Description

NOTE: Throughout this document the Rhino SD/XD Type-F Pneumatic Control Module is referred to as the Control Module.

See Figure 1. The Control Module (1) provides the pneumatic operating functions for Rhino SD/XD bulk unloaders (2). It mounts to the side of small- and large-frame Rhino SD/XD bulk unloaders.

The Control Module can be configured for use on standalone or changeover Rhino SD/XD bulk unloaders. The changeover configuration allows the operator to change the empty container of one Rhino SD/XD bulk unloader while the other one is operating.

See Figure 2 and refer to Table 1 for a list of the Control Module components.

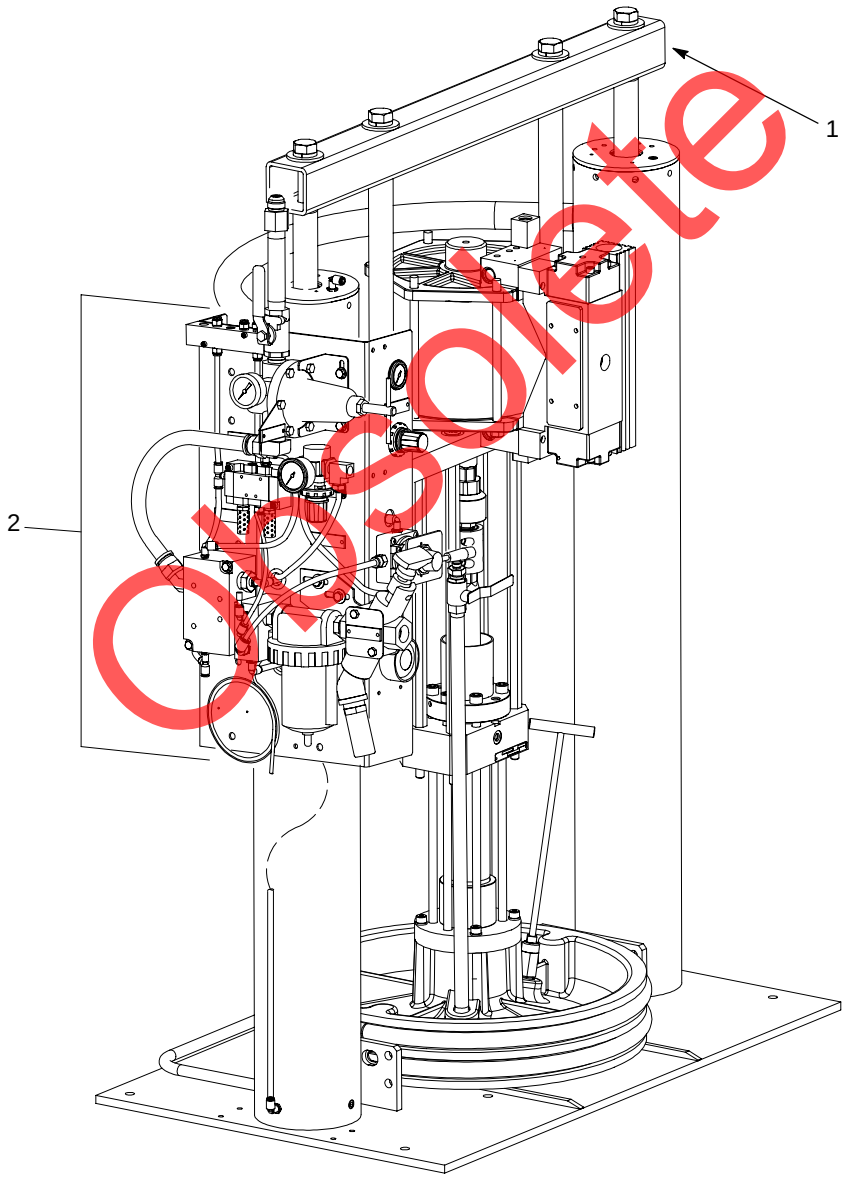

Figure 1 Control Module (Large Frame Rhino SD/XD Bulk Unloader Shown)

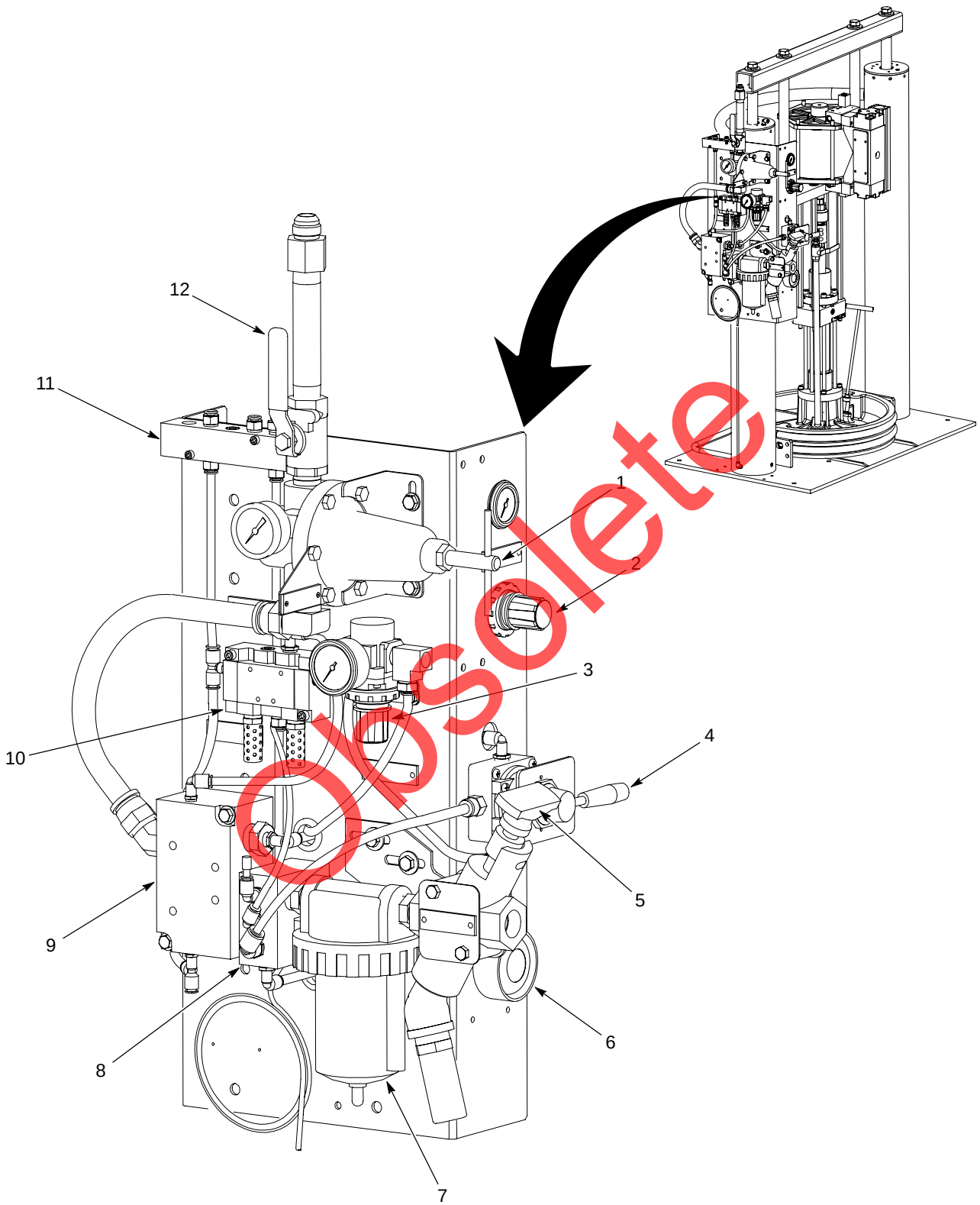

Figure 2 Control Module Components

Table 1 Control Module Components

Item	Function
1	Air Motor Regulator: Sets the amount of air pressure going to the air motor which determines the amount of material pressure exiting the unloader.
2	Ram Down Regulator: Sets the amount of air pressure going to the top of the ram cylinders which determines the amount of pressure the follower plate exerts on the material.
3	Preset 25-psi Rating Blow-off/Ram Up Regulator: This regulator controls the air pressure to the blow-off valve and the ram up side of the elevator cylinders.
4	Ram Control Valve: Rotary valve that initiates ram movement. Placing the ram control valve in the • RAM UP position, raises the ram and follower plate and supplies air to the blow-off valve. • NEUTRAL position, halts ram movement. • RAM DOWN position, lowers the ram and follower plate assembly into the material container. **NOTE:** When the ram control valve is in the NEUTRAL position, air pressure remains in the unloader ram cylinders. The elevator rams will drift downward if they are not supported by either the follower plate resting in a drum of material or on the base plate.
5	Master Air Lockout Valve: When this valve is in the open position, it supplies air to the unloader pneumatic circuit. Closing this valve, disables the unloader and also bleeds off air.
6	Material Purge Push Button: Supplies air to the air motor and allows the pump to purge material or air from the system. Allows the operator to purge an unloader even if the opposite unloader is active.
7	Filter/Separator: Has a 5-micron filter element that removes most contaminants and moisture from the supply air.
8	Main Air Manifold: Supplies line pressure to various components.
9	Air Motor Control Valve: Receives signals to control the air motor.
10	Air Logic Valve: Prevents an empty unloader from receiving an Empty signal from the other controller.
11	Distribution Manifold: Provides pneumatic connections to the air motor shift valves and empty/low drum level switches.
12	Air Lockout Valve: On each individual unloader, these valves lock out and vent air pressure to the individual air motors. They prevent the pump from stroking but do not shut off ram air. The follower plate can be raised and lowered but the air motor will not activate and cause the pump to stroke.

Installation

WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

NOTE: Read and understand the *Safety* section in the Nordson *System Documentation* that shipped with the system before installing the Control Module.

Install the Control Module to a Bulk Unloader Frame

See Figure 3. Mount the Control Module onto the bulk unloader using the supplied screws (1) and washers (2). Tighten the screws securely.

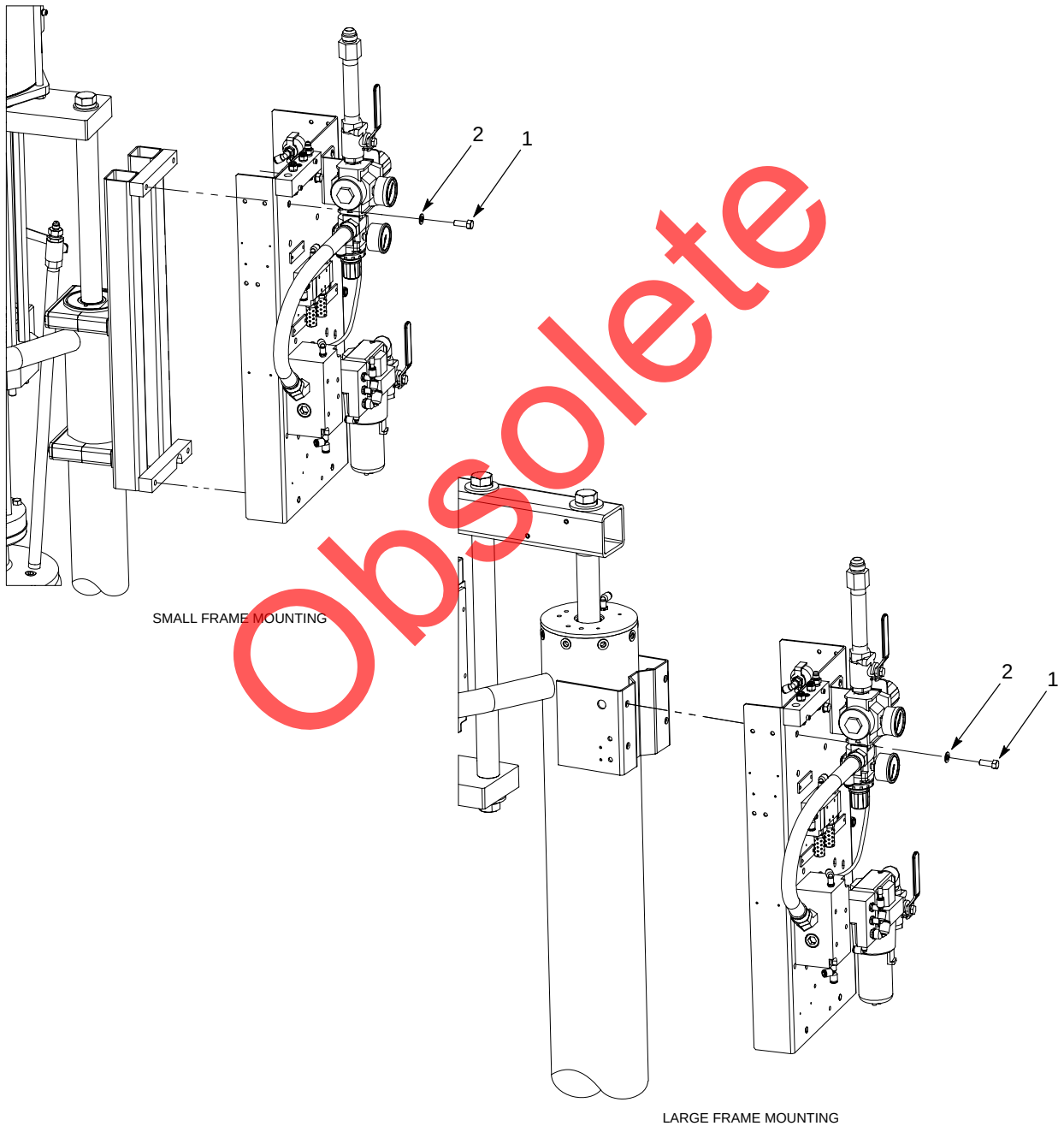

Figure 3 Installing the Control Module (Typical)

Connect the Ram Up and Ram Down Tubing

1. See Figure 4. Connect the ram up tubing (1) as shown.
2. Connect the ram down tubing (3) between the regulator (2) and frame fitting (4).

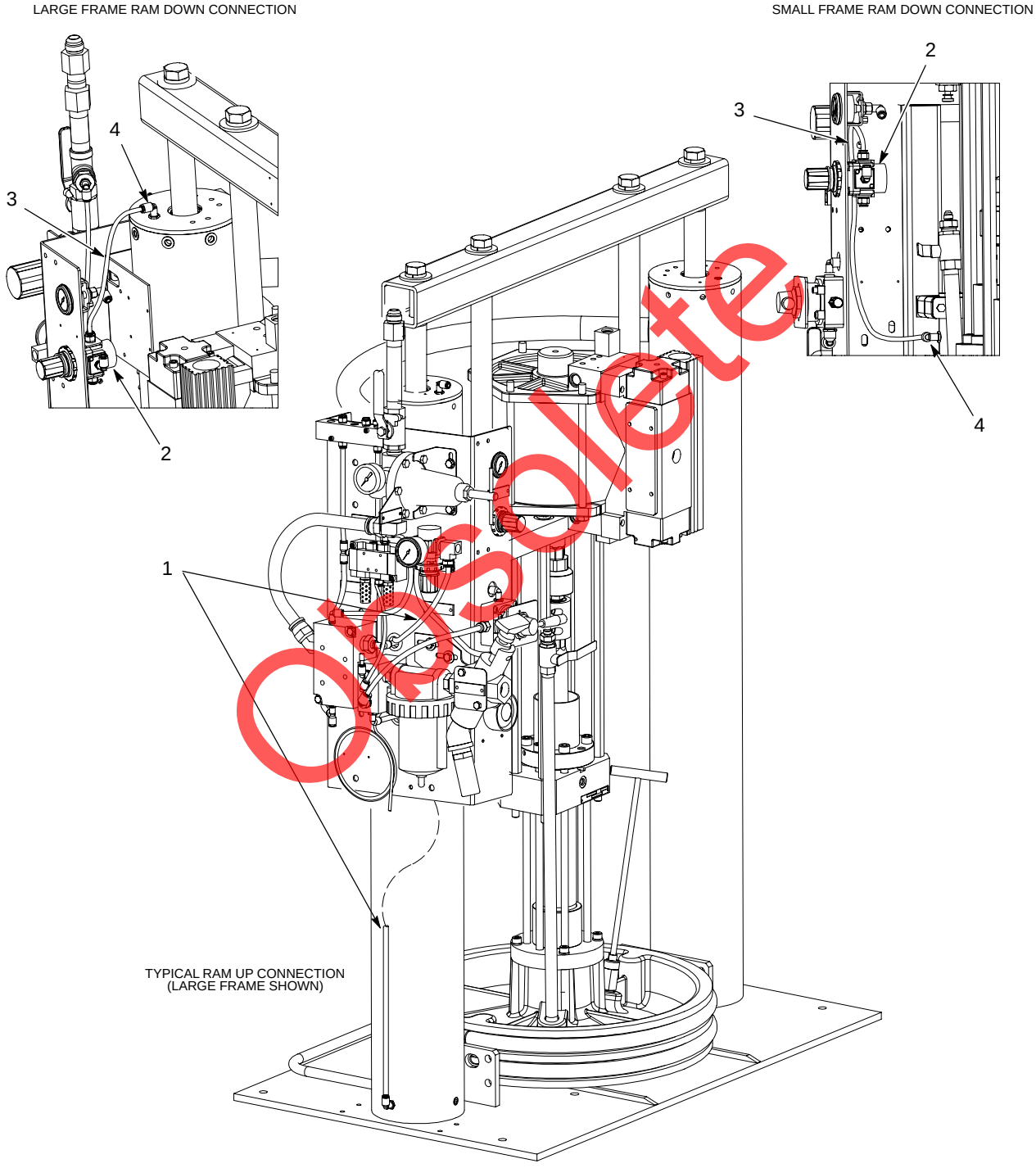

Figure 4 Ram Up and Ram Down Tubing Connections

Connect the Tubing for Standalone or Changeover Configurations

The Control module can be configured for standalone and changeover systems. Perform the applicable procedures.

Standalone Systems

1. See Figure 5. Remove the plug (2) from PORT S1 on the main air manifold (3). Install the plug into the T-fitting on the air motor control valve (4).
2. Cut the tubing (1A) connected to the air logic valve (5) to approximately 7 inches.
3. Connect the 7-inch piece of tubing (1B) from the air logic valve (5) to PORT S1 on the main air manifold (3).

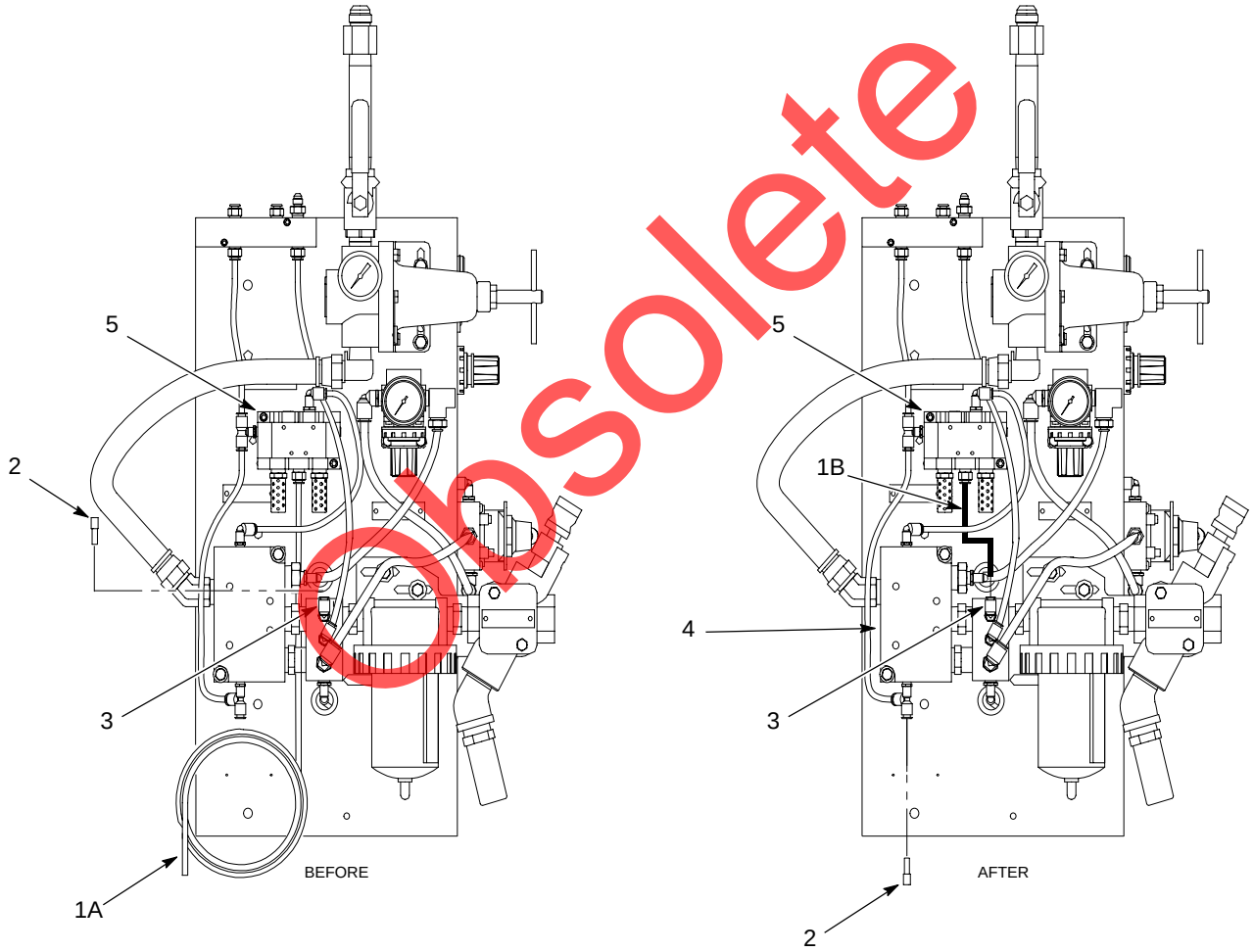

Figure 5 Standalone Configuration

Changeover Systems

Connect the tubing as shown on Figure 6.

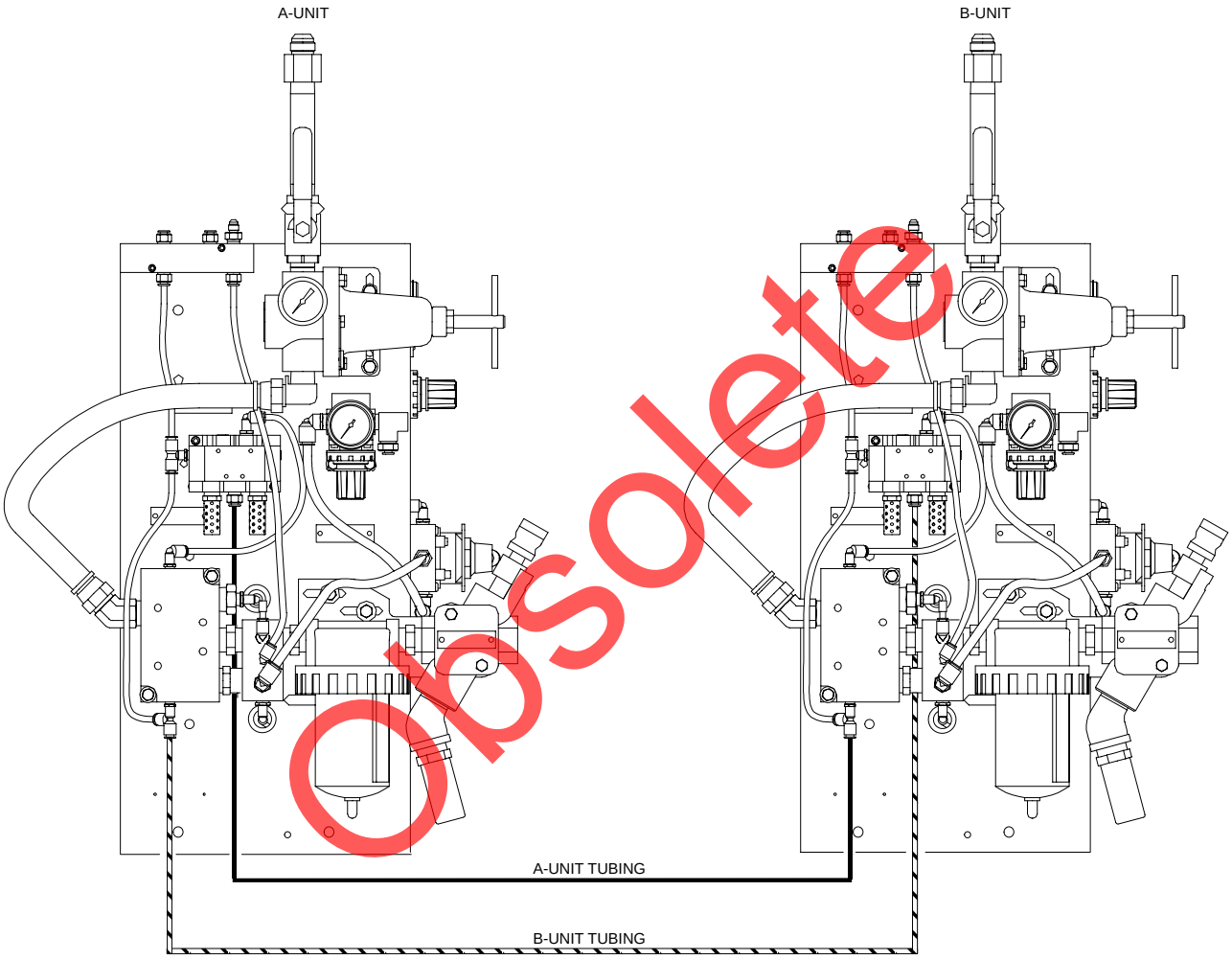

Figure 6 Changeover Configuration

Install an Air Motor Control Valve

See Figure 7. Install the desired air motor control valve (5) to the valve manifold base (4) using the screws (6). Tighten the screws securely.

Install an Air Logic Valve

See Figure 7. Install the desired air logic valve (2) to the air logic valve manifold base (1) using the screws (3). Tighten the screws securely.

Operation

Control Module operation is dependent upon the system application. Refer to the Nordson *System Documentation* that shipped with the system for specific application parameters and operating procedures.

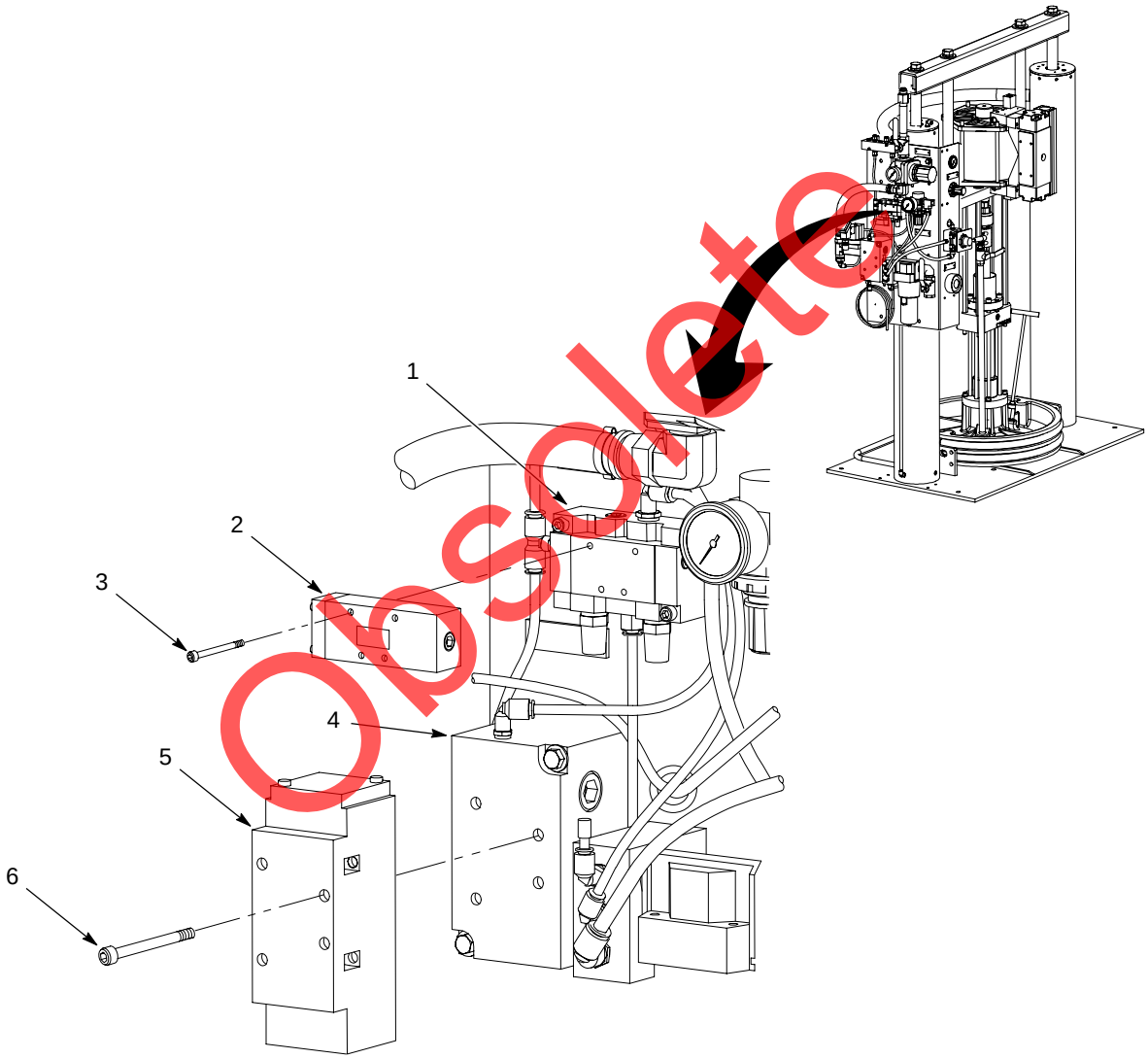

Figure 7 Typical Solenoid Valve and Air Logic Valve Installation

Parts

To order parts, call the Nordson Customer Service Center or your local Nordson representative.

Control Module

See Figures 8 and 9. Refer to the following parts list.

Item	Part	Description	Qty	Note
—	1044765	Module, controls, pneumatic	1	
1	1046891	• Panel, controls, bulk unloader	1	
2	901245	• Gage, pressure, 0-100 psi (0-7 Bar)	1	
3	1043084	• Regulator, air, 1/4 NPT, with check valve, panel mounted	1	
4	124797	• Valve, rotary, 3 position, 1/4 ports	1	
5	901252	• Gage, air, 1/4 NPT, psi-kpa-Kg/Cm2	1	
6	164639	• Valve, manual, push button, with cup	1	
7	237980	• Bracket, regulator, 3/4	1	
8	124800	• Regulator, 3/4 NPT, 0−125 psi	1	
9	1043086	• Regulator, 3/8 NPT, 25 psi, with check	1	
10	- - - - - -	• NOT USED ON THIS CONFIGURATION	—	
11	1029534	• Base, manifold, ISO 5599, Size 1, 1/4 NPT	1	
12	1029553	• Base, manifold, ISO 5599, Size 3, 3/4 NPT	1	
13	1029952	• Manifold	1	
14	1003453	• Filter, 3/4 NPT, 16-oz, 5 Micron	1	
15	1030866	• Valve, ball, vented, 3/4 NPT	1	
16	- - - - - -	• NOT USED ON THIS CONFIGURATION	—	
17	324896	• Grommet, rubber, 0.812 ID x 1.25 OD	2	
18	1036691	• Plate, label mounting	1	
19	- - - - - -	• NOT USED ON THIS CONFIGURATION	—	
20	1026829	• Nipple, stl, schedule 80, 3/4, close, plain	1	
21	1035504	• Muffler, exhaust, 1/8 in. NPT male	1	
22	973262	• Bushing, pipe, hyd, 3/4 x 1/4, stl, zinc	1	
23	973669	• Nipple, stl, Schedule 40, 3/4 x 6, plain	1	
24	1030650	• Connector, female, 37, 1 1/16-12 x 3/4, stl zinc	1	
25	972583	• Ell, male, 37,1-1/16-12 x 3/4, stl	1	
26	124795	• Fitting, hose, 3/4 barb x 1 1/16	2	
27	973140	• Elbow, male, 45d, 3/4 NPT x 1 1/16	1	
28	973442	• Plug, pipe, socket, flush, 3/4, zinc	1	
29−32	- - - - - -	• NOT USED ON THIS CONFIGURATION	—	
33	972194	• Elbow, male, 3/8 tube x 3/8	1	
34	- - - - - -	• NOT USED ON THIS CONFIGURATION	—	
35	971177	• Connector, male, 3/8 tube x 1/4 NPT	1	
36	971265	• Connector, male, 1/4 tube x 1/4 NPT	7	
37	971266	• Elbow, male, 1/4 tube x 1/4 NPT	6	
38	972183	• Elbow, male, 3/8 tube x 1/4 NPT	2	
39	1019099	• Muffler, 3/8 NPT male	2	
40	1040700	• Elbow, female, push-in, 1/4 tube x 1/8 FPT	1	
41	972119	• Elbow, 1/4 tube x 1/8 NPT	4	
42	972000	• Connector, male, 37, 7/16−20 x 1/4, stl	1	
43	973483	• Plug, pipe, socket, 1/8 in., steel	1	
44	1030359	• Plug, push-in, 1/4 tube	1	
45	973431	• Plug, pipe, socket, standard, 1/2, zinc	1	
46	1010810	• Tubing, 1/4 OD Polyethylene, flame-resistant	AR	

Continued...

Item	Part	Description	Qty	Note
—	1044765	Module, controls, pneumatic		
47	1010777	• Tubing, $^{3}/_{8}$ OD Polyethylene, flame−resistant	AR	
48	- - - - - -	• NOT USED ON THIS CONFIGURATION	—	
49	145240	• Hose, 0.75 ID, fire−resistant, blue	AR	
50	981710	• Screw, hex, $^{3}/_{8}$-16x 0.750, cap, zinc	4	
51	983061	• Washer, flat, E, 0.406 x 0.812 x 0.065, zinc	4	
52−53	- - - - - -	• NOT USED ON THIS CONFIGURATION	—	
54	983051	• Washer, flat, E, 0.344 x 0.688 x 0.065, zinc	2	
55	- - - - - -	• NOT USED ON THIS CONFIGURATION	—	
56	981314	• Screw, hex, $^{5}/_{16}$-18 x 3.500, cap, zinc	2	
57	981557	• Screw, socket, $^{1}/_{4}$-20 x 1.750, zinc	2	
58	345836	• Nut, hex, $^{1}/_{4}$-20, stl, zinc, 14441−GA	4	
59	345977	• Washer, lock, E, $^{1}/_{4}$, stl, zinc, 14451−GA	4	
60	971672	• Connector, male, $^{1}/_{4}$ tube x $^{3}/_{8}$ NPT	1	
61	973278	• Connector, male, run tee, $^{1}/_{4}$ tube x $^{1}/_{8}$ NPT	1	
62	973615	• Tee, branch, $^{1}/_{4}$ tube x $^{1}/_{8}$ NPT	1	
63	984120	• Nut, hex, machined, #10-32, stl, zinc, 14448−FA	4	
64	981176	• Screw, pan, 10-32 x 1.500, sl, zinc	4	
65	983123	• Washer, flat, E, 0.219 x 0.500 x 0.049, zinc	4	
66	983120	• Washer, lock, E, spt, #10, Stl, Ni	4	
67	985112	• Rivet, pop, $^{3}/_{32}$ x 0.250, black oxide	2	
68	981907	• Screw, drive, rd, 4 x 0.250, zinc	12	
69	- - - - - -	• NOT USED ON THIS CONFIGURATION	—	
70	1031135	• Label, kit	1	
71	973252	• Nipple, Hex, $^{3}/_{4}$ x $^{3}/_{4}$ x 1.96, stl, zinc	3	
72	- - - - - -	• NOT USED ON THIS CONFIGURATION	—	
73	1046936	• Plate, mounting, label, air lockout valve	1	
74	1046753	• Valve, manual, lockout, $^{3}/_{4}$ NPT port, 1 NPT exhaust	1	
75	- - - - - -	• NOT USED ON THIS CONFIGURATION	—	
76	1047130	• Ell, pipe, 45, street, 1 NPT, brass	1	
77	282906	• Muffler, exhaust $^{3}/_{4}$ NPT	1	
78	981211	• Screw, hex, $^{1}/_{4}$-20 x 0.750, cap, zinc	2	
79	345913	• Washer, flat, regular, $^{1}/_{4}$, zinc	2	
80	1034396	• Muffler, exhaust $^{1}/_{4}$ NPT male	1	
81	973276	• Tee, pipe, straight, $^{3}/_{8}$ x $^{3}/_{8}$, brass	1	
82−83	- - - - - -	• NOT USED ON THIS CONFIGURATION	—	
84	973410	• Plug, pipe, socket, standard, $^{1}/_{4}$, zinc	2	
85	981333	• Screw, hex, $^{5}/_{16}$-18 x 0.875, cap, zinc	4	
86	345938	• Washer, flat, E, 0.375 x 0.875 x 0.083 stl zinc	10	
87	345978	• Washer, lock, regular $^{5}/_{16}$, zinc	8	
88	984449	• Nut, hex, regular, $^{5}/_{16}$-18, G8, zinc	8	
89	981350	• Screw, hex, $^{5}/_{16}$-18 x 2.750, cap, zinc	2	
90	1046935	• Bracket, mounting, lockout valve	1	
91	1047099	• Muffler, exhaust 1 NPT	1	
92	901240	• Gage, air 0−30 psi (0−2.1 Kg/Cm)	1	

AR: As Required

Recommended Spare Parts

Keep the following on hand to reduce downtime.

Item	Part
Filter element, 5 micron, 16 oz	1004458

Optional Air Motor Control Valves

The following air motor control valves are available.

Part	Description
1025774	Size 3, air pilot, 2-position, 4-way, Numatics
1025777	Size 3, air pilot, 2-position, 4-way, Mac
1025779	Size 3, air pilot, 2-position, 4-way, Automatic Valve
1057781	Size 3, air pilot, 2-position, 4-way, Parker

Optional Air Logic Valves

The following air logic valves are available.

Part	Description
1025776	Size 1, air pilot, 2-position, 4-way, Numatics
1025778	Size 1, air pilot, 2-position, 4-way, Mac
1025780	Size 1, air pilot, 2-position, 4-way, Automatic Valve
1044436	Size 1, air pilot, 2-position, 4-way, SMC
1057780	Size 1, air pilot, 2-position, 4-way, Parker

Pneumatic Schematics

Control Schematic 1038934B01 shows the following:

Sheet	Description
1	Changeover with Empty Drum Level
2	Standalone with Empty Drum Level
3	Changeover Pump Timer Delay Module with Empty Drum Level
4	Low and Empty Drum Level Detection Option

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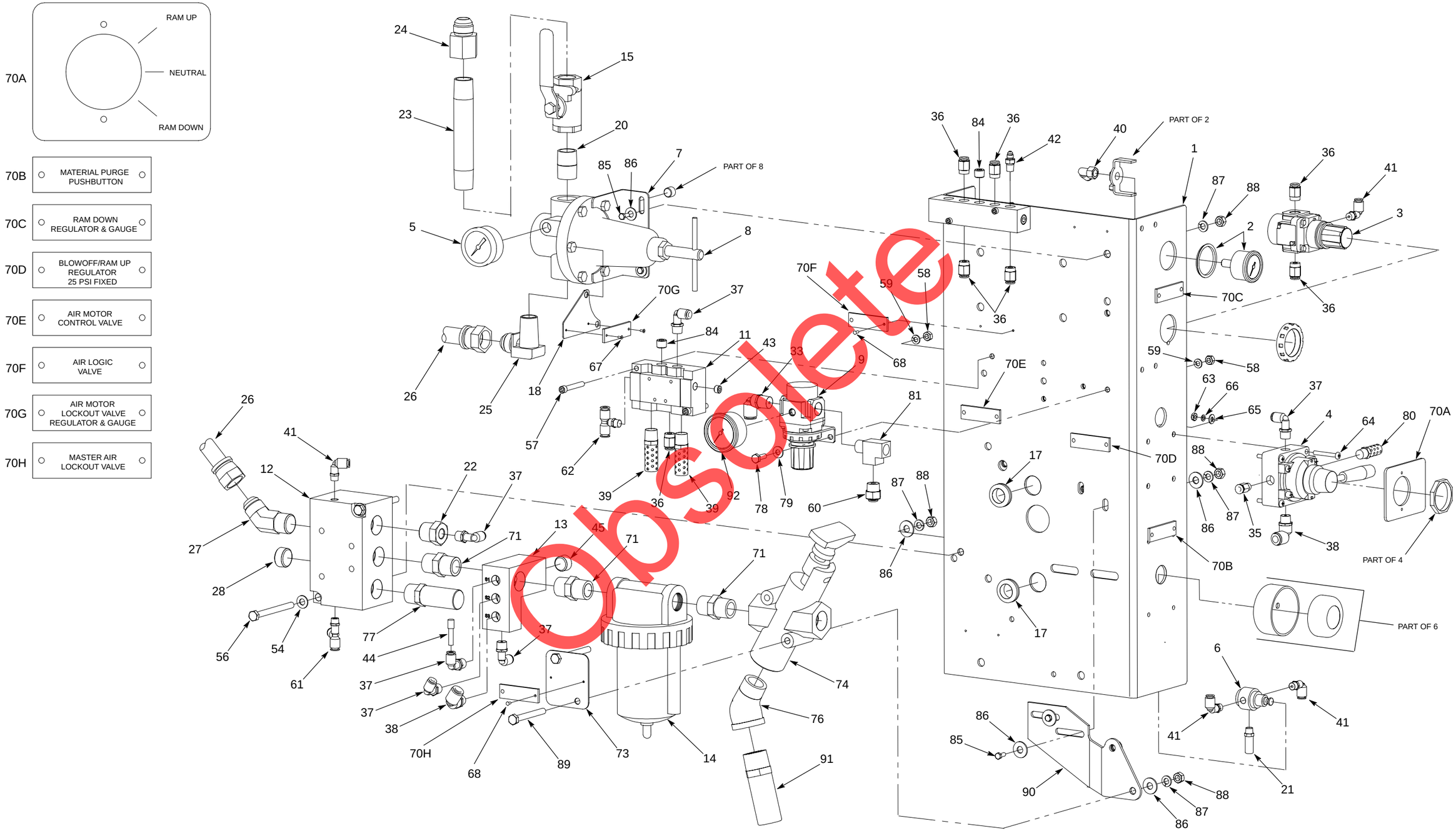
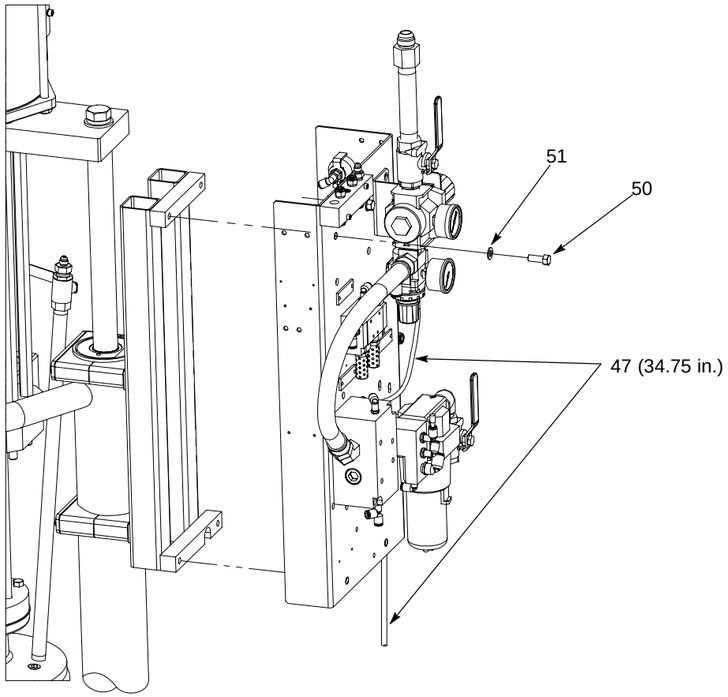
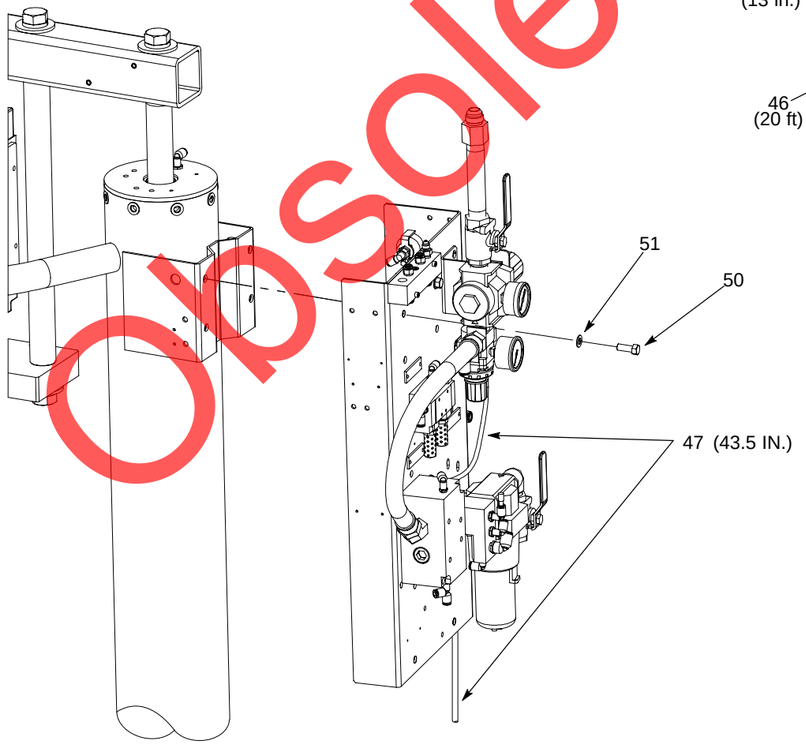


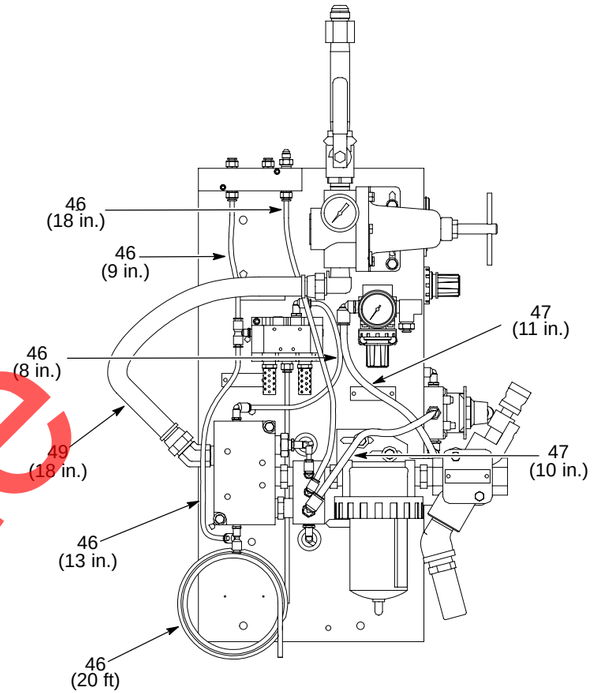
Figure 8 Parts



SMALL FRAME MOUNTING



LARGE FRAME MOUNTING



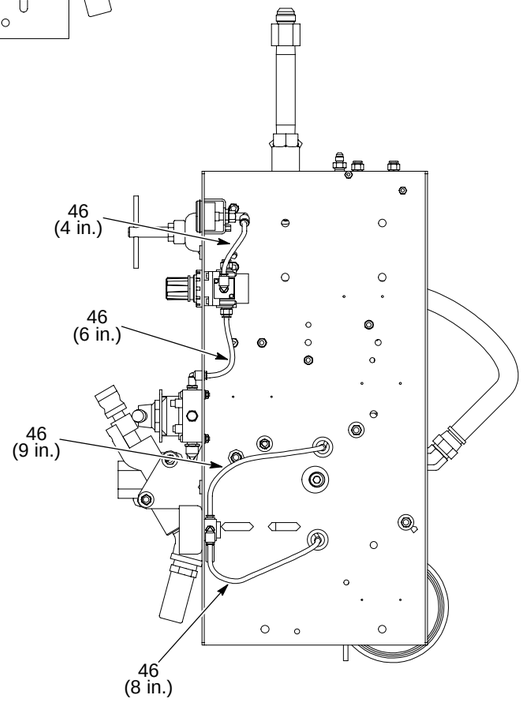
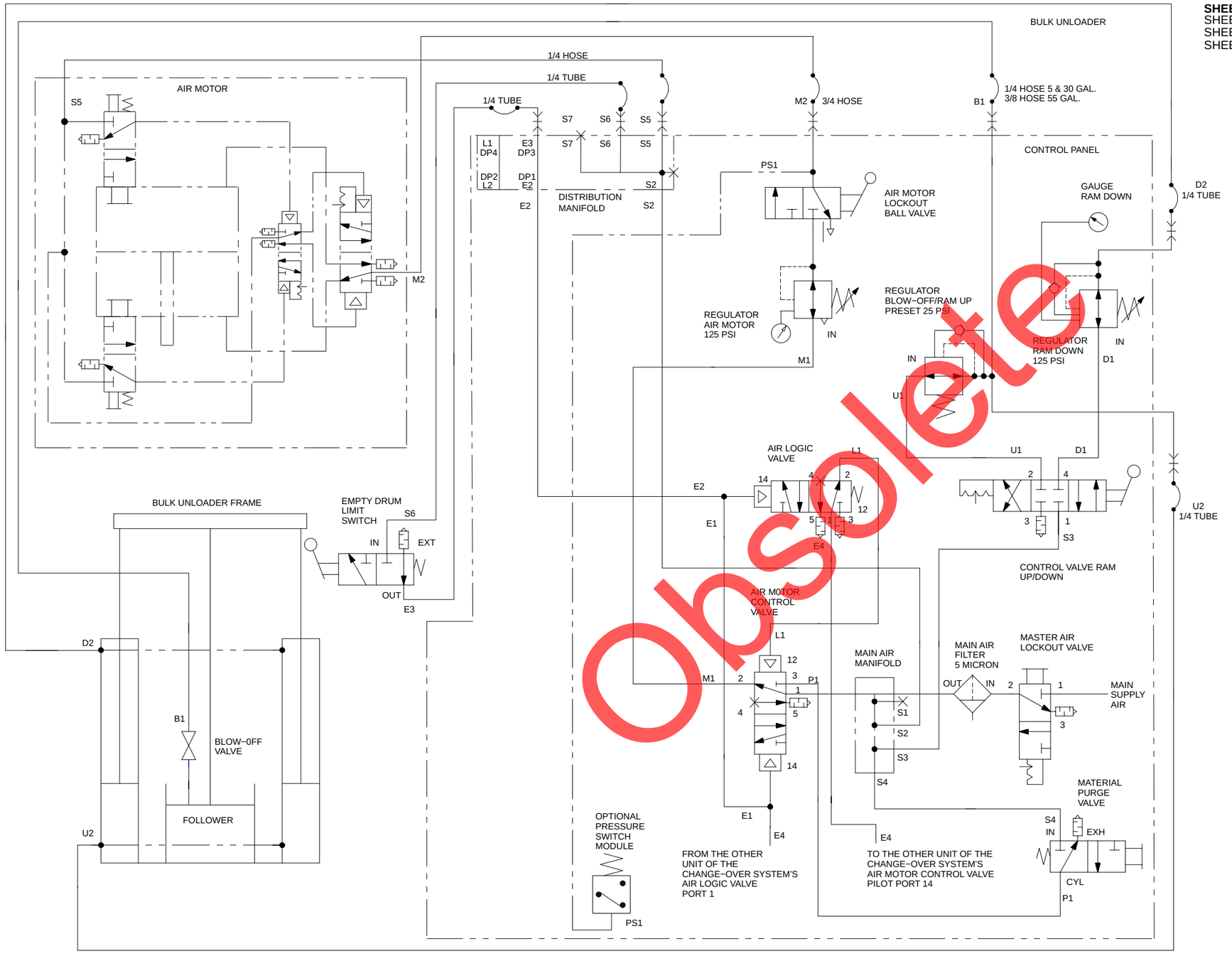


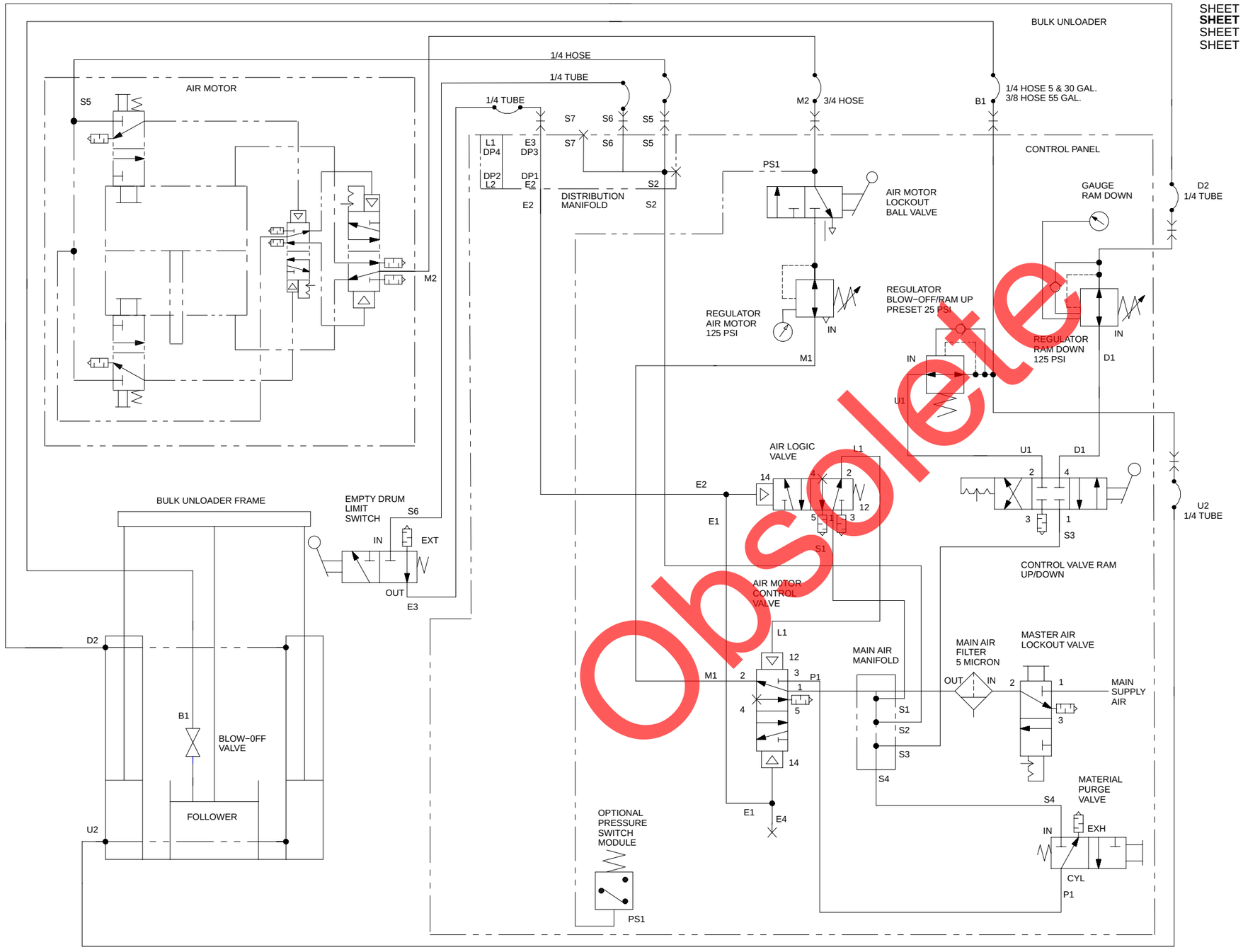
Figure 9 Parts

SHEET 1: CHANGEOVER WITH EMPTY DRUM LEVEL
SHEET 2: STANDALONE WITH EMPTY DRUM LEVEL
SHEET 3: CHANGEOVER PUMP TIMER DELAY MODULE WITH EMPTY DRUM LEVEL
SHEET 4: LOW AND EMPTY DRUM LEVEL DETECTION OPTION



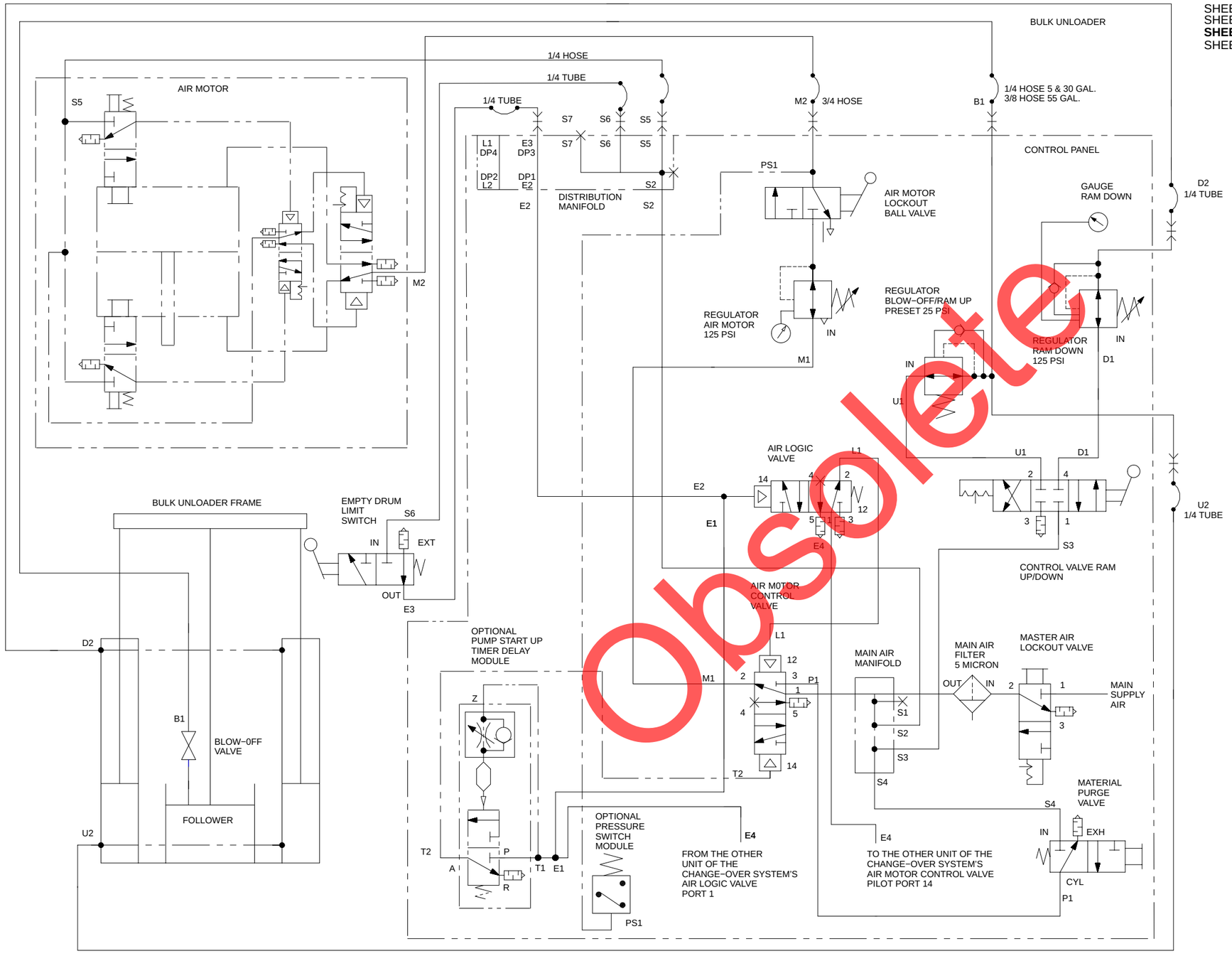
Schematic 1038934B01 (Sheet 1 of 4)

SHEET 1: CHANGEOVER WITH EMPTY DRUM LEVEL
SHEET 2: STANDALONE WITH EMPTY DRUM LEVEL
SHEET 3: CHANGEOVER PUMP TIMER DELAY MODULE WITH EMPTY DRUM LEVEL
SHEET 4: LOW AND EMPTY DRUM LEVEL DETECTION OPTION



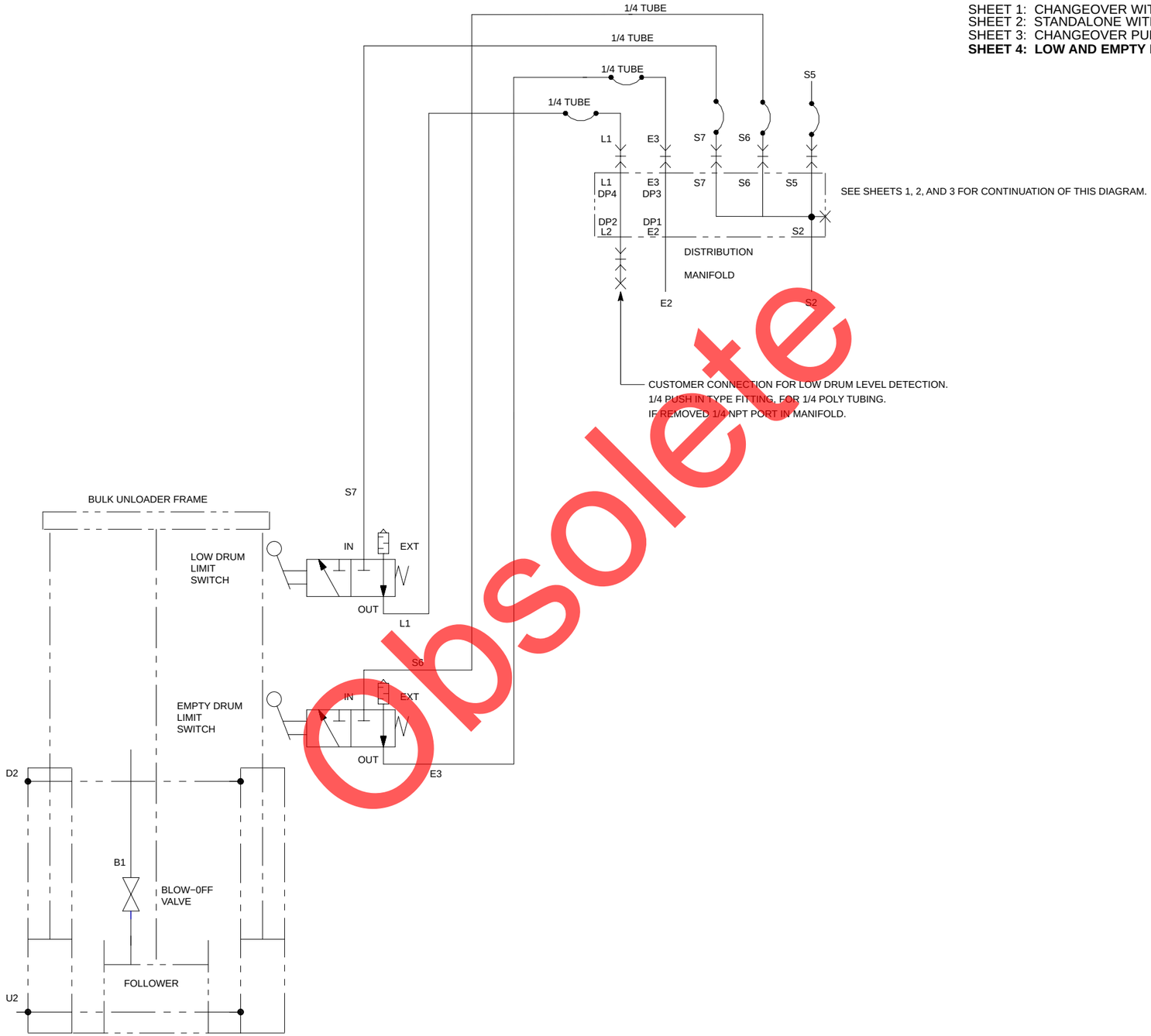
Schematic 1038934B01 (Sheet 2 of 4)

SHEET 1: CHANGEOVER WITH EMPTY DRUM LEVEL
SHEET 2: STANDALONE WITH EMPTY DRUM LEVEL
SHEET 3: CHANGEOVER PUMP TIMER DELAY MODULE WITH EMPTY DRUM LEVEL
SHEET 4: LOW AND EMPTY DRUM LEVEL DETECTION OPTION



Schematic 1038934B01 (Sheet 3 of 4)

SHEET 1: CHANGEOVER WITH EMPTY DRUM LEVEL
SHEET 2: STANDALONE WITH EMPTY DRUM LEVEL
SHEET 3: CHANGEOVER PUMP TIMER DELAY MODULE WITH EMPTY DRUM LEVEL
SHEET 4: LOW AND EMPTY DRUM LEVEL DETECTION OPTION



Schematic 1038934B01 (Sheet 4 of 4)

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