PENTALIFT TM

PENTALIFT EQUIPMENT CORPORATION

VERTICAL STORING HYDRAULIC DOCK LEVELER

OWNERS MANUAL

MODEL NUMBER : _____ **SERIAL NUMBER** : _____

CAPACITY : _____

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

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 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 LIGHT PACKAGE. 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, barricad all areas from traffic around the work area inside (and outside if applicable) for safet and post appropriate warning signs.**

⚠DANGER **Arc flash and shock hazard PPE (personal protection equipment) required. De-energ 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 pow source. Hazardous voltage will cause severe injury or death.**

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

⚠DANGER **NEVER GO INTO THE DOCK LEVELER'S OPERATING PATH FOR ANY REASON UNLESS THE DECK AND LIP ARE PROPERLY SUPPORTED (SEE page 5 AND THE POWER IS DISCONNECTED WITH A FUSED DISCONNECT, PROPERLY TAGGED AND LOCKED OUT. IT IS THE RESPONSIBILITY OF THE OWNER TO ENSURE THAT NO LOAD OR TRAFFIC IS PLACED ON THE DECK WHILE THE MAINTENANCE STAND IS ENGAGED. THE CONSTRUCTION OF THE MAINTENANCE STAND IS INTENDED TO SUPPORT THE WEIGHT OF THE UNLOADED DOCK LEVELER ONLY.**

⚠DANGER **STAY CLEAR OF THE EQUIPMENT'S OPERATING PATH AT ALL TIMES.**

⚠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.**

⚠DANGER **DO NOT LEAVE THE DECK IN THE LOWERED POSITION WITH THE OVERHEAD DOOR CLOSED.**

DANGER **DOCK LEVELER CAPACITY: THE RATED CAPACITY OF THE DOCK LEVELER AS STATED ON THE SERIAL NUMBER PLATE IS A STATIC RATING. NUMEROUS DYNAMIC LOADING FACTORS RESULT IN THE GROSS LOAD CAPACITY (ROLLOVER CAPACITY) BEING SIGNIFICANTLY LESS THAN THE RATED STATIC CAPACITY OF THE DOCK LEVELER. FACTORS WHICH AFFECT THE ROLL OVER CAPACITY ARE: WEIGHT OF THE LOAD; WEIGHT OF THE FORK TRUCK; SPEED OF THE FORK TRUCK AS IT ROLLS OVER THE DOCK LEVELER; INCLINE OR DECLINE SLOPE OF THE DOCK LEVELER DECK AND LIP WHEN IN USE; FREQUENCY OF USE AND DESIRED LIFE OF THE DOCK LEVELER. PRIOR TO USING THE DOCK LEVELER, OR IF THE APPLICATION CONDITIONS FOR THE DOCK LEVELER CHANGE IN ANY RESPECT, CONTACT YOUR AUTHORIZED PENTALIFT REPRESENTATIVE TO CONFIRM THE SPECIFIC DOCK LEVELER'S SUITABILITY FOR THE APPLICATION.**

Note On Capacity: The dock leveler capacity indicated on the serial plate must be divided with a factor to accommodate dynamic loading factors. For more information see Pentalift document - Dock Leveler Capacity – Understanding Loading Dock Capacity at http://www.pentalift.com/dock-leveler-capacity.php

DANGER **ENSURE THAT THERE ARE NO OTHER LIGHTS IN THE VICINITY OF THIS EQUIPMENT THAT MIGHT BE CONFUSED WITH THE INDICATOR LIGHTS SUPPLIED WITH THIS EQUIPMENT AND REFERENCED BY THE EQUIPMENT'S OPERATING INSTRUCTIONS AND OWNER'S MANUAL. INCORRECT SIGNALS OR CONFUSION CREATED BY SIMILAR OR DUPLICATE LIGHTS WILL CREATE A SIGNIFICANT HAZARD.**

DANGER **IF FOR ANY REASON IT IS POSSIBLE HYDRAULIC OIL IS NOT PRESENT IN THE HYDRAULIC CYLINDER FOLLOW THE HYDRAULIC CYLINDER PRIMING PROCESS DESCRIBED IN "PRIMING OF HYDRAULIC CYLINDERS" on page 7.**

WARNING **If the loading dock installation includes a manually activated vehicle restraint; in order to manually engage or disengage the vehicle restraint using the vehicle restraint push bar the operator must enter the operating path of the vertical storing dock leveler. To prevent possible injury, it is imperative that prior to entering the operating path of the vertical storing dock leveler for any reason, including for the purpose of activating or storing the manual restraint, that the operator confirms that the vertical storing dock leveler maintenance stand has been engaged. Once the vehicle restraint has been operated, confirm that the vertical storing dock leveler maintenance stand has been disengaged before attempting to operate the vertical storing dock leveler.**

1. Do not operate, use, maintain or install this equipment if you are impaired in any manner.
2. Never stand between the dock and a truck.
3. Always make sure the overhead door and the truck door are fully open and no one and nothing is in the operating path of the dock leveler, before lowering the leveler from the vertical position or damage may occur. It is recommended to have an overhead door interlock switch on each installation. This way, the leveler will not operate unless the door is open.
4. Return dock leveler to the stored position before allowing truck to depart.
5. Be certain no equipment, material or personnel are on the dock leveler before allowing the truck to depart.
6. The deck surface must be kept clean and free from oil, debris, etc. Keep debris, etc. from underneath the unit.
7. Before loading/unloading the truck, ensure the trailer is in position firmly against both of the dock bumpers and **ENGAGE A VEHICLE RESTRAINT OR CHOCK THE TRUCK WHEELS** to eliminate the possibility of the truck rolling or inching forward.
8. 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 "INSPECTION, MAINTENANCE, AND LUBRICATION" on page 41).

9. Anyone using or in the vicinity of this equipment must wear protective footwear with steel toes.

10. Ensure that the equipment is not used if any part of it might be in disrepair. (E.g. loose wires, leaking hoses, bent structural members, broken welds, etc.) See Warranty Section.

11. If you have any questions, contact your immediate supervisor or your authorized Pentalift representative for assistance. Please note the Warranty.

OWNER RESPONSIBILITY

The Owner's Responsibilities include the following:

1. *The owner shall recognize the inherent danger of the interface between dock and transport vehicle. The Owner shall, therefore, train and instruct operators in the safe use of dock leveling devices.*

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.*

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. *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 shall be kept.*

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* ***Pentalift Equipment Corporation's*** *authorized representative and repaired as needed before being placed back in service. The owner shall receive written authorization from* ***Pentalift Equipment Corporation*** *through the authorized Pentalift representative that they can continue to use the dock leveler.*

6. ***Pentalift Equipment Corporation*** *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.*

7. *Modifications or alterations of dock leveling devices shall be made only with written permission of* ***Pentalift Equipment Corporation****. Alteration permission must be signed by both the Pentalift Post Sale Customer Service Manager and the President to be valid.*

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.*
NOTE: *It is recognized that these devices are intended to secure a transport vehicle to a loading dock by mechanical means. However, no standards currently exist for the strength, construction or attachment of the underride guard on a transport vehicle. 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 signalling system used*
- *The need to use wheel chocks*

9. *In selecting dock leveling devices, it is important to consider not only present requirements, but also future plans or adverse environments.*

10. *In order for any applicable warranties to be valid, the equipment must be properly installed, maintained and operated, including but not limited to use with the rated capacities and / or specific design parameter and not otherwise abused.*

11. *When selecting and applying dock equipment it is important to consider not only present requirements but also future requirements and adverse environments.*

12. *Trailers equipped with air ride suspensions should remove the air from the suspension to minimize trailer bed drop, prior to unloading and loading.*

⚠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.

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SAFETY LABELING

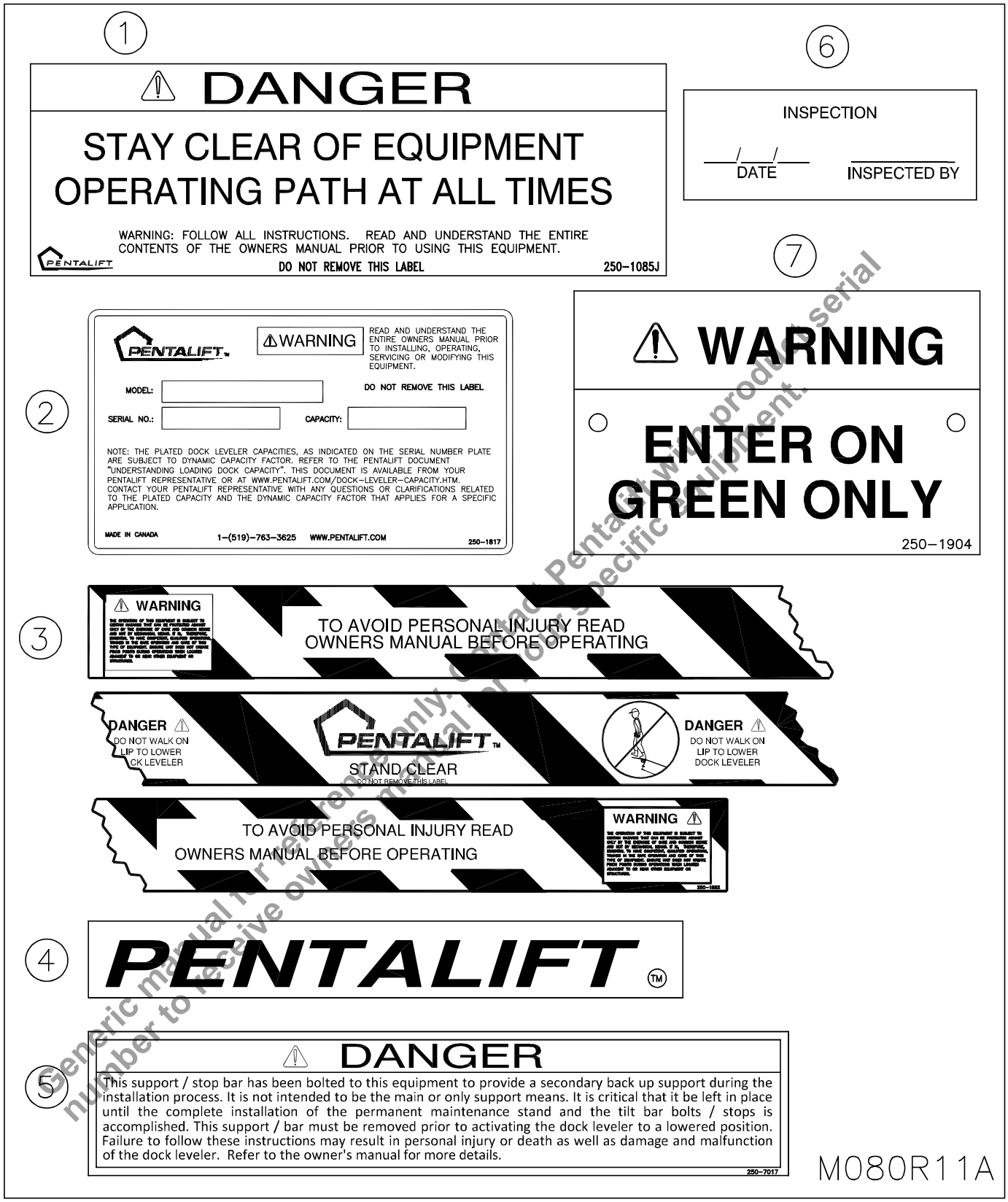

Figure 1a: Safety Labels and Decals

SAFETY LABELING CONTINUED

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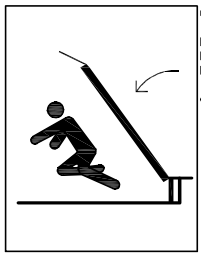
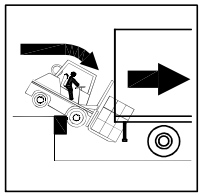
⚠ DANGER



CRUSH HAZARD

DO NOT WALK IN FRONT OF DOCK LEVELER until you:

- Restore the dock leveler to its safe stored vertical position with lip extended.



Unsupported dock levelers can lower unexpectedly.

Before allowing vehicle to leave the dock, always:

- Ensure that no equipment, material or people are on the dock leveler.

- Restore dock leveler to its safe stored vertical position with lip extended.

SAFETY INSTRUCTIONS

OPERATION

1. Read and follow all instructions and warnings in user's manual.
2. Use of dock leveler restricted to trained operators.
3. Always chock trailer wheels or engage trailer restraint before operating dock leveler or beginning to load or unload.
4. Never use hands or equipment to move ramp or lip.
5. Before activating dock leveler:
   - Ensure trailer is backed in against bumpers.
   - Remove any end loads if required.
   - Check trailer alignment to avoid lip interference. If lip does not lower to trailer bed, reposition vehicle.
6. Ensure truck bed supports extended lip or leveler frame supports ramp before diving on ramp.
7. Stay clear of hinges and front and sides of moving dock leveler.
8. never use damaged or malfunctioning dock leveler. Report problems immediately to supervisors.

MAINTENANCE/SERVICE

1. Read and follow all instructions, warning and maintenance schedules in iser:s manual.
2. Maintenance/Service of dock leveler restricted to trained personnel.
3. Place barriers on the driveway and dock floor to show service work is being performed.
4. DO NOT SERVICE LEVELER unless dock leveler is securely supported by maintenance lock-out pin.
5. Turn off power and use OSHA lockout/tagout procedures.

Failure to follow posted instructions will result in death or serious injury.

Do not remove this label 250-2551

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DANGER / IMPORTANT

READ AND FOLLOW THE INSTALLATION INSTRUCTIONS AND OWNERS MANUAL IN THEIR ENTIRETY BEFORE INSTALLING AND/OR USING EQUIPMENT; FAILURE TO COMPLY MAY RESULT IN DEATH OR PERSONAL INJURY.

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Attention Consignee

READ THESE IMPORTANT INSTRUCTIONS

YOU MUST THOROUGHLY INSPECT THIS SHIPMENT AS SOON AS RECEIVED

If any of the goods called for on this bill of lading are missing or damaged, DO NOT ACCEPT THEM until you or the freight agent makes a damaged notation on the delivery receipt. It is the obligation of the consignee to count and examine the condition of the shipper's containers at the time of delivery.

If any concealed damage is discovered after the transportation company leaves, notify your freight agent immediately and ask them to return and make an inspection. THIS IS ABSOLUTELY NECESSARY. If the carrier is given a clear receipt without any notation of loss or damage, it is the responsibility of the claimant to provide evidence that the loss or damage occurred in transit.

PENTALIFT.

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⚠ DANGER

CONFIRM TILT BAR BOLTS ARE TORQUED AND WELDED IN PLACE AS INDICATED IN OWNER'S MANUAL. DO NOT USE DOCK LEVELER WITHOUT PROPER WELDING. REFER TO OWNER'S MANUAL FOR DETAILS.

PENTALIFT DO NOT REMOVE THIS LABEL 250-0072

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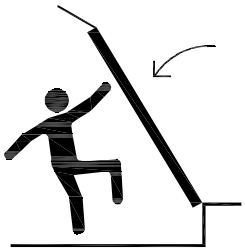
⚠ DANGER



CRUSH HAZARD

This Equipment should not be used or serviced except by trained personnel.

Do not go in front of the leveler without the maintenance stand locking pin properly engaged and locked out.

Before doing any maintenance, repair or adjustment, on the dock leveler, store the leveler in vertical position with lip extended, engage the maintenance stand locking pin, disconnect power, properly tag and lock out. Do not stand in front of the leveler while engaging or removing the maintenance stand locking pin. Reach in from the side of the leveler.

Do not force the maintenance stand locking pin out of the maintenance strut. If the pin does not slide freely, support the leveler securely using other means and determine the cause of the interference.

IMPORTANT: Read the installation instructions and owners manual in their entirety before installing and/or using this equipment.

Failure to follow these instructions could result in property damage, bodily injury or death.

Do not remove this label 250-2537

M080R22

Figure 1b: Safety Labels and Decals Continued

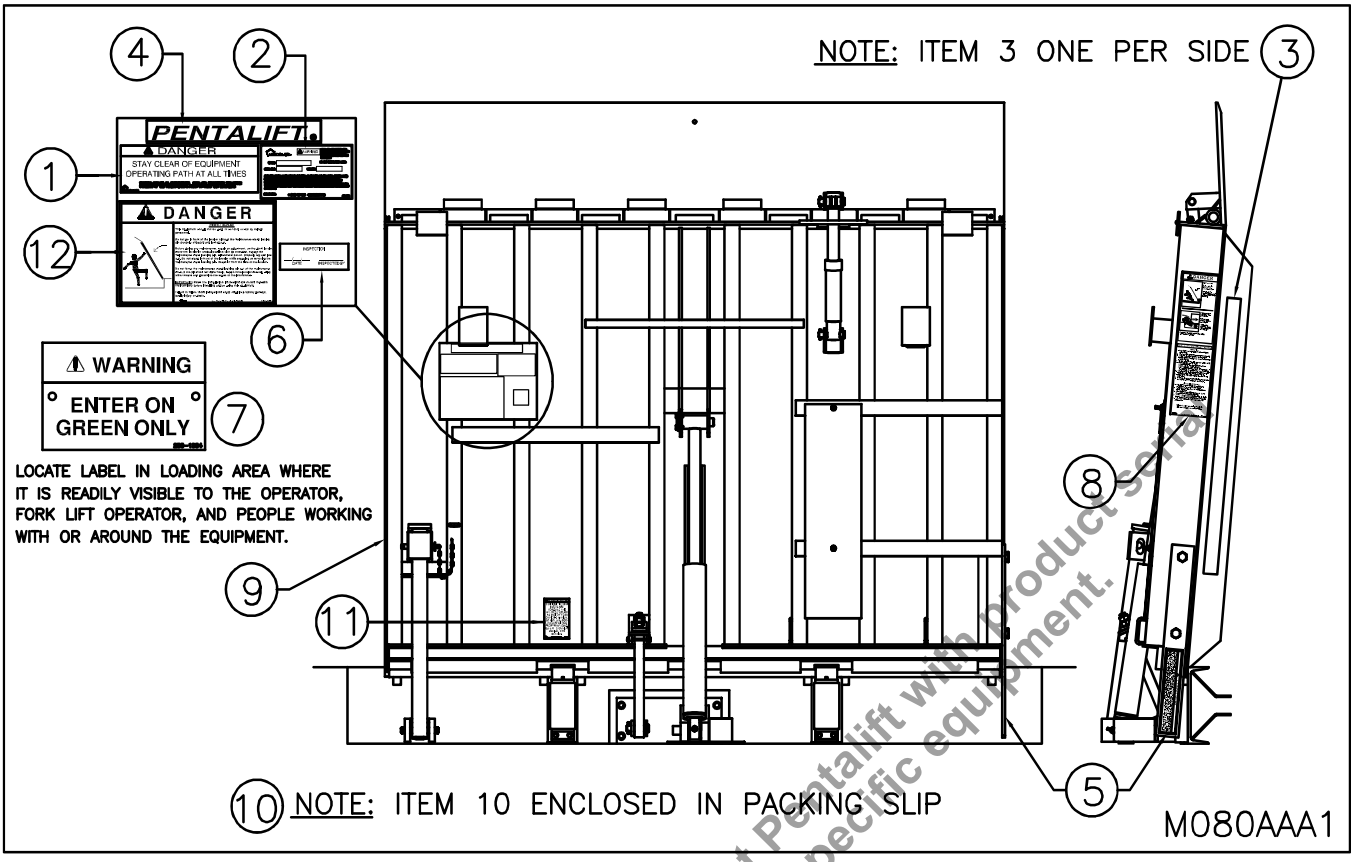


Figure 2: Safety Label and Decal Locations

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: It is the owner's responsibility to ensure 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 and around the equipment. If the visibility of any 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 INSPECTION, MAINTENANCE, AND LUBRICATION on page 41.

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

Item	Part No.	Qty.	Description
1	250-1085	1	"DANGER: STAY CLEAR..."
2	250-1817	1	Specification Plate
3	250-1882	2	Safety Stripe with Warning
4	250-1143	1	Pentalift
5	250-7017	1	"DANGER: THIS SUPPORT / STOP BAR..."
6	250-1148	1	FINAL INSPECTION
7	250-1904	1	"WARNING: ENTER ON GREEN ONLY"
8	250-2551	2	"DANGER: CRUSH HAZARD... SAFETY INSTRUCTIONS"
9	250-2058	1	"DANGER / IMPORTANT: READ AND FOLLOW..."
10	250-1185	1	Consignee Label
11	250-6972	1	"DANGER: CONFIRM TILT BAR BOLTS ARE TORQUED..."
12	250-2537	1	"DANGER: CRUSH HAZARD.."

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

SUPPORTING THE LEVELER FOR MAINTENANCE

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 **NEVER GO INTO THE DOCK LEVELER'S OPERATING PATH FOR ANY REASON UNLESS THE DECK AND LIP ARE PROPERLY SUPPORTED (SEE "Figure 3: How to Support the Dock Leveler for Maintenance" on page 5) AND THE POWER IS DISCONNECTED WITH A FUSED DISCONNECT, PROPERLY TAGGED AND LOCKED OUT. IT IS THE RESPONSIBILITY OF THE OWNER TO ENSURE THAT NO LOAD OR TRAFFIC IS PLACED ON THE DECK WHILE THE MAINTENANCE STAND IS ENGAGED. THE CONSTRUCTION OF THE MAINTENANCE STAND IS INTENDED TO SUPPORT THE WEIGHT OF THE UNLOADED DOCK LEVELER ONLY.**

DANGER **IF FOR ANY REASON IT IS POSSIBLE HYDRAULIC OIL IS NOT PRESENT IN THE HYDRAULIC CYLINDER FOLLOW THE HYDRAULIC CYLINDER PRIMING PROCESS DESCRIBED IN "PRIMING OF HYDRAULIC CYLINDERS" on page 7.**

1. Ensure the dock leveler is in its vertically stored position; with the lip fully extended.

2. **DANGER** **BEFORE ENTERING THE PIT AND ENGAGING THE MAINTENANCE STAND, ENSURE BOTH TILT BAR BOLTS ARE WELDED IN PLACE (SEE "Figure 3: How to Support the Dock Leveler for Maintenance" on page 5). NEVER REMOVE THE TILT BAR BOLTS FOR ANY REASON.**

3. Insert the Maintenance Stand Locking Pin, ensuring that the Locking Pin passes through the hole in the Maintenance Stand Arm (See "Figure 4: Maintenance Stand - Showing Location to Insert Locking Pin" on page 6) and lock in place using a Padlock (padlock by others) (See "Figure 5: Maintenance Stand - Showing Locking Pin Inserted and Padlocked in Place" on page 6).

4. Remove the bolt holding the lip support in the stored position. Swing the lip support to align it with the lip support locking bar. Move the lip in so that the weight is resting on the lip support. (See "Figure 3: How to Support the Dock Leveler for Maintenance" on page 5).

5. Disconnect the power, properly tag and lock out.

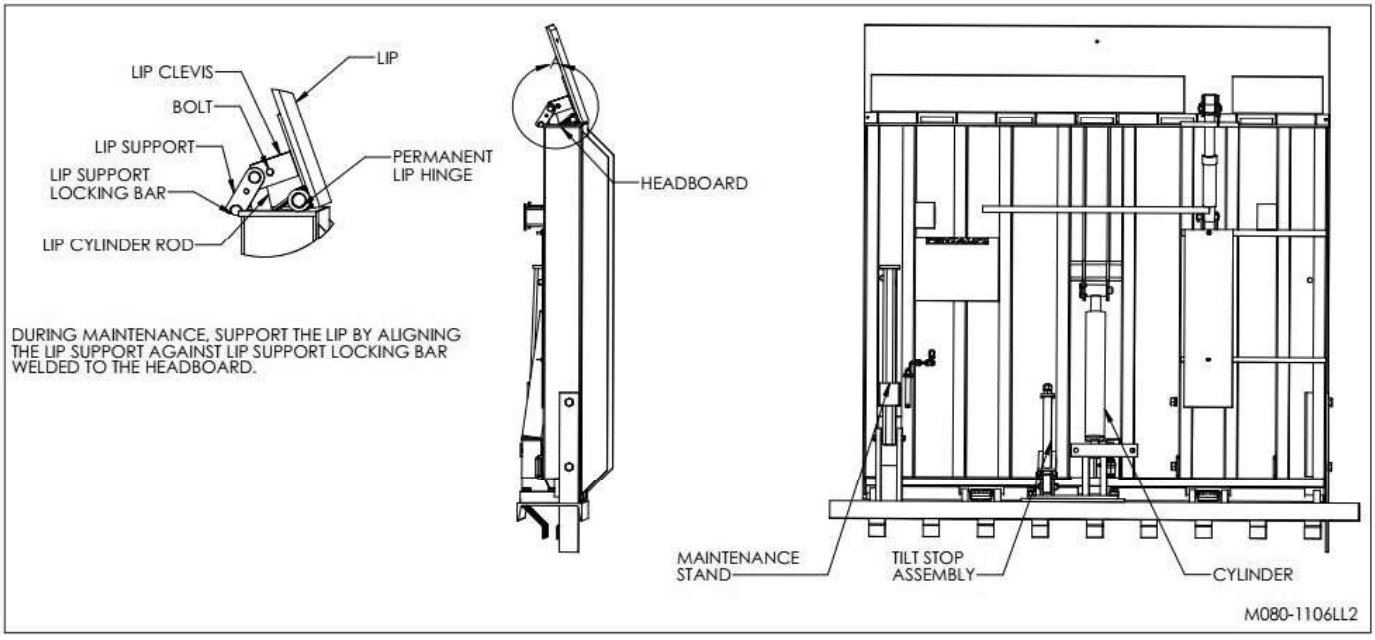


Figure 3: How to Support the Dock Leveler for Maintenance

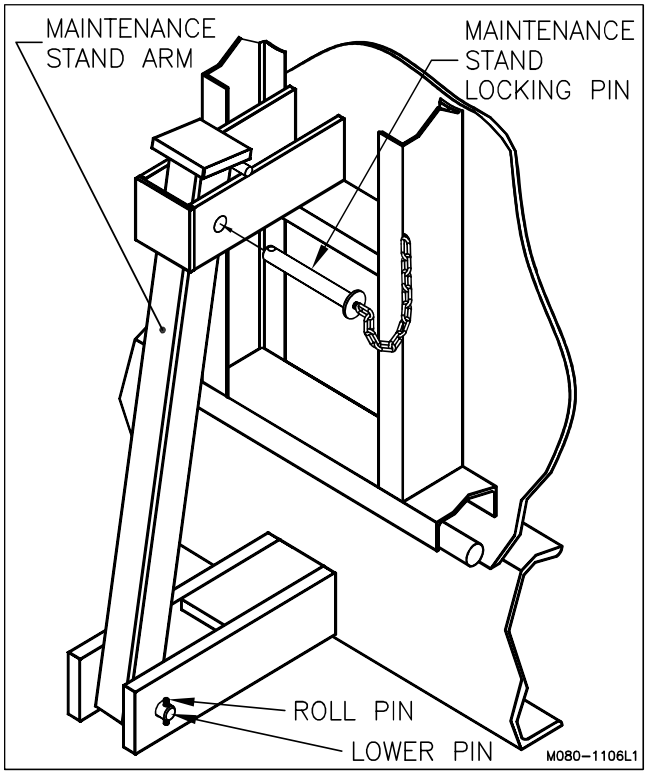


Figure 4: Maintenance Stand - Showing Location to Insert Locking Pin

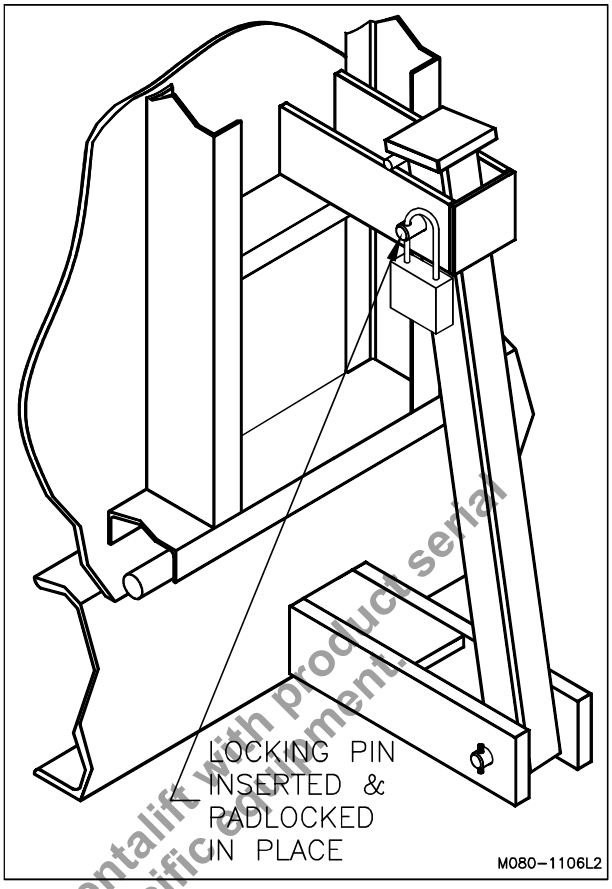


Figure 5: Maintenance Stand - Showing Locking Pin Inserted and Padlocked in Place

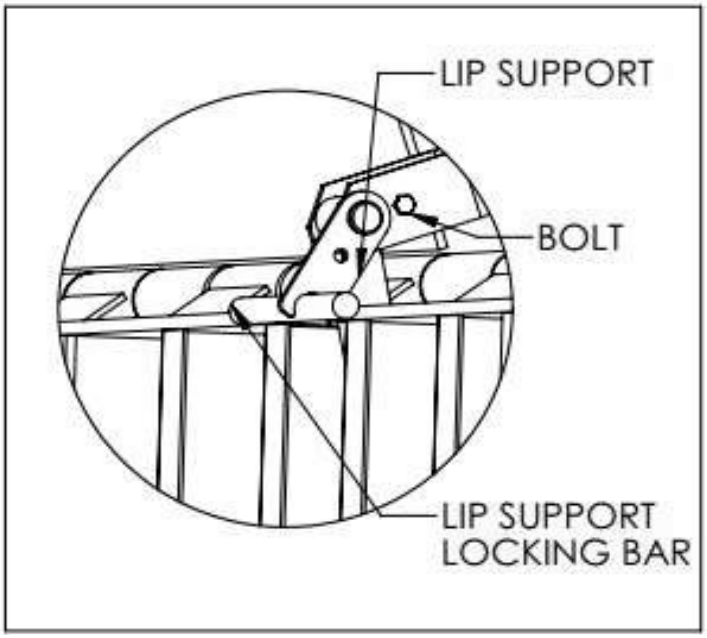


Figure 41: Showing components to support lip during maintenance

PRIMING OF HYDRAULIC CYLINDERS

DANGER **IF FOR ANY REASON IT IS POSSIBLE HYDRAULIC OIL IS NOT PRESENT IN THE HYDRAULIC CYLINDER FOLLOW THE HYDRAULIC CYLINDER PRIMING PROCESS DESCRIBED IN "PRIMING OF HYDRAULIC CYLINDERS" on page 7.**

DANGER **DURING INITIAL START-UP OR AT ANY TIME WHEN THE HYDRAULIC SYSTEM IS WORKED ON IN A MANNER THAT MIGHT CAUSE HYDRAULIC FLUID TO NOT BE PRESENT IN THE HYDRAULIC CYLINDERS AND SYSTEM COMPLETE ALL OF THE FOLLOWING STEPS TO PROPERLY PRIME THE HYDRAULIC SYSTEM. FAILURE TO DO SO COULD RESULT IN THE DOCK LEVELER FREE FALLING UNEXPECTEDLY CAUSING PERSONAL INJURY OR DEATH AND OR PROPERTY AND EQUIPMENT DAMAGE.**

1. Ensure the vertical storing dock leveler is properly supported for maintenance (See "SUPPORTING THE LEVELER FOR MAINTENANCE" on page 5).
2. Ensure all final electrical installation and connections are completed as required.
3. Confirm all hydraulic components are secure and are appropriately tightened.
4. Remove the upper pin of the hydraulic lift cylinder (See "Figure 17: Cylinder Rod Installation" on page 25).
5. With the upper lift cylinder pin removed, position the hydraulic lift cylinder leaning over center towards the front of the pit to extend the cylinder, or over center towards the rear of the pit or towards the deck plate to retract the cylinder (See "Figure 6: Cylinder Position Range for Extending/Retracting" on page 8). This positions the limit switch activating cams to allow use of the control panel to fully extend and fully retract the lift cylinder. Note: Make sure that during the extension and retraction of the hydraulic lift cylinder, the positioning of the cylinder avoids contact with any objects.
6. Confirm the hydraulic oil reservoir on the hydraulic power unit is almost full of oil.
7. Push and hold the deck raise button on the control panel with the hydraulic lift cylinder leaning towards the front of the pit until the cylinder is fully extended. Once the cylinder is fully extended, release the raise button and wait for 10 seconds. When completing this process, do not allow the hydraulic lift cylinder to lower to the dock leveler pit floor.
8. Push and hold the deck lower button with the hydraulic lift cylinder leaning towards the rear of the pit until the cylinder is fully retracted. Once the cylinder is fully retracted, release the deck lower button and wait for 10 seconds. Note: Make sure that during the extension and retraction of the hydraulic lift cylinder, the positioning of the cylinder avoids contact with any objects.
9. Repeat steps 7 and 8 a minimum of 3 times. Note: While completing these steps make sure to monitor the hydraulic fluid level in the power unit. If necessary, add more hydraulic fluid.
10. Once this process is completed, jog the deck raise button to extend the cylinder to allow the reinstallation of the lift cylinder upper pin.
11. Once the upper cylinder pin is properly installed, raise the dock leveler to remove the load bearing dependence on the maintenance stand and disengage the maintenance stand.
12. Raise the dock leveler to the stored position.

The priming process is now completed. There may be a small amount of remaining air in the hydraulic system. This may show up as some jerking movement as the dock leveler and or lip move. Through continued use the remaining residual air will automatically be evacuated from the hydraulic system.

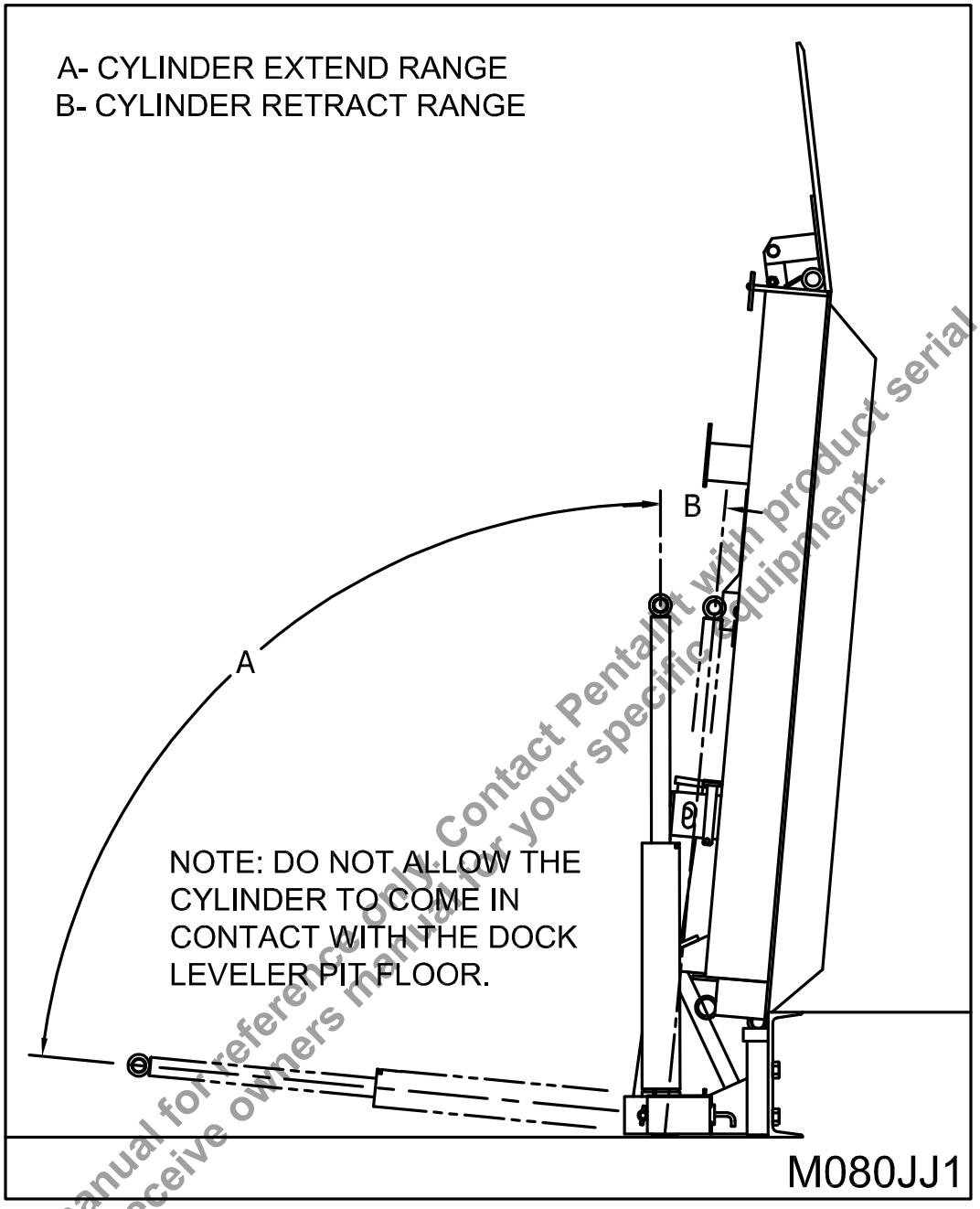


Figure 6: Cylinder Position Range for Extending/Retracting

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

NOTE: Perform installation instructions in the same sequence as they are listed below. 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.

NOTE: Vertical storing dock levelers are shipped deck plate down for stability during shipping. Due to the possible accumulation of precipitation within the deck structure, which could lead to premature rusting, it is the responsibility of others to ensure that the vertical storing dock levelers are not stored in the inverted position allowing the accumulation of precipitation within the deck structure after delivery and prior to 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 **NEVER GO INTO THE DOCK LEVELER'S OPERATING PATH FOR ANY REASON UNLESS THE DECK AND LIP ARE PROPERLY SUPPORTED (SEE "Figure 3: How to Support the Dock Leveler for Maintenance" on page 5) AND THE POWER IS DISCONNECTED WITH A FUSED DISCONNECT, PROPERLY TAGGED AND LOCKED OUT. IT IS THE RESPONSIBILITY OF THE OWNER TO ENSURE THAT NO LOAD OR TRAFFIC IS PLACED ON THE DECK WHILE THE MAINTENANCE STAND IS ENGAGED. THE CONSTRUCTION OF THE MAINTENANCE STAND IS INTENDED TO SUPPORT THE WEIGHT OF THE UNLOADED DOCK LEVELER ONLY.**

⚠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.**

⚠DANGER **ENSURE THAT THERE ARE NO OTHER LIGHTS IN THE VICINITY OF THIS EQUIPMENT THAT MIGHT BE CONFUSED WITH THE INDICATOR LIGHTS SUPPLIED WITH THIS EQUIPMENT AND REFERENCED BY THE EQUIPMENT'S OPERATING INSTRUCTIONS AND OWNER'S MANUAL. INCORRECT SIGNALS OR CONFUSION CREATED BY SIMILAR OR DUPLICATE LIGHTS WILL CREATE A SIGNIFICANT HAZARD.**

⚠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.**

1. __ Ensure pit conforms to appropriate Pentalift pit drawing.
2. __ Confirm pit curb angle/curb channels are properly installed and meet the force requirements as shown in "Figure 7: Draw Pull Forces Diagram" on page 11.
3. __ Clean pit of all debris.
4. __ Remove any packing material.
5. __ Move the unit to the installation area.
6. Proceed to the Rear Cast-in Channel or Weld-on Back Plate Installation (see note below).

Note:
The rear cast-in channel consists of a C-channel with concrete anchors welded on the backside along with tilt pockets and maintenance brackets welded to the front side. It is designed to be cast into the liquid concrete. The rear cast-in channel is supplied by the factory and is shipped with the vertical storing dock leveler.

The weld-on backplate consists of a rectangular plate with tilt pockets and maintenance brackets welded to the front side. There are holes provided through the plate to facilitate the welding of the plate to a pre-existing cast-in rear channel in the loading dock.

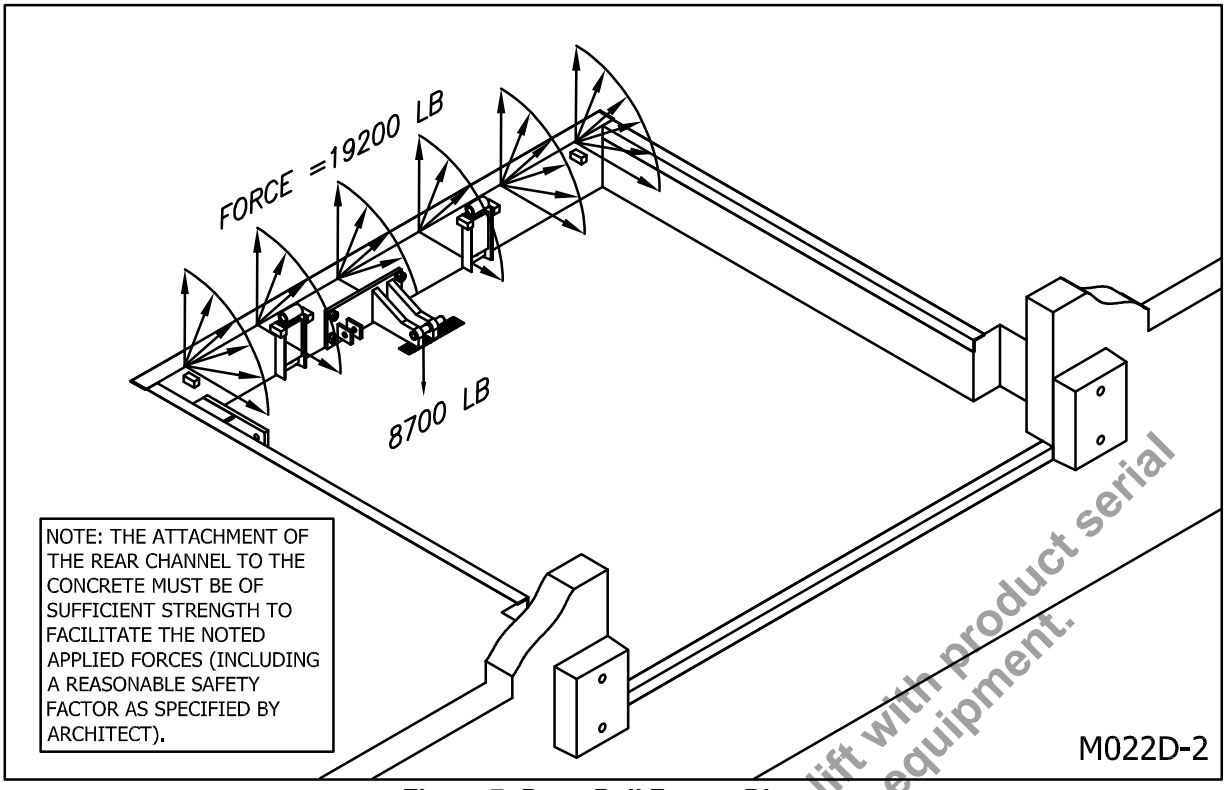


Figure 7: Draw Pull Forces Diagram

Rear Cast-in Channel Installation

1. __ Remove and retain the bolts and lock washer from the Rear Cast-in Channel that were supplied by the factory.

2. __ Position the Cylinder Mounting Plate onto the Rear Cast-in Channel as indicated in “Figure 10: Fasten Cylinder Mounting Plate Weldment to existing Rear Cast-in Channel” on page 21.

3. __ Re-install the four bolts/lockwashers to secure the cylinder mounting plate weldment.

4. __ Properly torque the bolts such that the Cylinder Mounting Plate is square, aligned and properly located and securely clamped to the Rear Cast-in Channel Assembly. This step will straighten any warpage. Torque each bolts to 270 ft/lbs.

5. __ Mount the power unit and push button control as shown in “Figure 11: Power Unit Installation” on page 24.

ENSURE UNOBSTRUCTED LINE OF SIGHT FROM PUSH BUTTON CONTROL TO DOCK LEVELER AND INTO PIT WHEN DOCK LEVELER IS RAISED.

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 impact, dirt, debris and splashing and / or wash down. 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 controls installation location.

NOTICE: Hose routing and potential hose damage

When routing the hoses to this equipment consider the following:

- If the hose(s) are to be routed through conduits make sure that the conduits are of a suitable inside diameter and that if there are bends in the conduit that the bends have sufficient radius for the size of hose(s) to be routed through the conduit (See “Figure 11: Power Unit Installation” on page 24).
- Do not force the hoses through the conduits as this could result in damage to the hose(s).
- Confirm the hose(s) have sufficient length to both connection points when routed through the conduit and other routing paths.
- For hoses that will be connected to a component that will move (I.E. a pivoting main cylinder on the vertical storing leveler) (see “Figure 35: Routing of hydraulic hoses (DETAIL)” on page 27):
    - Make sure to leave sufficient slack or additional hose movement that will be required and caused by the movement of the component (cylinder).
    - Make sure that hoses are routed to avoid any chance of pinching by or rubbing against moving components, throughout the entire range of motion.
    - Make sure that the routing path of the hose does not create a situation where the hose moves inside hose routing brackets or clips to a point where wear and tear or cuts and damage to the hose could occur. Confirm this concern by planning the hose routing path to the leveler and then confirming this concern is addressed by cycling the leveler through its full operating range and confirming this concern point is addressed.
    - Make sure the hose is not twisted when installed and will not twist significantly during operation.

6. __ **STAND ALONE DOCK LEVELER** – Connect the Lower Hose of the Lift Cylinder to the **C2** port on the Power Unit, the Raised Hose of the Lift Cylinder to the **C3** port, and the Hydraulic Hose from the Lip Cylinder to the **C1** port on the Power Unit.
   COMBINATION DOCK LEVELER & VEHICLE RESTRAINT – Connect the Lower Hose of the Lift Cylinder to the **C2** port on the Power Unit, the Raised Hose of the Lift Cylinder to the **C3** port, the Hydraulic Hose from the Lip Cylinder to the **P1** port on the Power Unit, and the Hydraulic Hose of the Restraint Cylinder to the **P2** port on the Power Unit (See “Figure 12: Stand Alone & Combination Hydraulic Valve Blocks” on page 22).

NOTE: The rotation of the main cylinder is approximately 90 degrees. Make sure to have appropriate routing with sufficient slack to accommodate the full cylinder movement without tightening or pinching the hydraulic hoses going to the cylinder.
Confirm this concern is addressed by cycling the dock leveler through it’s full travel several times while observing and confirming there are no issues.
If there are issues, change the hose routing to address the issues.

DANGER **Arc flash and shock hazard PPE (personal protection equipment) required. De-energ 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 pov source. Hazardous voltage will cause severe injury or death.**

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

7. __Install permanent electrical lines as per applicable electrical diagram provided inside the control panel.

8. __ **NOTE:** Power unit requires full voltage at motor. Wire size must be sufficiently sized to prevent voltage drop when motor is under load. (See Electrical Reference Chart on page 17) 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.

9. __ Remove tilt bar bolts and tilt bar stops and retain (See “Figure 13: Installation Outline” on page 23 and “Figure 15: Tilt Bar Bolts and Stop” on page 24).

10. __ **⚠DANGER**

THE SUPPORT / STOP BAR HAS BEEN BOLTED TO THIS EQUIPMENT TO PROVIDE A SECONDAY BACK UP SUPPORT DURING THE INSTALLATION PROCESS. IT IS NOT INTENDED TO BE THE MAIN OR ONLY SUPPORT MEANS. IT IS CRITICAL THAT IT BE LEFT IN PLACE UNTIL THE COMPLETE INSTALLATION OF THE PERMANENT MAINTENANCE STAND AND THE TILT BAR BOLTS / STOPS IS ACCOMPLISHED. THIS SUPPORT / BAR MUST BE REMOVED PRIOR TO ACTIVATING THE DOCK LEVELER TO A LOWERED POSITION. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY OR DEATH AS WELL AS DAMAGE AND MALFUNCTION OF THE DOCK LEVELER.

11. __ Remove tilt stop assembly adjustment nut and jam nut and retain (See Figure 14: Tilt Stop Assembly on page 24).

12. __ **⚠DANGER**

IT IS IMPERATIVE THAT THE DOCK LEVELER BE LIFTED INTO POSITION AND HELD THERE SECURELY AND POSITIVELY FOR THE ENTIRE INSTALLATION PROCESS. THE MEANS USED FOR DOING THIS MUST ENSURE THAT IT IS IMPOSSIBLE FOR THE DOCK LEVELER TO INADVERTENTLY MOVE.

NOTE: The dock leveler deck is required to lean approximately 10° toward the door during these procedures

13. __ Hoist leveler into a vertical position by using the lifting bar welded to the deck assembly (See “Figure 13: Installation Outline” on page 23). Lower the dock leveler so that the tilt bars slide into the tilt bar pockets on the rear mounting channel and the tilt stop assembly bar slides into the slot on the tilt stop bracket welded on the deck.

14. __ Re-Install the four (4) tilt bar bolts and two (2) tilt bar stops into the tilt bars. The bolts should be torqued to 118 ft-lb (See “Figure 15: Tilt Bar Bolts and Stop” on page 24).

15. __ Re-Install the tilt stop adjustment nut and jam nut (See Figure 14: Tilt Stop Assembly on page 24).

16. __ Remove the bolts from the mechanical latch plate and remove the upper cylinder pin. Extend the cylinder to the appropriate stroke length and install the rod end of the cylinder to the deck cylinder clevis using the upper cylinder pin. Re-install the mechanical latch plate and bolts. Confirm that the rod end of the cylinder has been properly installed (See “Figure 17: Cylinder Rod Installation” on page 25). This means that the cylinder must be aligned vertically and not tilted over to the left or right side of the dock leveler. Improper alignment will cause premature wear on hydraulic cylinder parts.

17. __ Ensure the leveler, when in its stored position, leans backward 5° from a fully vertical position. At a height of 4’ from the top of the curb channel using a 4’ level or plumb line held plumb, place the level against the deck and flush with dock floor (See “Figure 18: Tilt Back Setting” on page 25). The level or plumb line should be 4-1/4” from the deck plate at floor level.

If it does not, adjust as follows:

a) Ensure the leveler is fully restrained and supported.

b) Loosen off the jam nut on the tilt stop assembly. Loosen the adjustment nut to move the deck backwards, or tighten the adjustment nut to move the deck forward. Tighten the jam nut when done adjustment (See “Figure 14: Tilt Stop Assembly” on page 24).

NOTE: Accuracy of this adjustment is critical.

NOTE: Do not use a level or plumb line longer than 4’.

18. __ Ensure the Maintenance Stand is installed as in “Figure 3: How to Support the Dock Leveler for Maintenance” on page 5. Ensure the Maintenance Stand Lower Pin is fully inserted and Roll Pins installed (“Figure 5: Maintenance Stand - Showing Locking Pin Inserted and Padlocked in Place” on page 6).

19. __ Remove all shipping & lifting brackets.

20. __ Position the bumper backing plates so that there is a 1” space between the bumpers and the dock leveler deck edge when the deck is in the lowered position (See “Figure 19: Bumper Position” on page 25). The bumpers may protrude into the pit opening. Weld or bolt bumper backing plates in place.

21. __ With the dock leveler in the vertical stored position, engage the Maintenance Stand as shown in “SUPPORTING THE LEVELER FOR MAINTENANCE” on page 5.

22. __ Shim between the bottom cylinder bracket and the pit floor and weld securely in place. Lag the lower cylinder bracket to the floor using 5/8 x 4 1/2 concrete anchors with a minimum tension value of 3,900 lbs (1,769 kg). Torque to manufacturers specifications. Ensure all shims are welded together as well as to the leveler curb channel and cylinder bracket (See “Figure 20: Shim the Bottom Cylinder Bracket” on page 25).

23. __ Lubricate and test in accordance with the Break-in and Performance Check procedures on page 40.

24. __ Weld the tilt bar bolts permanently in position to the tilt bar stops (See “Figure 16: Tilt Bar Stop Weldment” on page 24).

25. __ Remove installation support / stop bar (see “Figure 13: Installation Outline” on page 23).

26. __ Follow the Priming of Hydraulic Cylinder (see “PRIMING OF HYDRAULIC CYLINDERS” on page 7), Break-in (see “BREAK-IN AND PERFORMANCE CHECK” on page 40), Performance Check and the Operation Instruction (see “OPERATING INSTRUCTIONS” on page 45) before proceeding to the next step below.

27. __Confirm proper fit and alignment by cycling the vertical storing dock leveler a number of times. Once form, fit and function are properly confirmed proceed to the next step below.

28. __ Place the dock leveler in the vertically stored position by depressing and holding the DECK RAISE button. The inside green light will deactivate upon entering the travel zone and the inside red light will illuminate. The dock will rise to its vertical stored position. (Note: If the deck is not in the fully stored position the buzzer will sound in a pulsating manner).

29. __ Secure the dock leveler in the vertical stored position (see “SUPPORTING THE LEVELER FOR MAINTENANCE” on page 5) before proceeding to the next step below. Failure to do so could result in serious injury or death.

30. __Weld the Cylinder Mounting Plate Weldment to the mounting plate of the Rear Channel Assembly. Weld along the top and two side edges as indicated on “Figure 10A: Welding Cylinder Mounting Plate Weldment” on page 21

This concludes the Rear Cast-in Channel installation.

Note: The cylinder mounting plate may be slightly warped when delivered. Installing the cylinder mounting plate onto the Rear Cast-in Channel Assembly and properly torquing the nuts will straighten the plate.

NOTE: Installation support / stop bar is for one time use only. Discard after installation.

Weld-on Back Plate Installation

1. __ Confirm the rear channel is cast in place with sufficient strength to accept the forces applied (see “Figure 7: Draw Pull Forces Diagram” on page 11). Position the weld on back plate assembly firmly against the rear channel. Tack weld the Back Plate to the rear channel with tacks distributed evenly on the edges to be welded. This will eliminate or reduce warping. After tacking, plug weld using the holes provided in the Weld on Back Plate, and fillet weld the Weld on Back Plate to the rear channel as indicated in “Figure 8: Weld on Back Plate to Existing Rear Channel” on page 20.

2. __ Remove and retain the four bolts/lockwashers supplied on the Weld on Back Plate.

3. __ Position the Cylinder Mounting Plate onto the Weld on Back Plate as indicated in “Figure 9: Fasten Cylinder Mounting Plate to Welded on Back Plate” on page 20.

4. __ Re-install the four bolts/lockwashers secure the cylinder mounting plate weldment.

5. __ Properly torque the bolts such that the Cylinder Mounting Plate is square, aligned and properly located and securely clamped to the Weld on Back Plate. This step will straighten any warpage. Torque each bolts to 270 ft/lbs.

6. __ Mount the power unit and push button control as shown in “Figure 11: Power Unit Installation” on page 24.

   ENSURE UNOBSTRUCTED LINE OF SIGHT FROM PUSH BUTTON CONTROL TO DOCK LEVELER AND INTO PIT WHEN DOCK LEVELER IS RAISED.

   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 impact, dirt, debris and splashing and / or wash down. 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 controls installation location.

7. __ **STAND ALONE DOCK LEVELER** – Connect the Lower Hose of the Lift Cylinder to the **C2** port on the Power Unit, the Raised Hose of the Lift Cylinder to the **C3** port, and the Hydraulic Hose from the Lip Cylinder to the **C1** port on the Power Unit.
   COMBINATION DOCK LEVELER & VEHICLE RESTRAINT – Connect the Lower Hose of the Lift Cylinder to the **C2** port on the Power Unit, the Raised Hose of the Lift Cylinder to the **C3** port, the Hydraulic Hose from the Lip Cylinder to the **P1** port on the Power Unit, and the Hydraulic Hose of the Restraint Cylinder to the **P2** port on the Power Unit (See “Figure 12: Stand Alone & Combination Hydraulic Valve Blocks” on page 22).

8. __ Install permanent electrical lines as per applicable electrical diagram provided inside the control panel.

9. __ **NOTE:** Power unit requires full voltage at motor. Wire size must be sufficiently sized to prevent voltage drop when motor is under load. (See Electrical Reference Chart on page 17) 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.

10. __ Remove tilt bar bolts and tilt bar stops and retain (See “Figure 13: Installation Outline” on page 23 and “Figure 15: Tilt Bar Bolts and Stop” on page 24).

NOTICE: Hose routing and potential hose damage

When routing the hoses to this equipment consider the following:

- If the hose(s) are to be routed through conduits make sure that the conduits are of a suitable inside diameter and that if there are bends in the conduit that the bends have sufficient radius for the size of hose(s) to be routed through the conduit (See “Figure 11: Power Unit Installation” on page 24).
- Do not force the hoses through the conduits as this could result in damage to the hose(s).
- Confirm the hose(s) have sufficient length to both connection points when routed through the conduit and other routing paths.
- For hoses that will be connected to a component that will move (I.E. a pivoting main cylinder on the vertical storing leveler) (see “Figure 35: Routing of hydraulic hoses (DETAIL)” on page 27):
    - Make sure to leave sufficient slack or additional hose movement that will be required and caused by the movement of the component (cylinder).
    - Make sure that hoses are routed to avoid any chance of pinching by or rubbing against moving components, throughout the entire range of motion.
    - Make sure that the routing path of the hose does not create a situation where the hose moves inside hose routing brackets or clips to a point where wear and tear or cuts and damage to the hose could occur. Confirm this concern by planning the hose routing path to the leveler and then confirming this concern is addressed by cycling the leveler through its full operating range and confirming this concern point is addressed.
    - Make sure the hose is not twisted when installed and will not twist significantly during operation.

NOTE: The rotation of the main cylinder is approximately 90 degrees. Make sure to have appropriate routing with sufficient slack to accommodate the full cylinder movement without tightening or pinching the hydraulic hoses going to the cylinder.
Confirm this concern is addressed by cycling the dock leveler through it’s full travel several times while observing and confirming there are no issues.
If there are issues, change the hose routing to address the issues.

DANGER **Arc flash and shock hazard PPE (personal protection equipment) required. De-energ 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 pow source. Hazardous voltage will cause severe injury or death.**

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

⚠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 ASSURE PHASE POLARITY IS CORRECT.**
- **ALWAYS OBSERVE ALL APPLICABLE ELECTRICAL CODES.**

ELECTRICAL REFERENCE - 1.5 HP

	AWG	115/1/60	230/1/60	230/3/60	380/3/50	480/3/60	575/3/60
Length of branch circuit which will have a 2% voltage drop at full load current (copper wire) ft/m. NOTE: Calculations are based on 30 C Ambient	14		60.3 ft/ 18.4m	168.7 ft/ 51.4m	406.7 ft/ 124m	704 ft/ 214m	1035.1 ft/ 315.5m
	12	38.1ft/ 11.6m	152.5 ft/ 46.5m	268.2 ft/ 81.8m	646.7 ft/ 197.1m		
	10	60.6 ft/ 18.5m	242.6 ft/ 73.9m	426.8 ft/ 130.1m			
	8	96.4 ft/ 29.4m	385 ft/ 117.5m	678.2 ft/ 206.7m	The values given are intended to be a rough wiring guide only.		
	6	153.2 ft/ 46.7m	612.9 ft/ 186.8m		Be sure to check all applicable electrical codes before wiring.		
Approximate Motor Current (full load) TENV Unit		19 amps	9.5 amps	5.4 amps	3.7 amps	2.7 amps	2.2 amps

11. __ **⚠DANGER**

THE SUPPORT / STOP BAR HAS BEEN BOLTED TO THIS EQUIPMENT TO PROVIDE A SECONDAY BACK UP SUPPORT DURING THE INSTALLATION PROCESS. IT IS NOT INTENDED TO BE THE MAIN OR ONLY SUPPORT MEANS. IT IS CRITICAL THAT IT BE LEFT IN PLACE UNTIL THE COMPLETE INSTALLATION OF THE PERMANENT MAINTENANCE STAND AND THE TILT BAR BOLTS / STOPS IS ACCOMPLISHED. THIS SUPPORT / BAR MUST BE REMOVED PRIOR TO ACTIVATING THE DOCK LEVELER TO A LOWERED POSITION. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY OR DEATH AS WELL AS DAMAGE AND MALFUNCTION OF THE DOCK LEVELER.

12. __ Remove tilt stop assembly adjustment nut and jam nut and retain (See Figure 14: Tilt Stop Assembly on page 24).

13. __ **⚠DANGER**

IT IS IMPERATIVE THAT THE DOCK LEVELER BE LIFTED INTO POSITION AND HELD THERE SECURELY AND POSITIVELY FOR THE ENTIRE INSTALLATION PROCESS. THE MEANS USED FOR DOING THIS MUST ENSURE THAT IT IS IMPOSSIBLE FOR THE DOCK LEVELER TO INADVERTENTLY MOVE.

NOTE: The dock leveler deck is required to lean approximately 10° toward the door during these procedures.

14. __ Hoist leveler into a vertical position by using the lifting bar welded to the deck assembly (See “Figure 13: Installation Outline” on page 23). Lower the dock leveler so that the tilt bars slide into the tilt bar pockets on the rear mounting channel and the tilt stop assembly bar slides into the slot on the tilt stop bracket welded on the deck.

15. __ Re-Install the four (4) tilt bar bolts and two (2) tilt bar stops into the tilt bars. The bolts should be torqued to a range between 106 ft-lb and 119 ft-lb (See “Figure 15: Tilt Bar Bolts and Stop” on page 24).

16. __ Re-Install the tilt stop adjustment nut and jam nut (See Figure 14: Tilt Stop Assembly on page 24).

17. __ Remove the bolts from the mechanical latch plate and remove the upper cylinder pin. Extend the cylinder to the appropriate stroke length and install the rod end of the cylinder to the deck cylinder clevis using the upper cylinder pin. Re-install the mechanical latch plate and bolts. Confirm that the rod end of the cylinder has been properly installed (See "Figure 17: Cylinder Rod Installation" on page 25). This means that the cylinder must be aligned vertically and not tilted over to the left or right side of the dock leveler. Improper alignment will cause premature wear on hydraulic cylinder parts.

18. __ Ensure the leveler, when in its stored position, leans backward 5° from a fully vertical position. At a height of 4' from the top of the curb channel using a 4' level or plumb line held plumb, place the level against the deck and flush with dock floor (See "Figure 18: Tilt Back Setting" on page 25). The level or plumb line should be 4-1/4" from the deck plate at floor level.

    If it does not, adjust as follows:
    a) Ensure the leveler is fully restrained and supported.

    b) Loosen off the jam nut on the tilt stop assembly. Loosen the adjustment nut to move the deck backwards, or tighten the adjustment nut to move the deck forward. Tighten the jam nut when done adjustment (See "Figure 14: Tilt Stop Assembly" on page 24).

    NOTE: Accuracy of this adjustment is critical.

    NOTE: Do not use a level or plumb line longer than 4'.

19. __ Ensure the Maintenance Stand is installed as in "Figure 3: How to Support the Dock Leveler for Maintenance" on page 5. Ensure the Maintenance Stand Lower Pin is fully inserted and Roll Pins installed ("Figure 5: Maintenance Stand - Showing Locking Pin Inserted and Padlocked in Place" on page 6).

20. __ Remove all shipping & lifting brackets.

21. __ Position the bumper backing plates so that there is a 1" space between the bumpers and the dock leveler deck edge when the deck is in the lowered position (See "Figure 19: Bumper Position" on page 25). The bumpers may protrude into the pit opening. Weld or bolt bumper backing plates in place.

22. __ With the dock leveler in the vertical stored position, engage the Maintenance Stand as shown in "SUPPORTING THE LEVELER FOR MAINTENANCE" on page 5.

23. __ Shim between the bottom cylinder bracket and the pit floor and weld securely in place. Lag the lower cylinder bracket to the floor using 5/8 x 4 1/2 concrete anchors with a minimum tension value of 3,900 lbs (1,769 kg). Torque to manufacturers specifications. Ensure all shims are welded together as well as to the leveler curb channel and cylinder bracket (See "Figure 20: Shim the Bottom Cylinder Bracket" on page 25).

24. __ Lubricate and test in accordance with the Break-in and Performance Check procedures on page 40.

25. __ Weld the tilt bar bolts permanently in position to the tilt bar stops (See "Figure 16: Tilt Bar Stop Weldment" on page 24).

26. __ Remove installation support / stop bar (see "Figure 13: Installation Outline" on page 23).

27. __ Follow the Priming of Hydraulic Cylinder (see "PRIMING OF HYDRAULIC CYLINDERS" on page 7), Break-in (see "BREAK-IN AND PERFORMANCE CHECK" on page 40), Performance Check and the Operation Instruction (see "OPERATING INSTRUCTIONS" on page 45) before proceeding to the next step below.

28. __ Confirm proper fit and alignment by cycling the vertical storing dock leveler a number of times. Once form, fit and function are properly confirmed proceed to the next step below.

29. __ Place the dock leveler in the vertically stored position by depressing and holding the DECK RAISE button. The inside green light will deactivate upon entering the travel zone and the inside red light will illuminate. The dock will rise to its vertical stored position. (Note: If the deck is not in the fully stored position the buzzer will sound in a pulsating manner).

30. ___ Secure the dock leveler in the vertical stored position before proceeding to the next step below (see “SUPPORTING THE LEVELER FOR MAINTENANCE” on page 5). Failure to do so could result in serious injury or death.

31. ___ Weld the Cylinder Mounting Plate Weldment to the mounting plate of the Weld-on Back Plate Assembly. Weld along the top and two side edges as indicated on “Figure 10A: Welding Cylinder Mounting Plate Weldment” on page 21

This concludes the Weld-on Back Plate installation.

Note: The cylinder mounting plate may be slightly warped when delivered. Installing the cylinder mounting plate onto the Weld-on Back PlateAssembly and properly torquing the nuts will straighten the plate.

NOTE: Installation support / stop bar is for one time use only. Discard after installation.

⚠DANGER **FAILURE TO PROPERLY INSTALL ANY PENTALIFT DOCK LEVELER MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY OR DEATH AND WILL VOID ALL WARRANTIES.**

INSTALLATION PICTURES

Upon completion of installation, photograph the following views as depicted below. Keep photos with owners manual.

1. __ Weld on Back Plate to Existing Rear Channel (see “Figure 8: Weld on Back Plate to Existing Rear Channel” on page 20)

2. __ Fasten Cylinder Mounting Plate to Welded (see “Figure 9: Fasten Cylinder Mounting Plate to Welded on Back Plate” on page 20) on Back Plate or Fasten Cylinder Mounting Plate Weldment to existing Rear Cast-in Channel (see “Figure 10: Fasten Cylinder Mounting Plate Weldment to existing Rear Cast-in Channel” on page 21) depending on the installation type.

3. __ Welding Cylinder Mounting Plate Weldment (see “Figure 10A: Welding Cylinder Mounting Plate Weldment” on page 21)

4. __ Stand Alone & Combination Hydraulic Valve Blocks (see “Figure 12: Stand Alone & Combination Hydraulic Valve Blocks” on page 22)

5. __ Installation Outline (see “Figure 13: Installation Outline” on page 23)

6. __ Power Unit Installation (see “Figure 11: Power Unit Installation” on page 24)

7. __ Tilt Stop Assembly (see “Figure 14: Tilt Stop Assembly” on page 24)

8. __ Tilt Bar Bolts and Stop (see “Figure 15: Tilt Bar Bolts and Stop” on page 24)

9. __ Tilt Bar Stop Weldment (see “Figure 16: Tilt Bar Stop Weldment” on page 24)

10. __ Cylinder Rod Installation (see “Figure 17: Cylinder Rod Installation” on page 25)

11. __ Tilt Back Setting (see “Figure 18: Tilt Back Setting” on page 25)

12. __ Bumper Position (see “Figure 19: Bumper Position” on page 25)

13. __ Shim the Bottom Cylinder Bracket (see “Figure 20: Shim the Bottom Cylinder Bracket” on page 25)

14. __ Routing of hydraulic hoses (see “Figure 34: Routing of hydraulic hoses” on page 26) and Routing of hydraulic hoses-DETAIL (see “Figure 35: Routing of hydraulic hoses (DETAIL)” on page 27)

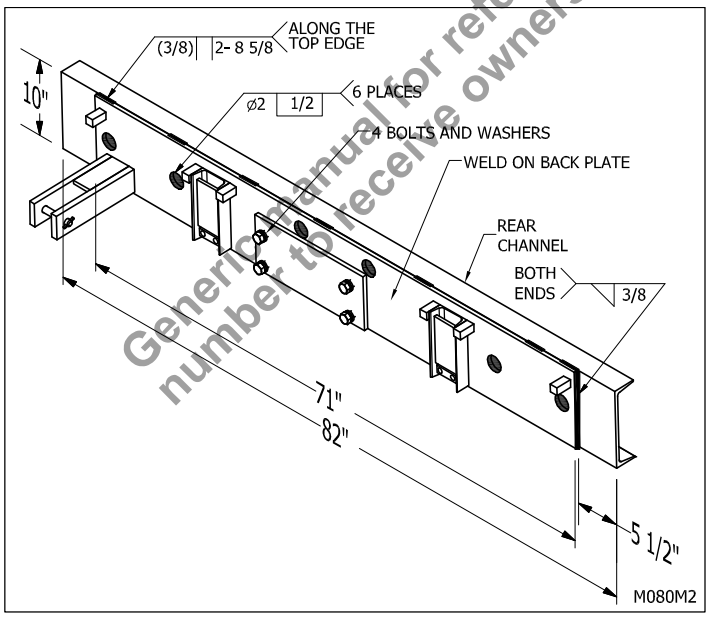


Figure 8: Weld on Back Plate to Existing Rear Channel

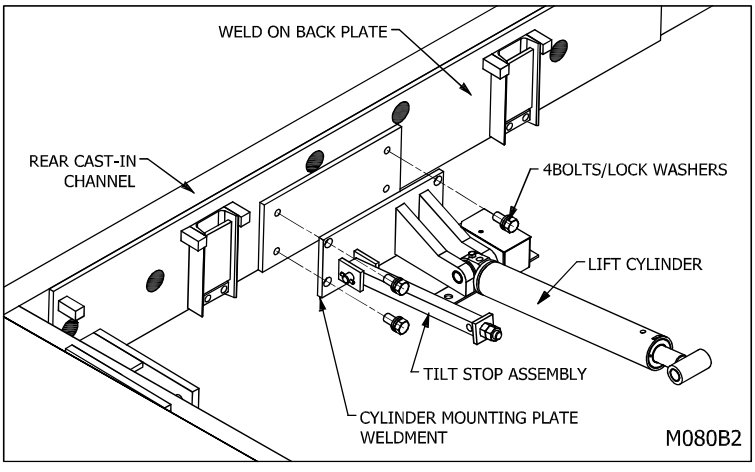


Figure 9: Fasten Cylinder Mounting Plate to Welded on Back Plate

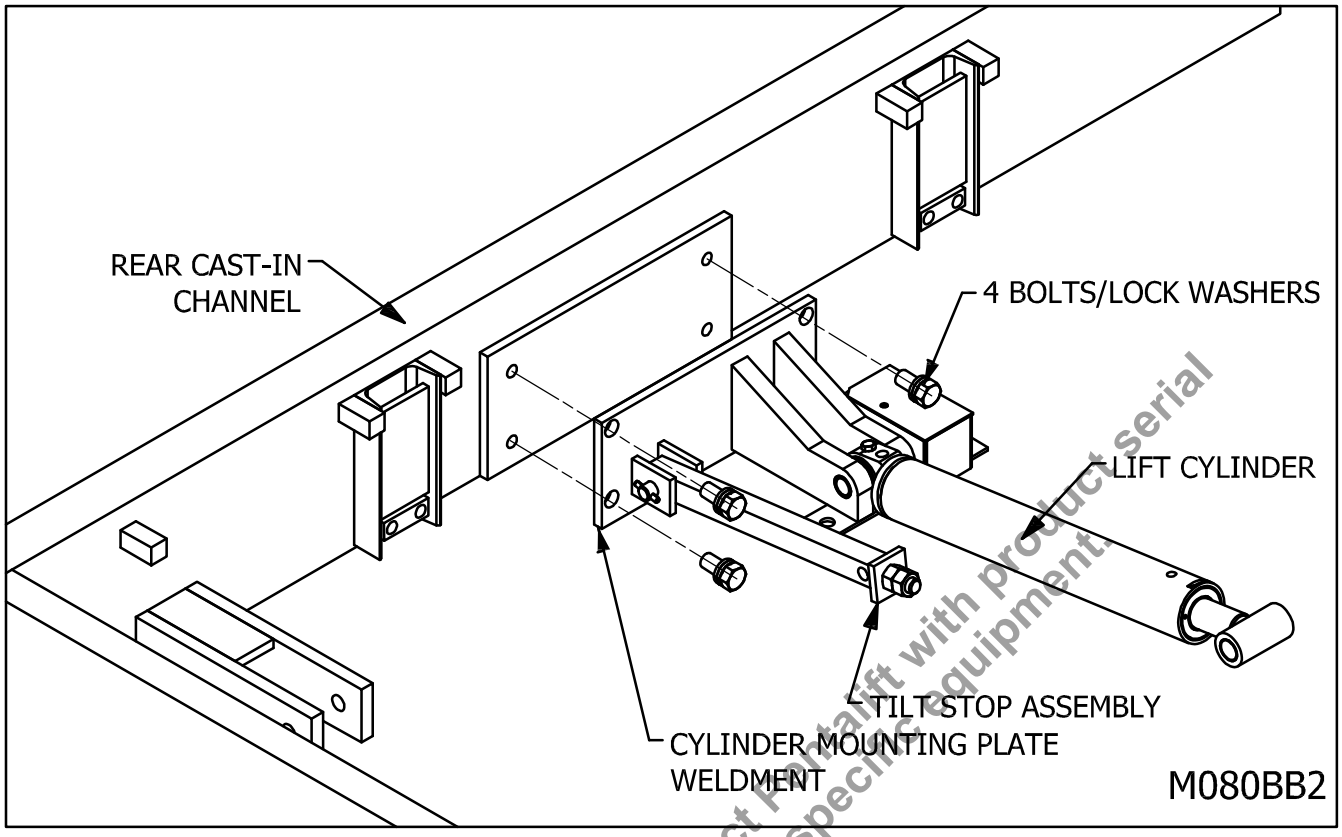


Figure 10: Fasten Cylinder Mounting Plate Weldment to existing Rear Cast-in Channel

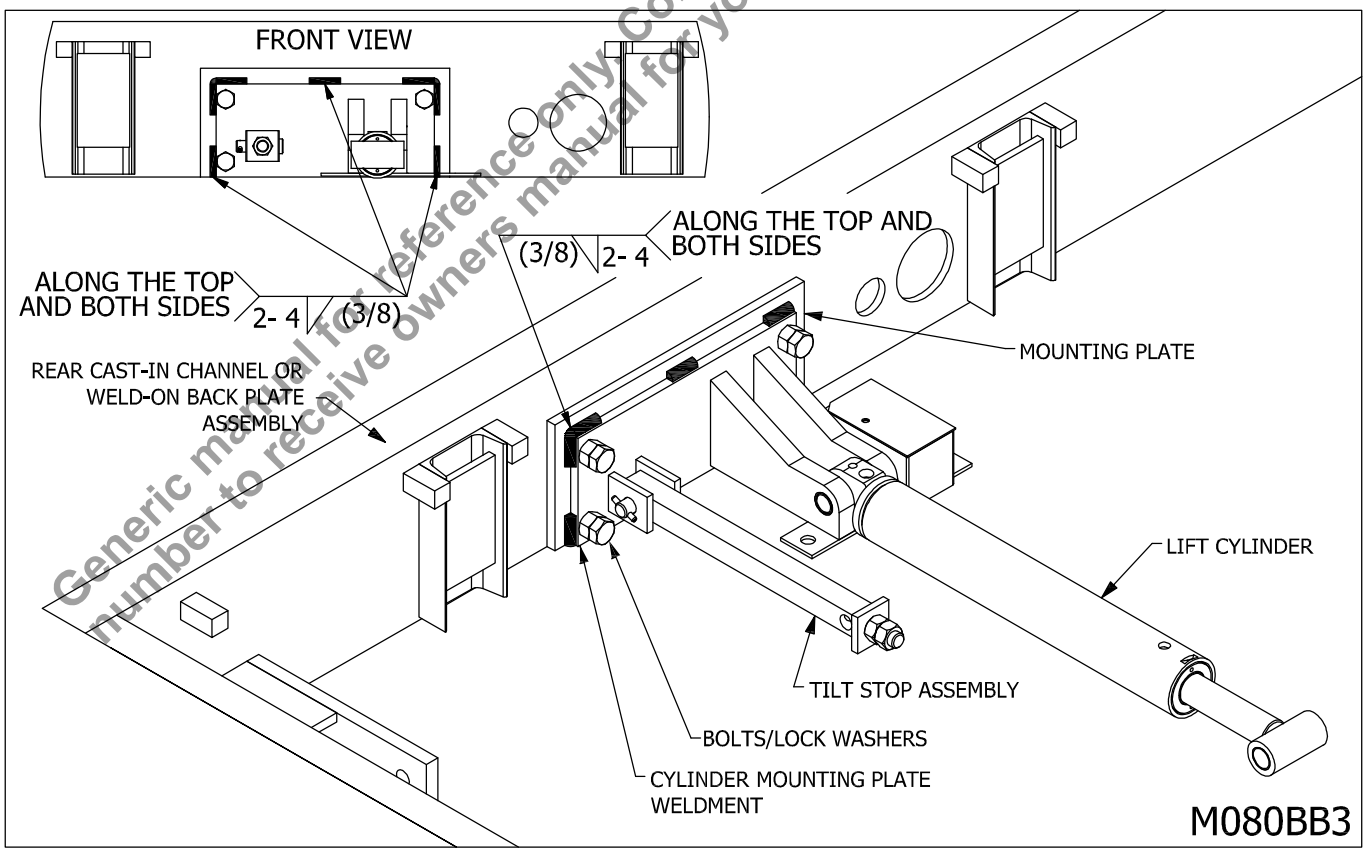


Figure 10A: Welding Cylinder Mounting Plate Weldment

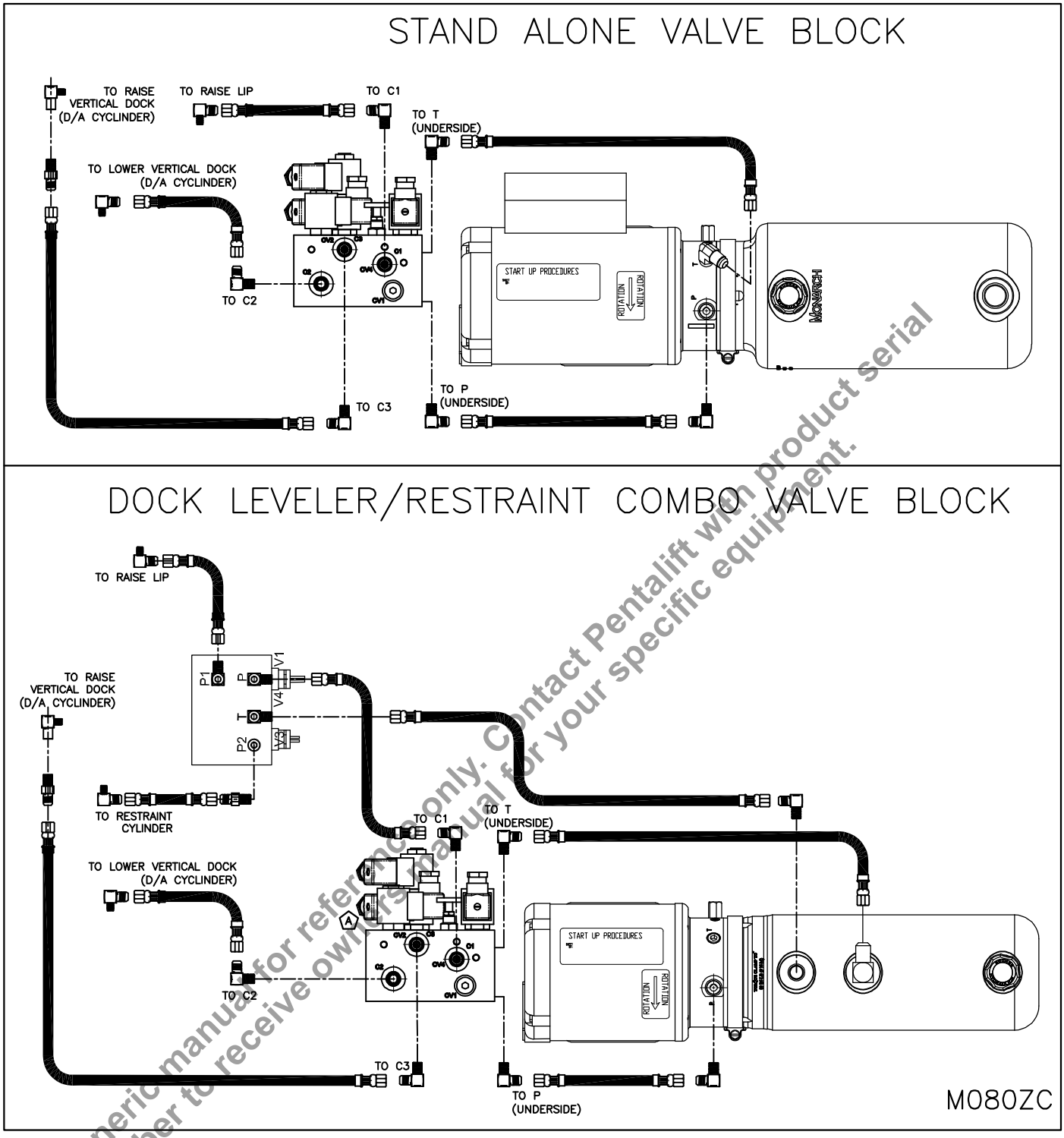


Figure 12: Stand Alone & Combination Hydraulic Valve Blocks

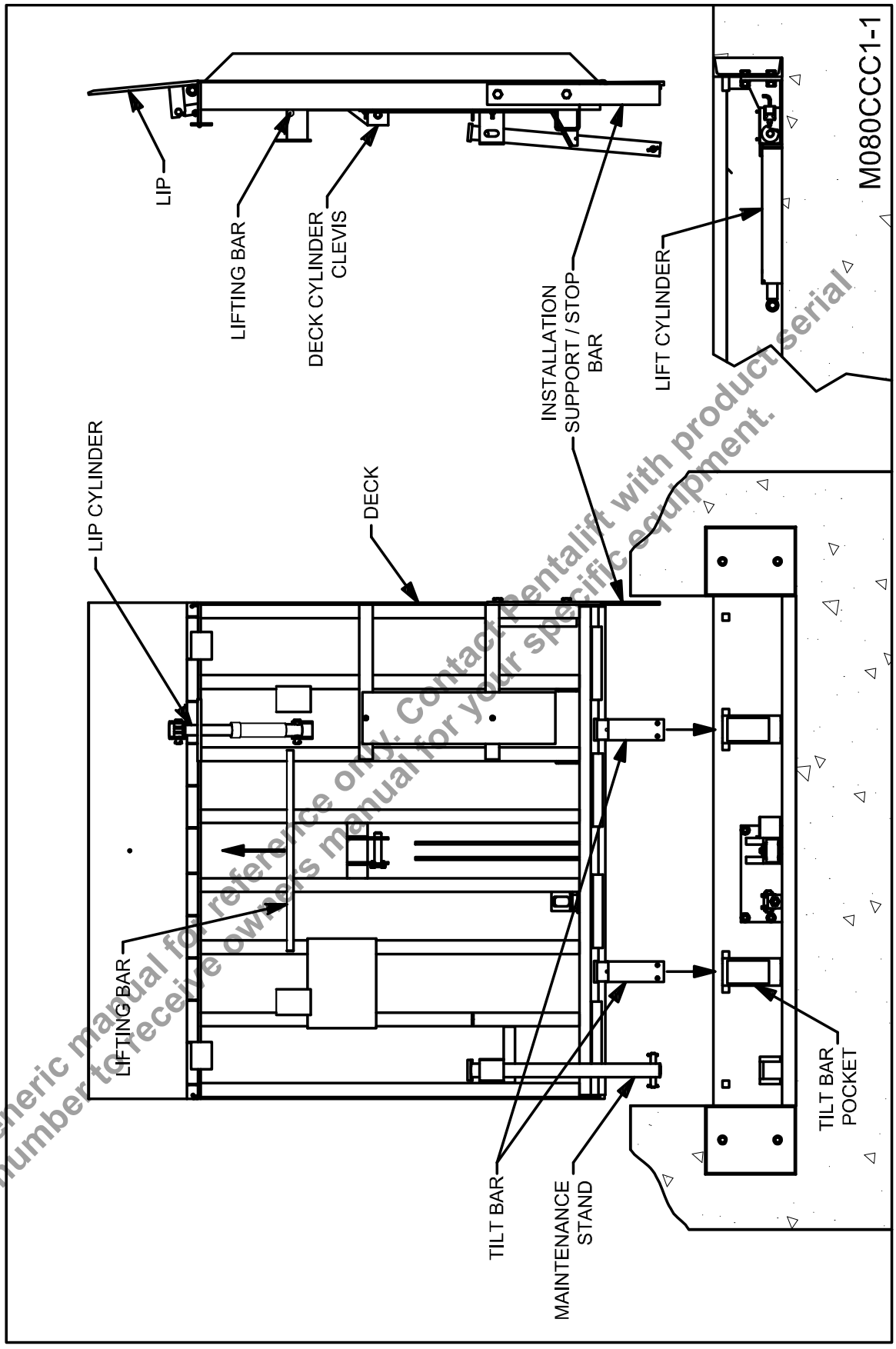


Figure 13: Installation Outline

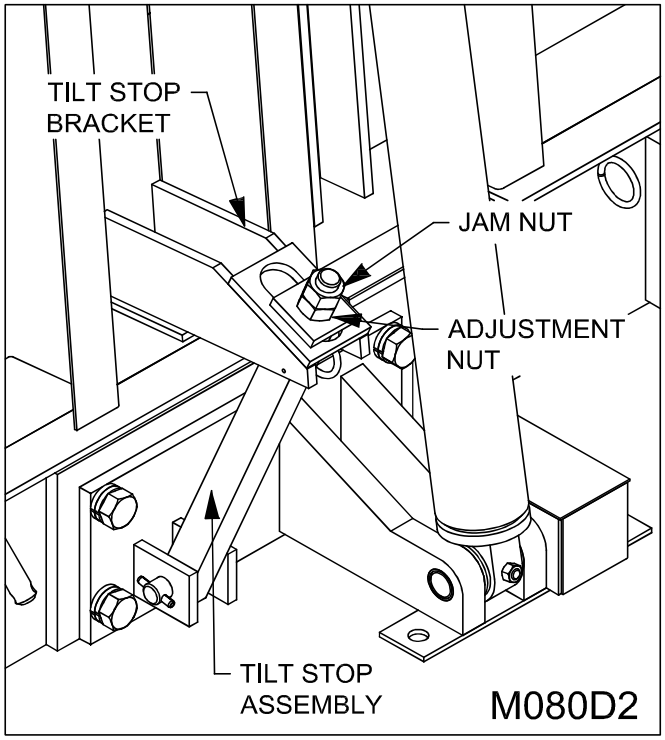


Figure 14: Tilt Stop Assembly

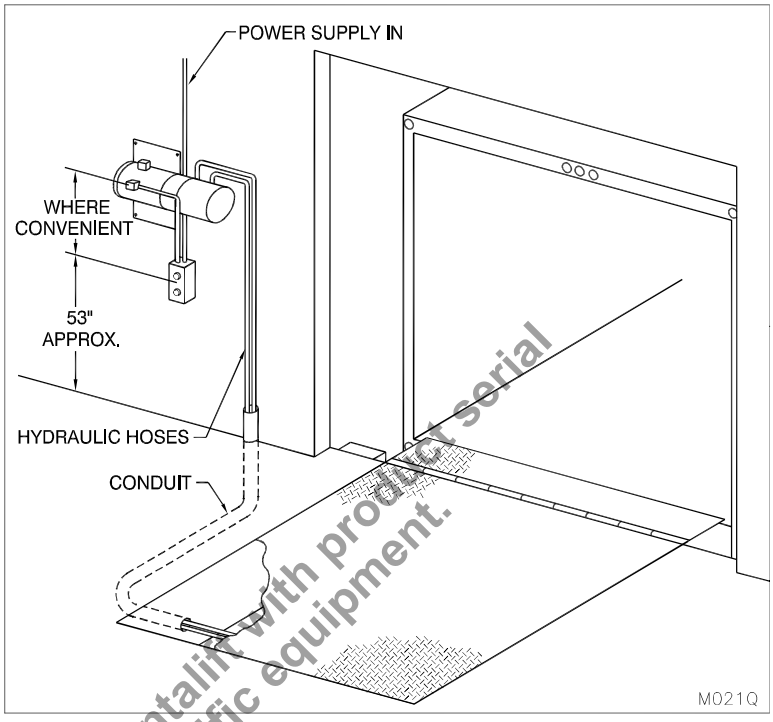


Figure 11: Power Unit Installation

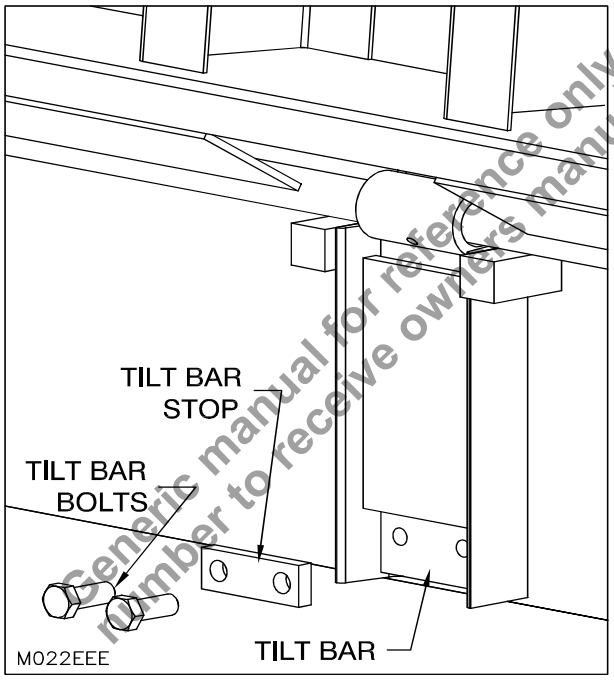


Figure 15: Tilt Bar Bolts and Stop

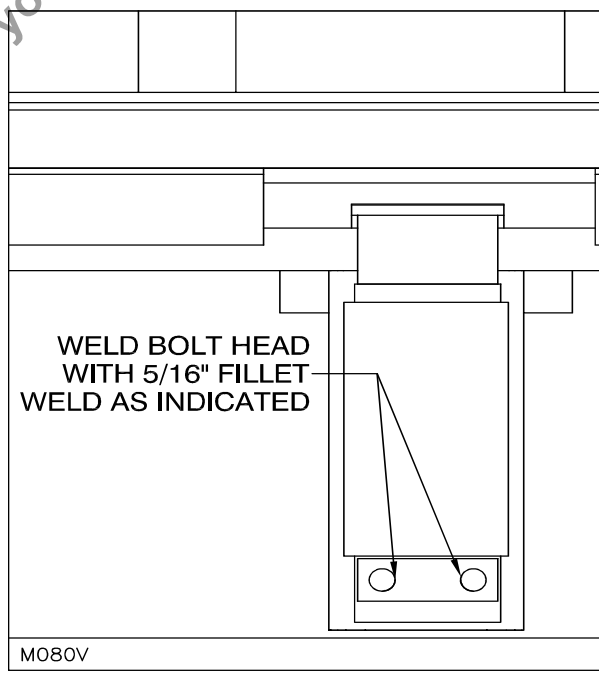


Figure 16: Tilt Bar Stop Weldment

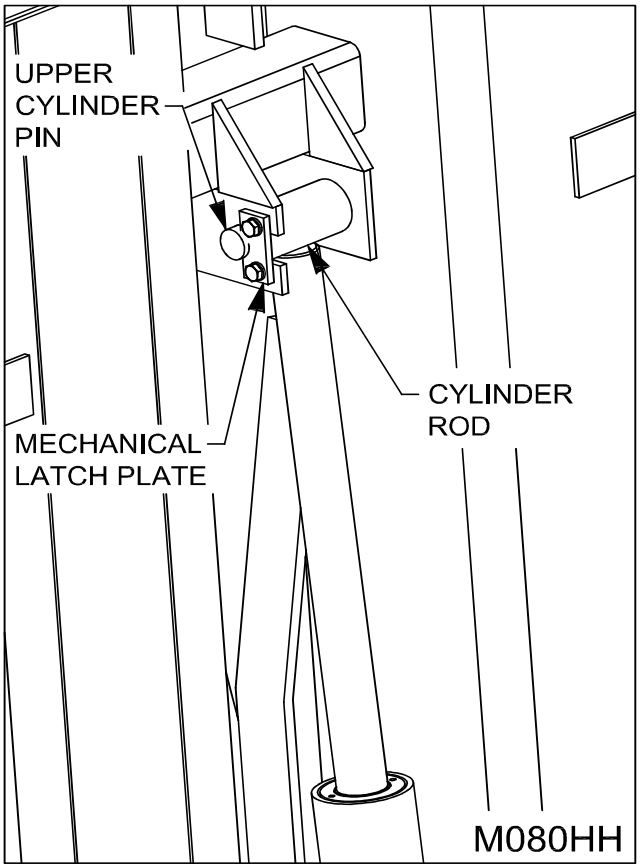


Figure 17: Cylinder Rod Installation

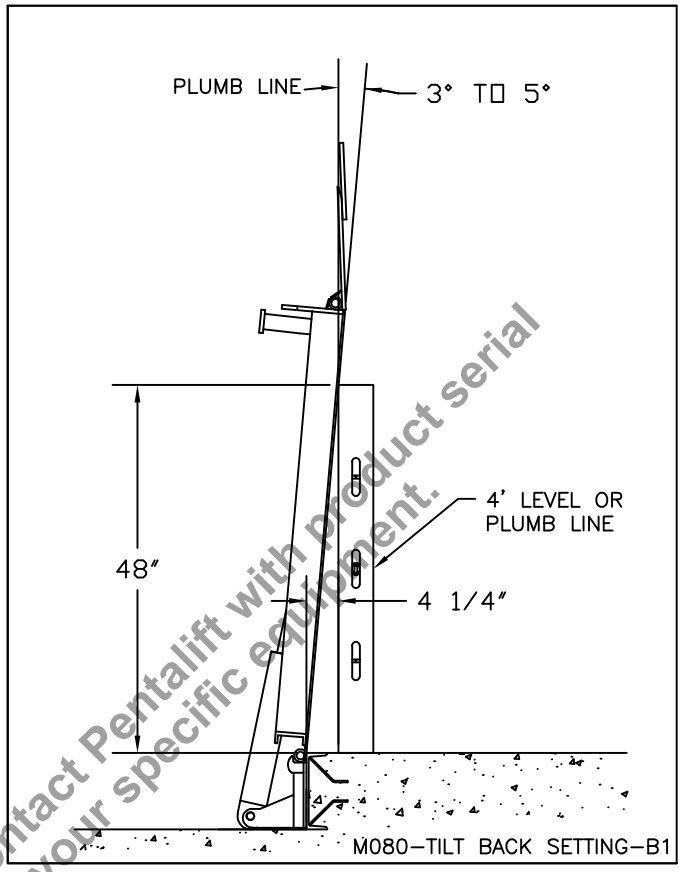


Figure 18: Tilt Back Setting

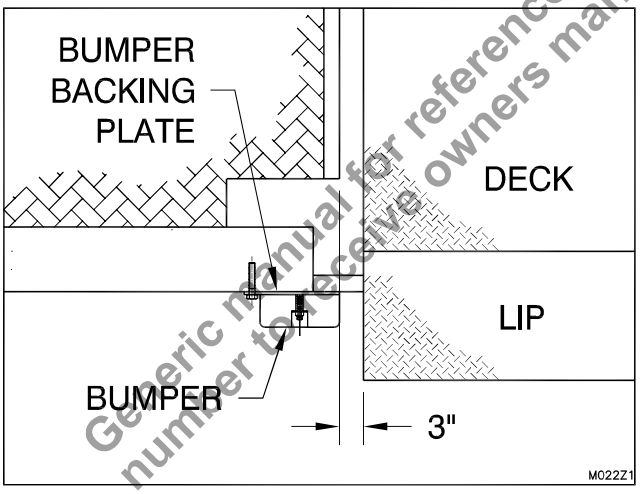


Figure 19: Bumper Position

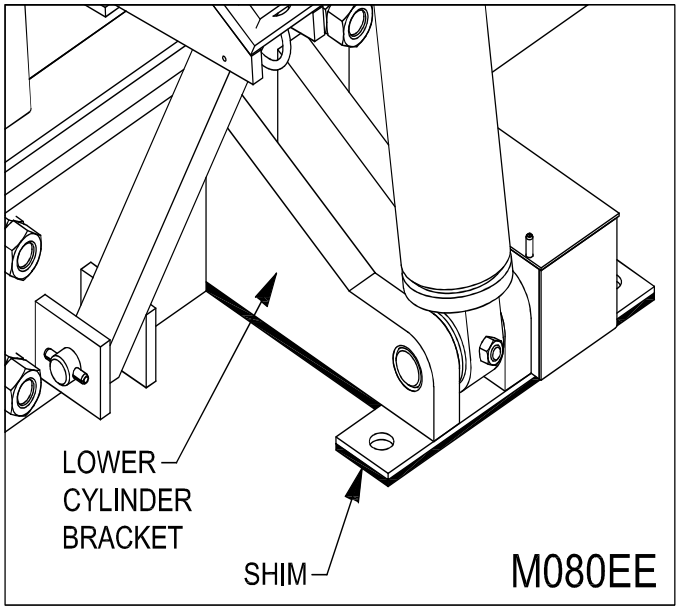


Figure 20: Shim the Bottom Cylinder Bracket

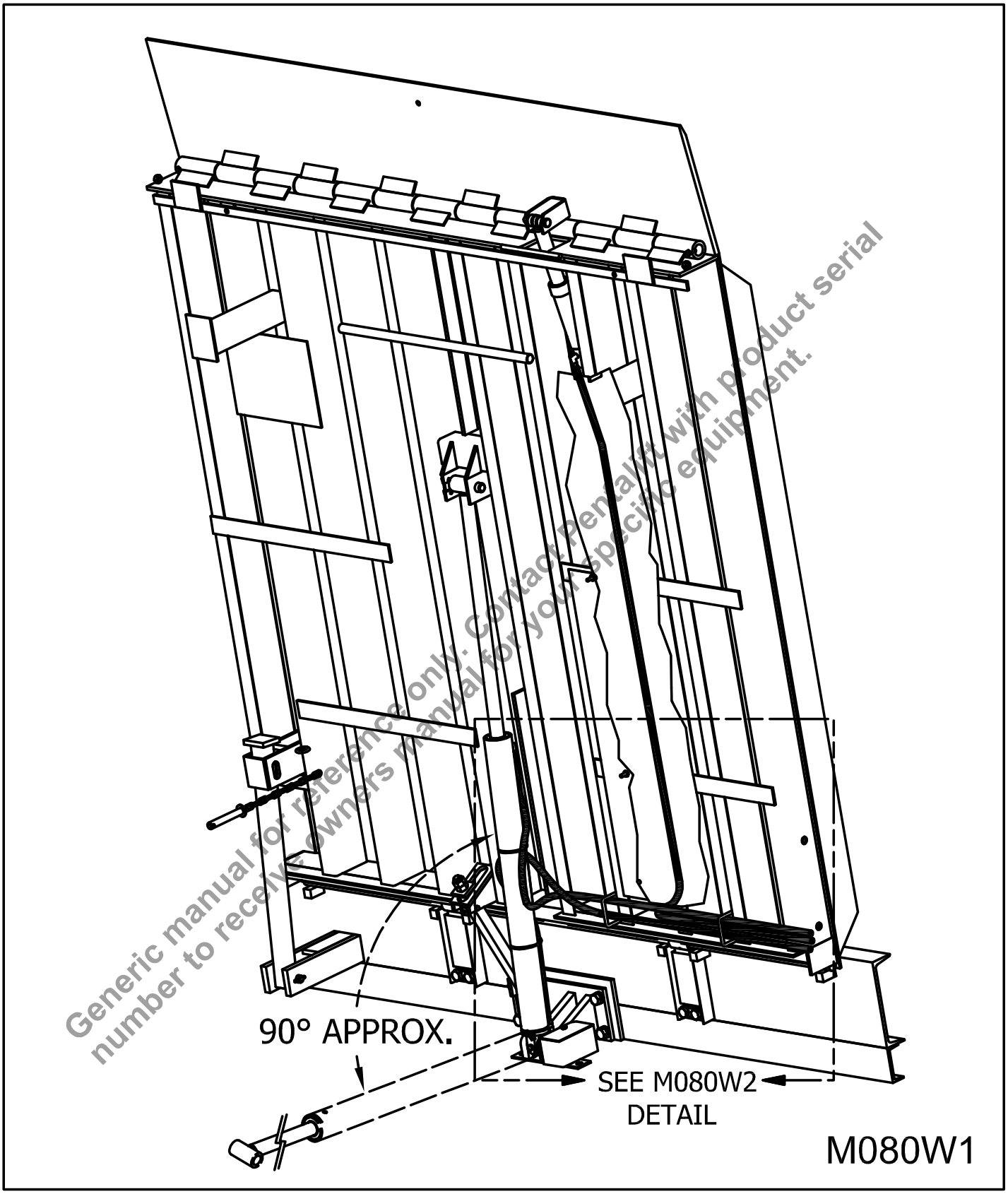


Figure 34: Routing of hydraulic hoses

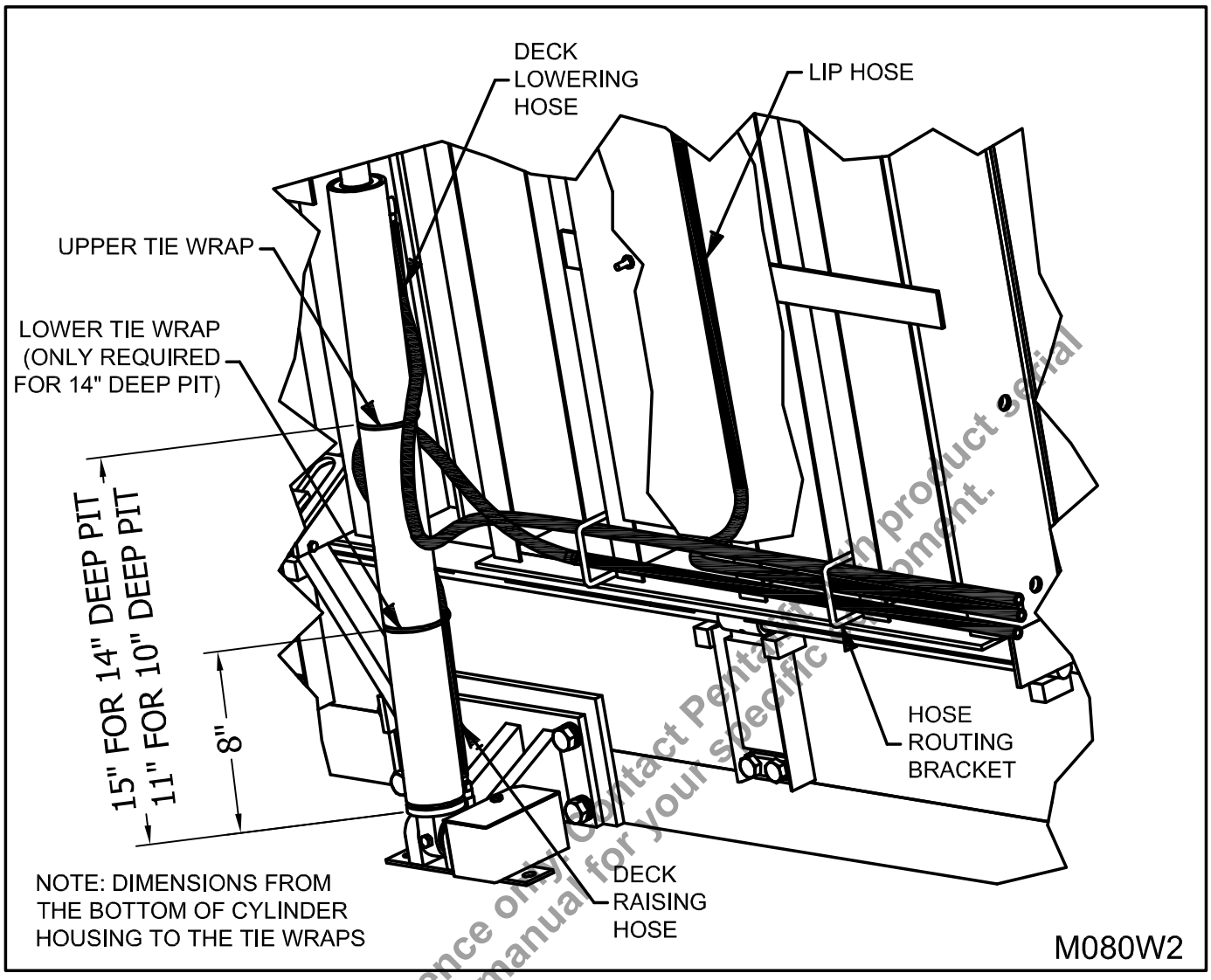


Figure 35: Routing of hydraulic hoses (DETAIL)

Installer Name (Print)

Installer Signature

Date Installation Completed

VERTICAL STORING BOTTOM CURTAIN 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.**

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 **NEVER GO INTO THE DOCK LEVELER'S OPERATING PATH FOR ANY REASON UNLESS THE DECK AND LIP ARE PROPERLY SUPPORTED (SEE "Figure 3: How to Support the Dock Leveler for Maintenance" on page 5) AND THE POWER IS DISCONNECTED WITH A FUSED DISCONNECT, PROPERLY TAGGED AND LOCKED OUT. IT IS THE RESPONSIBILITY OF THE OWNER TO ENSURE THAT NO LOAD OR TRAFFIC IS PLACED ON THE DECK WHILE THE MAINTENANCE STAND IS ENGAGED. THE CONSTRUCTION OF THE MAINTENANCE STAND IS INTENDED TO SUPPORT THE WEIGHT OF THE UNLOADED DOCK LEVELER ONLY.**

1. Ensure the dock leveler is in its vertically stored position; with the lip fully extended.
2. **DANGER** **BEFORE ENTERING THE PIT AND ENGAGING THE MAINTENANCE STAND, ENSURE BOTH TILT BAR BOLTS ARE WELDED IN PLACE (SEE "Figure 3: How to Support the Dock Leveler for Maintenance" on page 5). NEVER REMOVE THE TILT BAR BOLTS FOR ANY REASON.**
3. Engage the maintenance stand and properly support the lip in accordance with "SUPPORTING THE LEVELER FOR MAINTENANCE" on page 5.
4. Position the bottom curtain laterally centered on the underside of the deck assembly. Align the mounting holes located at the top hem of the bottom curtain with the holes of the mounting brackets located on the underside of the deck near the headboard as shown in Figure 36: Bottom Curtain Bracket on page 28.

   Note: When positioning the bottom curtain, make sure the installation location does not block the vision of any labels.
5. Using the mounting holes provided on the bottom curtain, fasten the assembly to the mounting bracket using 3/8"-16 x 1" long bolts and nuts.

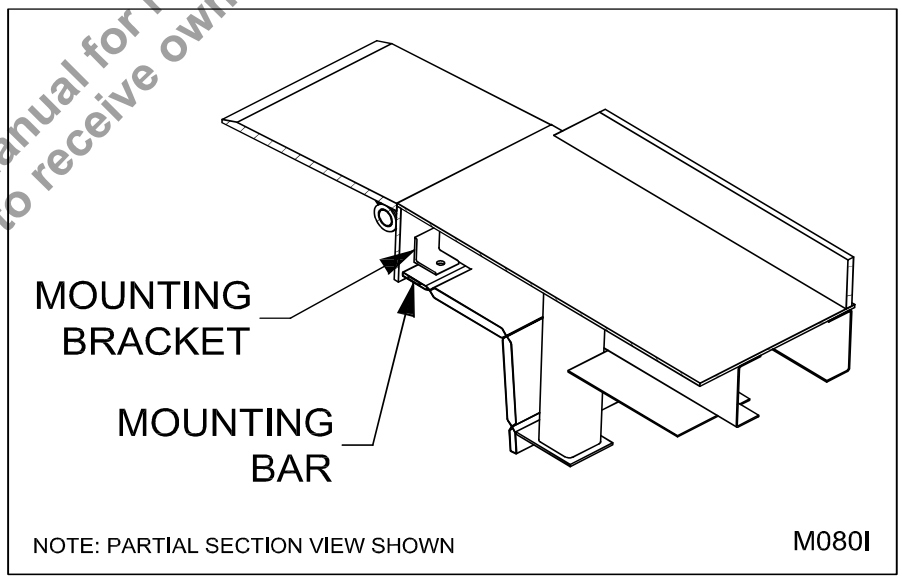


Figure 36: Bottom Curtain Bracket

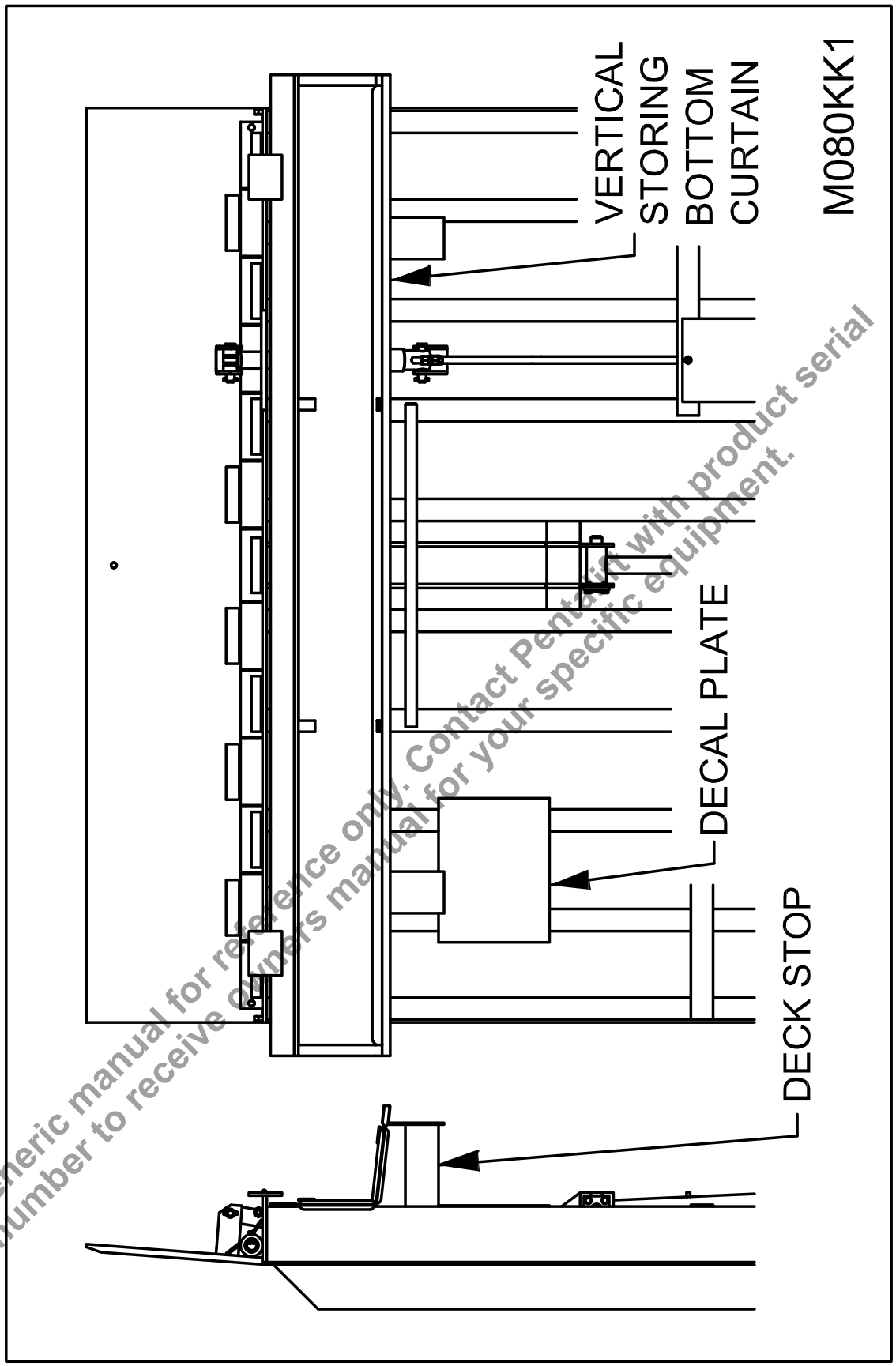


Figure 21: Bottom Curtain Installation Placement

STANCHION CONTROL STATION INSTALLATION

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.**

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 **NEVER GO INTO THE DOCK LEVELER'S OPERATING PATH FOR ANY REASON UNLESS THE DECK AND LIP ARE PROPERLY SUPPORTED (SEE "Figure 3: How to Support the Dock Leveler for Maintenance" on page 5) AND THE POWER IS DISCONNECTED WITH A FUSED DISCONNECT, PROPERLY TAGGED AND LOCKED OUT. IT IS THE RESPONSIBILITY OF THE OWNER TO ENSURE THAT NO LOAD OR TRAFFIC IS PLACED ON THE DECK WHILE THE MAINTENANCE STAND IS ENGAGED. THE CONSTRUCTION OF THE MAINTENANCE STAND IS INTENDED TO SUPPORT THE WEIGHT OF THE UNLOADED DOCK LEVELER ONLY.**

NOTE: The following installation pertains only to the Pentalift Stanchion Control Station which includes the stanchion frame, control panel, manifold valve block and power unit. If the stanchion is from another manufacturer then follow their installation procedures.

NOTE: Architect and dock designer to confirm there is sufficient room between the loading docks to facilitate the stanchion. Leave sufficient space between the stanchion and vertical storing dock leveler operating path to avoid a pinch point. Remember to consider the station location(s) and spacing for end of dock locations.

NOTE: Pentalift can provide the hydraulic power unit, valve manifold and control panel installed on the stanchions and provide all interconnecting wiring and hose connections to these components factory installed and tested. This arrangement saves field wiring costs and reduces possibilities of trouble shooting due to field wiring issues. Quoting would be completed through a custom quotation request.

NOTE: For ease of installation, the stanchion is shipped in three parts - upper and lower stanchion frame uprights and operator shelf. The upper and lower stanchion assemblies are designed to be bolted together in the field.

Stanchion Welded to Full Depth Rear Channel for Continuous Pit/Ledge Installation (recommended installation method)

1. Position the lower stanchion frame upright 4 inches below the top of the rear channel and allow sufficient space between the stanchion and vertical storing dock leveler to avoid pinch points. Ensure the lower stanchion frame upright is vertically plumb and straight. This may requiring shimming between the back surface of the stanchion uprights and the front surface of the rear channel prior to welding the stanchion in place (see "Figure 37: Full Depth Rear Channel Installation-Continuous Pit/Ledge" on page 31).

2. Weld the lower stanchion frame upright to rear channel using 1" stitch welds top and bottom on both sides of the uprights- 4 places. Weld the back surface of the stanchion to the top surface of the rear channel -2 places (see "Figure 37: Full Depth Rear Channel Installation-Continuous Pit/Ledge" on page 31).

3. The lag/weld brackets can be used as weld brackets if required or desired.

4. Raise and lower the upper stanchion frame upright onto the lower stanchion frame upright and bolt and secure the two halves together with the supplied fasteners as indicated on "Figure 37: Full Depth Rear Channel Installation-Continuous Pit/Ledge" on page 31.

5. Position the operator shelf between the uprights of the upper stanchion frame and below the control panel stand-off as indicated on “Figure 37: Full Depth Rear Channel Installation-Continuous Pit/Ledge” on page 31. Weld the operator shelf in place once it is properly positioned.

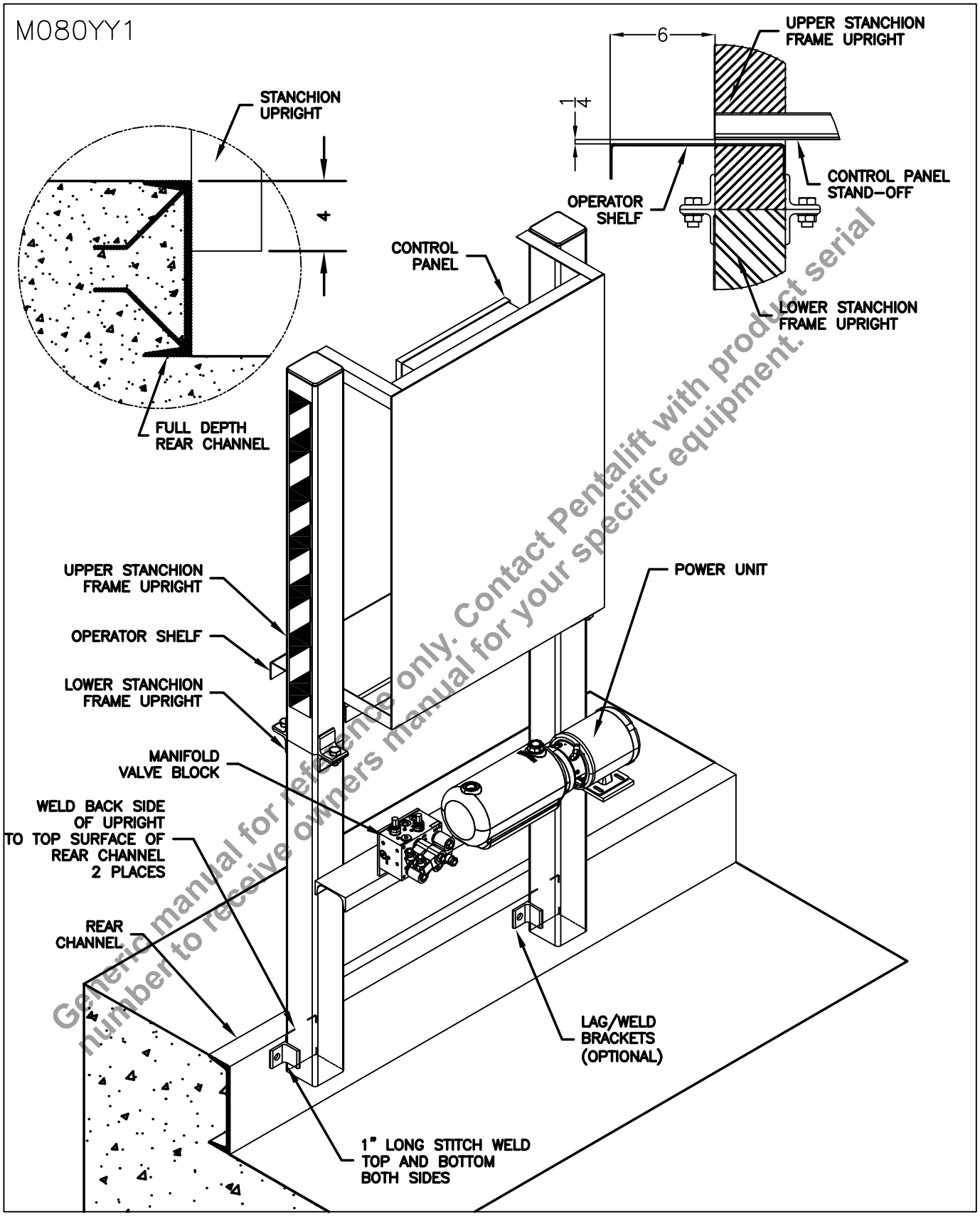


Figure 37: Full Depth Rear Channel Installation-Continuous Pit/Ledge

Stanchion Lagged to Pit Floor (Continuous Pit/Ledge Installation without curb channel to weld to at Stanchion location)

1. Weld the lag brackets to the bottom of the lower stanchion frame uprights (two bracket per upright) but make sure bottom surface of the brackets are flush with bottom surface of the lower stanchion frame uprights.

2. Position the lower stanchion frame upright at the bottom of the pit and close to the dock front face and allow sufficient space between the stanchion and vertical storing dock leveler to avoid pinch points (see “Figure 38: No Full Depth Channel Installation-Continuous Pit/Ledge” on page 33)

3. Ensure lower stanchion frame upright is vertically plumb and straight. This may requiring shimming between the pit surface and the bottom surface of the lower stanchion uprights and lag brackets.

4. Lag the lower stanchion upright to the pit floor with recommended fasteners, 5/8” dia x 4-1/2” long wedge anchors with a minimum shear value of 12,900 lbs, and tension value of 10,200 lbs. Torque to manufacturer specifications.

5. Raise and lower the upper stanchion frame upright onto the lower stanchion frame upright and bolt and secure the two halves together with the supplied fasteners as indicated on “Figure 38: No Full Depth Channel Installation-Continuous Pit/Ledge” on page 33.

6. Position the operator shelf between the uprights of the upper stanchion frame and below the control panel stand-off as indicated on “Figure 38: No Full Depth Channel Installation-Continuous Pit/Ledge” on page 33. Weld the operator shelf in place once it is properly positioned.

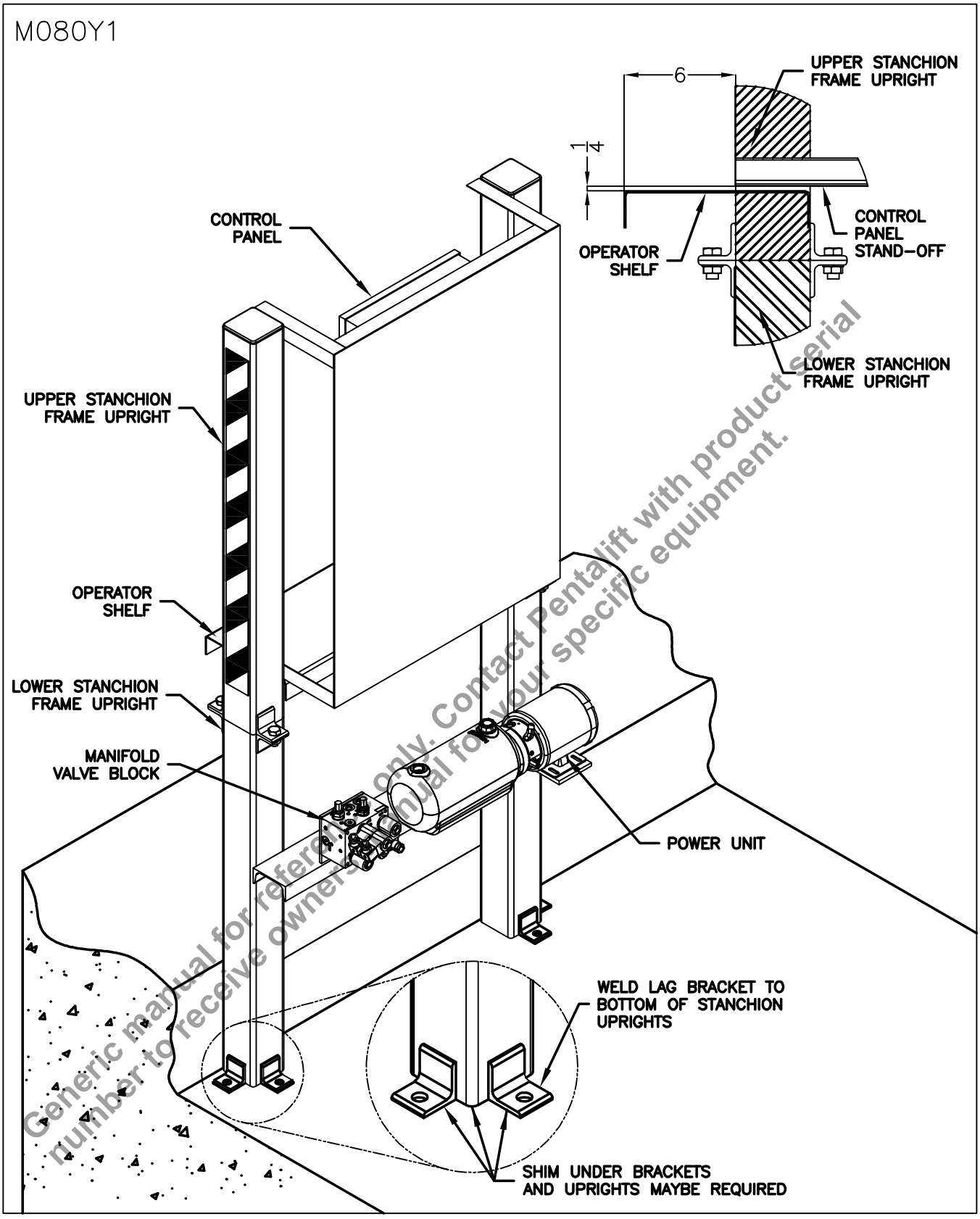


Figure 38: No Full Depth Channel Installation-Continuous Pit/Ledge

Stanchion Lagged to Loading Dock Floor (Individual Pit)

1. Weld the lag brackets to the bottom of the lower stanchion frame uprights (two bracket per upright) but make sure bottom surface of the brackets are flush with bottom surface of the lower stanchion frame uprights.

2. Position the stanchion next to the vertical storing and allow sufficient space between the lower stanchion frame upright and vertical storing dock leveler to avoid pinch points (see “Figure 39: Stanchion-Individual Pit” on page 35)

3. Lag the lower stanchion frame upright to the pit floor with recommended fasteners, 5/8” dia x 4-1/2” long wedge anchors with a minimum shear value of 12,900 lbs, and tension value of 10,200 lbs. Torque to manufacturer specifications.

4. Raise and lower the upper stanchion frame upright onto the lower stanchion frame upright and bolt and secure the two halves together with the supplied fasteners as indicated on “Figure 39: Stanchion-Individual Pit” on page 35.

5. Position the operator shelf between the uprights of the upper stanchion frame and below the control panel stand-off as indicated on “Figure 39: Stanchion-Individual Pit” on page 35. Weld the operator shelf in place once it is properly positioned.

Note: Using the stanchion to mount the power pack, manifold valve, and control panel is not the standard method for vertical storing dock leveler located in the individual pit. The standard method is to mount the power pack, manifold valve, and control panel as indicated on in “Figure 40: Standard Power Pack/Control Panel - Individual Pit” on page 36 to the interior loading dock wall.

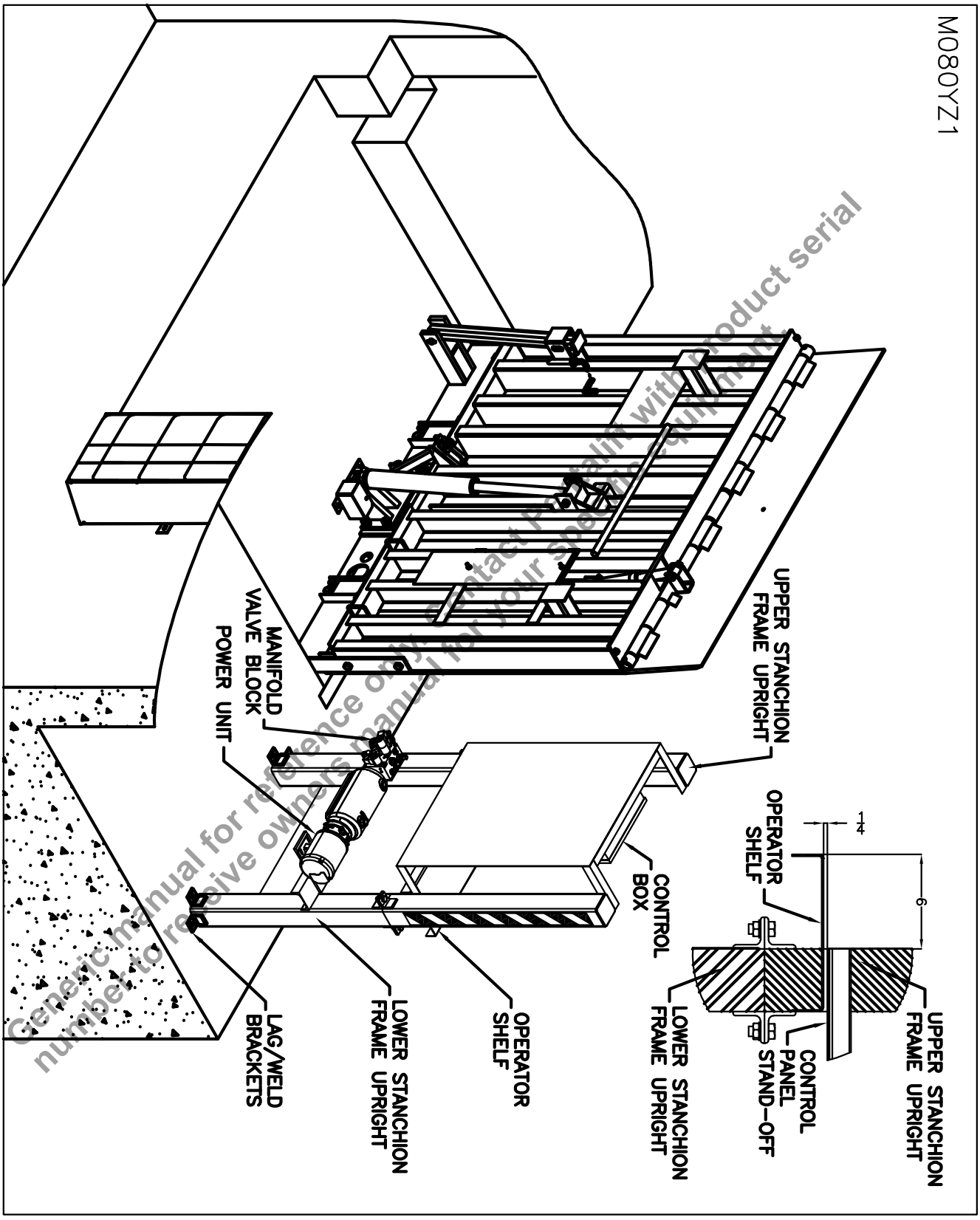


Figure 39: Stanchion-Individual Pit

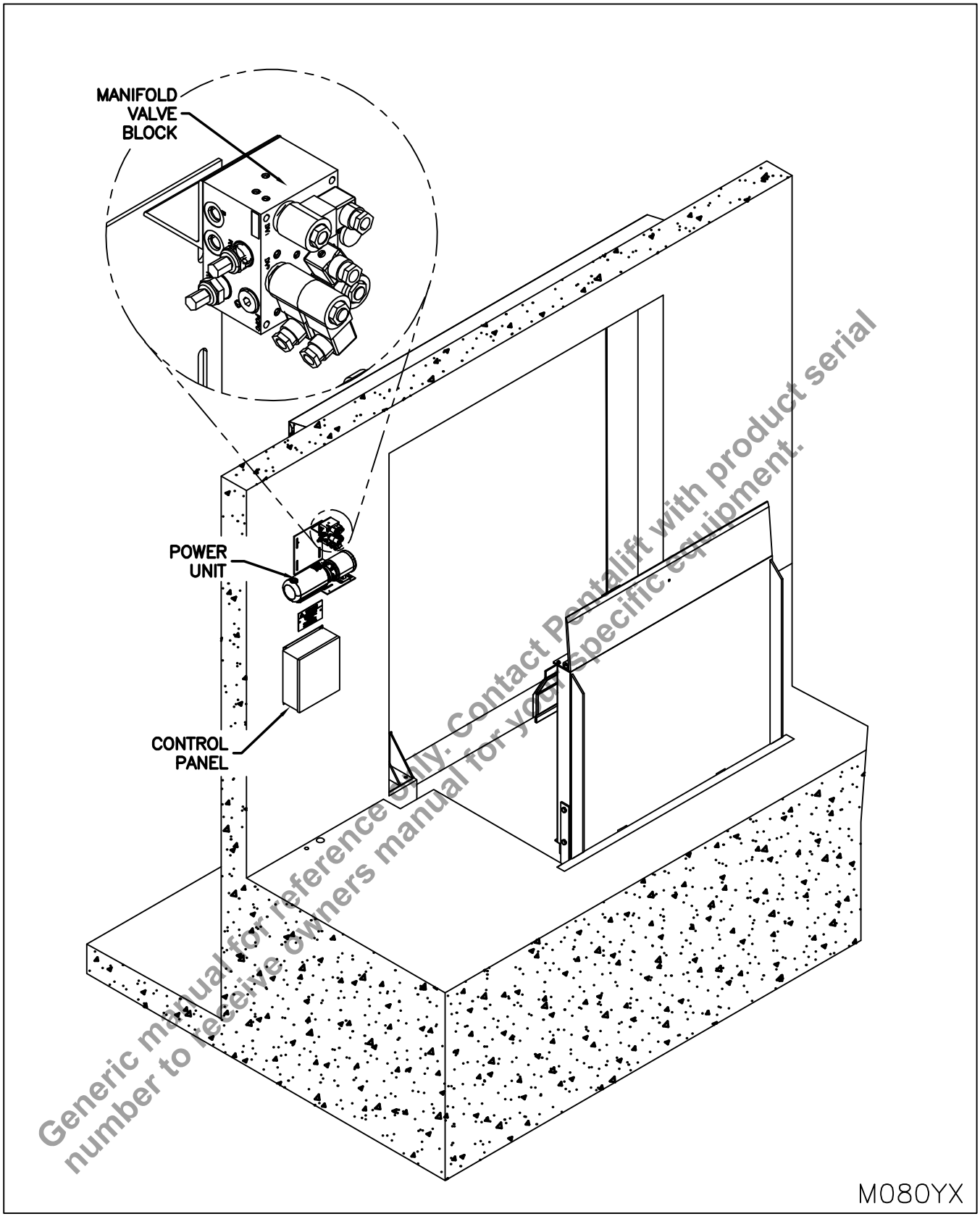


Figure 40: Standard Power Pack/Control Panel - Individual Pit

LIMIT SWITCH CAM ADJUSTMENTS

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.**

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 **NEVER GO INTO THE DOCK LEVELER'S OPERATING PATH FOR ANY REASON UNLESS THE DECK AND LIP ARE PROPERLY SUPPORTED (SEE "Figure 3: How to Support the Dock Leveler for Maintenance" on page 5) AND THE POWER IS DISCONNECTED WITH A FUSED DISCONNECT, PROPERLY TAGGED AND LOCKED OUT. IT IS THE RESPONSIBILITY OF THE OWNER TO ENSURE THAT NO LOAD OR TRAFFIC IS PLACED ON THE DECK WHILE THE MAINTENANCE STAND IS ENGAGED. THE CONSTRUCTION OF THE MAINTENANCE STAND IS INTENDED TO SUPPORT THE WEIGHT OF THE UNLOADED DOCK LEVELER ONLY.**

Note: when adjusting the limit switch cams, make sure to never run the vertical leveler against the tilt stop assembly under hydraulic pressure as it may cause structural damage and/or personal injury.

1. The limit switches come preset from the factory. If adjustment is needed, it should be minor. See below for instruction on the correct setting.
2. Ensure the dock leveler is in its vertically stored position; with the lip fully extended.
3. **DANGER** **BEFORE ENTERING THE PIT AND ENGAGING THE MAINTENANCE STAND, ENSURE BOTH TILT BAR BOLTS ARE WELDED IN PLACE (SEE "Figure 3: How to Support the Dock Leveler for Maintenance" on page 5). NEVER REMOVE THE TILT BAR BOLTS FOR ANY REASON.**
4. Engage the maintenance stand and properly support the lip in accordance with "SUPPORTING THE LEVELER FOR MAINTENANCE" on page 5.
5. Disconnect the power, properly tag and lock out.

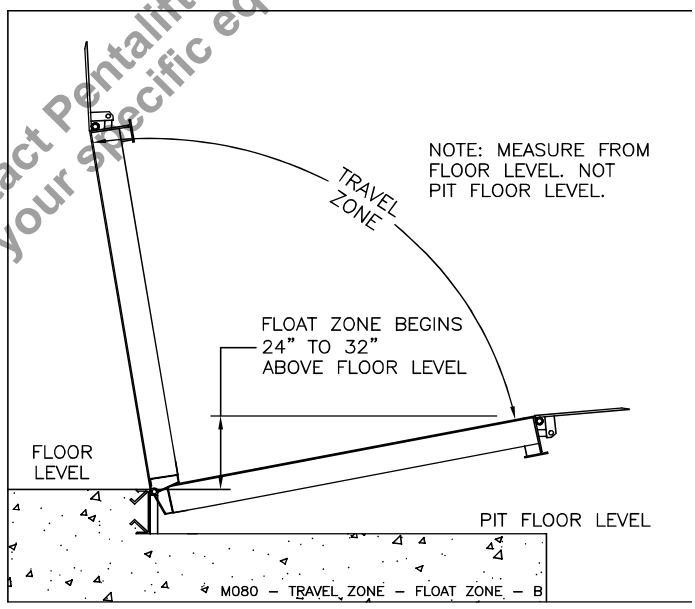


Figure 26: Travel & Float Zones

6. Remove the limit switch cover located at the base of the cylinder.
7. Setting the stored limit switch: **Warning**: Do not set the stored position cam in a position where the limit switch is not actuated when the deck is in the stored position.
   The stored position cam should actuate the limit switch just prior to the dock leveler reaching the stop on the tilt stop assembly. Confirm the proper setting by running the leveler to the top and testing to confirm the switch shuts off the power unit, just prior to the vertical dock leveler being stopped by the tilt bar stop. The switch setting should activate the switch to turn off the power so that the vertical storing dock leveler comes softly to a stop against the tilt bar stop. Confirm that the limit switch actuates so that there is no hydraulic pressure trying to continue push the vertical leveler deck assembly when it has reached the tilt stop in the stored position. Confirm the lift cylinder is not able to twist the deck assembly. **Warning**: Failure to properly adjust limit switches may cause product damage and/or personal injury. To adjust the stored limit activation point, adjust and rotate the stored position cam accordingly (See "Figure 22A: Stored Zone Limit Switch Cam Adjustments" on page 38).

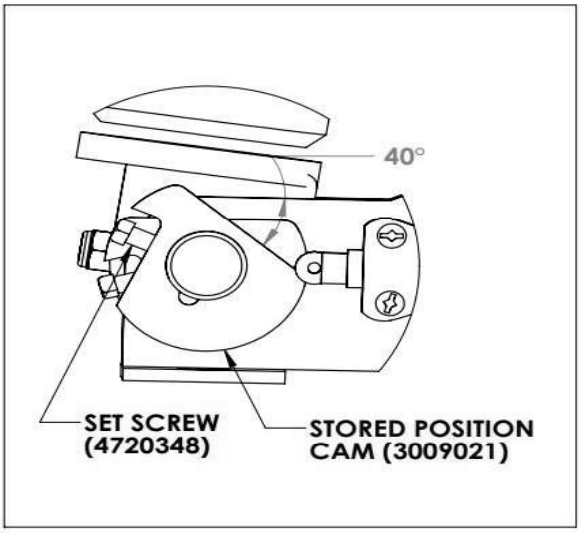


Figure 22A: Stored Zone Limit Switch Cam Adjustments

8. Setting the Float Zone: Confirm that the float zone activates at the correct position by lowering the dock leveler so that the front edge of the dock leveler deck is 34" above the dock floor level. From this point, jog the dock lower button. If the dock leveler stops lowering and the buzzer sounds the dock leveler is still in the travel zone. Continue jogging the deck lower. Once the float zone transition point has been reached the dock leveler will continuously lower to it's lowest point, even when the deck lower button is released.The buzzer will no longer sound and the green light will be illuminated. The transition point should be set at a point where the front edge of the dock leveler deck is 24" to 32" above the floor level (See "Figure 26: Travel & Float Zones" on page 37). When the dock leveler is in that zone, the dock leveler should float down automatically upon releasing the dock lower button. If the float zone point is not set between 24" and 32" then adjust the float zone cam (See "Figure 22B: Float Zone Limit Switch Cam Adjustments" on page 38) to achieve the desired zone range setting.

9. Once the limit switches are properly adjusted, replace the limit switch cover and disengage the maintenance stand after dock leveler is in the vertical stored position.

10. WARNING: Limit switch adjustments are very important. Always confirm that when the dock leveler is in the float zone range, the green light illuminates and the dock leveler deck assembly is downward biased. The dock leveler should lower to meet the truck bed or to the lower deck stops. If the float zone is not properly set and activated, the dock leveler is not downward biased when in the float zone, or the upper limit switch adjustment is not properly set, high pressure could be generated in the hydraulic system. This could result in damage to the hydraulic system, cylinders, cylinder mounts and other components. If not completely certain that the limit switch adjustment is correct, or that the dock leveler is "floating" properly, lock out the vertical storing dock leveler until confirmation of proper adjustment is completed.

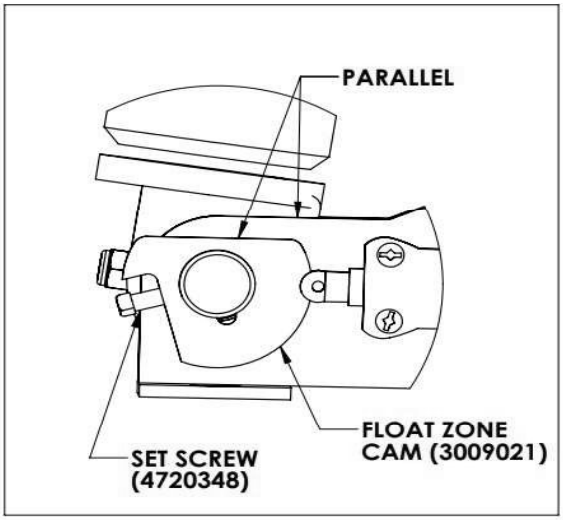


Figure 22B: Float Zone Limit Switch Cam Adjustments

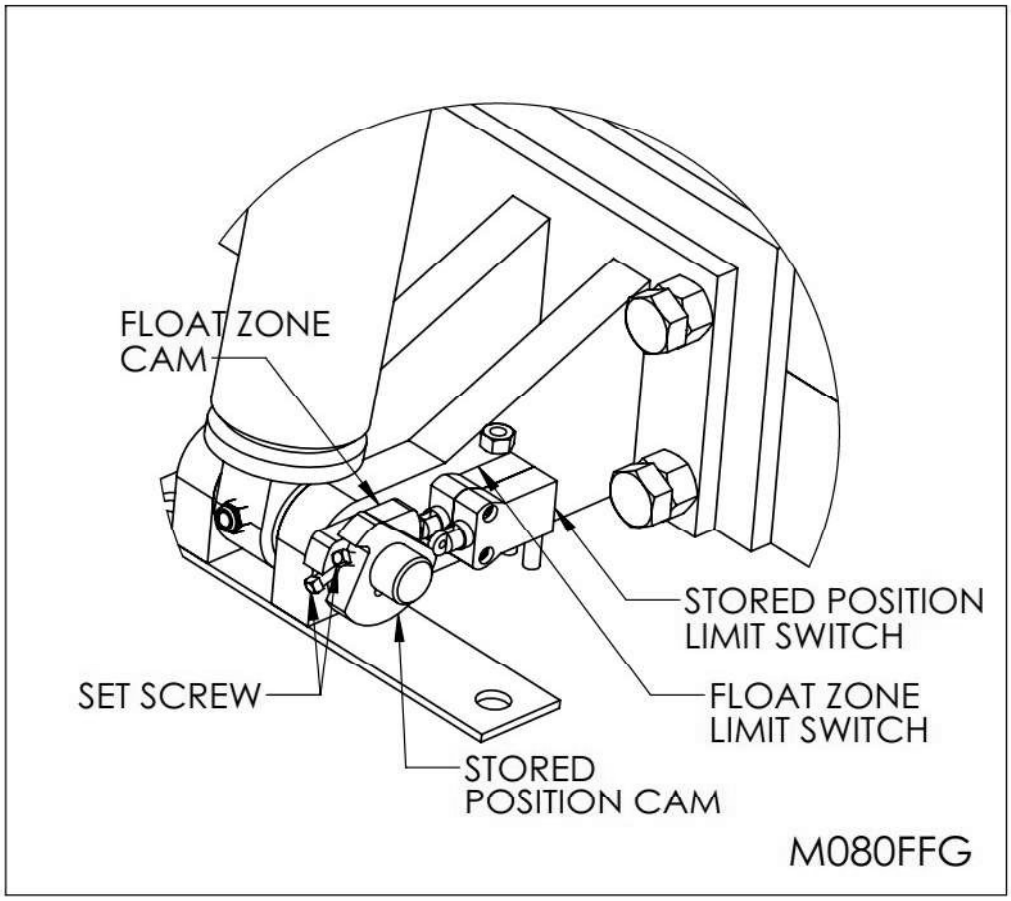


Figure 22C: Limit Switch and Cam Identifications

LIMIT SWITCH CAM LOGIC TABLE

POSITION	FLOAT ZONE LIMIT SWITCH #2	STORED POSITION LIMIT SWITCH #3
STORED	OPEN	CLOSED (DEPRESSED)
TRAVEL	OPEN	OPEN
FLOAT	CLOSED (DEPRESSED)	OPEN

BREAK-IN 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.**

NOTE: IN SOME CASES THERE IS A CONSIDERABLE AMOUNT OF TIME BETWEEN THE SHIPMENT DATE AND USE OF YOUR DOCK LEVELER. THIS INITIAL BREAK-IN AND PERFORMANCE CHECK SHOULD BE PERFORMED BEFORE YOU BEGIN REGULAR USE OF YOUR DOCK LEVELER TO ENSURE THAT IT IS OPERATING PROPERLY.

NOTE: Read the SAFETY INFORMATION AND WARNINGS before operating the dock leveler. (See page ii)

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. Ensure that any specified interlocks (e.g. overhead doors, restraints) are fully functional.

DANGER **STAY CLEAR OF THE EQUIPMENT'S OPERATING PATH AT ALL TIMES.**

DANGER **IF FOR ANY REASON IT IS POSSIBLE HYDRAULIC OIL IS NOT PRESENT IN THE HYDRAULIC CYLINDER FOLLOW THE HYDRAULIC CYLINDER PRIMING PROCESS DESCRIBED IN "PRIMING OF HYDRAULIC CYLINDERS" on page 7.**

2. Raise leveler to its vertical stored position and install maintenance stand as outlined on page 5.
3. Confirm the tilt bar stops are welded as indicated on page 18.
4. Confirm cylinder mounting plate is properly welded in place (see "Figure 10A: Welding Cylinder Mounting Plate Weldment" on page 21).
5. As the dock leveler is cycled a number of times, confirm alignment and motion is smooth without interference, scraping or misalignment. Any issues that arises during the cycle testing must be addressed immediately.
6. Confirm that the float zone and stored position settings are correct (See items 7 and 8 on page 37).
7. Inspect hydraulic system for leaks, especially at hydraulic fittings and hose connections.
8. Lubricate all pivot points with Dexron Automatic Transmission Fluid (See "INSPECTION, MAINTENANCE, AND LUBRICATION" on page 41).
9. **NOTICE** **As the performance test is being conducted, watch closely for any signs that the dock leveler might not be operating properly. If you are in doubt, refer to "OPERATING INSTRUCTIONS" on page 45 and "TROUBLE SHOOTING GUIDE" on page 53 or contact your Pentalift representative.**
10. Confirm the structural rigidity of the rear curb channel and ensure that it is not loose and is not flexing.

INSPECTION, MAINTENANCE, AND LUBRICATION

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.

NOTE: The deck, lip and frame assemblies of the dock leveler are structurally subjected to loads on going. It is important to regularly visually inspect the dock levelers structurally for signs of damage or wear. Damage could be in the form of distorted, cracked or broken structural members or welds. Areas to review include but are not limited to; lip and headboards tubes, deck beam adhesion to the head board, deck plate and tail board and rear frame attachment to rear curb angle. Any damage or signs of cracking, etc. should be noted and addressed immediately. Immediate attention and action to address issues of this nature generally results in simple repairs. Issues that are left unchecked and / or unaddressed result in significant repairs and even entire replacement. The frequency of reviews should be a maximum of every 30 days. The frequency should be increased for higher frequency and use applications i.e. multiple shifts or high traffic loading docks.

⚠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 fus disconnect, properly tagged and locked out. Fused disconnect and lockout device (supplied and installed by others) must meet with all applicable codes and regulation All electrical work must be performed by a qualified electrician in accordance with all applicable codes and regulations.**

⚠DANGER **NEVER GO INTO THE DOCK LEVELER'S OPERATING PATH FOR ANY REASON UNLESS THE DECK AND LIP ARE PROPERLY SUPPORTED (SEE "Figure 3: How to Support the Dock Leveler for Maintenance" on page 5) AND THE POWER IS DISCONNECTED WITH A FUSED DISCONNECT, PROPERLY TAGGED AND LOCKED OUT. IT IS THE RESPONSIBILITY OF THE OWNER TO ENSURE THAT NO LOAD OR TRAFFIC IS PLACED ON THE DECK WHILE THE MAINTENANCE STAND IS ENGAGED. THE CONSTRUCTION OF THE MAINTENANCE STAND IS INTENDED TO SUPPORT THE WEIGHT OF THE UNLOADED DOCK LEVELER ONLY.**

⚠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 **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.**

⚠DANGER **IF FOR ANY REASON IT IS POSSIBLE HYDRAULIC OIL IS NOT PRESENT IN THE HYDRAULIC CYLINDER FOLLOW THE HYDRAULIC CYLINDER PRIMING PROCESS DESCRIBED IN "PRIMING OF HYDRAULIC CYLINDERS" on page 7.**

NOTE: VERTICAL STORING DOCK LEVELERS ARE SHIPPED DECK PLATE DOWN FOR STABILITY DURING SHIPPING. DUE TO THE POSSIBLE ACCUMULATION OF PRECIPITATION WITHIN THE DECK STRUCTURE, WHICH COULD LEAD TO PREMATURE RUSTING. IT IS THE RESPONSIBILITY OF OTHERS TO ENSURE THAT THE VERTICAL STORING DOCK LEVELERS ARE NOT STORED IN THE INVERTED POSITION ALLOWING THE ACCUMULATION OF PRECIPITATION WITHIN THE DECK STRUCTURE AFTER DELIVERY AND PRIOR TO INSTALLATION.

NOTE: Read the SAFETY INFORMATION AND WARNINGS before servicing the dock leveler (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" on page 2).

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

Inspection, Lubrication and Weld Inspection:

DANGER **It is vital to confirm the function and operation of this equipment on a daily basis. If there are any items that are not functioning as they should or appear damaged or the dock leveler doesn't function properly, lock out the dock leveler and do not use the dock leveler until all necessary adjustments / repairs are completed and the function is reconfirmed to be as it should be. Do not reposition or move the dock leveler using a fork lift, crane or other means unless you are certain of the proper methods and precautions in doing so. Failure to follow these instructions could result in damage and bodily harm including death. Contact Pentalift post sales customer service for assistance and guidance if required.**

Daily: Confirm the Vertical storing dock leveler is moving into the float zone and that the travel zone and float zone operations are properly functioning.
Lower the dock leveler. Confirm that while the dock leveler is moving towards the float zone the red light remains illuminated and if the deck lower button is released the dock stops moving, the red light is on, and the warning buzzer sounds.

When the dock leveler reaches the float zone, which should be at a point where the front top of the dock leveler deck platform is between 24" and 32" above the floor surface of the loading dock (not the pit floor of the loading dock), confirm that the red light turns off and the green light illuminates. Also confirm during every downward cycle that once past the float zone point, the dock leveler no longer stops unless the deck stop button is depressed and that the green light remains on at all times. If required, adjust float zone setting (See "LIMIT SWITCH CAM ADJUSTMENTS" on page 37).

Confirm the vertical storing dock leveler is moving to the stored upright position
As the dock leveler moves from the float zone to the travel zone, the green light should turn off and the red light should illuminate. Confirm the power unit stops pumping as the dock leveler meets the tilt stop. If there are any issues see LIMIT SWITCH CAM ADJUSTMENTS on page 37 on adjusting the limit switches.

Review the hydraulic system
Visually inspect the hydraulic lift and lip cylinders, the hose assemblies, and the hydraulic power unit. If there are any leaks or damaged components, do not use the dock leveler until the necessary repairs and adjustments are made.

Weekly: The oil level should be checked weekly. When the cylinder(s) are fully retracted, the oil level in the reservoir should be close to full without overflowing from the breather cap. Recommended replacement Hydraulic Oil is **Dexron Automatic Transmission Fluid.**

The normal lubrication service interval is every 30 days. Lubrication frequency must be increased in harsh or high cycle environments. In high use, adverse or wash down environments, lubrication may be required as often as daily. **Dexron Automatic Transmission Fluid** is recommended for oiling and the recommended grease for lubricating the hinge tube/hinge pin for the tilt bar assemblies is NLGI Grade 2 grease with EP and MOS2 (See Figure 23: Lubrication on page 44 for lubrication points). Lubricate all pivot points.

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.

Confirm that all welds and structural items are intact, hydraulic cylinders, hoses and other compoents are in good working condition with no leaks.

Confirm that tilt bar stops are properly welded as indicated on page 18 and that there is no damage to the tilt bar stops. Confirm that the tilt stop is adjusted properly as indicatd on "Figure 14: Tilt Stop Assembly" on page 24.

Review structural condition of dock leveler.
Visually inspect the top deck and underside of the dock leveler, rear hinge assembly, deck assembly, and lip assemblies. Confirm there are no worn, distorted or twisted components. Confirm all welds are intact.

Review Hydraulic Cylinders.
Visually inspect lift and lip cylinders for leakage. Confirm lift cylinder is vertically aligned and not tilted to one side. Improper alignment will result in premature wear of the equipment.

Confirm that the float zone and stored position settings are correct (See items 7 and 8 on page 37).

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 Under normal circumstances, the standard hydraulic oil supplied with the equipment is suitable for use from approximately -20º C (-4ºF) minimum to +32ºC (+90ºF) maximum unless otherwise specified on the equipment order. When operating the dock leveler in temperatures lower than -20ºC (-4ºF) or above +32ºC (+90ºF), the pump may experience cavitation or premature wear, causing permanent damage to the power unit. This will void all warranty. As well some of the symptoms listed below may occur.

The standard replacement Hydraulic Fluid is DEXRON Automatic Transmission Fluid which is rated for use from -20°C (-4°F) to 50°C (122°F). There are special hydraulic fluids available to accommodate low temperatures and high temperature ranges. Contact your Pentalift representative for more information. 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: That when approaching 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, reduced equipment performance or 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.

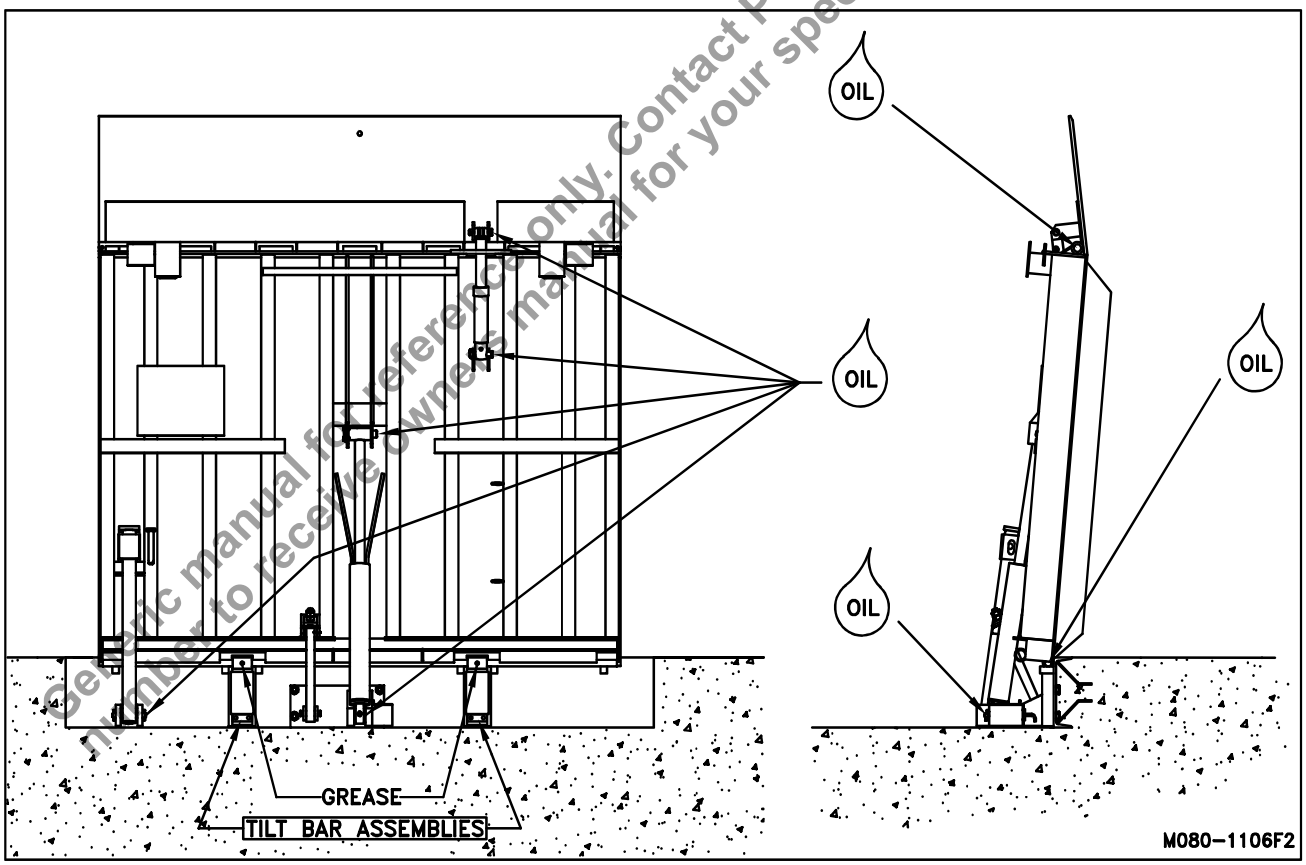


Figure 23: Lubrication

OPERATING INSTRUCTIONS

Note On Capacity: The dock leveler capacity indicated on the serial plate must be divided with a factor to accommodate dynamic loading factors. For more information see Pentalift document - Dock Leveler Capacity – Understanding Loading Dock Capacity at http://www.pentalift.com/dock-leveler-capacity.php

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.

Note regarding above and above level ranges of dock levelers relative to dock leveler deck length :
This dock leveler is designed to accommodate truck and trailer beds that arrive at the facility with heights that are different than the dock height of the facility. The dock leveler deck assembly pivots and rests at angle to accommodate the variance in the truck or trailer bed height. In doing this dock leveler accommodates truck and trailer beds that are both above and below the loading dock floor height.

It is important to manage the extent of this compensation for the difference to a reasonable and desirable level. Factors that determine reasonable and desirable levels include but are not limited to the following:

- The length of the dock leveler deck assembly. The longer the dock leveler deck assembly is the better it will be for accommodating dimensional differences in the truck / trailer bed heights relative to the load dock height. For example, all other conditions being equal, an 8ft long dock leveler deck assembly accommodates a greater height differences than 6ft long dock leveler deck assembly. The longer deck assembly simply reduces the angle of incline that the loading / unloading equipment (IE fork lift or pump truck) have to drive up and down as they go in and out of the truck / trailer.

- The type of loading / unloading equipment being used at the loading dock. For example a gas powered fork lift truck will generally have more power and larger wheels to accommodate larger angles of incline than an electrically powered pallet truck or a manually pushed pallet truck or cart.

- For obvious reasons, larger inclines create more wear and tear on equipment that is powered driven and has brakes.

- Larger inclines can result impact loads applied to the dock leveler as the fork lift hits the inclined dock leveler assembly and this can overload the leveler and result in damage to the dock leveler.

- Large inclines can create safety concerns due to possible run away loads. This is particularly true for manually propelled pump trucks or carts. As well, large inclines can make it onerous to push the same equipment up the inclines.

- Consideration of these factors should be made at the time the loading dock is designed.

- These factors should also be considered whenever changes to the factors listed above change at the loading dock.

DANGER **USE BY UNTRAINED PEOPLE CAN RESULT IN PROPERTY DAMAGE, BODILY INJURY OR DEATH. READ, KNOW, AND OBEY ALL OPERATING INSTRUCTIONS AND SAFETY INFORMATION. FOLLOW ALL OSHA REGULATIONS REGARDING THE USE OF THIS EQUIPMENT. DO NOT USE THE DOCK LEVELER IF ANY PART OF IT LOOKS BROKEN OR IF IT DOES NOT SEEM TO OPERATE PROPERLY. IF REPAIRS ARE NEEDED, CONTACT YOUR PENTALIFT REPRESENTATIVE.**

WARNING **Prior to operating the dock leveler confirm that all required inspections and maintenance have been completed as per INSPECTION, MAINTENANCE, AND LUBRICATION on page 41. If unsure of the status, or if the dock leveler doesn't seem to be in proper working condition, do not use the dock leveler and lock it out until proper review and confirmation is completed.**

NOTE: Always be certain that the truck/trailer is parked tight against the face of both dock bumpers and that the truck is locked in place by a vehicle restraint or use other suitable means to restrain the vehicle and the overhead door is open (See "Figure 27: Minimum 4" Penetration" on page 48) before loading or unloading. All 'air ride' trailers must release the air from the suspension mechanism prior to activating the dock leveler for use.

NOTE: Read the SAFETY INFORMATION AND WARNINGS before operating the dock leveler. (See page II)

STAND ALONE UNITS

1. To prevent damage or injury, ensure that the overhead door is open and trailer door is open, and nothing is in the operating path before lowering the dock leveler.

   NOTE: It is recommended to incorporate an overhead door interlock switch on each installation. This way, the leveler will not operate unless the overhead door is open. The overhead door interlock switch is an option that is purchased at the time of ordering the dock leveler.

2. Load or unload end loads with the deck and lip in the lowered position as shown in "Figure 29: End Loading" on page 52. (See "END LOADING/UNLOADING" on page 52).

3. With the deck in the fully stored position the inside red light will be illuminated. Depress and hold the **DECK LOWER** button. The inside red light will remain illuminated while in the travel zone (See Figure 26: Travel & Float Zones on page 48). The inside red light will deactivate and the inside green light will illuminate once the deck is in the float zone and has fully lowered onto the truck bed (See "Figure 27: Minimum 4" Penetration" on page 48). The inside green light must illuminate.

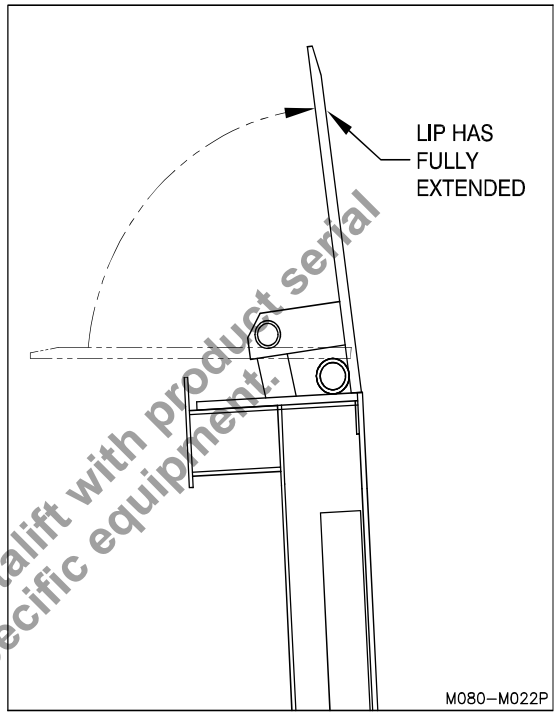


Figure 24: Lip Fully Extended

NOTE: If the DECK LOWER button is released when the deck is in the TRAVEL ZONE (See Figure 26: Travel & Float Zones on page 48), deck lowering will stop & the buzzer will sound in a pulsating manner.

NOTE: Always confirm the downward bias of the dock leveler in the float zone by releasing the lower button once the dock leveler lip is approximately 5" from contacting the truck bed. When the button is released the dock leveler should lower to the truck bed on it's own. If this lowering occurs then commence loading / unloading. If the dock leveler deck does not lower on it's own to the truck bed, the float process is not properly functioning. Lock out the dock leveler and do not use it until the issue is addressed.

4. Note: The lip must extend a minimum of 4" onto the truck bed (See "Figure 27: Minimum 4" Penetration" on page 48).

5. **Load/unload truck only when the inside green light is illuminated and the float zone downward bias has been confirmed!** Do not load or unload if the red light is illuminated, or the buzzer is sounding, or if there is no light on. (See Figure 25: Operator Interface - Stand Alone on page 47)

6. Proceed to load/unload the vehicle.

7. When load/unload is complete, depress and hold **DECK RAISE** button. The inside green light will deactivate upon entering the travel zone and the inside red light will illuminate. The dock will rise to its vertical stored position. **(Note: If the deck is not in the fully stored position the buzzer will sound in a pulsating manner)**

   NOTE: If at any time the dock leveler's downward movement needs to be stopped, utilize the deck stop button. The deck stop button is momentary contact type . Do not activate and hold the button when a fork lift is driving across the dock leveler. Damage will occur to the dock lelveler.

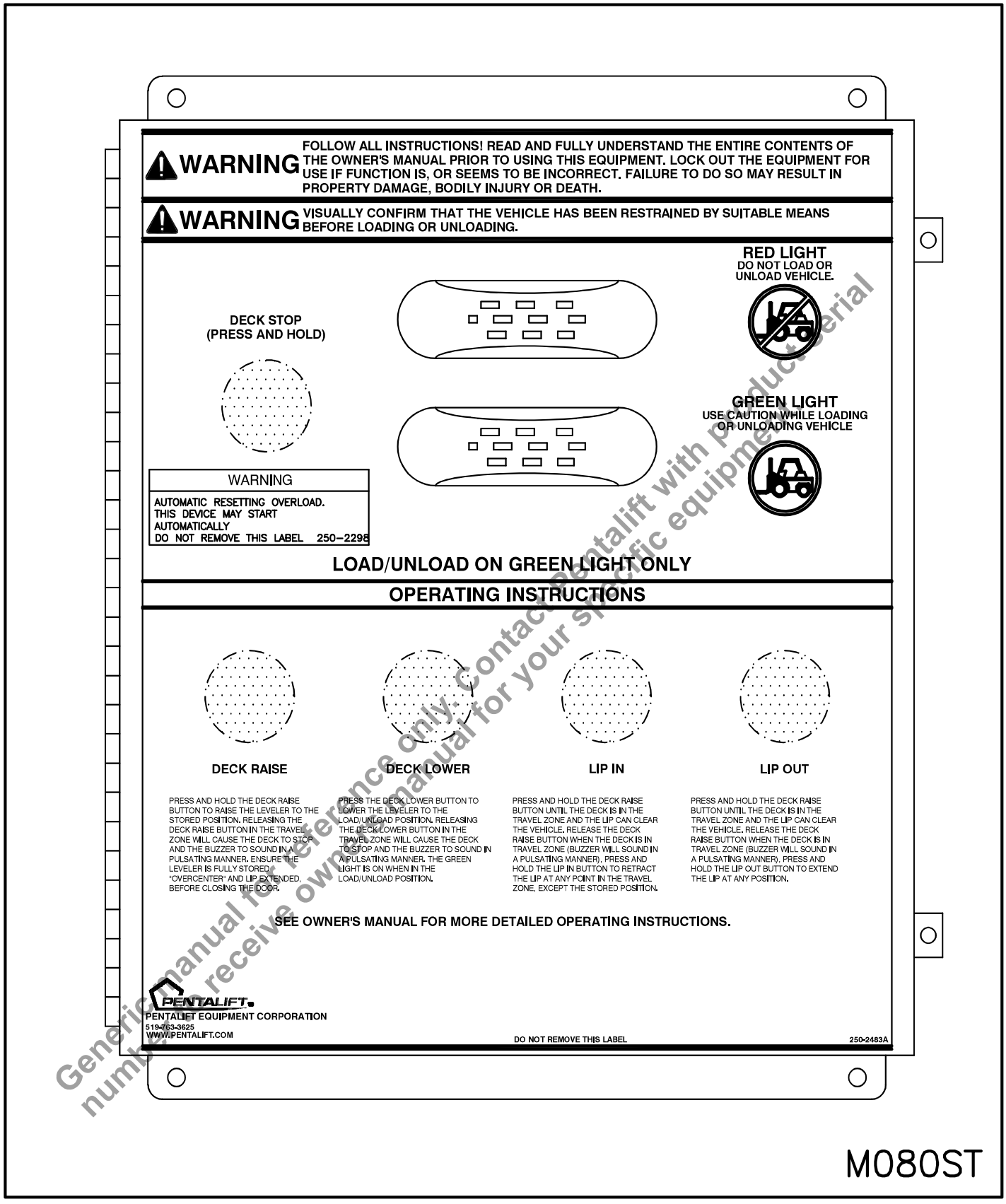


Figure 25: Operator Interface - Stand Alone

NOTE: It is the responsibility of the dock attendant to ensure that the dock leveler has been returned to the vertical stored position immediately after loading and/or unloading is complete. If the dock leveler appears to not function as it should, lock out the dock leveler until the issue is properly addressed.

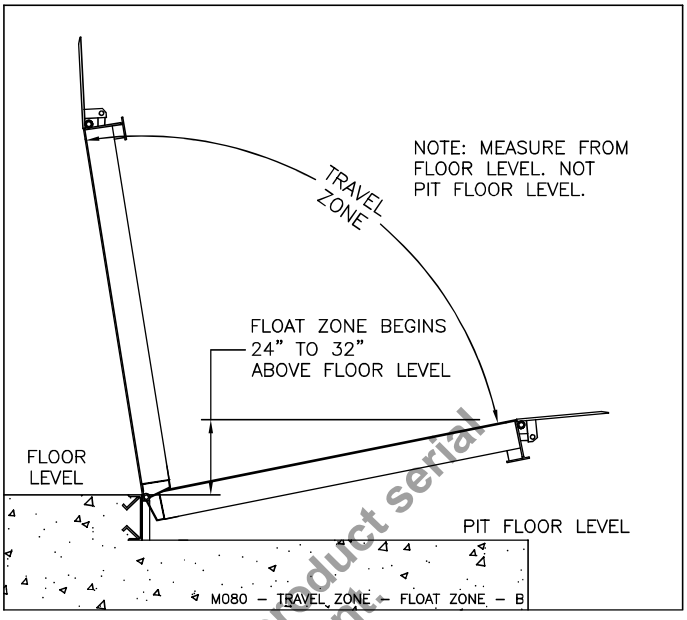


Figure 26: Travel & Float Zones

CAUTION **DO NOT LEAVE THE DECK IN THE LOWERED POSITION WITH THE OVERHEAD DOOR CLOSED.**

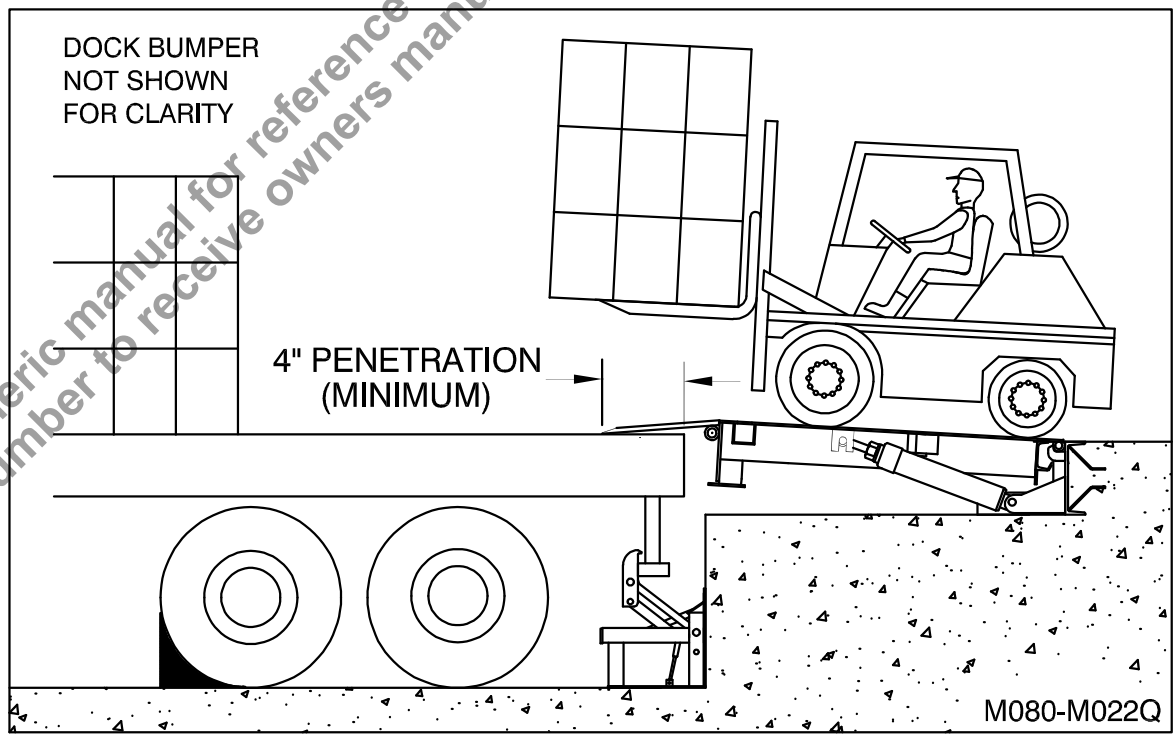


Figure 27: Minimum 4" Penetration

DANGER **USE BY UNTRAINED PEOPLE CAN RESULT IN PROPERTY DAMAGE, BODILY INJURY OR DEATH. READ, KNOW, AND OBEY ALL OPERATING INSTRUCTIONS AND SAFETY INFORMATION. FOLLOW ALL OSHA REGULATIONS REGARDING THE USE OF THIS EQUIPMENT. DO NOT USE THE DOCK LEVELER IF ANY PART OF IT LOOKS BROKEN OR IF IT DOES NOT SEEM TO OPERATE PROPERLY. IF REPAIRS ARE NEEDED, CONTACT YOUR PENTALIFT REPRESENTATIVE.**

WARNING **Prior to operating the dock leveler confirm that all required inspections and maintenance have been completed as per INSPECTION, MAINTENANCE, AND LUBRICATION on page 41. If unsure of the status, or if the dock leveler doesn't seem to be in proper working condition, do not use the dock leveler and lock it out until proper review and confirmation is completed.**

NOTE: Always be certain that the truck/trailer is parked tight against the face of both dock bumpers and that the truck is locked in place by a vehicle restraint or use other suitable means to restrain the vehicle and the overhead door is open (See "Figure 27: Minimum 4" Penetration" on page 48) before loading or unloading. All 'air ride' trailers must release the air from the suspension mechanism prior to activating the dock leveler for use.

NOTE: Read the SAFETY INFORMATION AND WARNINGS before operating the dock leveler. (See page II)

IN COMBINATION WITH RESTRAINT

1. Before the Dock Leveler can operate, the Restraint Switch must be turned to **"Engage"** (See Truck Restraint Manual). If Truck Restraint is unable to engage vehicle, a continuous warning buzzer will sound. The Restraint Switch must be turned to **"Override"**, the inside yellow light will illuminate, the warning buzzer will stop (See Vehicle Restraint Manual), **and other suitable means must be used to restrain the vehicle**.

WARNING **If the loading dock installation includes a manually activated vehicle restraint; in order to manually engage or disengage the vehicle restraint using the vehicle restraint push bar the operator must enter the operating path of the vertical storing dock leveler. To prevent possible injury, it is imperative that prior to entering the operating path of the vertical storing dock leveler for any reason, including for the purpose of activating or storing the manual restraint, that the operator confirms that the vertical storing dock leveler maintenance stand has been engaged. Once the vehicle restraint has been operated, confirm that the vertical storing dock leveler maintenance stand has been disengaged before attempting to operate the vertical storing dock leveler.**

2. To prevent damage or injury, ensure that the overhead door is open and trailer door is open, and nothing is in the operating path before lowering the dock leveler.

   NOTE: It is recommended to incorporate an overhead door interlock switch on each installation. This way, the leveler will not operate unless the overhead door is open. The overhead door interlock switch is an option that is purchased at the time of ordering the dock leveler.

3. Load or unload end loads with the deck and lip in the lowered position as shown in "Figure 29: End Loading" on page 52. (See "END LOADING/UNLOADING" on page 52).

4. With the deck in the fully stored position the inside red light will be illuminated. Depress and hold the **DECK LOWER** button. The inside red light will remain illuminated while in the travel zone (See Figure 26: Travel & Float Zones on page 48). The inside red light will deactivate and the inside green light will illuminate once the deck is in the float zone and has fully lowered onto the truck bed (See "Figure 27: Minimum 4" Penetration" on page 48). The inside green light must illuminate.

   NOTE: If the DECK LOWER button is released when the deck is in the TRAVEL ZONE (See Figure 26: Travel & Float Zones on page 48), Deck lowering will stop & the buzzer will sound in a pulsating manner.

NOTE: Always confirm the downward bias of the dock leveler in the float zone by releasing the lower button once the dock leveler lip is approximately 5" from contacting the truck bed. When the button is released the dock leveler should lower to the truck bed on it's own. If this lowering occurs then commence loading / unloading. If the dock leveler deck does not lower on it's own to the truck bed, the float process is not properly functioning. Lock out the dock leveler and do not use it until the issue is addressed.

5. Note: The lip must extend a minimum of 4" onto the truck bed (See "Figure 27: Minimum 4" Penetration" on page 48).

6. **Load/unload truck only when the inside green light is illuminated and the float zone downward bias has been confirmed!** Do not load or unload if the red light is illuminated, or the buzzer is sounding, or if there is no light on. (See "Figure 28: Operator Interface - In Combination with Restraint" on page 51)

7. Proceed to load/unload the vehicle.

8. When load/unload is complete, depress and hold **DECK RAISE** button. The inside green light will deactivate upon entering the travel zone and the inside red light will illuminate. The dock will rise to its vertical stored position. **(Note: If the deck is not in the fully stored position the buzzer will sound in a pulsating manner)**

NOTE: It is the responsibility of the dock attendant to ensure that the dock leveler has been returned to the vertical stored position immediately after loading and/or unloading is complete.

⚠CAUTION **DO NOT LEAVE THE DECK IN THE LOWERED POSITION WITH THE OVERHEAD DOOR CLOSED.**

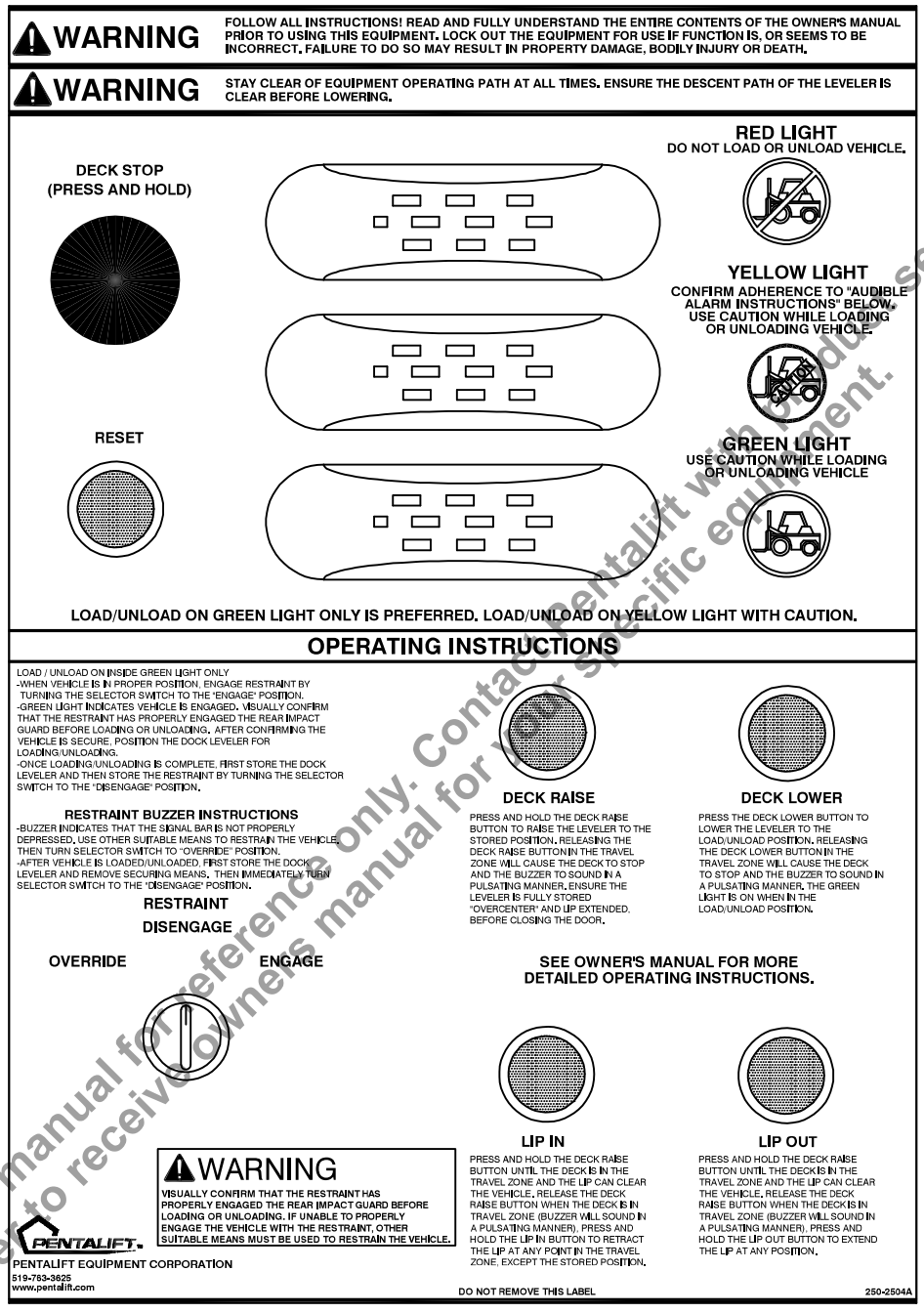


Figure 28: Operator Interface - In Combination with Restraint

END LOADING/UNLOADING

DANGER **When the cargo at the rear of the truck does not allow the lip to fully extend and rest firmly on the truck bed as outlined under the operating instructions, then the end loading/unloading procedures must be used as outlined under the Operating Instructions. During end loading/unloading there will be a gap present between the dock leveler and the truck bed. Ensure that the front wheels of the fork truck never fall into the gap between the stored dock leveler and the truck. Immediately after the end loads are removed, the dock leveler is to be used with the lip extended as indicated under Operating Instructions.**

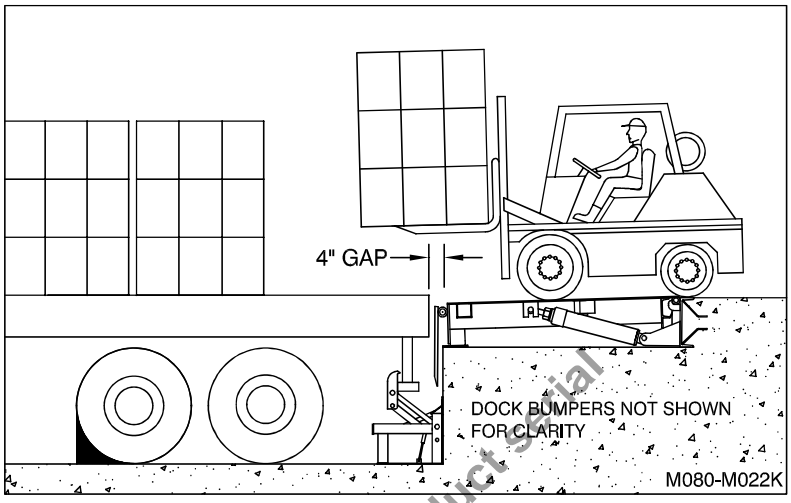


Figure 29: End Loading

END LOAD UNLOADING

1. With the dock leveler in its vertically stored position, Depress and hold the **DECK LOWER** button until the deck is 45 degrees from vertical and in the travel zone, release the **DECK LOWER** button (buzzer will sound in a pulsating manner). Depress and hold the **LIP IN** button until the lip has fully folded in (See “Figure 30: Lip Fully Folded In” on page 52).

2. Press and hold the **DECK LOWER** button. Leveler will lower to its below level position (See “Figure 29: End Loading” on page 52). **NOTE**: The inside green light must illuminate.

3. Once the end load is removed, **press and hold the DECK RAISE** button until the deck is in travel zone and the lip can fully clear the truck bed. Release the **DECK LOWER** button (buzzer will sound in a pulsating manner), **press and hold the LIP OUT** button until the lip is fully extended (See “Figure 24: Lip Fully Extended” on page 46), **release the LIP OUT** button and **press and hold the DECK LOWER** button. The deck will lower onto the truck bed. **NOTE**: The inside green light must illuminate before continuing to load/unload.

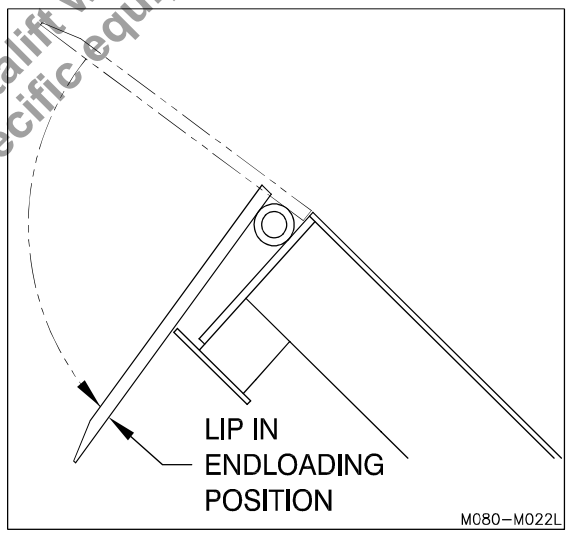


Figure 30: Lip Fully Folded In

END LOAD LOADING

1. With the dock leveler lip on the truck bed, **press and hold the DECK RAISE** button until the deck is in the travel zone and there is sufficient clearance to allow the lip to fully clear the truck bed. Release the **DECK RAISE** button (buzzer will sound in a pulsating manner), **press and hold the LIP IN** button until the lip is fully retracted. Release the **LIP IN** button and **press and hold the DECK LOWER** button. The deck will lower to its below level position. **NOTE**: The inside green light must illuminate before continuing to load/unload.

2. Once the end loading is complete, **press and hold the DECK RAISE** button. The inside green light will deactivate upon entering the travel zone and the inside red light will illuminate. The dock will rise to its vertical stored position. **(Note: If the deck is not in the fully stored position the buzzer will sound in a pulsating manner)**. Press and hold the **LIP OUT** button to extend the lipin the stored position.

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

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.

⚠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. ALL OTHER REPAIRS SHOULD BE DONE BY A TRAINED AUTHORIZED PENTALIFT REPRESENTATIVE.**

⚠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 **NEVER GO INTO THE DOCK LEVELER'S OPERATING PATH FOR ANY REASON UNLESS THE DECK AND LIP ARE PROPERLY SUPPORTED (SEE "Figure 3: How to Support the Dock Leveler for Maintenance" on page 5) AND THE POWER IS DISCONNECTED WITH A FUSED DISCONNECT, PROPERLY TAGGED AND LOCKED OUT. IT IS THE RESPONSIBILITY OF THE OWNER TO ENSURE THAT NO LOAD OR TRAFFIC IS PLACED ON THE DECK WHILE THE MAINTENANCE STAND IS ENGAGED. THE CONSTRUCTION OF THE MAINTENANCE STAND IS INTENDED TO SUPPORT THE WEIGHT OF THE UNLOADED DOCK LEVELER ONLY.**

⚠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.**

⚠DANGER **IF FOR ANY REASON IT IS POSSIBLE HYDRAULIC OIL IS NOT PRESENT IN THE HYDRAULIC CYLINDER FOLLOW THE HYDRAULIC CYLINDER PRIMING PROCESS DESCRIBED IN "PRIMING OF HYDRAULIC CYLINDERS" on page 7.**

NOTICE See page 41 for recommended hydraulic oil.

1. **Motor does not run when push button is engaged.**
   a) Check circuit breaker or fuses at the main power supply and at the disconnect.
   b) Check reset button (On combination units with vehicle restraints only).
   c) On some models, a transformer is supplied with the control panel. If your unit has a transformer, check the two (2) primary fuses and one (1) secondary fuse. Replace if required.
   d) Check for loose wires in the control panel.
   e) Check to ensure all connections made match the wiring diagram (supplied with the control panel).
   f) Check overhead door limit switch,if installed.
   g) If the problem cannot be solved, consult your authorized Pentalift representative.

2. **Motor runs but deck does not rise.**
   a) Check for debris or obstruction that may interfere with the operation of any moving parts.
   b) Check phase rotation (3 phase), reverse rotation (1 phase).
   c) Check the hydraulic fluid level (See page 43).
   d) Check hydraulic hoses and fittings for leaks.
   e) If the problem cannot be solved, consult your authorized Pentalift representative.

3. **Deck will not lower from the vertically stored position.**
   a) Ensure red light on the control panel is illuminated.
   b) Check for debris or obstruction that may interfere with the operation of any moving part.
   c) Check that maintenance stand is not engaged.
   d) Ensure phase polarity is correct. Incorrect polarity will cause the elevating dock not to lower. The motor will run backwards, resulting in cavitations and possible damage to the pump.
   e) If the problem cannot be solved, consult your authorized Pentalift representative.

4. **Main breaker or overload relay is tripping.**
   a) Check for a short circuit in the wiring.
   b) Check for supply voltage or missing phase.
   c) Check all wire connections and ensure the unit is wired according to the wire diagram supplied with the control panel.
   d) If the problem cannot be solved, consult your authorized Pentalift representative.

5. **Dock leveler will rise but has a bouncing movement.**

⚠DANGER **NEVER GO BENEATH THE DOCK LEVELER FOR ANY REASON UNLESS IT IS PROPERLY SUPPORTED. SEE “SUPPORTING THE LEVELER FOR MAINTENANCE” on page 5**

⚠DANGER **IF FOR ANY REASON IT IS POSSIBLE HYDRAULIC OIL IS NOT PRESENT IN THE HYDRAULIC CYLINDER FOLLOW THE HYDRAULIC CYLINDER PRIMING PROCESS DESCRIBED IN “PRIMING OF HYDRAULIC CYLINDERS” on page 7.**

   a) Check the hydraulic fluid level. (See page 43)
   b) Check the deck assembly for debris or obstruction.
   c) Check to ensure the bottom lift cylinder brackets have been supported and lag bolted (See item 24 “Figure 20: Shim the Bottom Cylinder Bracket” on page 25).
   d) Check for entrapped air in the hydraulic circuit
   d) If the problem cannot be solved, consult your authorized Pentalift representative.

6. **Deck raises but lip will not extend or lip extends too slowly.**

⚠DANGER **NEVER GO BENEATH THE DOCK LEVELER FOR ANY REASON UNLESS IT IS PROPERLY SUPPORTED. SEE “SUPPORTING THE LEVELER FOR MAINTENANCE” on page 5**

   a) Check hydraulic fluid level. (See page 43.)
   b) Check for damage to the lip cylinder and/or pivot pins and brackets.
   c) Check hydraulic hoses and fittings for leaks.
   d) Check for proper hydraulic pressure.
   e) Inspect the lip spools for debris or obstruction and ensure the lip is moving freely.

f) If the problem cannot be solved, consult your authorized Pentalift representative.

7. The lip does not retract.
a) Check for damage to the lip cylinder and/or pivot pins and brackets.
b) Inspect the lip spools for debris or obstructions and ensure the lip is moving freely. Lubricate if required.
c) If the problem cannot be solved, consult your authorized Pentalift representative.

8. The buzzer sounds when trying to load/unload.
a) Confirm the float zone cam is set correctly (See “LIMIT SWITCH CAM ADJUSTMENTS” on page 37).
b) Check for damage to the limit switches and/or cams.
c) If the problem cannot be solved, consult your authorized Pentalift representative.

9. The dock leveler lift cylinder continues to be hydraulically powered when it has reached the end of the tilt stop setting in the vertically stored position.
a) Confirm the stored position cam is set correctly (See “LIMIT SWITCH CAM ADJUSTMENTS” on page 37).
b) Check for damage to the limit switches and/or cams.
c) If the problem cannot be solved, consult your authorized Pentalift representative.

10. The green light does not illuminate with the dock leveler in th float zone position.
a) Confirm the float zone cam is set correctly (See LIMIT SWITCH CAM ADJUSTMENTS on page 37).
b) Check for damage to the limit switches and/or cams.
c) If the problem cannot be solved, consult your authorized Pentalift representative

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

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.

Item #	Part No.	Description
1	NOTE	Lip Hinge Pin
2	072-0178	Lip Hinge Screw
3	074-0086	Lip Hinge Lock Washer
4	070-0013	Lip Hinge Nut
5	802-0786	Lip Cylinder
6	302-0392	Lip Cylinder Pin
7	080-0001	Lip Cylinder Spring Pin
8A	800-8829	Lift Cylinder (10” DEEP PIT)
8B	800-8839	Lift Cylinder (14” DEEP PIT)
9	300-8966	Lower Lift Cylinder Pin
10	072-0044	Lower Lift Cylinder Bolt
11	070-0022	Lower Lift Cylinder Nut
12	074-0039	Lower Lift Cylinder Washer
13	300-5534	Upper Lift Cylinder Pin / Mechanical Latching Lock Pin
14	302-0551	Upper Lift Cylinder Locking Plate
15	800-5890	Maintenance Stand Tube
16	300-5661	Lower Pin - Maintenance Stand
17	080-0001	Spring Pin
18	317-0037	Tilt Bar Stop
19	072-0358	Tilt Bar Bolt
21	800-5889	Upper Pin - Maintenance Stand
22	NOTE	Lip Assembly
23	NOTE	Cylinder Mounting Plate
24	074-0086	Washer
25	072-0178	Bolt
26	300-9017	Limit Switch Mounting Plate
27	060-1064	Limit Switch
28	300-9065	Tilt Back Assembly Tube
29	302-1024	Tilt Back Assembly Lower Pin
30	300-9021	Float Zone Cam
31	300-9021	Stored Position Cam
32	800-9259	Limit Switch Cover
33	300-8954	Threaded Rod
34	817-0116	Adjustment Nut
35	070-0081	Jam Nut
36	500-0429	Lip Support Bracket (see figure 41)

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

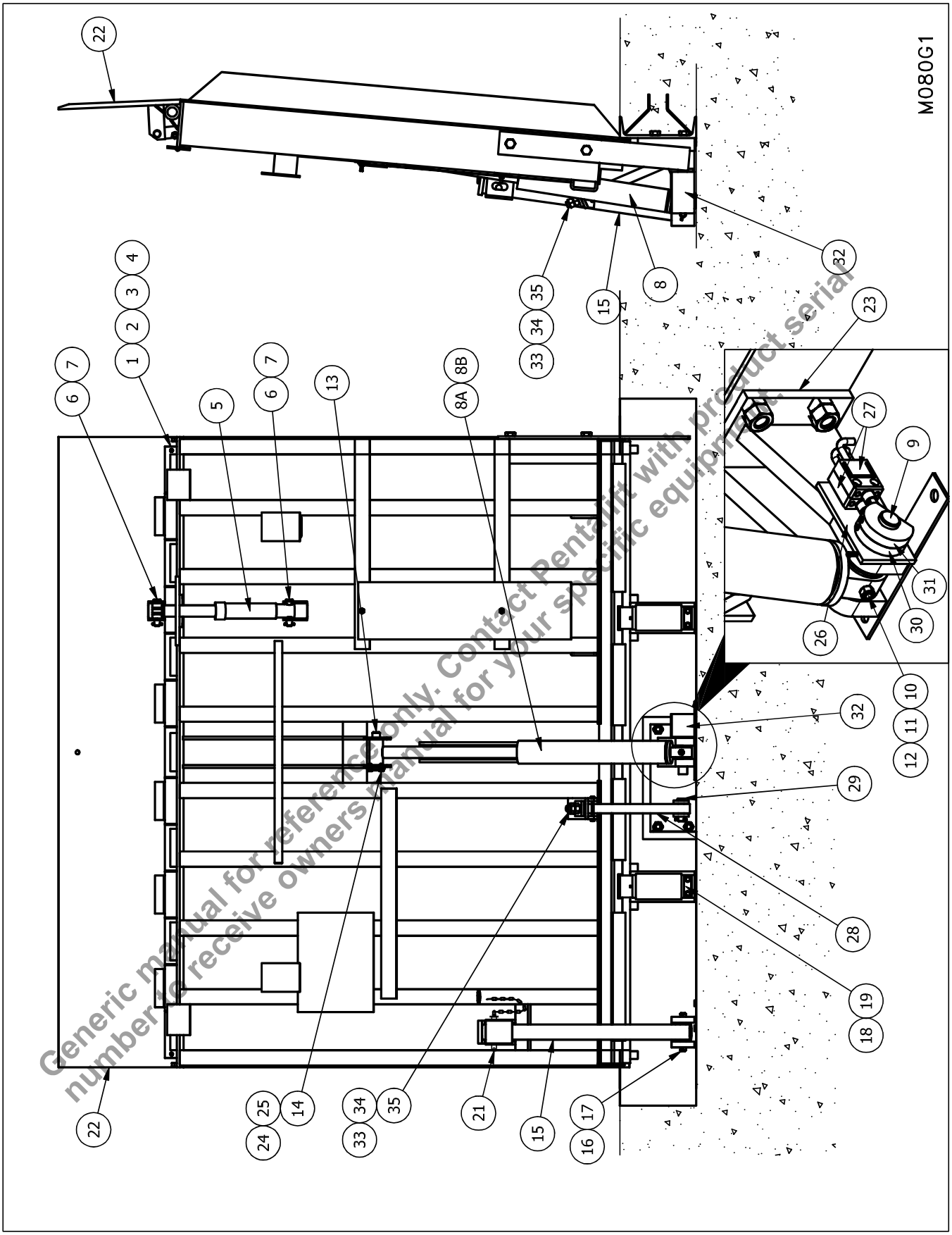


Figure 31: Dock Leveler Replacement Parts

CONTROL PANEL REPLACEMENT PARTS

USE ONLY GENUINE PENTALIFT REPLACEMENT PARTS

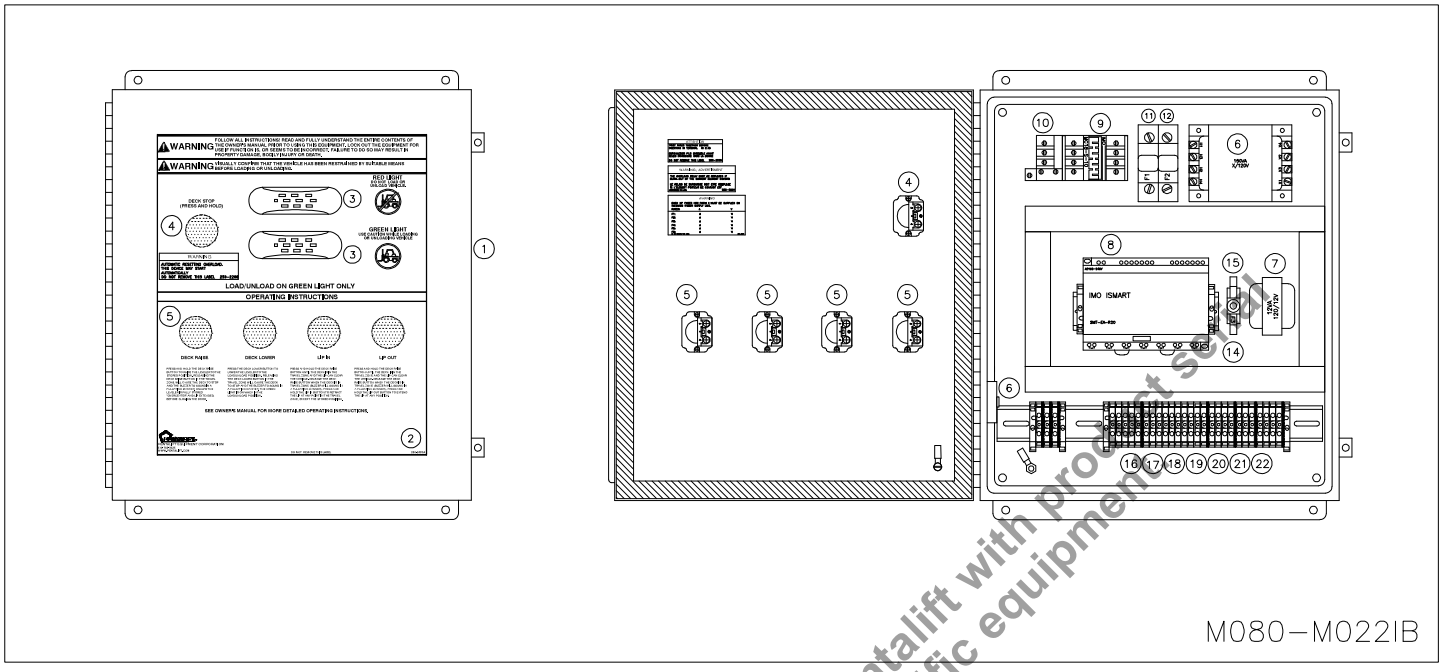


Figure 32: Standalone Control Panel Replacement Parts

Item	Part No.	Description
1	060-0248	Electrical Enclosure
2	250-2483	Decal
3	161RG	Green/Red Light Assembly
4	161DS	Deck Stop Push Button Assembly
5	161DR	Deck Raise Push Button Assembly
6	161BUZ	120V Buzzer Assembly
7	060-0209	15va 120/12V Transformer
8	060-0933	IMO Logic Relay
9	060-1036	Contactor
10	NOTE	Thermal Overload
11	NOTE	Fuse - Class CC Time Delay
12	NOTE	Double Body Class CC Fuse Holder
13	NOTE	150VA Transformer
14	060-0298	Fuse, 2A/250V - Time Delay
15	060-0380	1/4” 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	Dil Rail Mounting Bar

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

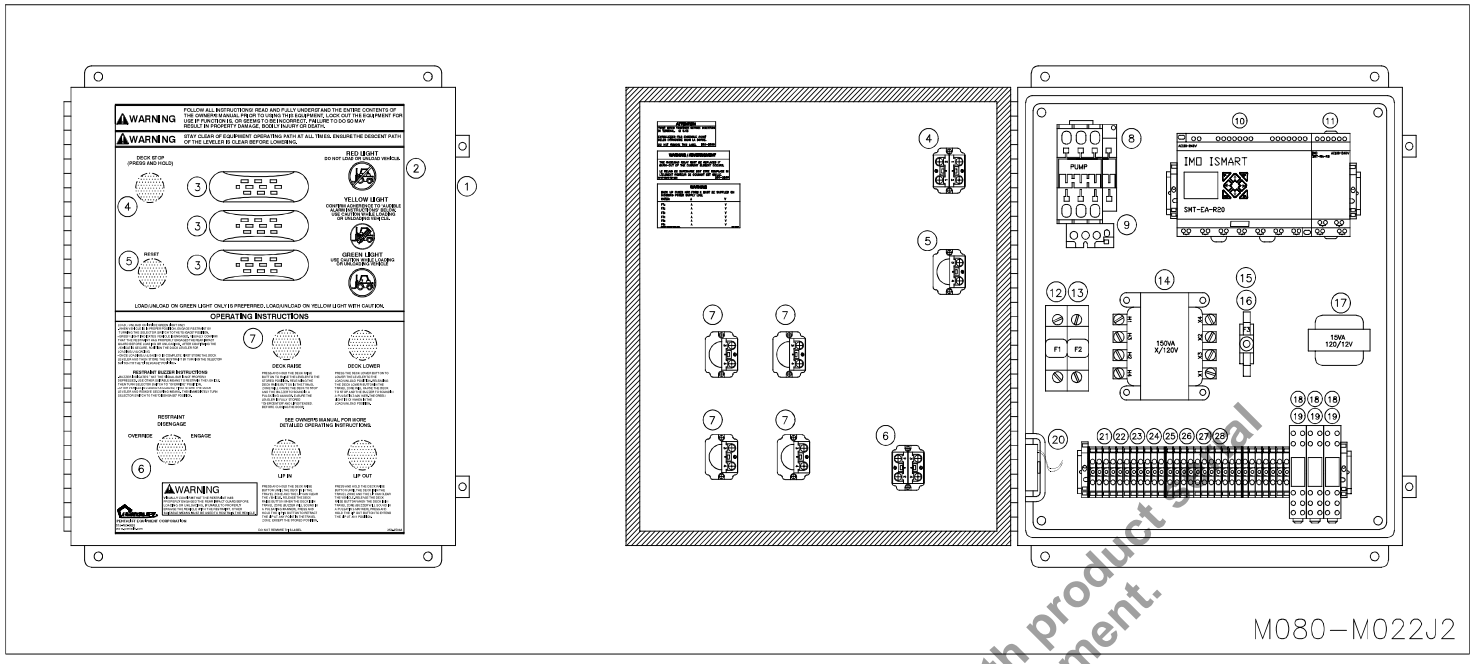


Figure 33: Combo Control Panel Replacement Parts

Item	Part No.	Description
1	060-0248	Electrical Enclosure
2	250-2483	Decal
3	161RGA	Red Green Amber Light Assembly
4	161DS	Deck Stop Push Button Assembly
5	161RS	Reset Push Button Assembly
6	161VRSW2	Restraint Switch Assembly
7	161DR	Deck Raise Push Button Assembly
8	060-1036	Motor Contactor
9	NOTE	Thermal Overload
10	060-0933	IMO Logic Relay
11	060-0934	IMO Logic Relay Expansion Module
12	NOTE	Fuse
13	060-0381	Fuse Holder
14	NOTE	Transformer
15	060-0298	Fuse
16	060-0380	Fuse Holder
17	060-0209	15VA, 120/12V, Transformer
18	060-0554	8 Pin Relay Mount
19	060-0551	DPDT 120V Relay
20	161BUZ	120V Buzzer Assembly

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

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.

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PENTALIFT TM

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