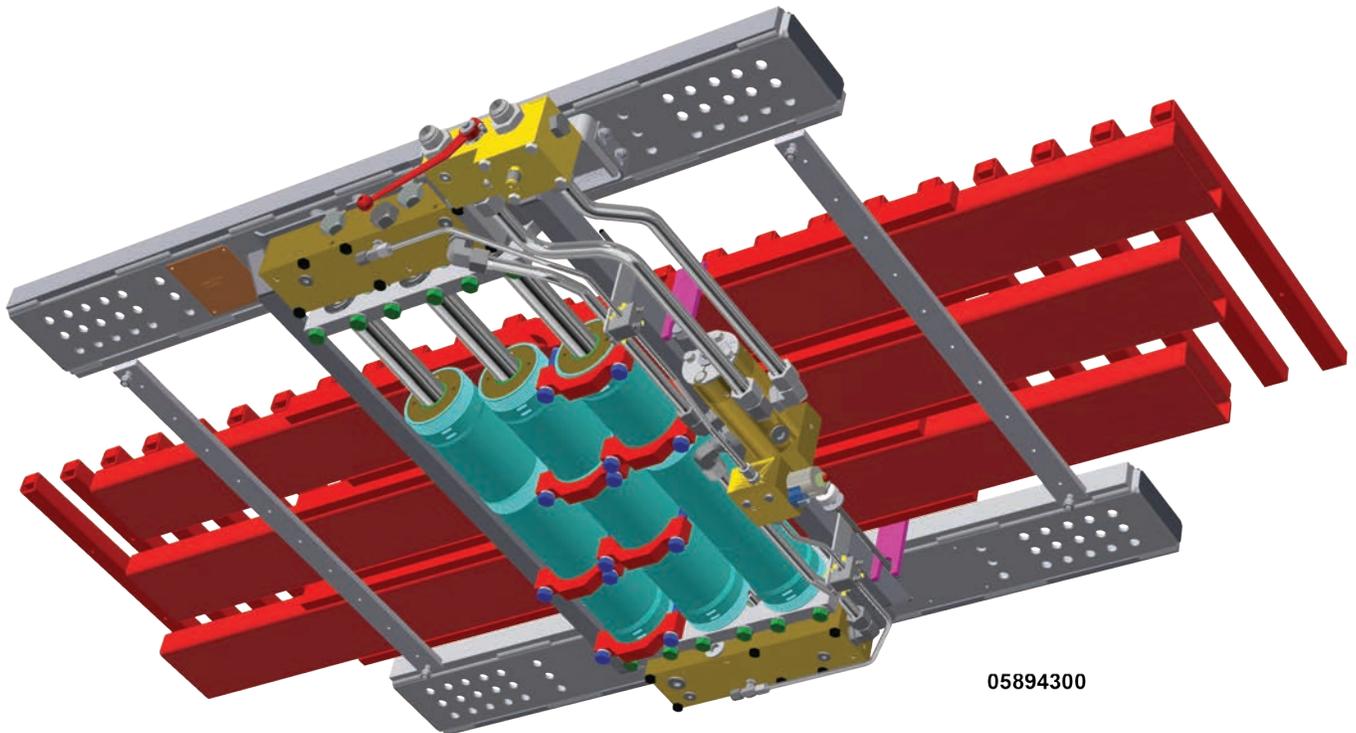


KEITH
MANUFACTURING CO

KFD 400 / KFD 425

KEITH Manufacturing Co.
www.KeithWalkingFloor.com
World Headquarters
Toll-Free: 800-547-6161
Phone: 541-475-3802
Fax: 541-475-2169



05894300



OWNER / OPERATOR MANUAL

Original Instructions

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Released 2019-03-05

DOC06301 Rev. B

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Introduction

We at KEITH Manufacturing Co. are very happy you have decided to equip your trailer with the KEITH® *WALKING FLOOR*® system. We take great pride in manufacturing the simplest, lowest maintenance self-unloading system available. Installing the KEITH® *WALKING FLOOR*® system in your trailer provides you with the versatility to load or unload virtually any type of material.

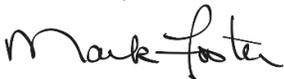
The following pages contain information on the operation of your KEITH® *WALKING FLOOR*® system. Further support and safety documents (manuals, brochures, and product specs) can be viewed or downloaded from our website at www.KeithWalkingFloor.com.

In addition, we have provided general information on the type of hydraulic wet kit that will be needed to operate your system. Please contact a KEITH sales representative or visit our website for more specific recommendations regarding pumps, filters, pressure relief valves and approved equivalent equipment. *It is critical to adhere to the outlined hydraulic wet kit specifications. Failure to follow the guidelines concerning required operation pressures can lead to system failure due to excessive heat buildup.*

Please review the entire manual before operating the KEITH® *WALKING FLOOR*® system. If you have any questions, please call 541-475-3802 or email Sales@KeithWalkingFloor.com where our support team will happily assist you.

Thank you again for putting your trust in our company!

Sincerely,



R. Mark Foster
President

Declaration of Incorporation

Manufacturer:

KEITH Manufacturing Co.
401 NW Adler Street
Madras, OR 97741
USA

Hereby declares that the following partly complete machinery,

KFD 400/425 system mobile kit, serial numbers from year 2016 onward

Complies with the following essential health and safety requirements of Directive 2006/42/EC:
1, 2, 3, 4, 1.1.1, 1.1.2, 1.1.3, 1.1.5, 1.1.6, 1.1.7, 1.3.1, 1.3.2, 1.3.4, 1.3.6, 1.3.9, 1.5.3, 1.5.4,
1.5.5, 1.5.6, 1.5.8, 1.5.9, 1.5.15, 1.6.1, 1.6.2, 1.6.4, 1.7.1, 1.7.1.1, 1.7.2, 1.7.3, 1.7.4

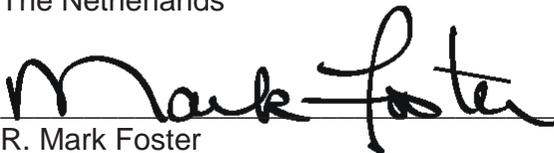
The relevant technical documentation is compiled in accordance with part B of annex VII.

In response to a reasoned request by national authorities, relevant information on the partly complete machinery will be transmitted as hard copies or digital files, unconstrained by intellectual property rights.

This partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of Directive 2006/42/EC.

The person authorized to compile the technical file is:

KEITH WALKING FLOOR Europe
Harselaarsweg 113
3771 MA Barneveld
The Netherlands



R. Mark Foster
President

Madras, Oregon, USA January 1, 2016

DOC06303 Rev A

KEITH® WALKING FLOOR® Unloading System Limited Warranty

KEITH Manufacturing Co. hereby warrants, to the first owner of a new **KEITH® Unloading system** from the factory or selling distributor, that the product shall be free from defects in material and workmanship for a period of **one year** after delivery or sale to the first registered owner. The **hydraulic drive system** has a **two year** limited warranty on all hydraulic parts and components. This warranty does not cover normal wear and tear and maintenance. A warranty card must be filled out and returned to **KEITH Manufacturing Co.** to activate this warranty.

Unloading system must only be used as recommended by KEITH Manufacturing Co. for normal use and service. This means the loading and/or unloading of uniformly distributed, non-corrosive material, properly restrained and secured, on properly maintained public roads, with gross vehicle weights not in excess of factory rated capacity. For stationary installations, normal use and service means the conveying of uniformly distributed, noncorrosive materials, with weights not in excess of factory rated capacity. The system must be installed according to **KEITH Manufacturing Co.** installation instructions.

Sole and Exclusive Remedy: If the product covered hereby fails to conform to the above stated warranty, **KEITH Manufacturing Co.’s** sole liability under this warranty and the owner’s sole and exclusive remedy is limited to repair or replacement of the defective part(s) at a facility authorized by **KEITH Manufacturing Co.**

THE WARRANTY SET FORTH ABOVE IS EXPRESSLY MADE IN LIEU OF ANY OTHER WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY. KEITH MANUFACTURING CO. MAKES NO WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR WARRANTIES OF MERCHANTABILITY. FURTHER, KEITH MANUFACTURING CO. WILL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES SUCH AS, BUT NOT LIMITED TO, THE LOSS OF USE OF THE PRODUCT, DAMAGE TO THE PRODUCT, ATTORNEY’S FEES AND THE LIABILITY IN RESPECT TO ANY OTHER REASON.

TORT DISCLAIMER: KEITH MANUFACTURING CO. EXCLUDES ANY LIABILITY IN TORT WITH RESPECT TO THEIR PRODUCTS, INCLUDING ANY LIABILITY BASED ON STRICT LIABILITY IN TORT AND NEGLIGENCE.

If This Warranty Violates Law: To the extent any provision of this warranty, contravenes the law of any jurisdiction, that provision shall be inapplicable in such jurisdiction and the remainder of the warranty shall not be affected thereby.

Warranty Return Policy

Any defective part(s) must be shipped freight prepaid to the nearest **KEITH** facility. Please contact **KEITH** for additional information on proper locations. Before returning any item for repair or replacement, contact **KEITH Manufacturing Co.** at 1-800-547-6161 or TechDept@KeithWalkingFloor.com for a “Returned Goods Authorization” (RGA) number. Make sure the RGA number is on the outside of the shipping carton and all paperwork is included.

The following information is needed:

- | | |
|-----------------|------------------------------|
| a. Company name | e. Part number |
| b. Contact name | f. Quantity |
| c. Address | g. Reason for return |
| d. Phone number | h. Customer’s account number |

Warranty Registration Card

Note: To validate the warranty, the registration information must be filled out completely and returned to KEITH Manufacturing Co. within ten (10) days of purchase and/or installation.

Please fill out the Warranty Registration form on our website at www.KeithWalkingFloor.com or fill out the Warranty Registration Card below and mail, fax or email it to:

KEITH Manufacturing Co.
P.O. Box 1
Madras, OR 97741-0001
Fax: 541-475-2169
TechDept@KeithWalkingFloor.com

This warranty registration card must be completed and on file at KEITH Manufacturing Co. in order for the warranty period to begin on the purchase date. If no purchase date is registered, the beginning of the warranty will automatically revert to the manufacture date.

Name / Company Name: _____

Address: _____

City, State / Prov.: _____ Postal Code: _____

Country: _____

Tel: _____ Fax: _____

E-Mail: _____

SYSTEM DATA:

Date of Purchase: _____

Model / Serial Number: _____

Purchased From: _____

Type of Material Loaded/Unloaded: _____

I have fully read the KEITH Manufacturing Co. warranty information and fully understand and agree to the terms of the warranty.

Name: _____ Date: _____ Signature: _____

1.0 Safety

1.1 General Safety

1.1.1 Intended Function and Expected Use

1.1.1.1. The KEITH® *WALKING FLOOR*® system is a reciprocating slat conveyor intended to hold, load, or unload primarily bulk materials. It can also handle unit loads such as pallets by using special handling techniques and sometimes additional safety controls. The system is supplied as a kit primarily intended for installation into mobile trailers or truck bodies. The floor is often loaded through an open trailer top or through the rear doors. The floor typically discharges material out of the rear door. It is hydraulically-actuated, powered by a pump mounted either to a PTO or an electric motor. The basic system is controlled by either mechanically-actuated or electrically-actuated valves and is also compatible with options and accessories to improve performance. For example, it can be either electrically controlled by hardwired switches or a wireless remote. Additionally, a CleanSweep® device can improve clean-out. Floor slat styles are selected based on the materials to be conveyed. The standard system handles a wide array of materials in a non-hazardous, non-explosive environment. Special modifications may be required for special environments such as food-grade applications or explosive conditions.

1.1.2 Improper Use

- 1.1.2.1. This equipment has been manufactured in accordance with the acknowledged safety regulations and state-of-the-art technology. However, dangerous situations may arise from improper use, resulting in serious injury or death. Improper use may also cause severe damage to the equipment and other assets. This equipment may only be used for its intended purpose. It may only be operated in impeccable technical condition and in accordance with the proper use and this user manual. Problems affecting safety must be resolved immediately. The manufacturer is not liable for any damage caused by improper use or arbitrary modifications. The installation, commissioning, operation, and maintenance instructions described in this manual must be followed.
- 1.1.2.2. Personnel must not enter the danger zone(s) when the system is enabled. Specifically, no person should be inside the trailer, under the trailer, or behind the trailer in the unloading zone during operation. Also, no person should be in a full or filling trailer. Lock-out and tag-out procedures must always be followed before accessing these areas.
- 1.1.2.3. The maximum load capacity must not be exceeded. (See Specifications section)
- 1.1.2.4. The hydraulic power source must not exceed the pressure and flow ratings. Install a relief valve to ensure the maximum pressure is not exceeded.
- 1.1.2.5. Control circuitry must not be altered or bypassed.
- 1.1.2.6. Safeguards must not be altered or bypassed.
- 1.1.2.7. The floor structure must not be altered.
- 1.1.2.8. The floor should not be used to handle any material other than specified.
- 1.1.2.9. The user and system designer must understand the characteristics and safe handling requirements of the material that is being conveyed.
- 1.1.2.10. Bulk materials are unstable and flowable by nature. Avoid burial by avoiding contact with the material.

1.1.3 Training

1.1.3.1. Operators must read and understand this manual before operating or maintaining the machine. Only qualified, trained personnel may execute commissioning, operation, and maintenance of the system.

1.1.4 Personal Protective Equipment

1.1.4.1. Always wear protective equipment appropriate for risks associated with each phase of the system's life, including transportation, installation, assembly, operation, inspection, maintenance, and dismantling, disabling, and scrapping. As a minimum, this includes the following personal protective equipment:

- Safety glasses
- Gloves
- Welding/grinding protection
- Thermal protection such as coats
- Protective / traction shoes
- Helmets
- Hearing Protection

1.1.5 Airborne Noise Emission

1.1.5.1. Since there is no defined workstation, sound pressure emitted by the *WALKING FLOOR*[®] modules was measured at a height of 1.6 meters from the floor surface and a distance of 1 meter from the surface of the *WALKING FLOOR*[®] system at the drive area.

- The maximum A-weighted emission sound pressure level = 74.8 dB
- The peak C-weighted instantaneous sound pressure value = below 63 Pa.

1.1.5.2. Slower floor speeds result in less noise.

1.1.6 Temperature

1.1.6.1. Operation of the system generates heat in the hydraulic oil. Hot oil can damage the internal seals, resulting in a failure to operate.

1.1.6.2. Overheated oil can degrade rapidly. Hot oil and the resulting hot surfaces can cause burns. Do not allow the oil temperature to exceed 140 °F [60 °C].

1.1.6.3. KEITH recommends some or all of the following temperature control measures depending on the circumstances. High duty cycle systems and hot environments will require more control measures.

- Maintain adequate oil level in the reservoir.
- Install a thermometer or sensor to monitor oil temperature.
- Install a cooler.
- Set a sensor to automatically shut down the system if oil temperature exceeds 140 °F [60 °C].

1.1.7 Lighting

1.1.7.1. Do not use or service the system in an environment of insufficient light.

1.1.8 Movement Around the System

1.1.8.1. Hydraulic oil can be slippery. Clean up oil spills immediately.

1.1.9 Hydraulic Oil Safety

1.1.9.1. See the MSDS for the oil used in your system for further information about hydraulic oil safety.

- 1.1.9.2. In an accident involving high pressure equipment, hydraulic oil may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.
- 1.1.9.3. Do not use high pressure systems in the vicinity of flames, sparks, or hot surfaces. Use only in well-ventilated areas.
- 1.1.9.4. Use only designated appropriate fill and drain ports for the oil.

1.2 Design / Installation Safety

1.2.1 Kit Components

- 1.2.1.1. The kit consists of a drive unit, flooring, and miscellaneous boxed parts. These modules are intended to be anchored in a shipping frame or stacked flat and braced with dunnage for shipping and storage.

1.2.2 Installation

- 1.2.2.1. Use designated lifting points as provided.
- 1.2.2.2. Only use equipment with appropriate capacity ratings to lift and handle components.
- 1.2.2.3. Use appropriate lifting procedures when handling components or boxed components.
- 1.2.2.4. The floor must be installed far enough away from other equipment or fixtures to prevent the moving parts of the floor module from creating a crush or pinch hazard.

1.2.3 Danger Zones

- 1.2.3.1. The reciprocating action of the floor creates pinch and shear points by nature. Specifically, the drive area cylinder, cross-drive, slats approaching each other, frame components, and walls. These and any other relevant exposed areas must be guarded.
- 1.2.3.2. The floor must be incorporated into its surroundings such that movement of the material on the floor does not create crushing, burial, drawing in, or entrapment hazards. The system must be designed to limit access to the material flow path.

1.2.4 Electric Components and Installation

- 1.2.4.1. KEITH recommends connecting to earth ground (whenever possible).
- 1.2.4.2. Wiring must be connected, consistent with local codes and regulations, including electromagnetic interference regulations.
- 1.2.4.3. Adequate electrical overcurrent protection must be provided.

1.2.5 Hydraulics

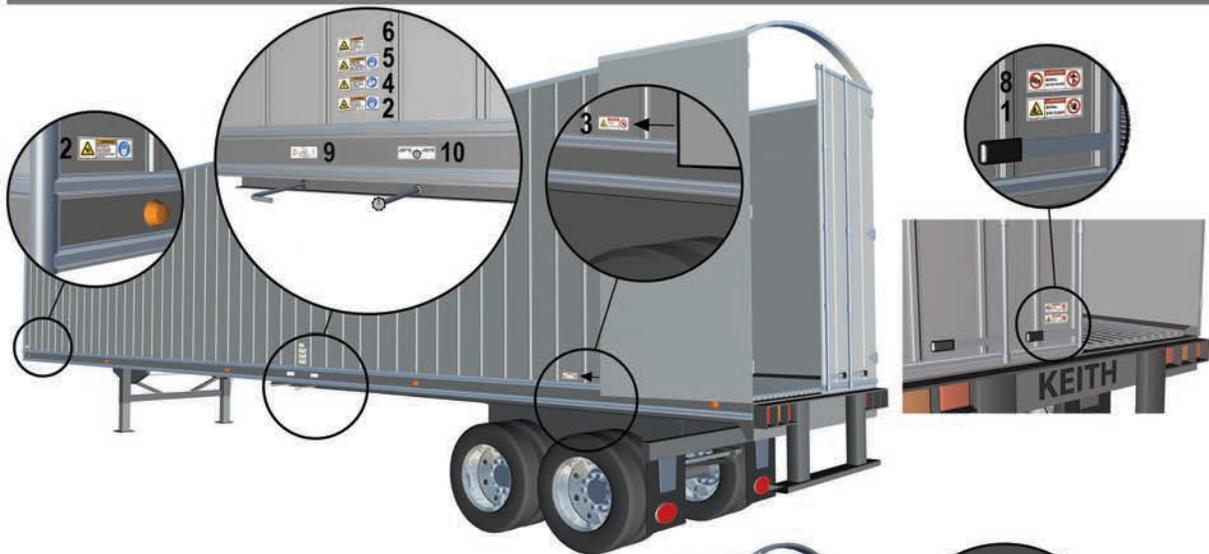
- 1.2.5.1. Hydraulic piping and components must be constructed of materials that are rated for system pressures, and must be installed with best industry practices. Follow all pipe, tubing, fitting, and hose manufacturer installation and routing guidelines.
- 1.2.5.2. Hydraulic piping should be supported and isolated from vibration. Contact a KEITH representative for recommendations on installation.
- 1.2.5.3. Place protective shrouds around the hydraulic tubing in any areas that may have operators or people frequently nearby.

1.2.6 Controls

- 1.2.6.1. The control panel must be located such that it is easily accessible for all sizes and capacities of people, and allows the operator to move freely (whenever applicable).
- 1.2.6.2. Control devices must be located outside of danger zones, such that any exposed persons in danger zones are visible from the control station.
- 1.2.6.3. An acceptable means must be provided to monitor the status and movement of the load.
- 1.2.6.4. The floor can generate enormous horizontal force which can destroy improperly designed surroundings. The floor module must not be allowed to compact material against an end wall or door, or end walls and doors must be designed to absorb these forces.
- 1.2.6.5. Do not allow the floor to move material toward the front of the trailer when material is contacting the front wall. KEITH recommends installing limit switches to prevent this. In the absence of a sensor switch, the operator must be keenly aware of the load position, and the control system must require the operator to hold the run signal in the on position to continue running, such that releasing the run signal causes the floor to stop (momentary signal).
- 1.2.6.6. Material compacted against closed doors can force the doors open dangerously fast when the door latch is released. The impact can cause serious injury or death. Do not allow the floor to run when the doors are closed. Do not open a door when it is possible that material may be compacted against it. KEITH strongly recommends installing a control interlock switch to prevent the floor from running when the door is closed. KEITH also recommends a door latch that can be remotely actuated by someone away from the door area unload zone.

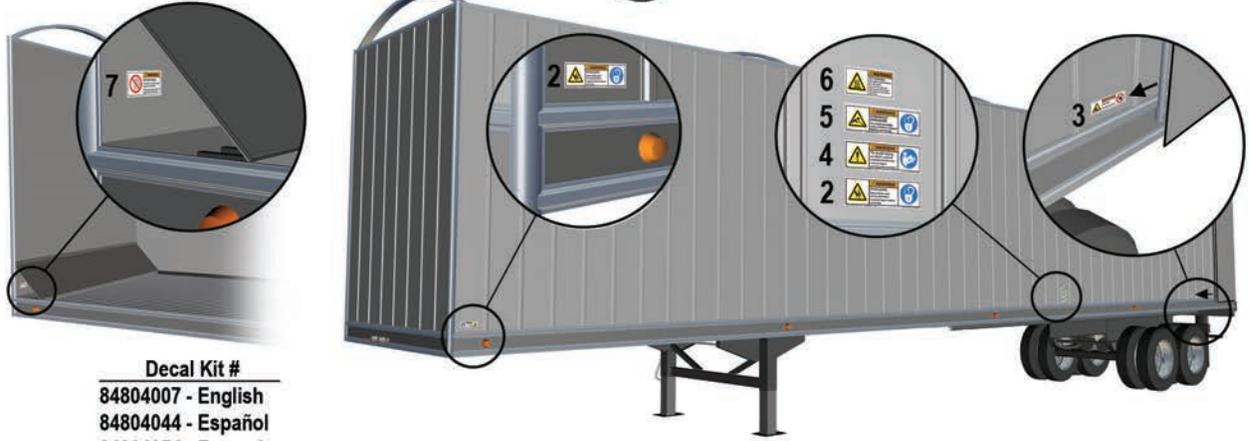
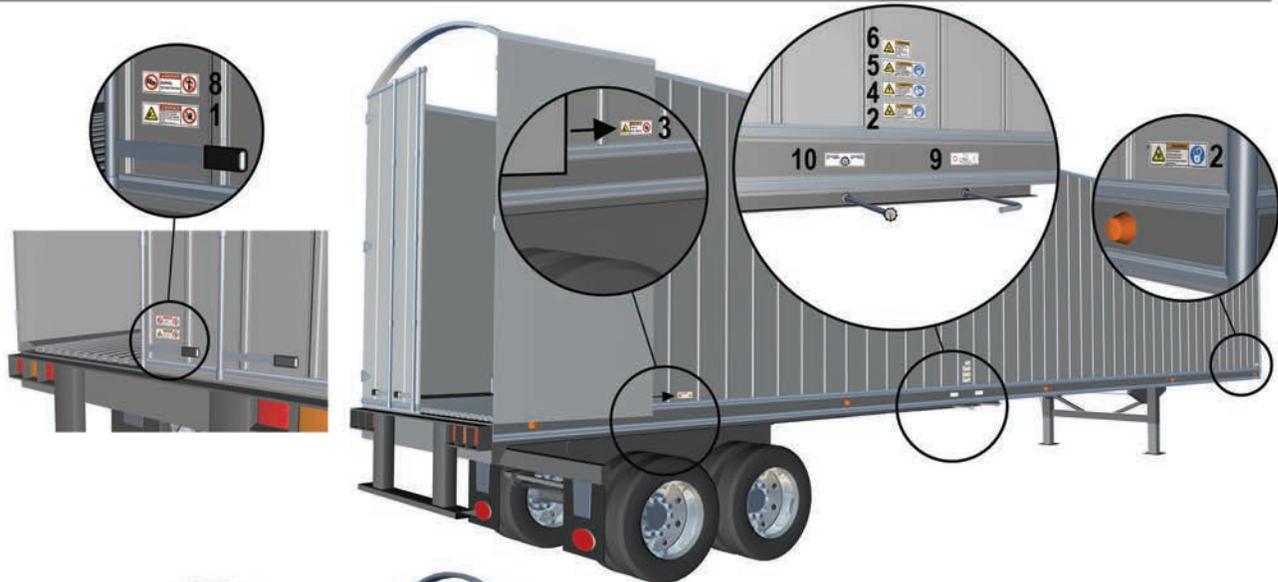
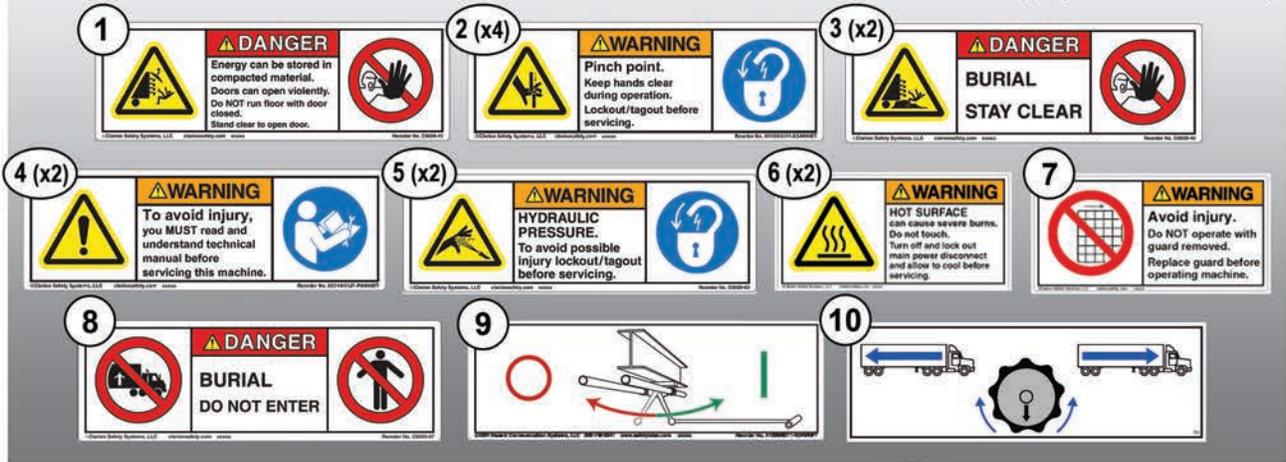
1.3 Marking of Machinery

1.3.1 Safety Decal Placement Guides



Decal Kit #
 84804005 - English
 84804043 - Español
 84804053 - Français
 84804063 - Deutsch
 84804241 - 日本語

Safety Decal Placement Guide: KFD & RUNNING FLOOR II® w/Electric Control Valve (Right Side Controls)



- Decal Kit #
 84804007 - English
 84804044 - Español
 84804054 - Français
 84804064 - Deutsch
 84804242 - 日本語

1.3.2 Serial Plate

Please fill in the information from the serial plate attached to your drive system. Over time these plates become difficult to read or even locate and this information is crucial in determining the specific replacement parts for your system.

KEITH

MANUFACTURING CO

KEITH Manufacturing Co. World Headquarters 401 NW Adler St. Madras, OR 97741 USA	KEITH <i>WALKING FLOOR</i> Europe Harselaarseweg 113 3771 MA Barneveld The Netherlands
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***WALKING FLOOR*[®] KFD**

MODEL: _____	
SERIAL#: _____	
DRIVE CORE #: _____	
D.O.M.: _____	
LOAD CAPACITY: _____	
MAX PRESSURE: _____	
MAX FLOW RATE: _____	
DRIVE WEIGHT: _____	

www.KeithWalkingFloor.com

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2.0 Specifications

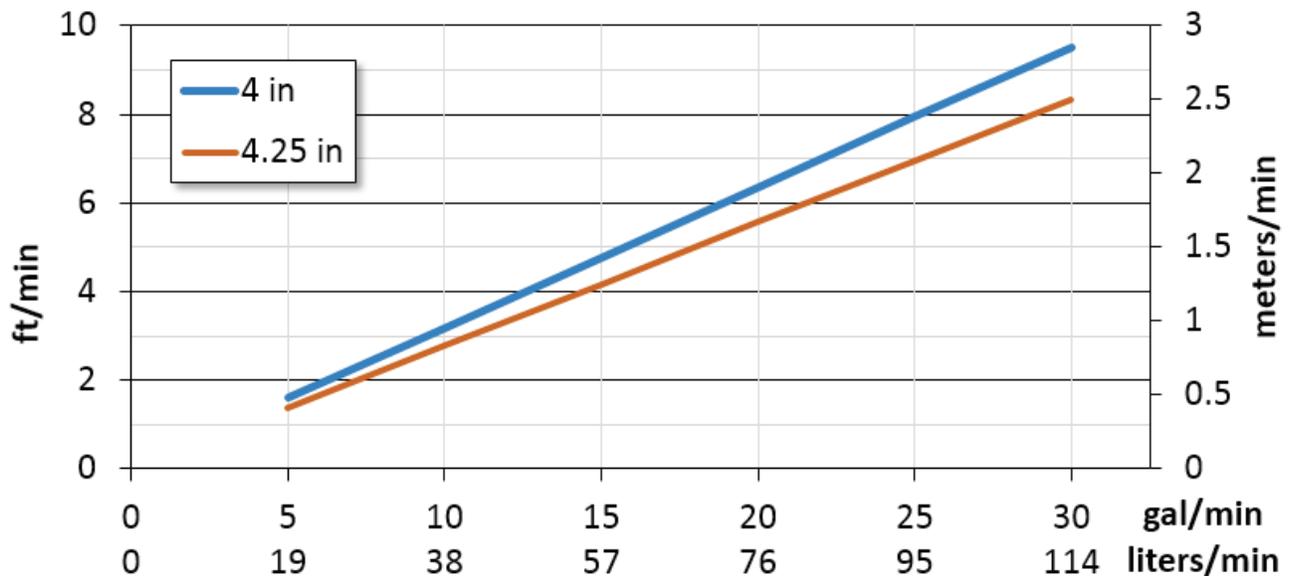
2.1 Hydraulic Drive Unit

Drive Style:	KFD-400		KFD-425
Cylinder Bore Diameter:	4.0" [102 mm]		4.25" [108 mm]
Cylinder Stroke:	8.0" [203 mm]		8.0" [203 mm]
Required Relief Valve Pressure Range:	Min:	Min.: 2,800 PSI [193 bar]	
	Max:	Max: 3,625 PSI [250 bar]	
Load Capacity:	30 tons at 2800 PSI [27.2 tonnes at 193 bar]	35 tons at 3625 PSI [31.75 tonnes at 250 bar]	35 tons [31.75 tonnes]
Pump Flow Rate:	4 - 30 gal/min [15 - 114 liter/min]		4 - 30 gal/min [15 - 114 liter/min]
* Floor Speed:	1 - 9.5 ft/min [0.3 - 2.9 meter/min]		1 - 8.2 ft/min [0.3 - 2.5 meter/min]
Maximum Temperature	140 °F [60 °C]		140 °F [60 °C]
** Drive Weight:	950-1100 lbs [431-499 kg]		950-1100 lbs [431-499 kg]

* Load/Unload times vary with pump flow rate, length of trailer, material type or other environmental variables.

** Varies by drive configuration and application.

KFD Floor Speed vs Pump Flow Rate



2.2 General Wet Kit Specifications

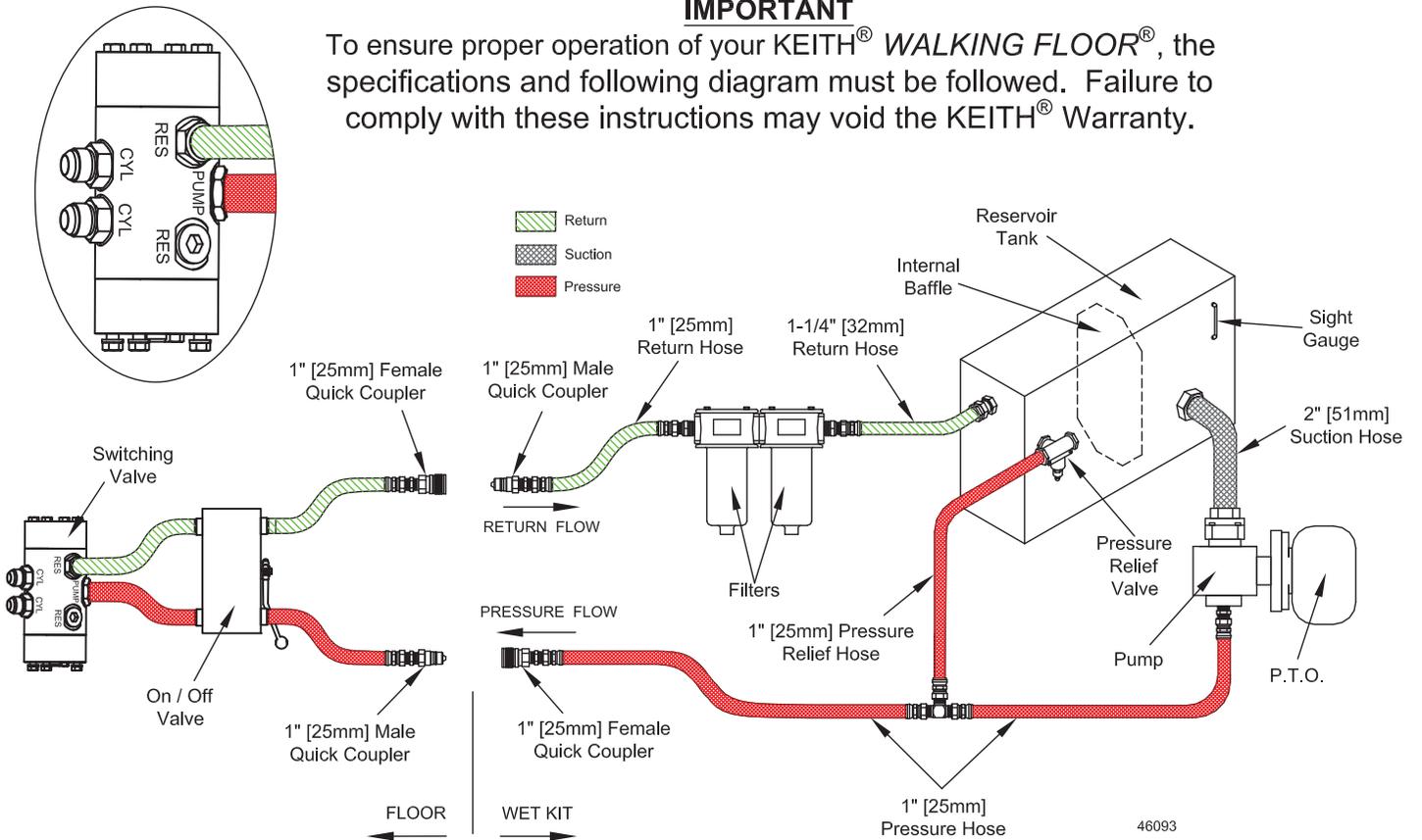
Oil:	ISO-L-HM 46 hydraulic oil (As per ISO 11158). If operating the system below 32 °F [0 °C], AW ISO 32 hydraulic oil is recommended.
PTO & Pump: *	<p>The PTO and Pump must be capable of producing a minimum flow rate of:</p> <p>4 gal/min at 3625 PSI [15 liters/min at 250 bar] for proper operation of KFD-400 4 gal/min at 3045 PSI [15 liters/min at 210 bar] for proper operation of KFD-425</p> <p>KEITH recommends a PTO and pump capable of producing:</p> <p>30 gal/min at less than 3625 PSI [15 liters/min at 250 bar] for proper operation of KFD-400 30 gal/min at less than 3045 PSI [15 liters/min at 210 bar] for proper operation of KFD-425</p> <p>NOTE: Pumps with built-in pressure relief valves are not recommended.</p> <p>Contact a KEITH Manufacturing Co. representative for specific recommendations on selecting a wet kit.</p> <p>Do not exceed the maximum flow rate.</p> <p>Do not exceed the maximum pressure.</p>
Filter:	<p>Filter should be double element, 10 to 25 µm, on the return line. A 25 µm filter is recommended in extremely cold environments. (The filter element should be changed after the initial 6 hours of operation, then every 6 months thereafter. This may vary with the operating environment).</p> <p>KEITH recommends installing an in-line pressure filter to increase the life of the system. Please contact the parts and service office in your region for recommendations.</p>
Hydraulic Reservoir:	Sized to desired flow rate. Should hold approximately 1 gallon of oil for every gallon per minute you plan to pump, i.e. 30 gal/min = 30 gallon reservoir. KEITH recommends a minimum 30 gallon [115 liters] reservoir for maximum oil cooling.
Suction Line:	<p>Suction hose from the reservoir tank to the pump should be no more than 5 ft [1.5 m] in length and a minimum of 2 inch [51 mm] inside diameter.</p> <p>KEITH recommends using SAE100R4 (This type of hose has a spiral wire to keep the hose from collapsing under suction).</p>
Pressure Line:	Hose from wet kit to floor should be 1 in [-16] SAE-100R2. [25mm]
Return Line:	<p>Hose from floor to wet kit filter should be 1 in [-16] SAE-100R1. [25mm]</p> <p>Hose from filter to reservoir tank should be 1¼ in [-20] SAE-100R1. [32mm]</p>
Pressure Relief Valve: *	High quality valve with the ability to relieve full pump flow at maximum PSI [bar]. NOTE: Relief valve must be set above 2800 PSI [193 bar] and no higher than 3625 PSI [250 bar] for the KFD-400 system and no higher than 3045 PSI [210 bar] for the KFD-425 system.

* If the information about your pump and pressure relief valve is not known, have a pressure/flow check done by a professional.

2.3 Floor to Wet Kit Connection Diagram

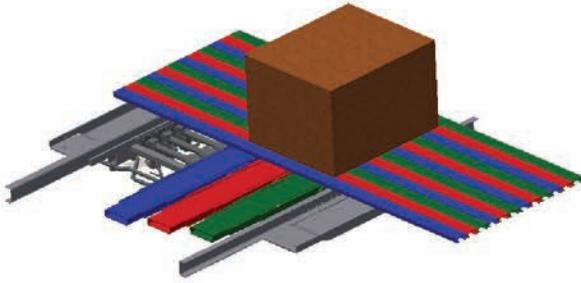
IMPORTANT

To ensure proper operation of your KEITH® WALKING FLOOR®, the specifications and following diagram must be followed. Failure to comply with these instructions may void the KEITH® Warranty.



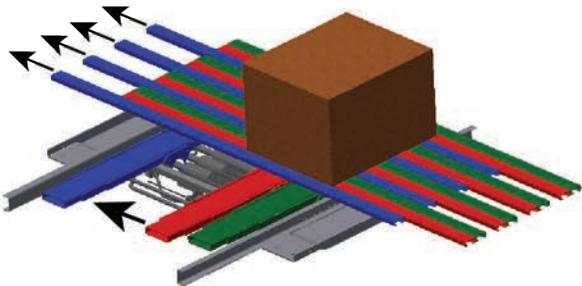
3.0 Operation

3.1 How it Works



Initial Stage

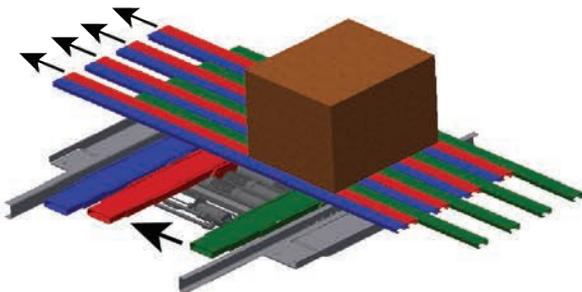
All slats are staged together toward the direction of material travel (discharge end).



Stage 1

The first group of slats (approximately every 3rd slat) moves under the load.

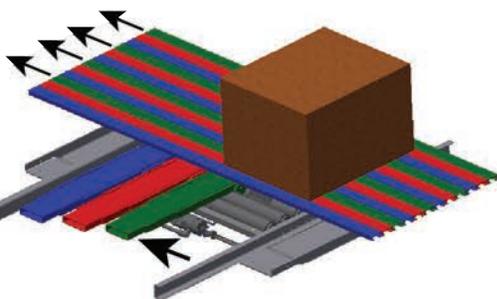
Load does not move.



Stage 2

The second group of slats moves under the load.

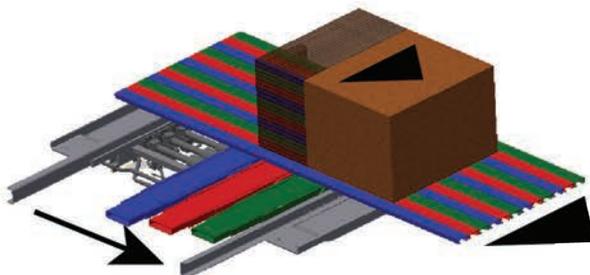
Load does not move.



Stage 3

The final group of slats moves under the load.

Load does not move.



Stage 4

All slats move together.

Load moves with the floor toward the discharge end.

(Stages 1, 2 & 3 require more pressure than Stage 4)

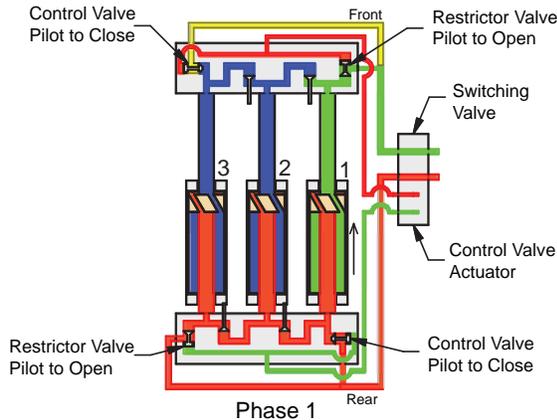
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3.2 Oil Flow Diagram

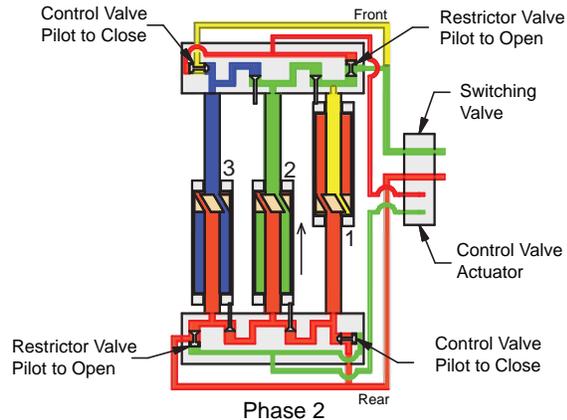
KEITH® WALKING FLOOR® F-SERIES
Oil Flow Diagram in the Unload Cycle

■ Pressure
 ■ Return
 ■ Blocked Return
 ■ Standing Oil

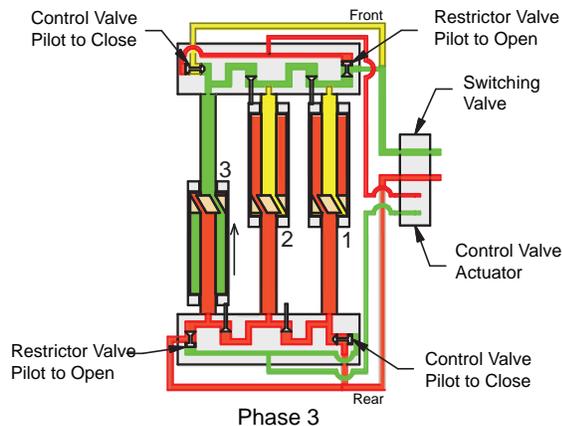
Looking from under the trailer up at the drive



Phase 1: All three cylinders receive pressure through the rear manifold to the front of the cylinders. The Control Valve Actuator sends pressure to the front manifold to close the Control (Load/Unload) Valve and open the Restrictor Valve. The return oil in Cylinder #1 is free to move to the tank through the opened restrictor valve. Cylinder #1 moves to front of trailer. In Cylinders #2 & #3, return oil is blocked by the check valves in the front manifold.



Phase 2: Cylinder #1 reaches the end of its stroke and pushes open Check Valve #1 in the front manifold, allowing return oil from Cylinder #2 to travel freely to the tank. Cylinder #2 moves to the front of trailer, and the return oil in Cylinder #3 is blocked by Check Valve #2.



Phase 3: Cylinder #2 reaches the end of its stroke and pushes open check valve #2 in the front manifold, allowing the return oil from Cylinder #3 to travel freely to the tank. Cylinder #3 moves to the front of the trailer. At the end of Cylinder #3 stroke, the 3rd cross-drive Switching Valve Actuator switches the switching valve.

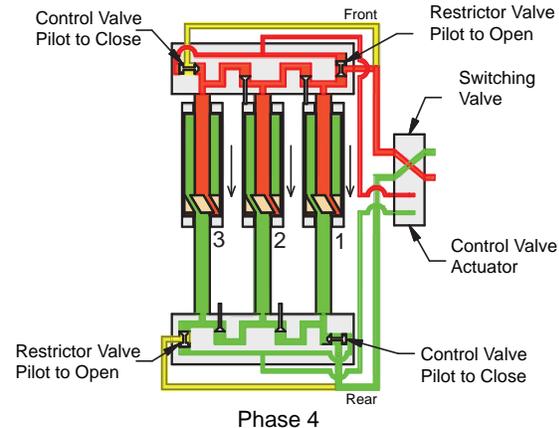
Troubleshooting:

If the Control (Load/Unload) Valve in the front manifold is not closed properly, all three cylinders will travel together to the front of the trailer.

Solution: 1) Remove the end cap off of the 6803-6-6-6 Branch Tee on the front manifold and attach a pressure gauge to see if there is pressure coming from the Control Valve Actuator. If there is no pressure, check the Control Valve Actuator. 2) Check the Control (Load/Unload) Valve in the front manifold for foreign material or a break in the O-Ring.

If the Restrictor Valve is not opening properly, none of the cylinders will move.

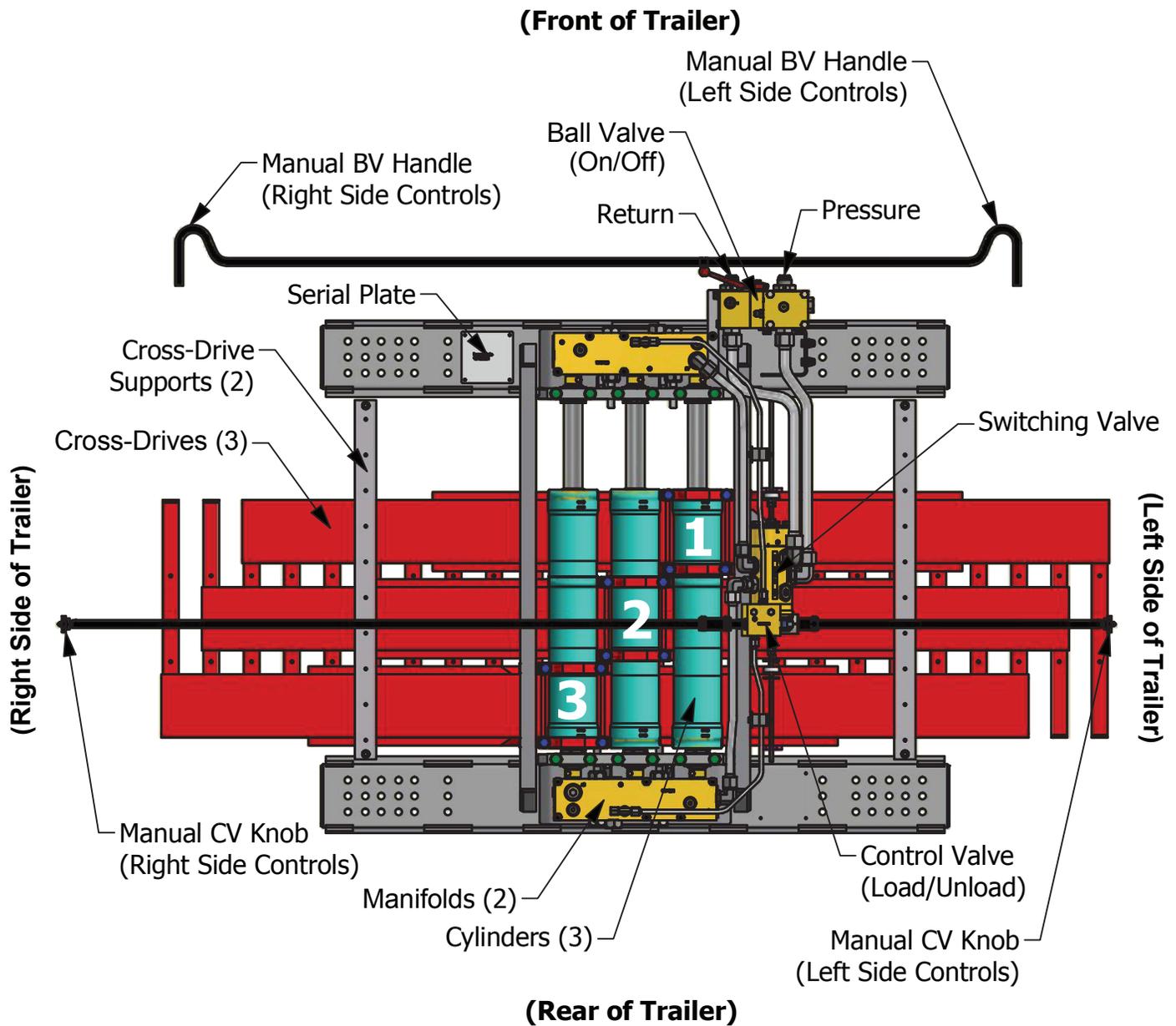
Solution: 1) Remove the end cap off of the 6803-6-6-6 Branch Tee on the rear manifold and attach a pressure gauge to see if there is pressure coming from the Control Valve Actuator. If there is no pressure, check the Control Valve Actuator. 2) Check the Restrictor Valve in the front manifold for foreign material or break in the O-Ring.



Phase 4: All three cylinders are now receiving oil through the front manifold to the rear of the cylinders. The Control Valve Actuator cycles the oil from the rear manifold to the tank, opening the Control (Load/Unload) Valve and closing the Restrictor Valve. The return oil from the front end of Cylinder #1 travels freely to the tank. The Cylinder #2's return oil floats open Check Valve #2 in rear manifold to get to the tank (restricting flow). The Cylinder #3's return oil floats open Check Valves #2 & #3 in rear manifold to get to the tank (restricting flow). The rear Restrictor Valve is blocking the return oil from going directly to tank and forcing it to go through the Check Valves, causing restriction. The #3 Cylinder has the most restriction. The cross-drives on Cylinders #1 & #2 will stack up against the 3rd cross-drive, making them all travel together.

3.3 Component Location Guide

Basic KFD Drive Component Locations

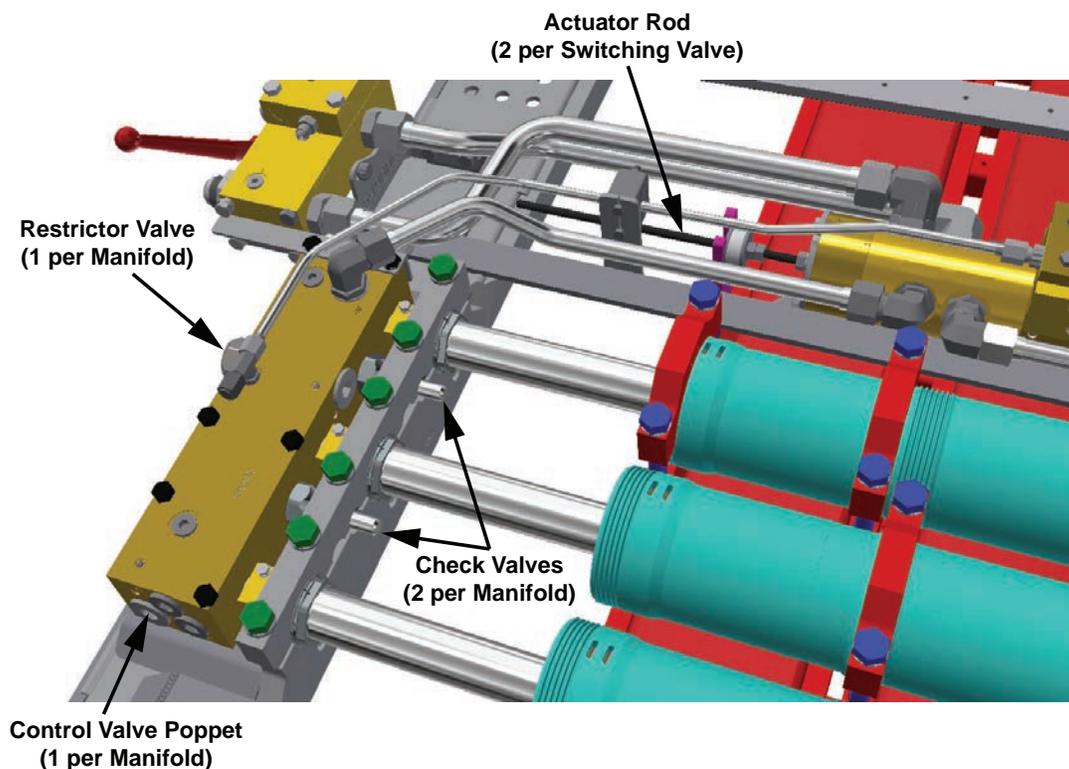


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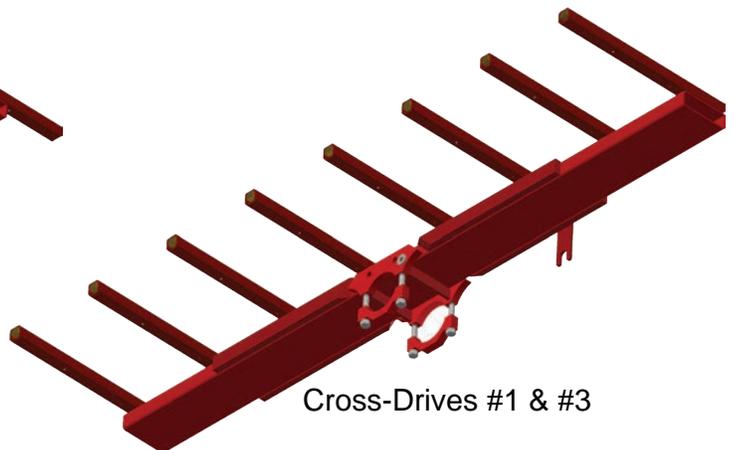
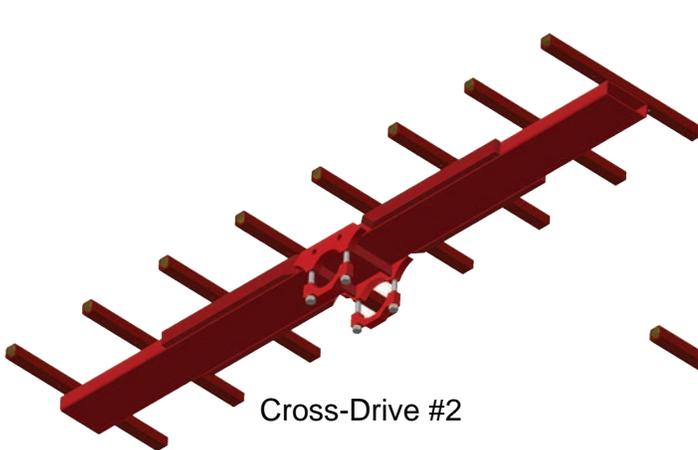
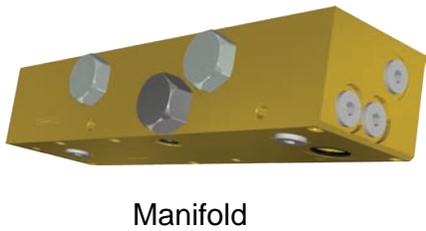
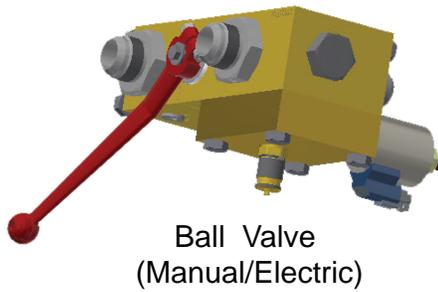
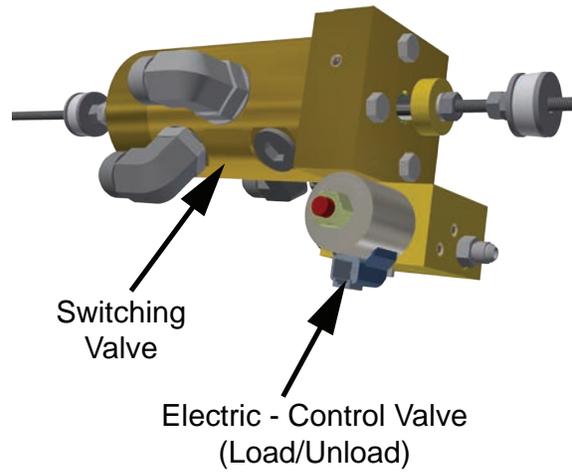
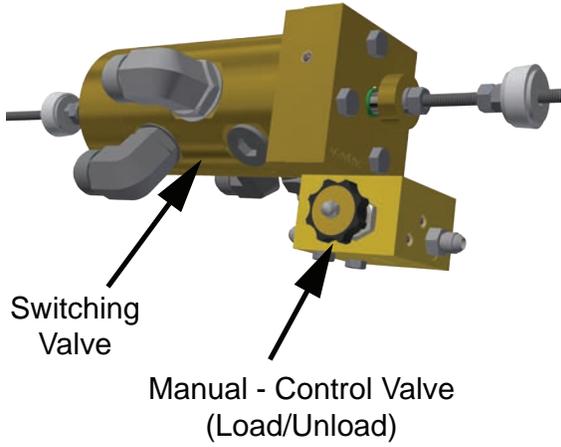
View From Underneath Trailer

3.4 Drive Unit Component Descriptions

Ball Valve On/Off Valve	A closed ball valve routes oil to the drive system (floor On). An open ball valve redirects it back to the tank (floor Off).
Switching Valve:	The switching valve changes the cylinder sequence from restaging of the floor slats to material movement and back. (Changes the direction of cylinder travel)
Actuator Rod:	The actuator rod is attached to both ends of the switching valve and allows the stroke to be adjusted between the actuators and is important for the efficient movement of the drive unit.
Control Valve:	The direction of material movement (Load/Unload) is controlled with an electric or manual control valve. It determines which check valves are active.
Manifolds:	The manifolds provide a passage for the flow of oil through the different valves on the drive unit.
Check Valves:	The check valves determine the cylinder restaging sequence.
Cylinders:	The cylinders move the floor slats.
Cross-Drives:	Three cross-drives are connected to the cylinders, allowing each cylinder to move multiple floor slats.
Cross-Drive Supports:	The cross-drive supports help maintain the position of the cross-drives over the mainframe rails.
Drive Shoes:	The drive shoes connect the cross-drives to the floor slats.



3.5 Drive Component Identification



(Shape, size and quantity of shoes on cross-drives may vary by configuration.)

3.6 Start-up Operation

3.6.1 Before Initial Start-Up:

- Read through this manual. If there is any confusion, contact a KEITH representative and resolve any concerns before operation of this system (see Contact Information section).
- Ensure that the hydraulic reservoir has the recommended amount of oil, as well as the correct type of oil (see the Specifications section of this manual for details about your system).
- Familiarize yourself with the Preventative Maintenance section of this manual. Following the maintenance schedule will significantly improve the life of the system.

3.6.2 After 6 Working Hours OR One Week:

- Visually inspect the system for hydraulic leaks. If any leaks are found, retighten fittings.
- Change oil filters. This will ensure that any contamination that was flushed out during start-up will not prematurely wear out your system.
- Inspect flooring for loose bolts. Floor bolts are installed with thread lock and should not be re-torqued. If floor bolts are loose, apply thread lock before re-installing and torque per Maintenance section of this manual.
- Check torque of manifold bolts, rod clamp bolts and barrel clamp bolts. If any bolts were loose during this inspection, check bolt torques twice as often as recommended in the Maintenance section of this manual.

3.7 Pre-Trip Checklist

- ✓ Inspect hoses and connectors for damage and contamination. Clean all dirt and water from connectors before hooking up (if applicable).
- ✓ Inspect drive unit for leaking fittings, leaking hoses, and visible damage.
- ✓ Open truck or trailer doors and inspect flooring for damage. Inspect flooring at the rear of the truck or trailer for loose or bent slats that may have popped up.
- ✓ Hook up hydraulic connectors, if applicable, and operate the floor. Inspect for leaks during operation. Test the remote control or engage and disengage ball valve fully to check for proper operation (On/Off). Check control valve for proper operation (Load/Unload).
- ✓ If problems are found, report them to the maintenance shop as soon as possible.
- ✓ Secure truck or trailer doors and proceed.

As the driver, you will see damage or operational problems before anyone else. Please report issues and concerns as soon as possible.

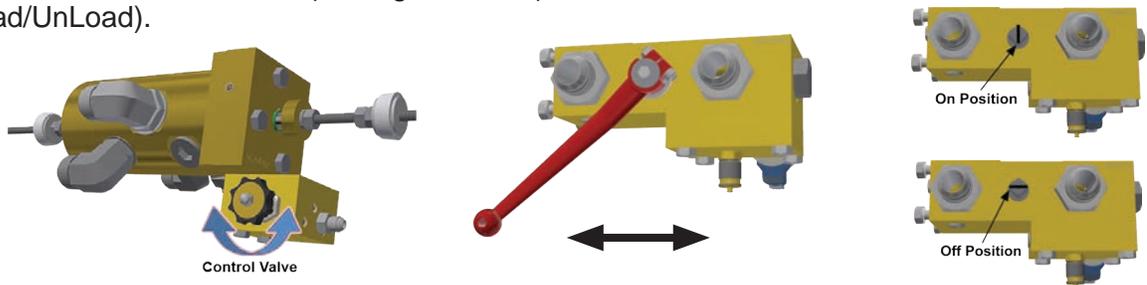
 **WARNING: Do not attempt to make adjustments or repairs without consulting with a trained service technician from your company or KEITH Manufacturing Co. (See the Technical support section for contact information.)**

3.8 Manual Controls

1. Before operating set the parking brake on the truck and trailer and follow the Pre-Trip Check List.
2. Open truck or trailer doors fully and secure doors with provided chains or loop rings.

⚠ CAUTION: ALWAYS have doors fully open! Do not, under any circumstances, engage the Power Take Off / Pump (PTO) or *WALKING FLOOR*® unloader with the doors of the truck or trailer closed. Catastrophic failure to the trailer may occur, as well as serious injury or death may occur.

3. Inspect hydraulic hoses and quick connects for damage, then connect the floor to the truck wet kit (if applicable).
4. Engage the PTO, then bring the truck engine up to the RPM to achieve desired flow rate from the wet kit.
5. Turn the control valve knob (See figure below) for the desired direction of material movement (Load/UnLoad).



6. Pull the ball valve (See figure above) fully closed. It is located between the pressure and return lines. Your truck or trailer floor should now be operating. **NOTE:** This ball valve controls (On/Off) and is used as an emergency shut-off.

⚠ CAUTION: While unloading, NEVER leave truck and trailer unattended.

⚠ WARNING: Do not go under the truck or trailer body or enter the truck or trailer while the system is in operation, nor allow anyone to stand or move through the area where the load is being discharged. Burial and/or loss of limb or life may occur.

7. After loading/unloading has been completed, stop the floor with all slats in the forward position by pushing the ball valve to the fully open position.
8. Disengage the PTO and return the truck engine to idle.
9. Close and secure the truck or trailer doors.
10. Disconnect and secure the hydraulic hoses (if applicable).

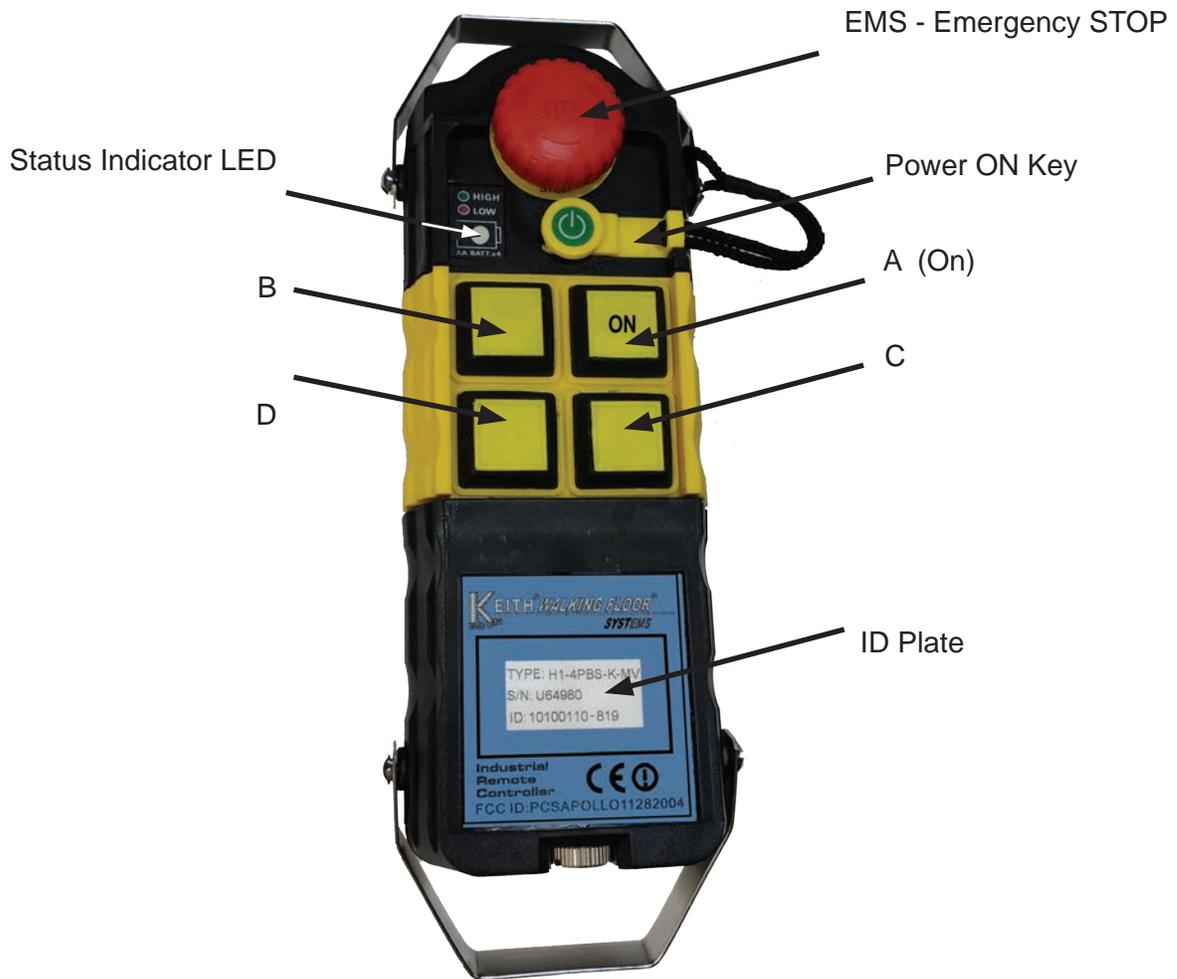
EMERGENCY STOP: In case of emergency the floor can be stopped in one of the following ways:

- Disengage the PTO / Pumping System.
- Push the ball valve handle fully open.

⚠ CAUTION: Observations may be made while system is operating for troubleshooting purposes, but NEVER touch any moving part or attempt to make any adjustments to the system with the Power Take Off/Pumping system engaged or the *WALKING FLOOR*® unloader operating.

3.9 Electric On/Off, Manual Load/Unload - Wireless Remote Control

3.9.1 4 Channel Remote Control Transmitter



1. Before operating set the parking brake on the truck and trailer and follow the Pre-Trip Check List.
2. Open truck or trailer doors fully and secure doors with provided chains or loop rings.



CAUTION: ALWAYS have doors fully open! Do not, under any circumstances, engage the Power Take Off (PTO) / Pump System or *WALKING FLOOR*[®] unloader with the doors of the truck or trailer closed. Catastrophic failure to the trailer, as well as serious injury or death may occur.

3. Inspect hydraulic hoses and quick connects for damage, then connect the floor to the truck wet kit (If applicable).
4. Engage the PTO, then bring the truck engine up to the RPM to achieve desired flow rate from the wet kit.
5. Turn ON the remote receiver by twisting the EMS button clockwise to disengage the EMS (emergency stop) button. (The button will pop up.)

6. Insert the yellow power-on key into the transmitter. The status indicator LED will start blinking.

Transmitter Status Indicator:

Green: Battery power sufficient

Red: Battery power low. Requires 4x AA (1.5V) alkaline or nickel rechargeable batteries.

7. The remote transmitter is now ready for use.

ON - Maintained: Push and release the “ON” button on the remote transmitter. The floor will continue to move until the “ON” button is pressed again.

“B” - Momentary: Push and hold the “B” button on the remote transmitter. The floor will continue to move until the button is released.



CAUTION: While unloading, NEVER leave truck and trailer unattended.



WARNING: Do not go under the truck or trailer body or enter the truck or trailer while the system is in operation, nor allow anyone to stand or move through the area where the load is being discharged. Burial, loss of limb or life may occur.

8. After unloading has been completed, stop the floor with all slats in the forward position, turn off the remote control by pushing the EMS button and remove the power-on key from the transmitter.
9. Turn off the receiver by pushing the EMS button.
10. Disengage PTO and return the truck engine to idle.
11. Close and secure the truck or trailer doors.
12. Disconnect and secure the hydraulic hoses (If applicable).

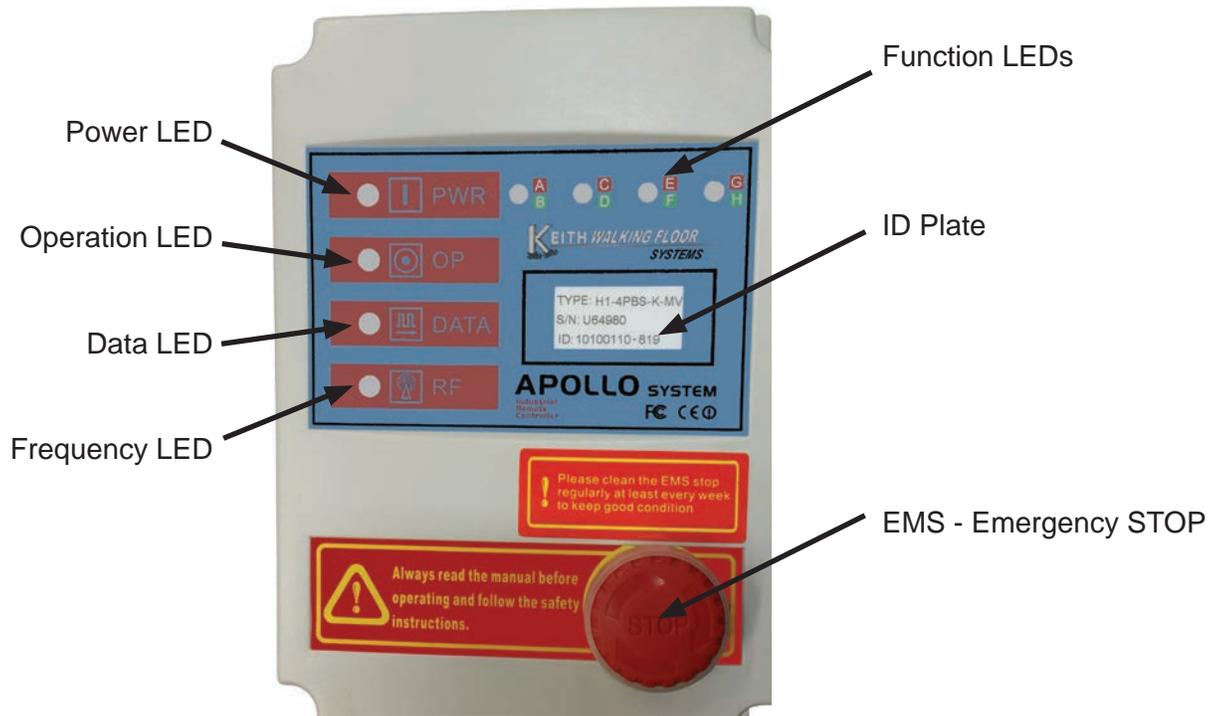
EMERGENCY STOP: In case of emergency the floor can be stopped in one of the following ways:

- Push the red EMS (emergency stop) button on the transmitter or receiver.
- Remove the yellow key from the transmitter.
- Disengage the PTO / Pumping System.
- Stop the electric power to the receiver.
- Manually push the ball valve handle fully open.

IMPORTANT NOTE: The KEITH wireless remote control has some built in features:

- The floor automatically stops moving if the continuous signal link, between receiver and transmitter, is not detected or out of range.
- The wireless remote control automatically turns off after 10 minutes if no buttons have been pressed. This will also cause the floor to stop moving.

3.9.2 4 Channel Remote Control Receiver

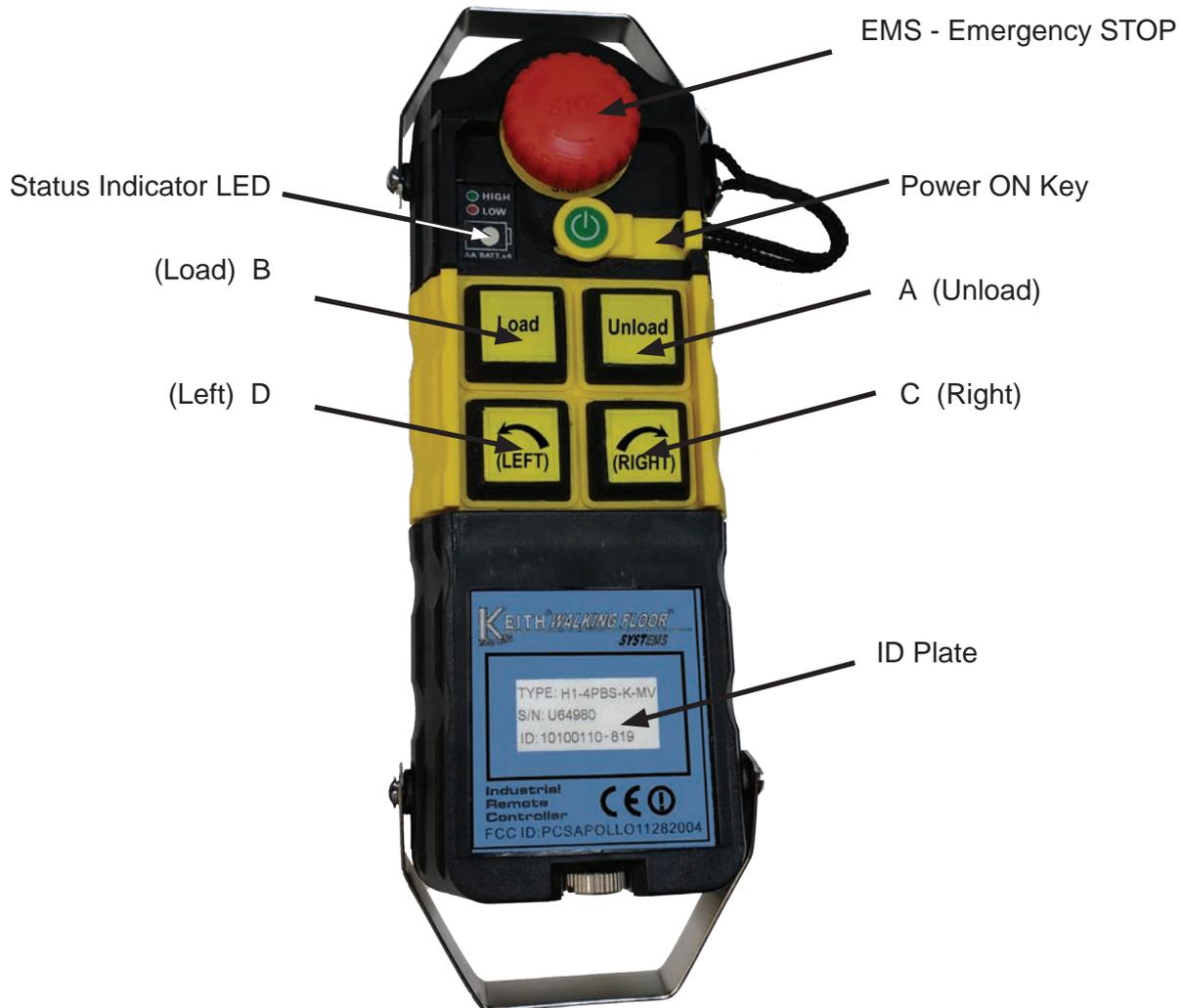


RECEIVER STATUS INDICATOR:

	<p>Power LED</p> <ul style="list-style-type: none"> GREEN = Receiver power is ON
	<p>Operation LED</p> <ul style="list-style-type: none"> GREEN = Both transmitter and receiver are ON OFF = Transmitter power is OFF
	<p>Data LED</p> <ul style="list-style-type: none"> OFF briefly = A button on the transmitter was pressed RED = Transmitter OFF (EMS engaged and/or Power Key not inserted) RED blinking slowly = Normal continuous signal link RED blinking irregularly = ID codes don't match
	<p>Frequency LED</p> <ul style="list-style-type: none"> OFF = Normal state RED = Blinking irregularly when interference incurred
	<p>Function LEDs</p> <ul style="list-style-type: none"> ON = Solid RED light "A" until pressed again or until "B" is pressed B = RED "A" and GREEN "B" both light while button is pressed C = RED "C" light while button is pressed D = GREEN "D" light while button is pressed

3.10 Electric On/Off & Electric Load/Unload - Wireless Remote Control

3.10.1 4 Channel Remote Control Transmitter



1. Before operating set the parking brake on the truck and trailer and follow the Pre-Trip Check List.
2. Open truck or trailer doors fully and secure doors with provided chains or loop rings.

⚠ CAUTION: ALWAYS have doors fully open! Do not, under any circumstances, engage the Power Take Off (PTO) / Pump System or *WALKING FLOOR*[®] unloader with the doors of the truck or trailer closed. Catastrophic failure to the trailer, as well as serious injury or death may occur.

3. Inspect hydraulic hoses and quick connects for damage, then connect the floor to the truck wet kit (if applicable).
4. Engage the PTO, then bring the truck engine up to the RPM to achieve desired flow rate from the wet kit.
5. Turn ON the remote receiver by twisting the EMS button clockwise to disengage the EMS (emergency stop) button. (The button will pop up.)

6. Insert the yellow power-on key into the transmitter. The status indicator LED will start blinking.

Transmitter Status Indicator:

Green: Battery power sufficient

Red: Battery power low. Requires 4x AA (1.5V) alkaline or nickel rechargeable batteries.

7. The remote transmitter is now ready for use.

UNLOAD - Maintained: Push and release the “UNLOAD” button on the remote transmitter. The floor will continue to move until the “UNLOAD” button is pressed again.

LOAD - Momentary: Push and hold the “LOAD” button. The floor will continue to move until the button is released.

LEFT / RIGHT: These buttons can be used for other functions, for example retracting a KEITH® WALKING FLOOR® Sweep System. Pushing and holding one of these buttons activates the function until the button is released.



CAUTION: While unloading, NEVER leave truck and trailer unattended.



WARNING: Do not go under the truck or trailer body or enter the truck or trailer while the system is in operation, nor allow anyone to stand or move through the area where the load is being discharged. Burial, loss of limb or life may occur.

8. After loading/unloading has been completed, stop the floor with all slats in the forward position. Turn off the remote control by pushing the EMS button and remove the power-on key from the transmitter.
9. Turn off the receiver by pushing the EMS button.
10. Disengage PTO and return the truck engine to idle.
11. Close and secure the truck or trailer doors.
12. Disconnect and secure the hydraulic hoses (If applicable).

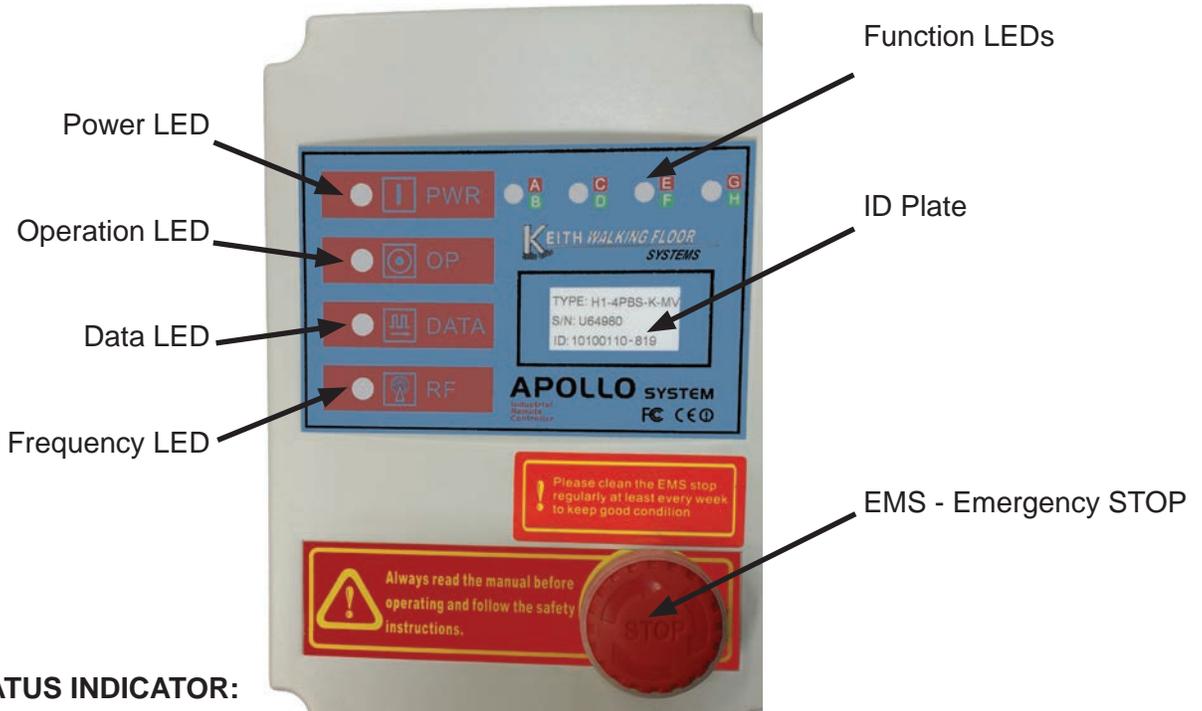
EMERGENCY STOP: In case of emergency the floor can be stopped in one of the following ways:

- Push the red EMS (emergency stop) button on the transmitter or receiver.
- Remove the yellow key from the transmitter.
- Disengage the PTO / Pumping System.
- Stop the electric power to the receiver.
- Manually push the ball valve handle fully open.

IMPORTANT NOTE: The KEITH wireless remote control has some built in features:

- The floor automatically stops moving if the continuous signal link, between receiver and transmitter, is not detected.
- The wireless remote control automatically turns off after 10 minutes if no buttons have been pressed. This will also cause the floor to stop moving.

3.10.2 4 Channel Remote Control Receiver



RECEIVER STATUS INDICATOR:

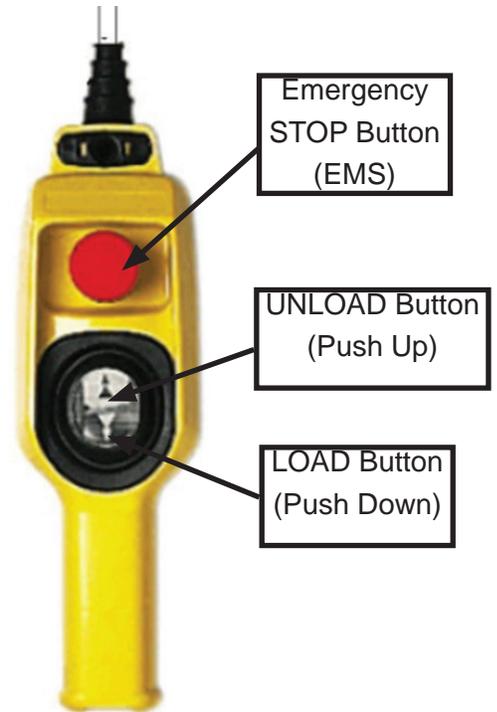
	<p>Power LED</p> <ul style="list-style-type: none"> GREEN = Receiver power is ON
	<p>Operation LED</p> <ul style="list-style-type: none"> GREEN = Both transmitter and receiver are ON OFF = Transmitter power is OFF
	<p>Data LED</p> <ul style="list-style-type: none"> OFF briefly = A button on the transmitter was pressed RED = Transmitter OFF (EMS engaged and/or Power Key not inserted) RED blinking slowly = Normal continuous signal link RED blinking irregularly = ID codes don't match
	<p>Frequency LED</p> <ul style="list-style-type: none"> OFF = Normal state RED = Blinking irregularly when interference incurred
	<p>Function LEDs</p> <ul style="list-style-type: none"> UNLOAD = Solid RED light "A" until any button is pressed LOAD = RED "A" and GREEN "B" both light while button is pressed RIGHT = RED "C" light while button is pressed LEFT = GREEN "D" light while button is pressed

3.11 Electric On/Off & Electric Load/Unload - Cabled Remote Control

1. Before operating set the parking brake on the truck and trailer and follow the Pre-Trip Check List.
2. Open truck or trailer doors fully and secure doors with provided chains or loop rings.

⚠ CAUTION: ALWAYS have doors fully open! Do not, under any circumstances, engage the Power Take Off (PTO) / Pump System or *WALKING FLOOR*® unloader with the doors of the truck or trailer closed. Catastrophic failure to the trailer, as well as serious injury or death may occur.

3. Inspect hydraulic hoses and quick connects for damage, then connect the floor to the truck wet kit (If applicable).
4. Engage the PTO, then bring the truck engine up to the RPM to achieve desired flow rate from the wet kit.
5. Turn on the electric power to operate the remote control.
6. Turn ON the remote by twisting the EMS button clockwise to disengage the EMS (emergency stop) button. (The button will pop up.)
7. Now the remote control is ready for use.



UNLOAD - Maintained: Push and release the Up button on the control. The floor will continue to move until the Up button is pushed again.

LOAD - Momentary: Push and hold the Down button. The floor will move until the button is released.

⚠ CAUTION: While unloading, NEVER leave truck and trailer unattended.

⚠ WARNING: Do not go under the truck or trailer body or enter the truck or trailer while the system is in operation, nor allow anyone to stand or move through the area where the load is being discharged. Burial, loss of limb or life may occur.

8. After loading/unloading has been completed, stop the floor with all slats in the forward position, turn off the remote control by pushing the EMS button.
9. Turn off the electric power to the remote control.
10. Disengage PTO and return the truck engine to idle.
11. Close and secure the truck or trailer doors.
12. Disconnect and secure the hydraulic hoses (If applicable).

EMERGENCY STOP: In case of emergency the floor can be stopped in one of the following ways:

- Push the red EMS (emergency stop) button on the remote
- Disengage the PTO / Pumping System.
- Manually push the ball valve handle fully open.

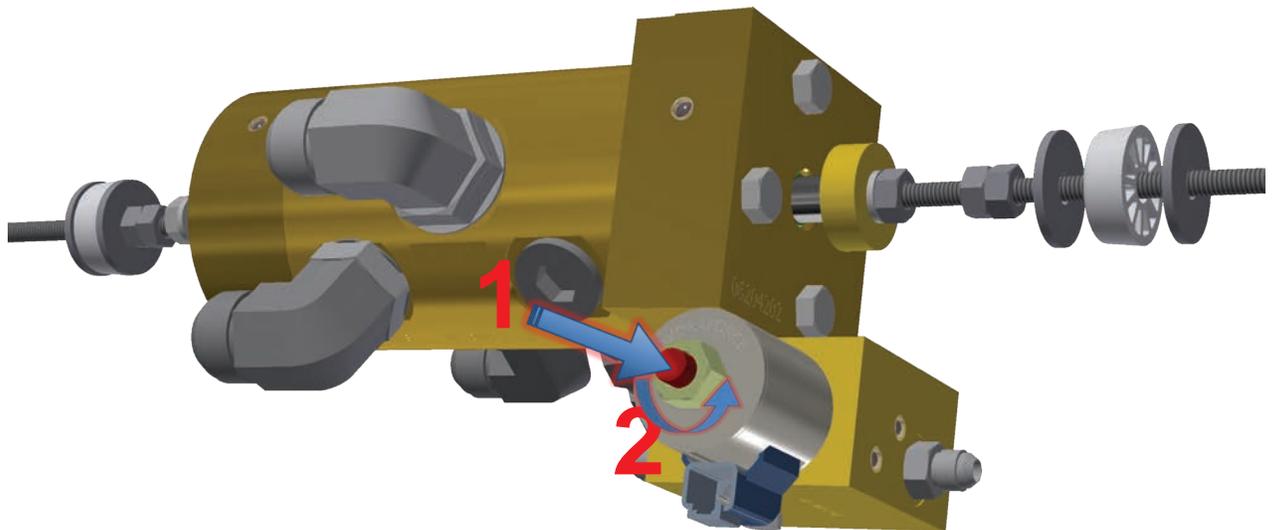
3.12 Manual Override of Electric Controls

In the case of a malfunction in the electrical system or loss of the remote control, the electric valves can still be operated by activating the manual override fitted for that purpose.

1. Before operating set the parking brake on the truck and trailer and follow the Pre-Trip Check List.
2. Open truck or trailer doors fully and secure doors with provided chains or loop rings.

⚠ CAUTION: ALWAYS have doors fully open! Do not, under any circumstances, engage the Power Take Off (PTO) / Pump System or *WALKING FLOOR*® unloader with the doors of the truck or trailer closed. Catastrophic failure to the trailer, as well as serious injury or death may occur.

3. Inspect hydraulic hoses and quick connects for damage, then connect the floor to the truck wet kit (If applicable).
4. Engage the PTO, then bring the truck engine up to the RPM to achieve desired flow rate from the wet kit.
5. Determine if the floor is in the load or unload mode. The typical position of the solenoid is in the unload position. If the floor is in the loading mode: Push the red button in (1) and turn it a half turn counter clockwise (2). Release the red button and it will pop out.

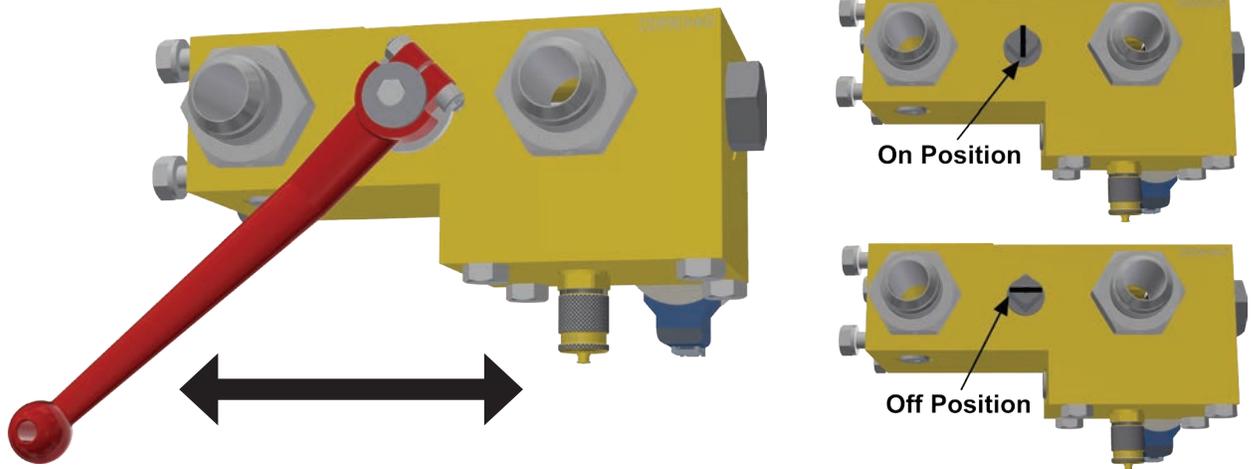


Manual Override - Control Valve (solenoid)

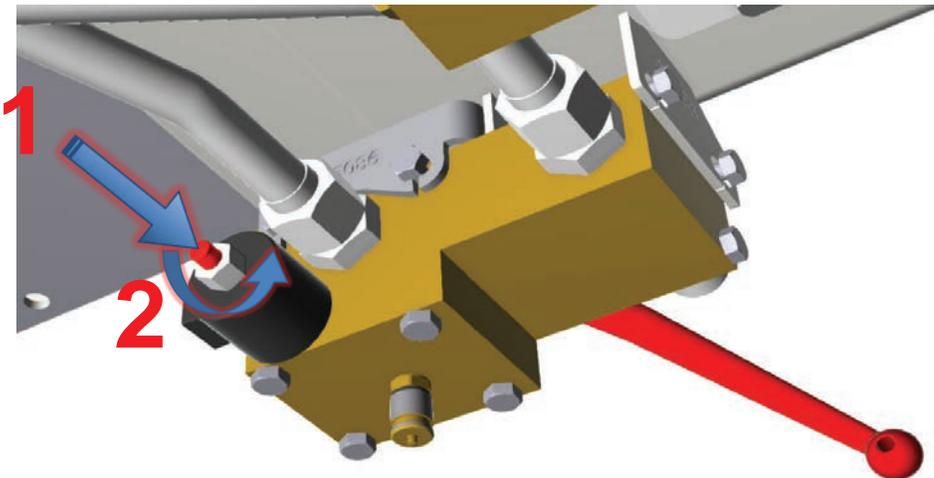
6. There are two ways to put the Ball Valve (On/Off) in ON-position.

A) Pull the red handle to the fully closed position. The floor will start to move! Take into account that the system can be left-hand (LH) or right-hand (RH) drive.

Manual Override - Ball Valve (handle)



B) Push the red button in (1) and turn it a half turn counter clockwise (2). Release the red button and it will pop out. The floor will start to move!



7. The floor can be stopped by returning the red handle or red button to the original position.

8. After using the system, return the red solenoid button to the original position.

4.0 Maintenance

 **WARNING:** The extreme forces exerted by the floor, when in operation, can result in damage to equipment, as well as cause serious injury or death. Always follow lockout/tagout procedures. Switch off the Power Take Off (PTO) / Pumping System and manually push the ball (On/Off) valve to the fully open position during maintenance and/or service work.

4.1 Life Extending Practices

- Follow the Start-up procedures in the Operation section of this manual.
- Use only clean oil, free from contamination.
- Use required torque on all bolts. The cross-drive clamp bolts must be checked regularly. (See Maintenance section)
- Floor bolts attaching the slats must be inspected regularly. Loose floor bolts will cause serious damage to the floor slats. Floor bolts are installed with thread lock and should not be re-torqued. If floor bolts are loose, apply thread lock before re-installing and torque per Maintenance section of this manual.
- Be aware of the pressures your system typically runs at (with and without loads). Increased pressure can indicate potential problems.

4.2 Preventative Maintenance

4.2.1 Monthly Service (25 operating hours)

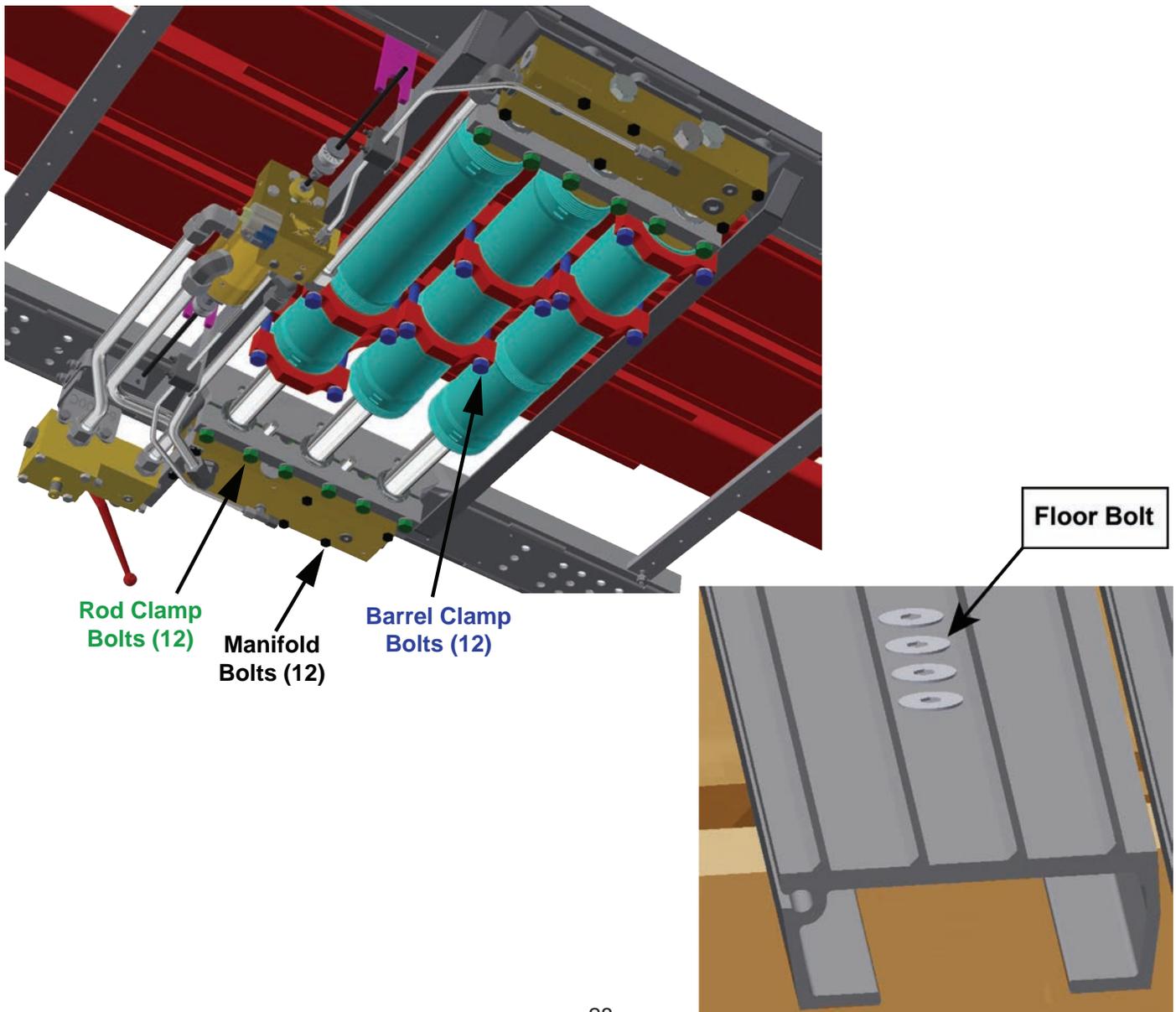
- Check the system for hydraulic leaks.
- Check the operating temperature. No single component should be warmer than 140 °F [60 °C] while the system is running.
- Check and torque the cylinder barrel clamp bolts. (See Bolt Torque Requirements section)
- Pressure wash drive unit, sub-deck, and slats (recommended quarterly, minimum twice per year).

4.2.2 6-Month Service (150 operating hours)

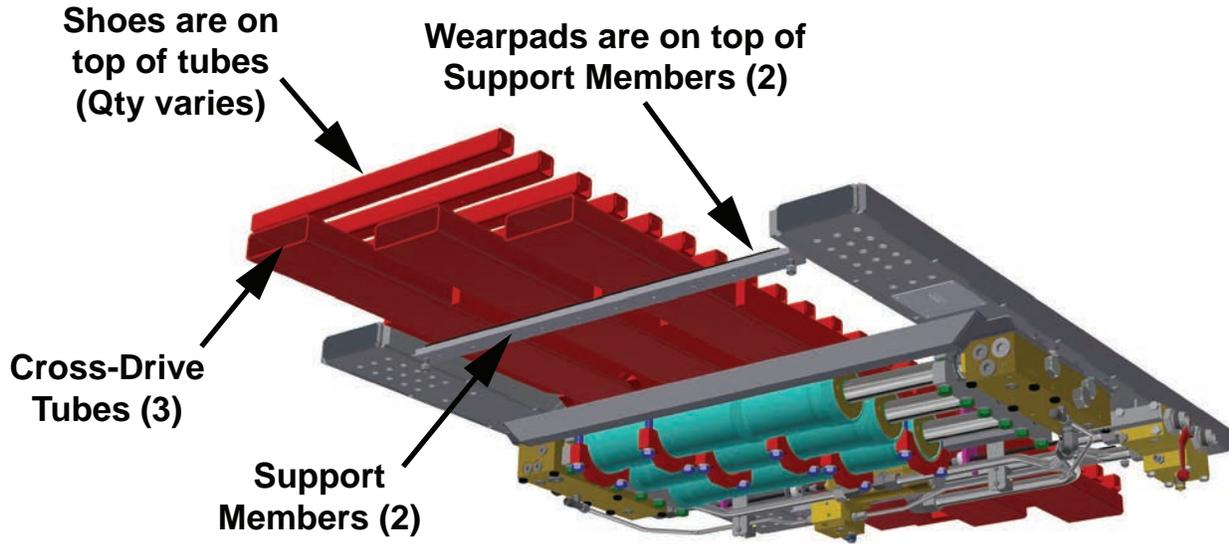
- Change the oil filters.
- Cycle the system (unloaded) in both directions and observe to ensure proper operation.
- Inspect cross-drive support bearings, wearpads, tubes and shoes for wear. (See Cross-Drive Wear Component Diagram section). Replace as needed.
- Inspect floor wear bearings and seals for excessive wear (especially above the tires). (See Floorings Wear Component Diagrams section) Replace as needed.
- Inspect floor slats for wear. If discharge end of slats are worn down more than 75% of original material thickness, rotate all floor slats end for end, to increase life of the floor. If floor has already been rotated, contact KEITH for replacement slats.

4.3 Bolt Torque Requirements

Description	Size	Quantity	Torque Values
Manifold Bolts	M10x100mm HCS Grade 10.9	6 per manifold	45 ft.-lbs [61 N·m]
Barrel Clamp Bolts	M16x120mm HCS Grade 10.9	4 per cylinder	135 ft.-lbs [183 N·m]
Rod Clamp Bolts	M16x80mm HCS Grade 10.9	6 per rod clamp	180 ft.-lbs [244 N·m]
Flooring (90° flat head) (use thread lock)	M12x35mm FHCS Grade 10.9	Varies with Flooring	81 ft.-lbs [110 N·m]

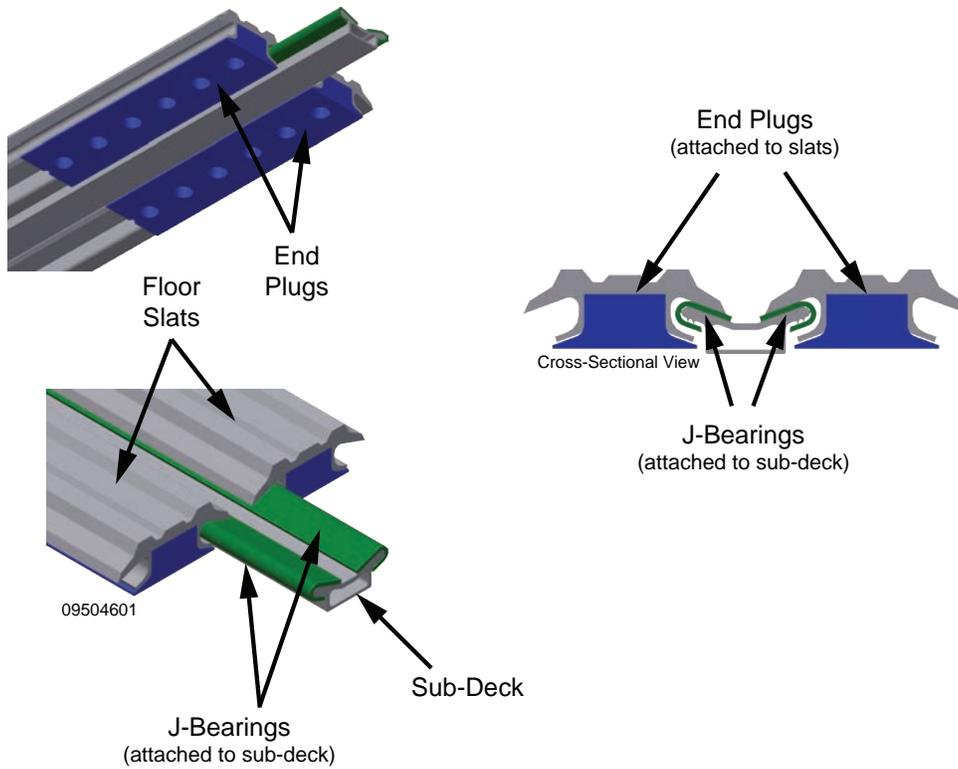


4.4 Cross-Drive Wear Component Diagram



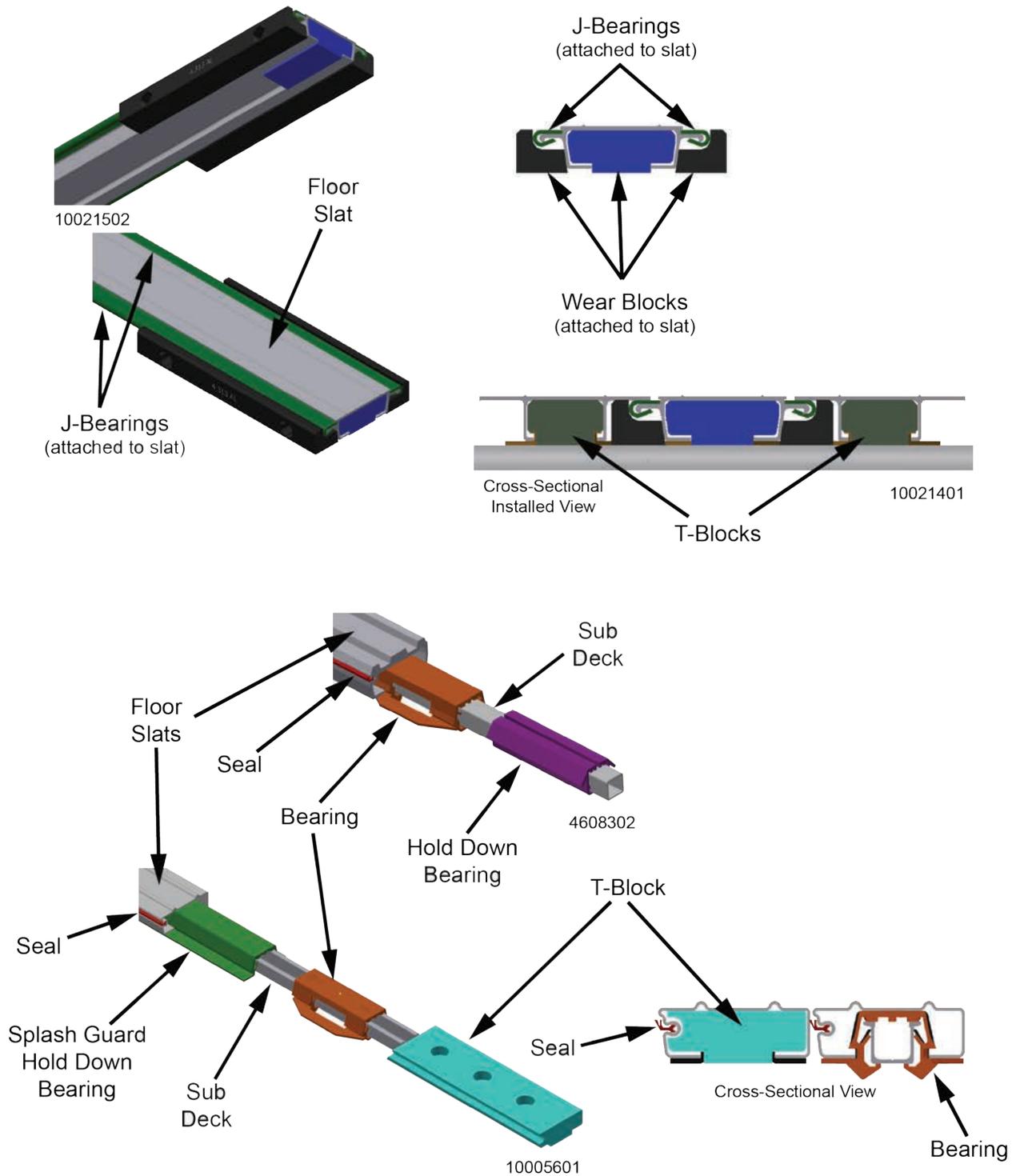
4.5 Flooring Wear Component Diagrams

Floor Wear Bearings & Seals *



* These images are for illustrative purposes with colors modified for clarity.
 Style and quantity of wear bearings & seals varies by design.
 Wear bearings & seals are non-metallic and run the length of the floor.
 (They are designed to be replaced to extend the life of the floor.)

Floor Wear Bearings & Seals *



* These images are for illustrative purposes with colors modified for clarity.
 Style and quantity of wear bearings & seals varies by design.
 Wear bearings & seals are non-metallic and run the length of the floor.
 (They are designed to be replaced to extend the life of the floor.)

5.0 Troubleshooting

5.1 Check List

Before requesting technical assistance, please verify the following:

- ✓ Wet Kit: Does your entire wet kit system meet the requirements in the Specifications section in this manual? Contact a KEITH Manufacturing Co. representative for specific recommendations on selecting a wet kit.
- ✓ Plumbing: Is your entire system plumbed per the Floor to Wet Kit Connection Diagram in Specifications section in this manual?
- ✓ Connections: Inspect the quick connects on the hydraulic lines for damage or contamination. Are the pressure line and return line quick disconnects the correct size and style and are they securely attached between the wet kit and floor and are they connected Pressure to Pressure, Return to Return?
- ✓ Pump: Does it meet minimum requirements in Specifications Section?
- ✓ Relief Valve: Is it set per the requirements in Specifications Section?
- ✓ Oil: Is the oil reservoir full?
- ✓ Power Take Off: Is the PTO engaged?
- ✓ Ball Valve: Is the ball valve, that engages the drive unit (On/Off), pulled fully closed?
- ✓ Manual Control Valve: Is the control valve fully engaged in the appropriate position (Load/Unload)?
- ✓ Electrical Operation: Is there sufficient voltage? Is the Emergency Stop button disengaged?

5.2 Problem / Solution - Troubleshooting

<u>Problem:</u>	The cycle begins, then the floor stops.
<i>Specific Trouble:</i>	The first cross-drive (#1) moves forward to the front of the vehicle, second cross-drive (#2) moves forward, the third cross-drive (#3) moves forward, then the system stops.
<i>Possible Cause:</i>	The switching valve is not switching correctly.
<i>Solution:</i>	The threaded rod nuts on the discharge end of the threaded actuator rod are not adjusted correctly. Break the two nuts apart and adjust toward the rear of the vehicle. Relock the nuts together.
<i>Specific Trouble:</i>	All cylinders move toward the rear of the vehicle, then the system stops.
<i>Possible Cause #1:</i>	The switching valve is not switching correctly.
<i>Solution:</i>	The threaded rod nuts on the forward end of the threaded actuator rod are not adjusted correctly. Break the two nuts apart and adjust toward the front of the vehicle. Relock the nuts together.

<i>Possible Cause #2:</i>	Insufficient pressure.
<i>Solution:</i>	Check the pressure and adjust the pressure relief valve, if necessary. If the floor stops in the full rear position and the switching valve has switched, the oil pressure may not be high enough. Less pressure is required to move the load than to pull the slats individually (1/3 at a time) under the load.
<i>Specific Trouble:</i>	The floor functions perfectly without a load or with a light load, but not with a heavy load.
<i>Possible Cause #1:</i>	Insufficient pressure.
<i>Solution:</i>	Check the pressure and adjust the pressure relief valve, if necessary.
<i>Possible Cause #2:</i>	The switching valve is not switching correctly.
<i>Solution:</i>	Check the adjustment of the nuts on the threaded actuator rod as detailed above.
<u>Problem:</u>	Drive cycles incorrectly when unloading.
<i>Specific Trouble:</i>	Cylinders #1 and #2 extend together toward the front of the vehicle.
<i>Possible Cause:</i>	The check valve at the front end of cylinder #1 has malfunctioned.
<i>Solution:</i>	Replace the check valve.
<i>Specific Problem:</i>	Cylinders #2 and #3 extend together toward the front of the vehicle.
<i>Possible Cause:</i>	The check valve at the front end of cylinder #2 has malfunctioned.
<i>Solution:</i>	Replace the check valve.
<i>Specific Trouble:</i>	All cylinders extend together toward the front of the vehicle.
<i>Possible Cause #1:</i>	The load/unload cartridge valve has malfunctioned.
<i>Solution:</i>	Replace the load/unload cartridge valve.
<i>Possible Cause #2:</i>	The check valves at the front end of cylinders #1 and #2 have malfunctioned.
<i>Solution:</i>	Replace the check valves.

<u>Problem:</u>	Drive cycles incorrectly when loading.
<i>Specific Trouble:</i>	Cylinders #2 and #3 extend together toward the rear of the vehicle.
<i>Possible Cause:</i>	The check valve at the rear end of cylinder #3 has malfunctioned.
<i>Solution:</i>	Replace the check valve.
<i>Specific Trouble:</i>	Cylinders #1 and #2 extend together toward the rear of the vehicle.
<i>Possible Cause:</i>	The check valve at the rear end of cylinder #2 has malfunctioned.
<i>Solution:</i>	Replace the check valve.
<i>Specific Trouble:</i>	All cylinders extend together toward the rear of the vehicle.
<i>Possible Cause #1:</i>	The load/unload cartridge valve has malfunctioned.
<i>Solution:</i>	Replace the load/unload cartridge valve.
<i>Possible Cause #2:</i>	The check valves at the rear end of cylinders #2 and #3 have malfunctioned.
<i>Solution:</i>	Replace the check valves.

5.3 Adjustments & Replacements

5.3.1 Switching Valve Adjustment

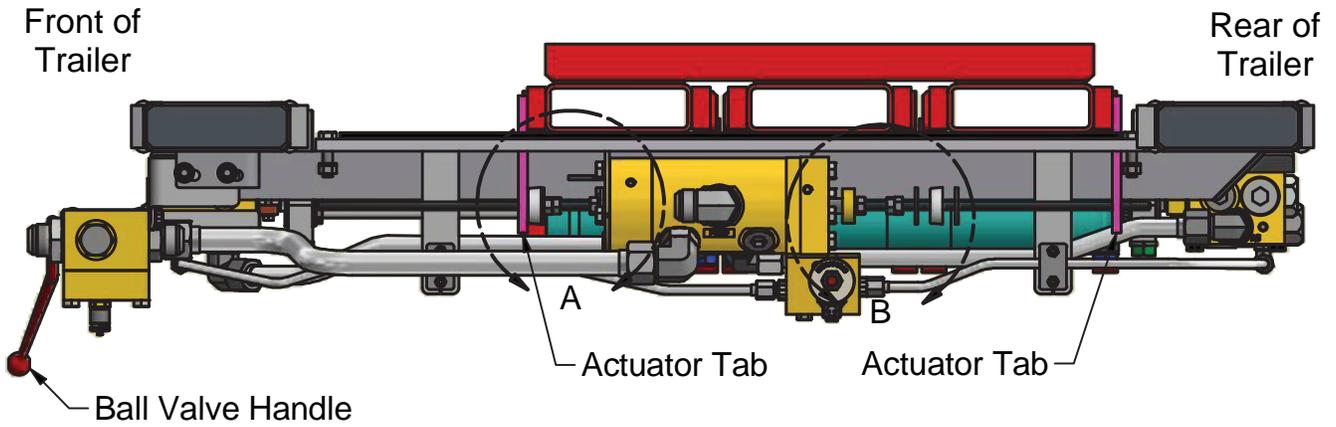
Required Tools:

- (2) 17mm open-end wrenches.

NOTE: Many switching valves are unnecessarily replaced when they are only in need of adjustment. Always adjust the switching valve as described below.

1. Use the ball valve to stop the drive unit. The ball valve is located toward the front of the drive unit, in front of the hydraulic cylinders. Push the ball valve handle toward the center of the trailer, which will allow the hydraulic oil to bypass the drive unit.
2. Loosen the 10mm jam nuts located on the threaded rods on each end of the switching valve. On each threaded rod there are two flat washers and a grommet. The 10mm jam nuts are located between the switching valve and the washers. After loosening the nuts, adjust them toward the switching valve. Doing this will throw the switching valve out of adjustment. Repeat the process at the other end of the switching valve.
3. Start the truck engine and engage the PTO. Let the clutch out slowly. Pull the ball valve handle toward the driver's side. The drive unit will move to the load or unload direction. The system will lock up and be under high pressure when the cylinders reach the end of the stroke. Immediately push the ball valve handle toward the center of the trailer. This will allow the hydraulic oil to bypass the system. At this point, the cylinders will be at maximum stroke.
4. Disengage PTO
5. Push the threaded rod in the direction that the cylinders are bottomed. Slide the washers and rubber grommet out toward the actuator tab on the cross drive. Turn the 10mm jam nuts out until they are tight against the washers. Then turn the first nut three extra turns. Bring the second nut up to the first nut and tighten the two together, setting the jam nuts.
6. Engage PTO
7. Move the ball valve handle slowly, causing the hydraulic cylinders to travel to the opposite direction. Let the cylinders travel until they lock up. Then push the ball valve handle to the center.
8. Disengage PTO
9. Push the threaded rod in the direction that the cylinders are bottomed. Slide the washers and rubber grommet out toward the actuator tab on the other cross drive. Turn the 10mm jam nuts out until they are tight against the washers. Then turn the first nut three extra turns. Bring the second nut up to the first nut and tighten the two together, setting the jam nuts.
10. The switching valve adjustment is completed.

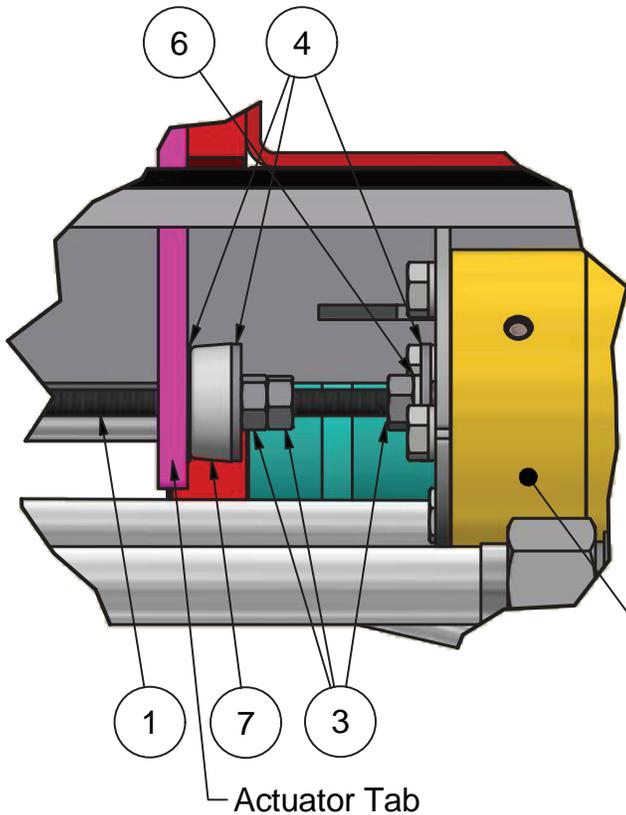
Switching Valve Adjustment Diagram



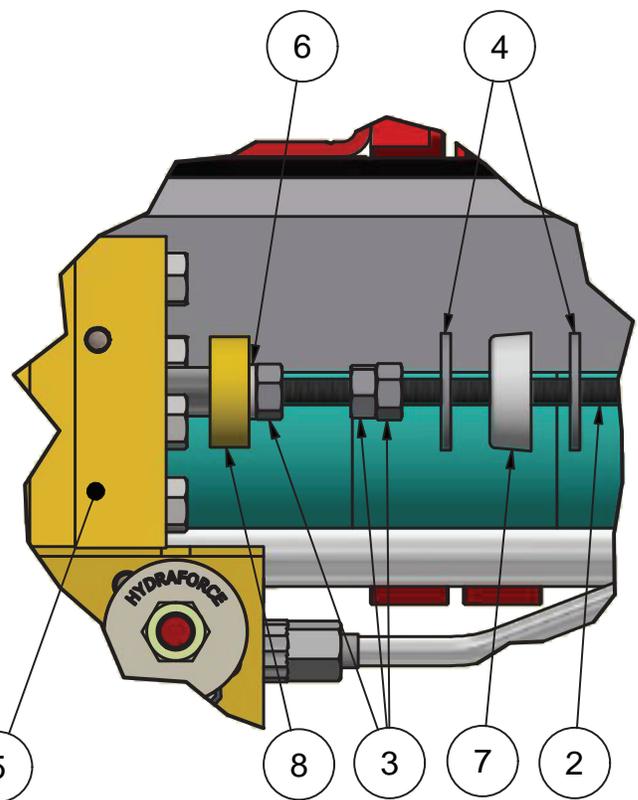
Note: This view is from the left side of the trailer (for left hand drive).
All cylinders are shown to the rear of the trailer.

- 1. Front M10 Threaded Rod
- 2. Rear M10 Threaded Rod
- 3. M10 Nuts
- 4. M10 Flat Washers

- 5. Switching Valve
- 6. M10 Lock Washers
- 7. Switching Valve Grommet
- 8. Switching Valve Limit Cap

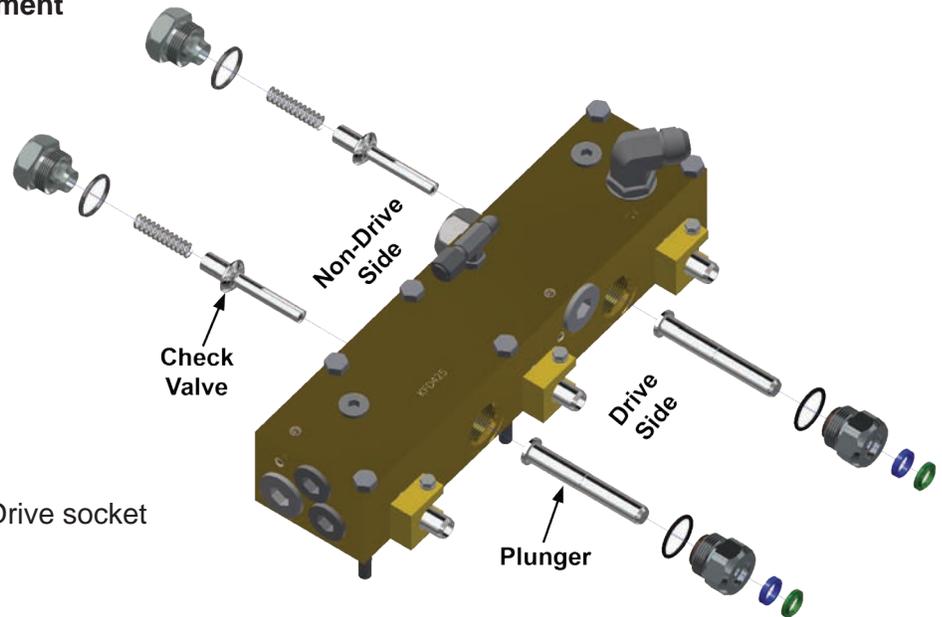


DETAIL A



DETAIL B

5.3.2 Check Valve Replacement



Required Tools:

- (2) 1-1/2" [38mm] x 1/2" Drive socket
- (1) 1/2" Drive ratchet
- (1) Small magnet
- (1) Flashlight
- (1) Bucket and shop towels

5.3.2.1. Check Valve Disassembly:

1. Run the cylinder away from the check valve to free it.
2. Place the bucket under the check valve to be removed.
3. Clean the area with a shop towel.
4. Remove the check valve (non-drive side) with the 1-1/2" drive socket and ratchet.
5. Use the magnet to remove the spring and check valve. If necessary the plunger rod can be pushed through and removed from the non-drive side.
6. NOTE: If the seals around the plunger end cap are leaking and need to be replaced, the entire manifold will need to be disconnected and removed from the drive frame.
7. Remove the check valve plunger assembly (drive side).
8. Remove plunger from end cap and remove wiper and rod seal from cap.
9. Inspect the valve seats for damage. Use the flashlight as necessary.

5.3.2.2. Check Valve Assembly:

1. Ensure all of the surfaces are clean.
2. Place new O-Ring on the plunger end cap and insert new rod seal and wiper.
3. Insert plunger into end cap and carefully thread assembly into manifold body (drive side).
4. Insert the check valve (non-drive side) and place the spring on the check valve stem.
5. Place new O-Ring on the check valve cap.
6. Place the check valve cap over the spring and carefully thread it into the manifold body.
7. Be careful not to cross thread, which will cause the manifold to permanently leak and tighten the caps to 18 ft-lb [24 Nm]. **DO NOT OVER TIGHTEN!**
8. Run the floor and check for leaks.

5.3.3 Cylinder Replacement

Required Tools:

- (1) 6mm x 3/8" Drive socket
- (1) 3/8" Drive ratchet
- (1) 15/16" [24mm] x 1/2" Drive socket
- (1) 1/2" Drive impact wrench
- (1) 6" x 1/2" Drive extension
- (1) 1/2" Drive torque wrench
- (1) 15/16" [24mm] Open-end wrench
- (1) Pry bar
- (1) Rubber Mallet
- (1) Bucket and shop towels

5.3.3.1. Cylinder Removal:

Clean the area with shop towels and place a bucket under the cylinder(s) to be replaced.

1. Run all of the cross-drives to mid-stroke, if possible.
2. Remove the M6 Bolt and Connector Retainer using the 6mm x 3/8" drive socket and 3/8" drive ratchet and move the Rod to Manifold Connector all the way toward the rod nut using the pry bar (see drawing 60036).
3. Remove the (6) Rod Clamp bolts from each end of the cylinders using the 15/16" [24mm] x 1/2" drive socket and 1/2" drive impact wrench.
4. Remove the cylinder clamp bolts using the 15/16" [24mm] x 1/2" drive socket and 1/2" drive impact wrench.



CAUTION: Cylinder may fall if not properly supported. Take extra care when removing bolts.

5.3.3.2. Cylinder Installation:

1. Ensure all of the surfaces are clean and place a bucket under the cylinder(s) to be replaced.
2. Loosely install both rod clamps using (1) M16x120mm barrel clamp bolt each to make a cradle to hold the cylinder while adjusting the barrel location and the adjustable rod nut.
3. Reinstall rod-to-manifold connectors and O-rings into both ends of cylinder rod. Lay the cylinder across the rod clamps with the stationary rod nut (no slots) toward the rear of the trailer. Raise up the rod clamp toward the rear of the trailer first and screw (1) M16 X 80mm bolt with lock washer loosely into the rod clamp on the opposite side of the rod. Remove the M16 X 120mm bolt and replace it with an M16 X 80mm bolt with lock washer and screw in loosely so the grooves interlock, but you are still able to raise the front end of the cylinder up and down to adjust the barrel location and the adjustable rod nut.
4. Raise the front end of cylinder to check the alignment of the barrel and adjustable rod nut. Using a rubber mallet, move the cylinder barrel until the grooves align with the barrel clamp grooves. Rotate the adjustable rod nut to align its grooves with rod clamp grooves. The grooves need to mate precisely. Tighten the M16 X 80mm bolt with lock washer and replace the M16 X 120mm bolt with M16 X 80mm bolt. Install barrel clamps with M16 X 120mm bolts. Torque bolts per Bolt Torque Requirements in Maintenance Section.
5. Run the floor and check for leaks.

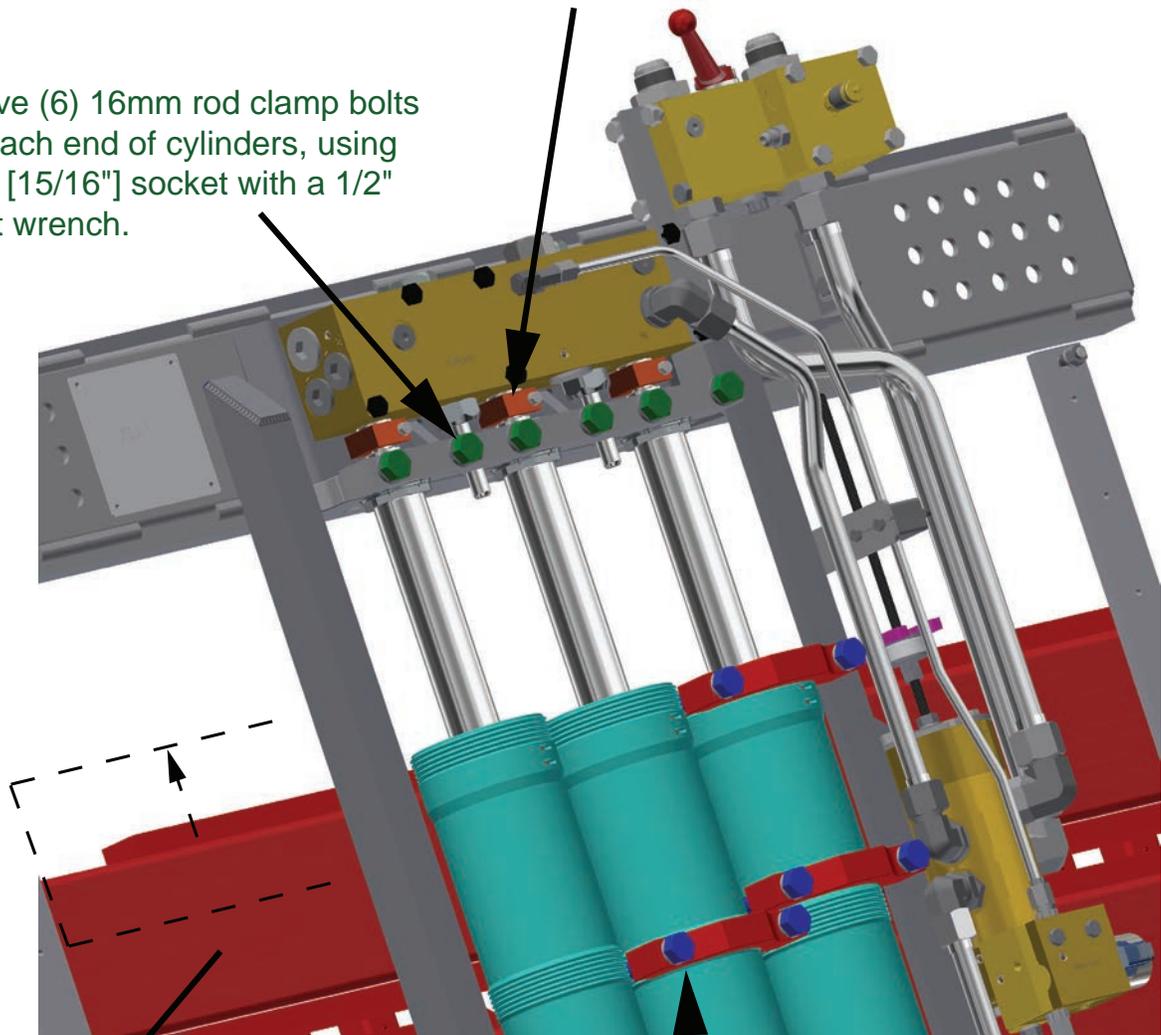
Cylinder Removal

Step #2

Remove Rod to Manifold connector retainer and move connector all the way toward the rod nut.

Step #3

Remove (6) 16mm rod clamp bolts from each end of cylinders, using 24mm [15/16"] socket with a 1/2" impact wrench.



Step #1

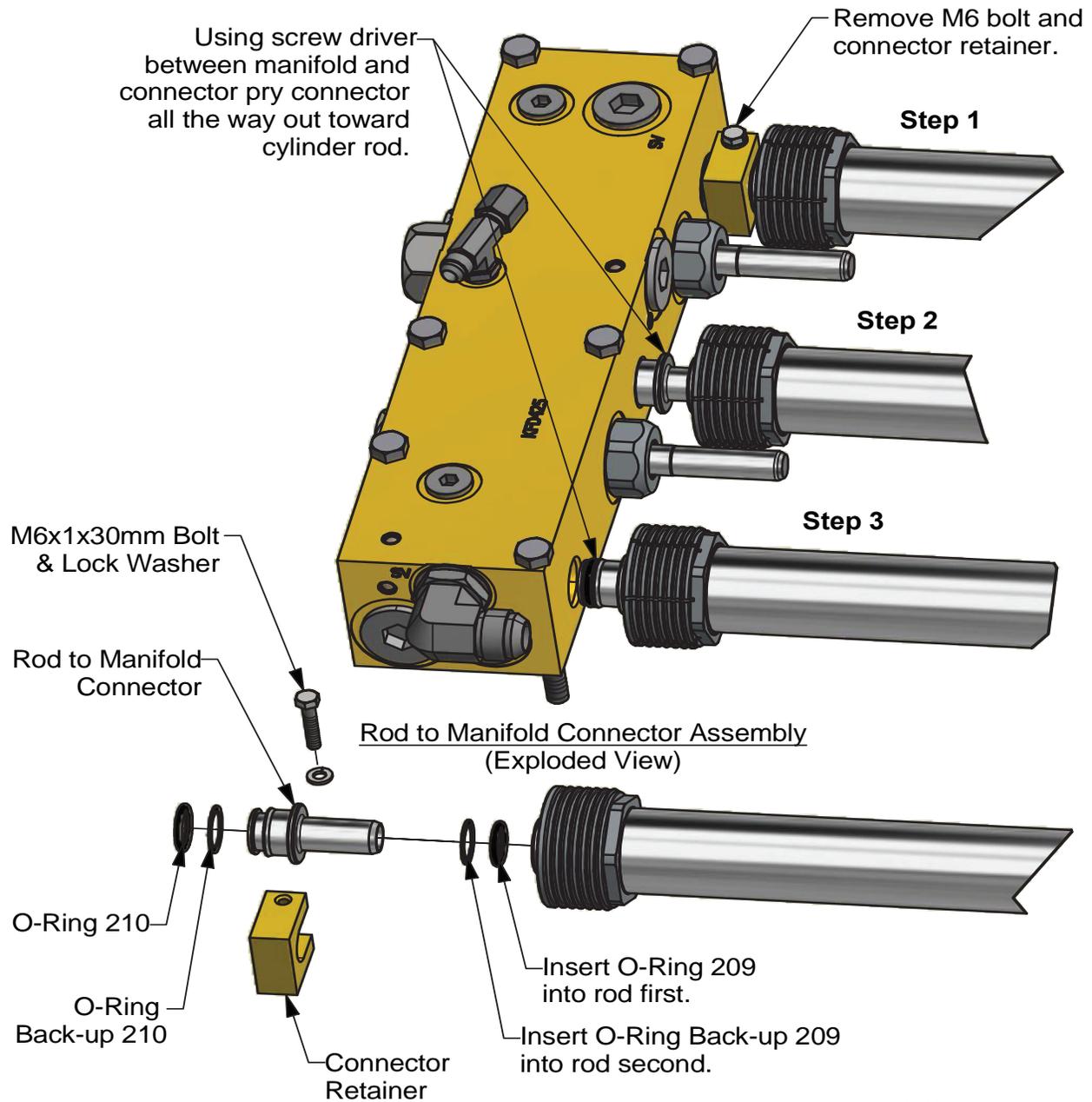
If possible cycle the (3) cross-drives to mid stroke. (This gives more clearance for check valves and rod clamps.)

Step #4

Caution: Cylinder could fall from drive unit after this step.

Remove (4) 16mm bolts from cylinder clamps using 24mm [15/16"] socket with 1/2" impact wrench.

Removal of Cylinder from Manifold Progression



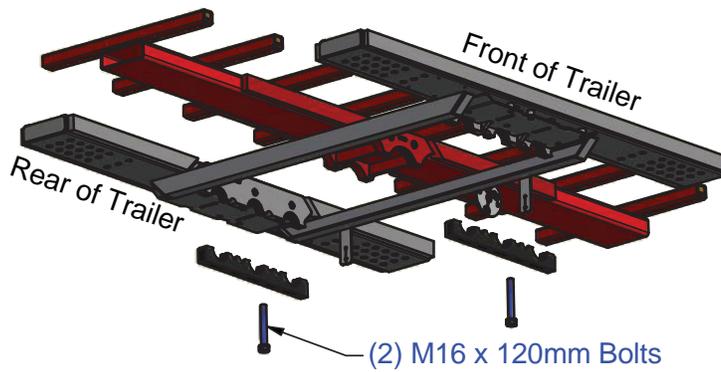
60036

Cylinder Installation

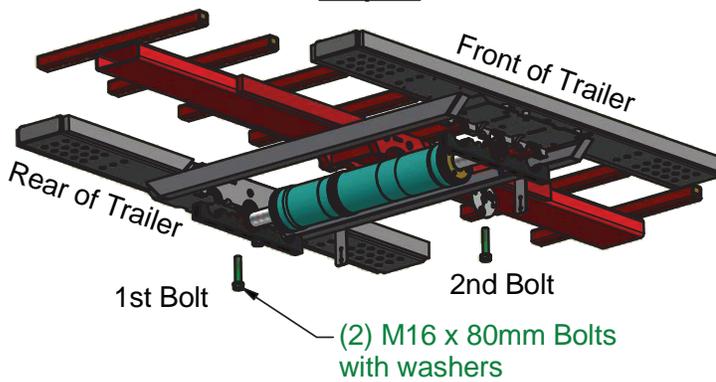
For clarification procedure is shown with bare frame, one cross-drive and one cylinder.



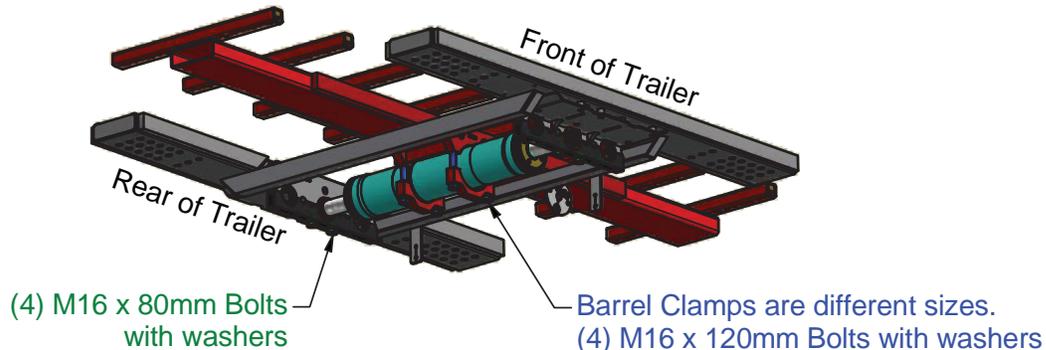
Step #1



Step #2



Step #3



5.4 Technical Support

Please have the following information readily available before contacting KEITH Manufacturing Co. for support:

- Model Number (Located on the Serial Plate of the drive unit)
- Serial Number (Located on the Serial Plate on the drive unit)
- Number of floor slats
- Vehicle make and unit installer

KEITH Manufacturing Co. Technical Support Contact Information:

Website: www.KeithWalkingFloor.com

Email: TechDept@KeithWalkingFloor.com

Toll-Free: (800) 547-6161

Telephone: (541) 475-3802

Fax: (541) 475-2169

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