



# PARTS & INSTALLATION MANUAL

# SL-650



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**HOIST SERIAL NUMBER**





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**TO THE CUSTOMER:**

**THIS MANUAL CONTAINS INSTALLATION INSTRUCTIONS TO THE TRUCK CHASSIS. ALL INSTRUCTIONS ARE RECOMMENDED PROCEDURES ONLY. THIS MANUAL ALSO PROVIDES BREAKDOWNS OF EACH SUB-ASSEMBLY APART OF THE HOIST THAT LISTS PART NUMBERS AND DESCRIPTIONS SHOULD ANYTHING NEED TO BE REPLACED ON THE HOIST. EACH SECTION IS CLEARLY IDENTIFIED SO YOU CAN EASILY FIND THE INFORMATION THAT YOU NEED. READ THE TABLE OF CONTENTS TO LEARN WHERE EACH SECTION IS LOCATED.**



Throughout this manual you will come across "**Dangers,**" "**Warnings,**" or "**Cautions**" which will be carried out in bold type and preceded by the symbol as indicated to the left. Be certain to carefully read the message that follows to avoid the possibility of personal injury or machine damage.

Record your SwapLoader Hoist serial number in the appropriate space provided on the title page. Your SwapLoader dealer needs this information to give prompt, efficient service when ordering parts. It pays to rely on an authorized SwapLoader Distributor for your service needs. For the location of the Distributor nearest you, contact SwapLoader.

Also, included with your hoist, is a Technical Guide. This guide provides safety suggestions, technical information, operation instructions, maintenance requirements, troubleshooting, and accessory installation instructions. Please refer to the Technical Guide for any questions you may have pertained to the above.

**NOTE:** It is SwapLoader's policy to constantly strive to improve SwapLoader products. The information, specifications, and illustrations in this publication are based on the information in effect at the time of approval for printing and publishing. SwapLoader therefore reserves the right to make changes in design and improvements whenever it is believed the efficiency of the unit will be improved without incurring any obligations to incorporate such improvements in any unit which has been shipped or is in service. It is recommended that users contact an authorized SwapLoader Distributor for the latest revisions.

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# INSTALLATION

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## **INITIAL INSPECTION**



When the hoist is installed and ready for delivery, it is your responsibility to fill out and submit the Product Registration Form. Visit [Truck-Mounted Product Registration - Swaploader](#) to complete this form.

When the SwapLoader hoist is received from the factory, you should inspect the hoist for damage, which may have occurred in shipment. If damage has occurred, you should contact the shipper immediately. Be sure to note any damage or missing items on bill of Lading.

When you receive your SwapLoader hoist, it is your responsibility to make sure you have received all the parts and pieces that were ordered, within 30 days of the invoice date of the hoist. Lay out all the options, loose parts and accessories on a table and compare the items received vs the Packing List and the Loose Parts Box List(s) shipped with the hoist order.

If you have any problems, shortages, or questions, please contact SwapLoader U.S.A., Ltd. immediately.

## **GENERAL INSTALLATION PROCEDURE**

The installation of the SwapLoader on a truck chassis will generally follow these steps:

1. Install hoist assembly onto truck chassis.
2. Mount the hydraulic control valve to the hoist and install the hydraulic plumbing from the control valve to the hydraulic cylinders. Then install the control levers in the cab and route the control cables to the hydraulic control valve assembly.
3. Install the hydraulic tank, hydraulic filter, and hydraulic plumbing between the hydraulic tank and the control valve assembly.
4. Select and install the P.T.O. on the truck transmission. (Note: This can be done prior to hoist installation on the truck chassis.)
5. Install the hydraulic pump and the plumbing from the pump to the hydraulic tank and control valve assembly.
6. Fill the hydraulic tank with oil, bleed the air from the pump suction line, and start up the unit.

Although SwapLoader attempts to include the mounts and attaching fasteners with each hoist unit, your installation may require some additional mounts or modifications. If you have problems with your installation, please contact SwapLoader at 1-888-767-8000, as we may be aware of another customer who has installed a SwapLoader on a similar truck chassis.

## HOIST INSTALLATION TO TRUCK CHASSIS

1. Place the SL-650 hoist assembly on the truck chassis. The truck chassis mounting surface should be flat without any steps or protrusions. If necessary, shim bars need to be added to ensure a flat surface on which to support hoist. It is advised to clamp the main frame of the hoist to the truck chassis prior to installing the mount brackets. The clear frame dimension

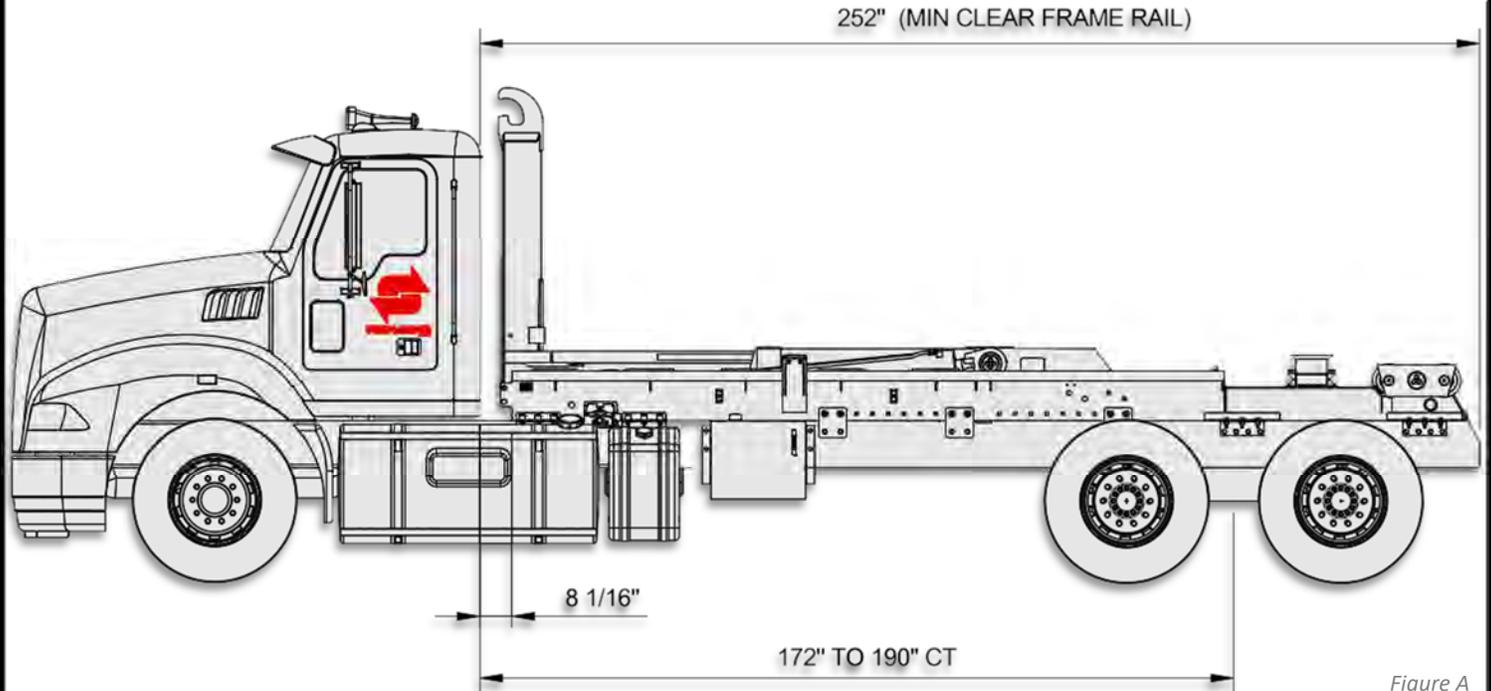


Figure A

indicated in *Fig. A* allows for the overall length of the hoist plus 5 inches for cab clearance and rear light bar mounting. Extra frame length may be needed to allow for mounting additional accessories (e.g., Cab Guard, Tarper, Light Kit, Stabilizer, etc.). For example, when mounting a light kit on a truck with a long CT, check that the hoist and the light kit are positioned far enough back to eliminate any interference between the fender and the light kit. You should also consider the final weight distribution regarding the bridge code when positioning the hoist.

### NOTE:

THE ABOVE SPECIFICATIONS ARE A MINIMUM REQUIREMENT. IT IS THE RESPONSIBILITY OF THE OWNER/ OPERATOR TO ENSURE THE COMPLETED CHASSIS MEETS OR EXCEEDS ALL FEDERAL, STATE, AND LOCAL REGULATIONS. ALSO, THE HOIST SHOULD NOT BE USED TO LIFT AND HAUL ANY LOAD THAT EXCEEDS THE LOAD RATING OF ANY OF THE INDIVIDUAL COMPONENTS OF THE COMPLETED CHASSIS (TIRES, AXLES, SUSPENSION, ETC.)

2. There are two types of mount brackets used on the Model SL-650 hoist as indicated in *Fig. B*. They are the angle brackets (*Pt. No. 89H51*), and the mid brackets (*Pt. No. 89H52*). Bolt the mount brackets to the side of the hoist as indicated in *Fig. B*. Adjust locations as necessary to miss chassis suspension, brackets, etc. When positioning the brackets allow for mounting the control valve assembly and the hydraulic tank. You should consult the truck chassis supplier for any limitations regarding drilling mount holes in the truck chassis frame rails. Typically, the holes must be at least  $2 \frac{3}{4}$ " from the top of the truck chassis rails but may vary (reference *Fig. C, D & E*). Once the locations of the mount brackets have been

determined, use the mount brackets as a template for marking the mounting holes in the truck chassis frame rails. Drill the 21/32" diameter holes required and attach the brackets to

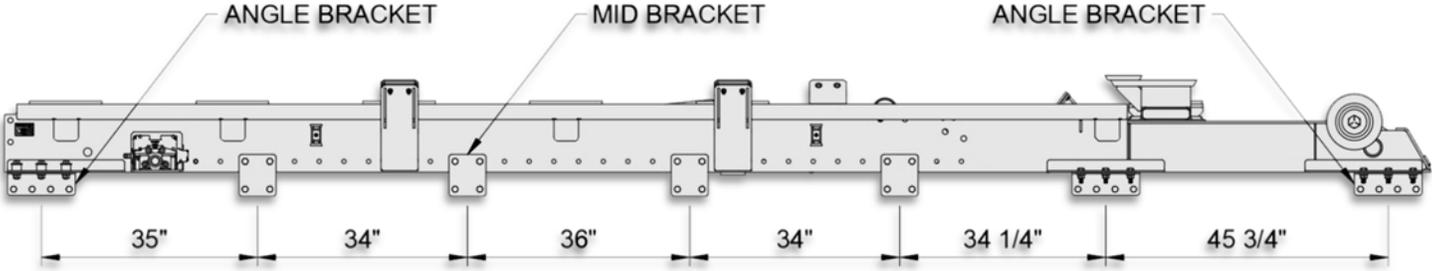


Figure B

the truck chassis with the 5/8" diameter bolts, washers, and locking hex nuts provided. Torque to 220 ft.lb.

- 3. Fasten the mount brackets to the hoist main frame as indicated on Fig. C and Fig. D. You may need to modify the mount brackets or add shim plates to allow for variances in the width of the truck chassis as well as to allow for top rivets, stepped channels, etc.

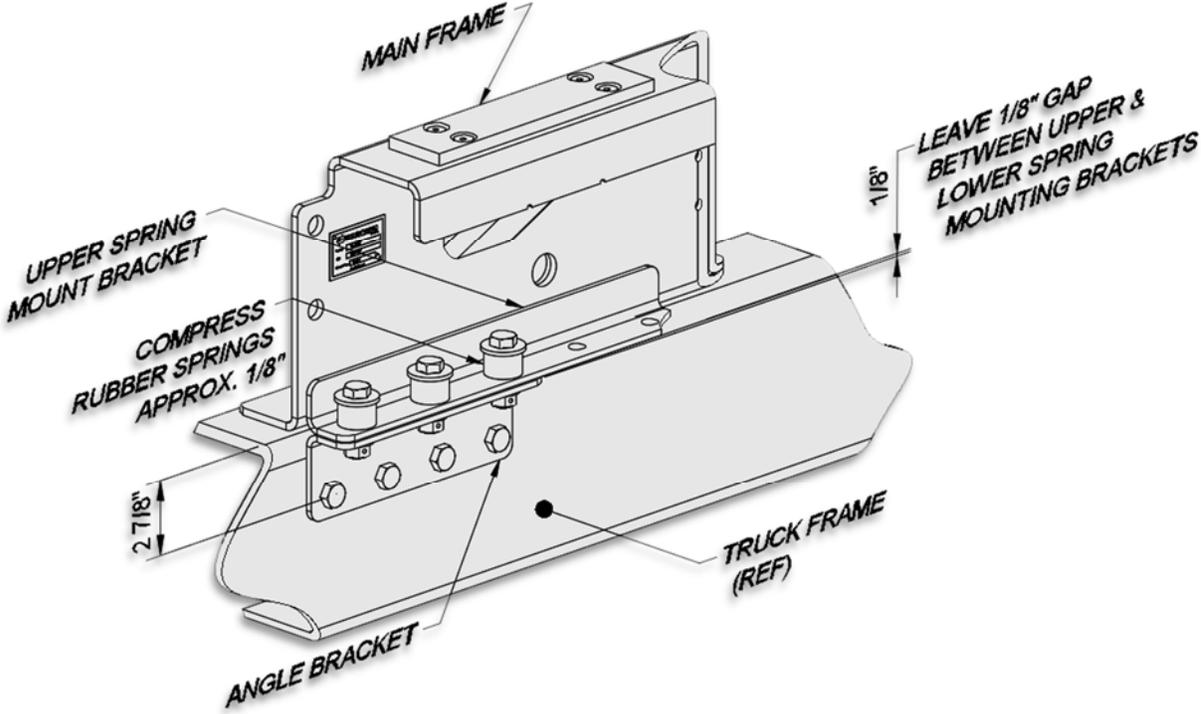


Figure C

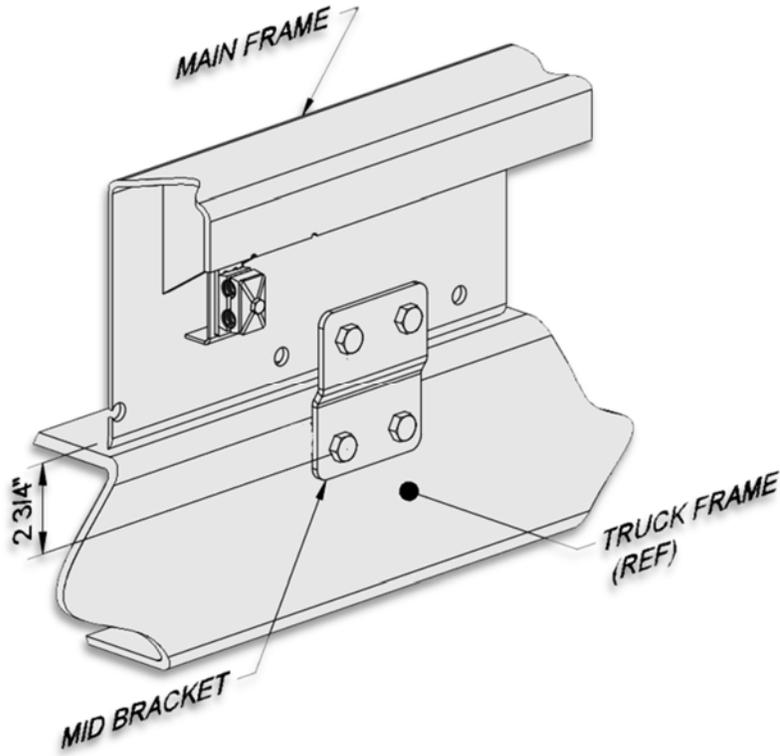


Figure D

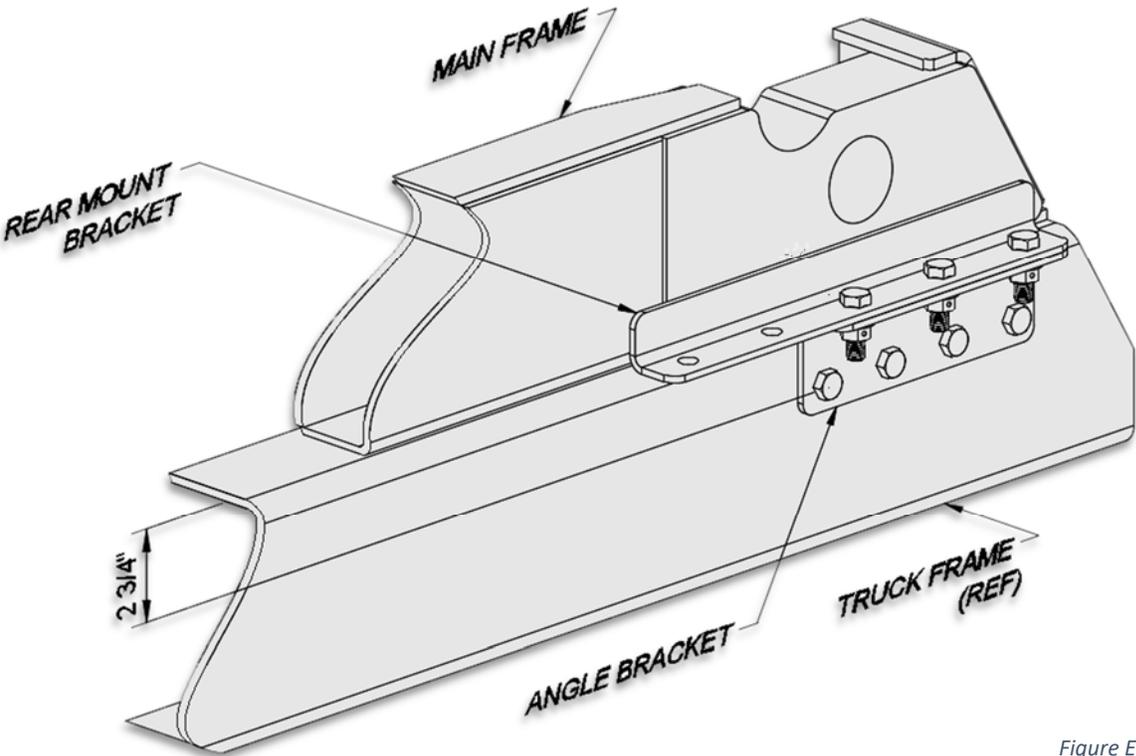


Figure E

## CONTROLS INSTALLATION – MANUAL

1. Attach the valve mount bracket (*Pt. No. 40H43*) to the main frame as indicated on *Pg. 3-11* with the fasteners provided (see *Pg. 3-7*).
2. Mount the hydraulic control valve assembly (*Pt. No. 20P59*) to the valve mount bracket as shown on *Pg. 3-11* with the fasteners provided.
3. Install the hydraulic adapters, connect the hydraulic tubing & hoses (*Pt. Nos. 11P46, 11P56 & 11P57*) to the control valve assembly as indicated on *Pg. 3-9*. The tubing should be supported by the clamp assemblies that are provided in the Loose Parts Box (see *Pg. 3-7*).
4. Determine the best location in the cab for the control levers (*Pt. No. 20P08*). The location should be such that the controls can be easily reached while operating the truck. A control lever console (*Pt. No. 20P09*) is provided to facilitate the mounting of the control levers (see *Pg. 3-11*).
5. Assemble and install the control lever console (see *Fig. F*). Typically, the console is fastened to the floor of the cab and the control cables are routed through additional holes drilled in the floor. Your installation may require that additional brackets be fabricated, or other modifications made.
6. Attach the control cables to the control levers and route the cable through the holes in the cab. Install the control levers in the console. Levers should be installed such that when the levers are pushed forward the control cable is extended. See *Pg. 3-11* (*Manual Control Assembly*) for control lever orientation.
7. Route the cables to the control valve location and attach them to the control valve with the bonnet connection kits provided (*Pt. No. 20P65*). See the following instruction sheet for installation procedures. The control cables supplied are 96 inches long. Your mounting may require different length control cables, which can be purchased locally or through SwapLoader. Take proper care when routing the control cables, as a good cable path is essential for a proper operating system. Keep bends in the cable path to a minimum and be as generous as possible. Under no circumstances should any bend be tighter than an 8" radius. Protect the cable from heat above 225 degrees F. and avoid hot areas such as exhaust pipes, etc. Protect the cable from physical damages such as pinching or crushing,

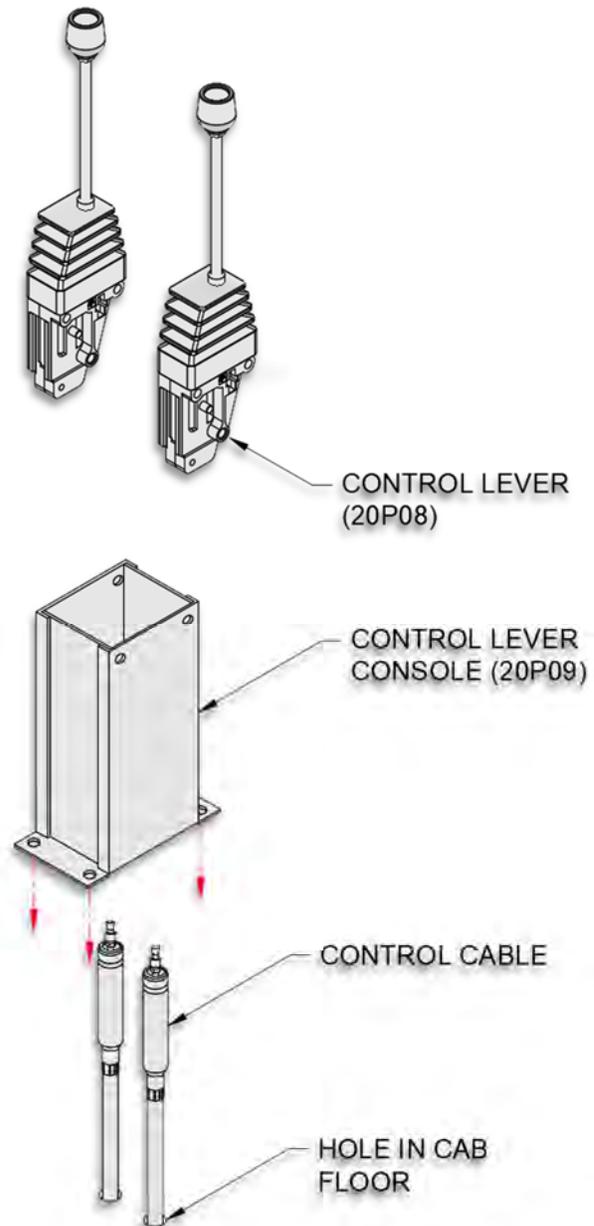
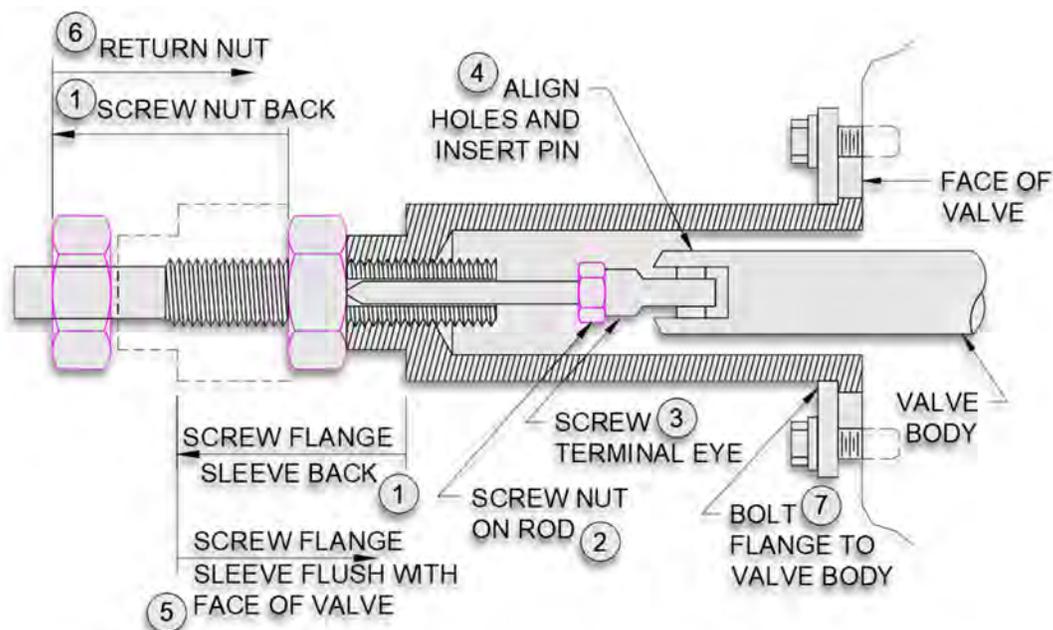


Figure F

and do not use cable supports, which may crush or deform the cable. Allow room for flexing where the cable is attached to moving parts of the equipment, so that the cable is neither kinked nor stretched.

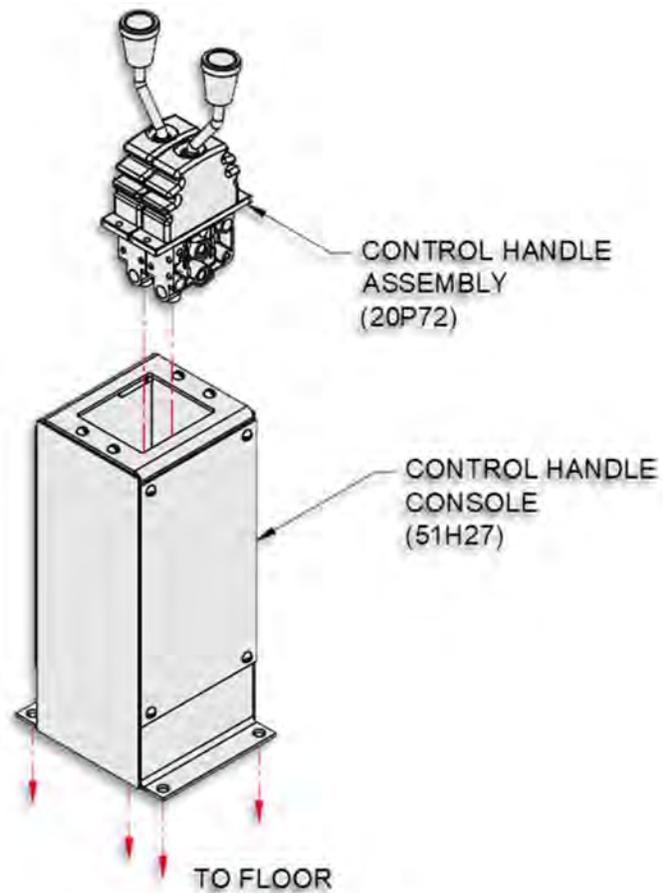
### **INSTALLATION PROCEDURE FOR A HYDRAULIC CONTROL CABLE TO HYDRAULIC VALVE WITH BONNET CONNECTION KIT**

1. Turn .750-16 UNF jam nut entire length of threaded hub back over the cable. Place Flange onto Sleeve (large end first) and flange onto sleeve and turn flange adaptor / flange / sleeve assembly entire length of threaded hub back over the cable.
2. Turn .250-28 UNF jam nut onto cable threaded rod until it bottoms.
3. Place clevis of threaded rod and bottom against jam nut. Turn other .250-28 UNF jam nut onto threaded rod until it bottoms against clevis. Align clevis so it will mate with spool terminal eye and secure jam nut against clevis.
4. Slide the clevis onto terminal eye on spool and align the holes. Insert clevis pin through yoke and terminal eye holes and secure clevis pin with retaining ring.
5. Now, with the cable attached to the valve and control head, turn the flange adaptor / flange / sleeve assembly back onto the threaded hub until it is flush with the valve face. When turning on the flange adaptor / flange / sleeve assembly, make sure that the control head remains in the neutral position.
6. Tighten the .750-16 UNF jam nut against the sleeve and lock in position.
7. Bring flange into position on bolt assembly to valve housing.



**CONTROLS INSTALLATION - AIR SHIFT**

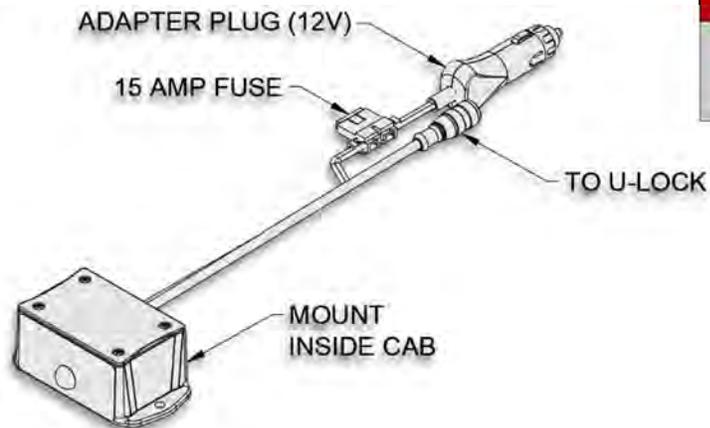
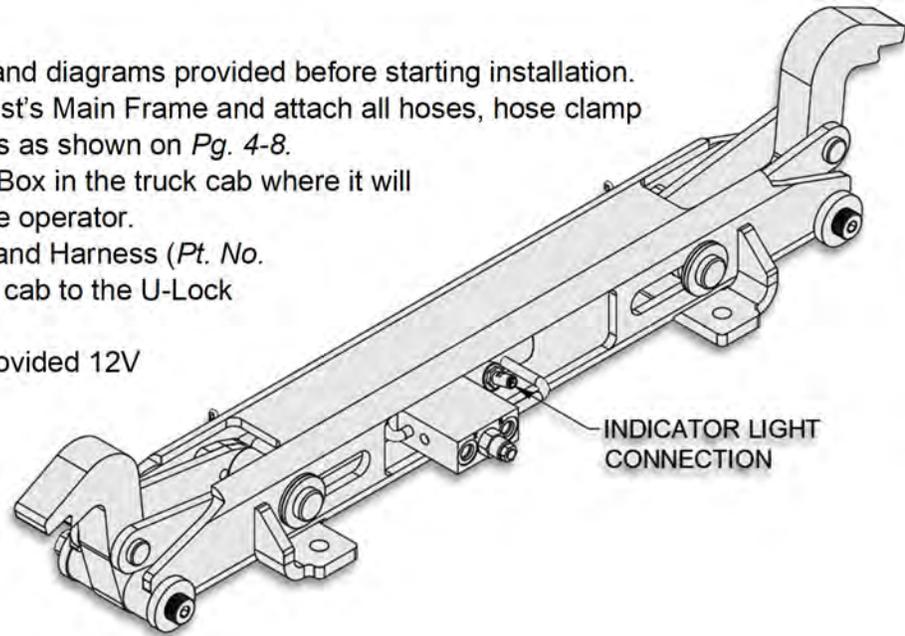
1. Attach the valve mount bracket to the main frame as indicated on *Pg. 4-3* with the fasteners provided.
2. Mount the hydraulic control valve assembly (*Pt. No. 20P59*) to the valve mount bracket as shown on *Pg. 4-3* with the fasteners provided.
3. Install the hydraulic adapters and connect the hydraulic hoses (*Pt. Nos. 11P46, 11P56 & 11P57*) to the control valve assembly as indicated on *Pg. 3-9*.
4. Determine the best location in the cab for the control handle assembly (*Pt. No. 20P72*). The location should be such that the controls can be easily reached while operating the truck. A control handle console (*Pt. No. 51H27*) is provided to facilitate the mounting of the control handles (see illustration on the right).
5. Install the air fittings and hose as shown on *Pg. 4-4* (Air Circuit Plumbing Diagram). An air pressure protection valve (*Pt. No. 20P74*) is provided so you can tap into the truck's air supply without jeopardizing the integrity of the air system. The air hose is provided in a bulk length, which you can cut to length as required for running the air lines. Take care in routing the air lines and avoid hot areas such as exhaust pipes, etc.



### **AIR OR CABLE CONTROL INSTALLATION w/ U-LOCK (OPTION)**

The Universal Body Lock (U-Lock) can be installed with a standard 3-section valve and operated from the cab (see *Pg. 4-5* for routing). A separate indicator light and harness will be provided to be installed in the truck cab. This will notify the operator when the U-Lock has been engaged or disengaged.

1. Review all directions and diagrams provided before starting installation.
2. Mount valve to the hoist's Main Frame and attach all hoses, hose clamp assemblies and fittings as shown on *Pg. 4-8*.
3. Mount Indicator Light Box in the truck cab where it will be clearly visible to the operator.
4. Route Indicator Light and Harness (*Pt. No. 40P60*) from the truck cab to the U-Lock cylinder.
5. Hardwire or plug in provided 12V adapter for indicator light.



#### **NOTE:**

AS A SAFETY MEASURE, THE JIB CYLINDER IS DISENGAGED WHENEVER THE U-LOCK/O-LOCK IS ENGAGED.

### **PUMP INSTALLATION**

1. Install the hydraulic pump to the P.T.O. (Bolts are not provided).
2. Install the hydraulic fittings into ports on the hydraulic pump as shown on *Pg. 3-10*.
3. Connect the suction hose assembly to the hydraulic tank (1-1/2" I.D. hose) and route to the hydraulic pump in as short and straight line as possible. Be sure to route the hose clear of exhaust components and of the drive shaft. Extra hose is provided so the hose can be shortened to an appropriate length. Install the hose on the hose barb fittings at the tank and at the pump and secure with the hose clamps provided.

**NOTE: Prior to startup, this hose must be filled with oil.**

4. The pressure hose from the hydraulic pump to the control valve assembly is not supplied with the hoist as it must be made to the proper length. This hose must be purchased from a local hydraulic hose assembly supplier per the following specification:
  - a. Hose ID: 1 inch
  - b. Working Pressure: 3500 PSI
  - c. Hose Fitting Threads: SAE 37° JIC 1 5/16-12
5. Install the pressure hose as indicated. Tie up the pressure and suction hoses as necessary. Again, be sure the hoses are routed to avoid exhaust components and to stay clear of the drive shaft.

### **HYDRAULIC TANK INSTALLATION**

1. Select a location to mount the hydraulic tank. Reference *Fig. G* or *Pg. 3-11* for the suggested location of the hydraulic tank to the rear of the control valve assembly on the left-hand side of the truck. The hydraulic hoses have been sized for the tank to be mounted in this general area. The tank can be located on the right-hand side or behind the cab, if necessary, which means longer hoses may be required.

2. Drill four (4) holes for 1/2" diameter bolts (provided) in the mount angle of the hydraulic tank (two per angle) and the frame rails of the truck chassis. Mount the hydraulic tank and install the hydraulic filter. Install the hydraulic return hose and the hose barb fitting as shown on Pg. 3-9. The hose length can be shortened if necessary. Secure the hose to the barb fittings with the hose clamps provided.

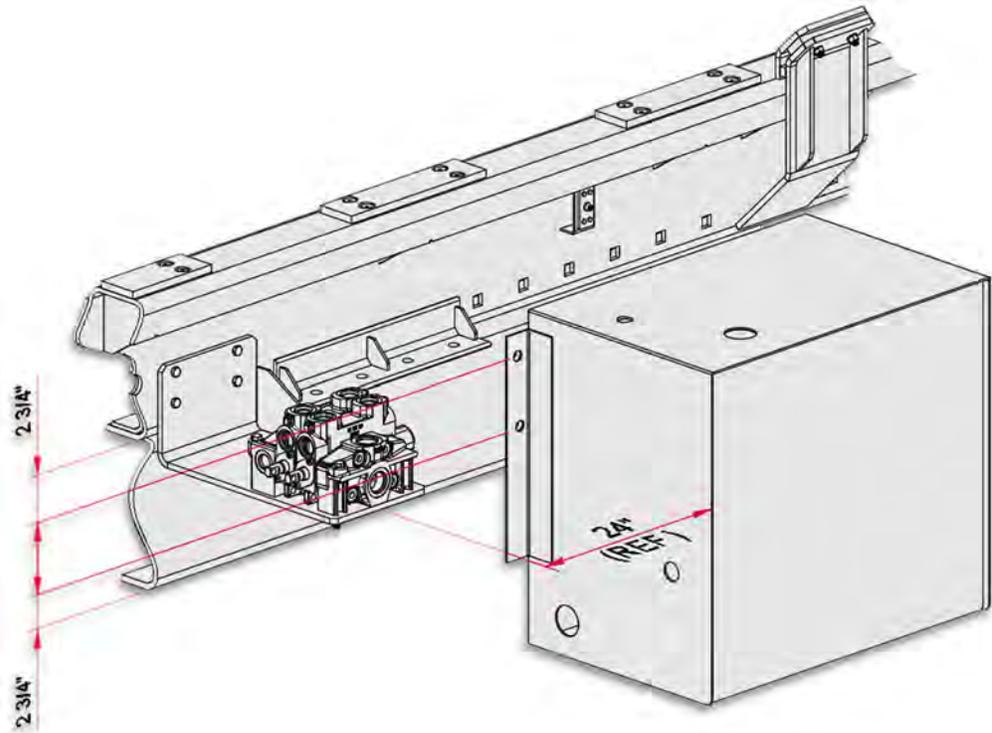


Figure G

## START UP PROCEDURE

1. Fill the hydraulic tank with hydraulic oil (see oil specification in Section IV: Maintenance.)
2. Prime the pump by loosening the clamp on the suction hose at the pump. Pull the hose back off the fitting till the air is bled from the line. Push the hose back on the fitting and retighten the clamp.
3. Engage the P.T.O. and run the engine at idle (700 to 900 RPM). Operate the cylinders at full stroke five to ten times to bleed the air from the lines and cylinders. The cylinders were filled with oil during testing at the factory, but some seepage may have occurred during shipping and installation. Refill the hydraulic tank, if needed, during this sequence and do not let the pump run without oil.
4. Check for leaks and tighten fittings as necessary.
5. Verify the movement of the control levers corresponds to the movement of the cylinders per the figure below.
6. Install all safety decals and product decals as shown on Pg. 3-12 after final installation and painting have been completed.
7. Fill out the Product Registration form online at [Truck-Mounted Product Registration - Swaploader](http://Truck-Mounted Product Registration - Swaploader).



### NOTE:

FAILURE TO FILL OUT AND SUBMIT PRODUCT REGISTRATION WITHIN 15 DAYS OF INSTALLATION MAY POSSIBLY VOID THE WARRANTY.

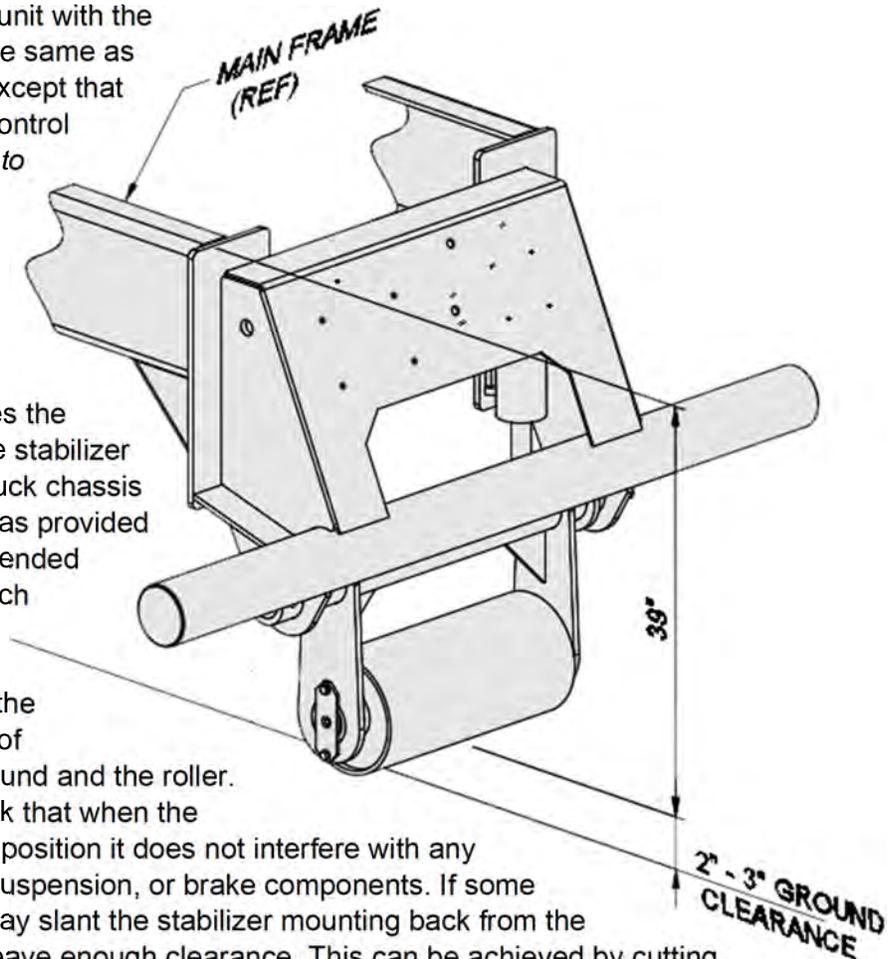


- CAUTION** The SwapLoader hoist must be used with bodies or containers that properly fit the front hook and the rear hold-downs (see Subframe Critical Dimensions in the Technical Guide). If possible, pick up one of the containers that will be used with the SwapLoader hoist and verify the following:
- Outside dimensions of the long sills match the guiding rollers on the hoist.
  - The front hook dimensions are correct for the hoist.
  - The rear hold-downs of the container latch into the hold-downs on the hoist.
  - Check for any interference between the container and any part of the hoist (i.e.: Hydraulic tank, hydraulic tubing or hose, hydraulic valve, etc.)

## **STABILIZER INSTALLATION (OPTION)**

1. The hoist installation for a unit with the stabilizer option is much the same as that for the standard unit except that a three-section hydraulic control valve is used (see Pg. 4-9 to 4-10 for the correct installation and plumbing diagrams for a hoist with three control circuits in the Option section of the manual).

2. The following diagram gives the approximate position of the stabilizer roller from the top of the truck chassis frame rail with the mounts as provided by SwapLoader. When extended down, the roller should touch the ground only when the vehicle is loading a heavy container. Therefore, with the truck empty, 2 to 3 inches of clearance between the ground and the roller. Also, you will need to check that when the roller is up in the transport position it does not interfere with any part of the rear axle, rear suspension, or brake components. If some interference occurs, you may slant the stabilizer mounting back from the vertical position until you leave enough clearance. This can be achieved by cutting the truck chassis frame rails off at an angle before installing the stabilizer mounts. Do not slant the mounting more than eight degrees (about a 14:2 pitch).
3. Once the required position of the stabilizer has been determined, install as shown on Pg. 4-9 in the Options section of the Parts & Installation manual (field weld size requirements are also indicated on this page).



### **NOTE:**

PRIOR TO ANY WELDING, CONSULT THE TRUCK MANUFACTURER FOR ANY SPECIAL PRECAUTIONS THAT MAY NEED TO BE TAKEN. TYPICALLY, THE BATTERIES MUST BE DISCONNECTED AND THE GROUND LEAD FROM THE WELDER SHOULD BE CONNECTED AS CLOSE AS POSSIBLE TO THE PART BEING WELDED TO AVOID THE POSSIBILITY OF ARCHING ACROSS BEARINGS, GEARS, ETC.

### **NOTE:**

THE HOIST MAIN FRAME IS MADE FROM HIGH STRENGTH LOW ALLOY STEEL. USE AN APPROPRIATE WELDING PROCESS.

4. Install the hydraulic adapters and hoses from the three-section hydraulic control valve to the hydraulic cylinder (Pt. No. 21P84) shown on Pg. 4-10 of the Parts & Installation manual. Tie up all loose hoses as required. Be sure the hoses are routed to avoid exhaust components and all moving components of the rear axles.

5. After the start procedure has been completed on the hoist, verify that the movement of each control lever corresponds to the movement of the cylinders per the figure below. Operate the stabilizer through 5 to 8 cycles to remove the air from the hydraulic cylinders and lines.



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# PARTS

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**DISC-LOCK WASHER TORQUE SPEC'S**

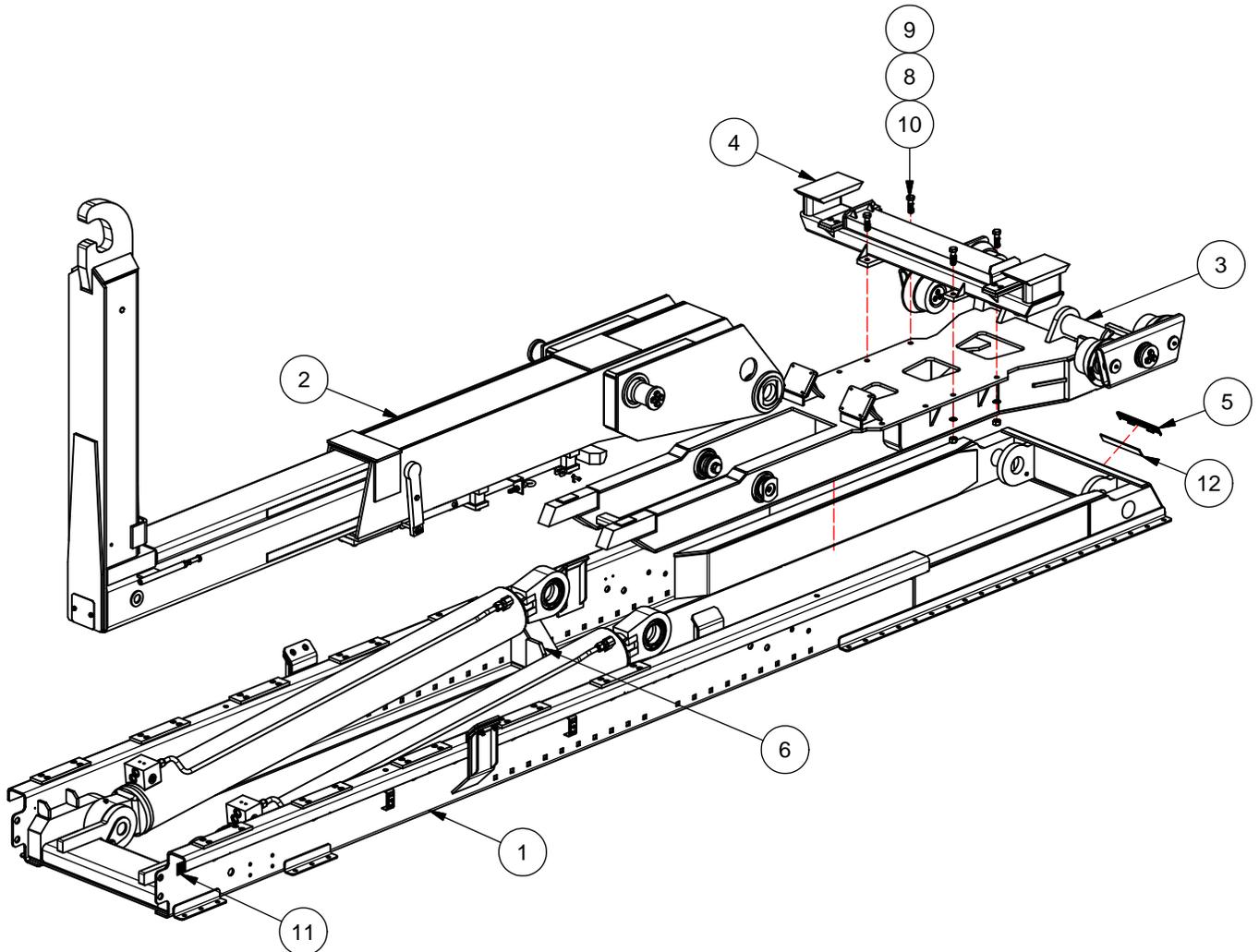
BOLT SIZE	SAE GR 8 ASSY TORQUE (FT-LBS)
3/8	53
7/16	85
1/2	130
5/8	258
3/4	459
7/8	739
1	1108

NOTE:  
APPLY LOCTITE 243 (BLUE)  
TO ALL BOLTS.

**42H42 - BASE HOIST W/ FIXED JIB ~ REV E**

ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	42H43	1	MAIN FRAME SUB-ASSEMBLY	3526.04
2	42H44	1	TELESCOPIC JIB SUB-ASSEMBLY	2753.17
3	42H45	1	PIVOT JOINT SUB-ASSEMBLY	1273.91
4	42H60	1	BODY LOCK W/SHELF, SL-650	185.40
5	62H99	1	LOGO NAME PLATE, MF	0.34
6	83H15	2	PIVOT GUIDE	5.43
* 7	91H10	1	BASE CYL CIRCUIT, 650	37.25
8	00769	4	WASHER, LOCK 3/4	0.01
9	00P17	4	NUT, HEX 3/4-10 UNC GR8	0.13
10	00P93	4	HHCS 3/4-10 UNC x 2-1/2 GR8	0.42
11	90P79	1	SL-650 SERIAL TAG	0.02
12	90P90	1	NAME PLATE INSERT	0.09

\* ITEM NOT SHOWN



**SL-650 BASE HOIST W/ FIXED JIB**

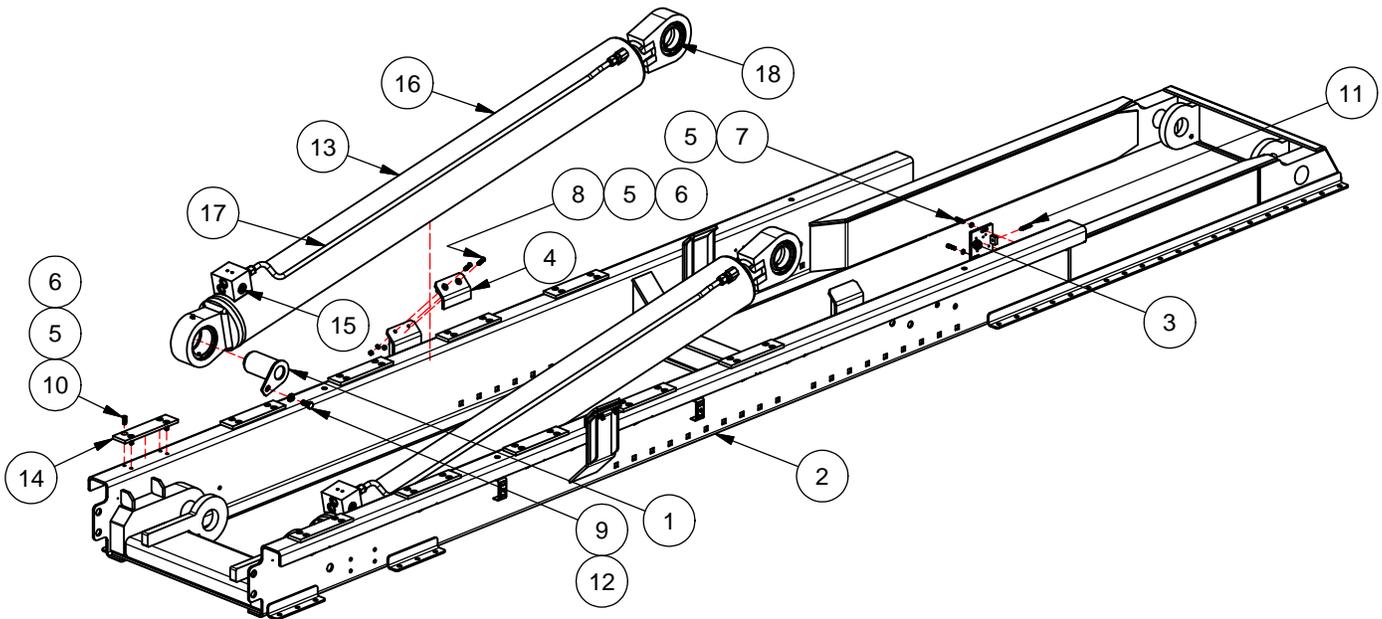
**DISC-LOCK WASHER  
TORQUE SPECS**

BOLT SIZE	SAE GR 8 ASSY TORQUE (FT-LBS)
3/8	53
7/16	85
1/2	130
5/8	258
3/4	459
7/8	739
1	1108

NOTE:  
APPLY LOCTITE 243 (BLUE)  
TO ALL BOLTS.

**42H43 - MAIN FRAME SUB-ASSEMBLY, SL-650 ~ REV B**

ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	40H83	2	PIN, MF/CYL 3-1/2 x 6-1/4 ZP	17.92
2	42H24	1	MAIN FRAME WDMT, SL-650	1704.10
3	42H49	1	JIB LOCKOUT MNT, 5 x 5 HD	2.54
4	44H75	2	FRONT GUIDE SHIM WDMT, 650	3.28
5	00755	46	WASHER, LOCK 3/8	0.03
6	00P14	44	NUT, HEX 3/8-16 UNC GR8	0.02
7	00P32	2	SHCS 3/8-16 UNC x 1-1/4 GR8	0.05
8	00P44	4	HHCS 3/8-16 UNC x 1-1/2 GR8	0.06
9	00P56	2	HHCS 5/8-11 UNC x 1-1/2 GR8	0.19
10	00P68	40	FHCS 3/8-16 UNC x 1-1/4 SS	0.04
11	01P20	1	SHCS 3/8-16 UNC x 1-3/4 GR8	0.07
12	01P31	2	WASHER, DISC LOCK 5/8 PR	0.03
13	21P75	2	HYD CYL 7.5x3.5x82	883.00
14	90P71	10	WEAR PAD, 2-3/4 x 1/2 x 11-3/4	0.63
<b>SERVICE PARTS PER LIFT CYLINDER</b>				
15	21P17	2	C'BAL CART, 3700 PSI CBEA-LHN	0.50
16	21P78	1	SEAL KIT, LIFT CYL 650	0.50
17	21P80	1	RETURN LINE, CYL 650	2.00
18	22P16	2	HYD CYL BRG, SPH 3.50ID	10.70



**MAIN FRAME SUB-ASSEMBLY**

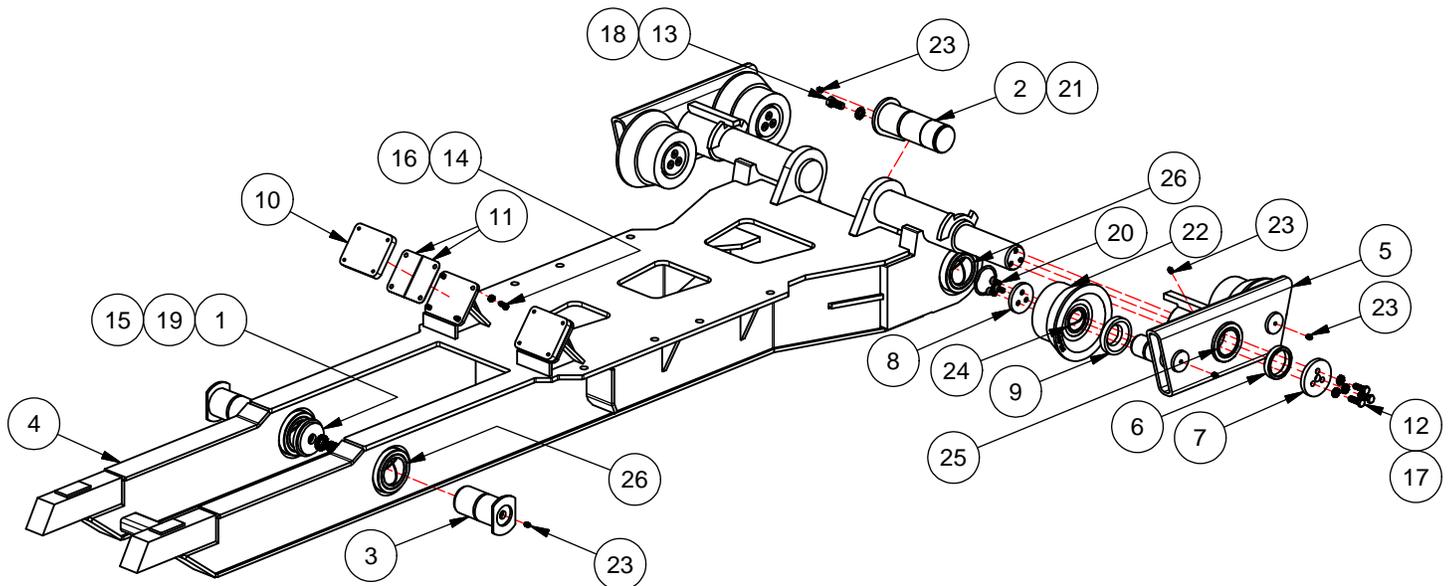
**DISC-LOCK WASHER TORQUE SPEC'S**

BOLT SIZE	SAE GR 8 ASSY TORQUE (FT-LBS)
3/8	53
7/16	85
1/2	130
5/8	258
3/4	459
7/8	739
1	1108

NOTE:  
APPLY LOCTITE 243 (BLUE)  
TO ALL BOLTS.

**42H45 - PIVOT JOINT SUB-ASSEMBLY, SL-650 ~ REV J**

ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	40H71	2	PIN CAP, 13/16 x 4 ZP	1.46
2	40H84	2	PIN, PJ/MF 3 x 8 ZP	17.93
3	41H99	2	PIN, PJ/OT 3 x 5-7/8 ZP	11.91
4	42H27	1	PIVOT JOINT WELDMENT	926.83
5	42H39	2	DUAL ROLLER MOUNT WELDMENT	59.43
6	83H10	2	SPACER, ROLLER 11/16x2-3/4 ZP	0.64
7	83H11	2	ROLLER RETAINER, 1/2 x 4 ZP	1.61
8	86H22	4	PIN CAP, 3/8 x 3-1/4	0.79
9	86H28	4	SPACER, ROLLER 1-1/16x2-1/4 ZP	1.60
10	89H66	2	BOLT PLATE, TUBE STOP 650	5.31
11	89H67	4	SHIM 2-21/32 x 22GA x 4-3/4	0.10
12	00P01	6	HHCS 1/2-13 UNC x 1-1/2 GR8	0.11
13	00P56	2	HHCS 5/8-11 UNC x 1-1/2 GR8	0.19
14	00P62	8	HHCS 3/8-16 UNC x 1 GR8	0.04
15	00P87	2	HHCS 1-8 UNC x 2 GR8	0.71
16	01P28	8	WASHER, DISC LOCK 3/8 PR	0.00
17	01P30	6	WASHER, DISC LOCK 1/2 PR	0.02
18	01P31	2	WASHER, DISC LOCK 5/8 PR	0.03
19	01P34	2	WASHER, DISC LOCK 1 PR	0.08
20	01P47	12	FHSS 7/16-14 UNC x 1 GR8	0.05
21	02P82	2	SNAP RING, EXT 3.00	0.05
22	80P09	4	ROLLER ASSY, 6-1/4x2-1/4ID	34.12
23	90P03	10	GREASE ZERK, 1/8-27 NPT STR	0.02
<b>BEARINGS</b>				
24	23H07	4	BRZ BRG, 2.25IDx3.00x2.75OD	1.71
25	86H10	4	BRZ BRG, 2.75IDx2.00x3.25OD	1.80
26	50P20	4	BRZ BRG, 3.00IDx3.44x3.75OD	4.00



**PIVOT JOINT SUB-ASSEMBLY**

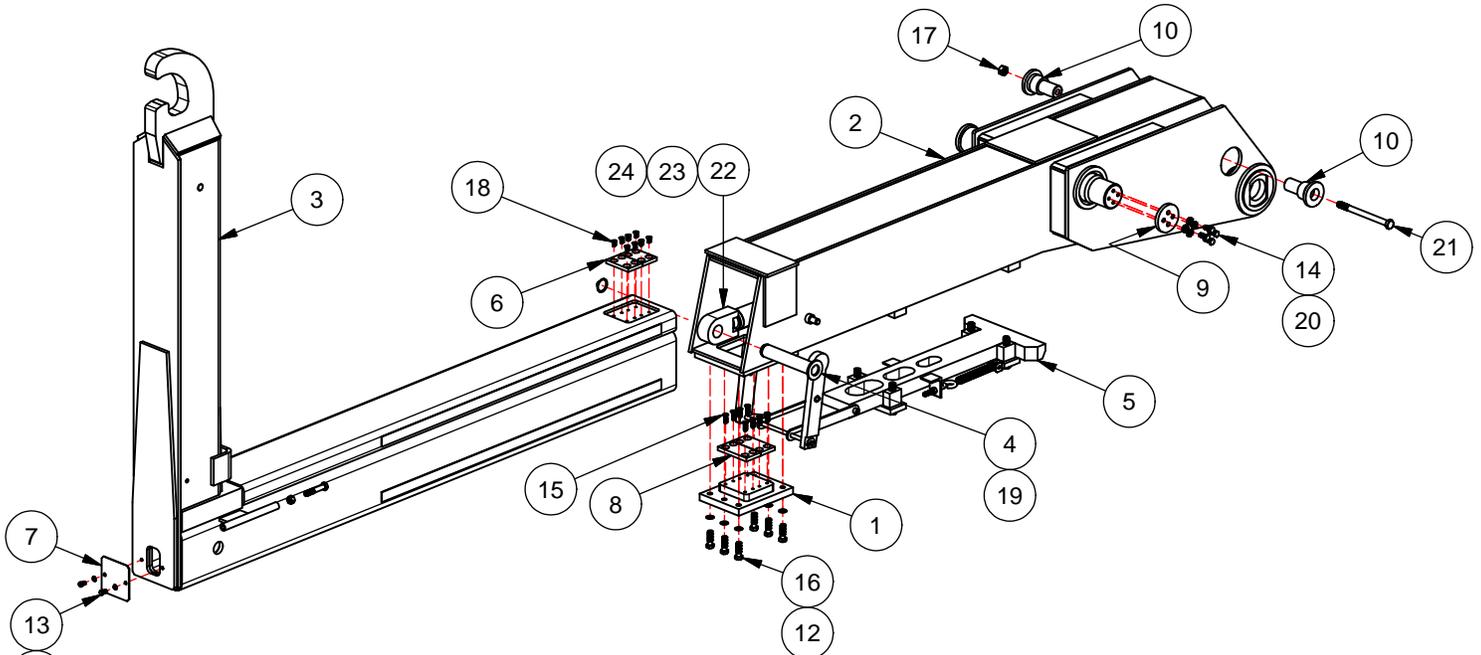
**DISC-LOCK WASHER TORQUE SPEC'S**

BOLT SIZE	SAE GR 8 ASSY TORQUE (FT-LBS)
3/8	53
7/16	85
1/2	130
5/8	258
3/4	459
7/8	739
1	1108

NOTE:  
APPLY LOCTITE 243 (BLUE)  
TO ALL BOLTS.

**42H44 - TELESCOPIC JIB SUB-ASSEMBLY, SL-650 ~ REV B**

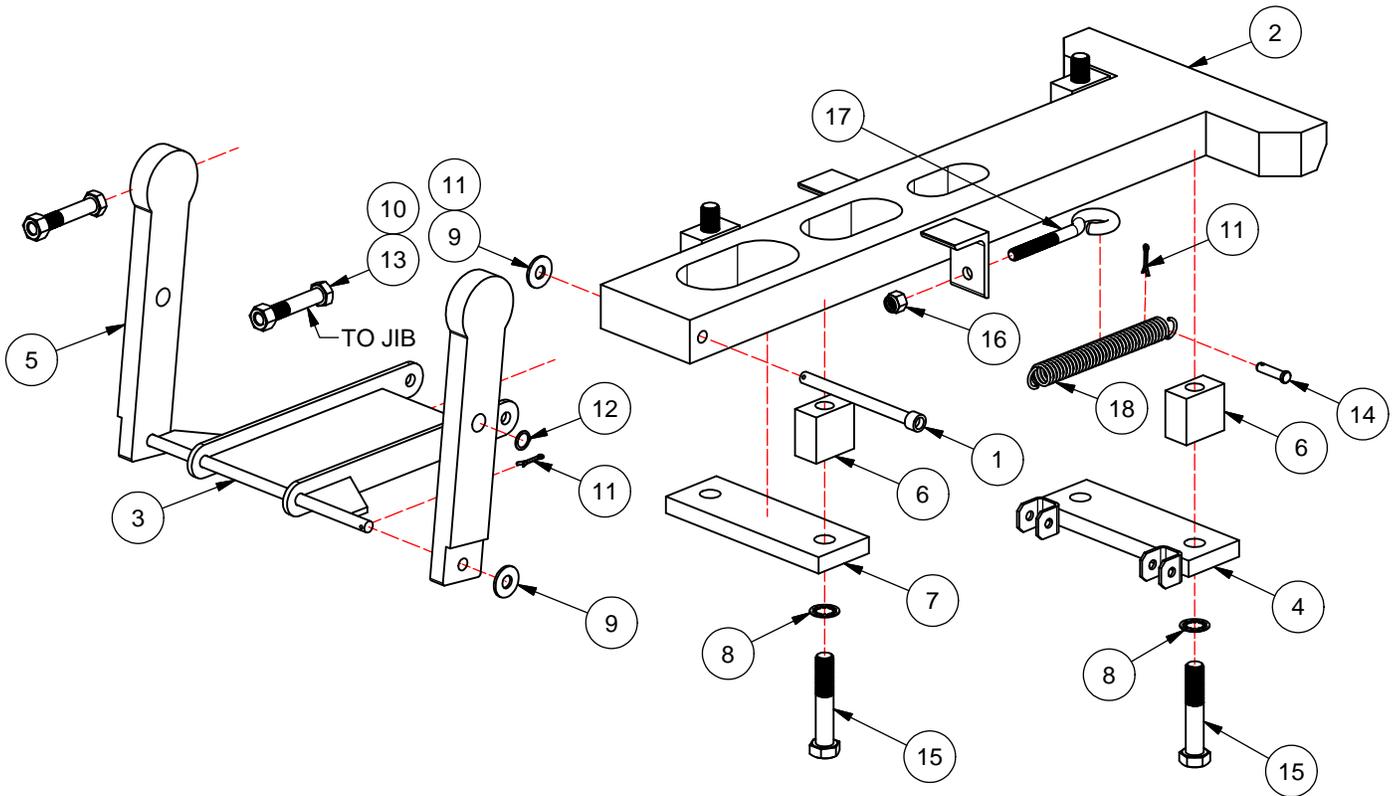
ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	40H44	1	CLAMP PLATE, 400 SERIES	30.05
2	42H31	1	OUTER TUBE WELDMENT	937.24
3	42H34	1	FIXED JIB WELDMENT	1274.88
4	42H37	1	PIN, JIB/CYL 1-3/4 x 9-1/8 ZP	6.81
5	42H46	1	PIVOT LOCK SUB-ASSY, 650	140.56
6	60H11	2	WEAR PAD, 2-3/4 x 1/2 x 4-1/4	0.21
7	62H11	1	COVER, JIB 5-1/4x11GAx5-1/4	0.92
8	80H35	2	WEAR PAD, 2-3/4x1/2x5-1/2	0.28
9	82H51	2	PIN CAP, 1/2 x 4 ZP	1.64
10	86H08	2	PIN, OT/CYL 1-3/4 x 2-7/8 ZP	4.39
11	00755	2	WASHER, LOCK 3/8	0.03
12	00767	6	WASHER, LOCK 5/8	0.01
13	00P03	2	HHCS 3/8-16 UNC x 3/4 GR8	0.04
14	00P31	8	HHCS 1/2-13 UNC x 1-1/4	0.10
15	00P68	8	FHCS 3/8-16 UNC x 1-1/4 SS	0.04
16	00P69	6	HHCS 5/8-11 UNC x 2 GR8	0.23
17	00P72	1	NUT, LOCK 3/4-10 UNC GR8	0.13
18	00P79	8	FHCS 3/8-16 UNC x 3/4 BR	0.03
19	00P97	1	SNAP RING, EXT 1.75	0.12
20	01P30	8	WASHER, DISC LOCK 1/2 PR	0.02
21	01P36	1	HHCS 3/4-10 UNC x 9-1/2 GR8	1.29
22	21P76	1	HYD CYL, 4.5X2.78X52	344.98
<b>SERVICE PARTS PER JIB CYLINDER</b>				
23	21P17	1	C'BAL CART, 3700 PSI CBEA-LHN	0.50
24	21P79	1	SEAL KIT, JIB CYL 518/520/650	0.50



**TELESCOPIC JIB SUB-ASSEMBLY**

42H46 - PIVOT LOCK SUB-ASSEMBLY, SL-650 ~ REV C

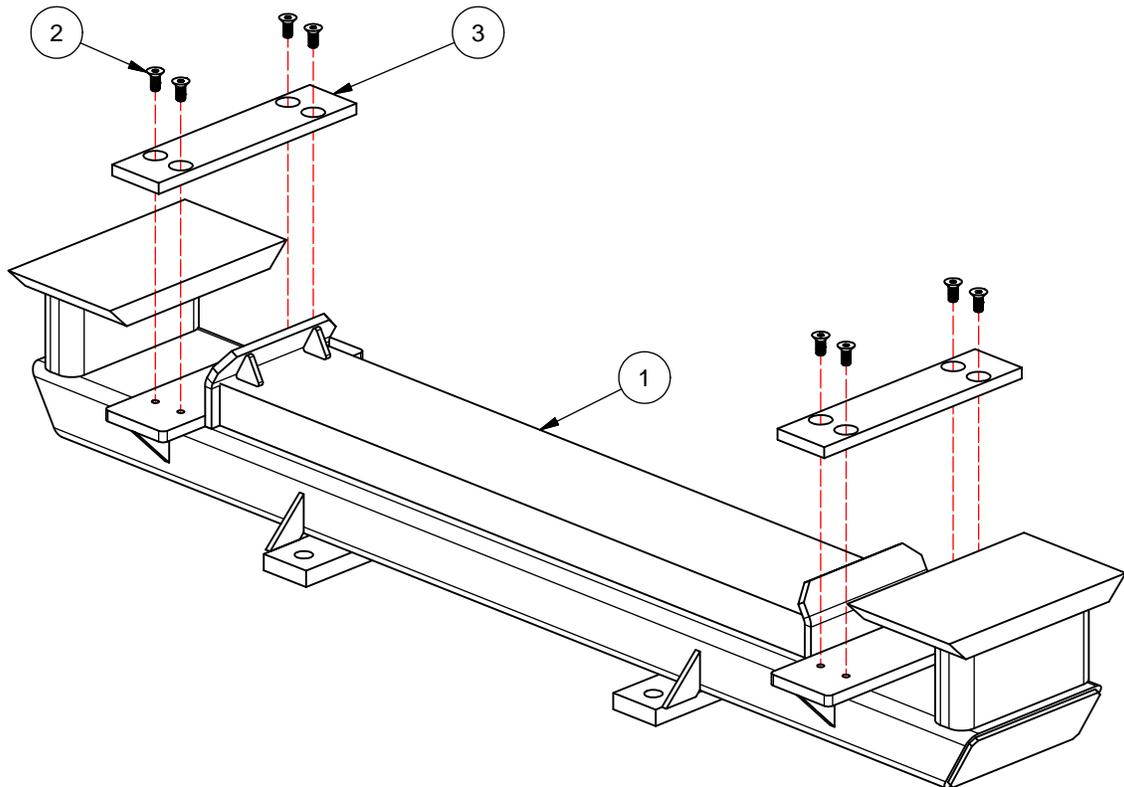
ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	42H56	1	CONNECTION PIN WDMT	0.40
2	42H57	1	LATCH PLATE WDMT, PL 650	92.85
3	42H58	1	CONNECTION BAR WDMT, 12-1/4	8.23
4	42H59	1	SPRING SPANNER BAR WELDMENT	5.76
5	81H51	2	RELEASE LEVER	8.42
6	86H38	4	SPANNER BLOCK	1.41
7	86H44	1	SPANNER BAR	5.49
8	00769	4	WASHER, LOCK 3/4	0.01
9	00772	3	WASHER, FLAT 1/2	0.04
10	00P24	2	NUT, HEX 5/8-11 UNC GR8	0.08
11	00P26	5	PIN, COTTER 1/8 x 1	0.00
12	00P28	2	SNAP RING, EXT 0.75	0.00
13	00P85	2	HHCS 5/8-11 UNC x 3 1/2 GR8	0.38
14	00P94	2	PIN, CLEVIS 3/8 x 1-1/2	0.05
15	01P38	4	HHCS 3/4-10 UNC x 4 GR8	0.61
16	01P78	2	NUT, NYLOCK 1/2-13 UNC SS	0.05
17	02P14	2	EYEBOLT 1/2-13 UNC x 4	0.48
18	90P04	2	SPRING, EXT 7/8 OD x 6 LG	0.33



**PIVOT LOCK SUB-ASSY, 650**

42H60 - BODY LOCK W/ SHELF ASSEMBLY, SL-650 ~ REV A

ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	42H61	1	BODY LOCK WDMT, SHELF 650	183.89
2	02P08	8	FHCS 3/8-16 UNC x 7/8 ZP	0.03
3	90P71	2	WEAR PAD, 2-3/4 x 1/2 x 11-3/4	0.63

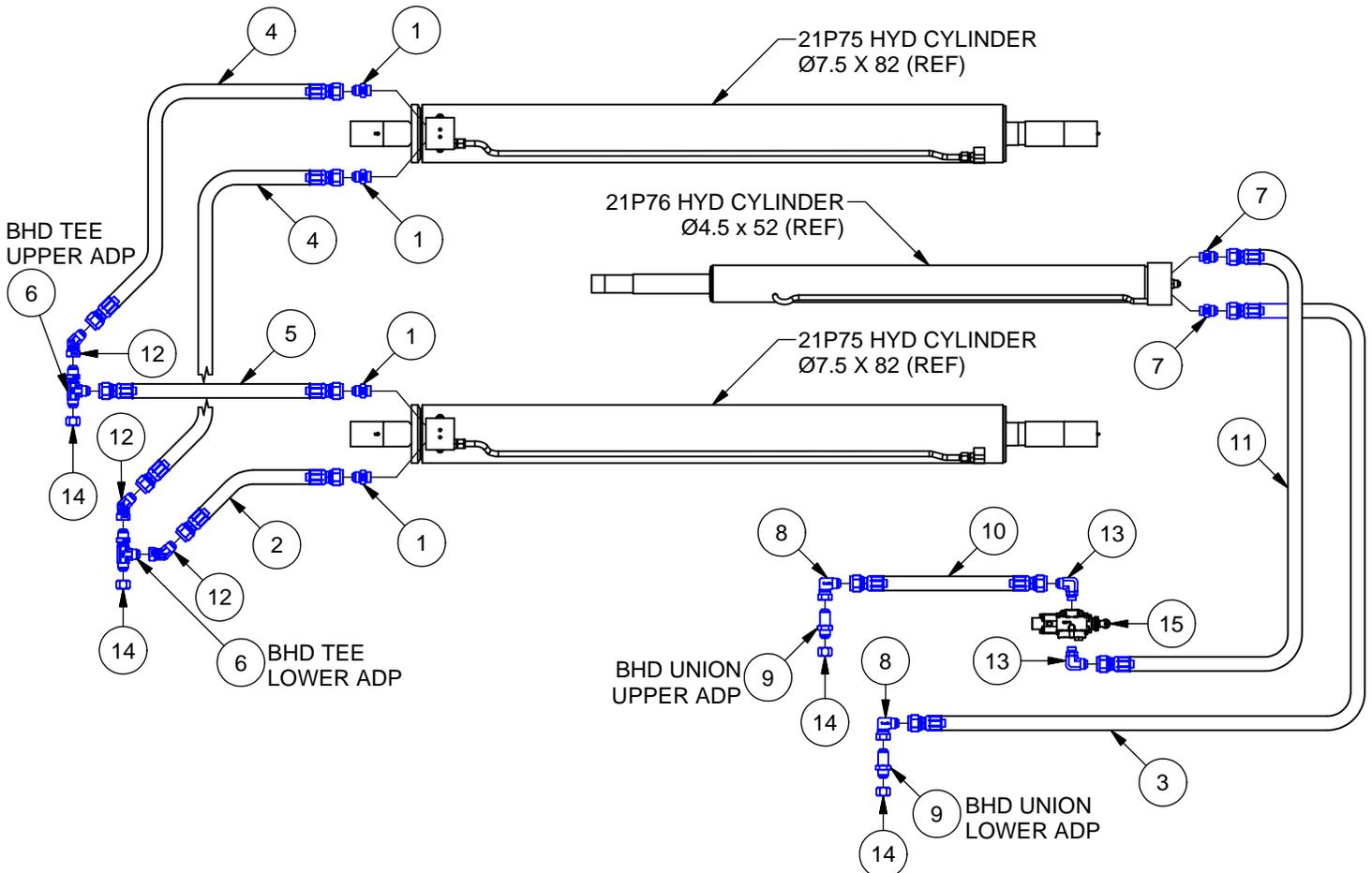


**BODY LOCK W/SHELF, SL-650**



91H10 - BASE CYLINDER CIRCUIT, SL-650 ~ REV C

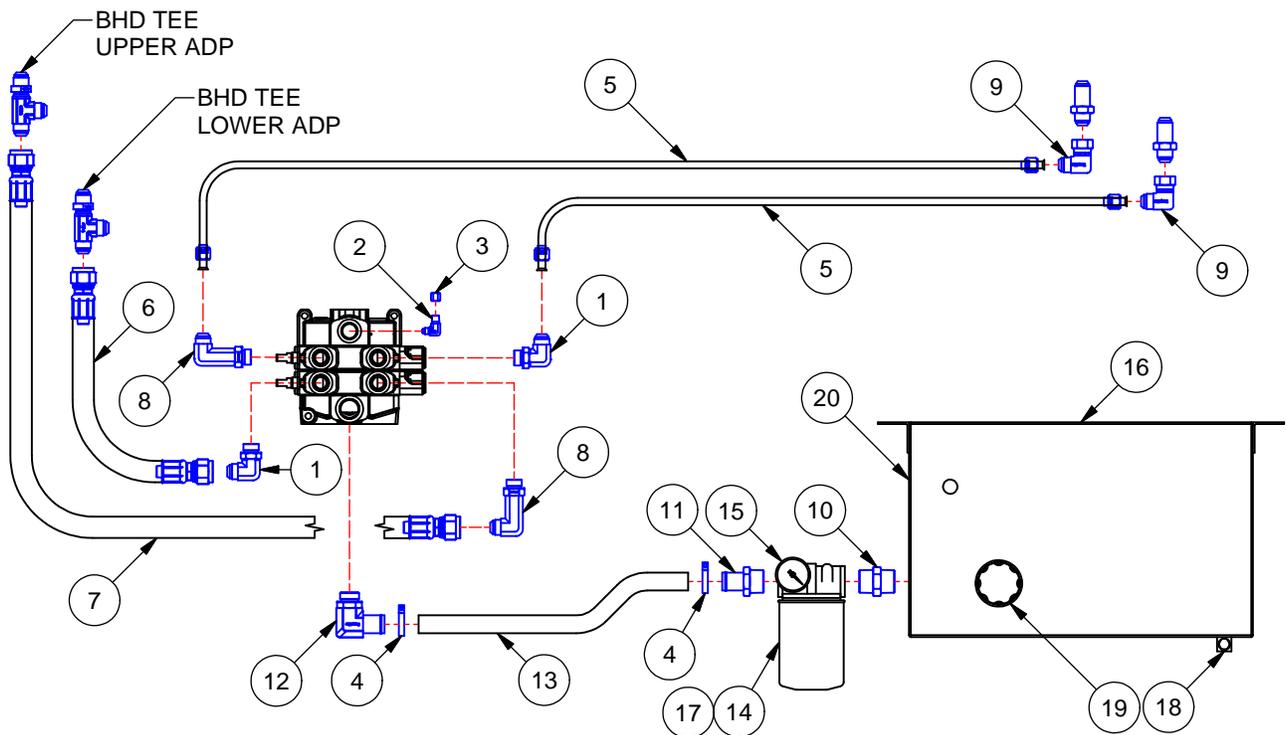
ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	10P90	4	ADP HYD 12MJ/12MB	0.36
2	11P51	1	HOSE ASSY 23 12-12FJ/12FJ	2.12
3	11P55	1	HOSE ASSY 192 12-12FJ/12FJ	5.45
4	11P58	2	HOSE ASSY 51 12-12FJ/12FJ	4.00
5	11P59	1	HOSE ASSY 24 12-12FJ/12FJ	2.14
6	11P61	2	ADP HYD 12MJ/12MJ/12MJ BHD	1.01
7	11P64	2	ADP HYD 12MJ/10MB	0.29
8	11P65	2	ADP HYD 12MJ/12FJ 90	0.58
9	11P66	2	ADP HYD 12MJ/12MJ BHD	0.65
10	11P67	1	HOSE ASSY 38 12-12FJ/12FJ	2.34
11	11P68	1	HOSE ASSY 150 12-12FJ/12FJ	4.73
12	11P94	3	ADP HYD 12FJ/12MJ 45	0.51
13	12P91	2	ADP HYD 12MJ/10MB 90	0.64
14	13P16	4	ADP HYD 12FJ CAP	0.17
15	23P05	1	HYD VALVE, 2-WAY 10FB	5.04



**BASE CYLINDER CIRCUIT, SL-650**

91H11 - TANK CIRCUIT, 2-SECT 650

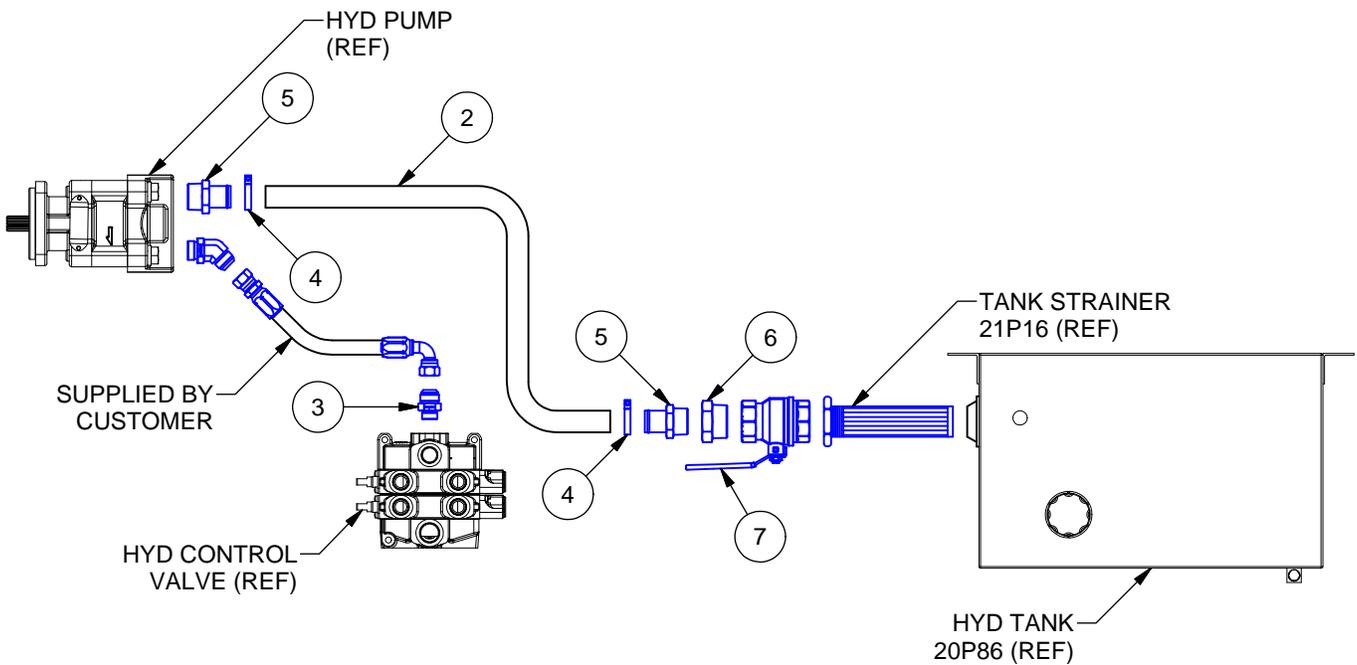
ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	10P36	2	ADP HYD 12MJ/12MB 90	0.30
2	10P37	1	ADP HYD 04MJ/04MP 90	0.11
3	10P38	1	ADP HYD 04FJ CAP	0.03
4	10P78	2	CLAIMP, T-BOLT Ø1-3/4	0.12
5	11P46	2	HYD TUBE, LOW 3/4 x 118-7/16	7.50
6	11P56	1	HOSE ASSY 28 12-12FJ/12FJ	2.40
7	11P57	1	HOSE ASSY 33 12-12FJ/12FJ	2.70
8	11P62	2	ADP HYD 12MJ/12MB 90 LL	0.40
9	11P65	2	ADP HYD 12MJ/12FJ 90	0.58
10	11P78	1	ADP HYD 20MP/20MP	0.70
11	12P25	1	ADP HYD 20HB/20MP	0.40
12	12P27	1	ADP HYD 20HB/16MB 90	0.70
13	12P33	1	HOSE 1-1/4 x 36 LP	2.37
14	20P61	1	HYD FILTER ASSY 70 GPM	4.50
15	20P64	1	HYD FILTER INDICATOR GAUGE	0.01
16	20P86	1	HYD TANK, 30 GALLON LS	73.00
SERVICE PARTS FOR TANK				
17	20P66	1	HYD FILTER ELEMENT	2.00
18	20P96	1	SIGHT GAUGE, HYD TANK	0.70
19	20P97	1	BREATHER CAP ASSY, HYD TANK	0.60
20	21P16	1	HYD STRAINER, 50 GPM	2.50



**TANK CIRCUIT, 2-SECT 650**

91H19 - PUMP CIRCUIT, HD ~ REV B

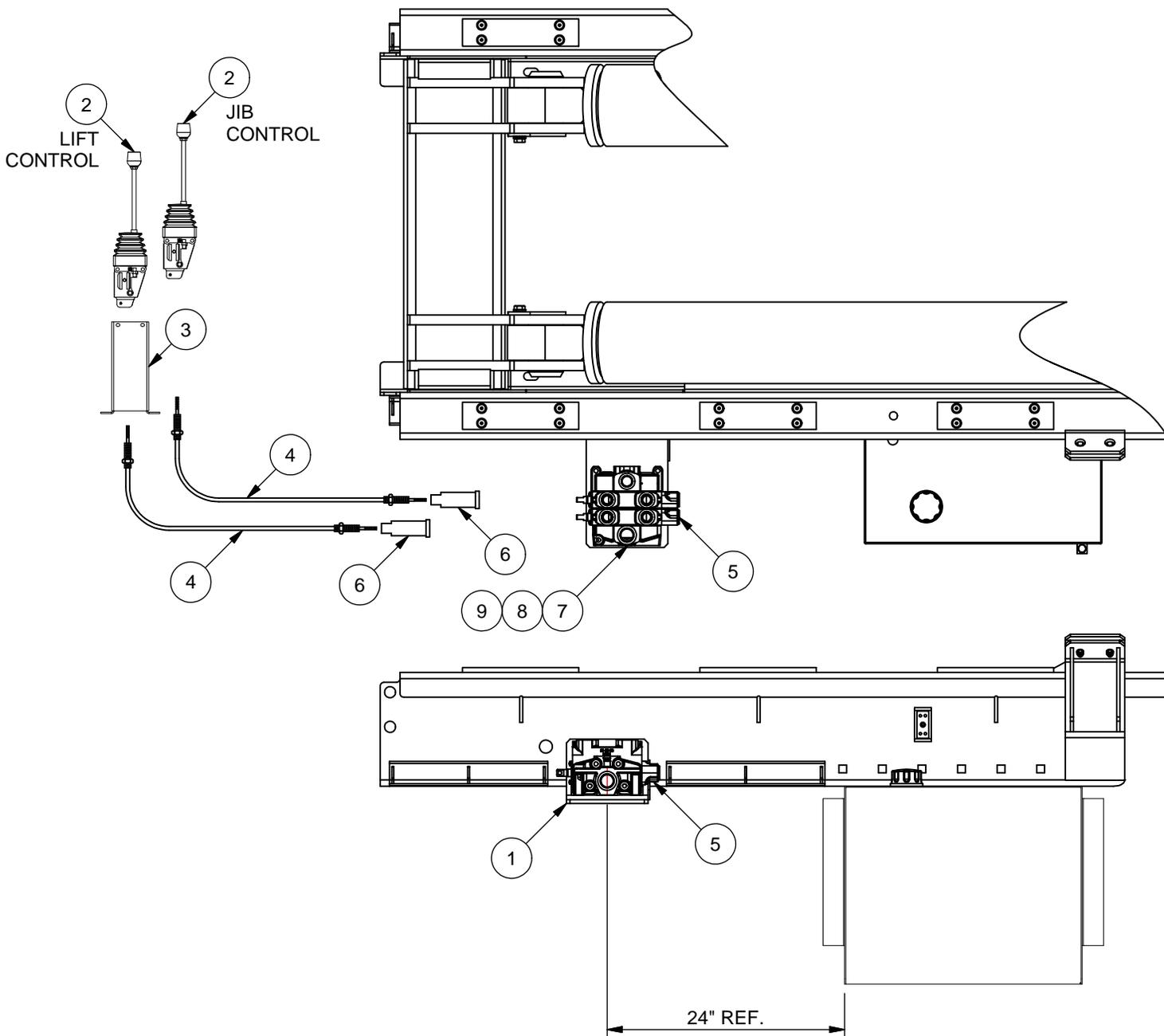
ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	10P31	1	ADP HYD 16MJ/16MB 45	0.90
2	11P71	1	HOSE 1-1/2 X 120 LP	9.38
3	11P74	1	ADP HYD 16MJ/12MB	0.44
4	11P77	2	CLAMP, T-BOLT Ø2	0.15
5	11P95	2	ADP HYD 24HB/24MP	0.66
6	12P48	1	ADP HYD 32MP/24FP	0.93
7	14P67	1	BALL VALVE 32FP/32FP	0.67



**PUMP CIRCUIT, HD**

90H49 - MANUAL CONTROL, 2-SECT HD ~ REV A

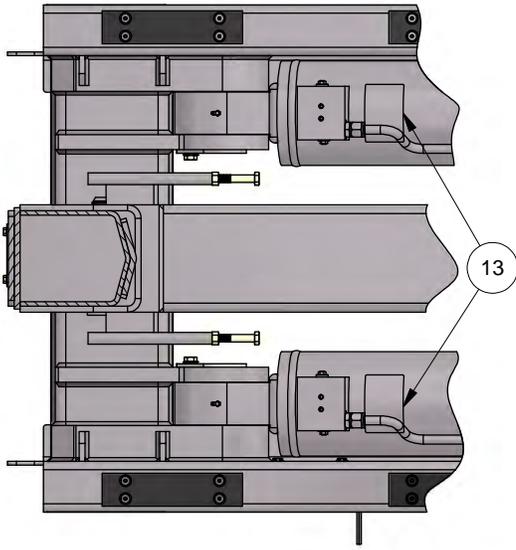
ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	40H43	1	VALVE MOUNT BKT, 2-SECT VG20	19.44
2	20P08	2	CONTROL HANDLE, CABLE	4.63
3	20P09	1	CONTROL CONSOLE, 2-SECT	5.83
4	20P40	2	CONTROL CABLE ASSY, 96 STD	1.83
5	20P59	1	HYD VALVE, 2-SECT 3500 VG20	31.41
6	20P65	2	BONNET KIT, VG20	0.50
SERVICE PARTS FOR HYD CONTROL VALVE				
7	21P18	1	RELIEF CARTRIDGE, VG20 3500	0.50
8	21P54	2	SEAL KIT, SECT VG20	0.20
9	21P55	2	SEAL KIT, SECT & SPOOL VG20	0.30



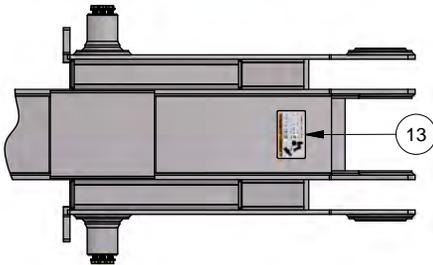
**MANUAL CONTROL, 2-SECT HD**

42H47 - DECAL ASSEMBLY, SL-650 ~ REV B

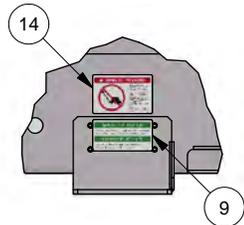
ITEM	PART #	QTY	DESCRIPTION	WT-lb./ea.
1	90P07	2	DECAL, OP & SERVICE MANUAL	0.00
2	90P08	2	DECAL, HOIST/BODY	0.00
3	90P09	1	DECAL, HYD OIL	0.00
4	90P10	1	DECAL, HYD OIL FLAMMABLE	0.00
5	90P11	2	DECAL, HOIST FALLING	0.00
6	90P12	1	LEVER CONTROL DECAL	0.01
7	90P13	1	DECAL, SAFETY INSTRUCTIONS	0.00
8	90P14	2	DECAL, SWAPLOADER	0.01
9	90P18	1	DECAL, RELIEF VALVE	0.00
10	90P78	1	DECAL, HIGH-PRESSURE FLUIDS	0.00
11	90P80	4	DECAL, SL-650	0.00
12	91P06	2	DECAL, LUBRICATION POINTS	0.00
13	91P52	3	DECAL, COUNTERBALANCE VALVE	0.00
14	91P66	1	DECAL, OUTSIDE CONTROLS	0.00



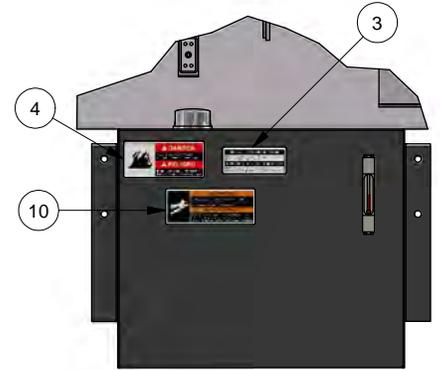
MAIN FRAME TOP VIEW



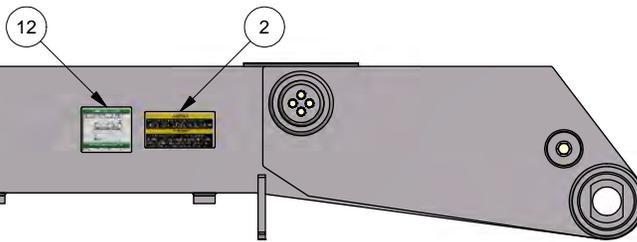
OUTER TUBE TOP VIEW



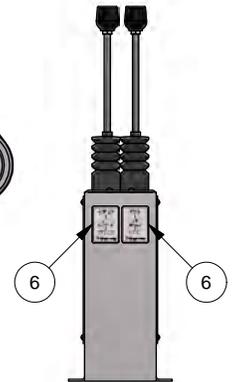
VALVE MOUNT DETAIL (FIELD INSTALL)



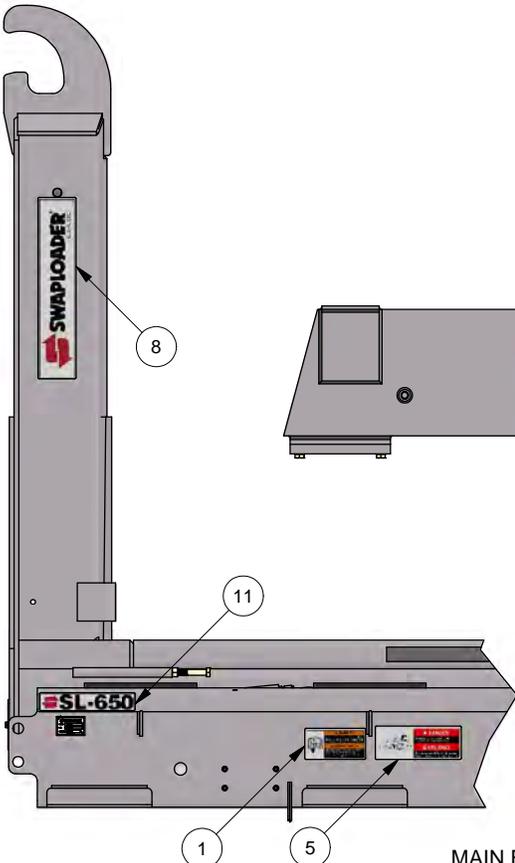
TANK DETAIL (FIELD INSTALL)



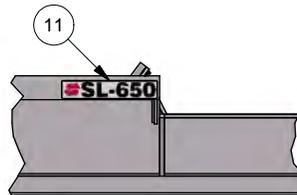
OUTER TUBE DETAIL (TYPICAL ON BOTH SIDES)



IN-CAB CONSOLE DETAIL (FIELD INSTALL)



MAIN FRAME DETAIL (TYPICAL ON BOTH SIDES)



# OPTIONS

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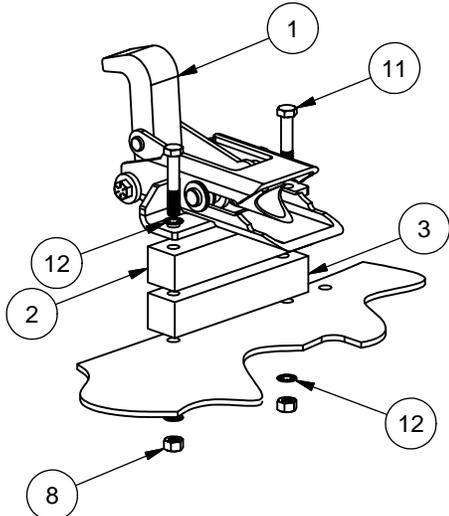
**DISC-LOCK WASHER TORQUE SPEC'S**

BOLT SIZE	SAE GR 8 ASSY TORQUE (FT-LBS)
3/8	53
7/16	85
1/2	130
5/8	258
3/4	459
7/8	739
1	1108

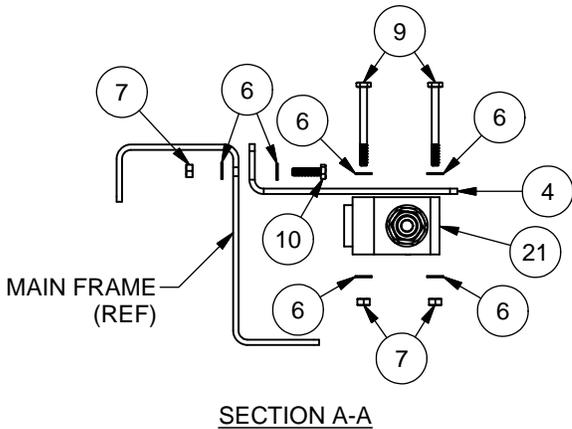
NOTE:  
APPLY LOCTITE 243 (BLUE)  
TO ALL BOLTS.

**91H61 - CYLINDER CIRCUIT, BL 650 STD**

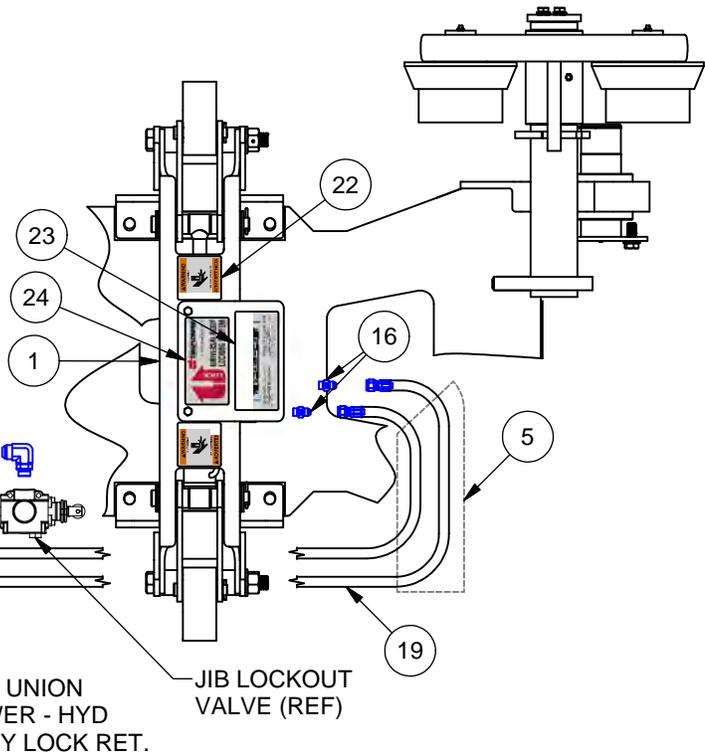
ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	44H79	1	U-LOCK ASSEMBLY, HD	125.72
2	89H41	2	SHIM, BL MOUNT HD 1-1/2	13.15
3	89H42	2	SHIM, BL MOUNT HD 2	17.54
4	89H45	1	VALVE MOUNT BKT, SOLENOID HD	1.02
5	90H74	1	NYLON HOSE SLEEVE x 60"	0.00
6	00770	8	WASHER, FLAT 1/4	0.00
7	00P51	4	NUT, LOCK 1/4-20 UNC GR8	0.01
8	00P72	4	NUT, LOCK 3/4-10 UNC GR8	0.13
9	01P41	2	HHCS 1/4-20 UNC x 2-3/4 GR8	0.04
10	01P56	2	HHCS 1/4-20 UNC x 1 GR8	0.02
11	01P84	4	HHCS 3/4-10 UNC x 5-1/2 GR8	0.80
12	02P04	8	WASHER, FLAT 3/4 DS GR8	0.04
13	10P43	2	ADP HYD 08MJ/08MJ BHD	0.28
14	10P90	1	ADP HYD 12MJ/12MB	0.36
15	13P14	2	ADP HYD 08FJ CAP	0.07
16	14P77	2	ADP HYD 06MJ/06MB .141 RSTR.	0.08
17	13P87	2	ADP HYD 08FJ/06MJ	0.10
18	14P01	1	ADP HYD 12MB/10FJ	0.34
19	14P10	2	HOSE ASSY 120 06-06FJ/06FJ90	2.00
20	14P12	1	HOSE ASSY 35 12-12FJ/12FJ	2.29
21	23P02	1	SOLENOID VALVE, U-LOCK	2.85
22	91P50	2	DECAL, PINCH POINT	0.00
23	91P51	3	DECAL, U-LOCK ENGAGEMENT	0.00
24	92P31	2	DECAL, U-LOCK PATENT	0.00



**HYD BODY LOCK MOUNTING DETAIL**



**SECTION A-A**



BHD UNION  
UPPER - HYD  
JIB CYL.

BHD UNION  
UPPER - HYD  
BODY LOCK EXT.

BHD UNION  
LOWER - HYD  
BODY LOCK RET.

JIB LOCKOUT  
VALVE (REF)

**CYLINDER CIRCUIT, BL 650 STD**

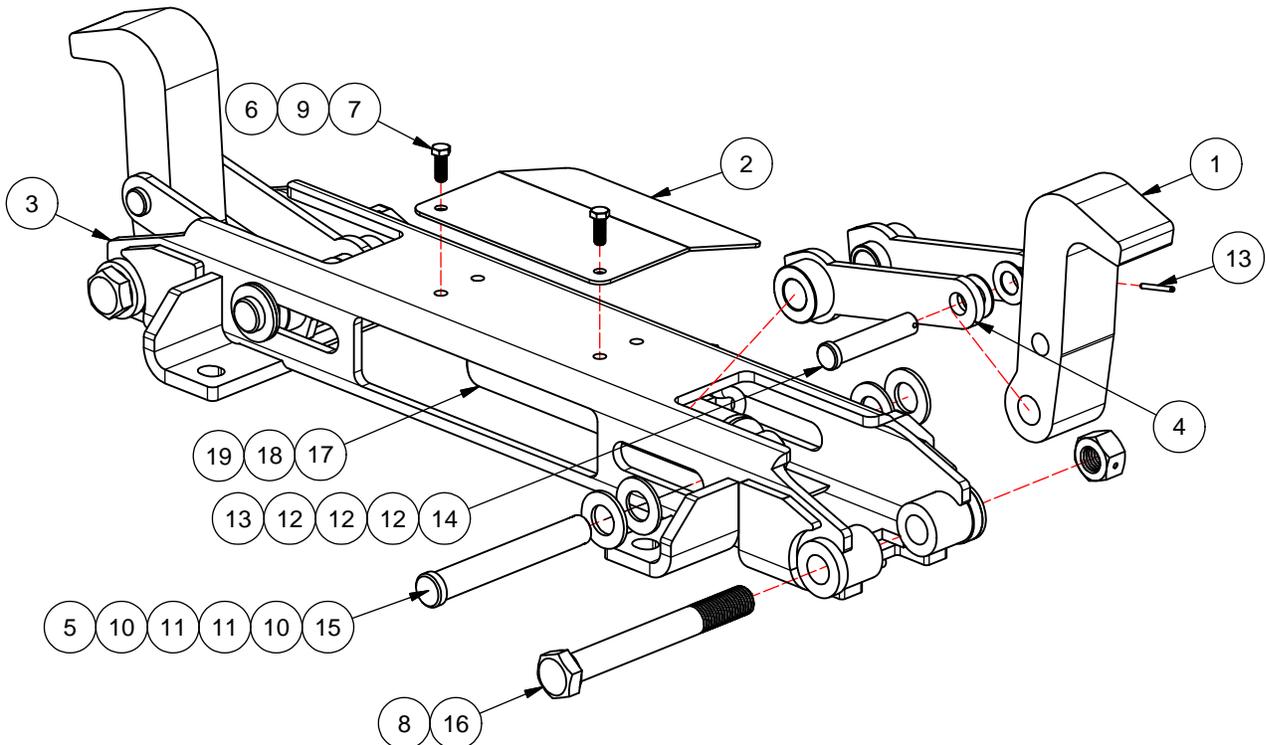
**DISC-LOCK WASHER  
TORQUE SPECS**

BOLT SIZE	SAE GR 8 ASSY TORQUE (FT-LBS)
3/8	53
7/16	85
1/2	130
5/8	258
3/4	459
7/8	739
1	1108

NOTE:  
APPLY LOCTITE 243 (BLUE)  
TO ALL BOLTS.

**44H79 - U-LOCK ASSEMBLY ~ REV D**

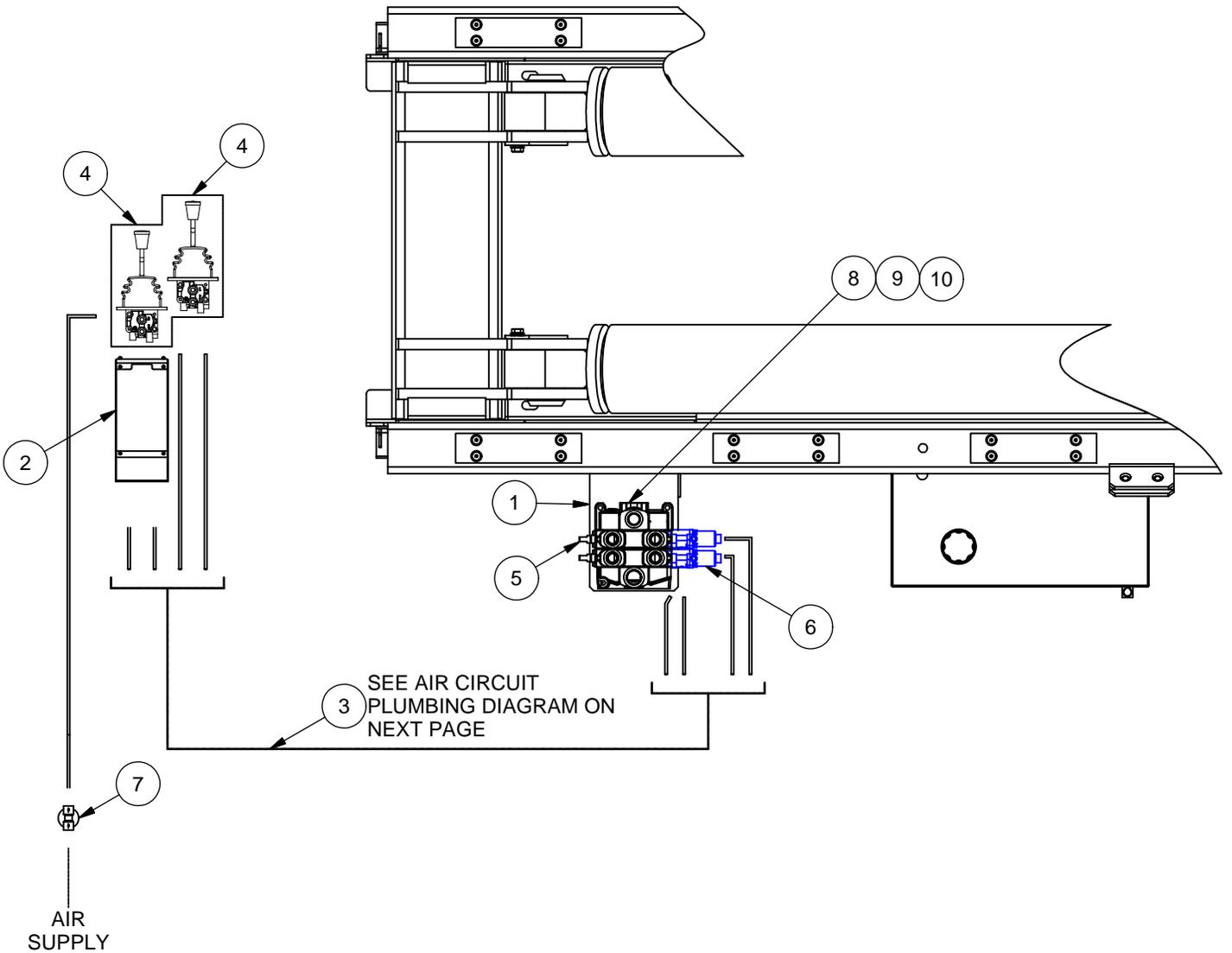
ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	26H98	2	PRONG, U-LOCK HD	13.95
2	27H26	1	COVER PLATE, HYD LOCK	2.43
3	44H80	1	U-LOCK WDMT, HD	65.68
4	44H81	4	LINKAGE WDMT, U-LOCK HD	2.28
5	00837	2	PIN, COTTER 3/16 DIA x 2	0.02
6	00P14	2	NUT, HEX 3/8-16 UNC GR8	0.02
7	00P62	2	HHCS 3/8-16 UNC x 1 GR8	0.04
8	00P67	2	NUT, LOCK 1-8 UNC GR8	0.31
9	01P28	2	WASHER, DISC LOCK 3/8 PR	0.00
10	01P87	6	WASHER, FLAT 1 ZP	0.10
11	01P89	4	WASHER, FLAT 1 NYLON	0.01
12	01P91	6	WASHER, FLAT 3/4 SS	0.02
13	01P92	2	PIN, SLTD SPG 5/32 x 1-1/2 ZP	0.01
14	01P95	2	PIN, CLEVIS 3/4 x 3-1/2	0.52
15	01P96	2	PIN, CLEVIS 1 x 6-11/16	1.65
16	02P37	2	HHCS 1-8 UNC x 8-1/2 GR8	0.27
17	22P93	1	HYD CYL 2 x 1 x 6. HD	14.14
<b>SERVICE PARTS FOR CYLINDER</b>				
18	22P78	1	C'BAL CART, 5000 PSI CBCG-LJN	0.50
19	23P94	1	PROXIMITY SWITCH, U-LOCK	0.10



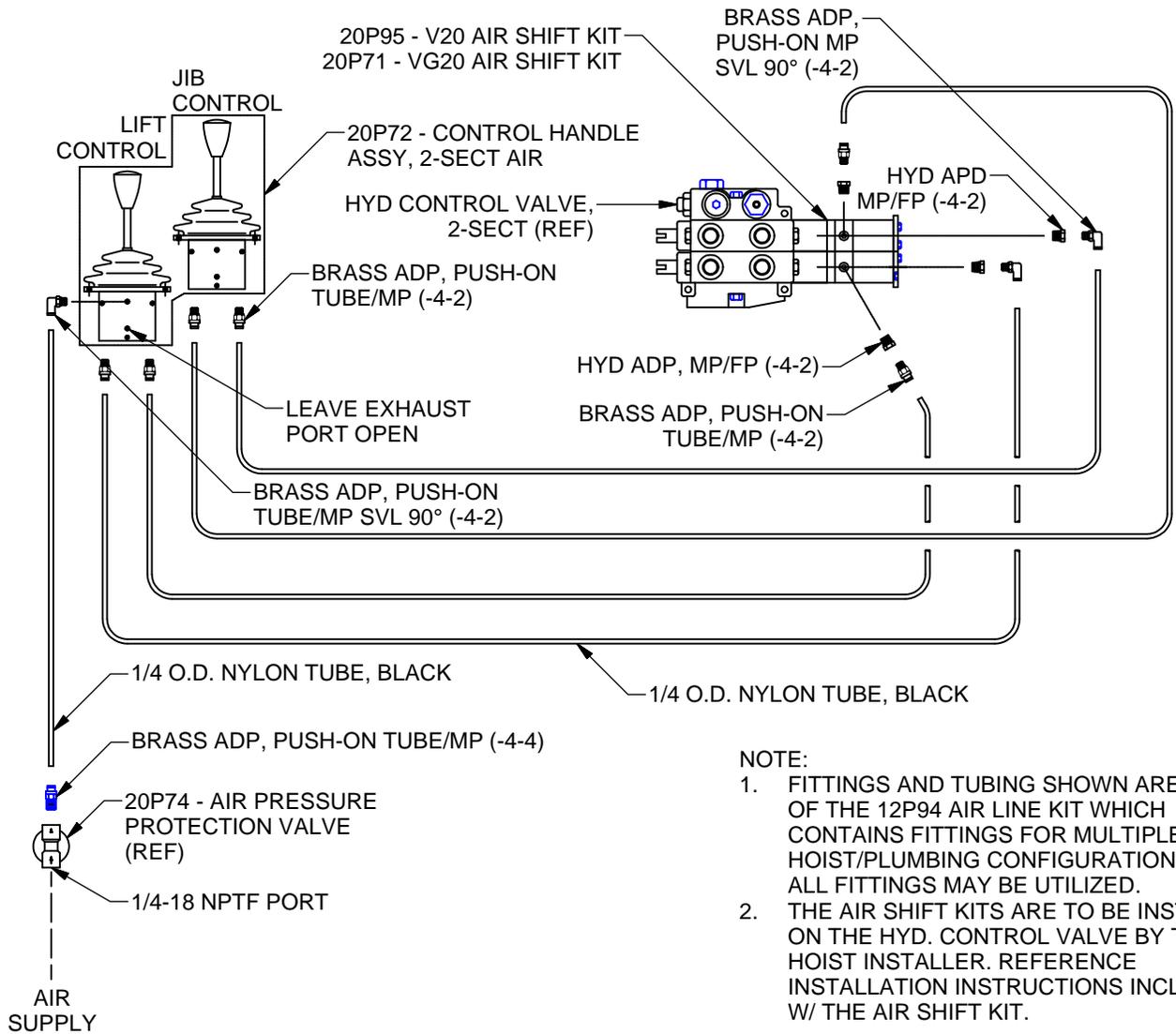
**U-LOCK ASSEMBLY, HD**

90H47 - AIR CONTROL, 2-SECT HD ~ REV C

ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	10H51	1	VALVE MOUNT BRACKET	10.65
2	51H27	1	AIR CTRL CONSOLE, 2-SECT	6.15
3	12P94	1	AIR LINE KIT	0.66
4	20P72	1	CONTROL HANDLE, 2-SECT AIR	4.48
5	20P59	1	HYD VALVE, 2-SECT 3500 VG20	31.41
6	20P71	2	AIR SHIFT KIT, VG20	1.50
7	20P74	1	AIR PRESSURE PROTECTION VALVE	0.75
SERVICE PARTS FOR VALVE				
8	21P18	1	RELIEF CARTRIDGE, VG20 3500	0.75
9	21P54	2	SEAL KIT, SECT VG20	0.20
10	21P55	2	SEAL KIT, SECT & SPOOL VG20	0.30



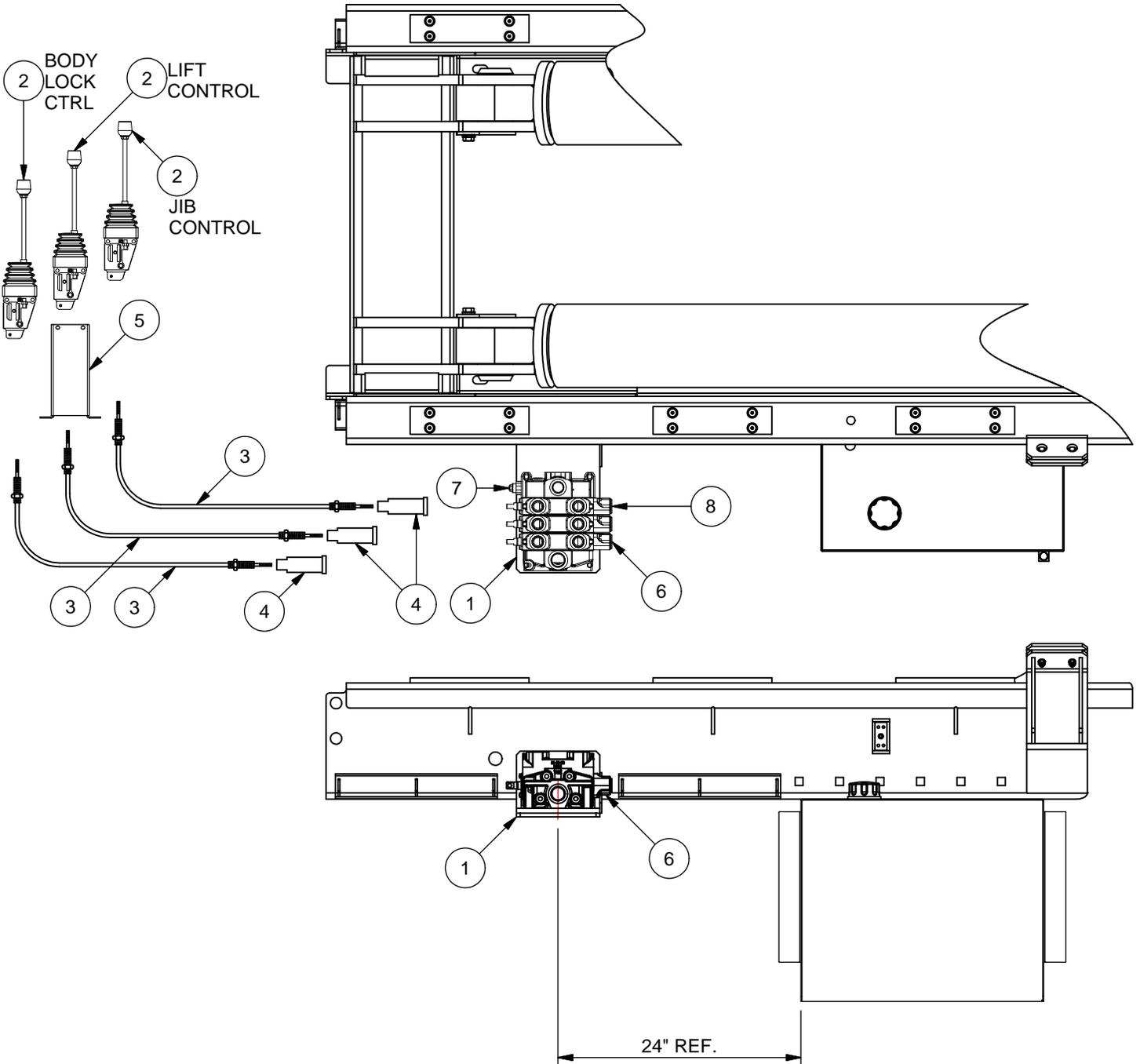
**AIR CONTROL ASSEMBLY, 2-SECT HD**



**AIR CIRCUIT PLUMBING DIAGRAM, 2-SECTION**

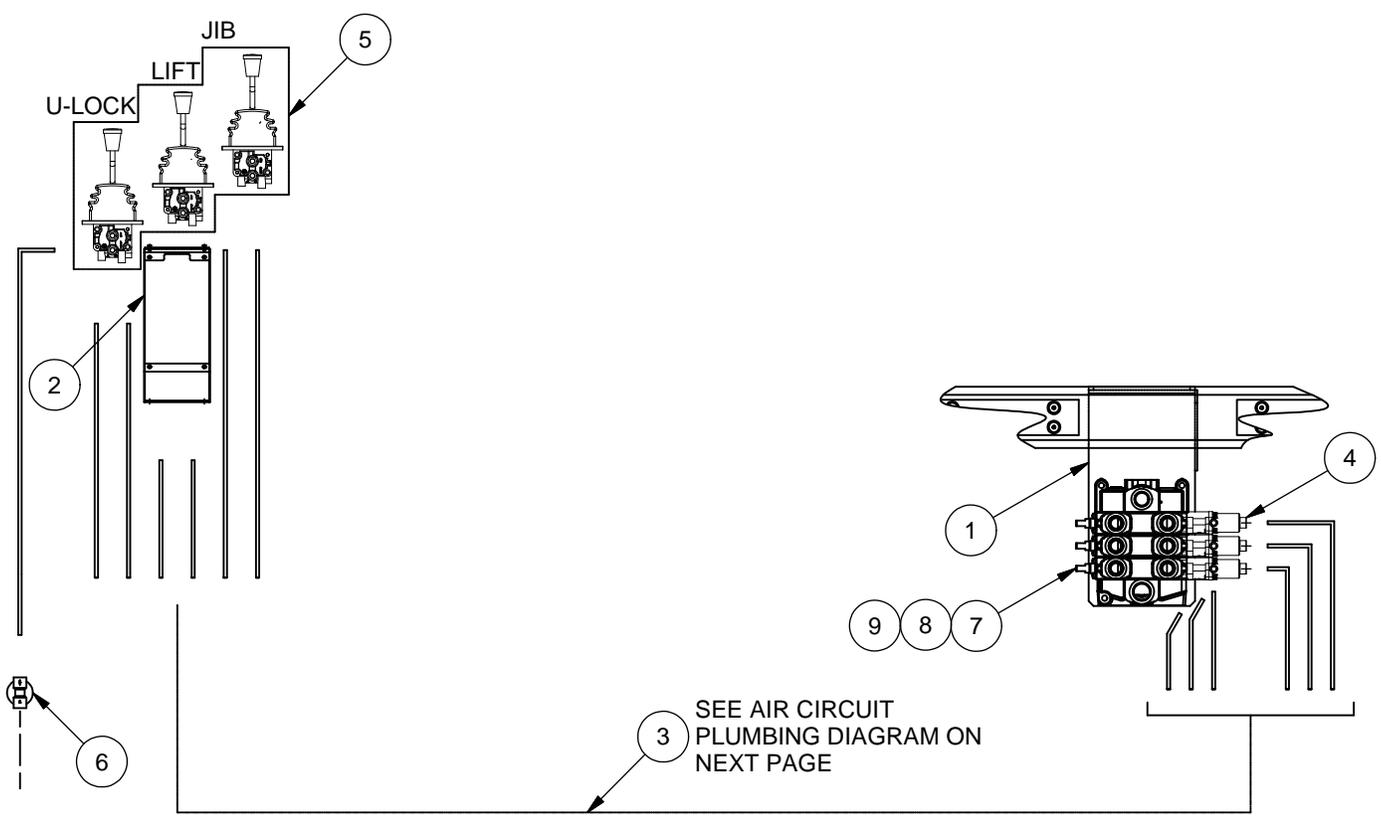
91H62 - MANUAL CONTROL, 3-SECT 650

ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	40H58	1	VALVE MOUNT BKT, 3-SECT VG20	20.74
2	20P08	3	CONTROL HANDLE, CABLE	4.63
3	20P40	3	CONTROL CABLE ASSY, 96 STD	1.83
4	20P65	3	BONNET KIT, VG20	0.50
5	20P78	1	CONTROL CONSOLE, 3-SECT	7.12
6	23P03	1	HYD VALVE, 3-SECT 3500 VG20 WR	41.25
SERVICE PARTS FOR HYD CONTROL VALVE				
7	21P18	1	RELIEF CARTRIDGE, VG20 3500	0.50
8	21P55	3	SEAL KIT, SECT & SPOOL VG20	0.30

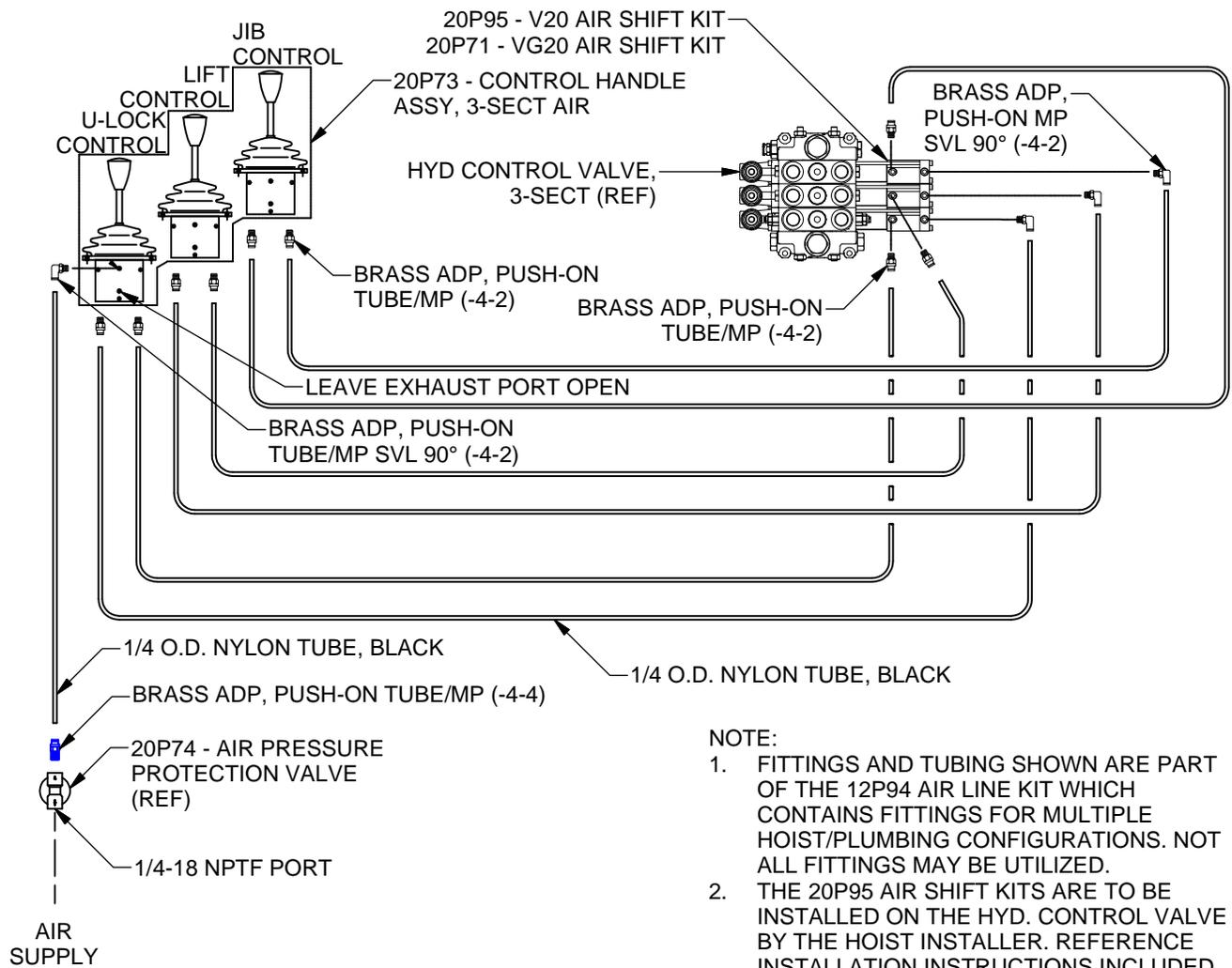


**MANUAL CONTROL, 3-SECT 650**

91H63 - AIR CONTROL ASSEMBLY, 3-SECT 650				
ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	40H58	1	VALVE MOUNT BKT, 3-SECT VG20	20.74
2	51H37	1	AIR CTRL CONSOLE, 3-SECT	6.88
3	12P94	1	AIR LINE KIT	0.66
4	20P71	3	AIR SHIFT KIT, VG20	1.50
5	20P73	1	CONTROL HANDLE, 3-SECT AIR	9.43
6	20P74	1	AIR PRESSURE PROTECTION VALVE	1.83
7	23P03	1	HYD VALVE, 3-SECT 3500 VG20 WR	41.25
SERVICE PARTS FOR HYD CONTROL VALVE				
8	21P18	1	RELIEF CARTRIDGE, VG20 3500	0.50
9	21P55	3	SEAL KIT, SECT & SPOOL VG20	0.30



**AIR CONTROL ASSEMBLY, 3-SECT 650**



**AIR CIRCUIT PLUMBING DIAGRAM, 3-SECTION**

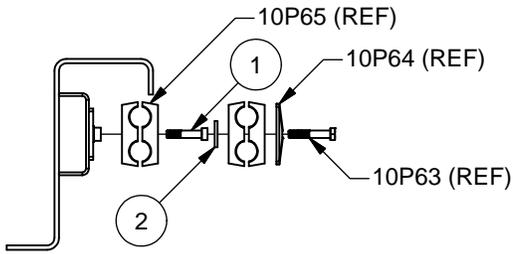
91H55 - TANK CIRCUIT, 3-SECT 650

ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	01P97	2	EXTENSION SCREW 5/16-18	0.04
2	01P98	2	EXT. PLATE, CLAMP	0.00
3	10P36	3	ADP HYD 12MJ/12MB 90	0.74
4	10P37	1	ADP HYD 04MJ/04MP 90	0.11
5	10P38	1	ADP HYD 04FJ CAP	0.03
6	10P44	2	ADP HYD 08MJ/08FJ 90	0.23
7	10P65	2	CLAMP ASSY, TWIN 7/8	0.07
8	10P78	2	CLAMP, T-BOLT Ø1-3/4	0.12
9	11P46	2	HYD TUBE, LOW 3/4 x 118-7/16	7.25
10	11P56	1	HOSE ASSY 28 12-12FJ/12FJ	2.40
11	11P57	1	HOSE ASSY 33 12-12FJ/12FJ	2.70
12	11P62	3	ADP HYD 12MJ/12MB 90 LL	1.07
13	11P65	2	ADP HYD 12MJ/12FJ 90	0.58
14	11P78	1	ADP HYD 20MP/20MP	0.62
15	12P25	1	ADP HYD 20HB/20MP	0.52
16	12P27	1	ADP HYD 20HB/16MB 90	1.32
17	12P33	1	HOSE 1-1/4 x 36 LP	1.68 </td
18	13P80	2	ADP HYD 08MJ/08FJ	0.16
19	13P82	2	ADP HYD 12FJ/08MJ	0.23
20	14P06	2	HOSE ASSY 135 08-08FJ/08FJ	9.28
21	20P61	1	HYD FILTER ASSY 70 GPM	4.50
22	20P64	1	HYD FILTER INDICATOR GAUGE	0.01
23	20P86	1	HYD TANK, 30 GALLON LS	78.28

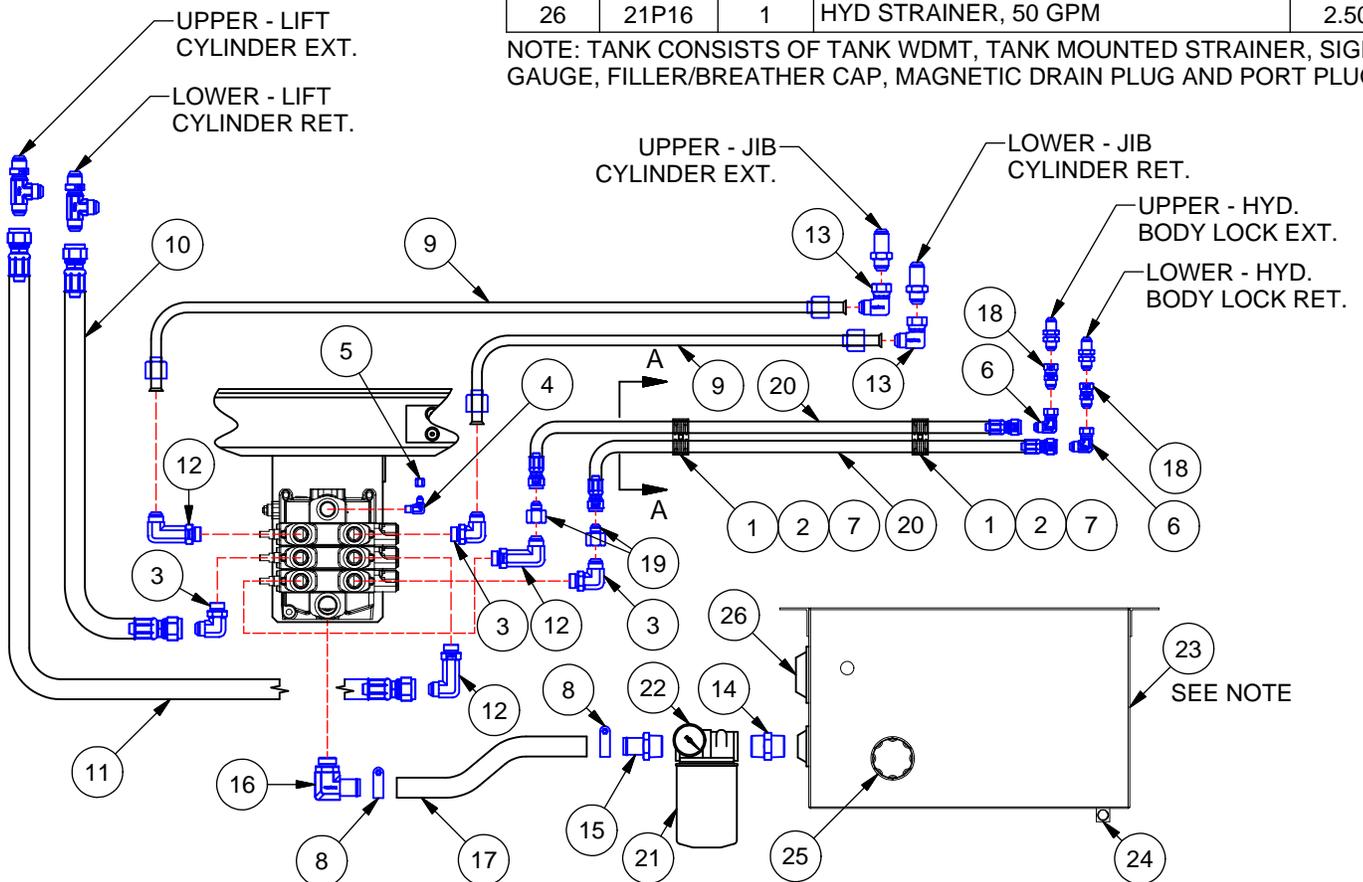
SERVICE PARTS FOR TANK

24	20P96	1	SIGHT GAUGE, HYD TANK	0.70
25	20P97	1	BREATHER CAP ASSY, HYD TANK	0.60
26	21P16	1	HYD STRAINER, 50 GPM	2.50

NOTE: TANK CONSISTS OF TANK WDMT, TANK MOUNTED STRAINER, SIGHT GAUGE, FILLER/BREATHER CAP, MAGNETIC DRAIN PLUG AND PORT PLUGS.



SECTION A-A



TANK CIRCUIT, 3-SECT 650

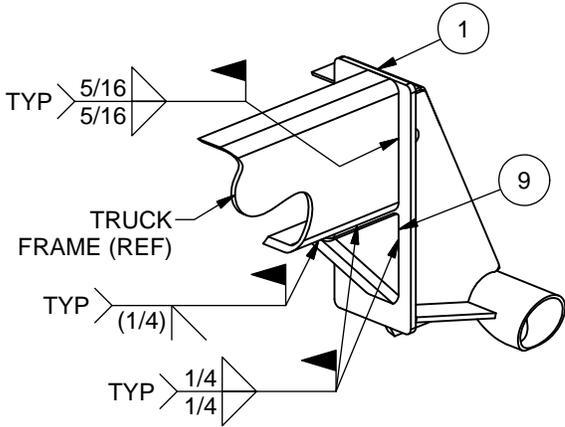
**DISC-LOCK WASHER TORQUE SPEC'S**

BOLT SIZE	SAE GR 8 ASSY TORQUE (FT-LBS)
3/8	53
7/16	85
1/2	130
5/8	258
3/4	459
7/8	739
1	1108

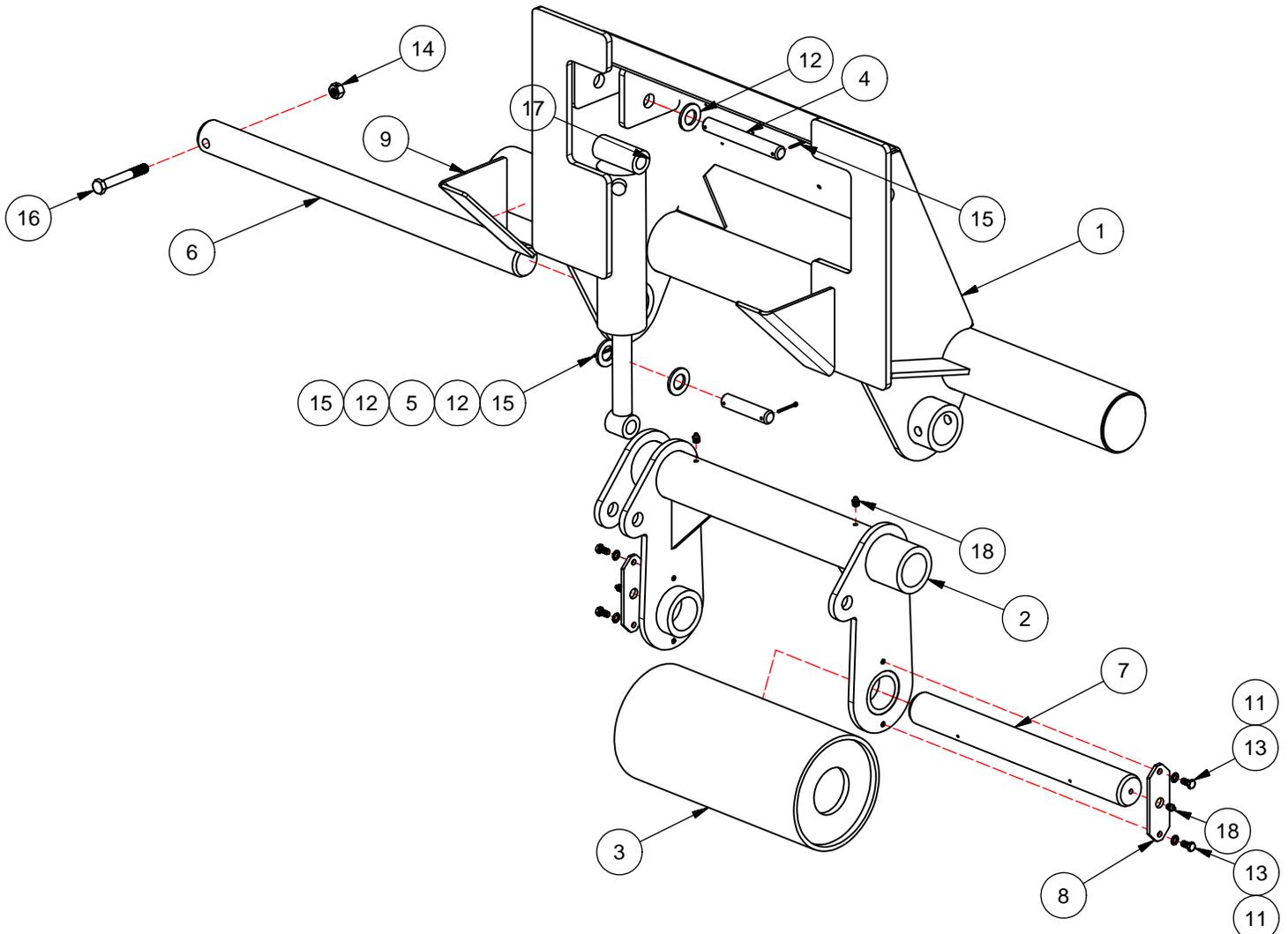
NOTE:  
APPLY LOCTITE 243 (BLUE)  
TO ALL BOLTS.

**42H62 - STABILIZER ASSEMBLY**

ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	42H63	1	STABILIZER MOUNT WELDMENT	180.10
2	42H64	1	STABILIZER ARM WELDMENT	65.32
3	42H65	1	STABILIZER ROLLER	54.13
4	86H65	1	UPPER CYLINDER PIN, STABILIZER	1.64
5	86H66	1	LOWER CYLINDER PIN, STABILIZER	0.97
6	86H67	1	UPPER SHAFT, STABILIZER	39.88
7	86H68	1	LOWER SHAFT, STABILIZER	26.37
8	86H69	2	SHAFT RETAINER, STABILIZER	0.70
9	86H70	2	MOUNT GUSSET, STABILIZER	3.58
10	90H83	1	STABILIZER CIRCUIT	21.20
11	00755	4	WASHER, LOCK 3/8	0.03
12	00787	4	WASHER, FLAT 1 HT	0.11
13	00P03	4	HHCS 3/8-16 UNC x 3/4 GR8	0.04
14	00P55	1	NUT, LOCK 5/8-11 UNC GR8	0.08
15	00P98	4	PIN, COTTER 5/32 x 1-1/2	0.01
16	01P39	1	HHCS 5/8-11 UNC x 4-1/2 GR8	0.45
17	21P84	1	HYD CYL 3x6	41.83
18	90P03	4	GREASE ZERK, 1/8-27 NPT STR	0.02



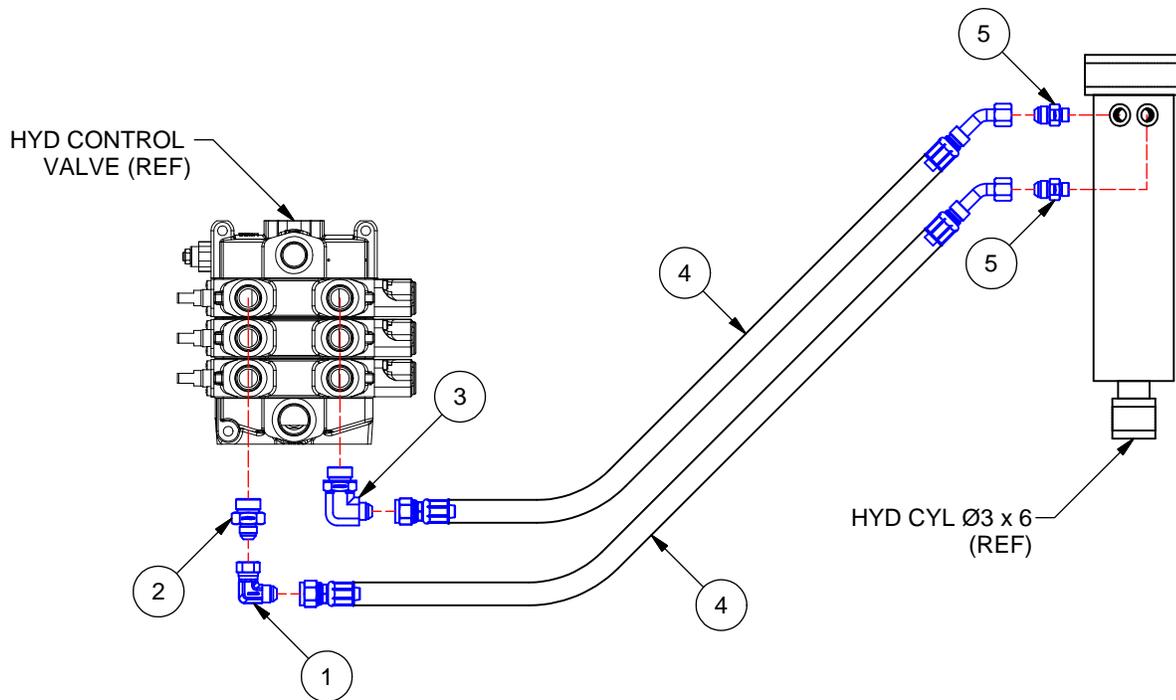
**STABILIZER WELD DETAIL**



**STABILIZER ASSEMBLY**

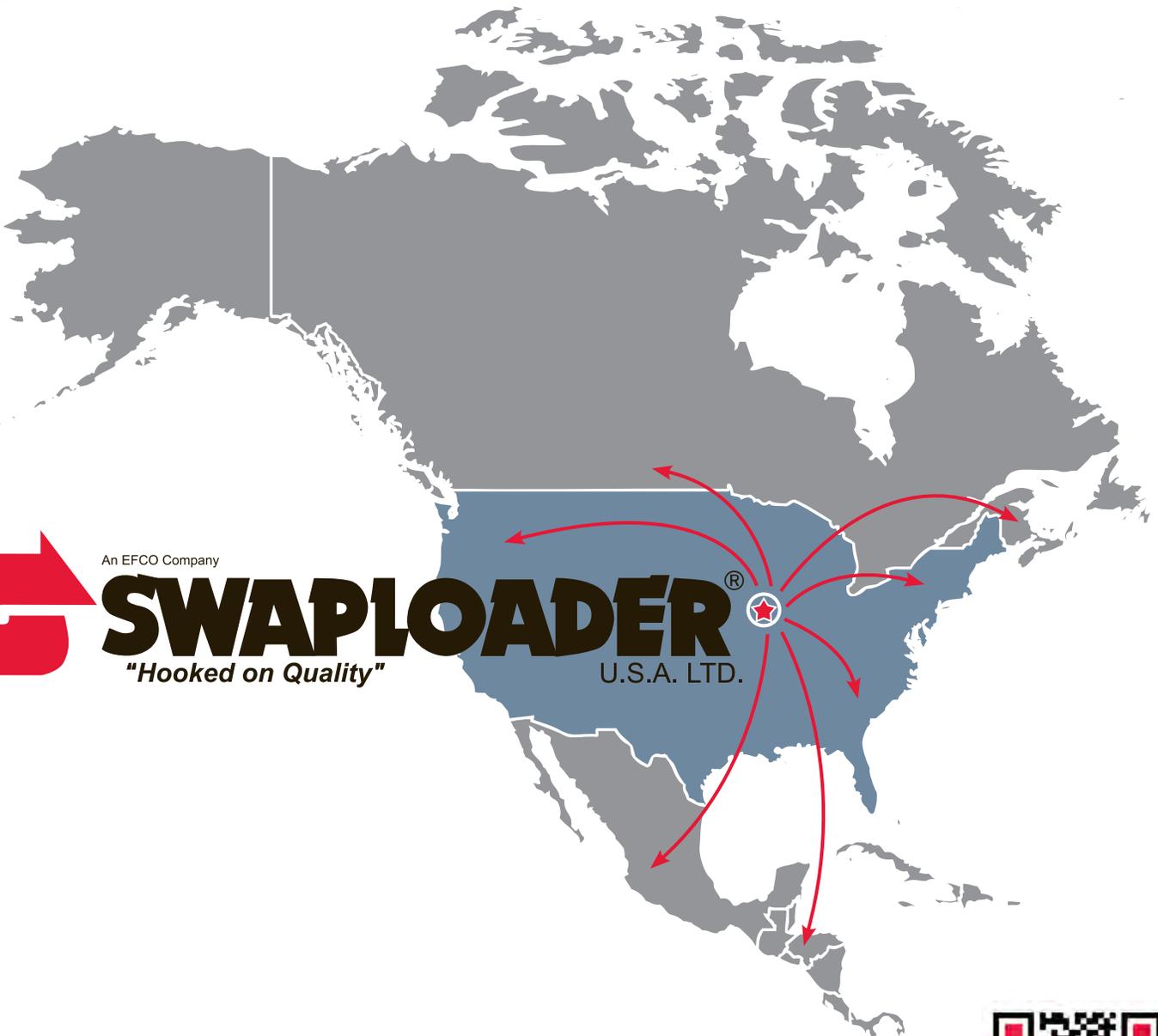
90H83 - STABILIZER CIRCUIT

ITEM	PART #	QTY	DESCRIPTION	WT-lb/ea
1	10P44	1	ADP HYD 08MJ/08FJ 90	0.23
2	11P83	1	ADP HYD 08MJ/12MB	0.30
3	11P84	1	ADP HYD 08MJ/12MB 90	0.76
4	11P87	2	HOSE ASSY 243.5 08FJ/08FJ45	8.00
5	11P89	2	ADP HYD 08MJ/06MP	0.13



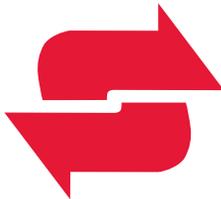
**STABILIZER CIRCUIT**





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