this manual.

Throughout this manual, the three following types of labels will be used: Danger, Warning, and Caution. For the safety of the operator, it is imperative that all labels are obeyed.

⚠ DANGER

Indicates imminent danger. Failure to follow this instruction will result in death or serious injury.

⚠ WARNING

Indicates a possibly impending danger. Failure to follow this instruction can result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation or unsafe practice which, if not avoided, could result in injury or component damage.

In all cases, Crysteel products are sold with the understanding that the purchaser agrees to thoroughly train all operating and maintenance personnel in the correct and safe installation and operation of hoist equipment and to provide adequate supervision of personnel at all times.

Read the following in its entirety before connecting, operating or repairing equipment. Purchasers and operators also should be familiar with the current version of any applicable OSHA regulations, standards and guidelines.

Should any questions arise concerning safe and proper procedures, contact Crysteel Manufacturing Inc. to the installation or use at 800-533-0494 or 507-726-2728.

The hydraulic system supplied with an LB-Series hoist manufactured by Crysteel Manufacturing Inc. is made up of components (pump, valves, reservoir, hoses, cylinder, etc.) designed to be compatible with each other. Several different types of pump and hydraulic components are available to power the LB-Series hoists. Refer to the pump and hydraulic component Installation and Operation Manual for more information.

⚠ DANGER

If the hydraulic system used to power the hoist was supplied by TBEI, an operation manual will be included with the hydraulic components. This manual MUST BE available for reference by the operator when needed.

If the hydraulic system used to power the hoist was supplied by a company other than TBEI, an operation manual will be included with the hydraulic components. This manual MUST BE available for reference by the operator when needed.

⚠ DANGER

It is the installer's responsibility to ensure any substituted components are compatible with Crysteel Manufacturing Inc. components. Incompatible hydraulic components may cause failure of the hoist, which in turn, could damage the vehicle, damage other property, and cause death or injury.

If hydraulic components are substituted, it is the installer's responsibility to be sure they are compatible with the components supplied by Crysteel Manufacturing Inc. Incompatible hydraulic components may cause failure of the hoist which in turn could damage the truck, damage other property, and cause human injury or death. Crysteel Manufacturing Incorporated's liability and warranty for a given hoist will be voided if it is determined by Crysteel Manufacturing Inc. that substituted hydraulic components were used that were incompatible with those supplied by Crysteel Manufacturing Inc.

⚠ DANGER

Welding, oxy-fuel cutting, or grinding sparks can cause fuel to ignite which in turn can lead to injury or death. Always take adequate steps to avoid ignition of fuel tanks during equipment installation.

⚠ DANGER

Not installing or operating equipment correctly can cause component damage or an accident which may cause injury or death. ALWAYS install and operate equipment in accordance with manufacturer's instructions. Read and understand this manual fully before proceeding.

⚠ DANGER

Damage to brake lines during equipment installation, or installing bolts or equipment in such a way that the line will rub and become damaged can lead to brake failure which can cause an accident and can lead to severe injury or death. ALWAYS take adequate steps to prevent brake line damage during installation and isolate brake lines from installed equipment.

⚠ DANGER

Malfunctioning equipment can cause property damage, injury or death. ALWAYS have faulty equipment repaired before continuing its use. If required, consult the manufacturer.

⚠ CAUTION

To prevent damage to the truck's electrical system, disconnect the positive battery cable and alternator when arc welding on the truck.

⚠ DANGER

The inadvertent shorting of the truck's electrical supply can cause a fire or equipment damage that could lead to injury or death. ALWAYS disconnect the vehicle battery prior to installing, servicing or repairing the pump.

⚠ DANGER

NEVER install a cable on a truck while the body is raised without first blocking, bracing, or propping the body up to prevent the body from inadvertently falling when the control valve lever is moved. A falling body will result in serious injury or death if the control valve lever is moved while someone is under the non-supported body.

⚠ DANGER

NEVER exceed the gross vehicle weight (GVW) or gross axle weight (GAW) rating of your vehicle. This may result in component damage, injury or death.

⚠ DANGER

Avoid bouncing or jerking of the hoist. This may result in component failure, injury or death.

⚠ DANGER

NEVER raise or drive a raised body against another object. This may result in property damage, injury or death.

⚠ DANGER

NEVER connect the hoist to a hydraulic system with more pressure (psi) or flow (gpm) than is recommended. This may result in component failure, injury or death.

⚠ CAUTION

Unlatch tailgate prior to elevating a loaded dump body as excessive forces on the rear of the dump body may result in component failure.

⚠ DANGER

NEVER operate the hoist until bystanders are free & clear of the hoist and body. This may result in injury or death.

⚠ DANGER

NEVER position yourself or allow others under a raised body as this can result in serious injury or death should the body inadvertently descend. ALWAYS prop up the **unloaded** body using the body props.

⚠ DANGER

Place a complete hoist operation manual in the glove box of the truck that will pull the trailer OR in a place on the trailer that is sheltered from the weather and other elements. This manual MUST BE available for reference by the operator when needed.

Section 2: Introduction

This manual covers the installation of the LB-series hoists.

Ensure the correct manuals are present when working on equipment. For help locating the correct manuals contact Crysteel Manufacturing Inc. at 800-533-0494 or 507-726-2728.

Serial Number

This information is required for any warranty or service inquiries, and should be recorded on the front cover of this manual for easy reference. The serial number is located on the hoist serial number plate. Figure 1.

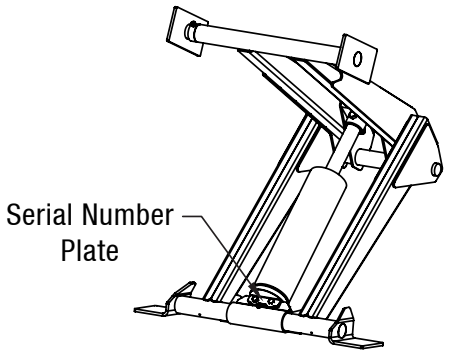


Figure 1: Serial Number Location

Specifications

Model	Previous Model Name	Maximum		
		Hydraulic Flow Rate (gpm)	Pressure (PSI)	Down Pressure (PSI)
LB-B5	B-5 (Bert)	4	3200	1000
LB-C8	C-8 (Charlie)	6	3200	1000
LB-D10	D-9 (Daniel)	6	3200	1000
LB-E15	E-15 (Ernie)	9	3200	1000
LB-F18	F-18 (Floyd)	9	3200	1000

⚠ DANGER

NEVER adjust the hydraulic pressure to more than the recommended setting. This may cause the hoist to fail during the dumping of a load and result in property damage, injury or death. NEVER adjust the pressure on your own. ALWAYS consult the manufacturer if the hydraulic pressure is in question to talk with a qualified mechanic.

Capacity Charts

The following charts are to be used as a reference when determining capacity based on overhang. The capacity and dump angle will vary depending on where the hoist is mounted in relation to the rear hinge. The following tables list dump angles and corresponding capacities for different mounting distances (D) (refer to Figure 2). REMEMBER, all capacities listed below are based on water level, non-diminishing loads and the hydraulic relief pressure set at the maximum of 3200 PSI.

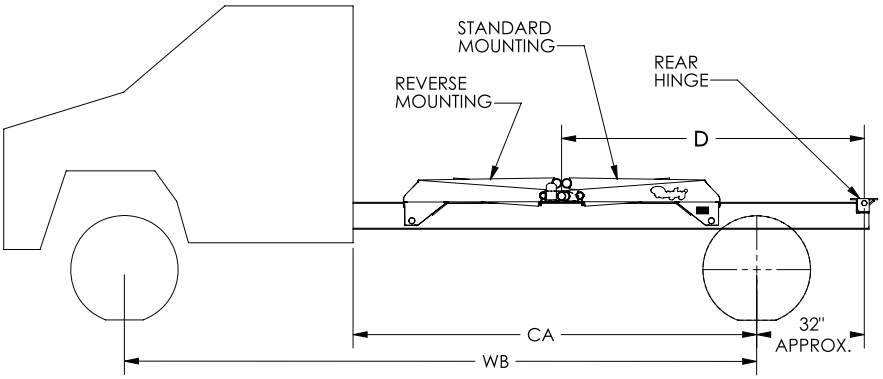


Figure 2: Mounting Distances

LB-B5 Forward Mounting Dump Class: 10 Conversion Class: B					
Body Length (feet)	**CA (inches)**	**Rear Overhang (inches)**	**D=91" Capacity 40º Dump (tons)**	**D=82" Capacity 45º Dump (tons)**	**D=74" Capacity 50º Dump (tons)**
8	56	0	6.5	5.9	5.3
9	56	12	7.5	6.7	6.1
9	60	3	6.0	5.4	4.9
10	56	24	8.8	7.9	7.1
10	60	15	10.2	9.2	8.2
12	84	15	5.4	4.8	4.4
Mounting Height			5.75"		
Minimum Longsill Height			7.00"		
Mounting Distance			91"	82"	74"

LB-C8 Forward Mounting* Dump Class: 20 Conversion Class: C					
Body Length (feet)	**CA (inches)**	**Rear Overhang (inches)**	**D=94" Capacity 40º Dump (tons)**	**D=85" Capacity 45º Dump (tons)**	**D=77" Capacity 50º Dump (tons)**
9	60	3	9.0	8.2	7.5
10	60	15	10.2	9.3	8.4
11	84	3	7.3	6.6	6.0
12	84	15	8.1	7.3	6.7
Mounting Height			5.75"		
Minimum Longsill Height			7.00"		
Mounting Distance			94"	85"	77"

*Reverse Mounting:
40º = 92"
45º = 83"
50º = 75"

LB-D10 Forward Mounting* Dump Class: 40 Conversion Class: D					
Body Length (feet)	**CA (inches)**	**Rear Overhang (inches)**	**D=110" Capacity 40º Dump (tons)**	**D=99" Capacity 45º Dump (tons)**	**D=90" Capacity 50º Dump (tons)**
12	84	18	14.4	12.7	11.7
13	84	30	16.2	14.5	13.2
13	102	12	11.8	10.6	9.6
13	108	6	10.8	9.7	8.8
14	102	24	13.0	11.7	10.6
14	108	18	11.8	10.6	9.6
14	120	6	10.0	9.0	8.1
15	102	36	14.4	12.9	11.7
15	108	30	13.0	11.7	10.6
15	120	18	10.8	9.7	8.8
Mounting Height			7.50"		
Minimum Longsill Height			8.00"		
Mounting Distance			108.75"	97.25"	88.25"

*Reverse Mounting:
40º = 107"
45º = 96"
50º = 87"

LB-E15 Forward Mounting* Dump Class: 50 Conversion Class: E					
Body Length (feet)	**CA (inches)**	**Rear Overhang (inches)**	**D=104.25" Capacity 40º Dump (tons)**	**D=93.25" Capacity 45º Dump (tons)**	**D=84.50" Capacity 50º Dump (tons)**
10	84	6	16.5	14.9	13.6
12	84	30	21.0	19.0	17.3
12	108	6	13.6	12.3	11.2
13	108	18	14.9	13.4	12.2
14	108	30	16.5	14.9	13.6
14	120	18	13.6	12.3	11.2
15	120	30	14.9	13.4	12.2
16	120	42	16.5	14.9	13.6
16	138	24	12.5	11.3	10.2
Mounting Height			7.13"		
Minimum Longsill Height			8.00"		
Mounting Distance			104.25"	93.25"	84.50"

*Reverse Mounting:
40º = 102.25"
45º = 91.25"
50º = 82.50"

NR = Not Recommended;
Contact Crysteel Engineering before using in an application listed as NR.

LB-F18 Forward Mounting* Dump Class: 60 Conversion Class: F					
Body Length (feet)	**CA (inches)**	**Rear Overhang (inches)**	**D=146" Capacity 40º Dump (tons)**	**D=131" Capacity 45º Dump (tons)**	**D=120" Capacity 50º Dump (tons)**
12	108	6	17.9	16.4	14.8
14	108	30	21.8	19.5	17.7
14	120	0	17.9	16.1	14.5
16	120	42	21.8	19.5	17.7
16	144	18	15.2	13.6	12.3
18	156	30	15.2	13.6	12.3
18	168	18	13.2	11.8	10.7
Mounting Height			8.50"		
Minimum Longsill Height			9.00"		
Mounting Distance			146"	131"	120"

*Reverse Mounting:
40º = 144"
45º = 129"
50º = 118"

NR = Not Recommended;
Contact Crysteel Engineering before using in an application listed as NR.

Torque Chart

The following chart is to be used as a guide during installation.

Size	Grade 2 (lb-ft)	Grade 5 (lb-ft)	Grade 8 (lb-ft)
			
1/4-20	3-4	6-7	10-11
1/4-28	4-5	8-9	11-12
5/16-18	8-9	14-15	21-22
5/16-24	9-10	15-16	21-22
3/8-16	17-18	24-26	37-40
3/8-24	19-20	28-30	40-43
1/2-13	38-42	60-65	90-100
1/2-20	43-47	70-75	95-105
5/8-11	75-80	122-130	180-190
5/8-18	85-90	145-150	200-210
3/4-10	132-140	220-230	315-330
3/4-16	152-160	250-260	355-370

The following abbreviations are used in describing hydraulic fittings:

Acronym	Description
ORBM	O-ring Boss - Male Thread
NPTM	Pipe - Male Thread
NPTF	Pipe- Female Thread
JICM	JIC 37º - Male Thread
JICF	JIC 37º - Female Thread

Section 3: Installation

Rear Hinge Installation

DANGER Locating the rear hinge farther back than recommended may cause undue stress on the truck frame resulting in instability during the lifting cycle.

On single-axle trucks, the rear hinge must be located as close as possible behind the rear spring hanger. This will be 32”-36” behind the center of the rear axle. On tandem-axle trucks, the center of the rear hinge should be located 42”-50” behind the center of the rear tandems. Mark the rear of the truck frame for notching as shown in Figure 3. Notch the truck frame as marked. Ensure the rear hinge is square with the truck frame and at the correct height. The top surface of the rear hinge bracket should be flush with the top of the angle mounting brackets of the hoist frame as show in Figure 3. Securely weld the rear hinge to the truck frame. Cap the ends of the truck frame under the rear hinge. Weld the capping plates to the ends of the truck frame and to the bottom side of the rear hinge angle.

On tandem-axle trucks, place the gussets in the corners formed by the truck frame rail and the rear hinge frame angle. Raise the front end of the gusset so it touches the top flange of the truck frame rail. Ensure that the gusset does not interfere with the rear hinge operation. Securely weld the gussets to the rear hinge, the truck frame rail, and the top flange of the truck frame rail.

1. Refer to Figure 3 below and cut a notch as shown.

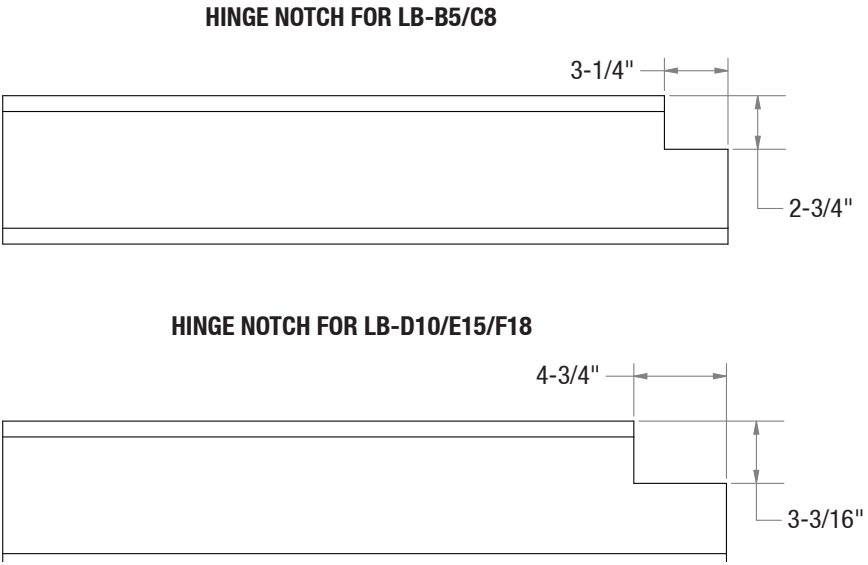


Figure 3: Notch Location

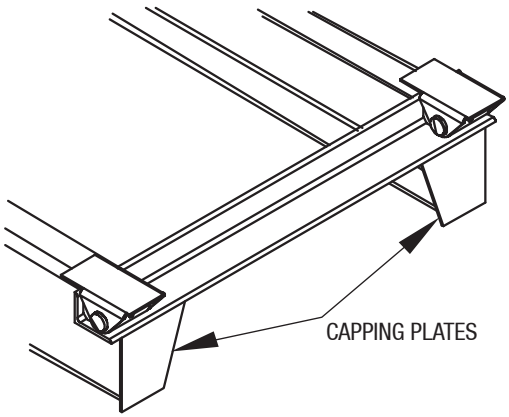


Figure 4: Capping Plates

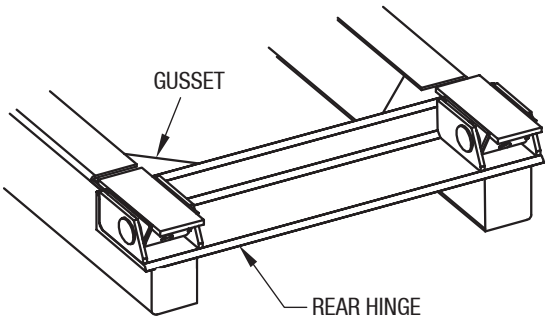


Figure 5: Rear Hinge Location on Tandem Axle Trucks

2. Position the rear hinge angle into the notch cut in Step 1 as shown in Figure 5. Center it side-to-side in the notch as illustrated and weld the rear hinge angle to each of the truck chassis frame rails.

   NOTES:
   - This hinge assembly is designed for a truck longsill spacing of 34" and is not recommended for any other width.
   - The distance between the rear hinge shaft center and the saddle center is referred to as the "D" dimension. See the "Capacity Charts" on page 10 to see the various dump angles.

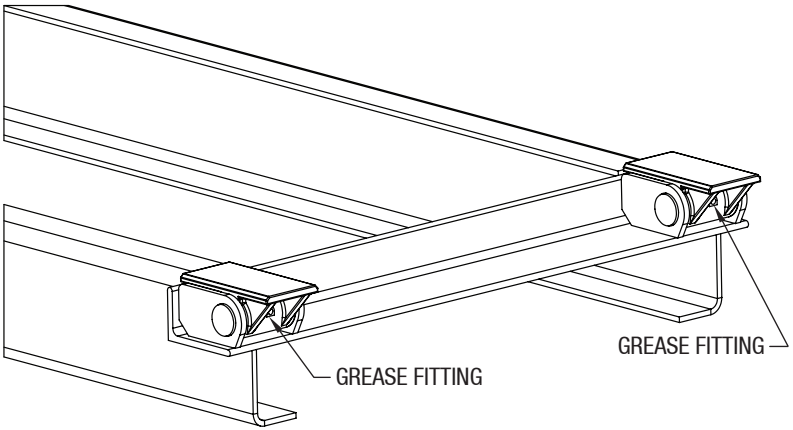
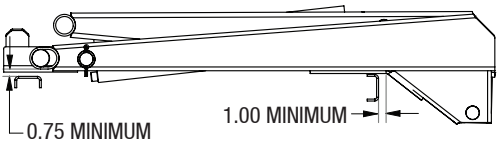


Figure 6: Rear Hinge Grease Fittings

⚠ CAUTION

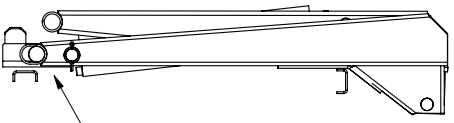
During the first degrees of the dump cycle, the hoist lower link will move forward if in the standard mounting configuration or rearward if in the reverse mounting configuration. It is important to keep these areas open to allow the hoist to move and operate as intended. Blocking these areas may damage the hoist and other truck components.



Maintain shown dimensions to allow room for the hoist to rotate freely during the lift cycle.

Notice how the hoist must be installed so the oval saddle tube is slid as far rearward as possible when the hoist is down.

Figure 7: Hoist Position Before Beginning the Lift Cycle

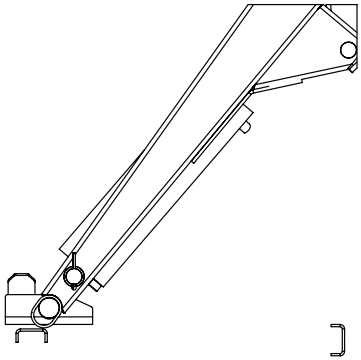


Notice how the oval saddle tube has slid forward. Hoist will slide ahead about 1 inch.

FORWARD MOVEMENT

Maintain clearance in this area to avoid interference between the hoist and the cross member.

Figure 8: Hoist Position in the First Few Degrees of the Lift Cycle



The size and shape of the cross members shown are for illustration purposes only.
Saddle brackets have been removed in the figures for illustration purposes.

Figure 9: Hoist Position in the Middle of the Lift Cycle

Hoist Frame Installation

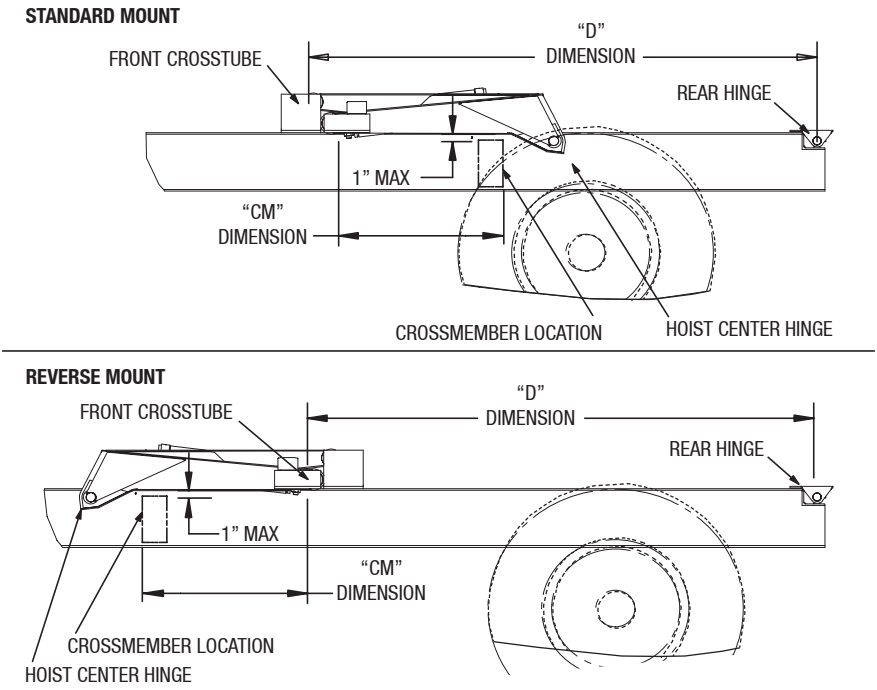


Figure 10: Hoist Location

1. Locate the hoist on the truck frame, making sure to center the hoist right and left, and to square the hoist with the truck frame. The hoist is designed to rest on the truck frame as shown in Figure 2. A small portion of the hoist extends below the truck frame, allowing the hoist to be moved forward or rearward to avoid truck cross members.
   NOTES:
   - If an obstruction can not be cleared by moving the hoist forward or rearward, the hoist may be reverse mounted as shown in Figure 2, or the portion of the hoist that extends below the frame may be lifted to the frame level without affecting the capacity or performance of the hoist. Be aware that lifting this portion of the hoist will raise the hoist mounting height.
   - The distance between the rear hinge shaft center and the saddle center is referred to as the "D" dimension. In Figure 2, the "D" dimension for several dump angles are tabulated.

- Moving the hoist rearward or forward along the truck frame will affect the hoist's performance. A forward movement will reduce the dump angle and will increase capacity while a rearward movement will increase the dump angle and reduce capacity.

2. Slide a lock collar onto each saddle shaft. Slide each saddle shaft into the lower tube as shown in Figure 11.

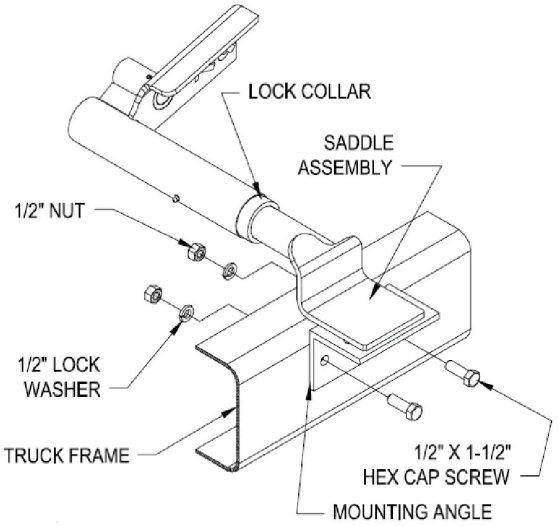


Figure 11: Saddle Assembly

3. When the hoist is positioned, place a mounting angle under each side of the hoist saddle. Secure each mounting angle to the truck frame by drilling 17/32" holes and installing 1/2" x 1-1/2" hex capscrews, 1/2" lock washers, and 1/2" hex nuts in each mounting bracket hole (see Figure 11). Tighten all 1/2" fasteners to 90 lb-ft.

4. Weld each end of the hoist saddle brackets to the corresponding mounting angle (see Figure 11).

NOTES:

- Do not weld the hoist or mounting angle to the truck frame.
- The hoist saddle must set directly on the truck frame. If rivet interference is encountered, counter sink the rivet head into the hoist saddle.

Hydraulic Systems

Crysteel offers PTO driven, gear pump hydraulic systems for use with all models of LB hoists. Crysteel also offers electric power units, both in single- and double-acting, for all models. Mounting instructions can be found on the following pages:

- PTO-driven Gear Pump with Remote Reservoir Valve - page 23
- Electric Pumps: General - page 33
- Electric Pumps: Single-Acting - page 35
- Electric Pumps: Double-Acting - page 37

Installing the Gear Pump

For Models LB-B5 and LB-C8

The gear pump for the LB-B5 and LB-C8 models has an SAE A mounting configuration, a 9-tooth splined-shaft and a two-bolt mounting flange, and is assembled for counter-clockwise rotation.

NOTE: This pump will mount directly to Chelsea's output type 'XE' or Muncie's output type 'R'.

Crysteel Manufacturing Inc. recommends a PTO ratio of 100-120%. This ensures a minimum pump operating speed of 600 RPM.

CHECK THE PTO ROTATION. If it is opposite the engine, then the pump can be used as is. If the PTO rotation is the same as the engine, then the pump will need to be reversed (see the instructions included with the pump).

Bolt the gear pump to the PTO output flange using 3/8" x 1" capscrews and lock washers.

NOTE: A pump with an SAE 'A' mounting configuration, a two-bolt mounting flange, but with an 11-tooth splined shaft, assembled for counter-clockwise rotation, is available for use with PTOs for the Ford TorqShift automatic transmission.

For Models LB-D10, LB-E15, and LB-F18

The gear pump for the LB-D10, LB-E15, and LB-F18 models has an SAE B mounting configuration, a 13-tooth splined-shaft and a four-bolt mounting flange, and is assembled for rotation in either direction.

NOTE: This pump will mount directly to Chelsea's output type 'XK' or Muncie's output type 'D'.

Crysteel Manufacturing Inc. recommends a PTO ratio of 100-120%. This ensures a minimum pump operating speed of 600 RPM.

Bolt the gear pump to the PTO output flange using 1/2" x 1-1/4" cap-screws and lock washers.

Mounting the Reservoir/Valve Assembly
For Models LB-B5 and LB-C8

1. The reservoir/valve assembly should be mounted on the same side of the vehicle as the pump with the exposed end of the valve spool toward the front.
2. Using 3/8" x 1" capscrews, flat washers, and hex lock nuts, bolt the reservoir mounting angles to the reservoir/valve assembly so the exposed end of the valve spool is toward the cab (see Figure 12) making it easier to connect the valve control cable to the valve.
3. Tighten the capscrews to a torque of 24-26 lb. ft.
4. Place the assembly against the outside of the truck frame on the same side as the pump and raise it as high as possible.
5. Clamp the mounting angles to the truck frame and mark the truck frame for drilling using the pump mounting angles as guides.
6. Ensure there is enough clearance for hot exhaust pipes.
   NOTE: NEVER allow engine exhaust to discharge directly onto the reservoir/valve assembly.

⚠ **CAUTION** Avoid brake lines, wiring, and other vehicle components inside the truck frame when drilling.

7. Drill 17/32" holes in the truck frame and bolt the reservoir/valve assembly in place using 1/2" x 2" capscrews and hex lock nuts and tighten to a torque of 90-100 lb. ft.

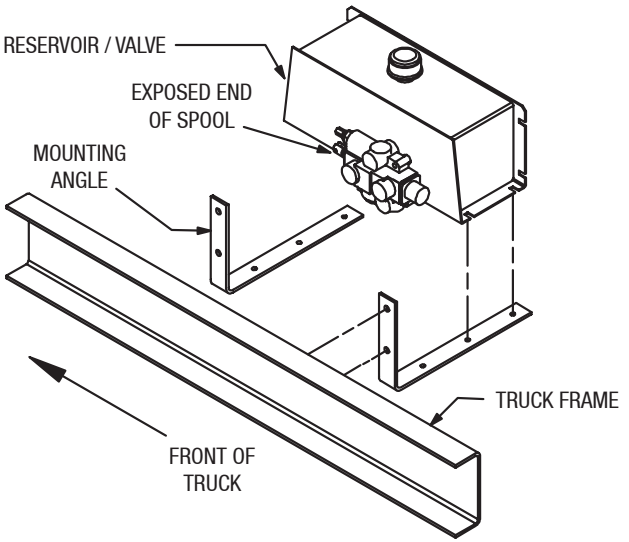


Figure 12: Reservoir/Valve Mounting for LB-B5 and LB-C8

For Models LB-D10, LB-E15, and LB-F18

1. The reservoir/valve assembly should be mounted on the same side of the vehicle as the pump with the exposed end of the valve spool toward the front.
2. Using 3/8" x 1" capscrews, flat washers, and hex lock nuts, bolt the reservoir mounting angles to the reservoir/valve assembly so the exposed end of the valve spool is toward the cab (see Figure 13) making it easier to connect the valve control cable to the valve.
3. Tighten the capscrews to a torque of 24-26 lb. ft.
4. Place the assembly against the inside of the truck frame on the same side as the pump and raise it as high as possible. (There is no drive line to align and the reservoir should be higher than the pump for reliable performance.)
5. Clamp the mounting angles to the truck frame and mark the truck frame for drilling using the pump mounting angles as guides.
6. Ensure there is enough clearance for hot exhaust pipes.
   NOTE: NEVER allow engine exhaust to discharge directly onto the reservoir/valve assembly.

CAUTION Avoid brake lines, wiring, and other vehicle components inside the truck frame when drilling.

7. Drill 17/32” holes in the truck frame and bolt the reservoir/valve assembly in place using 1/2” x 2” capscrews and hex lock nuts and tighten to a torque of 90-100 lb. ft.

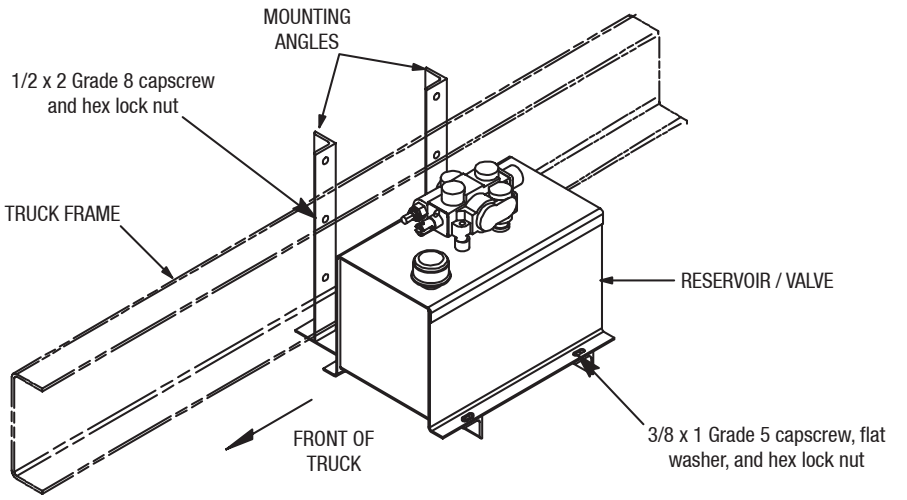


Figure 13: Reservoir/Valve Mounting for LB-D10, LB-E15, and LB-F18

Installing the Hoist Control

1. Mount the hoist control decal on the pedestal aligning the holes for the PTO cable and indicator light.
2. Temporarily assemble the valve control head to the pedestal using 5/16” x 2-1/2” machine screws and hex nuts.
3. Place the assembly on the floor of the cab with the pedestal and valve control angled forward making it convenient for the operator to pull the hoist control lever back to raise the hoist.
   NOTE:
   - Ensure there is enough room to operate the valve control, gear shift lever, and to adjust the seat.
   - Check below the floor for obstructions and cable routing.
   - Relocate the valve control if necessary.
4. Mark the floor using the pedestal as a template.
5. Drill 11/32” holes for the mounting screws and a 3/4” hole for the control cable.
6. Assemble the control cable to the valve control head.
7. Assemble the valve control head and cover to the pedestal using 5/16” x 2-1/2” machine screws and hex lock nuts.
8. Insert the control cable through the hole in the floor and mount the pedestal to the floor using 5/16” x 1/2” hex head capscrews, clamping plate (under the floor), and hex lock nuts.
   NOTE:
   - Ensure the valve control lever is in the center detent position.
   - Route the control cable away from hot exhaust pipes and rotating driveshafts.
   - Verify the control cable does not have any sharp bends or kinks in it as these will make the control more difficult to operate
9. Install the 3/4” hex jam nut onto the valve end of the control cable and tighten it past the threads.
10. Insert the end of the cable through the bonnet clamp.

11. Install the bonnet onto the control cable and tighten it past the threads.
12. Install the 1/4” hex jam nut and terminal eye onto the cable core rod.
13. Secure the terminal eye to the cable core rod using the hex jam nut.
14. Place the terminal eye into the valve spool slot.
15. Insert the short pin through the valve spool and terminal eye and secure it with the e-ring.
16. Thread the bonnet onto the end of the cable so it firmly touches the end of the valve.
    NOTE: NEVER over- or under-tighten the bonnet as either will move the valve spool out of its neutral position.
17. Remove the two capscrews from opposite corners of the seal retainer plate.
18. Slide the bonnet clamp onto the bonnet and secure it to the valve using the 1/4” x 1-1/4” capscrews, lock washers, and flat washers.
19. Lock the bonnet to the cable using the 3/4 hex jam nut.

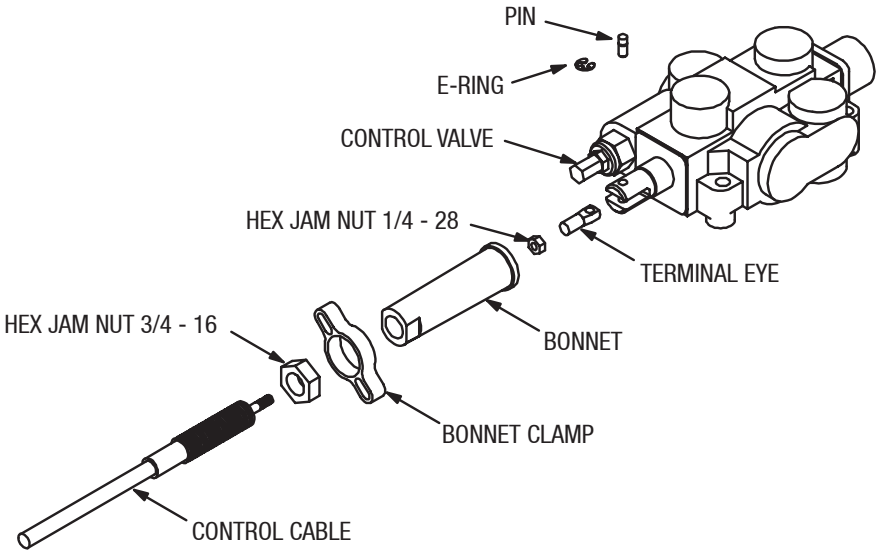


Figure 14: Hoist Control Assembly

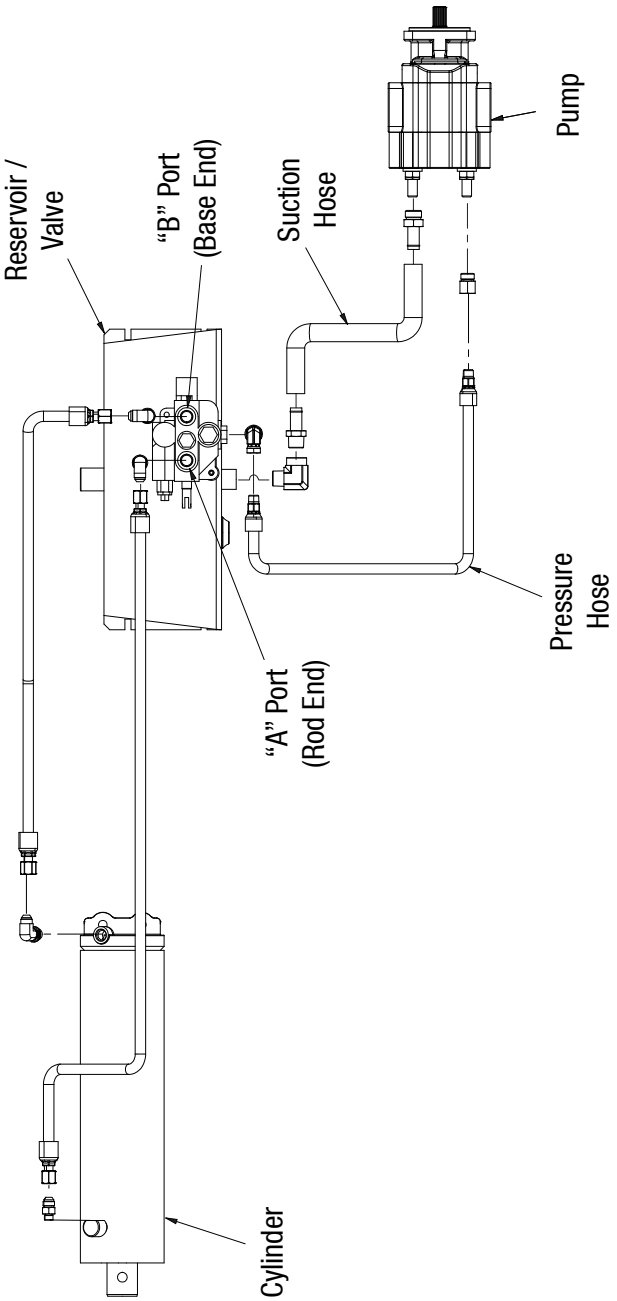


Figure 15: B5 & C8 Reservoir/Valve

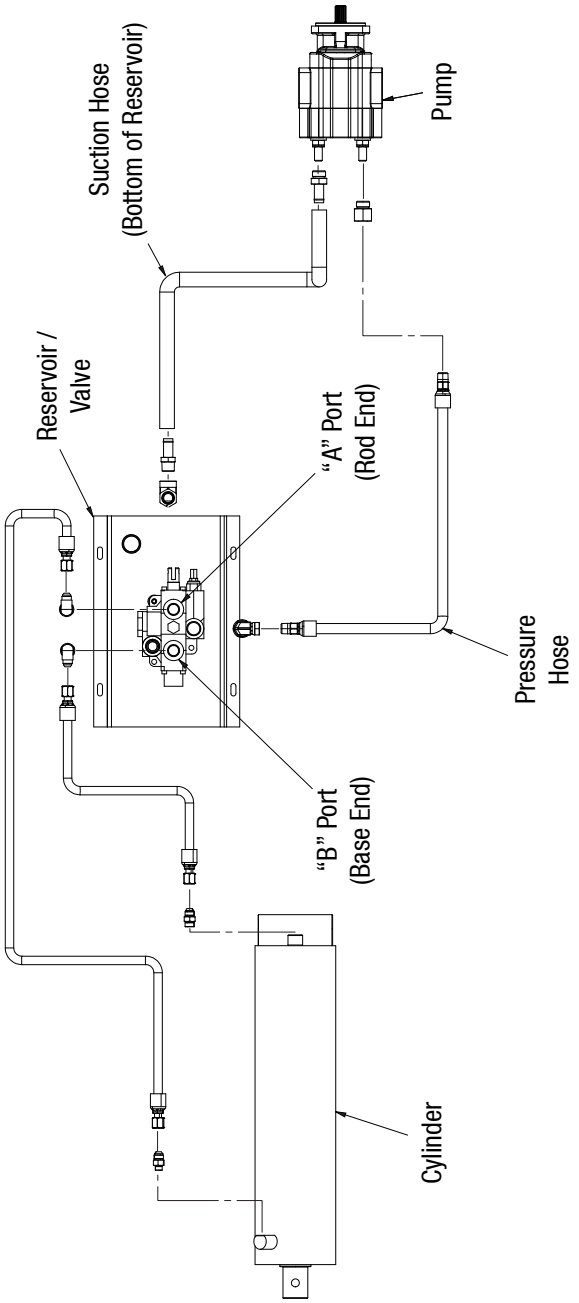


Figure 16: D10, E15, & F18 Reservoir/Valve

Hydraulic Fluid

1. Add a quality hydraulic fluid of 150 SSU @ 100°F which contains corrosion and oxidation inhibitors and a foam depressant. This is approximately the equivalent of SAE 10W or lighter weight oil. Initially fill the reservoir with the quantities given below.

NEVER OVERFILL THE RESERVOIR!

Model	Reservoir Size	Fluid Required
LB-B5	15 quarts	10 quarts
LB-C8	15 quarts	10 quarts
LB-D10	6 gallons	4 gallons
LB-E15	6 gallons	4 gallons
LB-F18	8 gallons	5.5 gallons

NOTE: If the pump does not pump oil, pressurize the reservoir and engage the pump with the engine at slow idle. Once the pump is working, release the pressure and install the breather cap.

2. Remove air from the cylinder(s) and hoses:
   - For the LB-B5 model hoist, fully raise and lower the hoist several times.
   - For LB-C8, LB-D10, LB-E15, and LB-F18 hoist models, fully raise the hoist and hold the hoist control in the `RAISE' position for 20 to 30 seconds.

3. Lower the hoist and check the fluid level in the reservoir is 2/3 full with the body down.

Hydraulic Fluid Maintenance

With normal use and working conditions the hydraulic oil should be changed annually. The breather cap should be cleaned every time the hydraulic oil is changed. With heavy use or very dusty working conditions the hydraulic oil should be changed more often.

Installing Electric Pumps

The electric power unit should be mounted close behind the cab, either inside or outside the truck frame.

1. After determining the location, bolt one mounting angle to the power unit using the 3/8” x 1” hex head capscrews tightened to 24 to 26 lb-ft.
2. Clamp the mounting bracket to the truck frame.
3. Clamp the second mounting angle to the truck frame so it supports the far end of the reservoir.
4. Insert a rubber pad between the mounting angle and the reservoir and secure it in place with a tie strap.
5. Mark the truck frame for drilling using the pump mounting angles as guides.

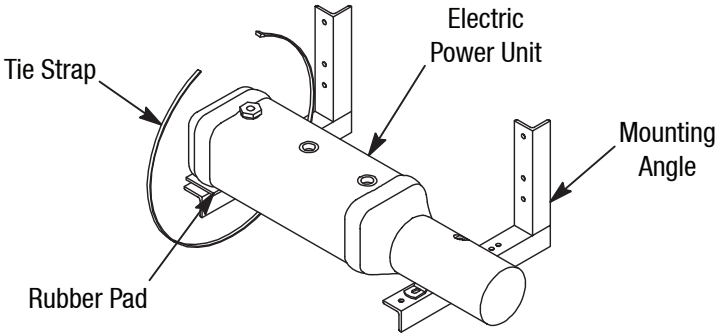


Figure 17: Electric Power Unit

CAUTION Avoid brake lines, wiring, and other vehicle components inside the truck frame when drilling.

6. Drill 17/32” holes in the truck frame and bolt the reservoir/valve assembly in place using 1/2” x 2” capscrews and hex lock nuts tightened to 90 to 100 lb-ft.

7. Measure the voltage between the large terminal of the start solenoid (where the battery cable is connected) and the power unit base. For rated performance, the voltage at the power unit must be a minimum of 12VDC.
   NOTE: Grounding the power unit is just as important as the installation of the positive battery cable. Grounding of the power unit can be completed either through the vehicle chassis or by a second battery cable. It is easier to get a good ground by using a second battery cable.

8. Connect the large terminal on the motor start solenoid to the positive terminal on the battery with a #0 gauge battery cable.
   - If grounding through the vehicle chassis, be sure to replace the light ground strap between the battery and the vehicle chassis with a #0 gauge cable.
   - If grounding with a second battery cable, connect the negative terminal on the battery to the grounding hole on the power unit base using an #0 size battery cable.

9. Check the voltage between the large terminal on the start solenoid and the power unit base.

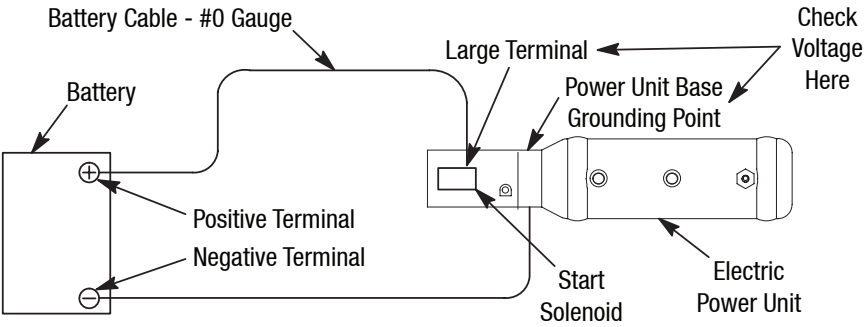


Figure 18: Battery Connections

10. Locate the push-button control in the cab and route the cable out of the cab through a hole in the back of the cab. Connect the push-button control to the electric power unit using the 3-pin connector set.
11. Secure the reservoir with the rubber pad beneath it using the long tie-strap included with the electric power unit.

Installing Single-Acting Electric Pumps

1. Install a 9/16 ORB x 3/4-16 JIC straight adapter in the power port on the electric power unit attached to a 3/4 JIC x 3/4 JIC 90° swivel adapter.
2. Install a 1/4 NPT x 3/4-16 JIC male elbow in the port on the angled face of the reservoir.
3. Install 9/16 ORB male x 3/4 JIC male adapter in the rod end port, and a ¾ ORB x ¾ JICM 90 in the base port on the cylinder.
4. Connect the shorter 3/8” hose with 3/4 JIC fittings from the base end port of the cylinder to the power port on the electric power unit.
5. Connect the longer 3/8” hose with 3/4 JIC fittings from the rod end port of the cylinder to the port on the reservoir.

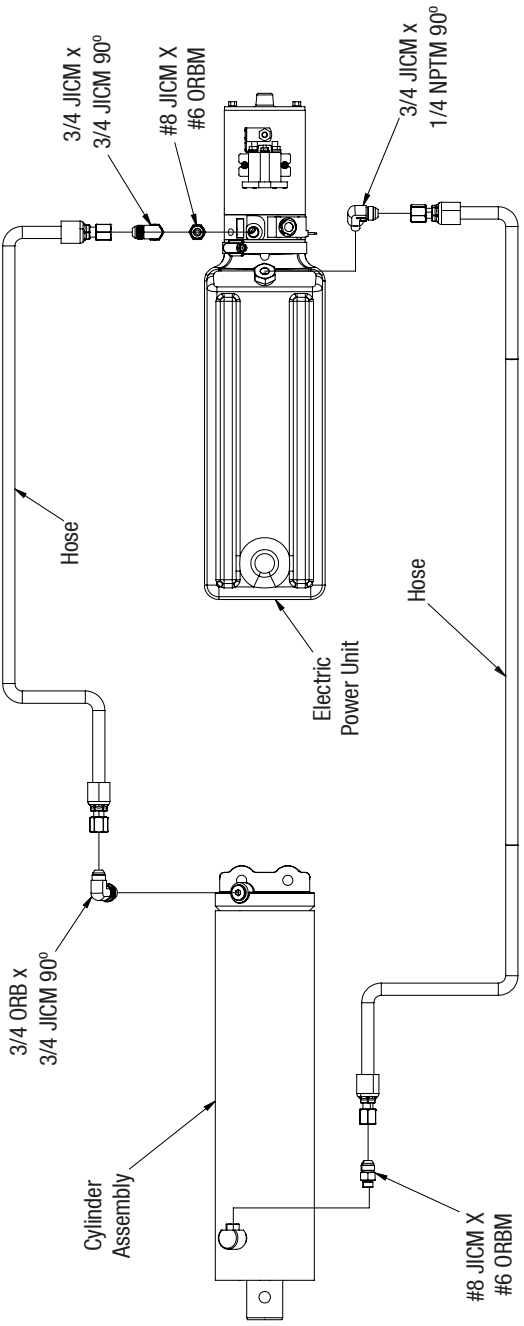


Figure 19: Single-Acting Hoses

Installing Double-Acting Electric Pumps

1. Install #8 JICM X #6 ORBM adapters in both work ports on the electric pump.
2. If needed, for good hose routing, install 3/4 JIC x 3/4 JIC 90° swivel adapters to both of these adapters.
3. Install 9/16 ORB male x 3/4 JIC male adapter in the rod end port, and a ¾ ORB x ¾ JICM 90 in the base port on the cylinder.
4. Connect the shorter 3/8 ID hose with 3/4 JIC fittings from the `C1' port on the pump to the base end port on the cylinder.
5. Connect the longer 3/8" ID hose with 3/4 JIC fittings from the `C2' port to the rod end port.
   NOTE: The `C2' port is the power down port and has only 500 PSI maximum pressure.

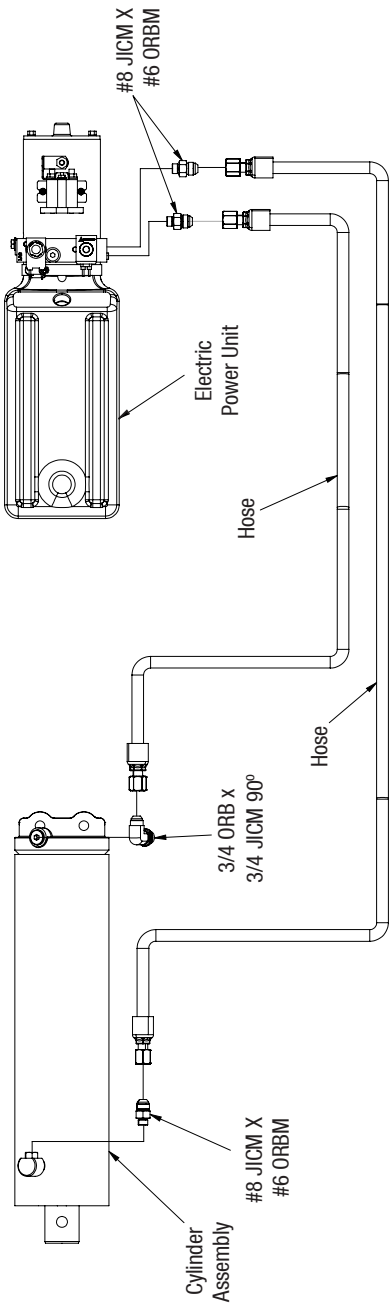


Figure 20: Double-Acting Hoses

Automatic Transmission Fluid (ATF)

1. Initially fill the reservoir with DEXRON III automatic transmission fluid. Refer to the following table for the amount.
   KEEP THE OIL CLEAN AND USE CLEAN CONTAINERS, FUNNELS, AND OTHER EQUIPMENT!
   NEVER OVERFILL THE RESERVOIR!

Model	Reservoir Size	Fluid Required
LB-B5	7 quarts	7 quarts
LB-C8	7 quarts	7 quarts
LB-D10	7 quarts	7 quarts
LB-E15	18 quarts	7 quarts
LB-F18	18 quarts	7 quarts

2. Remove air from the cylinder(s) and hoses:
   - For the LB-B5 model hoist, fully raise and lower the hoist several times to remove air from the cylinder and hoses.
   - For LB-C8, LB-D10, LB-E15, and LB-F18 hoist models with single-acting power units, fully raise the hoist and hold the `UP' button for 20-30 seconds.
   - For LB-C8 and LB-D10 hoist models with double-acting power units, fully raise the hoist and hold the `UP' button for 20-30 seconds.
   - For LB-E15 and LB-F18 hoist models with double-acting power units, raise the hoist until there is 2" of ATF in the reservoir. Add 2 quarts and raise the hoist until there is 2" of ATF in the reservoir. Repeat this until the hoist can be fully raised. Fully raise the hoist and hold the `UP' button for 20-30 seconds.
3. Lower the hoist and check the fluid level in the reservoir is within 1" of the top of the reservoir with the body down.

Automatic Transmission Fluid (ATF) Maintenance

With normal use and working conditions the automatic transmission fluid should be changed annually. The breather cap should be cleaned every time the fluid is changed. With heavy use or very dusty working conditions the fluid should be changed more often.

Body Installation

1. Slide a lock collar onto each lifting shaft. Slide a lifting shaft with collar into each end of the hoist lifting tube (Figure 21).

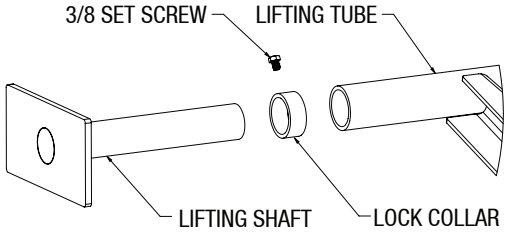


Figure 21: Lift Shaft Assembly

2. Position the body with the long beams (just long beams if they are separate from the body) onto the truck frame.
   NOTES:
   - A clearance of at least 2" is required between the truck cab and the closest point on the truck body.
     The LB-B5 & LB-C8 require 5-3/4" clearance above the truck frame.
     The LB-D10 and LB-E15 require 7-1/2" clearance above the truck frame.
     The LB-F18 requires 8-1/8" clearance above the truck frame.
   - On some truck models, the frame is not flat from front to rear. On these models, provisions must be made to level the frame before installing the body.
3. Position the rear hinge brackets against the long beams. Once in position, weld the rear hinge brackets to the body long beams (Figure 22).

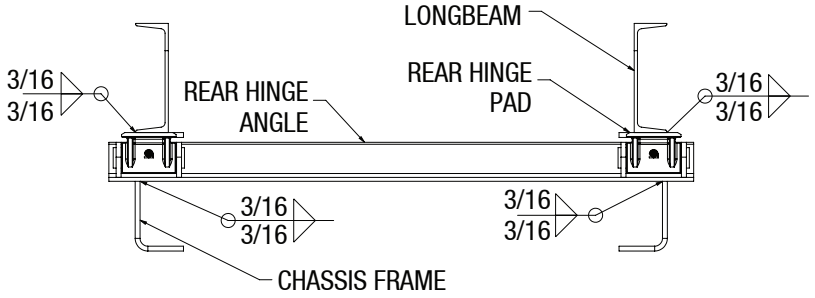


Figure 22: Rear Hinge Location on Long Beam

⚠ CAUTION

The saddle tube is oblong to allow the hoist to slide front to back as part of the anti-kickup design. Before performing the next step, the saddle tube must be slid as far rearward as possible as shown in Figure 6. Failure to do this will cause the anti-kickup to function improperly and cause damage to the hoist, truck body, and other truck components.

4. Slide each of the lifting shafts all the way against the inside of the long beam. Weld all around the lifting shaft plate to secure the shaft to the long beam. With the shaft secured, slide the lock collars against the hoist lifting tube and lock them there by tightening the set screw to 24 lb-ft (see Figure 23).

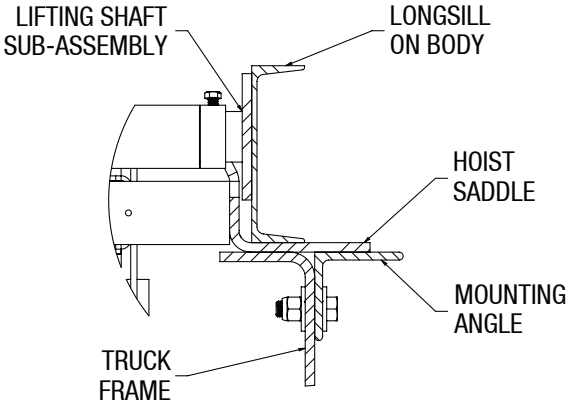


Figure 23: Hoist to Body Detail for 7" Structural Channel

5. Install and lubricate all grease fittings and tighten to 70 lb-in. See Section 6: Maintenance for grease fitting locations.

6. With the hoist and body completely installed, cycle the hoist several times to rid the hydraulic circuit of air.

⚠ DANGER

NEVER operate the hoist until bystanders are free & clear of the hoist and body. This may result in injury or death.

⚠ DANGER

Not installing or operating equipment correctly can cause component damage or an accident which may cause injury or death. ALWAYS install and operate equipment in accordance with manufacturer's instructions. Read and understand this manual fully before proceeding.

7. Install the Body Prop. See “Install the Body Prop” on page 43.

   NOTE: Before using the hoist, read the Operation section on page 47.

8. Place all Installation & Operation Manuals in the vehicle glove box to ensure they are always available for the operator.

Install the Body Prop

The body prop is designed and intended to support an EMPTY truck body in the raised position. Use of the body prop permits service to be performed safely beneath a raised body. It is mounted on the outside of the truck frame on the drivers side.

1. Raise the body half way up and brace it securely before beginning installation.
2. Install the prop arm on the hoist mount / prop pivot with a 1/4 x 3 roll pin.
3. Raise the body prop arm to the vertical, free standing position.
4. Place the body prop bracket in the prop arm saddle.
5. Lower the body so the bottom of the longbeam body prop bracket is between 1/2” and 1-1/2” up from the bottom of the body longbeam.
   NOTE: For bodies with angled longbeams, keep the longbeam body prop bracket as low as possible.
6. Securely weld the bracket to the longbeam.
   NOTE: An optional passenger’s side prop kit is available. When mounting the passenger’s side prop, replace the hoist mounting angle with the hoist mount/prop pivot. Prop the body in the raised position using the driver’s side prop. This will ensure that both props are supporting the empty body.

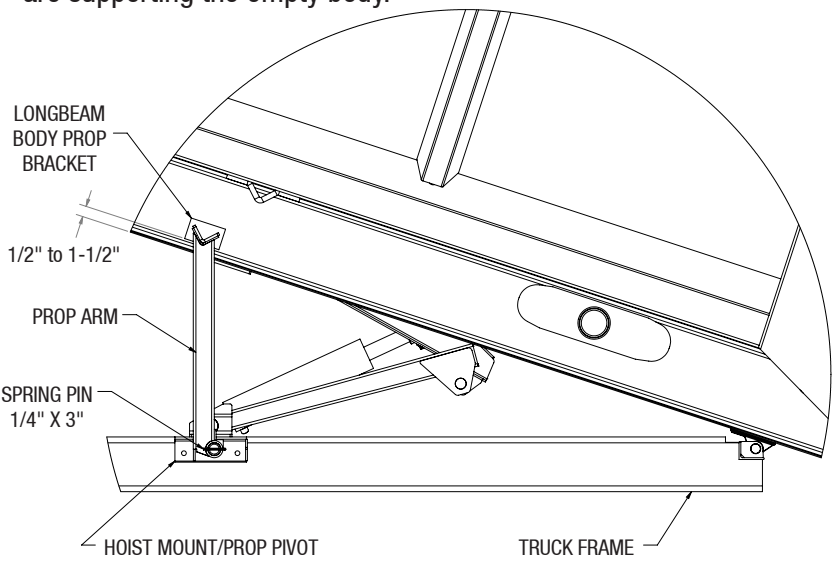


Figure 24: Body Prop Installation

Body Prop Use

A body prop and the required hardware is supplied with every LB-series hoist package. It is the responsibility of the installer to determine whether one body prop is sufficient. The following information will help make that determination.

⚠ DANGER

NEVER position yourself or allow others under a raised body as this can result in serious injury or death should the body inadvertently descend. ALWAYS prop up the **unloaded** body using the body props.

The body prop is designed for use only when the body is empty. The purpose of the body prop is to hold an empty body in the raised position when performing maintenance or inspection on the hoist, body, or any component that requires working under an **empty** body.

⚠ DANGER

NEVER operate the hoist until bystanders are free & clear of the hoist and body. This may result in injury or death.

⚠ DANGER

NEVER perform maintenance under a raised body without first blocking the empty body up with body prop(s).

⚠ DANGER

NEVER use a body prop that is bent or damaged.
A damaged body prop has reduced holding capacity and may break during use. This may result in injury or death.
Replace all damaged parts before using equipment.

1. To operate the body prop, raise the body to the desired height, shut off all power, raise the prop arm to a free standing position. Lower the body slowly until the body prop bracket contacts the prop arm saddle.
2. To place the body prop in the storage position, raise the body to clear the body prop saddle, lower the body prop to the storage position and lower the body.

Section 4: Decal Locations

⚠ DANGER

Missing or damaged decals can lead to accidents which may cause serious injury or death. Replace any missing or damaged decals immediately by contacting a Crysteel dealer or Crysteel Manufacturing Inc.

Mount decals in the proper places as shown below:

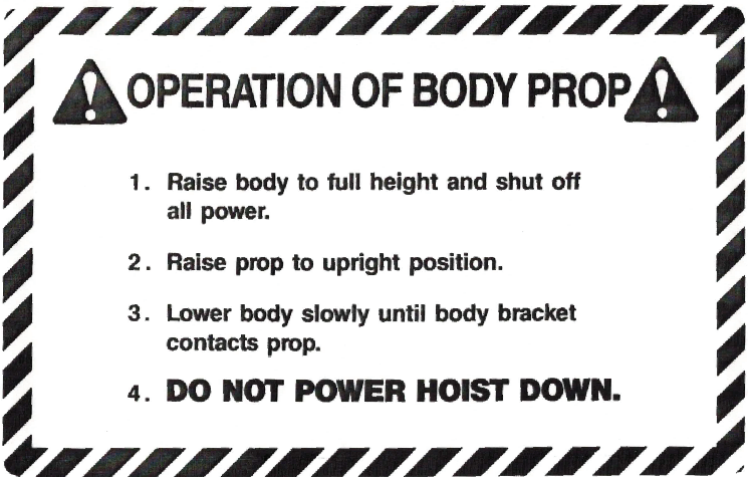


Figure 25: 1642848 Mount on the body longbeam near the body prop

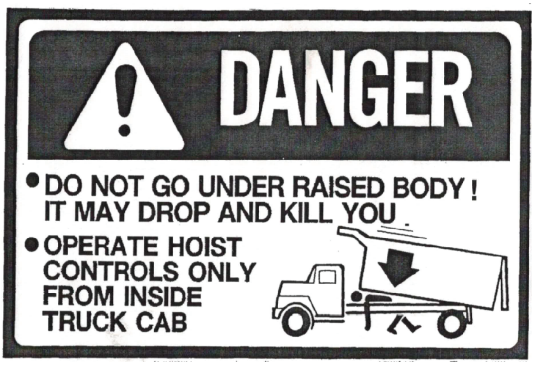


Figure 26: 1643067 Mount on the outside of the body longbeams near the front of the body (one on each side)

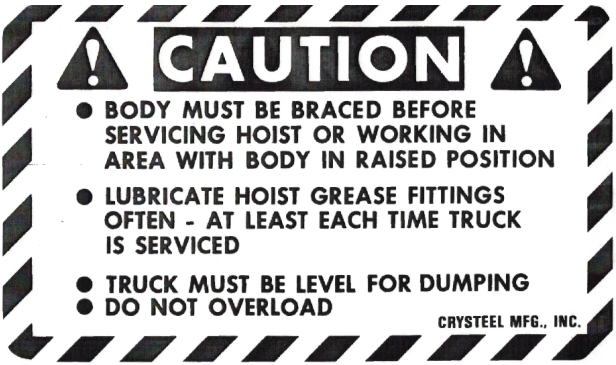


Figure 27: 1642844 Mount on the longbeam on the driver's side

Figure 28: 1643068 Mount in the cab in a prominent location

Figure 29: 1642843 Mount in the cab in a prominent location

Figure 30: 1642846 Mount on the body prop arm

Section 5: Operation

Important Safeguards

1. Use the proper hydraulic fluid. KEEP IT CLEAN. Change the hydraulic fluid regularly.
2. Lubricate all grease fittings every 100 cycles or every two months.
3. Check all bolts and fittings regularly ensuring they are tight. See the table on page 16 for proper torque values.

DANGER

- Infrequent or insufficient lubrication can cause hoist failure.
- ALWAYS block up the body, using the body prop, before working under it.
- NEVER load the hoist beyond its capacity.
- ALWAYS operate the hoist on a firm and level surface.
- ALWAYS ensure the area around the truck is clear and safe for hoist operation and dumping.
- Avoid bouncing and jerking of the hoist. This may result in component failure, property damage, injury or death.

CAUTION

- NEVER “race” the engine when unloading.
- NEVER tamper with the hydraulic relief valve. This can cause severe damage to the hoist and cylinder and will void the warranty.
- NEVER leave the PTO in gear while transporting to avoid damage to the hydraulic pump, PTO, or the transmission.

Standard Operation

1. Engage the PTO from the cab and adjust engine speed to fast idle.
2. ALWAYS operate the hoist from inside the cab of the truck.
3. If the hydraulic hoses have been connected correctly, the hoist will:
    - Raise when the hoist control lever is pulled back
    - Hold when the lever is in the center detent
    - Lower when the lever is pushed forward

4. ALWAYS return the hoist control lever to its center detent position after each use.
5. When the hoist cylinder reaches the end of the stroke, oil will flow through the automatic bypass valve built into the piston inside the cylinder and return to the reservoir.
6. It is advisable to run the PTO to “power down” or lower the hoist because this will act as a hydraulic lock to hold the hoist in the lowered position. It is not necessary to do this, however, because the reservoir has sufficient capacity whether or not the hoist is powered down. You will benefit from the advantages of the double-acting hoist only if you power down.
7. To make use of the hydraulic lock feature, place the hoist control lever in the center hold position after the hoist is powered down. This places the pressure on the valve, where it belongs, and not on the pump.
8. NEVER LEAVE THE PTO IN GEAR WHILE TRANSPORTING. THIS CAN CAUSE SEVERE DAMAGE TO THE PTO OR HYDRAULIC PUMP.
9. The hydraulic system should be drained, flushed, and refilled with proper hydraulic fluid at regular intervals.

CAUTION NEVER use hydraulic brake fluid in the hydraulic system!

10. After adding or replacing the hydraulic fluid, cycle the hoist several times to remove air from the cylinders and hydraulic hoses.

Hoist and Pump Operation

⚠ DANGER

Not installing or operating equipment correctly can cause component damage or an accident which may cause injury or death. ALWAYS install and operate equipment in accordance with manufacturer's instructions. Read and understand this manual fully before proceeding.

⚠ DANGER

NEVER operate the hoist until bystanders are free & clear of the hoist and body. This may result in injury or death.

⚠ DANGER

Avoid bouncing or jerking of the hoist. This may result in component failure, injury or death.

⚠ CAUTION

NEVER power the hoist downward when body prop(s) are being used. Damage to the hoist, truck body, and other truck components may occur.

⚠ DANGER

- NEVER allow bystanders to stand in or move through the work area or surroundings where the load may fall.
- NEVER leave a body raised or partially raised while the truck is unattended.
- The operator must ALWAYS remain at the controls during a dumping operation. All controls must be permanently located in the truck cab or a location where it is not possible to be under the body during a dumping operation.
- NEVER raise a loaded body when the vehicle is on uneven ground to prevent the vehicle from over turning.
- ALWAYS disengage the drive when the hoist is not in use or when moving a load on units that the pump is direct driven by the truck.

Raising the Hoist

1. Push in the “UP” button on the control station to start the pump and raise the box.
2. When the hoist reaches full extension, the pump will bypass. Care should be taken not to let the pump bypass for long periods of time, as this will put stress on the whole hydraulic and electrical system.
3. To stop the pump from bypassing, release the “UP” button on the control station.

Lowering the Hoist

1. Push the “DOWN” button in on the control station to start the pump and lower the box.
2. To stop the hoist from lowering, release the “DOWN” button on the control station. The hoist will stop lowering and hold its position.

Section 6: Maintenance

Every 100 cycles or every two months, whichever comes first:

Lubricate Grease Fittings

1. Install and grease the eight grease fittings in the hoist frame itself. Refer to the following figures for grease fitting locations.
2. Install and grease the two grease fittings in the truck rear hinge.
3. All grease fittings should be greased periodically or at least every time the truck itself is greased.

Check and Change Pump Reservoir

1. Check the pump reservoir oil level every time the oil is changed in the truck engine.
2. Keep the oil clean. An annual oil change can prevent contaminants from ruining the pump and hoist cylinder.

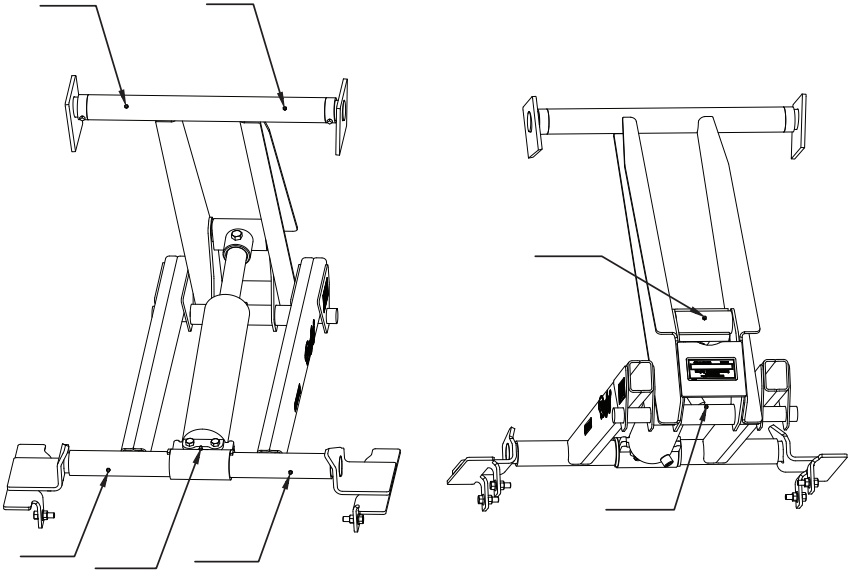


Figure 31: Grease Fitting Locations (LB-B5)

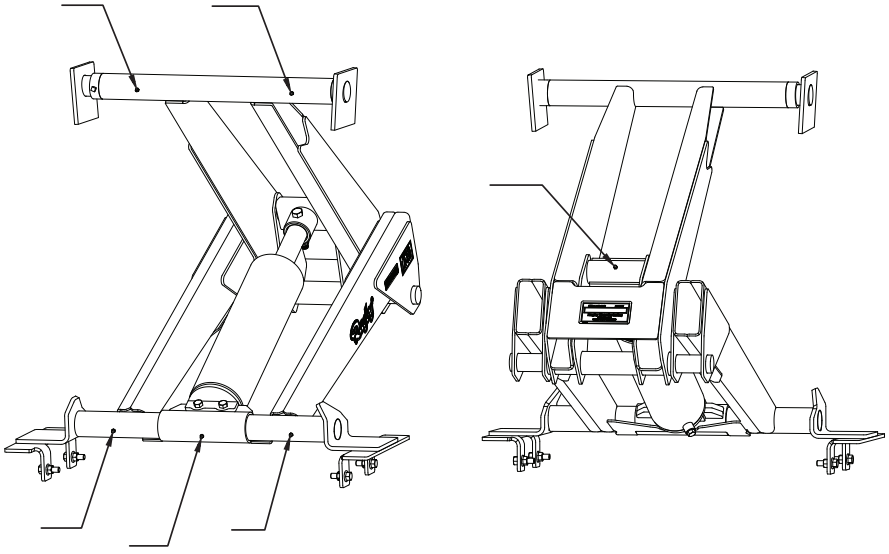


Figure 32: Grease Fitting Locations (LB-C8)

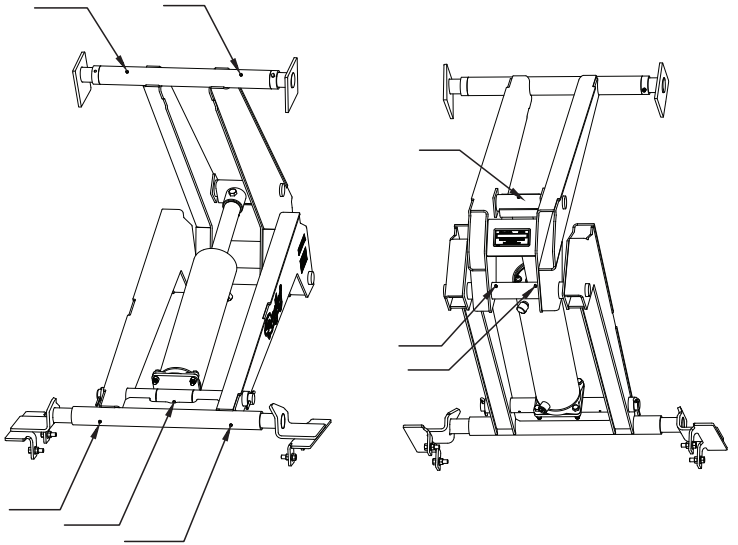


Figure 33: Grease Fitting Locations (LB-D10)

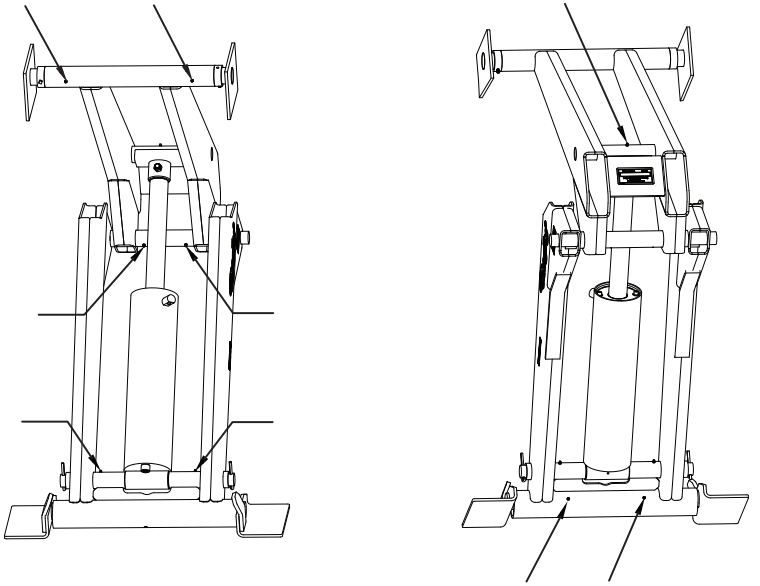


Figure 34: Grease Fitting Locations (LB-E15)

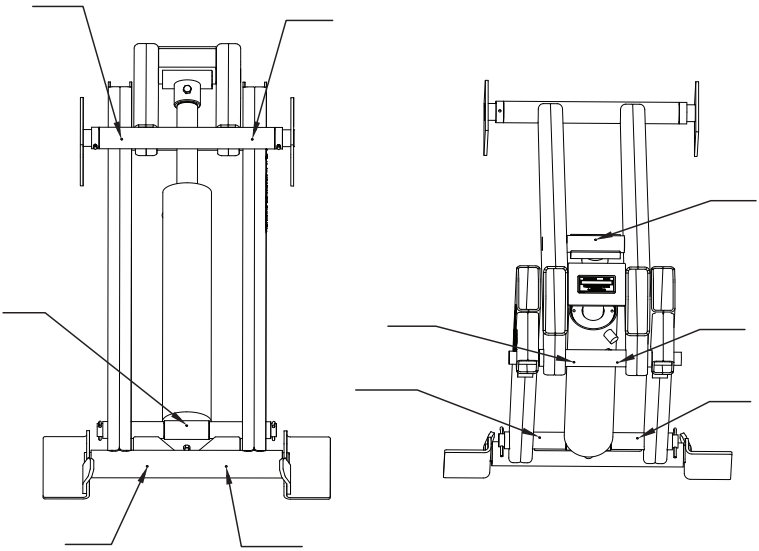
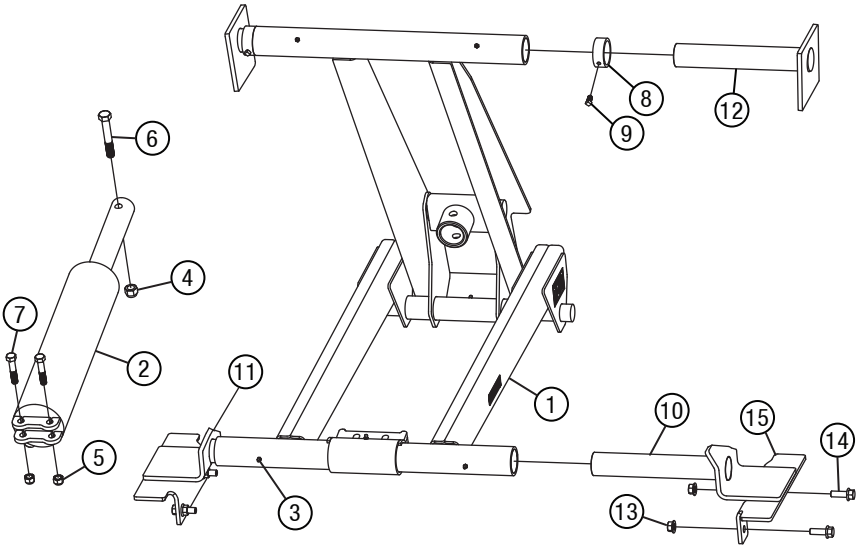


Figure 35: Grease Fitting Locations (LB-F18)

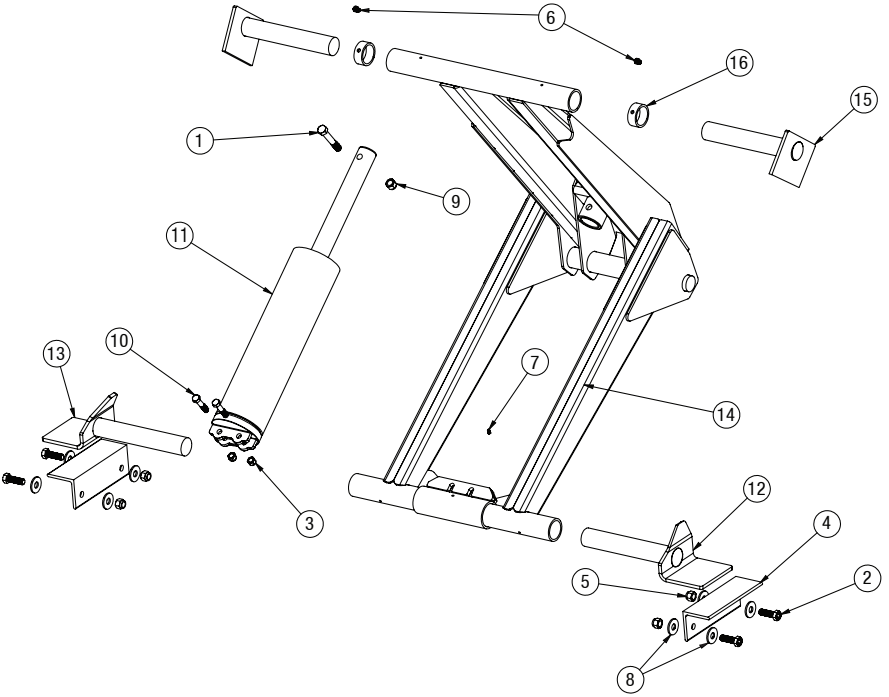
Section 7: Exploded Views

LB-B5 Model



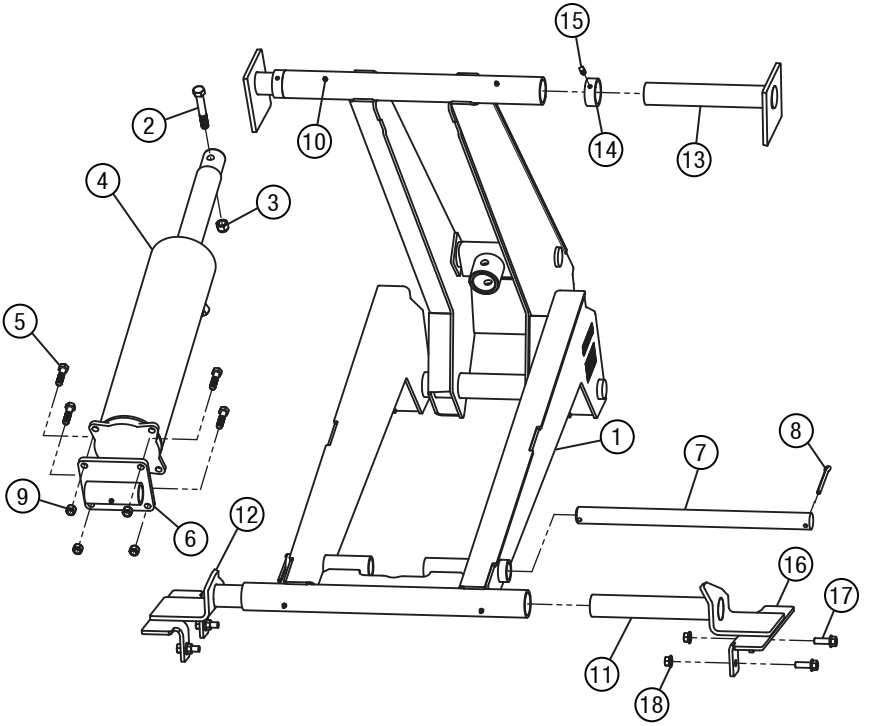
LB-B5 Parts List			
Item	**Part #**	**Description**	**Qty**
1	1657122	ASSY FRAME, LB-B5 HOIST PCBLK	1
2	1621265	ASSY CYLINDER TH-10 4 x 16	1
3	1645189	ZERK GREASE 1/4-28 STRAIGHT SELF-TAP	7
4	2238836	NUT HEX TOPLOCK 5/8-11 ECO	1
5	1620103	NUT, NYLOC, 1/2-13 FAD TAU	2
6	1369300	SCREW CAP 5/8 X 4 1/2 NC G8	1
7	2238841	SCREW CAP 1/2-13 X 2 1/2 GR 8 ECO	2
8	2471715	COLLAR-LOCK-2.00-LB-B5/C8/D10-PNT	2
9	1644364	SCREW CAP 3/8 UNC X 16 X 1/2	2
10	2447015	ASSY-SADDLE BRACKET-B5/C8/D10-L	1
11	2440801	ASSY-SADDLE BRACKET-B5/C8/D10-R	1
12	2497261	ASSY-LIFT BRACKET-LB-B5/C8/D10	2
13	1643070	NUT HEX 5/8-11 LOCK	4
14	1620058	HEXBOLT, 5/8-11 X 2.00, GR 8 TAJ	4
15	1629458	ANGLE, TRUCK FRAME/MNT 700695 80	2

LB-C8 Model



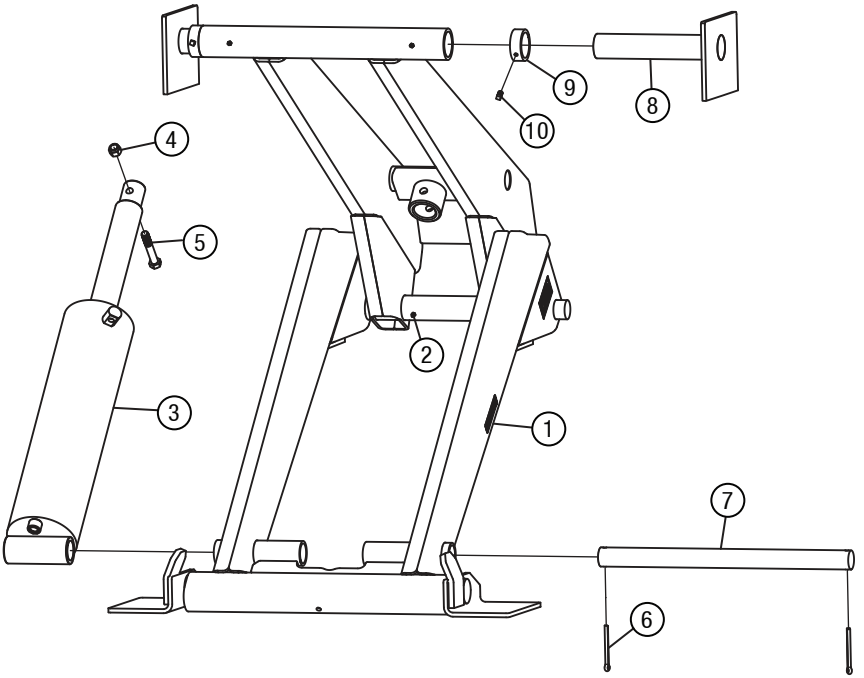
LB-C8 Parts List			
Item	**Part #**	**Description**	**Qty**
1	1369300	SCREW CAP 5/8 X 4 1/2 NC G8	1
2	1620058	HEXBOLT, 5/8-11 X 2.00, GR 8 TAJ	4
3	1620103	NUT, NYLOC, 1/2-13 FAD TAU	2
4	1629458	ANGLE, TRUCK FRAME/MNT 700695 80	2
5	1643070	NUT HEX 5/8-11 LOCK	4
6	1644364	SCREW CAP 3/8 UNC X 16 X 1/2	2
7	1642699	ZERK GREASE 1/8 NPT STRAIGHT	8
8	2232046	WASHER FLAT 5/8 ECO USS	8
9	2238836	NUT HEX TOPLOCK 5/8-11 ECO	1
10	2238841	SCREW CAP 1/2-13 X 2 1/2 GR 8 ECO	2
11	2394290	ASSY CYLINDER 5 X 16 PNT	1
12	2440801	ASSY-SADDLE BRACKET-B5/C8/D10-R	1
13	2447015	ASSY-SADDLE BRACKET-B5/C8/D10-L	1
14	2457413	ASSY FRAME, LB-C8 HOIST PNT	1
15	2497261	ASSY-LIFT BRACKET-LB-B5/C8/D10	2
16	2471690	COLLAR-LOCK-2.00-LB-B5/C8/D10-BARE	2

LB-D10 Model



LB-D10 Parts List			
Item	**Part #**	**Description**	**Qty**
1	2482581	FRAME, LB-D10 HOIST PCBLK	1
2	1653838	SCREW, 5/8-11 X 4 HHC GR8 PLT	1
3	1643070	NUT, 5/8-11 NYLOCK - NE, GR5 STL	1
4	2377956	CYLINDER, 5.5 X 20	1
5	1654458	HHC SCREW, 1/2-13 UNC-2A X 2, GR8, ZN	4
6	2482598	ASSY, LB-D10 CYLINDER ADAPTER	1
7	1657121	SHAFT, LB-D10 CYLINDER PIN	1
8	1653921	PIN, 5/16” X 3-1/2” ZP COTTER	2
9	1642984	NUT, 1/2-13 NYLOCK - NE GR8 STL	4
10	1520370	FITTING, 1/4-28 THREAD FORMING GREASE	8
11	1655677	BRACKET, LB-D10 LEFT SADDLE	1
12	1655678	BRACKET, LB-D10 RIGHT SADDLE	1
13	1655695	BRACKET, LB-D10 LIFT	2
14	1654905	COLLAR, 2.00 LOCK	2
15	1653845	SET SCREW, 3/8-16 X 5/8 SQR HD, BLK	2
16	1655917	BRACKET, MOUNTING ANGLE	2
17	1577459	BOLT, 1/2-13 X 1-1/2 FLG GR5	4
18	1576016	NUT, 1/2-13 FLANGE GR5 STL PLT	4

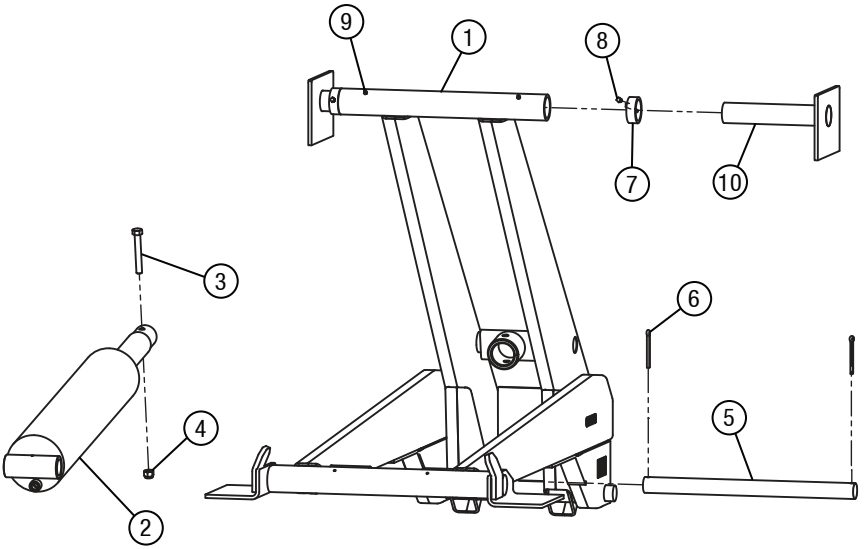
LB-E15 Model



LB-E15 Parts List			
Item	**Part #**	**Description**	**Qty**
1	2460805	ASSY FRAME, LB-E15 HOIST PNT	1
2	1642699	ZERK GREASE 1/8 NPT STRAIGHT	10
3	1621268	ASSY CYLINDER 6 X 20, 2.5 ROD, 2.0 NECK	1
4	2238836	NUT HEX TOPLOCK 5/8-11 ECO	1
5	1369300	SCREW CAP 5/8 X 4 1/2 NC G8	1
6	2440800	PIN, COTTER, 5/16 X 3 1/2	2
7	2460837	SHAFT, CYLINDER PIN LB-E15	1
8	1379776	ASSY-LIFT BRACKET-LB-E15/F18	2
9	2471730	COLLAR-LOCK-2.25-LB-E15/F18-PNT	2
10	1644364	SCREW CAP 3/8 UNC X 16 X 1/2	2
*	1620058	HEXBOLT, 5/8-11 X 2.00, GR 8 TAJ	4
*	1643070	NUT HEX 5/8-11 LOCK	4
*	1629458	ANGLE, TRUCK FRAME/MNT 700695 80	2

* Not shown in illustration

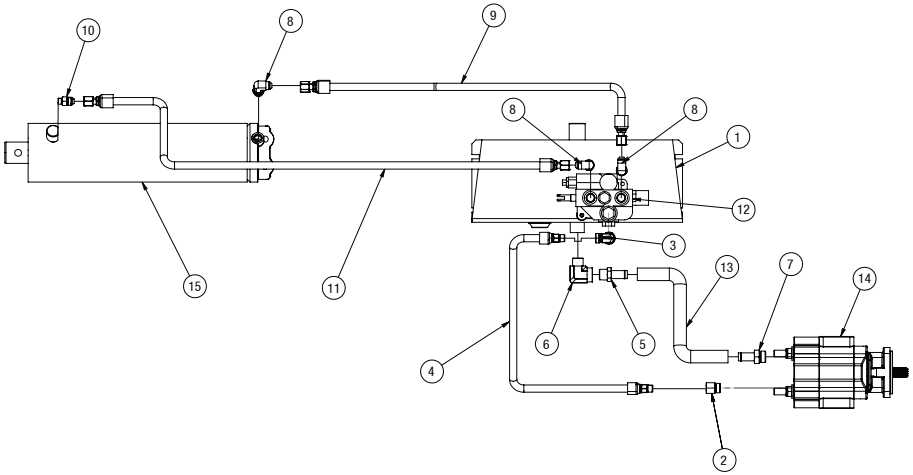
LB-F18 Model



LB-F18 Parts List			
Item	**Part #**	**Description**	**Qty**
1	2466059	ASSY FRAME, LB-F18 HOIST PNT	1
2	1621270	ASSY CYLINDER CP-618 6 x 28	1
3	1369300	SCREW CAP 5/8 X 4 1/2 NC G8	1
4	2238836	NUT HEX TOPLOCK 5/8-11 ECO	1
5	2460837	SHAFT, CYLINDER PIN LB-E15	1
6	2440800	PIN, COTTER, 5/16 X 3 1/2	2
7	2471730	COLLAR-LOCK-2.25-LB-E15/F18-PNT	2
8	1644364	SCREW CAP 3/8 UNC X 16 X 1/2	2
9	1642699	ZERK GREASE 1/8 NPT STRAIGHT	10
10	1379776	ASSY-LIFT BRACKET-LB-E15/F18	2
*	1620058	HEXBOLT, 5/8-11 X 2.00, GR 8 TAJ	4
*	1643070	NUT HEX 5/8-11 LOCK	4
*	1629458	ANGLE, TRUCK FRAME/MNT 700695 80	2

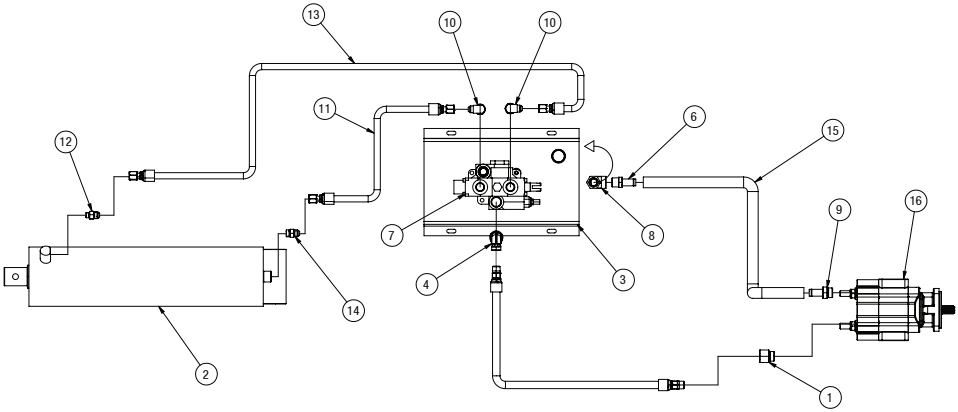
* Not shown in illustration

LB-B5 & LB-C8 Hydraulics



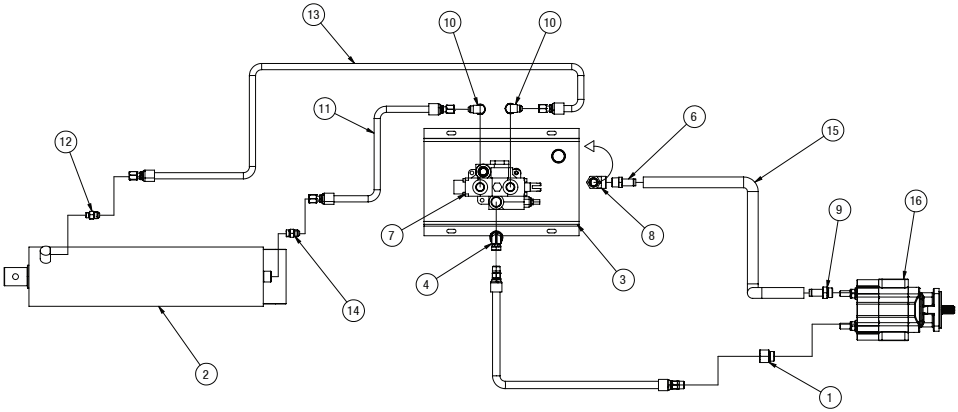
LB-B5 & LB-C8 Hydraulics Parts List			
Item	**Part #**	**Description**	**Qty**
1	1622166	ASSY RESERVOIR WELD 15QT UB	1
2	1642813	ADAPTER 7/8-14M X 3/8 NPTF	1
3	1642954	ADAPTER 7/8 ORBM X 3/8 NPTF 90	1
4	1643014	HOSE 3/8 NPT X 72 RM/RM 4000	1
5	1643017	HOSE BARB 3/4 NPT X 3/4	1
6	1643226	ELBOW PIPE 3/4" 90 STREET	1
7	1643228	HOSE BARB 1 1/16ORB X 3/4	1
8	1643357	ADAPTER 3/4 ORBM X 3/4 JICM 90	3
9	1643360	HOSE 3/4 JIC X 48 SF/SF 4000	1
10	1643375	ADAPTER #8 JICM X #6 ORBM	1
11	1643376	HOSE 3/4 JIC X 60 SF/SF 4000	1
12	1643398	VALVE CONTROL 12GPM 3250PSI DA	1
13	1643805	HOSE SUCTION 6' 3/4 ID	1
14	1872874	PUMP GEAR 4GPM PF4 CCW 11-TOOTH	1
15	2395007	ASSY CYLINDER TH-10 4 x 16 - LB-B5	1
15	2394290	ASSY CYLINDER 5 X 16 PNT - LB-C8	1

LB-D10 Hydraulics



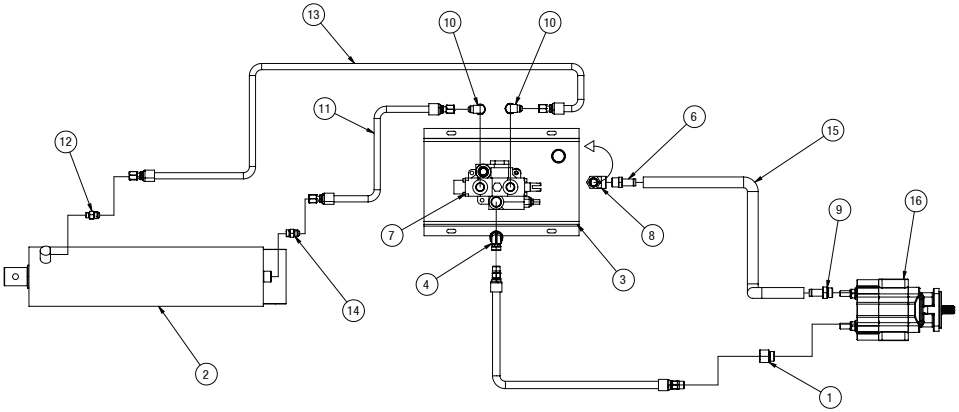
LB-D10 Hydraulics Parts List			
Item	**Part #**	**Description**	**Qty**
1	1283139	ADAPTER 1 1/16ORBM X 1/2 NPTF	1
2	2377956	ASSY CYLINDER, 5.5 X 20, 2.25 SHAFT CB	1
3	1621925	ASSY RESERVOIR WELD 6GAL IF	1
4	1642969	ADAPTER 1 1/16ORBM X 1/2NPTF90	1
5	1643015	HOSE 1/2 NPT X 72 RM/RM 3500	1
6	1643017	HOSE BARB 3/4 NPT X 3/4	1
7	1643185	VALVE CONTROL 30GPM 3250PSI DA 120	1
8	1643226	ELBOW PIPE 3/4" 90 STREET	1
9	1643228	HOSE BARB 1 1/16ORB X 3/4	1
10	1643356	ADAPTER 7/8 ORBM X 3/4 JICM 90	2
11	1643359	HOSE 3/4 JIC X 42 SF/SF 4000	1
12	1643375	ADAPTER #8 JICM X #6 ORBM	1
13	1643376	HOSE 3/4 JIC X 60 SF/SF 4000	1
14	1643586	ADAPTER 3/4 ORBM X 3/4 JICM	1
15	1643805	HOSE SUCTION 6' 3/4 ID	1
16	1644773	PUMP GEAR 6 GPM DM M20 ORB 5	1

LB-E15 Hydraulics



LB-E15 Hydraulics Parts List			
Item	**Part #**	**Description**	**Qty**
1	1283139	ADAPTER 1 1/16ORBM X 1/2 NPTF	1
2	2377960	ASSY CYLINDER, 6 X 20, 2.5 ROD, 2.0 NECK	1
3	1621925	ASSY RESERVOIR WELD 6GAL IF	1
4	1642969	ADAPTER 1 1/16ORBM X 1/2NPTF90	1
5	1643015	HOSE 1/2 NPT X 72 RM/RM 3500	1
6	1643017	HOSE BARB 3/4 NPT X 3/4	1
7	1643185	VALVE CONTROL 30GPM 3250PSI DA 120	1
8	1643226	ELBOW PIPE 3/4" 90 STREET	1
9	1643228	HOSE BARB 1 1/16ORB X 3/4	1
10	1643356	ADAPTER 7/8 ORBM X 3/4 JICM 90	2
11	1643359	HOSE 3/4 JIC X 42 SF/SF 4000	1
12	1643375	ADAPTER #8 JICM X #6 ORBM	1
13	1643376	HOSE 3/4 JIC X 60 SF/SF 4000	1
14	1643586	ADAPTER 3/4 ORBM X 3/4 JICM	1
15	1643805	HOSE SUCTION 6' 3/4 ID	1
16	1644773	PUMP GEAR 6 GPM DM M20 ORB 5	1

LB-F18 Hydraulics



LB-F18 Hydraulics Parts List			
Item	**Part #**	**Description**	**Qty**
1	1630083	ADAPTER 1 5/16-12M X 1/2 NPTF	1
2	2387162	ASSY CYLINDER CP-618 6 x 28 CB	1
3	1621921	ASSY RESERVOIR WELD 8GAL I-F	1
4	1642969	ADAPTER 1 1/16ORBM X 1/2NPTF90	1
5	1643015	HOSE 1/2 NPT X 72 RM/RM 3500	1
6	1643018	HOSE BARB 1 1/4 NPT X 1 1/4	1
7	1643185	VALVE CONTROL 30GPM 3250PSI DA 120	1
8	1642975	ELBOW PIPE 1 1/4" 90 STREET	1
9	1643019	HOSE BARB 1 5/16ORB X 1 1/4	1
10	1643356	ADAPTER 7/8 ORBM X 3/4 JICM 90	2
11	1643797	HOSE 3/4 JIC X 36 SF/SF 4000	1
12	1643375	ADAPTER #8 JICM X #6 ORBM	1
13	1643505	HOSE 3/4 JIC X 66 SF/SF 4000	1
14	1643586	ADAPTER 3/4 ORBM X 3/4 JICM	1
15	1643806	HOSE SUCTION 6' 1 1/4 ID	1
16	1644774	PUMP GEAR 10 GPM DM M20 ORB (407279) 5	1

If questions exist, call your Crysteel representative at 800-533-0494 for further information.

Crysteel Manufacturing Inc.
52182 Ember Road
Lake Crystal, MN 56055

www.crysteel.com

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