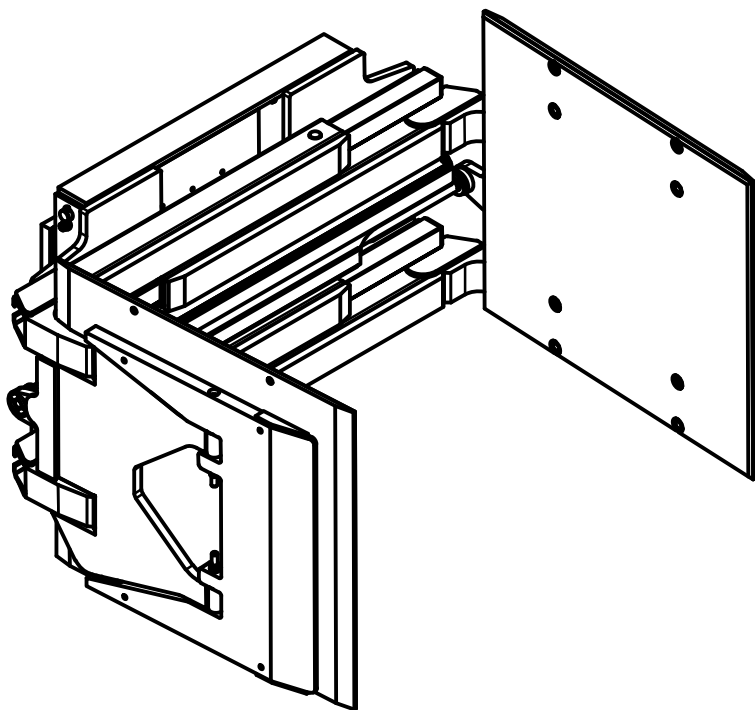




SERVICE MANUAL / PARTS LIST

TIPPING CLAMP 114210



CONTENTS:

PAGE	
1	Lift Truck Requirements General Installation Procedures General Inspection
2-3	Clamp Assembly
4	Carriage Assembly
5-6	Hydraulic Assembly
7	Clamp Cylinder Assembly
8-9	Carriage Cylinder Assembly
10	Clamp Valve Assembly
11	Adjusting Relief Pressure Adjusting System Pressure Adjusting By-Pass Pressure
12	Arm Slide & Shim Replacement
13	Troubleshooting Guide

Specifications:

Mounting: Class II

Capacity: 1500 lbs at 24"

Pad Size: 30" High x 34" Long

Range: 23.3" - 82"

Frame: 45" Wide

Solenoid: 48V

Rotation: 90° Forward

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

LIFT TRUCK REQUIREMENTS

CAPACITY

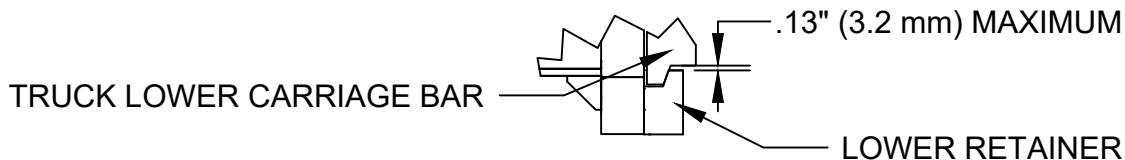
Capacity shown on the clamp's name plate is for the clamp only. The combined truck and clamp capacity is provided by the lift truck manufacturer.

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 the 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.

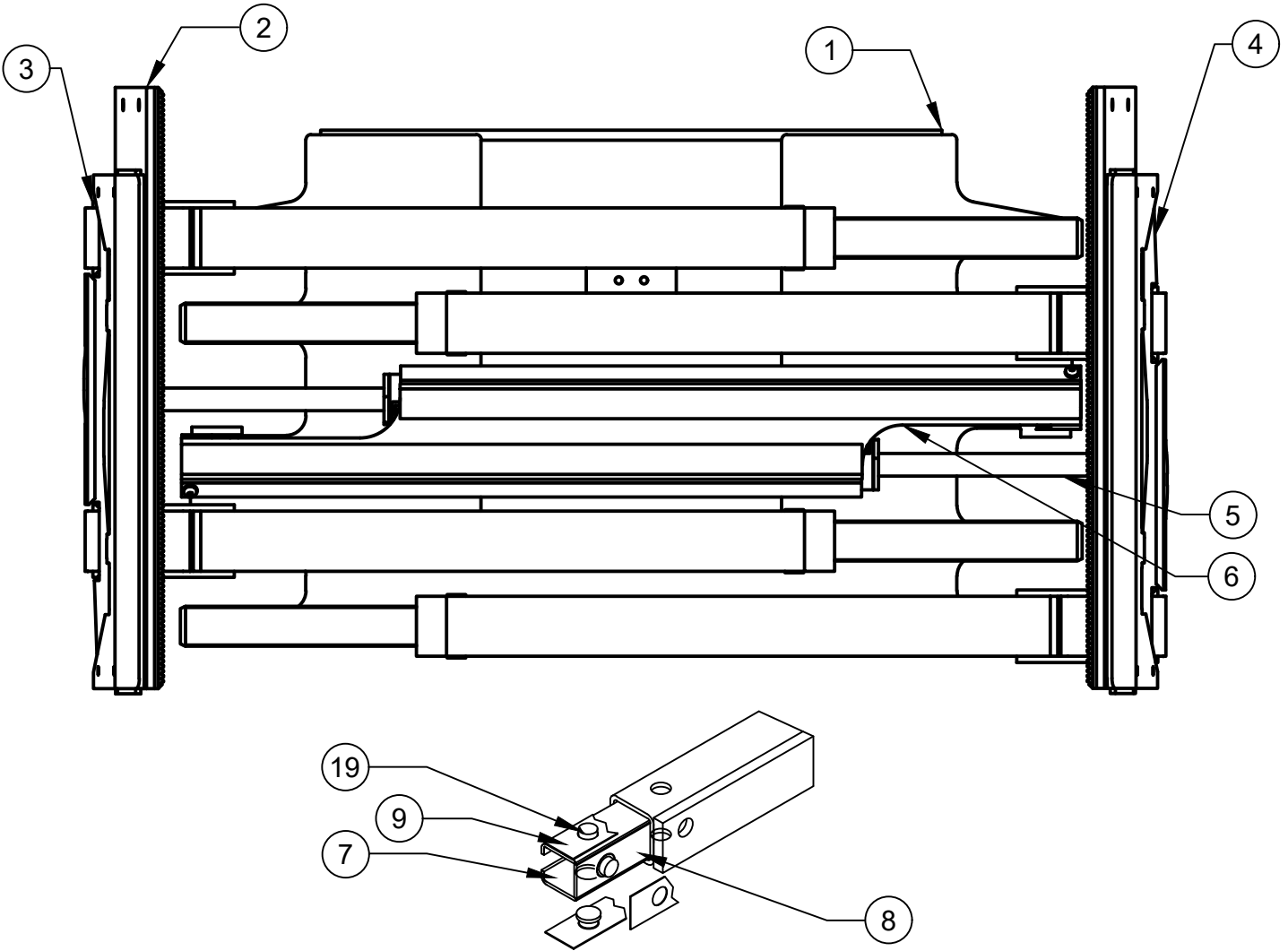
GENERAL INSPECTION

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 clearance if necessary.

CLAMP ASSEMBLY - 1

Drawing Reference: 114231

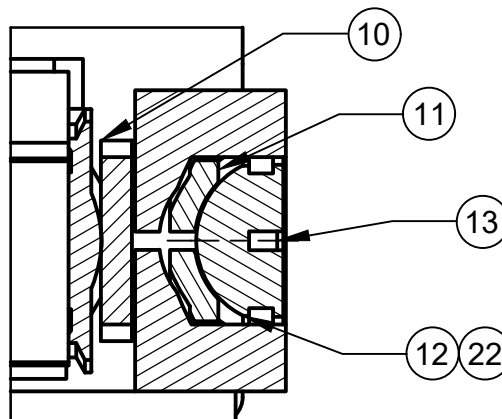
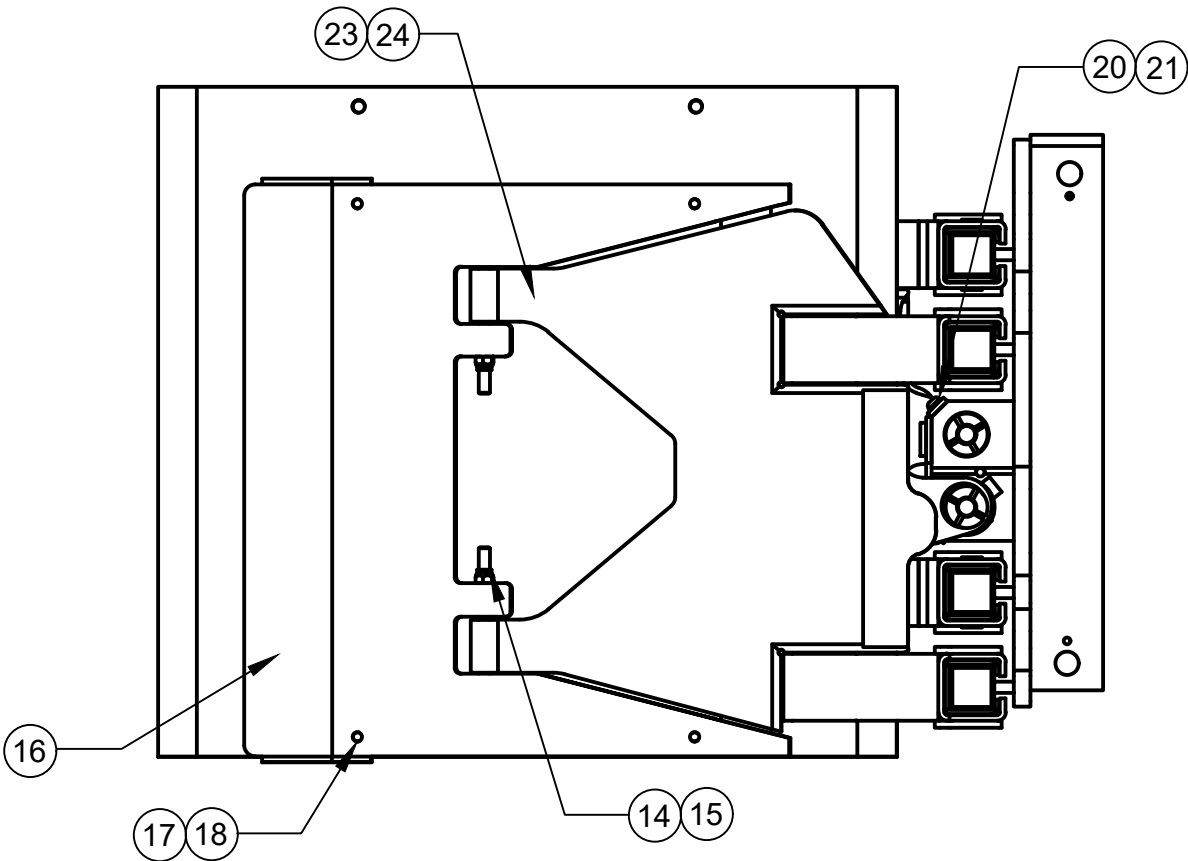
#	QTY	PART #	DESCRIPTION
1	1	114219	Frame Weldment REF
2	2	100954.39	Pad
3	1	114430.1	RH Arm
4	1	114431.1	LH Arm
5	2	101251.41	Cylinder Assembly
6	1	101917.8	Front Cover
7	8	111621.3	Angle Plastic Slide
8	4	114576.3	Flat Plastic Slide
9	8	103340.1	Shim
19	12	111619	Slide Button



CLAMP ASSEMBLY - 2

Drawing Reference: 114231

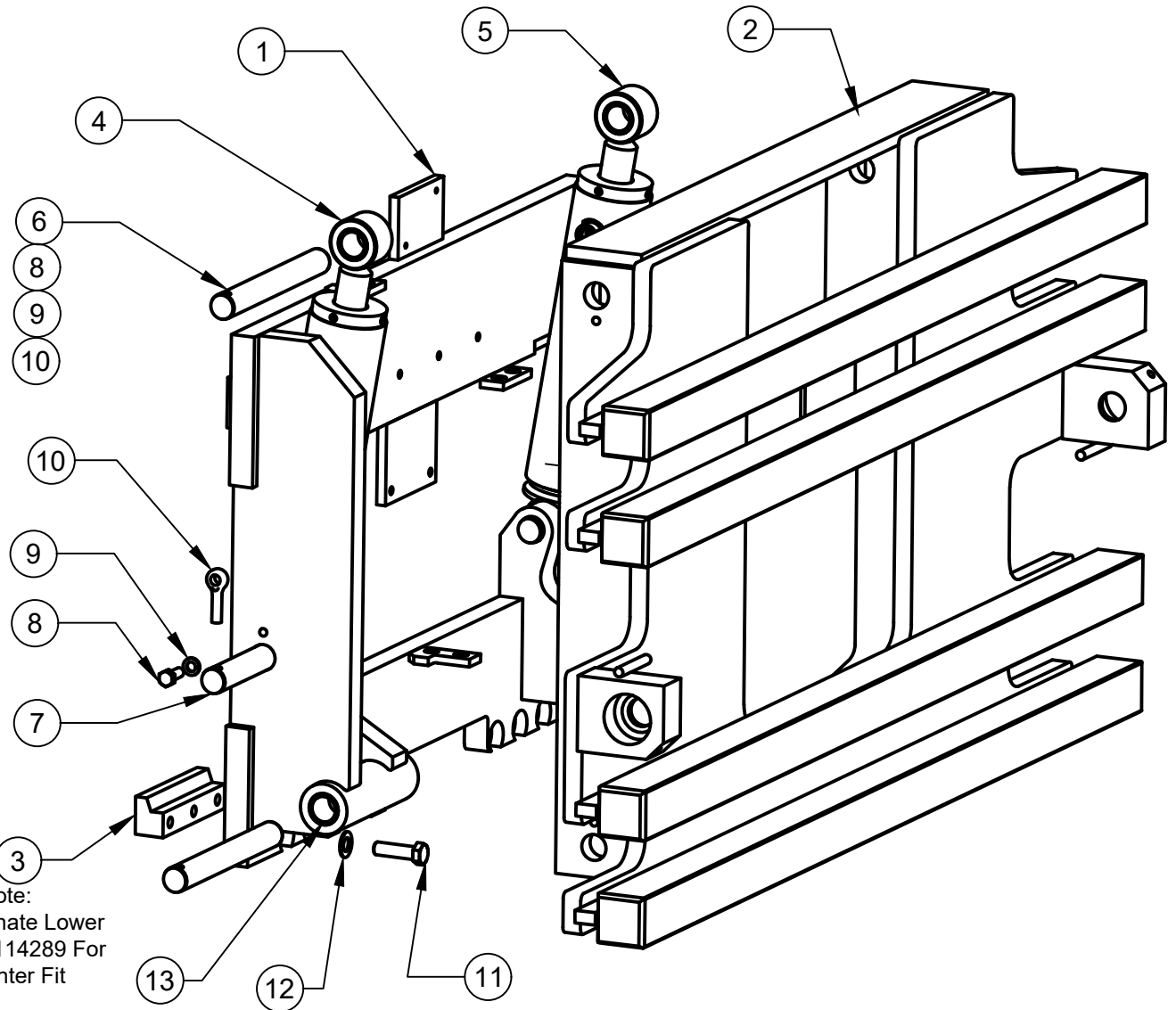
#	QTY	PART #	DESCRIPTION
10	4	100047	Cylinder Washer
11	4	110730	Spherical Bearing
12	4	110731	Slotted Nut
13	4	100574.83	Cotter Pin
14	4	11G.08136	Socket Head Bolt
15	4	17D.08	ESNA Nut LSP
16	2	109874.13	Pad Support
17	8	1C.0820	Hex HD Bolt LSP
18	8	108088	Spring Washer
20	2	25G.0612	Button Head Bolt LSP
21	2	4E.06	Lock Washer LSP
22	4	100029.314	O-Ring LSP
23	2	105904	Nylon Spring
24	4	2F.06	Plain Washer Shim As Required



CARRIAGE ASSEMBLY

Drawing Reference: 114230

#	QTY	PART #	DESCRIPTION	7	2	100663.5	Chrome Pin
1	1	114701	Base Carriage Weldment	8	6	1C.0616	Hex Head Bolt
2	1	114219	Front Carriage Weldment	9	6	4E.06	Lock Washer
3	2	108760	Lower Retainer II	10	6	101294.5	Lock Pin
4	1	114220	Right Cylinder Assembly	11	6	1CN.0828	Hex Head Bolt
5	1	114221	Left Cylinder Assembly	12	6	2F.08	Flat Washer
6	4	100663.14	Chrome Pin	13	4	100785.2	Bushing

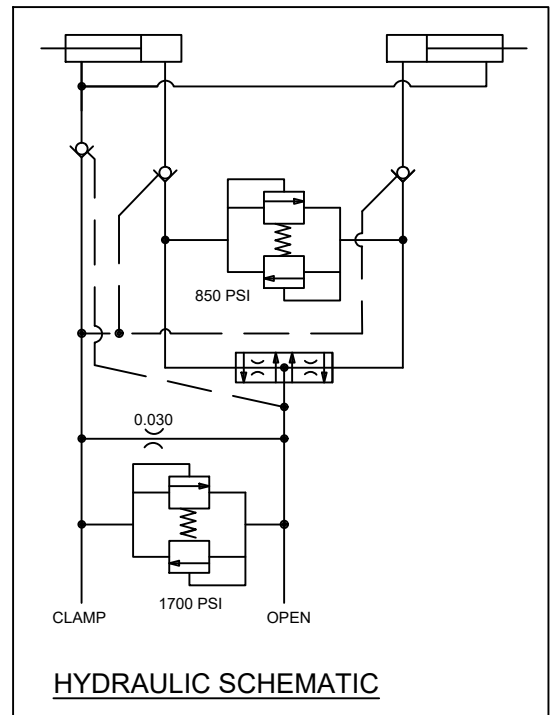
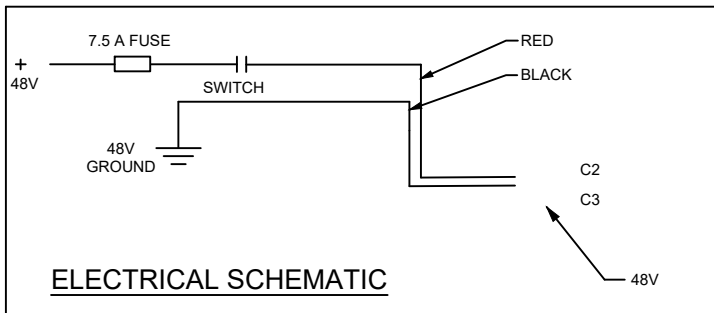
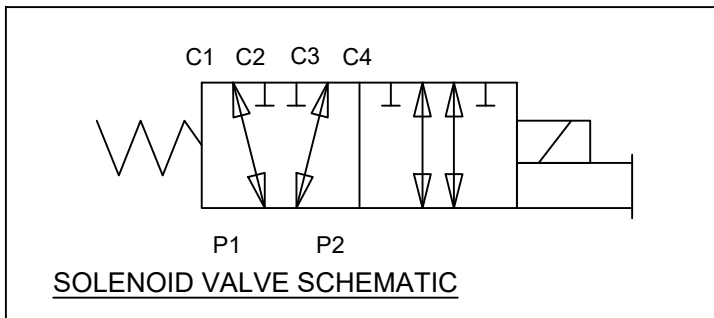


Note:
Use Alternate Lower Retainer 114289 For A Tighter Fit

HYDRAULIC ASSEMBLY - 1

Drawing Reference: 114232

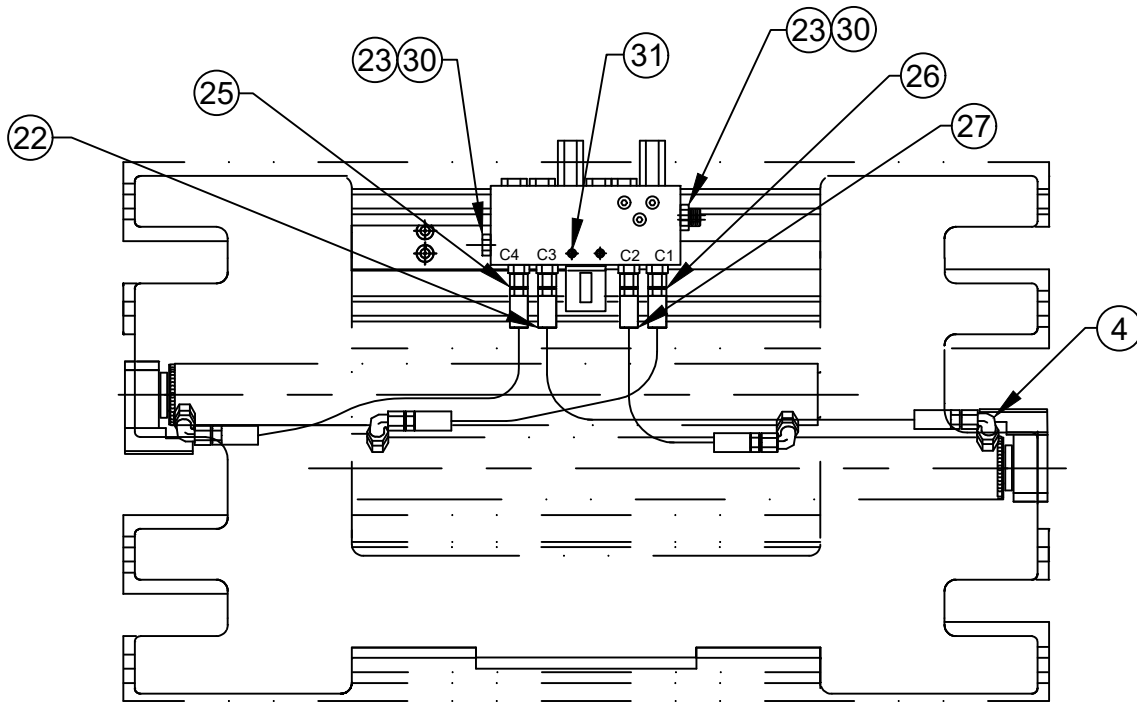
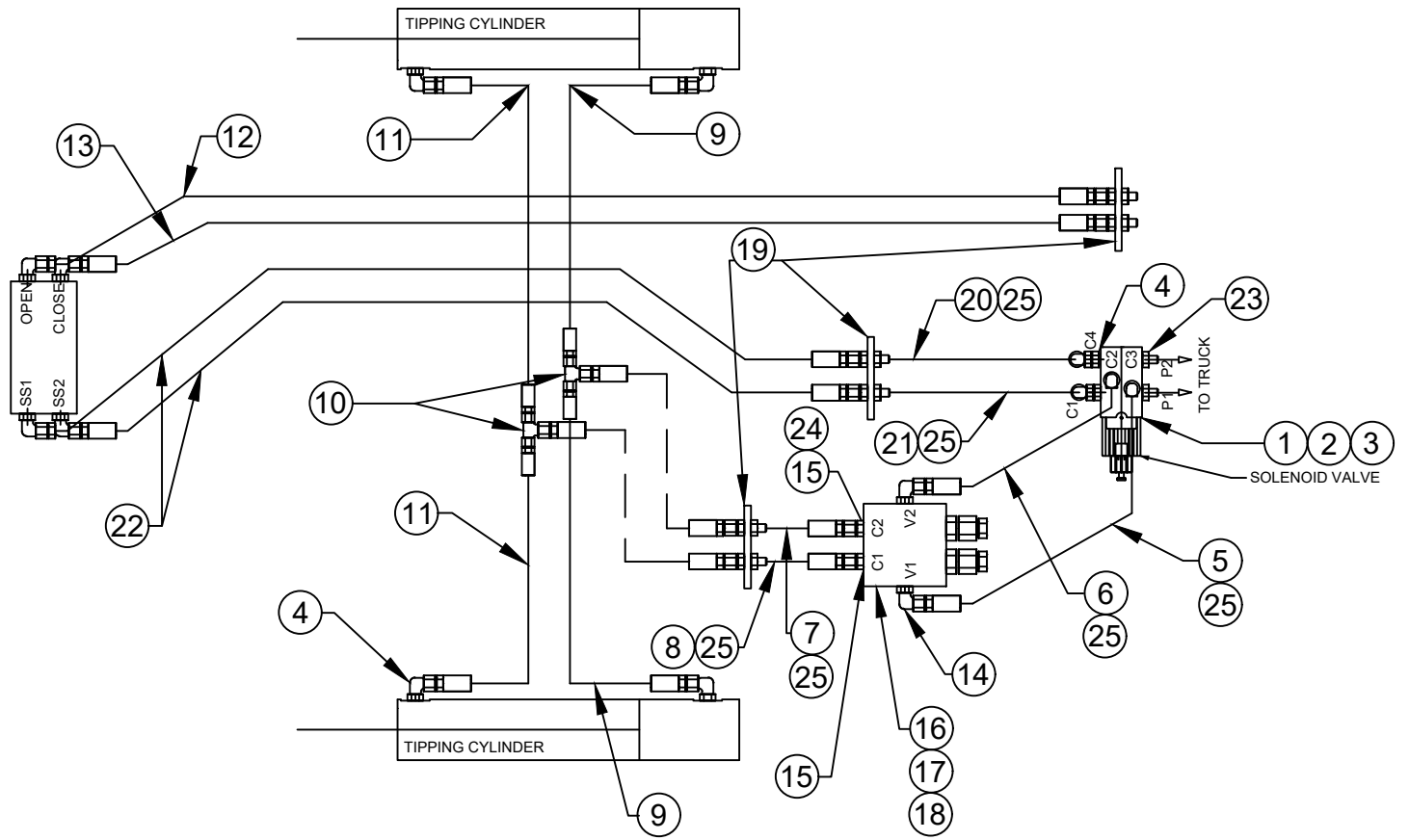
#	QTY	PART #	DESCRIPTION	#	QTY	PART #	DESCRIPTION
1	1	100841.3	Solenoid Valve 48V	17	2	1C.0632	Bolt Hex HD
2	2	1C.0448	Bolt Hex HD	18	2	4E.06	Lock washer
3	2	4E.04	Lock Washer	19	6	100744.05	Bulkhead Fitting
4	10	100095.05	90° Elbow Fitting	20	1	114238	Hydraulic Tube Assm
5	1	114240	Hydraulic Tube Assm	21	1	114239	Hydraulic Tube Assm
6	1	114241	Hydraulic Tube Assm	22	2	100674.0270	Hose Assembly
7	1	114237	Hydraulic Tube Assm	23	10	100676.05	Straight Thread Adapter
8	1	114236	Hydraulic Tube Assm	24	1	100238.05	Swivel Nut 45°
9	2	100233.0290	Hose Assembly	25	12	113622	Flaretite Seal
10	2	101134.05	Swivel Branch Tee	26	1	100674.0220	Hose Assembly
11	2	100223.0230	Hose Assembly	27	1	100674.0190	Hose Assembly
12	1	100674.0340	Hose Assembly	28	1	100674.0150	Hose Assembly
13	1	100674.0335	Hose Assembly	29	1	100674.0280	Hose Assembly
14	2	100095.051	90° Elbow Fitting	30	1	100011	Clamp Valve Manifold
15	2	100676.051	Straight Thread Adapter	31	2	25GN.0516	Nylock Button HD Bolt
16	1	114101	Dual Counterbalance Valve	32	5	100440.05	Swivel Nut Elbow



HYDRAULIC ASSEMBLY - 2

Drawing Reference: 114232

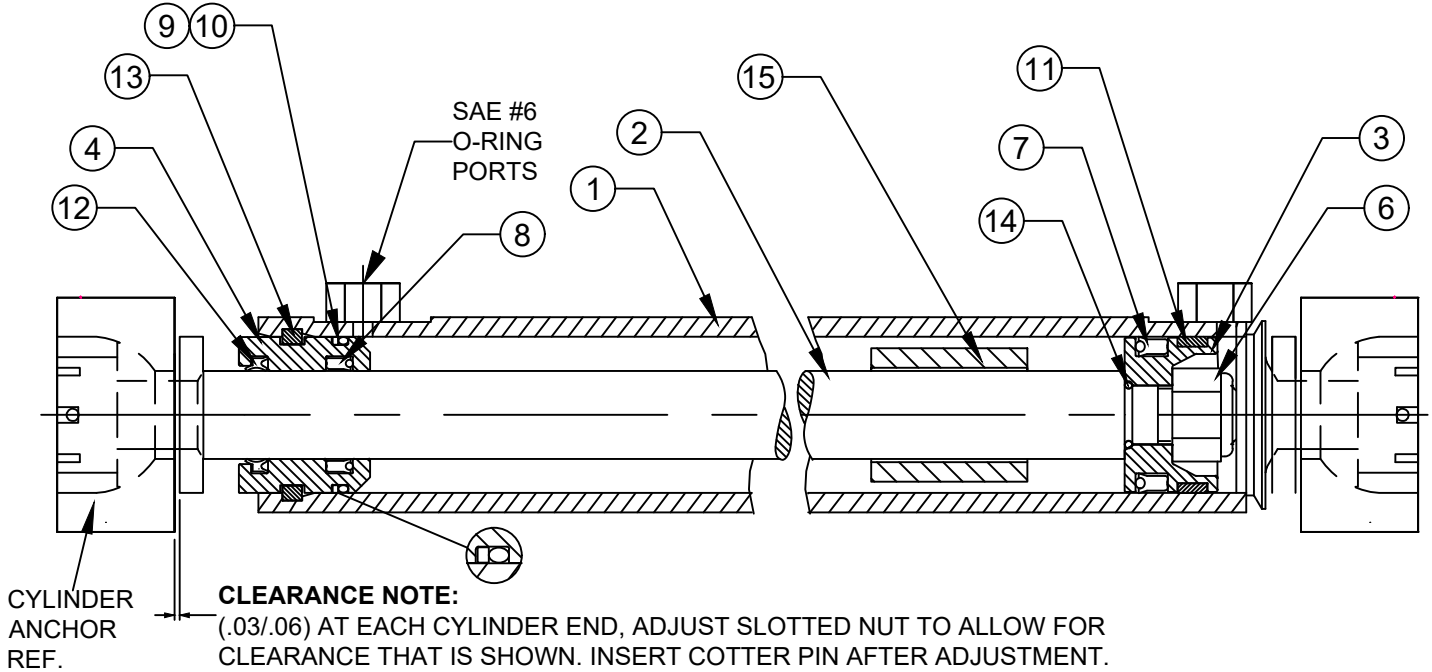
SEE PREVIOUS PAGE FOR PARTS LIST



AS VIEWED FROM DRIVERS SEAT

CLAMP CYLINDER ASSEMBLY

Drawing Reference: 101251.41



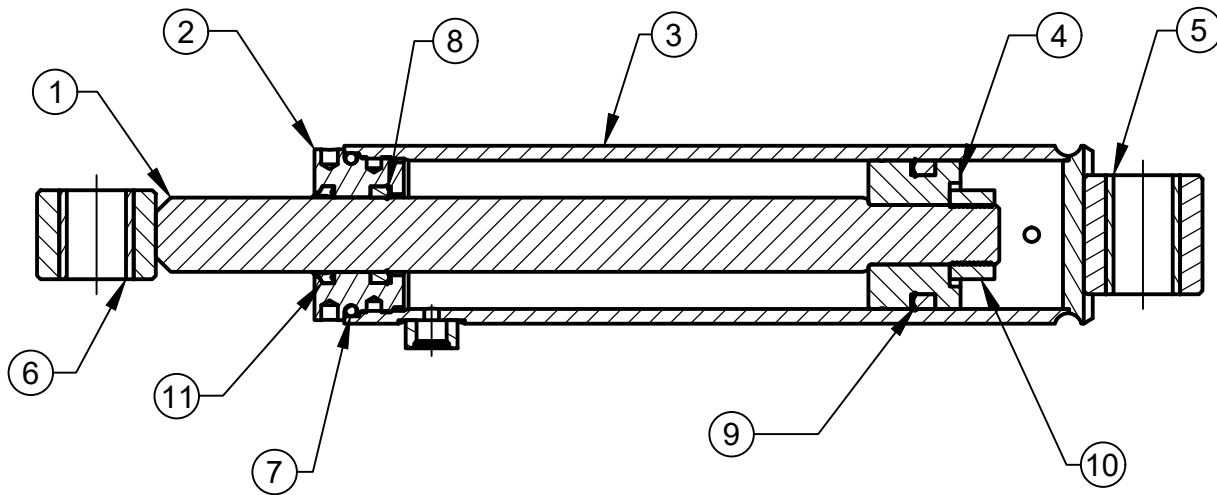
#	QTY	PART #	DESCRIPTION
1	1	101257.39	Cylinder Tube
2	1	100965.67	Rod
3	1	101256	Piston
4	1	101254	Gland
5	1	101261	Seal Kit (Items 6 thru 13)
6	1	101035	Modified ESNA Nut
7	1	100032.095	Poly Pak LSP
8	1	100031.059	Poly Pak LSP
9	1	100028.314	Back-up Ring LSP
10	1	100029.314	O-Ring LSP
11	1	101260	Wear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

Drawing Reference: 114220



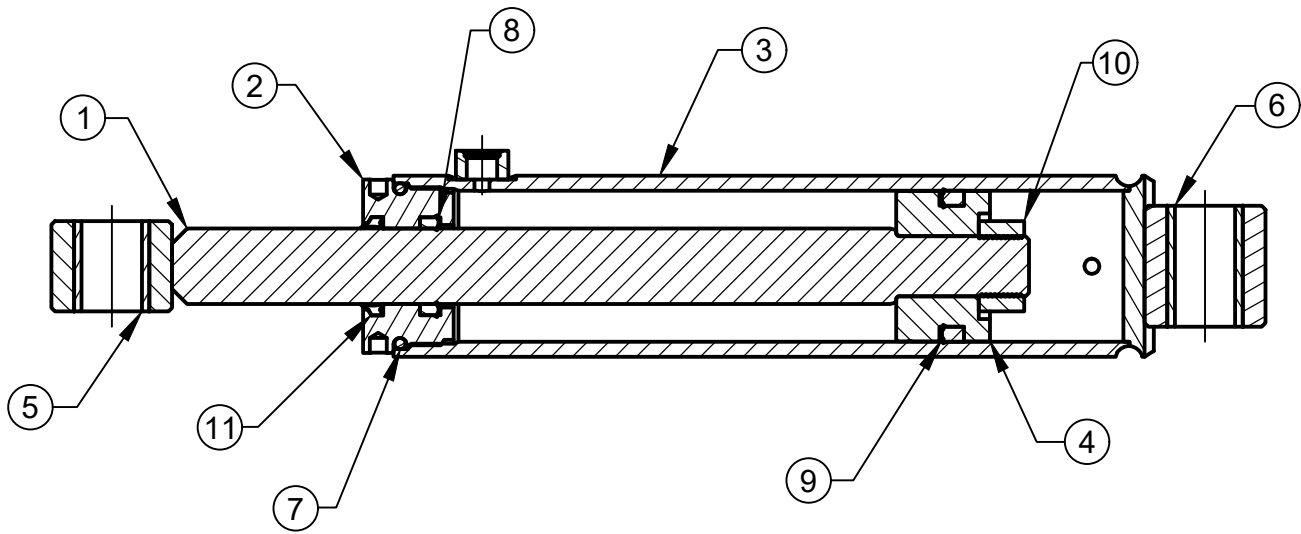
#	QTY	PART #	DESCRIPTION
1	1	109059	Rod Weldment
2	1	102242	Gland Nut
3	1	114222	Tube Weldment
4	1	109061	Piston
5	1	100785.2	Bushing
6	1	100785.3	Bushing
-	1	109271	Seal Kit (Items 7-11)
7	1	100029.10	O-Ring LSP
8	1	100031.5	Polypak BS LSP
9	1	100032.14	Polypak Seal LSP
10	1	109322	Modified Self-locking Nut LSP
11	1	103208.4	Wiper Ring LSP

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.

CARRIAGE CYLINDER ASSEMBLY - LH

Drawing Reference: 114221



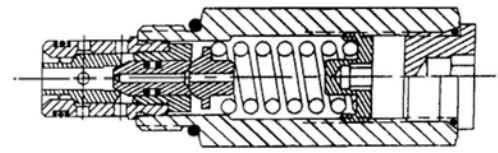
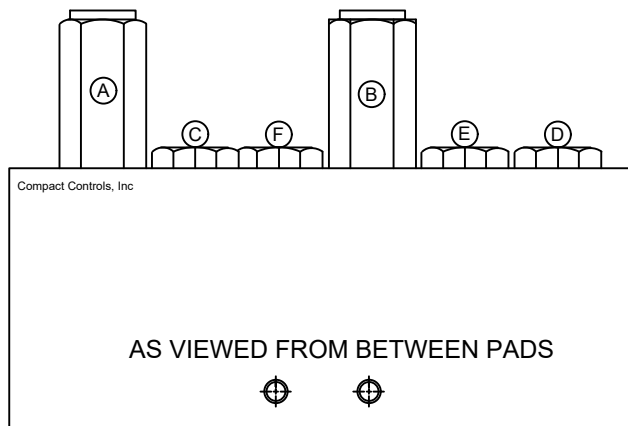
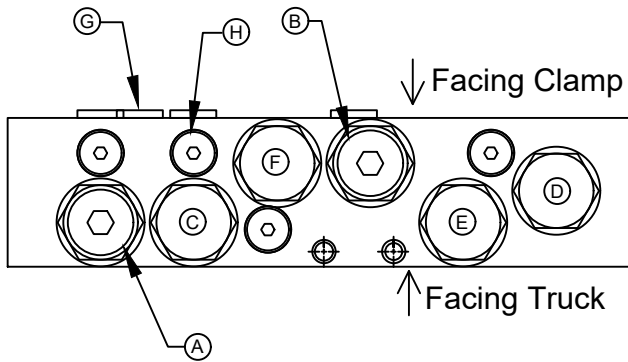
#	QTY	PART #	DESCRIPTION
1	1	109059	Rod Weldment
2	1	102242	Gland Nut
3	1	114223	Tube Weldment
4	1	109061	Piston
5	1	100785.2	Bushing
6	1	100785.3	Bushing
-	1	109271	Seal Kit (Items 7-11)
7	1	100029.10	O-Ring LSP
8	1	100031.5	Polypak BS LSP
9	1	100032.14	Polypak Seal LSP
10	1	109322	Modified Self-locking Nut LSP
11	1	103208.4	Wiper Ring LSP

CYLINDER SERVICE

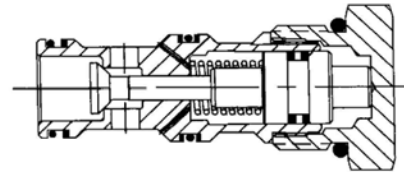
- Prior to assembly lubricate seals, cylinder bore and rod with STP.
- Inspect all parts for scratches, nicks and gouges. Replace all damaged components.
- Inspect cylinder bore and rod for scoring. Replace if scored.
- Avoid damage to seal grooves. Use a dull screwdriver for seal removal.
- Torque piston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

CLAMP CONTROL VALVE

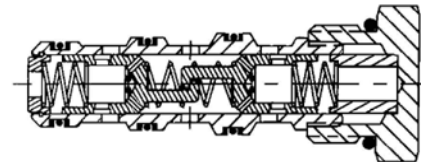
Drawing Reference: 100011



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



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



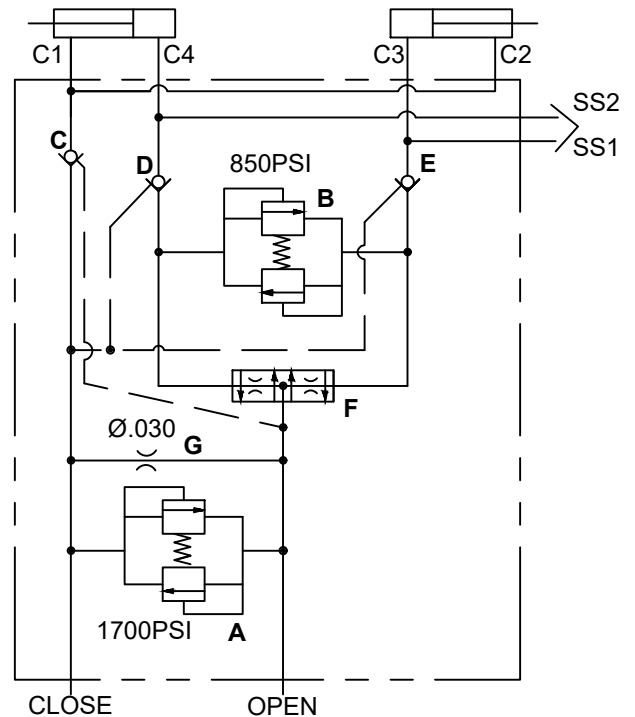
(C) 103813 FLOW DIVIDER
 TORQUE 10-12 FT/LBS
 104711 SEAL KIT

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

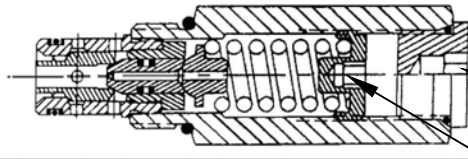
HYDRAULIC SCHEMATIC



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

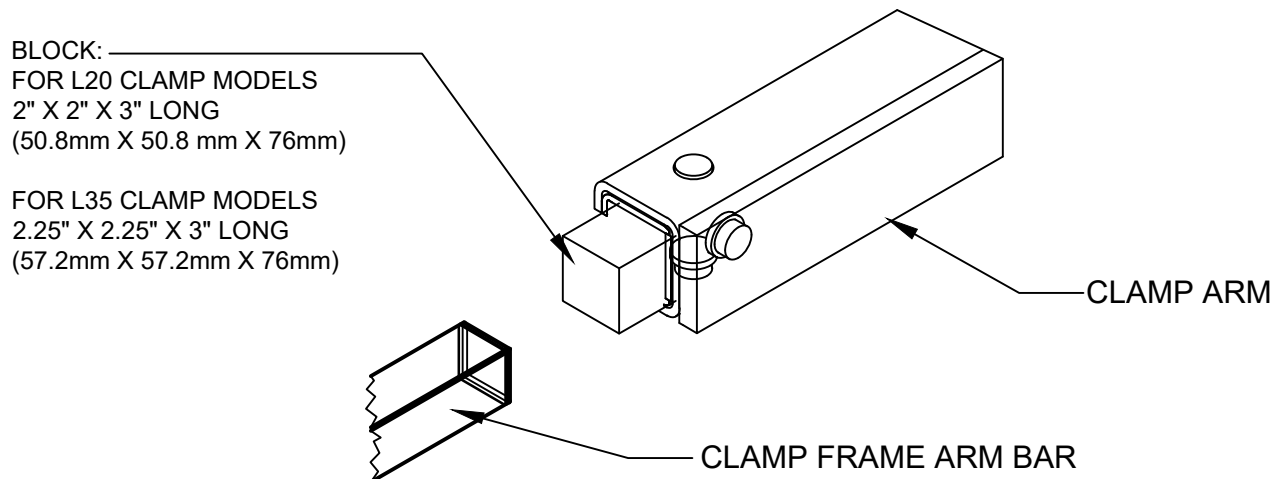
1. Release system pressure prior to servicing valve (See WARNING above).
2. Install a hydraulic pressure gauge (2 required) that is calibrated to 5000 psi (340 bar) using a short hose and tee to be in line with both the "open" and "close" ports of the main clamp valve.
3. Measure system pressure by deadheading 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 10) 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 10) 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 10. |
| 2. System relief pressure is set too low. | 2. See Adjusting System Pressure on page 11. |
| 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 11. |
| 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. |