A Division of Systems, Inc.

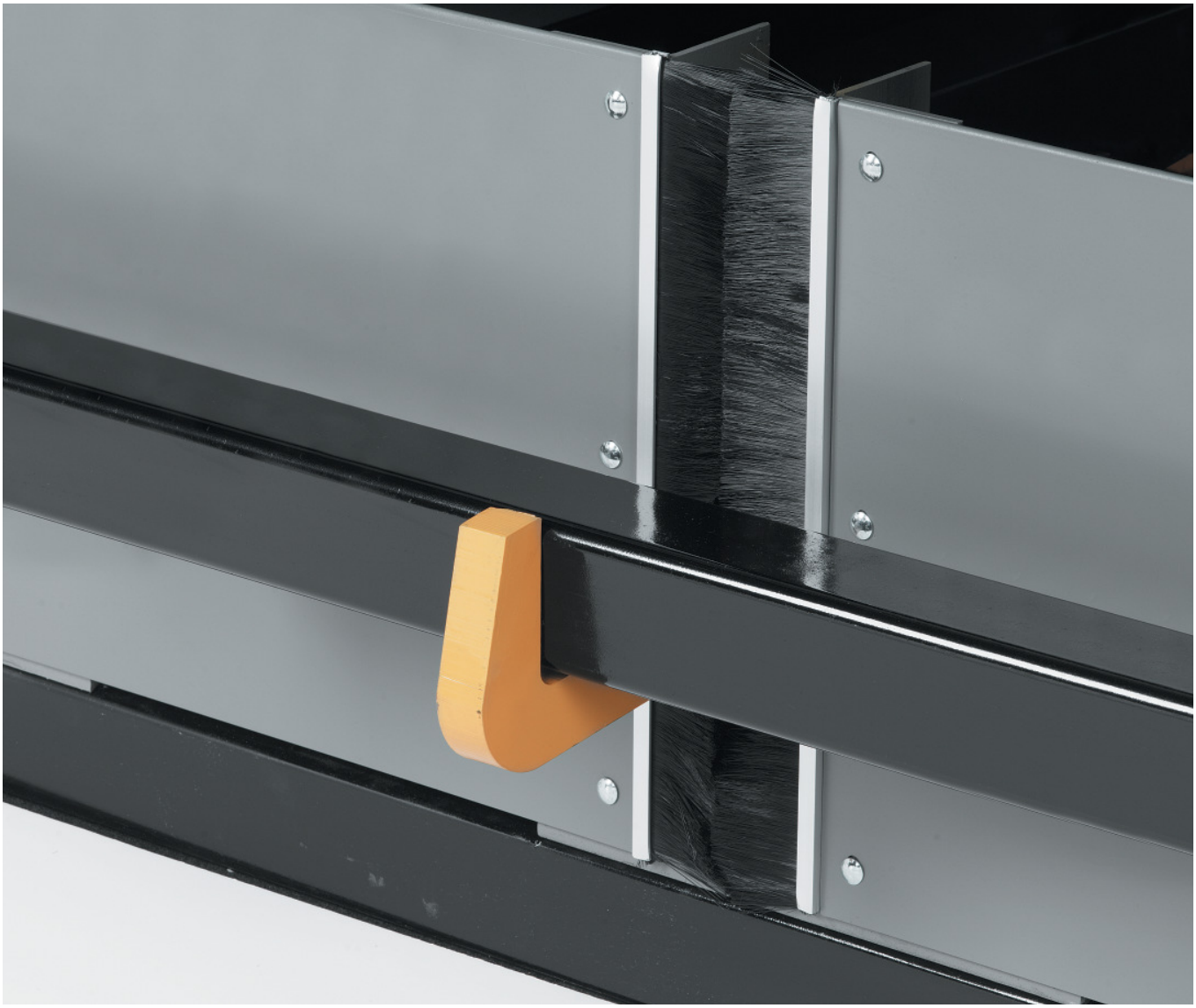
POWERAMP®

Premium Loading Dock Systems

PowerHook

Truck Restraint

Owner's/User's Manual



POWERAMP • Division of Systems, Inc. • W194 N11481 McCormick Drive • Germantown, WI 53022
800.643.5424 • fax: 262.255.5917 • www.**docksystemsinc**.com • techservices@docksystemsinc.com

Printed in U.S.A.

Manual No. 4111-0010
February 2011

Table of Contents

Recognize Safety Information

General Operational Safety Precautions

Read and understand the operating instructions and become thoroughly familiar with the equipment and its controls before operating the dock leveler.

Never operate a dock leveler while a safety device or guard is removed or disconnected.

Never remove DANGER, WARNING, or CAUTION signs or Decal's on the equipment unless replacing them.

Do not start the equipment until all unauthorized personnel in the area have been warned and have moved outside the operating zone.

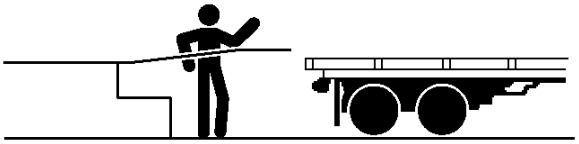
Remove any tools or foreign objects from the operating zone before starting.

Keep the operating zone free of obstacles that could cause a person to trip or fall.

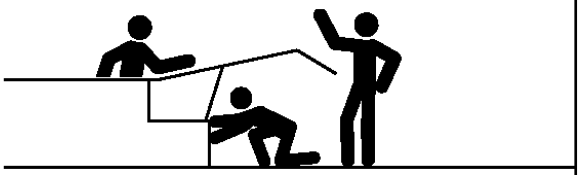
Operational Safety Precautions

Learn the safe way to operate this equipment. Read and understand the manufacturer's instructions. If you have any questions, ask your supervisor.

DANGER



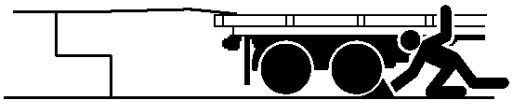
Stay clear of dock leveling device when freight carrier is entering or leaving area.



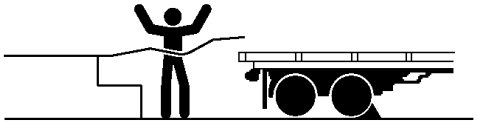
Do not move or use the dock leveling device if anyone is under or in front of it.

Keep hands and feet clear of pinch points. Avoid putting any part of your body near moving parts.

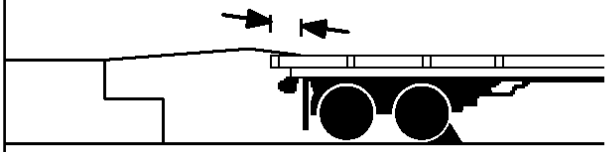
WARNING



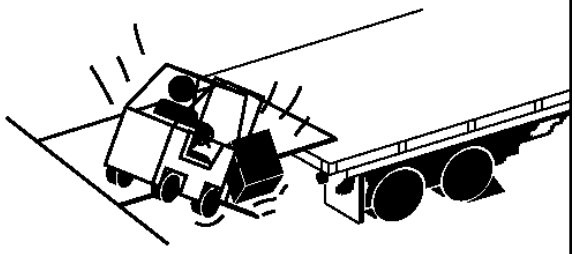
Chock/restrain all freight carriers. Never remove the wheel chocks until loading or unloading is finished and truck driver has been given permission to drive away.



Do not use a broken or damage dock leveling device. Make sure proper service and maintenance procedures have been performed before using.

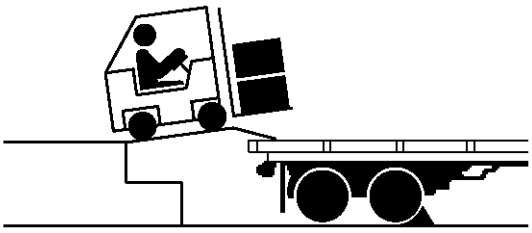


Make sure lip overlaps onto trailer at least 4 in. (102 mm).

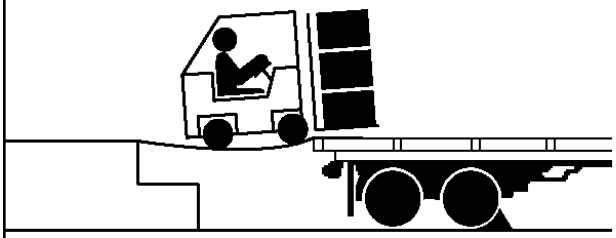


Keep a safe distance from both side edges.

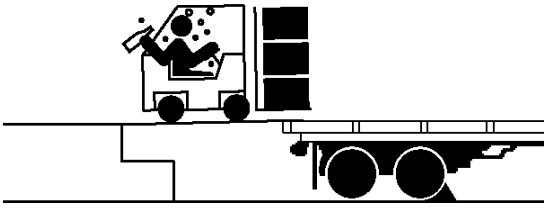
WARNING



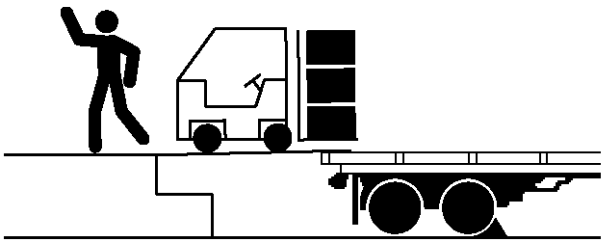
Do not use dock leveling device if freight carrier is too high or too low.



Do not overload the dock leveling device.



Do not operate any equipment while under the influence of alcohol or drugs.

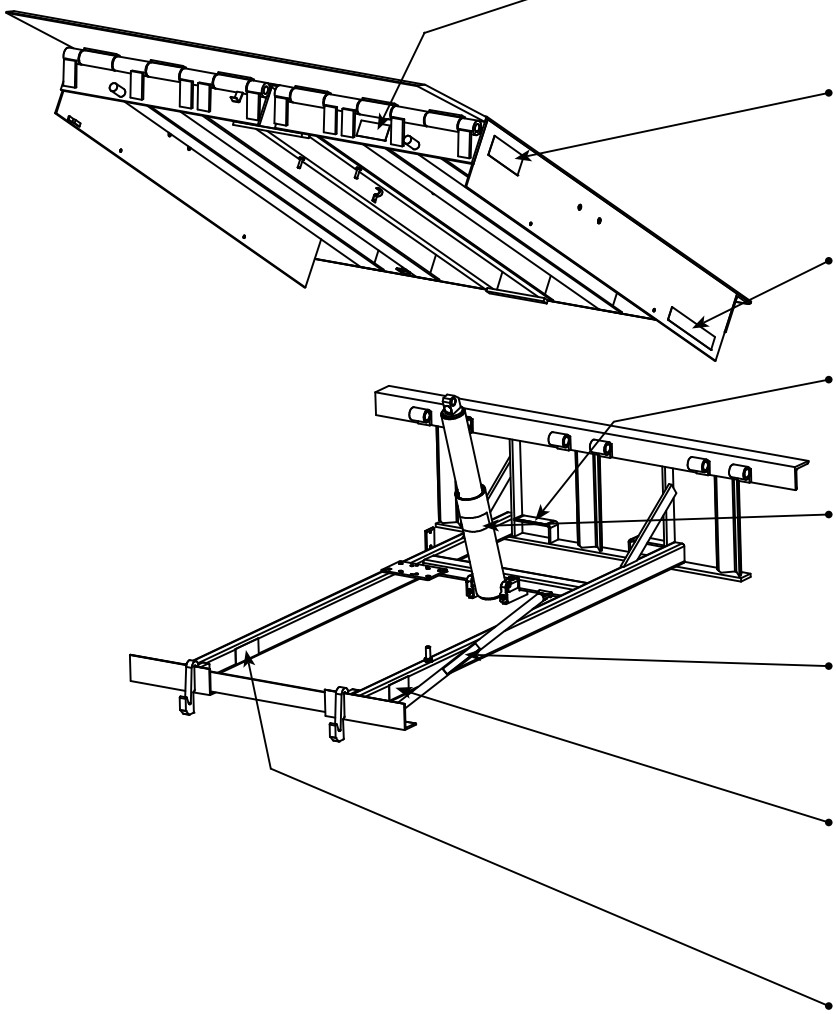


Do not leave equipment or material unattended on dock leveling device.

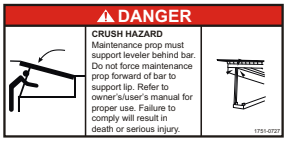
Maintenance Safety Precautions

Dock Leveler Safety Decal's

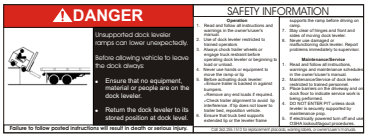
Every 90 days (quarterly) inspect all safety labels and tags to ensure they are on the dock leveler and are easily legible. If any are missing or require replacement, please call 1-800-643-5424 for replacements.



1751-0727



1751-0730 (x2)



(decal placed in same position on both sides)

1751-0329 (x2)

(decal placed in same position on both sides)

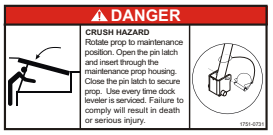
1751-0330 (x2)

(decal placed in same position on both sides)

1751-0138

1751-0729

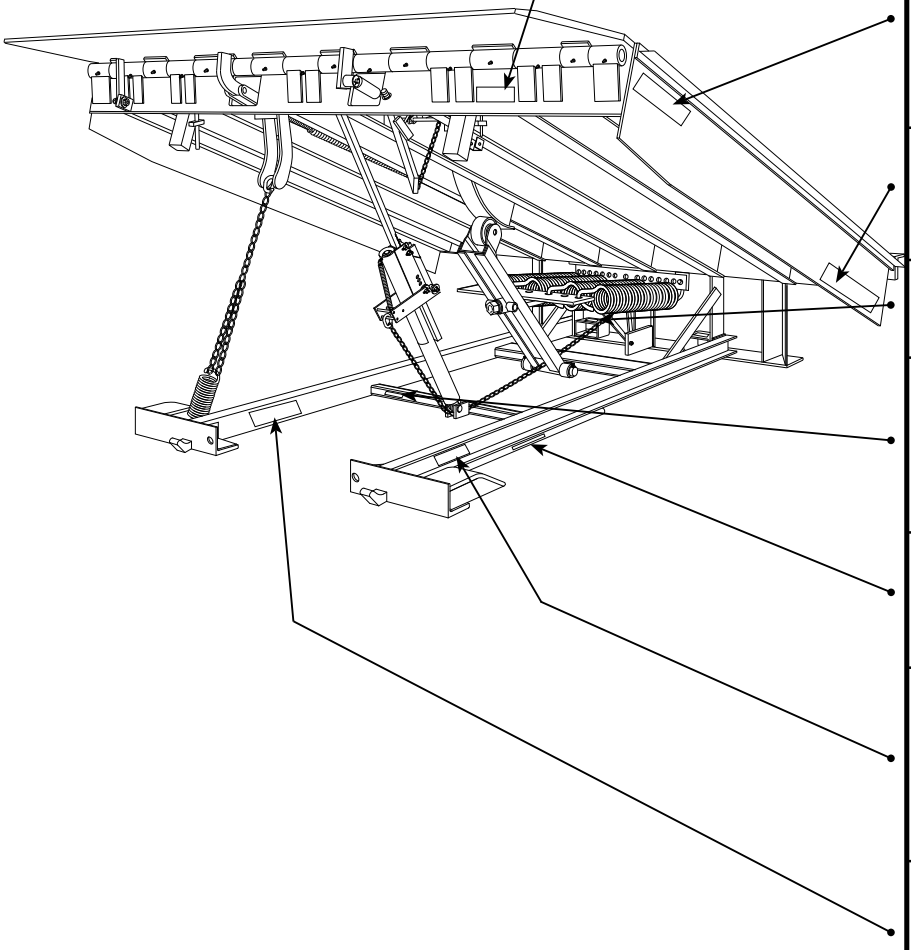
1751-0731



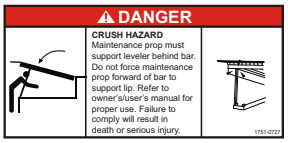
1751-0726

Dock Leveler Safety Decal's

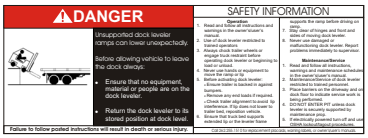
Every 90 days (quarterly) inspect all safety labels and tags to ensure they are on the dock leveler and are easily legible. If any are missing or require replacement, please call 1-800-643-5424 for replacements.



1751-0727



1751-0730 (x2)



(decal placed in same position on both sides)

1751-0329 (x2)

(decal placed in same position on both sides)

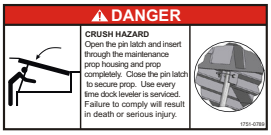
1751-0330 (x2)

(decal placed in same position on both sides)

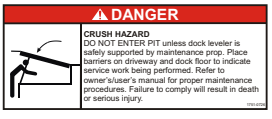
1751-0728

1751-0788

1751-0789



1751-0726



OWNER'S/USER'S RESPONSIBILITIES

1. The owner/ user should recognize the inherent dangers of the interface between the loading dock and the transportation vehicle. The owner/ user should, therefore, train and instruct all operators in the safe operation and use of the loading dock equipment in accordance with manufacturer's recommendations and industry standards. Before operation of the equipment, all operators shall read, understand and be familiar with all functions of equipment as described in the owner's/user's manual.

2. The manufacturer shall provide to the initial purchaser all necessary information with regards to: Safety Information, Operation, Installation and Safety Precautions, Recommended Initial and Periodic Inspections Procedures, Planned Maintenance Schedule, Product Specifications, Troubleshooting Guide, Parts Break Down, Warranty Information and Manufacturers Contact Information. The owner/ user shall be responsible to verify that this information is available and received as well as proper instructions, training and familiarity of the equipment for all operators has been completed. Owner's/User's shall actively maintain, update and re train all operators on safe working habits and operations of the equipment.

3. It is recommended when the transportation vehicle is positioned correctly in the dock opening and in contact with both bumpers, there shall be a minimum of 4.00 inches (100mm) overlap of the leveling device and the transportation vehicle at all times during the loading and unloading process.

4. Name plates, placards, decals, instructions and posted warnings shall not be obscured from the view of the operator or maintenance personnel for whom such warnings are intended for. Contact manufacturer for any replacements.

5. Manufacturer's recommended periodic maintenance and inspection procedures in effect at the date of shipment shall be followed at all times. Written documentation of maintenance, replacement parts or damage should be retained. In the event of damage notification to the manufacturer is requested.

6. Any modifications or alterations of loading dock equipment shall only be done with prior written approval from the original equipment manufacturer.

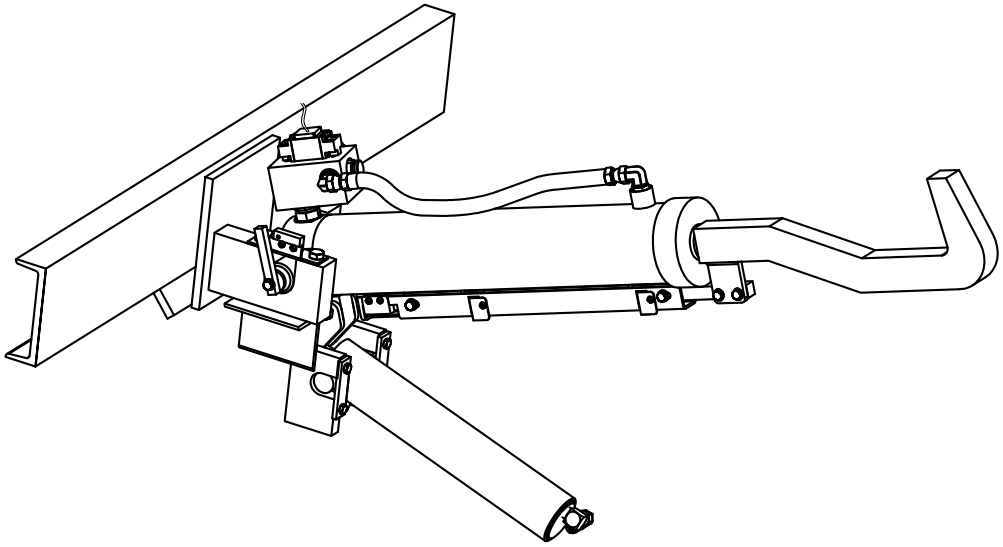
7. 7. When industrial moving devices are being used in the loading or unloading of product from the transportation vehicle, this vehicle shall have the brakes and wheel chocks applied appropriately or all other positive restraining device shall be fully utilized.

8. Loading dock safety equipment should never be used outside of its intended use, range, or capacity. Please consult the manufacturer if you have any questions as to the use, range or capacity of the equipment.

9. When selecting loading dock safety equipment, it is important to consider not only present requirements but also future plans and any possible adverse conditions, environments or use.

INTRODUCTION

General Information



Congratulations on your choice of a Poweramp PowerHook truck restraint. This manual covers the PowerHook Truck restraint operating system.

Designed by Poweramp to be a marvel of simplicity and efficiency, your truck restraint, when properly installed, will provide many years of trouble-free performance with an absolute minimum of maintenance. Its revolutionary hydraulic system efficiently controls and operates every function. To obtain maximum performance and longest possible use, a simple program of preventive maintenance is recommended and is outlined in this manual.

The PowerHook is the original truck restraint to seek, find and maintain a tight, continuous hold on the RIG (Rear Impact Guard) bar, effectively eliminating “trailer creep”. As an optional safety feature, the dock leveler and truck restraint can be interlocked, preventing operation of the dock leveler until the hook engages the truck RIG bar.

The truck restraint is firmly anchored in the loading dock pit for maximum holding power. The hook remains protected behind the pit wall until activated. The PowerHook restraint is designed to withstand a pulling force in excess of 35,000 lbs.

When not in use, PowerHook stores in a pit, concealed and out of the way, enabling dock workers to clear the driveway approach of snow or debris.

The PowerHook truck restraint comes equipped with an electrical control panel, which allows push button operation of the truck restraint functions.

When combining a Poweramp dock leveler with a PowerHook truck restraint, the control panel will allow for operation of both units in the same control panel.

Each PowerHook, Poweramp dock leveler and control panel has been factory pre wired and tested to ensure satisfactory operation.

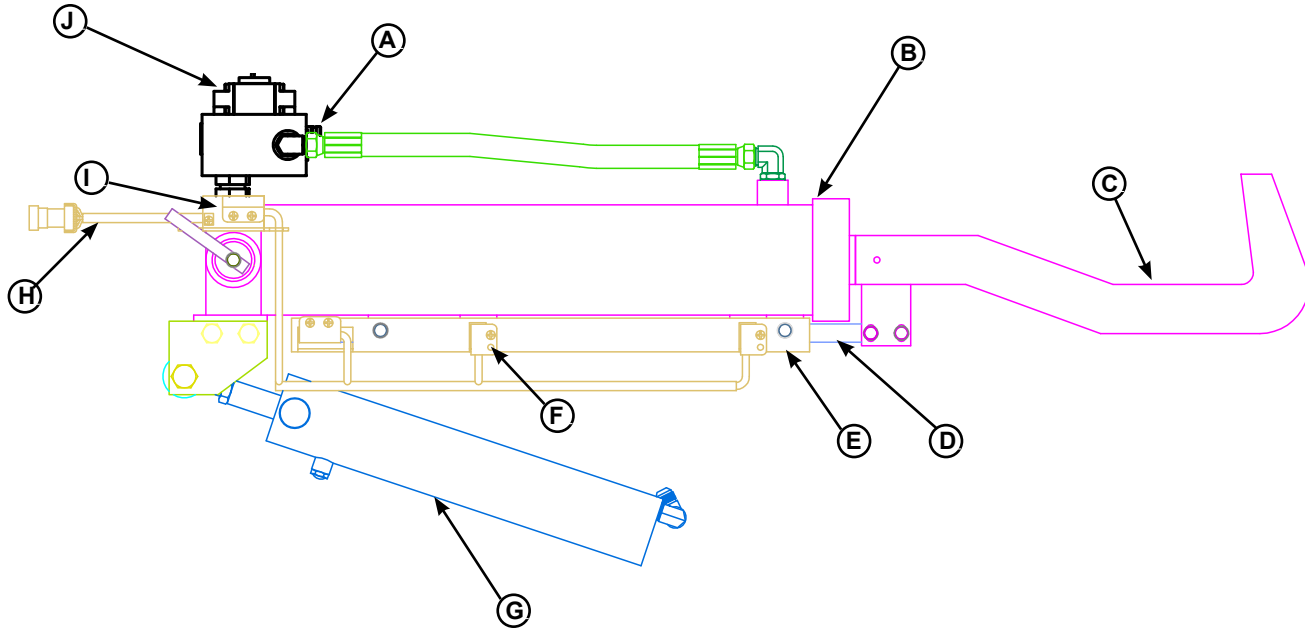
To illustrate which connections are to be made in the field at installation, electrical drawings are included with each order or by contacting Poweramp Technical Services.

Once again, thank you and congratulations on your purchase of a Poweramp PowerHook truck restraint.

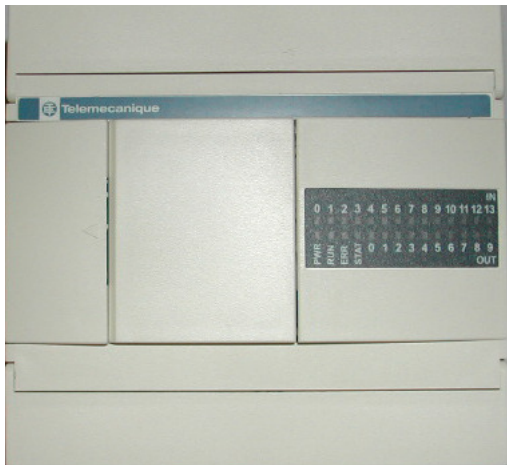
Due to ongoing product improvement, some parts have changed, along with operation and trouble shooting methods. This manual describes these changes. For further assistance, please contact:

Poweramp Technical Service at 800-643-5424 or techservices@docksystemsinc.com

Component Identification



A — Regeneration Valve
B — Hook Cylinder
C — Hook
D — Guide Track-Slide Rod
E — Guide Track
F — Sensor, Magnetic Reed Switch (Replaces Proximity Switch)
G — Positioning Cylinder
H — Guide Track Harness - Includes 4 Magnetic Reed Switches, Assembled
I — Hook Lowered Sensor Target
J--Pressure Differential Valve



New Telemecanique “TWIDO” Programmable Logic Controller

INSTALLATION

This manual covers three models of PowerHook® truck restraints: KS4, KS5, KS6. See Figures 1, 2, and 3. In addition to the hydraulically actuated truck restraint, PowerHook® has a programmable electronic controller and Dock alert, a dock communication systems

The installation instructions are to be used as basic guide lines for proper installation. There may be different techniques to install the levelers, but installation must conform to the correct welding and shimming as shown in the oweners/users manual

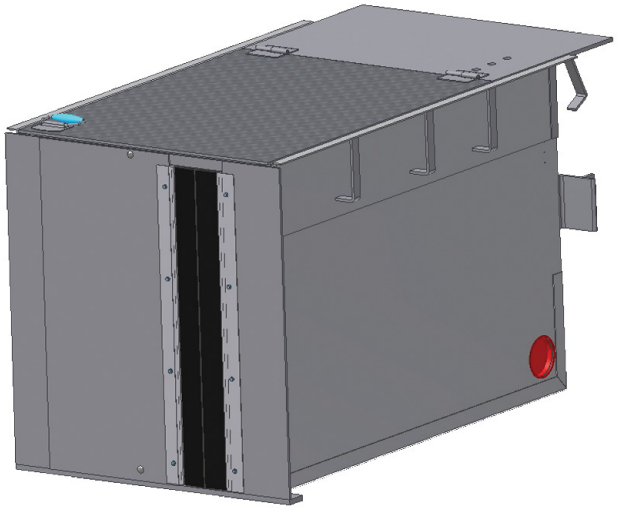


Fig. 1

KS4 PowerHook®

The PowerHook® KS4 box-type truck restraint is ideally suited for Vertical Leveler installations. The larger box form with insulated lid is fully assembled and ready to be poured in place during the construction process.

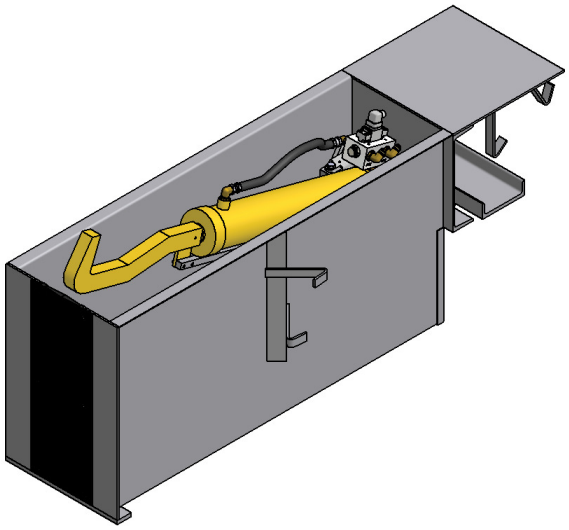


Fig. 2

KS5 PowerHook®

The PowerHook® KS5 pan-type truck restraint is an economical retrofit for dock levelers. The fully assembled pan ships complete with all the concrete anchors needed to insure a secure installation.

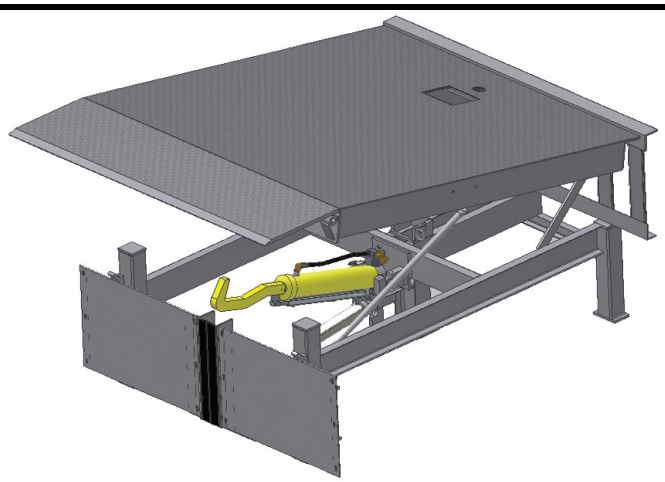


Fig. 3

KS6 PowerHook®

The PowerHook® KS6 free-standing frame type truck restraint is fully installed and integrated into full height leveler stand. It's easy to install...just weld it into position and run power to it.

KS4 INSTALLATION

These installation instructions were written for retrofitting a Poweramp® hydraulic dock leveler with integral power pack with a PowerHook® KS4 Vehicle Restraint.

If you are not adding the PowerHook® to an existing dock leveler, some steps may not be needed or additional procedures may be required, as follows:

- When installing in new construction (i.e., new PowerHook and new Poweramp hydraulic leveler in a newly prepared pit), skip steps 1 through 5. Platform modifications, step 5 were completed prior to shipment.
- When installing PowerHook with a Poweramp hydraulic dock leveler which is powered by remote power pack or a Centra Power® system, refer to the manuals provide with those units as well as to page 15 in this manual.
- When installing Powerhook with a mechanical dock leveler or a hydraulic dock leveler manufactured by another company, the PowerHook must be equipped with a remote hydraulic power pack. See page 15 of this manual.

⚠ WARNING

Post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the dock leveler before installation has been completed.

Failure to follow the installation instructions can result in damage to dock leveler, the facilities, and/or serious personal injury or death.

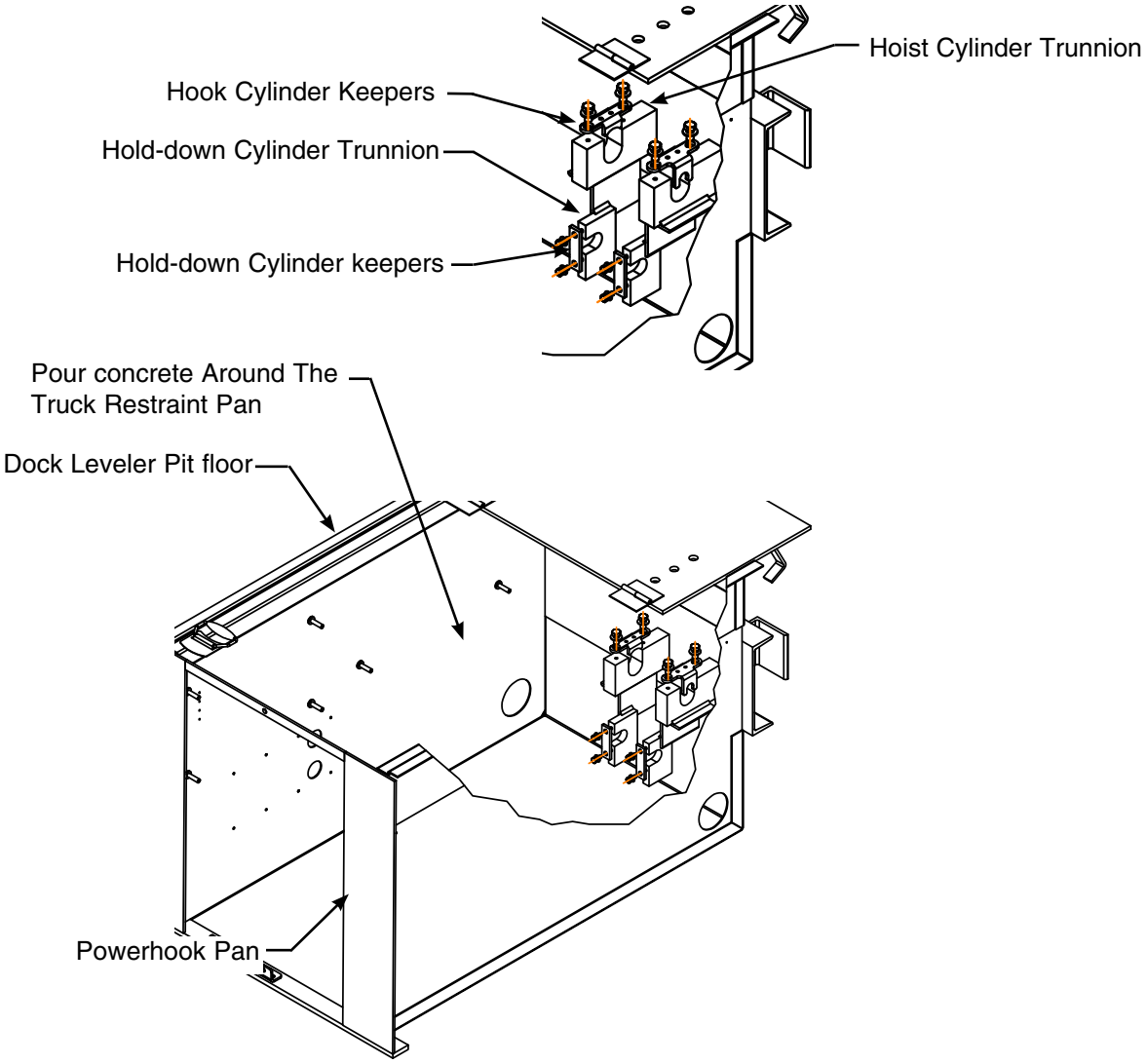
IMPORTANT

DO NOT connect the dock leveler electrical wiring and ground connections until all welding has been completed.

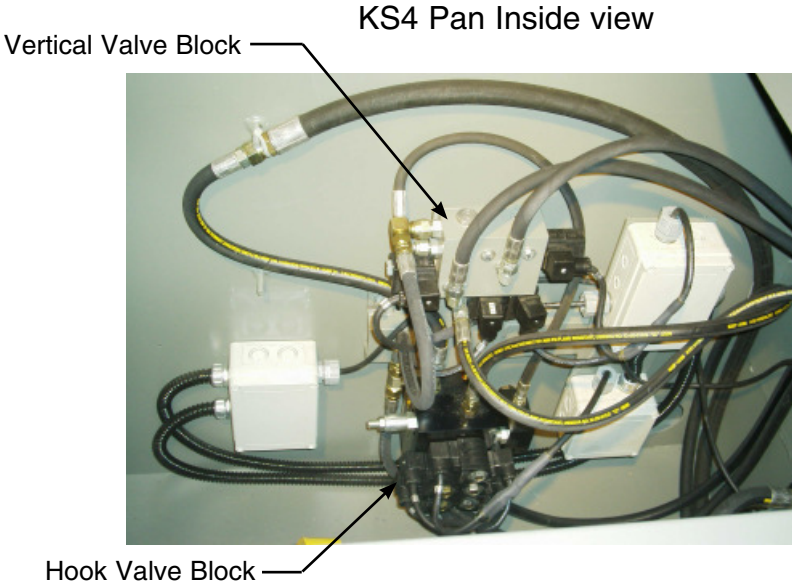
DO NOT ground welding equipment to any hydraulic or electrical components of the dock leveler. Always ground welding equipment to the dock leveler frame, NEVER to the platform.

Failure to follow these instructions may damage the motor, hoist cylinder, wiring, and/or control panel.

1. Review the Field Wiring Drawing and the certified pit drawing attached to this manual. The PowerHook KS4 vehicle restraint with a hydraulic dock leveler requires two separate 3/4” conduit runs from the control assembly to the junction box located at the rear pit wall. An additional conduit, if required, may be run either in a trench dug in the concrete or in a space between the pit walls and the dock leveler.
2. Install storage props on both side of the leveler and the safety pin on the maintenance prop.
3. Shut off all power to dock leveler control assembly.
4. Modify the underside of the dock leveler platform as indicated on the “Dock Leveler Modification Drawing(s)” attached to this manual.
5. Remove hydraulic fluid. To do so, locate the return port at the drive plate for the hydraulic pump. Set a catch vessel below the port. Remove the hose at the return port and allow the hydraulic fluid to drain from the reservoir. When the reservoir is empty, reinstall the hose. Dispose of the fluid properly.
6. Install restraint pan into the pit. Insert spreader bar into pan to reinforce during concrete pour. Make sure the pan’s square and flush with the pit floor and front dock wall.
7. Pour concrete around the truck restraint pan and Hoist cylinder trunnion plates(s) that is to be imbedded in the pit floor in the plate is separate from the pan.
8. Allow sufficient time for the concrete to set.
9. Assembly truck restraint (only required if pan was shipped separately).
   A. Remove all trunnion keepers.
   B. Grease cylinder trunnions.
   C. Install cylinders.
   D. Install all trunnion keepers and prox switches
   See adjustments See page 28
10. Modify dock leveler frame as needed per “Dock Leveler Modification Drawing”.
11. Install all hydraulic hose’s and fill system with approved hydraulic oil. See page 26
12. Install out side signs and lights
13. Finish all electrical connections.
14. Adjust and test leveler and restraint operations.



KS4 Pan Inside view



KS5 INSTALLATION

These installation instructions were written for retrofitting a Poweramp® hydraulic dock leveler with integral power pack with a PowerHook® KS5 Vehicle Restraint.

If you are not adding the PowerHook® to an existing dock leveler, some steps may not be needed or additional procedures may be required, as follows:

- When installing in new construction (i.e., new PowerHook and new Poweramp hydraulic leveler in a newly prepared pit), skip steps 1 through 6. Platform modifications, step 6 were completed prior to shipment.
- When installing PowerHook with a Poweramp hydraulic dock leveler which is powered by remote power pack or a CentraPower® system, refer to the manuals provide with those units as well as to page 15 in this manual.
- When installing Powerhook with a mechanical dock leveler or a hydraulic dock leveler manufactured by another company, the PowerHook must be equipped with a remote hydraulic power pack. See page 15 of this manual.

⚠ WARNING

Post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the dock leveler before installation has been completed.

Failure to follow the installation instructions can result in damage to dock leveler, the facilities, and/or serious personal injury or death.

IMPORTANT

DO NOT connect the dock leveler electrical wiring and ground connections until all welding has been completed.

DO NOT ground welding equipment to any hydraulic or electrical components of the dock leveler. Always ground welding equipment to the dock leveler frame, NEVER to the platform.

Failure to follow these instructions may damage the motor, hoist cylinder, wiring, and/or control panel.

1. Review the Field Wiring Drawing and the certified pit drawing attached to this manual. The PowerHook KS5 vehicle restraint with a hydraulic dock leveler requires two separate 3/4" conduit runs from the control assembly to the junction box located at the rear pit wall. An additional conduit, if required, may be run either in a trench dug in the concrete or in a space between the pit walls and the dock leveler. The dock leveler will be removed from the pit (steps 9-14) and reinstalled in the pit . If additional conduit is to be imbedded in the concrete, it may be best to do so when the dock leveler is not in the pit. If a surface route is planned, it may be better to install the conduit after returning the dock leveler to the pit.

2. Raise the platform, following instructions in the dock leveler owner's/user's manual, and support with the maintenance prop.

3. Attached lifting plates, supplied by others, to the outboard joists on both sides of the dock leveler. Use front hole on one side and rear hole on the other.

4. Shut off all power to dock leveler control assembly.

5. Disconnect all wires at the junction box located on the rear pit wall.

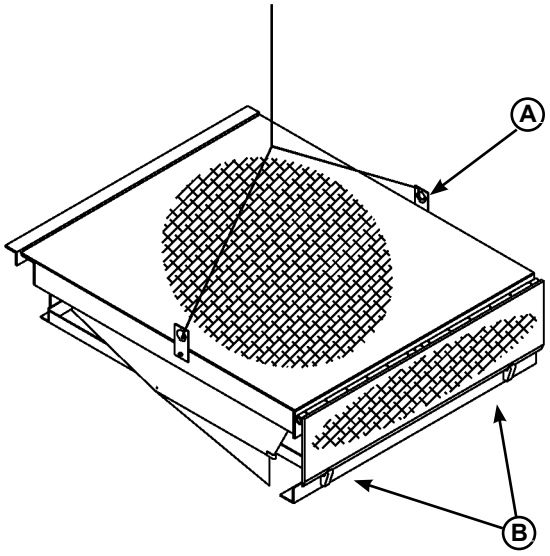
6. Modify the underside of the dock leveler platform as indicated on the "Dock Leveler Modification Drawing(s)" attached to this manual.

7. Remove hydraulic fluid. To do so, locate the return port at the drive plate for the hydraulic pump. Set a catch vessel below the port. Remove the hose at the return port and allow the hydraulic fluid to drain from the reservoir. When the reservoir is empty, reinstall the hose. Dispose of the fluid properly.

8. Use a fork truck (or other method) to raise and hold the dock leveler platform. Remove the maintenance prop.

9. Burn or grind all welds where the dock leveler frame is welded to steel imbedded in the pit.

NOTE: frame removal on 10' and 12' long CLEAN PIT® units may not be necessary. Consult factory.



A— Lifting Bracket (2 used) **B — Shipping Bands**

10. This set up is only required if the dock leveler is a CLEAN PIT® model.

    A. Burn or grind off welds where the maintenance prop and hoist cylinder trunnion box are welded to any steel imbedded in the pit.

    B. Refer to the CLEAN PIT Installation Instruction in the dock leveler owner's/user's manual. The center angle and the front angle, which were removed during the original installation, are to be reinstalled.

    NOTE: If the angles are supplied by Systems, Inc., the angles are shipped with the truck restraint pan unit.

11. Set the leveler platform in the cross traffic position (the lip fully folded, inside the lip keepers, and the platform level with the dock floor).

12. Place a shipping band through the lip hinge and around the front frame angle of the leveler. Secure the banding. The banding is to secure the frame angle to the platform when the leveler is removed from the pit.

13. Burn or grind all welds where the top rear frame angle of the dock leveler is welded to the rear pit curb angle.

14. Remove Dock leveler from the pit using the lifting brackets.

15. Cut pit for the truck restraint pan as indicated on the Pit Drawing.

16. Cut out or chip to accommodate 3/8" x 16" x 16" hoist cylinder trunnion plates (S) which must be imbedded into the pit floor as shown on the pit drawing. If the existing dock leveler is a CLEAN PIT model, it may be possible to reuse the existing plate. On eight foot long dock levelers the plate is an integral part of the truck restraint and a separate plate is not required. See table on page 15

17. Install restraint pan into the pit. Insert spreader bar into pan to reinforce during concrete pour. Make sure the pan's square and flush with the pit floor and front dock wall.

18. Pour concrete around the truck restraint pan and Hoist cylinder trunnion plates(s) that to be imbedded in the pit floor in the plate is separate from the pan.

19. Allow sufficient time for the concrete to set.

20. Assembly truck restraint (only required if pan was shipped separately).

    A. Remove all trunnion keepers.
    B. Grease cylinder truinons.
    C. Install cylinders.
    D. Install all trunnion keepers and prox switches
    See adjustments pg 28

21. Reinstall the dock leveler as indicated in the dock leveler manual. Do not complete electrical connections until all welding is complete.

22. Modify dock leveler frame as needed per "Dock Leveler Modification Drawing".

23. Install all hydraulic hose and fill system with approved hydraulic oil. See page 26

24. Install outside signs and lights

25. Finish all electrical connections.

26. Adjust and test leveler and restraint operations.

Existing Dock Leveler	Possible Cause	Hoist Cylinder Trunnion Plates
Length	CLEAN PIT Model	
6,10 or 12 Foot	NO	Supplied by others available from Systems Inc at extra costs.
8 Foot	NO	Supplied by Systems Inc (attached to KS5 pan)
6 Foot	YES	* Existing plate (s) must be removed since it is partially located in the concrete that is to be removed for the pan. Existing plate (s) can be reused if the integrity of the plate has not ben altered during its removal and if all the old concrete is chipped away from the anchors. * A new plate (s) is supplied by others or is available from Systems Inc at extra cost.
8 Foot	YES	Existing plate (s) must be removed since it is located in the area of the concrete that is to be removed for the pan. A new plate (s) is supplied by Systems Inc. Attached to pan). Dispose of old, existing plate.
10 or 12 Foot	YES	Existing plate (s) does not have to be removed since it is not in the area of the concrete that is to be removed for the pan. Existing plate (s) to be reused.

Installation Instructions for KS5 when dock leveler is power by a Centrapower.

1. Following step 1-4 of normal retrofit instructions, page 13.

   A. Disconnect and label the hydraulic hoses attached to the Centrapower Hydraulic valve assembly.

   B. Cap off all open fittings to prevent contamination.

2. Step 21. reinstall leveler.

3. Step 25 See VS KS4 manual on how to purge hydraulic system.

Additional instructions for KS5 when dock leveler is powered by a remote power pack.

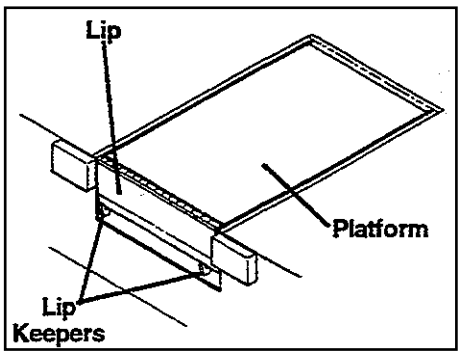
1. Drain power pack.

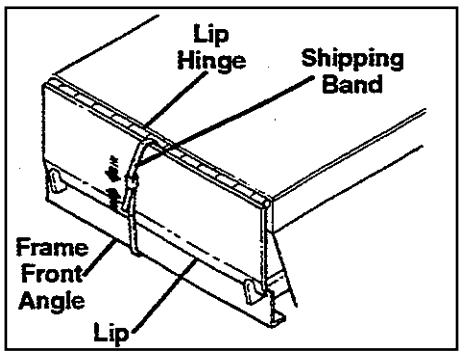
2. Disconnect and label hydraulic hoses that are attached to the logic block. The logic block is attached to the underside of the dock leveler platform.

   A. Cap Off all open fittings to prevent contamination.

   B. Tie off hoses to prevent damage when level is removed. Review the Field Wiring Drawing and the certified pit drawing attached to this manual.

3. Step 23, reconnect hoses to the logic block.





INSTALLATION

Powerhook Ks6 and Ks7 Installation instructions.

Additional installation procedures not given in this manual may be required. See the CENTRAPOWER manual for more information.

Preparation

1. Some units are shipped with the control assembly, bumpers and outside light assembly attached to the unit. Remove these items from unit prior to installing unit in pit. DO NOT remove the shipping bands at this time.

2. Remove all debris from the pit.

3. Check the pit dimensions with the certified pit drawing attached to this manual. Make sure that the walls of the pit are plumb and square with no bulges. Check dock height, location of imbed plates, and J-box.

Installing unit in pit

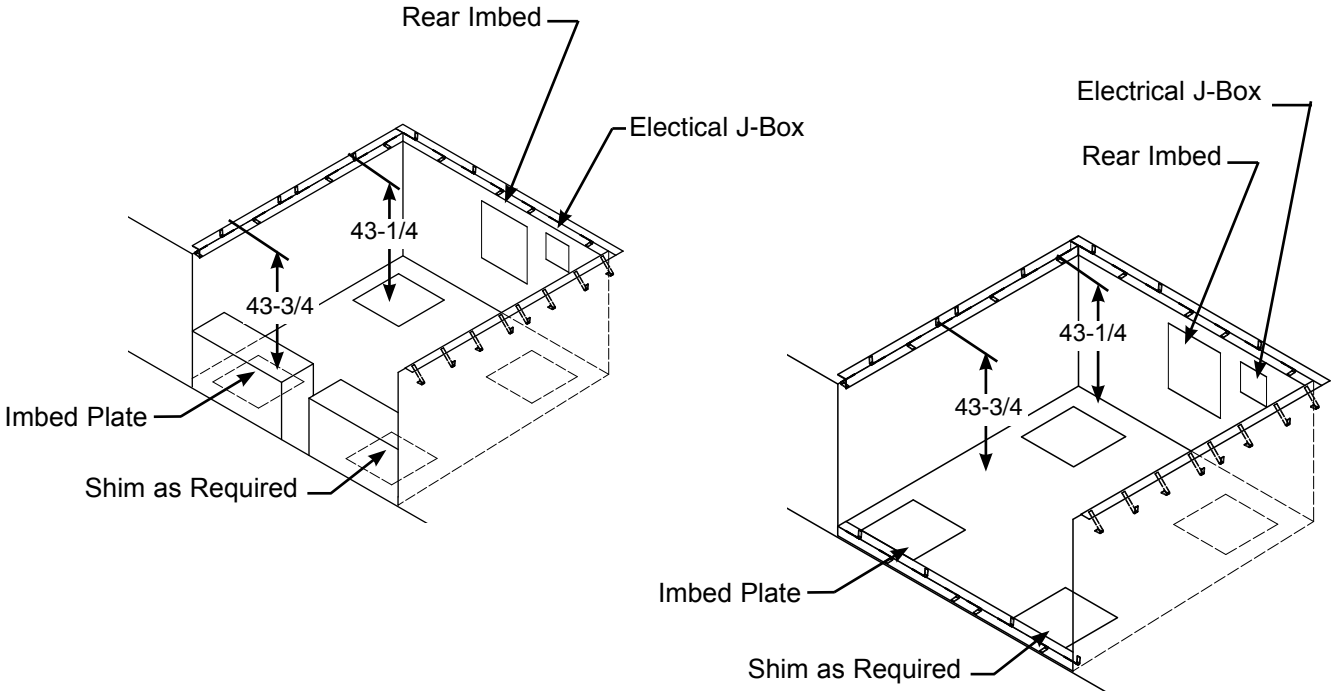
4. Place the shims for the front and rear of the leveler on the imbed plates in the pit floor. Position the shims so that the legs will rest firmly on the shims when the unit is lowered into the pit. Shim so that dimension from top of shims to dock floor is as shown. Recommended shim stock sizes see Figure 8

5. Install the leveler into the pit with the lifting brackets on the side of the platform. Perform the following checks before setting leveler into pit.
   A. Make sure the front and rear legs will rest securely on the shims set on the pit floor.
   B. Make sure the top rear frame angle of the dock leveler is tight against the rear curb angle and flush with the dock floor.
   C. Make sure there is equal clearance between the sides of the leveler platform and the pit walls.

6. Remove the shipping bands from the unit.

7. Use fork truck (or other method) to raise dock leveler platform.

8. Position shims under the hinge tubes of the maintenance prop so that the front panel support weldment is level. Recommended shim stock sizes see Figure 8



9. Use fork truck (or other method) to raise dock leveler platform to a height that will allow use of the maintenance prop. The maintenance prop is accessible when the platform is raised. The top of the prop should be positioned directly behind the front header plate of the platform. See Figure 4

10. Make sure that the front and rear legs are resting firmly and securely on the shims set on the pit floor. Do not weld shims at this time.

11. Use a fork lift (or other method) to raise the leveler platform. Remove the maintenance prop. Set the platform in the cross traffic position (lip fully folded, inside the keepers, and the platform level with the dock floor). See Figure 5.

12. Make sure the dock leveler deck is flush with the dock floor and that the top rear frame angle of the unit is tight against and flush with the rear pit curb angle. Raise platform install correct size shims. Check for equal clearance between the sides of the platform and the pit walls.

13. Weld the top rear frame angle to the rear pit curb angle. Weld behind each hinge tube of the leveler platform. See Figure 6

14. Powerhook KS6 units only: Tack weld the shims under the front legs to the legs, the plates imbedded in the pit floor, and to the pit front curb angle. This should be done from outside the pit prior to raising platform. See Figure 6

15. Repeat step 9.

16. Finish weld all shims to unit and, where possible, to plates or pit curb angles. Weld shims together where stacked

17. Refer to Figure 8.
    A. On levelers with single hoist cylinder, shim the hoist cylinder support so that the center channels are level. Weld shims in place.
    B. On levelers with dual hoist cylinders, shim under the cylinder supports so that the side channels are level. In addition, shim under the center beam support so that the center beam is level. Weld all shims in place.

18. Weld fish plates to the center channels of the leveler and to the plate imbedded in the rear pit wall. refer for recommended fish plate sizes and location. Figure 7

19. Clean and paint all welds

20. Weld and/or bolt bumpers in place on face of dock. Refer to certified Pit Drawing.

21. If leveler is part of a Centrapower system or if the power pack is located remotely, connect the hydraulic hoses to the dock leveler as indicated in the Centrapower manual instructions

22. Check the hydraulic fluid level. Standard units are shipped with the reservoir full. However, fluid level should be checked before operation unit for the first time to make sure no fluid loss occurred during shipment or installation. See the Preventative Maintenance Section.

    Note: For Centrapower or remote power pack units, see appropriate instructions

23. If the electrical installation is to be preformed at a later date, use a fork lift to set the unit in the cross traffic position (lip fully folded, inside the lip keepers and the platform level with the floor).

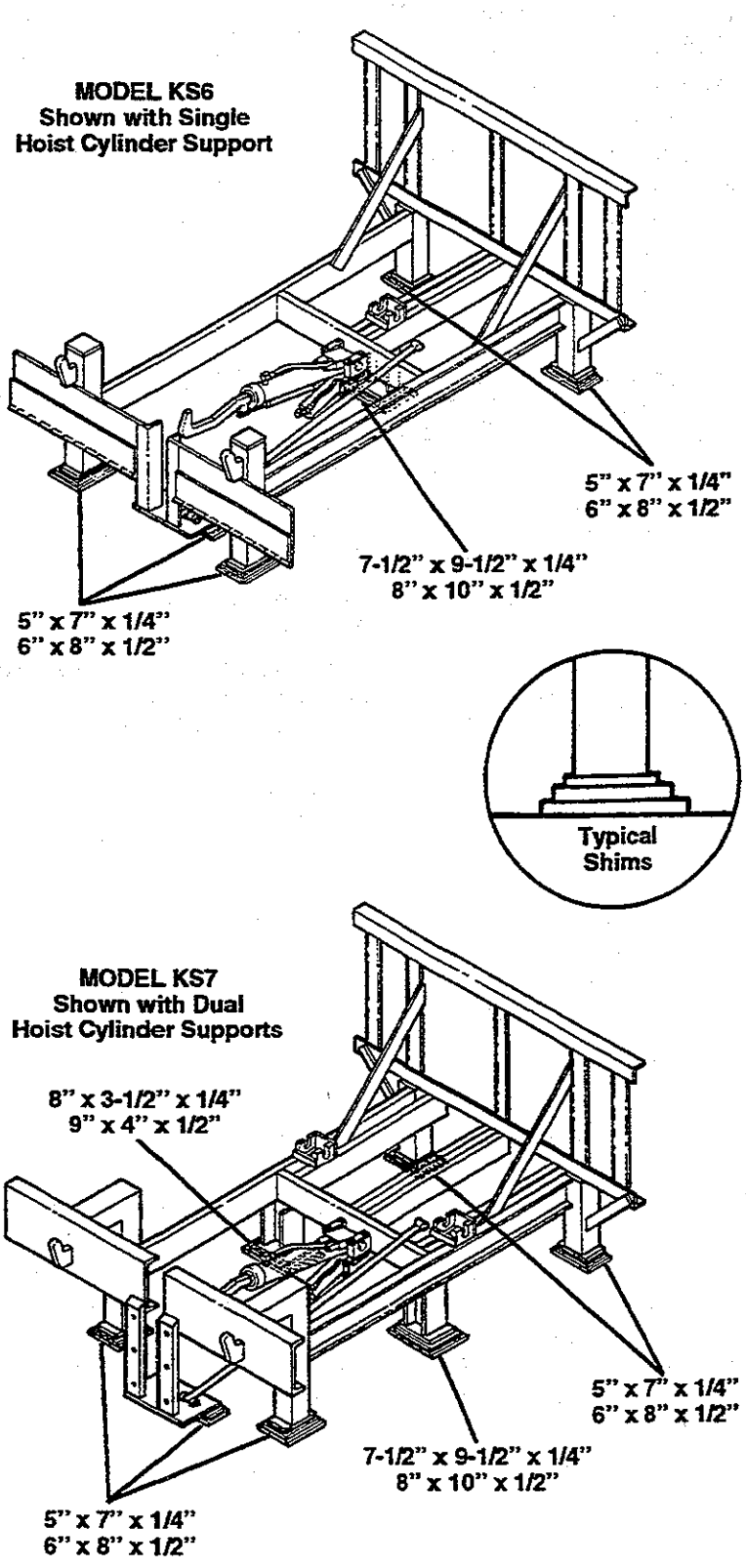

MODEL KS6
Shown with Single
Hoist Cylinder Support
5" x 7" x 1/4"
6" x 8" x 1/2"
7-1/2" x 9-1/2" x 1/4"
8" x 10" x 1/2"
5" x 7" x 1/4"
6" x 8" x 1/2"
Typical
Shims
MODEL KS7
Shown with Dual
Hoist Cylinder Supports
8" x 3-1/2" x 1/4"
9" x 4" x 1/2"
5" x 7" x 1/4"
6" x 8" x 1/2"
7-1/2" x 9-1/2" x 1/4"
8" x 10" x 1/2"
5" x 7" x 1/4"
6" x 8" x 1/2"

Figure 8

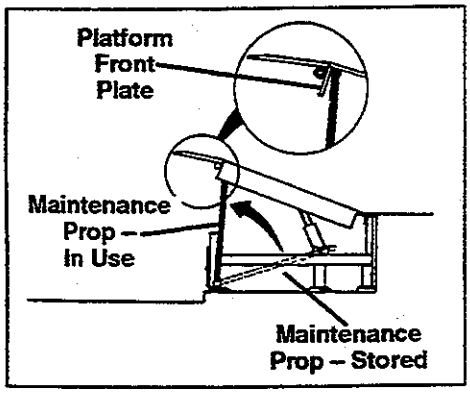


Fig. 19. Maintenance Prop In Position

Figure 4

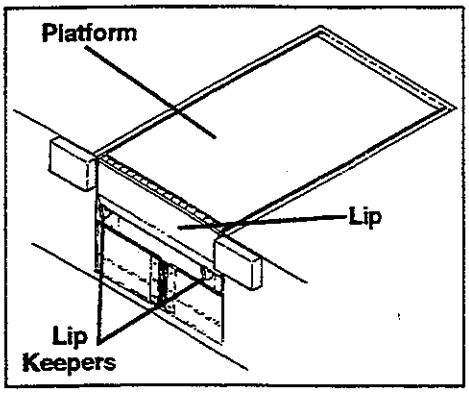


Fig. 20. Dock Leveler In Cross Traffic Position

Figure 5

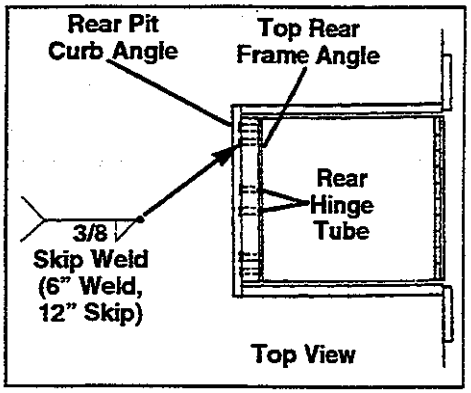


Figure 6

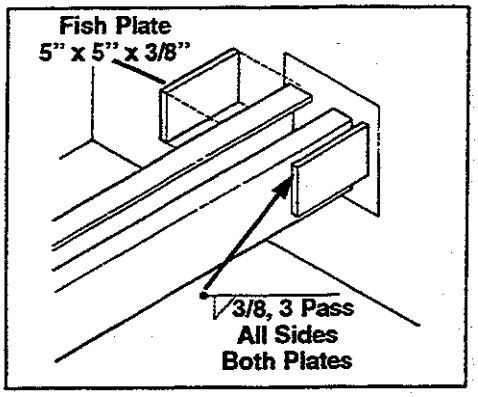
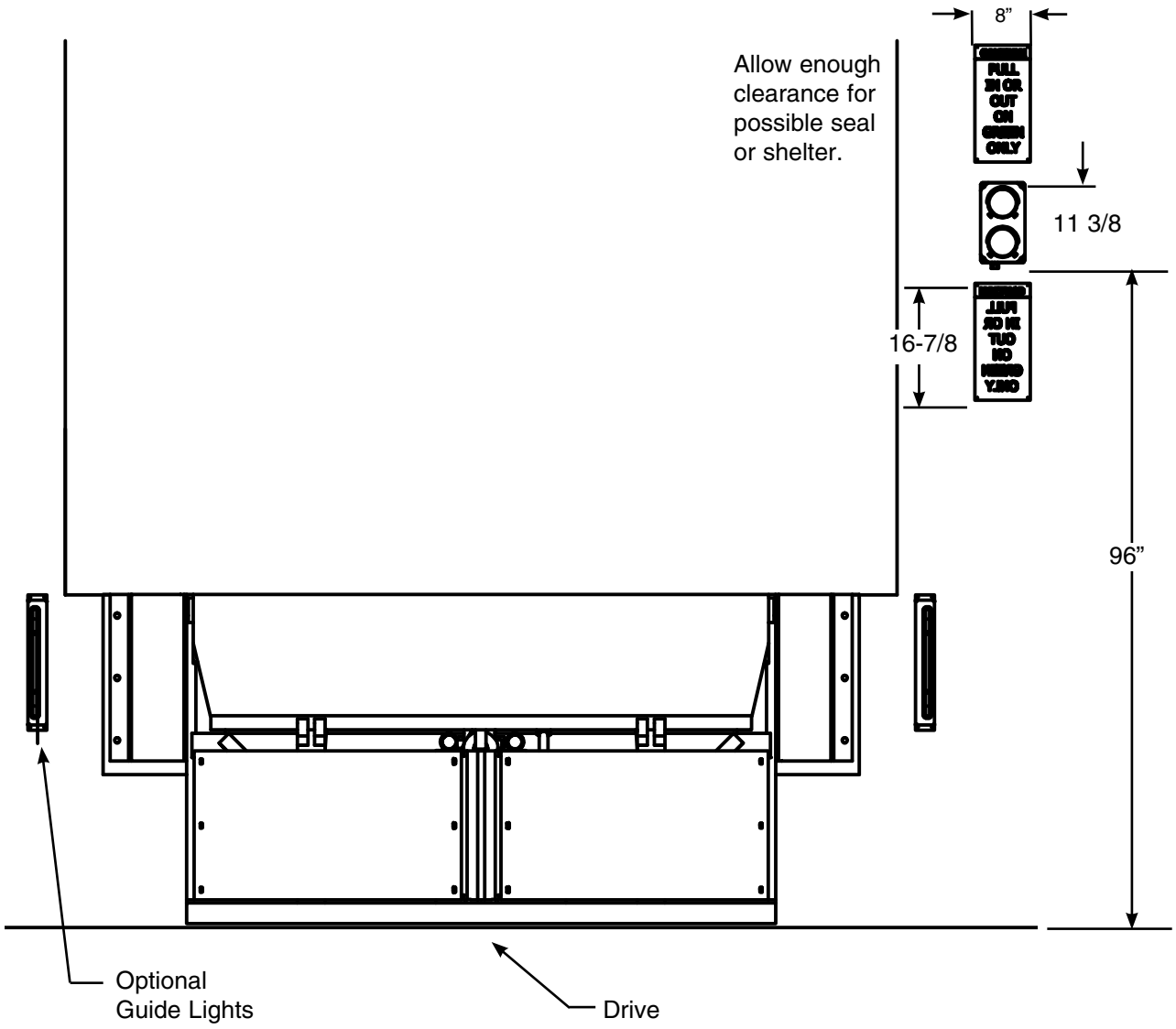


Figure 7



KS6 Dock Leveler

Operating Instructions

DANGER

Stay clear of dock leveler when freight carrier is entering or leaving dock area.

DO NOT move or use the dock leveler if anyone is under or in front of leveler.

Keep hands and feet clear of pinch points. Avoid putting any part of your body near moving parts.

Failure to follow these instructions may result in severe personal injury or death.

WARNING

Only trained personnel should operate the dock leveler and truck restraint.

DO NOT use a broken or damaged dock leveler or truck restraint. Make sure proper service and maintenance procedures have been performed on equipment before using.

Truck/trailer wheels must be chocked unless the truck restraint is used. Never remove the wheel chocks until loading/unloading is finished and truck driver has been given permission to leave.

Make sure platform lip rests on the truck/trailer bed with at least 4 in. (102 mm) of overlap.

Maintain a safe distance from side edges of leveler during the loading/unloading process.

Failure to follow these instructions may result in serious personal injury or death.

WARNING

DO NOT overload the dock leveler.

DO NOT operate any equipment while under the influence of alcohol or drugs.

DO NOT leave equipment or material unattended on the dock leveler.

Failure to follow these instructions may result in personal injury and/or damage to equipment.

OPERATION

SEQUENCE OF OPERATION - NORMAL

1. Check that the truck/trailer is positioned squarely against the dock bumpers.
   - Inside Red Light
   -Outside Green Light

2. Push ENGAGE button to activate restraint.
   - Inside Red Light
   -Outside Green Light

3. Visually inspect restraint for proper engagement.

   If RIG (Rear Impact Guard) is damaged or missing, dock leveler can be used in BYPASS

   IF BYPASS MODE IS REQUIRED
   SEE: SEQUENCE OF OPERATION - BYPASS

   FOR NORMAL OPERATION AFTER TRAILER RIG IS ENGAGED CONTINUE WITH: STEP 4

4. Position dock leveler onto truck/trailer.

5. When loading or unloading is complete, return dock leveler to the stored position.

6. Release truck restraint and/or remove chocks from truck/trailer wheels.

SEQUENCE OF OPERATION - BYPASS

1. Check that the truck/trailer is positioned squarely against the dock bumpers.

2. Push ENGAGE button to activate restraint.
   - Inside Red Light
   -Outside Green Light

3. Visually inspect restraint for proper engagement.

   If RIG (Rear Impact Guard) is damaged or missing dock leveler can be used in BYPASS.

4. If RIG (Rear Impact Guard) is damaged or missing, hook will automatically return to the stored position.
   -Inside Amber Light for 30 seconds, then Red
   -Outside Red Light for 30 seconds, then Green

5. Secure truck/trailer wheels with wheel chocks.

6. Use key to activate BYPASS mode.
   -Inside Green Light with Amber Caution Light
   -Outside Red Light and Strobe

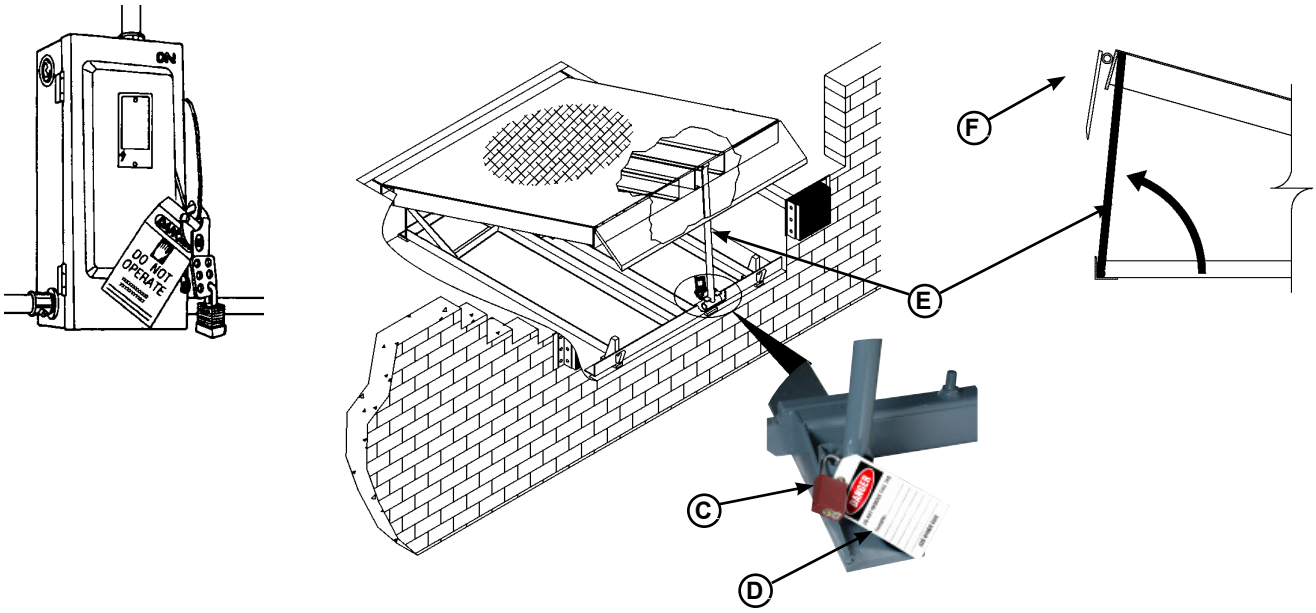
7. Position dock leveler onto truck/trailer

8. When loading or unloading is complete, return dock leveler to the stored position.
   -Inside Green Light with Amber Caution Light
   -Outside Red Light

9. Reset BYPASS mode to NORMAL mode by pressing the LOCK button once.
   -Inside Red Light, Amber turns Off
   -Outside Green Light
   -Pressing the LOCK button during any part of the cycle will end the BYPASS mode
   -Pressing the LOCK button a second time will cycle the PowerHook.

10. Remove wheel chocks from the truck/trailer wheels when truck is ready to depart.

Service Dock Leveler/Restraint Safely



A— Tag out Device B — Lockout Device C — Lockout Device D — Tag out Device E — Maintenance Prop F — Header Plate

WARNING

When service under the dock leveler is required, always lock all electrical disconnects in the OFF position after raising the platform and engaging the maintenance prop. Failure to do this may result in serious personal injury or death.

WARNING

Always stand clear of the dock leveler lip when working in front of the dock leveler.

The maintenance prop MUST be in the service position when working under the dock leveler. For maximum protection, use an OSHA approved locking device to lock the maintenance prop in the service position. Only the person servicing the equipment should have the key to unlock the maintenance prop.

Unless the dock leveler is equipped with a tethered remote, two people are required to engage the maintenance prop: one person to operate the unit, the other person to engage the maintenance prop.

Failure to follow these instructions may result in serious personal injury or death.

WARNING

Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the dock leveler before maintenance is complete. Failure to do this may result in serious personal injury or death.

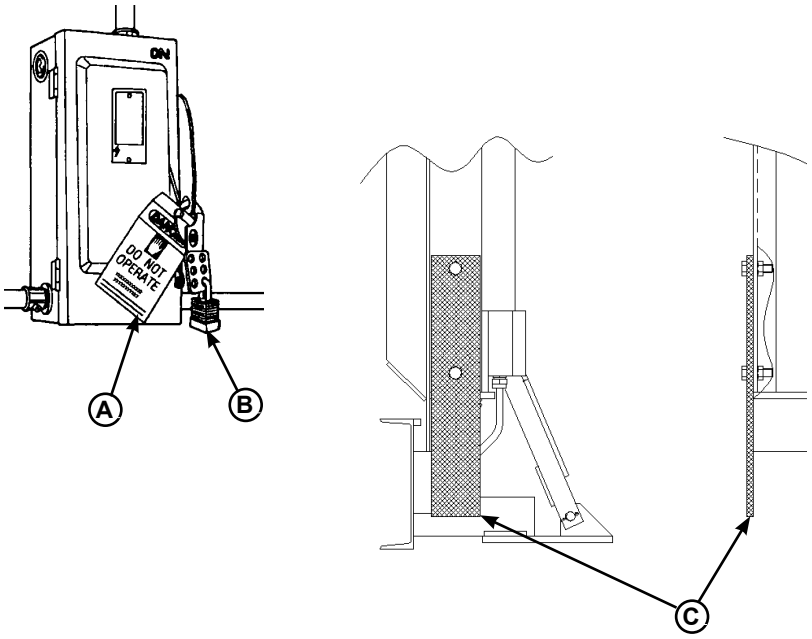
Whenever maintenance is to be performed under the dock leveler platform, support the platform with maintenance prop (E). Position the maintenance prop behind front header plate (F) while staying clear of the lip. The lip will fold down after the platform has rested on the maintenance prop. Lock the maintenance prop in the service (upright) position using an OSHA approved lockout device* (C) and Tag out device* (D).

Whenever servicing the dock leveler, lock the electrical power disconnect in the OFF position. Use only an OSHA approved lockout device* (B) and Tag out device (A).

Only the person servicing the equipment should have the capability to remove the lockout devices. The Tag out devices* must inform that repairs are in process and clearly state who is responsible for the lockout condition.

* Refer to OSHA regulation 1910.147.

Service Dock Leveler/Restraint Safely



WARNING

When service under the dock leveler is required, always lock all electrical disconnects in the OFF position after raising the platform and engaging the maintenance prop. Failure to do this may result in serious personal injury or death.

WARNING

Always stand clear of the dock leveler lip when working in front of the dock leveler.

The maintenance prop MUST be in the service position when working under the dock leveler. For maximum protection, use an OSHA approved locking device to lock the maintenance prop in the service position. Only the person servicing the equipment should have the key to unlock the maintenance prop.

Unless the dock leveler is equipped with a tethered remote, two people are required to engage the maintenance prop: one person to operate the unit, the other person to engage the maintenance prop.

Failure to follow these instructions may result in serious personal injury or death.

WARNING

Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the dock leveler before maintenance is complete. Failure to do this may result in serious personal injury or death.

When maintenance is to be performed on the dock leveler, First install the SAFETY bolt in the storage prop. Second support the platform with maintenance props (D). ***Caution***: The lip may will fold down after the platform has rested on the maintenance prop.

Whenever servicing the dock leveler, lock the electrical power disconnect in the OFF position. Use only an OSHA approved lockout device* (B) and tagout device (A).

Only the person servicing the equipment should have the capability to remove the lockout devices. The tagout devices* must inform that repairs are in process and clearly state who is responsible for the lockout condition.

* Refer to OSHA regulation 1910.147.

Daily Maintenance

- Make sure that all the Inside and Outside signal lights work.

Weekly Maintenance

- Operate the dock leveler and PowerHook through the complete operating cycle to maintain lubrication.

Quarterly Maintenance

- Lubricate the following areas with white lithium grease:

  (A)— Hook cylinder trunnions
  (B) — Position cylinder trunnions.
  (C) — Inspect Prox harness.
  (D) — Inspect Hoses.

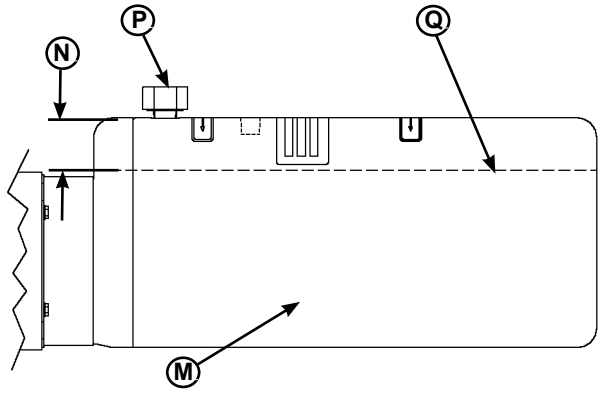
Yearly Maintenance

- Lubricate the following areas with white lithium grease:

  (A)— Hook cylinder trunnions
  (B) — Position cylinder trunnions.
  (C) — Inspect Prox harness
  (D) — Inpesct Hoses.
  (E) — Change Hydraulic Oil (May be required earlier depending on conditions).

IMPORTANT

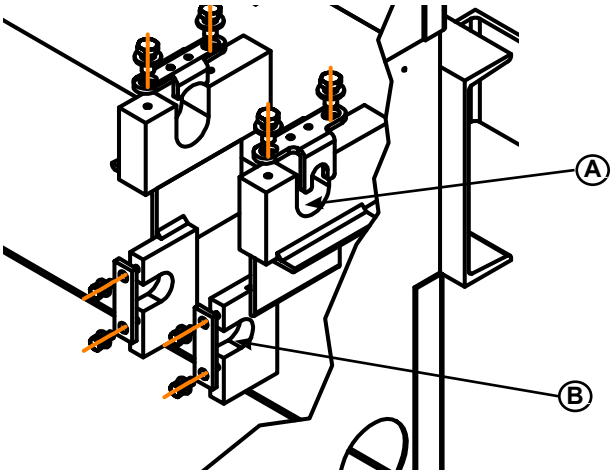
A low fluid level or the use of hydraulic fluids not equivalent to the fluid types recommended, will cause abnormal operation of the leveler and WILL void warranty.



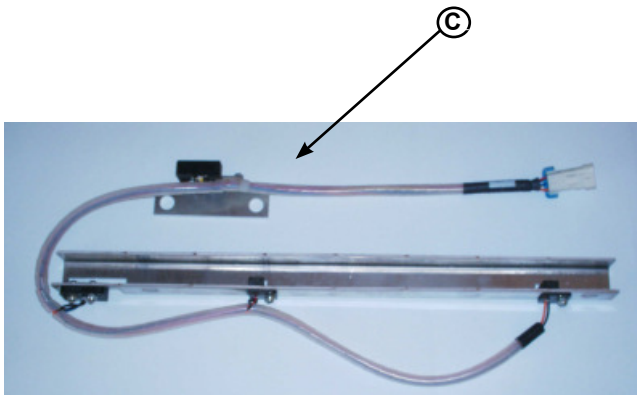
M — Reservoir
N — 2 in. (51 mm) (From Top of Reservoir)
P — Breather Cap
Q — Fluid Level

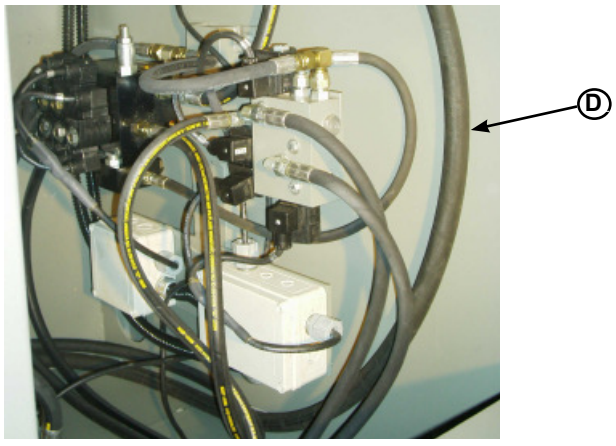
IMPORTANT

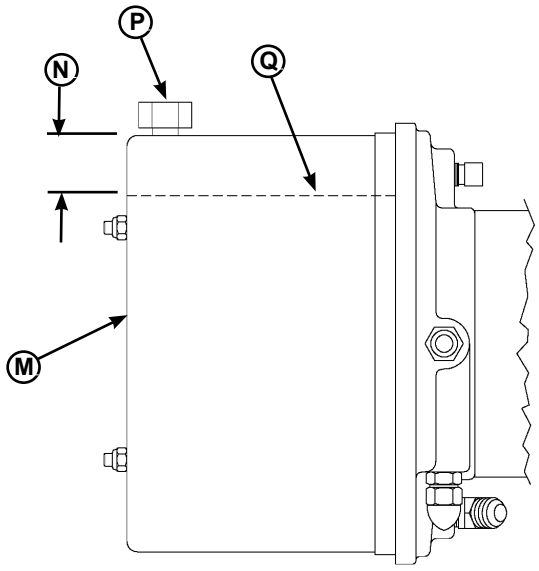
Failure to properly lubricate the Truck Restraint will cause abnormal operation.



KS4 Pan Wldt for Manual







M — Reservoir
N — 2 in. (51 mm) (From Top of Reservoir)
P — Breather Cap
Q — Fluid Level

KS4 Only

- Check reservoir fluid level (Q):

1. Put the leveler in the stored position Lip folded.
2. Turn OFF all electrical power to the leveler.
3. Remove breather cap (P).
4. Measure fluid level. The fluid level should be approximately 2 in. (51 mm) (N) from top of reservoir (M).
5. Add hydraulic fluid if necessary. Use only recommended fluid.
6. Install breather cap.
7. Turn ON electrical power to the leveler.

KS5 or KS6 and KS7

- Check reservoir fluid level (Q):

1. Put the dock leveler platform at the full below-dock position.
2. Turn OFF all electrical power to the leveler.
3. Remove inspection plate.
4. Remove breather cap (P).
5. Measure fluid level. The fluid level should be approximately 2 in. (51 mm) (N) from top of reservoir.
6. Add hydraulic fluid if necessary. Use only recommended fluid.
7. Install breather cap and inspection plate.
8. Turn ON electrical power to the leveler.
9. Return the platform to the cross-traffic position.

IMPORTANT

Use of fluids that do not have equivalent specifications to those in the following list will result in abnormal operation of the dock leveler and voiding of warranty.

To ensure normal operation of the truck restraint, use only aircraft hydraulic fluid designed to meet or exceed military specification MIL-L-5606. It is recommended that the following hydraulic fluids be used:

- Flomite 530 ZF
- Ultra-Vis HV1-15
- Aero Shell Fluid 4 or Fluid 41
- Mobil Aero HFA Mil-HS606A or Aero HF
- Texaco Aircraft Hydraulic Oil 15 or 5606
- Exxon Univis J13

These fluid brands can be mixed together. Mixing with fluids that do not meet or exceed MIL-L-5606 may damage the equipment and WILL void warranty. Use of hydraulic fluids with equivalent specifications to those listed here are acceptable.

Testing PowerHook Operating Range

WARNING

When service under the dock leveler is required, always lock all electrical disconnects in the OFF position after raising the platform and engaging the maintenance prop. Failure to do this may result in serious personal injury or death.

WARNING

Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the dock leveler before maintenance is complete. Failure to do this may result in serious personal injury or death.

WARNING

Always stand clear of the dock leveler lip when working in front of the dock leveler.

The maintenance prop MUST be in the service position when working under the dock leveler. For maximum protection, use an OSHA approved locking device to lock the maintenance prop in the service position. Only the person servicing the equipment should have the key to unlock the maintenance prop.

Unless the dock leveler is equipped with a tethered remote, two people are required to engage the maintenance prop: one person to operate the unit, the other person to engage the maintenance prop.

Failure to follow these instructions may result in serious personal injury or death.

Follow the installation instructions found in the PowerHook Installation & Operation Manual prior to attempting any adjustments.

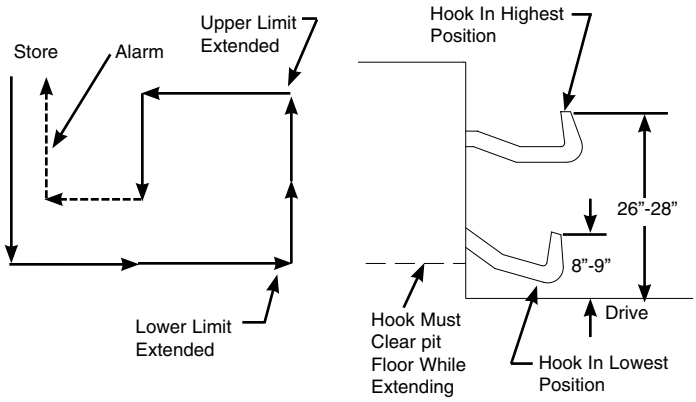
With the PowerHook installed in the hook pan and power supplied to the pump/motor, proceed with the PowerHook adjustments.

NOTE: Test operating range of PowerHook without truck/trailer backed into dock.

1. Position the selector switch in the Normal position, make sure BYPASS mode has not been activated.
   -Red Inside Light, No Amber Light
   -Green Outside Light

2. Momentarily press the ENGAGE button. Hook should lower, fully extend, fully raise, partially retract, lower, and then fully retract.
   -Inside Amber Light for 30 seconds, then Red
   *Alarm will sound if equipped
   -Outside Red Light for 30 seconds, then Green

3. Measure upper and lower limits of operating range. The upper and lower limits of the vertical operating range should be 26”-28” and 8”-9” respectively (Application Dependent).



NOTE: Hook cannot be stopped while cycling. To obtain measurements place tape measure next to the moving hook.

IMPORTANT: The upper and lower limits of the operating range will vary with application pit depth. These limits may not be attainable if variations in dock height and/or pit depth exist. Consult factory if this situation occurs.

Adjust PowerHook Operating Range

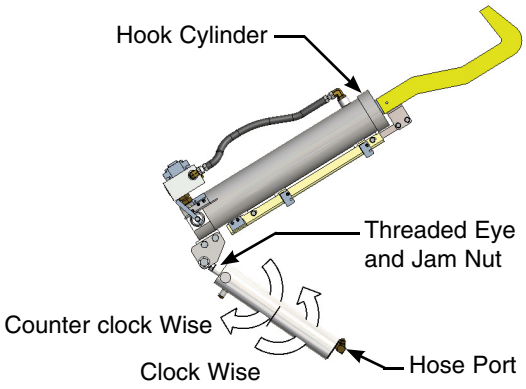


Figure 10

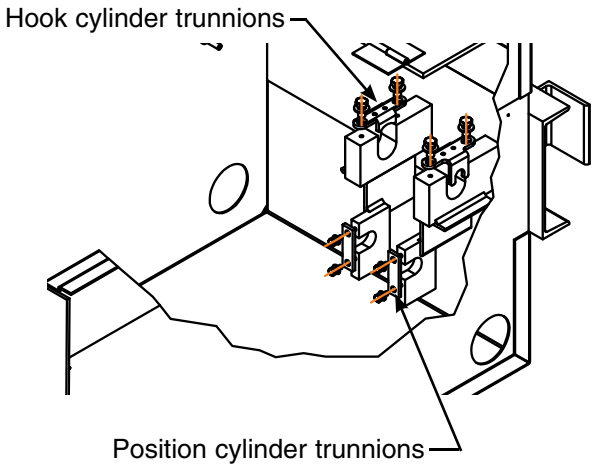


Figure 11

1. Adjust the upper vertical limit of PowerHook operating range if necessary.

   A. Locate the hook cylinder assembly and the hold down cylinder assembly. The length of the threaded eye on the hold down cylinder will determine the upper vertical limit of the hook movement.

   B. Disconnect the Hydraulic hose from the hold down cylinder. Cap off the open fittings to prevent fluid loss and to prevent contamination from entering the system.

   C. Remove the keepers from the hold down cylinder trunnion.

   D. Lift up on the hook cylinder. This will allow the hold down cylinder to exit the trunnion.

   E. Support hook cylinder, loosen the jam nut that is on the threaded eye of the hold down cylinder.

Adjust PowerHook Operating Range

1. Adjust the lower vertical limit of hook operating range if necessary.

   A. Locate the proximity switch that is mounted in the bracket located on the trunnion for the hook cylinder. Locate the target for the switch. See Figure 12.

NOTE: The position of the target in relation to the switch will determine the lower travel limit of the hook. When the hook lowers, the target is positioned into the sensing area of the proximity switch. The switch is activated when the target is sensed, at which time Input 3 on the PLC should be ON.

At no time should the target come into direct contact with the switch.

The typical factory set position for the target is at the 10 o'clock position looking at it from the side with the hook lowered sensor at 12 o'clock.
See Figure 13

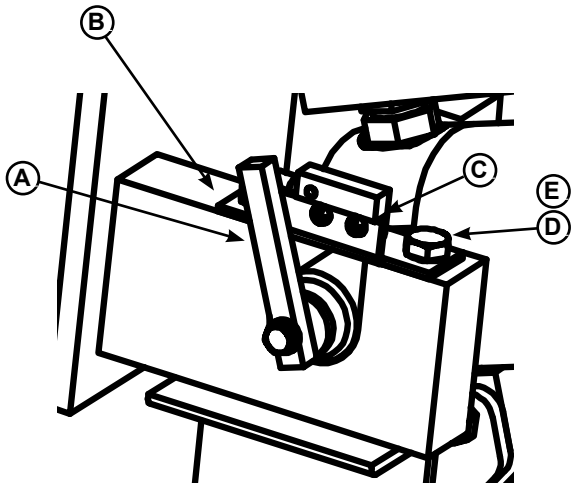


Figure 12

A— Hook Lowered Sensor Target Bar
B—Powerhook Hold Down Weldment
C— Hook Lowered Sensor Bracket
D—Flat Washer
E— Trunnion Bolt

   B. Loosen the bolt that holds the target.

   C. **Lower Hook**: Turn the target 2-4 degrees *counterclockwise* if top of the hook is greater than 9".

   D. **Raise Hook**: Turn the target 2-4 degrees *clockwise* if the top of the hook is less than 8".

   E. Repeat Steps C or D until the lower vertical limit of the top of hook is 8"-9" above the apron. When adjustments are completed hold the target in place and tighten the bolt.

2. Test with truck/trailer or a ICC bar simulator. (The simulator must span min of 6" past both sides of pan)

3. Press the ENGAGE button. Truck restraint hook should lower, extend, raise, and retract until it locks onto the ICC bar. Power pack should then shut off.

4. Check lights.
   -Inside Green
   -Outside Red

5. Test dock leveler operation. See dock leveler Owner's Manual.

6. Checking of Alarm (if equipped) and Lights for Premature Truck Departure can be accomplished by having a truck attempt to pull away from an engaged hook. It is **not recommended** due to potential damage to RIG bars that may not be up to current strength standards.

7. Press RELEASE button. The PowerHook should disengage from the RIG bar and restore behind the dock wall. Power pack should then shut off.

8. Check Lights
   -Inside Light Red
   -Outside Light Green

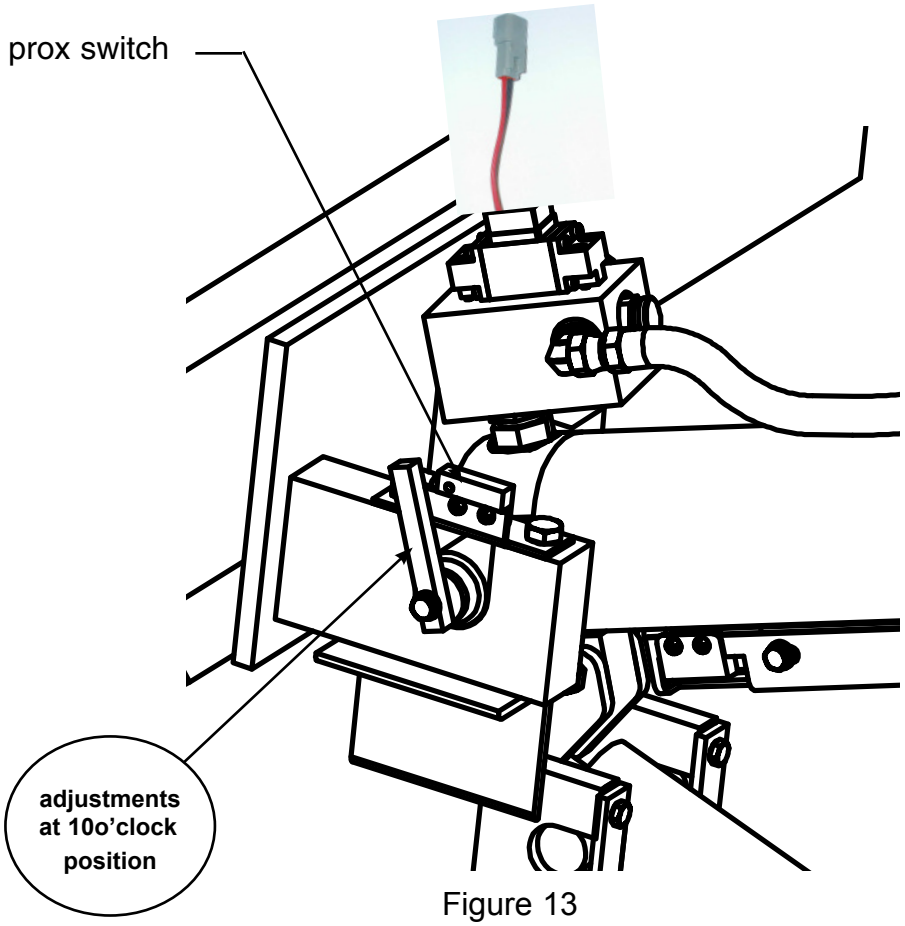


Figure 13

Powerhook Pressure relief Adjustment.
The pressure relief on a Powerhook is not adjusted by the relief mounted on the pump. The pressure relief is regulated by the relief mounted on the Big block.

On KS6 and KS7 restraints the relief is preset from the factory and normally is not touched. KS4 and KS5 truck restraints of some SC hooks the relief must be adjusted during installation.

Locate the hook cylinder assembly and the hold down cylinder assembly. See Figure 10. The length of the threaded eye on the hold down cylinder will determine the upper vertical limit of the hook movement.

A. Raise Leveler on to the maintenance prop and lock in place.

B. Remove wire (36) from input #3 on the PLC.

C. Loosen lock nut and turn valve RV counter clockwise until the valve stops.

E.Press the engage button the motor will run but the hook will not move. Turn the RV valve clockwise until the hook lowers to 2" off the bottom of the pan then add one full turn clockwise and lock in place. If the PLC shuts down the motor before adjustments have been reset the and continue were PLC shut off.

F.Re install wire (36) for input #3 on the PLC.

G.Test hook for proper operation.

Adjust Dock Leveler and Truck Restraint Interlock

WARNING

When service under the dock leveler is required, always lock all electrical disconnects in the OFF position after raising the platform and engaging the maintenance prop. Failure to do this may result in serious personal injury or death.

WARNING

Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the dock leveler before maintenance is complete. Failure to do this may result in serious personal injury or death.

WARNING

Always stand clear of the dock leveler lip when working in front of the dock leveler.

The maintenance prop MUST be in the service position when working under the dock leveler. For maximum protection, use an OSHA approved locking device to lock the maintenance prop in the service position. Only the person servicing the equipment should have the key to unlock the maintenance prop.

Unless the dock leveler is equipped with a tethered remote, two people are required to engage the maintenance prop: one person to operate the unit, the other person to engage the maintenance prop.

Failure to follow these instructions may result in serious personal injury or death.

With the PowerHook installed in the hook pan and power supplied to the pump/motor, proceed with the PowerHook adjustments.

Note: Test operating range of PowerHook without truck/trailer backed into dock.

Dock Leveler and Truck restraint Interlock

The dock leveler can be interlocked with the truck restraint so that the leveler cannot be operated until the restraint has engaged the truck/trailer RIG (Rear Impact Guard) when the OPERATION switch is in NORMAL and has NOT been switched to BYPASS.

The truck restraint is interlocked with the dock leveler so that the restraint cannot be operated until the leveler is stored in the cross traffic position (lip fully folded, inside the keepers, and the platform level with the dock floor).

Leveler and restraint interlocking are overridden when the OPERATION switch is in BYPASS. Thie allows the independent operation of the leveler (the restraint cannot be operated in BYPASS).

Pressing the restraint ENGAGE button when in BYPASS mode will return the leveler to NORMAL operating mode.

This option is not available on units equipped with the Auto Return to Dock option.

WARNING

When service under the dock leveler is required with power on. The platform must be on the maintenance prop and locked out. The are must be marked with safety cones and sighs Failure to do this may result in serious personal injury or death.

OPTIONAL EQUIPMENT ADJUSTMENTS

Adjust & Test Dock Leveler and Truck Restraint Interlock

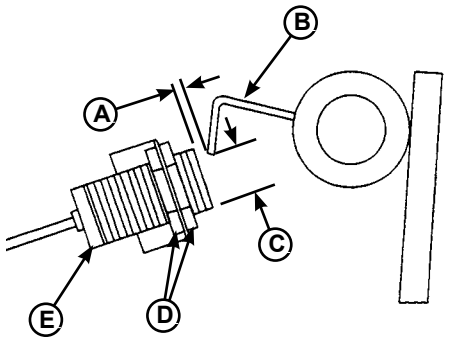


Figure 37

A— 1/4 in. (6.4 mm) Approximate
B— Target
C— 1 in. (25.4 mm) Approximate
D— Lock Nuts
E— Proximity Switch

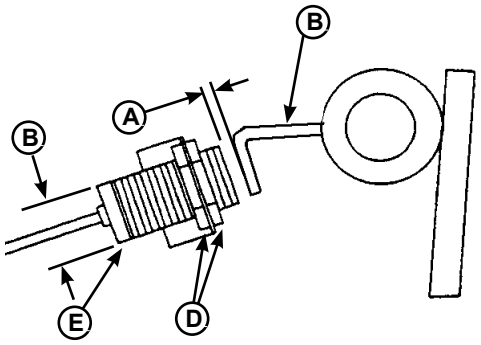


Figure 38

A— 3/16 in. (6.4 mm) Approximate
B— Target
C— 1 in. (25.4 mm) Approximate
D— Lock Nuts
E— Proximity Switch

1. The dock leveler should be in the cross traffic position (stored in the lip keepers) before beginning tests.

2. Back a truck/trailer with RIG bar into dock. A test fixture may be used to simulate the RIG bar. Use care to avoid damage to the equipment or harm to the operator.

3. Press the RAISE push button. The dock leveler should NOT raise. If the leveler did not raise, proceed with step 4. If the leveler did raise, decrease dimension “A” or “B”, Figure 37, so that the target is in the sensing range of the switch. Typical factory settings for “A” and “B” are approximately 3/4” and 1/8” respectively. Make adjustments at switch (dimension B) and/or target (dimension A) until leveler does not raise when the truck restraint is not engaged at truck trailer RIG bar.

4. Momentarily press the ENGAGE button. The truck restraint will be activated and the restraint will engage the truck/trailer RIG bar.

5. Raise the dock by pressing the RAISE button until the lip is fully extended. Release the RAISE button. The leveler will drop to the floor of the truck/trailer. If a RIG test fixture is used it should allow the leveler to drop to the full below dock position without the contact between the lip and test fixture.

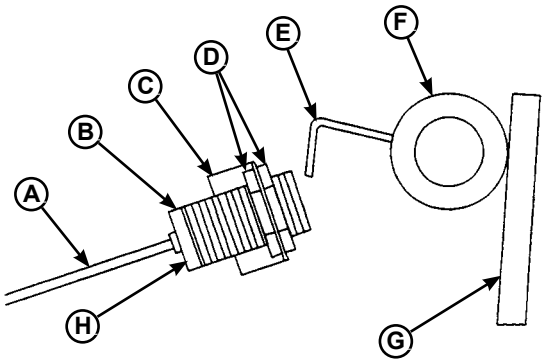
6. Press the RELEASE button. The truck restraint should NOT disengage from the truck/trailer RIG bar or test fixture. If the restraint did NOT engage, proceed with step 7. If the restraint DID disengage, move the switch farther from the target or bend the target so that the target is not in the sensing range of the switch as shown in Figure 38. Make adjustments at switch and/or target until restraint does not disengage truck/trailer.

   IMPORTANT: If adjustments are required in this step, make sure that the interlocking described in step 3 is still in effect after step 6 adjustments are complete.

7. Press the RAISE push button. The dock leveler will raise. The leveler lip will fold as the platform raises. When the lip is fully folded, release the RAISE push button. The leveler will descend to the cross traffic position.

8. Momentarily press the RELEASE button. The truck restraint will return to the stored position.

Adjust Auto Return To Dock (ARTD)



A— Cable
B— Proximity Switch
C— Bracket
D— Lock Nuts
E— Target
F— Lip Hinge Tube
G—Platform Lip
H— Indicator Light

Standard leveler with Powerhooks are equipped with Interlock unless leveler has option of Auto Return To Dock (ARTD).

The ARTD allows the platform to automatically return to the cross-traffic (stored) position after the truck departs. The ARTD uses a proximity switch (B) located under the platform and a piece of angled steel called the target (E) that is attached to the lip hinge tube (F).

The PLC provides a six-second delay after the platform has lowered to the full below-dock position, after which, the platform will return to the cross-traffic position. The switch also contains an indicator light (H) that can be used for diagnosing and adjusting the switch.

NOTE: The proximity switches has an indicator light at the back of the housing and some have the light at the side of the housing.

WARNING

When service under the dock leveler is required, always lock all electrical disconnects in the OFF position after raising the platform and engaging the maintenance prop. Failure to do this may result in serious personal injury or death.

Adjust the ARTD as Follows:

1. Raise platform fully and engage the maintenance prop in the service position. Allow platform to rest on the prop so the lip will fully fold until it contacts the lip stops.

2. Turn OFF all electrical power to the dock leveler. Attach safety lockout and tag-out devices.

WARNING

When service under the dock leveler is required with power on. The platform must be on the maintenance prop and locked out. The are must be marked with safety cones and sighs Failure to do this may result in serious personal injury or death.

WARNING

Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the dock leveler before maintenance is complete. Failure to do this may result in serious personal injury or death.

WARNING

Always stand clear of the dock leveler lip when working in front of the dock leveler.

The maintenance prop MUST be in the service position when working under the dock leveler. For maximum protection, use an OSHA approved locking device to lock the maintenance prop in the service position. Only the person servicing the equipment should have the key to unlock the maintenance prop.

Unless the dock leveler is equipped with a tethered remote, two people are required to engage the maintenance prop: one person to operate the unit, the other person to engage the maintenance prop.

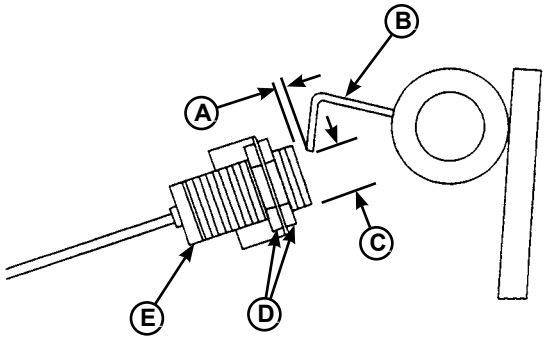
Failure to follow these instructions may result in serious personal injury or death.

ARTD Continued

IMPORTANT

Anytime proximity switch and target are adjusted, always check for interference between target and switch before operating the leveler. Damage to switch will occur if the target contacts the switch.

The maximum torque for proximity switch lock nuts is 27 N•m (29 lb-ft). Damage to switch will occur if maximum torque is exceeded.



A— 1/4 in. (6.4 mm) Approximate
B— Target
C— 1 in. (25.4 mm) Approximate
D— Lock Nuts
E— Proximity Switch

NOTE: Distances (A and C) are typical factory settings. Use these dimensions only as a starting point when adjusting the proximity switch and target, especially if switch and/or target have been replaced.

When dimensions (A and C) are obtained, the proximity switch and target may need finer adjustments to get the ARTD to operate satisfactorily.

3. Loosen lock nuts (D). Adjust proximity switch (E) to obtain distance (A). Tighten lock nuts.

4. Bend target (B) as needed to obtain distance (C). Recheck distance (A) and readjust if necessary.

   NOTE: At least two people may be required to manually move the lip.

5. After adjusting proximity switch and target, slowly move the lip up by hand while observing the target and proximity switch. The target MUST NOT contact the switch, otherwise, damage to switch will occur. Readjust switch and/or target if necessary, then recheck for interference.

6. Turn ON electrical power to the dock leveler.

7. Disengage the maintenance prop.

8. Turn the ARTD switch (on control panel) to the ON position.

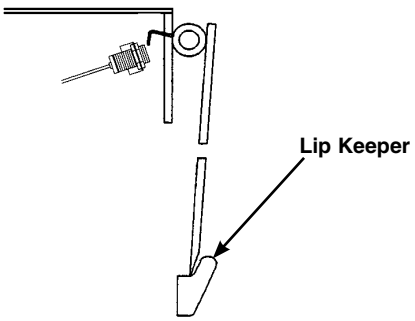
9. Raise the platform until the lip is fully extended, then allow the platform to drift to the below-dock position.

10. After approximately 6 seconds, the platform will return to the cross-traffic position.

11. Adjust the proximity switch and target as necessary. Make small adjustments, then operate the dock leveler to check results. Do this until satisfied with the ARTD operation.

12. Use the following illustrations to assist in fine tuning and/or diagnosing the ARTD operation.

Cross-Traffic Position

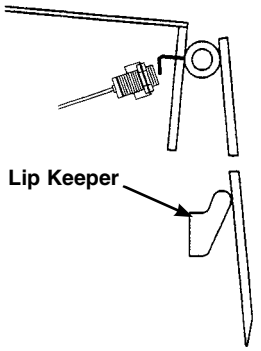


NOTE: The platform lip is fully folded when the platform is at the cross-traffic (stored) position (lip engaged with keepers) or when platform is resting on the maintenance prop.

Whenever the platform lip is at the cross-traffic position, the following conditions will exist for a normally operating ARTD:

- Target not in the sensing area of proximity switch.
- Proximity switch OFF (open) (no signal sent to control panel).
- Proximity switch indicator light is OFF.
- Platform stays at this position unless the operator activates the leveler.

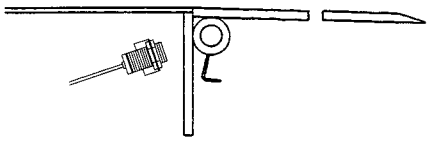
Full Below-Dock Position



Whenever the platform lip is at the full below-dock position, the following conditions will exist for a normally operating ARTD:

- Proximity switch senses target.
- Proximity switch ON (closed) (signal sent to the control panel).
- Proximity switch indicator light is ON.
- Platform will automatically rise after approximately a six-second delay, then returns to the cross-traffic position.

Lip Fully Extended Position



Whenever the platform lip is at the fully extended position, the following conditions will exist for a normally operating ARTD:

- Target not in the sensing area of proximity switch.
- Proximity switch OFF (open) (no signal sent to the control panel).
- Proximity switch indicator light is OFF.
- If the platform lip is resting on the truck bed, the platform will stay at this position unless the operator activates the leveler.

TROUBLESHOOTING POWERHOOK

⚠ WARNING

When service under the dock leveler is required, always lock all electrical disconnects in the OFF position after raising the platform and engaging the maintenance prop. Failure to do this may result in serious personal injury or death.

⚠ WARNING

Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the dock leveler before maintenance is complete. Failure to do this may result in serious personal injury or death.

⚠ WARNING

Always stand clear of the dock leveler lip when working in front of the dock leveler.

The maintenance prop MUST be in the service position when working under the dock leveler. For maximum protection, use an OSHA approved locking device to lock the maintenance prop in the service position. Only the person servicing the equipment should have the key to unlock the maintenance prop.

Unless the dock leveler is equipped with a tethered remote, two people are required to engage the maintenance prop: one person to operate the unit, the other person to engage the maintenance prop.

Failure to follow these instructions may result in serious personal injury or death.

Before performing the detailed troubleshooting procedures, check the following items first:

- Check all fuses inside the control panel(s). Replace any blown fuse(s) with a fuse of equal specification.
- Make sure the correct voltages are present at the proper locations inside the control panel(s).

Symptom	Possible Cause	Solution
Inside and outside signal lights do not operate. Controller (PLC) RUN indicator is on solid (not flashing). Unit operates as normal.	Bad Flasher.	Replace flasher with wire. If lights operate (lights will not flash), replace flasher.
Restraint does not operate. Motor does not energize.	Motor overload device tripped.	Reset overload relay (3 phase) or replace fuse (1 phase) or reset breaker (1 phase-new models). Determine cause of device tripping. ***NOTE:*** *If replacing fuse, use fuse with equal specification .*
	Motor starter (3 phase) or motor relay (1 phase) not energizing.	Check controller output that sends a signal to starter or relay. Output may have failed OPEN. Use meter to check for contact closure when output ON.

Symptom	Possible Cause	Solution
Three-phase units only: Restraint does not operate. Motor energizes but does not run. **If motor hums, but does not run, overload device should trip.**	3 Phase units only - no voltage is present on one line. *NOTE: A motor that is missing voltage on one line is said to be single-phased.*	Check for blown fuses at branch circuit disconnect. Replace fuse. Determine cause of blown fuse.
		Check motor starter as follows: 1. Disconnect wires at load side of starter. 2. Energize the starter. 3. Measure line-to-line voltage at line side of starter. 4. Measure line-to-line voltage at load side of starter. 5. Line-side and load-side voltages should be approximately the same. Replace starter if voltage values are considerably different from one another.
		Check all wiring to motor for high resistance or no connection.
		Replace motor.
Three-phase units only: Restraint does not operate. Motor runs in reverse	Phase reversed.	Reverse any two legs at the branch circuit disconnect.
Single-phase units only: Restraint does not operate. **Motor energizes, but does not run.**	Line voltage too low.	Check wiring to motor for high resistance. Check for loose or corroded connections. Check wire gauge for correct size and specification for load requirement. Replace if necessary.
	Defective motor centrifugal switch.	Replace motor.
	Defective motor capacitor.	Replace motor.
Restraint operates slowly.	Low hydraulic fluid.	Add fluid, see Maintenance section for proper fluid level and type.
	Pressure relief valve set too low.	Locate valve on main valve block (labeled RV). Turn the valve all the way counter-clockwise. While operating the restraint, slowly turn the valve in clockwise, until the restraint lowers and begins to extend. Turn valve in an additional 1.2 turn clockwise. ***NOTE:*** *The pressure relief valve must not be set at a level that causes the motor operating current to exceed the full load amp value* at any time, including when operating in pressure relief.* ** The full load amp value can be found on the inside cover of the control panel.*
	Damage or blocked hydraulic hose(s) and/or valve(s).	Replace damaged hose(s). Check and remove blockage from hose(s) and/or valve(s).

TROUBLESHOOTING POWERHOOK

Symptom	Possible Cause	Solution
Restraint does not fully extend or motor overcurrent device and/ or overload device continuously tripping.	Low hydraulic fluid.	Add fluid, see Maintenance section for proper fluid level and type.
Restraint lowers, fully extends but does not raise. Pump operates in pressure relief.	Solenoid “D” valve stuck ON.	Locate solenoid (See Parts: Valve Block). Remove coil from cartridge valve and cartridge valve from valve block. -Check valve for contaminant’s and/or damage. -Replace valve if damaged. -Carefully wipe valve with clean rag (do not damage “O” rings on valve). -Check valve block for contaminant’s. -Replace valve and coil. ***NOTE:*** *Do not over tighten valve into block. Max Torque: 30-40 lb/ft. or snug to prevent leakage. Tighten coil snug, avoid over tightening and causing valve to bind.* Operate unit. Replace valve if problem persists and all other troubleshooting procedures performed.
	Proximity switch on guide track that senses when restraint is fully extended is out of adjustment.	Locate switch on end of guide track closest to hook tip. Observe indicator light at controller input (#4) that receives signal from switch. Input light should turn OFF when restraint fully extended. If this does not occur: -Check switch position, loosen two guide track mounting bolts, tap guide track assembly back towards rear pit wall. -Switch should be positioned approximately 1/4” from the inside wall of the track. Make sure that the switch face does not extend further than the guide track mounting bars welded to the cylinder. Position switch so that face will not come into contact with guide rod. -Tighten nuts to secure switch. DO NOT over tighten nuts. Maximum tightening torque is 25 lb/ft. -Run restraint. Make sure motor shuts off when hook is in stored position. If motor does not shut off, reposition guide track slightly forward of current position.

Symptom	Possible Cause	Solution
Restraint extends from stored position without fully lowering.	Proximity switch at trunnion that senses when restraint lowered target out of adjustment.	Locate switch on hook trunnion. Observe indicator light at controller input (#3) that receives signal from switch. Input light should only turn ON when restraint fully lowered. If this does not occur, adjust target counterclockwise. See Adjustments section: Adjust PowerHook Operating Range. Use a screwdriver as a temporary target to test switch. Replace switch if screwdriver is present and input light on controller does not turn on.
Restraint extends from stored position without lowering at all.	Proximity switch at trunnion that senses when restraint lowered target out of adjustment.	Locate switch on hook trunnion. Observe indicator light at controller input (#3) that receives signal from switch. Input light should only turn ON when restraint fully lowered. If this does not occur, adjust target counterclockwise. See Adjustments section: Adjust PowerHook Operating Range. Use a screwdriver as a temporary target to test switch. Replace switch if screwdriver is present and input light on controller does not turn on.
	Solenoid “B” valve stuck OFF.	Locate solenoid (See Parts: Valve Block). Remove coil from cartridge valve and cartridge valve from valve block. -Check valve for contaminant’s and/or damage. -Replace valve if damaged. Carefully wipe valve with clean rag (do not damage “O” rings on valve. -Check valve block for contaminant’s. -Replace valve and coil. ***NOTE:*** *Do not over tighten valve into block. Max Torque: 30-40 lb/ft. or snug to prevent leakage. Tighten coil snug, avoid over tightening and causing valve to bind.* Operate unit. Replace valve if problem persists and all other troubleshooting procedures performed.
	Solenoid “B” coil is not receiving signal to energize. A solenoid that is energized will act like a magnet. Place a metal tool on coil of solenoid to determine if coil is receiving signal.	1. Check controller output that sends a signal to solenoid. Output may have failed OPEN. Use meter to check for contact closure when output is ON. 2. Check all wiring to solenoid for high resistance (loose) or no connection.
	Solenoid “B” coil receiving signal but not energizing.	Coil failed OPEN. Consult Factory for replacement part.

TROUBLESHOOTING POWERHOOK

Symptom	Possible Cause	Solution
Restraint does not lower at all from stored position. Pump operates in pressure relief (restraint does not extend).	Solenoid “D” valve stuck off.	Locate solenoid (See Parts: Valve Block). Remove coil from cartridge valve and cartridge valve from valve block. -Check valve for contaminant’s and/or damage. -Replace valve if damaged. -Carefully wipe valve with clean rag (do not damage “O” rings on valve). -Check valve block for contaminant’s. -Replace valve and coil. ***NOTE:*** *Do not over tighten valve into block. Max Torque: 30-40 lb/ft. or snug to prevent leakage. Tighten coil snug, avoid over tightening and causing valve to bind.* Operate unit. Replace valve if problem persists and all other troubleshooting procedures performed.
	Solenoid “D” coil not receiving signal to energize. A solenoid that is energized will act like a magnet. Place a metal tool on coil of solenoid valve to determine if coil is receiving signal.	1. Check controller output that sends a signal to solenoid. Output may have failed OPEN. Use meter to check for contact closure when output ON. 2. Check all wiring to solenoid for high resistance (loose) or no connection.
	Solenoid “D” coil receiving signal but not energizing.	Coil failed OPEN. Consult factory for replacement.
	Obstruction preventing the restraint from lowering.	Remove obstruction, check for damage to components.
	Fluid flow to positioning cylinder blocked.	Locate the needle valve that controls fluid flow to the cylinder. (Hook valve block has two needle valves, adjust valve adjacent to NV stamped in valve block) Turn valve out all the way counter clockwise. Turn valve in all the way clockwise. Turn valve out 1-1/2 turn counter clockwise.
	Binding inside positioning cylinder.	Locate the positioning cylinder and the hook weldment. Pushing down on the hook weldment should extend the positioning cylinder and releasing the weldment should allow the positioning cylinder to retract. Consult factory if this does not occur.

Symptom	Possible Cause	Solution
Restraint only partially lowers from stored position. Pump operates in pressure relief (Restraint does not extend).	Obstruction preventing the restraint from lowering.	Remove obstruction.
	Fluid flow to positioning cylinder blocked.	Locate the needle valve that controls fluid flow to the cylinder. (Hook valve block has two needle valves, adjust valve adjacent to NV stamped in valve block) Turn valve out all the way counter clockwise. Turn valve in all the way clockwise. Turn valve out 1-1/2 turn counter clockwise
	Binding inside positioning cylinder.	Locate the positioning cylinder and the hook weldment. Pushing down on the hook weldment should extend the positioning cylinder and releasing the weldment should allow the positioning cylinder to retract. Consult factory if this does not occur.
Restraint fully lowers from stored position but does not extend.	Proximity switch at trunnion that senses when restraint lowered target and/or switch out of adjustment.	Locate switch on hook trunnion. Observe indicator light at controller input (#3) that receives signal from switch. Input light should only turn ON when restraint fully lowered. If this does not occur, adjust target counterclockwise. See Adjustments section: Adjust PowerHook Operating Range. **NOTE:** Check circuit breaker inside control assembly before replacing switch. Make sure breaker is ON. Use a screwdriver as a temporary target to test switch. Adjust switch closer to target if input light turns on. Replace switch if screwdriver is present and input light on controller does not turn on.
	Solenoid “B” valve stuck ON or Solenoid(s) “C1” or C2” valve(s) stuck ON.	Locate solenoid (See Parts: Valve Block). Remove coil from cartridge valve and cartridge valve from valve block. -Check valve for contaminant’s and/or damage. -Replace valve if damaged. Carefully wipe valve with clean rag (do not damage “O” rings on valve. -Check valve block for contaminant’s. -Replace valve and coil. ***NOTE:*** *Do not over tighten valve into block. Max Torque: 30-40 lb/ft. or snug to prevent leakage. Tighten coil snug, avoid over tightening and causing valve to bind.* Operate unit. Replace valve if problem persists and all other troubleshooting procedures performed.
Restraint does not tightly engage truck/ trailer RIG bar (inside lights turn GREEN but gap exists between RIG bar and restraint.	Pressure switch trip point set too low.	Pressure switch is factory set. Do not attempt to adjust in field replace switch from factory pre-set unit.
	Pressure differential switch trip point set too Low.	Pressure differential switch is factory set. Switch must be replaced.
	Incorrect type of hydraulic fluid used.	Drain and re-fill system with proper fluid. See Maintenance section for proper fluid level and type.

TROUBLESHOOTING POWERHOOK

Symptom	Possible Cause	Solution
Restraint engages truck/ trailer RIG bar but does not automatically shut OFF. Pump operates in pressure relief.	Pressure switch trip point set too high.	Pressure switch is factory set. Do not attempt to adjust in field replace switch with factory.
	Pressure differential switch trip point set too high.	Pressure differential switch is factory set. Switch must be replaced.
Restraint extends from RIG bar engaged position, fully lowers but does not retract.	Solenoid "B" valve stuck ON, or solenoid(s) "C1" or "C2" stuck OFF.	Locate solenoid (See Parts: Valve Block). Remove coil from cartridge valve and cartridge valve from valve block. -Check valve for contaminant's and/or damage. -Replace valve if damaged. -Carefully wipe valve with clean rag (do not damage "O" rings on valve). -Check valve block for contaminant's. -Replace valve and coil. ***NOTE:*** *Do not over tighten valve into block. Max Torque: 30-40 lb/ft. or snug to prevent leakage. Tighten coil snug, avoid over tightening and causing valve to bind.* Operate unit. Replace valve if problem persists and all other troubleshooting procedures performed.
	Proximity switch at trunnion that senses when restraint lowered target and/or switch out of adjustment.	Locate switch on hook trunnion. Observe indicator light at controller input (#3) that receives signal from switch. Input light should only turn ON when restraint fully lowered. If this does not occur, adjust target counterclockwise. See Adjustments section: Adjust PowerHook Operating Range. Use a screwdriver as a temporary target to test switch. Replace switch if screwdriver is present and input light on controller does not turn on.
	Solenoid "C1" or "C2" coil(s) not receiving signal to energize. A solenoid that is energized will act like a magnet. Place a metal tool on coils of solenoids to determine if coils are receiving signal.	Check Controller output that sends the solenoid signal. Output may have failed OPEN. Use meter to check for contact closure when output ON. Check all wiring to solenoids for high resistance (loose) or no connection.
	Solenoid "C1" or "C2" coil(s) receiving signal but not energizing.	Coil(s) failed OPEN. Consult factory for replacement coil.

Symptom	Possible Cause	Solution
Lowered restraint returns to fully retracted position but unit does not automatically shut OFF. **Pump Operates in pressure relief.** **Restraint remains lowered.**	Proximity switch on rear of (closest to rear pit wall) guide track that senses when restraint fully retracted out of adjustment.	Locate switch on rear of guide track. Observe indicator light at controller input (#6) that receives signal from switch. Input light should turn OFF when restraint fully extended. If this does not occur: -Check switch position, loosen two guide track mounting bolts, tap guide track assembly back towards rear pit wall. -Switch should be positioned approximately 1/4" from the inside wall of the track. Make sure that the switch face does not extend further than the guide track mounting bars welded to the cylinder. Position switch so that face will not come into contact with guide rod. -Tighten nuts to secure switch. DO NOT over tighten nuts. Maximum tightening torque is 25 lb/ft. -Run restraint. Make sure motor shuts off when hook is in stored position. If motor does not shut off, reposition guide track slightly forward of current position.
Restraint fully retracted but does not raise, even when ON-OFF switch turned OFF.	Solenoid "D" valve stuck ON.	Locate solenoid (See Parts: Valve Block). Remove coil from cartridge valve and cartridge valve from valve block. -Check valve for contaminant's and/or damage. -Replace valve if damaged. Carefully wipe valve with clean rag (do not damage "O" rings on valve. -Check valve block for contaminant's. -Replace valve and coil. ***NOTE:*** *Do not over tighten valve into block. Max Torque: 30-40 lb/ft. or snug to prevent leakage. Tighten coil snug, avoid over tightening and causing valve to bind.* Operate unit. Replace valve if problem persists and all other troubleshooting procedures performed.
	Binding inside positioning cylinder.	Locate positioning cylinder. Place pan under hose connected to cylinder to catch fluid. SLOWLY loosen hose since fluid may exit cylinder rapidly (cylinder is spring loaded with spring compressed when lowered). A cylinder that is not binding will raise as fluid leaves the cylinder. A cylinder that is binding will remain lowered, even when the hose is completely removed from the cylinder. Replace a cylinder that is binding.

TROUBLESHOOTING DOCK LEVELER

Symptom	Possible Cause	Solution
Platform does not rise. Pump operates in pressure relief mode.	Heavy object(s) on platform.	Remove object(s) from platform. *NOTE: For safety reasons, the dock leveler is designed to lift only the platform's own weight.*
	Dock leveler binds.	Check for visible obstructions that could cause binding. Remove obstructions. If no obstructions found, call Poweramp Technical Services. See inside back cover for phone number and address.
	Pressure relief set too low.	Increase pressure relief. See Adjust Main Pressure Relief in the Adjustment section. *NOTE: The pressure relief valve must not be set at a level that causes the motor operating current to exceed the full load amp value* at any time, including when operating in pressure relief.* ** The full load amp value can be found on the inside cover of the control panel.*
Platform rises slowly.	Low hydraulic fluid.	Add fluid, see Maintenance section for proper fluid level and type.
	Contaminated hydraulic system.	Clean and inspect valves. Flush contaminated oil from hydraulic system. Fill system with new oil. See Periodic Maintenance in the Maintenance section.
	Damaged or restricted hydraulic hose(s).	Replace damaged hose(s). Remove restriction.
	Pressure relief set too low.	Increase pressure relief. See Adjust Main Pressure Relief in the Adjustment section. *NOTE: The pressure relief valve must not be set at a level that causes the motor operating current to exceed the full load amp value* at any time, including when operating in pressure relief.* ** The full load amp value can be found on the inside cover of the control panel.*
Pump motor loads down when platform reaches the full raised position.	Pressure relief set too high.	Decrease pressure relief. See Adjust Main Pressure Relief in the Adjustment section. *NOTE: The pressure relief valve must not be set at a level that causes the motor operating current to exceed the full load amp value* at any time, including when operating in pressure relief.* ** The full load amp value can be found on the inside cover of the control panel.*

Trouble shooting Levelers see appropriate manuals

ISSUES FOR PROGRAMMING.

- Error light is flashing, PLC is either missing or damaged.
- Update to newer program.
- Installation of new un programmed PLC.

MATERIAL REQUIRED.

You will receive two (2) E-proms.

- Blank run E-Prom.
- Program Specific E-Prom.

INSTALLATION

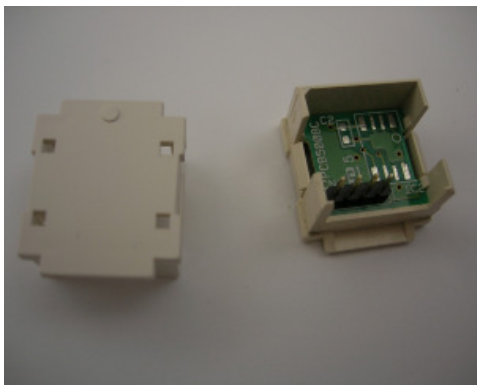
1. Turn power off power. (remove existing E-Prom if present).
2. Insert new “Blank Run” E-Prom.
3. Turn power on for 30 seconds.
4. Turn power off for 10 seconds repeat cycle 3 times.

- Insert program chip (program specific)

Repeat steps 1,3 and 4. Allow light sequence to complete flashing. Run light should be on STEADY *not flashing*. Error light should NOT be *on*. Check for proper input and out put lights on the PLC.
If not, repeat steps 3 and 4 until PLC responds properly. If the PLC does not accept the program or if questions contact the “Tech Service Department” at 800-643-9424.

Note: The PLC will maintain the program even if the power is turned off.

Twido PLC



E-Prom

TROUBLESHOOTING DOCK LEVELER

This is for **standard** Powerhooks only.

This is for Powerhooks that have a Telemecanique "Twido" computer (PLC) only.

This is for Powerhooks that have the new style valving only. Powerhooks with new style valving do not have any solenoid valves in the hydraulic valve block that is on the hook cylinder (Powerhooks with old style valving have 2 solenoid valves in the hydraulic block that is on the hook cylinder).

!! WARNING !!
Risk Of Electric Shock That Could Result In Severe Personnel Injury Or Death

Before disconnecting and/or connecting any wires inside the control panel, turn off all power entering the control panel at the disconnect switch(es). Some units may require 2 disconnect switches to be turned off before all power entering the control panel is turned off. The *POWER*, *OFF-ON* selector switch on the control panel is NOT a disconnect switch.

The solenoids are originally connected as follows:

Solenoid	Field Wire Number	Computer Terminal
A	60	Output 0
B	61	Output 1
C1, C2	62	Output 2
D	63	Output 3

For any of the following troubleshooting steps to work the solenoids need to be working correctly and the motor needs to be pumping fluid.

To force the Hook out (extend), do the following:
1. Set the dock leveler on the maintenance prop.
2. Turn off the disconnect switch(es) – see WARNING above.
3. Disconnect field wires 60, 61, 62 and 63. Cap off the end of each wire with a wire nut.
4. Turn on the disconnect switch(es).
5. Set the *POWER*, *OFF-ON* switch to *ON*.
6. Set the *OPERATION SWITCH* to *BYPASS*.
7. Push and hold the *RAISE* pushbutton. Release the *RAISE* pushbutton when the Hook is extended to the desired position.
8. Turn off the disconnect switch(es) – see WARNING above.
9. Reconnect field wires 60 through 63 as originally connected.

To force the Hook in (retract), do the following:

1. Set the dock leveler on the maintenance prop.
2. Turn off the disconnect switch(es) – see WARNING on page 1.
3. Disconnect field wires 60, 61, 62 and 63. Cap off the end of wires 60, 61 and 63 with a wire nut.
4. Connect field wire 62 to the right side of any terminal block 11.
5. Turn on the disconnect switch(es).
6. Set the *POWER*, *OFF-ON* switch to *ON*
7. Set the *OPERATION SWITCH* to *BYPASS*.
8. Push and hold the *RAISE* pushbutton. Release the *RAISE* pushbutton when the Hook is retracted to the desired position.
9. Turn off the disconnect switch(es) – see WARNING on page 1.
10. Reconnect field wires 60 through 63 as originally connected.

To force the Hook down (lower), do the following:

1. Set the dock leveler on the maintenance prop.
2. Turn off the disconnect switch(es) – see WARNING on page 1.
3. Disconnect field wires 60, 61, 62 and 63. Cap off the end of wires 60 and 62 with a wire nut.
4. Connect field wires 61 and 63 to the right side of any terminal block 11 (the wires do not have to go to same terminal block 11).
5. Turn on the disconnect switch(es).
6. Set the *POWER*, *OFF-ON* switch to *ON*.
7. Set the *OPERATION SWITCH* to *BYPASS*.
8. In this step it is very important that the operator does not allow the Hook to lower to a position that will cause any of the sensors on the guide track to come into contact with the positioning cylinder. **The sensors will contact the cylinder if the *RAISE* pushbutton is held in for too long of a time and this will damage the sensors.** The Hook will lower rather quickly so it is suggested that the operator apply only a quick momentary push on the *RAISE* pushbutton, thereby allowing the Hook to only lower slightly. The operator may have to apply additional quick momentarily pushes on the *RAISE* pushbutton in order to get the Hook to lower to the desired position. If the solenoids are working correctly the Hook will stay lowered until the *POWER*, *OFF-ON* switch is set to *OFF*.

   ……

   Momentary push the *RAISE* pushbutton. If necessary, keep momentarily pressing the *RAISE* pushbutton until the Hook is lowered to the desired position. Turn the *POWER*, *OFF-ON* switch to *OFF* to allow the Hook to raise.
9. Turn off the disconnect switch(es) – see WARNING on page 1.
10. Reconnect field wires 60 through 63 as originally connected.

ELECTRICAL DIAGRAM, GENERIC

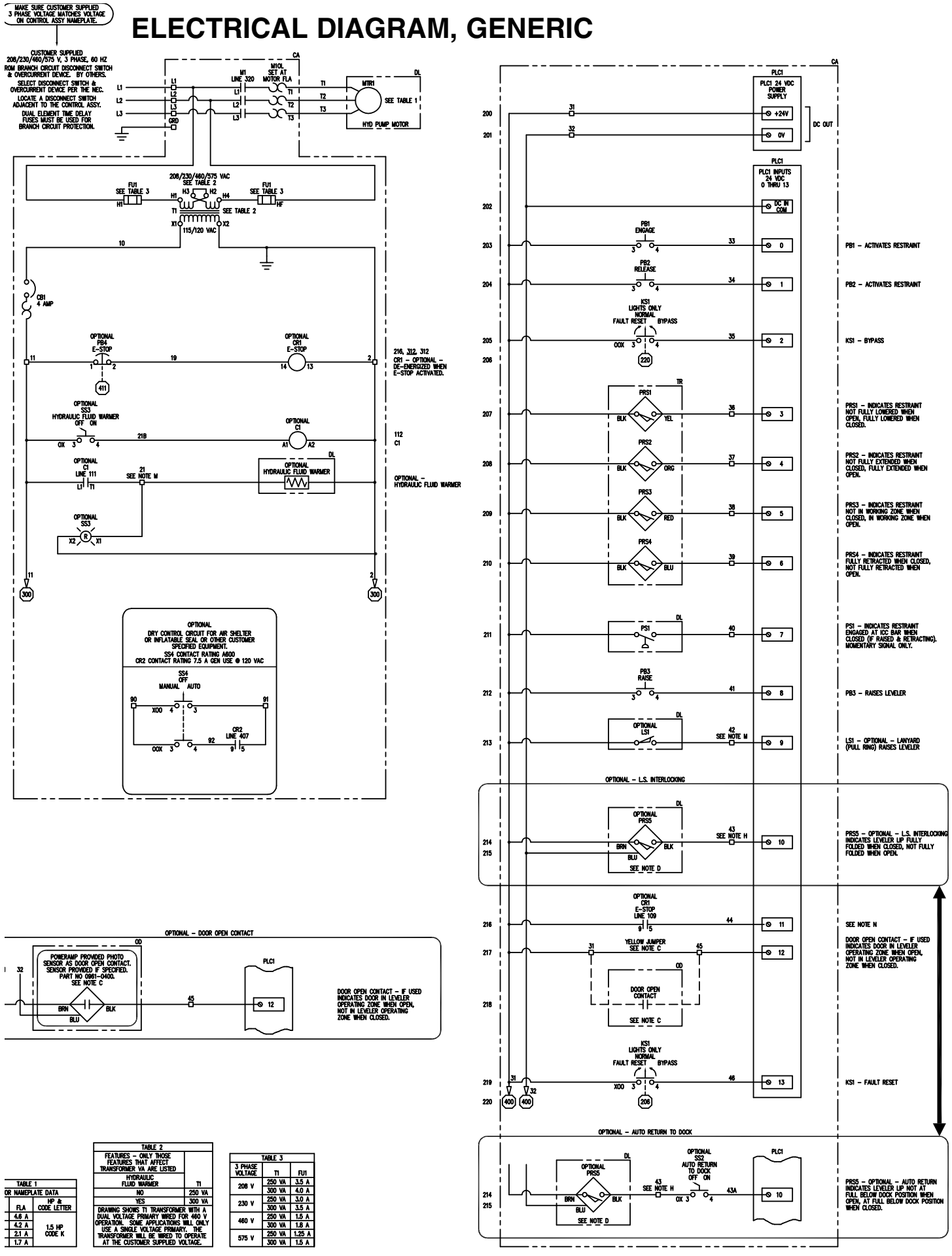
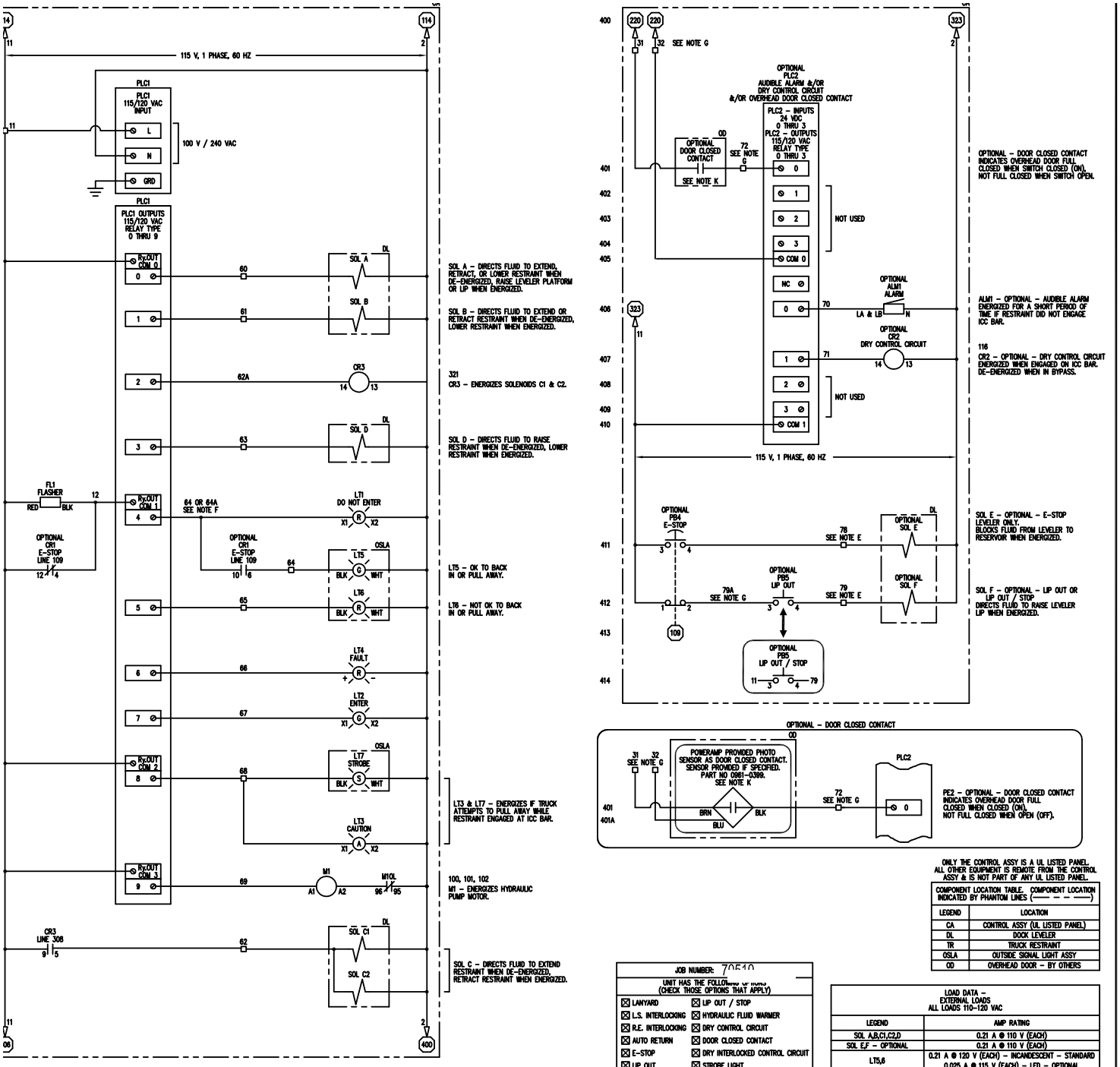


TABLE 1	
FLA	HP & CODE LETTER
4.6 A	1.5 HP CODE K
4.2 A	
2.1 A	
1.7 A	

TABLE 2	
FEATURES – ONLY THOSE FEATURES THAT AFFECT TRANSFORMER VA ARE LISTED	
HYDRAULIC FLUID WARMER	T1
NO	250 VA
YES	300 VA
DRAWING SHOWS T1 TRANSFORMER WITH A DUAL VOLTAGE PRIMARY WIRED FOR 460 V OPERATION. SOME APPLICATIONS WILL ONLY USE A SINGLE VOLTAGE PRIMARY. THE TRANSFORMER WILL BE WIRED TO OPERATE AT THE CUSTOMER SUPPLIED VOLTAGE.	

TABLE 3		
3 PHASE VOLTAGE	T1	FU1
208 V	250 VA	3.5 A
	300 VA	4.0 A
230 V	250 VA	3.0 A
	300 VA	3.5 A
460 V	250 VA	1.5 A
	300 VA	1.8 A
575 V	250 VA	1.25 A
	300 VA	1.5 A



ONLY THE CONTROL ASSY IS A UL LISTED PANEL. ALL OTHER EQUIPMENT IS REMOTE FROM THE CONTROL ASSY & IS NOT PART OF ANY UL LISTED PANEL.

COMPONENT LOCATION TABLE. COMPONENT LOCATION INDICATED BY PHANTOM LINES (— — — —)	
LEGEND	LOCATION
CA	CONTROL ASSY (UL LISTED PANEL)
DL	DOCK LEVELER
TR	TRUCK RESTRAINT
OSLA	OUTSIDE SIGNAL LIGHT ASSY
OD	OVERHEAD DOOR – BY OTHERS

JOB NUMBER: 70510

UNIT HAS THE FOLLOWING OPTIONS (CHECK THOSE OPTIONS THAT APPLY)

☒ LANYARD	☒ LIP OUT / STOP
☒ L.S. INTERLOCKING	☒ HYDRAULIC FLUID WARMER
☒ R.E. INTERLOCKING	☒ DRY CONTROL CIRCUIT
☒ AUTO RETURN	☒ DOOR CLOSED CONTACT
☒ E-STOP	☒ DRY INTERLOCKED CONTROL CIRCUIT
☒ LIP OUT	☒ STROBE LIGHT
☒ AUDIBLE ALARM	
☒ DRY INTERLOCKED PUSHBUTTON CONTROL CIRCUIT	

LOAD DATA – EXTERNAL LOADS ALL LOADS 110-120 VAC

LEGEND	AMP RATING
SOL A,B,C1,C2,D	0.21 A @ 110 V (EACH)
SOL E,F – OPTIONAL	0.21 A @ 110 V (EACH)
LT5,6	0.21 A @ 120 V (EACH) – INCANDESCENT – STANDARD 0.025 A @ 115 V (EACH) – LED – OPTIONAL
LT7	0.05 A @ 115 V
HYDRAULIC FLUID WARMER – OPTIONAL	0.5 A @ 120 V

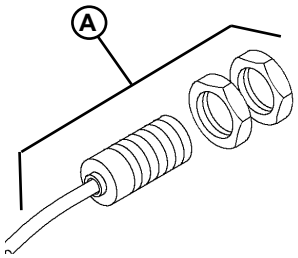
NOTES

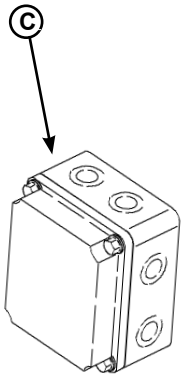
A. DRAWING SHOWS SYSTEM AT REST WITH POWER OFF & OVERHEAD DOOR NOT FULLY RAISED.
B. CI REPRESENTS A TERMINAL BLOCK.
C. DOOR OPEN CONTACT (LINE 218) BY OTHERS. DOOR OPEN CONTACT MAY BE PROVIDED BY POWERAMP IF SPECIFIED. DOOR OPEN CONTACT TO PREVENT OPERATION OF LEVELER UNTIL DOOR RAISED HIGH ENOUGH SUCH THAT LEVELER WILL NOT HIT DOOR. DOOR OPEN CONTACT TO BE OPEN (OFF) WHEN DOOR IS IN LEVELER OPERATING ZONE. DOOR OPEN CONTACT TO BE CLOSED (ON) WHEN DOOR IS NOT IN LEVELER OPERATING ZONE. IF DOOR OPEN CONTACT IS USED REPLACE JUMPER FORM TERMINAL BLOCKS 31 AND 45 WITH DOOR OPEN CONTACT WIRES.
D. PROXIMITY SWITCH PRS5 IS USED ONLY IF THE UNIT HAS EITHER THE L.S. INTERLOCKING OPTION OR THE AUTO RETURN OPTION. IF NEITHER OF THE OPTIONS ARE USED CONNECT WIRE 31 TO PLC1 – INPUT 10.
E. TERMINAL BLOCK 78 USED ONLY IF UNIT HAS THE E-STOP OPTION. TERMINAL BLOCK 79 ONLY USED IF UNIT HAS THE LIP OUT OR LIP OUT / STOP OPTION.
F. WIRE 64 IF UNIT DOES NOT HAVE E-STOP OPTION. WIRE 64A IF UNIT DOES HAVE E-STOP OPTION. THERE IS A TERMINAL BLOCK FOR 64. THERE IS NOT A TERMINAL BLOCK FOR 64A.
G. TERMINAL BLOCKS 31, 32 AND 72 ADDED ONLY IF THE UNIT HAS THE DOOR CLOSED CONTACT OPTION.
H. TERMINAL BLOCK 43 USED ONLY IF UNIT HAS THE L.S. INTERLOCKING AND/OR AUTO RETURN OPTION.
I. WIRE COLORS NEAR COMPONENT REFER TO COLOR OF WIRE SUPPLIED BY THE COMPONENT MFGR. BRN = BROWN, BLU = BLUE, BLK = BLACK, WHT = WHITE, RED = RED, YEL = YELLOW, & ORG = ORANGE.
J. NUMBERS NEAR COMPONENT REFER TO NUMBERS FOUND ON THE TERMINALS OF THE COMPONENT. EXAMPLE, 3 & 4 AT PB1, LINE 203.
K. DOOR CLOSED CONTACT (LINE 401) BY OTHERS. DOOR CLOSED CONTACT MAY BE PROVIDED BY POWERAMP IF SPECIFIED. DOOR CLOSED CONTACT USED TO AUTOMATICALLY RESET BYPASS MODE.
L. TERMINAL BLOCK 21 USED ONLY IF THE UNIT HAS THE HYDRAULIC FLUID WARMER OPTION.
M. TERMINAL BLOCK 43 USED ONLY IF UNIT HAS THE LANYARD OPTION.

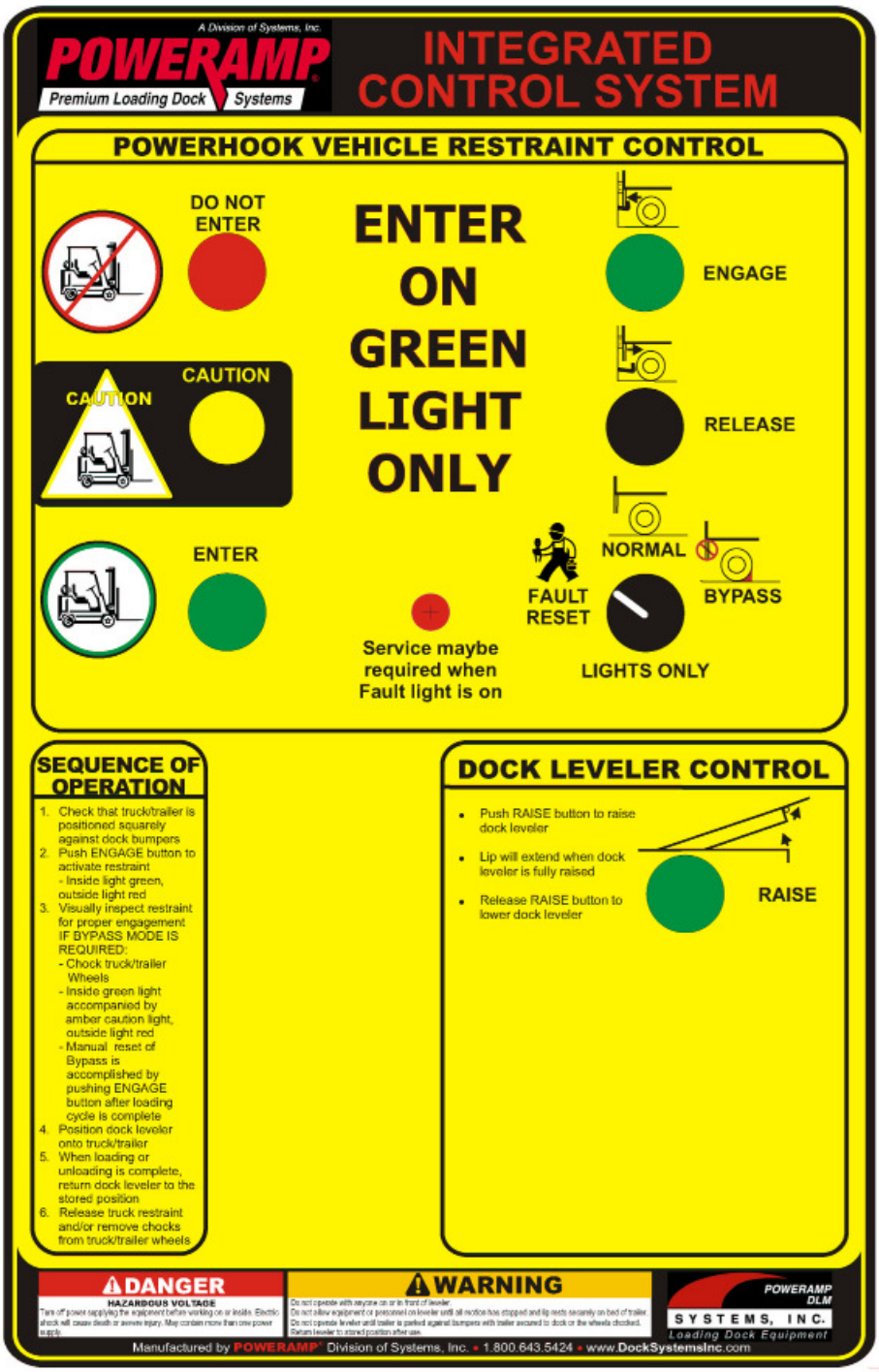
POWERAMP MCGUIRE DLM
SYSTEMS, INC.
Loading Dock Equipment

LADDER DIAGRAM
PR KS5

PARTS



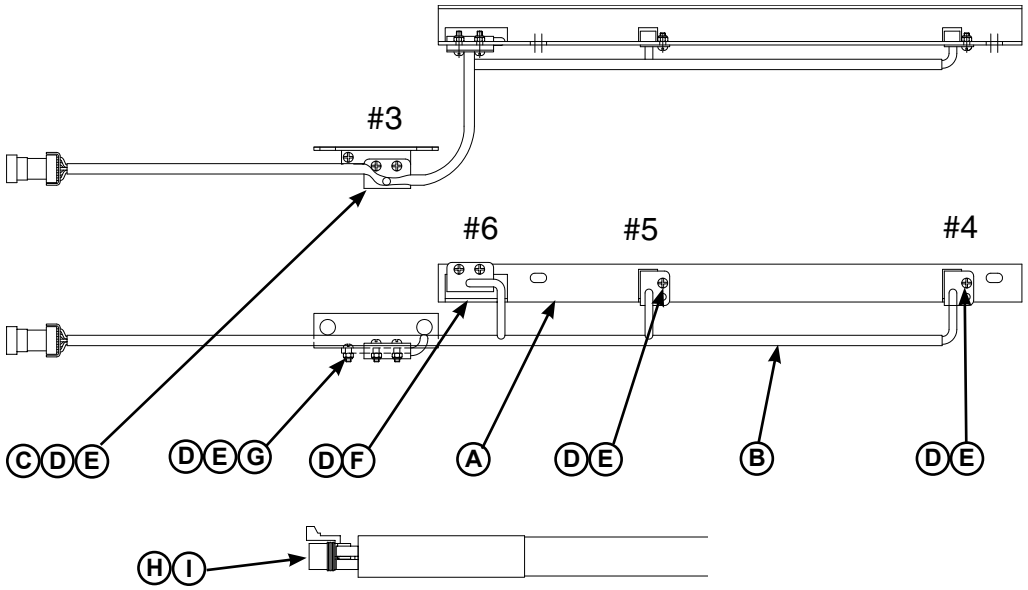




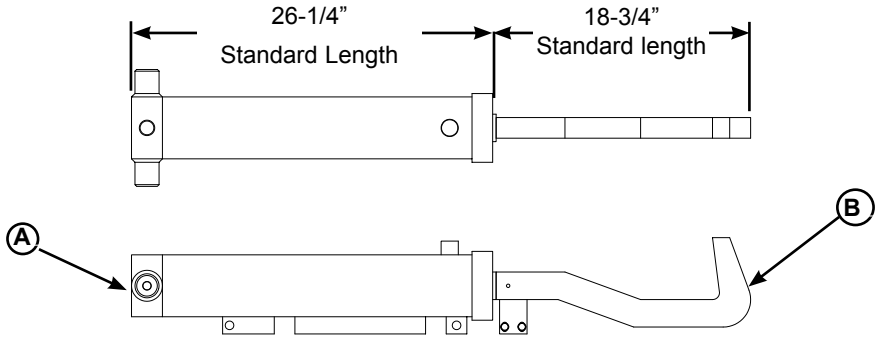
Item	Quantity	Part Number	Description
A	1	0961-0083	Proximity Switch with Harness (INTERLOCK Feature Only)
B	1	*	Push Button Controller
C	1	9511-0004	J-Box, Standard (4 x 4 in. Metal Box)
		9512-0429	J-Box, Cold Weather (5 x 5 in. Plastic Box)

* Provide dock leveler serial number, voltage, phase, and options when calling or faxing controller orders.

Powerhook Guide Track Components



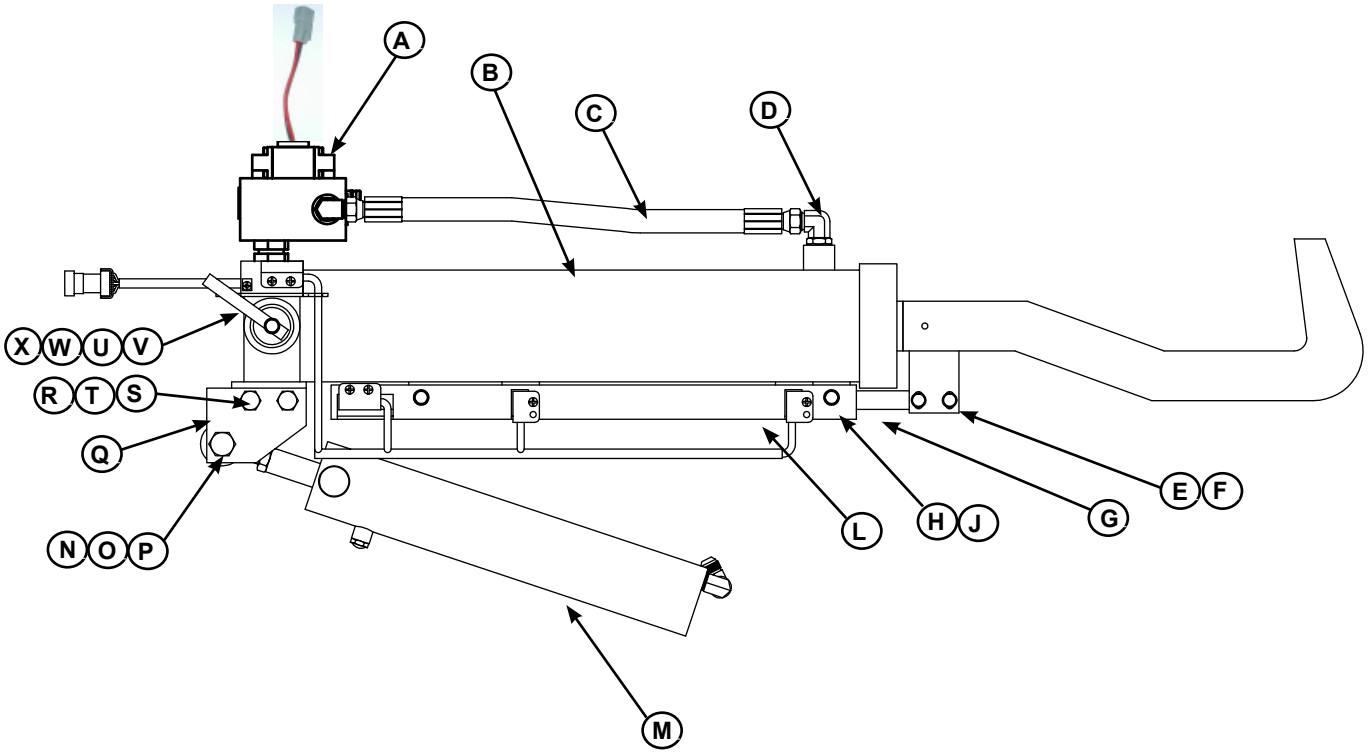
Item	Quantity	Part Number	Description
A	1	0521-0143	Guide Track - Aluminum
B	1	0521-0144	Cable Assembly - Powerhook - Standard
C	1	0521-0173	Sensor Mounting Bracket
D	7	2101-0196	Nylon Lock Nut, 10-32 UNF
E	5	2101-0202	Round Head Machine Screw, 10-32 UNF x 1/2, Stainless Steel
F	2	2101-0203	Round Head Machine Screw, 10-32 UNF x 3/4, Stainless Steel
A-G	1	0524-0075	Powerhook Guide Track Assembly Complete
H	1	0521-0146	Guide Track - Pig Tail 46” Long
I	1	0521-0147	Guide Track - Pig Tail 94” Long



Item	Quantity	Part Number	Description
A	1	0521-0123	Powerhook Cylinder Only
B	1	7054-0001	Powerhook Arm Weldment
C	1	7054-0010	Powerhook Standard length

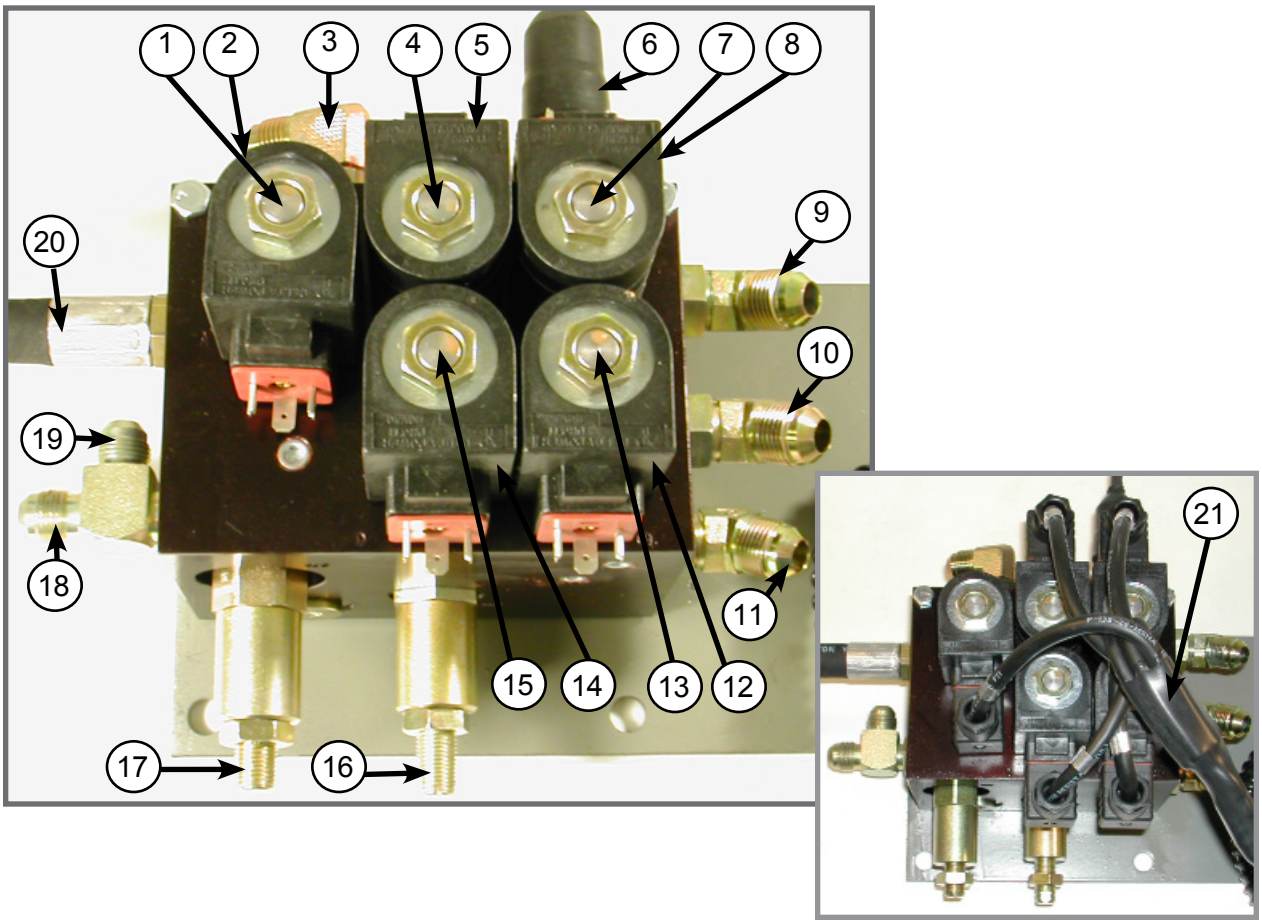
*Provide dock leveler and/or PowerHook serial number when calling or faxing orders.

PARTS



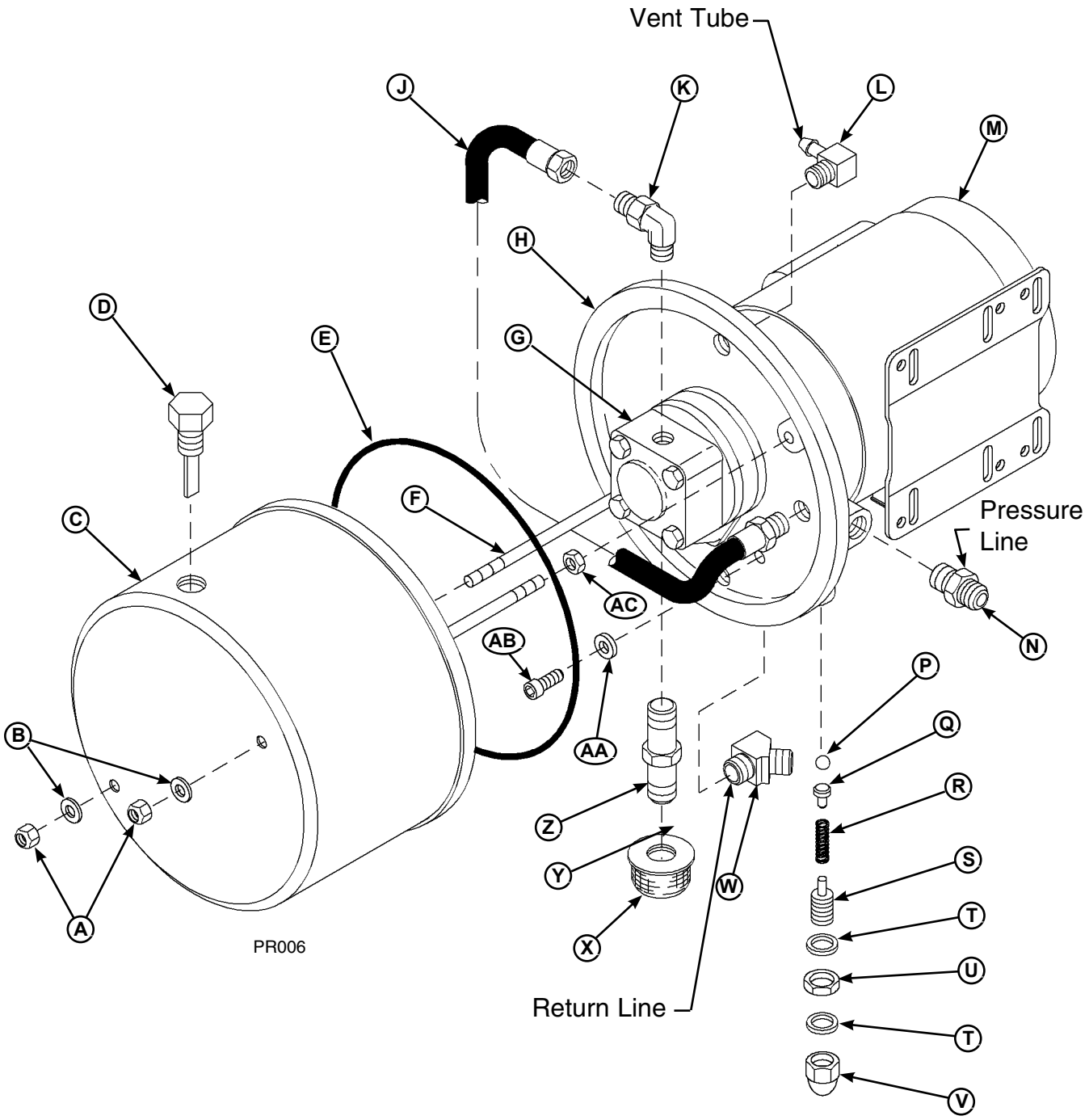
Item	Quantity	Part Number	Description
A	1	8585-0096	Valve Block Assembly - Regeneration (See Breakdown for Details)
B	1	7054-0010	Cylinder Assembly - PowerHook
C	1	9904-0110	Hydraulic Hose Assembly - 1/2” 100R1 x 20.00, #8 JIC
D	1	9301-0116	Fitting 90 Degree #8 ORBM, #8 JICM
E	2	2101-0012	Hex Head Cap screw, 5/16-18 UNC x 1-1/4
F	2	2101-0058	Lock Washer 5/16
G	1	0522-0061	Bar - Guide Rod
H	2	2101-0057	Hex Head Cap screw, 5/16-18 UNC x 1/2
J	2	2101-0058	Lock Washer, 5/16
K	1	2101-0059	Flat Washer, 1/4
L	1	0524-0075	Guide Track Assembly (See Guide Track Assembly Breakdown for Details)
M	1	0526-0005	Positioning Cylinder Assembly (With Breather)
		0526-0006	Positioning Cylinder Assembly (With Weep Tube Fitting)
N	1	2101-0004	Flat Washer, 5/8
O	1	2101-0052	Hex Head Cap screw, 5/8-11 UNC x 2-1/2
P	1	2101-0042	Hex Nut, 5/8-11 UNC
Q	2	0522-0062	Trunnion - Positioning Cylinder, 3/8 x 3 x 4
R	2	2101-0041	Hex Nut, 1/2-13 UNC
S	2	2101-0051	Hex Head Cap screw, 1/2-13 UNC x 2-1/2
T	2	2101-0055	Lock Washer 1/2
U	1	2101-0058	Lock Washer, 5/16
V	1	2101-0059	Flat Washer, 1/4
W	1	2101-0068	Hex Head Cap screw
X	1	7052-0005	Bar - Prox Target, 1/2 x 1-1/2 x 1

PowerHook Valve Body Assembly



Item#	Part Description	Bock Label	Function	Part Number
1	Cartridge Valve - 4-way - 2-position	A	Fluid to Powerhook or Dock Leveler if energized	8581-0011
2,5,8,12,14	Delta Coil		Activates Cartridge Valve	8581-0004
3	Elbow 90º Fitting	DLS	Fluid to Logic Block	9301-0127
4	Cartridge Valve - 3-way - 2-position	B	Fluid to lower Powerhook if energized (with D)	8581-0005
6	Pressure Switch Assemebly	PS	Tells PLC to stop Powerhook retracting when ICC bar engaged	0963-0004
7	Cartridge Valve - 3-way - 2-position	C2	Fluid to retract Powerhook when energized (with C1)	8581-0005
9	Elbow 45º Fitting	HC2	Fluid to top of Powerhook cylinder via regeneration valve	9301-0120
10	Elbow 45º Fitting	HC1	Fluid to base of Powerhook cylinder via regeneration valve	9301-0120
11	Elbow 45º Fitting	HDC	Fluid to positioning cylinder	9301-0120
13	Cartridge valve - 2-way - N.C.	C1	Fluid to retract Powerhook when energized (with C2)	8581-0074
15	Cartridge valve - 3-way - 2-position	D	Fluid to hold Powerhook in lowered position when energized	8581-0005
16	Cartridge valve - Flow control	NV	Conrols flow to/from positioning cylinder	8581-0008
17	Cartridge valve -relief	RV	Controls flow to/from Powerhook, dumps excess flow to tank	8581-0089
18	T-Fitting	R1	Return line (dump line) to pump	9301-0127
19	T-Fitting	R1	Fluid to dock leveler - logic block	9301-0127
20	Incoming pressure line	P1	Incoming hydraulic fluid from pump	varies by model
21	Cabel Assembly		Wire harness, 48”, 5 wire assembly: connects to 5 delta coils	4305-0234
22	Cable individual (not shown)		Individual wire, 48”, connects to single delta coil	4305-0235

Power Pack Assembly

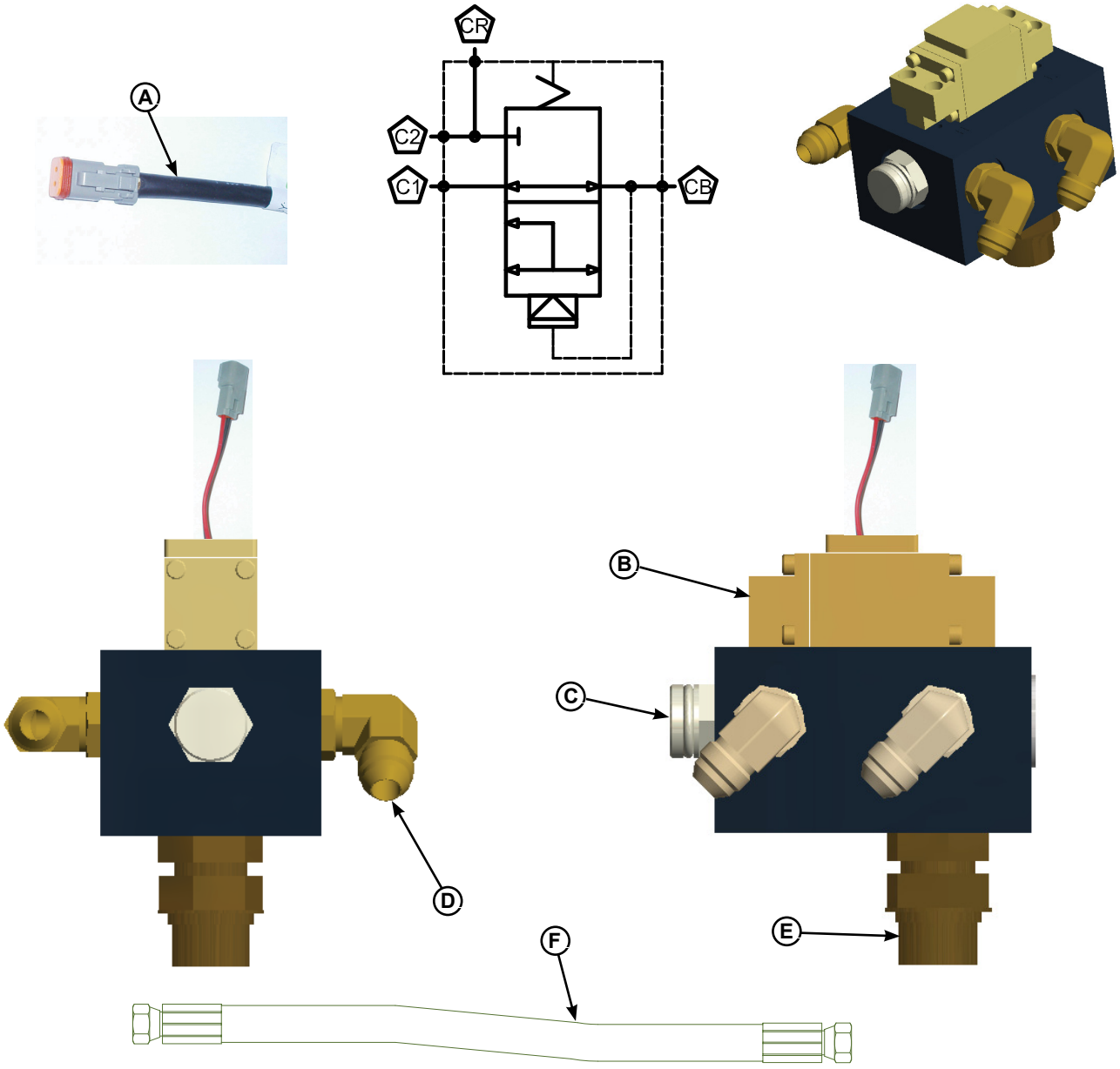


Power Pack Assembly

Item	Quantity	Part Number	Description
A	2	2101-0039	Nylon Lock Nut, 5/16-18 UNC
B	2	9301-0029	Seal, Thread
C	1	9302-0014	Reservoir
D	1	9301-0199	Breather Cap, 3/8 NPT Male
E	1	9301-0027	O-Ring (Reservoir)
F	2	9302-0012	Tie Rod (Reservoir)
G	1	9301-____ [1]	Pump Only
	4	2101-0016	Cap Screw, 5/16-18 UNC x 3-1/2 in., Grade 5
	1	9301-0028	Gasket, Pump
	1	9303-0002	Coupling Assembly
H	1	9302-0017	Plate, Drive
J	1	9904-0001	Hose
K	1	0521-0017	90° Elbow, 3/8 NPT Male x #8-JIC Male
L	1	0521-0007	90° Elbow, 1/4 NPT Male x 1/4 Tube
M	1	3411-____ [2]	Motor Only
N	1	0521-0015	Straight Fitting, 3/8 NPT Male x #8-JIC Male
P	1	0521-0014	Ball, Check
Q	1	9301-0024	Guide, Check Ball
R	1	9302-0009	Spring, Relief Valve
S	1	9303-0003	Screw, Adjusting
T	2	9301-0014	Washer, Nylon, 11/16 in. OD x 1/2 in. ID
U	1	9301-0015	Nut, Jam, 1/2-20 UNF
V	1	9301-0016	Nut, Acorn, 1/2-20 UNF
W	1	0521-0016	45° Elbow, 3/8 NPT Male x #8-JIC Male
X	1	9301-0009	Strainer, Suction
Y	1	9301-0082	Magnet
Z	1	9301-0008	Pipe Nipple, 3/8 NPT x 3 in.
AA	2	9301-0003	Washer, Aluminum, 9/16 in. OD x 3/8 in. ID x 1/16 in.
AB	2	9301-0004	Screw, Socket Head, 3/8-16 UNC x 1-3/4 in.
AC	2	2101-0063	Nut, Jam 5/16-18 UNC
	1	9395-____ [1]	Power Pack Complete (Includes All Items Except L, N, and W)

[1] Provide dock leveler serial number and type of installation when calling or faxing orders.
[2] Provide dock leveler serial number, voltage, and phase when calling or faxing orders.

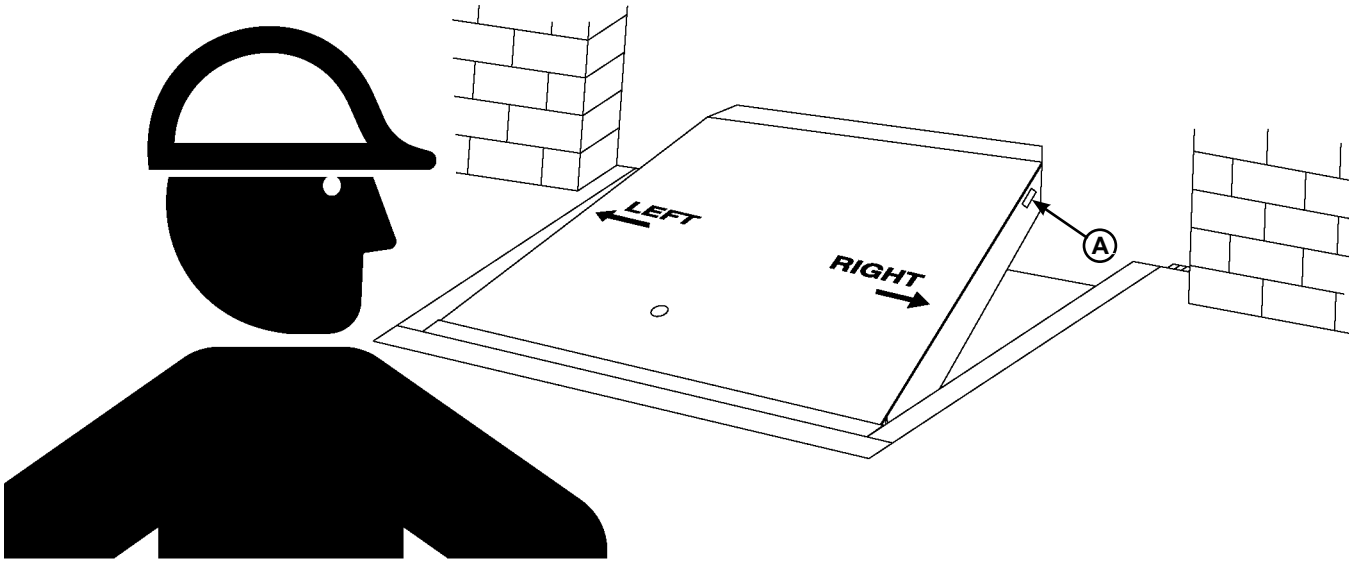
Pressure Differential Valve and Block



The Pressure Differential Valve takes the place of the Pressures Switch. The Pressure Differential Valve tells the PLC to stop retracking when the Powerhook makes contact with the ICC bar.

Item	Quantity	Part Number	Description
A	1	4305-0563	Cable Assembly, 48”
B	1	8581-0135	Pressure Differential Switch
C	1	8581-0090	Regeneration valve
D	3	9301-0116	Fitting, Elbow 90 Deg#8 O Ring To #8 Jic
E	1	9301-0126	Fitting, Union, Str
F	1	9904-0110	Hose, 1/2, 17” Lg #8 JicF Swivel Both Ends
A-F	1	8585-0096	Pressure Differential Valve Complete

Customer Information



NOTE: Refer to illustration for left/right orientation of dock leveler.

The model/serial number decal (A) is located on the right platform joist near the front (lip) of dock leveler.

When you receive your Poweramp product, write down the product model and serial number in the form provided. This will help ensure safe keeping of the numbers in the event the model/serial number decal (A) becomes lost or damaged.

Also, write down Systems, Inc.'s job number, the company that installed the dock leveler, and the original owner's name. This will all help to identify the specific dock leveler if more information is required.

When ordering, use part numbers and description to help identify the item ordered. Do not use "item" numbers. These are only for locating the position of the parts. Always give dock leveler MODEL NUMBER and/or SERIAL NUMBER.

For service, call or contact:

Systems, Inc.
P.O. Box 309
Germantown, WI 53022

Phone: (800) 643-5424
Fax: (262) 255-5917

Dock Leveler Information

Model _____

Serial No. _____

Systems, Inc., Job No. _____

Original Owner Information

Name _____

Address _____

_____

Installer Information

Name _____

Address _____

_____

Date of Installation _____

STANDARD PRODUCT WARRANTY

SYSTEMS, INC. warrants that its products will be free from defects in design, materials and workmanship for a period of one (1) year from the date of shipment. All claims for breach of this warranty must be made within 30 days af ter the defect is or can with reasonable care, be detected. In no event shall any claim be made more than 30 days after this warranty has expired. In order to be entitled to the benefits of this warranty, the product must have been properly installed, maintained and operated in accordance with all manufacturer's recommendations and/or specified design parameters and not otherwise have been subject to abuse, misuse, misapplication, acts of nature, overloading, unauthorized repair or modification, application in a corrosive environment or lack of maintenance. Periodic lubrication, adjustment and inspection in accordance with all manufacturers' recommendations are the sole responsibility of the Owner/User.

In the event of a defect, as determined by SYSTEMS INC., covered by this warranty, SYSTEMS INC. shall remedy such defect by repairing or replacing any defective equipment or parts, bearing the cost for the parts, labor and transportation. This shall be exclusive remedy for all claims whether based on contract, negligence or strict liability.

WARRANTY LIMITATIONS

THE ABOVE WARRANTIES ARE IN LIEU OF ANY OTHER WARRANTIES, WHETHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SYSTEMS INC. AND ITS SUBSIDARIES SHALL NOT IN ANY EVENT BE LIABLE TO ANYONE, INCLUDING THIRD PARTIES, FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND INCLUDING BUT NOT LIMITED TO, BREACH OF WARRANTY, LOSS OF USE, LOSS OF PROFIT, INTERUPTION OF BUSINESS OR LOSS OF GOODWILL.

PRODUCT SPECIFIC WARRANTY
"POWERHOOK®" SERIES LEVELER

In addition to the "Standard Product Warranty" provided with all Poweramp® Products, Systems Inc., guarantees materials, components and workmanship to be free of defects for the following extended periods:

- Structural Warranty – For a period of five (5) years from the date of shipment, this warranty specifically applies to; the deck section, lip section, frame, rear hinge assembly and front hinge assembly only.
- Hydraulic Warranty – For a period of five (5) years from date of shipment, this warranty specifically applies to; the hydraulic pump and motor, all hydraulic cylinders, hydraulic pressure lines and fittings and fluid control assemblies only.
- Electrical Warranty – For a period of two (2) years from date of shipment, this warranty specifically applies to; the control box components, guide track assembly, pressure differential switch, coils and proximity sensor when interlocked with Poweramp® dock leveler only.