



POWERHOLD SC TRUCK RESTRAINT INSTALLATION AND OPERATION MANUAL

Job Number _____

Job Name _____

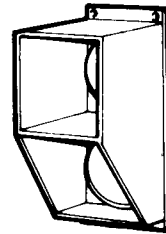
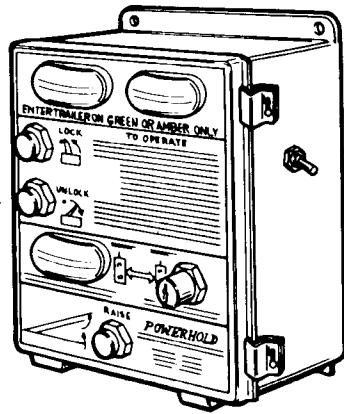
Serial Numbers _____

SYSTEMS, INC.
P.O. BOX 309
Germantown, WI 53022
Phone 262-255-1510
Fax 262-255-4199

INDEX

SECTION	PAGE
I. INSTALLATION	
A. MOUNTING AND ANCHORING	1
B. ELECTRICAL	2
C. HYDRAULIC	2
II. GENERAL INFORMATION	
A. DESCRIPTION OF OPERATING MODES	3
B. DESCRIPTION OF SIGNAL LIGHTS	4
C. SIGNAL LIGHTS AND ALARM SEQUENCE OF OPERATION	5,6
D. OPERATING NOTES	6-7
III. OPERATING INSTRUCTIONS	
A. NORMAL OPERATION	8
B. BYPASS OPERATION	8-9
IV. MAINTENANCE	
A. CLEANING	9
B. LUBRICATION	9
C. HYDRAULIC FLUID CHECK	9
D. SIGNAL LIGHTS CHECK	9
V. MECHANICAL RELEASE	10
VI. PARTS LISTS AND ILLUSTRATIONS	11-15

CONTROL UNIT



DOCK ALERT-2
DRIVER ALERT UNIT

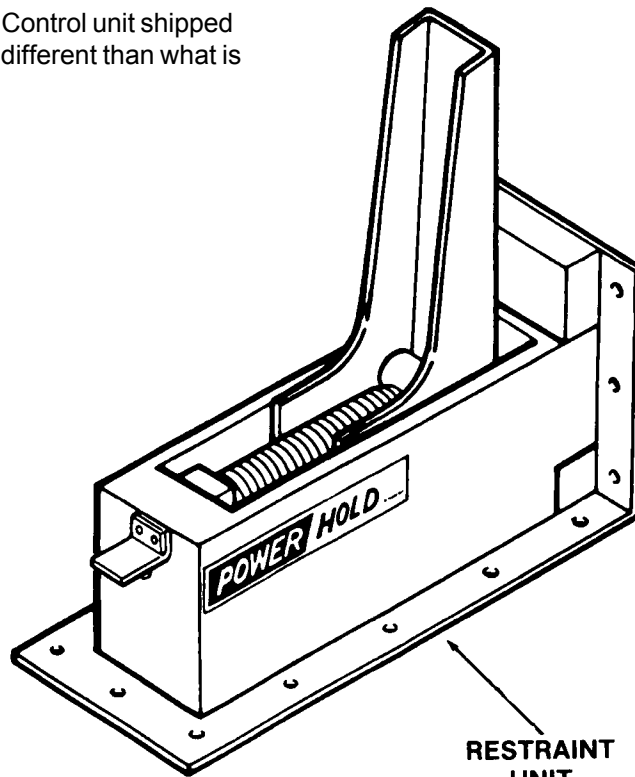
CAUTION
PULL
IN OR
OUT ON
GREEN
ONLY

NOTE: Control unit shipped
may be different than what is
shown.

CAUTION
PULL
IN OR
OUT ON
GREEN
ONLY



ANCHOR
BOLTS



RESTRAINT
UNIT

CAUTION
WHEELS
MUST BE
CHOCKED

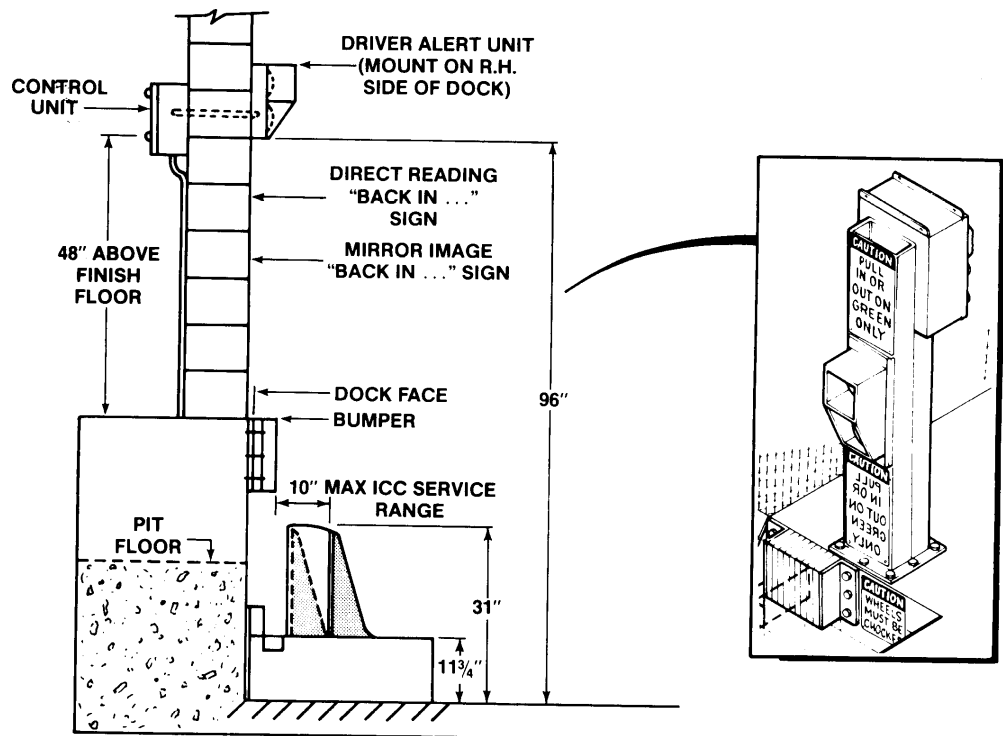
POWERHOLD COMPONENTS

INSTALLATION

MOUNTING AND ANCHORING

Inspect installation location: The POWERHOLD restraint will require solid anchors to assure proper operation. Optimum installations will have both a concrete drive and a poured concrete dock face so that anchor bolts can be well secured. Twelve 1/2" anchor bolts are recommended, however, sixteen mounting holes are provided.

The POWERHOLD restraint should be positioned at the center of the dock leveler and is designed to be flush with the dock face when 4-1/2" bumpers are used. A filler plate (not supplied with POWERHOLD systems) will be required for bumper projections greater than 4-1/2" as follows:



POWERHOLD SYSTEM MOUNTING REQUIREMENTS

BUMPER	FILLER PLATE
6"	1-1/2"
8"	3-1/2"
10"	5-1/2"

IMPORTANT

The restraint should be installed level from top to back and from side to side. The restraint should be installed square with the face of the dock.

Typical mounting requirements for the control unit, driver alert unit and "CAUTION PULL IN OR OUT ON GREEN ONLY" signs are shown in the illustration below. The "CAUTION WHEELS MUST BE CHOCKED" sign should be mounted FOR EASY READING BY TRUCK DRIVER outside and to the right of the overhead door or at the right side of the loading dock. Fasteners for these three caution signs are not included with the POWERHOLD system.

INSTALLATION CONTINUED

ELECTRICAL

Refer to the drawings indicated in Table I for the electrical installation. The drawings are attached to this manual.

IMPORTANT

Make sure that the power supply requirement(s) as shown on the electrical drawings and on the decal of the control assembly(s) are the correct requirement(s) for the application.

TABLE I	
DRAWING DESCRIPTION	INFORMATION ON DRAWING
FIELD WIRING DRAWING	<ul style="list-style-type: none">- ELECTRICAL DATA- RECOMMENDED WIRE SIZES- REQUIRED CONDUIT RUNS- REQUIRED FIELD WIRES PER CONDUIT RUN
INTERCONNECTION DRAWING	<ul style="list-style-type: none">- REQUIRED CONDUIT RUNS- REQUIRED FIELD WIRES PER CONDUIT RUN- TERMINATION POINTS FOR ALL FIELD WIRES

HYDRAULIC

Standard units are factory pre-connected so that no hydraulic field connections are required. Standard units are shipped with a full reservoir of hydraulic fluid. In the event of a fluid loss during shipment or installation, information concerning fluid replenishment can be found in the maintenance instructions section of this manual.

GENERAL INFORMATION

DESCRIPTION OF OPERATING MODES

A. "NORMAL" OPERATING MODE

Used to operate the POWERHOLD restraint to engage the truck ICC bar. An auto-raise cycle will be activated by momentary pressure on the "LOCK" push button (Note: Pressure on the "LOCK" push button must be maintained until the inside lights change from red to amber). An AUTO-LOWER cycle will be activated by momentary pressure on the "UNLOCK" push button. If no truck ICC is engaged, the unit will automatically return to the stored position and an alarm will turn on. The inside and outside signal lights will automatically change as the unit reaches different positions in the raise and lower cycle.

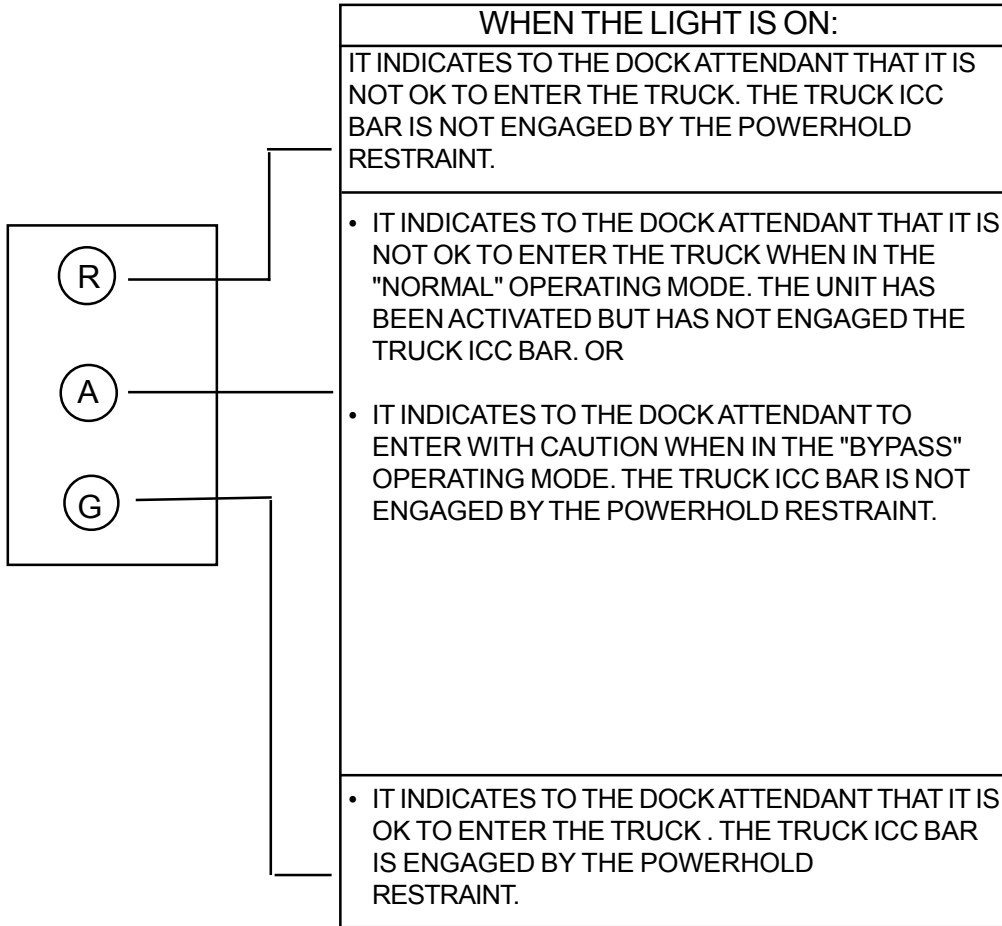
B. "BYPASS" OPERATING MODE

Used when the truck does not have a serviceable ICC bar or if operating the POWERHOLD restraint may damage equipment on the truck. The restraint cannot be operated in this mode. The inside lights are amber and the outside lights are red at all times in this mode. **The truck wheels must be chocked when operating in this mode.**

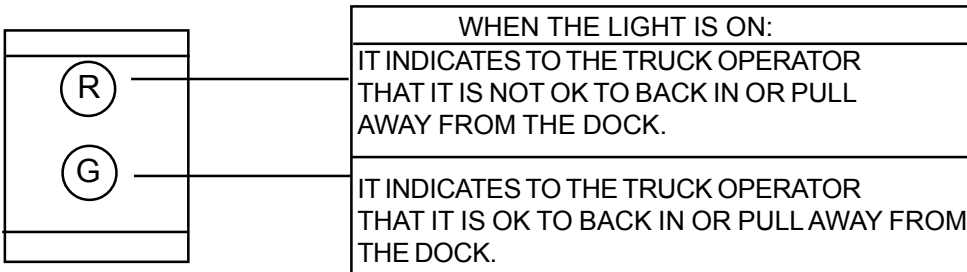
GENERAL INFORMATION CONTINUED

DESCRIPTION OF SIGNAL LIGHTS:

A. INSIDE SIGNAL LIGHTS. These lights are typically located on the PLC/ LOGIC control assembly. the assembly housing the light is to be mounted in a location that is clearly visible to the dock attendant.



B. OUTSIDE SIGNAL LIGHTS. These lights are located in the outside signal light assembly. This light assembly is mounted in a location that is clearly visible to the truck operator.



OUTSIDE SIGNAL LIGHT ASSEMBLY.

GENERAL INFORMATION CONTINUED

SIGNAL LIGHTS AND ALARM SEQUENCE OF OPERATION

A. "NORMAL" operating mode - truck ICC bar engaged.

1. The POWERHOLD restraint is in the fully lowered (stored) position. Limit switch "LS3" is closed.

- Outside light = Green
- Inside light = Red
- Alarm = Off

2. The POWERHOLD restraint is activated.

a. The unit leaves the fully lowered (stored) position. Limit switch "LS3" is open.

- Outside light = Red
- Inside light = Amber
- Alarm = Off

b. The unit reaches the fully raised ICC bar engaged position, Proximity switches "LS1" and "LS2" are closed.

- Outside light = Red
- Inside light = Green
- Alarm = Off

B. "NORMAL" operating mode - truck ICC bar not engaged.

1. The POWERHOLD restraint is in the fully lowered (stored) position, Limit switch "LS3" is closed.

- Outside light = Green
- Inside light = Red
- Alarm = Off

2. The POWERHOLD restraint is activated.

a. The unit leaves the fully lowered (stored) position. Limit switch "LS3" is open.

- Outside light = Red
- Inside light = Amber
- Alarm = Off

b. The unit reaches the fully raised no ICC bar engaged position. Proximity switch "LS1" is closed.

- Outside light = Red
- Inside light = Amber
- Alarm = On (Note: The alarm stays on until the unit reaches

GENERAL INFORMATION CONTINUED

the fully lowered position).

SIGNAL LIGHTS AND ALARM SEQUENCE OF OPERATION CONTINUED.

c. The unit reaches the fully lowered (stored) position. Limit switch "LS3" is closed.

- Outside light = Green
- Inside light = Red
- Alarm = Off

C. "BYPASS" operating mode

- Outside light = Red at all times
- Inside light = Amber at all times
- Alarm = Off at all times

OPERATING NOTES

A. When in the "NORMAL" operating mode, the raise cycle of the restraint will be activated by momentary pressure on the "LOCK" push button (auto raise cycle). However, the auto raise cycle will only be activated if pressure on the "LOCK" push button is maintained long enough to allow the restraint to leave the stored position (i.e., leave the "LS3" limit switch). This will ensure that the dock attendant does want the restraint to be activated. The inside lights will change from RED to AMBER when the restraint leaves the stored position.

B. When in the "NORMAL" operating mode, the lower cycle of restraint will be activated by momentary pressure on the "UNLOCK" push button (auto lower cycle). The inside lights will change from GREEN to AMBER when the restraint leaves the fully raised, ICC bar engaged position.

C. The automatic raise and lower cycles are backed-up with time based failure mode protection, described as follows:

1. Automatic raise cycle:

If the restraint does not reach the fully raised ICC bar engaged position or the fully raised no ICC bar engaged position within approximately 13 seconds after leaving the stored position, the restraint will automatically return to the stored position. Failure to reach the fully raised ICC bar engaged position or the fully raised no ICC bar engaged position can be due to an obstruction preventing the restraint from raising.

Also, the restraint will automatically return to the stored position after the 13 second delay if the unit reaches the fully raised ICC bar engaged position but the "LS1" proximity switch in the unit has failed "OPEN". (Note: If the restraint reaches the fully raised ICC bar engaged position but the "LS2" proximity switch in the unit has failed "OPEN", the automatic

GENERAL INFORMATION CONTINUED

return cycle (with alarm) will be activated).

2. Automatic return cycle (no ICC bar) and automatic lower cycle:

If the restraint does not reach the stored position within approximately 13 seconds after leaving the fully raised ICC bar engaged position or the fully raised no ICC bar engaged position, the restraint will automatically shut off. Failure to reach the stored position can be due to an obstruction preventing the restraint from lowering.

Also, the restraint will automatically shut off after the 13 second delay if the unit reaches the stored position but the "LS3" limit switch in the unit has failed "OPEN".

D. If power is lost after the restraint is activated, the automatic raise and lower cycles will be disabled. Thus, when power is restored the restraint must be reactivated to either the fully raised ICC bar engaged position or the stored position. If the restraint is not in the stored position or the fully raised ICC bar engaged position when power is restored, the alarm will turn on and off (10 seconds on, 50 seconds off) for approximately 10 minutes. This serves as an indication that the restraint should be activated to either the stored position or the fully raised ICC bar engaged position. The alarm will turn off when either the "LOCK" or "UNLOCK" push buttons are pressed.

NOTE: THE ABOVE DESCRIPTION IS FOR AN AUDIBLE ALARM. IF THE UNIT IS EQUIPPED WITH A VISUAL ALARM THE ALARM WILL STAY ON CONTINUOUSLY FOR 10 MINUTES AFTER POWER IS RESUMED. AUDIBLE ALARMS ARE TYPICALLY SUPPLIED. VISUAL ALARMS ARE SUPPLIED UPON CUSTOMER REQUESTS AND/OR FOR APPLICATIONS REQUIRING NEMA 4 RATED CONTROLS.

E. The restraint cannot be operated in the "BYPASS" operating mode.

OPERATING INSTRUCTIONS

NORMAL OPERATION

1. Set the "ON-OFF" switch to "ON".
2. Set the "NORMAL-BYPASS" key switch to "NORMAL".
3. Requirements for proper restraint operation are that the truck be parked perpendicular to the loading dock area with its ICC bar from 4-1/2" to 14-1/2" from the face of the dock when 4-1/2" bumpers are used. If 6" bumpers are used, the horizontal range would be from 6" to 16" from the face of the dock.
4. Inspect the truck to ensure that no truck equipment will be damaged by operating the POWERHOLD restraint.
5. Press the "LOCK" push button until the inside light changes from RED to AMBER. This will activate the auto-raise cycle of the restraint.
 - A. If the restraint engages the truck ICC bar, the inside lights will change from AMBER to GREEN. Proceed with loading/unloading of truck.
 - B. If the restraint does not engage the truck ICC bar, the inside lights will remain AMBER and an alarm will turn on while the restraint automatically returns to the stored position. The lights will change to RED and the alarm will turn off when the restraint reaches the stored position. Follow the "BYPASS" operating instructions.
6. Press the "UNLOCK" push button until the inside lights change from GREEN to AMBER. This will activate the auto-lower cycle of the restraint. The inside lights will change from AMBER to RED when the restraint reaches the stored position.

BYPASS OPERATION

1. Set the "ON-OFF" switch to "ON".
2. Chock truck wheels.
3. Set the "NORMAL-BYPASS" key switch to "BYPASS." The inside lights will change to AMBER.
4. Proceed cautiously with loading/unloading of truck.

CLEANING

The POWERHOLD restraint should be kept free of debris, ice, dirt and sand. Build-ups of foreign material, especially on the top of the slide block assembly (P/N 9413-0022), could result in abnormal operation of the restraint.

LUBRICATION

Lubrication should be performed on a monthly basis. Use Lubriplate No. 18339 multi-purpose grease or equivalent.

Remove all of the old grease from the slide block (P/N 9413-0022) guide channels and from the top of the slide block before applying the new grease. The slide block guide channels are located inside the unit, on the sides of the housing weldment (P/N 9414-0029).

Lubricate the slide block guide channels and the restraint weldment (P/N 9414-0014) pivot point. Also, apply a liberal amount of grease on top of the slide block, especially at the areas of the slide block on which the restraint weldment "rides".

HYDRAULIC FLUID CHECK

The hydraulic fluid level should be checked every month. Fluid level should be approximately 1-1/2" from the top of the reservoir when the restraint is in the fully lowered (stored) position.

To assure normal operation of the restraint the following fluids are approved:

Flomite 530 ZF from Poweramp
Part# 8512-0001 for 1 Gallon Container
Part # 8512-0002 for 5 Gallon Container

Aero shell Fluid 4 or Fluid 41#60421 by Shell Oil Co.
Mobile Aero HFA Mil-HS606A or Aero HF by Mobil Oil Co.
Texaco Aircraft Hydraulic Oil 15 or 5606 by Texaco Oil Co.
Exxon "UNIVISJ13" by Exxon Oil Co.

Note:

Use only aircraft hydraulic fluids designed to meet or exceed Military Specification: Mil-L-5606

Fluid brands can be mixed. Do not mix with fluids other than those listed.

Warranty repairs must use Poweramp and DLM supplied hydraulic fluids to qualify for fluid cost reimbursement.

Using non-approved fluids may effect equipment operation and will void warranty.

MECHANICAL RELEASE

SIGNAL LIGHTS CHECK

To assure dock attendant safety, check to make sure that the inside and outside signal lights function correctly. This check should be performed on a weekly basis. The correct sequence of light operation can be found in the general information section of this manual.

The POWERHOLD restraint is equipped with a mechanical release that can be utilized in the event of an electric and/or hydraulic failure which prevents the unit from releasing the truck ICC bar via normal operating methods.

MATERIAL REQUIRED

- 1-1/8" Wrench
- Phillips head screwdriver
- 2-1/2' or longer, 3/4" rod
- Hammer
- Oil (WD-40 or equivalent)

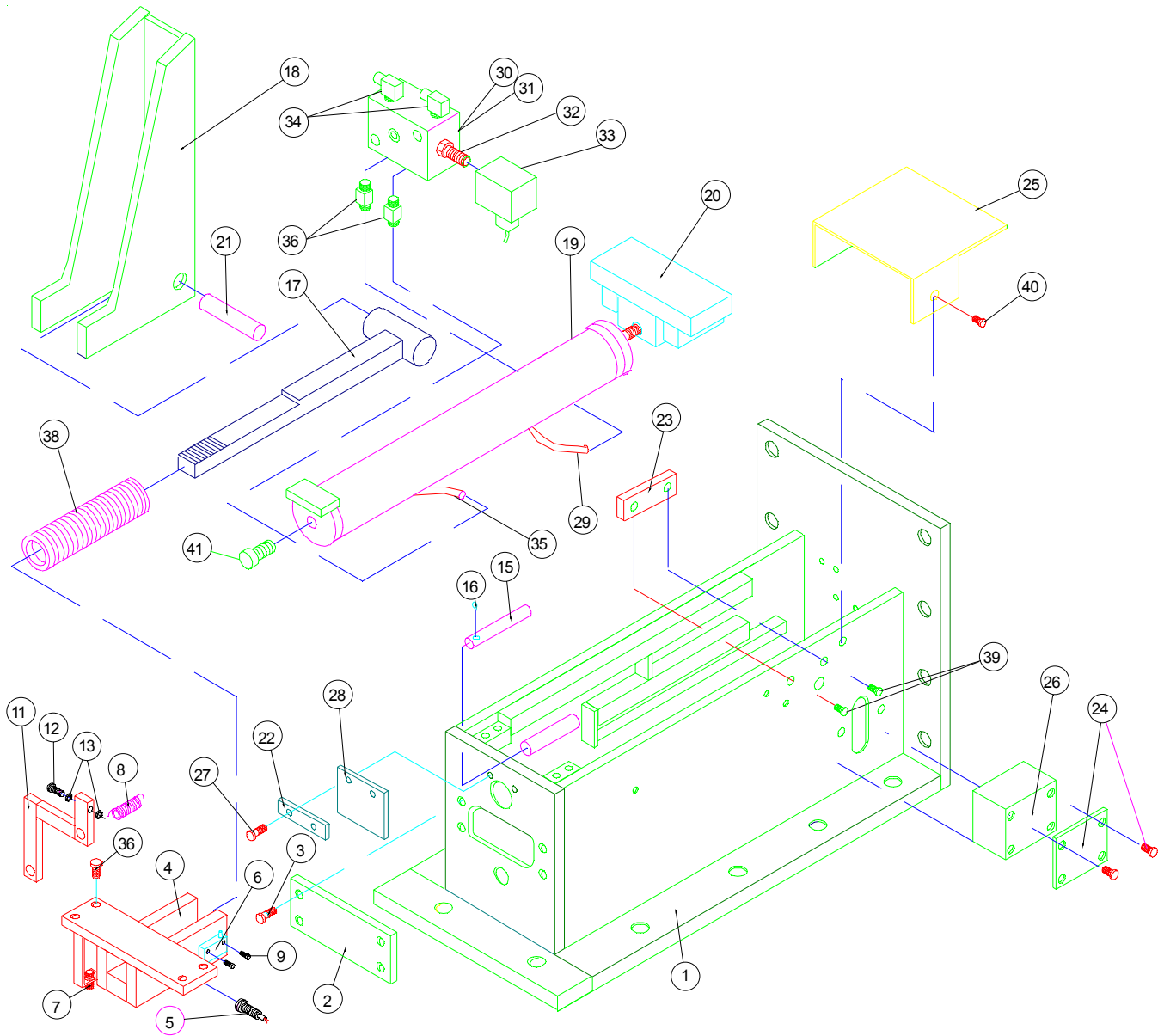
WARNING - POSSIBILITY OF SERIOUS INJURY

Keep all body parts out of the working zone of the restraint weldment (P/N 9414-0014) at all times when performing a mechanical release.

PROCEDURE

1. Make sure outside signal lights are red.
2. Chock truck wheels.
3. Apply a liberal amount of oil to the top of the slide block (P/N 9413-0022).
4. Use the screwdriver to remove the front cover plate (P/N 9411-0012) from the front of the housing weldment (P/N 9414-0029). This requires the removal of four screws.
5. Use the wrench to remove the capscrew (P/N 2101-0118) from the front of the housing weldment.
6. Insert the 3/4" rod through the front of the housing weldment (i.e., through the area of the weldment opened by the removal of the front cover plate). Set one end of the rod into the hole located in the front of the slide block.
7. Hammer on the exposed end of the 3/4" rod to force the slide block towards the face of the dock. The restraint weldment (P/N 9414-0014) should lower when the slide block is repositioned.
8. After truck is released and away from the restraint, reassemble the unit.
9. Determine cause of electric and/or hydraulic failure.

POWERHOLD END RELEASE



POWERHOLD END RELEASE

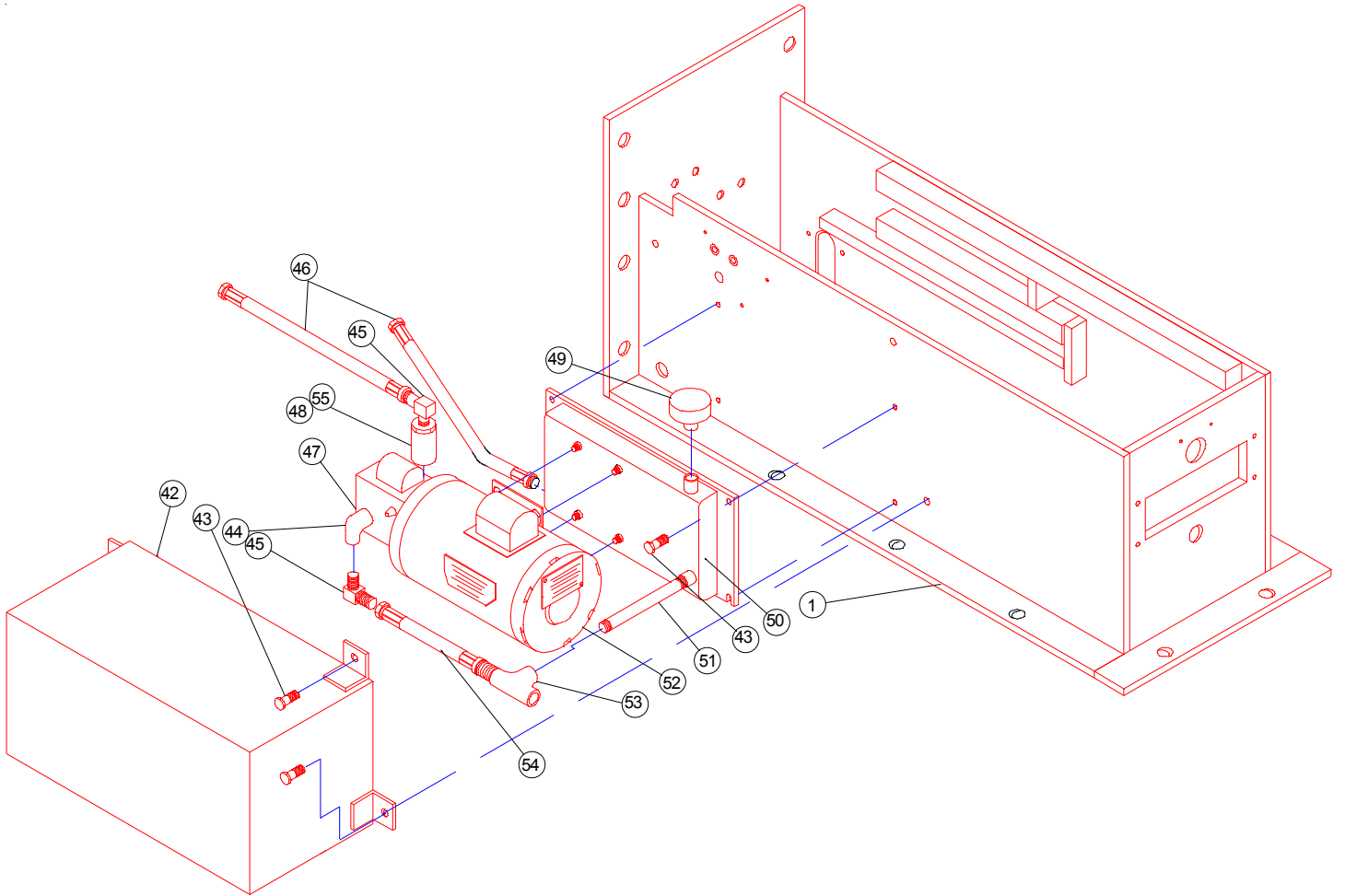
PARTS LIST

ITEM	DESCRIPTION	PART NUMBER
1	HOUSING WELDMENT	9414-0029
2	FRONT COVER PLATE	9411-0012
3	SCREW	2101-0099
4	LATCH WELMENT	9413-0027
5	PROX. SWITCH-RATCHET	0961-0035
6	LIMIT SWITCH-STORED	0961-0037
7	PROX. SWITCH-CYLINDER	0961-0035
8	SPRING SERVALITE	0941-0009
9	CAP SCREW	2101-0100
10	PROX. SWITCH LOCK NUT (NOT SHOWN)	-----
11	BAR-SPRING LEVER	9414-0017
12	CAP SCREW-JAM	2101-0011
13	WASHER	2101-0003
14	CAP SCREW-PIVOT 5/16-18X2 (NOT SHOWN)	2101-0013
15	PUSH ROD	9412-0095
16	CLIP	-----
17	RACK WELDMENT	9414-0021
18	RESTRAINT WELDMENT	9414-0014
19	CYLINDER ASSEMBLY	9414-0024
20	SLIDE BLOCK ASSEMBLY	9413-0022
21	PIN	9412-0030
22	BAR-WEATHERSEAL HOLD DOWN	9411-0007
23	BAR-REMOVABLE TRACK STOP (LH/RH)	9412-0063
24	ELECTRICAL BOX	2752-0029
25	SHROUD	9411-0015
26	COVER & GASKET (ELEC. BOX)	2751-0058

POWERHOLD END RELEASE CONTINUED

ITEM	DESCRIPTION	PART NUMBER
27	SCREW - FRONT PLATE	2101-0076
28	WEATHERSEAL	0192-0016
29	HOSE ASSY - 22"	9904-0039
30	HYDRAULIC VALVE ASSEMBLY	8585-0035
31	BODY WITH SPOOL	8582-0017
32	4-WAY SOLENOID SPOOL	8581-0042
33	SOLENOID COIL ASSEMBLY	8583-0011
34	HOSE ADAPTER 90 DEGREES EL	0521-0042
35	HOSE ASSY 35"	9904-0040
36	HOSE ADAPTER STREET	0521-0043
37	CAPSCREW	2101-0074
38	SPRING	9411-0005
39	CAPSCREW - TRACK STOP	2101-0069
40	SCREW	2101-0076
41	CAPSCREW	2101-0118

POWERHOLD SELF CONTAINED



POWERHOLD SELF CONTAINED

ITEM	DESCRIPTION	PART NUMBER
42	SHROUD - MOTOR	9412-0107
43	CAPSCREW	2101-0009
44	90 DEGREE STREET ELBOW	9301-0034
45	HOSE ADAPTOR - 90 DEGREE ELBOW	0521-0076
46	HOSE ASSY - 14"	9904-0038
47	PUMP	9301-0084
48	FILTER	9301-0085
49	BREATHER CAP	9301-0020
50	RESERVOIR	9303-0010
51	NIPPLE	9301-0045
52	MOTOR	3411-0008
53	TEE	9301-0012
54	HOSE ASSY - 11"	9904-0041
55	ELEMENT	9301-0086