PENTALIFT TM

PENTALIFT EQUIPMENT CORPORATION

LPR35
LOW PROFILE VEHICLE RESTRAINT
OWNERS MANUAL

SERIAL NUMBER : _____

Individual Serial Number(s) must be filled out by the user for future reference.

CAPACITY: 35,000 LB DRAW PULL FORCE

This manual is an important document.
It shall be kept with the machine or located where readily available to operators and maintenance personnel for reference purposes. Do not install, operate or service this product unless you have read and fully understand the entire contents of this manual. Failure to do so may result in property damage, bodily injury or death. Keep this manual in a safe place for future reference.

NOTE: A very high level of field issues with this type of equipment can be directly attributed to improper or incomplete installation. The installation instructions and information provided for this equipment is thorough. A step by step sequence for installation is provided. All steps must be followed and completed to provide a complete installation. Incomplete or improper installations can lead to equipment malfunction and / or damage, create safety issues and void warranties. Please follow all installation and set ups steps as indicated in the installation instructions and owner's manual. If you are unclear or uncertain regarding any of the steps contact your Pentalift representative for clarification. A copy of the completed steps listing with the sign off and photos of the installation as indicated at the conclusion of the installation instructions will be required prior to any Pentalift factory trouble shooting assistance.

Pentalift Equipment Corporation
21 Nicholas Beaver Rd
Puslinch, ON N0B 2J0
Phone: 519-763-3625
Fax: 519-763-2894
Parts Phone: 519-763-3625 Extension 625
Ask for Parts Department

Pentalift Equipment Corporation provides an owners manual when equipment is shipped. Additional manuals are available at $25.00 each.

IMPORTANT: The owners manuals that are provided on Pentalift Equipment Corporations website are generic in nature. They are provided for general information only. For all purposes, only the owners manual that is specific to the equipment should be referenced and relied on. In order to receive the specific owners manual for specific Pentalift equipment, please contact your Pentalift representative and supply the specific serial number(s) for the equipment the manual is required for. Do not rely on the information in the generic owners manuals provided through the website as it may not be appropriate for your specific Pentalift equipment.

PRODUCT REGISTRATION

PRODUCT REGISTRATION

PRODUCT REGISTRATION CARD

To validate warranty and to advise of product updates please complete the following information and return to
Pentalift Equipment Corporation
To validate warranty on-line go to: www.pentallift.com

End User Information

*Company Name:		
Contact *First Name:	*Last Name:	Title:
*Mailing Address:		
*City:	*State/Prov.	*Zip/Postal Code:
*Phone: ( ) -	Fax: ( ) -	Email:
Check Products Purchased: ف Levelers, ف Vehicle Restraints, ف Seals/Shelters, ف Elevating Docks, ف Lift Tables		
*Serial Number(s):	Invoice # (if available):	
Dealer Name:	Sales Rep.:	
Manual Verification *Manual Number:		

*Indicates information that must be provided.

Please return to:

Pentalift Equipment Corporation
P.O. Box 1510,
Buffalo, NY 14240-1510

or

Pentalift Equipment Corporation
21 Nicholas Beaver Rd
Puslinch, Ontario N0B 2J0

Attention: Service Department

Or Fax to (519) 763-2894

SAFETY INFORMATION AND WARNINGS

DANGER **READ THESE SAFETY PRACTICES BEFORE INSTALLING, OPERATING OR SERVICING THE LPR35 VEHICLE RESTRAINT. FAILURE TO FOLLOW THESE SAFETY PRACTICES MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY OR DEATH.**

THE OPERATION OF THIS EQUIPMENT IS SUBJECT TO CERTAIN HAZARDS THAT CAN BE PROTECTED AGAINST ONLY BY THE EXERCISE OF CARE AND COMMON SENSE AND NOT BY MECHANICAL MEANS. IT IS, THEREFORE, ESSENTIAL TO HAVE COMPETENT, QUALIFIED OPERATORS TRAINED IN THE SAFE OPERATION AND CARE OF THIS TYPE OF EQUIPMENT. ALL PERSONNEL MUST COMPLETELY UNDERSTAND THIS SAFETY INFORMATION BEFORE WORKING ON OR NEAR THIS EQUIPMENT.

DANGER **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION **CAUTION**, used with the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE **NOTICE** is used to address practices not related to personal injury.

DANGER **Before doing any installation, maintenance, inspection or trouble shooting, barricade all areas from traffic around the work area inside (and outside if applicable) for safety and post appropriate warning signs.**

DANGER **Arc flash and shock hazard PPE (personal protection equipment) required. De-energize equipment before working on or inside. Do not open cover without appropriate PPE. Refer to NFPA 70E for PPE requirements. This panel may contain more than one power source. Hazardous voltage will cause severe injury or death.**

DANGER **Before doing any electrical work, be certain that the power is disconnected with a fused disconnect, properly tagged and locked out. Fused disconnect and lockout device (supplied and installed by others) must meet with all applicable codes and regulations. All electrical work must be performed by a qualified electrician in accordance with all applicable codes and regulations.**

DANGER **THE VEHICLE RESTRAINT IS AN IMPORTANT SAFETY DEVICE. NEVER DISCONNECT POWER TO THE RESTRAINT SYSTEM WHILE THE DOCK IS IN USE. IN THE EVENT OF A POWER FAILURE, BARRICADE THE WORK AREA TO PREVENT USE OF THE DOCK.**

WARNING **It is the responsibility of others to ensure the proper mounting of any wall mounted equipment such as remote power units, control panels and light packages and to ensure that the mounting surface is capable of fully supporting the loads generated by the equipment.**

1. Do not load/unload any truck without visually confirming that the vehicle restraint has securely engaged the truck's R.I.G. (Rear Impact Guard) and the appropriate signal lights are illuminated as indicated by the operating instructions in the Owners Manual and on the control panel. If the vehicle restraint fails to engage the truck's R.I.G. for any reason, be certain to restrain the truck with appropriate alternate means and follow the override procedures listed in this manual before proceeding with any loading/unloading.

2. **NEVER** attempt to load/unload the truck when the **INSIDE RED** light is illuminated.

3. Do not operate, use, maintain or install this equipment if you are impaired in any manner.

4. Never stand between the dock and a truck. Stay clear of operating path at all times.

5. When not in use, the restraint must always be in the stored position.

6. Regular inspection and maintenance must be performed to keep the equipment in proper operating condition in accordance with the detailed instructions in this manual. (see 'MAINTENANCE' Section, page 37)

7. Ensure that the equipment is not used by anyone if you believe that any part of it might be in disrepair (e.g. loose wires, leaking hoses, bent structural members, broken welds, etc.). See Warranty Section, page 57.

8. If you have any questions, contact your immediate supervisor or your authorized Pentalift representative for assistance.

OWNER RESPONSIBILITY

The Owner's Responsibilities include the following:

6.3.1 The owner should recognize inherent danger of the interface between dock and transport vehicle. The owner shall, therefore, train and instruct loading dock operating personnel in the proper use of restraining devices in accordance with information provided in Section 6.1.2.

6.3.2 Nameplates, cautions, instructions, posted warnings and communication lights shall not be obscured from the view of loading dock operating personnel or maintenance personnel for whom such warnings are intended (also see 6.1.3 and 6.3.5).

6.3.3 Manufacturer's recommended periodic maintenance and inspection procedures in effect at date of shipment shall be followed, and written records of the performance of these procedures should be kept.

6.3.4 Restraining devices that are structurally damaged shall be removed from service, inspected by the manufacturer's authorized representative, and repaired as needed before being placed back in service.

6.3.5 The manufacturer shall supply replacement nameplates, communication lights, caution or instructional labels, and operating and maintenance manuals upon request of the owner. The owner shall see that all nameplates, communication lights, and caution and instruction markings or labels, are in place and legible and that the appropriate operating and maintenance manuals are provided to users (see also 6.1.3 and 6.3.2).

6.3.6 Modifications or alterations of restraining devices shall be made only with written permission of the original manufacturer. These changes shall be in conformance with all applicable provisions of this standard and shall be at least as safe as the equipment was before modification. These changes shall also satisfy all safety recommendations of the original equipment manufacturer for the particular application of the restraint.

6.3.7 When industrial vehicles are driven on or off a transport vehicle during loading or unloading operation, the parking brakes on the transport vehicle shall be applied and wheel chocks or another vehicle restraint that provides equal or better protection shall be engaged. Also, whenever possible air-ride suspension systems should have the air exhausted prior to performing said loading or unloading operations.

6.3.8 When a vehicle restraint is unable to properly engage a transport vehicle, the user shall activate the applicable communication if so included, or provide an alternate method to address a "not restrained vehicle condition" to alert and or protect the loading dock operating personnel.

6.3.9 When selecting a restraining device, it is important to consider not only present requirements but also future plans or adverse environments.

6.3.10 The restraint should never be used in a manner not intended by its design. It must also be compatible with the loading dock equipment and other conditions relating to the loading dock area.

***NOTE:** The MH30 Committee recognizes the devices intended to secure a transport vehicle to a loading dock by mechanical means. The NHTSA Standard 49CFR ch.V 571.223 specifies the strength of the rear impact guard and 49 CFR Ch.V 571.224 specifies the size and locations of the rear impact guard. It is, therefore, recommended that users of such positive restraint devices review:*

- *The means of attachment to the transport vehicle*
- *The strength of the overall connection*
- *The proper coordination of the actuation of devices with any signaling system used*
- *The need to use wheel chocks*

⚠DANGER

Unless specifically agreed to in writing by Pentalift Equipment Corporation at the time the equipment is ordered and prior to the equipment's manufacture, this equipment is sold as a complete package. It is not to be altered, changed or added to in any way or form, in its configuration and function, without the written permission of Pentalift Equipment Corporation.

If requested by a customer, Pentalift Equipment Corporation is not supplying all or some of the power unit and / or control components for the equipment's application. The power unit and controls constitute important safety and functional aspects of the equipment. It is the customer's responsibility to address the operational and safety issues associated with providing the required controls and power units to satisfy the operational and safety requirements of the equipment.

The customer's decision to supply all or some of these components indicates that the customer is taking full responsibility for any and all possible operational, safety and liability issues associated to the product and its configuration. The customer also agrees to absolve Pentalift Equipment Corporation from any and all possible operation, safety and liability issues.

TABLE OF CONTENTS

PRECAUTIONARY LABELING

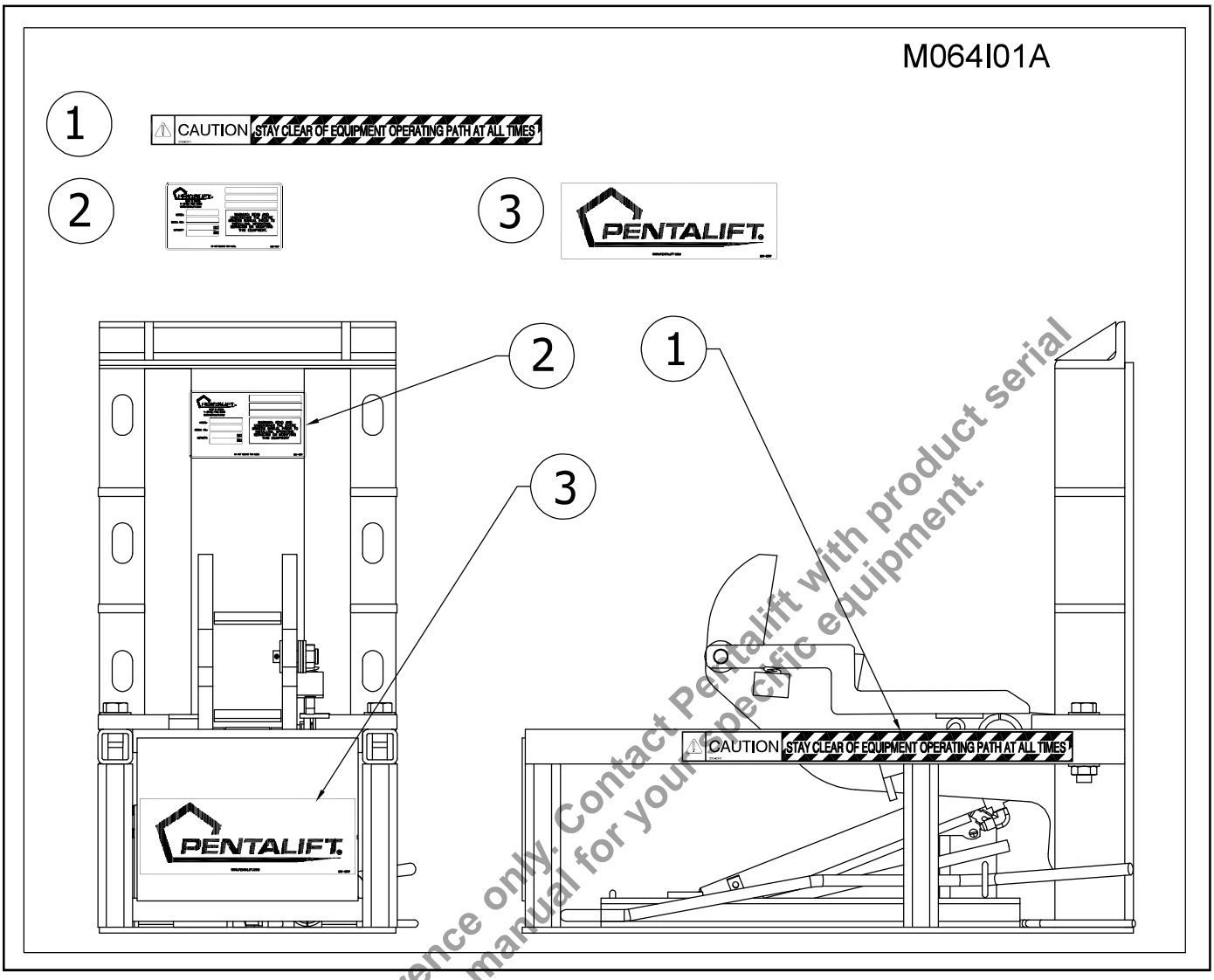


Figure 1: Precautionary Labels and Signs

Be sure that all labeling is in place and intact when the unit is received. If any of the precautionary labels or decals are missing or illegible, contact your Pentalift representative for immediate replacement.

NOTE: In some instances, product configuration and / or product options may dictate that the product labels will not be placed as indicated on the drawing (Figure 1). Different label locations will be selected at the factory, when required, to avoid an impaired view of the labels. Note the label locations as supplied on the product, when it is received to accommodate future label replacement requirements.

NOTE:It is the owner's responsibility to ensure that all precautionary labeling remains legible and in its original position throughout the life of the product. It is also the owner's responsibility to ensure that all labels are and will continue to be readily visible to the operators and people working with or around the equipment. If visibility of any of label is compromised for any reason then; either 1) Rectify the situation to allow the label to be readily visible 2) Order replacement label(s) from Pentalift for installation in a location that does facilitate complete visibility. If any of the precautionary labels are missing or illegible, contact your Pentalift representative for immediate replacement. Inspection shall be done during regular maintenance and lubrication (See "MAINTENANCE AND LUBRICATION" on page 37).

To re-order labels , use the following part numbers:

Item	Part No.	Qty / Unit	Description
1	250-2341	2	“CAUTION Stay clear of equipment...”
2	250-2368	1	Specification Plate
3	250-2307	1	“PENTALIFT” Manufacturers Name Label

NOTE: State Model # and Serial # when ordering replacement parts.

INSTALLATION INSTRUCTIONS

⚠DANGER **Do not install, operate or service this product unless you have read and fully understand the entire contents of this manual. Failure to do so may result in property damage, bodily injury or death.**

NOTE: A very high level of field issues with this type of equipment can be directly attributed to improper or incomplete installation. The installation instructions and information provided for this equipment is thorough. A step by step sequence for installation is provided. All steps must be followed and completed to provide a complete installation. Incomplete or improper installations can lead to equipment malfunction and / or damage, create safety issues and void warranties. Please follow all installation and set ups steps as indicated in the installation instructions and owner's manual. If you are unclear or uncertain regarding any of the steps contact your Pentalift representative for clarification. A copy of the completed steps listing with the sign off and photos of the installation as indicated at the conclusion of the installation instructions will be required prior to any Pentalift factory trouble shooting assistance.

IMPORTANT

PREPARATION PRIOR TO INSTALLATION

Follow all installation instructions in the precise consecutive order that they are written. If the equipment cannot be installed in the order as outlined below, contact Pentalift Equipment Corporation for written instructions on how to proceed. Do not proceed with an alternate installation method unless written confirmation has been provided by Pentalift Equipment Corporation. To accommodate a complete installation there is a blank space provided beside each numbered step in the installation instructions. Please check off the steps sequentially as they are completed. This will assist in confirming a complete installation.

⚠DANGER **Before doing any installation, maintenance, inspection or trouble shooting, barricade all areas from traffic around the work area inside (and outside if applicable) for safety and post appropriate warning signs.**

⚠DANGER **Arc flash and shock hazard PPE (personal protection equipment) required. De-energize equipment before working on or inside. Do not open cover without appropriate PPE. Refer to NFPA 70E for PPE requirements. This panel may contain more than one power source. Hazardous voltage will cause severe injury or death.**

⚠DANGER **Before doing any electrical work, be certain that the power is disconnected with a fused disconnect, properly tagged and locked out. Fused disconnect and lockout device (supplied and installed by others) must meet with all applicable codes and regulations. All electrical work must be performed by a qualified electrician in accordance with all applicable codes and regulations.**

⚠DANGER **MAKE SURE LIFTING AND SLINGING DEVICES ARE OF SUFFICIENT CAPACITY, USED IN THE CORRECT MANNER AND ARE IN GOOD WORKING ORDER. ALL LIFTING, POSITIONING AND INSTALLATION, AS WELL AS THE BREAK-IN AND PERFORMANCE CHECK MUST BE DONE BY QUALIFIED PERSONNEL TRAINED AND EXPERIENCED IN NECESSARY SAFETY PROCEDURES.**

⚠CAUTION **BE SURE ALL HYDRAULIC FITTINGS ARE RATED FOR HYDRAULIC SYSTEMS THAT MAY PEAK OUT AT 4000PSI. HARDWARE STORE ITEMS CAN BURST AT 150PSI. ONLY BUY REPLACEMENT PARTS FROM PENTALIFT.**

⚠WARNING **It is the responsibility of others to ensure the proper mounting of any wall mounted equipment such as remote power units, control panels and light packages and to ensure that the mounting surface is capable of fully supporting the loads generated by the equipment.**

⚠WARNING **THIS RESTRAINT IS DESIGNED TO OPERATE WITH THE FACE OF THE DOCK BUMPERS EXTENDED 4" PAST THE POSITION OF THE BACK PLATE OF THE RESTRAINT ONCE IT IS INSTALLED. THIS DIMENSION RELATIONSHIP IS CRITICAL TO ASSURING THE PROPER OPERATIONAL POSITIONING OF THE RESTRAINT. PRIOR TO COMMENCING WITH THE INSTALLATION, CONFIRM THAT THE ABOVE NOTED RELATIONSHIP BETWEEN THE DOCK BUMPER AND THE RESTRAINT WILL EXIST ONCE THE INSTALLATION IS COMPLETED. ONCE THIS IS CONFIRMED, COMMENCE THE INSTALLATION. IF THE PROPER RELATIONSHIP WILL NOT EXIST, A RESTRAINT INSTALLATION EXTENSION PLATE MAY BE REQUIRED. CONSULT YOUR AUTHORIZED REPRESENTATIVE FOR ASSISTANCE.**

LAG INSTALLATION

NOTICE **Never weld on the Pentalock vehicle restraint after sensing switches are wired into the control box and the power to the box is on. Electrical current from the welder can "feedback" through the circuit and damage the motor and other components.**

1. __ Ensure that the required conduits are in place (See "Figure 24: Conduit / Sign Locations" on page 26).
2. __ Consult the Lag Installation Tables on "LAG INSTALLATION" on page 6, 7 and 8 to determine which installation method applies to your application.
3. __ Ensure the concrete has sufficient strength to meet the draw pull forces which will be applied (See "Figure 2: Draw Pull Forces and Installation Methods" on page 9).
4. __ Mark center line of dock and center line on restraint back plate.
5. __ Center the restraint on the center line of the dock and position as shown in "Figure 3: Shim Locations" on page 10.
   (If the restraint has an extension plate, see "EXTENSION INSTALLATION INSTRUCTIONS" on page 21 for installation instructions)

LAG INSTALLATION TABLE FOR DOCK LEVELERS WITH 16” AND 18” LIPS				
		METHOD 1	METHOD 2	METHOD 3
DOCK HEIGHT		STANDARD LPR WITH 8 BOLTS ON BACK PLATE- NO HORIZONTAL LAG PLATES	STANDARD LPR WITH 6 BOLTS ON BACK PLATE AND 2 ON HORIZONTAL LAG PLATES	EXTRA LOW DOCK LPR WITH 4 BOLTS ON BACK PLATE AND 2 ON HORIZONTAL LAG PLATES
20” LEVELER PIT DEPTH	24” LEVELER PIT DEPTH			
56”		√		
55”		√		
54”		√		
53”		√		
52”	56”	√		
51”	55”	√		
50”	54”	√		
49”	53”	√		
48”	52”	√		
47”	51”	√		
46”	50”	√		
45”	49”		√	
44”	48”		√	
43”	47”		√	
42”	46”		√	
41”	45”			√
40”	44”			√
39”	43”			√
38”	42”			√

NOTE 1: See “Figure 2: Draw Pull Forces and Installation Methods” on page 9.

NOTE 2: If the dock height measurement is between values, round the measurement down to the lower value to choose the appropriate installation method.

LAG INSTALLATION TABLE FOR DOCK LEVELERS WITH 20” LIP			
		METHOD 1	METHOD 4
DOCK HEIGHT		STANDARD LPR WITH 8 BOLTS ON BACK PLATE	EXTRA LOW DOCK LPR WITH 6 BOLTS ON BACK PLATE
20” LEVELER PIT DEPTH	24” LEVELER PIT DEPTH		
56”		√	
55”		√	
54”		√	
53”		√	
52”	56”	√	
51”	55”	√	
50”	54”	√	
49”	53”	√	
48”	52”	√	
47”	51”	√	
46”	50”	√	
45”	49”		√
44”	48”		√
43”	47”		√
42”	46”		√

NOTE 1: See “Figure 2: Draw Pull Forces and Installation Methods” on page 9.

NOTE 2: If the dock height measurement is between values, round the measurement down to the lower value to choose the appropriate installation method.

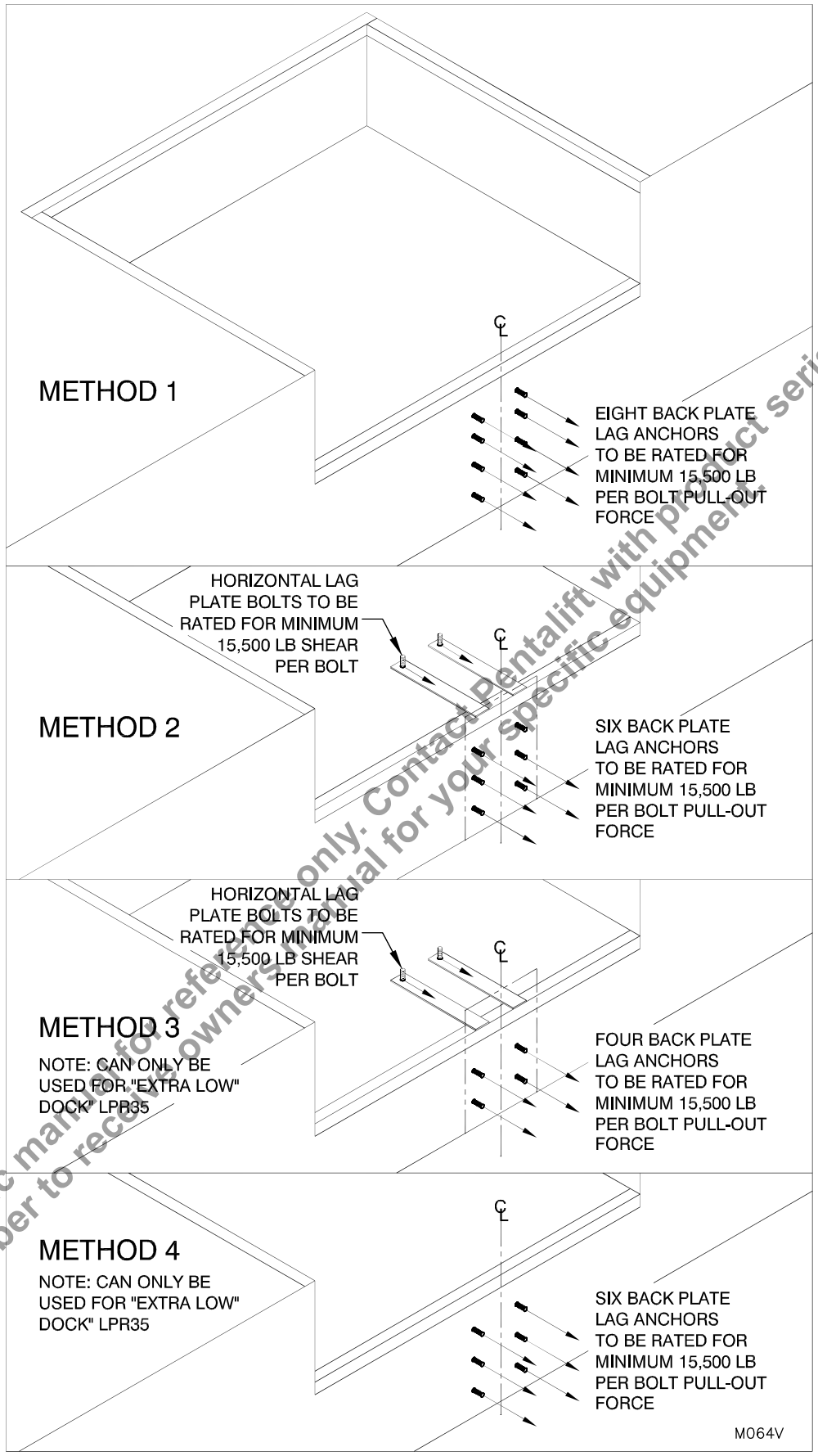


Figure 2: Draw Pull Forces and Installation Methods

6. __ Remove the guard assembly from the restraint by unbolting and sliding the guard forward. (See “Figure 4: Remove/ Replace Guard Assembly” on page 10)

7. __ Restraint must be level and plumb when positioned against the foundation wall. If the wall and/or ground are not square with respect to the back plate and the bottom plate of the restraint, metal shims must be inserted. Ensure the shims, if required, are located behind the lag holes in the back plate, below the bottom cylinder clevis and beneath the front corners of the bottom plate to prevent the back plate or bottom plate from twisting during lagging to the wall and to support the restraint appropriately during use (See “Figure 3: Shim Locations” on page 10). All shims must be welded together as well as to the back plate or bottom plate.

8. __ Proceed to Method 1, Method 2, Method 3 or Method 4 as determined in step 2.

9. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

Installer Name (Print) _____

Installer Signature _____

Date Installation Completed _____

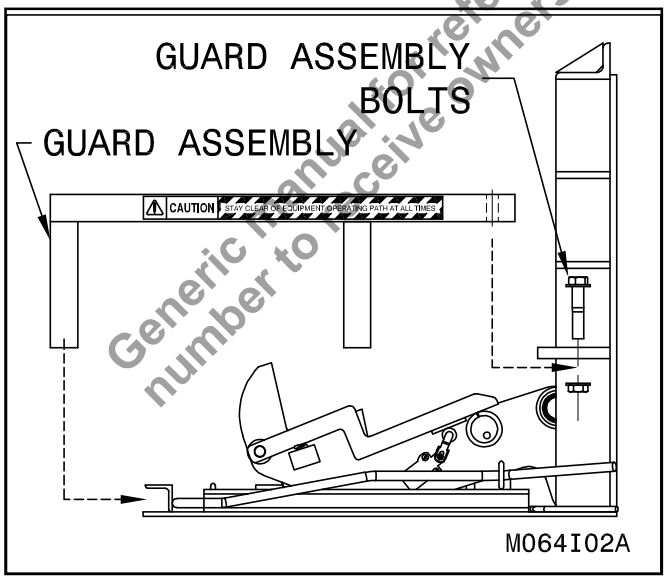


Figure 4: Remove/ Replace Guard Assembly

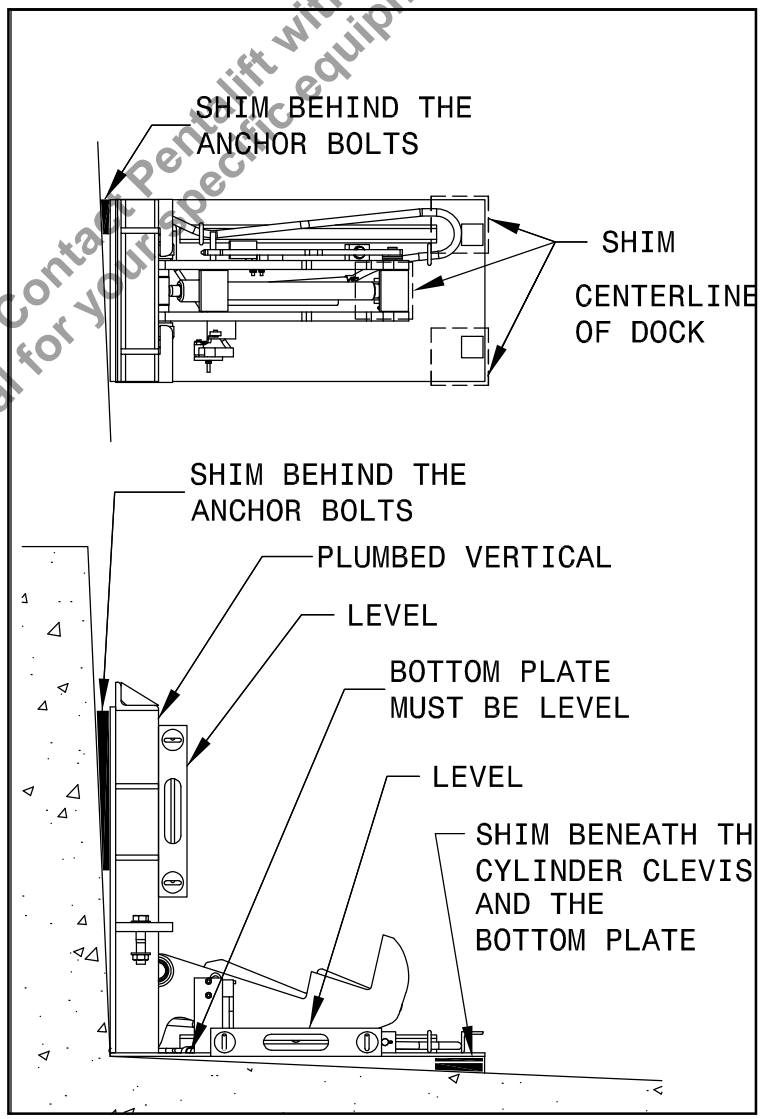


Figure 3: Shim Locations

LAG METHOD 1

1. __ Drill eight lag holes into the dock face using the back plate of the restraint as a template.

2. __ Lag the unit to the dock face with recommended fasteners, 3/4" diameter x minimum 7" long wedge anchors with a minimum shear value of 19,200 lbs (8,540 kg), and minimum tension value of 15,500 lbs (6,890 kg) or any other anchor that provides equal or superior specifications. Torque to manufacturers' specifications. Ensure that flat washers are used for all slotted holes.

3. __ Proceed to "LIP DIVERTER INFORMATION" on page 24.

4. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

Installer Name (Print) **Installer Signature**

Date Installation Completed

LAG METHOD 2

1. __ Drill lag holes into the dock face using only the lower six holes in the back plate of the restraint as a template.

2. __ PIT MODEL DOCK LEVELER

   a) If there is a gap (as a result of shimming the dock) between the front angle of the dock leveler and the dock leveler pit floor of ¼" or more, place the horizontal lag plates onto the dock leveler pit floor, directly behind and perpendicular to the back plate of the restraint, and slide the horizontal lag plates under the front angle of the dock leveler until they butt up against the back plate of the restraint. See "Figure 5: Horizontal Lag Plate Installation" on page 11. (If no gap is present, proceed to item 2.h) and follow the Pour-In Dock Leveler instruction.)

   b) The horizontal lag plates must be positioned centered behind the back plate and parallel to each other; not more than 10 ¼" apart and not less that 5 ¼" apart (This variation allows for any shims which may be present under the front angle). See "Figure 6: Horizontal Lag Plate Location" on page 12.

   c) Tack weld the horizontal back plates to the back plate or mark the position.

   d) Pull the restraint away from the wall and place a minimum 5/16" fillet weld the full width of the horizontal lag plate to the back plate of the restraint. See "Figure 5: Horizontal Lag Plate Installation" on page 11.

   e) Reposition the restraint against the dock face.

   f) Drill two holes into the dock leveler pit floor using the horizontal lag plates as a template.

   g) Proceed to item 3 on page 12.

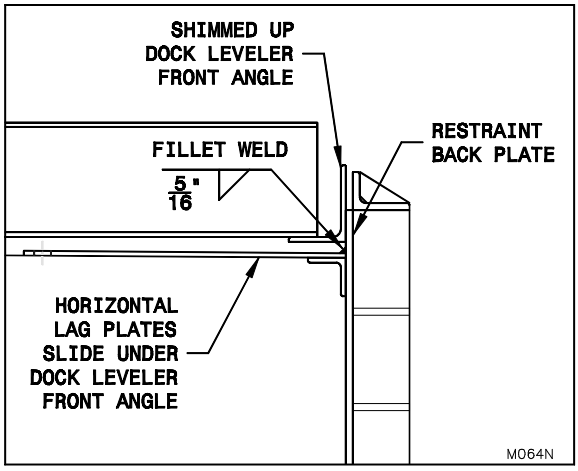


Figure 5: Horizontal Lag Plate Installation

__ POUR-IN DOCK LEVELER

h) Because there is no gap between the front angle of the dock leveler and the dock leveler pit floor, the horizontal lag plates and restraint back plate must both be welded to the dock leveler front angle. Position the horizontal lag plates centered directly behind and perpendicular to the back plate of the restraint, butted up against the front angle of the dock leveler. They must be parallel to each other; not more than 10 ¼" apart and not less than 5 ¼" apart. See "Figure 7: Horizontal Lag Plate for Pour-In Dock" on page 12.

i) Using the horizontal lag plates as a template, mark the holes in the horizontal lag plates onto the bottom pan of the dock leveler.

j) Remove the horizontal lag plates and drill two holes through the bottom pan to install lag anchors.

k) Position the horizontal lag plates into the position as noted in item 2.h).

l) Weld the full width of the horizontal lag plates as well as the vertical depth of the horizontal lag plates to the front angle of the dock leveler. See "Figure 7: Horizontal Lag Plate for Pour-In Dock" on page 12.

m) If the back plate of the restraint is higher than the front angle of the dock leveler, shim between the top angle of the back plate and the front angle of the dock leveler and weld the shim to both as shown in "Figure 9: Back Plate is Higher than Dock Front Angle" on page 13.

n) If the back plate of the restraint is lower than the top of the front angle of the dock leveler, shim between the top angle of the back plate and the front angle of the dock leveler and weld the shim to both as shown in "Figure 8: Back Plate is Lower than Dock Front Angle" on page 13.

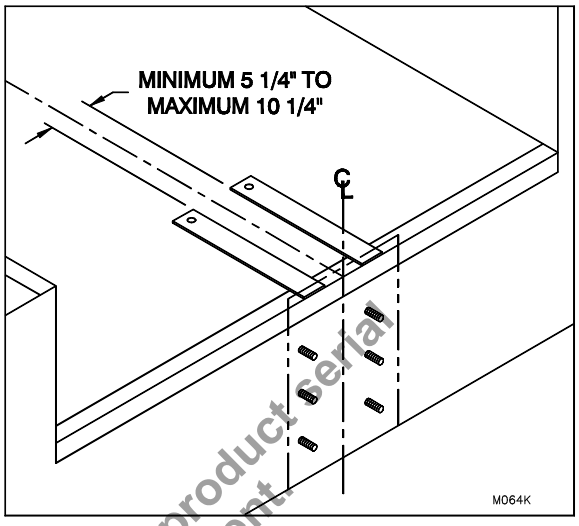


Figure 6: Horizontal Lag Plate Location

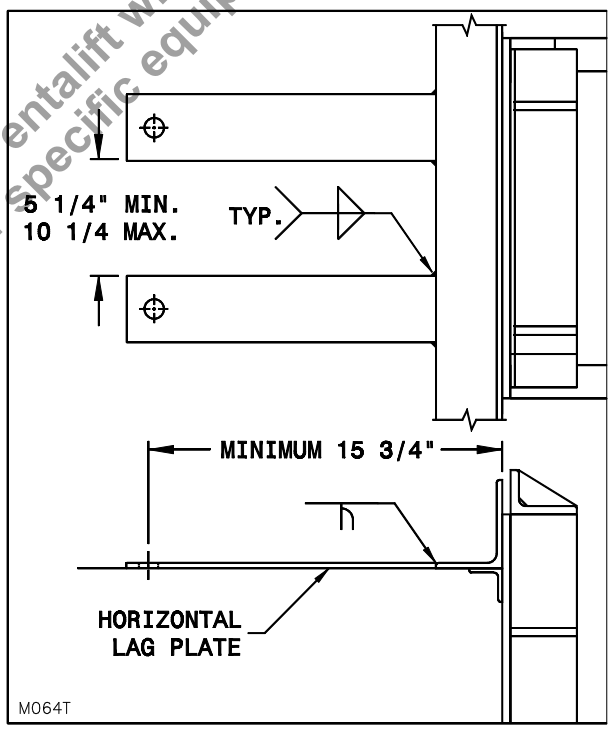


Figure 7: Horizontal Lag Plate for Pour-In Dock

3. __ Lag the unit to both the dock face and the dock leveler pit floor with recommended fasteners, 3/4" diameter x minimum 7" long wedge anchors with a minimum shear value of 19,200 lbs (8,540 kg), and minimum tension value of 15,500 lbs (6,890 kg) or any other anchor that provides equal or superior specifications. Torque to manufacturers' specifications. Ensure that flat washers are used for all slotted holes.

4. __ Proceed to "LIP DIVERTER INFORMATION" on page 24.

5. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

Installer Name (Print) _____

Installer Signature _____

Date Installation Completed _____

LAG METHOD 3

1. __ Follow LAG METHOD 2, beginning on page 9, using only four bolts to the dock face rather than six. See "Method 3" illustrated in "Figure 2: Draw Pull Forces and Installation Methods" on page 9.

2. __ Proceed to "LIP DIVERTER INFORMATION" on page 24.

3. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

Installer Name (Print) **Installer Signature**

Date Installation Completed

LAG METHOD 4

NOTE: This method is only to be used with an "Extra Low Dock" LPR35 vehicle restraint. (Optional: the installer must specify this model when placing order. If you are not sure that the model you are installing is an "Extra Low Dock" model, measure the height of the back plate and confirm that it is 20 ¼".)

1. __ Follow LAG METHOD 1, beginning on page 9, using only 6 bolts to the dock face rather than eight. See "Method 4" illustrated in "Figure 2: Draw Pull Forces and Installation Methods" on page 9.

2. __ Proceed to "LIP DIVERTER INFORMATION" on page 24.

3. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

Installer Name (Print) **Installer Signature**

Date Installation Completed

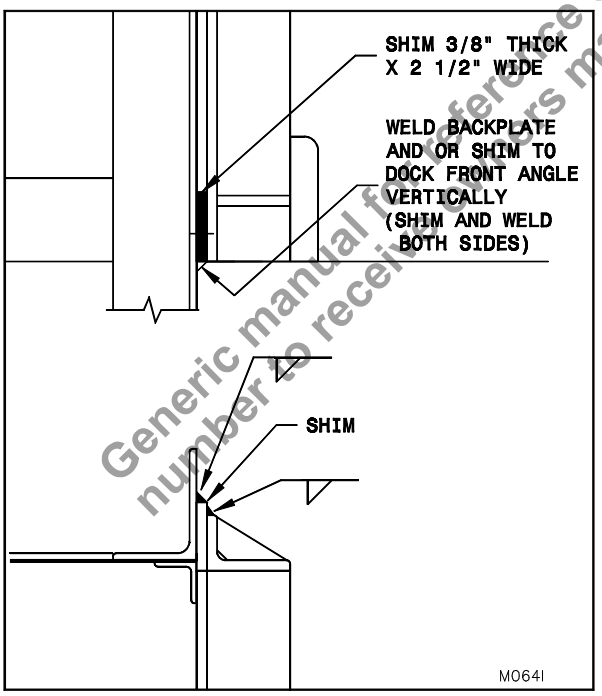


Figure 8: Back Plate is Lower than Dock Front Angle

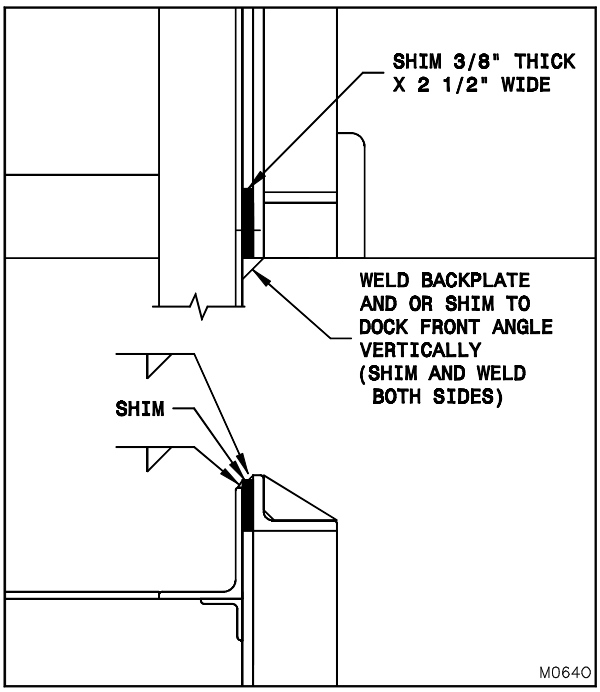


Figure 9: Back Plate is Higher than Dock Front Angle

CAST-IN WELD PLATE INSTALLATION

NOTICE **Never weld on the vehicle restraint after sensing switches are wired into the control box and the power to the box is on. Electrical current from the welder can "feedback" through the circuit and damage the motor and other components.**

Follow these instructions when a weld plate has been pre-cast into the foundation wall. If the restraint has an extension plate, see page 21 for installation instructions. If the weld plate has not been cast into the foundation wall, see "LAG INSTALLATION" on page 6.

1. __ Ensure that the required conduits are in place (See "Figure 24: Conduit / Sign Locations" on page 26).
2. __ Consult the Weld Installation Tables on page 15 and 13 to determine which installation method applies to your application.
3. __ Center the restraint back plate on the center line of the cast in weld plate.
4. __ If there is a gap between the bottom plate of the restraint and the finished driveway surface when the back plate is positioned square and flat to the cast in weld plate, shim the gap beneath the lower cylinder clevis. (Reference "Figure 3: Shim Locations" on page 10) Weld all shims together as well as to the bottom plate of the restraint.
5. __ Reposition the restraint and remove the guard assembly from the restraint. (see "Figure 4: Remove/ Replace Guard Assembly" on page 10)
6. __ Proceed to Method 1, Method 2, Method 3 or Method 4 as determined in item 2.
7. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

Installer Name (Print) _____ **Installer Signature** _____

Date Installation Completed _____

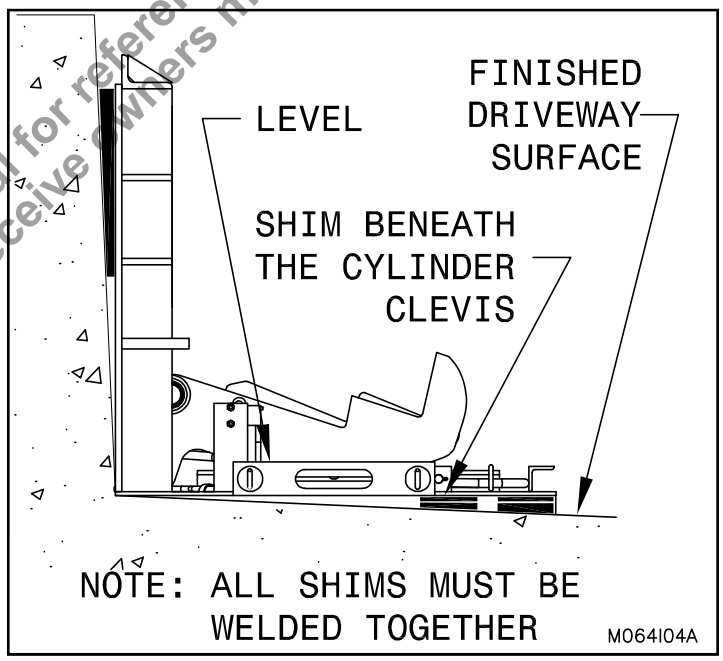


Figure 10: Shim Below the Bottom Cylinder Clevis

WELD INSTALLATION TABLE FOR DOCK LEVELERS WITH 16" AND 18" LIPS

		METHOD 1	METHOD 2	METHOD 3
DOCK HEIGHT		STANDARD LPR WITH 8 WELD SLOTS ON BACK PLATE- NO HORIZONTAL LAG PLATES	STANDARD LPR WITH 6 USEABLE WELD SLOTS ON BACK PLATE AND 2 BOLTS ON HORIZONTAL LAG PLATES	EXTRA LOW DOCK LPR WITH 4 USEABLE WELD SLOTS ON BACK PLATE AND 2 BOLTS ON HORIZONTAL LAG PLATES
20" LEVELER PIT DEPTH	24" LEVELER PIT DEPTH			
56"		√		
55"		√		
54"		√		
53"		√		
52"	56"	√		
51"	55"	√		
50"	54"	√		
49"	53"	√		
48"	52"	√		
47"	51"	√		
46"	50"	√		
45"	49"		√	
44"	48"		√	
43"	47"		√	
42"	46"		√	
41"	45"			√
40"	44"			√
39"	43"			√
38"	42"			√

NOTE 1: Reference **Figure 2,** page 9 for horizontal lag plate representation only. (In the cast in weld plate installation, however, welds will be applied in lieu of the dock face bolts shown.)

NOTE 2: If the dock height measurement is between values, round the measurement down to the lower value to choose the appropriate installation method.

WELD INSTALLATION TABLE FOR DOCK LEVELERS WITH 20” LIP			
		METHOD 1	METHOD 4
DOCK HEIGHT		STANDARD LPR WITH 8 WELD SLOTS ON BACK PLATE	EXTRA LOW DOCK LPR WITH 6 USEABLE WELD SLOTS ON BACK PLATE
20” LEVELER PIT DEPTH	24” LEVELER PIT DEPTH		
56”		√	
55”		√	
54”		√	
53”		√	
52”	56”	√	
51”	55”	√	
50”	54”	√	
49”	53”	√	
48”	52”	√	
47”	51”	√	
46”	50”	√	
45”	49”		√
44”	48”		√
43”	47”		√
42”	46”		√

NOTE 1: Reference **Figure 2**, page 9 for horizontal lag plate representation only. (In the cast in weld plate installation, however, welds will be applied in lieu of the dock face bolts shown.)

NOTE 2: If the dock height measurement is between values, round the measurement down to the lower value to choose the appropriate installation method.

CAST IN WELD PLATE METHOD 1

1. __ Apply a 3/8” fillet weld x 2” long to the intersection of the cast in weld plate and the restraint back plate at each gusset on the two sides. Apply an additional 3/8” fillet weld x 2” long mid way between the lower gusset and the base plate. Also, weld all slots in the back plate to the cast in weld plate as shown. See “Figure 11: Weld Locations - Method 1” on page 17.

2. __ Proceed to “LIP DIVERTER INFORMATION” on page 24.

3. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

Installer Name (Print) _____

Installer Signature _____

Date Installation Completed _____

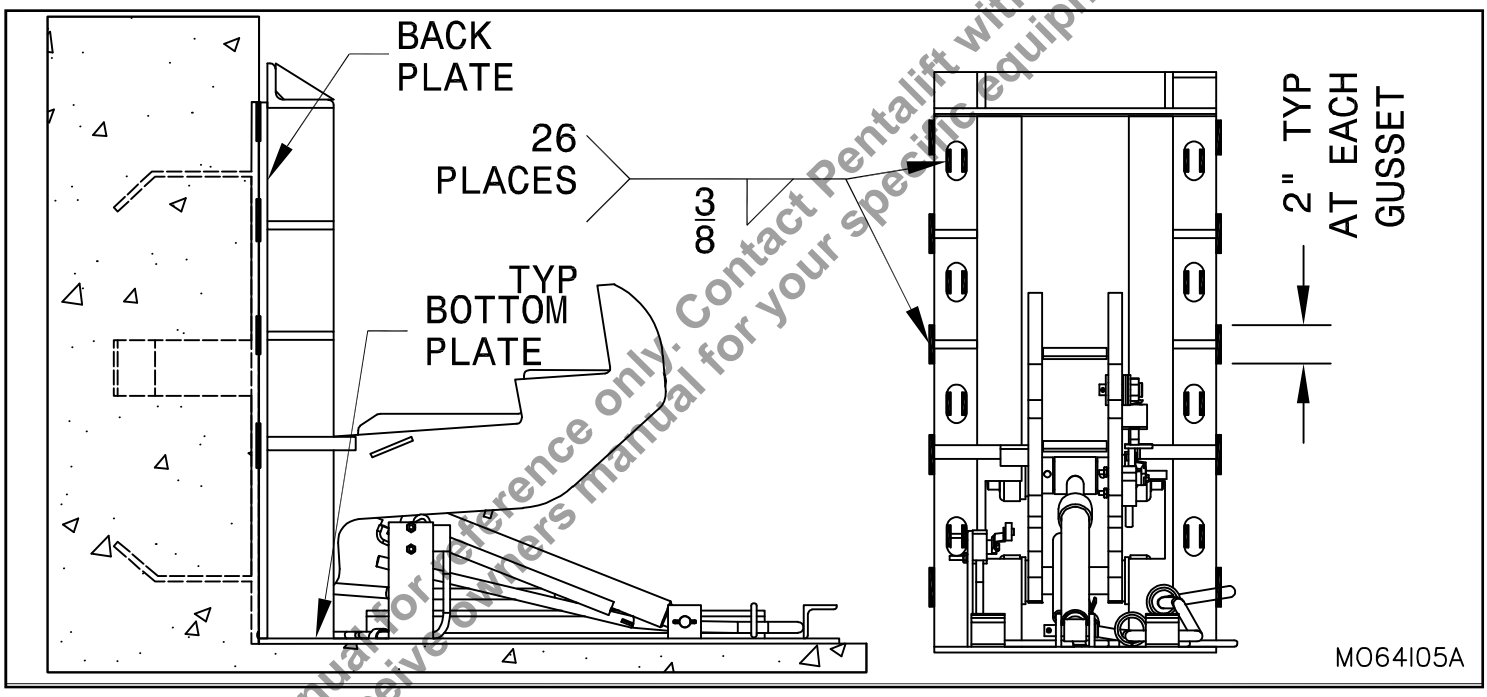


Figure 11: Weld Locations - Method 1

CAST IN WELD PLATE METHOD 2

1. __ PIT MODEL DOCK LEVELER

a) If there is a gap (as a result of shimming the dock) between the front angle of the dock leveler and the dock leveler pit floor of ¼" or more, place the horizontal lag plates onto the dock leveler pit floor, directly behind and perpendicular to the back plate of the restraint, and slide the horizontal lag plates under the front angle of the dock leveler until they butt up against the back plate of the restraint. See "Figure 12: Horizontal Lag Plate Installation" on page 18. (If no gap is present, proceed to item 1.g) and follow the Pour-In Dock Leveler instruction.)

b) The horizontal lag plates must be positioned centered behind the back plate and parallel to each other; not more than 10 ¼" apart and not less that 5 ¼" apart (This variation allows for avoiding any shims which may be present under the front angle). See "Figure 13: Horizontal Lag Plate Location" on page 18.

c) Tack weld the horizontal lag plates to the back plate or mark the position.

d) Pull the restraint away from the wall and place a minimum 5/16" fillet weld the full width of the horizontal lag plate to the back plate of the restraint. See "Figure 12: Horizontal Lag Plate Installation" on page 18.

e) Reposition the restraint against the cast in weld plate.

f) Proceed to item 2, page 16.

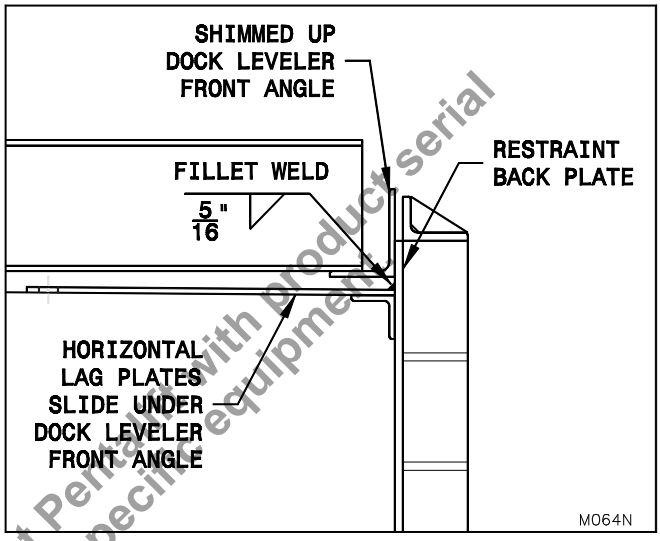


Figure 12: Horizontal Lag Plate Installation

__ POUR-IN DOCK LEVELER

g) Because there is no gap between the front angle of the dock leveler and the dock leveler pit floor, the horizontal lag plates and restraint back plate must both be welded to the dock leveler front angle. Position the horizontal lag plates directly behind and perpendicular to the back plate of the restraint, butted up against the front angle of the dock leveler. They must be parallel to each other, not more than 10 ¼" apart and not less than 5 ¼" apart. See "Figure 13: Horizontal Lag Plate Location" on page 18.

h) Using the horizontal lag plates as a template, mark the holes in the horizontal lag plates onto the bottom pan of the dock leveler.

i) Remove the horizontal lag plates and drill two holes through the bottom pan for installing lag anchors.

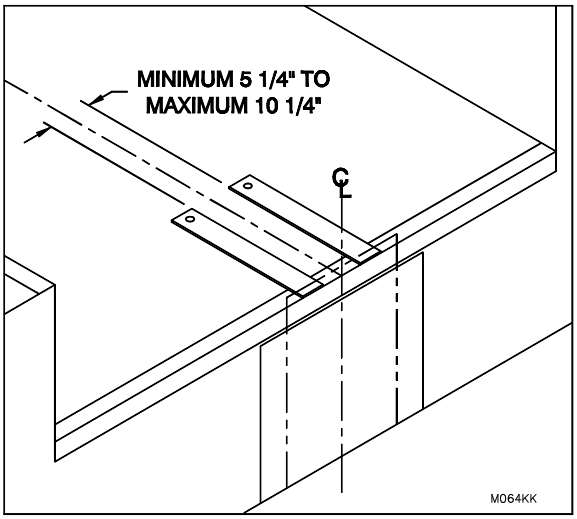


Figure 13: Horizontal Lag Plate Location

j) Position the horizontal lag plates into the position as noted in item 1.g).

k) Weld the full width of the horizontal lag plates, as well as the vertical depth of the horizontal lag plates, to the front angle of the dock leveler. (See "Figure 7: Horizontal Lag Plate for Pour-In Dock" on page 12.)

l) If the back plate of the restraint is higher than the front angle of the dock leveler, shim between the top angle of the back plate and the front angle of the dock leveler and weld the shim to both as shown in "Figure 15: Back Plate is Higher Than Dock Front Angle" on page 19.

m) If the back plate of the restraint is lower than the top of the front angle of the dock leveler, shim between the top angle of the back plate and the front angle of the dock leveler and weld the shim to both as shown in “Figure 14: Back Plate is Lower Than Dock Front Angle” on page 19.

2. __ Lag the unit to the dock leveler pit floor with recommended fasteners, ¾” diameter x minimum 7” long wedge anchors with a minimum shear value of 19,200 lbs (8,540 kg), and minimum tension value of 15,500 lbs (6,890 kg) or any other anchor that provides equal or superior specifications. Torque to manufacturers’ specifications.

3. __ Apply a 3/8” fillet weld x 2” long to the intersection of the cast in weld plate and the restraint back plate at each of the six gussets that meet the cast in weld plate on the two sides. Apply an additional 3/8” fillet weld x 2” long mid way between the lower gusset and the base plate. Also, weld the six slots in the back plate that meet the cast in weld plate. See “Figure 16: Weld Locations - Method 2” on page 20.

4. __ Proceed to “LIP DIVERTER INFORMATION” on page 24.

5. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

Installer Name (Print)

Installer Signature

Date Installation Completed

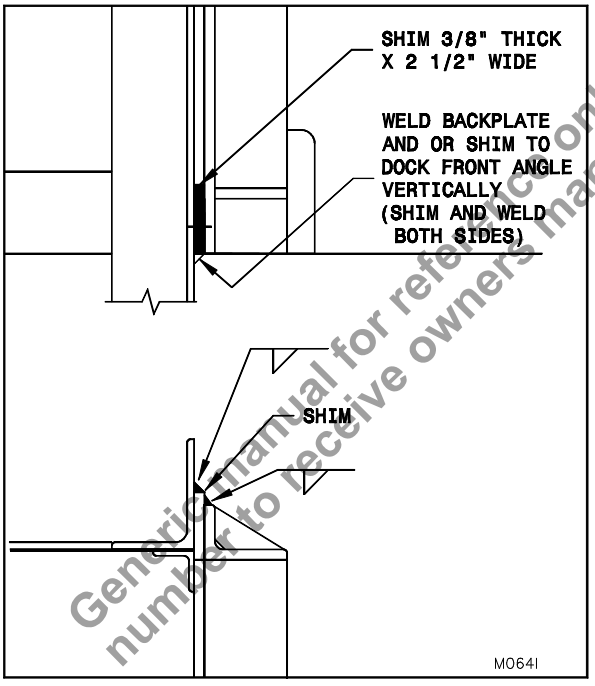


Figure 14: Back Plate is Lower Than Dock Front Angle

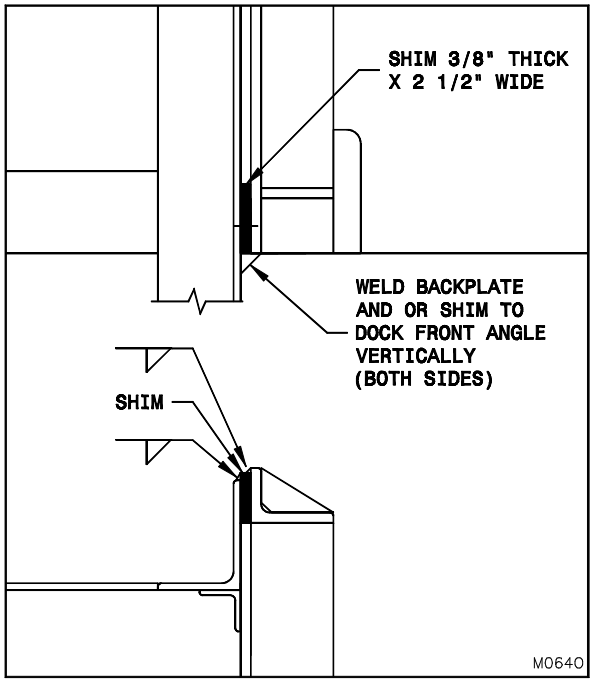


Figure 15: Back Plate is Higher Than Dock Front Angle

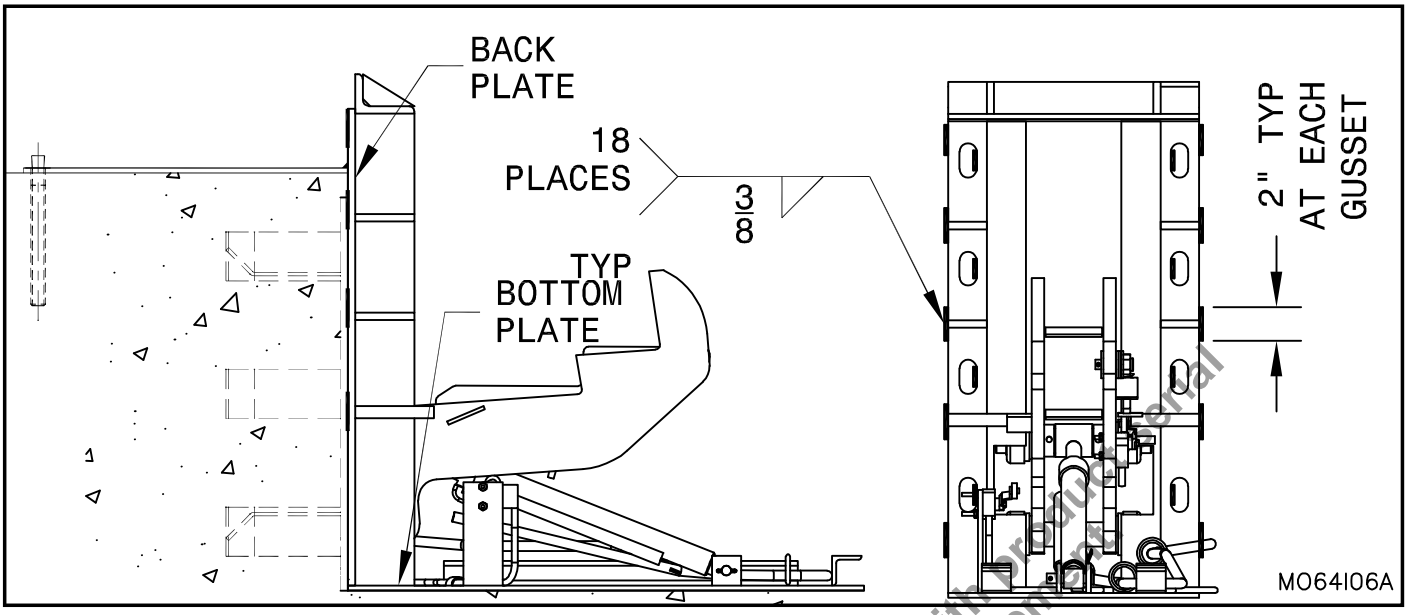


Figure 16: Weld Locations - Method 2

CAST IN WELD PLATE METHOD 3

1. __ Follow Method 2, however, only four slots and four gussets will be able to be welded to the cast in plate rather than six.

2. __ Proceed to “LIP DIVERTER INFORMATION” on page 24.

3. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

Installer Name (Print) **Installer Signature**

Date Installation Completed

CAST IN WELD PLATE METHOD 4

NOTE: This method is only to be used with an “Extra Low Dock” LPR35 vehicle restraint. (Optional: the installer must specify this model when placing order. If you are not sure that the model you are installing is an “Extra Low Dock” model, measure the height of the back plate and confirm that it is 20 ¼”.)

1. __ Follow Method 1, however, only six slots and 6 gussets will be able to be welded to the cast in plate rather than eight.

2. __ Proceed to “LIP DIVERTER INFORMATION” on page 24.

3. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

Installer Name (Print) **Installer Signature**

Date Installation Completed

EXTENSION INSTALLATION INSTRUCTIONS

1. __ For **LAG INSTALLATION** of the extension plate, follow the Lag Installation instruction referring to the restraint back plate beginning on “LAG INSTALLATION” on page 6. Return to item 2 in this chapter when lagging is complete.

   __ For **CAST IN WELD PLATE INSTALLATION**, the extension plate is not required. Proceed directly to item 2.

2. __ Position the extension I-beam assemblies to the restraint backplate as shown in”Figure 17: Extension I-Beam Assemblies” on page 21, and weld using a minimum ¼” leg on top and on both sides of the web. (Refer to the “WELDING REFERENCE INFORMATION” on page 22.)

3. __ Position the restraint (complete with extension I-beams welded to it) centered vertically and horizontally to the extension plate. Restraint must be at finished driveway level. If the ground is not square with respect to the bottom plate of the restraint, metal shims must be inserted below the bottom cylinder clevis. See “Figure 18: Bottom Shimming” on page 21. NOTE: All shims must be welded together as well as to the restraint bottom plate.

4. __ Weld restraint to the lagged in extension plate or cast in weld plate following the weld pattern shown in “Figure 19: Restraint / Extension Plate Weldment” on page 22.

5. __ Proceed to “LIP DIVERTER INFORMATION” on page 24.

6. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

Installer Name (Print) _____

Installer Signature _____

Date Installation Completed _____

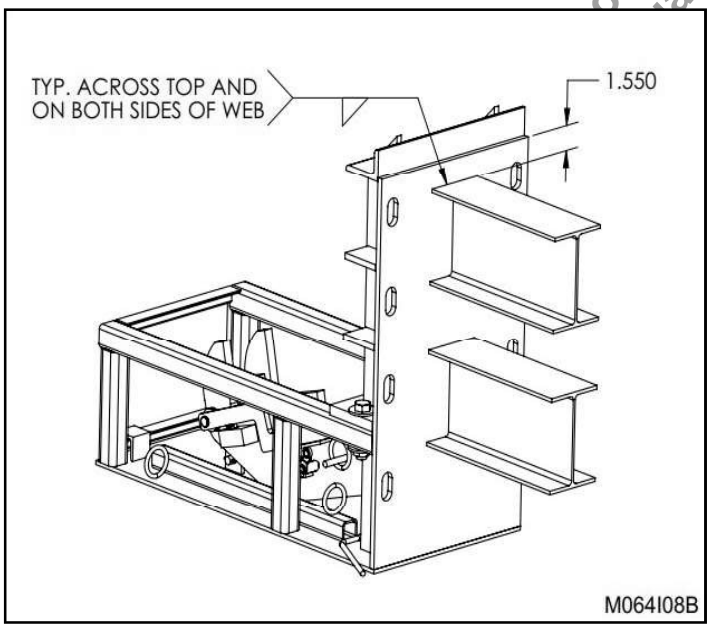


Figure 17: Extension I-Beam Assemblies

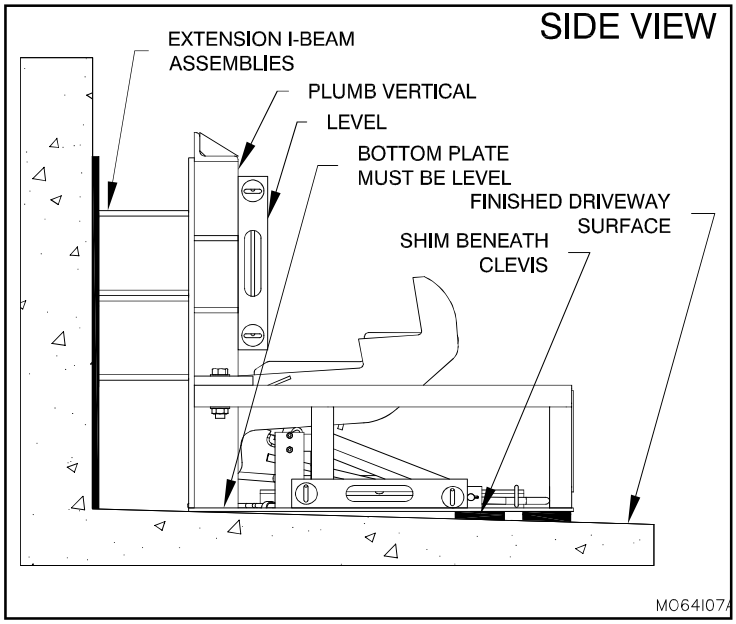


Figure 18: Bottom Shimming

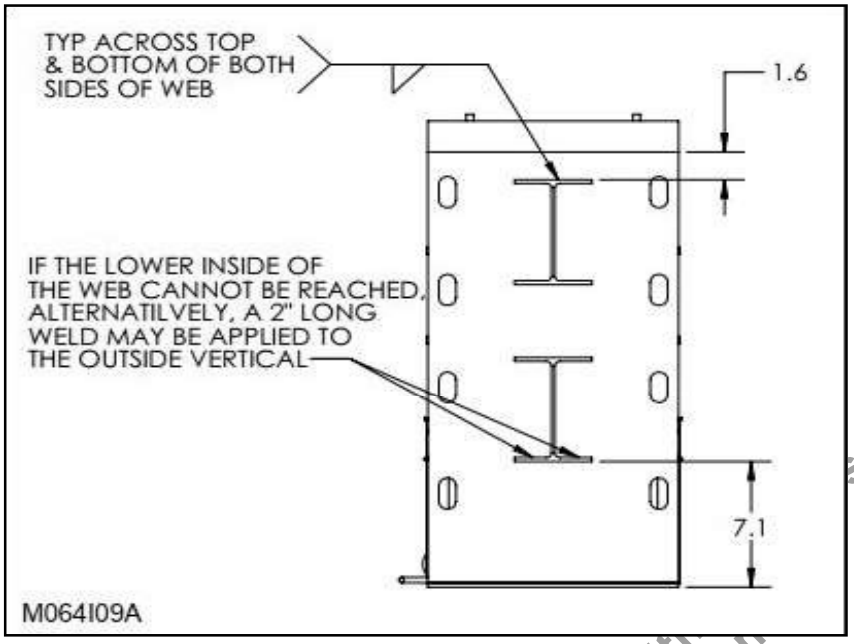


Figure 19: Restraint / Extension Plate Weldment

WELDING REFERENCE INFORMATION

- Observe and obey all welding safety requirements per AWS D1.1-92. (W117.2-74 in Canada.)
- Welding electrodes are to be clean and free from moisture.
- Material to be welded must be clean and free of oils, excessive millscale/rust etc.
- All craters are to be filled to a minimum of 85% of the cross sectional area of the weld.
- All under cutting is to be removed by either welding, grinding or a combination of both.
- Maximum reinforcement on butt welds is 1/8".
- Use highest current possible per chart below to obtain satisfactory weld.

Electrode	**E7018**	
Diameter	1/8"	5/32"
Amperage	130-150	140-180

OPTIONAL HORIZONTAL SURFACE MOUNTING BOX INSTALLATION INSTRUCTIONS

DANGER **Before doing any installation, maintenance, inspection or trouble shooting, barricade all areas from traffic around the work area inside (and outside if applicable) for safety and post appropriate warning signs.**

WARNING **THIS RESTRAINT IS DESIGNED TO OPERATE WITH THE FACE OF THE DOCK BUMPERS EXTENDED 4" PAST THE POSITION OF THE BACK PLATE OF THE RESTRAINT ONCE IT IS INSTALLED. THIS DIMENSION RELATIONSHIP IS CRITICAL TO ENSURING THE PROPER OPERATIONAL POSITIONING OF THE RESTRAINT.**

Important note: A horizontal surface mounting box creates the ability for the vehicle restraint to be installed at any location on the driveway. The dimensional location of the vehicle on the loading dock is critical in maximizing the restraints functionality and ability to properly restrain truck and trailers. When installing the surface mount box, install the restraint so that it is centered laterally on the loading dock door and in a location from the dock face so that the back plate of the restraint (not including the horizontal mounting box) is located 4" behind the face of the loading dock bumpers.

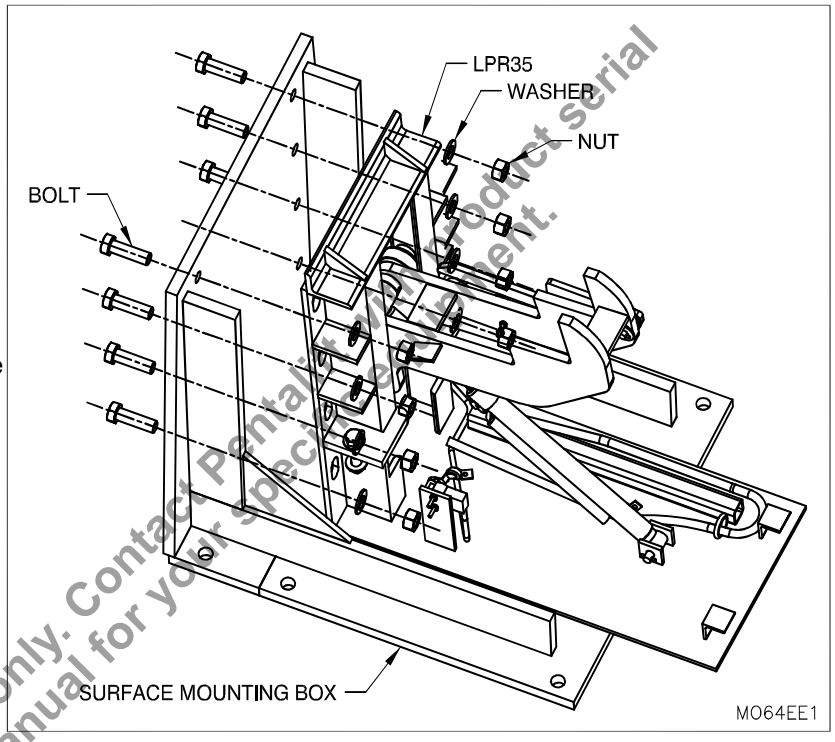


Figure 20: Horizontal Surface Mounting Box Installation

1. __ Inspect the LPR35 and surface mounting box for damage. If there is damage, rectify the damage. If there is no damage, proceed with the installation.

   Note: It is important that the surface that the restraint is being attached to is sufficiently strong to accept the high forces that the vehicle restraint could subject it to.

2. __ Align the LPR35 with the surface mounting box and fasten using the supplied hardware, with the bolt at the rear of the surface mounting box, in the order as shown in "Figure 20: Horizontal Surface Mounting Box Installation" on page 23. Insert bolts from the back of the surface mounting box and torque each nut to a value of 266 ft-lbs.

3. __ Clean surface mounting area of all debris.

4. __ Mark the center line of the dock leveler and the center line of the surface mounting box.

5. __ Center the surface mounting box with the centerline of the dock leveler.

6. __ Orient the restraint at the appropriate distance that places the back of the restraint 4" behind the front face of the loading dock bumper.

7. __ Use a level to ensure that the surface mounting box is level side to side and front to back. Shimming may be required. All shims must be welded together and to the bottom of the surface mounting box.

8. __ Lag the surface mounting box to the supporting surface using 3/4” diameter lag bolts with a minimum shear value of 5,000 lbs and a minimum tension value of 4,000 lbs. **Note: Lagging bolts are supplied by others.**

9. __ Clean and paint welds using Tremclad High Performance Rust Enamel (Gloss Dark Machine Grey) if unit is not zinc coated. If unit is zinc coated, use Tremclad Gloss Aluminum Rust paint.

10. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

Installer Name (Print) **Installer Signature**

Date Installation Completed

LIP DIVERTER INFORMATION

When the dock leveler is in the stored cross traffic position, and if the lip is stored outside the front angle of the dock leveler in extended lip keepers, check to ensure the lip is fully seated in the extended lip keepers (See “Figure 21: Lip Diverters with Lip Keepers” on page 24). If the lip does not fully seat in the extended lip keepers, notch the lip diverters as shown in “Figure 21: Lip Diverters with Lip Keepers” on page 24.

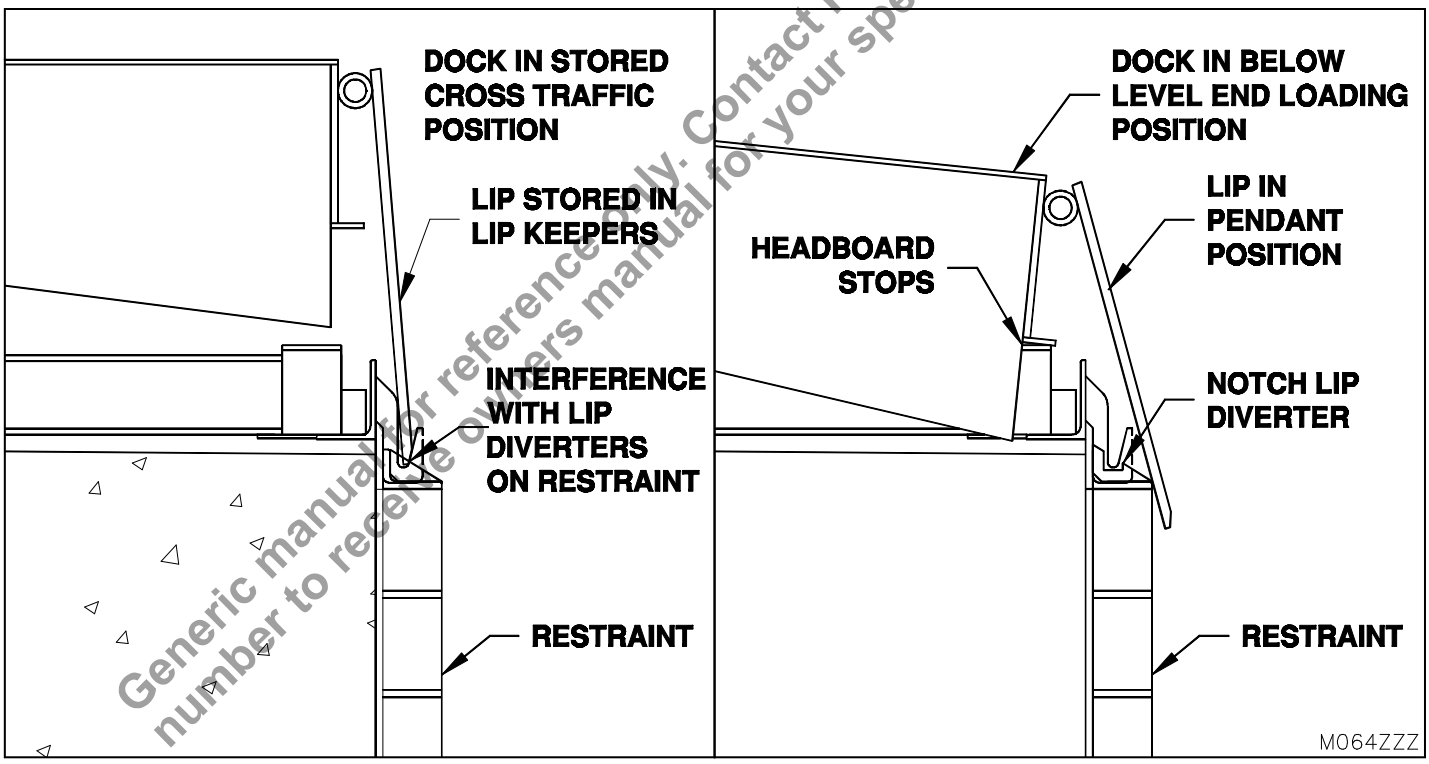


Figure 21: Lip Diverters with Lip Keepers

NOTE: AFTER THE LIP DIVERTERS HAVE BEEN MODIFIED, CHECK TO ENSURE THAT THE DOCK LEVELER LIP IS NOT ABLE TO REST ON THE RESTRAINT TOP ANGLE.

POWER, CONTROLS, AND COMMUNICATION SYSTEMS INSTALLATION

1. __ Mount the power unit horizontally with reservoir breather facing up (See “Figure 22: Control / Power Unit Locations” on page 26). When mounting the power unit on a wall, position the power unit above the wall bracket keeping the ½” wall mount holes below the power unit. This ensures easier access to all the wall bracket holes when mounting the power unit (See “Figure 23: Wall Mounted Power Unit” on page 26). Note: The hydraulic power unit and the control panel are important components of the equipment. It is important that they be installed in a location that is free from dirt, debris and splashing and / or wash down. The location should also be free from the liklihood of impacts. Each application has different conditions and design features. Evaluation of the specific site conditions and parameters in conjunction with common sense should be used to determine the appropriate hydraulic power unit and control panel installation location. Confirm the hose(s) length is sufficient to accommodate the desired routing path from the equipment to the power unit.

2. __ Install the control panel in a location that ensures an unobstructed view at all times. The installation location must ensure the complete legibility of the operating instructions during the operation of all loading dock equipment, including the fork lifts.

3. __ Feed the hydraulic hose through the conduit from the power unit to the cylinder on the restraint, connect and secure.

4. __ Mount the outside light approximately 90” high from the center of the light to the finished driveway level (See “Figure 24: Conduit / Sign Locations” on page 26).

5. __ Mount the mirror image “Caution” sign above the outside light and normal vision “Caution” sign below the outside light.

6. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

Note: If restraint is not a standalone unit, meaning the restraint will be hydraulically driven by the dock leveler power unit, then refer to Figure “Figure 6B: DOCK LEVELER/RESTRAINT COMBO UNIT” on page 27, “Figure 6C: VERTICAL DOCK LEVELER/RESTRAINT COMBO UNIT” on page 28 , or “Figure 6D: 100K DOCK LEVELER/ RESTRAINT COMBO UNIT” on page 29 for the appropriate hook up of the restraint to the leveler power unit.

REFER TO THE DOCK LEVELER OWNER MANUAL FOR SUPPORTING THE DOCK LEVELER FOR MAINTENANCE.

Installer Name (Print) _____

Installer Signature _____

Date Installation Completed _____

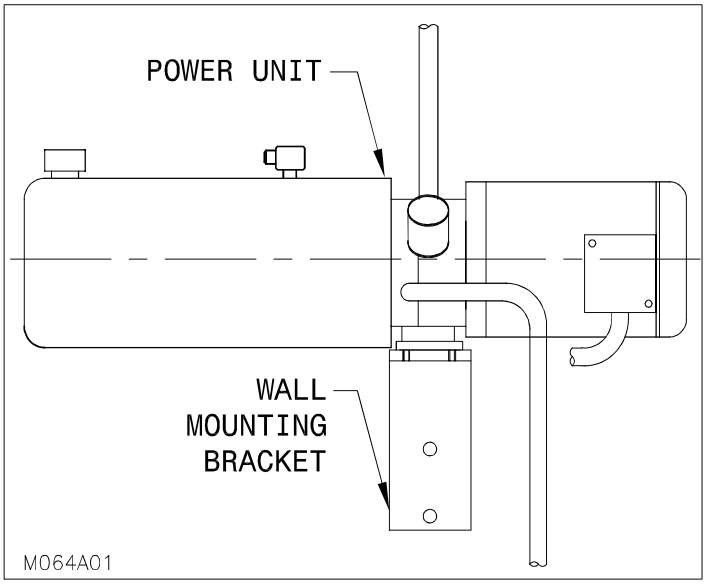


Figure 23: Wall Mounted Power Unit

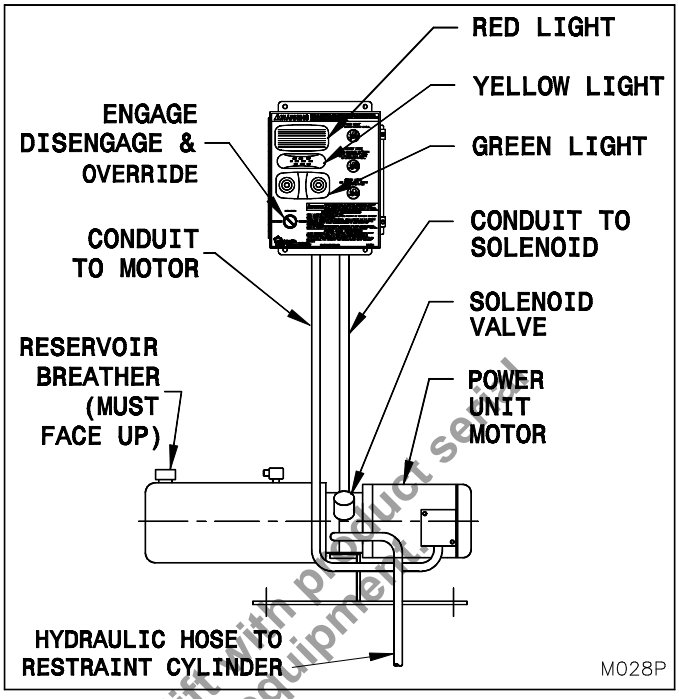


Figure 22: Control / Power Unit Locations

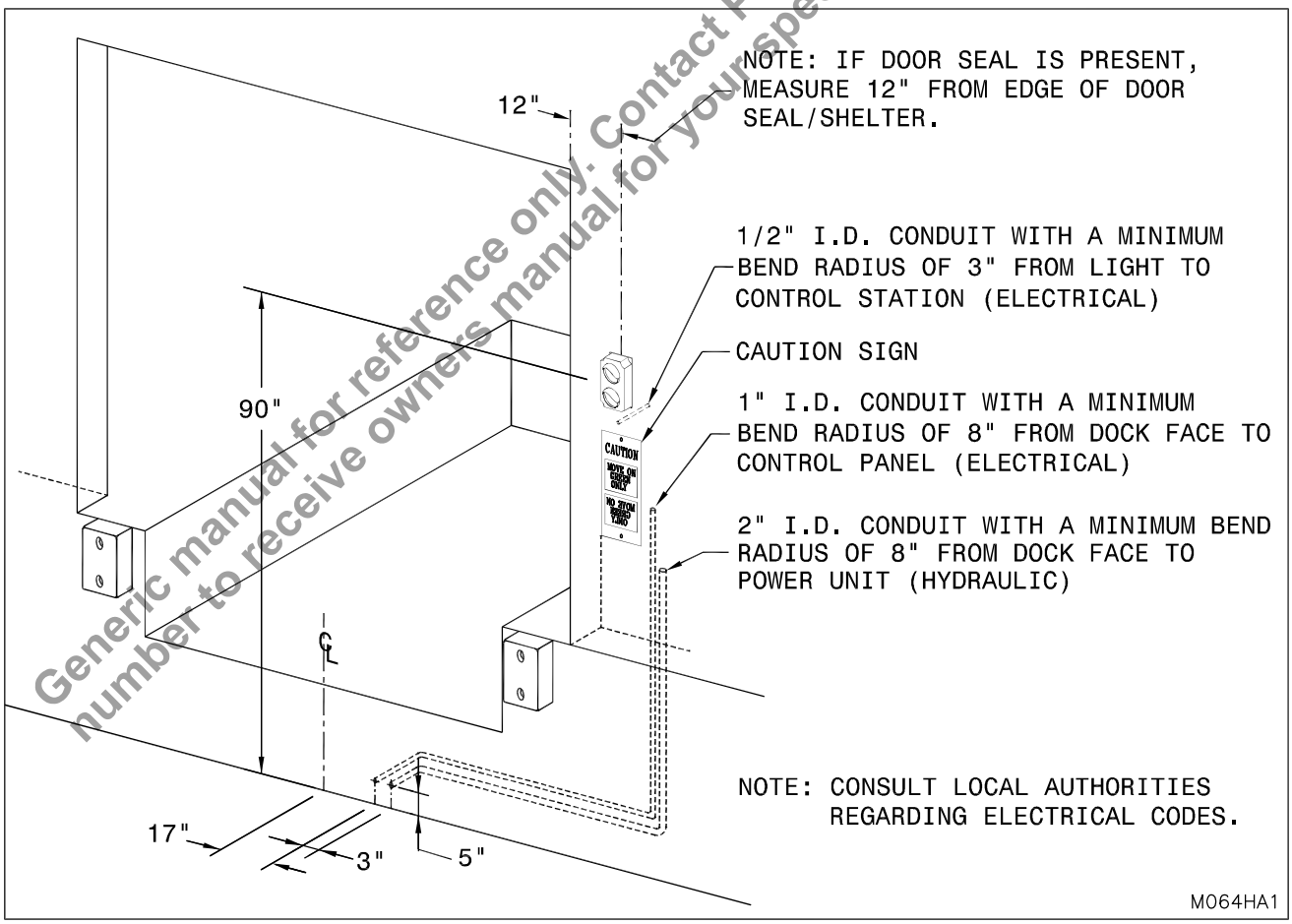
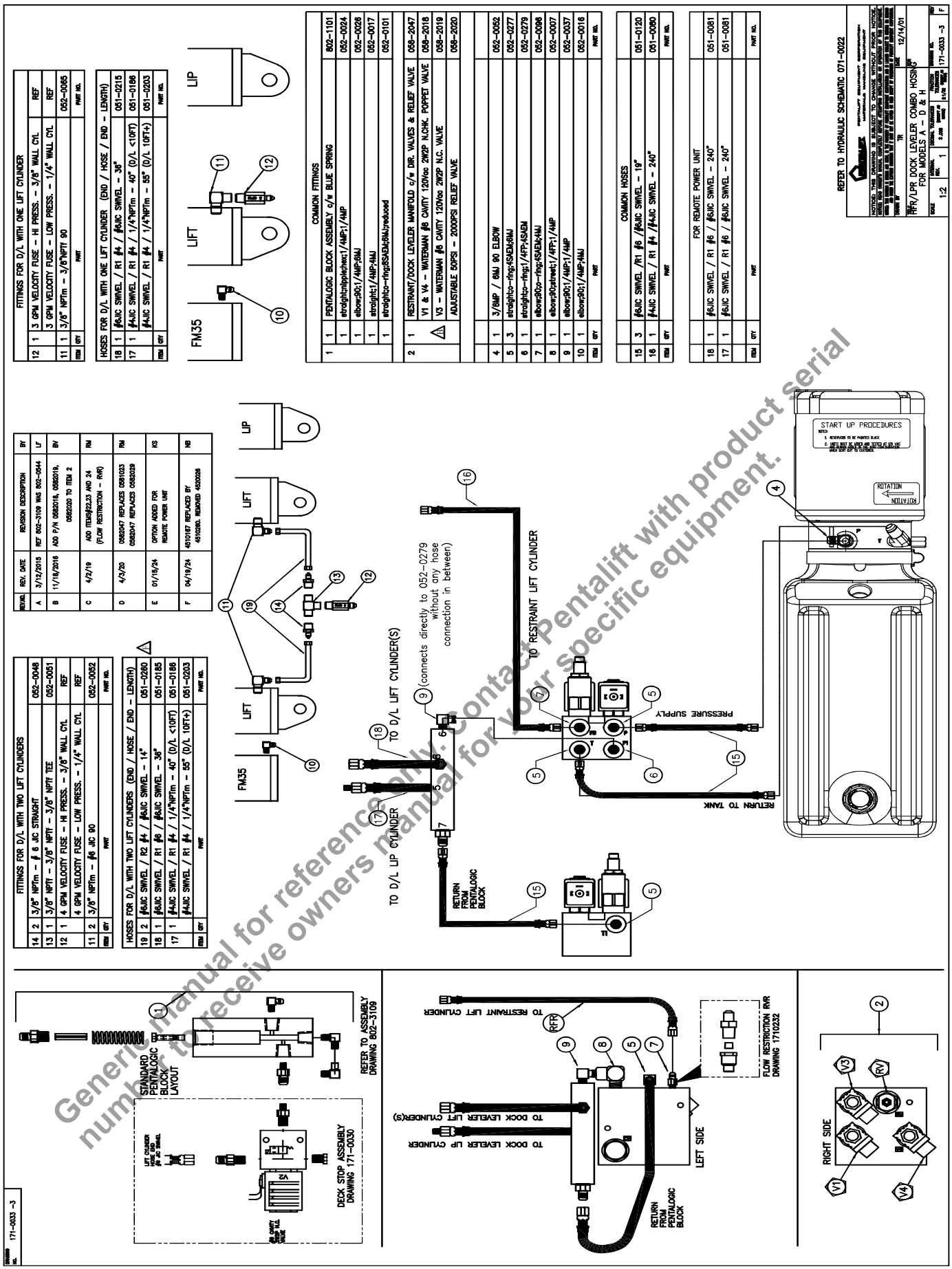


Figure 24: Conduit / Sign Locations



FITTINGS FOR D/L WITH ONE LIFT CYLINDER				
12	1	3 GPM VELOCITY FUSE – HI PRESS. – 3/8" WALL CYL		REF
		3 GPM VELOCITY FUSE – LOW PRESS. – 1/4" WALL CYL		REF
11	1	3/8" NPTm – 3/8"NPTF 90		052-0065
ITEM	QTY	PART		PART NO.

HOSES FOR D/L WITH ONE LIFT CYLINDER (END / HOSE / END – LENGTH)			
18	1	#6JIC SWIVEL / R1 #4 / #6JIC SWIVEL – 36"	051-0215
17	1	#4JIC SWIVEL / R1 #4 / 1/4"NPTm – 40" (D/L <10FT)	051-0186
		#4JIC SWIVEL / R1 #4 / 1/4"NPTm – 55" (D/L 10Ft+)	051-0203
ITEM	QTY	PART	PART NO.

COMMON FITTINGS			
1	1	PENTALOGIC BLOCK ASSEMBLY c/w BLUE SPRING	802-1101
	1	straight/nipple/check:1/4MP:1/4MP	052-0024
	1	elbow:90:1/4MP:6MJ	052-0026
	1	straight:1/4MP:4MJ	052-0017
	1	straight/co–ring:4SAE/6MJ/reduced	052-0101
2	1	RESTRAINT/DOCK LEVELER MANIFOLD c/w DIR. VALVES & RELIEF VALVE	058-2047
		V1 & V4 – WATERMAN #8 CAVITY 120Vac 2W2P N.CHK. POPPET VALVE	058-2018
	⚠	V3 – WATERMAN #6 CAVITY 120Vac 2W2P N.C. VALVE	058-2019
		ADJUSTABLE 50PSI – 2000PSI RELIEF VALVE	058-2020
4	1	3/8MP / 6MJ 90 ELBOW	052-0052
5	3	straight/co–ring:4SAE/6MJ	052-0277
6	1	straight/co–ring:1/4FP:4SAE/6MJ	052-0279
7	1	elbow/90/co–ring:4SAE/6MJ:4MJ	052-0096
8	1	elbow/90/swivel:1/4FP:1/4MP	052-0007
9	1	elbow/90:1/4MP:1/4MP	052-0037
10	1	elbow/90:1/4MP:4MJ	052-0016
ITEM	QTY	PART	PART NO.

COMMON HOSES			
15	3	#6JIC SWIVEL /R1 #6 /#6JIC SWIVEL – 19"	051-0120
16	1	#4JIC SWIVEL / R1 #4 /#4JIC SWIVEL – 240"	051-0080
ITEM	QTY	PART	PART NO.

FOR REMOTE POWER UNIT			
18	1	#6JIC SWIVEL / R1 #6 / #6JIC SWIVEL – 240"	051-0081
17	1	#6JIC SWIVEL / R1 #6 / #6JIC SWIVEL – 240"	051-0081
ITEM	QTY	PART	PART NO.

FITTINGS FOR D/L WITH TWO LIFT CYLINDERS			
14	2	3/8" NPTm – # 6 JIC STRAIGHT	052-0048
13	1	3/8" NPTF – 3/8" NPTF TEE	052-0051
12	1	4 GPM VELOCITY FUSE – HI PRESS. – 3/8" WALL CYL	REF
		4 GPM VELOCITY FUSE – LOW PRESS. – 1/4" WALL CYL	REF
11	2	3/8" NPTm – #6 JIC 90	052-0052
ITEM	QTY	PART	PART NO.

HOSES FOR D/L WITH TWO LIFT CYLINDERS (END / HOSE / END – LENGTH)			
19	2	#6JIC SWIVEL / R2 #4 / #6JIC SWIVEL – 14"	051-0260
18	1	#6JIC SWIVEL / R1 #6 / #6JIC SWIVEL – 36"	051-0185
17	1	#4JIC SWIVEL / R1 #4 / 1/4"NPTm – 40" (D/L <10FT)	051-0186
		#4JIC SWIVEL / R1 #4 / 1/4"NPTm – 55" (D/L 10FT+)	051-0203
ITEM	QTY	PART	PART NO.

REVISIONS					
REVISIONS	REV. DATE	REVISION DESCRIPTION	BY
A	3/12/2015	REF 802-3109 WAS 802-0544	LF
B	11/18/2016	ADD P/N 0582016, 0582019, 0582020 TO ITEM 2	BV
C	4/2/19	ADD ITEMS#22,23 AND 24 (FLOW RESTRICTION – RVR)	RM
D	4/3/20	0582047 REPLACES 0581023 0582047 REPLACES 0582039	RM
E	01/15/24	OPTION ADDED FOR REMOTE POWER UNIT	KS
F	04/19/24	4510167 REPLACED BY 4510260. REMOVED 4520208	NB

Figure 6B: DOCK LEVELER/RESTRAINT COMBO UNIT
(Reference drawing 171-0033-3)

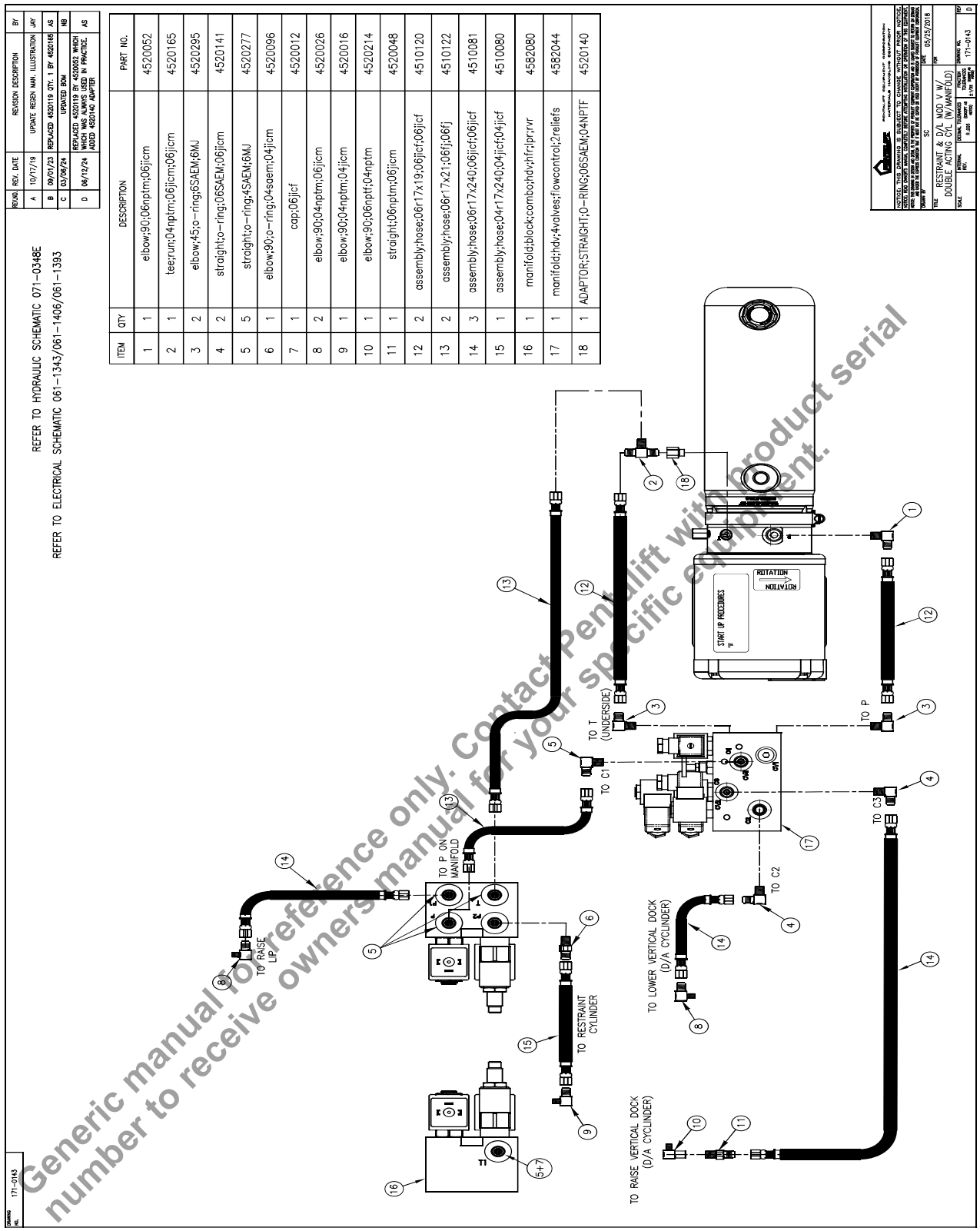


Figure 6C: VERTICAL DOCK LEVELER/RESTRAINT COMBO UNIT
(Reference drawing 171-0143)

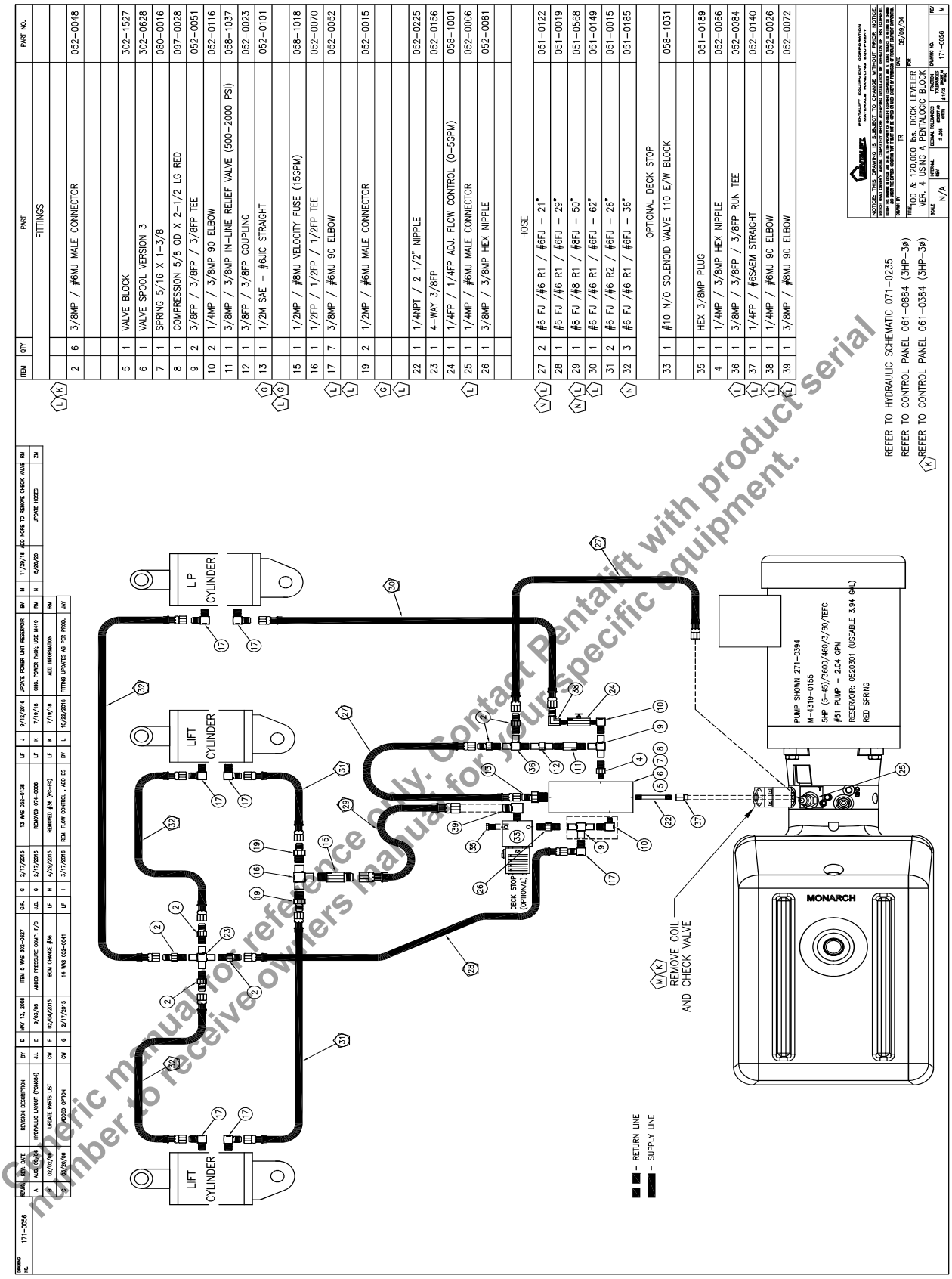


Figure 6D: 100K DOCK LEVELER/RESTRAINT COMBO UNIT
(Reference drawing 171-0056)

ELECTRICAL INSTALLATION INSTRUCTIONS

The LPR35 Vehicle Restraint system is supplied in four separate main components consisting of the power unit, control panel, outside lights and the restraint. Each component is internally wired at the factory. They must all be connected to each other on site. The wiring diagram is inside the electrical control panel.

⚠DANGER

- **WIRING MUST BE DONE BY A QUALIFIED ELECTRICIAN.**
- **ALWAYS USE APPROPRIATE LOCK-OUT PROCEDURES DURING ANY ELECTRICAL INSTALLATIONS.**
- **ENSURE SUPPLY VOLTAGE IS CORRECT.**
- **ON 3 PHASE UNITS ENSURE PHASE POLARITY IS CORRECT. INCORRECT POLARITY WILL CAUSE THE MOTOR TO RUN BACKWARDS RESULTING IN CAVITATION AND POSSIBLE DAMAGE TO THE PUMP.**
- **ALWAYS OBSERVE ALL APPLICABLE ELECTRICAL CODES.**

⚠DANGER **Before doing any installation, maintenance, inspection or trouble shooting, barricade all areas from traffic around the work area inside (and outside if applicable) for safety and post appropriate warning signs.**

⚠DANGER **Before doing any electrical work, be certain that the power is disconnected with a fused disconnect, properly tagged and locked out. Fused disconnect and lockout device (supplied and installed by others) must meet with all applicable codes and regulations. All electrical work must be performed by a qualified electrician in accordance with all applicable codes and regulations.**

⚠DANGER **Arc flash and shock hazard PPE (personal protection equipment) required. De-energize equipment before working on or inside. Do not open cover without appropriate PPE. Refer to NFPA 70E for PPE requirements. This panel may contain more than one power source. Hazardous voltage will cause severe injury or death.**

The following instructions apply to standard units:

1. __ Run 6 wires (minimum 14 AWG – or sized to meet applicable codes) from the control panel to a junction box on the outside wall (junction box by others).

2. __ Run wires from the two limit switches on the vehicle restraint to a waterproof junction box (supplied by others) and connect to the appropriate leads. Ensure the limit switch wire for the signal bar is routed through the tube provided along the side of the hydraulic cylinder and all three limit switch wires go through the tube provided on the base plate of the restraint. Keep the limit switch wire for the signal bar above the hydraulic hose after exiting the tube on the cylinder and before entering the tube on the base plate. See “Figure 25: Routing the Limit Switch Wires” on page 31.

3. __ Attach wires to the appropriate terminal strip on the control panel. Confirm with the wiring schematic (located inside the control panel) that all limit switches are wired properly. Run 3 wires from the control panel terminal strip to the outside signal lights.

4. __ On LPR35/Dock Leveler combination units and/or three phase power units, ensure that the thermal overload relay is set to match the full load current as shown on the motor name plate. Consult all applicable electrical codes.

5. __ Connect lead wires from the power unit to the terminal strip in the control box.

6. __ Connect the AC Power supply.

7. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

NOTE: Power unit requires full voltage at motor. Wire size should be sufficiently sized to prevent line voltage drop when the motor is under load.

Installer Name (Print) **Installer Signature**

Date Installation Completed

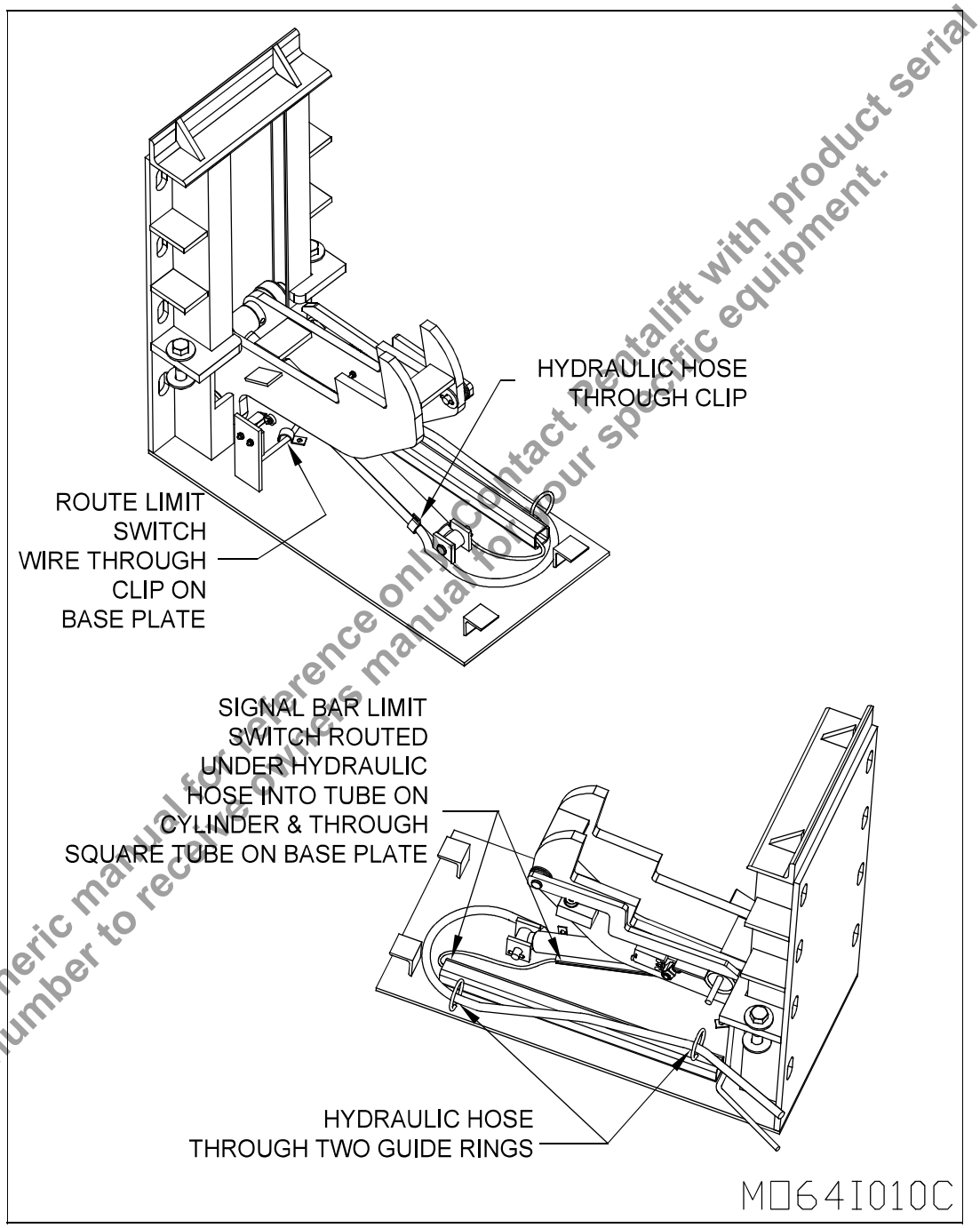


Figure 25: Routing the Limit Switch Wires

COMPLETING THE MECHANICAL INSTALLATION

1. __ Fully raise and lower the unit a minimum of 10 times and check the performance of the switches and lights to ensure correct operation. (See “OPERATION AND PERFORMANCE CHECK” on page 33)

2. __ Clean and paint welds using Tremclad High Performance Rust Enamel (Gloss Dark Machine Grey) if unit is not zinc coated. If unit is zinc coated, use Tremclad Gloss Aluminum Rust paint.

3. __ Lubricate all pivot points. (See “MAINTENANCE AND LUBRICATION” on page 37)

4. __ Re-install guard assembly on restraint. (See “Figure 4: Remove/ Replace Guard Assembly” on page 10)

5. __ Unit is ready to operate. Test operation to ensure unit is operating properly.

6. __ Confirm that all steps of the installation instructions have been completed. Fill out the following information.

DANGER **FAILURE TO PROPERLY INSTALL THE LPR35 MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY OR DEATH AND WILL VOID ALL WARRANTIES.**

Installer Name (Print) _____

Installer Signature _____

Date Installation Completed _____

OPERATION AND PERFORMANCE CHECK

DANGER **BEFORE DOING ANY INSTALLATION, MAINTENANCE, INSPECTION OR TROUBLE SHOOTING, BARRICADE ALL AREAS FROM TRAFFIC AROUND THE WORK AREA INSIDE (AND OUTSIDE IF APPLICABLE) FOR SAFETY AND POST APPROPRIATE WARNING SIGNS. ENSURE THAT THERE IS NOT A TRUCK/TRAILER POSITIONED AT THE DOCK.**

DANGER **FAILURE TO CONFIRM THE CORRECT OPERATION OF THE VEHICLE RESTRAINT IN ACCORDANCE WITH THESE INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY OR DEATH.**

NOTE: A very high level of field issues with this type of equipment can be directly attributed to improper or incomplete installation. The installation instructions and information provided for this equipment is thorough. A step by step sequence for installation is provided. All steps must be followed and completed to provide a complete installation. Incomplete or improper installations can lead to equipment malfunction and / or damage, create safety issues and void warranties. Please follow all installation and set ups steps as indicated in the installation instructions and owner's manual. If you are unclear or uncertain regarding any of the steps contact your Pentalift representative for clarification. A copy of the completed steps listing with the sign off and photos of the installation as indicated at the conclusion of the installation instructions will be required prior to any Pentalift factory trouble shooting assistance.

THIS OPERATION AND PERFORMANCE CHECK MUST BE PERFORMED PRIOR TO THE INITIAL USE OF THE RESTRAINT AND THEREAFTER ON A DAILY BASIS:

1. Confirm the hook limit switch and the signal bar limit switch are properly set up (see "Figure 36: Hook Limit Switch (LS3)" on page 43, "Figure 37: Signal Bar Limit Switch (LS1)" on page 44 and "Figure 38: Signal Bar Limit Switch (LS1)" on page 45)

2. Ensure the vehicle restraint has been returned to the STORED position (hook fully lowered). The inside RED light should be illuminated and the outside GREEN light must be illuminated.

3. Turn the selector switch to the "ENGAGE" position (See "Figure 30: Inside Red Light Remains and Alarm will Sound" on page 36). The Restraint hook arms should rotate until the upper rollers are inside the vertical track, then roll straight vertically to the FULLY raised position. The inside red light must be illuminated while the outside red light must be illuminated and the alarm must be sounding. (See "Figure 31: Rear Impact Guard Not Secure" on page 36)

4. Return the vehicle restraint to the stored position by turning the selector switch to the "DISENGAGE" position.

5. Turn the selector switch to the "ENGAGE" position. The vehicle restraint will begin to rise. While the vehicle restraint is rising (before it gets to the end of the upward travel) depress the signal bar. The upward movement of the vehicle restraint movement should stop and inside green light should illuminate while the inside red and yellow lights are off. Allow the signal bar to move to the normal (inactivated) position for a short distance by lifting hand off it slightly. Confirm the restraint rises and the buzzer sounds until the signal bar is again depressed.

6. Depress and hold the signal bar (See "Figure 37: Signal Bar Limit Switch (LS1)" on page 44) (this will simulate a truck's rear impact guard). Only the inside GREEN light must be illuminated. The outside RED light must be illuminated and the alarm must turn off.

7. To test the OVERRIDE feature, ensure the signal bar is not depressed and follow the entire sequence outlined in Step 2. With the restraint in the fully raised position and with the alarm sounding, turn the selector switch to the "OVERRIDE" position (See "Figure 33: Use Other Suitable Means to Restrain the Vehicle" on page 36). The hooking arm will automatically return to the stored position, and the alarm will be silenced. The outside RED light must be illuminated and the inside YELLOW light must be illuminated. (See "Figure 33: Use Other Suitable Means to Restrain the Vehicle" on page 36 and "Figure 32: Inside Yellow Light" on page 36).

8. Replace burnt out light bulbs on the control panel or defective LED modules immediately.

9. Lubricate all pivot points as outlined in the “MAINTENANCE AND LUBRICATION” on page 37.

The above steps describe and confirm the correct operation of this important piece of safety equipment. If the unit you have does not meet the requirements listed above, discontinue its use and/or repair it immediately. See the Troubleshooting section to correct problems. Contact your Pentalift representative for any required assistance.

OPERATING INSTRUCTIONS

⚠DANGER **USE BY UNTRAINED PEOPLE CAN RESULT IN PROPERTY DAMAGE, BODILY INJURY OR DEATH. READ, KNOW AND OBEY ALL OPERATING INSTRUCTIONS AND SAFETY INFORMATION. PRIOR TO ENGAGING THE RESTRAINT, THE TRUCK/TRAILER MUST BE CENTERED AND PARKED TIGHT AGAINST THE FACE OF BOTH DOCK BUMPERS. INSPECT AND TEST OUTSIDE LIGHTS, INSIDE LIGHTS AND ALARM DAILY (FOLLOWING INSTRUCTIONS NUMBER 1 THROUGH 5 ON PAGE 23). OBEY ALL INSTRUCTIONS, LABELS AND SIGNS PROVIDED WITH THE VEHICLE RESTRAINT.**

⚠DANGER **THE VEHICLE RESTRAINT IS AN IMPORTANT SAFETY DEVICE. NEVER DISCONNECT POWER TO THE RESTRAINT SYSTEM WHILE THE DOCK IS IN USE. IN THE EVENT OF A POWER FAILURE, BARRICADE THE WORK AREA TO PREVENT USE OF THE DOCK.**

NOTE: It is common for this product to be supplied in combination with other Pentalift Products. When the product supplied with other Pentalift products it is quite common for a combination control panel to be provided. The combination control panel will be a single control panel from which more than one product will be controlled and operated. If your installation incorporates the use of such a common control panel then read and follow all the instructions on the panel. If the instructions on the control panel conflict with instructions in this manual then follow the instructions on the control panel.

VEHICLE RESTRAINT PARKED

With the selector switch set at the "**DISENGAGE**" position, the inside light is illuminated red and the outside light is illuminated green, indicating that the dock is ready for truck arrival or departure.

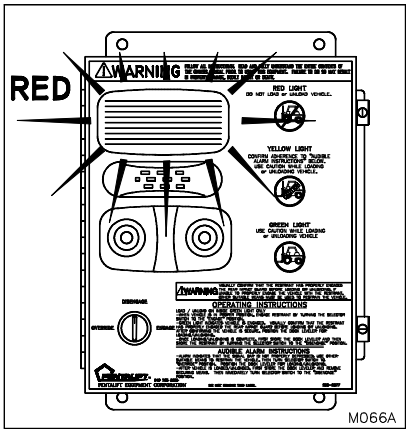


Figure 26: Inside Red Light

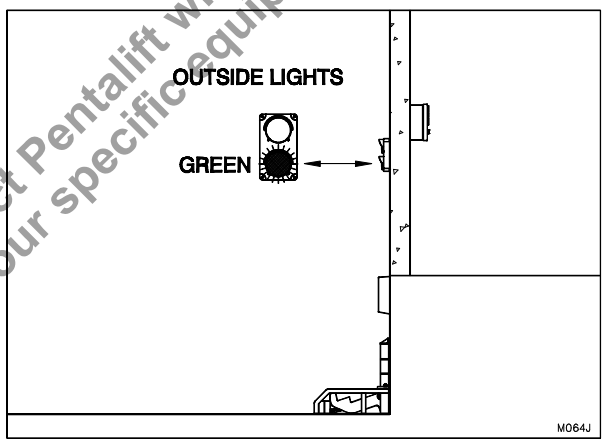


Figure 27: Loading Dock Vacant

TRAILER IN POSITION

With the trailer centered with the loading dock and parked tight against both dock bumpers, the operator turns SELECTOR SWITCH TO "**ENGAGE**" POSITION. The outside light will turn to illuminate red and the restraint will rise until the signal bar makes contact with the truck's rear impact guard. (if alarm sounds see "**REAR IMPACT GUARD**

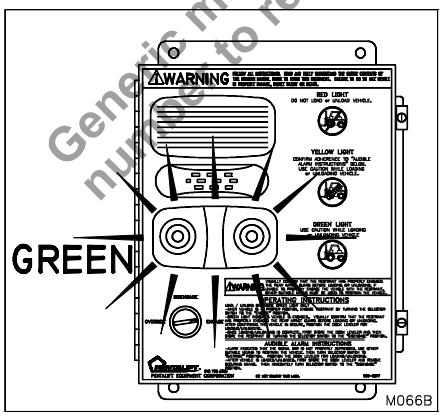


Figure 28: Inside Green Light

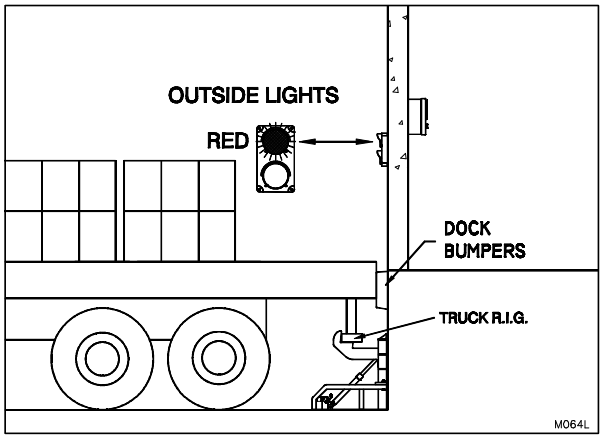


Figure 29: Trailer in Position

CANNOT BE ENGAGED BY RESTRAINT" on page 36). With the rear impact guard properly engaged, the inside light turns green. Visually confirm that the restraint has properly engaged the rear impact guard before loading/unloading commences. When loading/unloading is complete, turn the SELECTOR TO SWITCH TO THE "**DISENGAGE**" POSITION. Illumination of the lights will reverse (inside red will illuminate and the outside green will illuminate) and the truck is free to depart.

REAR IMPACT GUARD CANNOT BE ENGAGED BY RESTRAINT

If the restraint fails to properly engage the rear impact guard, an ALARM WILL SOUND. Visually confirm that the restraint cannot properly engage the rear impact guard (See Item 1, page II). The inside light and the outside light will remain red. Confirm that the trailer is centered with the loading dock and parked tight against both bumpers; and that the rear impact guard is not damaged, missing or located too far toward the rear trailer axle for the restraint to properly engage it.

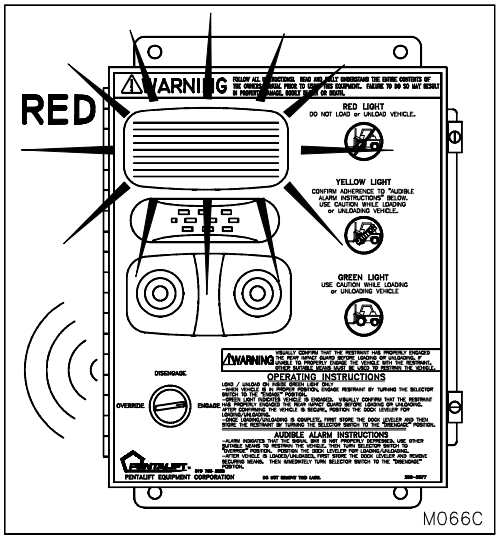


Figure 30: Inside Red Light Remains and Alarm will Sound

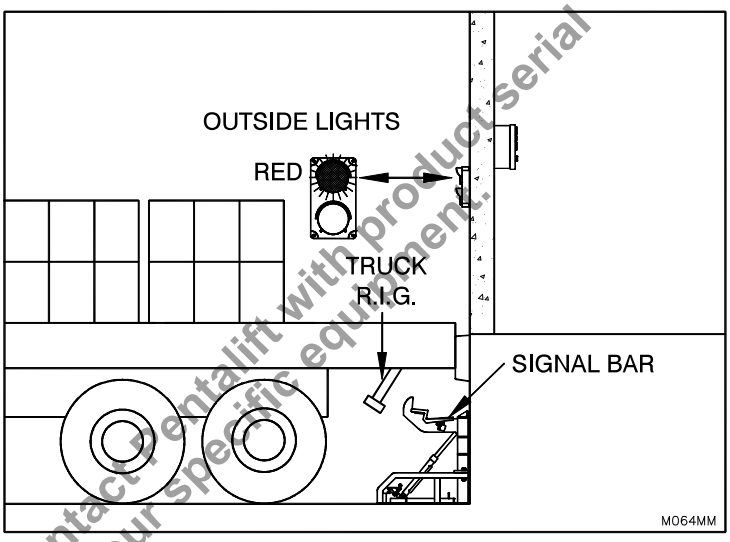


Figure 31: Rear Impact Guard Not Secure

If proper engagement of the rear impact guard by the restraint is not possible, USE OTHER SUITABLE MEANS TO RESTRAIN THE VEHICLE. Turn the SELECTOR SWITCH TO THE "**OVERRIDE**" POSITION. The outside red light will remain illuminated, the inside yellow light will illuminate. The inside red light and alarm will turn off. The restraint will return to its stored position.

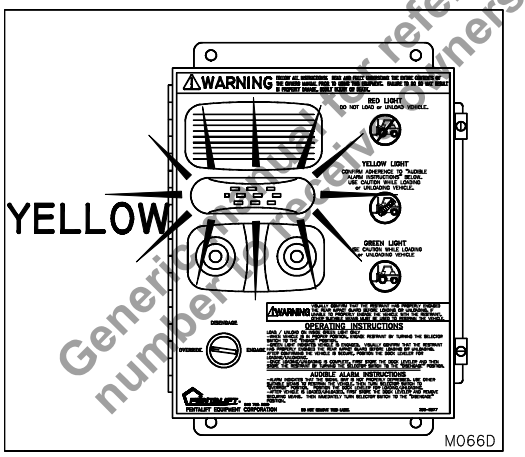


Figure 32: Inside Yellow Light

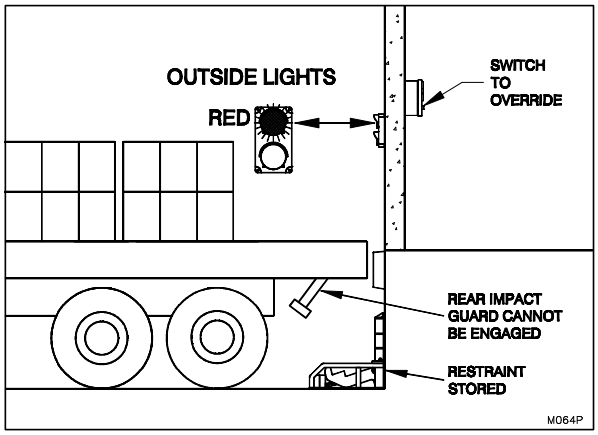


Figure 33: Use Other Suitable Means to Restrain the Vehicle

NOTE: If the vehicle R.I.G. has moved forward during loading / unloading (truck "creep" has occurred), there may be draw pull force and friction holding the restraint in the engaged position. If the restraint will not release, move the trailer back toward the dock to release the tension on the restraint, allowing it to lower.

MAINTENANCE AND LUBRICATION

DANGER **ONLY TRAINED AND QUALIFIED PERSONNEL SHALL PERFORM INSPECTION OR MAINTENANCE AND SERVICE PROCEDURES.**

DANGER **Before doing any installation, maintenance, inspection or trouble shooting, barricade all areas from traffic around the work area inside (and outside if applicable) for safety and post appropriate warning signs.**

DANGER **Arc flash and shock hazard PPE (personal protection equipment) required. De-energize equipment before working on or inside. Do not open cover without appropriate PPE. Refer to NFPA 70E for PPE requirements. This panel may contain more than one power source. Hazardous voltage will cause severe injury or death.**

DANGER **Before doing any electrical work, be certain that the power is disconnected with a fused disconnect, properly tagged and locked out. Fused disconnect and lockout device (supplied and installed by others) must meet with all applicable codes and regulations. All electrical work must be performed by a qualified electrician in accordance with all applicable codes and regulations.**

DANGER **THE RELIEF VALVE ON THE POWER UNIT IS PRESET AT THE FACTORY. IT IS AN IMPORTANT SAFETY DEVICE. DO NOT ADJUST OR REMOVE THE RELIEF VALVE.**

CAUTION **BE SURE ALL HYDRAULIC FITTINGS ARE RATED FOR HYDRAULIC SYSTEMS THAT MAY PEAK OUT AT 4000PSI. HARDWARE STORE ITEMS CAN BURST AT 150PSI. ONLY BUY REPLACEMENT PARTS FROM PENTALIFT.**

CLEANING: The face of a loading dock is generally one of the dirtiest areas in a facility. Dirt and debris fall from the loading dock into and on the restraint area. The equipment is designed to have a long trouble free operating life in this type of condition. However, the area around the restraint must be cleaned on a regular basis. Frequency will vary depending on the conditions at each individual location. Initially, cleaning must be done on a weekly basis. Thereafter, the frequency of cleaning can be adjusted to suit the specific individual installation conditions. Snow and ice must be cleaned away as soon as it accumulates.

CHECK ON A DAILY BASIS:

Replace defective LED modules immediately. Due to the continuous duty of dock traffic light systems and the life span of light bulbs, daily inspection of the light system should be performed. Spare light bulbs and an LED module should be kept on hand at all times for immediate replacement. Ensure that the proper lens color is in the proper position after checking bulbs and LED modules.

Check the signal arm spring to ensure that it is not broken (See RESTRAINT REPLACEMENT PARTS on page 48 item #21). Replace broken signal arm springs immediately. **USE ONLY GENUINE PENTALIFT REPLACEMENT PARTS.**

Conduct the steps listed in the OPERATION AND PERFORMANCE CHECK Section of this manual. (See page 33.)

NOTE: Read the SAFETY INFORMATION AND WARNINGS before servicing the LPR35 Vehicle Restraint. (See page ii.)

NOTE: It is the owner's responsibility to ensure that all labeling remains legible and in its original position throughout the life of the product (See SAFETY LABELING, page 3).

NOTE: Inspect equipment for protective coatings (i.e. paint) that have deteriorated or been removed. Prepare affected area and reapply protective coating as required using Tremclad High Performance Rust Enamel (Gloss Dark Machine Grey) if zing coating not used.

NOTE: At every maintenance interval, inspect the equipment for any damaged or worn parts. If any damaged or worn parts are found, discontinue use of the equipment and/or repair immediately.

Hydraulic Oil/Lubrication:

Weekly: Once a week, or after repetitive operation, the cylinder should be extended to its maximum stroke. This will get rid of cylinder oil seepage build-up and lubricate the upper barrel.

Monthly: As shown by "Figure 34: Lubrication Points" on page 39, the upper and lower pivot points of the vehicle restraint's cylinder and the signal bar pivot must be lubricated regularly to help maintain the unit in proper working condition. The wear strip surfaces that faces toward the rollers and roller axes must be greased as well. The recommended lubrication service interval is every 30 days or at a greater frequency as required in severe environments. The oil should be changed once a year under normal operating conditions. It is strongly urged that a maintenance log be maintained with the dates of monthly inspections, the name of the inspector and results of the inspection.

Seasonal or semiannual maintenance: Change hydraulic fluid for ambient temperature changes if appropriate. Check the fluid reservoir to see if there is any evidence of accumulated condensation creating water contamination. The fluid will appear "milky" and light pink in color. Water accumulation will damage the hydraulic pump.

Bi-Annual: For maximum bearing life, lubricate needle bearing of roller assembly once every two years using NLGI Grade 2 grease. The hook weldment assembly will need to be removed from the frame weldment.
Note: Grease is applied directly to roller bearings. There are no grease zerk fittings.

NOTICE: HYDRAULIC FLUID

The standard hydraulic oil supplied with the equipment is HVI-22 Hydraulic fluid. This fluid is suitable for use from approximately -30º C (-22F) minimum to +35ºC (+95ºF) unless otherwise specified on the specific equipment order. The equipment can be operated in temperatures slightly higher and lower than the temperatures stated on an intermittent basis. Operating the equipment for extended periods of times at temperatures higher or lower than the stated temperatures above may result in functional issues for the equipment. It may also result in damage and issues to hydraulic components. As the actual temperature the equipment is used in moves further away from the recommended temperature range the concern points increase. Abuse and overuse in this regard will void all warranty.
The standard replacement Hydraulic Fluid is HVI-22 hydraulic fluid which accommodates the temperature range stated above. There are special hydraulic fluids available to accommodate temperatures that are consistently and or significantly lower or higher than those stated above. In many cases the use of these types of specialty fluids will result in the requirement for hydraulic fluid changes during seasonal yearly temperature changes.

Recommended for colder temperatures is Hydraulic Fluid 5606A
Recommended for warmer temperatures is Hydraulic Fluid HVI-32

If the hydraulic oil provided from the factory is non-standard, refer to the hydraulic reservoir fluid label which will specify the particular oil requirements.
Note: When approaching or operating in temperature beyond the high and low temperature ranges of the ratings for the hydraulic fluids, there may be some adverse effects to the functionality of the equipment. This could include (but not be limited to) harmonics and vibration of cylinders, inhibited or reduced equipment performance and function, slower cycle times, hydraulic leaks unwanted activation of velocity fuses. To address concerns of this nature a change in hydraulic fluid or a special oil additive maybe required. Contact your Pentalift representative for more information.

Note: The remote installation location of the hydraulic power unit can also help address concerns with hydraulic fluid temperature ranges. For example if the equipment is purchased with a remote power unit, the power unit can be installed in a warmer (indoor) location. In this arrangement, even though the main equipment and it's hydraulic components maybe exposed to more extreme temperatures, the hydraulic power unit and the hydraulic fluid stored in it will be exposed to and therefore absorb the more moderate and desirable internal temperature. During operation the oil in the power unit will quickly mix with the oil in the equipment and will typically mix to a more desirable temperature level.

Note: That if the hydraulic power unit is installed in a pit, as is usually the case for dock levelers, the pit will have moderating effect on the temperature the hydraulic power unit is exposed to. This should be part of the consideration of hydraulic fluid selection.

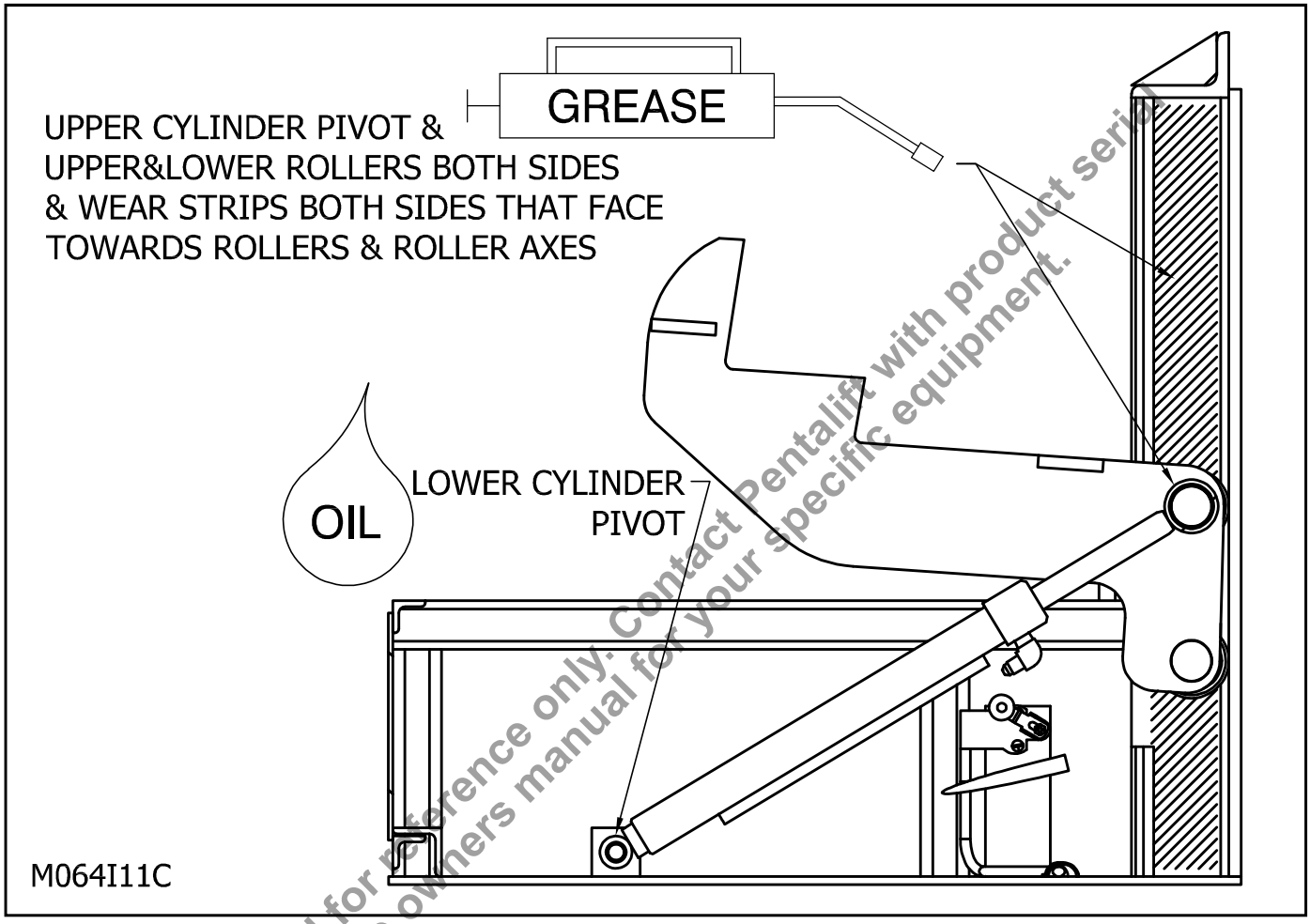


Figure 34: Lubrication Points

TROUBLE SHOOTING GUIDE

NOTE: This equipment has been fully tested and confirmed to be operational at the factory. Historically, the majority of operating problems are caused by unnecessary tampering by unqualified personnel. To conform to the terms of the Warranty, contact your authorized Pentalift representative if you are having any difficulty with the restraint during the warranty period. Do not risk voiding the warranty by tampering with the equipment.

⚠DANGER **ONLY TRAINED AND QUALIFIED PERSONNEL SHOULD PERFORM INSPECTION OR MAINTENANCE AND SERVICE PROCEDURES.**

⚠DANGER **Before doing any installation, maintenance, inspection or trouble shooting, barricade all areas from traffic around the work area inside (and outside if applicable) for safety and post appropriate warning signs.**

⚠DANGER **BEFORE DOING ANY ELECTRICAL WORK, BE CERTAIN THAT THE POWER IS DISCONNECTED WITH A FUSED DISCONNECT, PROPERLY TAGGED AND LOCKED OUT. FUSED DISCONNECT AND LOCKOUT DEVICE (SUPPLIED AND INSTALLED BY OTHERS) MUST MEET WITH ALL APPLICABLE CODES AND REGULATIONS. ALL ELECTRICAL WORK MUST BE PERFORMED BY A QUALIFIED ELECTRICIAN IN ACCORDANCE WITH ALL APPLICABLE CODES AND REGULATIONS. FOLLOW ALL WARNINGS IN THE SAFETY INFORMATION AND WARNINGS SECTION OF THIS MANUAL.**

⚠DANGER **Arc flash and shock hazard PPE (personal protection equipment) required. De-energize equipment before working on or inside. Do not open cover without appropriate PPE. Refer to NFPA 70E for PPE requirements. This panel may contain more than one power source. Hazardous voltage will cause severe injury or death.**

NOTICE See page 37 for recommended hydraulic oil.

NOTE: A very high level of field issues with this type of equipment can be directly attributed to improper or incomplete installation. The installation instructions and information provided for this equipment is thorough. A step by step sequence for installation is provided. All steps must be followed and completed to provide a complete installation. Incomplete or improper installations can lead to equipment malfunction and / or damage, create safety issues and void warranties. Please follow all installation and set ups steps as indicated in the installation instructions and owner's manual. If you are unclear or uncertain regarding any of the steps contact your Pentalift representative for clarification. A copy of the completed steps listing with the sign off and photos of the installation as indicated at the conclusion of the installation instructions will be required prior to any Pentalift factory trouble shooting assistance.

1. **Restraint will not rise when the selector switch is turned to the "II" (ENGAGED) position:**
   a. Confirm that the signal bar limit switch has not been depressed (See "Figure 37: Setting the Signal Bar Limit Switch" on page 44).
   b. Check the signal bar spring is in place (See "Figure 37: Setting the Signal Bar Limit Switch" on page 44).
   c. Check signal bar limit switch adjustment on signal bar (See "Figure 37: Setting the Signal Bar Limit Switch" on page 44).
   d. Check that hydraulic fluid level is approximately two inches from the top of the reservoir when the restraint is completely lowered.
   e. Examine all moving parts for obstructions or binding.
   f. Check all wiring and hydraulic connections.
   g. Confirm that power is reaching the power unit.
   h. Check if the inputs I-1 on the PLC screen is highlighted. If not, connections going in the terminal needs to be checked. (See Figure 46A and 46B on page 42).
   i. Check if the output Q2 gets highighted (See Figure 46A and 46B on page 42).
   j. If the problem cannot be solved, consult your authorized Pentalift representative.

2. **Restraint rises but has a jerking movement:**
   a. Check that hydraulic fluid level is approximately two inches from the top of the reservoir when the restraint is completely lowered.
   b. Check of any obstructions and bindings restricting free motion.
   c. Check signal bar limit switch adjustment (See “Figure 37: Setting the Signal Bar Limit Switch” on page 44).
   d. If the problem cannot be solved, contact your authorized Pentalift Representative.

3. **Pump continues to run when restraint is at the raised position:**
   a. check if the signal bar limit switch is getting depressed once the restraint is at the raised position.
   b. check if the limit switches are wired at the correct terminal blocks inside the panel by refering to the electrical schematic.
   c. confirm all the wiring is correct and there are no loose connections inside the panel.
   d. check if the input I3 on the PLC screen highlights once the signal bar limit switch is depressed.
   e. If the problem cannot be solved, contact your authorized Pentalift Representative.

4. **The restraint will not raise completely:**
   a. Check that hydraulic fluid level is approximately two inches from the top of the reservoir when the restraint is completely lowered.
   b. Check for any obstructions or binding to ensure the hook can move freely.
   c. If the problem cannot be solved, contact your authorized Pentalift Representative.

5. **The Restraint will not lower:**
   a. Check for any obstructions and binding to ensure the hook can move freely.
   b. The down travel limit switch lower position setting may need to be reset.
   c. Check for power to the lowering valve.
   d. Check if the input I4 is highlighted on the PLC screen (See “Figure 46B: I/O on PLC screen” on page 42).
      NOTE: If the vehicle R.I.G. has moved forward during loading/unloading (truck “creep” has occurred), there may be draw pull force and friction holding the restraint in the engaged position. If the restraint will not release, move the trailer back toward the dock to release the tension on the restraint, allowing it to lower.
   e. Ensure lowering extension spring is in place (See item 14, “Figure 39: Replacement Parts” on page 48).
   f. If the problem cannot be solved, contact your authorized Pentalift Representative.

6. **Alarm Sounds and Restraint is not completely raised:**
   a. Check the signal bar wiring and limit switch adjustments.
   b. Check for leaking hose or hydraulic connections.
   c. Check that hydraulic fluid level is approximately two inches from the top of the reservoir when the restraint is completely lowered.
   d. Confirm that the signal bar limit switch is not activated. (See “Figure 37: Setting the Signal Bar Limit Switch” on page 44)
   e. If the problem cannot be solved, contact your authorized Pentalift Representative.

7. **Outside red light remains illuminated and will not change to green.**
   a. Confirm that restraint is able to completely lower. The rear limit switch will not switch the outside lights unless the restraint hook is completely lowered and in contact with the bottom plate.
   b. Check down travel limit switch lower position setting.
   c. Confirm that the signal bar limit switch is not activated. (See “Figure 37: Setting the Signal Bar Limit Switch” on page 44)
   d. Confirm that the input I3 on PLC screen is not highlighted (See Figure 46B : I/O on PLC Screen” on page 42).
   e. If the problem cannot be solved, contact your authorized Pentalift Representative.

If damaged or worn parts are detected upon inspection, replacement must be undertaken immediately. **The vehicle restraint must not be used until replacement is completed.** Parts are readily available from your Pentalift representative.

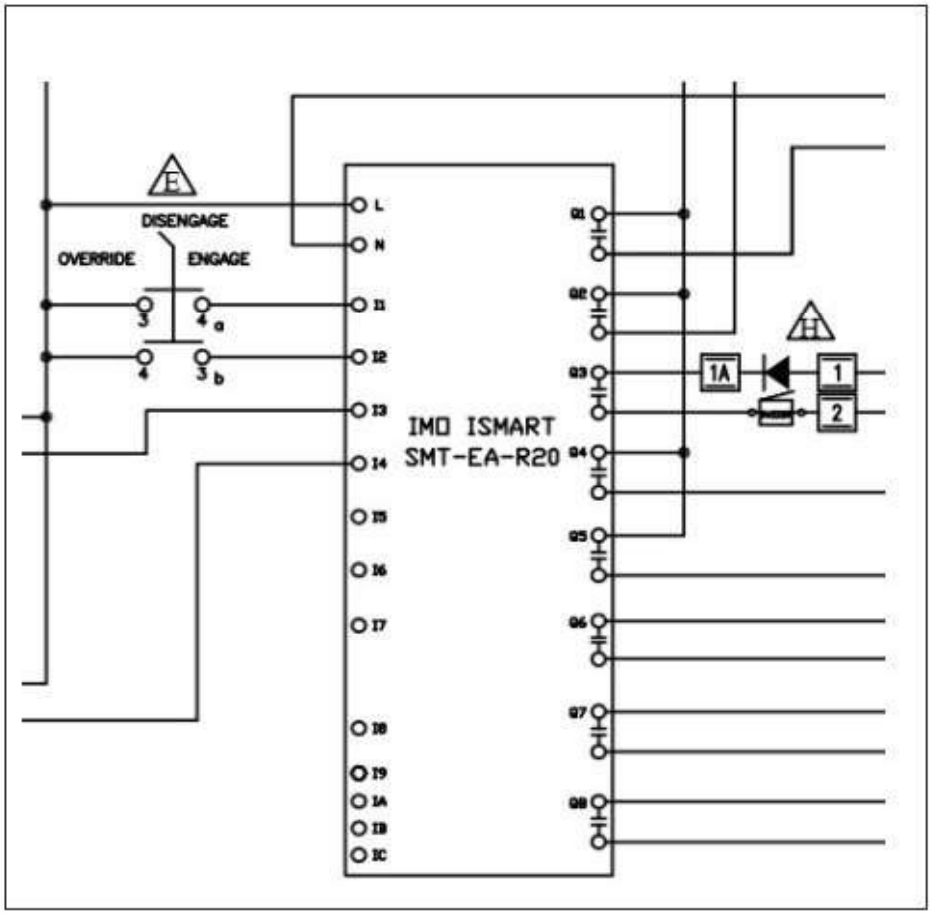
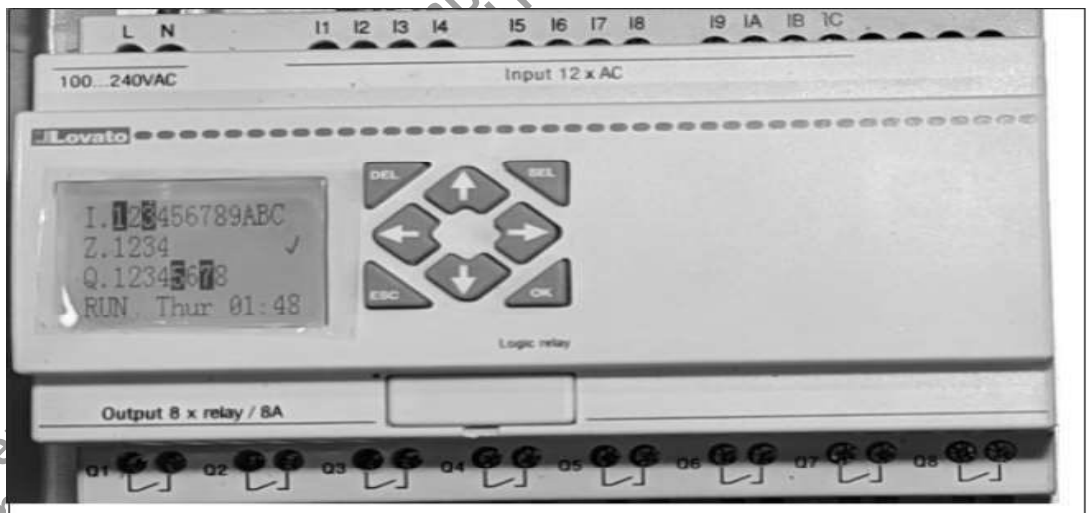


Figure 46A: PLC I/O Connections



IN THIS FIGURE,

1. INPUTS I-1 AND I-3 ARE SWITCHED ON.
2. OUTPUTS Q-5 AND Q-7 ARE SWITCHED ON.

Figure 46B: Inputs/Outputs on PLC Screen

RESTRAINT ADJUSTMENTS

DANGER **ONLY TRAINED AND QUALIFIED PERSONNEL SHOULD PERFORM INSPECTION OR MAINTENANCE AND SERVICE PROCEDURES.**

DANGER **TO ENSURE THAT THE RESTRAINT IS NOT INADVERTANTLY ACTIVATED WHILE THE FOLLOWING ADJUSTMENTS ARE BEING MADE, BARRICADE ALL AREAS FROM TRAFFIC AROUND THE WORK AREA INSIDE (AND OUTSIDE IF APPLICABLE) FOR SAFETY (PARTICULARLY THE CONTROL BOX LOCATION) AND POST APPROPRIATE WARNING SIGNS.**

SETTING THE HOOK LIMIT SWITCH (LS1) POSITION:

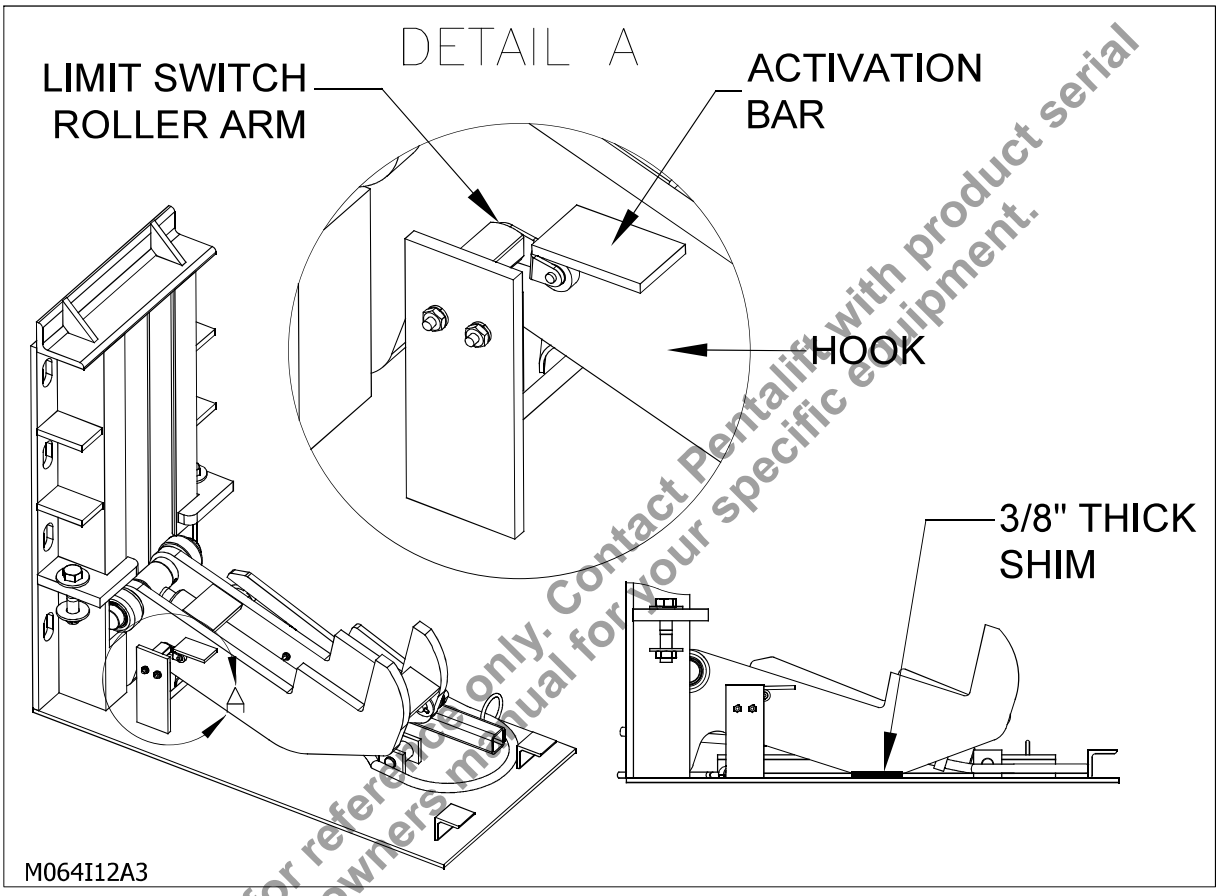


Figure 36: Hook Limit Switch (LS3)

a) Remove the guard assembly (See “Figure 4: Remove/ Replace Guard Assembly” on page 10).
b) Raise the restraint hook and place a 3/8” shim under the hooking arm.
c) Lower the restraint onto the 3/8” shim.
d) Loosen the hex socket set screw on the limit switch roller lever.
e) Rotate the roller lever until it contacts the striker plate which is located between the hook arms. Note that the roller lever will be about horizontal.
f) Tighten the hex socket set screw on the limit switch roller lever while ensuring that the roller lever does not rotate around the shaft during tightening.
g) With the 3/8” shim still in place, confirm that the outside red light is illuminated.
h) Raise the restraint; remove the 3/8” shim and lower the restraint.
i) Confirm that the outside green light is illuminated.
j) Repeat items b) thru i) as required until step g), the outside red light is illuminated, and step i) ,the outside green light is illuminated, have been confirmed.
k) Reinstall the guard assembly (See “Figure 4: Remove/ Replace Guard Assembly” on page 10).

SIGNAL BAR LIMIT SWITCH ADJUSTMENTS

Perform these steps for signal bar.

a) Turn the control box selector switch to the “ENGAGE” position. The restraint will rise to the fully raised position; the pump operation will “time-out” (approximately 6 seconds); and the alarm should sound.
b) Check the signal bar spring is in place and push down the signal bar ensuring the spring backs it up. See “Figure 37: Signal Bar Limit Switch (LS1)” on page 44.
c) Make sure the limit switch is configured as shown in “Figure 44: Limit Switch Arm at 90°” on page 46 which shows the starting point of the adjust. From this, rotate the arm two notches as shown in “Figure 45: Limit Switch Arm at 90° + 2 notch position” on page 46.
d) Press the signal bar down. As soon as the signal bar is depressed (after very little travel) the limit switch should activate changing the inside lights from red to green illumination.
Note: *It is important that the limit switch is activated to change the inside lights after very minimal travel of the signal arm. If this is not occurring and the limit switch is not activating as soon as the signal bar begins to depress, adjust the limit switch (See page 45) to accomplish immediate activation on depression of the signal bar.*
e) Release the signal bar (it should spring back up). The inside light should turn red.
f) Ensure the signal bar limit switch roller lever has remaining travel when the signal bar is completely depressed to the signal bar stop block. See “Figure 38: Signal Bar Limit Switch (LS1)” on page 45.
g) Repeat steps d) through g) until the desired inside light signals are accomplished.
h) Return the control box selector switch to the “DISENGAGE” position.

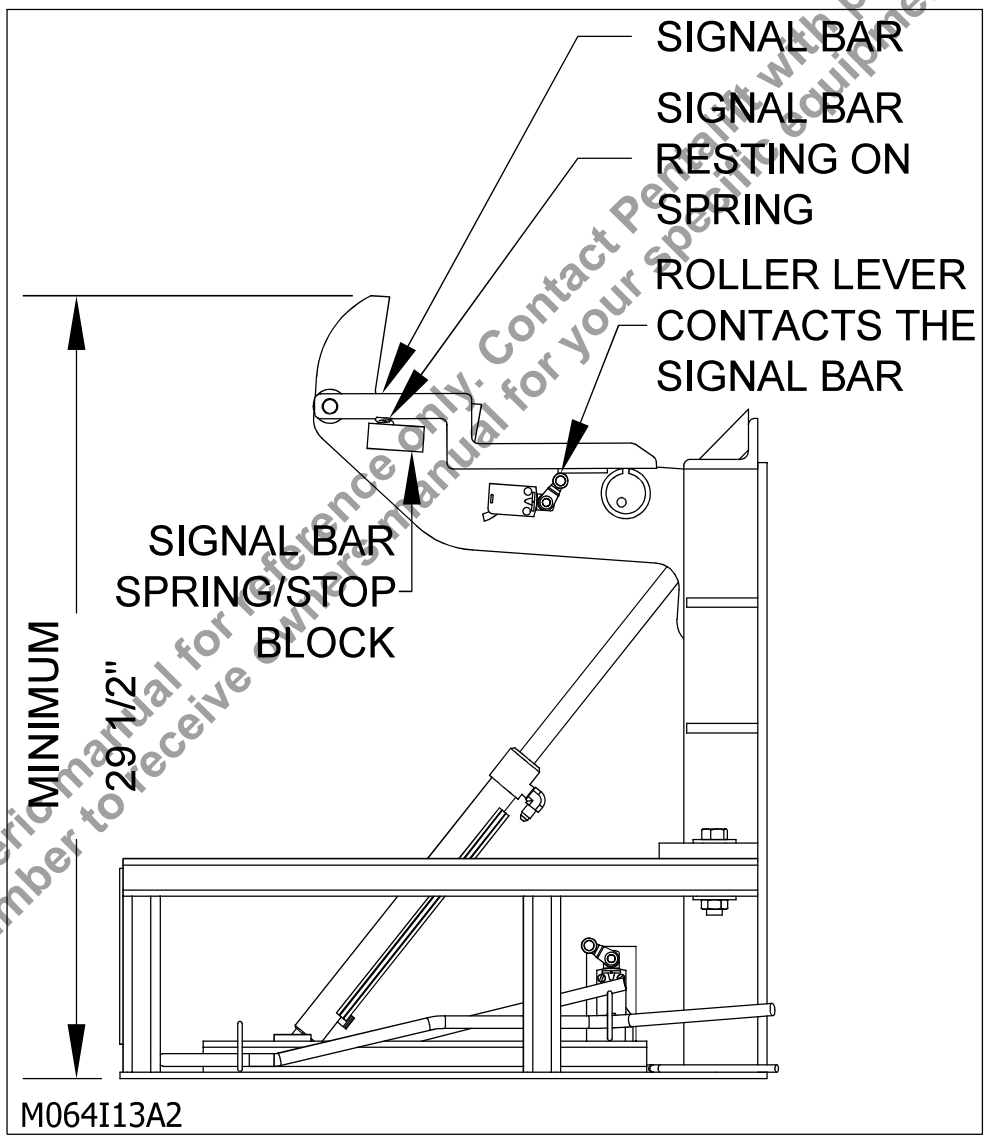


Figure 37: Signal Bar Limit Switch (LS1)

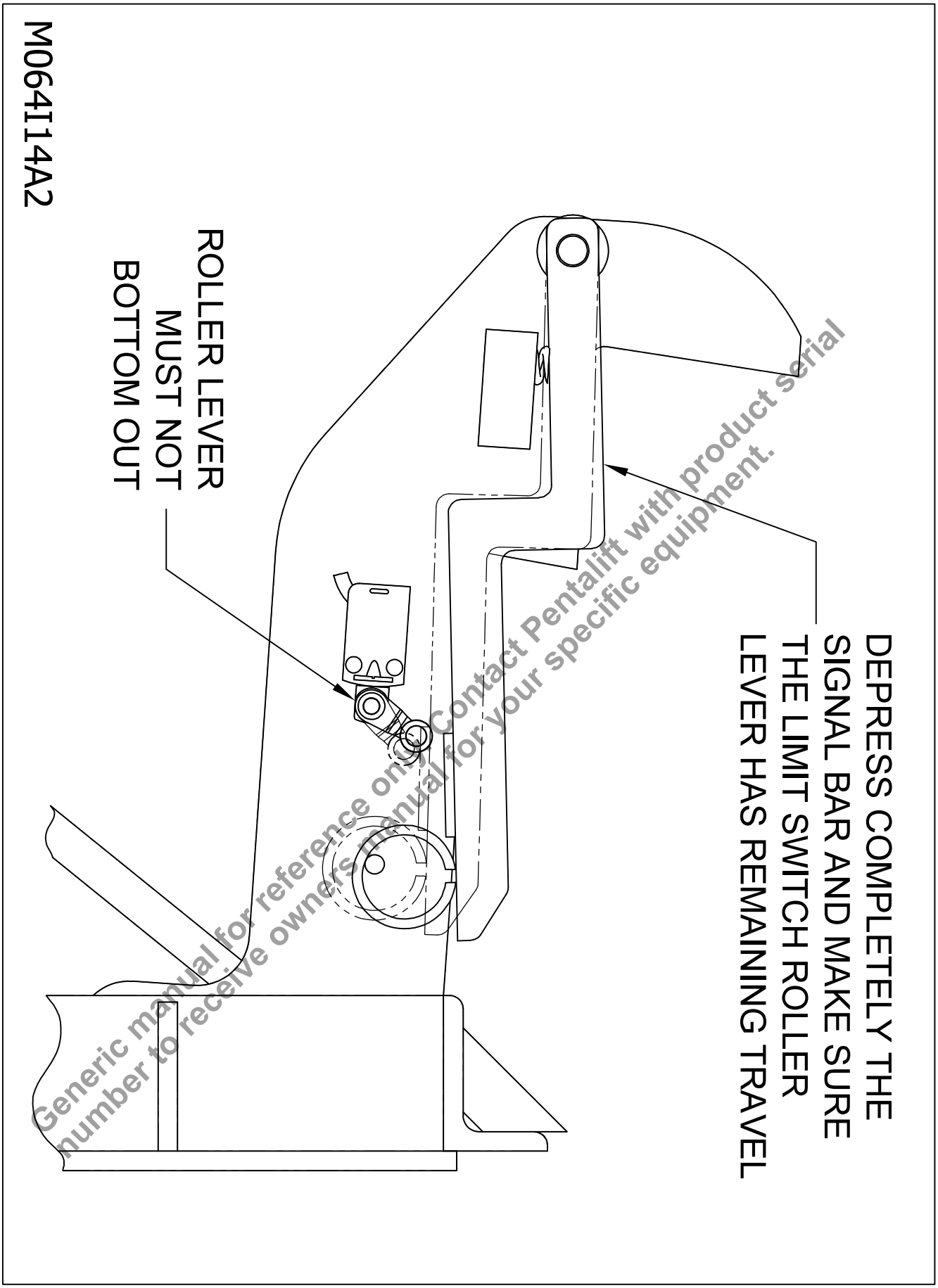


Figure 38: Signal Bar Limit Switch (LS1)

SIGNAL BAR LIMIT SWITCH CONFIGURATION

The limit switch can be adjusted by rotating the switch head. Loosen the hex socket set screw on the limit switch roller lever and make sure to adjust it as described below:

- **Switch head rotation:** Make sure the switch head is rotated 90 degrees (See “Figure 44: Limit Switch Arm at 90°” on page 46) from the base of the switch. Then, rotate the head 2 notch position in clockwise direction (See “Figure 45: Limit Switch Arm at 90° + 2 notch position” on page 46).

  Note: if the switch roller lever is adjusted incorrectly, the switch will be constantly triggered, falsely indicating contact with a RIG. or the switch may not trigger, even if a RIG is in contact.

When the position is adjusted, tighten the hex socket set screw on the limit switch roller lever while ensuring that the roller lever does not rotate around the shaft during tightening.

Go back to step d) on page 43 after making signal bar limit switch adjustments.

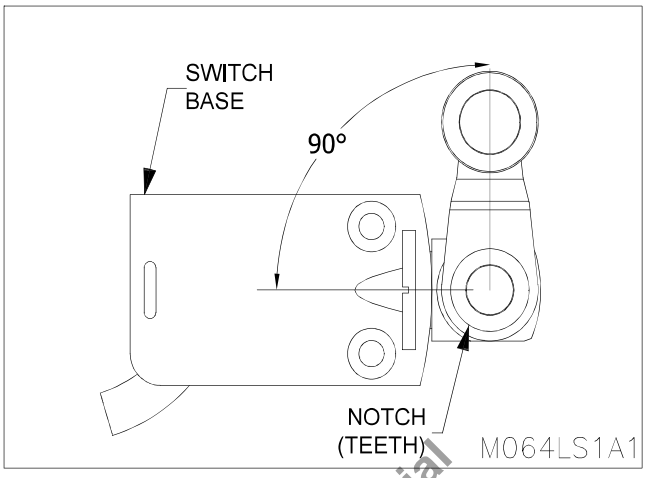


Figure 44: Limit Switch Arm at 90°

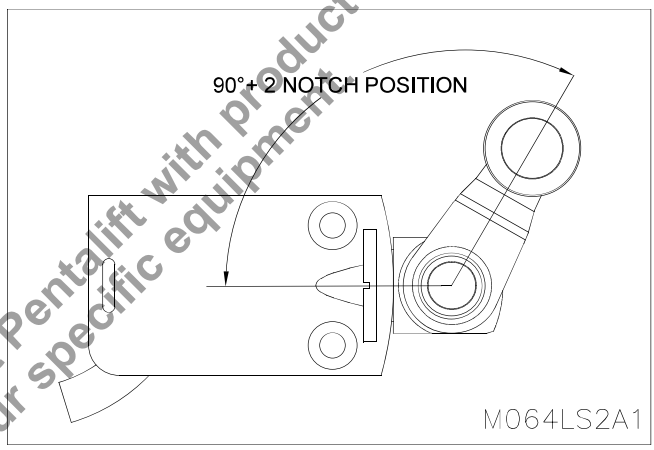


Figure 45: Limit Switch Arm at 90° + 2 notch position

REPLACEMENT PARTS

USE ONLY GENUINE PENTALIFT REPLACEMENT PARTS

DANGER **To ensure proper functioning, durability and safety of the product, only genuine pentalift replacement parts must be used. Altering the product from its original manufactured configuration must not be done. Pentalift equipment Corporation disclaims all liability for failure to comply with this warning. Warranties are specifically disclaimed in the event the purchaser fails to comply with this warning.**

To expedite order processing when ordering parts, provide the following information to your Pentalift representative:

1. Model and Serial Number of equipment.
2. Part Number, Description and Quantity.
3. Shipping Instructions.

Fuse I.D.	Single Phase Standalone	
	Part No.	Description
F1	060-0537	2 Amp / 250V Fuse
F2	060-0496	7 Amp / 250V Fuse

Fuse I.D.	Single Phase Combo	
	Part No.	Description
F1	060-0537	2 Amp / 250V Fuse

Fuse I.D.	Three Phase		
	Voltage	Part No.	Description
F1 and F2	575V	060-0024	1/2 Amp / 600V
	460V	060-0024	1/2 Amp / 600V
	230V	060-0300	1 Amp / 600V
F3	575V	060-0537	2 Amp / 250V
	460V	060-0537	2 Amp / 250V
	230V	060-0537	2 Amp / 250V

3 PHASE TRANSFORMER AND OVERLOAD

Three Phase Control Box Replacement Parts		
Powe Unit Voltage	Part Numbers	
	Transformer	**Overload**
575 / 120V	060-0937	060-1042
460 / 120V	060-0937	
230 / 120V	060-0943	060-1041

NOTE: State Model # and Serial # when ordering replacement parts.

RESTRAINT REPLACEMENT PARTS
USE ONLY GENUINE PENTALIFT REPLACEMENT PARTS

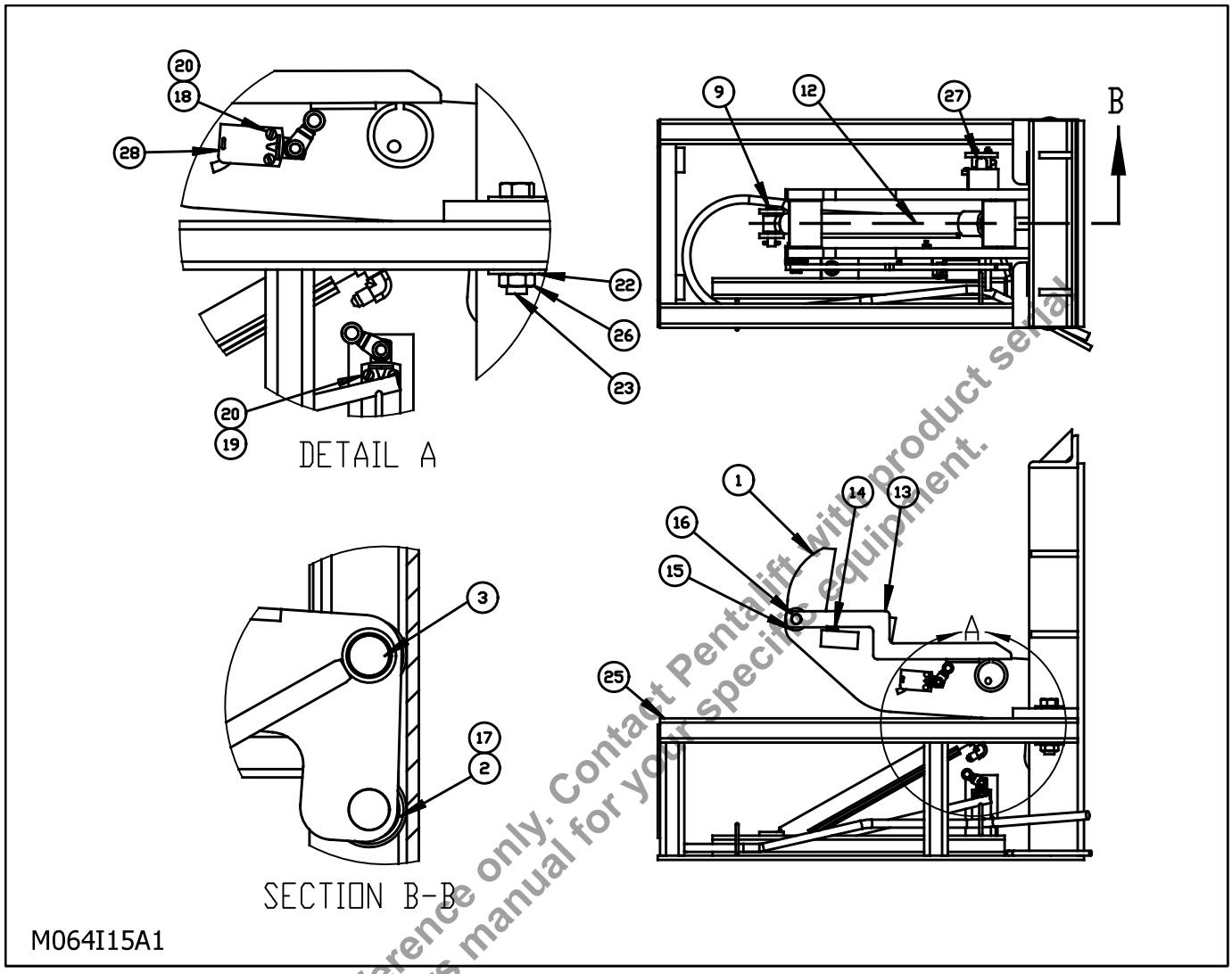


Figure 39: Replacement Parts

Item #	Part No.	Description
1	809-0095	Hook Weldment
2	809-0005	Roller Assembly
3	309-0128	Roller Pin
4		
5		
6		
7		
8		
9	080-0039	Cylinder Housing Pin
10		
11		
12	809-0096	Cylinder
13	809-0055	Signal Bar
14	097-0042	Spring
15	074-0004	Washer
16	095-0053	Bushing
17	087-0122	Retaining Ring
18	072-0218	Screw
19	072-0188	Screw
20	074-0074	Lock Washer
21		
22	074-0065	Washer
23	072-0206	Bolt
24		
25	809-0069	Guard Weldment
26	070-0021	Nut
27	060-1225	Limit Switch
28	060-1225	Limit Switch

To replace operator or driver signs, refer to “SAFETY INFORMATION AND WARNINGS” on page II.
NOTE: State Model # and Serial # when ordering replacement parts.

CONTROL PANEL REPLACEMENT PARTS

USE ONLY GENUINE PENTALIFT REPLACEMENT PARTS

SINGLE PHASE STANDALONE REF: 161-0497

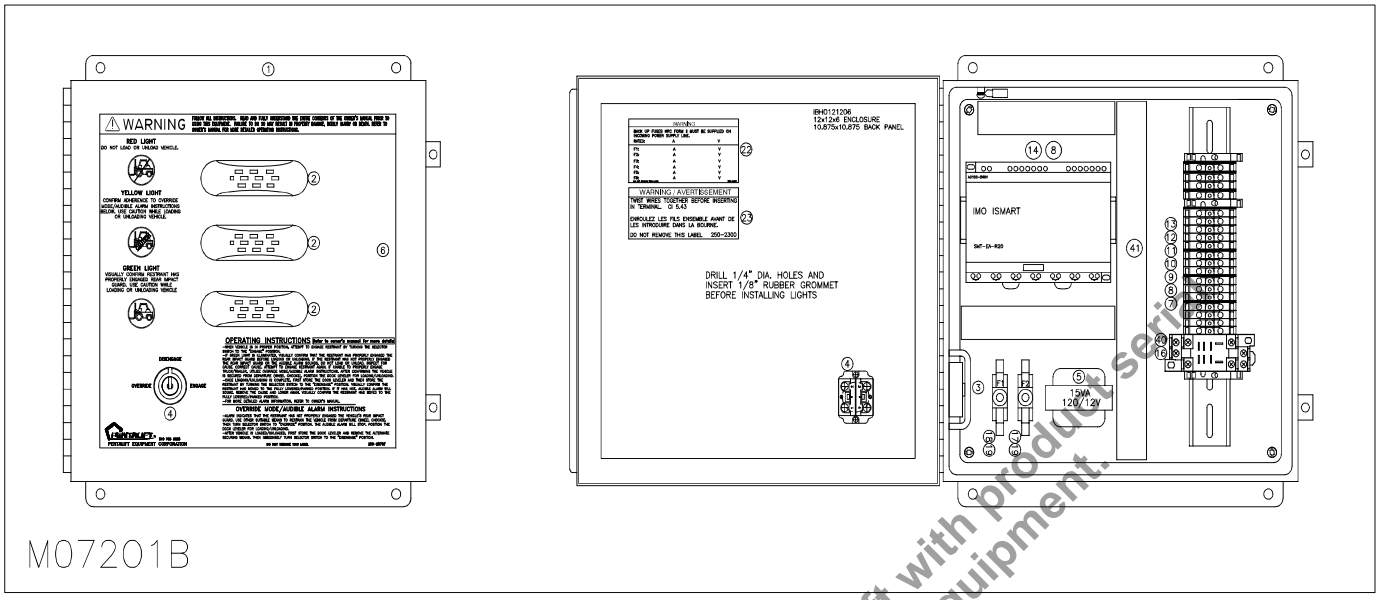


Figure 40: Single Phase Control Panel

Item	Part No.	Description
1	060-0233	Electrical Enclosure
2	161RGA	Red Green Amber Light Assembly
3	161BUZ	120Vac Buzzer Assembly
4	161VRSW2	Restraint Switch Assembly
5	060-0209	15VA 20/12V Transformer
6	250-2575	Control Panel Label
7	060-0549	Jumper Bar 32A 10 Pole
8	060-0293	Din Rail Mounting Bar
9	060-1056	Self Grounding Terminal Block
10	060-0548	Terminal Block Beige
11	060-0463	Terminal Ends
12	060-0466	Terminal Markers
13	060-0464	Terminal Stops
14	060-0933	IMO Logic Relay
16	060-0552	120Vac DPDT Realy
17	060-0496	Fuse, 7A/250V - Time Delay
18	060-0537	Fuse, 2A/250V - Time Delay
19	060-0380	1/4” Fuse Holder
22	250-2297	CSA Label - Fuses
23	250-2300	CSA Label - Twist Wires

NOTE: State Model # and Serial # when ordering replacement parts.

SINGLE PHASE COMBO PANEL REF: 161-0502

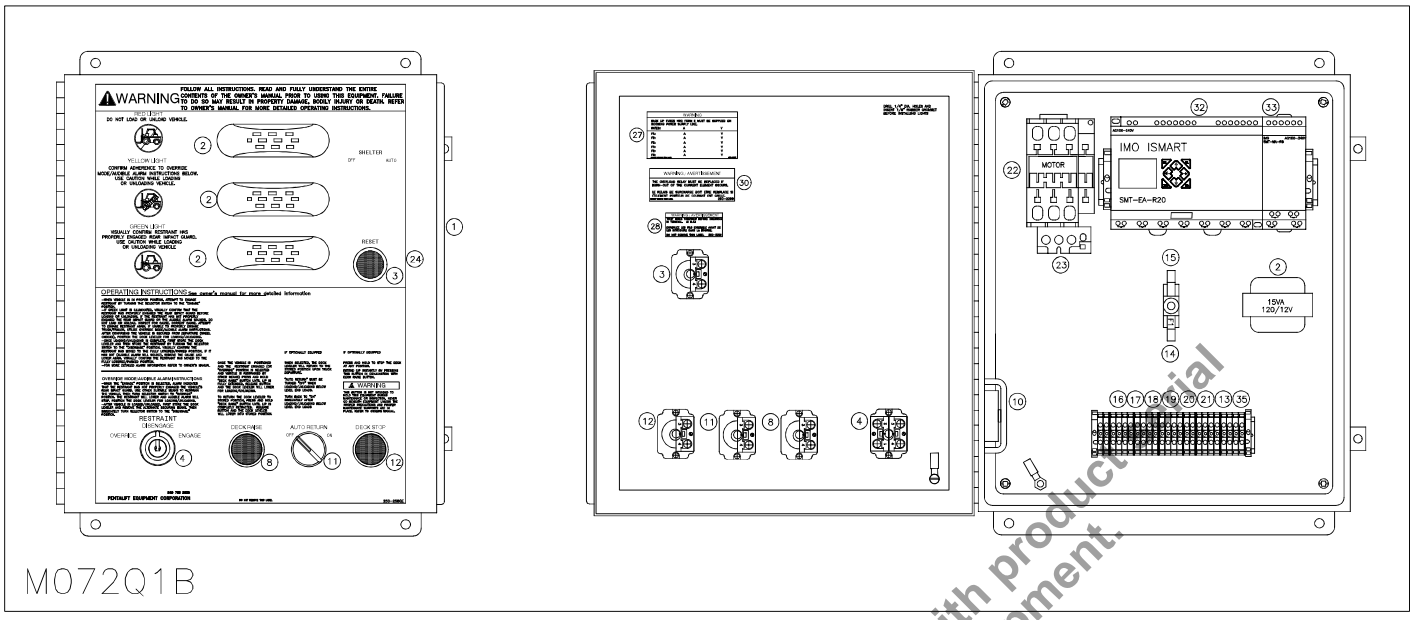


Figure 41: Single Phase Combo Control Panel

Item	Part No.	Description
1	060-0592	Electrical Enclosure
2	161RGA	Red Amber Green Panel Light Assembly
3	161RB	Electric Reset Button Assembly
4	161VRSW2	Restraint Switch Assembly
5	060-0209	15VA 20/12V Transformer
8	161DR	Deck Raise Button
10	161BUZ	120V Buzzer Assembly
11	161AR	Auto Return Switch Assembly
12	161DS	Deck Stop Switch Assembly
13	060-0293	Din Rail Mounting Bar
14	060-0537	Fuse - 2A/250V Time Delay
15	060-0380	Fuse Holder
16	060-0548	Terminal Block, Beige
17	060-1056	Terminal Block, Self Grounding
18	060-0463	Terminal Block End
19	060-0466	Terminal Markers
20	060-0464	Terminal Block End Stop
21	060-0549	Terminal Block Jumper Bar, 10 Pole
22	060-1036	Contactor
23	NOTE	Thermal Overload
24	250-2580	Control Panel Label
27	250-2297	CSA Label - Fuses
28	250-2300	CSA Label - Twist Wires
30	250-2299	CSA Label - Replace Overload
32	060-0933	IMO Logic Relay
33	060-0934	IMO Logic Relay - Expansion Module
35	060-1083	22 KΩ Resistor

NOTE: State Model # and Serial # when ordering replacement parts.

THREE PHASE COMBO PANEL REF: 161-0473

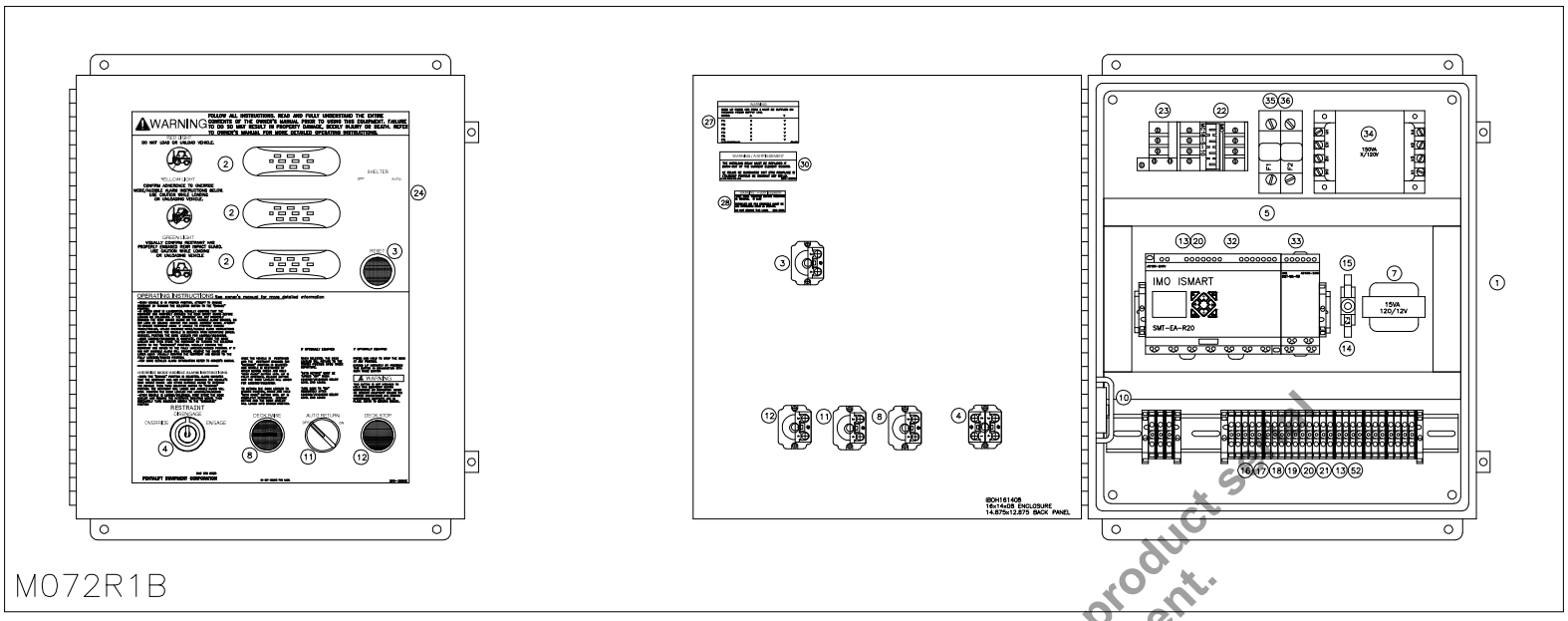


Figure 47: Three Phase Combo Control Panel

Item	Part No.	Description
1	060-0248	Electrical Enclosure
2	161RGA	Red Amber Geen Panel Light Assembly
3	161RB	Electric Reset Button Assembly
4	161VRSW2	Restraint Switch Assembly
7	060-0209	15VA 20/12V Transformer
8	161DR	Deck Raise Button
10	161BUZ	120V Buzzer Assembly
11	161AR	Auto Return Switch Assembly
12	161DS	Deck Stop Switch Assembly
13	060-0293	Din Rail Mounting Bar
14	060-0537	Fuse - 2A/250V Time Delay
15	060-0380	Fuse Holder
16	060-0548	Terminal Block, Beige
17	060-1056	Terminal Block, Self Grounding
18	060-0463	Terminal Block End
19	060-0466	Terminal Markers
20	060-0464	Terminal Block End Stop
21	060-0549	Terminal Block Jumper Bar, 10 Pole
22	060-1036	Contactor
23	NOTE	Thermal Overload
24	250-2580	Control Panel Label
27	250-2297	CSA Label - Fuses
28	250-2300	CSA Label - Twist Wires
30	250-2299	CSA Label - Replace Overload
32	060-0933	IMO Logic Relay
33	060-0934	IMO Logic Relay - Expansion Module
34	NOTE	150VA Transformer
35	060-0381	Class CC Fuse Holder
36	NOTE	Primary Fuses
52	060-1083	22 KΩ Resistor

NOTE: State Model # and Serial # when ordering replacement parts.

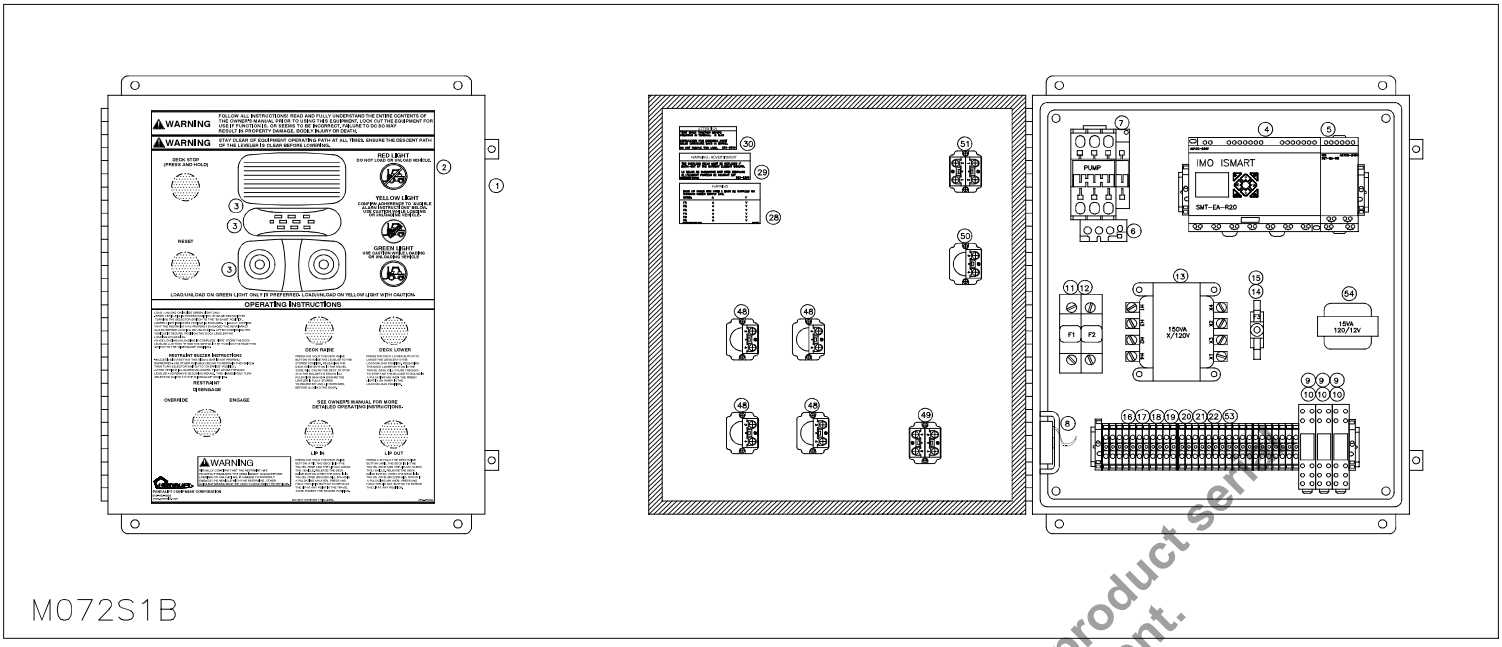


Figure 48: Vertical Dock Leveler Control Panel

Item	Part No.	Description
1	060-0248	Electrical Enclosure
2	250-2504	Instruction Label
3	161RGA	Red Amber Geen Panel Light Assembly
4	060-0933	IMO Logic Relay
5	060-0934	IMO Logic Relay - Expansion Module
6	NOTE	Thermal Overload
7	060-1036	Contactor
8	161BUZ	120V Buzzer Assembly
9	060-0554	8 Pin Relay Mount
10	060-0551	DPDT 120V Relay
11	NOTE	Fuse - Class CC Time Delay
12	060-0381	Double Body Class CC Fuse Holder
13	Note	150VA Transformer
14	060-0537	Fuse - 2A/250 Time Delay
15	060-0380	Fuse Holder
16	060-0548	Terminal Block, Beige
17	060-1056	Terminal Block, Self Grounding
18	060-0463	Terminal Block End
19	060-0466	Terminal Markers
20	060-0464	Terminal Block End Stop
21	060-0549	Terminal Block Jumper Bar, 10 Pole
22	060-0293	Din Rail Mounting Bar
28	250-2297	CSA Label - Fuses
29	250-2299	CSA Label - Replace Overload
30	250-2300	CSA Label - Twist Wires
48	161DR	Deck Raise Button
49	161VRSW2	Restraint Switch Assembly
50	161RB	Electric Reset Button Assembly
51	161STOP	Emergency Stop Button Assembly
53	060-1083	22 KΩ Resistor
54	060-0209	15VA 20/12V Transformer

NOTE: State Model # and Serial # when ordering replacement parts.

TRAFFIC LIGHT REPLACEMENT PARTS

USE ONLY GENUINE PENTALIFT REPLACEMENT PARTS

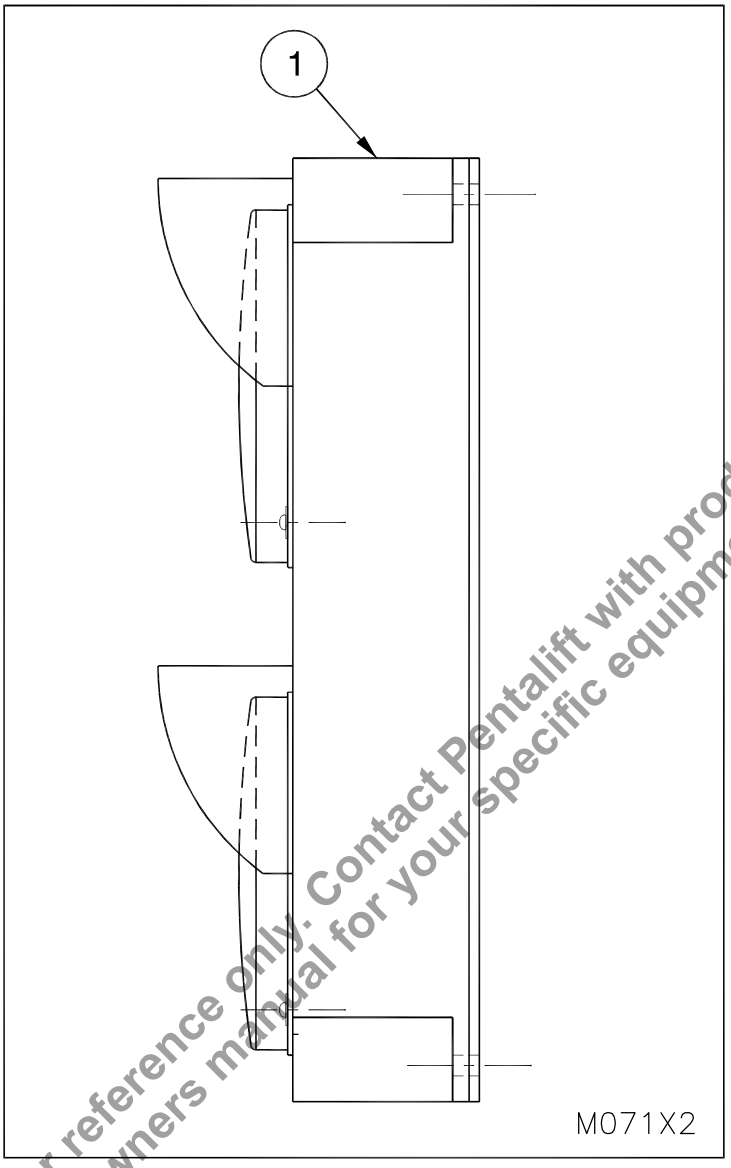


Figure 42: Traffic Light Replacement Parts

Item	Part No.	Description
1	060-1271	12V Traffic Light Fixture

NOTE: State Model # and Serial # when ordering replacement parts.

REPLACEMENT SIGNS

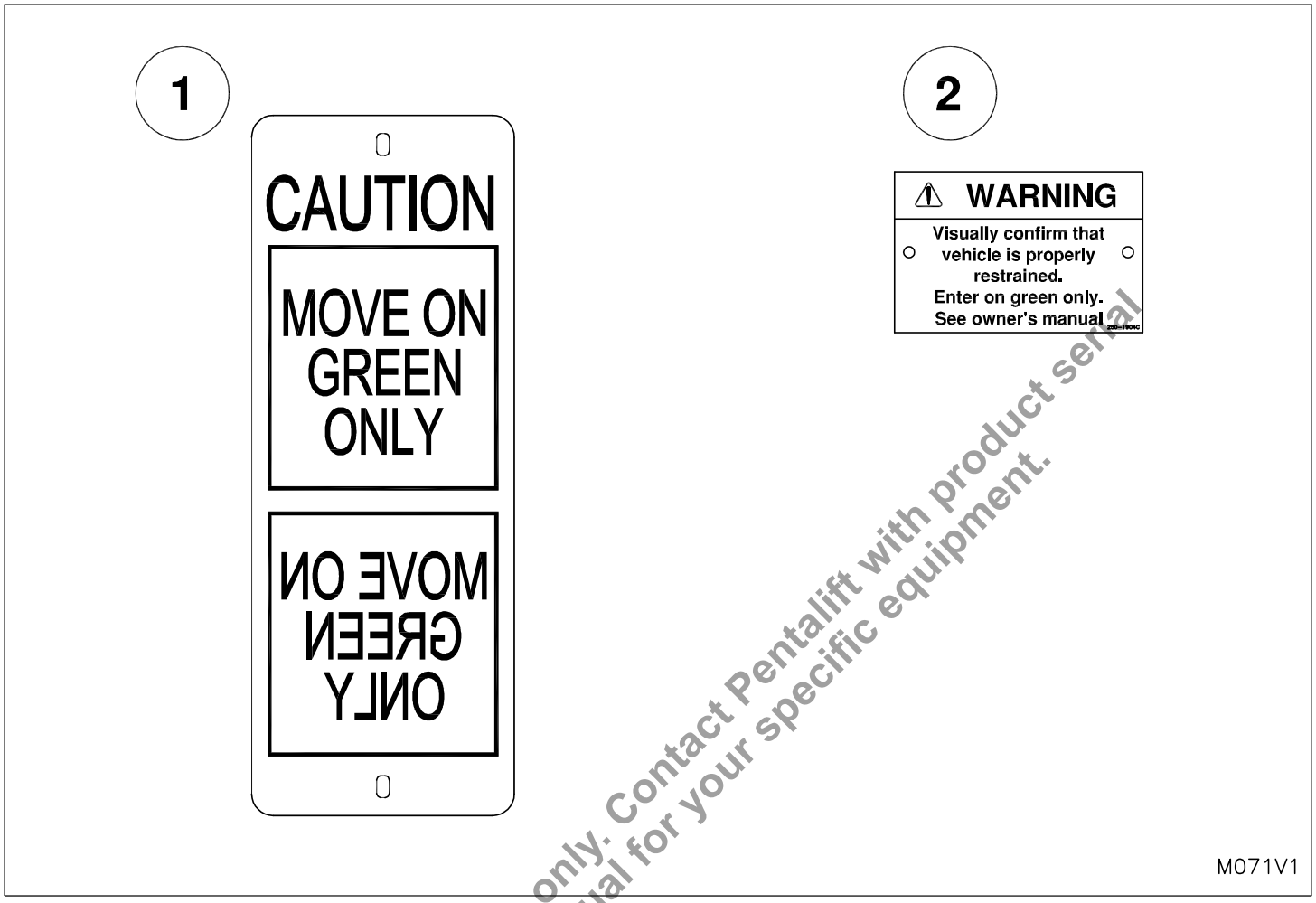


Figure 43: Replacement Signs

Item	Part No.	Description
1	250-6991	Caution Sign-Move on Green Only
2	250-1904	Interior Shipper / Receiver Sign

LIST OF ILLUSTRATIONS

PENTALIFT EQUIPMENT CORPORATION WARRANTY

WARRANTY

Pentalift Equipment Corporation expressly warrants that any product manufactured by **Pentalift Equipment Corporation** will be free from defects in material and workmanship under normal use for a period of one (1) year from the date of shipment of the equipment, provided the original purchaser maintains and operates the product in accordance with proper procedures. In the event the product proves defective in material or workmanship, **Pentalift Equipment Corporation** will at its option:

1. Replace the product or the defective portion thereof without change to the purchaser; or
2. Alter or repair the product; on site or elsewhere, as **Pentalift Equipment Corporation** may deem advisable, without charge to the purchaser.

The warranty stated in the previous paragraph is that expressed by **PENTALIFT EQUIPMENT CORPORATION** AND IS IN LIEU OF ALL GUARANTEES AND WARRANTIES, EXPRESSED OR IMPLIED BY ANYONE OTHER THAN **PENTALIFT EQUIPMENT CORPORATION**. This warranty does not cover any failure caused by improper installation, misapplication, overloading, abuse, negligence, or failure to lubricate and adjust or maintain the equipment properly and regularly. Parts requiring replacement due to damage resulting from abuse, improper operations, improper or insufficient lubrication, lack of proper protection or vehicle impact are not covered by this warranty. **Pentalift Equipment Corporation** assumes no responsibility or liability for:

1. Consequential damages of any kind which result from use or misuse of the equipment.
2. Damage or failure resulting from the use of unauthorized replacement parts.
3. Damage or failure resulting from modification of the equipment.
4. Damage resulting from the misuse of the equipment.

THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF, AND THERE IS NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

Pentalift Equipment Corporation warranties extend only to the original product itself. In no event shall **Pentalift Equipment Corporation** be responsible for or liable to anyone, including third parties, for special, indirect, collateral, punitive, incidental or consequential damages, even if **Pentalift Equipment Corporation** has been advised of the possibility of such damages. Such excluded damages include, but are not limited to, loss of good will, loss of profits, loss of use, interruption of business or other similar indirect financial loss.

Pentalift Equipment Corporation DISCLAIMS all liability arising out of the workmanship, methods and materials used by the installer.

Pentalift Equipment Corporation DISCLAIMS all liability for premature product wear, product failure, property damage or bodily injury arising from improper installation and application.

Pentalift Equipment Corporation will not accept any warranty for which the original purchaser does not notify **Pentalift Equipment Corporation's** Warranty Department of the defect within ninety (90) days after the product defect is discovered. A fully completed Product Registration Card is required prior to the review or processing of any warranty requests or claims.

WARRANTIES, whether expressed or implied, relating to workmanship and materials used in connection with the installation of **Pentalift Equipment Corporation** products are specifically DISCLAIMED.

WR001R02

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NOTE: All Pentalift Equipment Corporation products are subject to design improvement through modification without notice.