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**CRYSTEEL'S
STINGRAY
HOIST**

MOUNTING AND OPERATING INSTRUCTIONS



**HWY. 60 E. / P.O. BOX 178
LAKE CRYSTAL, MN. 56055-0178**

**TELEPHONE 507-726-2728
OUT OF MN 800-533-0494**

DATE PURCHASE _____
 HOIST SERIAL NUMBER _____
 CYLINDER SERIAL NUMBER _____
 DEALER _____
 ADDRESS _____
 PHONE _____

TABLE OF CONTENTS

Purchase Record	Inside Front Cover
Foreword	2
Warranty	Back Cover
OPERATION AND MAINTENANCE	
Operation and Use	3
Some Do's and Don'ts for Safety and Long Service	3
INSTALLATION INSTRUCTIONS	
Complete Cylinder Instructions	4
Mount the Rear Hinge	4
Locate Hoist on Truck Frame	5
Mount Hoist to Truck Frame	7
Mount Pump	7
Install Driveshaft	8
Install Control Cable	8
Install Hoses-Single-Acting	9
Install Hoses-Double-Acting	9
Install Hoses - 1500, 1900	10
Add Hydraulic Oil	10
Grease Hoist	11
Mount Body	11
Install Body Guides	12
Install Body Prop	12
Bleed Cylinders	13
Install Decals	13
ROUTINE MAINTENANCE	
Lubricate Regularly	15
Change Hydraulic Oil	15
Lubricate Valve Control Cable	15
PARTS LISTS & ILLUSTRATIONS	16

FOREWORD


The Stingray twin cylinder underbody hoist is designed for use on single and tandem axle trucks with 12 to 28 foot bodies. The Stingray line provides hoists ranging from Model 1500 in NTEA class E/50 to the Model 7700 in NTEA class L/120.

This manual contains the information needed for the proper installation and operation of these hoists.

These instructions are for standard installations using a self contained reservoir-pump-valve unit. Study it carefully before attempting to install or operate this product. Remote Mount Pump or Direct Mount Pump instruction sheets


are supplied separately when needed. With the proper installation, use and regular maintenance, Crysteel's Stingray hoist will give many years of trouble free service.

When ordering parts, be sure to give serial number of hoist, pump, and cylinder. The serial number of the pump is found on the plate on the front of the pump. 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 on page 1. Order parts by number and description as given in the parts listing in this manual.



DANGER

- DO NOT GO UNDER RAISED BODY
IT MAY DROP AND KILL YOU
- OPERATE HOIST
CONTROLS ONLY
FROM INSIDE
TRUCK CAB



OPERATION AND MAINTENANCE INFORMATION

OPERATION AND USE

1. Engage PTO from cab and adjust engine speed to fast idle.
2. To raise the hoist, pull the hoist control knob out. To hold the body in a raised position, return the hoist control knob to the center detent position.
3. To lower the hoist, push the hoist control knob in. Always return the hoist control knob to the center detent position after the body is all the way down.
4. **DO NOT LEAVE THE PTO IN GEAR WHILE TRANSPORTING. THIS WILL CAUSE SEVERE DAMAGE TO THE HYDRAULIC PUMP AND/OR DRIVELINE.**
5. 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.**

SOME DO'S AND DON'T'S FOR SAFETY AND LONG SERVICE

1. **NEVER** operate the hoist control valve from outside the cab.
2. Use the proper hydraulic fluid. **KEEP IT CLEAN.** Remember to change it regularly.
3. Lubricate all grease fittings at regular intervals.
4. **ALWAYS** carefully block up the body, using the body prop, before working under it.
5. Do not "race" the engine when unloading.
6. Do not load the hoist beyond its capacity.
7. **DO NOT** tamper with the hydraulic relief valve. This will void the warranty. It can cause severe damage to the hoist and cylinder.
8. Never leave the PTO in gear while transporting. It will ruin the hydraulic pump.
9. Check all bolts and set screws regularly. Keep them tight.

**NEVER EXCEED THE G.V.W. (GROSS VEHICLE WEIGHT) RATING NOR THE G.A.W.
(GROSS AXLE WEIGHT) RATING SPECIFIED FOR YOUR TRUCK**

INSTALLATION INSTRUCTIONS

COMPLETE CYLINDER INSTALLATION

Place the hoist upside down on the floor. The cylinders have been installed in the cylinder mounting sleeves. They need to be bolted to the crossheads. Rotate the inner tubes so the temporary bleed plug is down for single-acting cylinders. On double-acting cylinders the head ports should be toward the center of the hoist for hoist models 3300 through 7700. Lift the

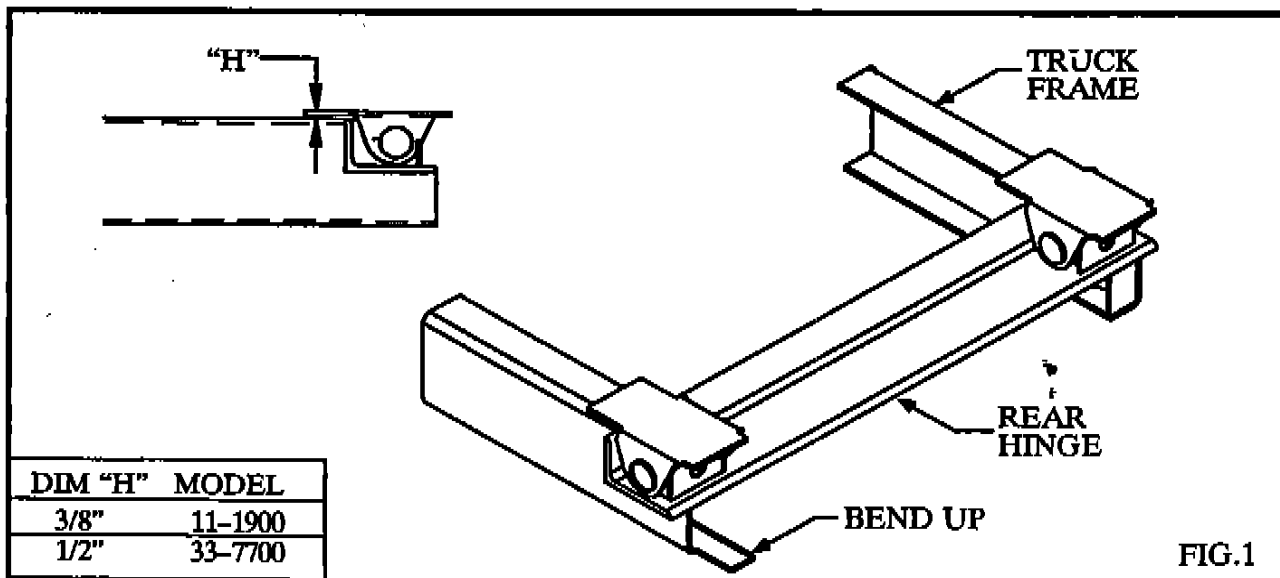
base end of the cylinders to align the cylinders with the crossheads. (The hoist may need to be opened slightly to do this.) Bolt the cylinders to the crossheads using $3/8 \times 1\ 1/2$ cap screws, lock washers and hex nuts. Check the cylinder mounting screws; they should be tight. Remove the temporary bleed plug in each cylinder and replace with the bleed valve supplied.

MOUNT THE REAR HINGE

The rear hinge must be located as close as possible behind the rear spring hanger. This will be 32 to 36 inches behind the center of the rear axle on single axle trucks and 42 to 50 inches behind the center of the tandem on tandem axle trucks. Mark the rear of the truck frame for notching as shown, leaving enough of the bottom flange of the truck frame to be bent up later to box in the truck frame. Notch the truck frame

as marked.

Make sure 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. Securely weld the rear hinge to the truck frame. Bend the bottom flange of the truck frame up and weld all around to box in the truck frame.

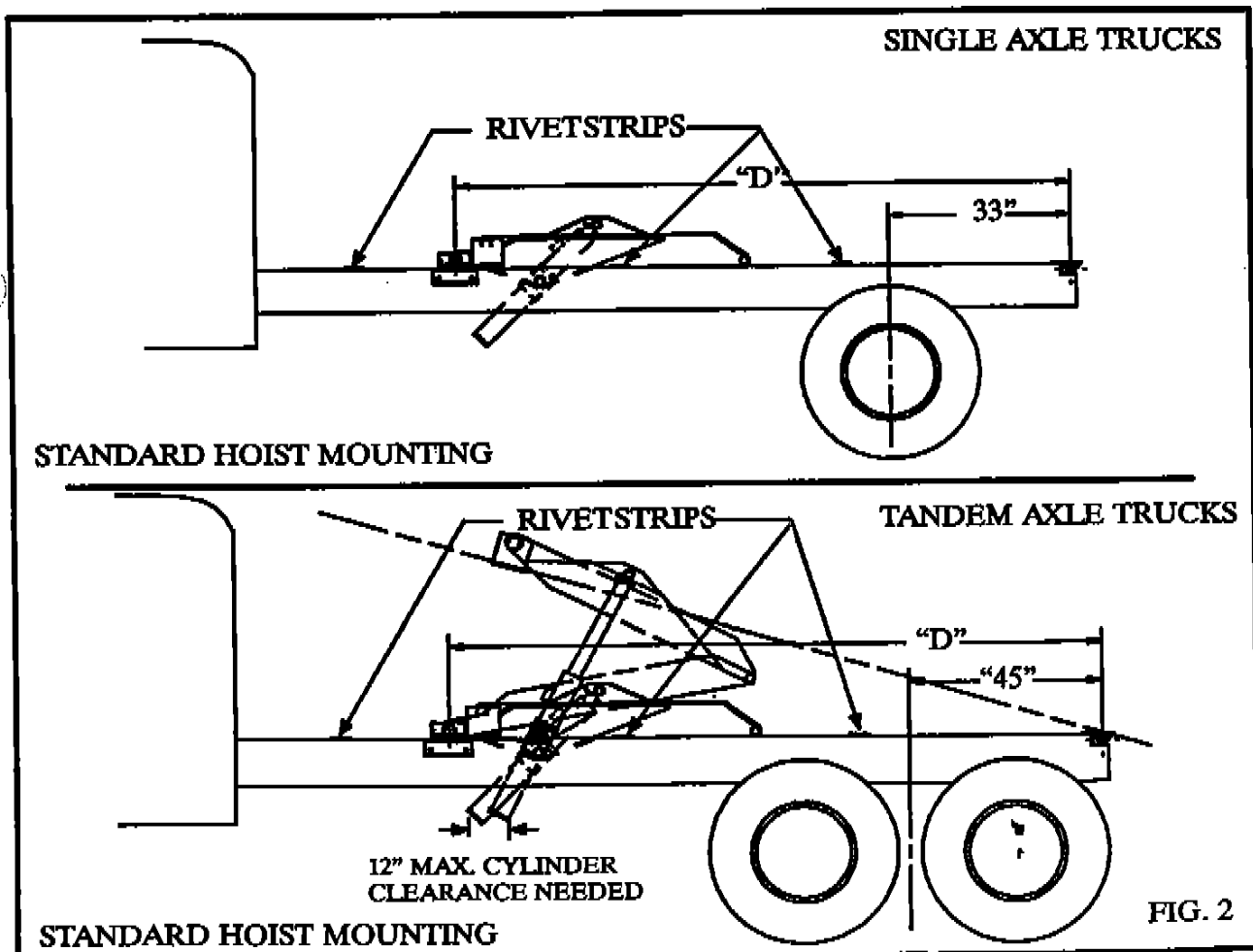


LOCATE HOIST ON TRUCK FRAME

Find the "D" dimension in TABLE 1, on page 6, for the hoist model and desired dump angle. Using this dimension, measure forward from the center of the rear hinge and mark the truck frame. Place the hoist on the truck frame. (See Fig. 2) Center the front cross tube of the hoist over the mark on the truck frame. Be sure to allow enough room for the cylinders to swing as the body is raised. Make sure the hoist is centered on and square with the truck frame. The angle mounting brackets must rest flat on the truck frame. If rivets are encountered in the truck frame, and the hoist cannot be moved to

clear them, countersink the rivet heads into the brackets. The rear end of the main hoist frame is designed to rest on a crossmember in the truck frame. If no crossmember exists to support the hoist frame, add one.

Note: In some cases the hoist may fit the truck frame better if it is mounted reversed or "backwards" as shown in Figure 3. When mounting the hoist "backwards" be sure to measure to the front crosstube of the hoist as shown in Figure 3 and to allow enough room for the cylinders to swing as the body is raised.



TRUCKS MOUNTING AND POSITIONING

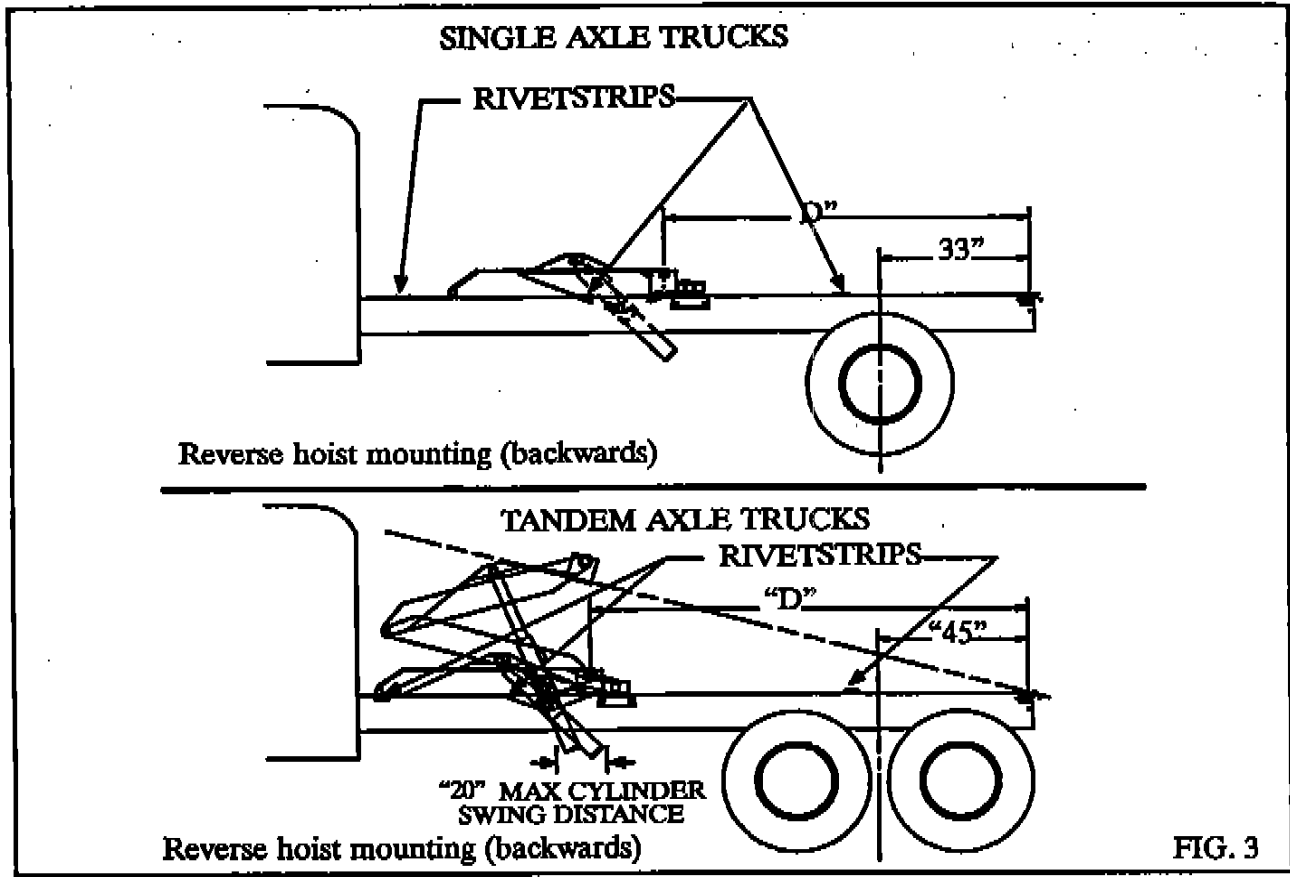


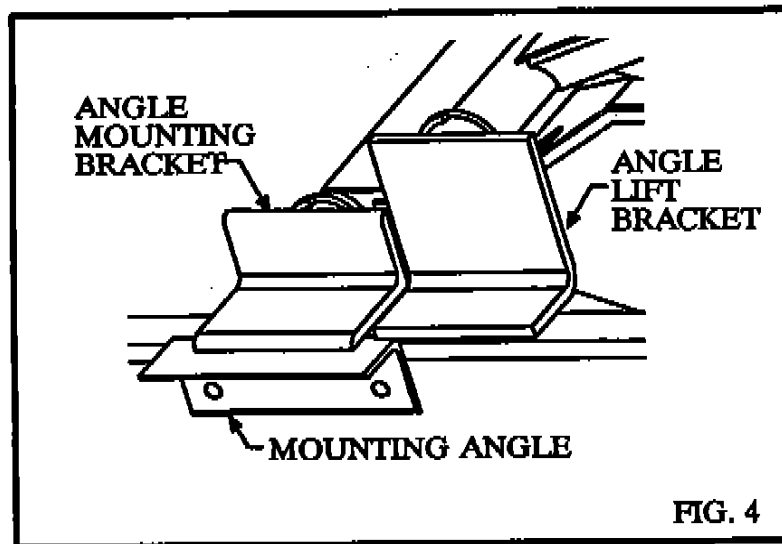
TABLE 1

MODEL	DUMP ANGLE			
	40°	45°	50°	55°
1500	113"	97"	88"	81"
1900	113"	97"	88"	81"
3300	136"	123"	111"	102"
4400	136"	123"	111"	102"
5500	171"	153"	140"	128"
6600	191"	171"	156"	143"
7700	208"	186"	169"	155"

123" - 57°

MOUNT HOIST TO TRUCK FRAME

Center the mounting angles under the angle mounting brackets on the hoist. Clamp them in place and mark the truck frame for drilling, using the mounting angles as guides. (See Fig. 4)



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

Drill $2\frac{1}{32}$ inch holes in the truck frame and

bolt the mounting angles in place using $\frac{5}{8} \times 1\frac{3}{4}$ cap screws, lock washers and hex nuts. Securely weld the angle mounting brackets to the mounting angles.

MOUNT PUMP

Determine which side of the truck frame to mount the pump (same side as the PTO opening on the transmission). Bolt the mounting angles to the pump using $\frac{3}{8} \times 1$ cap screws, flat washers, lock washers and hex nuts. Clamp the pump mounting angles to the truck frame with the pump inside the truck frame a few inches behind the cab. (See Figure 5) Check that the PTO drive shaft is long enough and does not exceed 15° in angularity. Check for sufficient clearance around the pump. Reposition the pump for the best location. Be sure the PTO shaft and the pump shaft are parallel. This improves the life

expectancy of the U-Joints. In some cases, it may be necessary to rework the exhaust system for sufficient clearance around the pump.

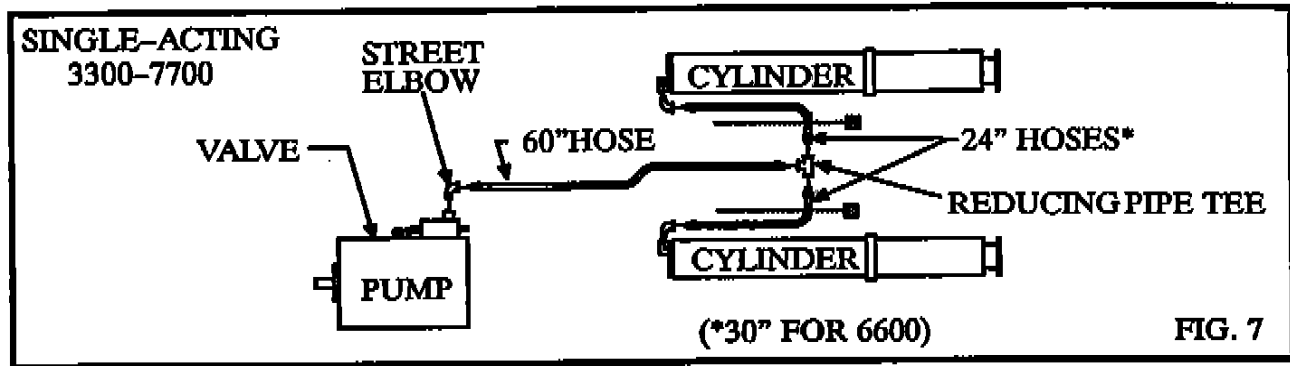
NOTE: UNDER NO CIRCUMSTANCES SHOULD THE ENGINE EXHAUST BE PERMITTED TO BLOW DIRECTLY ONTO THE PUMP!

After locating the pump, drill $\frac{17}{32}$ holes through the truck frame and bolt in place using $\frac{1}{2} \times 1\frac{3}{4}$ cap screws, lock washers and hex nuts (See caution note above).

INSTALL HOSES - SINGLE ACTING MODELS 3300 - 7700

Please study Figure 7 very carefully before installing the hoses. Install a 90° street elbow in the valve port. On Models 3300 and 4400, install 1/2 x 3/8 hex bushings in the cylinder ports. Install 90° street elbows in the cylinder ports. Connect a 60" long hose from the valve to the

reducing pipe tee. Connect a 24" long hose from the reducing pipe tee to each of the cylinders. (Refer to Fig. 18, page 18 for proper sizes of fittings and hoses for your particular hoist.) Secure the hoses to the cylinder mount with the tie straps supplied.

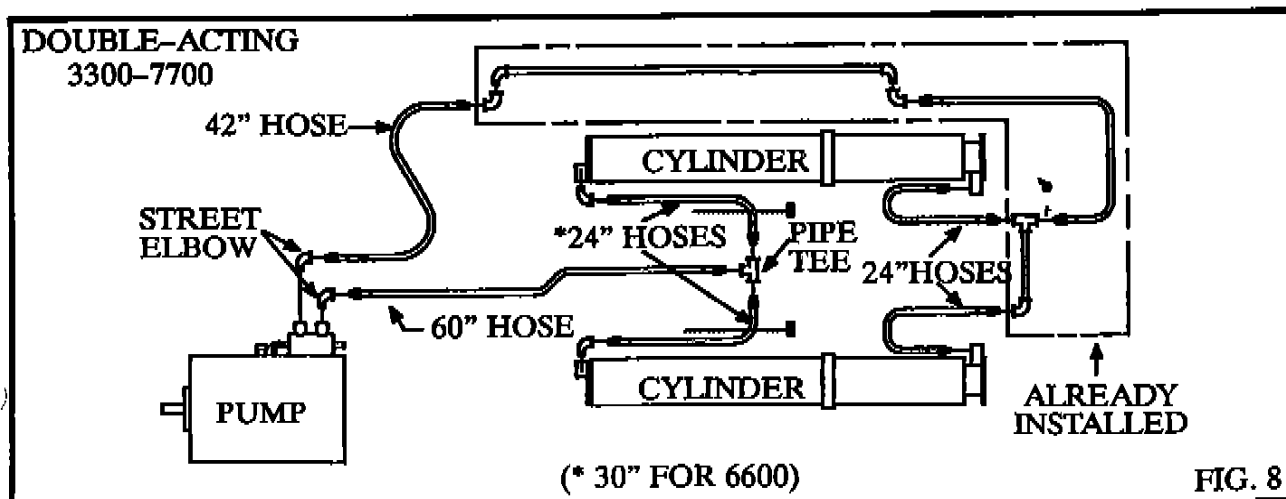


INSTALL HOSES - DOUBLE ACTING MODELS 3300 - 7700

Please study Figure 8 very carefully before installing the hoses. Install 90° street elbows in both work ports of the control valve. (Refer to Fig. 21, page 23 for proper elbow selection.) On Model 3300DA, install 1/2 x 3/8 hex bushings in the bottom cylinder ports. Install 90° street elbows in the ports on the bottom end of the cylinders. Connect a 60" long hose from the rear port on the control valve to the pipe tee. Connect a 24" hose from the pipe tee to the base end port of each cylinder. (Refer to Fig. 18, page 18 for proper sizes of fittings and hoses for your

particular hoist.) Secure the hoses to the cylinder mount with the tie straps supplied.

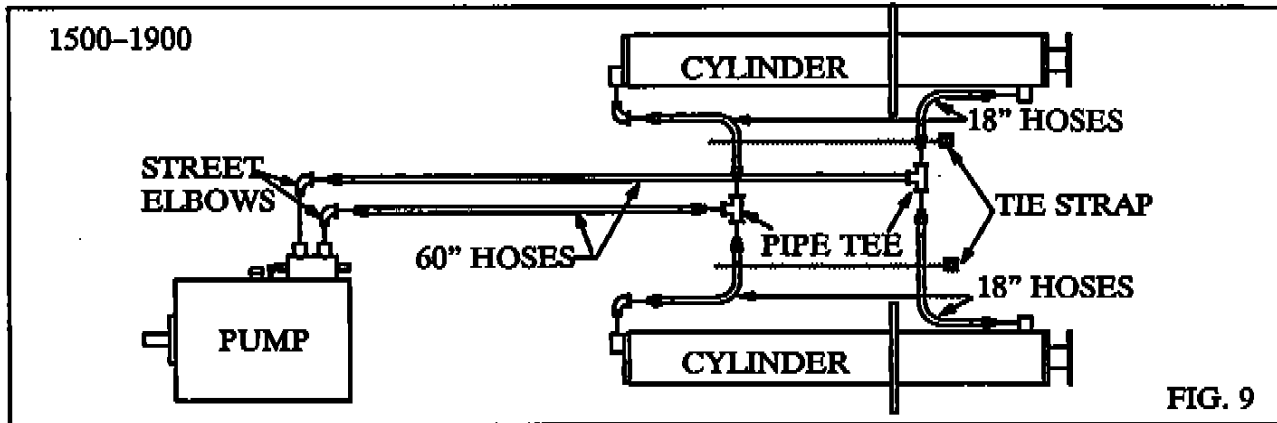
There is plumbing inside the hoist frame for the power down function of the hoist. Connect a 3/8 x 42" long hose from the front port on the control valve to the pipe elbow near the front of the hoist frame. Connect 1/4 x 24" long hoses from the elbows on the upper frame to the ports on the top end of the cylinders. When the hoses are connected properly, the hoist should raise when the control knob is pulled out and lowered when it is pushed in.



60" - INSTALL HOSES - MODELS 1500, 1900

Please study Figure 9 very carefully before installing the hoses. Install 90° street elbows in both work ports of the control valve. Install 90° street elbows in the ports on the bottom end of both cylinders. Connect a 60" long hose from the rear port on the control valve to a pipe tee. Connect 18" long hoses from the pipe tee to the ports on the bottom end of the cylinders. Connect a 60" hose from the front port on the con-

trol valve to a second pipe tee. Connect 18" long hoses from the second pipe tee to the ports on the top end of the cylinders. (Refer to Fig. 16, page 16 for proper sizes of fittings and hoses for your particular hoist.) Secure the 18" hoses to the cylinder mount using the tie straps provided. When the hoses are connected properly, the hoist should raise when the control knob is pulled out and lowered when it is pushed in.



ADD HYDRAULIC OIL

Refer to TABLE 2 below for the amount of hydraulic oil required to operate the hoist. Use a quality hydraulic fluid of 150 SSU @ 100°F. which contains corrosion and oxidation inhibitors and a foam depressant. This is approxi-

mately the equivalent of SAE 10W or lighter weight oil, or use Type A automatic transmission fluid for improved performance in cold weather.

TABLE 2

HOIST MODEL	RESERVOIR SIZE	OIL REQUIRED	HOIST MODEL	RESERVOIR SIZE	OIL REQUIRED
1500-4	15QT	11QTS	4400	27QT	27QTS
1500-8	21QT	13QTS	5500	42QT	34QTS
1900	21QT	15QTS	6600	42QT	34QTS
3300	27QT	20QTS	7700	42QT	42QTS

GREASE HOIST

Install grease zerks and lubricate in the following locations:

- | | |
|--------------------|------------------------|
| A. Upper Crosstube | 2 fittings |
| B. Lower Crosstube | 2 fittings |
| C. U-Joints | 3 fittings (Installed) |
| D. Body Props | 2 fittings |
| E. Rear Hinge | 2 fittings (Installed) |

Lubricate all fittings at regular intervals, at least

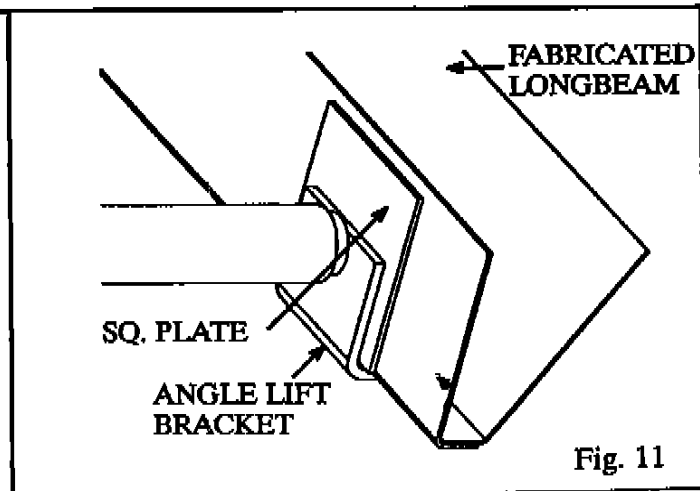
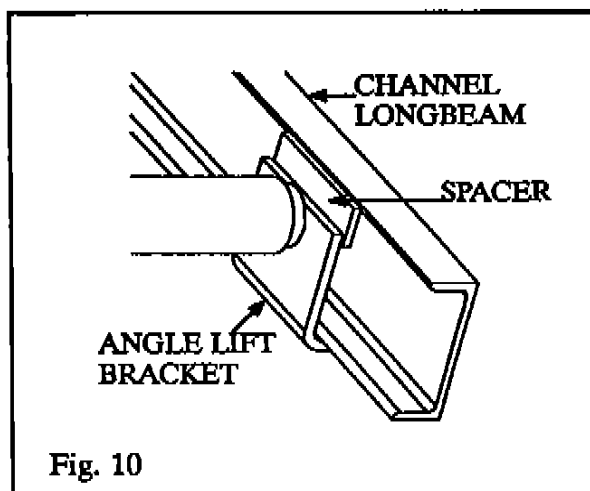
every 200 cycles or 2 months. There are very high forces on the bearing surfaces within the hoist frame. It pays to be generous in lubricating the hoist to ensure proper operation and long life.

NOTE: The crossheads, the lower cylinder mount pivots and the center hinge of the hoist are equipped with SELF LUBRICATING COMPOSITE BEARINGS. These points do not need to be greased.

MOUNT BODY

It is recommended that the body be painted before it is mounted on the truck. Place the body in position on the truck with three inches of clearance behind the cab. Use the rivet strip mounting pads between the longbeams and the truck frame. Use three on each side, spaced as seen on Fig. 2 on page 5 or Fig. 3 on page 6. Weld them to the longbeams. Align body longbeams carefully with the truck frame. Securely weld the longbeams to the rear hinge brackets.

Weld the longbeams securely to the angle lift brackets of the hoist. On the inside of the longbeams, securely weld the flat spacer to the top of the angle lift bracket and to the top flange of the longbeam channels as shown in Fig. 10. For Crysteel's new grain body, place the 9 inch square plate between the angle lift bracket and the inside of the longbeam as shown in Fig. 11. Securely weld this plate to the longbeam and to the angle lift bracket. Be sure to do this on both sides.



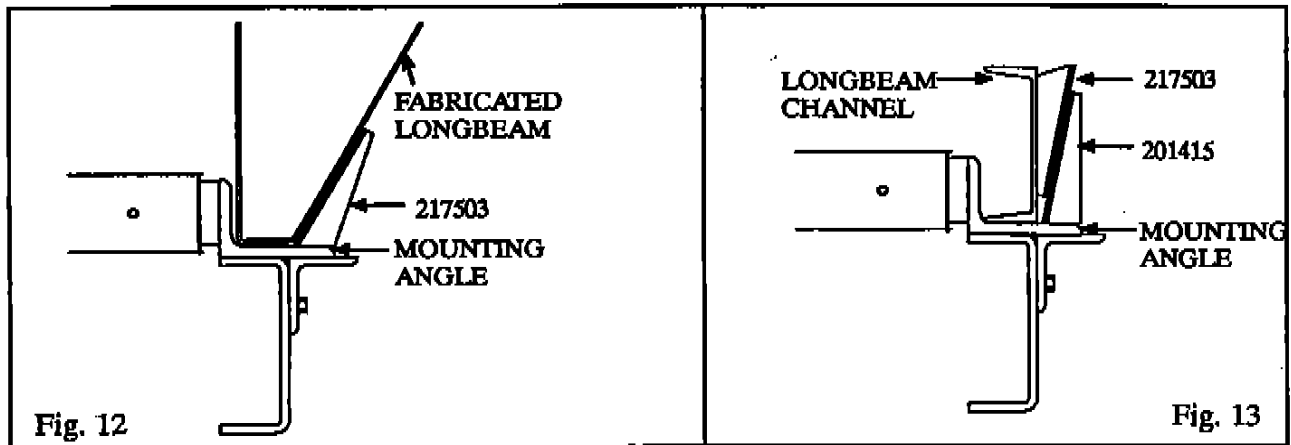
INSTALL BODY GUIDES

The four body guides supplied with your hoist are of two types. Part number 201415 has an obtuse angle that allows it to match the angle of fabricated longbeams. Position this type as shown in Fig. 12 with wide end down, pushed against the longbeam, and centered over the hoist lower mounting angle. Weld securely to the mounting angles. **DO NOT** use the other body guides with fabricated longbeams.

Part number 217503 body guide is used with

channel type longbeam and has a right angle that allows it to be positioned as shown in Fig. 13. Position this guide 1/4" away from the longbeam, centered over the lower mounting angle. Place the 201415 body guide inside of it as shown so that the flat sides of the guides fit together. Weld number 217503 to the lower mounting angle and 201415 to the longbeam.

There should be **NO SIDEPLAY** when the truck body is in the lowered position.



INSTALL BODY PROP

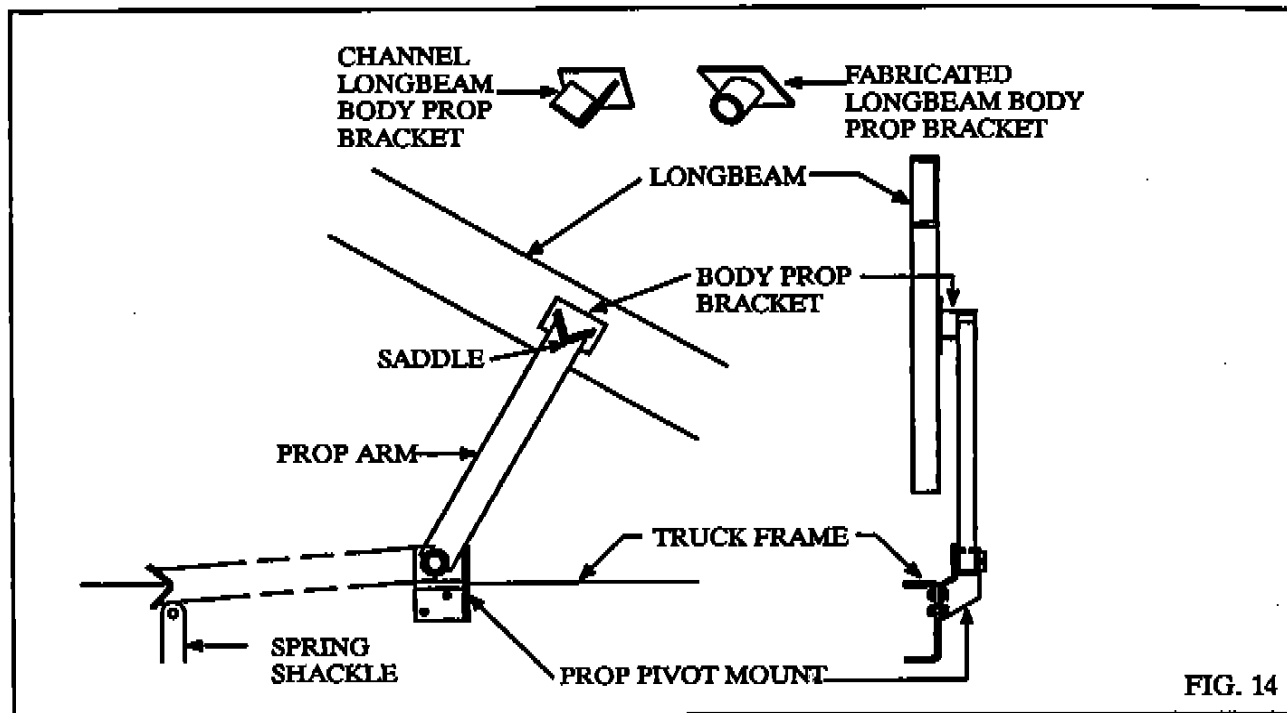
The body prop is designed and intended to support an **EMPTY** truck body in the raised position. Use of the body prop permits service to be performed safely beneath a raised body. One body prop is included with Stingray Hoist models 1500 and 1900; two body props (one pair) are included with models 3300 through 7700. Be sure to install each prop on the correct side of the truck as explained below.

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 1 3/4 cap screws, lock washers and hex nuts. 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. **DO NOT POWER HOIST DOWN.**
 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.



BLEED CYLINDERS - SINGLE ACTING

After the body and the body prop have been installed, use the hoist to raise the body to its full height. Shut off the engine and place the control valve in neutral. Raise the body props to their support positions. Lower the body to within four inches of the body props. Very carefully, slowly loosen the valve cap on the top end of one of the cylinders - **DO NOT REMOVE IT!** When oil starts seeping out through the hole in

the valve cap, tighten it. Repeat this for the other cylinder. After both cylinders have been bled, raise the body, lower the body prop and lower the body.

NOTE: Double-acting cylinders do not have bleed valves because they bleed themselves in use. Cycle the hoist several times to remove any air from the cylinders.

INSTALL DECALS

There should be a total of 9 decals supplied in the manual packet. Be sure that you have all of them as shown on the following page. If you do not, notify Crysteel and we will gladly supply

those missing. Be careful that the decals are placed in the proper places and are applied to a clean, dry surface. Installation is not considered complete without all decals in place.

OPERATION OF BODY PROP

1. Raise body to full height and shut off all power.
2. Raise prop to upright position.
3. Lower body slowly until body bracket contacts prop.
4. **DO NOT POWER HOIST DOWN.**

400719-Place on longbeam near body prop. on drivers side.

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

400642-Place in cab of truck where easily seen.


CAUTION

UNLOAD BODY BEFORE USING BODY PROP.

400661-Place one on each body prop arm.

DANGER

- DO NOT GO UNDER RAISED BODY IT MAY DROP AND KILL YOU
- OPERATE HOIST CONTROLS ONLY FROM INSIDE TRUCK CAB



401576-Place on longbeams near front of body. One on each side. (2)

DOUBLE ACTING VALVE
OUT-RAISE; CENTER-HOLD; IN-LOWER

TO USE HYDRAULIC LOCK-DOWN
 CONTINUE POWER DOWN UNTIL RELIEF VALVE BY-PASSES; THEN SET IN "HOLD" POSITION.

400640-Place in cab next to hoist cable. (for DOUBLE ACTING MODELS ONLY)

DANGER

- DO NOT GO UNDER RAISED BODY IT MAY DROP AND KILL YOU
- OPERATE HOIST CONTROLS ONLY FROM INSIDE TRUCK CAB



401577-Place in cab of truck where easily seen.

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.

400643-Place on longbeam near body prop, on drivers side.

FIG. 15

ROUTINE MAINTENANCE

LUBRICATE REGULARLY

Install grease zerks and lubricate the Stingray Hoist in the following locations:

- A. U-joint 3 fittings
- B. Body Prop 2 fittings
- C. Upper Crosstube 2 fittings
- D. Lower Crosstube 2 Fittings
- E. Rear Hinge 2 Fittings

Lubricate all fittings at regular intervals, at least every 200 cycles or 2 months. There are very

high forces on the bearing surfaces within the hoist frame. It pays to be generous in lubricating the hoist to ensure proper operation and long life.

NOTE: The crossheads, the lower cylinder mount pivots and the center hinge of the hoist are equipped with SELF LUBRICATING COMPOSITE BEARINGS. These points do not need to be greased.

CHANGE HYDRAULIC OIL

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

Use 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, or use Type A automatic transmission oil for improved performance in cold weather. Refer to chart on page 10 for the amount of oil needed.

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

LUBRICATE VALVE CONTROL CABLE

With normal use and working conditions the control cable should be oiled annually. With heavy use or very dusty conditions it should be oiled more often. Raise the body and rest it on the body props. Remove the valve guard cover. Disconnect the control cable from the control valve lever, remove the control wire from the control cable housing and oil the inside of the control cable housing. Reinsert the control wire in the control cable housing to center detent position and reattach the control cable to the control valve lever. Check for proper operation and

adjust if necessary. Reinstall the valve guard on the pump.

NOTE: It is extremely important that the valve guard cover remain in place. It should be removed ONLY for lubrication or adjustment of the lever or cable, then replaced immediately. It protects the lever and cable from the weather and corrosion. It also prevents operation of the valve from outside the cab. NEVER, under any circumstances, try to operate the valve manually from outside the cab.

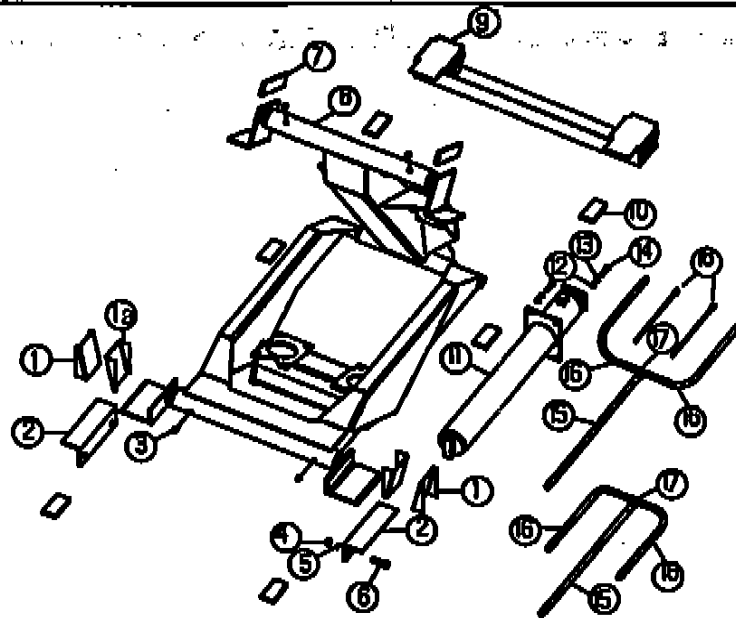
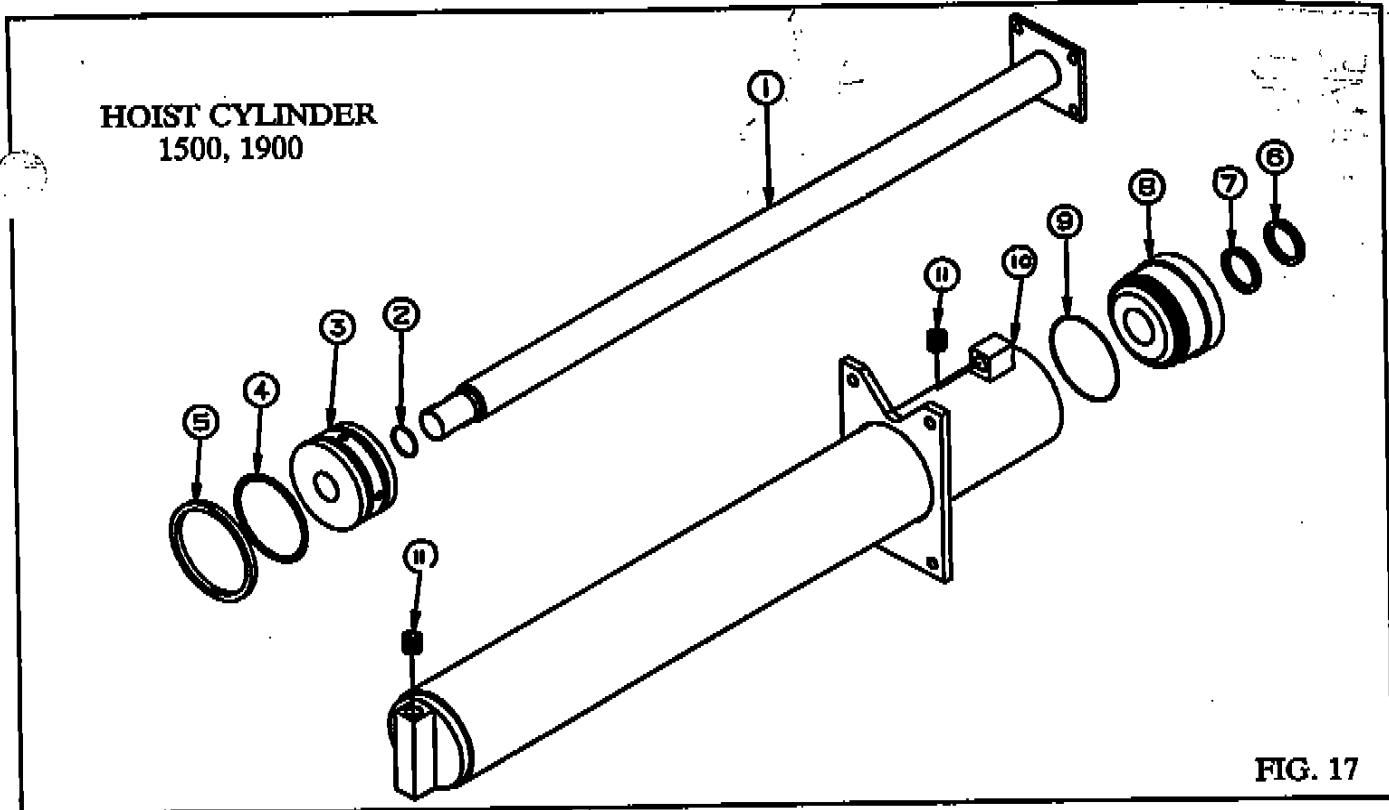
STINGRAY PARTS LIST**HOIST FRAME
1500, 1900**

FIG. 16

FRAME PARTS LIST 1500-1900

ITEM	PART NO.	DESCRIPTION	QTY.
1.	201415	Body Guide	2
1a.	217503	Body Guide	2
2.	201422	Mounting Angle	2
3.	400103	Grease Zerk	4
4.	400181	Hex Nut 5/8 NC	4
5.	400160	Lock Washer 5/8	4
6.	400100	Hex Cap Screw 5/8 NC X 1 3/4	4
7.	200900	Longbeam Filler	2
8.	111716	Hoist Frame - 1500	1
	112972	Hoist Frame - 1900	1
9.	106060	Rear Hinge	1
10.	200892	Longbeam Spacer	6
11.	112138	Cylinder - 1500	2
	111717	Cylinder - 1900	2
12.	400183	Hex Nut 3/8 NC	16
13.	400162	Lock Washer 3/8	16
14.	400114	Hex Cap Screw 3/8 NC x 1 1/2	16
15.	400515	Hose 3/8 NPT x 60	2
16.	400509	Hose 3/8 NPT x 18	4
17.	400416	Tee 3/8 NPT	2
18.	401542	Tie Strap	2



CYLINDER PARTS	1500	1900
1. SHAFT ASSY	112141	112141
2. O-RING*	401131	401131
3. PISTON	215364	214838
4. O-RING*	401633	401616
5. POLYSEAL*	401634	401646
6. WIPER SEAL	401617	401617
7. POLYSEAL*	401132	401132
8. HEAD	215363	214837
9. O-RING*	401634	400957
10. OUTER TUBE ASSY	112140	111721
11. PIPE PLUG 3/8"	400422	400422
12. SEAL KIT (includes items with *)	113478	113479

HOIST FRAME 3300-7700

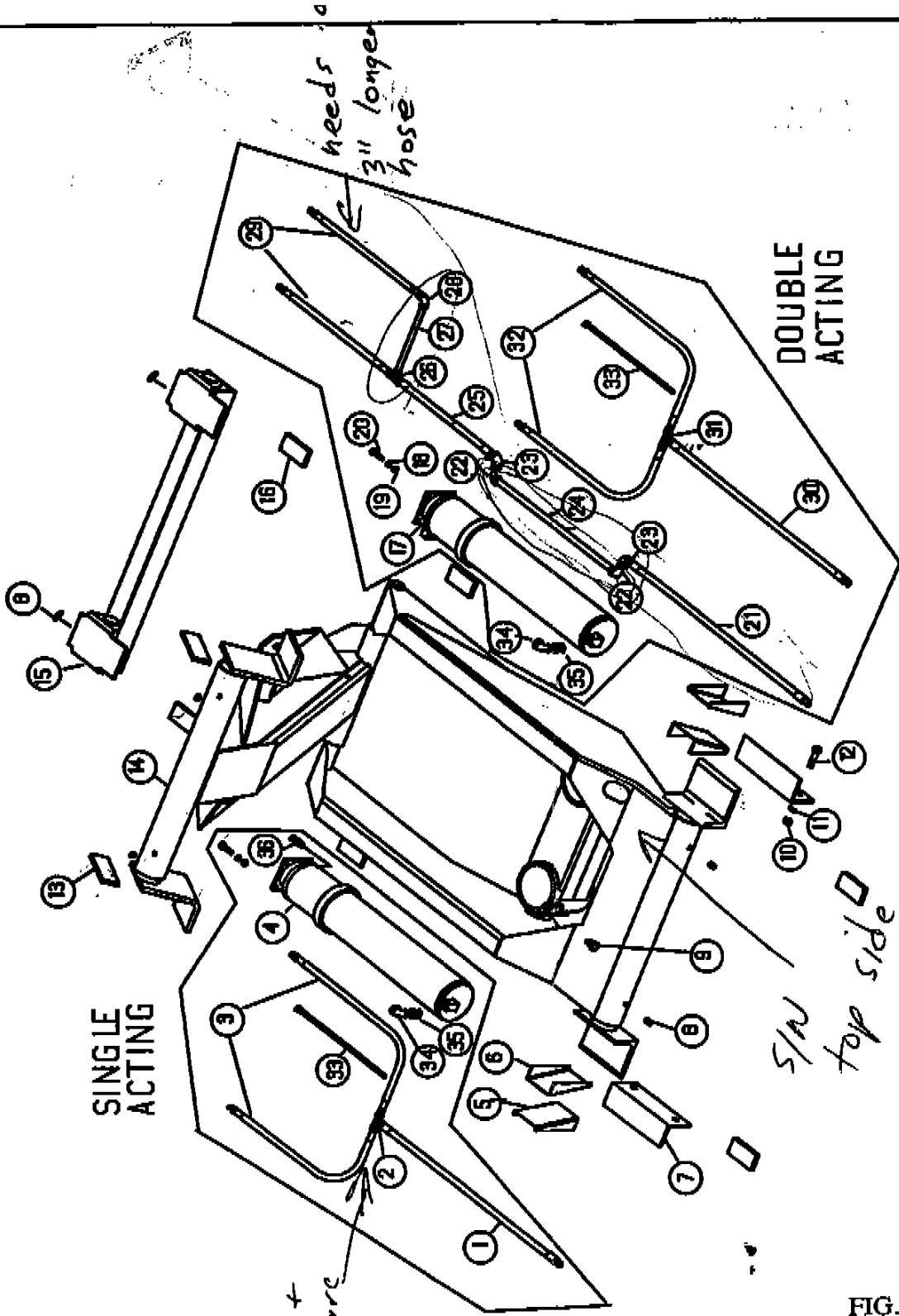


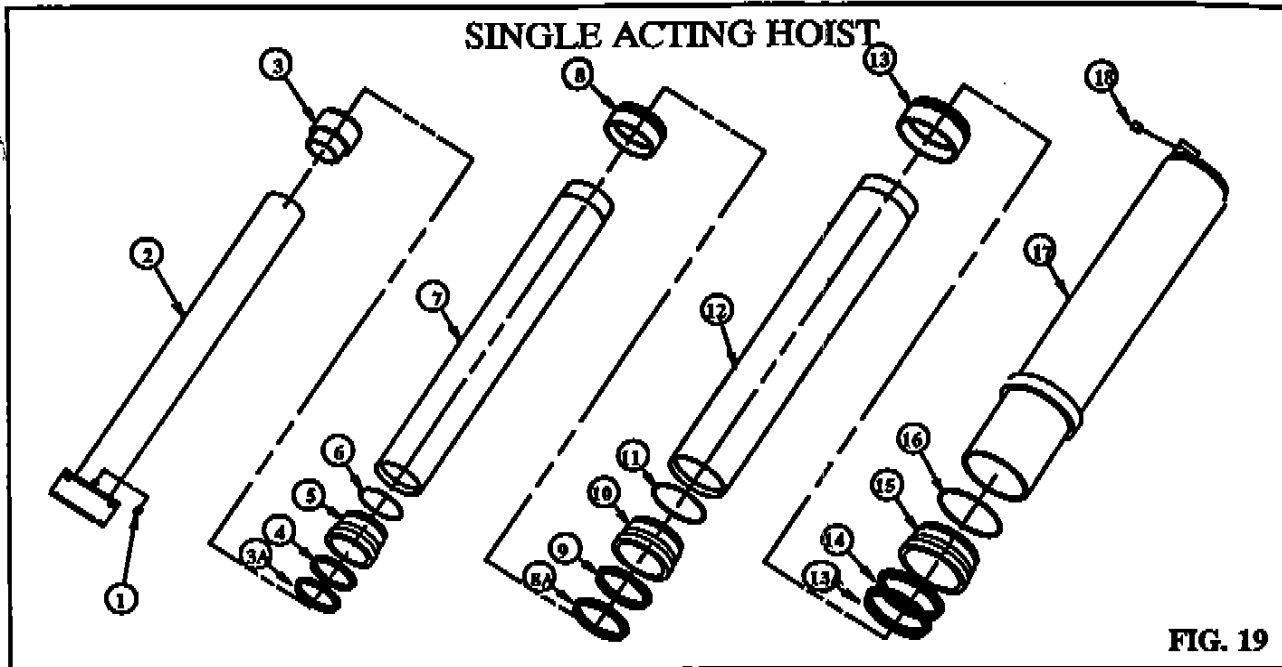
FIG. 18

STINGRAY FRAME PARTS LIST

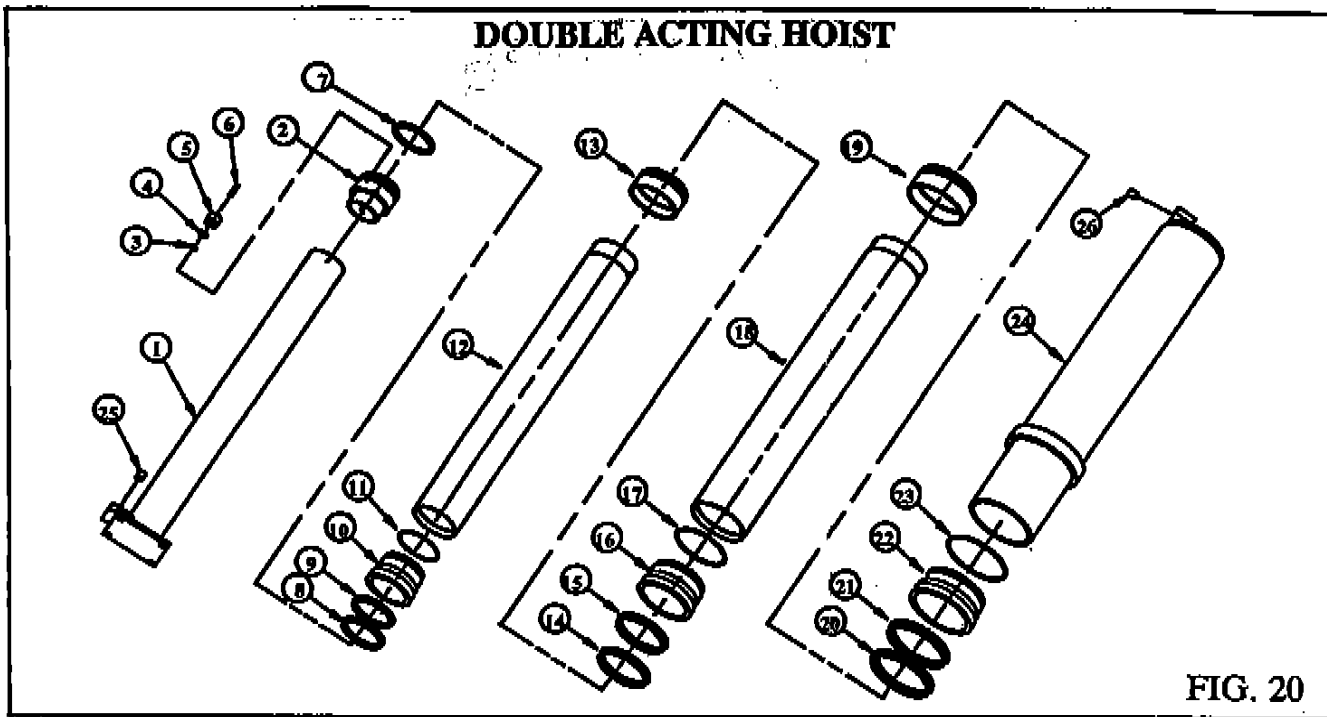
ITEM	PART NO.	DESCRIPTION	QTY.
1.	401502	Hose 1/2 NPT x 60" 3300SA, 4400SA	1
	401938	Hose 3/4 NPT x 60" 5500SA, 6600SA, 7700SA	1
2.	401934	Tee, Red. 3/8 x 3/8 x 1/2 3300SA, 4400SA	1
	401935	Tee, Red. 1/2 x 1/2 x 3/4 5500SA, 6600SA, 7700SA	1
3.	400510	Hose, 3/8 NPT x 24" 3300SA, 4400SA	2
	401755	Hose, 1/2 NPT x 24" 5500SA, 7700SA	2
	401939	Hose 1/2 NPT x 30" 6600SA	2
4.	110023	Cylinder, SA 3300	2
	110028	4400	2
	109567	5500	2
	110295	6600	2
	110374	7700	2
5.	201415	Body Guide	2
6.	217503	Body Guide	2
7.	201422	Mounting Angle, Truck Frame	2
8.	400103	Grease Zerk, 1/8 NPT	6
9.	401612	Retaining Screw	2
10.	400181	Hex Nut 5/8-11	4
11.	400160	Lock Washer 5/8	6
12.	400100	Hex Cap Screw 5/8-11 x 1 3/4	4
13.	200896	Longbeam Filler	2
14.	110021	Hoist Frame 3300SA	1
	111348	3300DA	1
	110026	4400SA	1
	111349	4400DA	1
	109655	5500SA	1
	111350	5500DA	1
	110293	6600SA	1
	111352	6600DA	1
	110373	7700SA	1
	111354	7700DA	1
15.	107073	Rear Hinge	1
16.	200890	Longbeam Spacer	6
17.	111072	Cylinder, DA 3300	2
	111073	4400	2
	111074	5500	2
	111076	6600	2
	111078	7700	2

STINGRAY FRAME PARTS CONTINUED

18.	400183	Hex Nut 3/8-16	8
19.	400162	Lock Washer 3/8	8
20.	400114	Hex Cap Screw 3/8-16 x 1 1/2	8
21.	400513	Hose 3/8 NPT x 42" ALL DA	1
22.	400412	Street Elbow 3/8	2
23.	400413	Elbow 3/8	2
24.	401521	Pipe 3/8 x 34" 3300DA, 4400DA	1
	401597	Pipe 3/8 x 46" 5500DA,	1
	401598	Pipe 3/8 x 55" 6600DA,	1
	401599	Pipe 3/8 x 62" 7700DA	1
25.	400510	Hose 3/8NPT x 24" 3300DA, 4400SA	1
	400512	Hose 3/8 x 36" 5500DA,	1
	400513	Hose 3/8 x 42" 6600DA,	1
	400514	Hose 3/8 x 48" 7700DA	1
26.	401519	Tee, Reducing 3/8 x 1/4 x 1/4	1
27	401520	Pipe 1/4 x 9"	1
28.	400417	Elbow 1/4	1
29.	400516	Hose 1/4 NPT x 24" ALL DA	2
30.	400515	Hose 3/8 NPT x 60" 3300DA	1
	401502	Hose 1/2 NPT x 60" 4400-7700DA	1
31	400416	Pipe Tee 3/8" 3300DA	1
	401364	Pipe Tee 1/2" 4400-7700DA	1
32.	400510	Hose 3/8 NPT x 24" 3300DA	2
	401755	Hose 1/2NPT x 24" 4400DA, 5500DA, 7700DA	2
	401939	Hose 1/2 NPT x 30" 6600 DA	2
33.	401542	Tie Strap	3
34	400412	Street Elbow 3/8" 3300DA, 33 & 4400SA	2
	401504	Street Elbow 1/2" 44-7700DA, 55-7700SA	2
35.	400440	Pipe Bushing 1/2 x 3/8 3300DA,3300SA,4400SA	2
36.	115311	Bleed Valve	2



SINGLE ACTING HOIST 3300-7700					
	3300	4400	5500	6600	7770
1. PIPE PLUG 1/8 NPT	400477	400477	400477	400477	400477
2. INNER TUBE ASSY	113802	113803	113804	113805	113806
3. INNER PISTON	213683	213684	213683	213683	213683
3A. WIPER 2 3/4 ID	401690	---	401690	401690	401690
4. POLYSEAL 2 3/4ID X 1/4 *	401695	---	401695	401695	401695
5. HEAD 2 3/4 ID	208341	---	208341	208341	208341
6. O-RING 2 7/8 ID X .070 *	400956	---	400956	400956	400956
7. TUBE 3 1/2 OD	217517	---	217518	217519	217520
8. PISTON 3 3/4 OD	208360	---	208360	208360	208360
8A. WIPER 3 1/2 ID	401691	401691	401691	401691	401691
9. POLYSEAL 3 1/2ID X 1/4 *	401696	401696	401696	401696	401696
10. HEAD 3 1/2 ID	208342	208342	208342	208342	208342
11. O-RING 4 1/4 ID *	400957	400957	400957	400957	400957
12. TUBE 4 1/4 OD	---	217521	217522	217523	217524
13. PISTON 4 1/4 OD	---	208361	208361	208361	208361
13A. WIPER 4 1/4 ID	---	401692	401692	401692	401692
14. POLYSEAL 4 1/4ID X 1/4 *	---	401697	401697	401697	401697
15. HEAD 4 1/4 ID	---	208343	208343	208343	208343
16. O-RING 4 1/4OD X .070 *	---	400958	400958	400958	400958
17. OUTER TUBE ASSY	113797	113798	113799	113800	113801
18. PIPE PLUG 3/8 NPT	401753	401753	401753	401753	401753
HEX BUSHING 1/2NPTX3/8NPT	400440	400440	---	---	---
19. SEAL KIT (includes *)	114346	114347	114348	114348	114348



DOUBLE ACTING HOIST 3300-7700					
	3300	4400	5500	6600	7700
1. INNER TUBE ASSY	113811	113812	113813	113814	113815
2. PISTON INNER	218237	218238	218237	218237	218237
3. BALL 3/8 DIA.	400013	400013	400013	400013	400013
4. O-RING 7/16 I.D. X .070	401017	401017	401017	401017	401017
5. BY PASS PLUG	400978	400978	400978	400978	400978
6. BY PASS SHAFT	401338	401338	401338	401338	401338
7. SEAL, PIP 3" O.D. *	401777	---	401777	401777	401777
SEAL, PIP 3 3/4 O.D. *	---	401778	---	---	---
8. WIPER 2 3/4 I.D.	401690	---	401690	401690	401690
9. SEAL, BS 2 3/4 I.D. X 1/4" *	401695	---	401695	401695	401695
10. HEAD 2 3/4" I.D.	208341	---	208341	208341	208341
11. O-RING 2 7/8 I.D. X .070 *	400956	---	400956	400956	400956
12. TUBE 3 1/2 O.D.	218231	---	218232	218233	218234
13. PISTON 3 1/2"	208360	---	208360	208360	208360
14. WIPER 3 1/2" I.D.	401691	401691	401691	401691	401691
15. SEAL, BS 3 1/2 I.D. X 1/4" *	401696	401696	401696	401696	401696
16. HEAD 3 1/2 I.D.	208342	208342	208342	208342	208342
17. O-RING 3 1/2 I.D. X .070 *	400957	400957	400957	400957	400957
18. TUBE 4 1/2" O.D.	---	218235	217522	217523	217524
19. PISTON 4 1/4"	---	208361	208361	208361	208361
20. WIPER 4 1/4 I.D.	---	401692	401692	401692	401692

DOUBLE ACTING PARTS LIST CONTINUED

	3300	4400	5500	6600	7700
21. SEAL, BS 4 1/4 LD. X 1/4 *	---	401697	401697	401697	401697
22. HEAD 4 1/4 LD.	---	208343	208343	208343	208343
23. O-RING 4 1/4 LD. X .070 *	---	400958	400958	400958	400958
24. OUTER TUBE ASSY	113797	113798	113799	113800	113801
25. PIPE PLUG 1/8 NPT	400428	400428	400428	400428	400428
26. PIPE PLUG 1/2 NPT	401753	401753	401753	401753	401753
27. SEAL KIT (includes *)	114350	114351	114352	114352	114352

STINGRAY HYDRAULICS

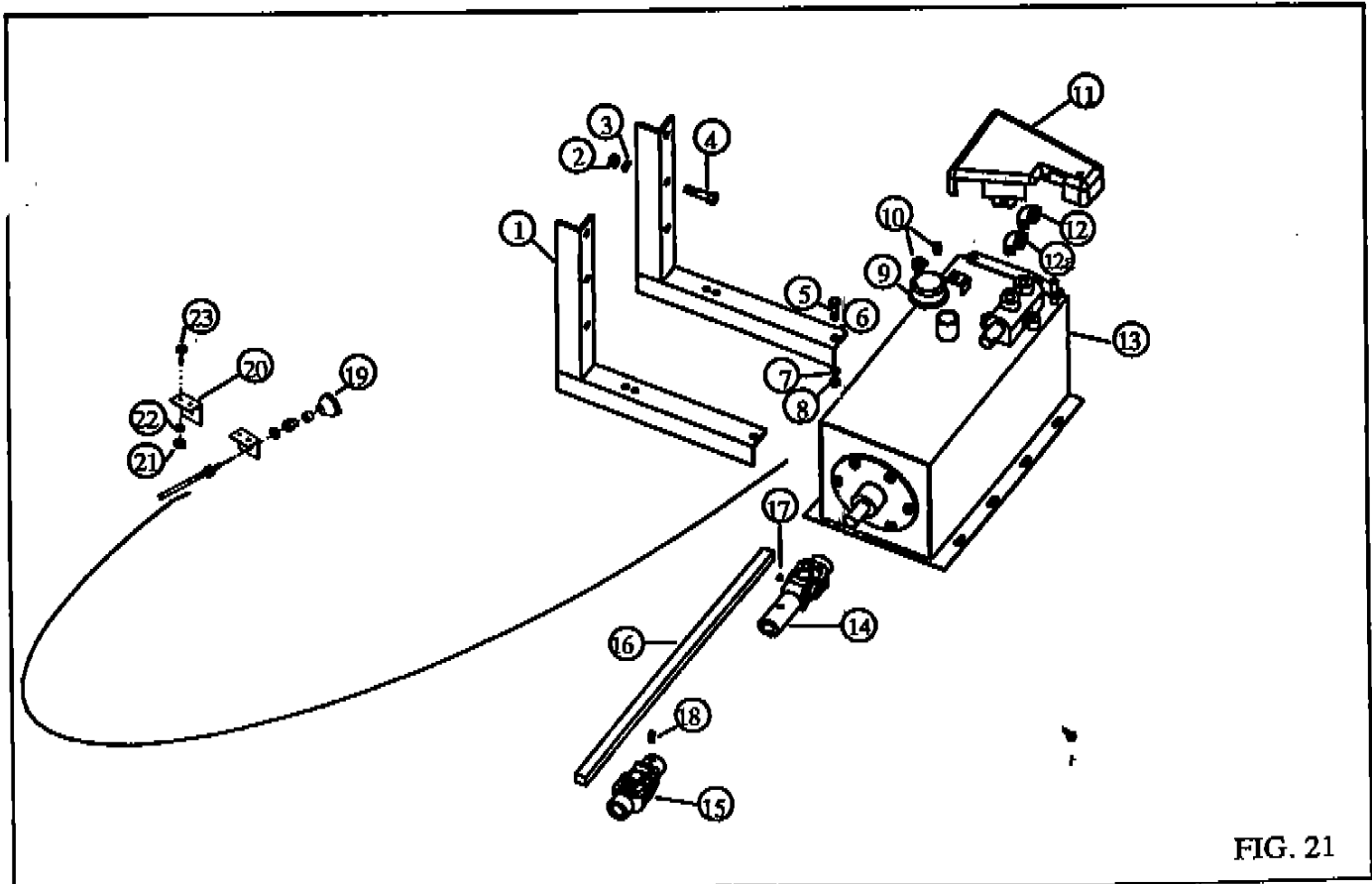


FIG. 21

STINGRAY HYDRAULIC PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY.
1.	100511	Pump Angle	2
2.	400182	Hex Nut 1/2-13	4
3.	400161	Lock Washer 1/2	4
4.	400104	Cap screw 1/2 x 1 3/4	4
5.	400121	Cap Screw 3/8 x 1	4
6.	400164	Flat Washer 3/8	4
7.	400162	Lock Washer 3/8	4
8.	400183	Hex Nut 3/8-16	4
9.	400764	Wms Breather Cap	1
10.	400741	Control Cable Clamp	1
11.	400807	Pump Valve Shield	1
12.	400412	Street Elbow 3/8	3300DA 1
	401504	Street Elbow 1/2	3300SA, 4400SA 1
	401936	Street Elbow 1/2 x 3/8 red	4400-7700DA 1
	401756	Street Elbow 3/4 x 1/2 red.	5500-7700SA 1
12a.	400412	Street Elbow 3/8"	3300-7700DA 1
13.	SA	DA Wms Pump	
		401661 1500-4	4 GPM, 15 Qt. 1
		401662 1500-8	8 GPM, 21 Qt. 1
		401662 1900-8	8 GPM, 21 Qt. 1
	401396	400324 3300	8 GPM, 27 Qt. 1
	401395	400319 4400	8 GPM, 27 Qt. 1
	401397	401548 5500	12 GPM, 40 Qt. 1
	401397	401548 6600	12 GPM, 40 Qt. 1
	401397	401548 7700	12 GPM, 40 Qt. 1
14.	400583	Slip Joint -Long	1
15.	400578	U-Joint Std.	1
16.	200885	Driveshaft 7/8 Sq. x 48"	1
17.	400103	Grease Zerk 1/8	1
18.	400102	Set Screw 3/8 x 1/2	3
19.	400025	Control Cable 15'	1
20.	201391	Control Cable Bracket-Dash	2
21.	400101	Cap Screw 1/4 x 3/4	4
22.	400163	Lock Washers 1/4	4
23.	400184	Hex Nut 1/4-20	4

SPECIALLY DESIGNED – WITH QUALITY IN MIND**WARRANTY**

- Crysteel Manufacturing, Inc. warrants its products for a period of one year from date of purchase.
- The warranty provides that our products must perform satisfactorily or we will repair, replace or refund the purchase price at the option of the purchaser. Hydraulic pumps, valves, hoses and other purchased parts are covered by the warranties of their respective manufacturers.
- Any parts returned to Crysteel Manufacturing, Inc. shall be shipped prepaid, and will be returned F.O.B. Lake Crystal, Minnesota.
- We will not assume responsibility for shipping, labor or travel expenses.
- The warranty is void if the product has been obviously abused, or subjected to other than normal usage.
- We reserve the right to make improvements without notice or obligation regarding models previously sold.

! 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.

401509B 041092

HWY. 60 E. / P.O. BOX 178 LAKE CRYSTAL, MN. 56055-0178
