A Division of Systems, LLC

POWERAMP®

Premium Loading Dock Systems

PowerHook®

Vehicle Restraint

Owner's/User's Manual

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Manual No. 4111-0010
Feb. 2019

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Recognize Precautionary Information

Safety-Alert Symbol

The Safety-Alert Symbol is a graphic representation intended to convey a safety message without the use of words. When you see this symbol, be alert to the possibility of death or serious injury. Follow the instructions in the safety message panel.

DANGER

The use of the word DANGER signifies the presence of an extreme hazard or unsafe practice which will most likely result in death or severe injury.

WARNING

The use of the word WARNING signifies the presence of a serious hazard or unsafe practice which could result in death or serious injury.

CAUTION

The use of the word CAUTION signifies possible hazard or unsafe practice which could result in minor or moderate injury.

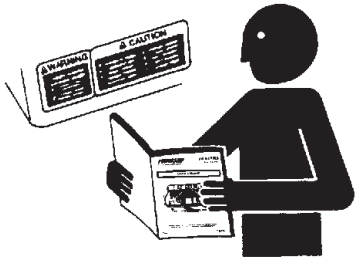
NOTICE

The use of the word NOTICE indicates information considered important, but not hazard-related, to prevent machine or property damage.

SAFETY INSTRUCTIONS

Indicates a type of safety sign, or separate panel on a safety sign, where safety-related instructions or procedures are described.

General Operational Precautions



Read and understand the Owner's/User's Manual and become thoroughly familiar with the equipment and its controls before operating the equipment.

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

Never remove DANGER, WARNING, or CAUTION signs, Placards or Decals on the equipment unless replacing them.

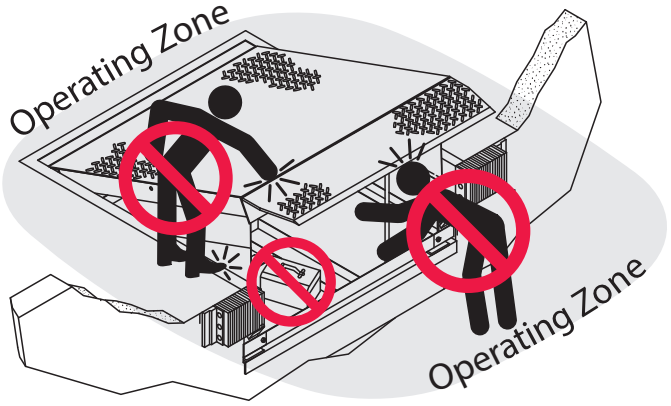


Figure 1

Do not start the equipment until all unauthorized personnel in the area have been warned and have moved outside the operating zone (Figure 1).

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.

WARNING: This product can expose you to chemicals including lead, which are known to the State of California to cause cancer or birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

PRECAUTIONS

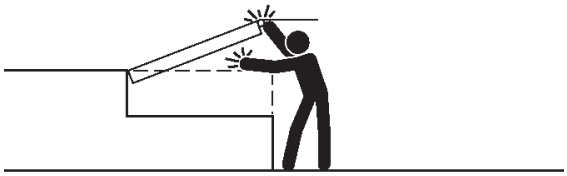
Operational Precautions

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 transport vehicle is entering or leaving area.

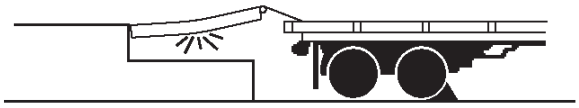
Do not move or use the dock leveling device if anyone is under or in front of it.



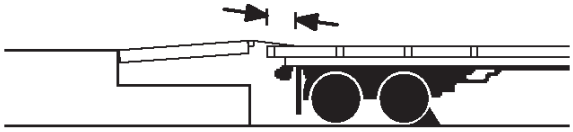
Keep hands and feet clear of pinch points. Avoid putting any part of your body near moving parts.

WARNING

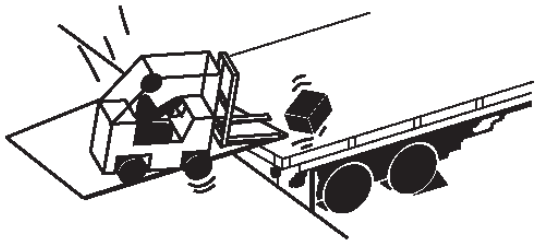
Chock/restrain all transport vehicles. Never remove the wheel chocks or release the restraining device until loading or unloading is finished, and transport driver has been given permission to drive away.



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



Make sure lip overlaps onto transport vehicle bed at least 4 in. (102 mm).



Keep a safe distance from both side edges.

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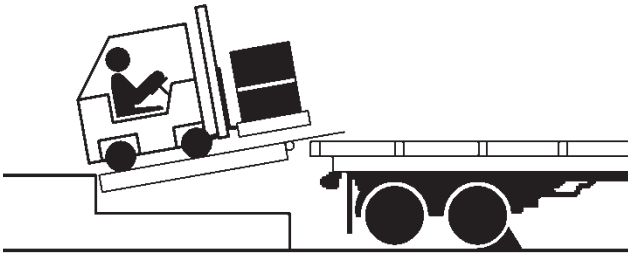
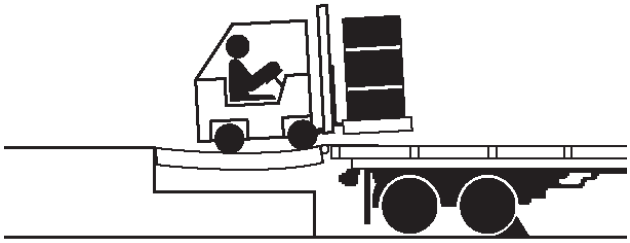
Operational Precautions

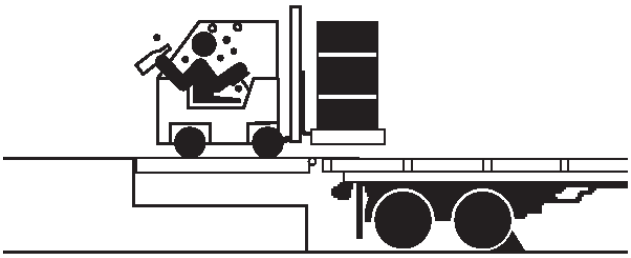
⚠WARNING



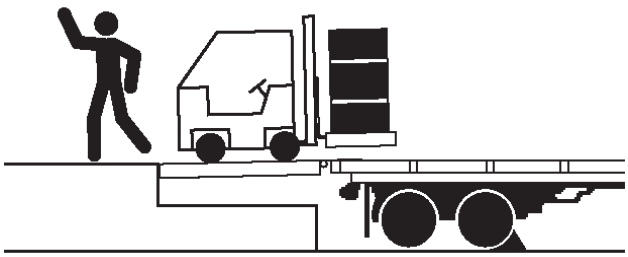
Do not use dock leveling device if transport vehicle is too high or too low.



Do not overload the dock leveling device.



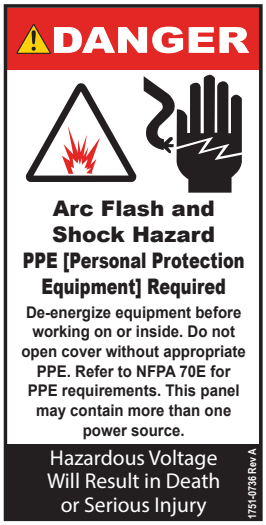
Do not operate any equipment while under the influence of alcohol or drugs.



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

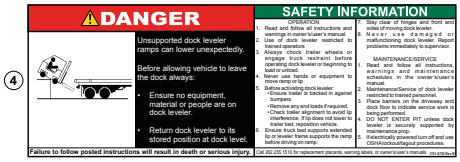
PRECAUTIONS

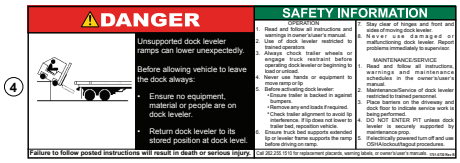
Safety Decals



1751-0329

1751-0330 Two positions one on top of each fork pocket.





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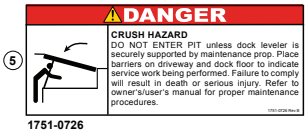

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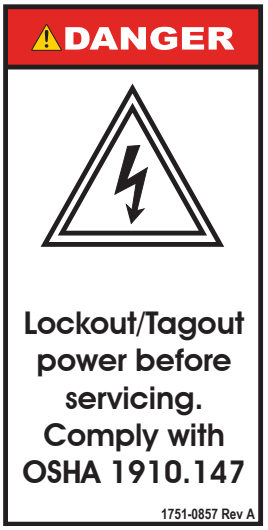

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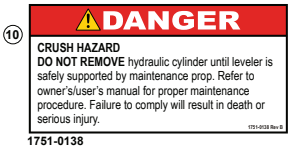

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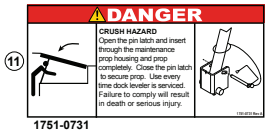

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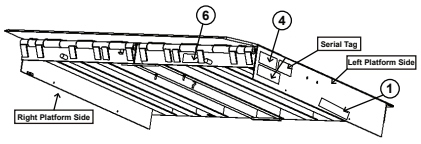

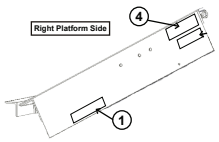

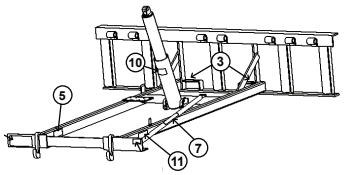

Figure 2

Note: This is a example of dock leveler safety decals. See specific model manual for correct safety decal sheet, or consult Systems, LLC Tech Services.

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Placard

DANGER

- Read and follow all instructions, warnings, and maintenance schedules in the manual and on placards.
- Vehicle restraint operation and servicing is restricted to authorized personnel.

1. Before using the vehicle restraint:
   - Remove any debris, snow, or ice that may obstruct vehicle restraint operation.
   - Alert personnel in the area of potential vehicle restraint operation and ensure area is clear.
   - Operate the vehicle restraint through one complete cycle inspecting it for proper operation and light sequence. Advise maintenance personnel of any damage or improper operation immediately. Remove all malfunctioning or damaged vehicle restraints from service using approved lockout/tagout procedures.
2. Before attempting to restrain a transport vehicle:
   - Verify that transport vehicle is positioned squarely against dock bumpers.
   - Inspect the transport vehicle's rear impact guard (RIG). Damaged or missing RIGs, lift gates, plates or other obstructions may not allow the vehicle restraint to securely capture the RIG. Wheel chocks must be used whenever the ability for the vehicle restraint to capture the RIG is in question. **(NOTE: The transport vehicle's suspension and load condition will affect trailer height.)**
3. After activating vehicle restraint:
   - Verify that the transport vehicle's RIG has been restrained successfully. In the event this cannot be determined, use wheel chocks in addition to restraint.
   - If equipped with a light communication system, load and unload on GREEN light only.
4. Maintenance or service must be performed by authorized personnel only. Follow approved lockout/tagout procedures.

FAILURE TO FOLLOW THESE INSTRUCTIONS WILL RESULT IN DEATH OR OTHER SERIOUS INJURY.

Scan to view our owner's/user's manuals online.
www.**LoadingDockSystems**.com

1.800.643.5424
Call for additional placards, or manuals, or with questions regarding proper use, maintenance, and repair of dock leveler.

POWERAMP MCGUIRE DLM SYSTEMS Loading Dock Equipment

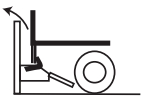
WARNING: CANCER AND REPRODUCTIVE HARM
www.P65Warnings.ca.gov

1751-0880 Rev F

1751-0880

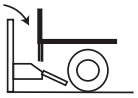
OPERATING INSTRUCTIONS

VEHICLE RESTRAINTS



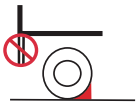
ENGAGE RESTRAINT

1. Open overhead door and visually check that transport vehicle is positioned squarely against dock bumpers and has a RIG bar. Inside light is RED and outside light is GREEN.
2. Press the ENGAGE button to activate restraint.
3. Once RIG has been secured, inside light is GREEN and outside light is RED



RELEASE RESTRAINT

1. To release restraint press the RELEASE button. When safely stored, inside light is RED and outside light is GREEN.



BY-PASS

1. If restraint is unable to secure transport vehicle's RIG, use wheel chocks to secure transport vehicle at the dock.
2. Turn switch to BY-PASS. Inside light is GREEN and outside light is RED.
3. Loading/unloading may proceed with caution.

BY-PASS RESET (RETURN TO NORMAL OPERATION)

1. When loading or unloading is completed and wheel chocks are removed. Manual reset of BY-PASS is accomplished by pressing the RELEASE button or turning switch to NORMAL. Lights change to RED inside and GREEN outside.

Use for PowerHook, PowerHold, HoldTite and TPR series

OWNER'S/USER'S RESPONSIBILITIES

1) The manufacturer shall provide to the initial purchaser and make the following information readily available to the owners/users and their agents, all necessary information regarding 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.

2) The owner/user should recognize the inherent dangers of the interface between the loading dock and the transport vehicle. The owner/user should, therefore, train and instruct all operators in the safe operation and use of the restraining device in accordance with manufacturer's recommendations and industry standards. Effective operator training should also focus on the owner's/user's company policies, operating conditions and the manufacturer's specific instructions provided with the restraining device. Maintaining, updating and retraining all operators on safe working habits and operation of the equipment, regardless of previous experience, should be done on a regular basis and should include an understanding and familiarity with all functions of the equipment. Owners/users shall actively maintain, update and retrain all operators on safe working habits and operations of the equipment.

3) When selecting a restraining device, it is important to consider not only present requirements but also future plans and any possible adverse conditions, environmental factors or usage. The owners/users shall provide application information to the manufacturer to receive recommendations on appropriate equipment specifications.

4) The owner/user must see all nameplates, placards, decals, instructions and posted warnings are in place and legible and 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) Modifications or alterations of restraining devices shall be made only with prior written approval from the original manufacturer. These changes shall be in conformance with all applicable provisions of the MH30.3 standard and shall also satisfy all safety recommendations of the original equipment manufacturer of the particular application.

6) An operator training program should consist of, but not necessarily be limited to, the following:

   a) Select the operator carefully. Consider the physical qualifications, job attitude and aptitude.
   b) Assure that the operator reads and fully understands the complete manufacturer's owners/users manual.
   c) Emphasize the impact of proper operation upon the operator, other personnel, material being handled, and equipment. Cite all rules and why they are formulated.
   d) Describe the basic fundamentals of the restraining device and components design as related to safety, e.g., mechanical limitation, stability, functionality, etc.
   e) Introduce the equipment. Show the control locations and demonstrate functions. Explain how they work when used properly and maintained as well problems when they are used improperly.
   f) Assure that the operator understands nameplate data, placards and all precautionary information appearing on the restraining device.
   g) Supervise operator practice of equipment.
   h) Develop and administer written and practical performance tests. Evaluate progress during and at completion of the course.
   i) Administer periodic refresher courses. These may be condensed versions of the primary course and include on-the-job operator evaluation.

7) It is recommended that the transport vehicle is positioned as close as practical to the dock leveling device and in contact with both bumpers. When an industrial vehicle is driven on or off a transport vehicle during loading and unloading operations, the transport vehicle parking brakes shall be applied and wheel chocks or a restraining device that provides equal or better protection of wheel chocks shall be engaged. Also, whenever possible, air-ride suspension systems should have the air exhausted prior to performing said loading and unloading operations.

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8) When goods are transferred between the loading dock and a trailer resting on its support legs/ landing gear instead of a tractor fifth wheel or converter dolly, it is recommended that an adequate stabilizing device or devices shall be utilized at the front of the trailer.

9) In order to be entitled to the benefits of the standard product warranty, the dock safety equipment 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.

10) Manufacturer's recommended maintenance and inspection of all restraining devices shall be performed in conformance with the following practices: A planned maintenance schedule program must be followed, only trained and authorized personnel shall be permitted to maintain, repair, adjust and inspect restraining devices, and only the use of original equipment manufacturer parts, manuals, maintenance instructions, labels, decals and placards or their equivalent. Written documentation of maintenance, replacement parts or damage should be kept. In the event of damage, notification to the manufacturer is required.

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

INTRODUCTION

General Information

Figure 3

This manual provides current information on the PowerHook vehicle restraint. Due to ongoing product improvement, some parts may have changed, along with operation and troubleshooting methods. This manual describes these changes where applicable.

The PowerHook is the original vehicle 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 vehicle restraint can be interlocked, preventing operation of the dock leveler until the hook engages the vehicle RIG bar.

The vehicle 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 vehicle restraint comes equipped with an electrical control panel, which allows push button operation of the vehicle restraint functions. When combining a Poweramp Dock Leveler with a PowerHook vehicle restraint, the control panel will allow for operation of both units in the same control panel.

Each PowerHook vehicle restraint unit 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 Systems, LLC Technical Services.

Call Systems, LLC to discuss available voltages, phases and options to meet your specific needs.

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

Component Identification

Inspect package and all components. Report any missing or damaged items immediately and note on the shipping Bill Of Lading (BOL).

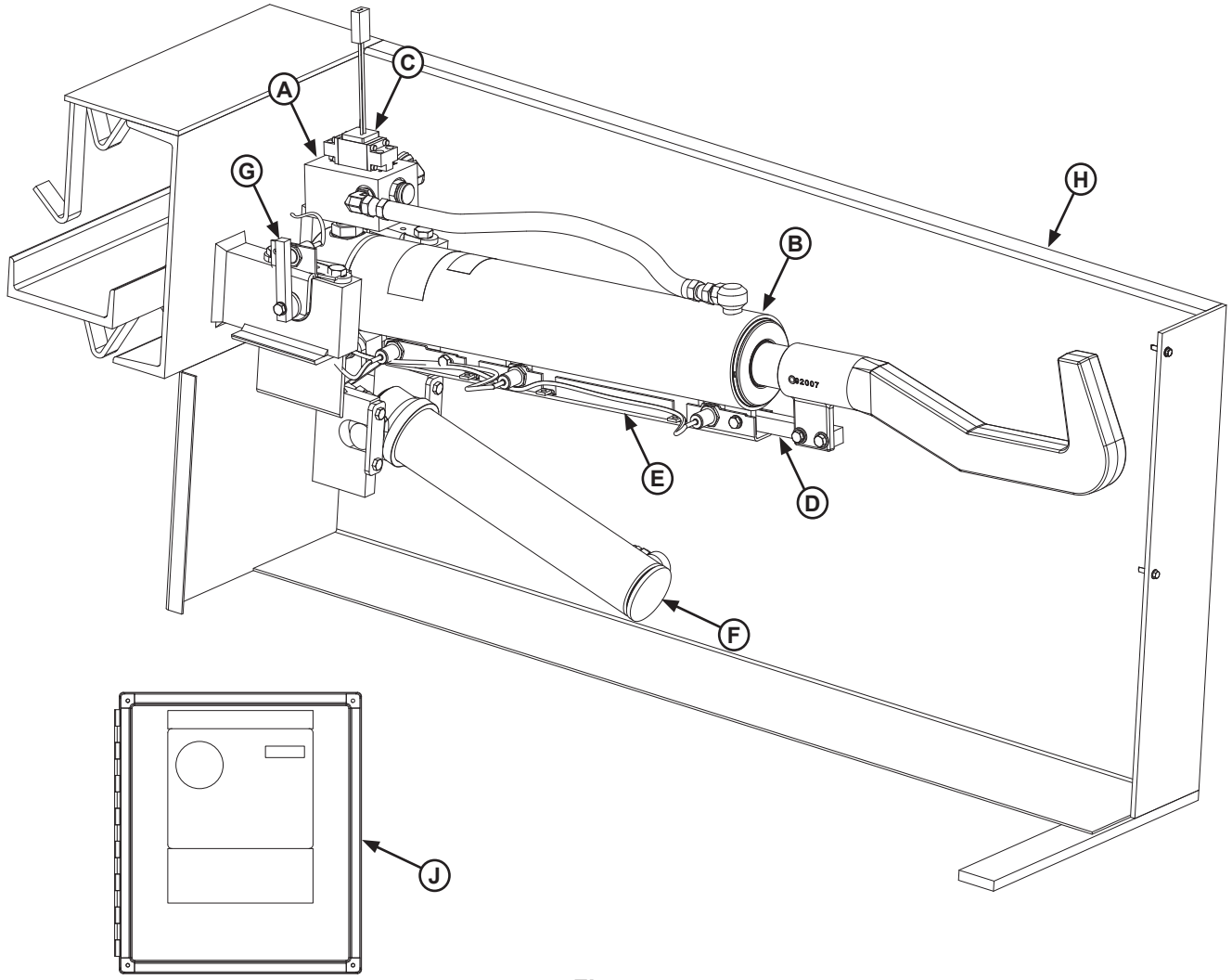

Figure 4

A — Regeneration Valve
B — Hook Cylinder & Hook
C — Pressure Differential Switch
D — Guide Track-Slide Rod
E — Guide Track
F — Positioning Cylinder
G — Lower Limit Sensor Target
H — KS5 Pan Assembly*
J — Control Box**

** KS4, KS5, KS6 and KS7 models differ in pan/frame appearance, but all core PowerHook components are identical.*
***Control box appearance may vary depending on options.*

INSTALLATION

Installation Precautions

⚠DANGER

It is recommended and good safety practice to use an additional means to support the dock platform and lip anytime when physically working in front of or under the dock leveler. This additional means may include, but is not limited to a boom truck, fork truck, stabilizing bar or equivalent.

⚠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 installation is complete.

A hard hat or other applicable head protection should always be worn when working under or around a dock leveler.

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

⚠WARNING

DO NOT grind or weld if hydraulic fluid or other flammable liquid is present on the surface to be ground or welded.

DO NOT grind or weld if uncontained hydraulic fluid or other flammable liquid is present. Stray sparks can ignite spills or leaks near the work area. Always clean up the oil leaks and spills before proceeding with grinding or welding.

Always keep a fire extinguisher of the proper type nearby when grinding or welding.

⚠CAUTION

Only trained installation professionals with the proper equipment should install this product.

⚠CAUTION

In applications where adhesive anchors will be used, holes must be properly prepped and cleaned before applying adhesive into holes. Refer to adhesive instructions for further detail.

NOTICE

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

DO NOT ground welding equipment to any hydraulic or electrical components of the vehicle restraint. Always ground welding equipment to the vehicle restraint base, NEVER to the moving components.

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

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PowerHook Installation Overview

This manual covers three models of PowerHook vehicle restraints: KS4 (Figure 5), KS5 (Figure 6), and KS6/KS7 (Figure 7). Individual installation techniques may vary, but installation must conform to the correct welding and shimming procedures as shown in this manual.

KS4 PowerHook

The PowerHook KS4 box-type vehicle restraint is ideally suited for vertical-storing leveler installations. The larger box form with insulated lid is fully assembled and ready to be poured in place during the construction process.

See pages 12-13 for KS4 installation instructions.

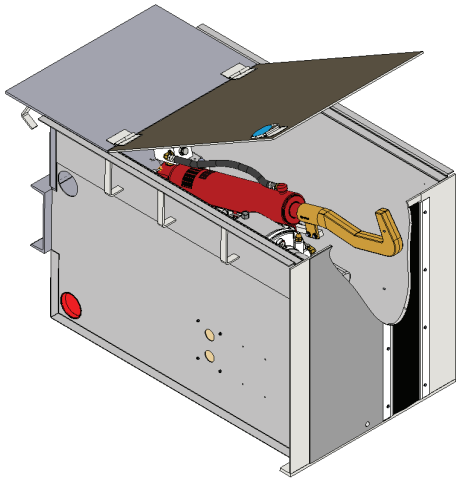

Figure 5

KS5 PowerHook

The PowerHook KS5 pan-type vehicle 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.

See pages 14-16 for KS5 installation instructions.

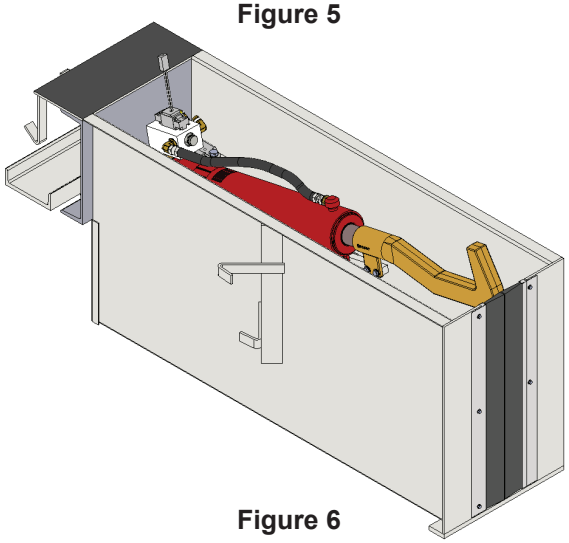

Figure 6

KS6/KS7 PowerHook

The PowerHook KS6/KS7 free-standing frame type vehicle 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.

See pages 17-19 for KS6/KS7 installation instructions.

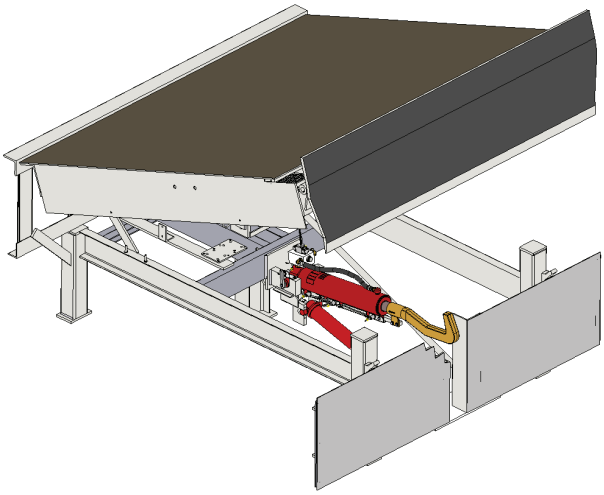

Figure 7

INSTALLATION

KS4 Installation

These installation instructions are 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 a remote power pack or a CentraPower® system, refer to the manuals provided with those units.
- 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.

Installation Steps

1. Review the field wiring drawing and the certified pit drawing included with the equipment. 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. Lock out and tag out the dock leveler, then place the maintenance props in their service/down position with hardware fully secured, and ensure the storage prop is locked out with the prop pin and clip.

3. Modify the underside of the dock leveler platform as indicated on the “Dock Leveler Modification Drawing(s)” included with the equipment.

4. 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.

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

6. Pour concrete around the vehicle restraint pan and hoist cylinder trunnion plates(s) that will be embedded in the pit floor (if the plate is separate from the pan).

7. Allow sufficient time for the concrete to set.

8. If pan was shipped separately, assemble the vehicle restraint:

9.
   a. Remove all trunnion keepers.

   b. Grease cylinder trunnions.

   c. Install cylinders.

   d. Install all trunnion keepers and prox switches.

10. Modify dock leveler frame as needed per “Dock Leveler Modification Drawing(s)” included with the equipment.

11. Install all hydraulic hoses (see Figure 9), then fill and bleed system with approved hydraulic oil (see page 26 for approved fluids).

12. Proceed to “Install Control Panel and Wiring” on Page 20.

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KS4 Installation (continued)

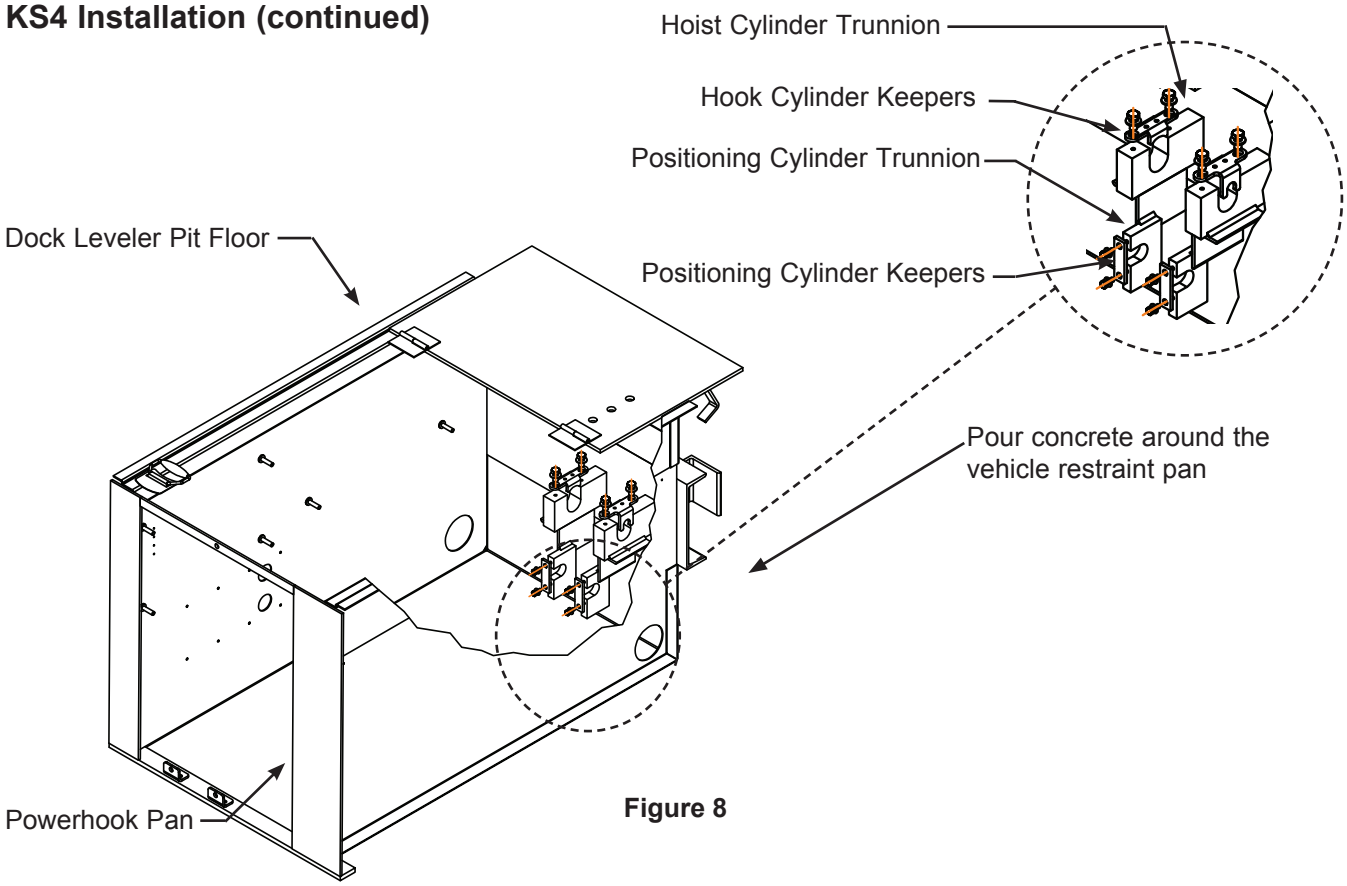
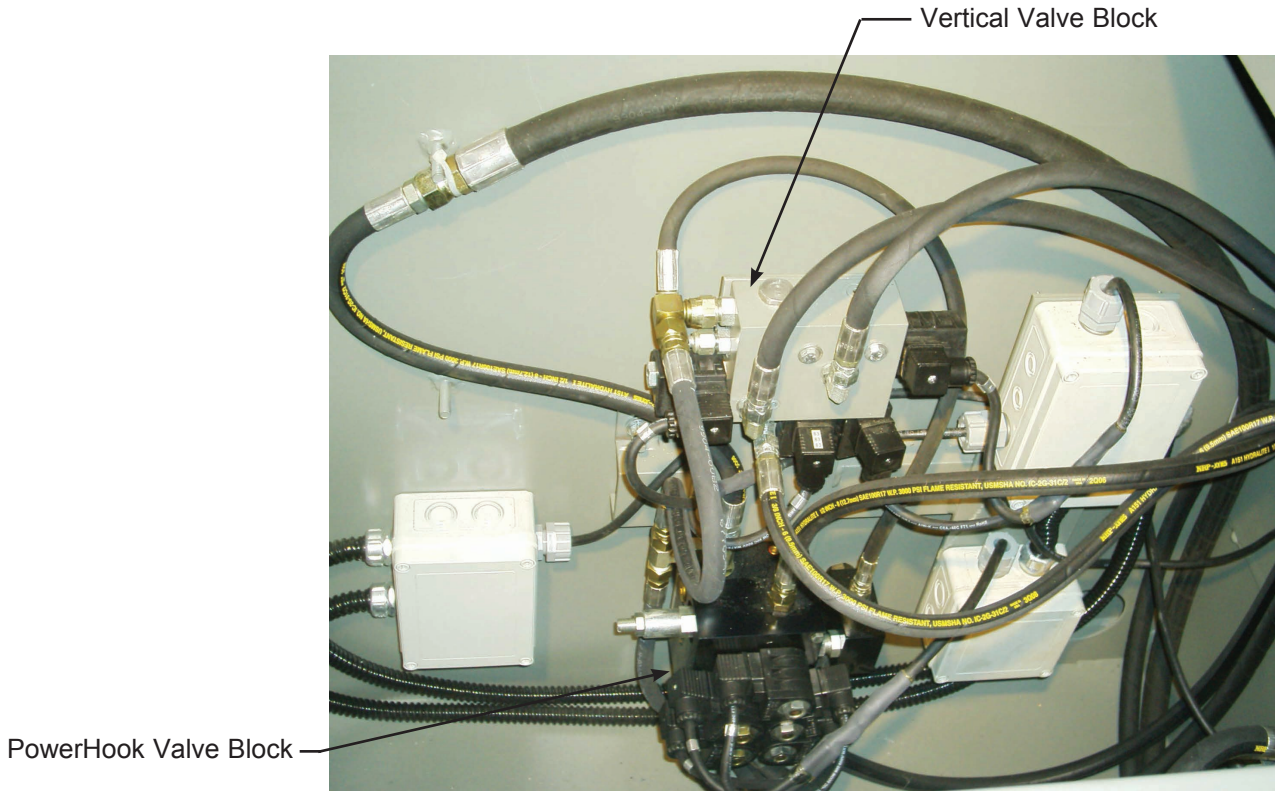


Figure 8



(View inside KS4 pan)

Figure 9

INSTALLATION

KS5 Installation

These installation instructions are written for retrofitting a Poweramp hydraulic dock leveler that uses an 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.

- 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.

Installation Steps

1. Review the field wiring drawing and the certified pit drawing included with the equipment. 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.

Note: The dock leveler will be removed from the pit (steps 9-13) 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. See Figure 10.

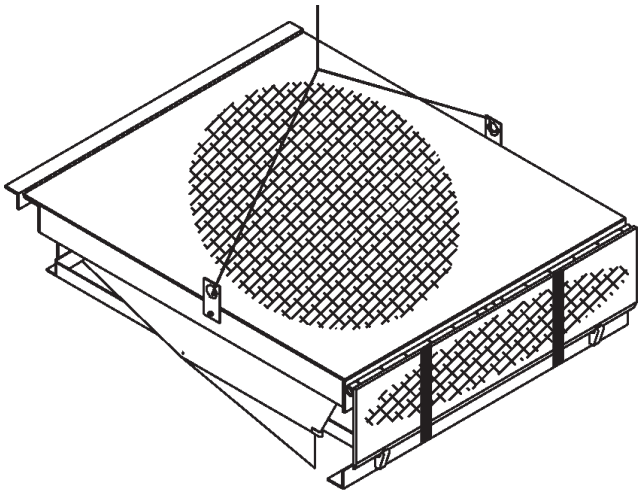


Figure 10

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

4. Turn OFF all electrical power to the dock leveler. Attach lock out/tag out devices.

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)” included with the equipment.

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.

Remote Mount Powerpack models only:

a. After Powerpack is drained, 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.

b. Cap off all open fittings to prevent contamination.

c. Tie off hoses to prevent damage when leveler is removed.

8. Use a fork vehicle (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.

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KS5 Installation (continued)

CleanPit models only:

Note: Frame removal on 10' and 12' long CleanPit units is typically not necessary. Contact Systems, LLC Technical Services if modification is required.

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 CleanPit Installation Instructions 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, LLC, the angles are shipped with the vehicle restraint pan unit.

10. Set the leveler in the cross traffic position, with the lip fully folded inside the lip keepers, and the platform level with the dock floor. See Figure 11:

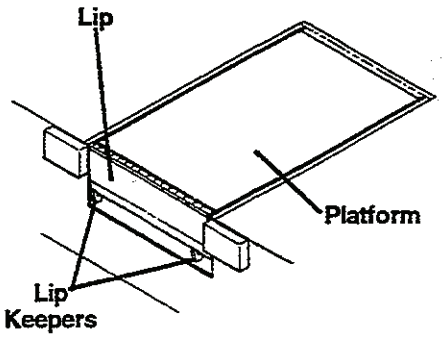

Figure 11

11. 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. See Figure 12 for reference.

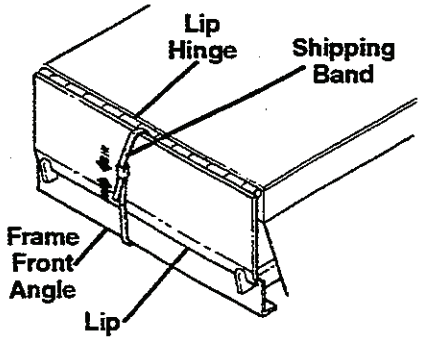

Figure 12

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

13. Remove dock leveler from the pit using the lifting brackets. See Figure 10.

14. Cut pit for the transport vehicle restraint pan as indicated on the pit drawing included with the equipment.

15. Cut out or chip concrete to accommodate 3/8" x 16" x 16" hoist cylinder trunnion plates(s) which must be embedded into the pit floor as shown on the pit drawing. On eight foot long dock levelers the plate is an integral part of the vehicle restraint, and a separate plate is not required; see table below.

Dock Leveler		Hoist Cylinder Trunnion Plates
Length	CleanPit	
6,10 or 12 Foot	NO	Supplied by others or available from Systems, LLC (upon request).
8 Foot	NO	Supplied by Systems, LLC (attached to KS5 pan).
6 Foot	YES	* Existing plate(s) must be removed, as plates are 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 been altered during removal and if all the old concrete is chipped away from the anchors. * New plate(s) supplied by others or available from Systems, LLC (upon request).
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. New plate(s) is supplied by Systems, LLC (attached to KS5 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.

KS5 Installation (continued)

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

17. Pour concrete around the vehicle restraint pan and hoist cylinder trunnion plates(s) that will be embedded in the pit floor (if the plate is separate from the pan).

18. Allow sufficient time for the concrete to set.

19. If pan was shipped separately, assemble the vehicle restraint:

    a. Remove all trunnion keepers.

    b. Grease cylinder trunnions.

    c. Install cylinders.

    d. Install all trunnion keepers and prox switches.

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

21. Clean and paint all welds.

22. Modify dock leveler frame as needed per “Dock Leveler Modification Drawing(s)” included with the equipment.

23. Update all hydraulic valving to run dock leveler and vehicle restraint from one hydraulic system.

24. Install all hydraulic hoses, fill, and properly bleed system with approved hydraulic oil (see page 26 for approved fluids).

25. Proceed to “Install Control Panel and Wiring” on page 20.

Installation Steps - w/CentraPower®

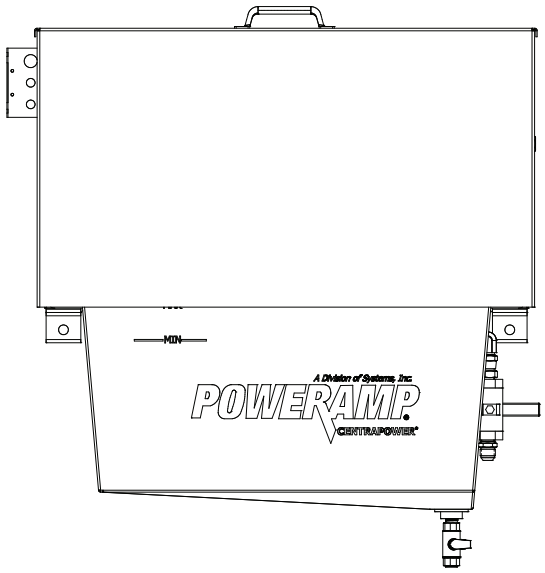

Figure 13

1. Complete steps 1-6 of normal retrofit instructions on page 14.

2. Disconnect and label the hydraulic hoses attached to the CentraPower® valve assembly.

3. Cap off all open fittings to prevent contamination.

4. Tie off hoses to prevent damage when leveler is removed.

5. Follow steps 8-14 for prep and removal of dock leveler on pages 14-15.

6. Follow steps 15-25 to install vehicle restraint & leveler on pages 15-16.

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KS6/KS7 Installation

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.

2. Remove all debris from the pit.

3. Check the pit dimensions with the certified pit drawing included with the equipment. 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. See Figure 14 for example KS6 pit.

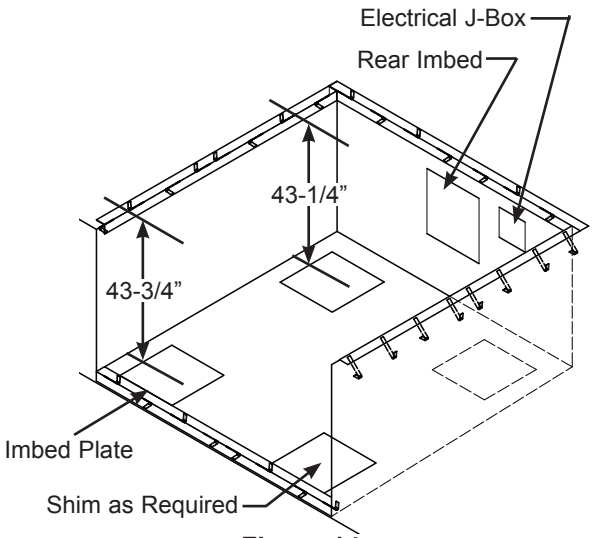

Figure 14

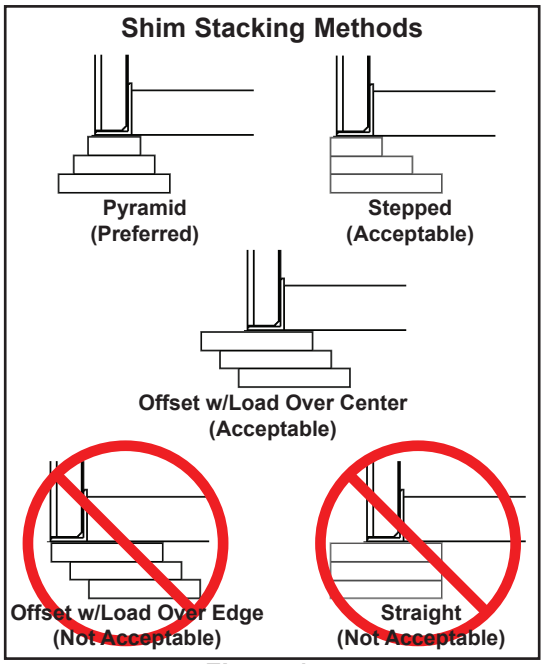

Figure 15

Installation Steps

1. 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. Dimension from top of shims to dock floor should be as shown in Figure 14. Stack shims as shown in Figure 15.

Note: 6” x 8” x 1/2” base, then 5” x 7” x 1/4” shims are recommended for the front legs, rear legs and maintenance prop. See page 19

2. 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.

3. Remove the shipping bands from the unit.

4. Using an external lifting device (i.e. crane or fork truck) attached to the platform lifting brackets, slowly raise the platform.

5. Position shims under the hinge tubes of the maintenance prop so that the front panel support weldment is level.

6. Using an external lifting device, raise dock leveler platform to a height that will allow use of the maintenance prop. Raise the maintenance prop to the service (upright) position behind the platform header as shown in Figure 16 and lower the platform:

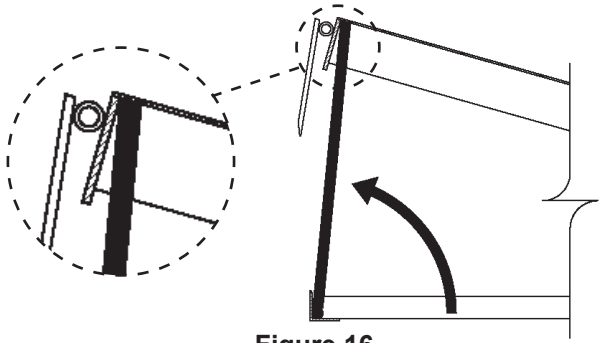

Figure 16

7. With the platform supported by the maintenance prop, 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.

KS6/KS7 Installation (continued)

8. Using an external lifting device, raise dock leveler platform and then store the maintenance prop. Lower the platform into the cross traffic position (lip fully folded, inside the keepers, and the platform level with the dock floor) as shown in figure 16:

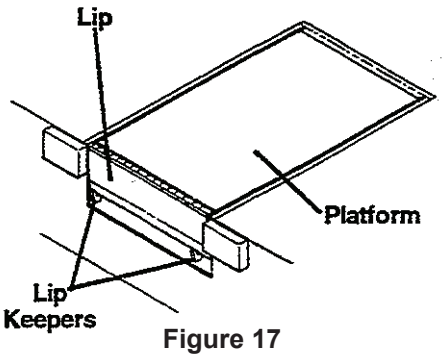

Figure 17

9. Verify that the front and rear legs are resting securely on the shims set on the pit floor, the top rear frame angle of the dock leveler is tight against the rear curb angle and flush with the dock floor, and there is equal clearance between the sides of the leveler platform and the pit walls.

KS6 models 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 20.

10. Using an external lifting device, raise dock leveler platform and engage the maintenance prop. Tack weld the rear frame angle to the rear pit curb angle. Weld behind each hinge tube of the leveler platform.

11. Re-check shims, rear frame angle and side clearance as described in step 9.

12. Finish weld all shims to unit, and where possible, to plates or pit curb angles. Stack as shown in Figure 22, and weld shims together where stacked.

13. Weld the rear hinge frame angle to the rear pit curb angle using a 3/8 in. (9.5 mm) flare bevel skip weld — each weld being 6 in. (152 mm) long.

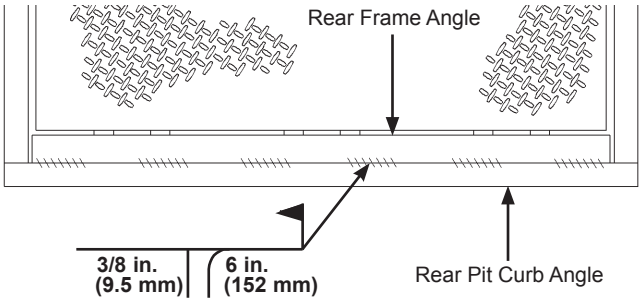

Figure 18

14. Shim the hoist cylinder support:

Note: 8" x 10" x 1/2" base, then 7-1/2" x 9-1/2" x 1/4" shims are recommended for the center support.

- Single hoist cylinder models: shim the hoist cylinder support so that the center channels are level. Stack as shown in Figure 22, and weld shims in place. See Figures 20 & 21.

- Dual hoist cylinder models: shim the hoist cylinder supports so that the side channels are level. In addition, shim under the center beam support so that the center beam is level. Stack as shown in Figure 22, and weld shims in place.

15. Weld fish plates to the center channels of the leveler and to the plate imbedded in the rear pit wall as shown in Figure 19.

Note: 5" x 5" x 3/8" fish plate size is recommended.

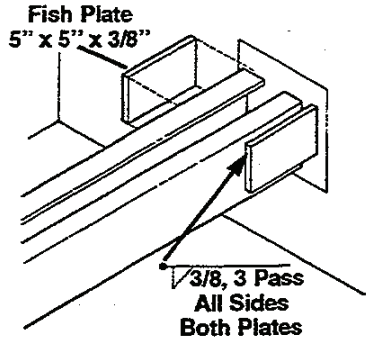

Figure 19

16. Weld and/or bolt bumpers in place on face of dock. Refer to the certified pit drawing included with the equipment.

17. Clean and paint all welds.

Note: If leveler is part of a CentraPower® hydraulic system or if Powerpack is located remotely, refer to the manuals provide with those units for final connection instructions.

18. Check the hydraulic fluid level. Standard units are shipped with the reservoir full; however, fluid level should be checked before operation to ensure no fluid loss occurred during shipment or installation. See page 27 for details.

19. Proceed to "Install Control Panel and Wiring" on page 20.

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KS6/KS7 Installation (continued)

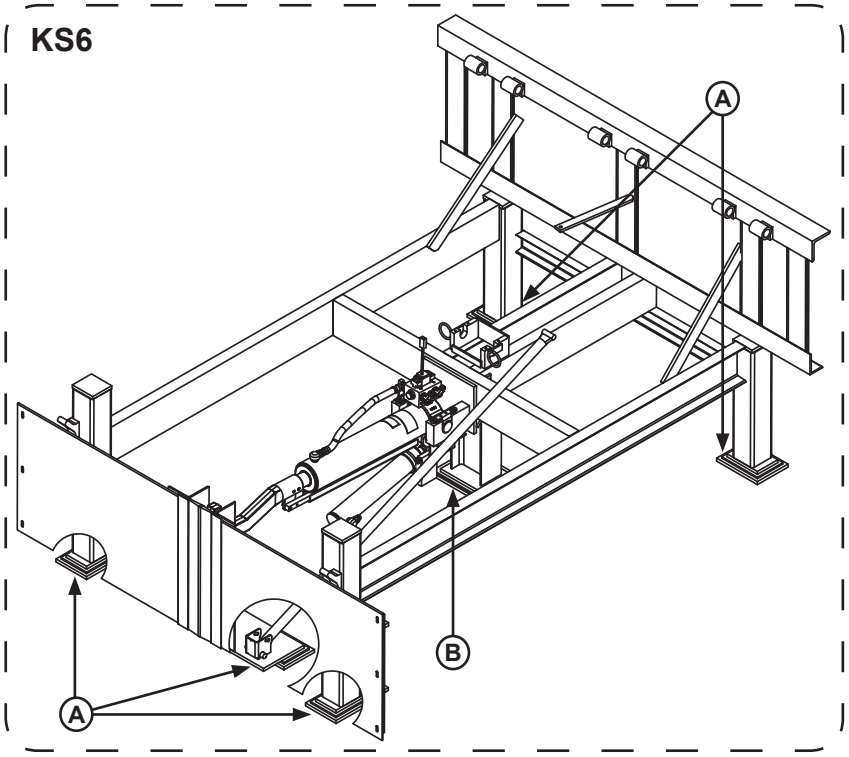


Figure 20

Ⓐ Shims:	Ⓑ Shims:
5” x 7” x 1/4”	7-1/2” x 9-1/2” x 1/4”
6” x 8” x 1/2”	8” x 10” x 1/2”

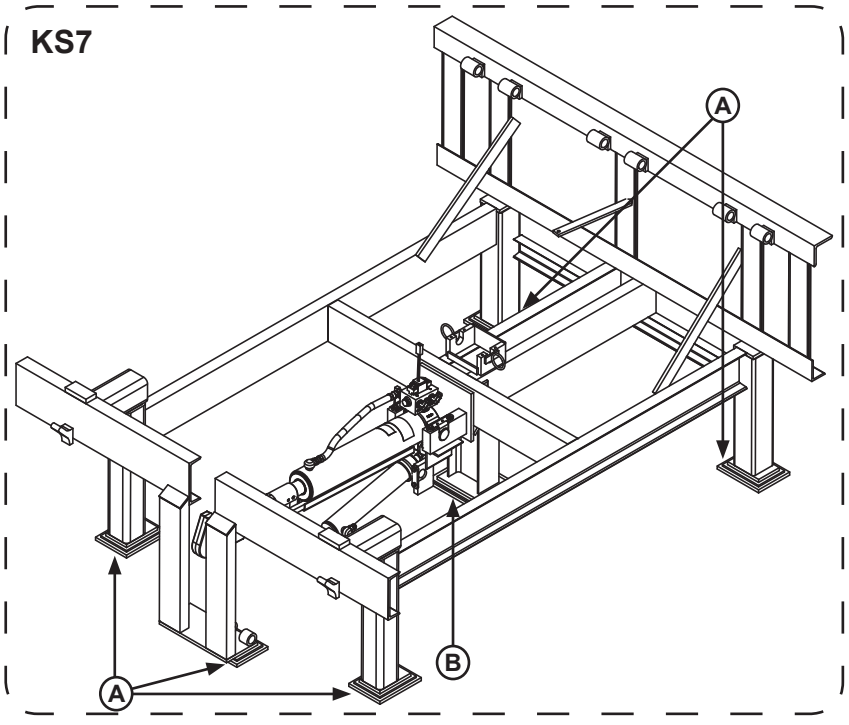


Figure 21

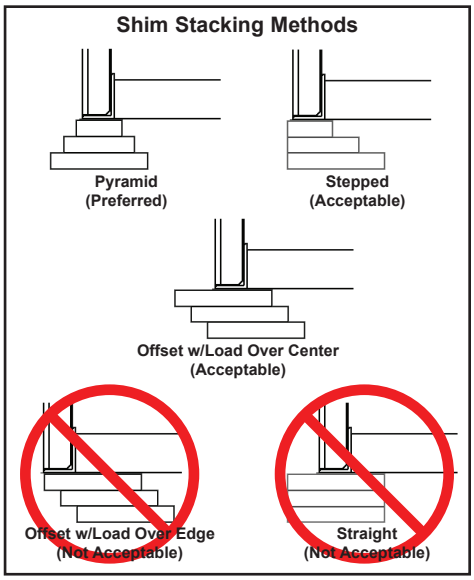


Figure 22

Install Control Panel and Wiring

⚠DANGER

Make sure that the power source has been locked out and tagged according to OSHA regulations and approved local electrical codes.

NOTICE

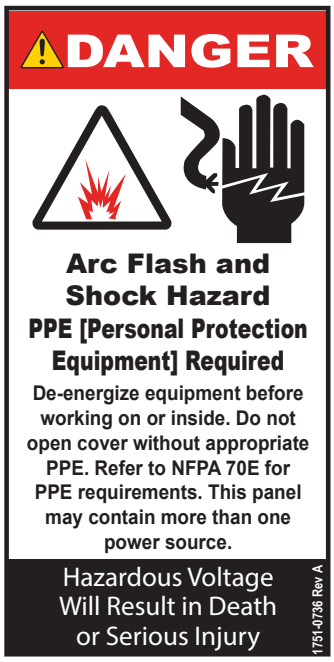
DO NOT connect the dock leveler electrical wiring and ground connections until all welding has been completed.

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, hydraulics, wiring, and/or control panel.

⚠CAUTION

All electrical work — including the installation of the disconnect panel, control panel, and final connections to the pit junction box — must be performed by a certified electrician and conform to all local and applicable national codes.



NOTICE

Where indicated, all components must be connected to a SAFETY EARTH GROUND that conforms to the 1999 National Electrical Code Section 250-50 section (a) or section (c) for a grounding electrode system.

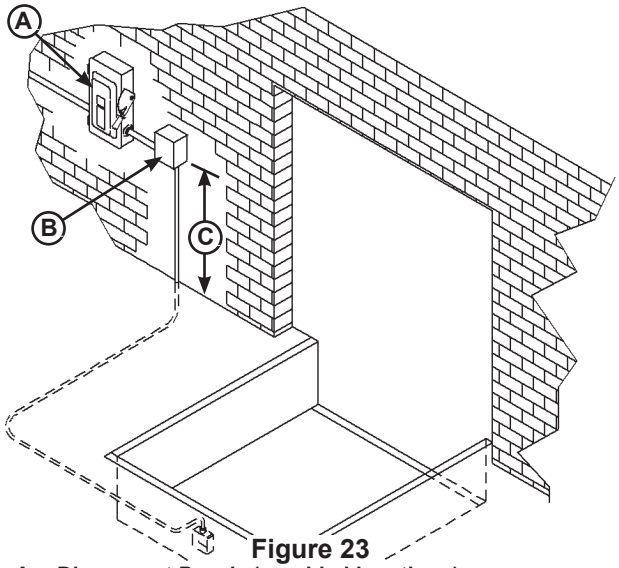


Figure 23

A— Disconnect Panel (provided by others)
B— Control Panel C— Distance, 48 in. (1219 mm)

1. Mount the push-button control panel (**B**) so bottom of control panel-to-dock floor distance (**C**) is approximately 48 in. (1219 mm). See Figure 23.

2. Install electrical disconnect panel (**A**) if not already installed. Disconnect panel supplied by others.

3. Install and connect the control wiring (see pages 21-24 for standard control boxes, or drawings supplied with equipment for combo boxes).

4. Connect the dock leveler power cable to the field wires in the pit junction box.

5. Seal the conduit in any location where the conduit crosses over temperature zones that could produce condensation.

Optional: Install spacers between the wall and enclosure to provide temperature insulation and air flow. If the conduit could fill with water, a drip leg may be needed.

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Install Outside Light Assembly and Signs

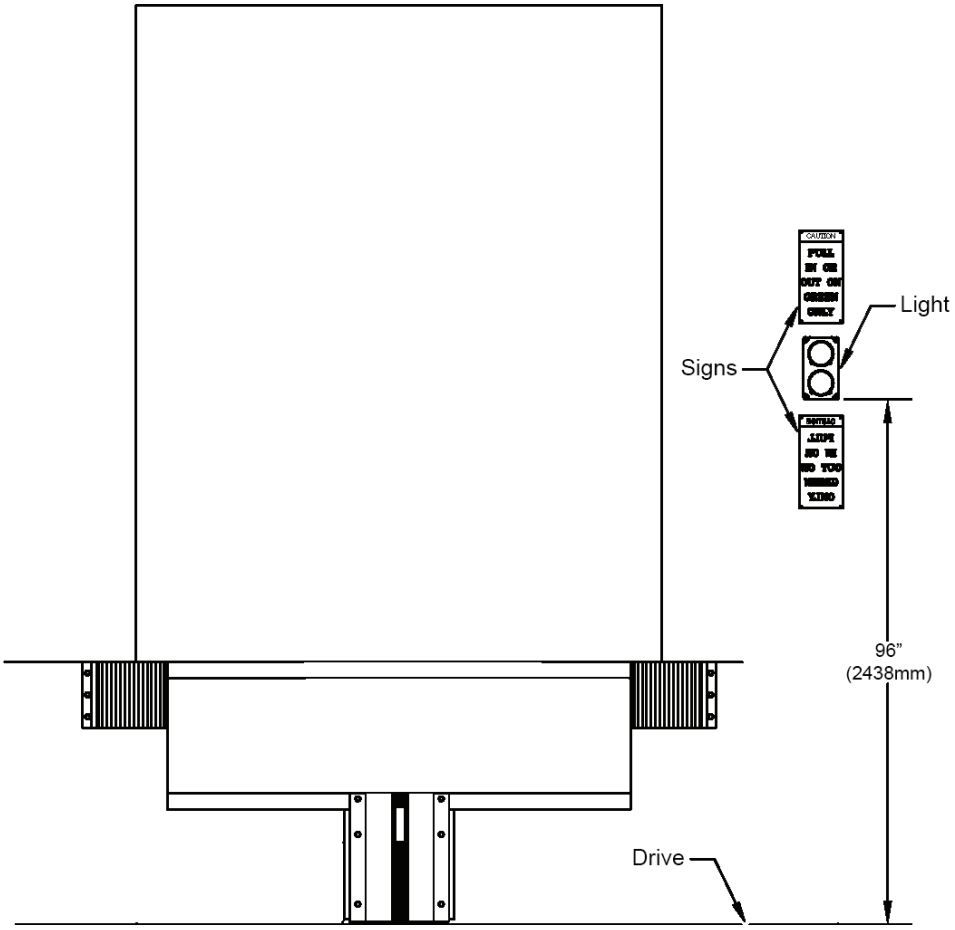


Figure 24

Note: Installation measurements shown are recommended based on typical dock conditions. Some installations may require alternate placement.

1. Mount the Outside Light Assembly (**B**) so bottom of outside light-to-drive distance (**C**) is 96 in. (2438 mm).

2. Connect the wiring for the Outside Light Assembly.

3. Install “CAUTION: PULL IN OR OUT ON GREEN ONLY” signs on outside of building above and below Outside Light Assembly.

4. Install “CAUTION: ENTER ON GREEN ONLY” sign inside building near control box.

5. Install placard (see page 22).

NOTICE

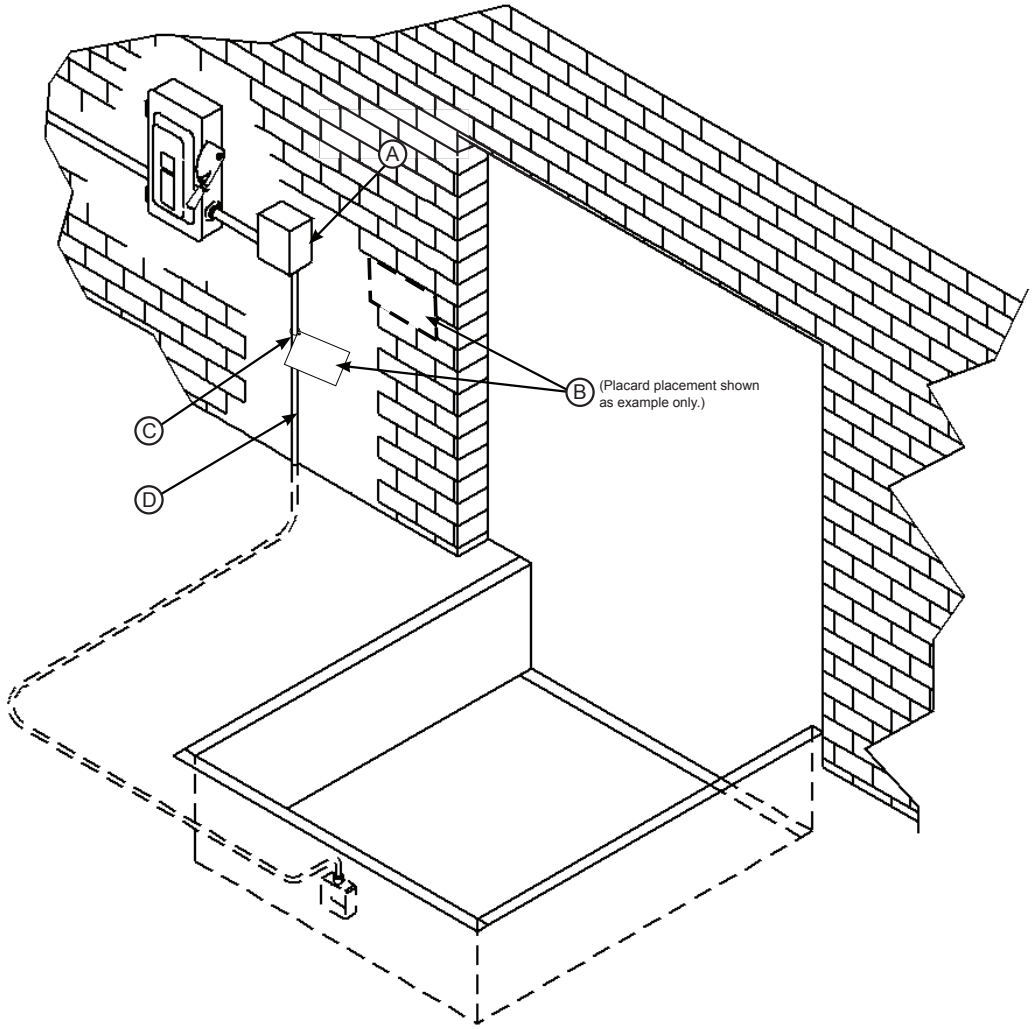
The iDock Control System is designed to function with 12v DC outside lights only.

Using 115v AC or other non-12v DC outside lights and wiring will cause the iDock Control System to enter a fault state and equipment will not function.

If 12v DC outside lights are already present and functioning, they can be re-used, but new wiring should always be run to ensure correct operation.

Placard Installation Instructions

- Owner/Users are responsible for the installation and placement of product placards.
- Make sure placard is in plain view of dock leveler and/or vehicle restraint operations.
- Suggested placement of placard is near control box attached to electrical conduit by using nylon cable tie. If there is no control box present, mount placard on wall to the immediate left of leveler at eye level.



A - Control Box B - Placard C - Nylon Cable Tie D - Conduit

Figure 25

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Operational Precautions

DANGER

Stay clear of dock leveler and vehicle restraint when transport vehicle is entering or leaving dock area.

DO NOT move or use the dock leveler or restraint 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.

WARNING

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

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

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

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

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

WARNING

Once the vehicle restraint has been activated, the dock attendant must visually inspect to assure that the restraint hook has properly engaged the Rear Impact Guard (RIG) bar.

Proper engagement occurs when the hook is able to travel vertically, contacting the bottom edge of the horizontal member of the RIG, without obstruction.

Operation - Normal

1. Check that the transport vehicle is positioned squarely against both dock bumpers.
   - Inside light - RED
   - Outside light - GREEN

2. Push ENGAGE button to activate restraint.
   - Inside lights - AMBER
   - Outside light - RED

3. Restraint will ENGAGE on transport vehicle RIG. Visually inspect restraint for proper engagement.
   - Inside light - GREEN
   - Outside light - RED

4. Position dock leveler onto transport vehicle.

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

6. Push RELEASE button to store restraint.
   - Inside lights - AMBER
   - Outside light - RED

7. Transport vehicle can now depart.
   - Inside light - RED
   - Outside light - GREEN

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Operation - Bypass

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

1. Secure transport vehicle wheels by other means.

2. Activate BYPASS mode through menu screens under OPERATION MODE.
- Inside light - GREEN & AMBER
- Outside light - RED

3. Position dock leveler onto transport vehicle trailer.

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

5. Reset BYPASS mode to NORMAL mode by pressing the RELEASE button once, or through menu screens under OPERATION MODE.
- Inside light - RED
- Outside light - GREEN

6. Release the transport vehicle wheels when transport vehicle is ready to depart.

Operation - Bypass From Unsuccessful Engage

If the restraint fails to successfully ENGAGE a trailer RIG, the hook will automatically return to the stored position.
- Inside light - AMBER & RED
- Outside light - RED

Bypass mode can then be activated by pressing ENTER button (user code may be required).
- Inside light - GREEN & AMBER
- Outside light - RED

Or, to reset back to NORMAL mode, press RELEASE button.
- Inside light - GREEN
- Outside light - RED

See the iDock Owner's/User's Manual for more information on iDock menus and navigation.

Power Interruption

If power to the control box is interruped, the inside light will flash Red/Amber. The restraint must then be cycled to determine its position.

- If restraint is in the stored position, press the RELEASE button.

- If restraint is in the engaged button, press the ENGAGE button.

OPERATION

Multi-Colored & Outside Light Sequence Charts

Normal Operation

Condition	Lights	
	Inside	**Outside**
Ready For Use	Red	Green
Leveler Operating or Restraint Engaging/Releasing In Progress	Amber	Red
Restraint Engaged	Green	Red
Restraint Engage Failure	Red/Amber, Display Backlight*	Red
Emergency Stop Active	Red (solid)*	Red (solid)
Attempted Pullout	Red/Amber*	Red (fast flashing)

**If equipped, Audible Alarm will also be active.*

Bypass Mode

Condition	Lights	
	Inside	**Outside**
Restraint Engage Failure (Bypass Mode prompt)	Red/Amber, Display Backlight	Red
Bypass Mode	Green/Amber (Green/Red on Dock Alert)	Red
Reset Attempted (Leveler in Use)	Red/Amber, Display Backlight	Red
Reset Attempted (Door Open)	Green/Amber, Display Backlight	Red
Reset Lights to Normal Mode	Red, Display Backlight (5 seconds)	Green

Menu & Diagnostics

Condition	Lights	
	Inside	**Outside**
Main Menu Active	Red (solid)	Red (solid)
System Fault Present	Red/Amber	Red
Restraint Use Disabled	Amber	None

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Maintenance Precautions (KS4)

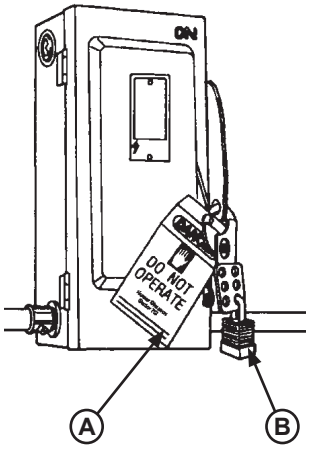

Figure 26

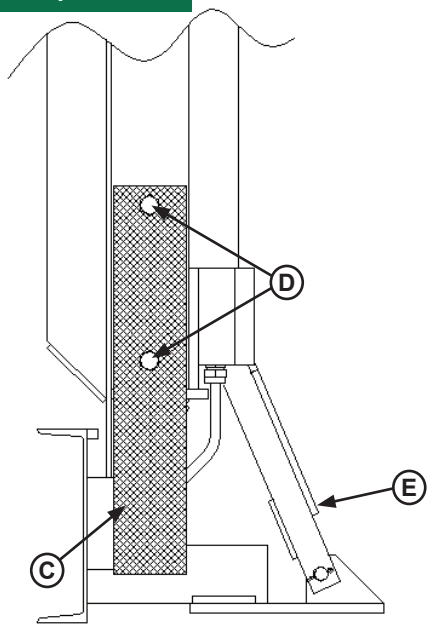

Figure 27

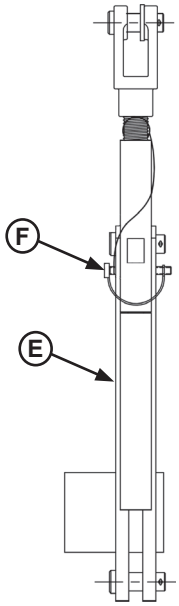

Figure 28

A— Tag Out Device
B —Lock Out Device
C — Maintenance Props
D — Maintenance Prop Hardware
E — Storage Prop
F — Storage Prop Pin and Clip

DANGER

It is recommended and good safety practice to use an additional means to support the dock platform and lip anytime when physically working in front of or under the dock leveler. This additional means may include, but is not limited to a boom truck, fork truck, stabilizing bar or equivalent.

WARNING

Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the unit before maintenance is complete.

When working with electrical or electronic controls, make sure that the power source has been tagged (**A**)* and locked out (**B**) according to OSHA regulations and approved local electrical codes (see Figure 26).

When maintenance is to be performed on the dock leveler, place the maintenance props (**C**) in their service/down position with hardware (**D**) fully secured and ensure the storage prop (**E**) is locked out with the prop pin and clip (**F**). See Figures 27 and 28. The lip may fold down if the platform has rested on the maintenance props.

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.

WARNING

A hard hat or other applicable head protection should always be worn when working under or around a dock leveler.

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

** Refer to OSHA regulations 1910.146. Confined Space and 1910.147. Lockout/Tagout*

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Maintenance Precautions (KS5/KS6/KS7)

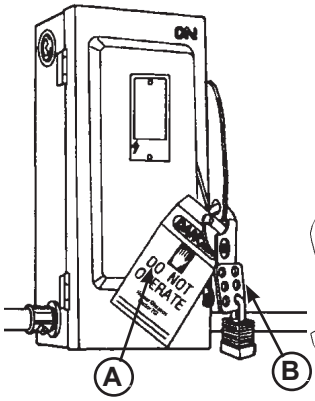


Figure 29

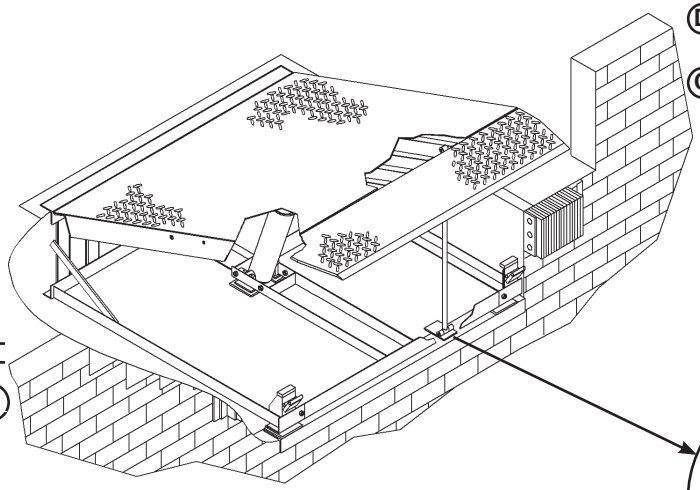


Figure 30

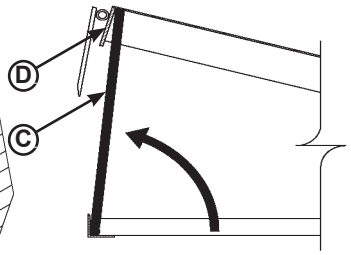
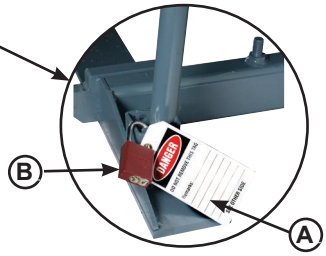


Figure 31



A— Tag Out Device B —Lock Out Device C — Maintenance Prop D— Header

⚠DANGER

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.

In addition, it is recommended and good safety practice to use an additional means to support the dock platform and lip anytime when physically working in front of or under the dock leveler. This additional means may include, but is not limited to a boom truck, fork truck, stabilizing bar or equivalent.

⚠WARNING

Always post safety warnings and barricade the work area at dock level and ground level to prevent unauthorized use of the unit before maintenance is complete.

When working with electrical or electronic controls, make sure that the power source has been tagged (A) and locked out (B) according to OSHA regulations* and approved local electrical codes (see Figure 29).

Whenever maintenance is to be performed under the dock leveler platform, support the platform with maintenance prop (**C**). Position the maintenance prop behind front header plate (**D**) 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* (**B**) and tag out device* (**A**). See Figures 30 and 31.

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.

⚠WARNING

A hard hat or other applicable head protection should always be worn when working under or around a dock leveler.

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

** Refer to OSHA regulations 1910.146. Confined Space and 1910.147. Lockout/Tagout*

Periodic Maintenance

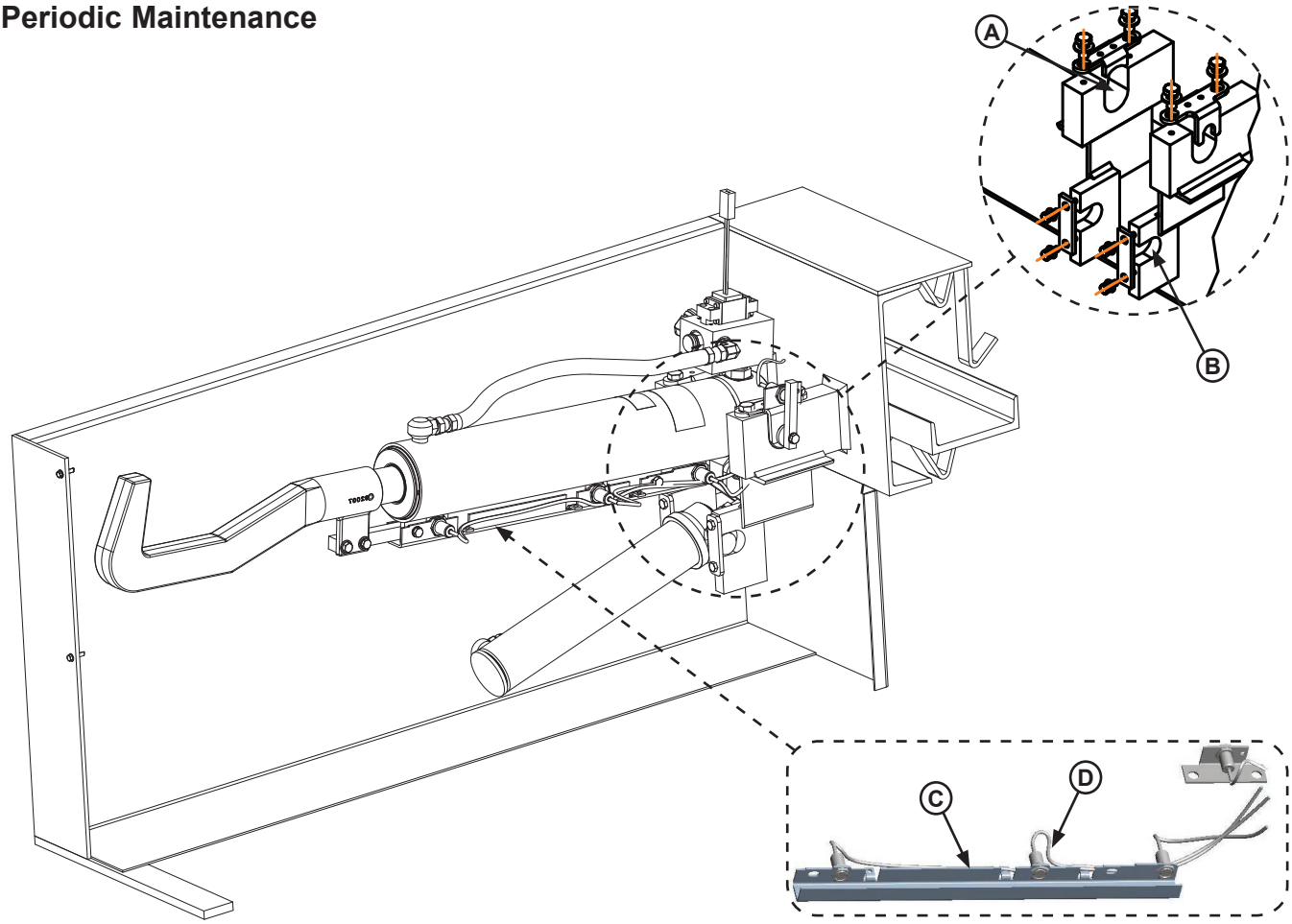


Figure 32

A— Hook Cylinder Trunnions
B— Positioning Cylinder Trunnions
C— Guide Track Assembly
D— Proximity Switch Harness

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

- ULTRA-VIS-HVI-15
- Aero Shell Fluid 4 or Fluid 41
- Mobil Aero HFA Mil-H5606A or Aero HF
- Texaco Aircraft Hydraulic Oil 15 or 5606
- Exxon Univis J13
- Castrol Brayco Micronic 756

These fluid brands can be mixed together. Use of hydraulic fluids with equivalent specifications to those listed here are acceptable.

NOTICE

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

Daily Maintenance

- Verify that all inside and outside signal lights work correctly.

Weekly Maintenance

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

- Inspect warning decals and placards. Replace if damaged or missing

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Quarterly Maintenance

- Complete Weekly Maintenance.

- Inspect the following for damage/abnormal wear:
  - Check welds for cracks.
  - Cylinder pins and mounting holes.
  - Check J-box for water damage.
  - Inspect hoses, cylinders, fittings and powerpack.
  - Control box and conduit for damage.
  - Bumpers for more than 1” of wear. Replace worn, loose, damaged or missing bumpers.
  - Inspect guide track assembly (**C**) and prox switch harness (**D**).

- Lubricate the following areas with white lithium grease (see Figure 32):

  (**A**) — Hook cylinder trunnions
  (**B**) — Positioning cylinder trunnions

- Check reservoir fluid level (see Figures 33 and 34; appearance may vary depending on model):

  1. Raise the platform fully and engage the maintenance prop in the service position.

  2. Turn OFF all electrical power to the leveler.

  3. Remove breather cap (**F**).

  4. Measure fluid level (**G**). The fluid level should be approximately 3 in. (76.5 mm) from top of reservoir (**E**) with platform raised on the maintenance prop.

  5. Add hydraulic fluid if necessary. Use only recommended fluid (see page 30).

  6. Install breather cap.

  7. Turn ON electrical power to the leveler.

  8. Return the platform to the cross-traffic position.

Yearly Maintenance

- Complete Quarterly Maintenance.

- Change hydraulic fluid (varying environmental conditions may require this more frequently). See page 30 for list of approved fluids.

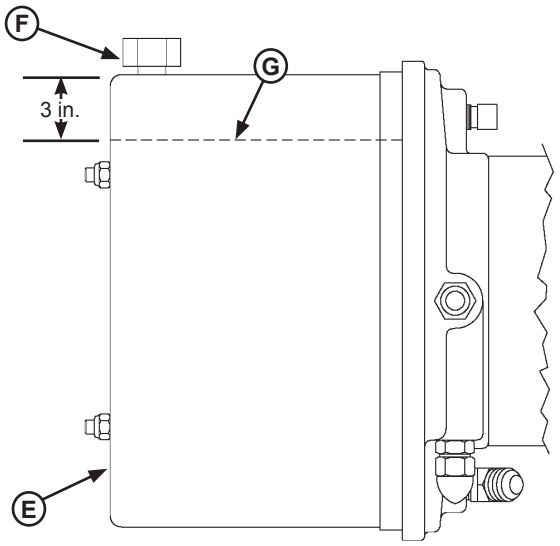

Figure 33

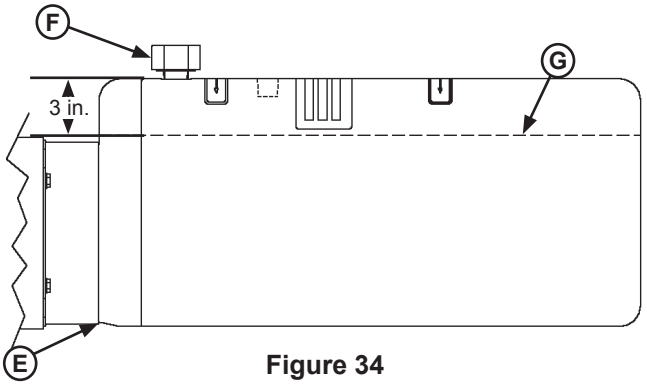

Figure 34

E — Reservoir
F — Breather Cap
G — Fluid Level

NOTICE

For CentraPower® fluid check/fill instructions, see CentraPower® Owner’s/User’s Manual.

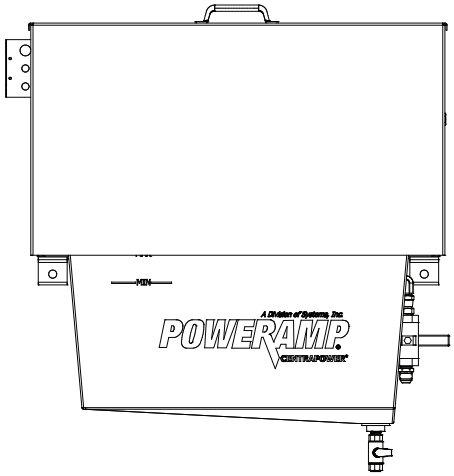

Figure 35

ADJUSTMENTS

Testing Operating Range

DANGER

It is recommended and good safety practice to use an additional means to support the dock platform and lip anytime when physically working in front of or under the dock leveler. This additional means may include, but is not limited to a boom truck, fork truck, stabilizing bar or equivalent.

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.

A hard hat or other applicable head protection should always be worn when working under or around a dock leveler.

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

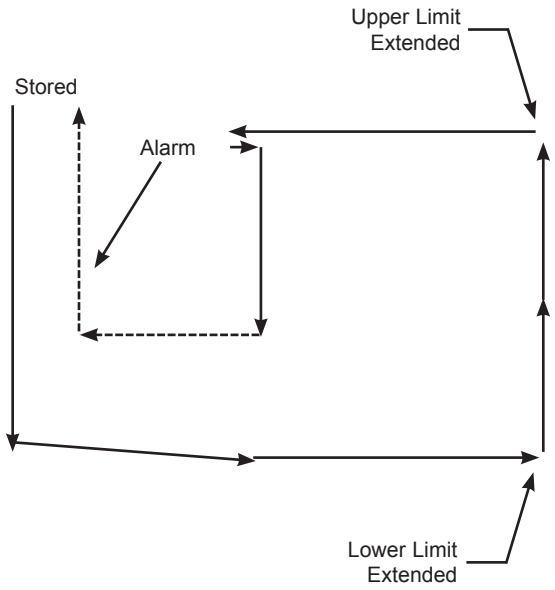

Figure 36

Note: PowerHook operating range should be tested without a transport vehicle present.

1. Make sure BYPASS mode has not been activated.
   - Inside light - RED
   - Outside light - GREEN

2. Momentarily press the ENGAGE button. Hook should lower, fully extend, fully raise, partially retract, lower, and then fully retract. See Figure 35.
   - Inside lights - AMBER, then RED
   - Outside light - RED, then GREEN

3. Measure upper and lower limits of operating range. In most applications, the upper and lower limits of the vertical operating range should be 26”-28” from the bottom of the pan and 8”-9” from the bottom of the drive. See Figure 37.

Note: PowerHook cannot be stopped while cycling. To obtain measurements, place a tape measure next to the moving hook.

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 Systems, LLC Technical Services if this situation occurs.

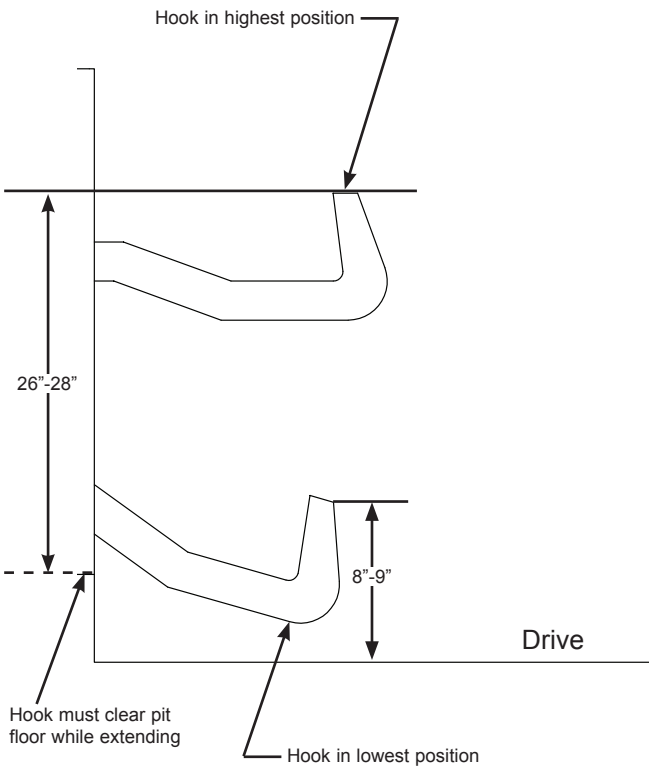

Figure 37

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Adjust Upper Vertical Limit

In some cases, it may be necessary to adjust the upper vertical limit of the PowerHook.

1. Raise the platform fully and engage the maintenance prop in the service position.

2. Locate the PowerHook cylinder and the positioning cylinder assembly. The length of the threaded rod eye on the positioning cylinder will determine the upper vertical limit of the PowerHook cylinder.

3. Disconnect the hydraulic hose from the hose fitting on the positioning cylinder; see Figure 38. Cap off the open fittings to prevent fluid loss and to prevent contamination from entering the system.

4. Remove the keepers from the positioning cylinder trunnion. See Figure 39.

5. Lift up and support the PowerHook cylinder to allow the positioning cylinder to exit the trunnion. See Figure 37.

6. Loosen the jam nut that is on the threaded rod eye of the positioning cylinder. See Figure 38.

7. Rotate the positioning cylinder clockwise to raise the PowerHook cylinder height, or counter-clockwise to lower as shown in Figure 38

8. Lower the PowerHook cylinder to allow the positioning cylinder back into the trunnion.

9. Verify the stored PowerHook height is 26” to 28” from top of PowerHook to drive as shown in Figure 40. Repeat steps 5-8 untill correct height is obtained.

10. Tighten jam nut on positioning cylinder.

11. Install trunnion keepers.

12. Reconnect hydraulic hose to positioning cylinder.

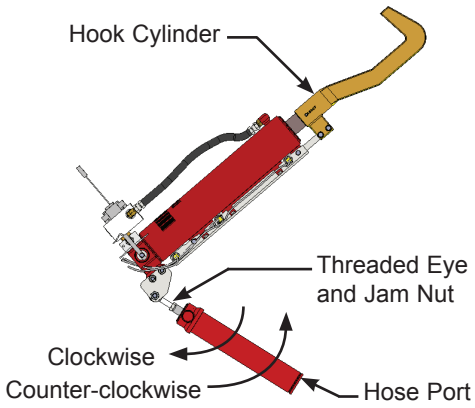

Figure 38

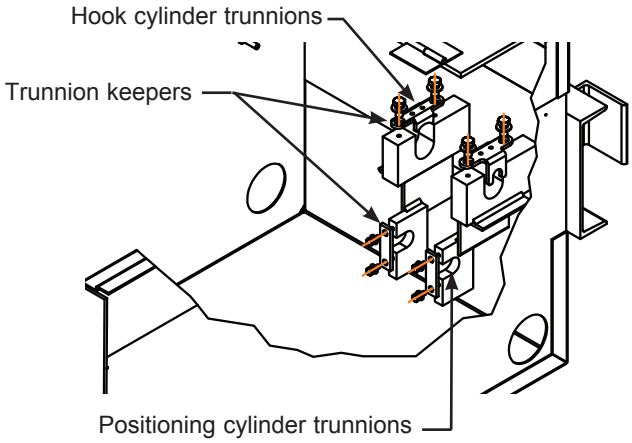

Figure 39

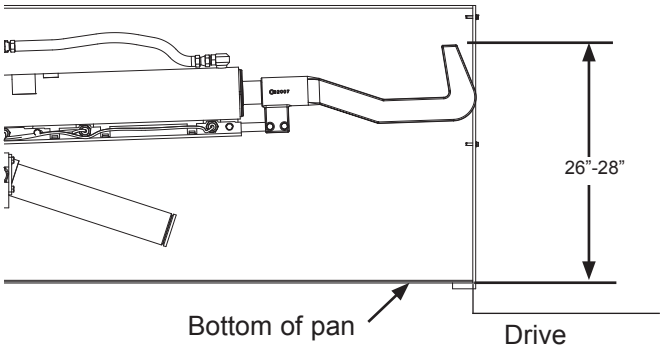

Figure 40

Adjust Lower Vertical Limit

In some cases, it may be necessary to adjust the lower vertical limit of the PowerHook.

The lower vertical limit is determined by an adjustable target bar (**A**) on the hook cylinder. As the cylinder lowers, the target bar rotates forward into the path of a proximity switch (**B**) which tells the PLC that the hook is fully lowered and operation can continue.

Adjusting the target bar's position relative to the proximity switch will subsequently change how far the hook lowers (lower vertical limit) before triggering the switch. Adjust as follows:

1. Raise the platform fully and engage the maintenance prop in the service position.

2. Locate the target bar and proximity switch. The lower limit proximity switch (**B**) is mounted in the bracket (**C**) located on the trunnion for the PowerHook cylinder; see Figure 41.

Note: If viewed from the side, the factory set position for the target bar (**A**) is at the "10 o'clock" position, with the proximity switch (**B**) at "12 o'clock." **The target bar should never contact the face of the proximity switch; a small gap should be present.**

3. Loosen the bolt (**D**) that holds the target.

4. Adjust target bar (**A**) as follows:

- To lower the hook limit, rotate the target bar counter-clockwise in 2-4 degree increments

- To raise the hook limit, rotate the target bar clockwise in 2-4 degree increments.

5. Repeat step 3 until the lower vertical limit of the top of hook is 8"-9" above the drive. When adjustments are completed, hold the target in place and tighten the bolt.

6. Test operation with a transport vehicle or a RIG bar simulator (simulator must extend at least 6" past both sides of the pan to prevent damage).

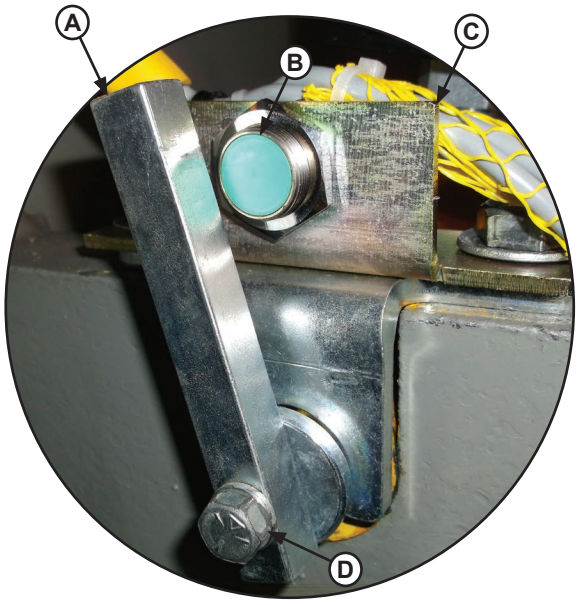

Figure 41

A - Target Bar
B - Proximity Switch
C - Prox Switch Bracket
D - Target Adjustment Bolt

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Adjust Pressure Relief

The pressure relief for the PowerHook system is regulated by the relief valve located on the PowerHook valve block. See Figure 42.

Note: The pressure relief on a PowerHook system is not adjusted by the relief valve mounted on the pump; the pressure on the pump is preset and should not be adjusted.

The pressure relief valve is preset from the factory and should not require adjustment unless equipment is being replaced.

Due to variances in the procedure required for different PowerHook installations, contact Systems, LLC Technical Services with equipment serial number or customer order number (CO#) for instructions on adjusting PowerHook pressure relief.

Figure 42

Adjust Dock Leveler and Vehicle Restraint Interlock

Dock Leveler & Vehicle Restraint Interlock Options

There are two options to interlock the dock leveler and vehicle restraint*:

- Restraint Engage before Leveler Operate (RELO) Interlock: Dock leveler can be interlocked with a vehicle restraint to prevent the leveler from operating until the restraint has engaged the transport RIG (Rear Impact Guard) when the OPERATION MODE is NORMAL and has NOT been switched to BYPASS MODE.

- Leveler Stored before Restraint Release (LSRR) Interlock: Vehicle 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).

Interlocking is overridden when the OPERATION MODE is in BYPASS. This allows the independent operation of the leveler (the restraint cannot be operated in BYPASS MODE).

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

Special interlocking options are available upon request. Call Systems, LLC to discuss interlock options to meet your specific needs.

*Dock levelers equipped with Auto-Return-To-Dock have limited interlocking options. Auto-Return-To-Dock feature is not available for dock levelers equipped with combination dock leveler/vehicle restraint control panels.

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Adjust Dock Leveler and Vehicle Restraint Interlock

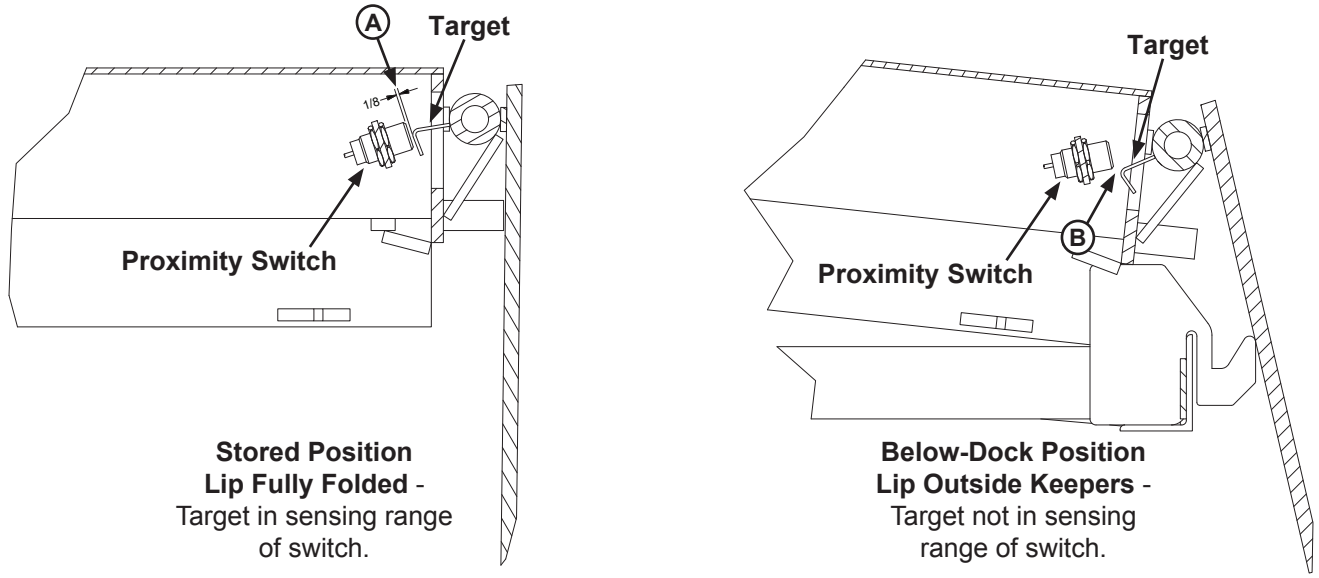

Figure 43

1. The dock leveler should be in the cross traffic position before beginning tests.

2. Back a transport vehicle 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 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**), so that the target is in the sensing range of the switch. Typical factory setting for (**A**) is approximately 1/8”. Make adjustments at switch until leveler does not raise when the vehicle restraint is not engaged on transport vehicle RIG bar. See Figure 43.

4. Momentarily press the ENGAGE button. The vehicle restraint automatic engage cycle will be activated and the restraint will engage the transport vehicle 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 transport vehicle. 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 vehicle restraint should NOT disengage from the transport vehicle RIG bar or test fixture. If the vehicle restraint did NOT disengage, proceed with Step 7. If the vehicle restraint DID disengage, move the switch farther from the target or bend the target to increase dimension (**B**) so that the target is not in the sensing range of the switch. Make adjustments at switch and/or target until vehicle restraint does not disengage transport vehicle. See Figure 43.

Note: 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 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 vehicle restraint will return to the stored position.

NOTICE

Work lip by hand when making adjustments to make sure that target does NOT contact switch as lip extends.

TROUBLESHOOTING

⚠DANGER

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.

In addition, it is recommended and good safety practice to use an additional means to support the dock platform and lip anytime when physically working in front of or under the dock leveler. This additional means may include, but is not limited to a boom truck, fork truck, stabilizing bar or equivalent.

⚠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.

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.

A hard hat or other applicable head protection should always be worn when working under or around a dock leveler.

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

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
Restraint does not operate. Motor does not energize.	Motor overload device tripped.	Reset overload relay or breaker. Determine cause of device tripping.
	Combination Units Only Motor starter (3 phase) or motor relay (1 phase) not energizing.	Check terminal board output that sends a signal to starter or relay. Output may have failed OPEN. Use meter to check for contact closure when output ON. See iDock Control System manual for more information.

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Symptom	Possible Cause	Solution
Three-Phase Remote Powerpack Units Only **Restraint does not operate. Motor energizes but does not run.** **If motor hums, but does not run, overload device should trip.**	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 Remote Powerpack Units Only **Restraint does not operate. Motor runs in reverse**	Phase reversed.	Reverse any two legs at the branch circuit disconnect.
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 if gauge of wires to motor are of correct size and specification for load requirement. Replace if necessary.
	Faulty motor centrifugal switch.	Replace motor.
	Faulty motor capacitor.	Replace motor.
	Low hydraulic fluid.	Add fluid, see page 30 for proper fluid level and type.
Restraint operates slowly.	Low hydraulic fluid.	Add fluid, see page 30 for proper fluid level and type.
	Hold-Tite raises slowly, or is slow to release.	Ensure pressure relief cartridge is adjusted per max amp draw.
	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).
Restraint does not fully raise or motor over current device and/ or overload device continuously tripping.	Low hydraulic fluid.	Add fluid, see page 30 for proper fluid level and type.
	Debris in tank.	Drain and clean tank. If debris cannot be cleaned out replace tank.

TROUBLESHOOTING

Symptom	Possible Cause	Solution
Restraint does not fully extend.	Low hydraulic fluid.	Add fluid, see page 30 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 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.

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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 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.
	Proximity switch at trunnion that senses when restraint lowered target out of adjustment.	Locate switch on hook trunnion. Observe indicator light at controller input 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

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.
	Fluid flow to positioning cylinder blocked.	
	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.
	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.

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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.	See adjustment section. pg 28.
	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 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 vehicle/ trailer RIG bar (inside lights turn GREEN but gap exists between RIG bar and restraint.	Pressure switch trip point set too low. Pressure differential 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 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

Symptom	Possible Cause	Solution
Restraint engages transport vehicles RIG bar but does not automatically shut OFF. Pump operates in pressure relief.	Pressure differential switch installed incorrectly, or faulty pressure differential switch.	Ensure “High” and “Low” labels on pressure differential switch correspond with “H” and “L” marks on valve block. Replace switch if faulty.
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 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.

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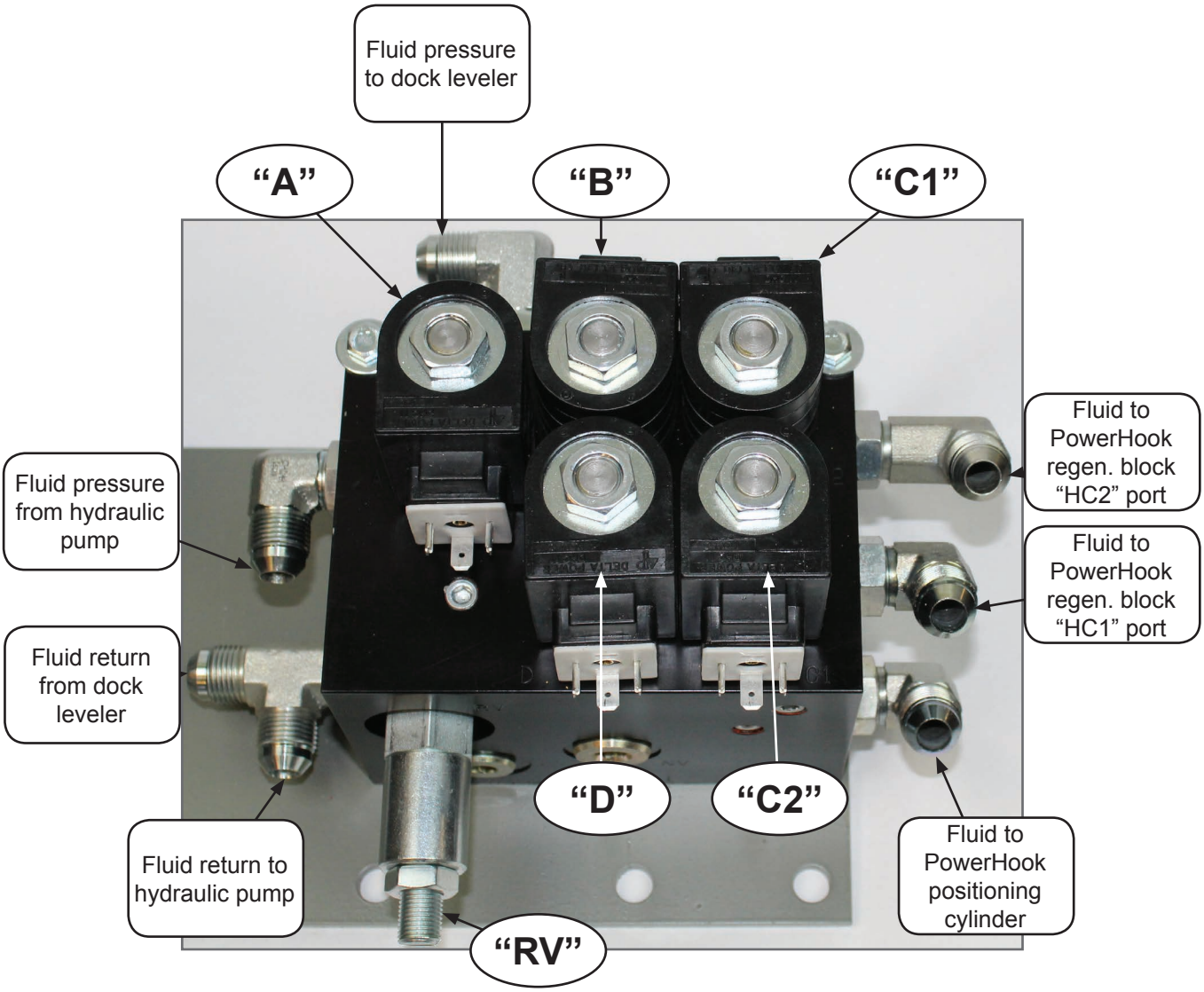
Symptom	Possible Cause	Solution
Lowered restraint returns to fully retracted position but unit does not automatically shut OFF. **Pump Operates in pressure relief.** **Restraint remains lowered.**	Proximity switch on rear of (closest to rear pit wall) guide track that senses when restraint fully retracted out of adjustment.	Locate switch on rear of guide track. Observe indicator light 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.

If additional troubleshooting assistance is required, contact Systems, LLC Technical Services with equipment serial number or customer order number (CO#).

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

PowerHook Valve Block Component Overview



Item	Description	Function
A	Valve “A” (4-way 2-position)	Switches fluid flow from PowerHook to dock leveler when energized.
B	Valve “B” (3-way 2-position)	Lowers PowerHook when energized.
C1	Valve “C1” (2-way N.C.)	Retracts PowerHook when energized with C2.
C2	Valve “C2” (3-way 2-position)	Retracts PowerHook when energized with C1.
D	Valve “D” (3-way-position)	Holds PowerHook in lowered position when energized.
RV*	Pressure Relief Valve*	Controls system pressure by returning excess pressure to reservoir.

**Not used on CentraPower installations.*

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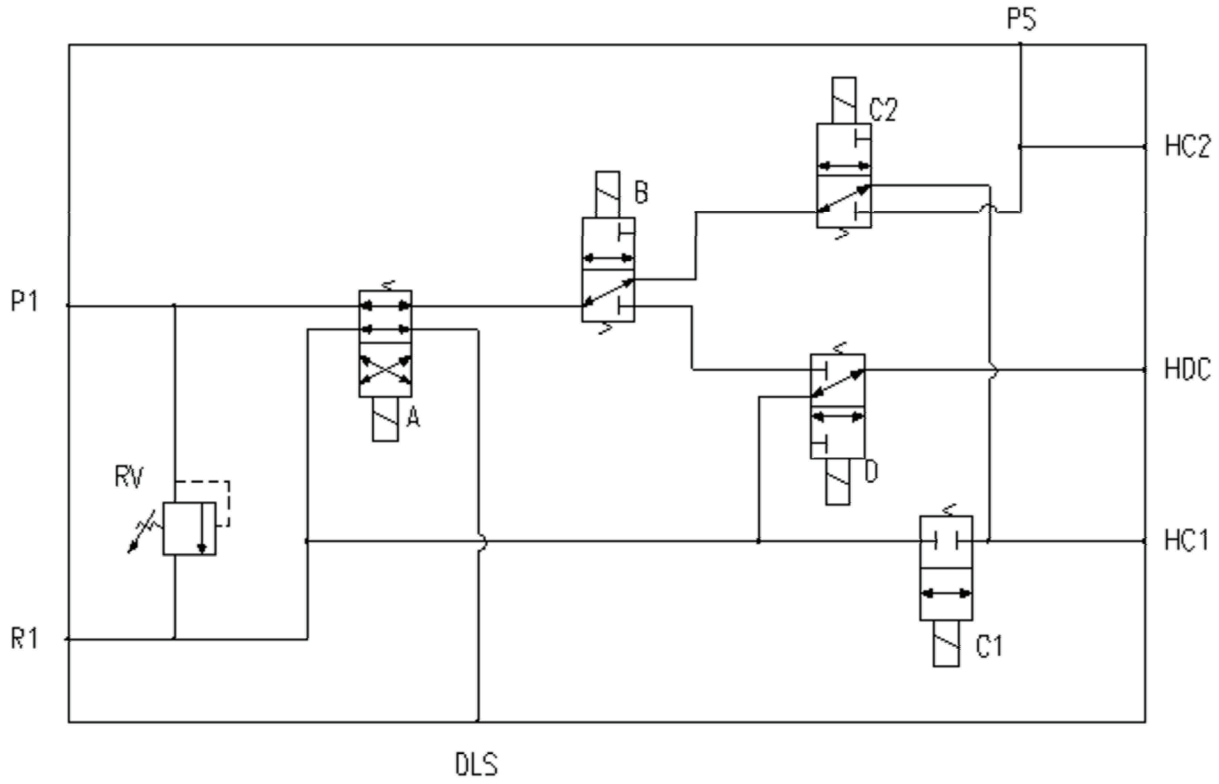
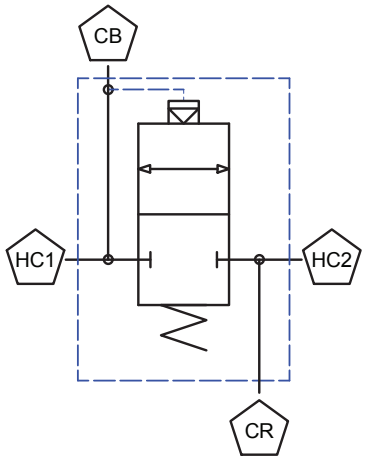
PowerHook Hydraulic Schematic

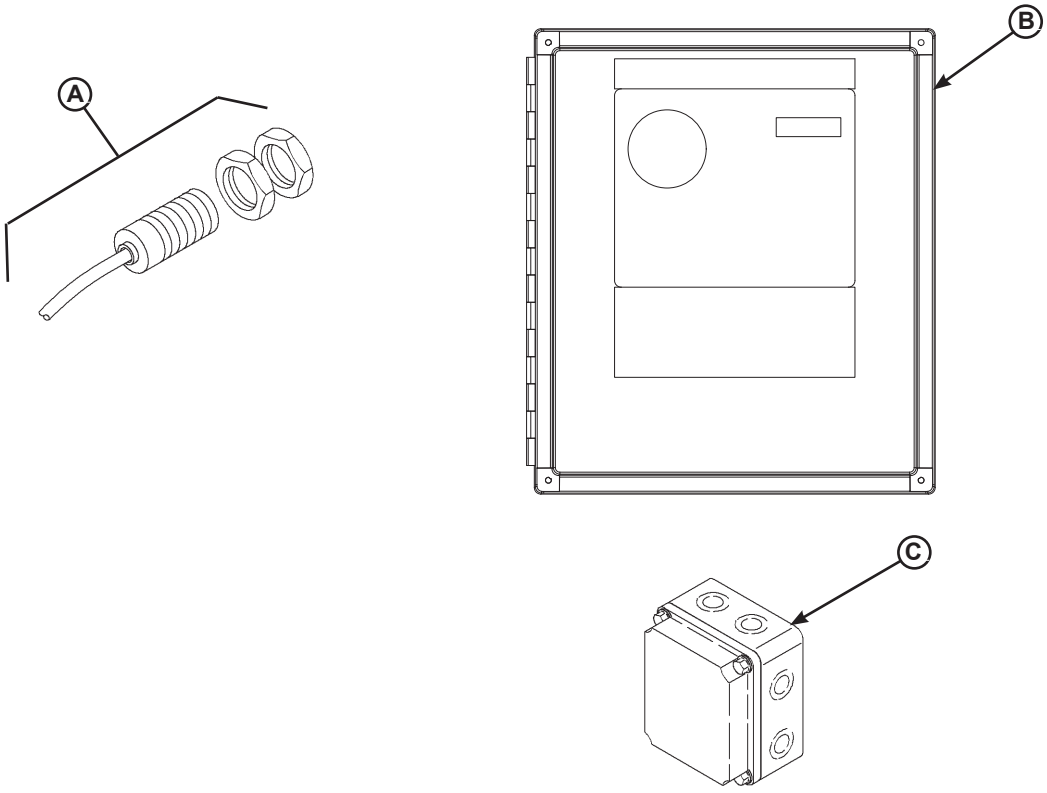


Main Valve Block



Regeneration Valve Block

Electrical Parts



Item	Quantity	Part Number	Description
A	1	0961-0083	Proximity Switch with Harness (Interlock)
B	1	*	Control Box
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 or vehicle restraint serial number, voltage, phase, and options when e-mailing, calling or faxing controller orders.*

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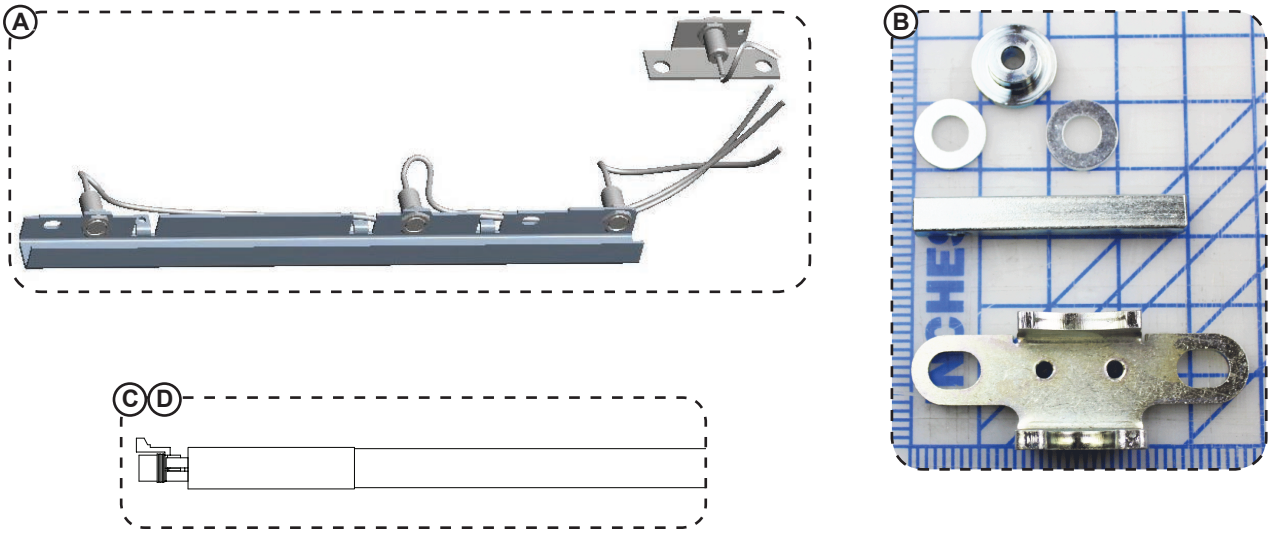
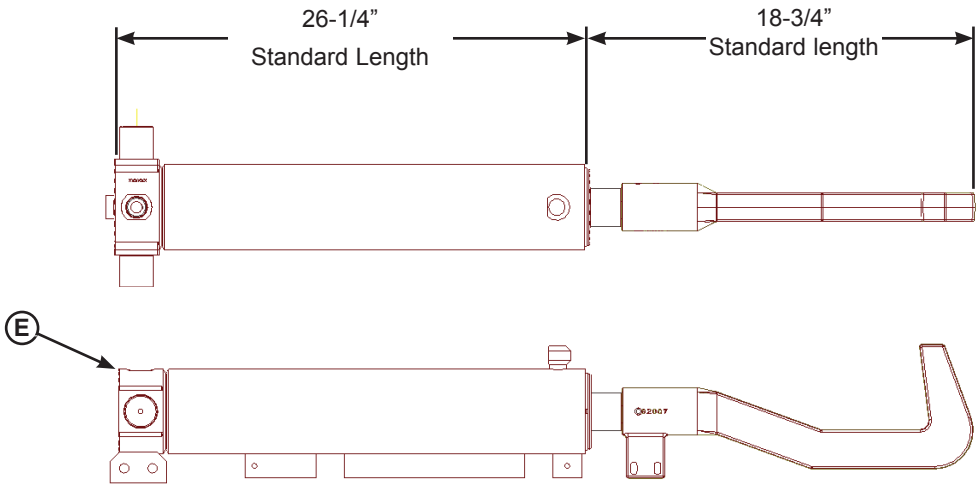
PowerHook Guide Track Components



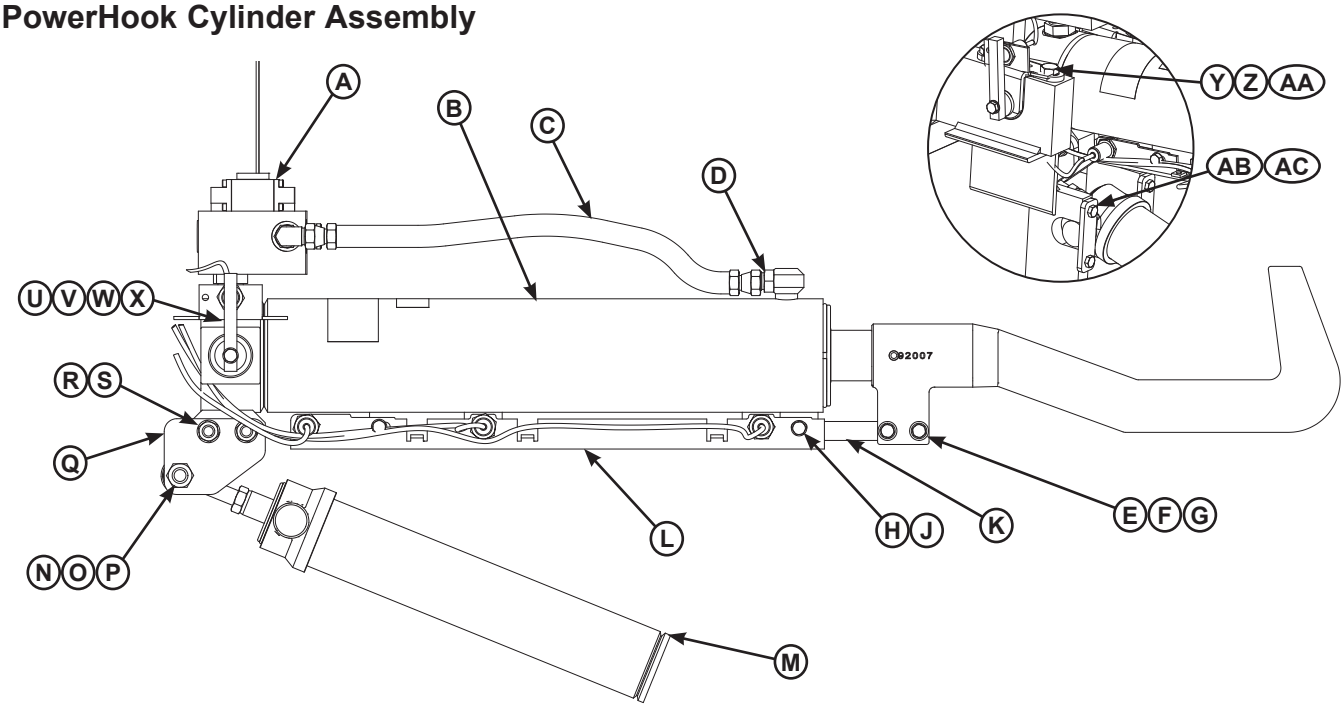
Item	Quantity	Part Number	Description
A	1	0524-0097	Guide Track Assembly, Complete
B	1	7056-0002	Target Bar Upgrade Kit (required for pre-09/2009 units)
C	1	0521-0146	Extension Cable Subassembly, 46” Long
D	1	0521-0147	Extension Cable Subassembly, 94” Long



Item	Quantity	Part Number	Description
E	1	0526-0018	PowerHook Cylinder and Hook

PARTS

PowerHook Cylinder Assembly



Item	Quantity	Part Number	Description
A	1	See Page 52	Valve Block Assembly - Regeneration
B	1	0526-0018	PowerHook Cylinder Assembly (With Hook)
C	1	9904-0110	Hydraulic Hose Assembly-1/2” 100R1 x 20.00, #8 JIC
D	1	9301-0112	Fitting, #8 ORBM, #8 JICM
E	2	2101-0012	Screw, Hex Head Cap, 5/16-18 UNC x 1-1/4
F	2	2101-0058	Washer, Lock 5/16
G	2	2101-0059	Washer, Flat 1/4
H	2	2101-0057	Screw, Hex Head Cap 5/16-18 UNC x 1/2
J	2	2101-0058	Washer, Lock 5/16
K	1	0522-0061	Bar - Guide Rod
L	1	See Page 47	Guide Track Assembly
M	1	0526-0005	Positioning Cylinder Assembly
N	4	2101-0004	Washer, Flat 5/8
O	1	2101-0052	Screw, Hex Head Cap, 5/8-11 UNC x 2-1/2
P	1	2101-0042	Nut, Hex 5/8-11 UNC
Q	2	0522-0062	Trunnion-Positioning Cylinder, 3/8 x 3 x 4
R	2	2101-0041	Nut, Hex 1/2-13 UNC
S	2	2101-0111	Screw, Hex Head Cap, 1/2-13 UNC x 3
U	1	0521-0172	Spacer, Stepped
V	1	2101-0059	Washer, Flat 1/4
W	1	2101-0068	Screw, Hex Head Cap, 5/16-18 UNC x 1-3/4
X	1	0521-0171	Bar-Prox Target, 1/2 x 1/2 x 3-7/8
Y	2	7051-0006	Bracket Hold-down PowerHook
Z	4	2101-0079	Washer, Flat 1/2
AA	4	2101-0144	Screw, Hex Head Cap, 1/2-13 UNC x 1
AB	2	7942-0001	Bracket, Hold-down Positioning cylinder
AC	4	2101-0009	Screw, Hex Head Cap, 5/16-18 UNC x 3/4

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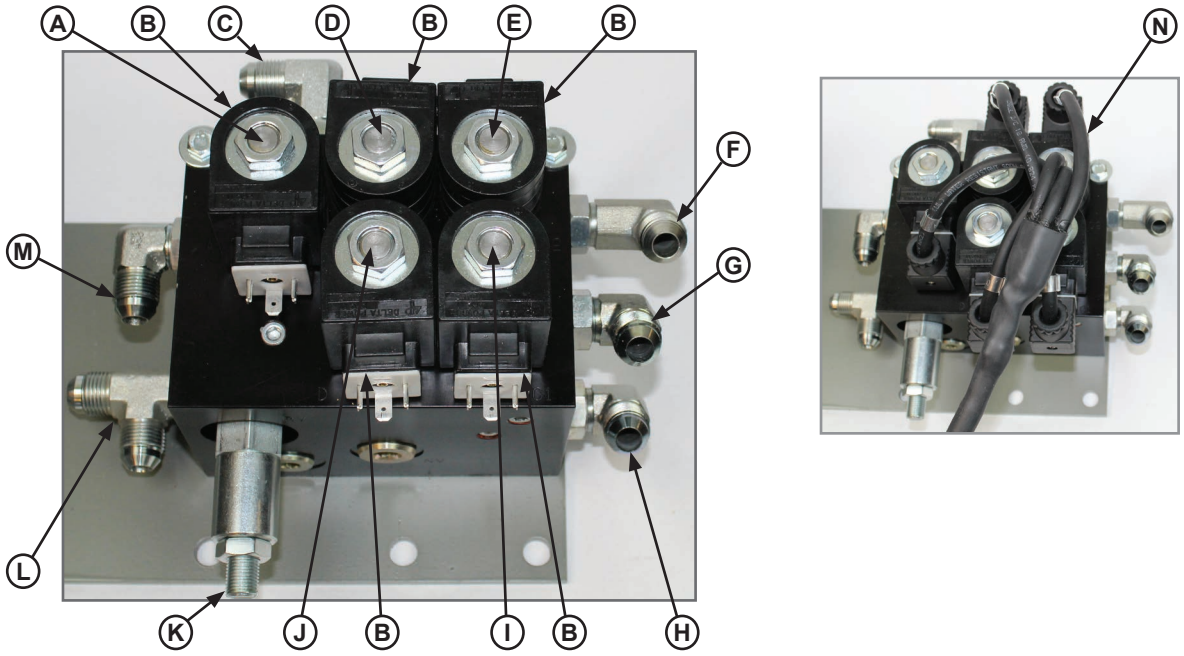
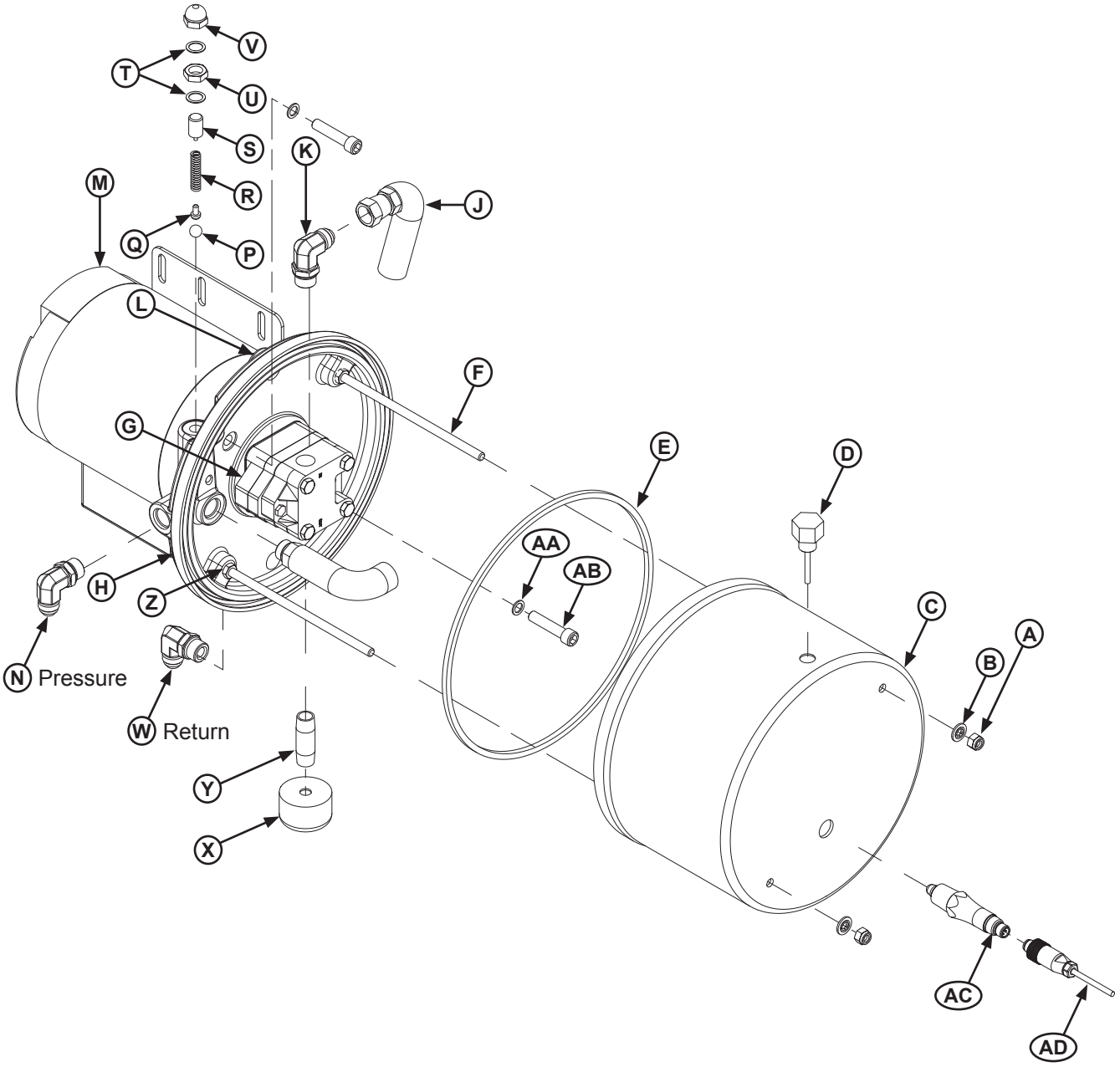
PowerHook Valve Body Assembly



Item	Part Number	Description
A	8581-0011	Cartridge Valve, 4-way 2-position
B	8581-0004	Coil, Delta
C*	9301-0120	Elbow, 45° #8-ORB Male x #8-JIC Male
	9301-0116	Elbow, 90° #8-ORB Male x #8-JIC Male
D	8581-0005	Cartridge Valve, 3-way 2-position
E		
F*	9301-0120	Elbow, 45° #8-ORB Male x #8-JIC Male
	9301-0201	Elbow, Long, 90° #8-ORB Male x #8-JIC Male
G*	9301-0120	Elbow, 45° #8-ORB Male x #8-JIC Male
	9301-0116	Elbow, 90° #8-ORB Male x #8-JIC Male
H*	9301-0120	Elbow, 45° #8-ORB Male x #8-JIC Male
	9301-0116	Elbow, 90° #8-ORB Male x #8-JIC Male
I	8581-0074	Cartridge Valve, 2-way N.C.
J	8581-0005	Cartridge Valve, 3-way 2-position
K	8581-0089	Cartridge Valve, Relief
L	9301-0127	T-Fitting, #8-ORB Male x #8-JIC Male
M*	9301-0112	Fitting, Straight, #8-ORB Male x #8-JIC Male
	9301-0116	Elbow, 90° #8-ORB Male x #8-JIC Male
N	4301-0001	Cable Assembly, 27” OAL, 5-Coil
P	4301-0004	Cable Subassembly, 48” OAL, 1-Coil (not shown, for service use)

** Part used depends on installation type. Provide restraint serial number when e-mailing, calling or faxing orders.*

Remote Mount Powerpack Assembly



NOTICE

Restraint pressure is set by relief valve on restraint.
Remote mount powerpack pressure is factory set.

Typical cookpot-style remote mount Powerpack shown for reference purposes only.
Contact Systems, LLC Technical Services with serial number for exact breakdown.

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

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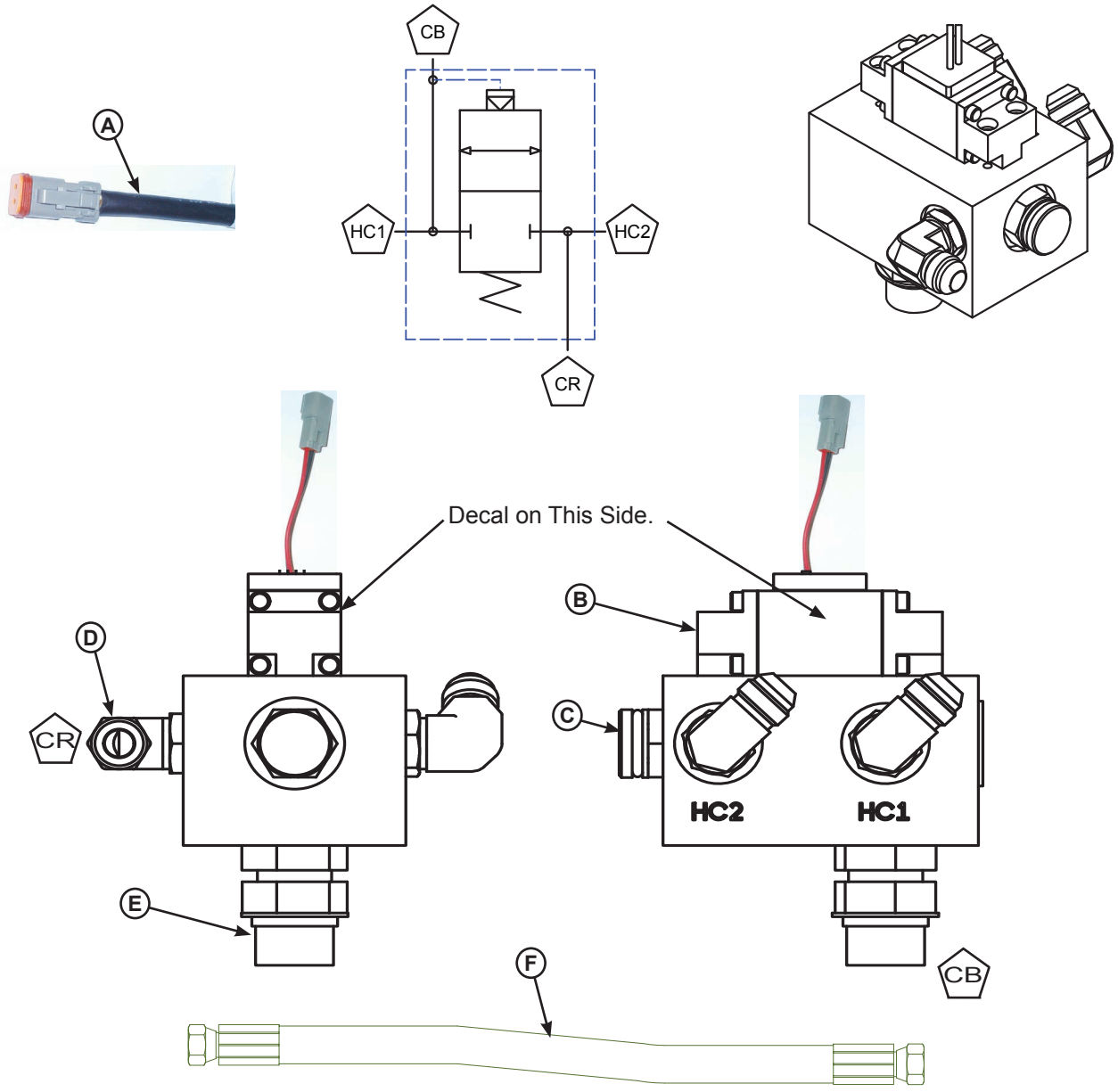
Remote Mount Powerpack Assembly (continued)

Item	Quantity	Part Number	Description
	1	**9395-____** [1]	**Powerpack, Complete (Includes All Items Except L, N, and W)**
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-____ [1]	Plate, Drive
J	1	9904-0071	Hose, 1/2”100R1 x 17”, #8 ORB x #8 JICF Swivel
K	1	9301-0116	90° Elbow, #8-ORB Male x #8-JIC Male
L	1	9301-0106	Plug, #8-ORB
M	1	3411-____ [2]	Motor Only
N	1	9301-0116	90° Elbow, #8-ORB 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	9301-0175	90° Elbow, #8-ORB Male x #10-JIC Male
X	1	9301-0009	Strainer, Suction
Y	1	9301-0008	Pipe Nipple, 3/8 NPT x 3 in.
Z	2	2101-0063	Nut, Jam 5/16-18 UNC
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	1	0961-0642	Sensor, Fluid, Cookpot **(Optional)**
AD	1	0961-0648	Cable, 5M Lg, M12 Plug **(Optional)**

[1] Provide restraint serial number and type of installation when e-mailing, calling or faxing orders.
[2] Provide restraint serial number, voltage, and phase when e-mailing, calling or faxing orders.

Regeneration Valve Block Assembly



Item	Quantity	Part Number	Description
A-F	**1**	**8585-0096**	**Regeneration Valve Block Assembly, Complete**
A	1	4301-0010	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 ORB To #8 JIC
E	1	9301-0126	Fitting, Union, STR, #12 ORB
F	1	9904-0110	Hose, 1/2, 17” Lg #8 JICF Swivel Both Ends

* *Provide vehicle restraint serial number when e-mailing, calling or faxing orders.*

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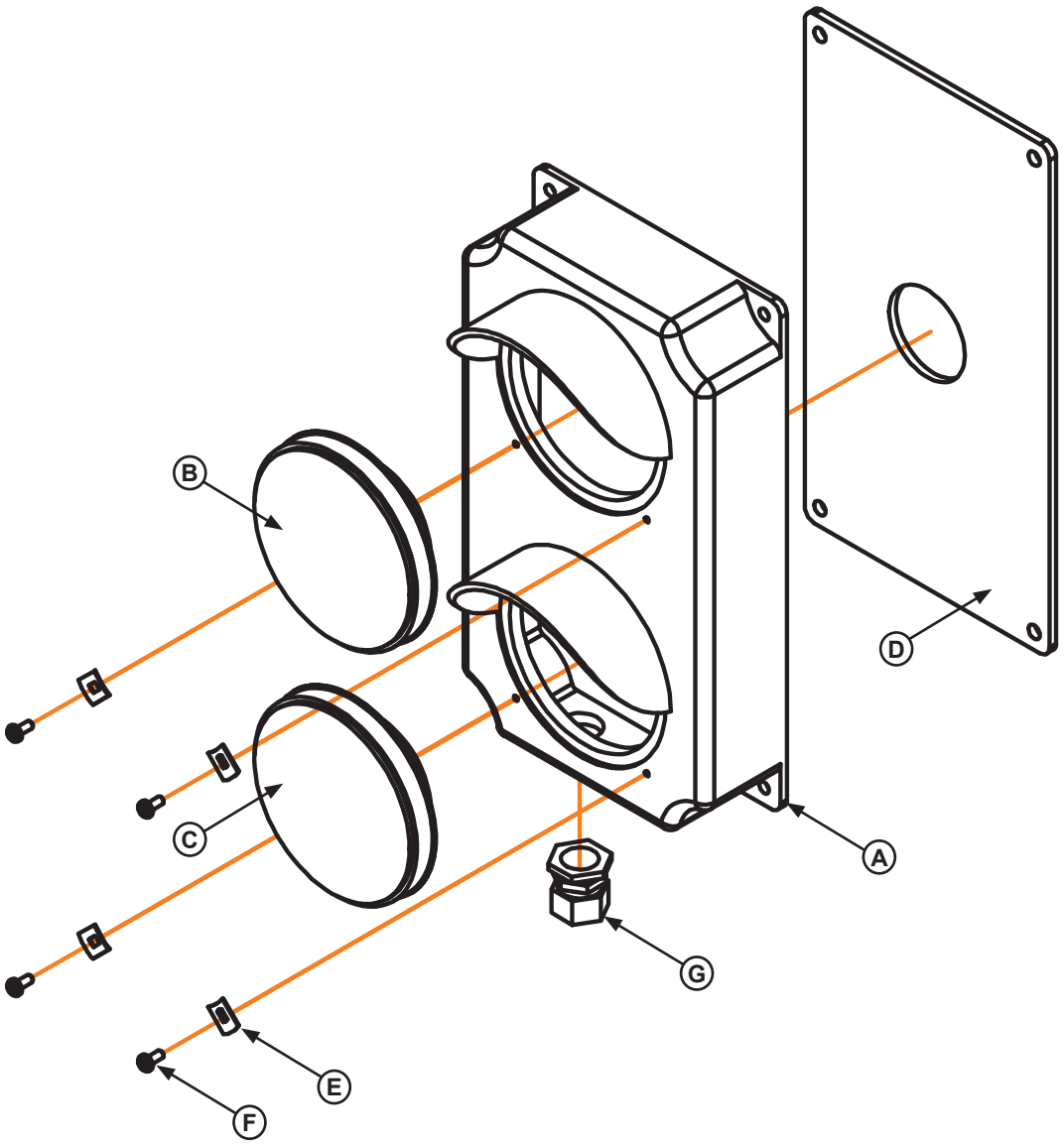
OSLA (Outside Light Assembly)



Item	Quantity	Part Number	Description
*	**1**	**3055-0011**	**Complete Light Housing, Yellow Plastic, With 12v LED Lights***
A	1	3051-0002	Light Housing Only, Yellow Plastic
B	1	3051-0147	Red LED Lens/Housing/Circuit Assembly, 12v
C	1	3051-0149	Green LED Lens/Housing/Circuit Assembly, 12v
D	1	3051-0068	Mounting Gasket
E	4	3051-0105	Clip, Lens Holding
F	4	3051-0104	Screw, Lens Holding
G	1	*	Conduit Fastener, 3/4” x 3/8” **(Included with 3055-0011)**

**Provide vehicle restraint serial number when e-mailing, calling or faxing orders.*

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Customer Information

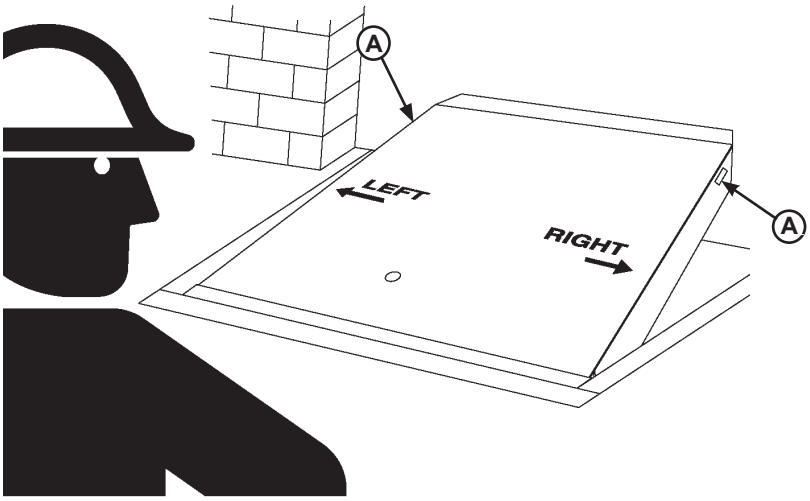

Figure 44

Figure 45

NOTE: Refer to Figure 44 for orientation of dock leveler and Figure 45 for orientation of restraint.

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

*The RESTRAINT model/serial number decal (**B**) is located on the main hook cylinder.*

When you receive your new equipment, write down the 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, B**) becomes lost or damaged.

Also, write down Systems, LLC's order number, the company that installed the equipment, and the original owner's name. This will all help to identify the specific equipment 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 MODEL NUMBER and/or SERIAL NUMBER.

For service, call or contact:

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

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

www.loadingdocksystems.com

Dock Leveler Information

Model _____

Serial No. _____

Systems, LLC, Job No. _____

Vehicle Restraint Information

Model _____

Serial No. _____

Systems, LLC Order No. _____

Original Owner Information

Name _____

Address _____

_____

Installer Information

Name _____

Address _____

_____

Date of Installation _____

STANDARD PRODUCT WARRANTY

SYSTEMS, LLC 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 after 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 LLC, covered by this warranty, SYSTEMS LLC 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 LLC AND ITS SUBSIDIARIES 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, INTERRUPTION OF BUSINESS OR LOSS OF GOODWILL.

PRODUCT SPECIFIC WARRANTY
"POWERHOOK®" SERIES RESTRAINT

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

- Structural Warranty – For an additional period of four (4) years from the base warranty.
- Hydraulic Warranty – For an additional period of four (4) years, 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 an additional period of one (1) year, this warranty specifically applies to; the control box components, guide track assembly, pressure differential switch, coils and proximity sensor when interlocked with a Poweramp dock leveler only.