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CRYSTEEL'S MARATHON TELESCOPIC HOIST



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DATE PURCHASED _____

HOIST SERIAL NUMBER _____

CYLINDER SERIAL NUMBER _____

DEALER _____

ADDRESS _____

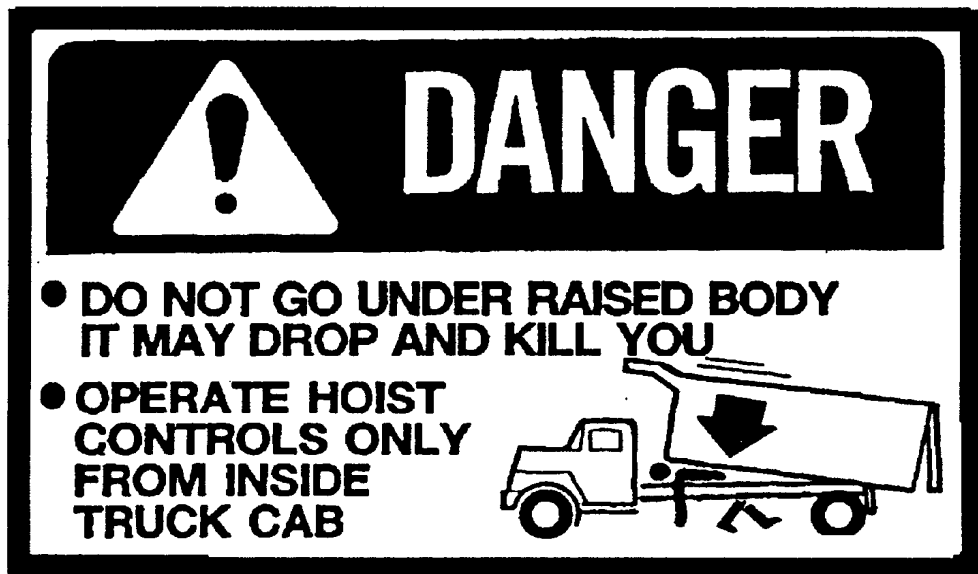
PHONE _____

FOREWORD

Crysteel's Marathon hoist is a heavy duty, front-mount telescopic hoist designed and intended for use under dump bodies. The Marathon hoist is available with either a single-acting or a double-acting cylinder. The Marathon hoist line consists of 8 sizes that fit single-, tandem- and triple-axle trucks with body lengths from 9 feet through 17 feet.

This manual contains the information needed for the proper installation and operation of Crysteel's Marathon hoist. Study it carefully before attempting to mount or use these products. With proper installation and maintenance, the Marathon Hoist and Crysteel Body will give many years of trouble-free service.

When ordering parts, be sure to give serial number of hoist, and cylinder. The serial number of the cylinder is stamped on the barrel of the cylinder near the base. For future reference, copy these numbers NOW in the space provided above. Order parts by number and description as given in the parts listing in this manual.



KEEP THIS MANUAL IN A SAFE PLACE FOR FUTURE REFERENCE

OPERATION AND USE

1. Engage PTO from cab and adjust engine speed to fast idle.
2. ALWAYS operate the hoist from inside the cab of the truck.
3. If the hydraulic hose connections are correct, the hoist should raise when the hoist control lever is pulled back, hold when the lever is in the center detent, and lower when the lever is pushed forward.
4. To raise the hoist, pull the control lever back. To hold the body in a raised position, place the control lever in its center detent position. To lower the hoist, push the control lever forward.
5. ALWAYS return the hoist control lever to its center detent position after each use.
6. DO NOT LEAVE THE PTO IN GEAR WHILE TRANSPORTING. THIS CAN CAUSE SEVERE DAMAGE TO THE PTO OR HYDRAULIC PUMP.
7. 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.
8. After adding or replacing the hydraulic fluid, cycle the hoist several times to remove air from the cylinders and hydraulic hoses.

SOME DO'S AND DON'TS FOR SAFE AND LONG SERVICE

1. Use the proper hydraulic fluid. KEEP IT CLEAN. Remember to change it regularly.
2. Lubricate all grease fittings every 100 cycles or every two months. Infrequent or insufficient lubrication will cause hoist failure and possibly injury or death.
3. ALWAYS carefully block up the body, using the body prop, before working under it.
4. Do not "race" the engine when unloading.
5. Do not load the hoist beyond its capacity.
6. DO NOT tamper with the hydraulic relief valve. This will void the warranty. It can cause severe damage to the hoist and cylinder.
7. Never leave the PTO in gear while transporting. It could ruin the hydraulic pump, the PTO or the transmission.
8. Check all bolts and fittings regularly. Keep them tight. See table on page 5 for torque values.
9. Always operate hoist on a firm and level surface.
10. Always make sure area around truck is clear and safe for hoist operation and dumping.




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GENERAL INFORMATION

It is a good idea to look through these installation instructions before beginning to mount the hoist and hydraulic system.

When welding, protect the truck's electrical, air and brake systems by disconnecting, removing or covering. Tighten all nuts and bolts to a consistent level. Use the following table for torque values.

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

The following abbreviations are used in describing hydraulic fittings.

ORBM	O-Ring Boss - Male Thread
NPTM	Pipe - Male Thread
NPTF	Pipe - Female Thread
JICM	JIC 37° - Male Thread
JICF	JIC 37° - Female Thread

INSTALLATION INSTRUCTIONS

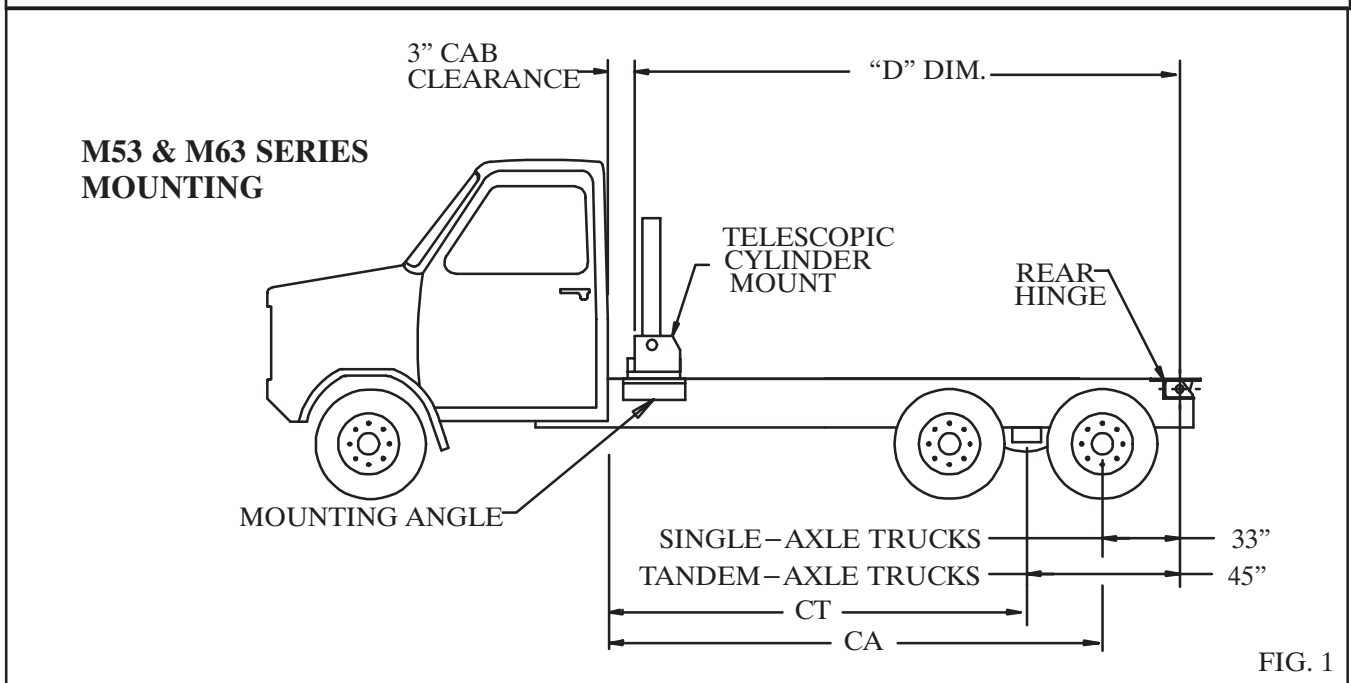
LOCATE CYLINDER MOUNT AND REAR HINGE

The telescopic cylinder mount and the rear hinge must be located relative to each other according to the following chart. The chart shows the hoist model, recommended body length and CA or CT, the overhang, dump angle and mounting distance. The mounting distance is measured from the center of the rear hinge pin to the front of the body lift assembly.

The rear hinge must be located as close as possible behind the rear spring hanger. For single axle trucks this will be approximately 33 inches behind the rear axle and must never be more than 36 inches. For tandem axle trucks, this will be approximately 45 inches behind the center of the tandem, and must never be more than 50 inches. The telescopic cylinder mount should be located so there is at least 3" of clearance between the front of the body lift assembly and the back of the cab. See Fig. 1. (The lower cylinder mount extends past the front of the body 1 1/4".)

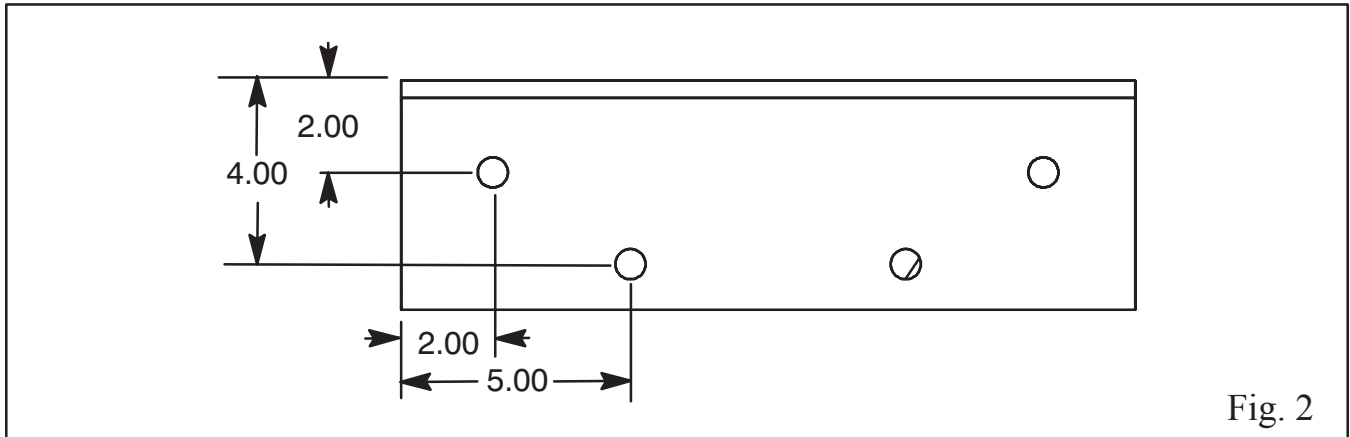
HOIST MODEL	BODY LENGTH	CA OR CT DIMENSIONS	OVERHANG	DUMP ANGLE	"D" DIM
M5390	10'	84" CA	6"	49°	114"
M5399	11'	96" CA	6"	51°	120"
M53117	12'	102" CA OR 96" CT	6"	55°	132"
	13'	108" CT	12"	50°	144"
M63138	14'	114" CT	12"	55°	156"
	15'	126" CT	12"	50°	168"
M63153	16'	138" CT	12"	52°	180"
	17'	150" CT	12"	49°	192"

- NOTE: 1. The "CA or CT Dimensions" and "Overhang" columns assume a cab clearance of 3" and a rear hinge dimension of 33" for single-axle trucks and 45" for tandem-axle trucks.
2. The front edge of the lift plates is even with the front of the body.



INSTALL CYLINDER MOUNT

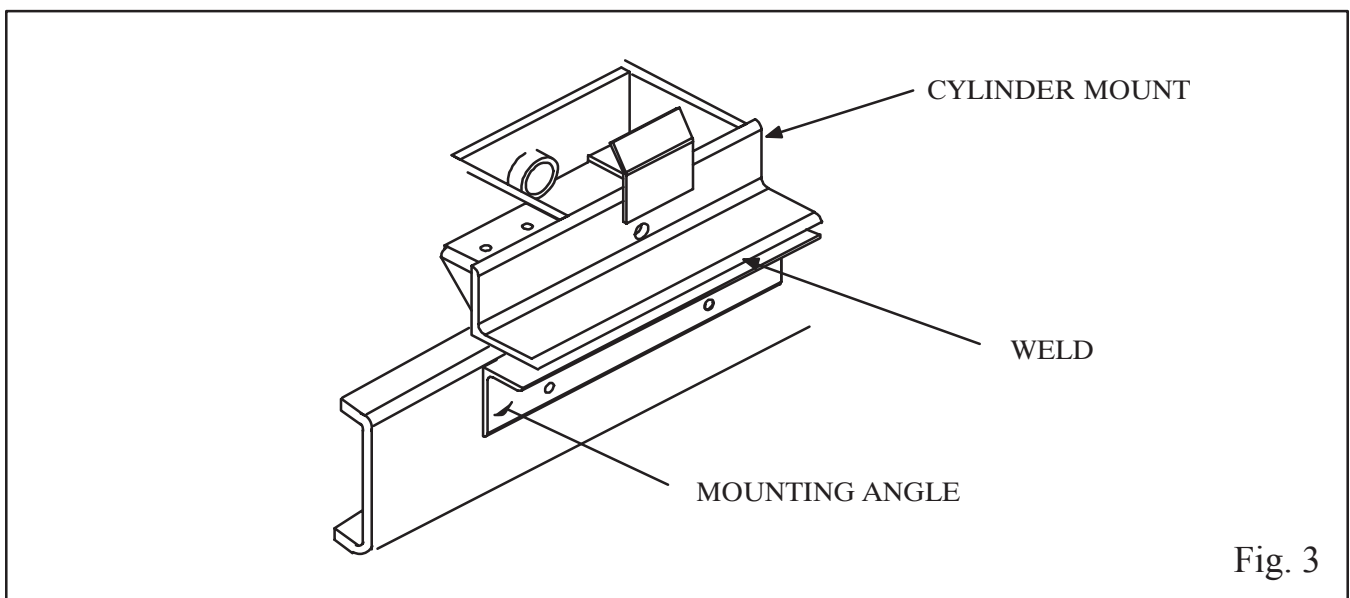
Make sure the cylinder mount is correctly located (as determined by the previous instructions), centered, and square with the truck frame. If there are rivets or frame bolts in the way, holes can be drilled in the cylinder mount to allow it to sit flat on the truck frame. The mounting angles do not have predrilled holes in them to allow the use of existing holes in the truck frame. Clamp the mounting angles against the outside of the truck frame and against the bottom of the cylinder mount. (See Fig. 2.) Mark the location of the holes in the truck frame on the mounting angles. Remove the mounting angles and drill the holes in the locations marked.



Bolt the mounting angles to the truck frame using the existing holes. The mounting angles must be attached to the truck frame with a minimum of four (4) 5/8" grade 8 cap screws. If the existing holes are not evenly spread over the whole length, additional holes should be drilled, spaced approximately as shown in Fig. 2.

CAUTION: BE CAREFUL OF BRAKELINES, WIRING, ETC. INSIDE THE TRUCK FRAME WHEN DRILLING THE TRUCK FRAME.

Drill 21/32" diameter holes in the mounting angles and truck frame and bolt the mounting angles in place using 5/8 x 2 cap screws (grade 8) and hex lock nuts. Tighten the cap screws to 180 to 190 lb-ft. Securely weld the cylinder mount to the mounting angles. **DO NOT** weld the cylinder mount to the truck frame. (See Fig. 3.)



INSTALL REAR HINGE

If the front of the body longbeams are notched for the hoist, mount the rear hinge as shown in Fig. 4, style A. If the front of longbeams are notched, use Fig. 4, style B. Notch the truck frame as shown in Fig. 4. Place the rear hinge on the truck frame. Make sure the rear hinge is correctly located, centered and square with the truck frame and the telescopic cylinder mount. Securely weld the rear hinge to the truck frame. Box the end of the truck frame with 1/4" thick plate (not supplied) and weld all around to the truck frame and rear hinge angle. 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. Be sure 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.

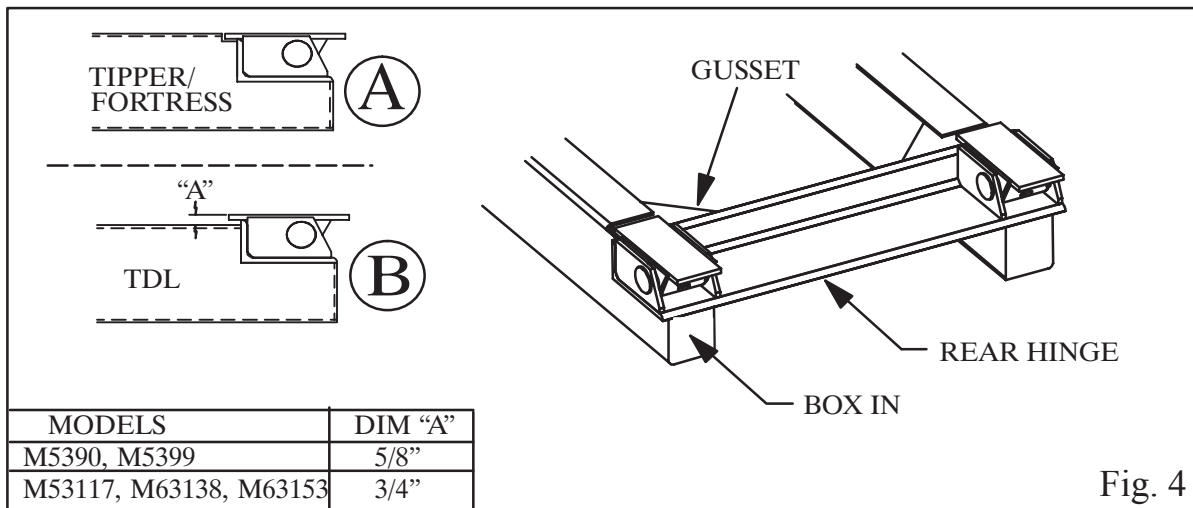


Fig. 4

NOTE: IT IS VERY IMPORTANT TO INSTALL THESE GUSSETS TO SECURELY MOUNT THE REAR HINGE TO THE TRUCK FRAME.

NOTE: If there are rivets on the top flange of the truck frame run a spacer the full length of the truck frame before mounting the telescopic cylinder mount or the rear hinge.

INSTALL BOY/HOIST ASSEMBLY

On some standard and custom bodies, the hoist is installed at the factory. This requires altering the installation procedures. Before placing the body/hoist assembly on the truck, install a male ORB x female NPT 90° swivel adapter in the power up port on the cylinder. For M53 and M63 double-acting cylinders, install a 3/4 ORB male x 3/8 NPT female 90° swivel adapter in the power down port.

Place the body/hoist assembly on the truck frame with 3" of cab or exhaust clearance. Make sure the body and hoist assembly is correctly located, centered and square with the truck frame. Refer to the INSTALL CYLINDER MOUNT section above for installing the mounting angles.

Rivet strips (not supplied) may be installed for supporting the longbeams of Crysteel TDL dump bodies.

MOUNT PUMP - STANDARD

The standard pump/valve is intended to be mounted directly to a two-gear PTO with a direct mount flange. This saves time and effort and simplifies the installation. The pump has an SAE 'B' 4-bolt flange and a 13 tooth splined shaft. NOTE: This pump will mount directly to Chelsea's output type "XK" or Muncie's output type "D". Crysteel recommends a PTO ratio of 100 to 120%. This assures a minimum pump operating speed of 600 RPM. The pump is assembled with a counter-clockwise rotation when looking at the shaft end of the pump.

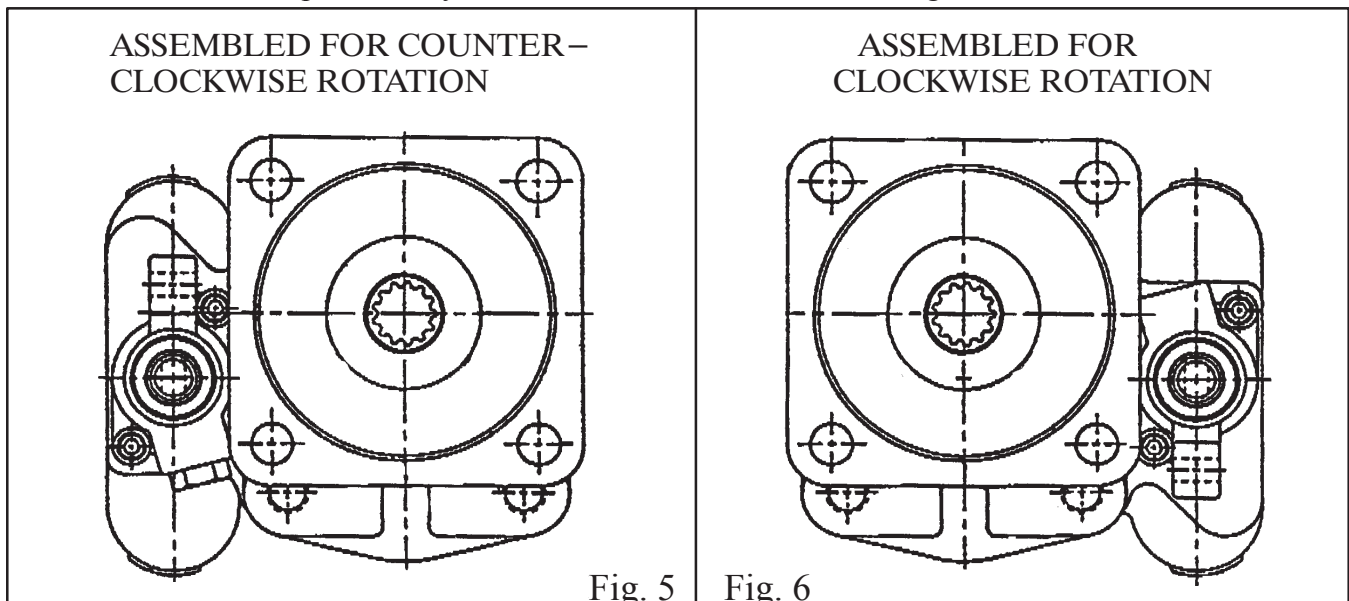
IMPORTANT: Before mounting the pump/valve, check the rotation of the PTO and make sure it matches the rotation of the pump. If it is opposite, the pump rotation will have to be reversed. To reverse the pump rotation, follow the pump reversing procedure below. Make sure the pump has plenty of clearance and that the hoses are kept clear of hot mufflers and exhaust pipes.

IMPORTANT: The C102D pump/valve supplied for the M5399 through M63153 can be mounted directly to a PTO but **MUST** be supported externally to the transmission. Long mounting studs and extra nuts are provided with each unit for this purpose.

REVERSING PUMP ROTATION

The pump is assembled with a counter-clockwise rotation when looking at the shaft end of the pump. (Looking at the shaft end of the pump with the drive shaft on top and the idler gear on the bottom, the valve spool will be on the left side. See Fig. 5.) If the pump needs to rotate in the opposite direction, then follow these steps to reverse the pump:

1. Remove the four 9/16-12 capscrews holding the pump together.
2. CAREFULLY remove the valve body assembly from the pump.
3. CAREFULLY remove the gear housing. Rotate the housing 180° and replace it. The drive shaft gear bore becomes the idler gear bore.
4. Rotate the valve body 180° from its original position and replace it.
5. Replace the four 9/16-12 capscrews and torque to 2400 in-lbs.
6. To verify that the pump is now assembled for clockwise rotation, look at the shaft end of the pump with the drive shaft on the top and the idler gear on the bottom, the valve spool will be on the right side. (See Fig. 6.)
7. Fill the suction port with hydraulic oil and rotate shaft to fill the gears with oil.

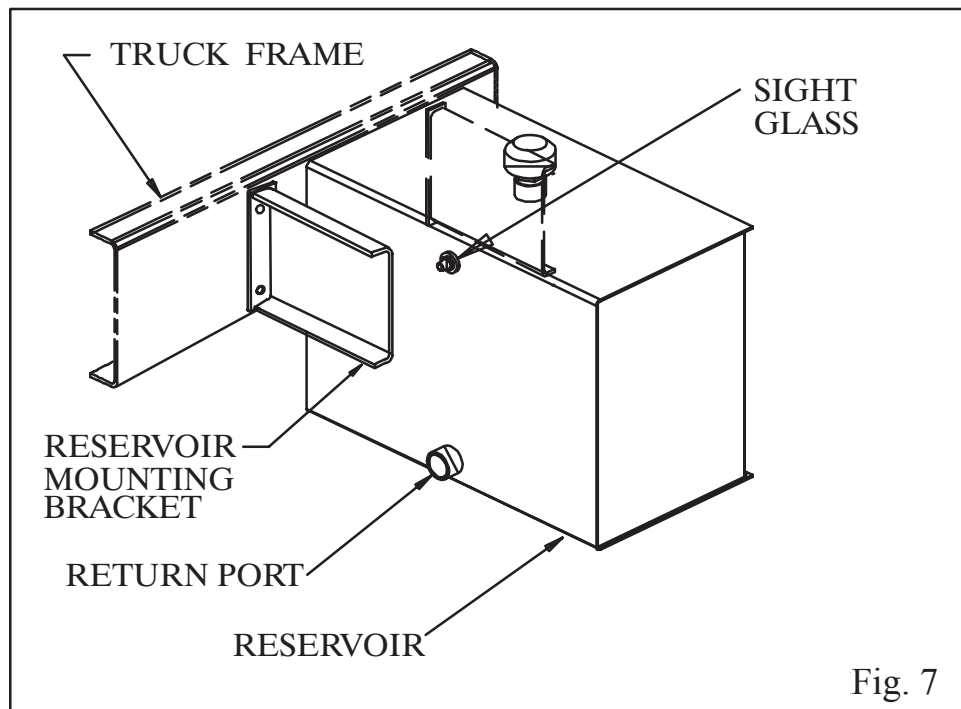


MOUNT RESERVOIR

Determine on which side of the truck to mount the reservoir. There are four ports on the reservoir - a fill port on the top, a 2" NPT suction port on the bottom, a 1 1/4" NPT return port near the bottom on one side and one smaller port near the top on one side for a sight glass. Clamp the reservoir mounting brackets to the sides of the reservoir and place the reservoir against the outside of the truck frame. (See Fig. 7.) Mark the truck frame for drilling using the mounting brackets as guides.

CAUTION: BE CAREFUL OF BRAKELINES, WIRING, ETC. INSIDE THE TRUCK FRAME WHEN DRILLING THE TRUCK FRAME.

Drill 17/32" holes in the truck frame and bolt the mounting brackets in place using 1/2 x 2 grade 8 cap screws and hex lock nuts, tightening to 90 to 100 lb-ft. Securely weld the reservoir to the reservoir mounting brackets. Install the sight glass in the port provided.

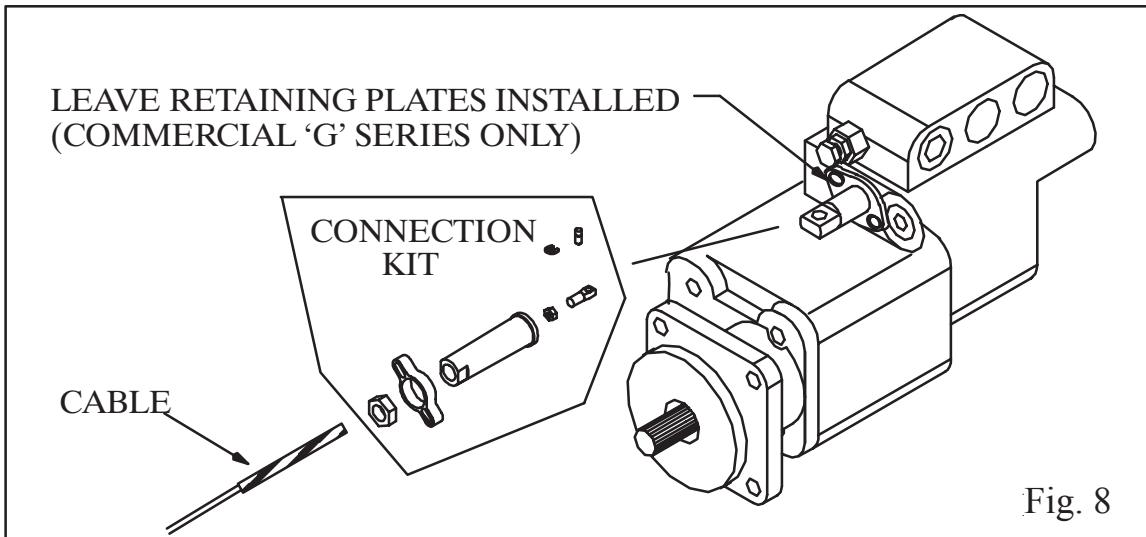


INSTALL VALVE CONTROL

Place the control pedestal assembly on the floor of the cab in a convenient location next to the drivers seat. Mark the floor using the pedestal as a template and drill 5/16 inch holes for the mounting screws and a 3/4 inch hole for the control cable. (Check below the floor for obstructions and cable routing before drilling.)

Assemble the control cable to the valve control. Bolt the valve control to the pedestal using 1/4 x 1/2 machine screws. Install the cover on the side of the pedestal using 1/4 x 1/2 machine screws. Mount the pedestal to the floor using 5/16 x 1/2 cap screws and hex lock nuts. Connect the other end of the cable to the control valve using the parts and instructions in the valve connection kit. (See Fig. 8.) NOTE: The two spool seal retaining plates on the 'G' series pump/valves must remain installed on the pump/valve. If

the are removed, oil can be pumped past the spool into the control cable and into the cab of the truck.



INSTALL CYLINDER HOSES - DOUBLE ACTING

For M53 series, install a 1 1/16 ORB male x 3/4 NPT female 90° swivel adapter in the power-up port on the cylinder. For M63 series, install a 1 1/16 ORB male x 1 NPT female 90° swivel adapter in the power-up port on the cylinder. Install a 3/4 ORB male x 3/8 NPT female 90° swivel adapter in the power-down port.

For M53 series, install a 1 1/16 ORB x 3/4 NPT 90° swivel adapter in the B (power up) port of the control valve. For M63 series, install a 1 1/16 ORB x 1 NPT 90° swivel adapter in the B (power up) port of the control valve. Install a 1 1/16 ORB x 3/4 ORB extension and a 3/4 ORB x 3/8 NPT 90° swivel adapter in the A (power down) port. Using a 60" long hose, connect the B port on the control valve to the power up port on the cylinder. Using a 60" long 3/8" I.D. hose, connect the A port to the power down port. This will raise the body when the valve control lever is pulled back and lower the body when the lever is pushed forward.

INSTALL CYLINDER HOSES - SINGLE ACTING

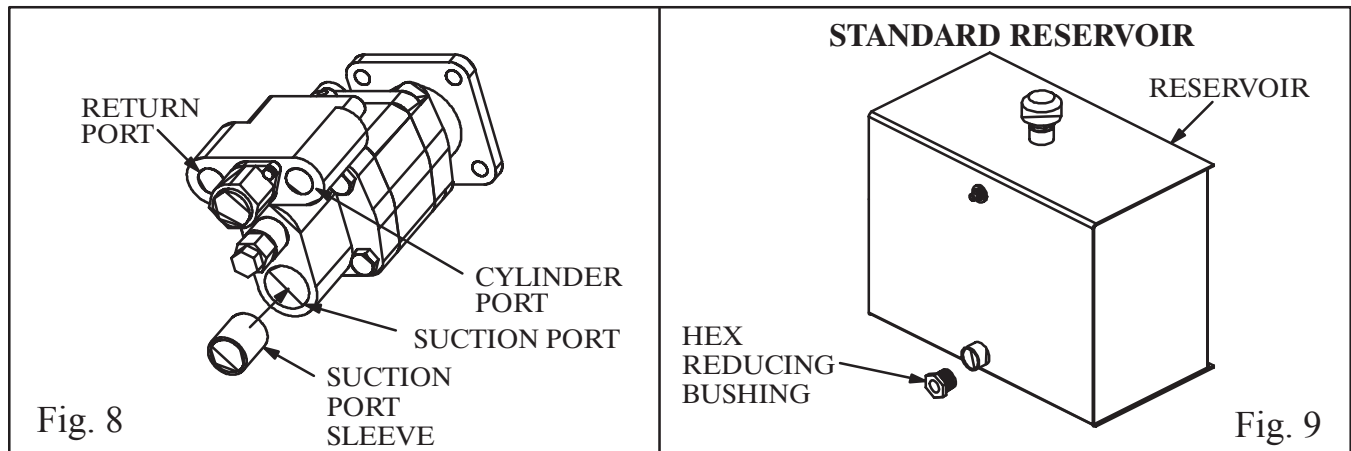
For M53 series, install a 1 1/16 ORB male x 3/4 NPT female 90° swivel adapter in the port on the cylinder. Install a 1 1/16 ORB x 3/4 NPT swivel adapter in the work port of the control valve. Using a 60" long hose, connect the work port of the control valve to the port on the telescopic cylinder.

For M63 and M74 series, install a 1 5/16 ORB male x 1 NPT female 90° swivel adapter in the port on the cylinder. Using a 60" long hose, connect the work port of the control valve to the port on the telescopic cylinder.

INSTALL RETURN AND SUCTION HOSES

A return line hose must be installed for long pump life. A suction port sleeve has been installed in the suction port on the pump. (See Fig. 8.) This sleeve prevents the oil from recirculating inside the pump/valve and directs the oil flow out the return port. Operating this pump/valve without installing the return line will cause the pump/valve to fail.

For M53 series, install a 1 1/4 x 1 hex reducing bushing in the return port on the reservoir. Remove the plug from the return port on the control valve and install a swivel adapter in its place. Install a 72" long hose from the return port on the pump to the return port on the reservoir.



Install the 2" NPT x 1 1/2" hose barb in the suction port on the bottom of the frame-mounted reservoir and the 1 1/4" NPT x 1 1/2" hose barb in the suction port on the back of the pump/valve. Connect a 1 1/2" I.D. suction hose from the reservoir to the pump and secure it with hose clamps.

ADD HYDRAULIC OIL

Use a quality hydraulic fluid of 150 SSU @ 100°F which contains corrosion and oxidation inhibitors and a foam depressant (ISO 32 grade). This is approximately the equivalent of SAE 10W or lighter weight oil. Initially fill the reservoir with the quantities given below. After bleeding the air from the cylinder, refill the reservoir to the sight glass level. **DO NOT OVERFILL THE RESERVOIR!**

KEEP THE OIL CLEAN. USE CLEAN CONTAINERS, FUNNELS AND OTHER EQUIPMENT!

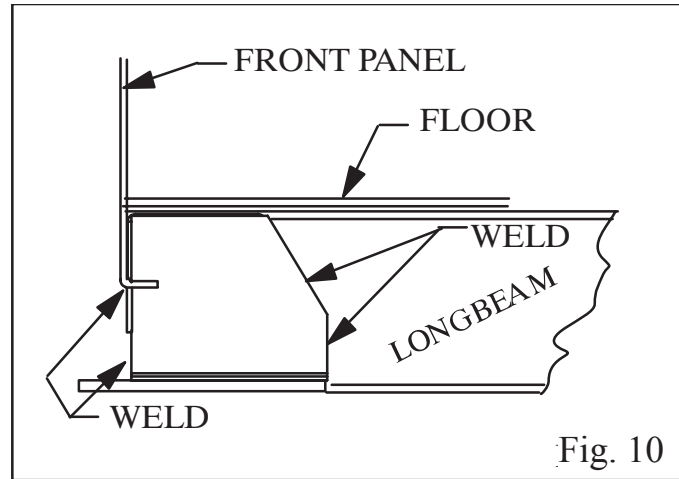
HOIST MODEL	RESERVOIR SIZE	INITIAL FILL AMOUNT
M5390	16 Gal.	12 Gal.
M5399	16 Gal.	12 Gal.
M53117	23 Gal.	16 Gal.
M63117	28 Gal.	21 Gal.
M63138	28 Gal.	21 Gal.
M63153	28 Gal.	21 Gal.

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.

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.

MOUNT BODY

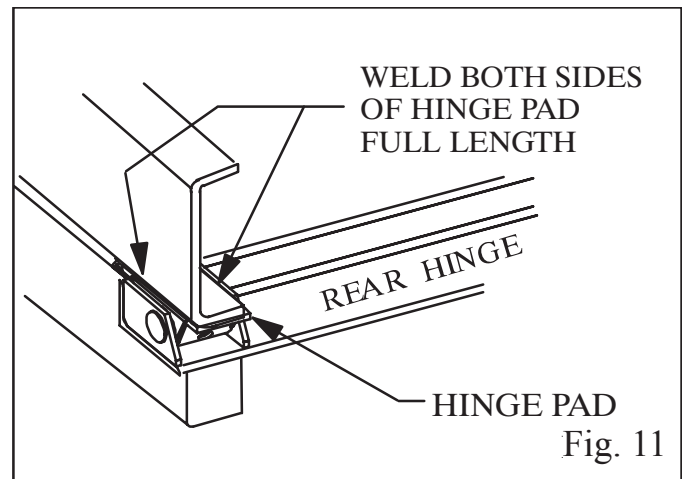
Place the body on the truck with 3” cab clearance for M53 and M63 hoists. Slide the body back until the front panel contacts the upper lift of the cylinder mount. Securely weld the body longbeams to the outside edge of the upper lift of the telescopic cylinder mount. (See Fig. 10.)



DO NOT WORK UNDER A RAISED BODY UNLESS THE BODY IS SECURELY BLOCKED OR PROPPED IN THE RAISED POSITION.

ALIGN HOIST CYLINDER AND WELD REAR HINGE

The entire body and body lift assembly can now be moved slightly forward or rearward to align the cylinder in the doghouse. Make certain that the cylinder is vertical and is not leaning to the front or to the rear. Weld the body longbeams very securely to the rear hinge plates. (See Fig. 11.)

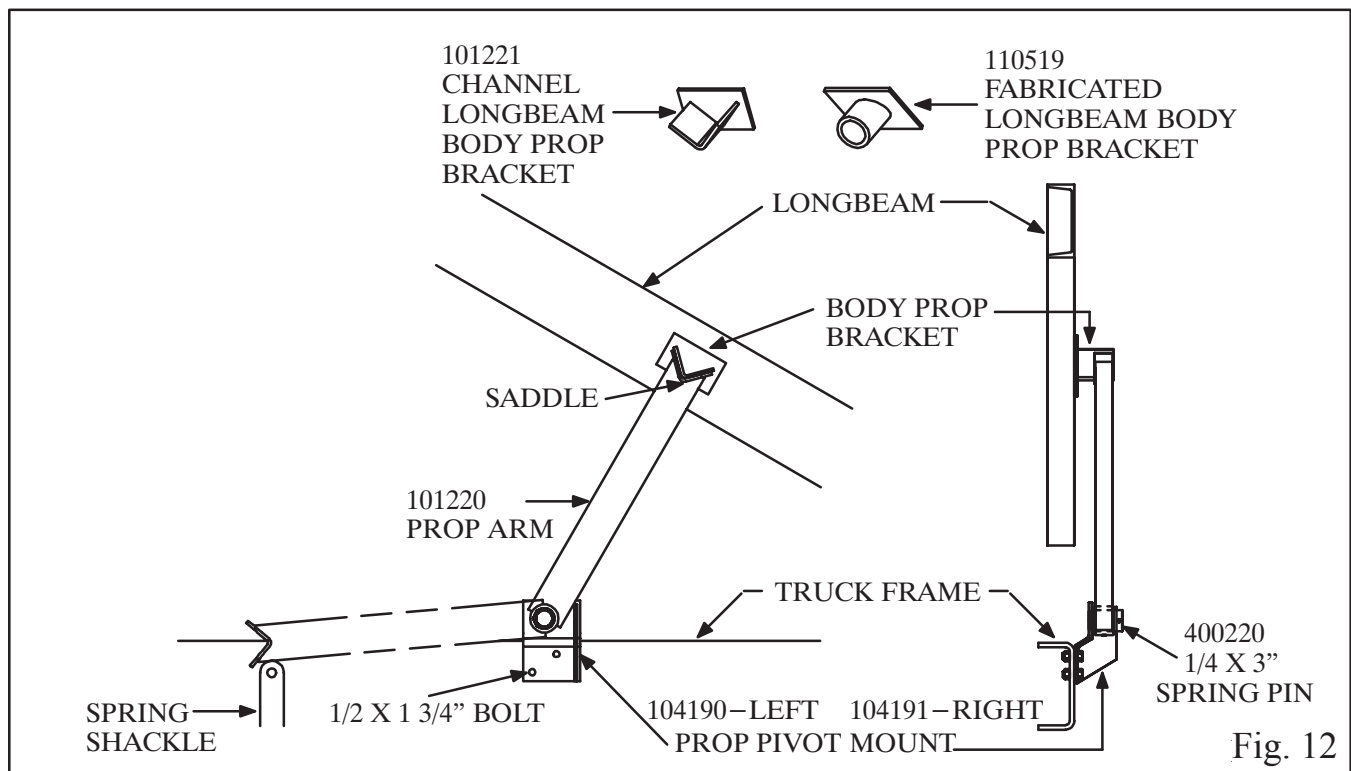


DO NOT WORK UNDER A RAISED BODY UNLESS THE BODY IS SECURELY BLOCKED OR PROPPED IN THE RAISED POSITION.

INSTALL BODY PROPS

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. One body prop is included with Marathon Hoist models M5390 and M5399; two body props (one pair) are included with models M53117 through M63153. Be sure to install each prop on the correct side of the truck as explained below and shown in Fig. 12.

1. Raise the body to a 30° to 35° angle and brace it securely before beginning installation.
2. Assemble the prop arm to the prop pivot mount with a 1/4 x 3 roll pin. Clamp the prop pivot mount against the outside of the truck frame just behind the rear axle. Raise the body prop arm to a free standing position. Place the body prop bracket in the prop arm saddle. Reposition if needed to locate the prop bracket on the longbeam. It may be necessary to raise or lower the body to get the best location for the prop pivot mount. Using the prop pivot mount as a guide, mark the location of holes on the truck frame and drill 17/32 inch holes. Assemble the prop pivot mount to the frame using 1/2 x 2 cap screws, and hex lock nuts, tightening to 90 to 100 lb-ft. Raise the prop arm to a free standing position, place the body prop bracket in the saddle and securely weld the bracket to the longbeam.



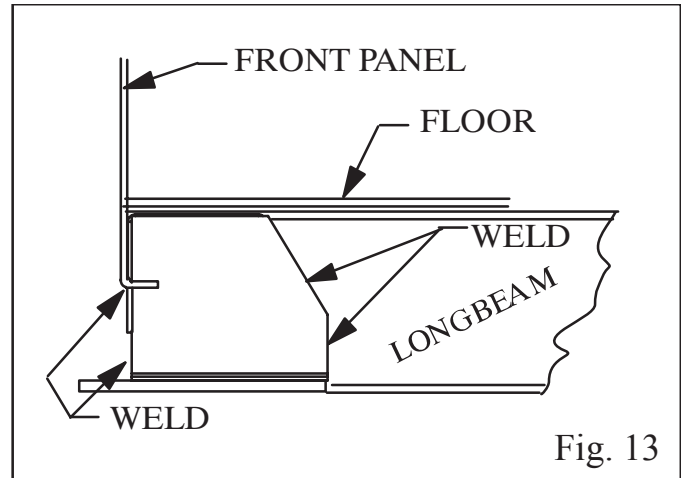
3. When mounting two body props, repeat steps 1 and 2 for the other side. Use the body prop already mounted to assure that both body props hold the body at the same height. The left and right body props should pivot toward the front of the truck in the storage position.
4. To operate the body prop, raise 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.
5. 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.

***DO NOT WORK UNDER A RAISED BODY UNLESS THE BODY IS SECURELY
BLOCKED OR PROPPED IN THE RAISED POSITION.***

FINISH WELDING BODY TO HOIST

After the body props have been installed, raise the body to rest on the props. Finish welding the upper lift of the telescopic cylinder mount to the inside of the body longbeams. Securely weld the upper lift to the body longbeams the full height of the upper lift on both the front and back sides of the upper lift. Also weld the bottom edge of the front panel to the upper lift. (See Fig. 13.)

If the body and hoist have been assembled at the factory, finish welding the hoist lift brackets to the fill plates on the inside of the longbeams.



BLEED TELESCOPIC CYLINDER

All of the air must be removed from the cylinder for smooth and safe operation of the hoist. All M-Series single-acting cylinders are equipped with a self-bleeding feature. To bleed the air from these models, raise and lower the hoist two or three times to remove the air.

After bleeding the cylinder, check the oil level in the reservoir. There should be 2 or more inches of oil in the bottom of the reservoir when the body is raised to its full height. When the body is down, oil should be visible in the sight glass.

***DO NOT WORK UNDER A RAISED BODY UNLESS THE BODY IS SECURELY
BLOCKED OR PROPPED IN THE RAISED POSITION.***

INSTALL CAB PROTECTOR

If a cab protector is to be installed on the front of the dump body, it must be notched to fit around the “dog-house”. This is because the top of the cylinder swings forward out of the doghouse in the body as the body is raised and severe damage would occur if the cylinder were trapped by the cab protector.

INSTALL GREASE ZERKS AND LUBRICATE

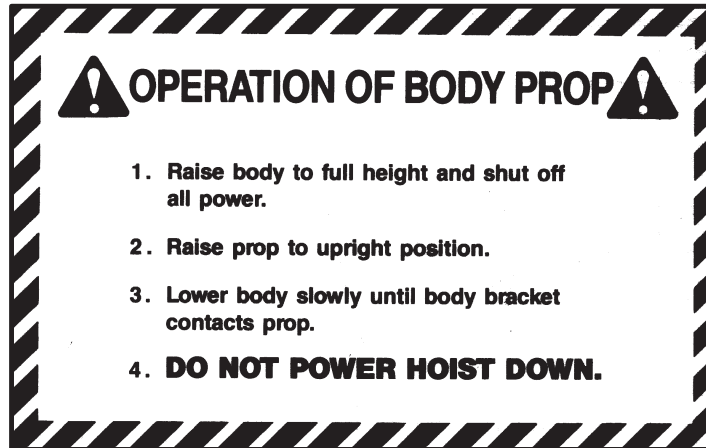
Install grease zerks in the body props. Lubricate all fittings at regular intervals, at least every 150 cycles or every two months. The grease fittings are located as follows:

- | | |
|---------------|--------------------|
| A. Body Prop | 1 fitting per prop |
| B. Rear Hinge | 2 fittings |

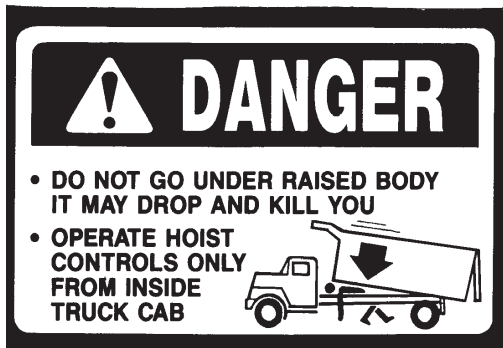
NOTE: The hoist cylinder pivots, both truck mount and body mount, do not require lubrication. These pivot points are equipped with self-lubricating composite bearings that do not need lubrication. If they are ever disassembled (to repair or replace the cylinder), care must be used to avoid damage to the composite bearings.

INSTALL LIGHTS, REFLECTORS AND DECALS

Install the lights and wiring harness. Mount the amber reflectors near the front on the sides. Mount the red reflectors near the rear on the sides and on the tailgate near the sides. Slip the rubber hand grip over the end of the latch control lever. MOUNT DECALS IN THE PROPER PLACES. See Fig. 14 for decal identification and placement.



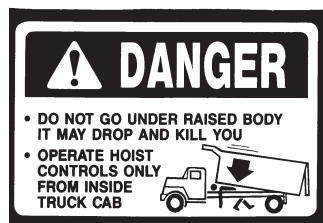
400719 – Mount on the body longbeam near the body prop



401576 – Mount on the outside of the body longbeams near the front of the body (one on each side).



400643 – Mount on the longbeam on the drivers side.



401577 – Mount in the cab in a prominent location



400642 – Mount in the cab in a prominent location'



400661 – Mount on the body prop arm.

Fig. 14

MARATHON HOIST PARTS

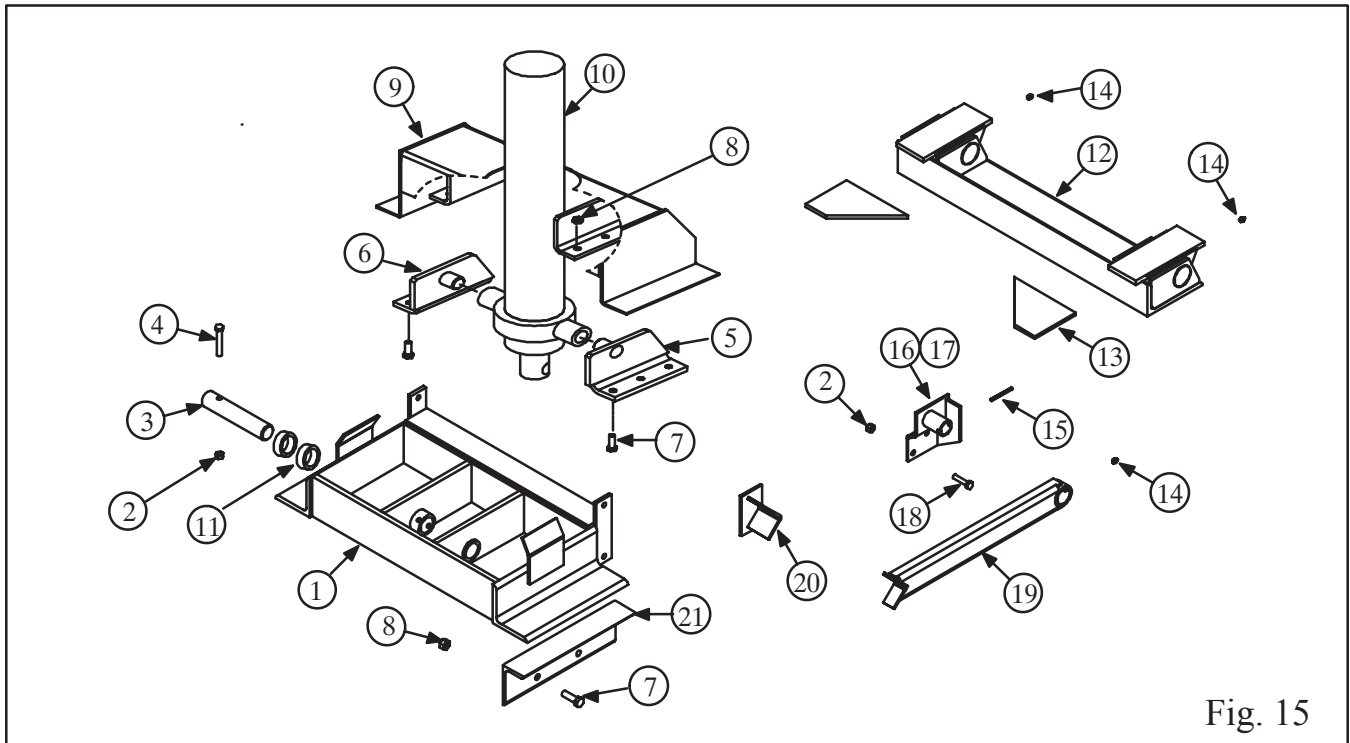


Fig. 15

ITEM	DESCRIPTION	M5390	M5399	M53117	M63117	M63138	M63153	QTY
1.	Assy Lower Mount	107347	107347	107345	144667	144667	144667	1
2.	Hex Lock Nut 1/2-13	401316	401316	401316	401316	401316	401316	5
3.	Pin Hoist Pivot	208047	208047	208047	248708	248708	248708	1
4.	Cap Screw 1/2-13 x 3 1/4 HH	401140	401140	401140	401140	401140	401140	1
5.	Assy Upper Pivot - LH	159259	159259	159259	159259	159259	159259	1
6.	Assy Upper Pivot - RH	159260	159260	159260	159260	159260	159260	1
7.	Cap Screw 5/8-11 x 2 HH	402374	402374	402374	402374	402374	402374	14
8.	Hex Lock Nut 5/8-11	401582	401582	401582	401582	401582	401582	14
9.	Assy Upper Lift	159258	159258	159258	159258	159258	159258	1
10.	Assy Cylinder - SA	403656	403657	403658	406806	404902	404903	1
	Assy Cylinder - DA	403122	403123	403124	407373	405820	405821	1
11.	Spacer Lower - M53	208939	208939	208939				2
12.	Assy Rear Hinge	106060	106060	107037	107037	107037	107037	1
13.	Gusset Rear Hinge	208075	208075	208075	208075	208075	208075	2
14.	Grease Zerk 1/8 NPT Straight	400103	400103	400103	400103	400103	400103	4
15.	Spring Pin 1/4 x 3	400220	400220	400220	400220	400220	400220	2
16.	Assy Prop Pivot - LH	104190	104190	104190	104190	104190	104190	1
17.	Assy Prop Pivot - RH			104191	104191	104191	104191	1
18.	Cap Screw 1/2-13 x 2 HH	400105	400105	400105	400105	400105	400105	4
19.	Assy Body Prop Arm	101220	101220	101220	101220	101220	101220	2
20.	Assy Prop Bracket	125259	125259	125259	125259	125259	125259	2
21.	Angle Mounting - 16" Lg	402325	402325	402325	402325	402325	402325	2
22.	Seal Kit	403153	403153	403153	403154	403154	403154	1

MARATHON HYDRAULIC SYSTEM PARTS

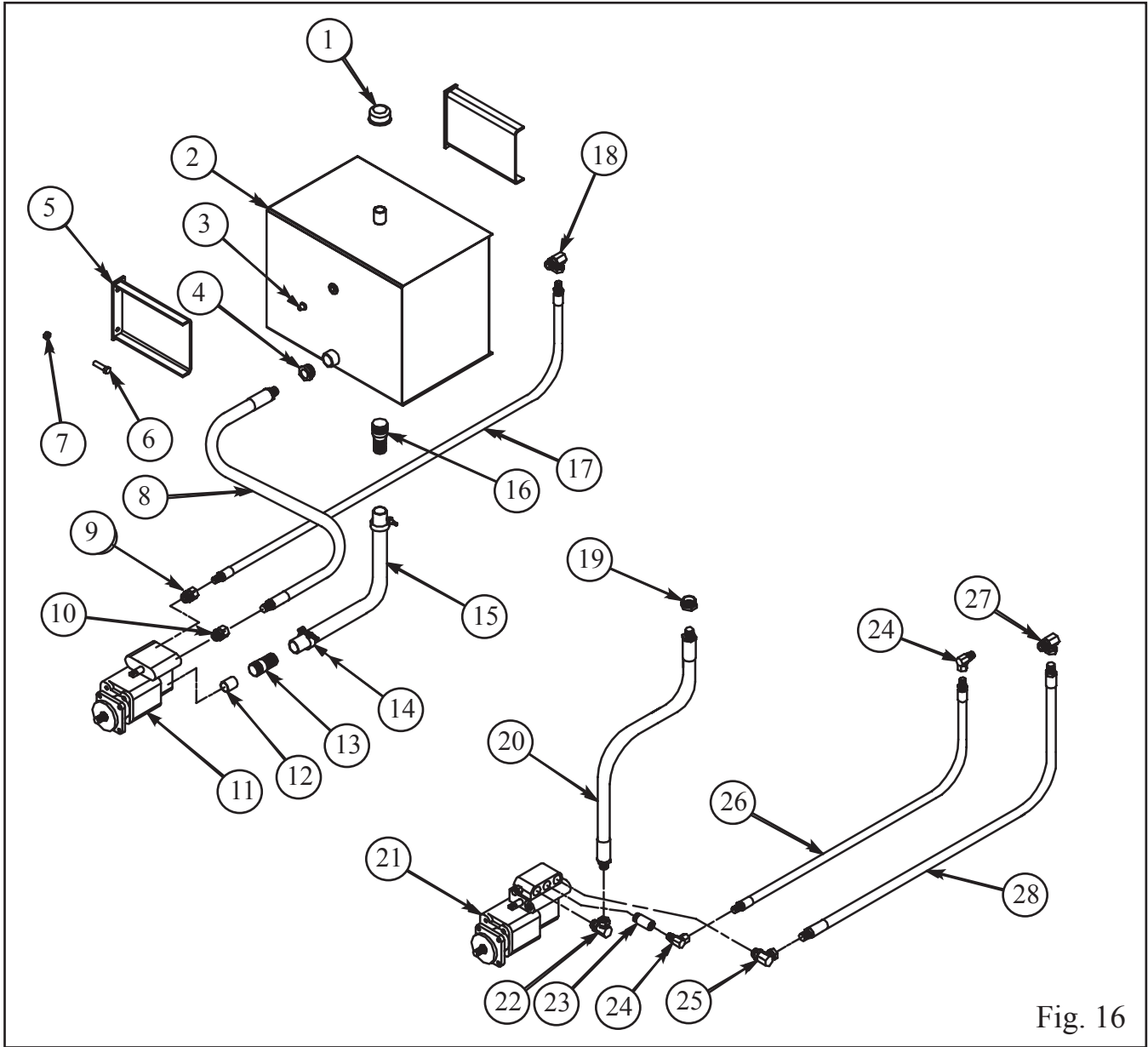


Fig. 16

ITEM	DESCRIPTION	MODELS	PART NO.	QTY	
1.	Breather Cap	All	407125	1	
2.	Reservoir Assy	16 Gal	M5390-M5399	113744	1
		23 Gal	M53117	113745	1
		28 Gal	M63	113746	1
3.	Sight Glass	All	401433	1	
4.	Bushing Hex Reducing 1 1/4 x 1	M53	404915	1	
		M63	Not Req'd		
5.	Mounting Bracket	All	127123	2	
6.	Cap Screw 1/2-13 x 2 HH	All	400105	4	
7.	Hex Lock Nut 1/2-13	All	401316	4	

ITEM	DESCRIPTION	MODELS	PART NO.	QTY
8.	Hose 1 NPT x 72" Lg	M53	405200	1
	1 1/4 NPT x 72" Lg	M63	405201	1
9.	Swivel Adapter 1 1/16 ORB x 3/4 NPT	M53	401657	1
		M63	Not Req'd	
10.	Swivel Adapter 1 1/16 ORB x 1 NPT	M53	405331	1
	Swivel Adapter 1 NPT x 1 1/4 NPT	M63	405332	1
11.	Pump / Valve - Single-Acting	M5390 M5399-M63138	405196	1
	SA 10 GPM 'G' Series		405197	1
	SA 20 GPM 'C' Series			
12.	Suction Port Sleeve	All	401540	1
13.	Hose Barb 1 1/4 NPT x 1 1/2"	All	401725	1
14.	Hose Clamp 2"	All	402163	2
15.	Suction Hose 1 1/2" ID x 72" Lg	All	401727	1
16.	Hose Barb 2 NPT x 1 1/2"	All	401724	1
17.	Hose 3/4 NPT x 60" Lg	M53	401563	1
	1 NPT x 60" Lg	M63	404905	1
18.	Adapter 1 1/16 ORB x 3/4 NPT 90°	M53	401291	1
	Adapter 1 5/16 ORB x 1 NPT 90°	M63	404904	
19.	Bushing Hex Reducing 1 1/4 x 1 1 1/4 x 1	M53 DA	401452	1
		M63 DA	404915	1
20.	Hose 3/4 NPT x 72" Lg	M53 DA	401982	1
	1 NPT x 72" Lg	M63 DA	401993	1
21.	Pump / Valve - Double-Acting	M5390-M5399 M53117-M63153	405193	1
	DA 10 GPM 'G' Series		405194	1
	DA 15 GPM 'G' Series			
22.	Adapter 1 1/16 ORB x 3/4 NPT 90°	M53 DA	401291	1
	Adapter 1 1/16 ORB x 1 NPT 90°	M63 DA	404615	1
23.	Extension 1 1/16 ORB x 3/4 ORB	All DA	214157	1
24.	Adapter 3/4 ORB x 3/8 NPT 90°	All DA	401199	2
25.	Adapter 1 1/16 ORB x 3/4 NPT 90°	M53 DA	401291	1
	Adapter 1 1/16 ORB x 1 NPT 90°	M63 DA	404615	1
26.	Hose 3/8 NPT x 60" Lg	All DA	401564	1
27.	Adapter 1 1/16 ORB x 3/4 NPT 90°	M53 DA	401291	1
	Adapter 1 5/16 ORB x 1 NPT 90°	M63 DA	404904	1
28.	Hose 3/4 NPT x 60" Lg	M53 DA	401563	1
	1 NPT x 60" Lg	M63 DA	404905	1

CUSTOMER SATISFACTION PLEDGE

Crysteel's Customer Satisfaction Pledge is designed to be the most comprehensive warranty in the truck equipment industry. This pledge covers new products for a period of five (5) years, and is not restricted by vehicle mileage or when product is invoiced to our distributors. Our warranty begins when our product is put into service by the final customer.

This warranty covers our products for defective material and/or workmanship at a rate of 100 % for the first (3) years and at a rate of 50 % for years 4 and 5. This warranty covers:

- Crysteel Manufactured product
- OEM Products purchased by Crysteel as part of our product
- The repair of warranted product
- The replacement of warranted product
- Labor to replace warranted product
- Freight for replacement product
- Warranted product return freight (if required)

This warranty is limited to product supplied under the Crysteel Mfg. name and does not cover distributor modifications. Repair or replacement is at Crysteel's option. Primer warranty is limited to adherence to metal surfaces only and does not include the inside or understructure of dump bodies. Crysteel will not assume responsibility for travel, loss of use, downtime expenses or other incidental or consequential damages. This warranty is void if the product has been obviously abused or subjected to other than normal usage. There are no other warranties except as described above, and Crysteel makes no warranty of fitness for a particular purpose.

! CAUTION !

- **BODY MUST BE BRACED BEFORE SERVICING HOIST OR WORKING IN AREA WITH BODY IN RAISED POSITION**
- **LUBRICATE HOIST GREASE FITTINGS OFTEN – AT LEAST EACH TIME TRUCK IS SERVICED**
- **TRUCK MUST BE LEVEL FOR DUMPING**
- **DO NOT OVERLOAD**

CRYSTEEL MFG, INC.

CRYSTEEL MANUFACTURING, INC.