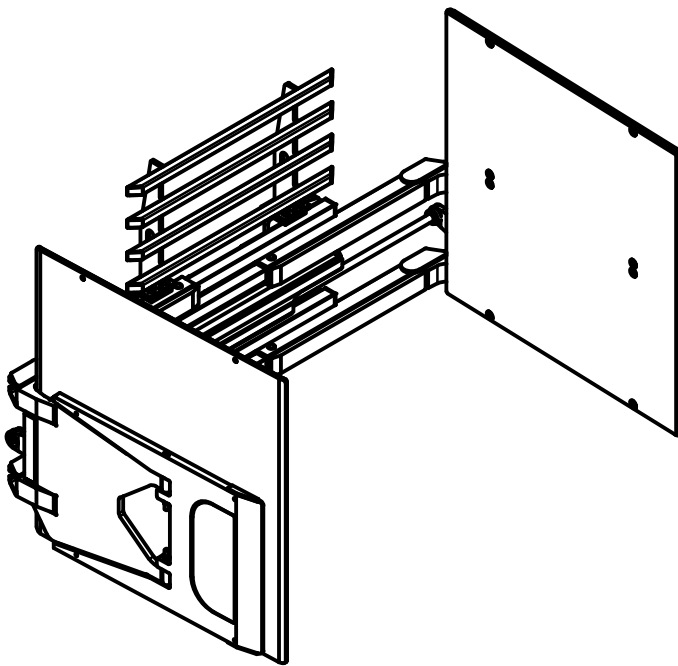




SERVICE MANUAL / PARTS LIST

TIPLING CLAMP 113922



CONTENTS:

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1	Lift Truck Requirements General Installation Procedures General Inspection
2-4	Clamp Assembly
5-6	Carriage Assembly
7-8	Hydraulic Assembly
9	Clamp Cylinder Assembly
10	Carriage Cylinder Assembly
11	Clamp Valve Assembly
12	Adjusting Relief Pressure
13	Arm Slide & Shim Replacement
14	Troubleshooting Guide

Specifications:

Mounting: Class II

Capacity: 1500 lbs at 24"

Pad Size: 30" High x 34" Long

Range: 23" - 82"

Frame: 45" Wide

Solenoid: 12V With 36V Converter

Rotation: 90° Forward

425 Hazel St.
Kelso WA 98626
(800) 248-6079
Fax (360) 578-9934

LIFT TRUCK REQUIREMENTS

CAPACITY

Capacity shown on the clamp's name plate is for the clamp only. The combined truck and clamp capacity is provided by the lift truck manufacturer.

CLAMP HYDRAULICS

Recommended Truck Pressure: 2000 PSI (140 bar)

Oil volume: 6-10 GPM (22.5 to 38 l/min)

Hydraulic fluid: petroleum based hydraulic fluid only

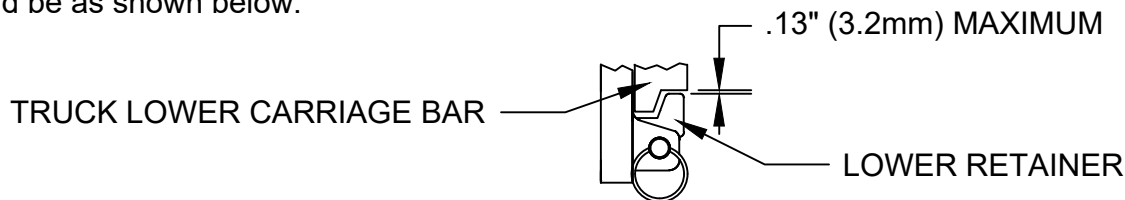
Hydraulic supply group: includes hoses and take-up - one set for each function

Auxiliary valve:

2 Function (Side Shift & Clamp) = double auxiliary valve

GENERAL INSTALLATION PROCEDURES

1. Make sure the attachment's centering lug is correctly seated in truck carriage center notch.
2. Clearance between the lower retainers that hold the attachment to the truck's lower carriage bar should be as shown below.



3. Connect hydraulic jumper hoses from the truck's supply group to solenoid and bulkhead fittings.
4. Standing clear of the clamp attachment, cycle the attachment open and close several times to distribute the hydraulic oil. Use caution because partially filled hydraulic lines may cause erratic movement.

GENERAL INSPECTION

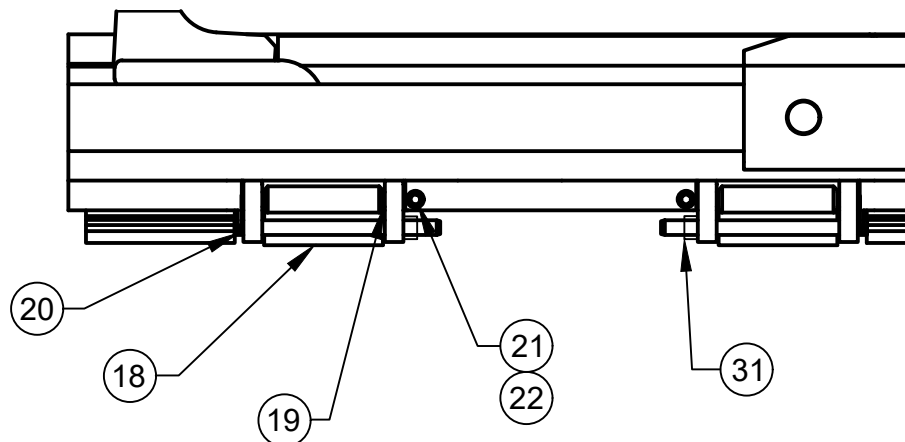
1. Check all hydraulic fittings, hoses, cylinders and valves for leakage. Repair or replace as required
2. Check hoses for pinch points and signs of wear. Replace worn hoses with LORON hose or Parker 560TJ hose (wire reinforced hose only).
3. All bolts should be checked and tightened as required.
4. Check lower retainer clearance referenced in item 2 of the General Installation Procedures above. A shim may be tack-welded to the bottom of the lower retainers to tighten the clearance if necessary.

CLAMP ASSEMBLY - 1

Drawing Reference: 114109.1

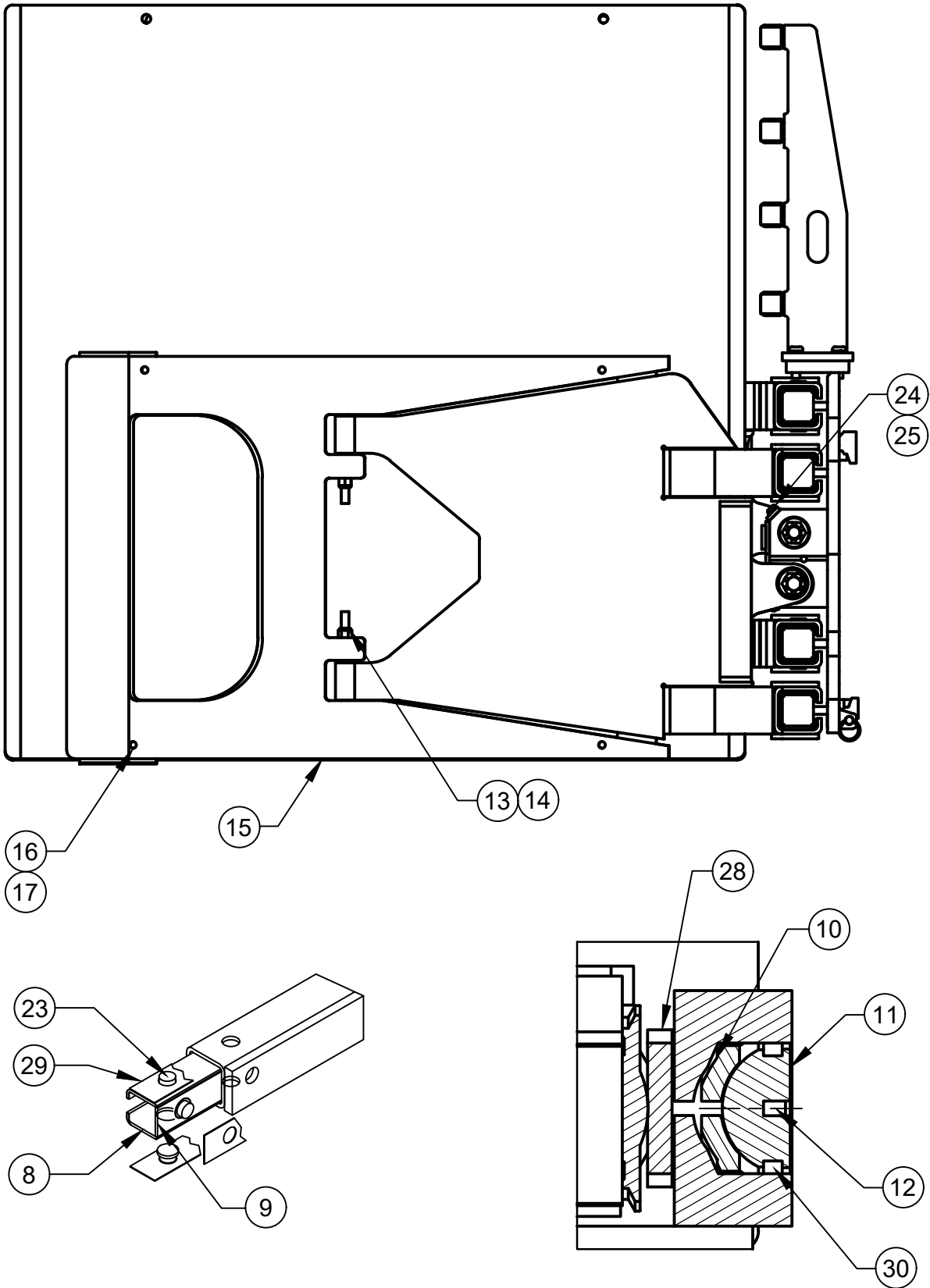
#	QTY	PART #	DESCRIPTION
1	1	111932.2	Frame Weldment
2	2	100954.39	Pad
3	1	111936.9	Right Hand Arm
4	1	111935.9	Left Hand Arm
5	2	101251.41	Cylinder Assembly
6	1	113386.5	Load Backrest
7	1	101917.8	Front Cover
8	8	111621.3	Angle Plastic Slide
9	4	111622.3	Flat Plastic Slide
10	4	110730	Spherical Seat
11	4	110731	Spherical Bearing
12	4	100574.83	Cotter Pin
13	4	11G.08136	Bolt
14	4	17D.08	ESNA Nut
15	2	109874.13	Pad Support
16	8	1C.0820	Bolt
17	8	108088	Spring Washer
18	2	100470.1	Lower Hook
19	2	100077.3	Round Bar
20	2	11G.08104	Bolt
21	2	11G.0612	Bolt
22	2	16E.06	High Collar Lock Washer
23	12	111619	Slide Button
24	2	25G.0612	Bolt
25	2	4E.06	Lock Washer
26	8	25G.0832	Bolt
27	8	4E.08	Lock Washer
28	4	100047	Cylinder Washer
29	12	103340.1	Shim
30	4	100029.314	O-Ring
31	2	17D.08	ESNA Nut
32	-	-	-

Drawing Reference: 114109.1



CLAMP ASSEMBLY - 3

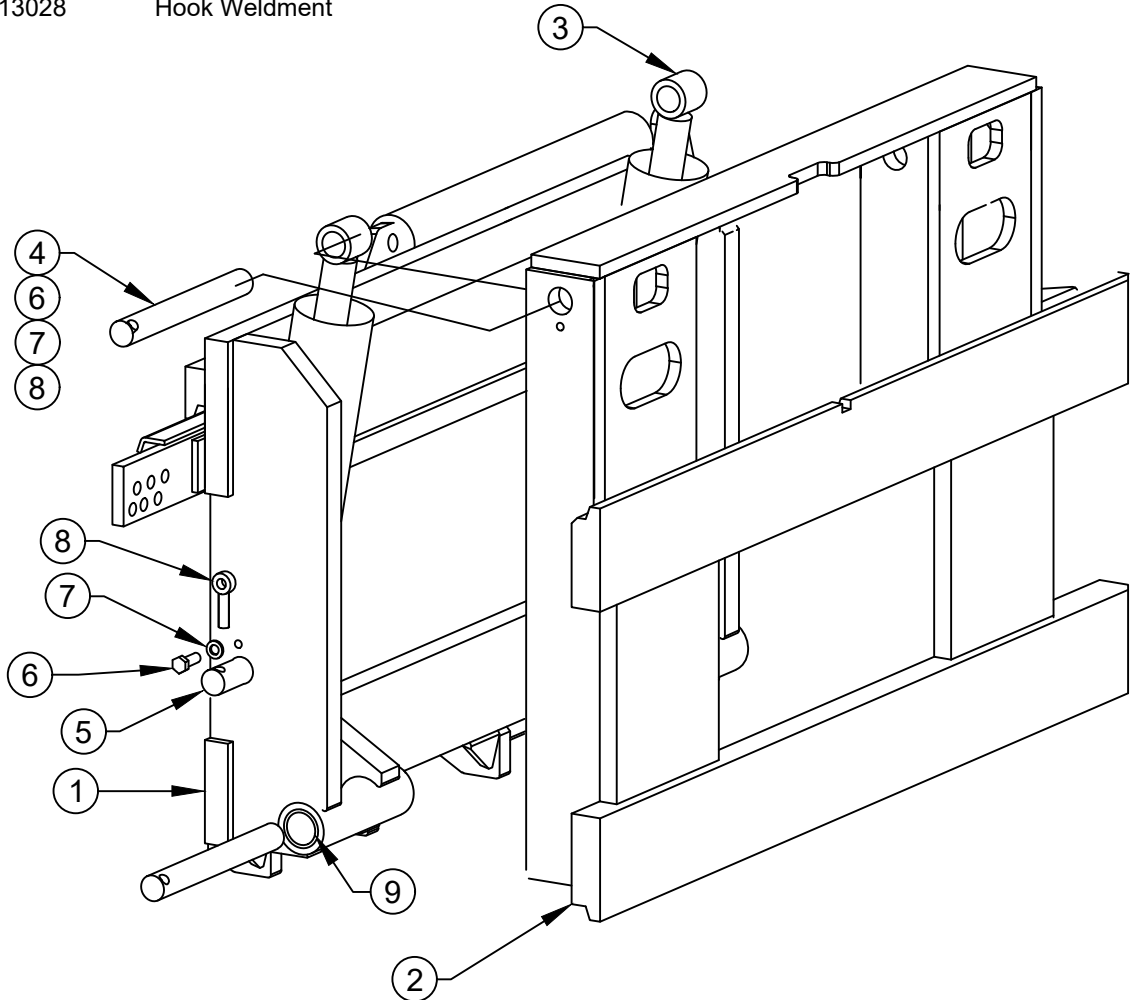
Drawing Reference: 114109.1



CARRIAGE ASSEMBLY - 1

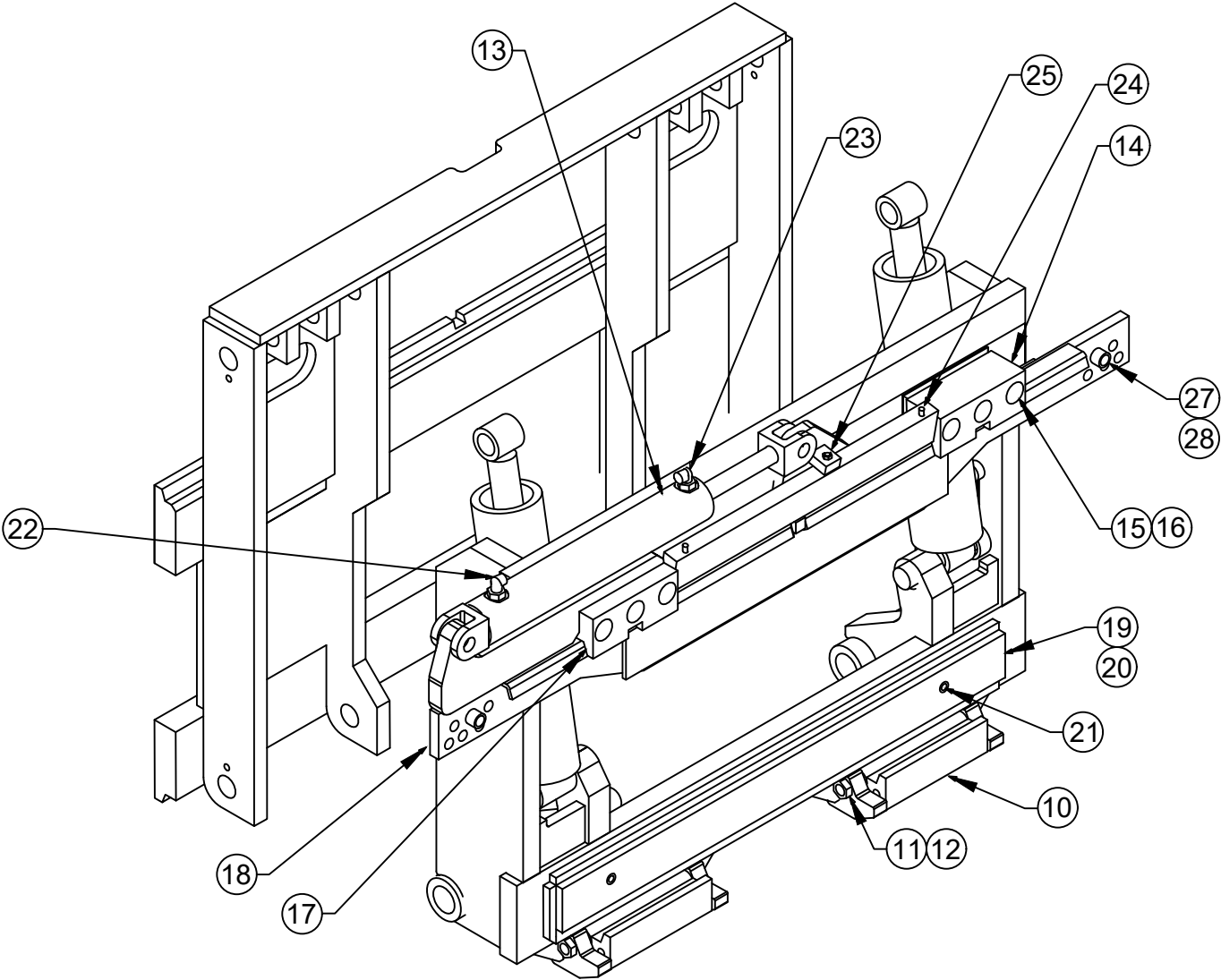
Drawing Reference: 114094

#	QTY	PART #	DESCRIPTION				
1	1	114703	Base Carriage Weldment	15	6	11G.1040	Bolt LSP
2	1	108919	Front Carriage Weldment	16	6	16E.10	Lockwasher LSP
3	2	109058	Cylinder Assembly	17	2	108421	Slide II
4	4	100663.14	Chrome Pin	18	1	113029	Cylinder Anchor Weldment
5	2	100663.5	Chrome Pin	19	1	113262	Lower Slide
6	6	1C.0616	Hex HD Bolt LSP	20	1	113150.2	Shim
7	6	4E.06	Lockwasher LSP	21	2	25GN.0612	Bolt LSP
8	6	101294.5	Lock Pin LSP	22	1	100095.05	Fitting LSP
9	4	100785.2	Bushing	23	1	100222.1	Restrictor Fitting
10	2	107870.1	Retainer Lower	24	2	100075.14	Grease Fitting LSP
11	2	11G.08136	Bolt Socket HD LSP	25	1	108272	Brass Setscrew
12	2	17D.08	Nut Nylock LSP	26	1	7D.06	Jam Nut LSP
13	1	100106	Cylinder Assembly	27	2	11G.0808	Bolt Socket HD LSP
14	1	113028	Hook Weldment	28	2	16E.08	Lockwasher LSP



CARRIAGE ASSEMBLY - 2

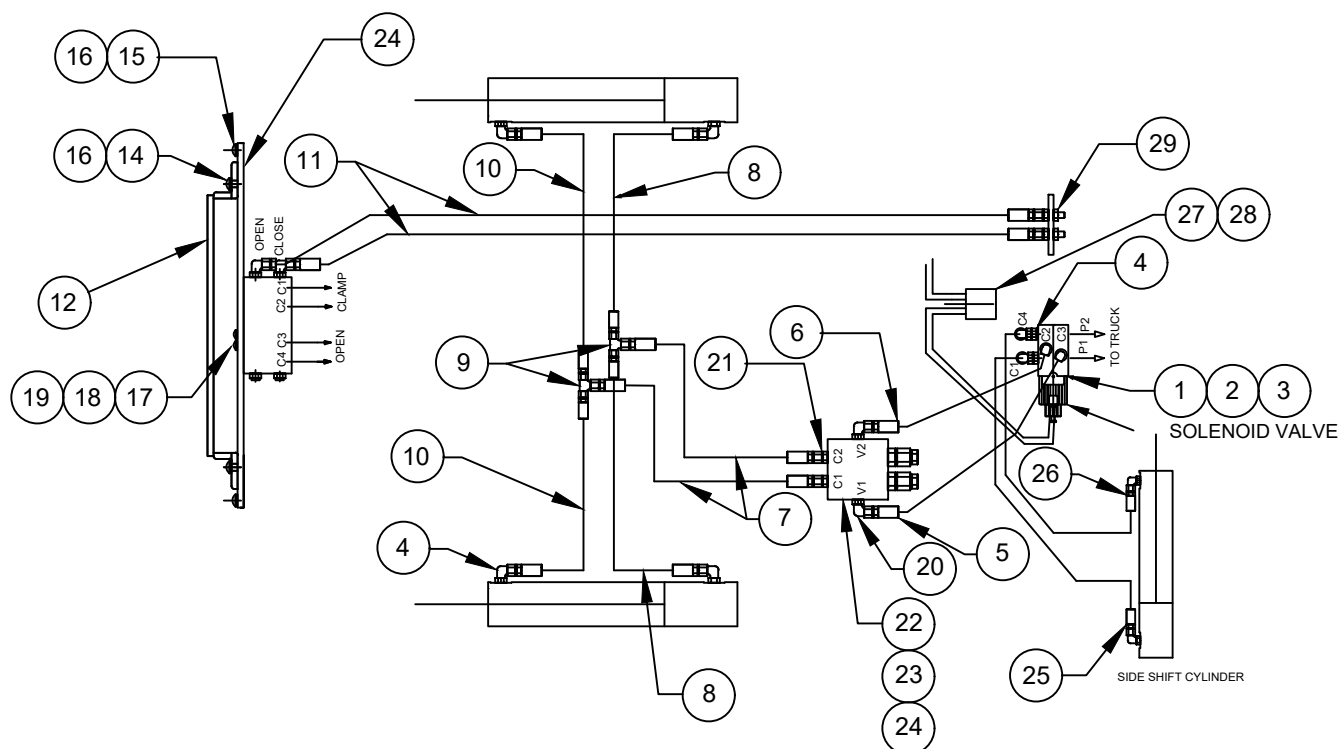
Drawing Reference: 114094



HYDRAULIC ASSEMBLY - 1

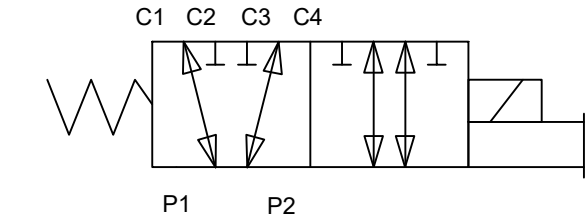
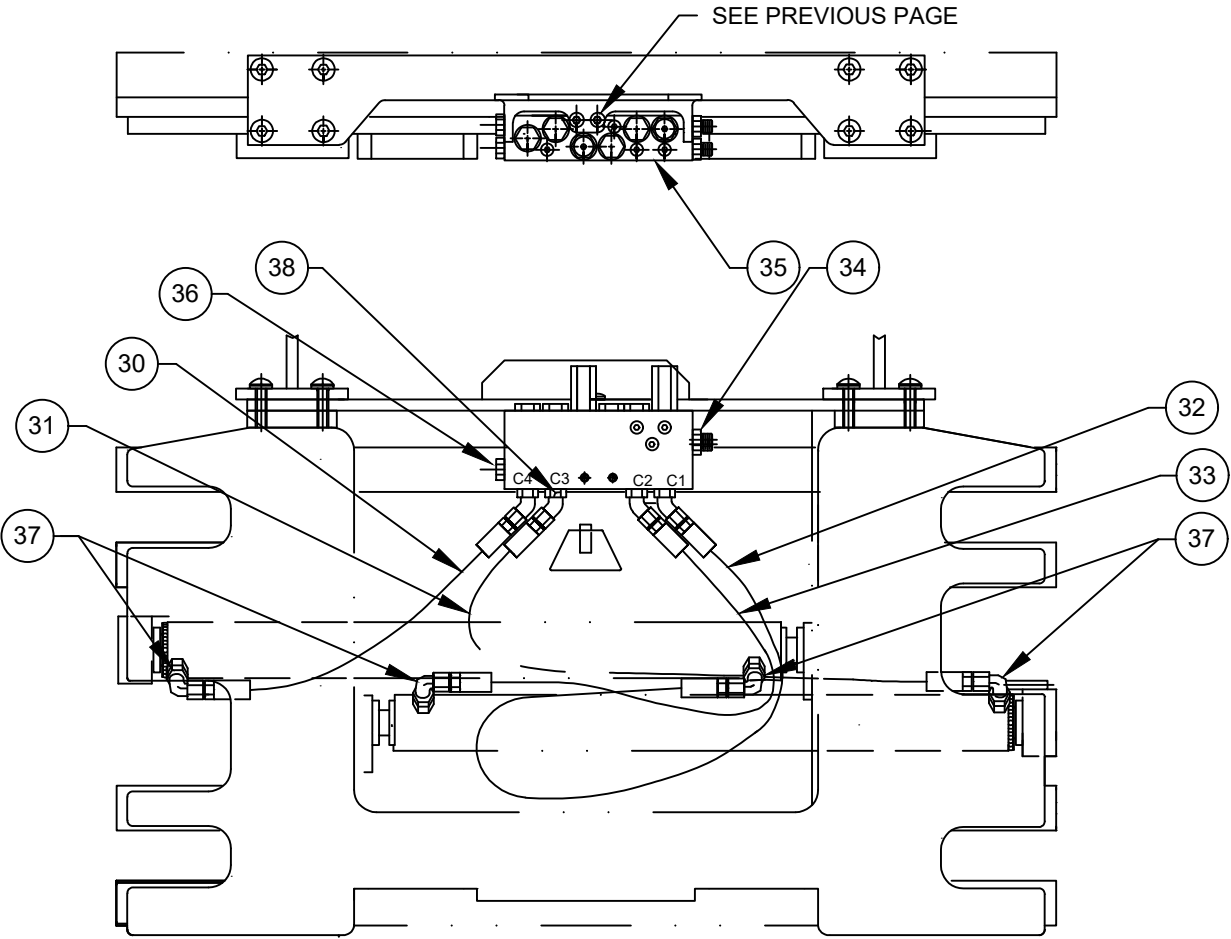
Drawing Reference: 114100

#	QTY	PART #	DESCRIPTION				
1	1	100841.1	Solenoid Valve 12V	20	2	100095.16	90° Elbow 10-6 LSP
2	2	1C.0448	Bolt Hex HD	21	2	100676.052	Straight Thread Adapter 10-6 LSP
3	2	4E.04	Lockwasher LSP	22	1	114101	Dual Counterbalance Valve
4	10	100095.05	90° Elbow LSP	23	2	1C.0640	Bolt Hex HD LSP
5	1	100233.0142	Hose Assmbly 6-4-6 LSP	24	2	4E.06	Lockwasher LSP
6	1	100233.0210	Hose Assmbly 6-4-6 LSP	25	1	100233.0202	Hose Assm 6-4-6 LSP
7	2	100233.0177	Hose Assmbly 6-4-6 LSP	26	1	100233.0120	Hose Assm 6-4-6 LSP
8	2	100233.0130	Hose Assmbly 6-6 LSP	27	1	112898	Voltage Reducer 36V to 12V
9	2	100678.05	Branch Tee LSP	28	2	21G.1006	Bolt Hex Soc HD LSP
10	2	100233.0190	Hose Assmbly 6-6 LSP	29	2	100744.05	Bulkhead FTG LSP
11	2	100674.0340	Hose Assmbly 6-6 LSP	30	1	100674.0200	Hose Assembly 6-6 LSP
12	1	108214	Valve Guard WDMT	31	1	100674.0335	Hose Assembly 6-6 LSP
13	1	103084	Mounting Bracket WDMT	32	1	100674.0380	Hose Assembly 6-6 LSP
14	4	25G.0824	Bolt Button HD LSP	33	1	100674.0250	Hose Assembly 6-6 LSP
15	4	25G.0820	Bolt Button HD LSP	34	2	100676.05	Straight Thread Adapter Fitting LSP
16	8	4E.08	Lockwasher LSP	35	1	100011	Clamp Valve w/ Flow Divider
17	2	25G.0516	Bolt Button HD LSP	36	2	101419.05	Hollow Hex Plug LSP
18	2	4E.05	Lockwasher LSP	37	4	100095.05	90° O-Ring LSP
19	2	2F.05	Flat Washer LSP	38	4	100254.05	45° O-Ring Elbow LSP

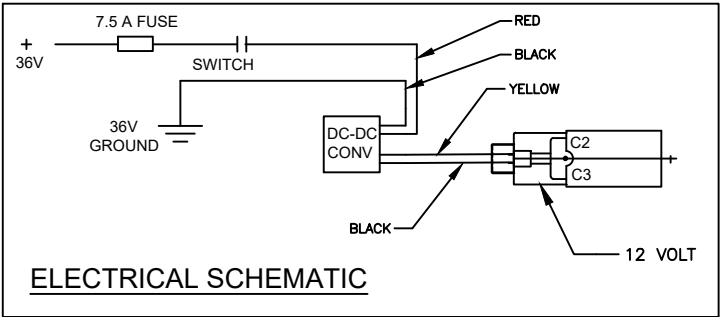


HYDRAULIC ASSEMBLY - 2

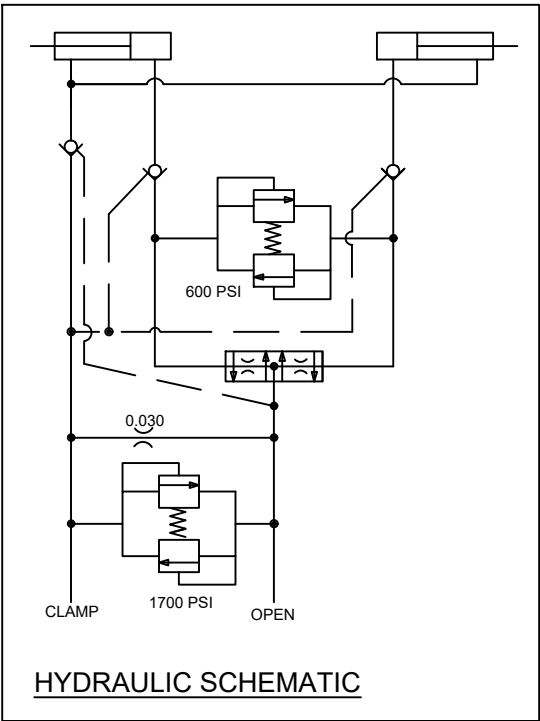
Drawing Reference: 114100



SOLENOID VALVE SCHEMATIC



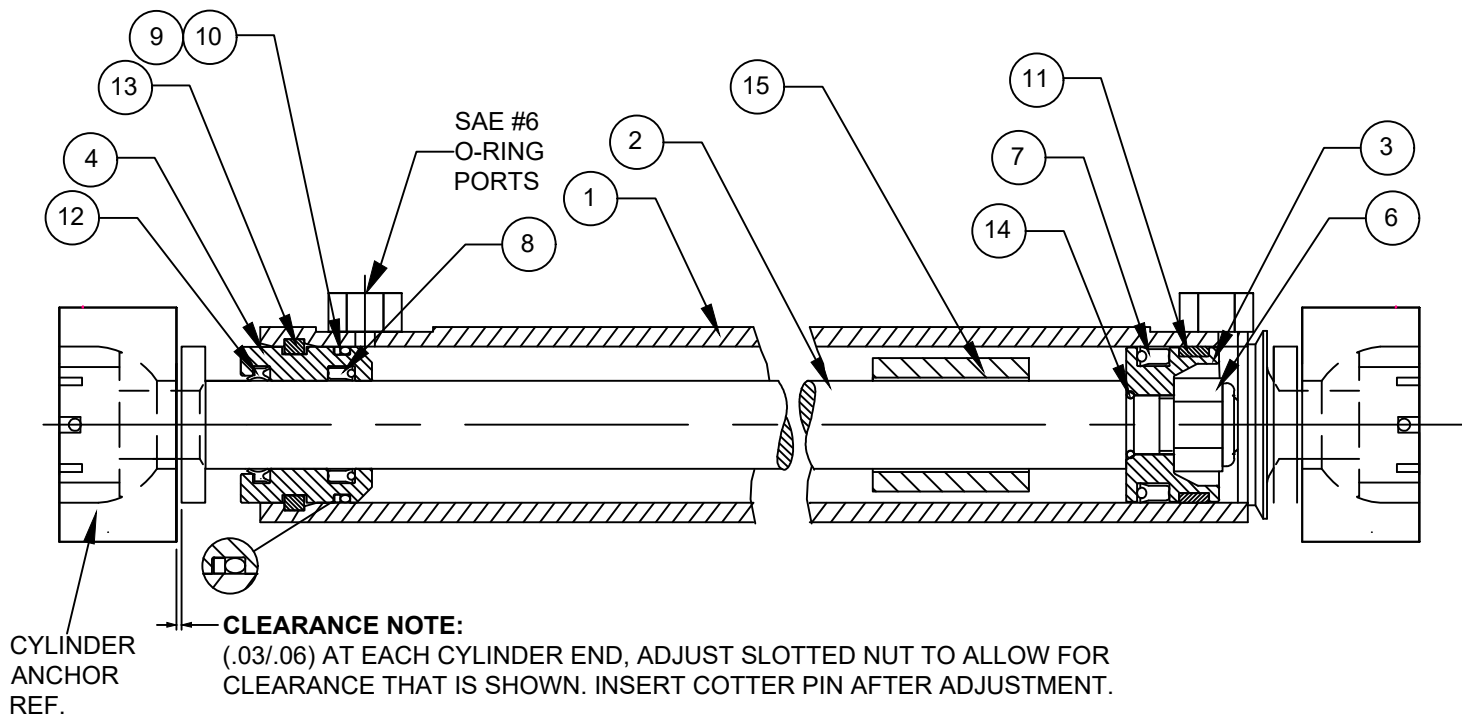
ELECTRICAL SCHEMATIC



HYDRAULIC SCHEMATIC

CLAMP CYLINDER ASSEMBLY

Drawing Reference: 101251.41



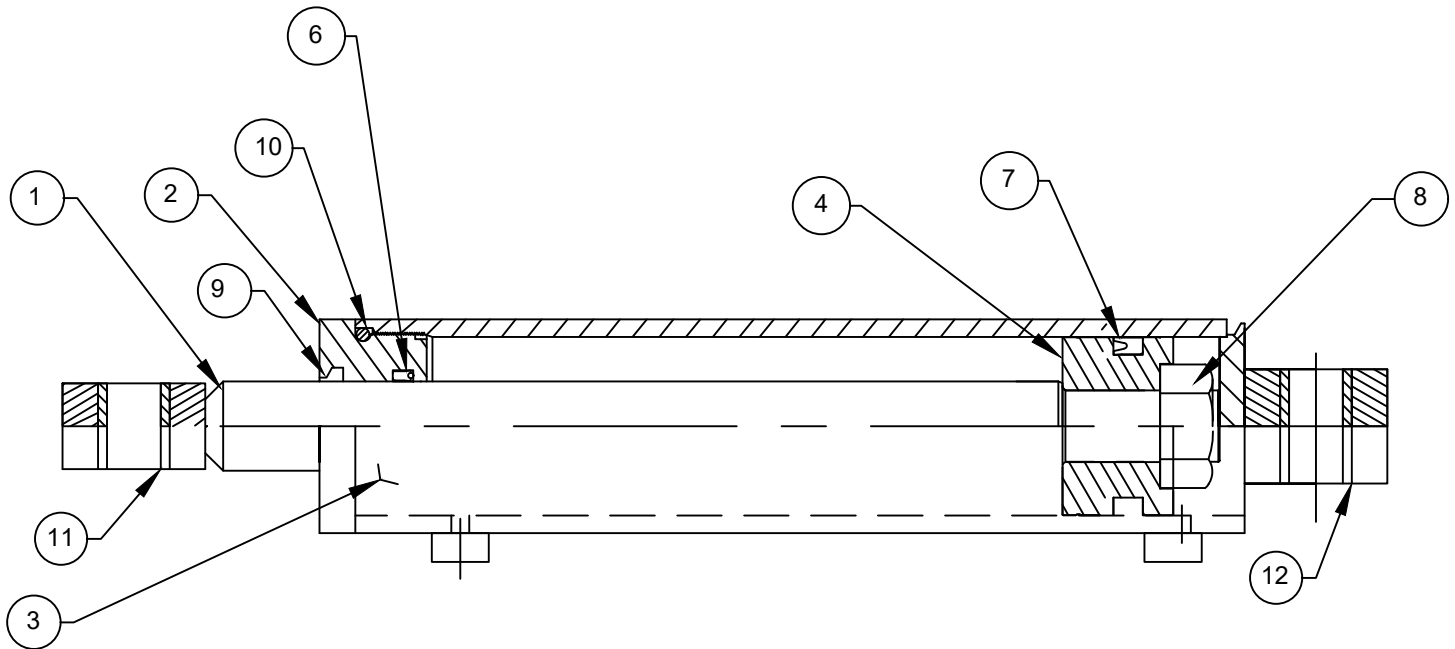
#	QTY	PART #	DESCRIPTION
1	1	101257.39	Cylinder Tube
2	1	100965.67	Rod
3	1	101256	Piston
4	1	101254	Gland
5	1	101261	Seal Kit (Items 6 thru 13)
6	1	101035	Modified ESNA Nut
7	1	100032.095	Poly Pak LSP
8	1	100031.059	Poly Pak LSP
9	1	100028.314	Back-up Ring LSP
10	1	100029.314	O-Ring LSP
11	1	101260	Wear Ring
12	1	101034.6	Wiper Ring
13	1	100027.2	Lockwire
14	1	100029.203	O-Ring LSP
15	-	-	Spacer

CYLINDER SERVICE

- Prior to assembly lubricate seals, cylinder bore and rod with STP.
- Inspect all parts for scratches, nicks and gouges. Replace all damaged components.
- Inspect cylinder bore and rod for scoring. Replace if scored.
- Avoid damage to seal grooves. Use a dull screwdriver for seal removal.
- Torque piston nut to 200 FT-LBS.

CARRIAGE CYLINDER ASSEMBLY

Drawing Reference: 109085



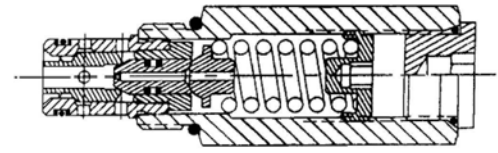
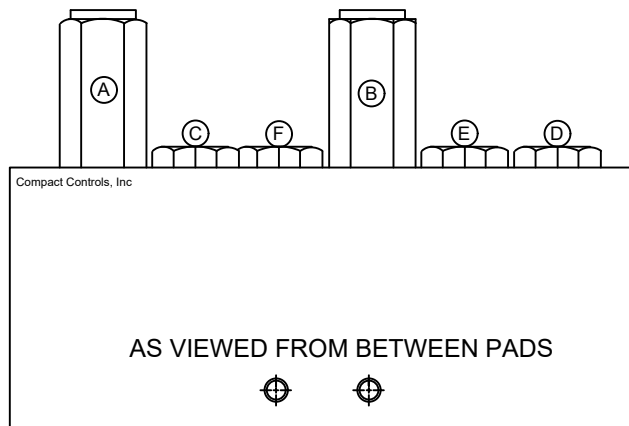
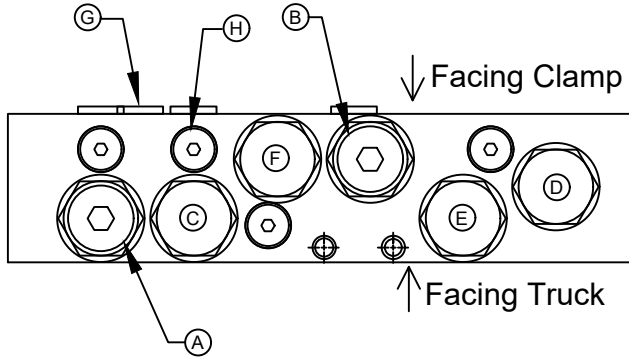
#	QTY	PART #	DESCRIPTION
1	1	109059	Rod Weldment
2	1	102242	Gland Nut
3	1	103994	Tube Weldment
4	1	109061	Piston
5	1	109271	Seal Kit (Items 6-11)
6	1	100031.5	Polypak BS LSP
7	1	100032.14	Polypak Seal LSP
8	1	109322	Modified Self-locking Nut LSP
9	1	103208.4	Wiper Ring LSP
10	1	100029.10	O-Ring LSP
11	1	100785.3	Bushing
12	1	100785.2	Bushing

CYLINDER SERVICE

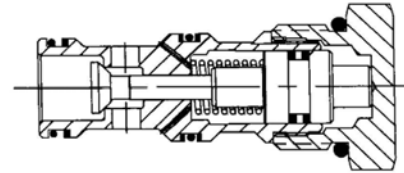
- Prior to assembly lubricate seals, cylinder bore and rod with STP.
- Inspect all parts for scratches, nicks and gouges. Replace all damaged components.
- Inspect cylinder bore and rod for scoring. Replace if scored.
- Avoid damage to seal grooves. Use a dull screwdriver for seal removal.
- Torque piston nut to 350 FT-LBS.

CLAMP CONTROL VALVE

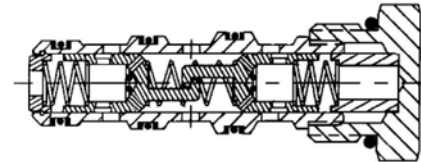
Drawing Reference: 100011



(B) 103815 BIDIRECTIONAL RELIEF
(A) 103815.1 BIDIRECTIONAL RELIEF
 TORQUE TO 35-40 FT/LBS
 104716 SEAL KIT

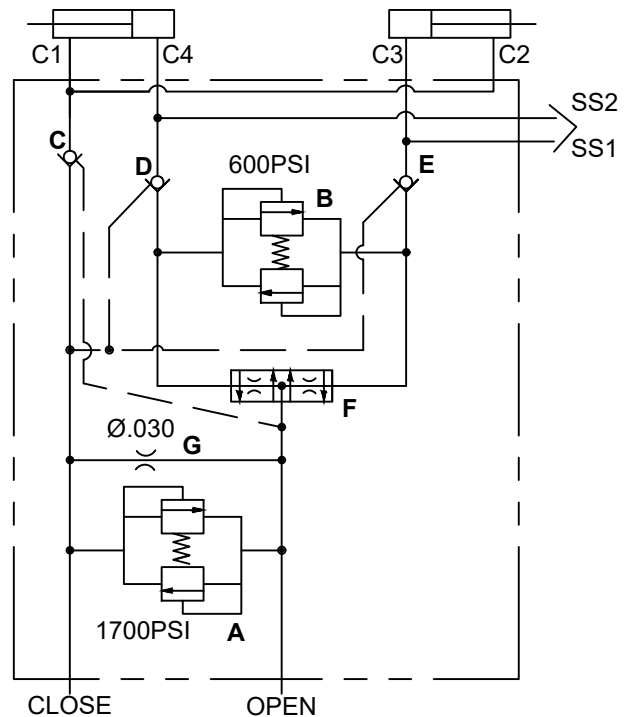


(C, D, E) 103814 P.O. CHECK VALVE
 TORQUE 35-40 FT/LBS
 104715 SEAL KIT



(F) 103813 FLOW DIVIDER
 TORQUE 10-12 FT/LBS
 104711 SEAL KIT

HYDRAULIC SCHEMATIC



NOTE:

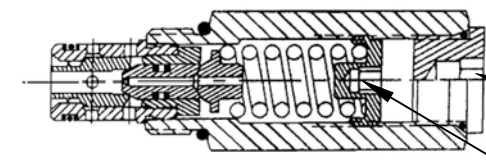
Lubricate threads & seals prior to assembly.
 Side Shifting Ports plugged for Non-Side Shift

ID	QTY	PART #	DESCRIPTION
A	1	103815.1	Bi-Directional Relief Cartridge
B	1	103815	Bi-Directional Relief Cartridge
C	1	103814	P.O. Check Valve Cartridge
D	1	103814	P.O. Check Valve Cartridge
E	1	103814	P.O. Check Valve Cartridge
F	1	103813	Flow Divider Cartridge
G	1	104721	Orifice
H	14	101419.03	SAE #4 O-Ring Plug

ADJUSTING RELIEF VALVE

WARNING:

RELEASE TRUCK PRESSURE PRIOR TO SERVICING VALVE BY TURNING THE TRUCK OFF AND "WORKING" THE SIDE SHIFT AND CLAMP FUNCTION CONTROLS.



REMOVE CAP - ADJUST INTERNAL BOLT
REPLACE CAP - PRIOR TO PRESSURIZING SYSTEM.

DO NOT EXCEED 2000 PSI (136 BAR)

TURN ADJUSTMENT:
COUNTERCLOCKWISE TO DECREASE PRESSURE
CLOCKWISE TO INCREASE PRESSURE.

ADJUSTING SYSTEM PRESSURE

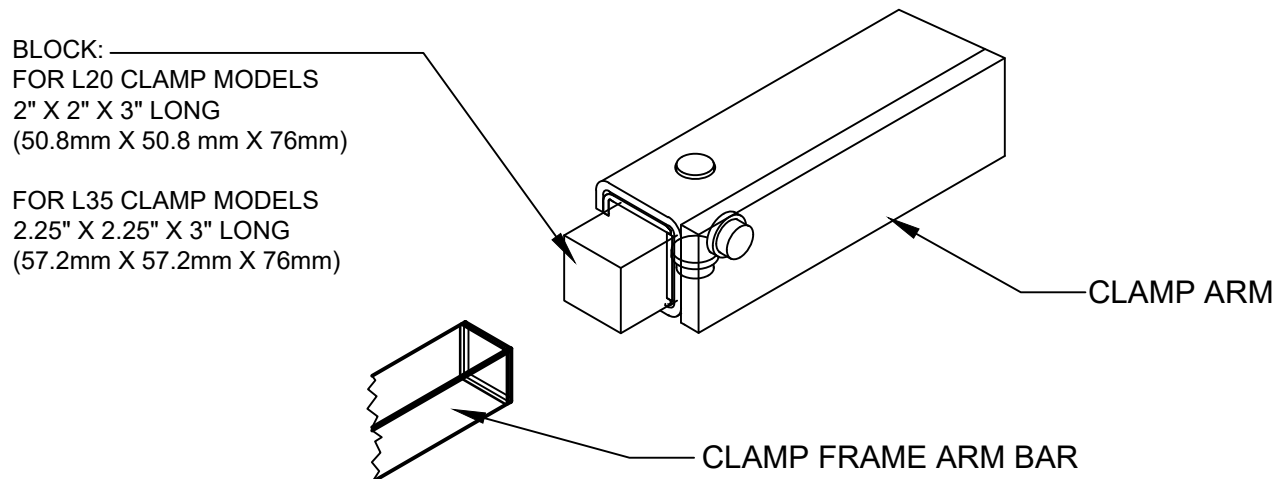
1. Release system pressure prior to servicing valve (See WARNING above).
2. Install a hydraulic pressure gauge (2 required) that is calibrated to 5000 psi (340 bar) using a short hose and tee to be in line with both the "open" and "close" ports of the main clamp valve.
3. Measure system pressure by deadheading the clamp in the closed position. System pressure is the difference between the pressure gauge reading of the "open" port subtracted from the pressure gauge reading of the "close" port.
4. Repeat step one if adjusting system pressure. Remove cap of the bi-directional relief valve (refer to item A page 11) and adjust cartridge no more than one quarter turn. Replace cap prior to pressurizing system. Repeat until desired pressure setting is achieved. Do not exceed 2000 psi (136 bar) in the system pressure.

ADJUSTING BY-PASS PRESSURE

1. If one arm bottoms out before the other with more than 2" (51mm) difference adjustment is needed. Increase relief pressure (See above) if arms are moving independent of each other. If the lagging arm is moving slowly after first arm bottoms out, decrease relief pressure (See above).
2. To adjust by-pass relief pressure, release system pressure prior to servicing valve by turning the truck off and working the side shift and clamp function control several times.
3. Remove cap on bi-directional valve (item B page 11) and adjust cartridge no more than one quarter turn in needed direction. Replace cap prior to pressurizing system. Repeat adjustments until arms are in sync or within 2" (51mm) difference.
4. If assistance is needed in adjustments contact Loron engineering.

ARM SLIDE & SHIM REPLACEMENT

1. To replace the slides, the arms need to be in the fully open position. Release system pressure prior to removing the arms by turning the truck off and working the side shift and clamp function controls several times.
2. Support the arm with an overhead crane or lift truck. Be sure to secure the chain or sling in a manner that prevents the arm from falling out of the chain or sling when hanging free of the clamp.
3. Remove the cotter pin, slotted nut and spherical bearing from the end of the clamp cylinder rod. Keeping hands and feet clear, and carefully slide the clamp arm off of the clamp frame.
4. Inspect slides and slide buttons for wear. Slides may be rotated end-to-end and reused if excessively worn on the outer end only. Extra shims may be used to tighten operating clearance on slightly worn slides. Replace any slides worn to less than .15" (3.8mm) thick or any slide that is deeply scored or broken.



5. To aid in replacing the slides a block may be fashioned of wood or another convenient material to the dimensions shown above. The block is inserted to the end of the arm to hold the slides, shims, and buttons in position while the arm is inserted over the arm bars on the clamp frame. The block is expelled out the opposite end of the arm as the arm is pushed onto the frame. Prior to installing the arm the block may be used to determine the number of shims to place under the slides. Adjust the clearance between the slides and the block to provide approximately .06" (1.5mm) running clearance between the slides and arm when installed.
6. Keeping hands and feet clear, carefully slide the clamp arm onto the clamp frame. Be sure the arm moves freely without excessive binding. If the arm is too loose or too tight, add or remove shims as required.
7. Install the spherical bearing, slotted nut and cotter pin onto the end of the clamp cylinder rod. Be sure to leave .03"-.06" (.7mm to 1.5mm) clearance to allow the cylinder to "float" on its mountings.

TROUBLE SHOOTING GUIDE

LOADS SLIPPING OR DROPPING

POSSIBLE CAUSES

SOLUTIONS

- | | |
|--|--|
| 1. Valve cartridges are not sufficiently tight. | 1. Tighten all cartridges to torque values shown on page 11. |
| 2. System relief pressure is set too low. | 2. See Adjusting System Pressure on page 12. |
| 3. Internal leakage in cylinder. | 3. Replace Cylinder seals. If tube, piston or rod is scored replace with new parts. |
| 4. Incorrect clamp pad size or load not fully engaged in clamp arms. | 4. Be sure the clamp pads are correctly sized for the load and the load is positioned fully in the clamp arms. |
| 5. Pad camber is set incorrectly. | 5. Shim pads to change camber. |
| 6. Load too heavy for clamp capacity. | 6. Consult factory. |
| 7. Load may not be stacked correctly or may need to be unitized. | 7. Re-stack or unitize load (shrink wrap). |
| 8. Bent arms or contact pads. | 8. Consult factory. |

CRUSHING LOADS

POSSIBLE CAUSES

SOLUTIONS

- | | |
|--|--|
| 1. System relief pressure is set too high. | 1. See Adjusting System Pressure page 12. |
| 2. Operator over-working (milking) control valve. | 2. Once the pad contacts the load, clamp the load in one even motion - do not over-work the valve. |
| 3. Bent arms or contact pads. | 3. Consult factory. |
| 4. Pad camber is set incorrectly. | 4. Shim pads to change the camber. |
| 5. Variable loads that require different clamping pressures. | 5. Install a 4-position pressure regulator on truck cowl - consult factory for part number and availability. |