



PENTALIFT EQUIPMENT CORPORATION

PENTALOCK 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 SHOULD 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.

Pentalift Equipment Corporation
P.O. Box 1060
Guelph, ON N1H 6N1
Phone: 519-763-3625
Fax: 519-763-2894
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Pentalift Equipment Corporation provides an owners manual when equipment is shipped. Additional manuals are available at \$25.00 each.

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.pentalift.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: <input type="checkbox"/> Levelers, <input type="checkbox"/> Vehicle Restraints, <input type="checkbox"/> Seals/Shelters, <input type="checkbox"/> Elevating Docks, <input type="checkbox"/> 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
P.O. Box 1060
Guelph, Ontario
N1H 6N1

Attention: Service Department

Or Fax to (519) 763-2894

SAFETY INFORMATION AND WARNINGS



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 indicates a hazardous situation which, if not avoided, will result in death or serious injury.



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



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



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 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 THEN ONE POWER SOURCE. HAZARDOUS VOLTAGE WILL CAUSE SEVERE INJURY OR DEATH.



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 use the vehicle restraint while under the influence of drugs or alcohol.
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 26)
7. Assure 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 39.
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:

- 4.4.1 *The owner should recognize the inherent danger of the interface between dock and transport vehicle. The Owner should, therefore, train and instruct operators in the safe use of dock leveling devices in accordance with information provided in Section 4.1.2.*
- 4.4.2 *When a transport vehicle is positioned as closely as practicable to a dock leveling device, there shall be at least 4" (100 mm) of overlap between the front edge of the lip and the edge of the floor or sill of the transport vehicle.*
- 4.4.3 *Nameplates, cautions, instructions and posted warnings shall not be obscured from the view of operating or maintenance personnel for whom such warnings are intended.*
- 4.4.4 *Manufacturer's recommended periodic maintenance and inspection procedures in effect at date of shipment shall be followed, and written records of performance of these procedures should be kept.*
- 4.4.5 *Dock leveling devices that are structurally damaged or have experienced a sudden loss of support while under load, such as might occur when a transport vehicle is pulled out from under the dock leveling device, shall be removed from service, inspected by the manufacturer's authorized representative, and repaired as needed before being placed back in service.*
- 4.4.6 *The manufacturer shall supply replacement nameplates, caution or instruction labels and operating and maintenance manuals upon request of the owner. The owner shall see that all nameplates and caution and instruction markings or labels are in place and legible and that the appropriate operating and maintenance manuals are provided to users.*
- 4.4.7 *Modifications or alterations of dock leveling 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 dock leveler.*
- 4.4.8 *When industrial trucks are driven on and off transport vehicles during the loading and unloading operation, the brakes on the transport vehicle shall be applied and wheel chocks or positive restraints that provide the equivalent protection of wheel chocks engaged.*
- 4.4.9 *In selecting dock leveling devices, it is important to consider not only present requirements but also future plans or adverse environments.*
- 4.4.10 *The dock leveler should never be used outside its vertical working range or vertical lifting range or outside the manufacturer's labeled rated capacity. It must also be compatible with the loading equipment and other conditions relating to the dock.*

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*



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.

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SAFETY LABELING

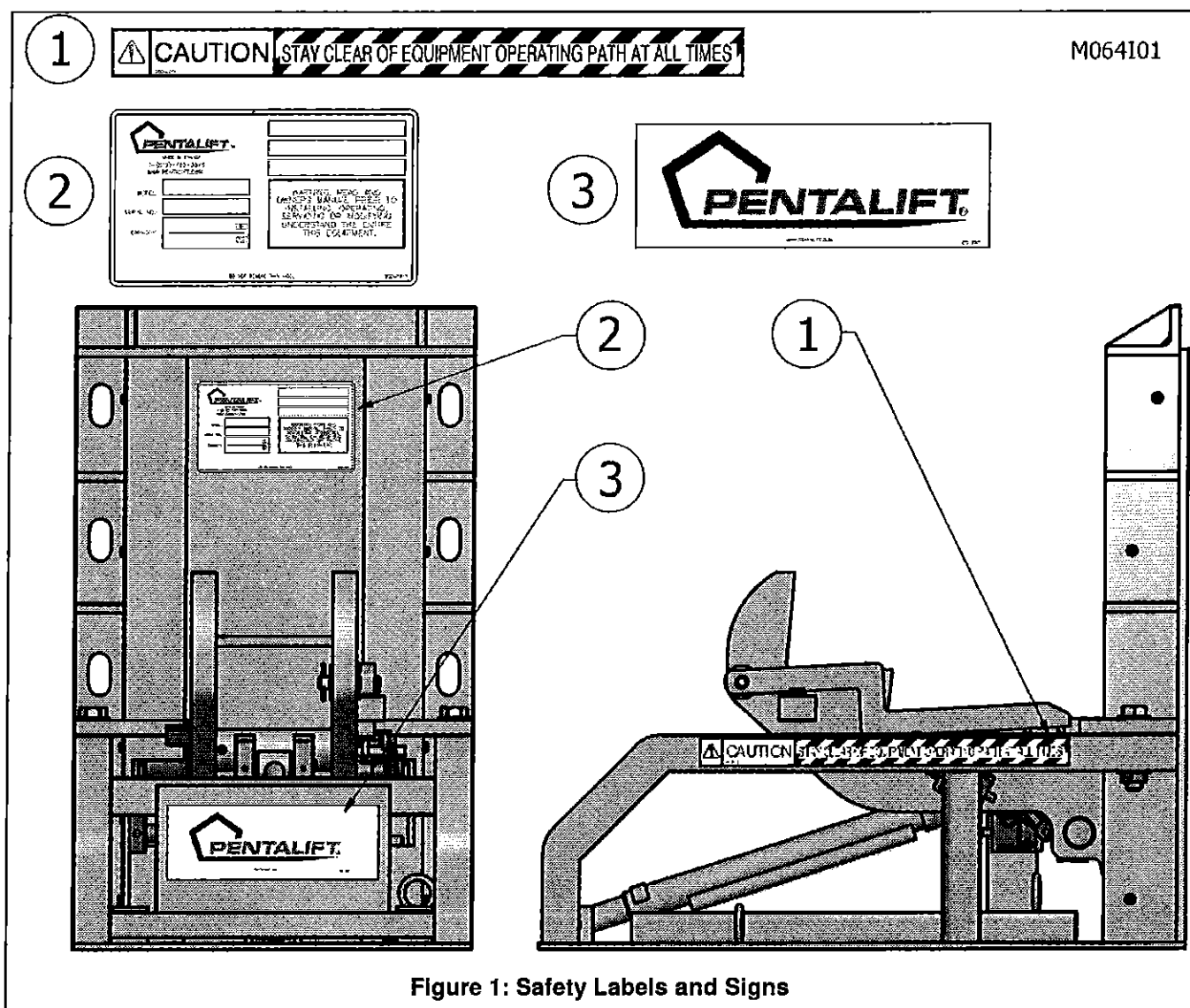


Figure 1: Safety Labels and Signs

Be sure that all labeling is in place and intact when the unit is received. If any of the safety 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 assure that all safety labeling remains legible and in its original position throughout the life of the product. It is also the owner's responsibility to assure 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 safety labels or decals are missing or illegible, contact your Pentalift representative for immediate replacement. Inspection shall be done during regular maintenance and lubrication (See MAINTENANCE & LUBRICATION, PAGE 26).

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

<u>ITEM</u>	<u>PART NO.</u>	<u>QTY/UNIT</u>	<u>DESCRIPTION</u>
1	250-2341	2	"CAUTION Stay clear..."
2	250-1817	1	Specification Plate
3	250-2307	1	"PENTALIFT" Manufacturer's Name Label

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

INSTALLATION INSTRUCTIONS FOR THE LPR35 VEHICLE RESTRAINT

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.

IMPORTANT PREPARATION PRIOR TO INSTALLATION

Follow all installation instructions in the precise consecutive order that they are written. If the equipment cannot be installed as outlined below, contact Pentalift Equipment Corporation for written confirmation to proceed with a safe alternate method. Do not proceed with an alternate installation method unless written confirmation has been provided by Pentalift Equipment Corporation.

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.

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

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.

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.

LAG INSTALLATION

NOTICE

Never weld on the Pentlock 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. Assure that the required conduits are in place (See Figure 23, Page 20).
2. Consult the Lag Installation Tables on pages 5 and 6 to determine which installation method applies to your application.
3. Assure the concrete has sufficient strength to meet the draw pull forces which will be applied (See Figure 2, Page 7).
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, Page 8.
(If the restraint has an extension plate, see page 17 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 TWO ON HORIZONTAL LAG PLATES	EXTRA LOW DOCK LPR WITH 4 BOLTS ON BACK PLATE AND TWO 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**, page 7.

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**, page 7.

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

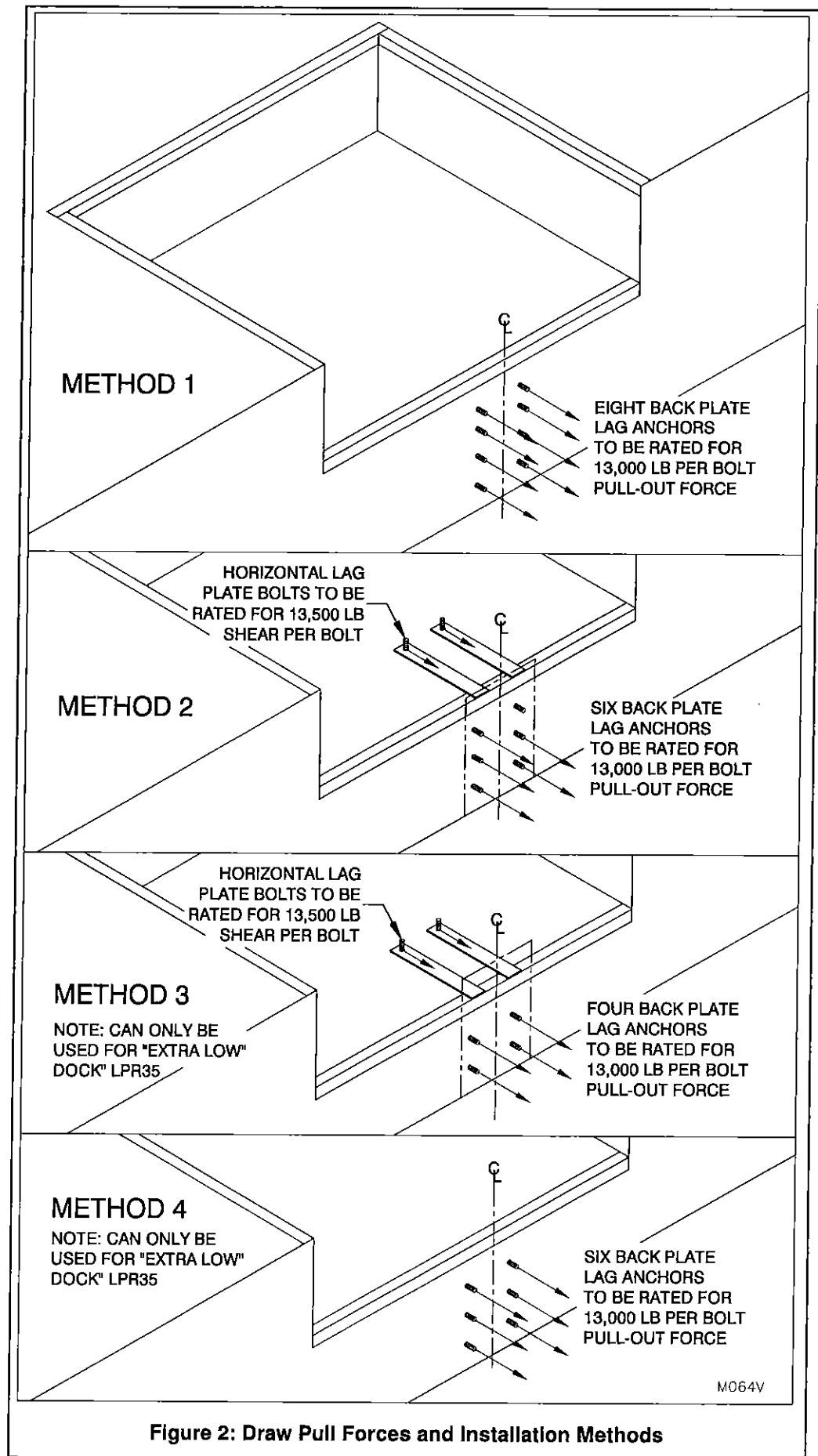
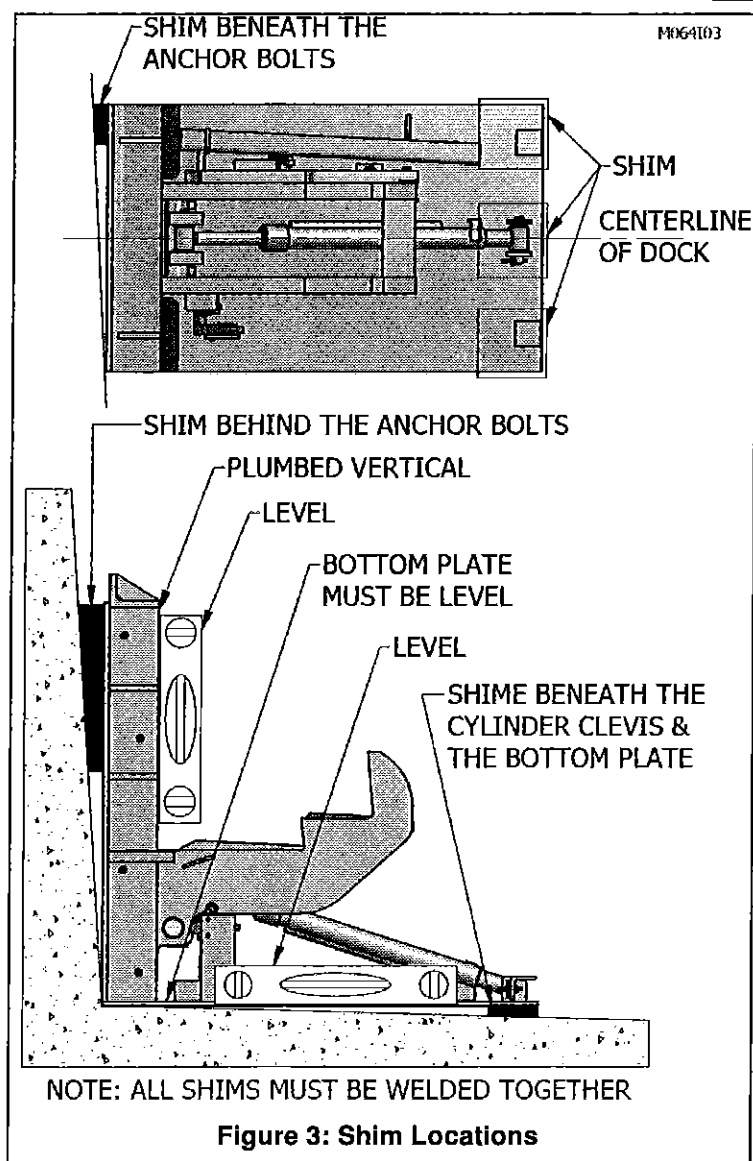
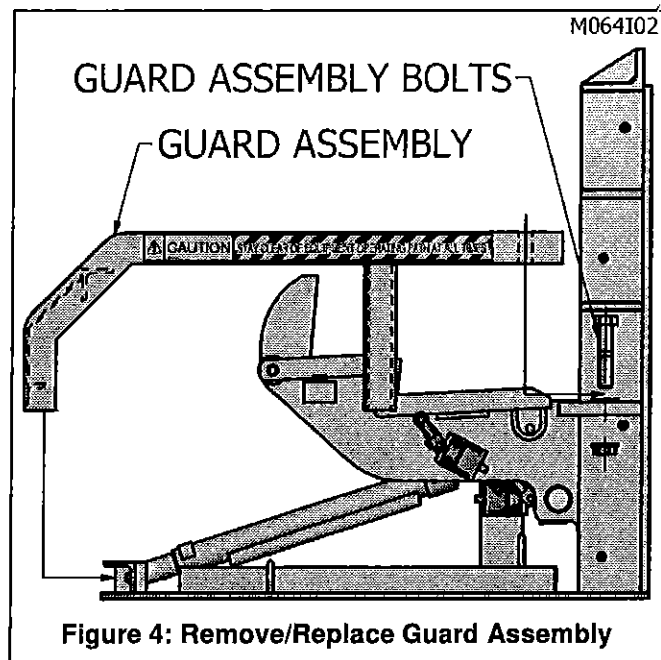


Figure 2: Draw Pull Forces and Installation Methods

6. Remove the guard assembly from the restraint by unbolting and sliding the guard forward. (see Figure 4, page 8)



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, Page 8). 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.

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 18.

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 1/4" 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, page 9. (If no gap is present, proceed to item 2.h) and follow the Pour-In Dock Leveler instruction.)

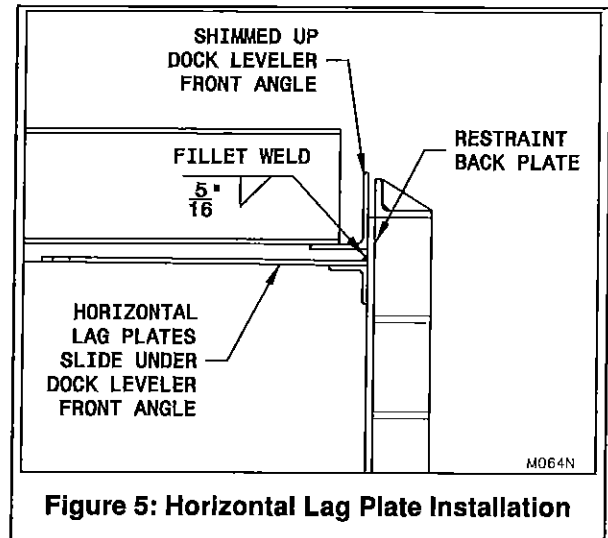


Figure 5: Horizontal Lag Plate Installation

- b) The horizontal lag plates must be positioned centered behind the back plate and parallel to each other; not more than 10 1/4" apart and not less than 5 1/4" apart (This variation allows for avoiding any shims which may be present under the front angle). See Figure 6, page 9.
- 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, page 9.
- 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 10.

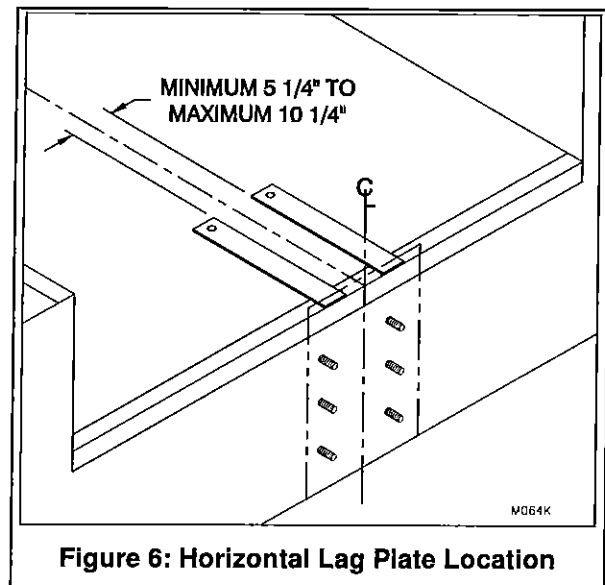


Figure 6: Horizontal Lag Plate Location

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 1/4" apart and not less than 5 1/4" apart. See Figure 7, page 10.

- 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 cut two holes through the bottom pan to install lag anchors.
 - k) Replace 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, page 10.
 - 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, page 10.
 - 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, page 10.
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

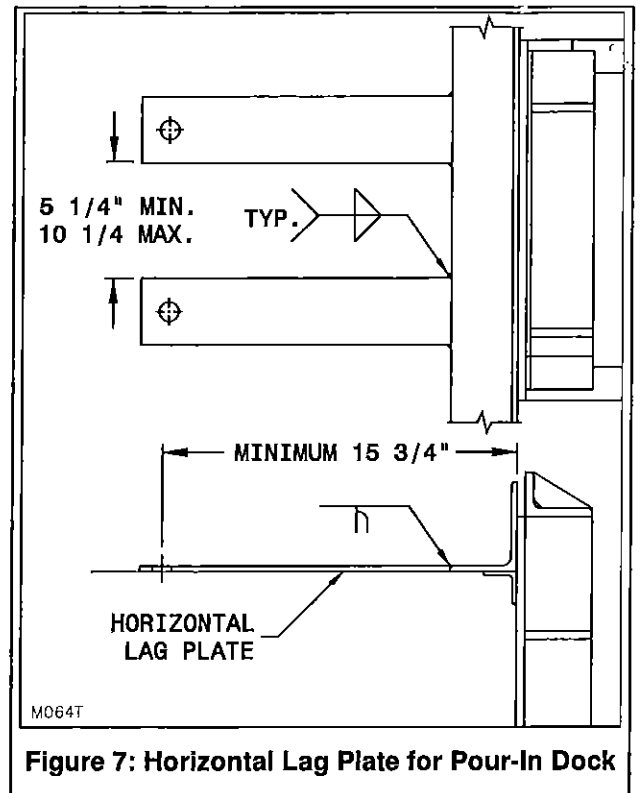


Figure 7: Horizontal Lag Plate for Pour-In Dock

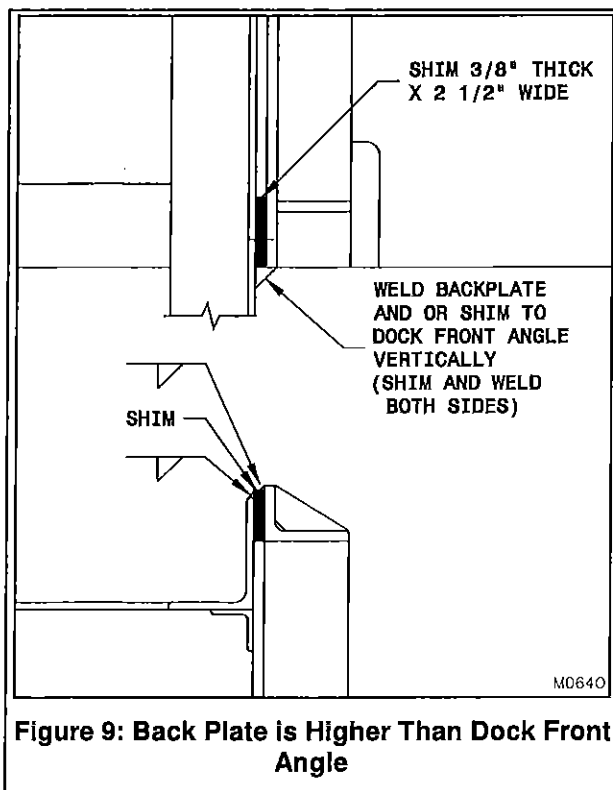


Figure 9: Back Plate is Higher Than Dock Front Angle

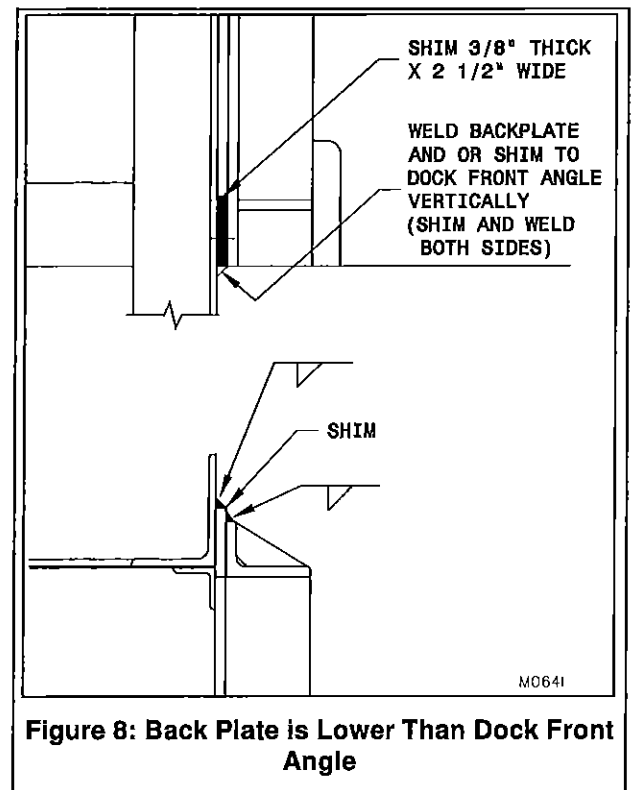


Figure 8: Back Plate is Lower Than Dock Front Angle

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 18.

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, page 7.
2. Proceed to LIP DIVERTER INFORMATION on page 18.

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 1/4".)

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, page 7.
2. Proceed to LIP DIVERTER INFORMATION on page 18.

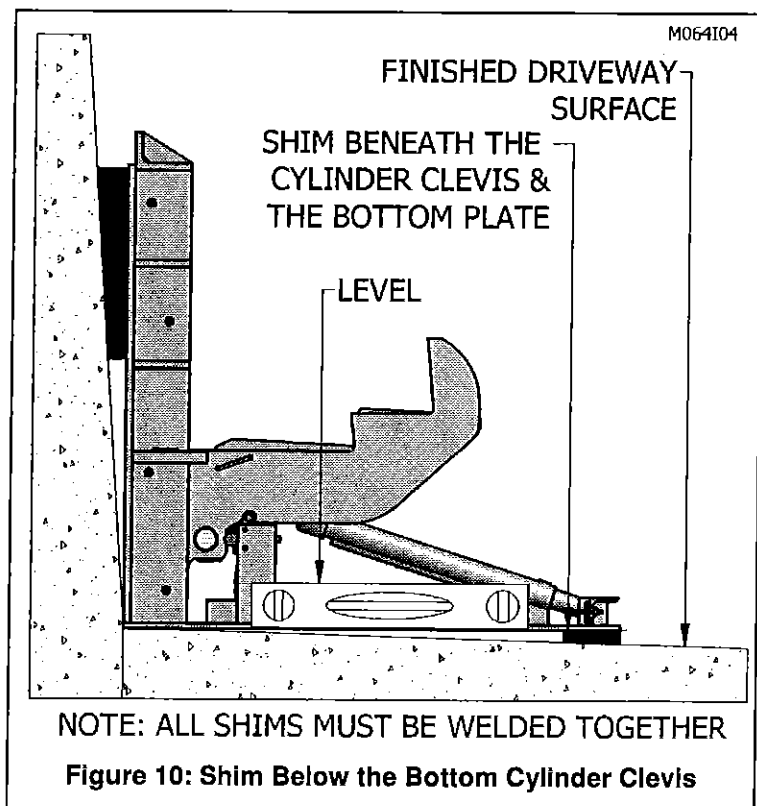
CAST-IN WELD PLATE INSTALLATION

NOTICE

Never weld on the Pentlock 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 17 for installation instructions. If the weld plate has not been cast into the foundation wall, see LAG INSTALLATION instructions on page 5.

1. Assure that the required conduits are in place (See Figure 23, Page 20).
2. Consult the Weld Installation Tables on pages 12 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, page 8) 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, page 8)
6. Proceed to Method 1, Method 2, Method 3 or Method 4 as determined in item 2.



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 TWO BOLTS ON HORIZONTAL LAG PLATES	EXTRA LOW DOCK LPR WITH 4 USEABLE WELD SLOTS ON BACK PLATE AND TWO 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 7 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 7 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 $\frac{3}{8}$ " 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 $\frac{3}{8}$ " 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, page 14.

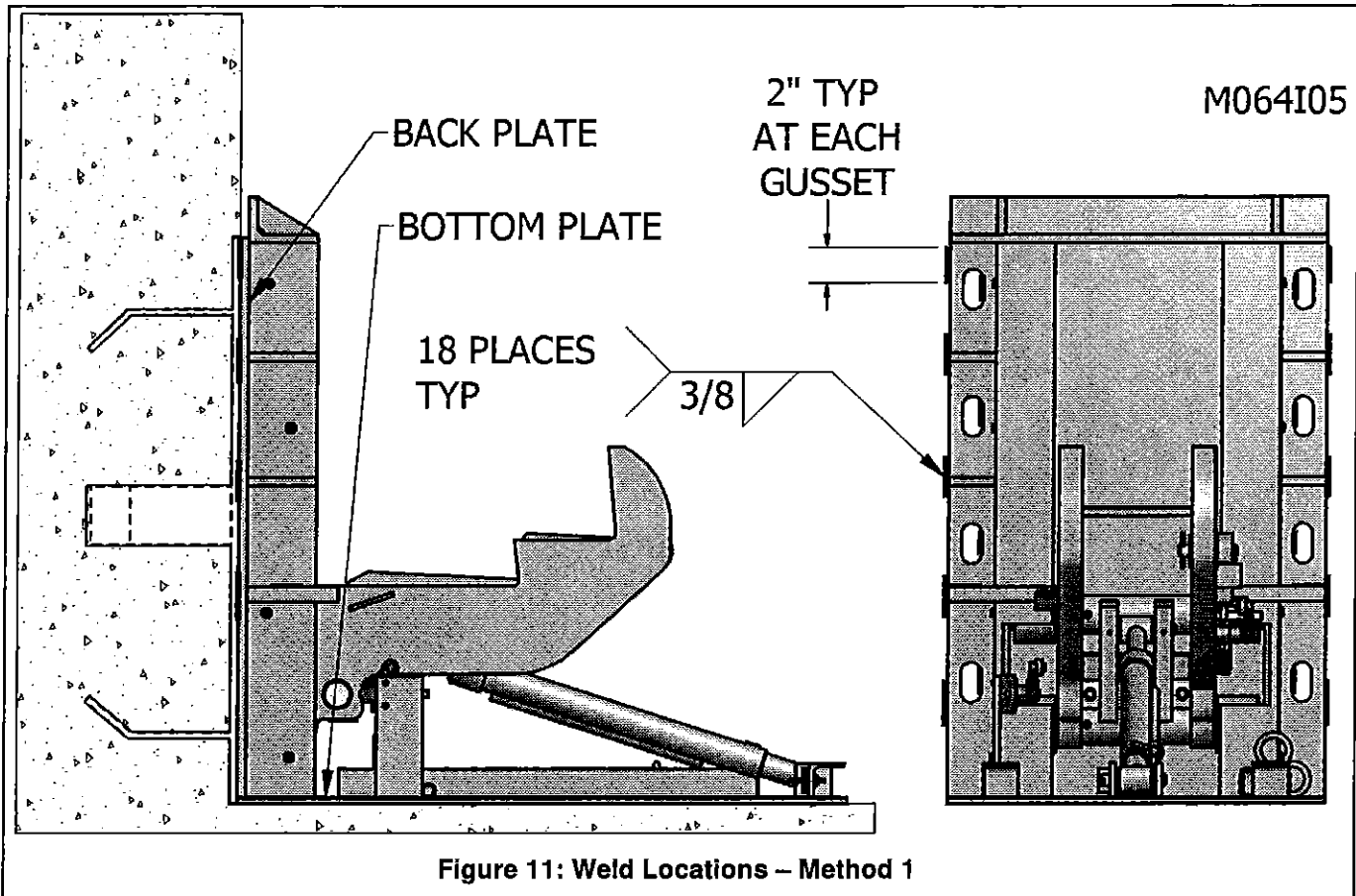


Figure 11: Weld Locations – Method 1

2. Proceed to LIP DIVERTER INFORMATION on page 18.

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 $\frac{1}{4}$ " 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, page 14. (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 $10 \frac{1}{4}$ " apart and not less than $5 \frac{1}{4}$ " apart (This variation allows for avoiding any shims which may be present under the front angle). See Figure 13, page 15.

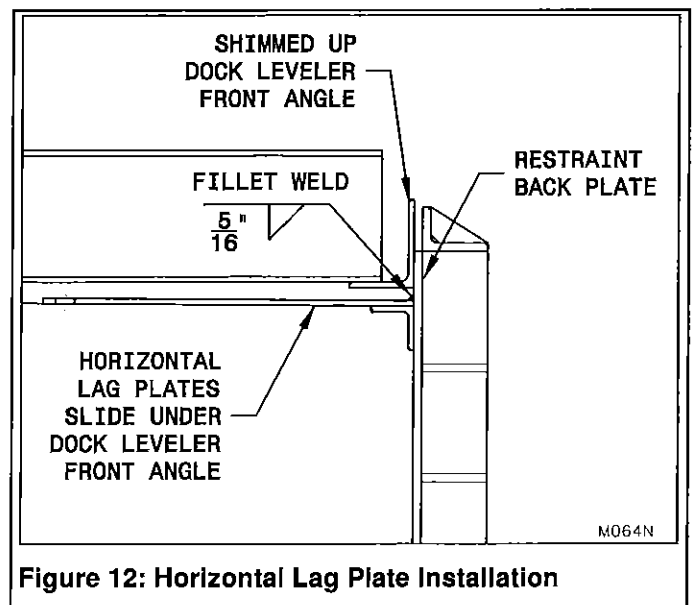


Figure 12: Horizontal Lag Plate Installation

- 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, page 14.
- e) Reposition the restraint against the cast in weld plate.
- f) Proceed to item 2, page 16.

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 1/4" apart and not less than 5 1/4" apart. See Figure 13, page 15.
- 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 cut two holes through the bottom pan for installing lag anchors.
- j) Replace 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, page 10.)
- 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, page 15.
- 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

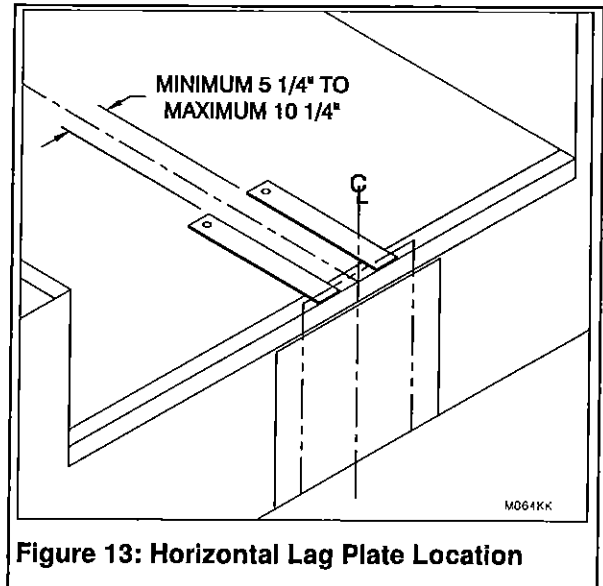


Figure 13: Horizontal Lag Plate Location

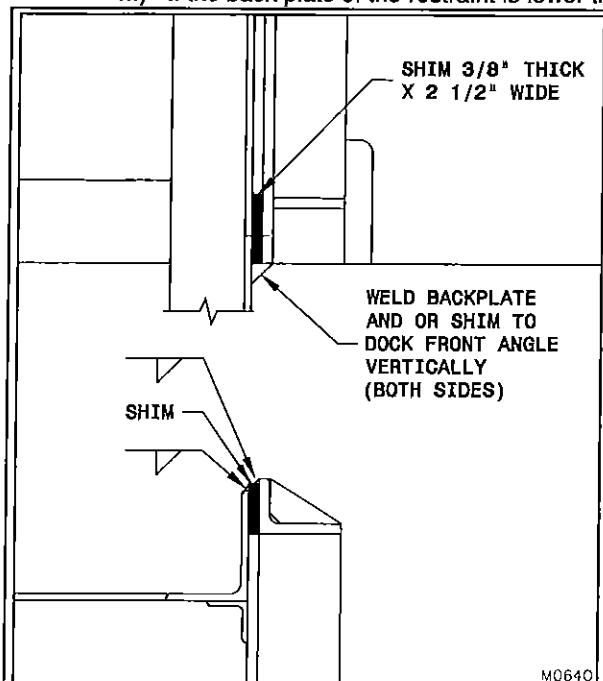


Figure 15: Back Plate is Higher Than Dock Front Angle

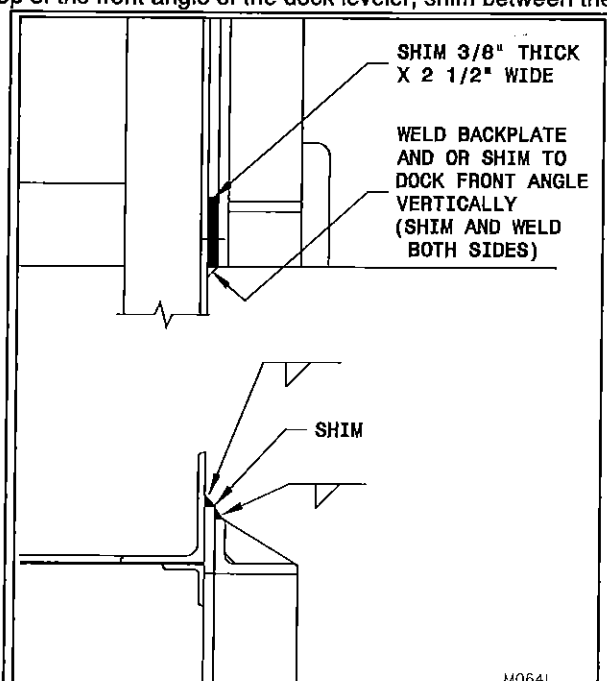
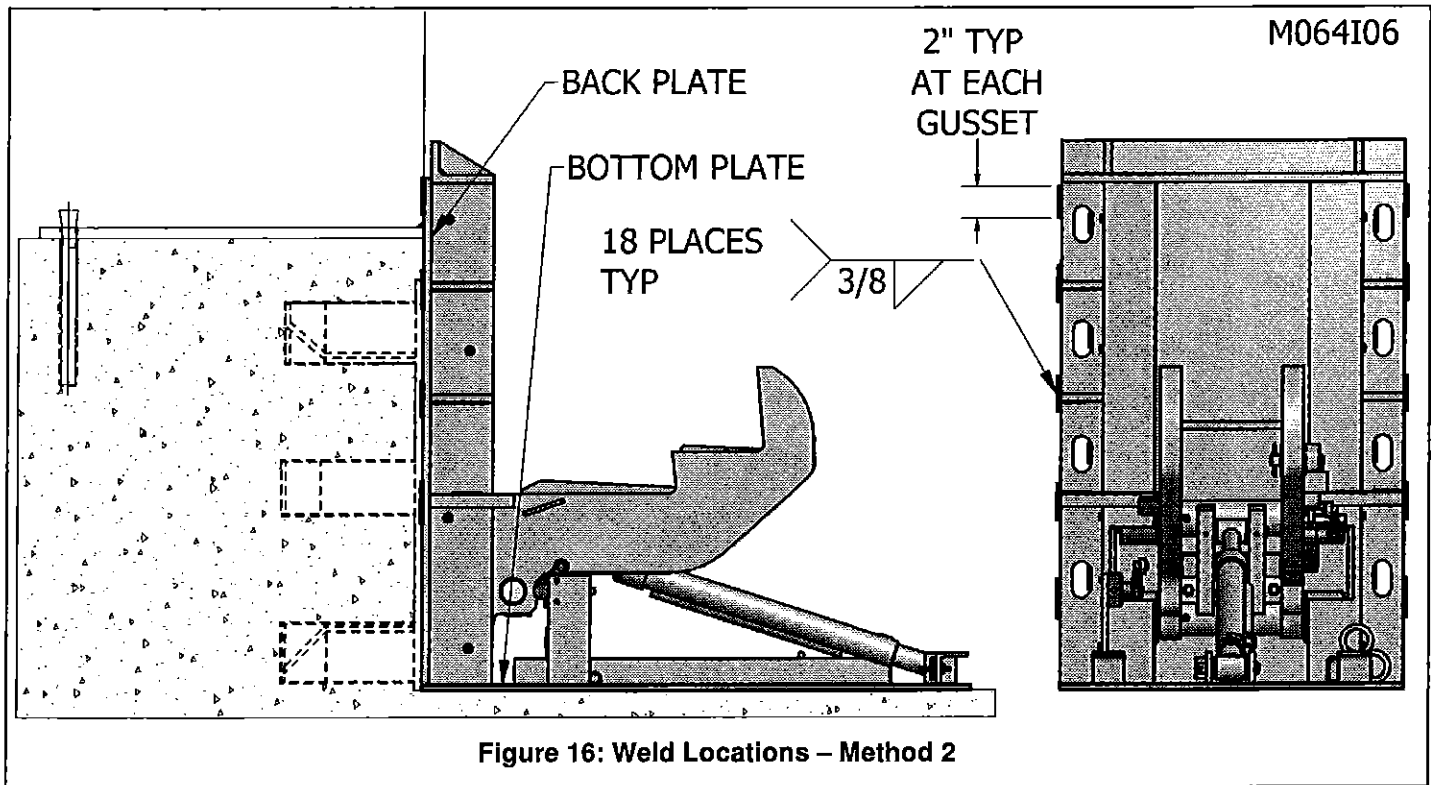


Figure 14: Back Plate is Lower Than Dock Front Angle

of the back plate and the front angle of the dock leveler and weld the shim to both as shown in Figure 14, page 15.

2. Lag the unit to the dock leveler pit floor with recommended fasteners, $\frac{3}{4}$ " 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.
3. Apply a $\frac{3}{8}$ " 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 $\frac{3}{8}$ " 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, page 16.



3. Proceed to LIP DIVERTER INFORMATION on page 18.

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 18.

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 $\frac{1}{4}$ ".)

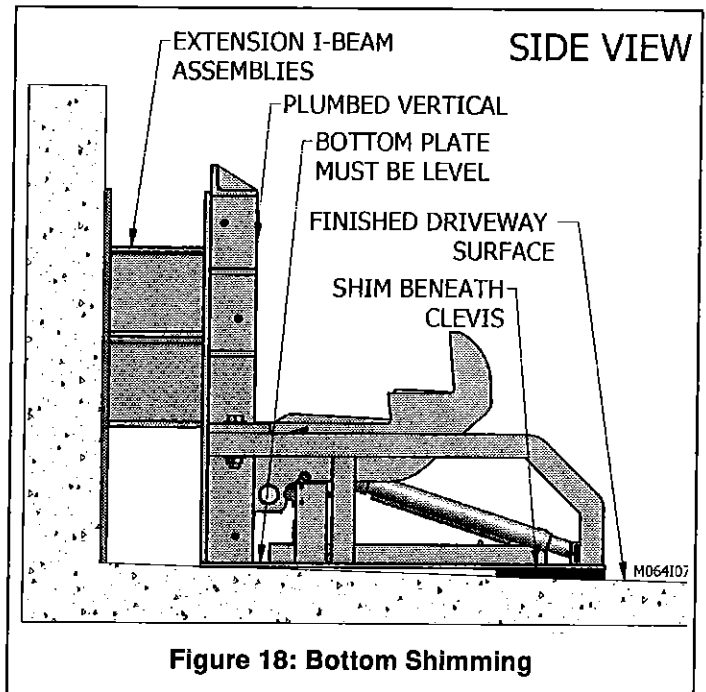
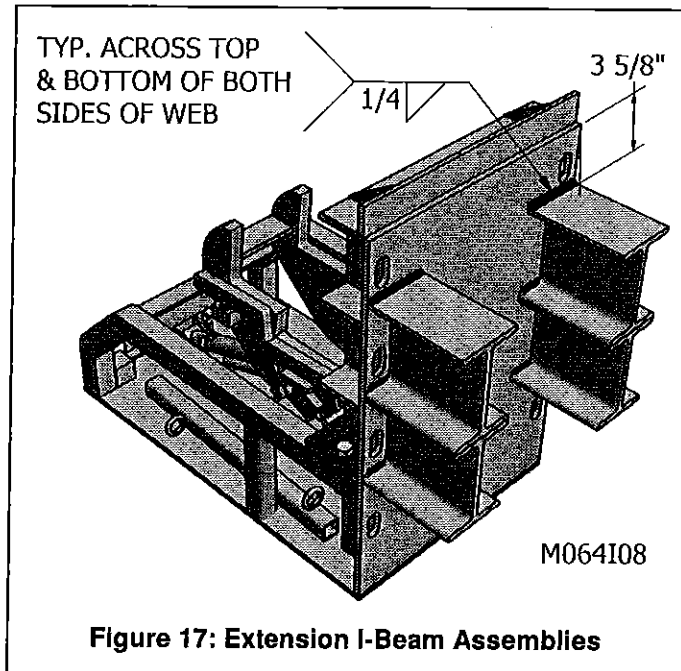
1. Follow Method 1, however, only six slots and 6 gussets will be able to be welded to the cast in plate rather than eight.
2. Proceed to LIP DIVERTER INFORMATION on page 18.

EXTENSION INSTALLATION INSTRUCTIONS

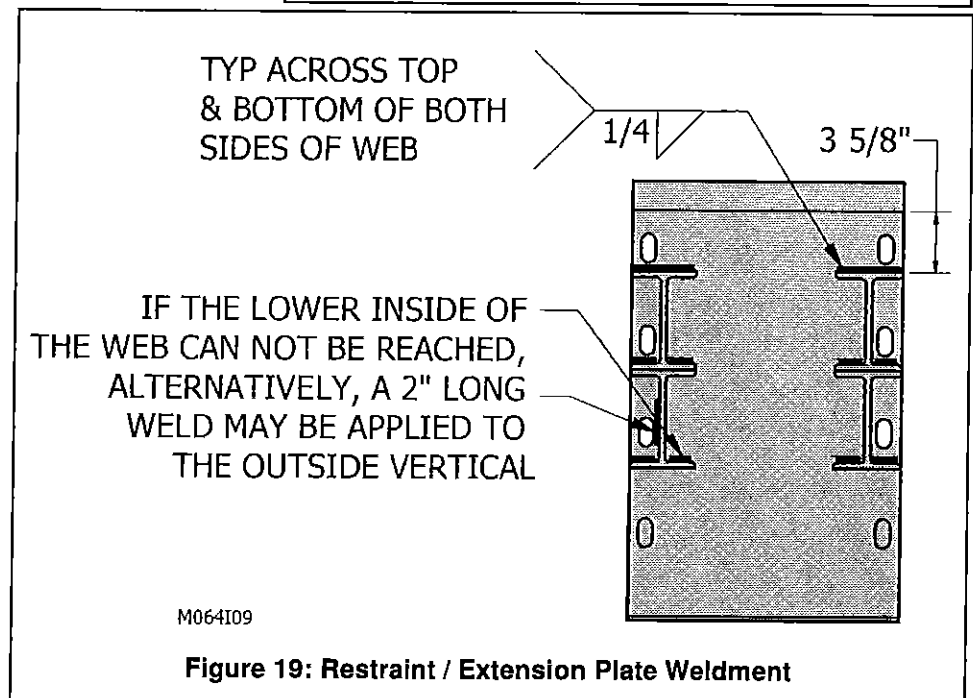
1. For **LAG INSTALLATION** of the extension plate, follow the Lag Installation instruction referring to the restraint back plate beginning on **page 5**. Return to item 2 in this chapter when lagging is complete.

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, page 17, and weld using a minimum $\frac{1}{4}$ " leg on top and on both sides of the web. (Refer to the WELDING REFERENCE INFORMATION on page 18.)
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, page 17. 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, page 17.
5. Proceed to LIP DIVERTER INFORMATION on page 18.



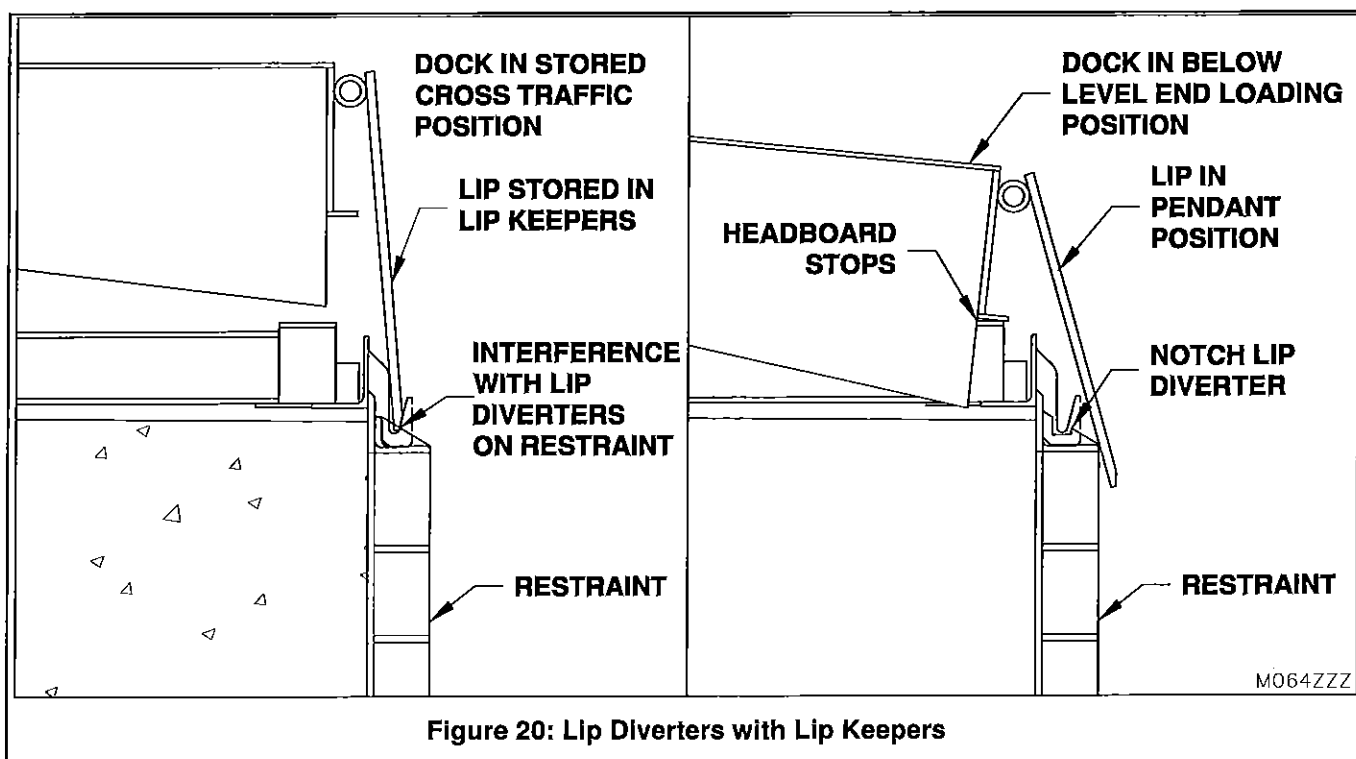
WELDING REFERENCE INFORMATION

- 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 mill scale/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) to obtain satisfactory weld.

<i>Electrode</i>	E7018	
<i>Diameter</i>	1/8"	5/32"
<i>Amperage</i>	130-150	140-180

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 20, page 18). If the lip does not fully seat in the extended lip keepers, notch the lip diverters as shown in Figure 20, page 18.



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 21, Page 19). When mounting the power unit on a wall, position the power unit above the wall bracket keeping the 1/2" wall mount holes below the power unit. This ensures easier access to all the wall bracket holes when mounting the power unit (see Figure 22, Page 19).
2. Install the control panel in a location that assures 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 23, Page 20).
5. Mount the mirror image "Caution" sign above the outside light and normal vision "Caution" sign below the outside light.

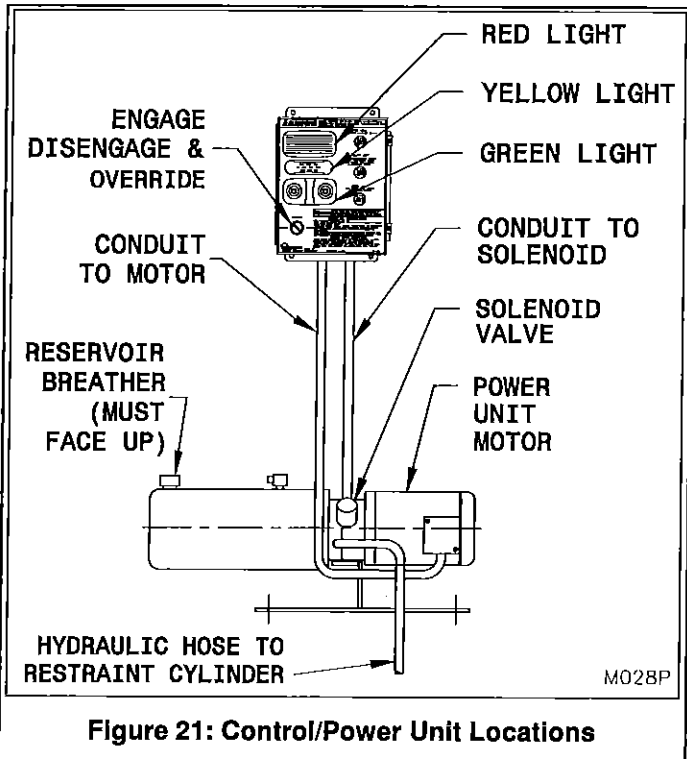


Figure 21: Control/Power Unit Locations

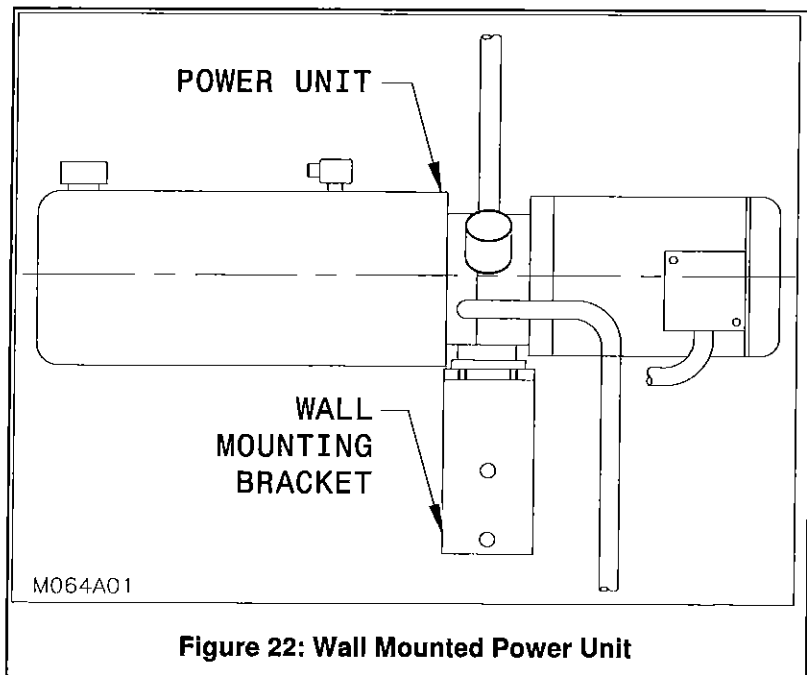
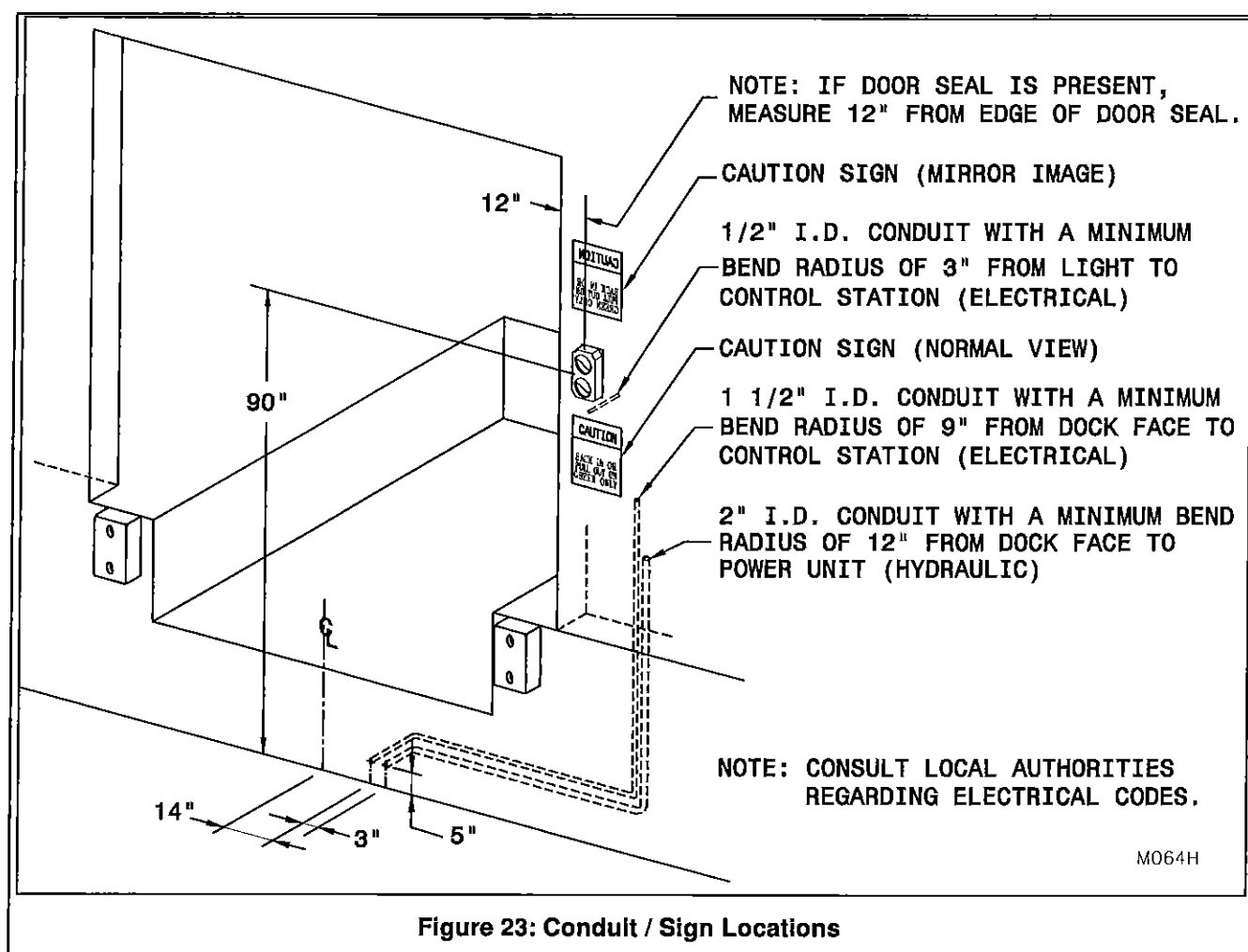


Figure 22: Wall Mounted Power Unit



ELECTRICAL INSTALLATION

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.
- ASSURE SUPPLY VOLTAGE IS CORRECT.
- ON 3 PHASE UNITS ASSURE 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.



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 THEN ONE POWER SOURCE. HAZARDOUS VOLTAGE WILL CAUSE SEVERE INJURY OR DEATH.

The following instructions apply to standard units:

1. Run 10 wires (minimum 14 AWG – please check applicable codes) from the control panel to a junction box on the outside wall (junction box by others).
2. Run wires from the three 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 24, page 22.
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.

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.

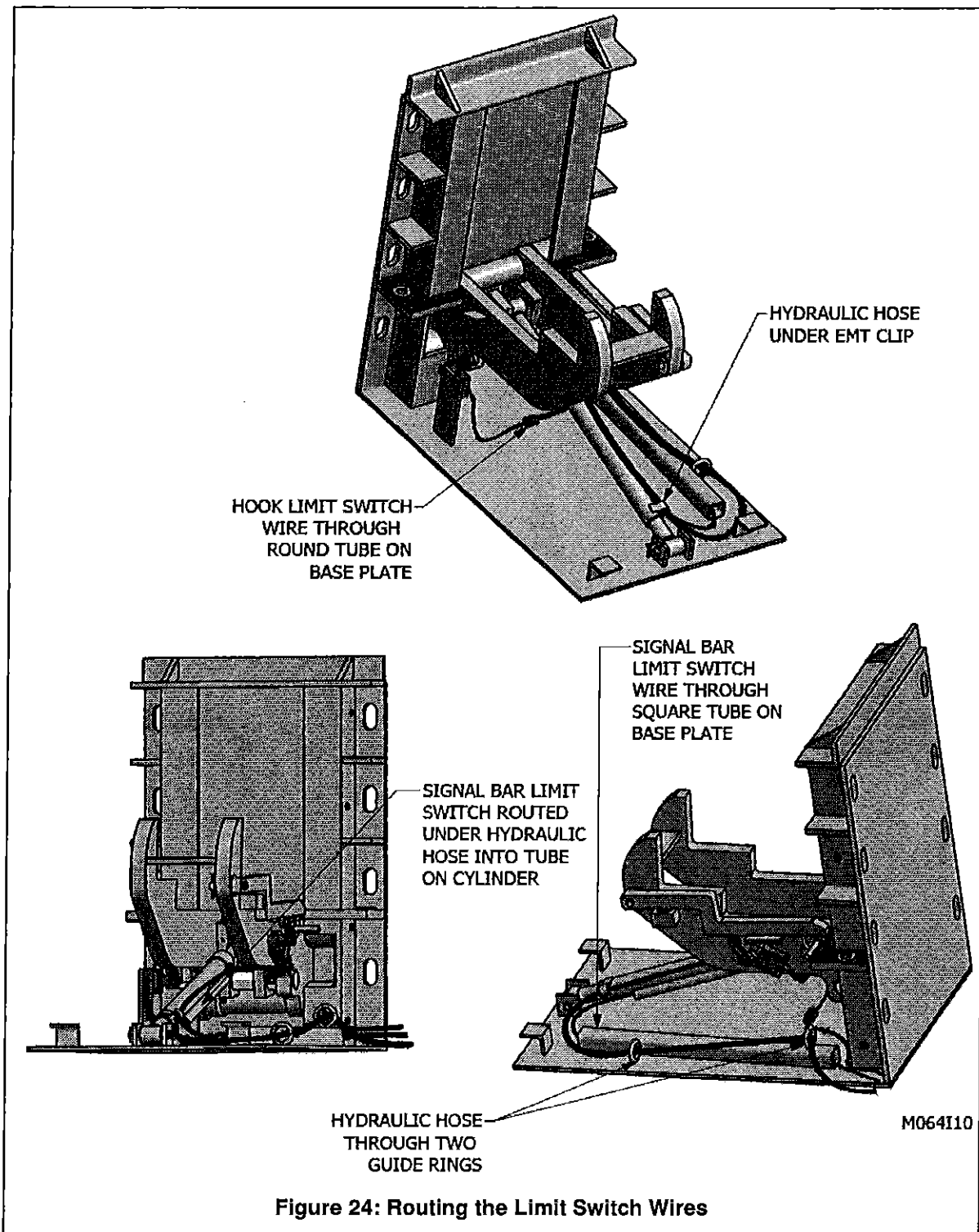


Figure 24: Routing the Limit Switch Wires

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 23)
2. Clean and paint welds.
3. Lubricate all pivot points. (see MAINTENANCE & LUBRICATION Section on page 26)
4. Re-install guard assembly on restraint. (see Figure 4, Page 8)
5. Unit is ready to operate. Test operation to ensure unit is operating properly.



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

OPERATION AND PERFORMANCE CHECK



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.



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

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

1. 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.
2. Turn the selector switch to the **"ENGAGE"** position (see Figure 29, Page 25). 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 30 and Figure 29, Page 25)
3. **Depress and hold the signal bar** (see Figure 36, Page 31) (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.
4. 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 32, Page 25). 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 32 and Figure 31, Page 25).
5. Replace burnt out light bulbs on the control panel or defective LED modules immediately.
6. Lubricate all pivot points as outlined in the MAINTENANCE & LUBRICATION Section on page 26.

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



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.



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.

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.

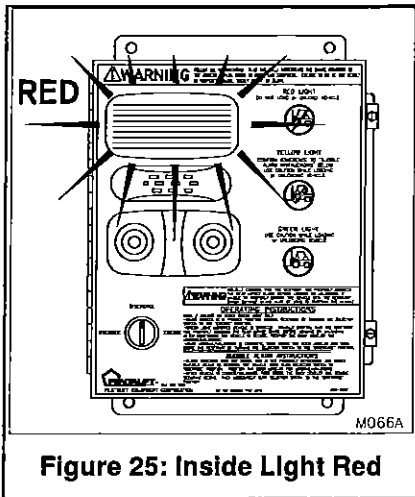


Figure 25: Inside Light Red

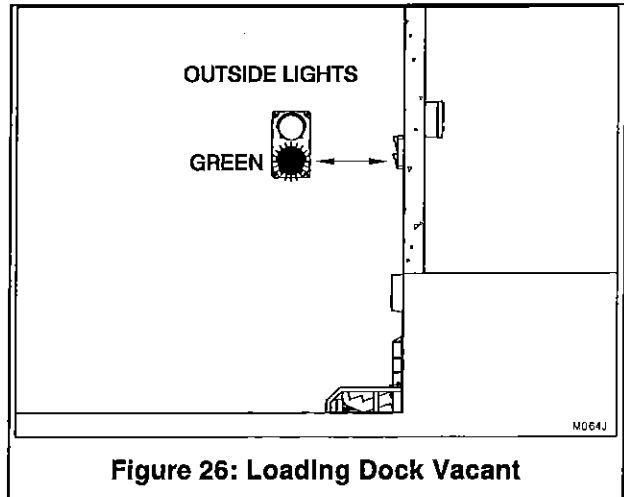


Figure 26: Loading Dock Vacant

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 CANNOT BE ENGAGED BY RESTRAINT" on page 25). 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.

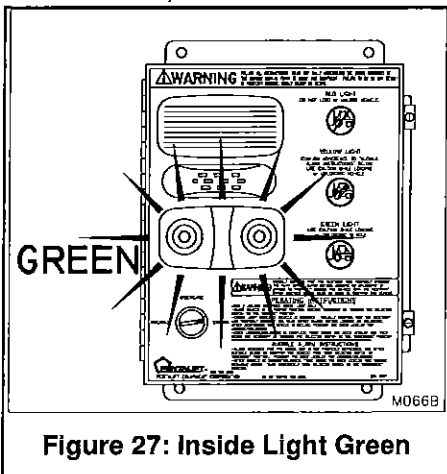


Figure 27: Inside Light Green

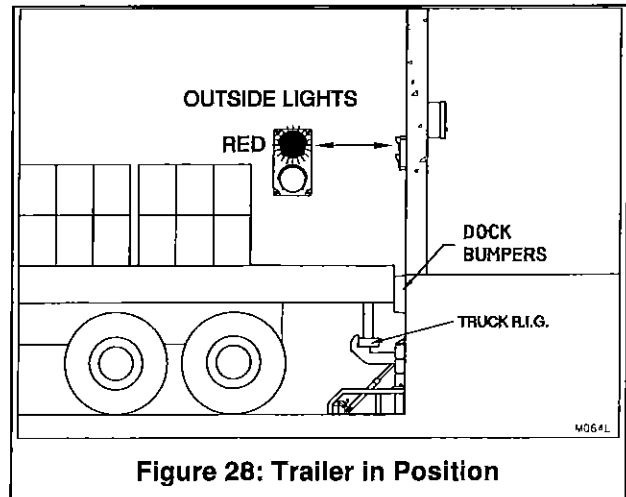


Figure 28: Trailer in Position

REAR IMPACT GUARD CANNOT BE ENGAGED BY RESTRAINT

If the restraint fails to properly engage the rear impact guard, an ALARM WILL SOUND. 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.

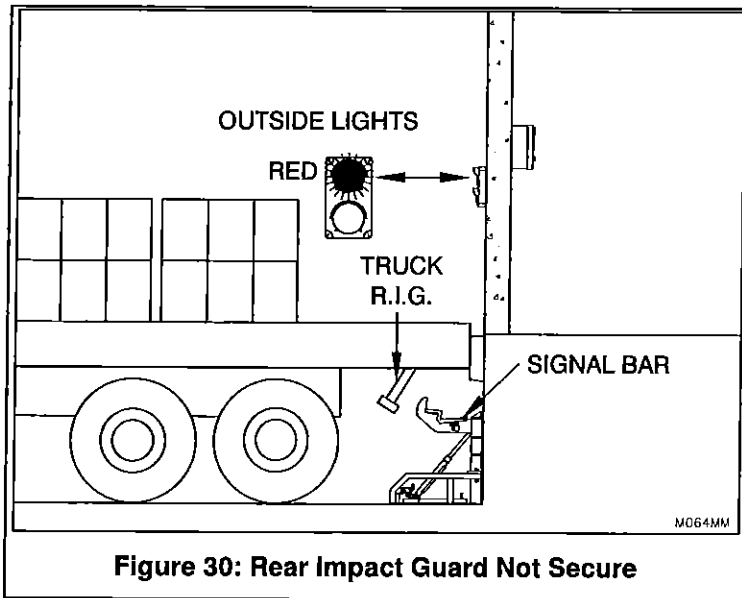


Figure 30: Rear Impact Guard Not Secure

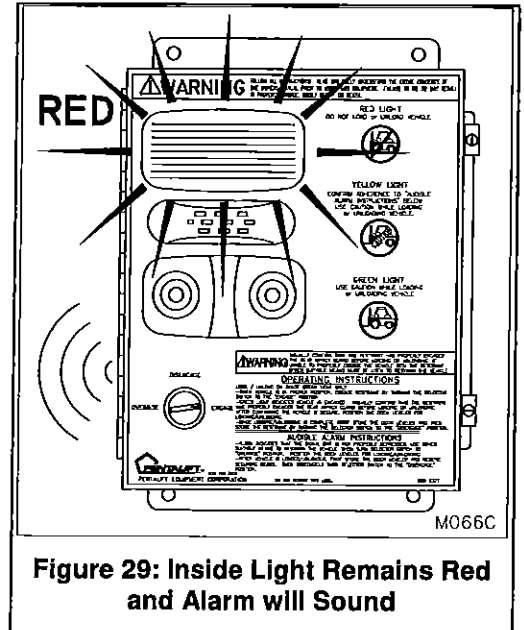


Figure 29: Inside Light Remains Red and Alarm will Sound

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.

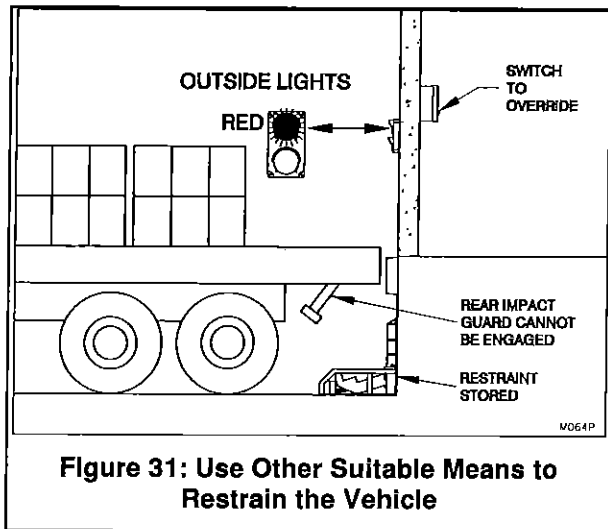


Figure 31: Use Other Suitable Means to Restrain the Vehicle

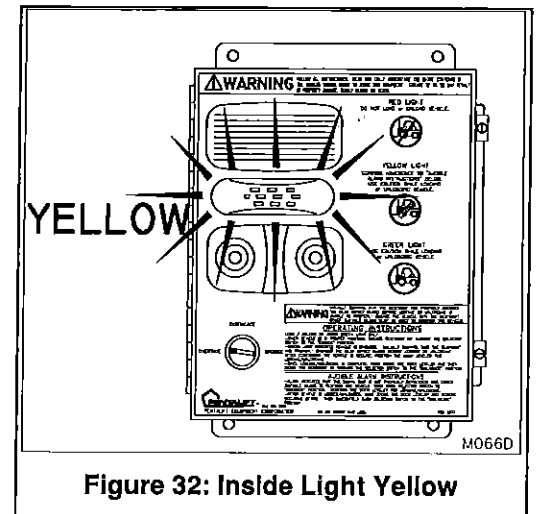


Figure 32: Inside Light Yellow

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 & LUBRICATION



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



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.



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.



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 THEN ONE POWER SOURCE. HAZARDOUS VOLTAGE WILL CAUSE SEVERE INJURY OR DEATH.



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.



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 **LPR-35 Vehicle Restraint** 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 burnt out light bulbs on the control panel or 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 33 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 23.)

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

NOTE: It is the owner's responsibility to assure that all labeling remains legible and in its original position throughout the life of the product (See **SAFETY LABELING**, Page 2).

NOTE: Inspect equipment for protective coatings (i.e. paint) that have deteriorated or been removed. Prepare affected area and reapply protective coating as required.

NOTE: At every maintenance interval, inspect the **LPR35 vehicle restraint** for any damaged or worn parts. If any damaged or worn parts are found, discontinue use of the vehicle restraint and/or repair immediately.

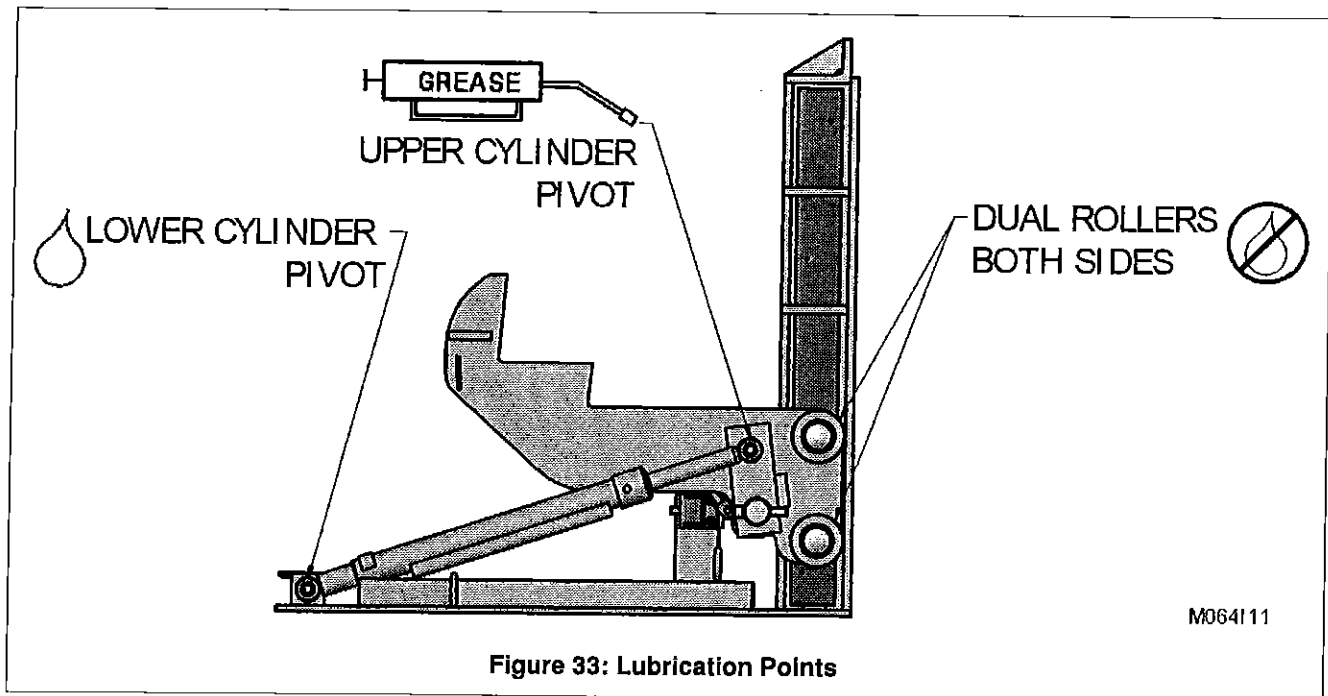
Hydraulic Oil/Lubrication:

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 cylinder barrel.

Monthly: As shown by Figure 33, Page 27, 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 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.

NOTICE The standard hydraulic oil supplied with the restraint is good from +10° C (+50°F) minimum to +50°C (+122°F) maximum unless otherwise specified on the equipment order. When operating the restraint in temperatures lower than +10°C (+50°F) or above +50°C (+122°F), the pump may create cavitation, causing permanent damage to the power unit. This will void all warranty. The standard replacement Hydraulic Fluid is DEXRON III Automatic Transmission Fluid which has an operating range of -10°C (14°F) to 50°C (122°F). If the hydraulic oil is non-standard, check the hydraulic reservoir for fluid label which will specify the particular oil requirements.



TROUBLE SHOOTING GUIDE



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

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 vehicle restraint during the warranty period. Do not risk voiding the warranty by tampering with the equipment.



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.



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.



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 THEN ONE POWER SOURCE. HAZARDOUS VOLTAGE WILL CAUSE SEVERE INJURY OR DEATH.

NOTICE

See page 26 for recommended hydraulic oil.

1. Restraint will not rise when the selector switch is turned to the "ENGAGE" position:

- Confirm that power is reaching the power unit.
- Check all wiring. Refer to wiring diagram. The wiring diagram is shipped inside the control panel. However, check the serial number decal 250-1313 on the control panel to ensure the correct diagram has been stored with the appropriate dock. Should the wiring diagram numbers not match, consult your authorized Pentalift representative, providing the serial number and listed wiring diagram number (i.e. 061-####) to acquire the proper diagram.
- Confirm that the signal bar limit switch has not been activated. (see Figure 36, Page 31)
- Check the signal bar spring is in place (see Figure 36, Page 31).
- Check signal bar limit switch adjustment on signal bar (see SIGNAL BAR LIMIT SWITCH ADJUSTMENTS, Page 31).
- Check for leaking hose or hydraulic connections.
- Check that hydraulic fluid level is approximately two inches from the top of the reservoir when the restraint is stored.
- Examine all moving parts for obstructions or binding.
- Check the timer in the control box and verify time and mode settings. The top dip switch must be toggled to the right and the second down toggles to the left for the 6 second range. The third dip switch must be toggled to the right and the forth toggled to the left for the off setting. (See Figure 34, page 28) The timer should be set at 6 seconds.
- If the problem cannot be solved, consult your authorized Pentalift representative.

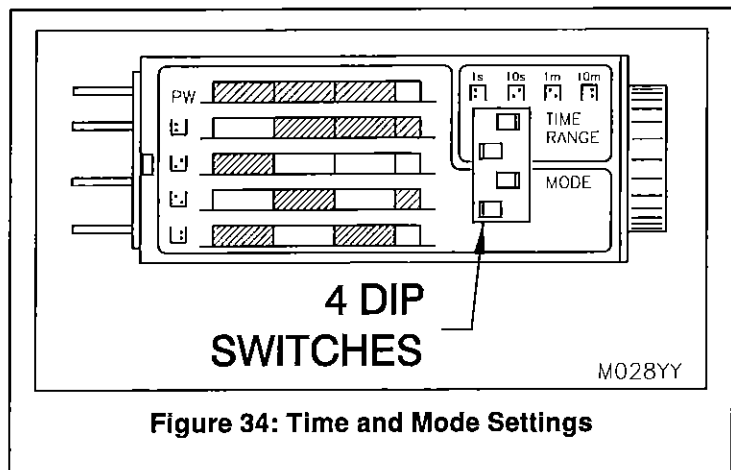


Figure 34: Time and Mode Settings

2. The restraint will not raise completely:

- Check that hydraulic fluid level is approximately two inches from the top of the reservoir when the restraint is stored.
- Check for any obstructions or binding to ensure the hook and rollers can move freely.

- c. Check the timer in the control box and verify time and mode settings. The top dip switch must be toggled to the right and the second down toggles to the left for the 6 second range. The third dip switch must be toggled to the right and the forth toggled to the left for the off setting. (See Figure 34, page 28) The timer should be set at 6 seconds.
 - d. If the problem cannot be solved, contact your authorized Pentalift Representative.
- 3. 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 stored.
 - b. Check signal bar limit switch adjustment (See Figure 36, Page 31).
 - c. Inspect for dirt, foreign objects, damage to the roller tracks or binding of the rollers.
 - d. If the problem cannot be solved, contact your authorized Pentalift Representative.
- 4. Pump continues to run when restraint hook is at the raised position:**
 - a. Check all wiring.
 - b. Check the timer in the control box and verify time and mode settings. The top dip switch must be toggled to the right and the second down toggles to the left for the 6 second range. The third dip switch must be toggled to the right and the forth toggled to the left for the off setting. (See Figure 34, page 28) The timer should be set at 6 seconds.
 - c. If the problem cannot be solved, contact your authorized Pentalift Representative.
- 5. Alarm Sounds and Restraint hook is not completely raised.**
 - a. Check all wiring.
 - b. Check the timer in the control box and verify time and mode settings. The top dip switch must be toggled to the right and the second down toggles to the left for the 6 second range. The third dip switch must be toggled to the right and the forth toggled to the left for the off setting. (See Figure 34, page 28) The timer should be set at 6 seconds.
 - c. If the problem cannot be solved, contact your authorized Pentalift Representative.
- 6. The Restraint will not return to the stored position (hook fully lowered):**
 - a. Check for any obstructions and binding to ensure the hook can move freely.
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.
 - b. The down travel limit switch position setting may need to be reset. See SETTING THE HOOK LIMIT SWITCH (LS1) POSITION:, page 30.
 - c. Check for power to the lowering valve.
 - d. Verify that the lowering valve (V2) is energizing.
 - 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 hook is able to completely lower. The down travel limit switch will not switch the outside lights unless the restraint hook is completely lowered and in contact with the bottom plate. Inspect for dirt, foreign objects, damage to the roller tracks or binding of the rollers.
 - b. Check down travel limit switch position setting. (See SETTING THE HOOK LIMIT SWITCH (LS1) POSITION:, page 30.)
 - c. 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.

USE ONLY GENUINE PENTALIFT REPLACEMENT PARTS

RESTRAINT ADJUSTMENTS



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

SETTING THE HOOK LIMIT SWITCH (LS1) POSITION:



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.

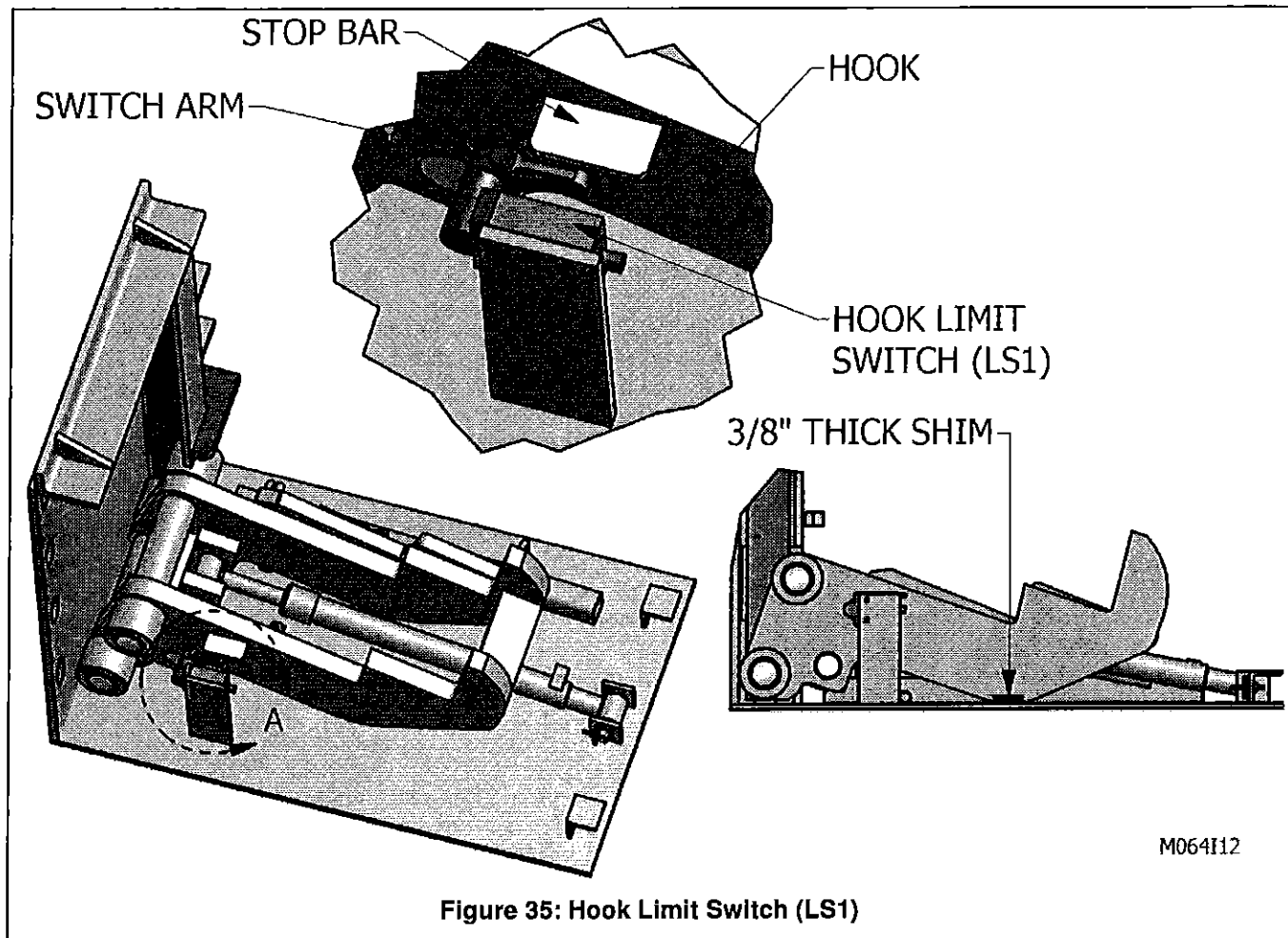


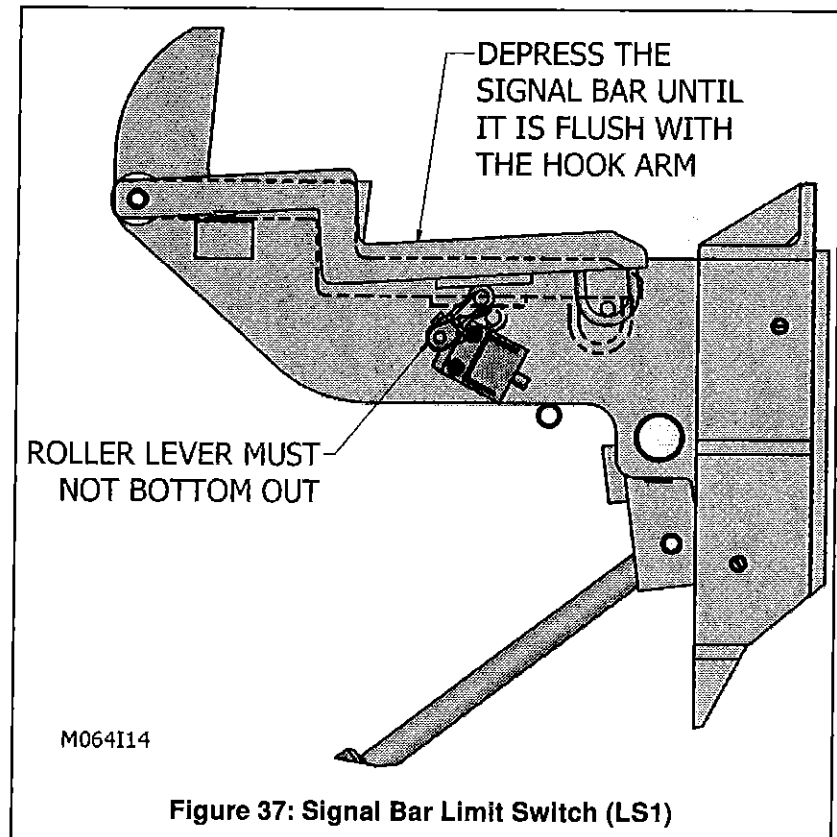
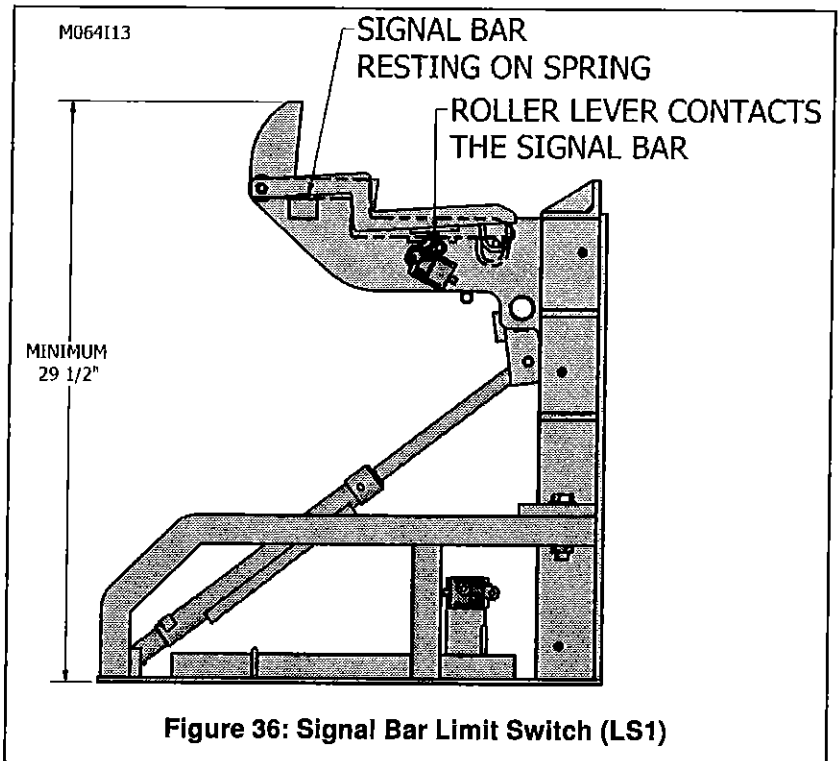
Figure 35: Hook Limit Switch (LS1)

- a) Remove the guard assembly (see Figure 4, Page 8).
- 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 approximately 10 degrees from vertical, leaning toward the dock face.
- 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, Page 8).

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) Manually raise the signal bar and confirm that the signal bar spring is in position.
- c) Lower the signal bar and confirm that it is resting on the signal bar spring. See Figure 36, page 31.
- d) Loosen the hex socket set screw on the limit switch roller lever.
- e) Rotate the roller lever until it contacts the signal bar.
- 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) Press the signal bar down. The inside light should turn green.
- h) Release the signal bar (it should spring back up). The inside light should turn red.
- i) Ensure the signal bar limit switch does not bottom out when the signal bar is completely depressed (flush with the hook arms). See Figure 37, page 31.
- j) Repeat steps b) through i) until the desired inside light signals are accomplished.
- k) Return the control box selector switch to the "DISENGAGE" position.



REPLACEMENT PARTS

USE ONLY GENUINE PENTALIFT REPLACEMENT PARTS



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, please provide the following information to your Pentalift representative.

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

FUSES

Limit Switch I.D.	Single Phase	
	Part No.	Description
F1	060-0537	2 AMP/250V Fuse
F2	060-0328	10 AMP/250V Fuse
F3	060-0316	1 AMP/250V Fuse

Limit Switch I.D.	Three Phase		
	Voltage	Part No.	Description
F1 and F2	575V	060-0024	0.5 AMP/600
	460V	060-0024	0.5 AMP/600
	230V	060-0300	1 AMP/600
	208V	060-0030	1 AMP 600
F3	120V	060-0537	2 AMP/250
F4	12V	060-0316	1 AMP/250

3 Ø TRANSFORMER AND OVERLOAD

Three Phase Control Box Replacement Parts (See page 35)		
Power Unit VOLTAGE	Part Numbers	
	ITEM 23 Transformer	ITEM 25 Overload
575/120V	060-0121	060-0070
460/120V	060-0532	
230/120V	060-0539	060-0069
208/120V	060-0540	

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

RESTRAINT REPLACEMENT PARTS: USE ONLY GENUINE PENTALIFT REPLACEMENT PARTS

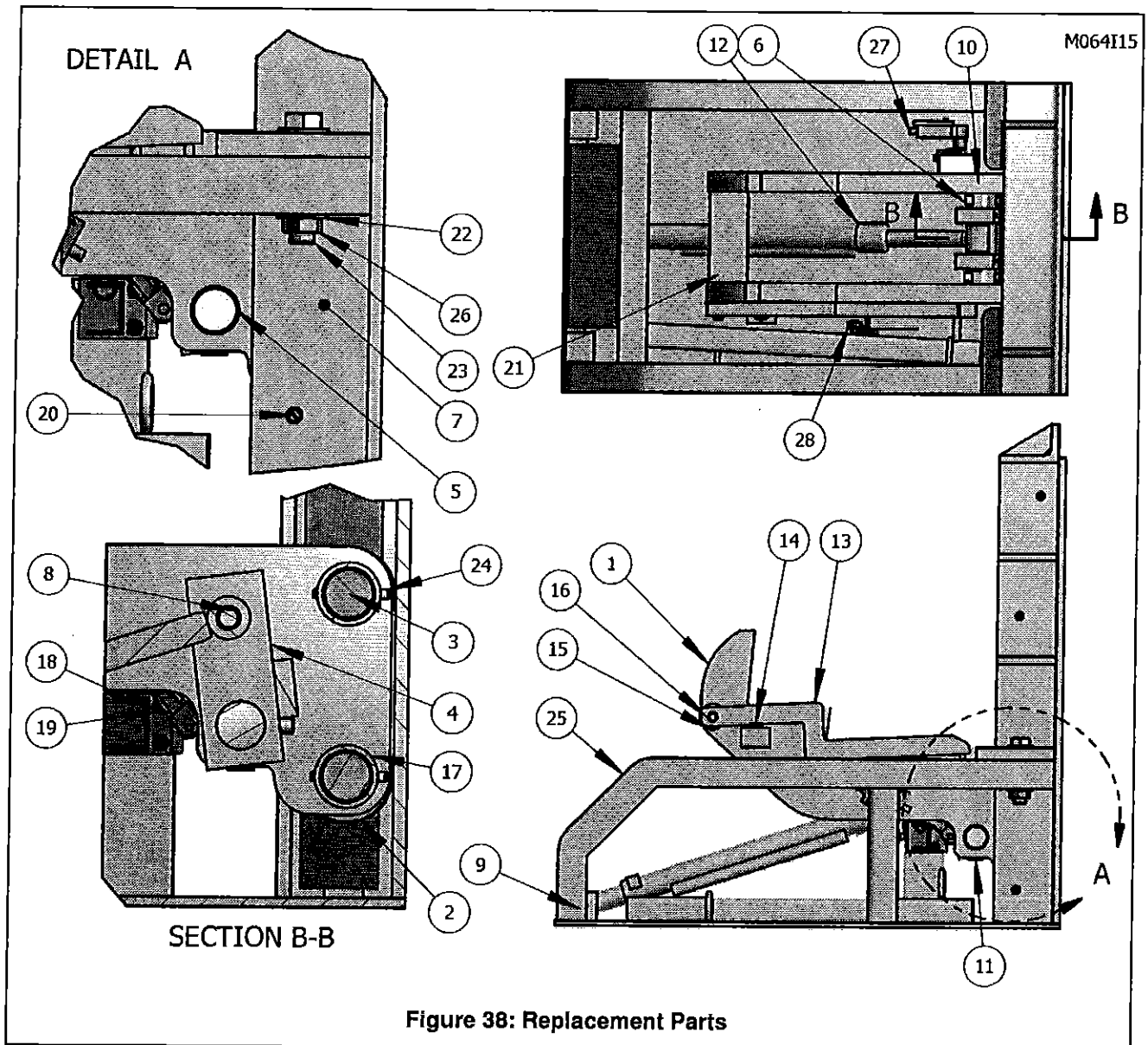


Figure 38: Replacement Parts

PARTS LIST		
ITEM	PART NUMBER	DESCRIPTION
1	8090004	HOOK WELDMENT
2	8090005	ROLLER ASSEMBLY
3	3090087	ROLLER PIN
4	8090056	ROTATING BLOCK
5	3090103	STOP PIN
6	3090109	BOLT
7	3090086	WEAR STRIP
8	3090107	CYLINDER UPPER PIN
9	3090029	CYLINDER HOUSING PIN
10	0740083	LOCK WASHER
11	0720335	BOLT
12	8090043	CYLINDER
13	8090055	SIGNAL BAR
14	0970042	SPRING

15	0740004	WASHER
16	0950053	BUSHING
17	0870122	RETAINING RING
18	0720118	SCREW
19	0740068	LOCK WASHER
20	0720292	SCREW
21	0800028	PIN
22	0740017	WASHER
23	0720206	BOLT
24	0800004	PIN
25	8090006	GUARD WELDMENT
26	0700021	NUT
27	060-0686	LIMIT SWITCH
28	060-0686	LIMIT SWITCH

To replace operator or driver signs, refer to "Safety Labeling" Section on page 2.

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

**CONTROL PANEL REPLACEMENT PARTS
USE ONLY GENUINE PENTALIFT REPLACEMENT PARTS**

SINGLE PHASE

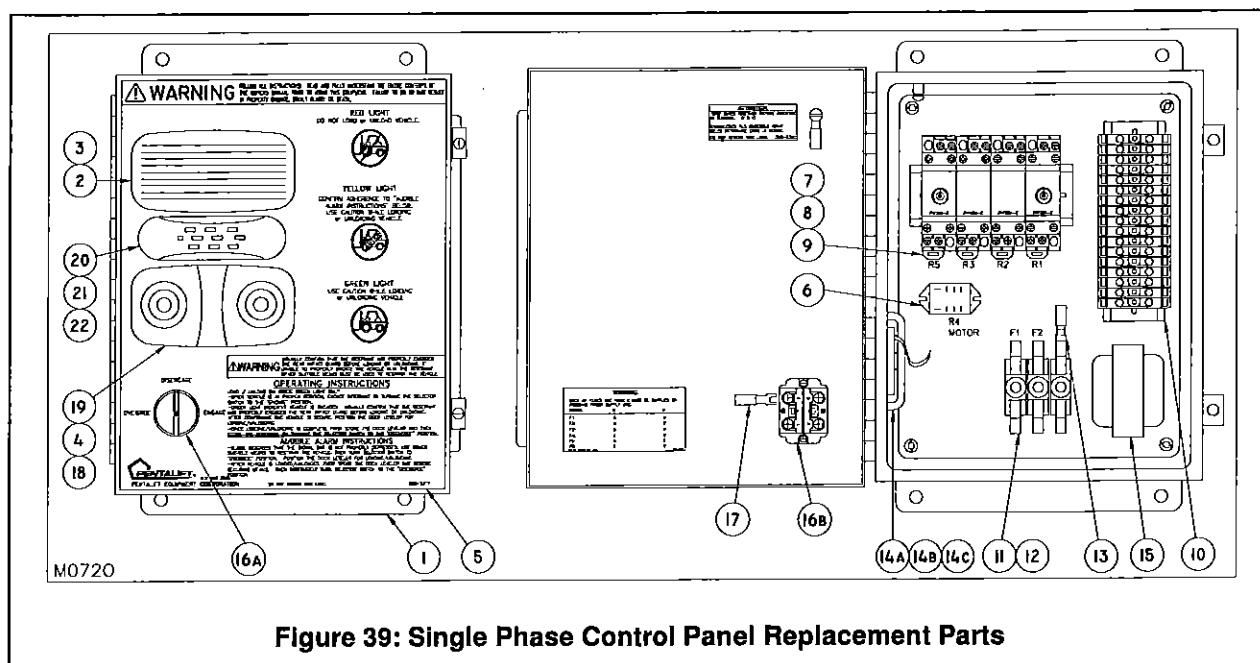


Figure 39: Single Phase Control Panel Replacement Parts

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	060-0200	Electrical Enclosure
2	060-0772	Red Light Assembly – Includes Fixture, Lens and LEDs (Note: Lens may also be ordered separately - see item 3)
3	060-0773	Red Lens
4	060-0201	Green Light Assembly – Includes Fixture, Lens and Bulb (Note: Lens may also be ordered separately – see item 19)
5	250-2377	Decal
6	060-0552	Relay
7	060-0553	Timer
8	060-0551	Relay
9	060-0554	Relay
10	NOTE	Terminals
	060-0463	Ends
	060-0466	Makers
	060-0464	Stops
11	060-0380	Fuse Holder
12	NOTE	Fuse
13	060-0203	Crimp
14a	060-0097	Audible Alarm
14b	309-0061	Bracket
14c	054-0224	O-ring
15	060-0209	Transformer
16a	060-0710	Selector Switch Head
16b	060-0719	Selector Switch Contact
17	060-0205	Terminal
18	060-0330	Replacement Bulb for Item 4, Green Light
19	060-0202	Green Lens
20	060-0502	Yellow Light Assembly – Includes Fixture, Bulb and Lens (Note: Lens may also be ordered separately – see item 21)
21	060-0512	Yellow Lens
22	060-0329	Replacement Bulb for Lights (item 20)

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

THREE PHASE

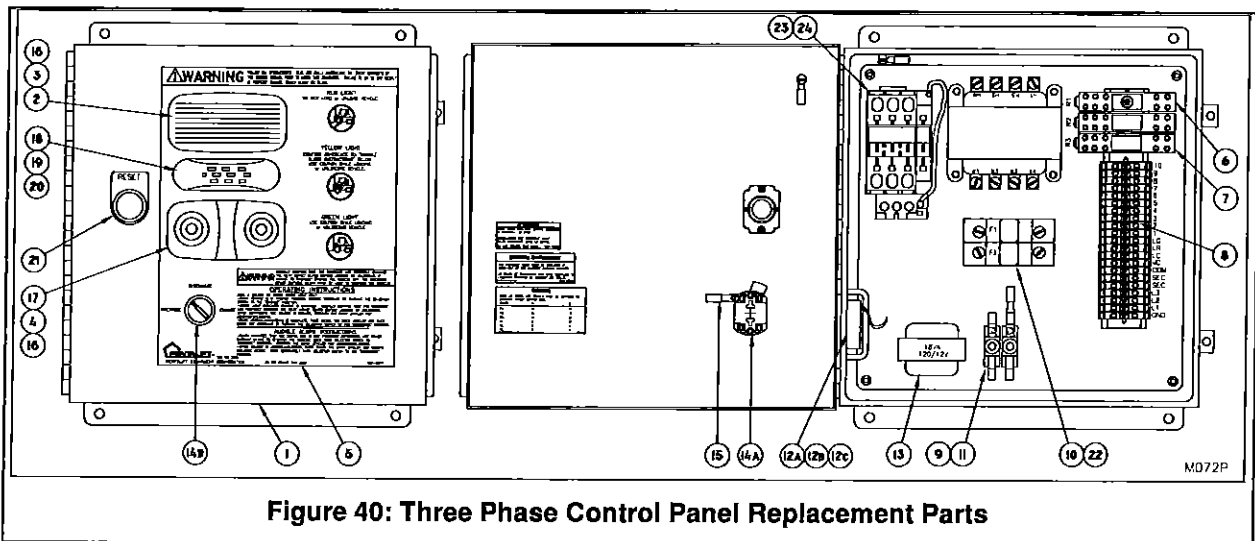


Figure 40: Three Phase Control Panel Replacement Parts

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	060-0233	Electrical Enclosure
2	060-0772	Red Light Assembly – Includes Fixture, Lens and LEDs (Note: Lens may also be ordered separately- see item 3)
3	060-0773	Red Lens
4	060-0201	Green Light Assembly – Includes Fixture, Lens and Bulb (Note: Lens may also be ordered separately – see item 17)
5	250-2377	Decal
6	060-0553	Timer
7	060-0551	Relay
8	NOTE	Terminals
	060-0463	Ends
	060-0466	Makers
	060-0464	Stops
9	060-0380	Fuse Holder
10	NOTE	Fuse
11	060-0203	Crimp
12	060-0097	Audible Alarm
13a	NOTE	Transformer
13b	309-0061	Bracket
13c	054-0351	O-ring
14a	060-0719	Selector Switch Contact
14b	090-0710	Selector Switch Head
15	060-0205	Terminal
16	060-0330	Replacement Bulb for Item 4, Green Light
17	060-0202	Green Lens
18	060-0502	Yellow Light Assembly – Includes Fixture, Bulb and Lens (Note: Lens may also be ordered separately – see item 19)
19	060-0512	Yellow Lens
20	060-0329	Replacement Bulb for Lights (item 18)
21	060-0289	Reset Push Button
22	060-0381	Midget Fuse Holder
23	NOTE	Contactor
24	NOTE	Overload
25	WATTS9913	1/4" NPT WOG VALVE (NOT SHOWN)

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

TRAFFIC LIGHT REPLACEMENT PARTS
USE ONLY GENUINE PENTALIFT REPLACEMENT PARTS

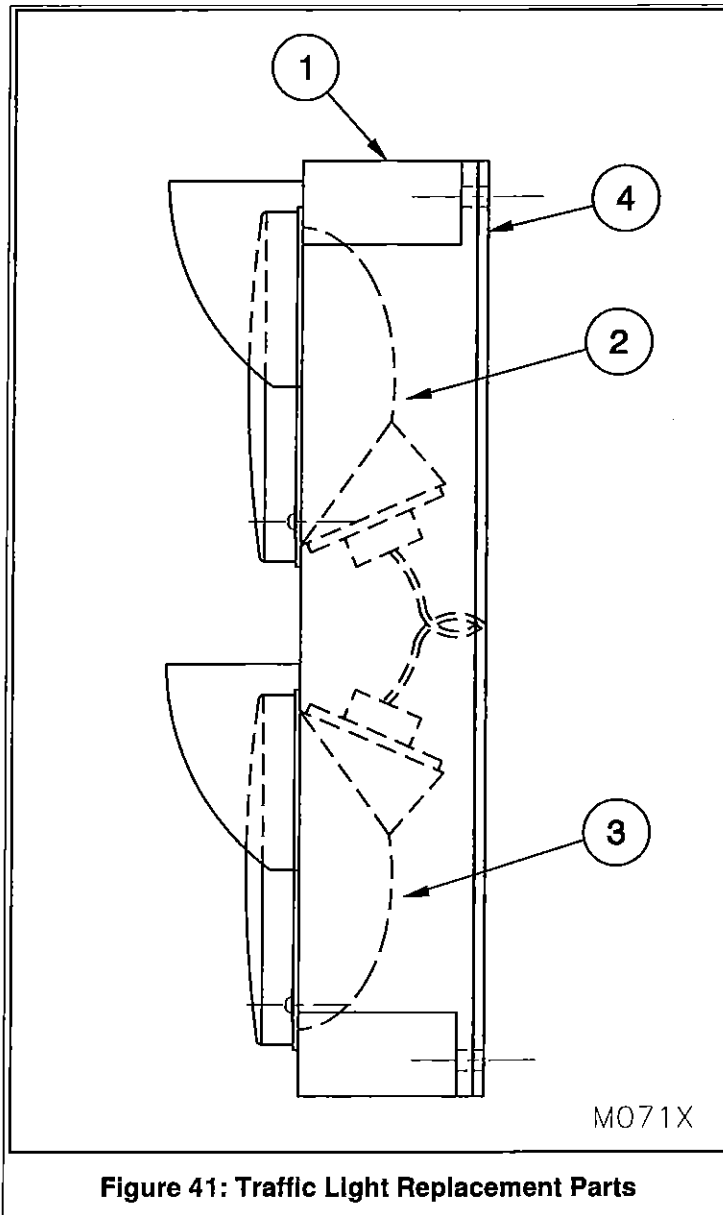
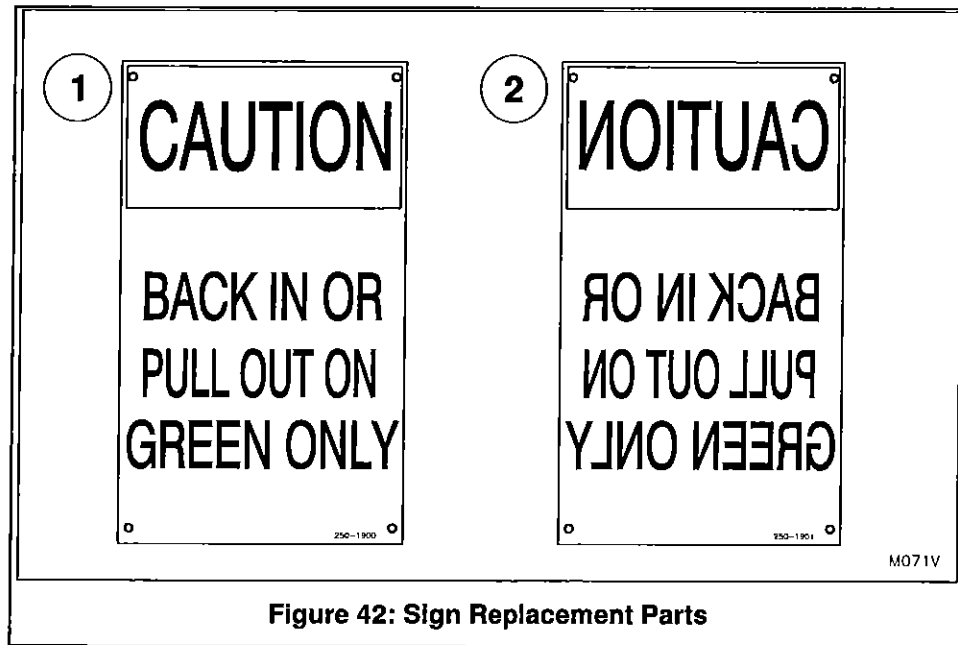


Figure 41: Traffic Light Replacement Parts

<u>ITEM NO.</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	060-0529	Housing
2	060-0702	Red LED Module
3	060-0703	Green LED Module
4	060-0524	Mounting Gasket
5	060-0701	Complete Unit (Includes items 1 – 4)

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

SIGNS



<u>ITEM NO.</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	250-1900	Exterior Driver Sign
2	250-1901	Exterior Driver Sign - Mirror

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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 charge 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.

