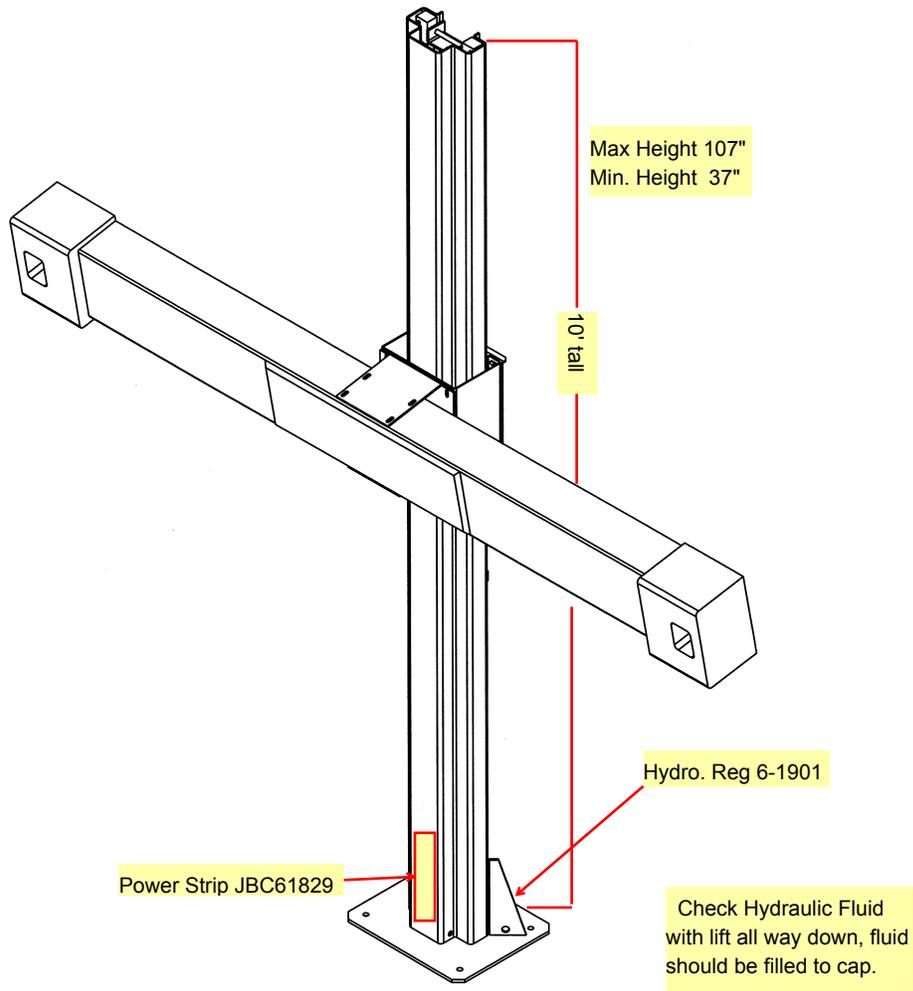




MODEL: 89200H V3D VARIABLE HEIGHT CAMERA BEAM LIFT



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I. INTRODUCTION

Overview:

These instructions are for use when installing a 89200H Variable Height Camera Beam Lift option for use with a V3D Aligner. Read all instructions before starting install.

These instructions are intended for use by authorized service personnel only.

To optimize V3D Aligner performance, four main factors must be considered during installation:

- ◆ The type of lift the alignment system will be used with.
- ◆ The minimum and maximum operating heights of the alignment lift.
- ◆ The distance from the lift turntables to the aligner. This distance is constant in the case of a four-post or scissor type lift and it is variable in the case of a parallelogram style lift.
- ◆ The minimum and maximum height of the aligner's beam and camera pod assemblies.

The V3D Aligner Variable Height Camera Beam Lift option is designed to provide an operator with optimal choices for alignment heights from floor level to 66". The minimum beam height is 37", while the maximum design height is approximately 106". This gives a minimum working lift height of 5" and a maximum working height of 78".

Pre-Installation Notes:

If this a new installation of a V3D Aligner and alignment lift, the installer must lay out the alignment bay so the available space is optimized and facilitates working in the bay. Install the alignment lift first, then the V3D Aligner and the Variable Height Camera Beam Lift. The Variable Height Camera Beam Lift must be anchored to a concrete floor with a minimum thickness of 3 inches and a minimum concrete strength of 3000 PSI.

Tools Required:

Safety Glasses	Rotary Hammer Drill
Tape Measure	1/2" Masonry Drill Bit
Felt Tip Marker	Torque Wrench
Chalk Line	Adjustable Wrench
Plumb Bob	Step Ladder
Center Punch	String
7/16", 1/2", 9/16", & 3/4" Socket	Hammer
7/16", 1/2", 9/16", 5/8", & 11/16" Open Ended Wrench	

Electrical and Pneumatic Requirements:

The Variable Height Camera Beam Lift mechanism comes pre-wired for 110 VAC – 60 Hz single phase operation; it can also be re-wired to operate at 220 VAC – 60 Hz single phase operation. Call a qualified electrician to make any changes needed to the wiring at the installation location. A filtered and oiled air supply of 90-145 psi is required.

II. CAMERA BEAM INSTALLATION

Positioning with Respect to Lift:

This system must be used with a lift or rack as the alignment surface.

1. Determine the minimum and maximum *alignment heights* (normal operating heights) of the rack. Measure the minimum and maximum distances from the floor to the top of the lift turntables.

TABLE 1

Installation Base Line to Turntable Centerline	Camera Beam Offset	Comments
90 – 96 Inches	27 ¾"	Extremely Short
96 – 102 Inches	28 ½"	Short
102 – 108 Inches	29 ½"	Short
108 – 114 Inches	30 ¾"	Best Performance
114 – 119 Inches	32"	Long

2. Find the *lift centerline*. Measure between runways front and rear and mark midpoints at both locations. A mark can be made forward of the lift by placing one end of a string at a spot on one side of the lift, placing a marker on the other end of a string, and scribing an arc forward of the lift across the centerline. Scribe another arc from the same spot on the opposite runway. This arc must intersect the first arc. This intersection of arcs is the projected lift centerline. Snap a chalk line between the marks, and extend this line at least 114 inches to the front of the *turntable centerline* (see Step 3), or to the shop wall if closer. This is the *lift centerline*. See **Figure 1**.

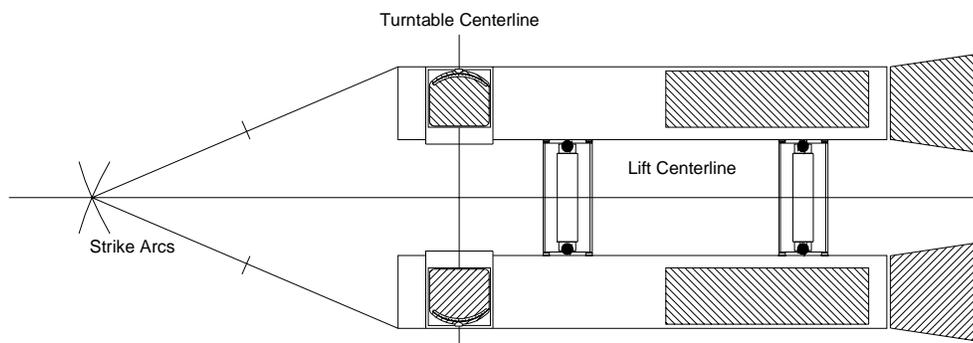


FIGURE 1. DETERMINE CENTERLINES

3. To determine the *turntable centerline*, raise the lift to a predetermined alignment height (step 1). Drop a plumb bob from the center of each turntable. Mark the floor at the point of the plumb bob next to each turntable. Snap a chalk line through the marks. This establishes the *turntable centerline*. See **Figure 1**.

- Determine the *installation baseline*. The V3D Aligner camera beam must be installed at least 90 inches and no more than 119 inches from the center of the turntables. In addition, a minimum of 2 inches of clearance behind the beam is recommended to allow access. The ideal installation distance to maximize equipment performance is 108 – 114 inches.

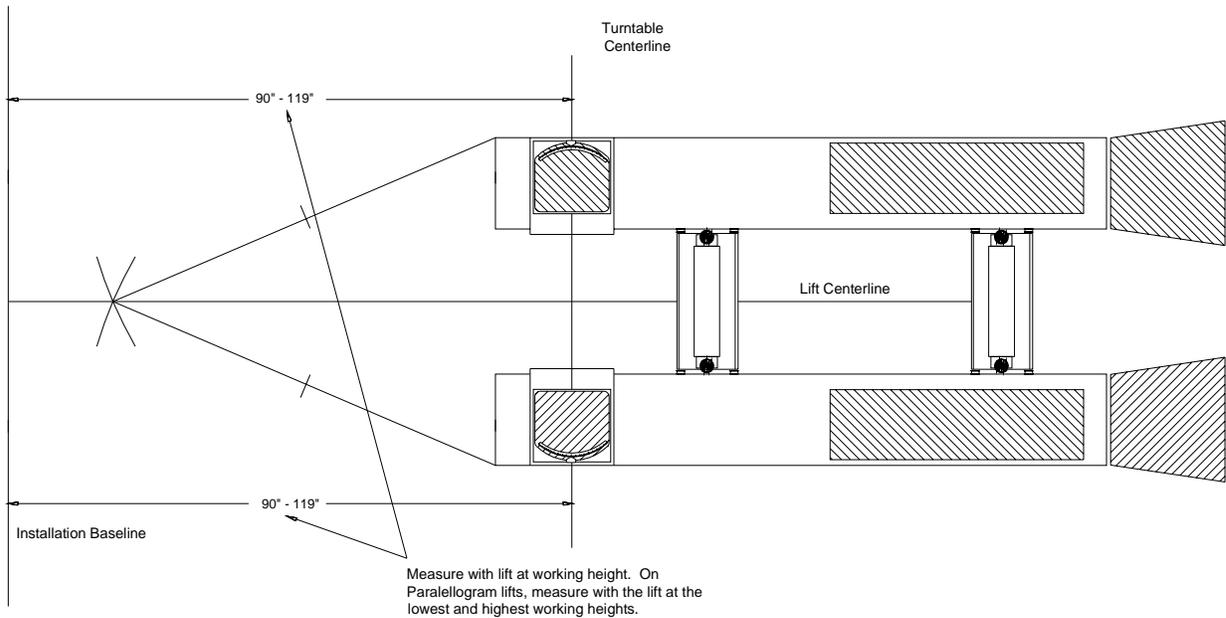


FIGURE 2. DETERMINE INSTALLATION BASELINE

- Measure 108 – 114 inches (or whatever the space will allow within the guidelines in step 4) from the turntable center line forward at two locations and mark these points. Snap a chalk line on the floor through these two points. This is the *installation baseline*. See **Figure 2**. This line must be parallel to the turntable centerline. If installing in front of a parallelogram style lift that moves in rearward arc as it raises, mark the center of the turntable with the lift at the first usable locked and leveled position. Raise the lift to its maximum height. Drop a plumb bob from the turntable centerline and mark the floor at that point. Measure from the first mark to the second mark. This is the total amount of rearward travel of the turntables. Compare the rearward motion of the lift to the installation baseline distance; the baseline dimension – [the distance from the first mark to the second mark] must also fall within 90 – 119 inches. The total tolerance for camera beam installation position relative to turntable centerline is [119 inches – 90 inches] or 29 inches. In this case, proper operation of the lift and camera beam combination is dependent on understanding the effects of lift rearward motion related to camera beam position on the Variable Height Camera Beam Lift.

Variable Height Camera Beam Setup and Installation:

6. Remove the Variable Height Camera Beam Lift and its accessories from the shipping crate. Remove all packaging material from the Variable Height Camera Beam Lift and its accessories, except the packaging that supports the Cylinder to the Tower.

7. **WARNING!** *The Camera Beam Lift MUST be supported at all times. It will not stand securely on its own and may fall over.*

Stand the Camera Beam Lift upright (you will need assistance to stand, position, and support the lift).

8. Remove the packaging that supports the Cylinder to the Tower, including the wooden block between the Cylinder and Tower. Lift the Slide up so that the top is 60 inches above the ground.
9. Remove the Cable Assembly and the Hardware Box from the Accessory Box. Remove the Poly Bag labeled “F” from the Hardware Box. Insert the threaded end of the Cable Assembly through the Cable Spacer and then feed it through the hole in the bottom of the Slide. Route the Cable Assembly around the pulley on the end of the Cylinder and down to the base of the Tower; you will need an assistant to raise the Slide as you pull the Cable Assembly down to the base of the Tower. Connect the threaded end of the Cable Assembly to the bracket on the Tower base using one ¼” Nut on each side of the bracket.
10. Connect one end of the Coil Hose, located in the Accessory Box, to the bulkhead connector located on the gusset at the base of the Tower (Item 5, Figure 8). Connect the other end of the Coil Hose to the bulkhead connector on the Slide (Item 11, Figure 8). Use thread sealant or tape on these fittings.
11. Remove the cap on the hydraulic fitting extending out the side of the Tower near the base (Item 4, Figure 7). Have an assistant support the Tower as you pull down the Slide; you will need to manually release the safety as you are doing this.
12. Connect one end of the Hydraulic Hose, located in the Accessory Box, to the hydraulic fitting at the base of the Tower (Item 2, Figure 7).
13. Locate the center point of the Camera Beam Lift. Move the beam support to center it left to right over the lift centerline. Move the Camera Beam Lift in proximity with the installation Baseline. Mount the camera beam to the Camera Beam lift. The camera beam may be mounted in front of, or behind the beam lift. Front mounting is recommended if space is severely limited. When space is not a problem, rear mounting will give the installer slightly over 12 inches more space to work with.

Rectangular Beam Mounting Instructions:

14. When front mounting the beam, simply secure the bracket to the cradle on the front of the carrier using four 1/4"-20 x 1" HHCS and related hardware, located in Poly Bag labeled "D". See **Figure 3**. (See Figure 12 for more detail).

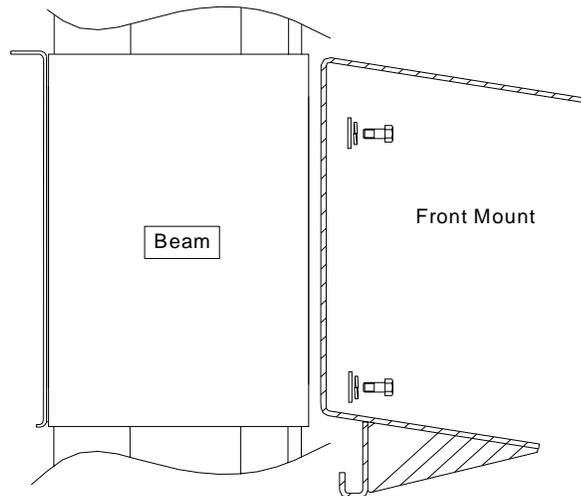


FIGURE 3

15. The camera beam can be lifted into place and secured to the bracket using eight 5/16"x 3/4" HHCS, lock washers and flat washers located in Poly Bag labeled "E". Use four on top and four on the bottom.
16. If rear mounting the camera beam an extra bracket is required. An "L" bracket must be mounted on top of the carrier on the back side of the lift. Secure the bracket to the back of the carrier using two 1/4"-20 x 1" HHCS and related hardware. See **Figure 4**.

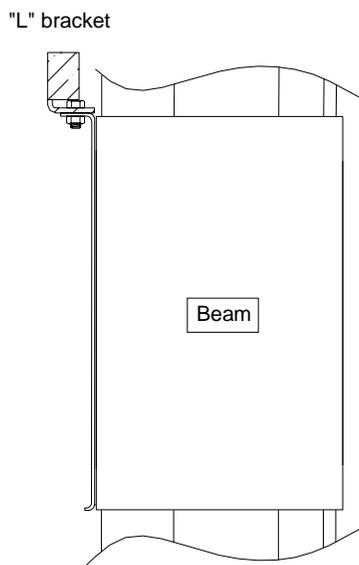


FIGURE 4

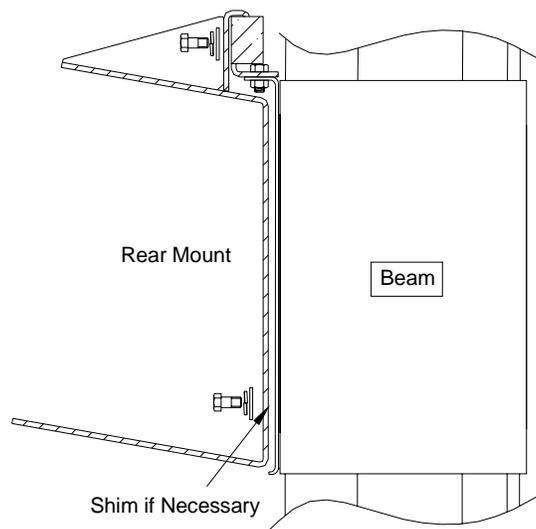


FIGURE 5

17. Secure the camera beam to the bracket using eight 5/16"x3/4" HHCS, lock washers and flat washers found in Poly Bag labeled "E". Use four on top and four on the bottom.
18. The camera beam and bracket assembly can now be lifted and hung from the "L" bracket. See **Figure 5**
19. Secure the camera beam and bracket assembly to the rear of carrier using four 1/4"-20 x 1" HHCS and related hardware. It may be necessary to add shims to accommodate the gap between the lower mounting bolts. See **Figure 5**
20. Use a plumb bob on either end of the camera beam to verify the beam is parallel and located above the installation baseline chalk line.
21. Using a level, check the Camera Beam Lift to ensure it is plumb. Shimming under the base plate may be required to make the lift stand vertically.
22. Verify that the Variable Height Camera Beam lift is square and centered with respect to the Alignment Lift by performing "diagonal" measurements as follows:
 - ◆ Choose a spot on one side of the alignment lift and measure across to the opposite end of the camera beam. Note the measurement.
 - ◆ Make the measurement from the same point on the other side of the alignment lift to the opposite end of the camera beam. Note the measurement.
 - ◆ Compare the measurements. Adjust the beam support as needed to equalize the diagonal measurements.
23. Select one corner of the tower baseplate that will best support the Camera Beam Lift in the vertical position; drill a 1/2" diameter hole through the hole in the baseplate at that corner. Carefully clean out the hole and hammer in one 1/2" anchor bolt. Hand tighten the anchor nut.
24. Once the Camera Beam Assembly is mounted on the Variable Height Camera Beam Lift, perform a rough camera aim. This helps ensure that the beam is properly positioned before anchoring the Camera Beam Lift to the floor. Performing rough camera aim before final leveling and anchoring insures that sufficient adjustment is available in the cameras to optimize the camera's vision field. Follow the Camera Aiming procedures outlined in the Camera installation manual. **NOTE:** this does NOT complete the camera aim. Final camera aim MUST be done AFTER the beam support is anchored to the floor!
25. After camera aim is roughed in and the Variable Height Camera Beam Lift assembly position is finalized, securely anchor the unit to the floor. Using the holes in the base plate as a guide, mark the floor with a center punch. This helps keep the drill bit from walking when drilling holes. Drill 1/2" holes in the concrete at least 4" deep. Carefully remove concrete dust from the holes and install the anchor studs. Tighten the nuts with flat washers between the nut and the base. Recheck the Camera Beam Lift to ensure it is as close to plumb as possible side-to-side and vertical using a bubble level. If required, loosen the nuts and shim the base using the shims supplied under the flange to level the beam. Torque all anchor bolts to 50 ft. lb.

26. Attach the Powerpack to Wall / Stand Mounting Bracket Assembly using the hardware in Poly Bag labelled "B". You now have the option of installing the Powerpack to either the wall or to the Stand; hardware is provided in Poly Bag labeled "A" (see Figure 9).
27. Connect the hydraulic Elbow from Poly Bag labeled "C" to the Power-pack in place of Packaging Plug (Item 7, Figure 10). Connect the free end of the Hydraulic Hose to the hydraulic Elbow. Connect the ¼" Polytube, from the Accessory Box, to the fitting at the base of the Tower and to the fitting on the Valve located behind the Wall / Stand Mounting Bracket. Proceed to connect a filtered and lubricated air line to the Valve located behind the Wall / Stand Mounting Bracket. Air pressure should not exceed 145 psi. Fill the Powerpack reservoir with ISO32 hydraulic fluid.
28. You can now plug in the Powerpack and operate the Camera Beam Lift. Use the button on the Powerpack to raise the Slide and Cameras; to lower the Slide and Cameras hold the release button on the Wall / Stand Mount Bracket and then depress the descent lever on the Powerpack. You will have to run the Slide and Camera up and down several times to bleed the hydraulic system of any air. Verify that the system raises and lowers smoothly before proceeding.
29. Establish alignment height combinations for the system. These will vary with each individual installation, but must be maintained per **Table 1**. The Camera Beam Lift may be marked with self-adhesive numbers (purchase locally) indicating what beam height corresponds to which lift level. Using numbers on the beam to correspond to the lift lock level provides an auditory / sight prompt for the operator that makes locating the appropriate boom level simple and quick. You may want to mark the most commonly used positions to make it easier to locate the lift at particular alignment heights later. One way is to hang a light chain from the lift with colored markings (such as plastic tape) on it marking various set alignment heights. Corresponding heights for the camera beam can be marked with similar colors on the beam support post. This should be visible from the lift operation controls. A second method is to use light-coloured self-adhesive numerals on the front of the Camera Beam Lift to correspond to lift lock positions. These marks must maintain proper lift/camera height relationships. See **Table 1**.
30. Train the operator(s) in use of the system.

III. FIGURES AND PARTS LISTS

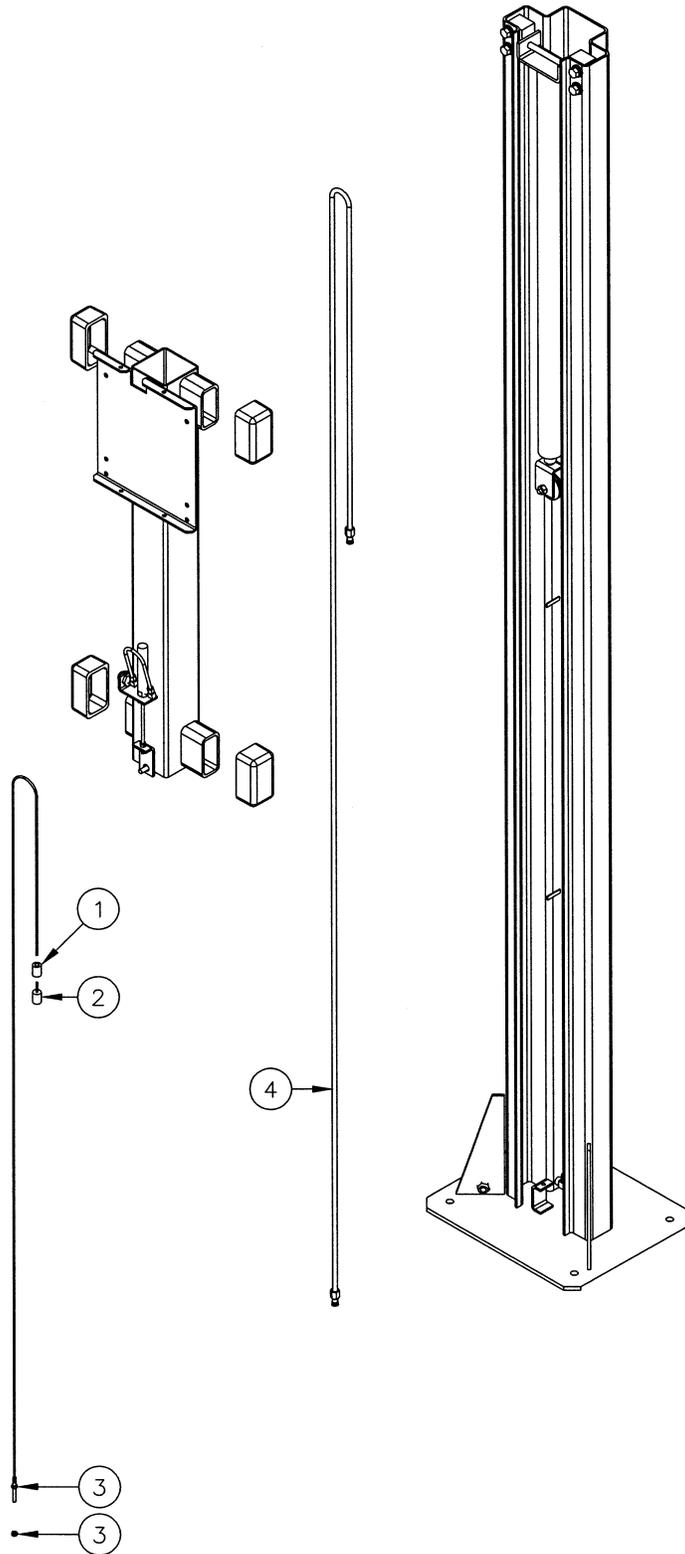


FIGURE 6. CABLE INSTALLATION

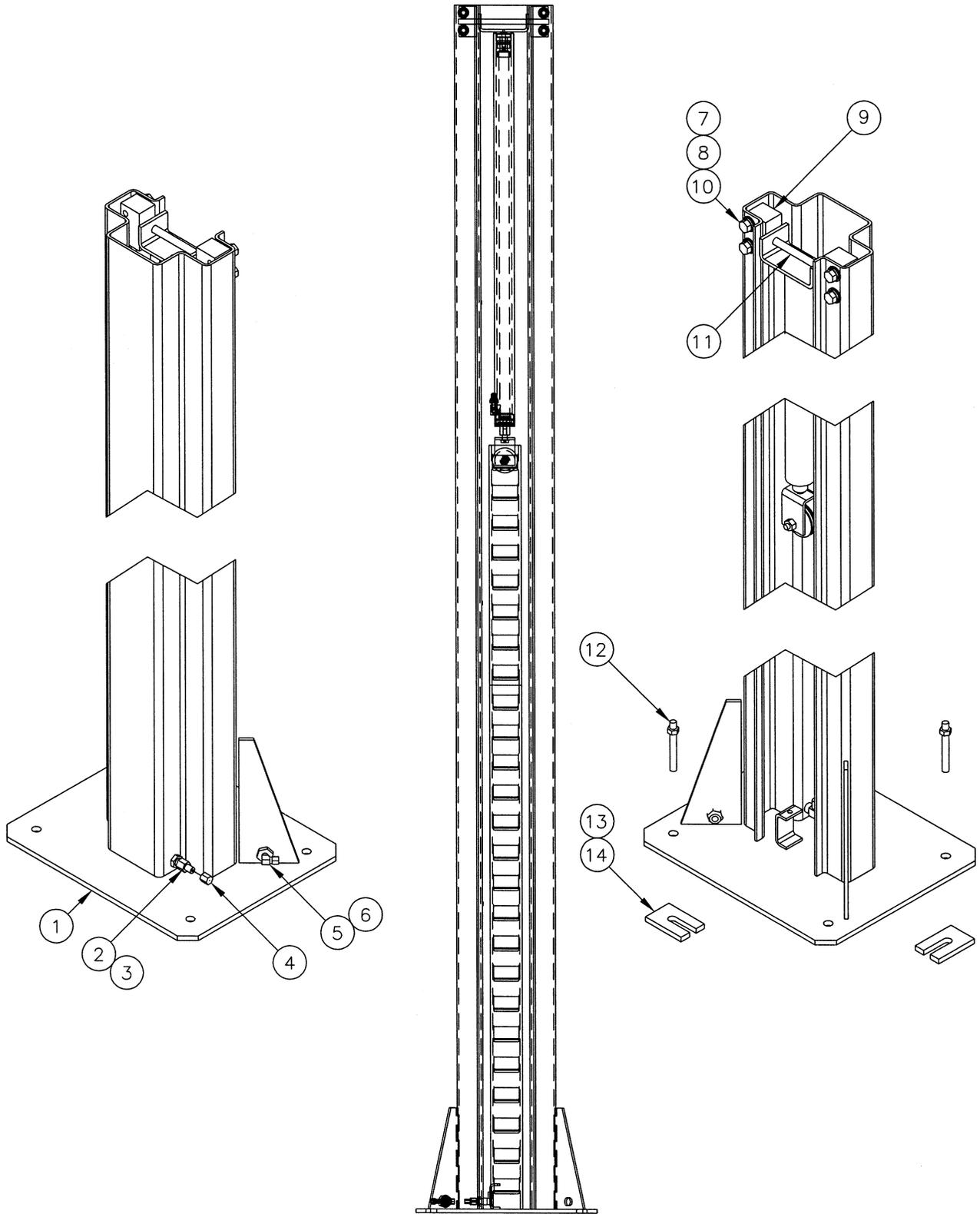


FIGURE 7. TOWER

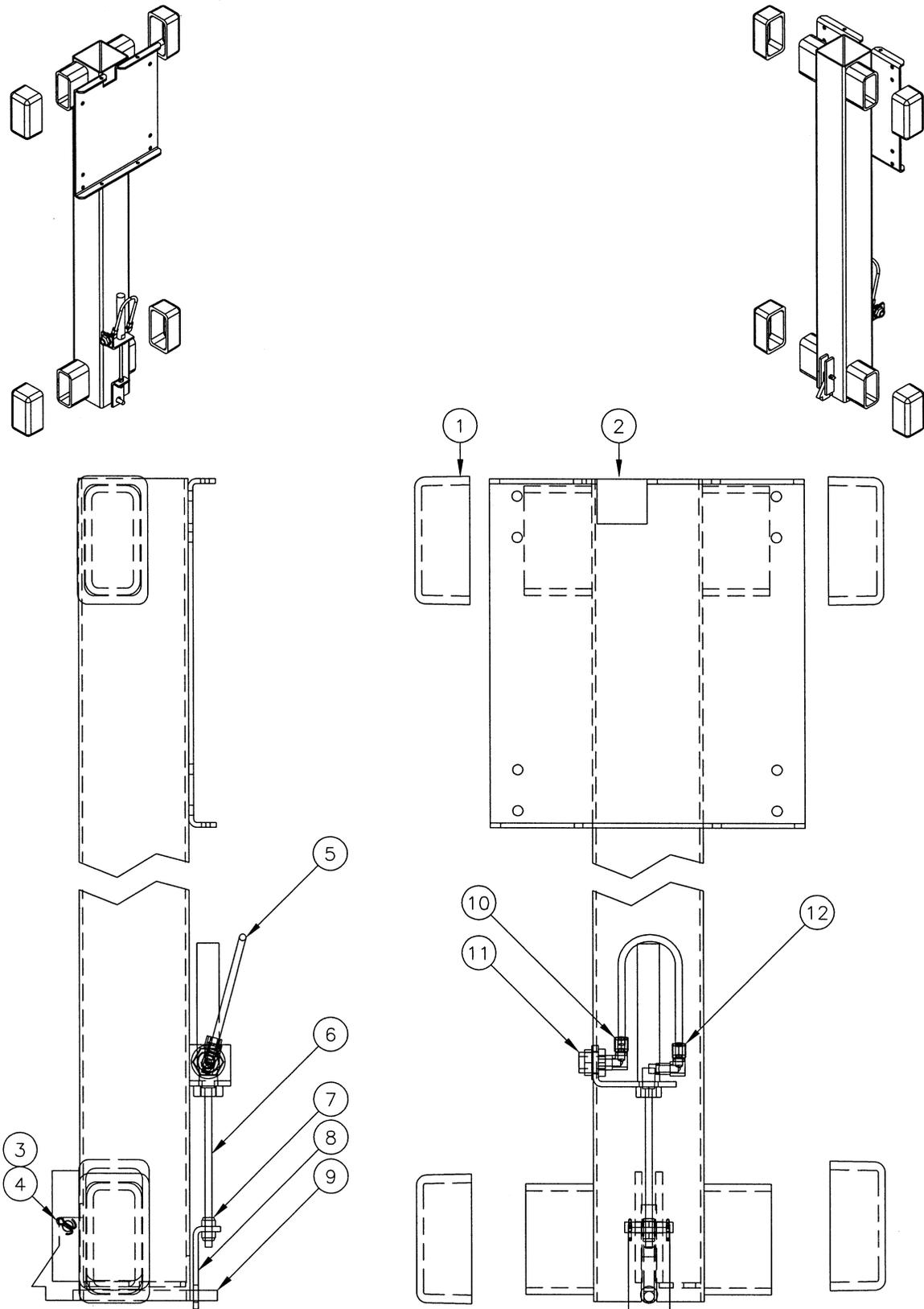


FIGURE 8. SLIDE

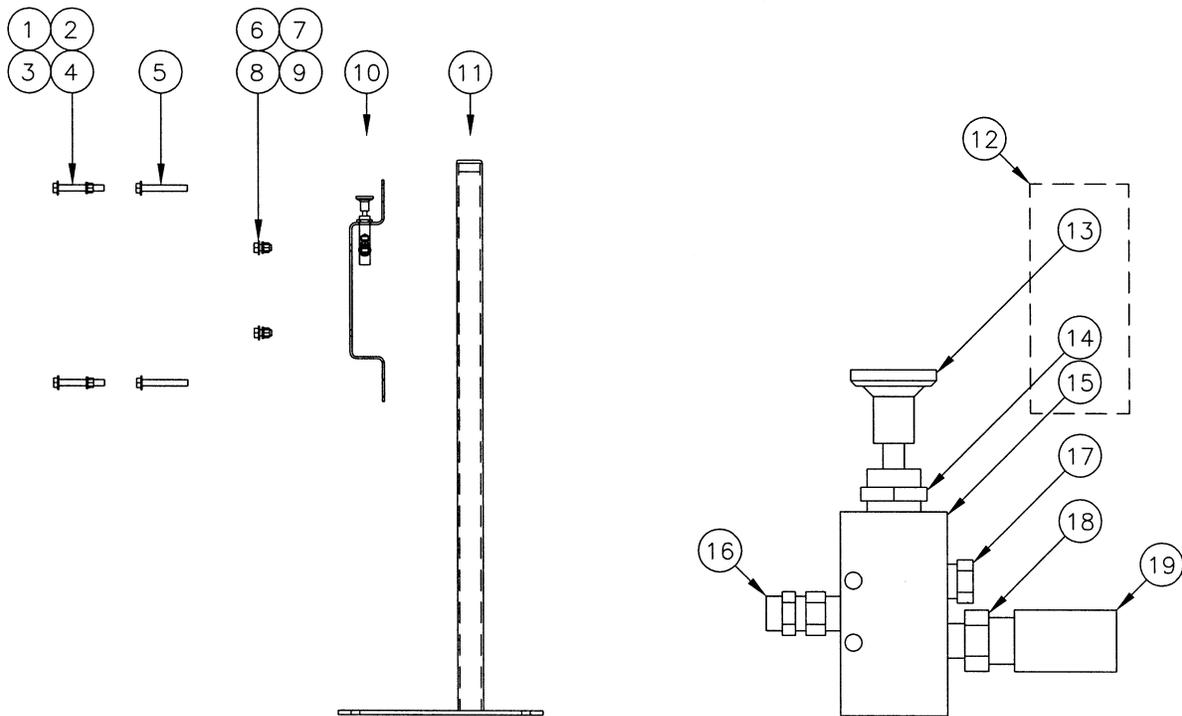
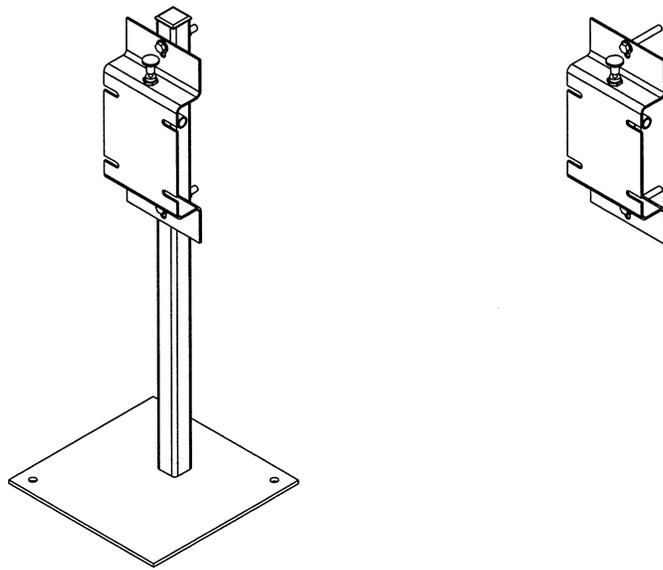


FIGURE 9. WALL / STAND POWERPACK MOUNTING

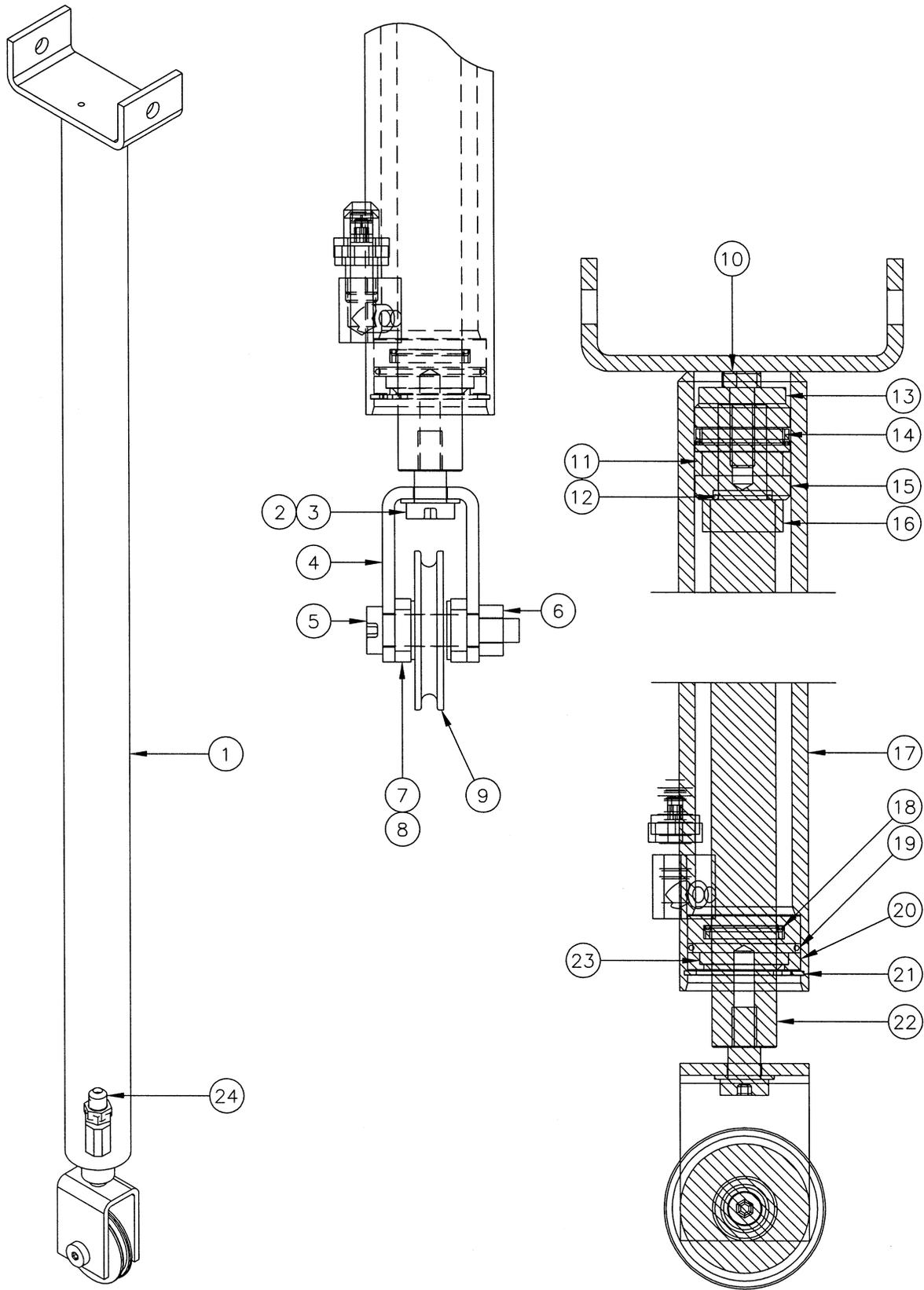


FIGURE 11. CYLINDER

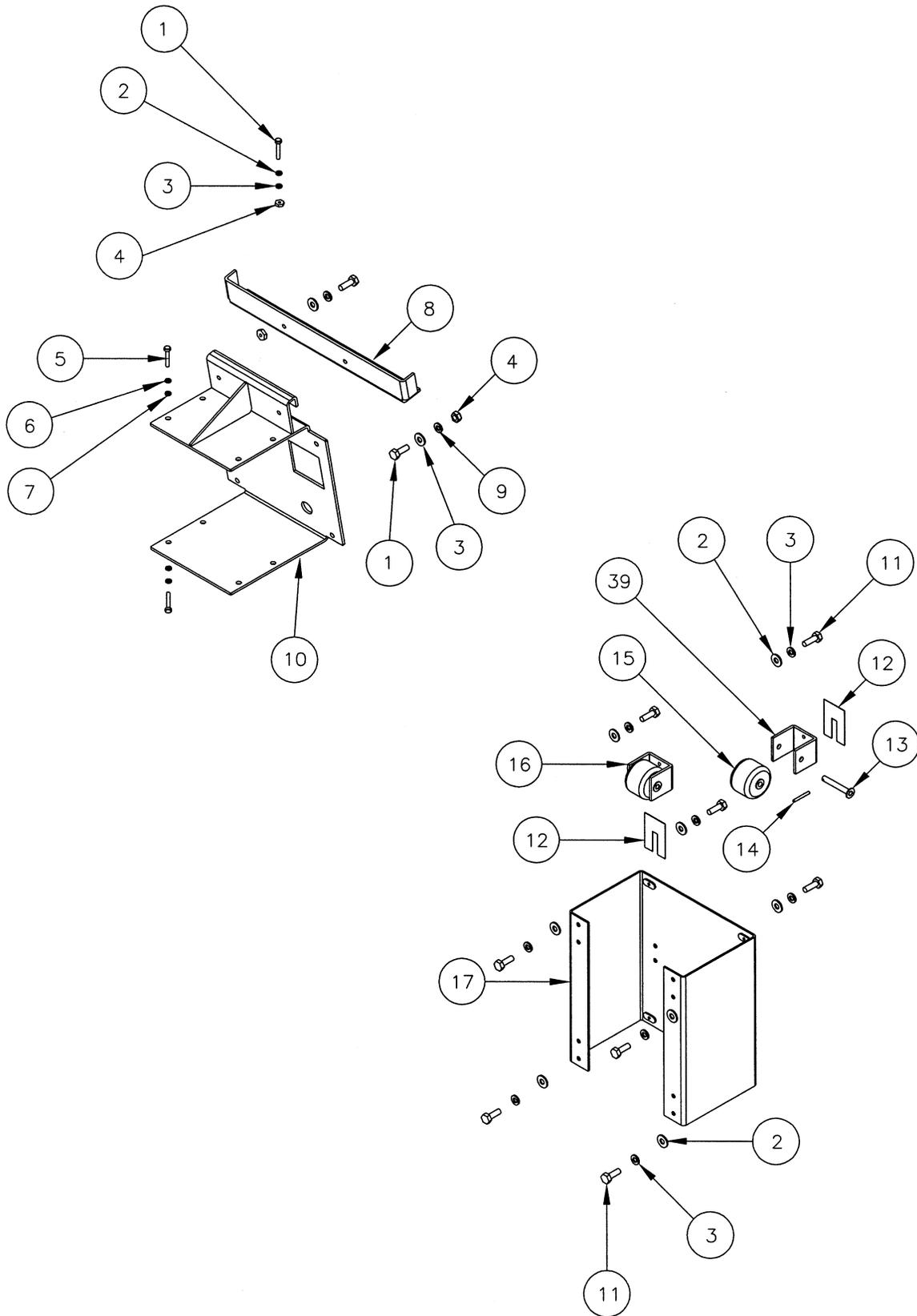


FIGURE 12. BRACKETS

FIGURE 6. CABLE INSTALLATION

NUMBER	DESCRIPTION	PART NUMBER
1	CABLE SPACER	1-2459
2	CABLE ASSEMBLY	1-2451
3	1/4"-20 NUT	6-0032
4	HYDRAULIC TUBE ASSEMBLY	2-1863

FIGURE 7. TOWER

NUMBER	DESCRIPTION	PART NUMBER
1	TOWER	4-097301
2	BULKHEAD ELBOW 3/8" JIC	6-0012
3	3/8"-1/4" JIC REDUCER	6-0974
4	CAP	6-1884
5	SHORT TERMINAL BOLT	6-0713
6	1/4" POLY – 1/4" M NPT ELBOW ADAPTER	6-1904
7	1/2"x1 3/4" LG. HEX HEAD BOLT	6-0047
8	1/2" LOCK WASHER	6-0059
9	CYLINDER MOUNTING BLOCK	1-2447
10	1/2" FLAT WASHER	6-0248
11	CYLINDER MOUNTING PIN	1-2446
12	1/2"x4 1/2" WEDGE ANCHOR (C/W F.W. & NUT)	6-0140
13	1/8" THICK SHIM	6-0740
14	1/16" THICK SHIM	6-0739
NOT SHOWN	HYDRAULIC HOSE	6-2319
NOT SHOWN	1/4" POLYTUBE (SPECIFY LENGTH)	8-0141
NOT SHOWN	COIL HOSE	6-0337

FIGURE 8. SLIDE

NUMBER	DESCRIPTION	PART NUMBER
1	SLIDER BLOCK	2-0772
2	SLIDE	4-097401
3	SAFETY PIN	1-2460
4	1/8" COTTER PIN	6-0267
5	1/4' POLYTUBE (SPECIFY LENGTH)	8-0141
6	PNEUMATIC CYLINDER	6-0651
7	1/4"-28 NYLON LOCKING NUT	6-1563
8	SAFETY ANGLE	1-246401
9	SAFETY	2-186101
10	1/4" POLY – 1/4" M NPT ELBOW ADAPTER	6-1904
11	SHORT TERMINAL BOLT	6-0713
12	1/4" POLY – 1/8" M NPT ELBOW ADAPTER	6-0709

FIGURE 9. WALL / STAND POWERPACK MOUNTING

NUMBER	DESCRIPTION	PART NUMBER
1	3/8"x2 3/4" LG. HEX HEAD BOLT	6-0730
2	3/8" LOCK WASHER	6-0058
3	3/8" FLAT WASHER	6-0062
4	3/8" NUT	6-0034
5	3/8"x2 1/4" WEDGE ANCHOR (C/W F.W. & NUT)	6-1571
6	5/16"x3/4" HEX HEAD BOLT	6-0423
7	5/16" LOCK WASHER	6-0674
8	5/16" FLAT WASHER	6-0295
9	5/16" NUT	6-0294
10	WALL/STAND MOUNT ASSEMBLY	2-1864
11	STAND	2-1852
12	3-WAY VALVE ASSEMBLY	6-2506
13	PUSH BUTTON	6-2506PB
14	NUT	6-2506NUT
15	VALVE BODY	6-2506VB
16	1/4" POLY – 1/8" M NPT ADAPTER	6-0708
17	BREATHER	6-0183
18	1/4" M NPT – 1/8" M NPT ADAPTER	6-1382
19	1/4" NPT COUPLER	6-0215

FIGURE 10. POWER PACK PARTS LIST: #0-0893 115V/1PH/60Hz

ITEM	QTY.	DESCRIPTION	PART #
1	2	BOLT 5/16"-24 x 2 3/4" TORX G8	6-2298
2	1	COUPLING SAE 9T-20/40 1.260"	6-0774
3	1	SEAL SHAFT 0.500" x 1.00" x 0.25"	6-2158
4	1	MOTOR AC PSC #613000 115/230 1 HP 1PH BLK	6-2299
5	1	WASHER 0.338" x 0.625" x 0.060" STEEL	6-2159
6	1	CORDSET 16/3 SJO 8FT 115V PLUG	6-2300
7	1	PACKAGE PLUG 9/16" SAE	6-2301
8	1	PLUMBING MAGNET	6-2162
9	1	RELIEF VALVE CAP ASSEMBLY	6-1089
11	2	ELECTRIC STAKON NUT	6-2302
12	1	COVER ASS'Y SUCTION	6-2165
13	2	SCREW TAPTITE M6x1.0 12MM TORX	6-2164
14	1	NAMEPLATE, SERIAL	
15	1	ENDHEAD UNIVERSAL AUTOHOIST	6-2155
16	1	ELECTRIC CORD GRIP 3/4" NPT	6-2303
17	1	ELECTRIC PIPENUT 3/4"	6-2304
18	1	VALVE CARTRIDGE CHECK	6-1087
19	1	VALVE LOAD DELAY	6-2305
20	1	NUT 3/4"-16 x 1"HEX x 0.250 STEEL	6-2167
21	1	WASAHER 3/4" INT. TOOTH LOCK	6-2168
22	1	BRACKET HANDLE ASS'Y REL BLACK	6-0776
23	1	COMPRESSION TUBE NUT	6-2153
24	4	BOLT M6 x 1.0 35MM SOC HD	6-2169
25	4	WASHER 1/4" LOCK HI-COLLAR	6-2170

26	4	BOLT #12-24 x .50 HEX WSHRHD	6-1091
27	1	O-RING 2-348 BUNA	6-0875
28	1	COVER ASSY SUCTION	6-2165
29	1	PUMP ASS'Y 0.8 SHORT SPLINE	6-2306
30	1	TANK PLASTIC 6.7 CT 11.0" BLACK	6-2307
31	1	SPRING 0.480" x 0.063" x 0.42" COMP	6-2151
32	1	PLUMBING PLUG 5/16" SAE	6-2157
34	1	PLUMBING ASS'Y INLET 6.61 (3)	6-2308
35	1	VALVE CARTRIDGE RELEASE MANUAL	6-0880
36	1	RELIEF ASSEMBLY	6-2564
37	1	COMPRESSION TUBE SLEEVE	6-2154
38	1	RETURN HOSE 3/8" OD x 10.0"	6-2310
39	1	PLUMBING PLUG 3/8"NPT	6-2161
40	2	ELECTRIC REDUCER WASHER	6-2311
41	1	WIRING ASSEMBLY AC 1PH FENNER Micro Switch	6-2156
42	1	LABEL INSTALLATION AUTOHOIST	6-2136
43	1	BREATHER CAP & BLADDER	6-1376
NOT SHOWN	1	ELBOW 1/4" JIC-9/16" SAE	6-1093

FIGURE 11. CYLINDER

NUMBER	DESCRIPTION	PART NUMBER
1	CYLINDER	4-097601
2	1/2"x1/2" SHOULDER BOLT	6-0053
3	THRUST WASHER	6-0419
4	PULLEY MOUNT	1-228401
5	1/2"x1 1/2" SHOULDER BOLT	6-2544
6	3/8" NYLON LOCK NUT	6-0042
7	SPACER	1-0228
8	THRUST WASHER	6-0419
9	PULLEY	6-1819
10	3/8"x1 1/4" GR. 8 HEX HEAD BOLT	6-0666
11	WEAR RING	6-2324
12	'O' RING	6-2325
13	PISTON RETAINER WASHER	1-2279
14	PISTON SEAL	6-2323
15	PISTON	1-2230
16	CYLINDER SPACER	1-2278
17	CYLINDER TUBE	4-0975
18	ROD SEAL	6-2329
19	'O' RING	6-2328
20	GUIDE RING	1-2277
21	INTERNAL RETAINING RING	6-2322
22	PISTON SHAFT	1-2382
23	ROD WIPER	6-2330
24	FLOW CONTROL	1-2461

FIGURE 12. BRACKETS

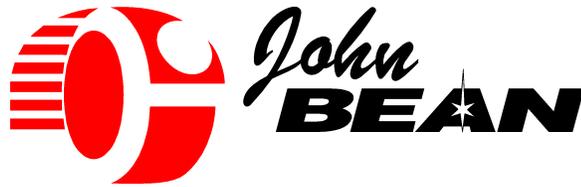
<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
1	1/4"-20 x 1" Hex. Hd. Bolt	6-0008
2	1/4" Flat Washer	6-0060
3	1/4" Lock Washer	6-0056
4	1/4"-20 Nut	6-0032
5	5/16"-18 X 3/4" Hex Hd. Bolt	6-0423
6	5/16" Lock Washer	6-0674
7	5/16" Flat Washer	6-0295
8	Angle Support Bracket	2-176101
9	1/4" I.D. Fender Washer	6-0626
10	Mounting Cover Plate	3-082001
11	1/4"-20 x 3/4" Hex. Hd. Bolt	6-0178
12	Shim (#22 Ga.)	6-1900
13	Roller Pin	1-1836
14	1/8" x 1" Cotter Pin	6-0267
15	Duratex Wheel	6-1821
16	Roller Assembly	2-1558
17	Cradle	3-071001

IV. MAINTENANCE

EVERY 3 MONTHS	1) CHECK ALL CONNECTION POINTS AND FASTENERS TO ENSURE THAT THEY ARE SECURE.
	2) TORQUE ALL ANCHOR BOLTS TO 50 FT. LB.
	3) INSPECT ALL HYDRAULIC AND PNEUMATIC CONNECTIONS AND LINES FOR LEAKS. TIGHTEN CONNECTIONS AND / OR REPLACE ANY ITEMS THAT ARE WORN OR DAMAGED.
	4) WITH THE CAMERA BEAM IN THE LOWERMOST POSITION CHECK HYDRAULIC FLUID LEVEL IN THE POWERPACK RESERVOIR. IF LOW, TOP UP WITH ISO 32 HYDRAULIC FLUID.
	5) VISUALLY INSPECT ALL COMPONENTS FOR WEAR OR DAMAGE. REPLACE ANY ITEMS THAT ARE WORN OR DAMAGED.
	6) APPLY MULTI-PURPOSE GREASE TO THE INSIDE OF THE TOWER GUIDE AREAS.
	7) RUN THE CAMERA BEAM UP AND DOWN; TEST THE OPERATION OF THE SAFETY LOCKS. CORRECT ANY FUNCTIONAL PROBLEMS BEFORE CONTINUING USAGE OF THE CAMERA BEAM LIFT.
YEARLY	1) PERFORM THE SAME INSPECTION STEPS REQUIRED AT 3 MONTH INTERVALS.
	2) INSPECT THE WIRE ROPE FOR WEAR OR FRAYING. REPLACE ANY COMPONENTS THAT ARE WORN OR DAMAGED.
	3) CHECK ALL CONNECTION POINTS AND FASTENERS FOR WEAR OR DAMAGE. REPLACE ANY ITEMS THAT ARE WORN OR DAMAGED.
EVERY OTHER YEAR	1) PERFORM THE SAME INSPECTION STEPS REQUIRED AT 3 MONTH AND 1 YEAR INTERVALS.
	2) WITH THE CAMERA BEAM IN THE LOWERMOST POSITION, DRAIN THE HYDRAULIC FLUID AND REPLACE WITH ISO 32 HYDRAULIC FLUID.

V. TOWER DIMENSIONS and WORKING HEIGHTS

Max working Height	106"
Minimum working height	37"
Overall tower height	120"



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