

DPO10A / DPO10A2 TWO POST ASYMMETRICAL LIFT

INSTALLATION AND OWNERS MANUAL

NOV 1997

I MAN 994317

IMPORTANT NOTICE:

THE FLOOR ON WHICH THE LIFT IS TO BE INSTALLED MUST BE 4 INCH MINIMUM THICKNESS CONCRETE, WITH A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI, AND REINFORCED WITH STEEL BAR.

FAILURE BY THE PURCHASER TO PROVIDE THE RECOMMENDED MOUNTING SURFACE COULD RESULT IN UNSATISFACTORY LIFT PERFORMANCE, PROPERTY DAMAGE, OR PERSONAL INJURY.

IMPORTANT NOTICE REGARDING CEILING HEIGHT:

THIS IS AN OVERHEAD TYPE LIFT WHICH REQUIRES A CEILING HEIGHT OF AT LEAST 12' - 0".

IMPORTANT:

READ THIS INSTALLATION MANUAL BEFORE INSTALLING THE LIFT.

READ THE ANCHOR BOLT INSTRUCTION PAGE BEFORE DRILLING AND INSTALLING THE ANCHOR BOLTS.

DO NOT RAISE A VEHICLE ON THE LIFT UNTIL THE LIFT HAS BEEN CORRECTLY INSTALLED AND ADJUSTED AS DESCRIBED IN THIS MANUAL.

DO NOT REMOVE A TRANSMISSION, SUSPENSION ASSEMBLY, OR OTHER HEAVY ITEM FROM THE FRONT OF A FRONT WHEEL DRIVE VEHICLE UNLESS THE VEHICLE IS ADEQUATELY SUPPORTED IN THE REAR.

IMPORTANT NOTICE REGARDING INSTALLATION:

THIS LIFT REQUIRES A CERTAIN PROCEDURE DURING INSTALLATION TO REDUCE THE AMOUNT OF AIR TRAPPED IN THE CYLINDERS. FAILURE TO FOLLOW THE PROCEDURE WILL RESULT IN UNSATISFACTORY LIFT PERFORMANCE.

TABLE OF CONTENTS

Maintenance.....	1
Operating Tips.....	1
Tools Required for Installation.....	1
SECTION 1 <i>Installation Instructions</i>	2
SECTION 2 <i>Concrete Anchor Bolt Instructions</i>	12
SECTION 3 <i>Troubleshooting</i>	
1. Pump motor will not run.....	13
2. Lift does not move up and down smoothly.....	13
3. Lift does not pick up rated load.....	14
4. Lift will not lower.....	14
5. Cylinder leaks down.....	15
6. Power unit switch sticks.....	15
SECTION 4 <i>Cylinder Replacement</i>	16
DPO10A Exploded View.....	17
DPO10A Parts List.....	18
DPO10A2 Parts List.....	19
APPENDIX A <i>DPO10A2 Extended Uprights Installation Supplement</i>	20

MAINTENANCE, EVERY MONTH

1. Lubricate the four inside corners of the legs with heavy duty bearing grease.
2. Check the hydraulic fluid level. If necessary add oil cross referenced to Mobil DTE 25 or Texaco HD 46. These are petroleum based hydraulic oils, non-foaming, non-detergent, 10 weight. Fill to screw near top of tank. Do not overfill.
3. Check carriage latch synching: Latches should click at the same time. Adjust cables if required. Instructions are in the Installation text.
4. Check anchor bolt tightness. If the anchor bolts are excessively loose, check more often.

OPERATING TIPS

1. Always set a vehicle on the latches before working under it.
2. SLOWLY lower vehicles onto the safety latches.
3. Keep the four inside corners of the legs lubricated with heavy duty bearing grease.
4. If the carriages get out of sync (latches do not click at the same time), readjust the cables as described in the Installation Instructions in Section 1 of this manual.
5. Check anchor bolt tightness every month.
6. Do not remove the transmission, suspension assemblies, or other heavy items from the front of front wheel drive vehicles without supporting the rear of the vehicle.

TOOLS FOR INSTALLATION

Concrete hammer drill with 3/4" bit

11/16" open end wrench

3/4" open end wrench

1-1/16" deep socket

1-1/8" socket or wrench

13/16" open end wrench

Level (18" minimum length)

Vise grips

Tape measure

Funnel

Hoist or Forklift (optional)

Two 12' step ladders

SECTION 1

INSTALLATION

1. Unpack the lift. Remove the swing arms, bolt box, power unit box, and overhead beam. **SAVE ALL PACKING BOLTS!**
2. Remove the 1/2" bolts from the packing bracket (Figure 1) which hold the two legs together. Remove the top leg.

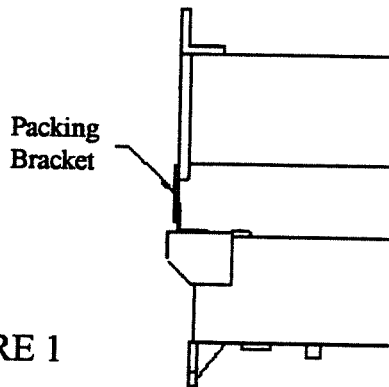


FIGURE 1

3. Figure 2 shows how the lift is assembled and lists the different parts to the lift.

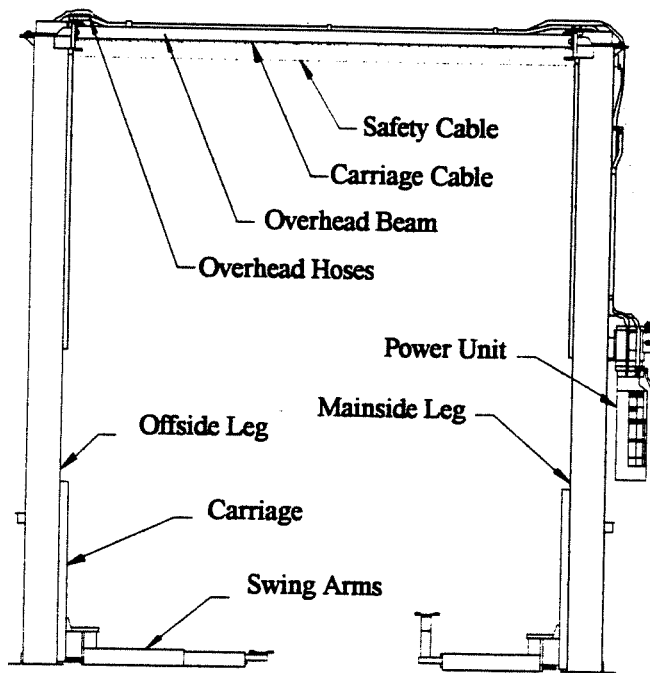


FIGURE 2

4. Figure 3 shows proper placement of the legs in the service bay. The mainside leg has a mounting bracket on its back for the power unit along with two holes in its back near the top. The mainside leg is located on the right hand or passenger side of the lift.

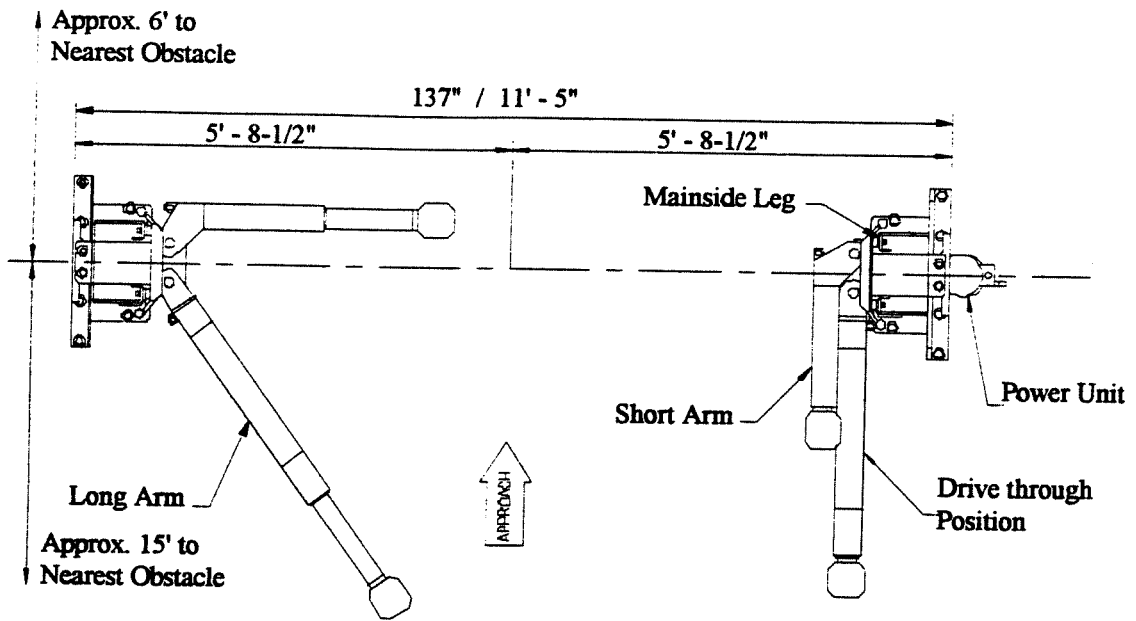


FIGURE 3

5. With the mainside leg on the ground, attach the ring weldment to the cylinder mount weldment using a 1/2 x 2-1/2 NC bolt, as shown in Figure 4.

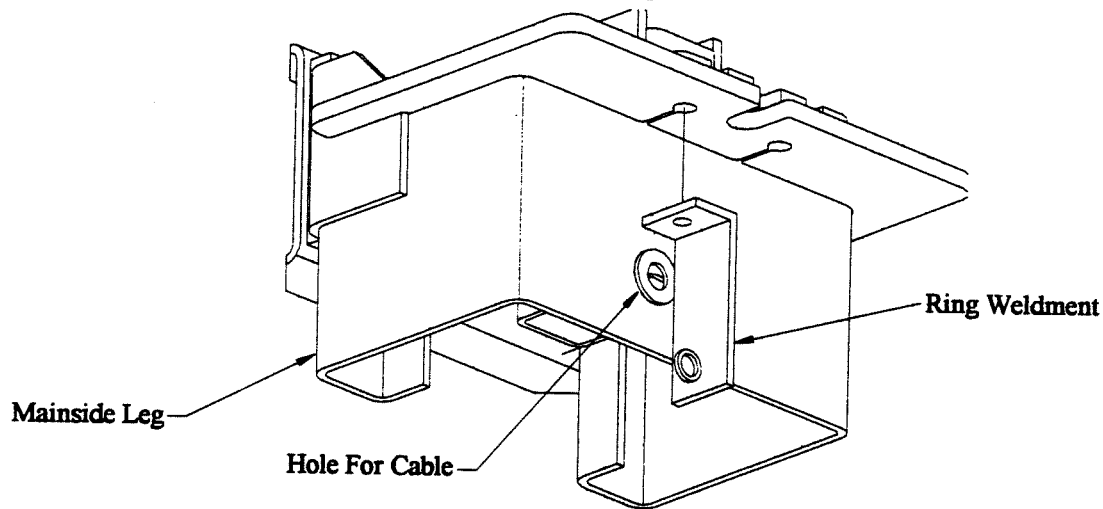


FIGURE 4

6. With both legs on floor, pull out the latch rods at bottom of both carriages. Slide the carriages to the bottoms of the legs. Push in the latch rods and slide each carriage up till the first "click" is heard.
7. Remove the red port plugs from each cylinder. Attach a male pipe thread to male JIC 90 elbow to the nipple at the bottom end of both cylinders. The fitting should face toward the top of the cylinder. Attach a male pipe thread to male JIC branch tee to the top opening of the mainside leg cylinder. The branch tee should run perpendicular to the mounting bolt. Figure 5
8. Install the cylinders in the legs by attaching them to the Cylinder Mount Weldments with 1/2" x 5" Grade 8 bolt with nut. The fitting at the bottom of the cylinder should be positioned to

the left, as you look into the leg. See Figures 5 & 6 for placement of cylinders in the top of the legs.

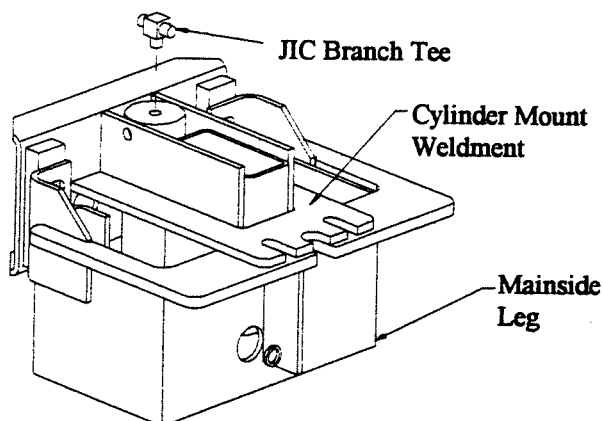


FIGURE 5

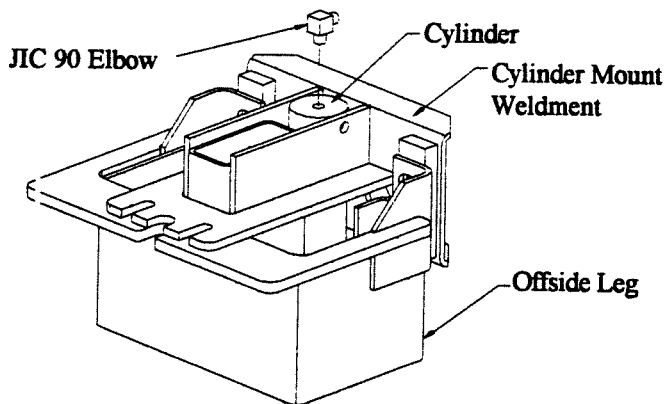


FIGURE 6

WARNING!

DO NOT HOLD THE ROD WITH PLIERS, CHANNEL LOCKS, ETC. UNDER ANY CIRCUMSTANCE. CYLINDER LEAKS CAUSED BY A DAMAGED FINISH ON THE ROD ARE NOT COVERED BY WARRANTY.

9. Pull each cylinder rod down and insert the threaded end into the mounting holes at the carriage base. Make sure the snap ring on the cylinder rod is in its groove. Pull the rod through the hole until the snap ring on the rod comes in contact with the carriage base plate. See Figure 7. Attach a 3/4" NF nut to the threaded rod and tighten until the rod turns. Hold the 3/4" nut with a wrench and tighten a 3/4" NF jam nut against it.

10. Attach a male pipe thread to male JIC 90 elbow to top opening of the offside leg cylinder. The elbow should face to the inside of the leg. Figure 6 above.

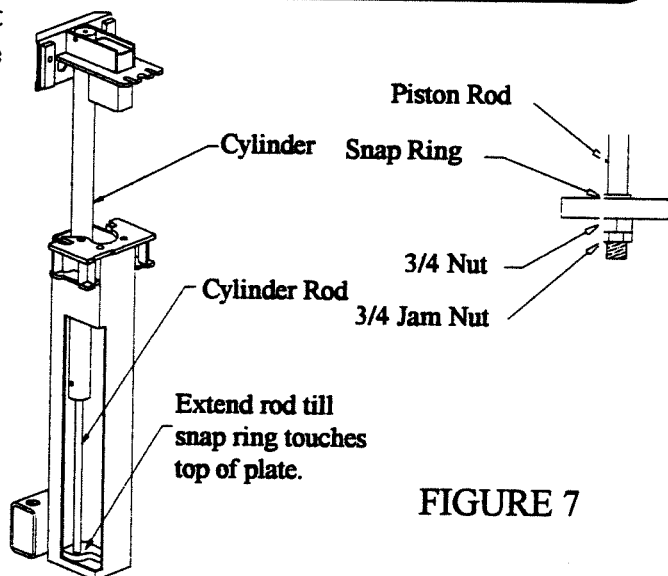


FIGURE 7

WARNING!

When attaching hydraulic fitting with pipe threads to the cylinders use Teflon tape. DO NOT START THE TAPE CLOSER THAN 1/8" FROM THE END OF THE PIPE FITTING. This will prevent pieces of tape from coming loose and contaminating the hydraulic system.

11. Lay out and mark the floor for the leg placement locations. Raise the two legs and place them in the spots where they are to be secured. Drill the six anchor bolt holes for the MAINSIDE LEG ONLY!! Install the bolts but do NOT tighten yet.

NOTE:

READ SECTION 2 (PAGE 13) ON ANCHOR BOLT INSTALLATION BEFORE PROCEEDING.

12. The mainside leg MUST be checked for vertical alignment both side to side and front to back. Use a level to check alignment (18" minimum length for level). Shim the legs as necessary to level the legs. Shim next to and on both sides of the anchor bolts. Once the leg is perfectly plumb you may then tighten the anchor bolts. Do NOT use an impact wrench on anchor bolts. Recheck plumbness after tightening anchor bolts.

IMPORTANT: The legs must be shimmed so that the bases are adequately supported. If more than 1/2" of shimming is required, do NOT use the small shims provided by the factory. Fabricate larger shims from steel flat, 1/4" or 1/2" thick by 2" or more wide.

13. Raise the overhead beam and secure it to the top of the legs using the two 1/2 x 2-1/2 NC bolts that already secure the front of the cylinder mount weldment to the leg. See Figure 8.

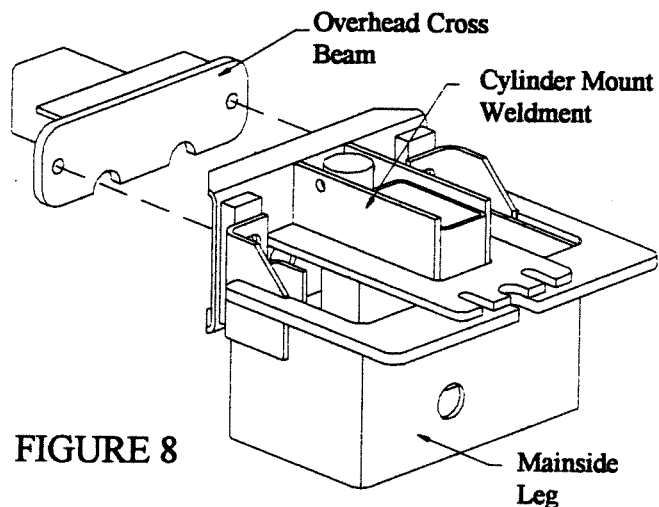


FIGURE 8

14. Check the alignment and plumbness of the entire structure. Level the offside leg in both the side to side and front to back directions. The base of the leg may vary slightly from the measured dimension, as it is more important that the leg be perpendicular to the floor and parallel with the other leg.

15. Drill the anchor bolt holes for the offside leg. Install the anchor bolts and shim the base as required. Tighten the nuts and recheck the plumbness of the leg. Make any necessary adjustments. DO NOT USE AN IMPACT WRENCH ON THE ANCHOR BOLTS.

16. Refer to Figure 9 for installation of carriage cables. Assemble a 3/4" NF nylon insert nut with a SAE washer onto one end of each cable. Start at the left rear hole at the top of the offside carriage. Thread the cable up through the hole in the carriage top, up to the overhead pulley, across to the other overhead pulley on the mainside through the holes in the cylinder mount weldment, down through the right rear hole in the carriage top, around the pulley in the leg bottom, and up to the right front hole of the carriage top. Secure the cable end with a 3/4" NF nylon insert nut and SAE washer. Do NOT tighten the cable at this time.

17. Start at the left rear hole of the mainside carriage and run the second cable in the same manner. Secure the cable end with a 3/4" NF nylon insert nut and a SAE washer. Do NOT tighten the cables at this time.

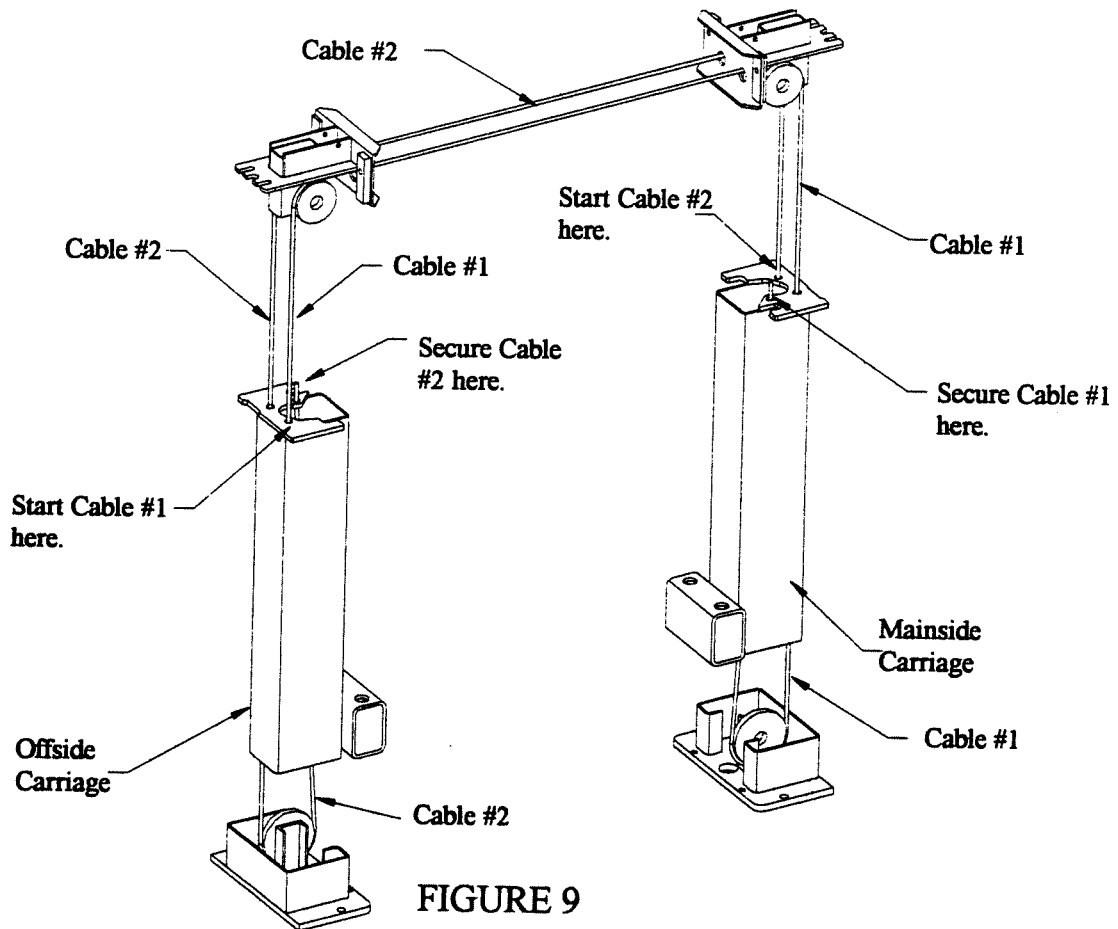


FIGURE 9

18. The carriage should be resting on the same safety rack tooth and the cables should be slack. The safety latch pull rods will not pull down, indicating that the weight of each carriage is on its safety latch. Measure the height above the base plate for each carriage. The measurements should be within 3/8" of each other. Make a note of the two measurements.

IMPORTANT!

The carriages must remain at the same height while the cross cables are being tightened. Overtightening of one cable could raise the carriage in the opposite leg and cause the carriage safety latches to be out of sync.

19. Take out the slack, but do NOT tighten, both cables by turning down the nuts on the top of each carriage top. Use vise grips to hold the cable end, but be very careful not to damage the threads.

20. Alternately tighten the cable nuts at both carriages until the cables are tightened. Correct tension in the cables is indicated by approximately 1/4" deflection on the cable in the leg when pulled at its midpoint. Measure the carriage heights or check the safety latch pull rod for the

carriage weight to verify that neither carriage has been raised. If a carriage has been raised more than 1/8", loosen the cables and repeat the procedure.

NOTE:

If you do not have a forklift, go to step 22.

21 If you have access to a forklift, lift one carriage up just enough to release pressure from the safety latch. If the cables are installed correctly, both carriages will raise. Pull out the safety latch pull rods under both carriages and lower to the ground. This will simplify the cylinder bleeding procedure.

22. Refer to Figure 10 below for mounting of the power unit. Locate the power unit mounting bracket on the back of the mainside leg. Attach 5/16" x 1" bolts to the mounting brackets and secure with 5/16" plain nuts. Attach the power unit to these bolts and secure with 5/16" nylon insert nuts.

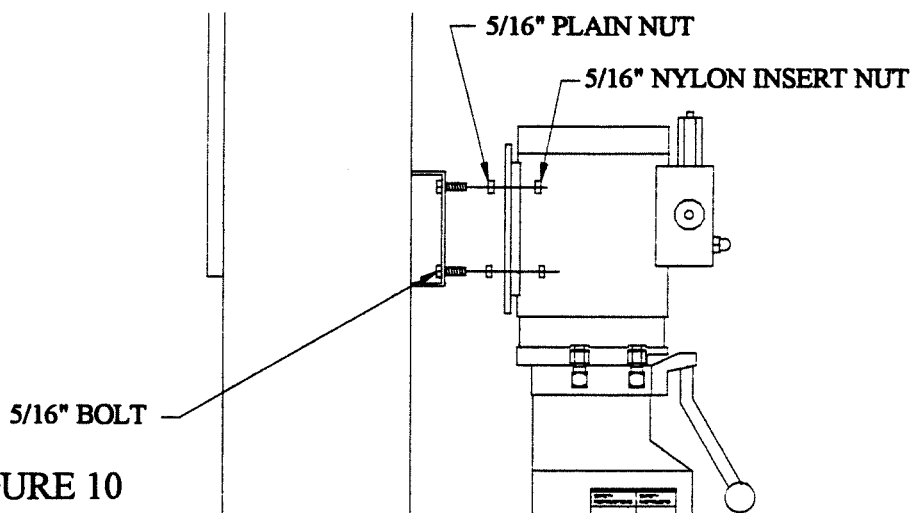


FIGURE 10

23. Strip approximately 8" from the end of the plastic coated 1/16" cable. Loop this end through the ring on the cylinder mount weldment on the offside leg and secure with a squeeze clamp. Thread the cable through the lift to the power unit as shown in Figure 11. On top of the conduit box of the power unit is the pull rod for the cable. Cut the cable 6" longer than the pull

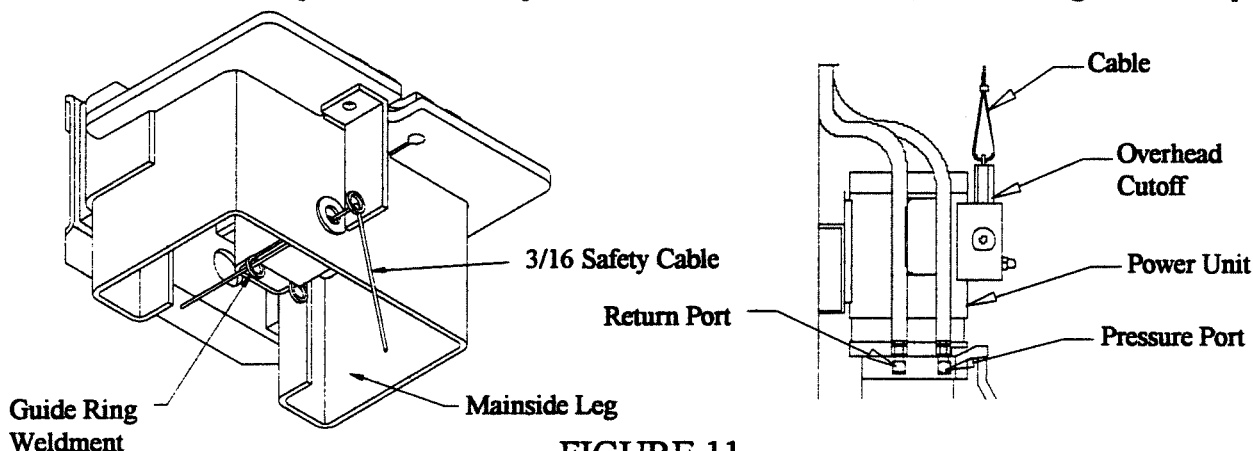


FIGURE 11

rod location, strip 8" from this end of the cable, and attach with a threaded clamp. The cable should not have any slack, but it should not hold the plunger off the limit switch inside the conduit box as indicated by the switch "clicking". Check and adjust if necessary. Put a dab of grease on the rings where the cable rubs the ring.

24. The power unit has two ports on its left side. On this side, the port on the left is the **return port**. The port on the right is the **pressure port**. See Figure 11 on previous page. Attach a 3/8" Male Pipe to 3/8" Male JIC 90 elbow to the return port. Attach a 3/8" O-Ring to 3/8" Male JIC to the pressure port. To the 3/8" O-Ring fitting, attach a 3/8" JIC Swivel Nut 90. Route the hoses as shown in Figure 11.

25. On the back of the mainside leg there are two holes near the top. On the bottom hole, attach the hydraulic fittings as shown in Figure 12. Two 9/16" SAE washers are used as spacers in the bulkhead fitting installation.

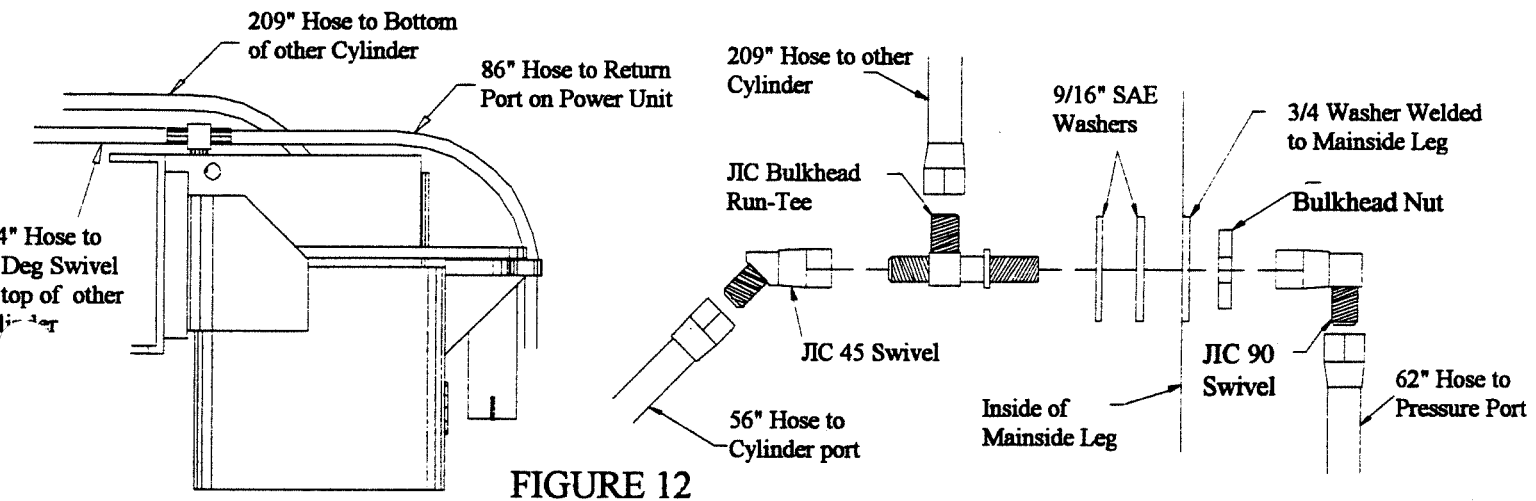


FIGURE 12

26. Figure 12 shows the hose installation. The 114" hose runs between the fittings on the cylinder tops and the hose sits on the overhead beam. Make sure to run the hoses through hose guides on top of the overhead beam. The 86" hose runs from the top of the mainside cylinder, through the slot on the back of the cylinder mount weldment through the hose guides on the leg back, to the return port (the return port is on the left and the pressure port is on the right) on the power unit. Install the 62" hose between the 90-deg swivel fitting and the pressure port on the power unit. Run the hose through the hose guides on the leg back. Install the 56" hose between the 45-deg swivel and the mainside cylinder port. Do not tighten the cylinder end of the hose fitting. Install the 209" hose between the top of the bulkhead fitting and the offside cylinder port. Do not tighten the cylinder end of the hose fitting. Thread the hose through the cylinder mount weldments and the hose guides on the overhead beam. Secure the 209" hose to the offside cylinder approximately 18" below the cylinder mount weldment using the supplied tie wrap.

27. Remove the fill level screw near the top of the tank on the power unit. Remove the breather and insert a funnel in the tank and fill with petroleum base hydraulic oil, non foaming, non detergent, such as Mobil DTE 25 or Texaco Hd 46, until fluid reaches the bottom of the screw hole. Replace the screw and tank breather.

28. Establish electrical hook-up to 220V single phase as shown in Figure 13.

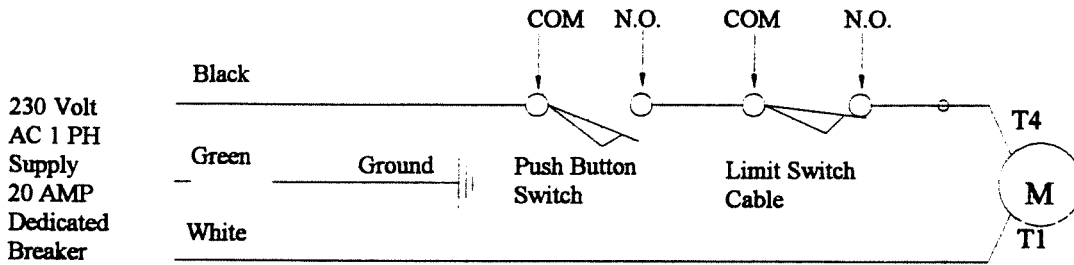


FIGURE 13

29. To bleed the hydraulic system, first loosen the hose connections at the rod end of both cylinders. Do NOT loosen the fittings from the cylinder, just the hose from the fitting. Run the power unit until fluid appears at the mainside cylinder port. Tighten that hose connection. Run the power unit until fluid appears at the offside cylinder port and there is no more air. Tighten that hose connection.

30. If a forklift was used in Step 21 to lower the carriages, no further bleeding is required. If no forklift was used continue with Steps 31 and 32.

31. Lower the lift to the ground. To do this, first manually raise the carriages just enough to release the latches using the push button switch on the power unit. Pull out the latch pull rods under each carriage, then lower the lift by pushing the lowering control level on the power unit. **KEEP FEET OUT FROM UNDER THE CARRIAGES. THEY CAN DROP VERY SUDDENLY.** Figure 14.

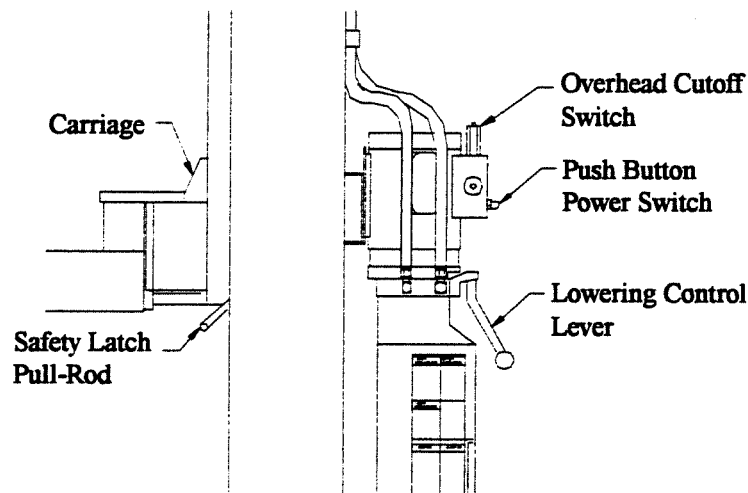


FIGURE 14

32. If a forklift was used, skip this step. Otherwise bleed the hydraulic system a second time. Repeat Step 29.

33. Install the swing arms with the swing arm pins. The pins just drop in, there is no attaching hardware. The long arms go to the rear, or drive in side of the lift. Refer to Figure 3 for placement of the swing arms.

34. Install the swing arm slide locks as shown in Figure 15. The 11" sliders are installed on the short swing arms.

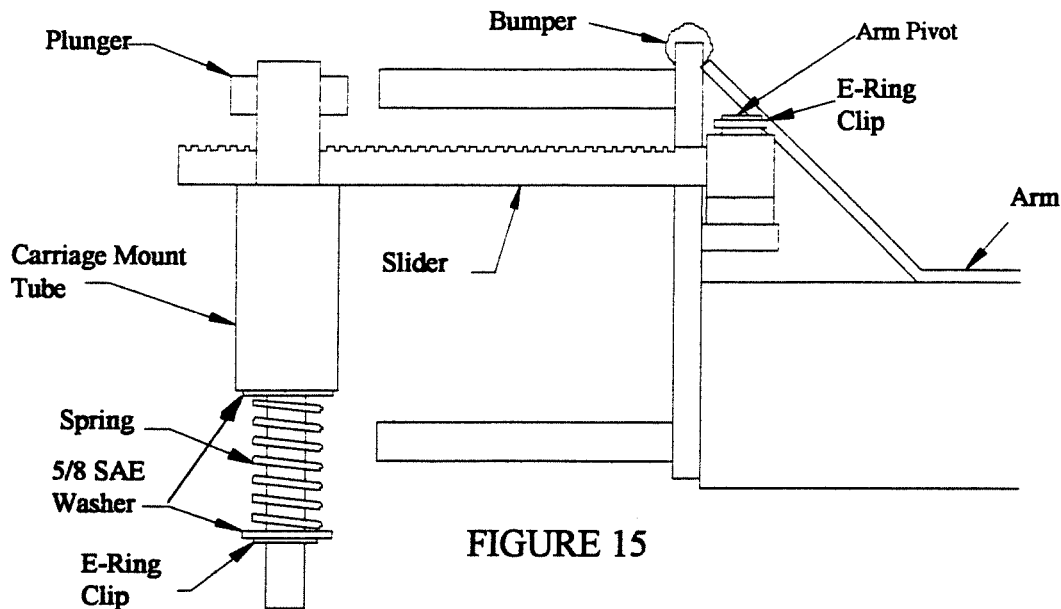


FIGURE 15

35. Lubricate the four inside corners of both legs with heavy duty bearing grease.

WARNING!

DO NOT ATTEMPT TO RAISE A VEHICLE AT THIS TIME. THE HYDRAULIC SYSTEM FIRST MUST BE BLED TO REMOVE ALL AIR.

36. Raise the lift to full height. Lower the lift onto the safety latches. Raise the carriages, pull out both latch pull rods, and lower the lift to the ground. If there are any problems, check the Troubleshooting section of this manual. (Page 13)

37. Raise the lift to the top of its travel and lower it the floor three (3) times (WITHOUT A CAR) to remove the last air from the hydraulic system.

38. Install the rubber bumper strips on the tops of the long swing arms. They just push right on. Figure 15.

IMPORTANT!

DO NOT ATTEMPT TO RAISE A VEHICLE UNTIL

- ◆ The cables are adjusted correctly. The latches should click together as the lift is being raised. Both safety latches lock when the carriages are lowered onto the locks and the pull rods cannot be pulled out.
- ◆ The legs have been leveled and the anchor bolts have been tightened.
- ◆ The leg corners have been greased.
- ◆ The hydraulic system has been bled and the lift has been cycled three (3) times to remove any additional air in the system air.

39. THE FIRST TIME A VEHICLE IS PLACED ON THE LIFT, RAISE IT NO HIGHER THAN THREE FEET. Lower the vehicle onto the safety latches. Raise the lift a few inches and pull out both latch pull rods then lower the vehicle to the floor. If there are any problems, check the Troubleshooting section of this manual. Correct any problems before continuing.

40. Raise the vehicle to full height and lower the carriages onto the safety latches. Lower the vehicle to the floor. If there are any problems check the Troubleshooting section of this manual. Correct any problems before continuing.

41. After cycling the lift a few times with a vehicle on it, recheck the tightness of the anchor bolt nuts. Check the nuts for tightness every week for the first month, and every month afterwards.

SECTION 2

CONCRETE ANCHOR BOLT INSTRUCTIONS

DRILLING AND INSTALLATION PROCEDURE

1. The anchor bolts must be installed at least 5" from any edge of the concrete or any seam.
2. Use a CARBIDE TIP, SOLID DRILL BIT, 3/4" DIAMETER. Tip diameter to ANSI STANDARD B95.12-1977. (.775" to .787").
3. Use a concrete hammer drill only!
4. Do NOT use excessively worn bits or bits which have been incorrectly sharpened.
5. Keep the drill perpendicular line while drilling.
6. Let the drill do the work. Do NOT apply excessive pressure.
7. Lift the drill up and down to remove dust and reduce binding.
8. Drill the hole completely through the slab.
9. Blow out the dust from the hole. This increases the holding power.
10. Assemble the washer and nut onto the anchor bolt. Thread the nut approximately 4/5's of the way onto the anchor bolt where the top of the nut is just above the top of the bolt. Using a hammer on the nut, carefully tap the anchor bolt into the concrete. DO NOT DAMAGE THE NUT OR THREADS. Figure 16 on previous page.
11. Tap the nut and bolt so the washer rests against the base of the lift.
12. Tighten the nut two or three turns using hand tools.

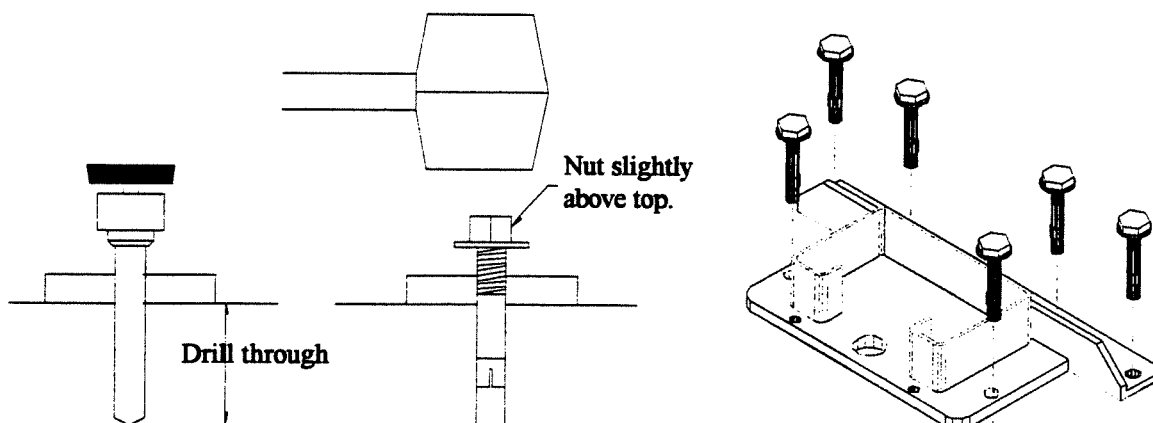


FIGURE 16

SECTION 3

TROUBLESHOOTING

1. PUMP MOTOR WILL NOT RUN

- ◆ Check electrical supply breaker.
- ◆ Check for activation of the travel limit switch by a tall vehicle. Normally, lowering a vehicle onto the safety latches will deactivate the limiting mechanism. However, if the plunger in the switchbox has lifted off the limit switch and the carriages are on the safety latches, the pin on the limit switch must be manually held down to activate the circuit.
- ◆ Check adjustment of overhead cable and micro-switch in motor control box. Figure 17. If the cable holds the plunger off of the micro-switch the circuit is broken and the cable has too much tension. The cable needs to be readjusted.
- ◆ Check micro-switch in motor control box. Figure 17.

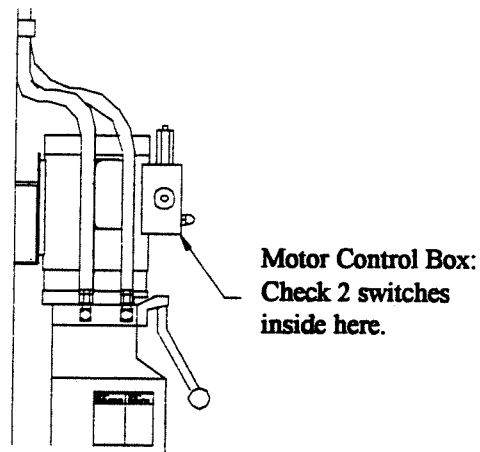


FIGURE 17

2. THE VEHICLE DOES NOT MOVE UP AND DOWN SMOOTHLY.

IMPORTANT!

IF A VEHICLE DOES NOT MOVE UP AND DOWN SMOOTHLY, DO NOT CONTINUE TO RAISE IT. LOWER THE VEHICLE AND CORRECT THE PROBLEM.

- ◆ Adjust vehicle placement on the lift for more equal weight distribution.
- ◆ Check the four inside corners of the two legs for roughness. Any rust or burrs must be removed with 120 grit emery cloth. The surfaces **MUST** be smooth.
- ◆ Lubricate the leg corners with heavy duty bearing grease.
- ◆ Check the legs for vertical alignment both side to side and front to back. use a level to check this. shim the legs as necessary to level the legs. Use steel 3/4" washers or 2 x 1 x 1/16" or 1/8" steel flat strips. Shim next to and on both sides of the anchor bolts.
- ◆ If bouncy, bleed the hoses as described in Step 29 in Section 1 of this manual.

IMPORTANT!

The legs must be shimmed so that the bases of the legs are adequately supported. If more than 1/2" of shimming is required, do NOT use the shims provided by the factory. Fabricate larger shims from steel flat which is 1/4" to 1/2" thick by 2" or more wide.

3. THE LIFT WILL NOT PICK UP ITS RATED LOAD.

- ◆ Adjust the vehicle placement on the lift for more equal weight distribution.
- ◆ Check the voltage of the electrical supply with the unit running under load. The voltage should be at least 208 V. Voltage less than this will not allow the motor to develop full power.
- ◆ The relief valve in the power unit is preset at the pump factory and cannot be adjusted. Call the lift manufacturer for assistance.

4. THE LIFT WILL NOT LOWER.

A. SAFETY LATCH PULL RODS

The lift will lower approximately 1", then it stops. Check the safety latch pull rods. If one of the rods has moved back up, that carriage is resting on its safety latch.

Explanation: The pull rod is out of adjustment and is rubbing on the leg. When the carriage is lowered, the rod is pulled in, engaging the safety latch. Adjust the rod to clear the leg. Push down on the first bend of the rod just inside the leg. Bend the rod slightly to allow it to move freely between the leg and the carriage. Figure 18

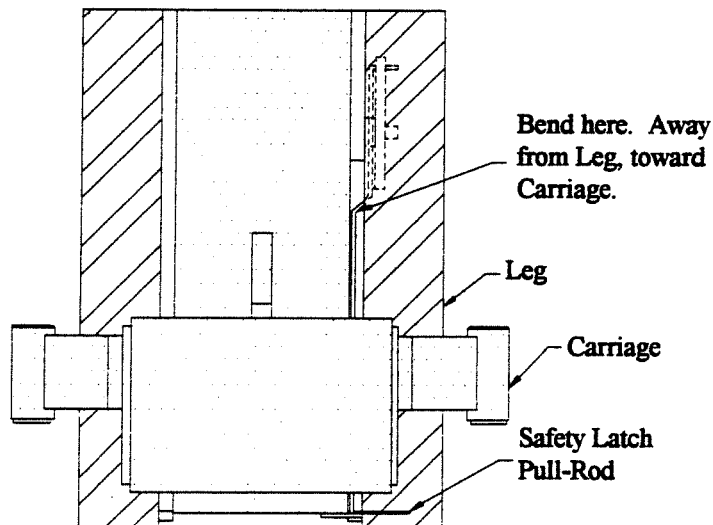


FIGURE 18

B. CARRIAGES OUT OF SYNC

The vehicle is at the top of the lift's travel and one safety latch will not disengage to allow the lift to lower.

Explanation: the carriages are out of sync. The carriage which is 'low' cannot be raised enough to clear the latch rack so that the safety latch can be disengaged. This is confirmed by the inability to pull down the latch rod on that carriage. Also, the carriages do not 'click' at the same time as the lift is raised.

To lower lift:

- ◆ Raise the lift to full height.
- ◆ Push IN both safety latch pull rods to engage latches.
- ◆ Use a hydraulic jack and a length of pipe to raise the low carriage enough to disengage the safety latch. Pull the latch rod on that carriage only.
- ◆ Remove the jack and pipe.
- ◆ Pull the latch rod on the other carriage to disengage the latch.
- ◆ Lower the lift and remove the vehicle.
- ◆ Readjust the cables as described in the INSTALLATION section of this manual.

5. CYLINDER LEAKS DOWN.

There may be some contamination in the check valve which prevents the valve from seating.

- ◆ Hold open the lowering valve by push the control lever on the power unit.
- ◆ Run the motor by holding the push button switch for 30 seconds to flush the valve.
- ◆ Repeat 3 or 4 times.
- ◆ If cylinder continues to leak down, the valve may be faulty. Contact the manufacturer.

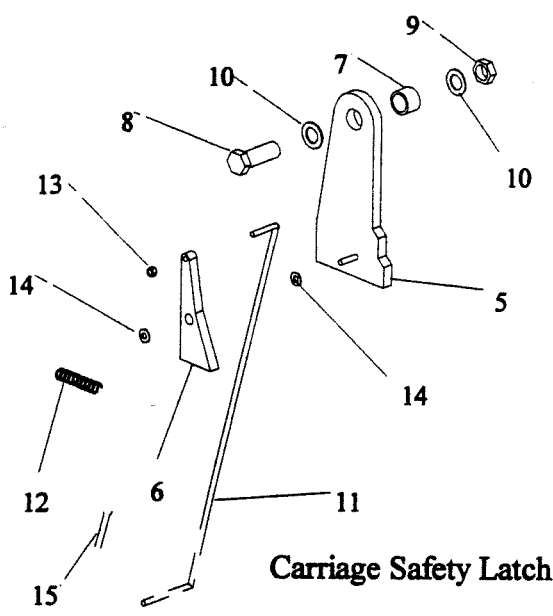
6. POWER UNIT SWITCH WILL NOT RELEASE.

Contact the manufacturer for a replacement switch.

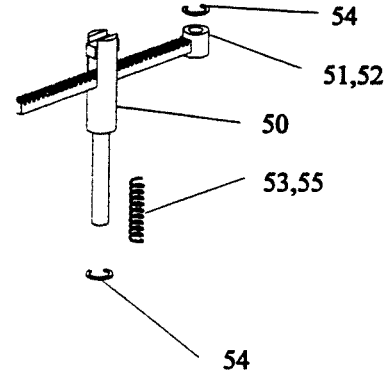
SECTION 4

CYLINDER REPLACEMENT

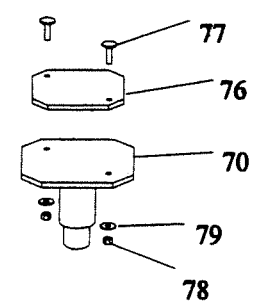
1. Raise the lift carriages a few inches. Place a 2" spacer under each carriage. Lower carriages onto the spacers.
2. **DO NOT HOLD THE CYLINDER ROD WITH ANYTHING WHICH WILL DAMAGE THE FINISH. CYLINDER LEAKS CAUSED BY DAMAGED RODS ARE NOT COVERED BY WARRANTY.** Hold the 3/4" full nut and remove the jam nut. Remove the full nut.
3. Remove the pressure hose from the bottom fitting of the cylinder. Remove the return hose from the top of the cylinder.
4. Pull the rod from the carriage bottom plate. Push the rod into the cylinder to prevent damage to the rod during handling.
5. Remove the cylinder from the upright by taking out the 1/2 x 5 grade 8 bolt at the top of the cylinder.
6. Reverse the procedure to replace the cylinder.
7. Bleed hydraulic system as described in INSTALLATION section of this manual.



Carriage Safety Latch



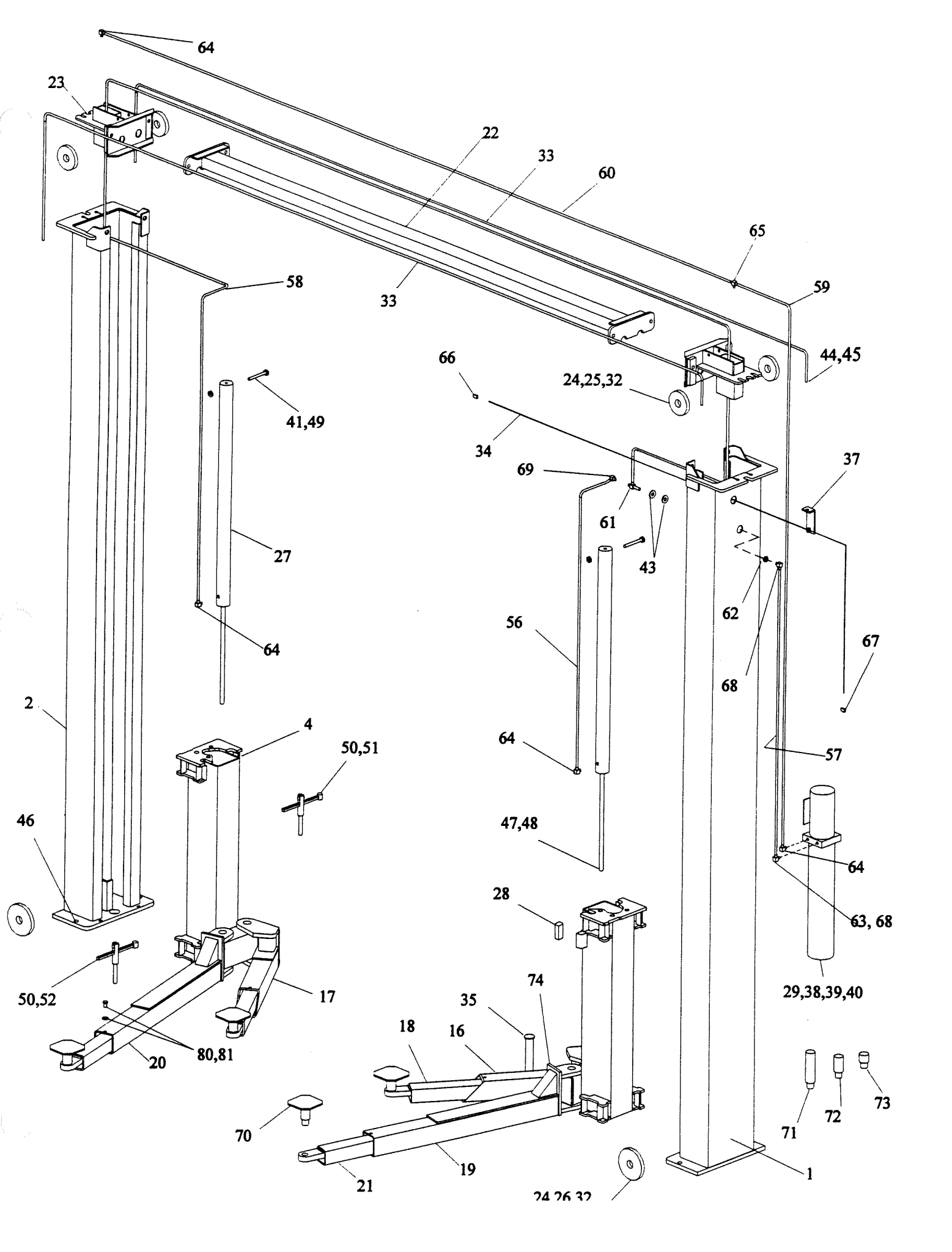
Arm Lock Assembly

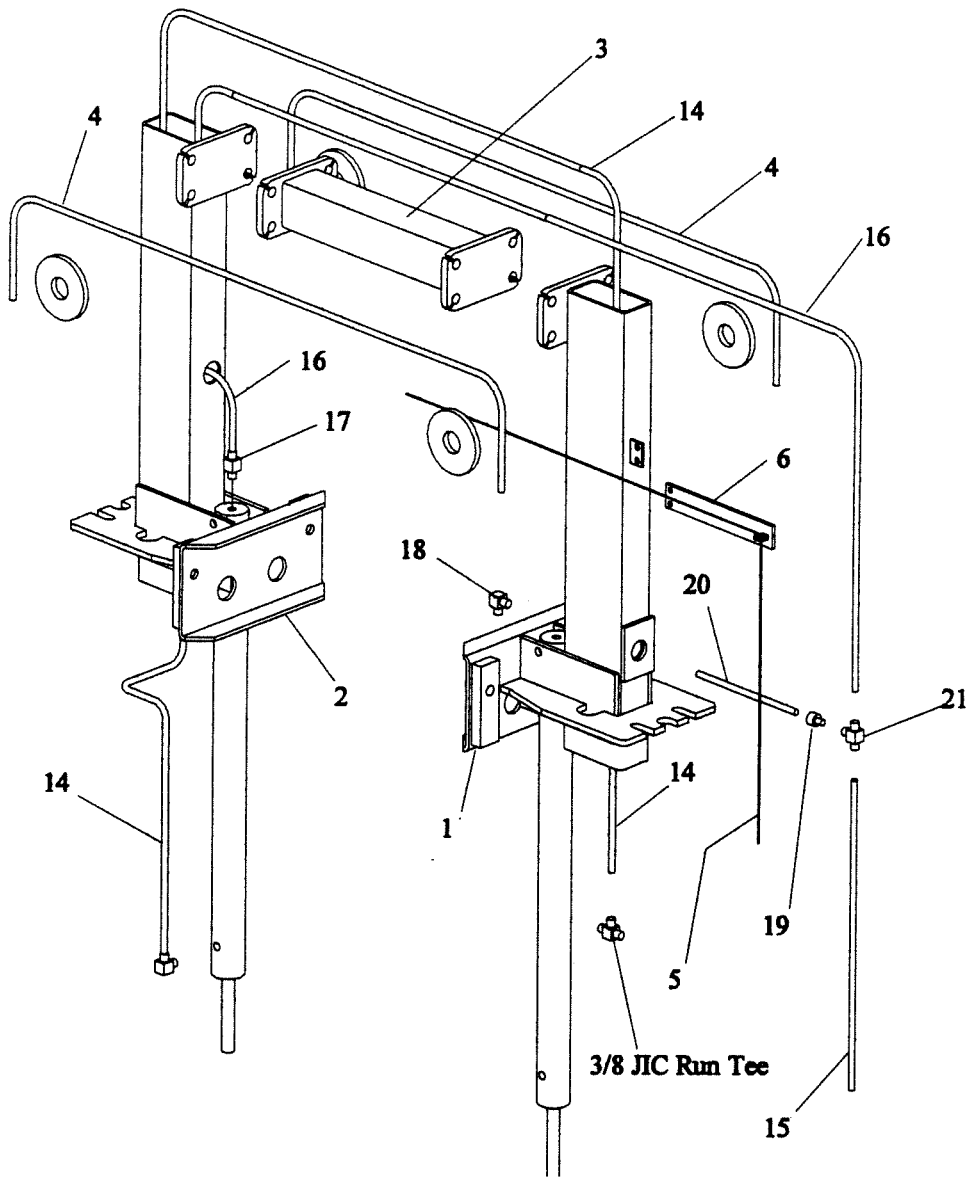


Swivel Pad w/ Rubber Insert

Item	Part No.	Description
1	106101	Mainside Leg Weldment
2	106201	Offside Leg Weldment
3	106500	Carriage Assembly
4	106501	Carriage Weldment
5	070525	Safety Latch
6	070528	Wipeout
7	070530	Pivot, Latch
8	913682	Bolt, Latch, 3/4 x 2 NC
	913600	Nut, Latch, 3/4 Nyloc NC
	913605	Washer, Latch, 3/4 Flat
11	090541	Pull Rod
12	991071	Spring, Latch
13	991070	Cap, Nut, 3/16
14	912005	Washer, 3/8 Flat
15	991077	Cotter Pin, 3/32 x 1-1/2
16	106606	Short S/A Tube Wld, R/H
17	106607	Short S/A Tube Wld, L/H
18	106608	Short Slider Weldment
19	106704	Long S/A Tube Wld, R/H
20	106705	Long S/A Tube Wld, L/H
21	106703	Long Slider Weldment
22	106801	Overhead Wldmnt, 113"
23	106802	Cyl Mount Wld
24	991030	1-3/8 Snap Ring
25	995020	4" Sheave
26	995030	5" Sheave
27	992317	Cylinder, 2 x 67-1/2
28	995120	Rub Block, UHMWPE
29	992017	Pwr Unit, AB-1135, RV19
30	912701	1/2 x 2-1/2 NC Bolt
31	912601	1/2 NC Nut
32	991211	Bushing, Sheave
33	992627	Cable, 3/8 Dia x 33'-6"
	992609	Cable, Limit Switch, 1/16" x 16'
35	995430	Swing Arm Pin, 8"
36	991124	Shims
37	106804	Overhead Limit Cable Ring Wld
38	011701	5/16 NC Nut, Power Unit Mount

Item	Part No.	Description
39	911703	5/16 Nyl Ins Nut, NC
40	911741	5/16 x 1 NC Bolt, 4 P/U, 2 Ring
41	912603	1/2 NC Nyloc Nut, Cyl mount
42	912605	1/2 Flat Washer
43	912906	9/16 SAE Washer, Bulkhd Mnt
44	913604	3/4 Nyl Insert Nut, NF, Cable
45	913606	3/4 SAE Washer
46	913828	3/4 x 5-1/2 Anchor Bolt
47	913602	3/4 NF Nut, Cyl Mount
48	913611	3/4 NF Jam Nut, Cyl Mount
49	912791	1/2 x 5 NC Bolt, Gr 8
		Arm Lock Assembly
50	106702	7" Plunger
51	070705	8" Slider
52	106701	11" Slider
53	991216	Spring, 13/16 Dia x 3
54	991209	E-Clip
55	913206	5/8 SAE Washer
56	992156	3/8 Hose x 56", High Press
57	992142	3/8 Hose x 62", High Press
58	992157	3/8 Hose x 209", High Press
59	992137	3/8 Hose x 86", High Press
60	992144	3/8 Hose x 114", High Press
61	992431	3/8 JIC Bulkhead Run Tee
62	992454	3/8 Bulkhead Nut
63	992410	3/8 O-Ring to 3/8 Male JIC
64	992402	3/8 Male JIC to 3/8 MNPT 90
65	992419	3/8 JIC Branch T to 3/8 MNPT
66	991084	1/16 Cable Clamp, Alum Squeeze
67	991244	1/8 Cable Clamp, Threaded
68	992426	3/8 JIC 90 Swivel Nut
69	995464	3/8 JIC 45 Swivel Nut
70	106605	Pad Weldment Stacking Type
71	995550	6" Pad Extension
72	995560	3" Pad Extension
73	996220	1-1/2" Pad Extension
74	991303	Bumper Strip, 4-5/8 Long
75	991082	Tie Wrap, 24"
76	991234	Rubber Pad Insert
77	991243	1/4 x 1 Elevator Bolt
78	911401	1/4 NC Nut
79	911405	1/4 Flat Washer
80	912631	1/2 x 3/4 NC Bolt, S/A Assy
81	912607	1/2 Lock Washer, S/A Assy
82	991019	Manual, DPO9A/A2





<u>Item</u>	<u>Part No.</u>	<u>Description</u>	<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	108801	2' Extended Upright, M/S	11	912605	1/2 Flat Washer
2.	108802	2' Extended Upright, O/S	12	912603	1/2 NC Nyloc Nut
3	108803	Overhead Wldment for Ext.	13	912791	1/2 x 5 NC Gr 8 Bolt
4.	992639	Cable, 3/8 Dia x 37' - 6"	14	992158	3/8 Hose x 257"
5	992609	Cable, Limit Switch, 1/16 Dia	15	992161	3/8 Hose x 77"
6	057804	O/H Limit Cable Ring Wld	16	992159	3/8 Hose x 176"
7	911703	5/16 Nyl Ins Nut, Ring Wld	17	992403	3/8 MJIC to 3/8 M Pipe
8	911741	5/16 x 1 NC Bolt, 2 Ring Wld	18	992471	3/8 M Pipe Street Elbow 90
9	912701	1/2 x 2-1/2 NC Bolt, O/H Mnt	19	992472	3/8 F Pipe to 3/8 MJIC
10	912601	1/2 NC Nut	20	992473	3/8 x 8 Pipe Nipple
			20	992427	3/8 JIC Swivel Nut Branch Tee

APPENDIX A

EXTENDED UPRIGHTS, DP LIFTS

NOTE:

Please familiarize yourself with the steps included here. The following steps should be replaced in Section 1 when installing the DP extended lift instead of the DP standard height lift.

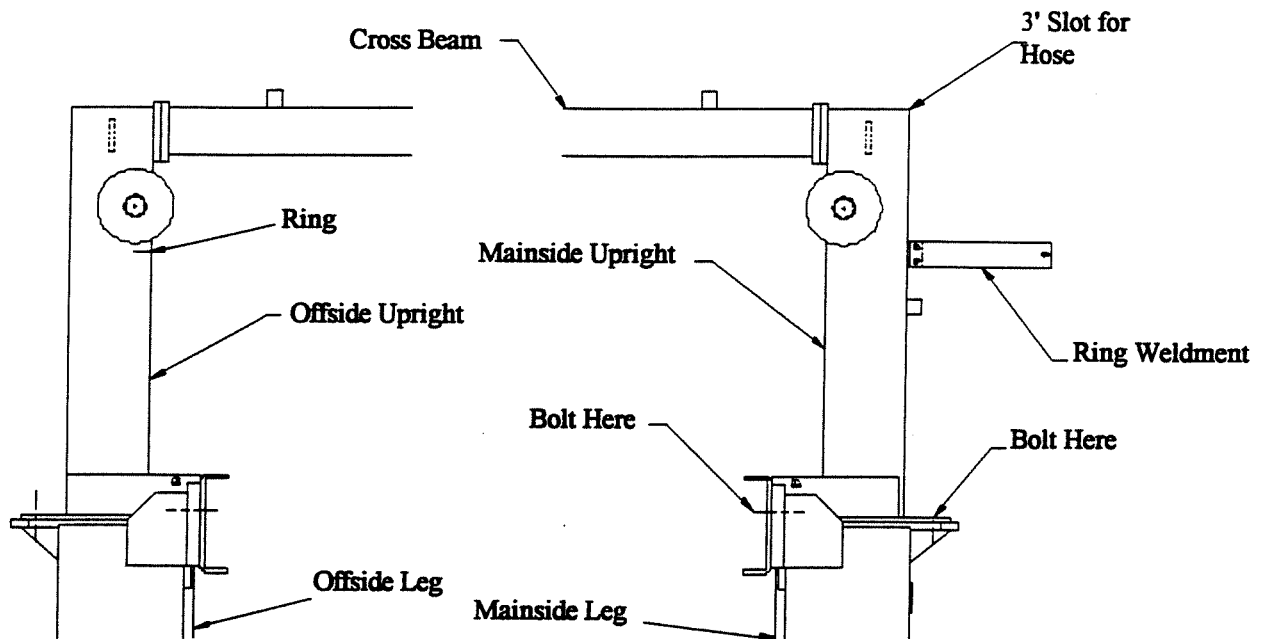


FIGURE 1

5a. While the legs are on the ground, attach the extended uprights to the legs using the same $1/2 \times 2-1/2$ bolts which were used as packing bolts. The mainside upright will be characterized as having a 3" slot at its top rear. The offside upright has the hole in the center of the tube and a ring welded on its side. Bolt the mainside upright to the mainside leg and the offside upright to the offside leg. Figure 1.

7a. Remove the red port plugs from each cylinder. Attach a male JIC 90 elbow to the nipple at the bottom end of both cylinders. The fitting should face toward the top of the cylinder. Attach the 90 street elbow to the top of the mainside cylinder. The end should face toward the hole in the upright. Figure 2 on following page.

10a. Attach the $3/8$ " male JIC to $3/8$ " male pipe fitting to the top of the offside cylinder.

13a. Raise the overhead beam and secure it to the top of the uprights using two $1/2 \times 2-1/2$ " NC bolts at each end.

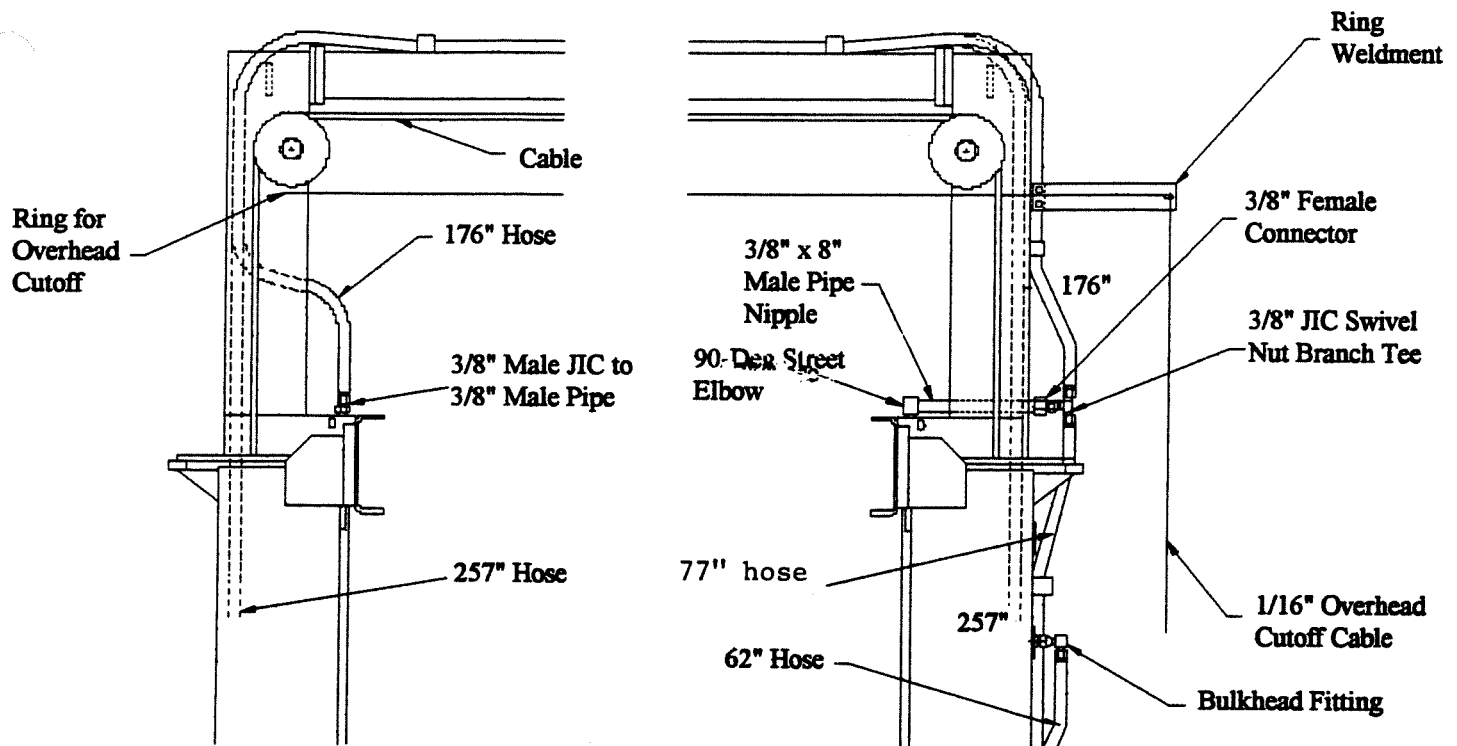


FIGURE 2

16a. The cable installation is the same as described in Section 1, Steps 16-17, except here the cables are run up out of the top of the leg and over the sheaves. Figure 2

23a. Attach the ring weldment to the mainside upright using two 5/16" x 1" bolts. The safety cable for the uprights runs directly from the pull rod on the conduit box on top of the power unit (Figure 11, Page 8) through the ring weldment across to the ring which is attached to the offside upright.

26a. Refer to Figure 2 above. Run the 8" male pipe nipple through the hole in the mainside upright and attach it to the 90 street nipple. Attach the 3/8" female connector to the other end of the pipe. Next, attach the 3/8" JIC swivel nut branch-tee to the end of the 3/8" female connector.

26b. Refer to Figure 2. The Bulkhead Fitting is the same as described in Section 1, Step 26. Attach one end of the 257" hose to the top of the branch tee bulkhead fitting. Run it up through the mainside upright, across the overhead beam, through the hose guides, down through the offside upright, and attach it to the cylinder port near the bottom of the cylinder. Do NOT tighten the cylinder end of the hose. Next, take the 176" hose and attach it to the top of the branch tee coming out of the mainside upright. Run it up alongside the upright, through the hose guides, through the slot at the top, across the overhead beam, through the hose guides, down into the offside upright, out of the hole in the upright, and attach it to the fitting on the top of the offside cylinder. Run the 62" from the pressure port on the power unit to the bulkhead fitting coming out of the back of the mainside leg. Install the 56" hose between the JIC 45 swivel and the mainside cylinder port as shown in Figure 12, Page 9. Do NOT tighten the cylinder end of the hose.

DP10A (143000) / DPO10A (173000), ASYM ARM / STD HT, ASSEMBLY LIST (4/28/98)

ITEM	PART NO.	NAME/DESCRIPTION	RQD.
1	994173	Bolt Box, DP/DPO/97A/9A/10A, AsymArm/Std Ht	1
2	145101	Mainside Leg Weldment	1
3	145201	Offside Leg Weldment	1
4	145500	Carriage Assembly	2
5	145501	Carriage Wldmnt 6x8x5/16x47-7/8	2
6	070525	Safety Latch	2
7	070528	Wipeout	2
8	070530	Pivot, latch	2
9	991077	Cotter pin, 3/32 x 1-1/2	2
10	913682	Bolt, latch, 3/4 x 2 NC	2
11	913600	Nut, latch, 3/4 nyl insert, NC	2
12	913605	Washer, latch, 3/4 flat	4
13	912005	Washer, wipeout	4
14	090541	Pull rod	2
15	991071	Spring, latch	2
16	991070	Cap nut, 3/16	2
17	106606	Short Swing Arm Tube Wld R/H	1
17.1	106607	Short Swing Arm Tube Wld L/H	1
18	143602	Short Slider Wld	2
19	145603	Long Slider Wld	2
19.1	143604	Long Swing Arm Tube Wld R/H	1
19.2	143605	Long Swing Arm Tube Wld L/H	1
20	106801	Overhead Wldmnt, 112" Tube	1
21	106802	Cylinder Mount Wldmnt	2
23	106851	Packing Bracket	2
24	991030	1-3/8 Snap Ring	6
25	995020	4" Sheave	4
26	995030	5" Sheave	2
27	991211	Bushing, sheaves	6
28	992317	Cylinder, 2 x 67-1/2	2
29	912603	1/2 NC Nylon Insert Nut, cyl mnt	2
30	912791	1/2 x 5 NC Bolt, Gr 8, "	2
31	995120	Rub Block	16
32	992030	Power Unit, Fenner AB 1205	1
33	912701	1/2 x 2-1/2 NC Bolt	12
34	912601	1/2 NC Nut	12
35	912605	1/2 Flat Washer	24
36	912631	1/2 x 3/4 NC Bolt, Swing Arm	4
37	912607	1/2 Lock Washer, Swing Arm Assy	4

DP/DPO/97A/9A/10A, ASYM ARMS / STD HT, BOLT BOX LIST, PN 994173 (4//98) P.1

ITEM	PART NO.	NAME/DESCRIPTION	RQD.
1	994322	Manual, DP/DPO/97/9/10/A/A2, Asym Arm	1
2	992627	Cable, 3/8 dia x 33', 6"	2
3	992609	Cable, Limit Switch, 1/16 cable	16'
4	995430	Swing Arm Pin, 8"	4
5	991124	Shims	16
6	057804	O/H Limit Cable Ring Wldmnt	1
7	911701	5/16 NC nut, power unit mnting	4
8	911703	5/16 Nyl ins nut, NC "	4
9	911741	5/16 x 1 NC bolt, 4 P/U	4
10	912906	9/16 SAE Washer, Bulkhd mount	2
11	913604	3/4 Nyl Insert Nut NF, cable mnt	4
12	913606	3/4 SAE Washer, "	4
13	913828	3/4 x 5-1/2 anchor bolt	12
14	913602	3/4 NF Nut, Cyl mnt	2
15	913611	3/4 NF Jam Nut, Cyl mnt	2
16	148701	7" Threaded Plunger	4
17	148702	8" Threaded Slider	2
17.1	148703	11" Threaded Slider	2
18	991216	Spring, 13/16 dia x 3	4
19	991209	E-Clip	8
20	913206	5/8 SAE Washer	8
26	992156	3/8 Hose x 56, High Press	1
27	992142	3/8 Hose x 62, " "	1
28	992157	3/8 Hose x 209, " "	1
29	992174	3/8 Hose x 92, " "	1
30	992160	3/8 Hose x 114, " "	1
31	992431	3/8 JIC Bulkhd Run Tee	1
32	992454	3/8 Bulkhead Nut	1
33	992425	3/8 OR to 3/8 MJIC	2
34	992402	3/8 Male JIC to 3/8 MNPT, 90	4
35	992426	3/8 JIC 90 Swivel Nut	3
36	995464	3/8 JIC 45 Swivel Nut	1
37	992419	3/8 JIC Branch Tee to 3/8 MNPT	1
38	991084	1/16 Cable Clamp, Alum Squeeze	1
39	991244	1/8 Cable Clamp, Threaded	1

DP/DPO/97A/9A/10A, ASYM ARMS / STD HT, BOLT BOX LIST, PN 994173 (4/98) P.2

40	106605	Pad Wldmnt, Stacking Type	4
41	995550	6" Pad Extension	4
42	995560	3" Pad Extension	4
43	996220	1-1/2" Pad Extension	4
44	991303	Bumper Strip, 4-5/8 Long	2
45	991082	Tie Wrap, 24"	4
46	991234	Rubber Pad Insert	4
47	991243	1/4 x 1 Elevator Bolt	8
48	911401	1/4 NC Nut	8
49	911405	1/4 Flat Washer	8

DP10A2 (144000) / DPO10A2 (174000) ASY ARM, EXT HT, ASSEMBLY LIST (4/29/98)

ITEM	PART NO.	NAME/DESCRIPTION	RQD.
1	994174	Blt Bx, DP/DPO/97A2/9A2/10A2, AsyArm, Ext Ht	1
2	145101	Mainside Leg Weldment	1
3	145201	Offside Leg Weldment	1
4	145500	Carriage Assembly	2
5	145501	Carriage Wldmnt 6x5x5/16x47-7/8	2
6	070525	Safety Latch	2
7	070528	Wipeout	2
8	070530	Pivot, latch	2
9	991077	Cotter pin, 3/32 x 1-1/2	2
10	913682	Bolt, latch, 3/4 x 2 NC	2
11	913600	Nut, latch, 3/4 nyl insert, NC	2
12	913605	Washer, latch, 3/4 flat	4
13	912005	Washer, wipeout	4
14	090541	Pull rod	2
15	991071	Spring, latch	2
16	991070	Cap nut, 3/16	2
17	106606	Shrt Swing Arm Tube Wld R/H	1
18	106607	Shrt Swing Arm Tube Wld L/H	1
19	106608	Shrt Swing Arm Slider Wld	2
20	143604	Long Swing Arm Tube Wld, R/H	1
21	143605	Long Swing Arm Tube Wld, L/H	1
22	106703	Long Swing Arm Slider Wld	2
23	108803	Overhead Wldmnt for Extended, 119" Long	1
24	108801	2' Extended Upright, M/S	1
25	108802	2' Extended Upright, O/S	1
26	106805	Packing Bracket	2
27	991030	1-3/8 Snap Ring	6
28	995020	4" Sheave	4
29	995030	5" Sheave	2
30	991211	Bushing, sheaves	6
31	992317	Cylinder, 2 x 67-1/2	2
32	912603	1/2 NC Nylon Insert Nut, cyl mnt	2
33	912791	1/2 x 5 NC Bolt, Gr 8, "	2
34	995120	Rub Block	16
35	992030	Power Unit, Fenner 1205	1
36	912701	1/2 x 2-1/2 NC Bolt	12
37	912601	1/2 NC Nut	12
38	912605	1/2 Flat Washer	24
39	912631	1/2 x 3/4 NC Bolt, Swing Arm	4
40	912607	1/2 Lock Washer, Swing Arm Assy	4

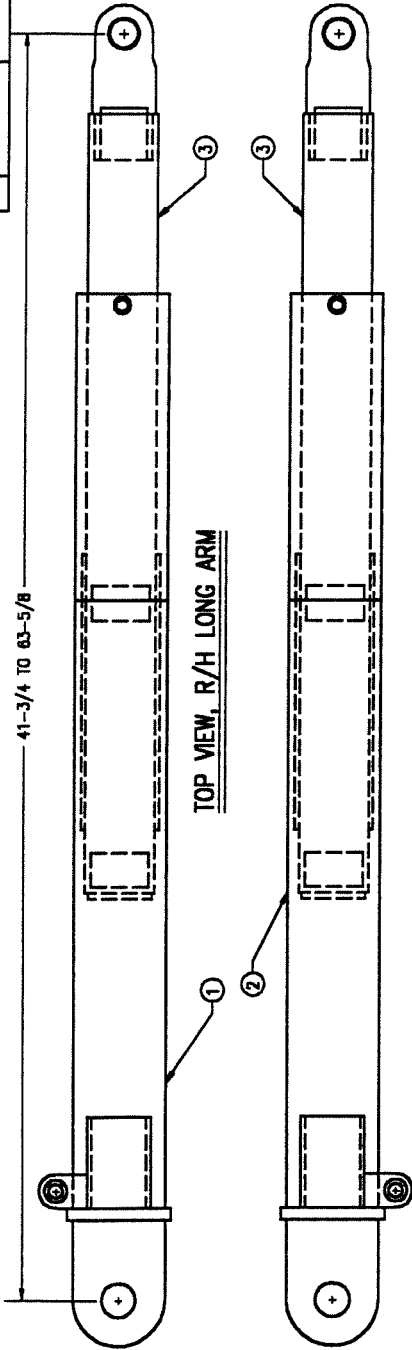
DP/DPO/97A2/9A2/10A2, ASYM ARM / EXT HT, BOLT BX LIST, PN 994174 (4/98) P. 1

ITEM	PART NO.	NAME/DESCRIPTION	RQD.
1	994322	Manual, DP/DPO/97/9/10/A/A2, Asym Arm	1
2	992639	Cable, 3/8 dia x 37', 6"	2
3	992609	Cable, Limit Switch, 1/16 cable	19.5'
4	995430	Swing Arm Pin, 8"	4
5	991127	Shims	16
6	057804	O/H Limit Cable Ring Wldmnt	1
7	911701	5/16 NC nut, power unit mnting	6
8	911703	5/16 Nyl ins nut, NC "	6
9	911741	5/16 x 1 NC bolt, 4 P/U	4
10	912603	1/2 Nc Nyloc Nut, Cyl Mount	2
11	912791	1/2 x 5 NC Bolt, Gr 8	2
12	912701	1/2 x 2-1/2 NC Bolt, O/H Mnt	8
13	912601	1/2 NC Nut	8
14	912605	1/2 Flat Washer	16
15	912906	9/16 SAE Washer, Bulkhd mount	2
16	913604	3/4 Nyl Insert Nut NF, cable mnt	4
17	913606	3/4 SAE Washer, "	4
18	913828	3/4 x 5-1/2 anchor bolt	12
19	913602	3/4 NF Nut, Cyl mnt	2
20	913611	3/4 NF Jam Nut, Cyl mnt	2
21	148701	7" Threaded Plunger	4
22	148702	8" Threaded Slider	2
23	148703	11" Threaded Slider	2
24	991216	Spring, 13/16 dia x 3	4
25	991209	E-Clip	8
26	913206	5/8 SAE Washer	8
27	992156	3/8 Hose x 56, High Press	1
28	992142	3/8 Hose x 62, " "	1
29	992158	3/8 Hose x 257, " "	1
30	992175	3/8 Hose x 83, " "	1
31	992159	3/8 Hose x 176, " "	1

DP/DPO/97A2/9A2/10A2, ASYM ARM / EXT HT, BOLT BX LIST, PN 994174 (4/98) P. 2

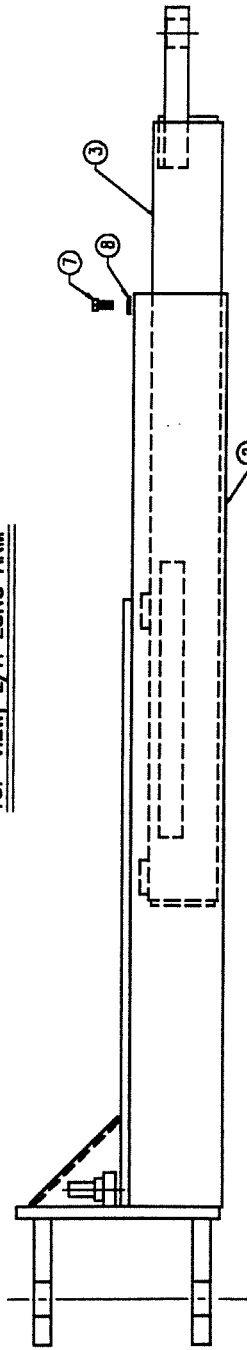
32	992431	3/8 JIC Bulkhd Run Tee	1
33	992454	3/8 Bulkhead Nut	1
34	992425	3/8 OR to 3/8 MJIC Straight Adapter	2
35	992473	3/8 x 8" Pipe Nipple	1
35	992472	3/8 F Pipe to 3/8 MJIC Conn	1
36	992471	3/8 M Pipe Street Elbow 90	1
37	992427	3/8 JIC Swivel Nut Branch Tee	1
38	992403	3/8 MJIC to 3/8 M Pipe	1
39	992402	3/8 Male JIC to 3/8 MNPT, 90	4
40	992426	3/8 JIC 90 Swivel Nut	3
41	995464	3/8 JIC 45 Swivel Nut	1
42	991084	1/16 Cable Clamp, Alum Squeeze	1
43	991244	1/8 Cable Clamp, Threaded	1
44	106605	Pad Wldmnt, Stacking Type	4
45	995550	6" Pad Extension	4
46	995560	3" Pad Extension	4
47	996220	1-1/2" Pad Extension	4
48	991303	Bumper Strip, 4-5/8 Long	2
49	991082	Tie Wrap, 24"	4
50	991234	Rubber Pad Insert	4
51	991243	1/4 x 1 Elevator Bolt	8
52	911401	1/4 NC Nut	8
53	911405	1/4 Flat Washer	8

41-3/4 TO 63-5/8

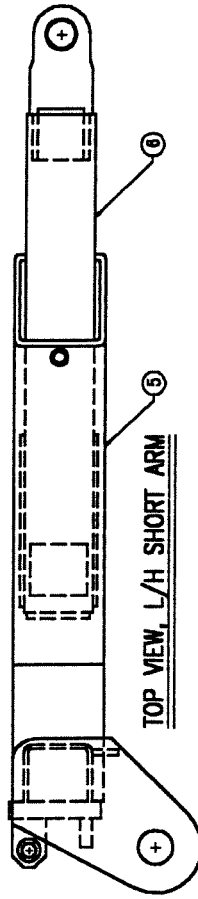


TOP VIEW, R/H LONG ARM

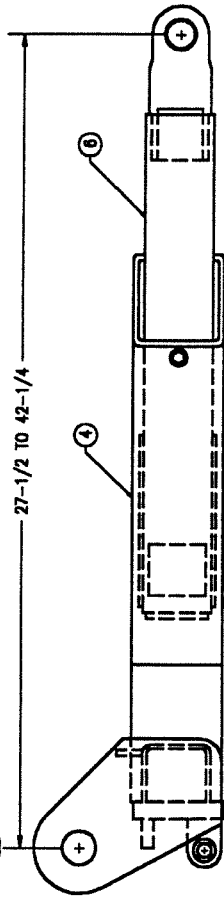
TOP VIEW, L/H LONG ARM



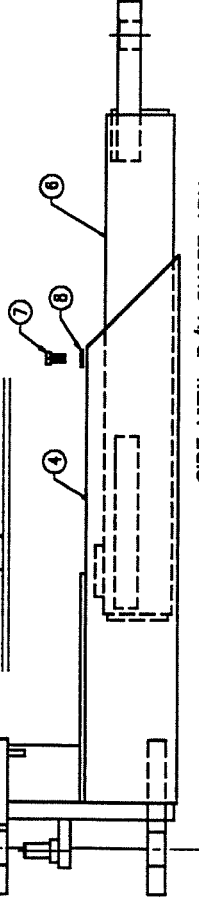
SIDE VIEW, L/H LONG ARM



TOP VIEW, L/H SHORT ARM



TOP VIEW, R/H SHORT ARM



SIDE VIEW, R/H SHORT ARM

ITEM	P/N	REV	NAME	DESCR.	QTY
8	912607		1/2 LOCK WASHER		4
7	912631		1/2 X 3/4 NC BOLT		4
6	143602		SHORT SLIDER WLDMNT	DPO10 EXCLUSIVE	2
5	106607	C	L/H SHORT S/A WLDMNT	DPO9 AND DPO10	1
4	106606	C	R/H SHORT S/A WLDMNT	DPO9 AND DPO10	1
3	145603		LONG SLIDER WELDMENT	DPO10 EXCLUSIVE	2
2	143605		L/H LONG S/A WLDMNT	DPO9 AND DPO10	1
1	143604		R/H LONG S/A WLDMNT	DPO9 AND DPO10	1
					RQD.

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S/A ASSY; SHORT & LONG, R/H & L/H
MODEL DP010A, DP10

SCALE: 1/4
DATE: 9/27/97

FORWARD MFG. CO. INC.

REV — PART NO. 143600