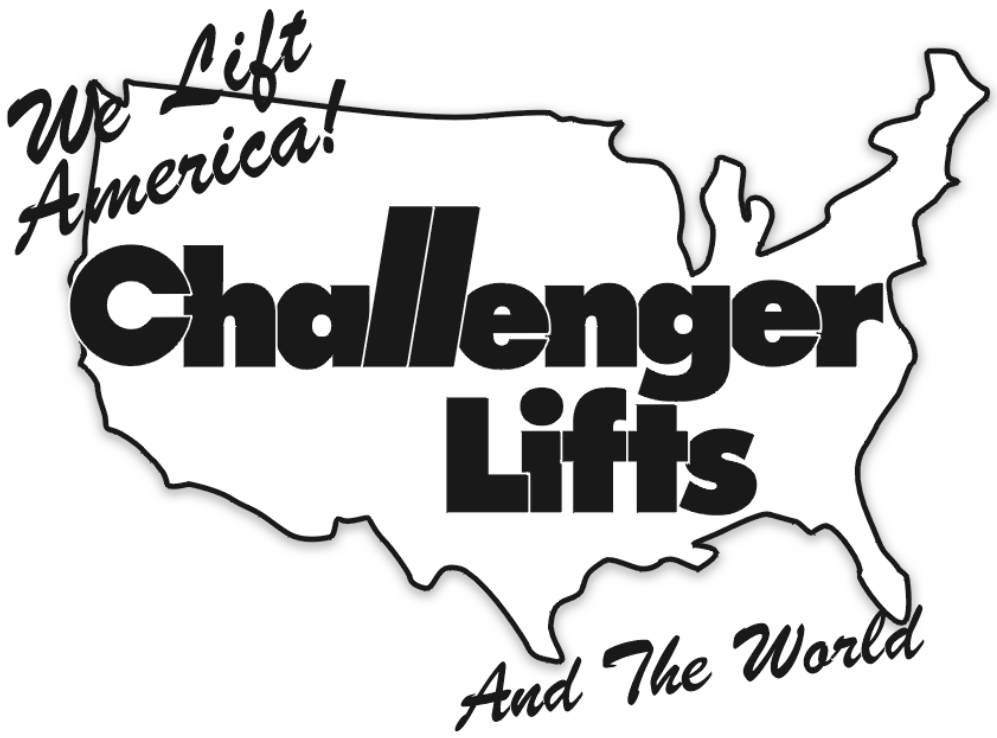
Challenger Lifts, Inc.

MODELS 27000 & 31000

TWO POST SURFACE MOUNTED LIFT OPERATION, INSTALLATION & MAINTENANCE MANUAL



IMPORTANT !!!

READ THIS MANUAL COMPLETELY BEFORE INSTALLING OR OPERATING THE LIFT

200 CABEL STREET, P.O. BOX 3944
LOUISVILLE, KENTUCKY 40201-3944

OFFICE (502) 625-0700 **FAX (502) 587-1933**

Installation Procedure

1. Before installing your Challenger 2-Post lift, inspect the lift to insure that it is complete and undamaged. Challenger 2-Post lifts are shipped ready to assemble to facilitate shipping and reduce damage. If it is apparent that the lift has been mishandled in shipment, or if parts or assemblies are missing, note the damage or missing part(s) on the shipping papers and notify Challenger Lifts, Inc. Immediately.

   A 2-Post lift consists of several major components. These components are described below:

   One power column assembly, identified by the presence of a motor mounting plate and serial tag, (This is the top column in the column bundle).

   One idler column assembly, identified by the presence of a Challenger decal, (This is the bottom column in the column bundle).

   (Besides, the motor mounting plate, the two column assemblies are identical)

   One power pack, single-phase or three-phase at the purchasers option,

   One set of hydraulic tubing,

   One set of synchronizer cables or chains,

   One arm pack, symmetric or asymmetric at the purchasers option,

   One hardware box containing anchor bolts, arm restraints, overhead shutoff switch were applicable and miscellaneous hardware and fasteners,

   One overhead channel assembly.

   Besides the components furnished with the lift, as listed above, certain tools, equipment, supplies and aerials are required. These items must be furnished by the installer or purchaser of the lift:

   Hammer drill, rotohammer, or coredrilling machine to drill anchor bolt holes;

   Cleaning supplies to remove grease and oil from the floor slab;

   Optical level, water level, or four foot carpenter's level to check slope of floor an elevation of columns;

   Drywall square, chalk line, or transit to check alignment of columns;

   Wiring, conduit, and wiring device for electrical power supply;

   Hand tools for assembly of lift;

   Special anchor bolts for non-standard installation;

   Twelve quarts of hydraulic oil.

2. Select a site for the lift. The Challenger 27000/31000 surface mounted lift is designed to be installed on a 3500 psi, steel reinforced concrete floor slabs, at least four inches thick. The floor should be dead level and free of cracks, construction joints, holes, drains, and spalled areas over an area at least two feet larger than the outline of the lift in every direction. The lift should not be installed closer to the edge of the slab than one foot. If the floor slab is not level, the floor must be reworked, or the lift must be shimmed to obtain proper alignment of the lift. If the floor slab is damaged, a section large enough to accommodate the lift may have to be replaced. See Figure 1 for these dimensional limitations.

A floor that does not meet these requirements may cause the loss of lifting height, impair access to vehicles with low ground clearance, reduced lifting capacity, and decrease reliability of operation.

If a new floor is to be poured, it should be laid out so that it is dead level in the areas where lifts will be installed. Drains should be installed in the aisle, which can be sloping without affecting the installation and operation of the lift(s). Figure 2 illustrates a shop layout plan that follows these guidelines.

Select a location that provides adequate clearance for an aisle in front of the largest vehicle that the lift must accommodate, that provides adequate clearances for an aisle on either side of the lift, and that is free from overhead obstacles to either installation or operation of the lift.

3. Lay out the lift stalls. Strike a centerline through the center of the stall, along the direction in which the vehicle will be driven onto the lift. This centerline is the longitudinal centerline. Strike a second centerline at right angles to the longitudinal centerline through the center of the lift columns. This is the transverse centerline. Strike two lines parallel to the longitudinal centerline, one on either side, 54-1/2 inches from it. These lines will be used to align the columns. Determine the degree and direction of the slope of the floor, mark the location of the low side. Figure 3 illustrates the layout of these center lines.

4. Arrange the lift components near the installation site. Insure that all loose components have been removed from the column interiors and remove the shipping braces.

5. Erect both columns and move them into position. The front (open) faces of the columns should be centered on the transverse centerline, and align with the last pair of lines drawn n the floor. Figure 4 shows the correct alignment of the columns. **The 109-inch dimension is the dimension that governs the lift layout.** The other dimensions are reference dimensions.

6. Plumb the column on the high side, using the shims provided. Install shims at the anchor bolt location, column corners and beneath the cylinder as needed. Insure that the column remains aligned with the transverse centerline and the column line. Use a drywall square, chalk line, four-foot level, or long straight edge to verify alignment of the columns with the column line. Figure 5 shows the correct placement of the shims. Shims may not be required at all locations shown in the drawing, but should not be installed at locations other than those shown.

7. Level and plumb the column on the low side, using shims provided. Shim the column until the base plates are at the same elevation as the high side column, and plumb. Insure the column remains aligned with transverse centerline and column line. Insure that all shim stacks are tight. **Improper shimming, or lack of shimming, can cause the columns to twist when the anchor bolts are installed or when the column is loaded.**

8. Drill through the anchor bolt holes and shim stacks into the floor slab, using a 3/4 inch diameter bit. Drill holes in the floor a minimum of four inches deep, measured from the top of the floor slab, drill through the floor slab whenever possible. If steel reinforcing is encountered, use a suitable core drill to cut through it, or move the lift to a different location. Special anchors (not furnished) may be required where steel reinforcing is encountered. After drilling, remove all dust and debris from the anchor bolt holes.

9. Measure the distance from the bottom of the baseplate to the top of the floor slab at each anchor location. If the distance exceeds 2 inch at any location, a longer anchor bolt (not furnished) must be used at this location. The anchor bolts should be selected to provide four inches of embedment (the length of the anchor bolt that is actually in the slab).

10. Install the anchor bolts according to the anchor bolt manufacturer's instructions. (See Appendix B.)

11. Lift the overhead channel above the columns, and lower it into the notches in the columns, as illustrated in Figure 6. The top of the overhead channel will be flush with the tops of the columns if

seated correctly. If necessary, spread the sides of the columns slightly to allow the overhead channel to drop into position. Fasten the overhead channel to the columns using the 3/8-16 hex head cap screws, nuts, and washers furnished with the lift. Verify that the columns remain straight after the overhead channel is bolted in place. If the columns exhibit a twist after the overhead channel is installed, they are not aligned correctly at the base. Loosen the anchor bolts, realign and/or re-shim the columns, and tighten the anchor bolts.

12. Install the overhead shutoff bar and switch assembly. See Figure 7.

13. Manually raise both carriages to a height of approximately 50 inches above the base plates and allow the carriage safety latches to engage.

14. Route the hydraulic lines through the overhead channel as seen in Figure 8. Remove the plugs or caps from the hydraulic lines and connect the lines, following the procedure in Appendix A. **Do not over tighten the fittings**. Check all fittings for tightness, including the factory installed fittings. Insure that the hydraulic lines are positioned so that they do not interfere with the travel of carriage or synchronizer cables.
Leave the line to the power pack loose until the power unit is installed.

15. (31000) Route the synchronizer cables through the overhead channel, and around the cable sheaves. Synchronizer cables are shipped loose and must be connected to the carriage at both ends.

    (27000) Route the synchronizer chains through the overhead channel, and around the sprockets. Synchronizer chains are installed at the factory except for a section between the two columns, which must be installed with master links provided.

    Figure 9 illustrates the proper synchronizer chain and cable routing.

16. Adjust the cable tension, using the adjusting nuts at the stud ends of the cable. Adjust the two cables so that the two carriages remain at the sane elevation, measured from the base plate, not the floor. Adjust the tension so the cable(s) can be deflected by hand 1 inch at midspan, in the overhead channel.

17. Mount the power pack on the power column, using four 5/16-18 hex nuts. Remove the shipping plugs from the valve body. Install the O-ring fitting into the O-ring port in the valve body, as illustrated in Figure 10. Connect the power pack hydraulic line and tighten both fittings.

18. Fill the power pack reservoir with twelve quarts of new, clean petroleum or vegetable based hydraulic oil.

19. Connect the power pack to a dedicated 20 Amp electrical branch circuit, using wiring methods prescribed by local codes.

    Remove the motor junction box cover and connect the overhead shutoff switch into the motor control circuit, as illustrated in Figure 11.

20. Raise the lift under power until the carriages reach full height. Readjust synchronizer cable tension if required. Remove the cylinder shipping restraints (wire ties).

21. Cycle the lift several times, from the full down to full up to full down to observe its operation. Tighten any leaking fitting, including the factory installed fittings, and wipe the cylinder rods with a clean rag soaked in hydraulic oil.

22. Install the extension swing arms as shown in Figure 12, using 1-1 /2 inch diameter pivot pins provided. Position the clevis of each arm over the cross arm, align the top holes, and insert the pin. Move the arm slightly until the pin drops through the lower holes.

23. Install the arm restraints with the carriages raised to convenient working height. Disassemble each arm restraint in turn, and fasten the inner sleeve to the bottom of the cross arm with one of the 2-13 socket head cap screws furnished with the lift. Place the outer sleeve and spring over the inner sleeve, compress the two sleeves, and insert the threaded rod through the opening in the two sleeves. Connect the rod eye to the lower pin plate, making sure the long side of the eye is toward the pin plate, using one of the 2-13 socket head cap screws furnished with the lift. These 1/2-13 allen bolts should be tightened and backed off 1/8 of a turn to allow the parts to pivot. Install the 2-13 hex head adjustment screws in the outer sleeve. Figure 13 shows an exploded view of a typical arm restraint assembly.

24. Install the adhesive back foam strips on the carriage and columns, as shown in Figure 14.

25. Demonstrate the operation of the lift to the operators. Review the Lifting It Right booklet, Safety Tips Card, and the Operation and Maintenance Manual, furnished with the lift, with the operators, supervisors, and owner of the lift. Explain the meaning of the ALI safety labels affixed to the lift. The labels are reproduced in Figure 15.

26. Complete the warranty registration card and return it to:

Challenger Lifts, Inc.
200 Cabel Street
Louisville, KY 40206

Operation Procedure

Notice: This Challenger 31000 Surface Mounted lift has been designed and constructed according to ANSI/ALI B153.1-1990 standard to insure that it is safe to use. The standard applies to the lift owners, and employers, as well as to lift manufacturers. The owner/employer's responsibilities, as prescribed by ANSI/ALI B153.1-1990, are summarized below. For exact wording refer to the actual standard in the literature pack.

The Owner/Employer shall ensure that the lift operators are instructed in the safe use and operation of the lift using the manufacturer's instructions and the ALifting It Right@ and ASafety Tips@ supplied with the lift.

The Owner/Employer shall display the operating instructions and ALifting It Right@ and ASafety Tips@ supplied with the lift in a conspicuous location in the lift area convenient to the operator.

The Owner/Employer shall establish procedures to periodically maintain, inspect, and care for the lift in accordance with the manufacturer's recommended procedures to ensure its continued safe operation.

The Owner/Employer shall provide necessary lockout/tag-outs of energy sources per ANSI Z244.1-1982 before beginning any repairs.

The Owner/Employer shall not modify the lift in any manner without the prior written consent of the manufacturer.

This product is furnished with graphic safety warning labels, which are reproduced in these instructions. Do not remove or deface these warning labels, or allow them to be removed or defaced.

1. Lifting a Vehicle

Insure that the lifting arms are parked, out of the way of the vehicle.

Position the vehicle in the service bay so that the vehicle=s center of gravity is on or slightly behind a line between the two columns, and so the vehicle is centered between the two columns. The short extension arms are to be placed at the vehicles front lifting points, and the long extension arms are to be placed at the rear lifting points.

Do not place the vehicle in the service bay backwards.

Do not attempt to lift the vehicle with only two arms, as this will void the warranty

Refer to the vehicle manufacturer=s service manual, technical bulletins, or other publications to locate the recommended lifting points.

Position the arms so that all four pads contact the vehicle simultaneously.

The vehicle should remain level during lifting.

Raise the lift until all four wheels are off the ground. Test the stability of the vehicle by attempting to rock the car. If the vehicle seems unstable, lower the lift and readjust the arms. If the vehicle is stable, raise the vehicle to a height a few inches above the desired working height.

When the vehicle has reached the desired working height, release the power pack button, and lower the vehicle until the safety latches on both columns engage. The vehicle should remain level when both latches are engaged. If one side engages and the other continues to descend, stop lowering the vehicle, raise it several inches, and try again to engage both latches.

It is not safe to work under the vehicle unless both latches are engaged, and the vehicle level.

Removal of large components of the vehicle could cause a change in the center of gravity resulting in an unsafe condition. If this is intended, vehicle support stands are recommended.

2. Lowering a vehicle

Insure that the area under the vehicle is clear of personnel and tools.

Raise the vehicle until both latches are free.

Retract both latches by pulling both lock release cables (yellow cables extending through the carriage).

Lower the vehicle by depressing the lowering valve handle.

Continue to lower the vehicle until the carriages stop against the base plate. Retract the extension arms, and park them. It is important to fully lower the lift to release hydraulic pressure on the system.

Maintenance

The following maintenance points are suggested as the basis of a preventive maintenance program. The actual maintenance program should be tailored to the installation.

Daily

Inspect the lift for loose anchor bolts (If loose tighten to 80 ft-lbs), fluid leaks, and loose connections.

All anchor bolts should take full torque

Weekly

Check fluid level in power pack reservoir.
Check for lock release activation.

Monthly

Check synchronizer cables or chains for wear and tension, adjust if necessary.
Lubricate cable sheaves or chain sprockets with light oil to reduce drag.
Lubricate synchronizing chain with light oil to reduce drag.
Lubricate carriage slide tracks with heavy viscous grease.

Appendix A

Hydraulic Fitting Assembly

Hydraulic line sets are prefabricated to allow easy assembly in the field. Follow the steps outlined below for reliable, leak-free joint:

1. Remove any shipping plugs or caps, insuring that no remnants of the plugs or caps remain in the tube.

2. Lubricate the threads and seat of the fitting with hydraulic oil or a compatible lubricant. **Do not use pipe dope or Teflon tape on these fittings**.

3. Align the tubing joints so that the tubing and sleeve assemblies can be inserted easily into the fitting.

4. Insert the tubing and sleeve assemblies into the fitting and start the fitting nut by hand.

   CAUTION: If the fitting nut cannot be started by hand, the joint is not aligned properly. Attempting to start a misaligned fitting with a wrench is likely to damage the fitting and result in a leaking joint.

5. Tighten the fitting nut until the force required to turn it rises sharply.

6. Tighten the fitting nut 1/4 turn past the point noted in the previous step. Only if the joint leaks in operation should the joint be tightened further.

   CAUTION: Do not over tighten the hydraulic fittings.

Appendix B

Anchor Bolt Installation

1. Insure the concrete has had sufficient time to cure - 28 days minimum.

2. Always wear safety glasses.

3. Follow the drill manufacturers safety instruction.

4. Use only solid carbide-tipped drill bits meeting ANSI B94 tip diameter standards.

5. Drill the anchor bolt holes perpendicular to the work surface. To assure full holding power, do no ream the hole or allow the drill to wobble.

6. Drill the hole at least as deep as the full length of the anchor, completely through the slab if possible.

7. Clean the hole, using compressed air and a wire brush. A clean hole is necessary for proper performance.

8. Assemble the washer and nut on the anchor bolt so that the anchor protrudes slightly beyond the nut.

   The anchor should drop easily into the hole, requiring no more than a slight tap to seat it fully.

9. Tap the anchor through the fixture (lift base plate) and into the hole, making sure that the nut rests solidly against the fixture.

10. Tighten the nut to 150 ft-lbs for 3/4 inch diameter bolts and to 75 ft-lbs for 3/8 inch diameter bolts.

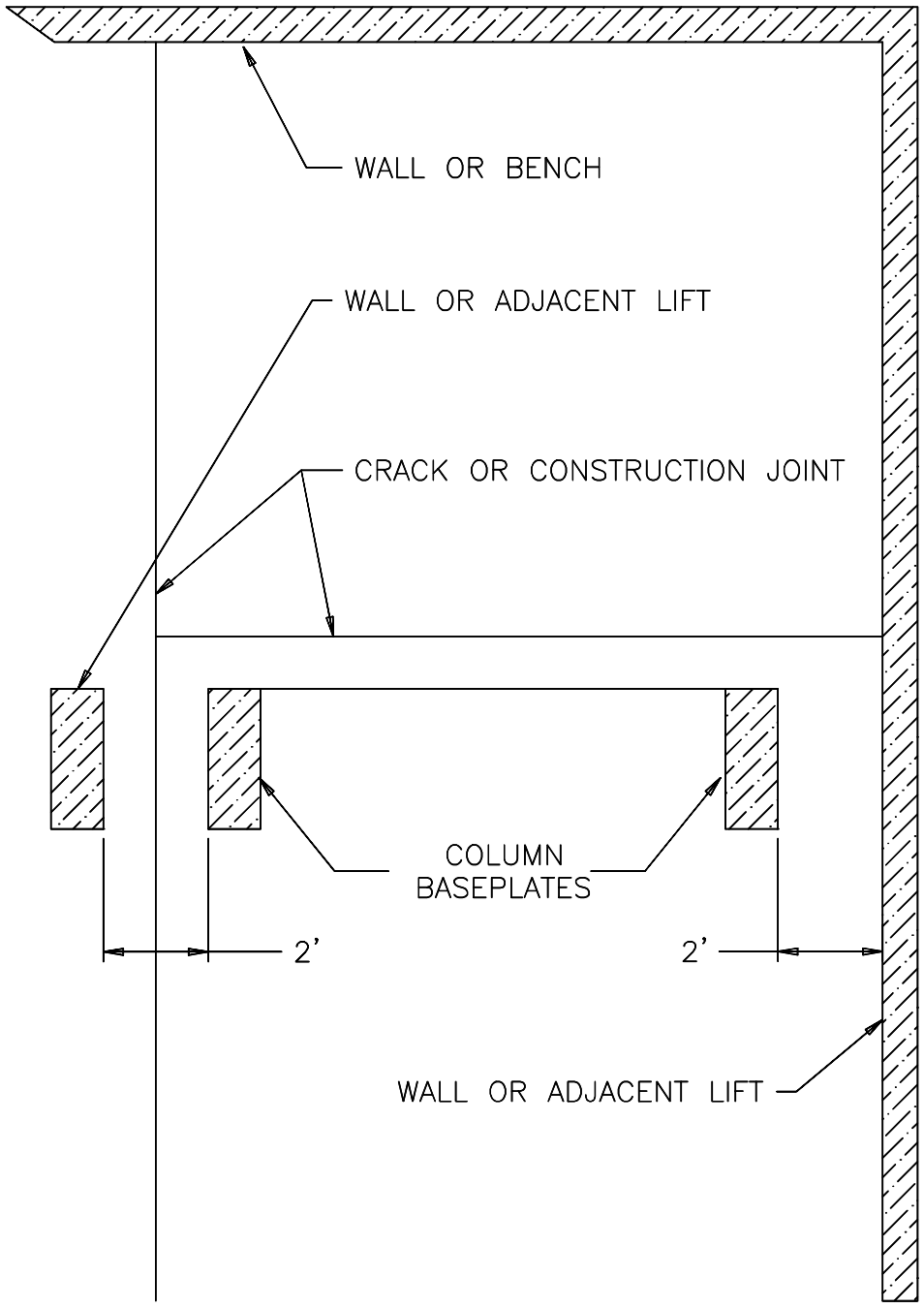


Figure 1

Select a location for the lift that is free of cracks, construction joints, and other imperfections

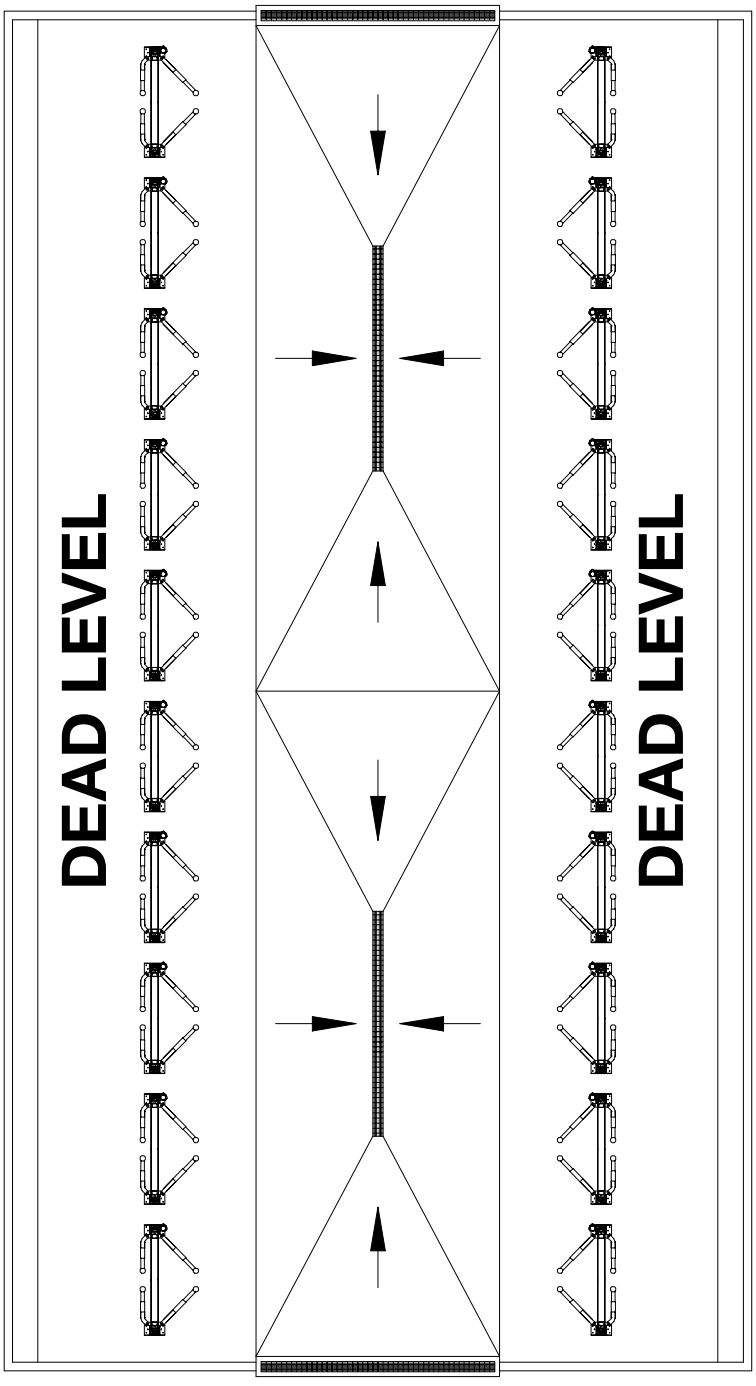


Figure 2

A new floor slab should be poured so that it is dead level in the vicinity of the lifts. Drainage should be accommodated in the aisles.

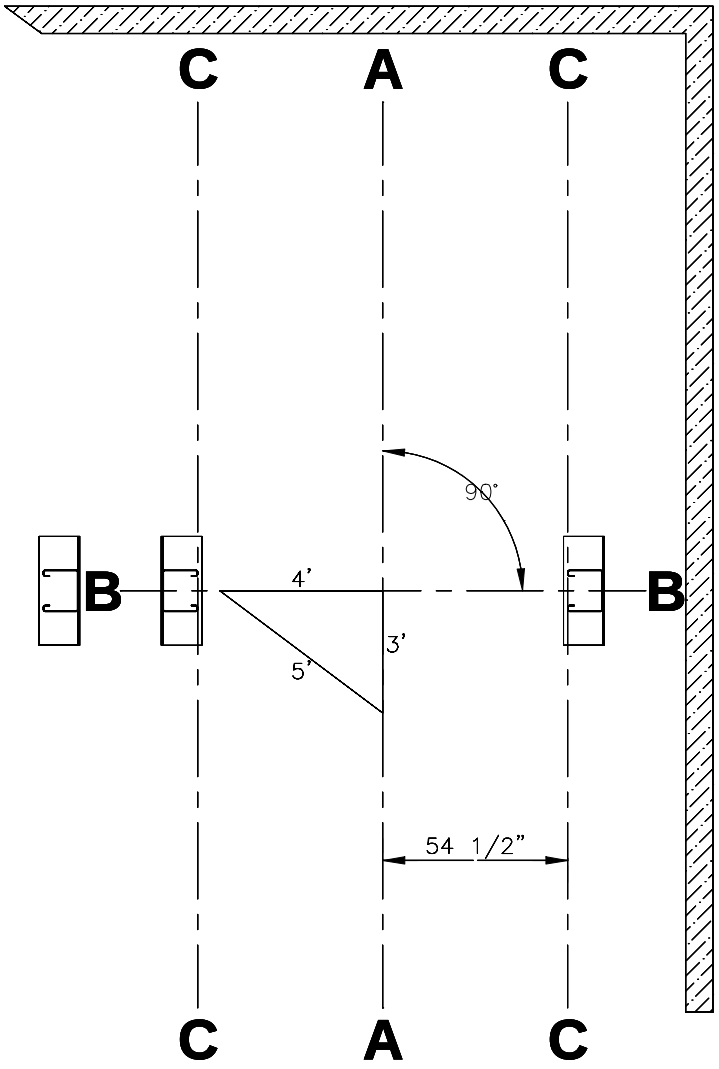


Figure 3

Layout the lifts longitudinal centerline (A-A), followed by the transverse centerline (B-B), and then lines for column alignment (C-C)

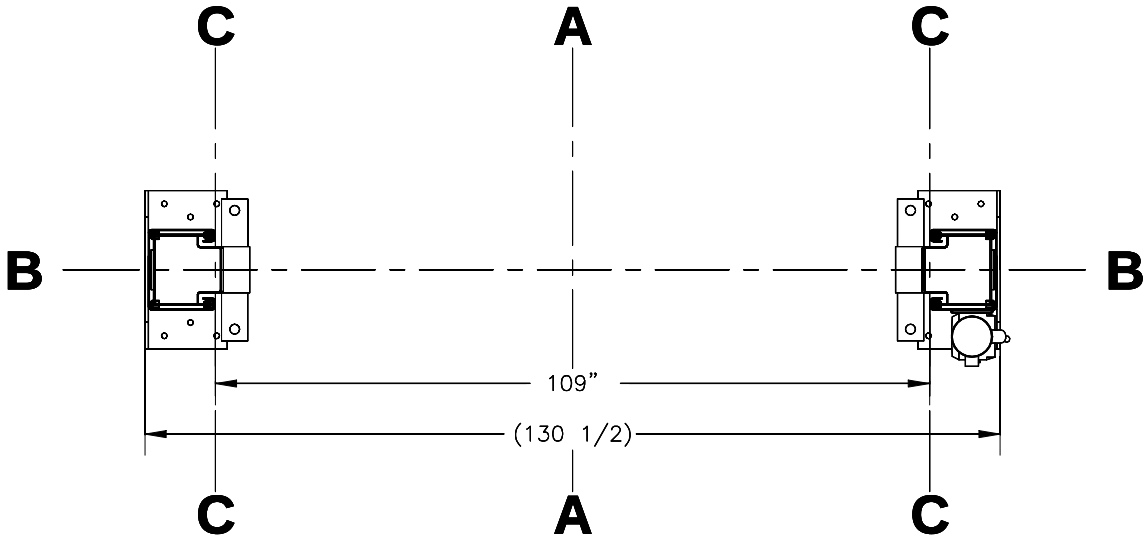


Figure 4

Lift columns should be spaced 109 inches apart, measured between the front (open) side of the column.

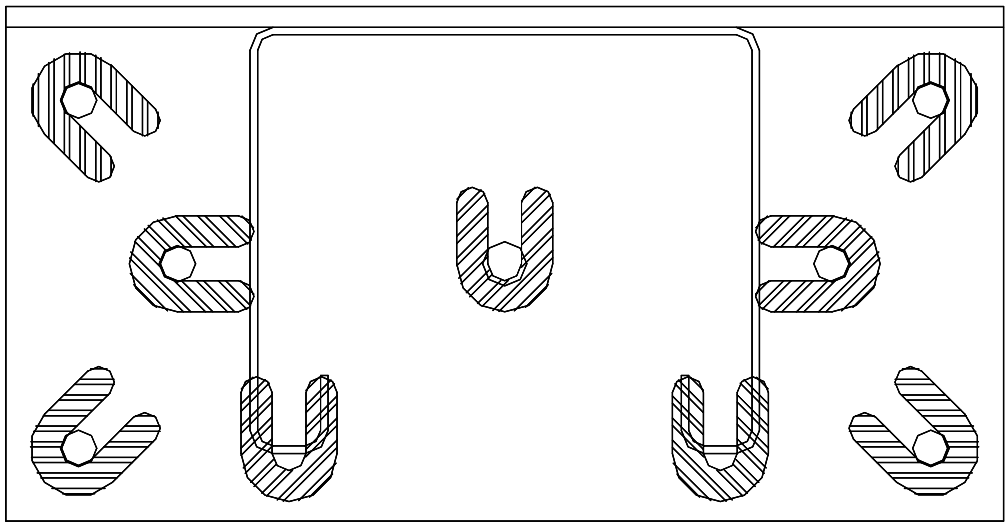


Figure 5

If the column must be shimmed, shims should be placed at the anchor boltholes, at the front corners of the column, and under the cylinder.

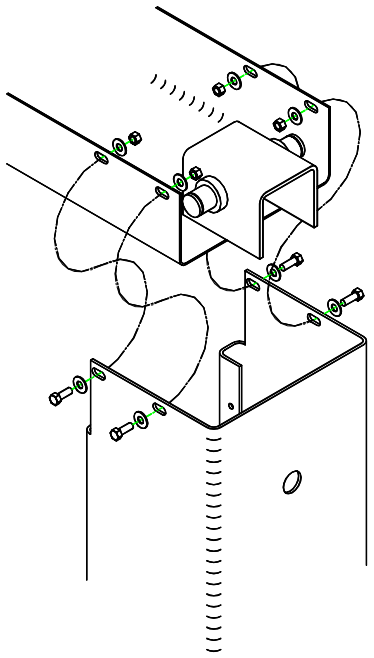


Figure 6

Install the overhead channel using 3/8-16 hex head bolts and nuts provided.

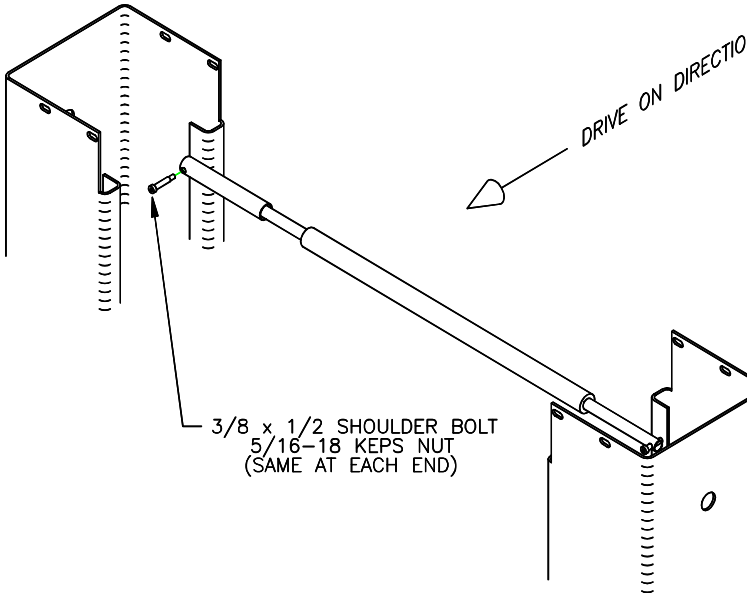


Figure 7

Install the switch tube assembly on the power column as shown.
Insert shutoff bar assembly in switch tube and mount to idler column as shown.

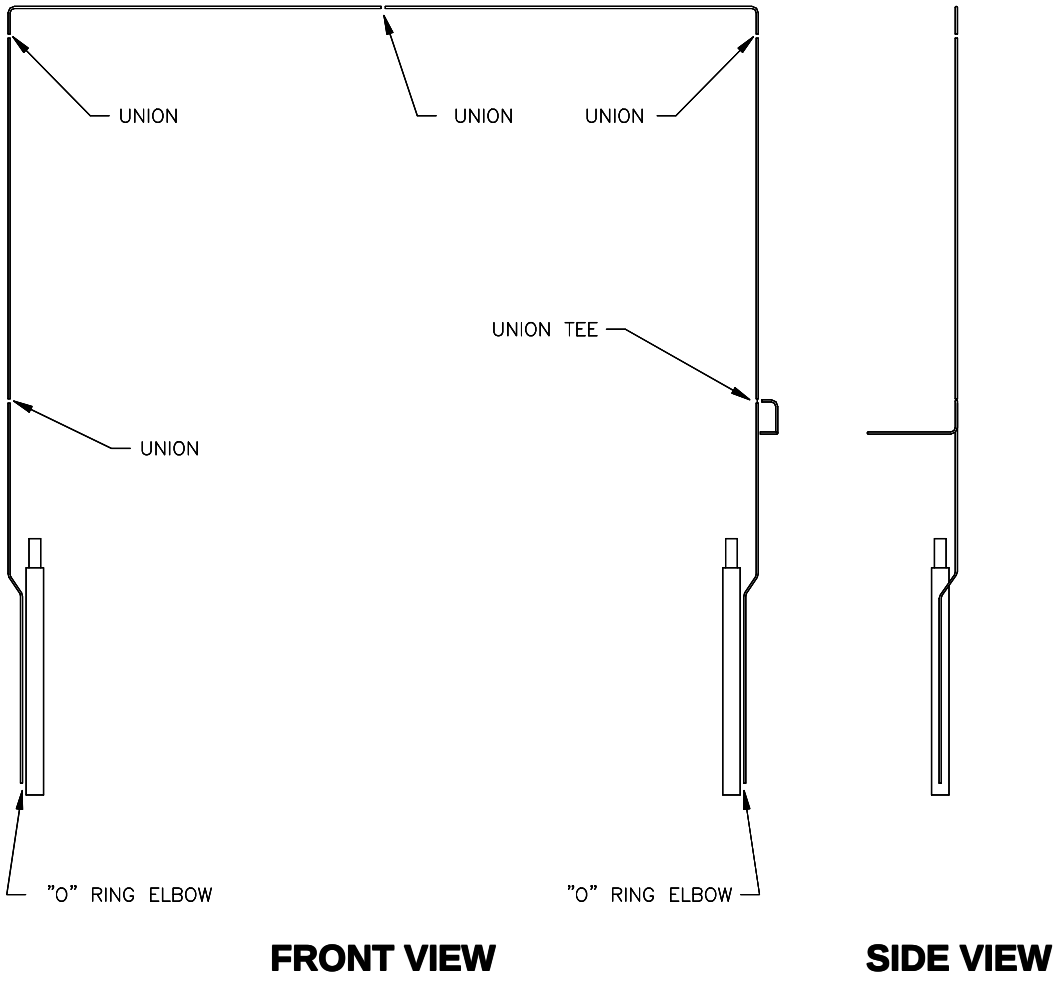


Figure 8

Clear-floor hydraulic line routing.

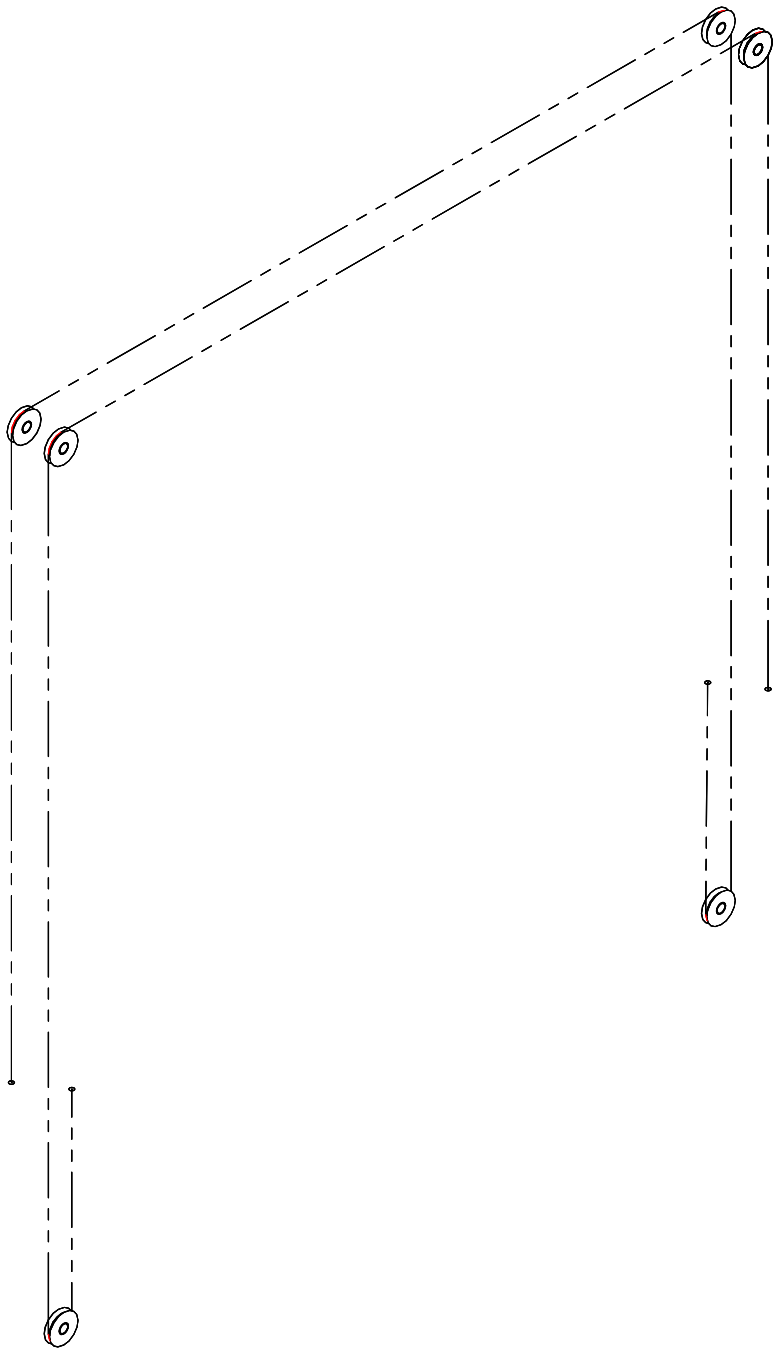


Figure 9

Synchronizer cable/chain routing

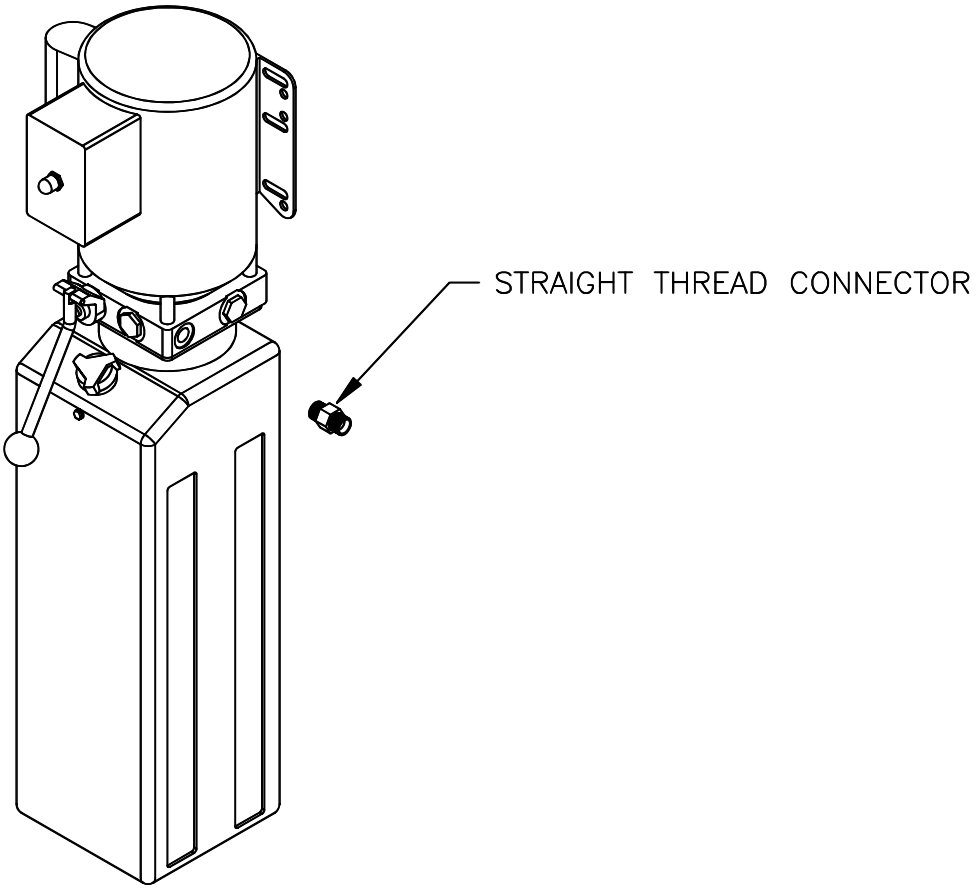


Figure 10

Install the “O” ring union in the power pack body.

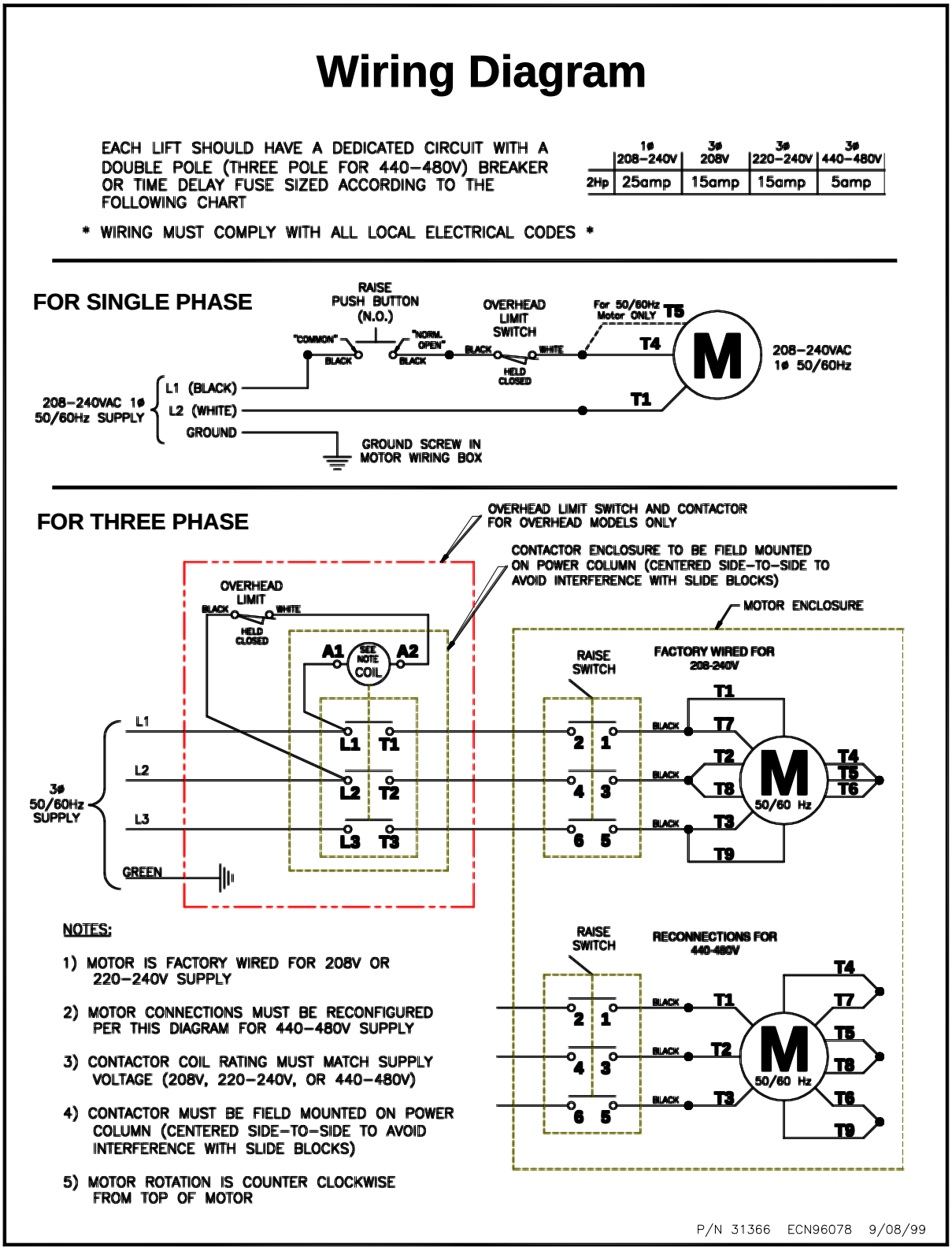


Figure 11

Motor junction box wiring schematic.

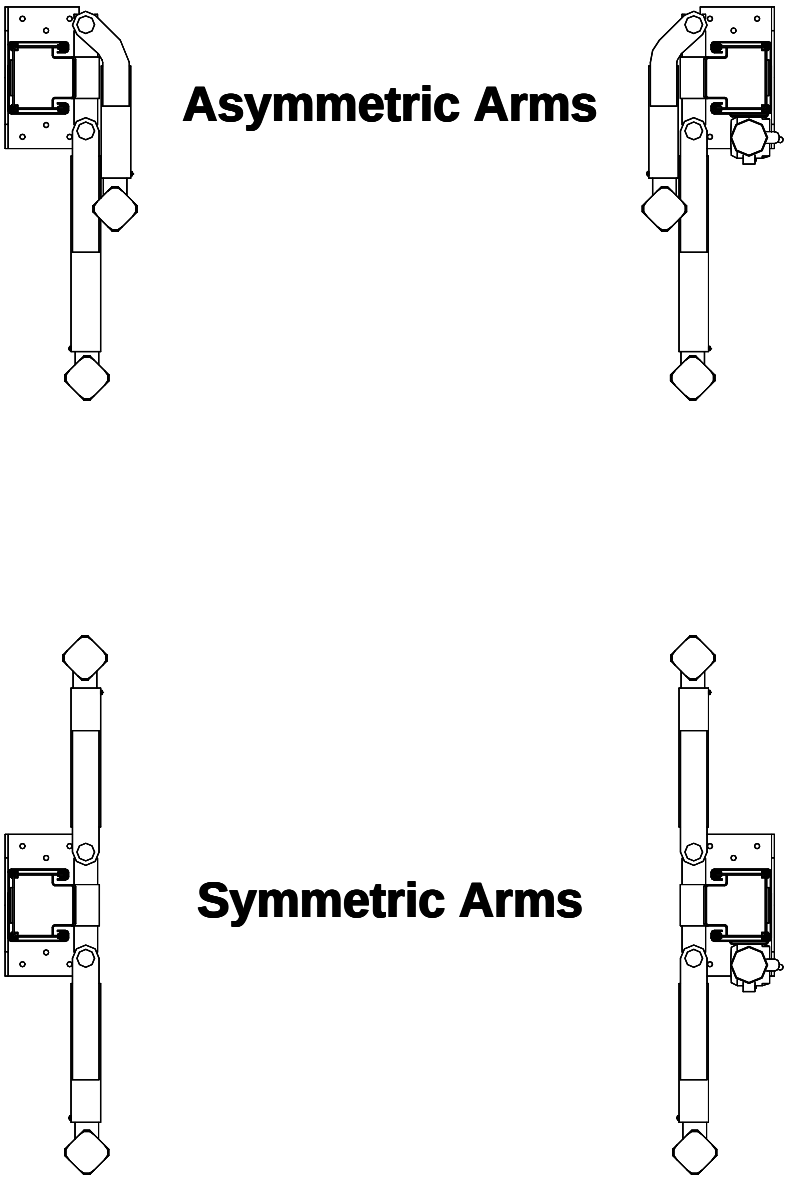


Figure 12

Swing Arm Installation.

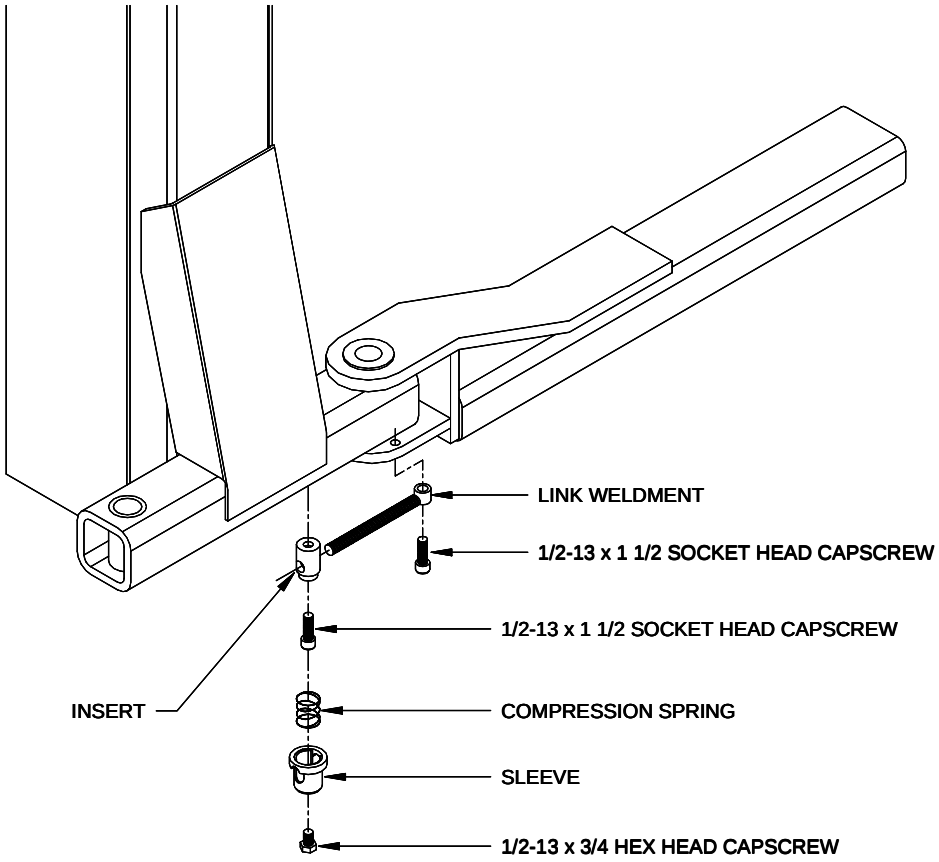


Figure 13

Arm restraint installation.

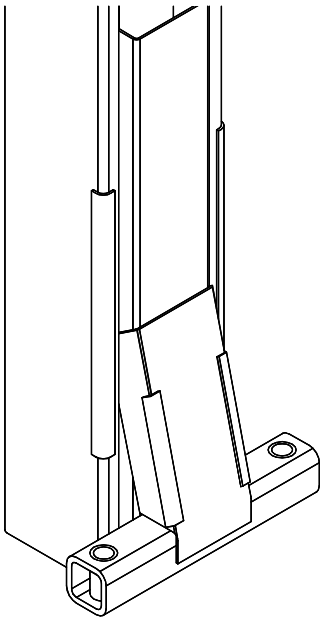
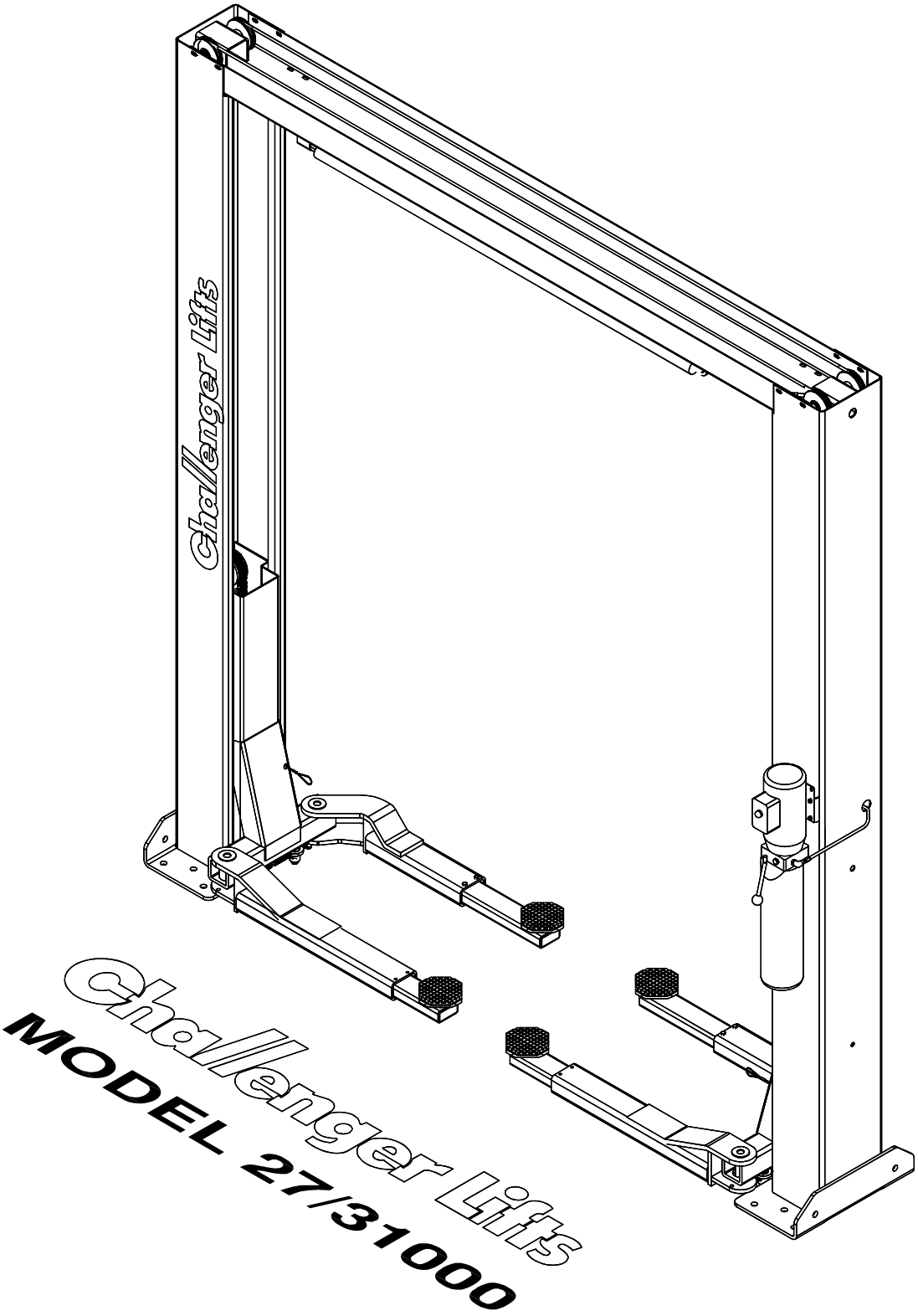


Figure 14

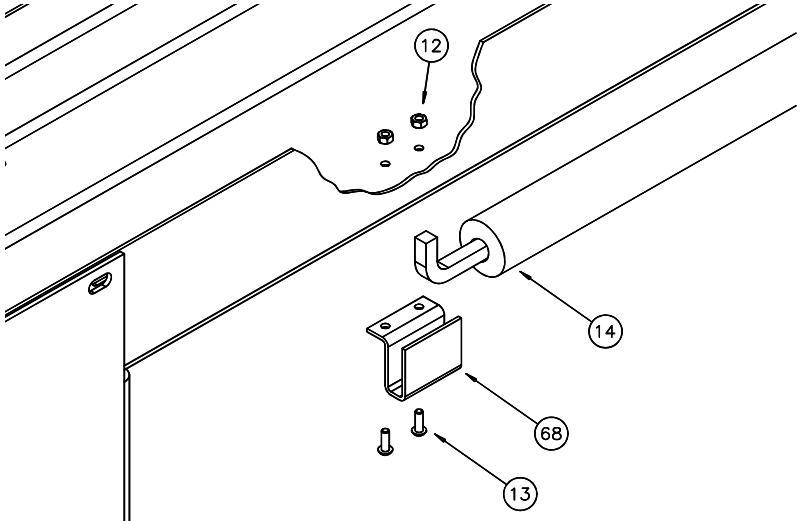
Foam bumper strips


Challenger Lifts
Challenger Lifts
MODEL 27/31000

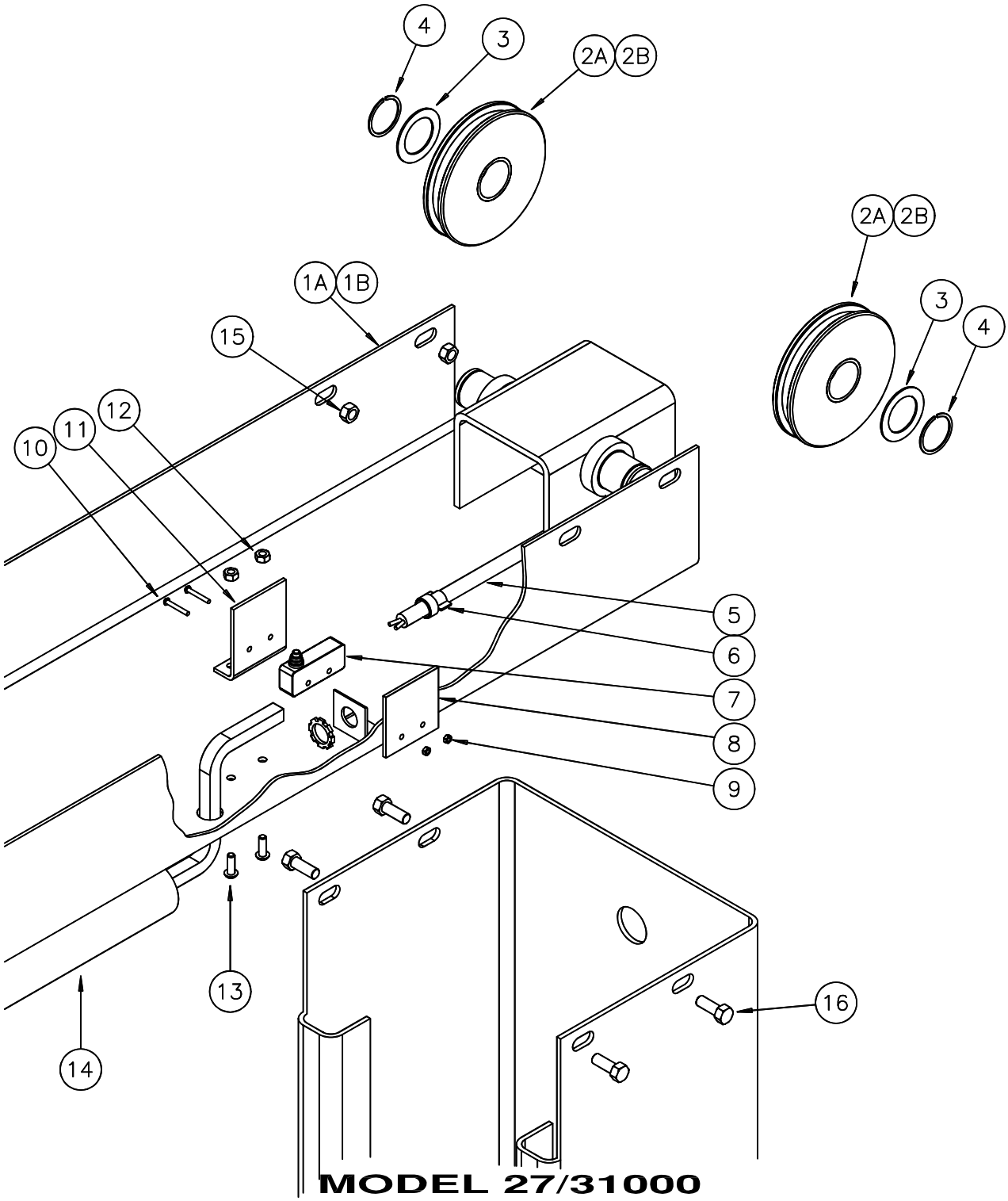
Parts Break Down
Models 27/31000

Overhead Assembly

Item Number	Part Number	Qty/Ass'y	Description
1A	27016	1	Overhead Weldment (27000)
1B	31059	1	Overhead Weldment (31000)
2A	26008	4	Synchronizing Sprocket (27000)
2B	31019	4	Synchronizing Sheave (31000)
3	31020	4	1 3/8 Phoenix Washer
4	31021	4	1 3/8 External Snap Ring
5	31167	1	Limit Switch Cord
6	31060	1	Strain Relief
7	31166	1	Limit Switch
8	31165	1	Capture Plate, Limit Switch
9	31029	2	#6-32 Hex Nut
10	31168	2	#6-32 x 1 ¾" lg Phil. Hd. Screw
11	31164	1	Bracket, Limit Switch
12	31061	4	¼-20 Keps Nut
13	31062	4	¼-20 x ¾" lg Phil. Pan Hd. Screw
14	31038	8	3/8-16 Hex Nut
15	31035	8	3/8-16 x 1" lg Hex Hd. Bolt
16	31129	1	Pad, Shut Off Bar
17	31128	1	Shut Off Bar
18	31063	1	Pivot Bracket, Shut Off Bar
	31121	1	Limit Switch Ass'y, (Items: 5-12)
	31064	1	Shut Off Bar Ass'y (items 16 & 17)



MODEL 27/31000
OVER HEAD SYSTEM, IDLER COLUMN SIDE



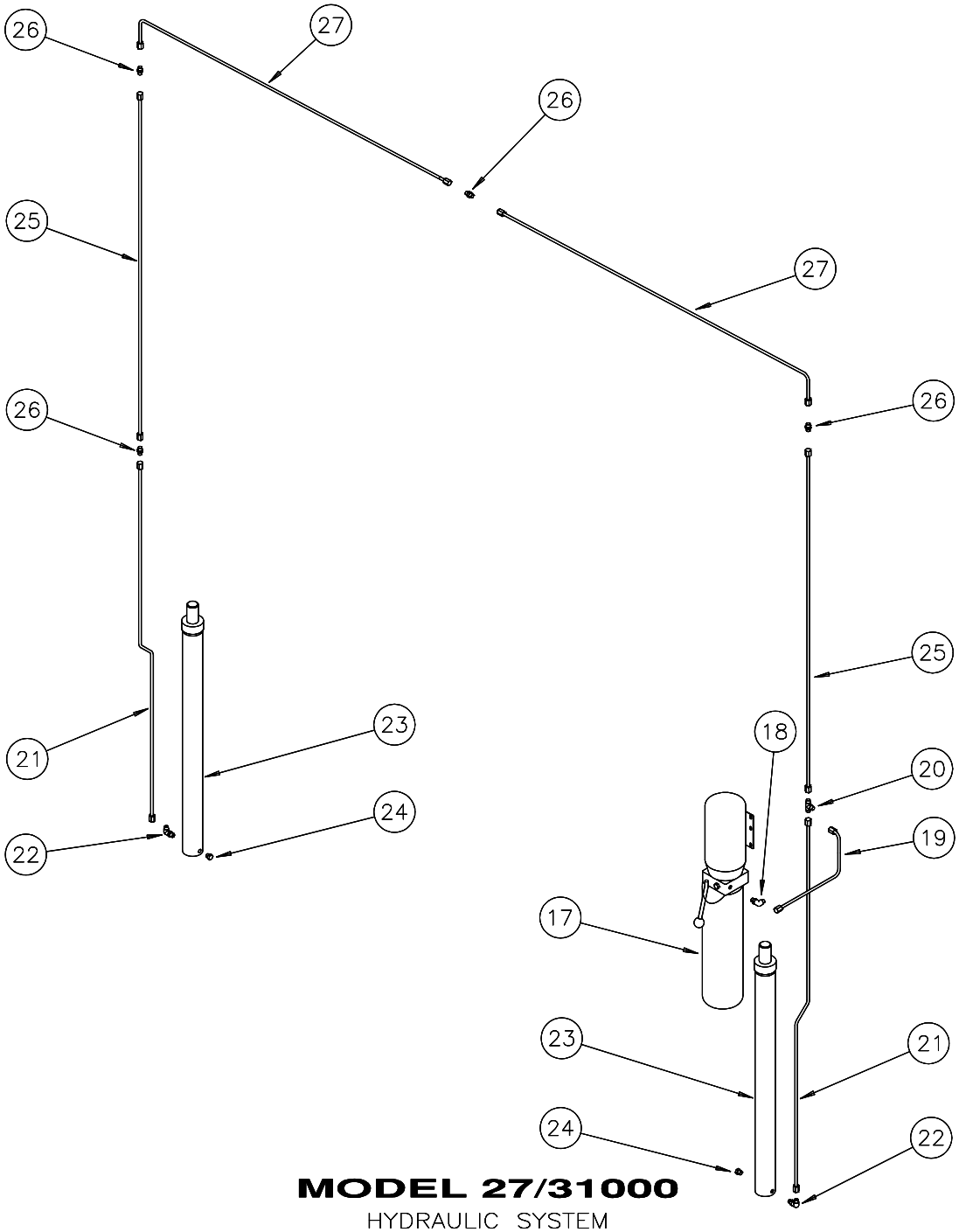
MODEL 27/31000

OVERHEAD SYSTEM, POWER COLUMN SIDE

Parts Break Down
Models 27/31000

Hydraulic System

Item Number	Part Number	Qty/Ass'y	Description
19	(27) 31295-1	1	208/230V, 1 Ph, Power Unit (Fenner)
	(27) 31296-1	1	230/460V, 3 Ph, Power Unit (Fenner)
	(31) 31295-2	1	208/230V, 1 Ph, Power Unit (Fenner)
	(31) 31296-2	1	230/460V, 3 Ph, Power Unit (Fenner)
20	31116	1	9/16-18 O-Ring x 3/8 Tube Fitting
21	31298	1	Hydraulic Line, Power Unit
22	31032	1	3/8 Union Tee Fitting
23	31090	1	Hydraulic Line, Cylinder
24	31089	2	9/16-18 O-Ring Elbow x 3/8 Tube Fitting
25	31265	2	Hydraulic Cylinder, 36 ½" Short Stroke
26	31088	2	9/16-18 O-Ring Plug
27	31031	1	Hydraulic Line, Power Column
28	31047	4	3/8 Tube x 3/8 Tube Union
29	31066	2	Hydraulic Line, Overhead
30	31031	1	Hydraulic Line, Idler Column
	31299	1	Hydraulic Line Pack (Items 21 & 29)



MODEL 27/31000
HYDRAULIC SYSTEM

Parts Break Down
Models 27000

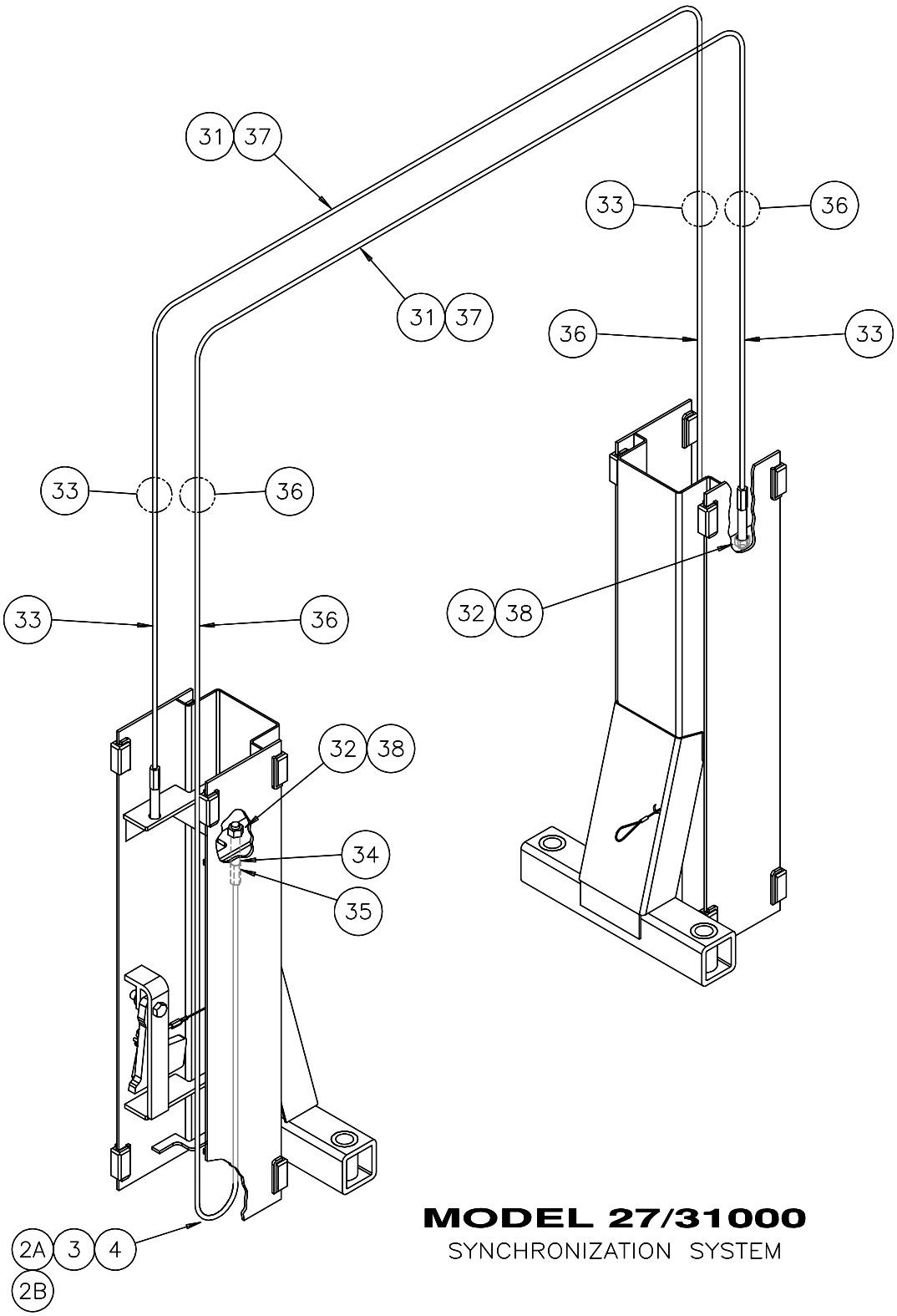
Synchronizing System

Item Number	Part Number	Qty/Ass'y	Description
2A	26008	6	Synchronizing Sprocket
3	31020	6	1 3/8 Phoenix Washer
4	31021	6	1 3/8 external Snap Ring
31	27124	2	261 Pitch Synchronizing Chain
32	11035	8	Master Link
33	26046	2	28 Pitch Synchronizing Chain
34	26054	2	Chain Adjustment Lug
35	26055	2	7/8-14 ESNA Nut-Adjustment Lug
36	27024	2	110 Pitch Synchronizing Chain

Parts Break Down
Models 31000

Synchronizing System

Item Number	Part Number	Qty/Ass'y	Description
2B	31019	6	Synchronizing Sheave
3	31020	6	1 3/8 Phoenix Washer
4	31021	6	1 3/8 external Snap Ring
37	31067	2	Synchronizing Cable (34'-4")
38	31068	4	¾-10 ESNA Locknut

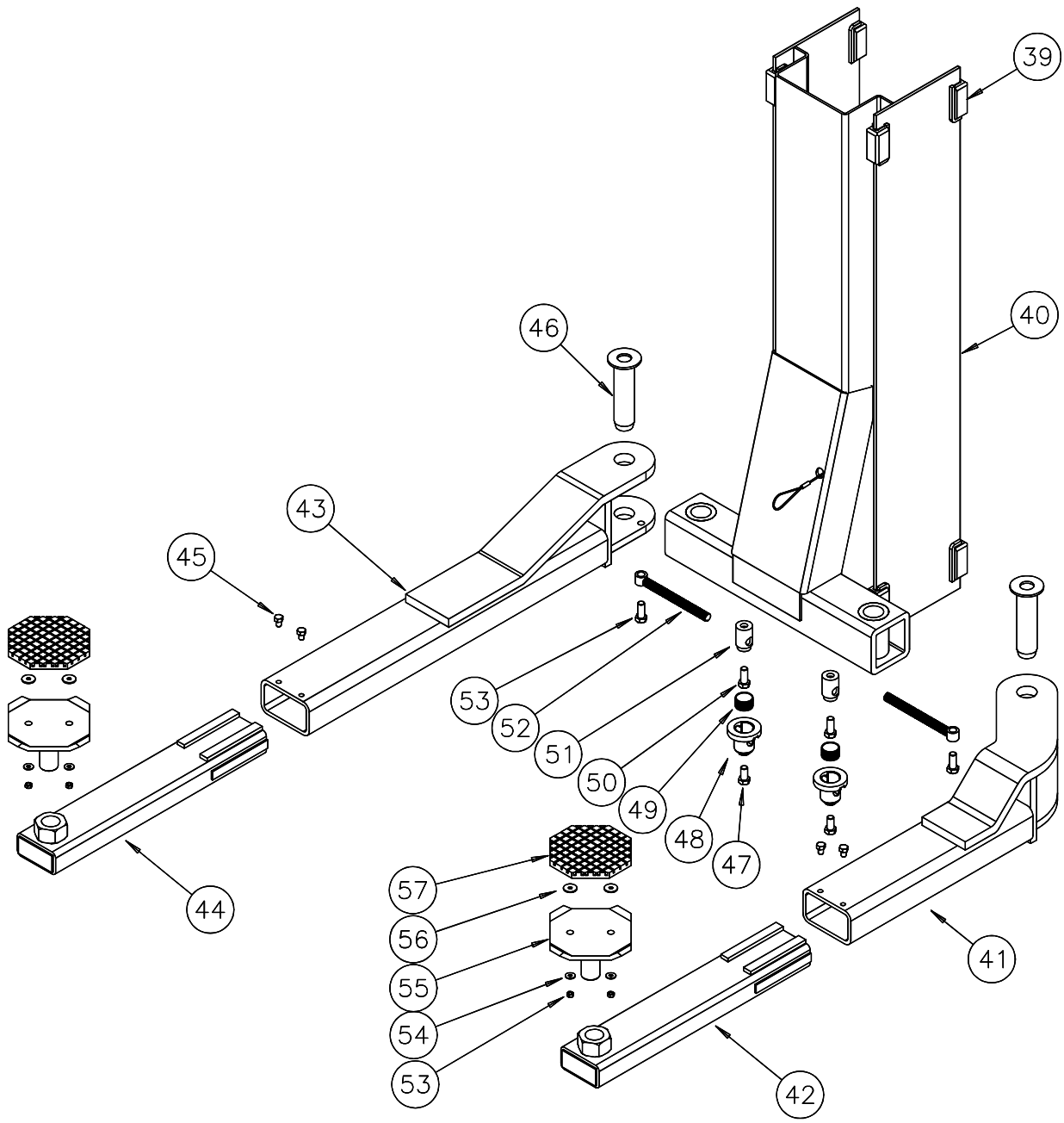


MODEL 27/31000
SYNCHRONIZATION SYSTEM

Parts Break Down
Models 27/31000

Carriage/Arm Assembly

Item Number	Part Number	Qty/Ass'y	Description
39	31023	16	Slide Block Assembly
40	27007	2	Carriage Weldment
41	39015	1	Female Arm Weld, Left Front
	39016	1	Female Arm Weld, Right Front
42	39019	2	Male Arm Weld, Front
43	39017	2	Female Arm Weld, Rear
44	39018	2	Male Arm weld, Rear
45	31305	8	3/8-16 x ¾" lg Stop Bolts
46	31134	4	Arm Pin
47	31111	4	½-13 x 3/4 " lg Hex Bolt
48	31107	4	Arm Restraint Sleeve Weld
49	31109	4	Arm Restraint Compression Spring
50	31112	8	½-13 x 1 ½" lg Socket Head Cap Screw
51	31108	4	Arm Restraint Insert
52	31110	4	6 ½" lg Link Weldment
53	31061	8	¼-20 Keps Nut
54	31115	8	¼" Flat Washer
55	31133	4	Foot Pad Weldment
56	31114	8	¼" Fender Washer
57	31057	4	Rubber Insert
	39003	1	Arm Pack Assembly, 9,000 lb
	39037	1	Right Front Arm Assembly, 9,000 lb
	39036	1	Left Front Arm Assembly, 9,000 lb
	39038	2	Rear Arm Assembly, 9,000 lb
	11024	4	Foot Pad Assembly
	11052	4	Rubber Insert Kit



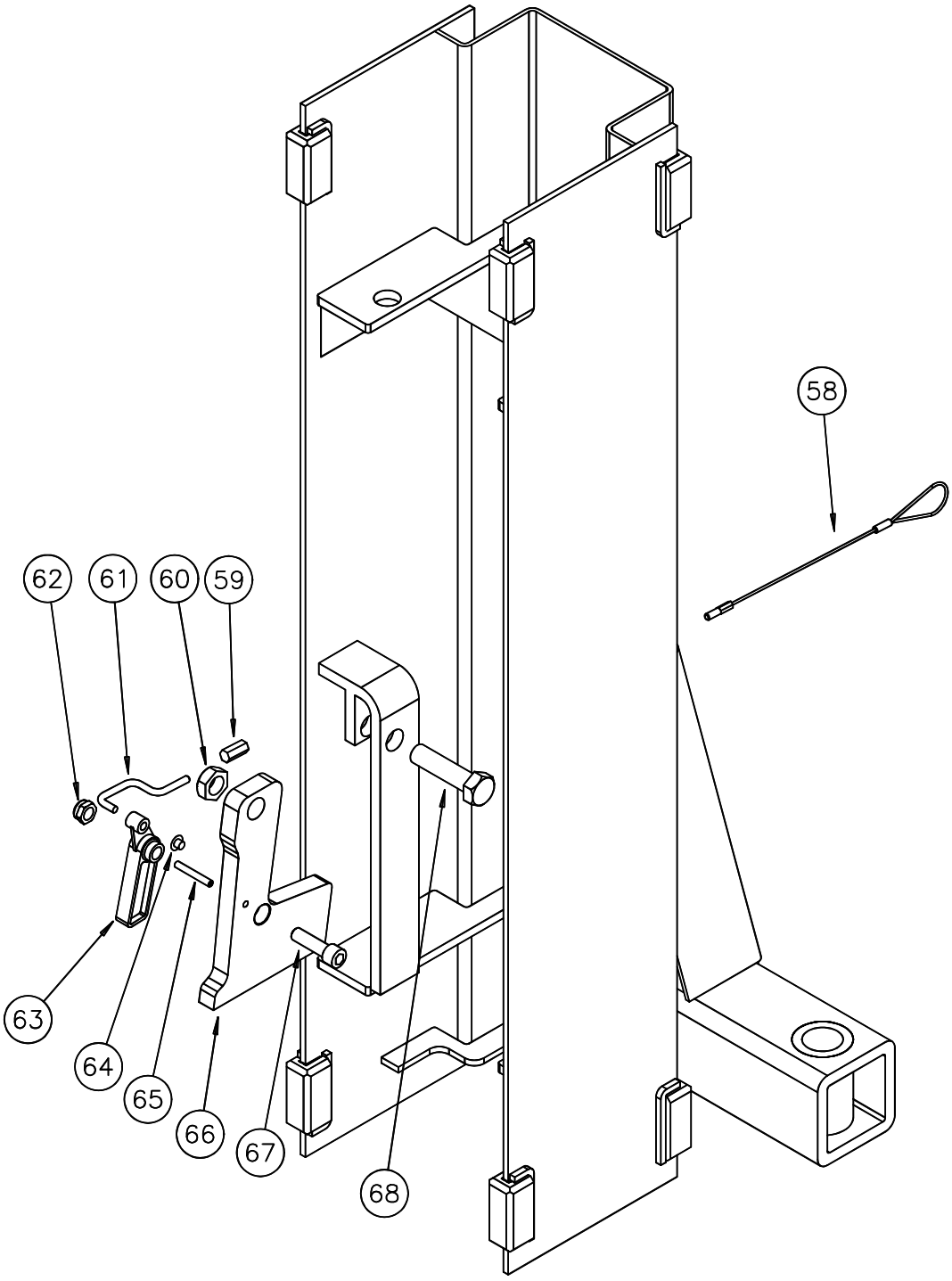
MODEL 27/31000

CARRIAGE ARM ASSEMBLY

Parts Break Down
Models 27/31000

Locking System

Item Number	Part Number	Qty/Ass'y	Description
58	31150	2	Soft Latch Cable
59	31149	2	¼-20 Union Nut
60	31082	2	¾-16 Thin ESNA Nut
61	31151	2	Attachment, Soft Latch
62	31267	2	½-20 Thin ESNA Nut
63	31262	2	Trigger
64	485439	2	! /4" Push Nut
65	31211	2	¼" Dia. x 1 ¾" lg Roll Pin
66	31261	2	Gravity Latch, Blank
67	31263	2	½-20 x 1 ¾" lg. Soc. Hd. Cap Screw
68	31081	2	¾-16 x 3" lg. Hex Bolt, Grade 8
	31083	2	Latch Release Assembly (items: 58,59,61,64)
	31084	2	Gravity Latch Assembly (items: 62,63,65,66,67)



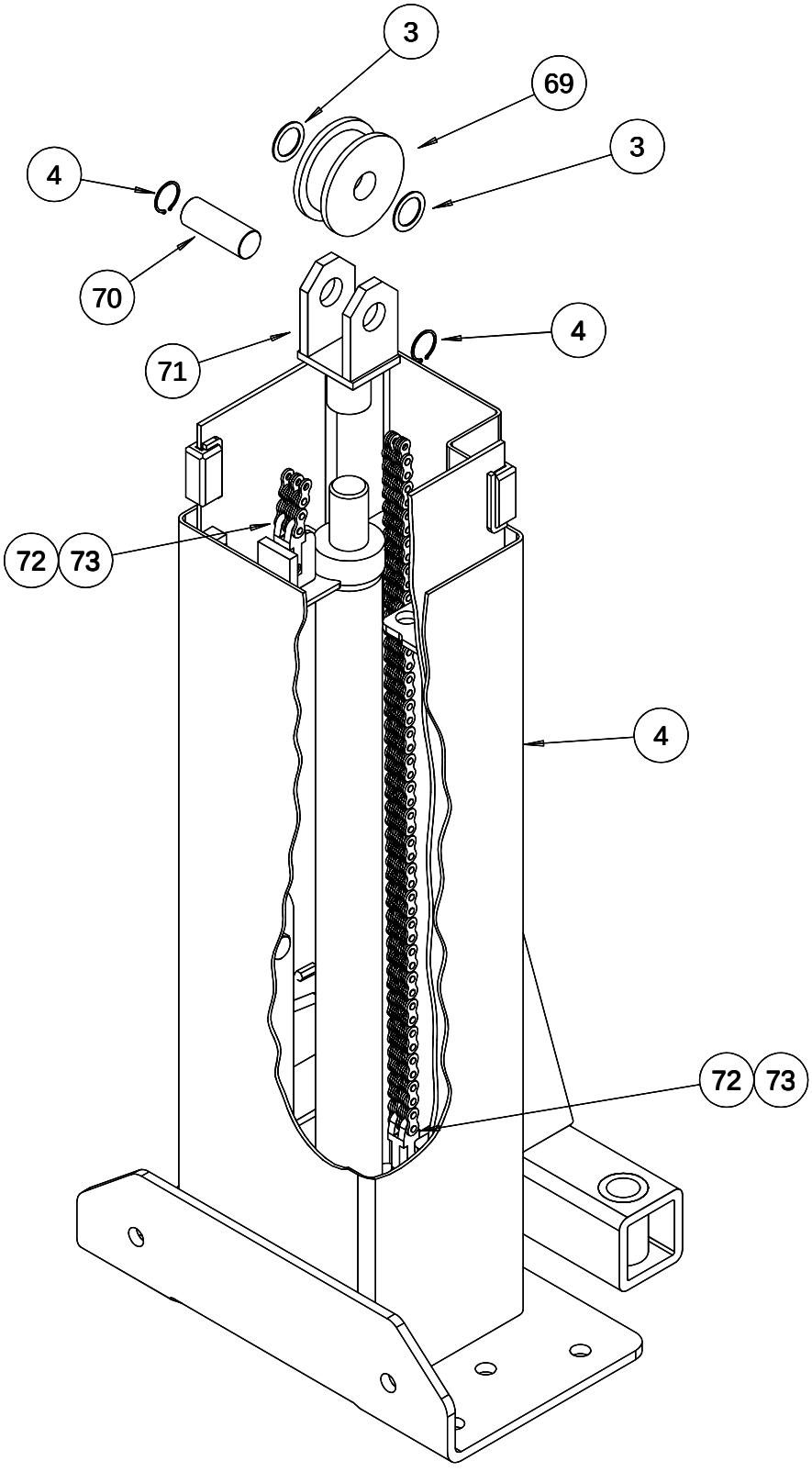
MODEL 27/31000

LOCKING SYSTEM

Parts Break Down
Models 27/31000

Lifting System

Item Number	Part Number	Qty/Ass'y	Description
3	31020	2	1 3/8 Phoenix Washer
4	31021	2	1 3/8 External Snap Ring
69	31095	1	Roller, Lifting Chain
70	31093	1	Pin, Chain Roller
71	31094	1	Cylinder Rod End Weldment
72	31297	2	Headed Pin
73	31079	1	Lift Chain, BL646 x 73 pitch
74	31303	1	Column Weldment, Power
	31304	1	Column Weldment, Idler
	31033	1	Cylinder Rod End Assembly (items: 3,4,69,70,71)



MODEL 27/31000

LIFTING SYSTEM