KEITH MANUFACTURING CO

RUNNING FLOOR II® DX

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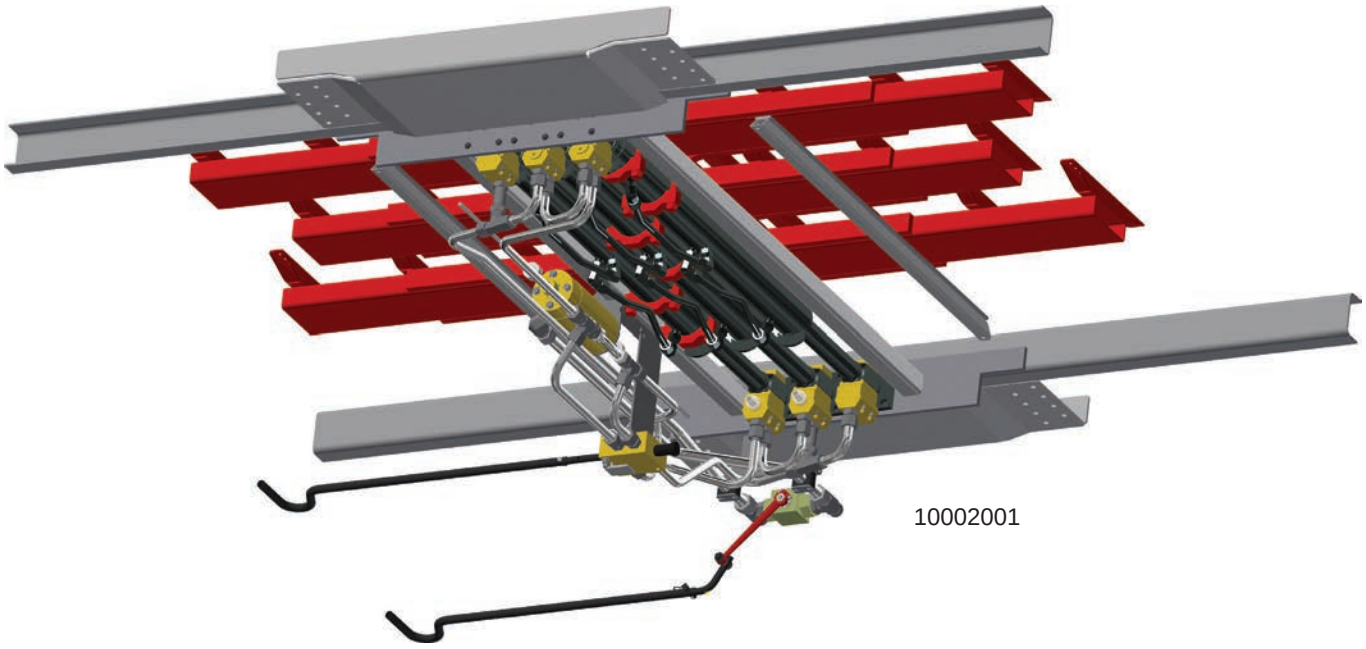


10002001

SERVICE / REPAIR MANUAL

Original Instructions

Released: 2023-07-12 DOC06820 Rev. D

Table of Contents

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 primarily intended to load, hold, or unload bulk materials. It can also handle unit loads such as pallets by using special handling techniques and possibly 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 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 mechanically-actuated valves, but has the option for electrically-actuated valves. The system is compatible with options and accessories to improve performance. For example, it can be electrically controlled by hardwired switches or a wireless remote. A KEITH® *WALKING FLOOR*® Sweep System 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 like food-grade applications or explosive conditions.

1.1.2 Improper Use

1.1.2.1. This equipment has been manufactured utilizing state-of-the-art technology in accordance with acknowledged safety regulations. Nevertheless, dangerous situations could arise from improper use, which could endanger life and limbs of personnel and 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, which could affect 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 must be followed as outlined in this manual.

1.1.2.2. Personnel must not enter the danger zone(s) when the system is enabled. Specifically, nobody should be inside, under, or behind the trailer in the unloading zone during operation. Additionally, no one should be in a full or filling trailer. Lock-out and tag-out procedures must be followed before accessing the drive area.

1.1.2.3. The maximum load capacity must not be exceeded.

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 by nature unstable and flowable. Avoid burial by avoiding contact with the material.

1.1.3 Temperature

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

1.1.3.2. 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].

1.1.3.3. 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].

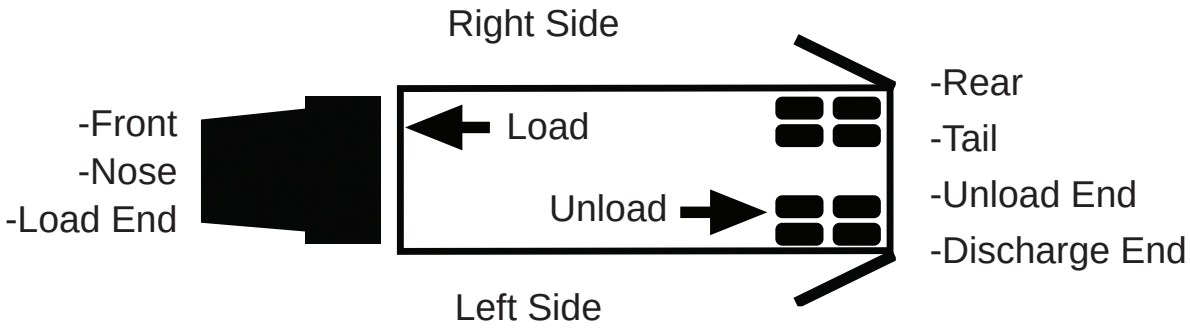
1.1.4 Hydraulic Oil Safety

1.1.4.1. See the Material Safety Data Sheet (MSDS) for the oil used in your system for further information about hydraulic oil safety.

1.1.4.2. 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, due to the system's 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.

1.1.4.3. Do not use high pressure systems in the vicinity of flames, sparks, and hot surfaces. Use only in well ventilated areas.

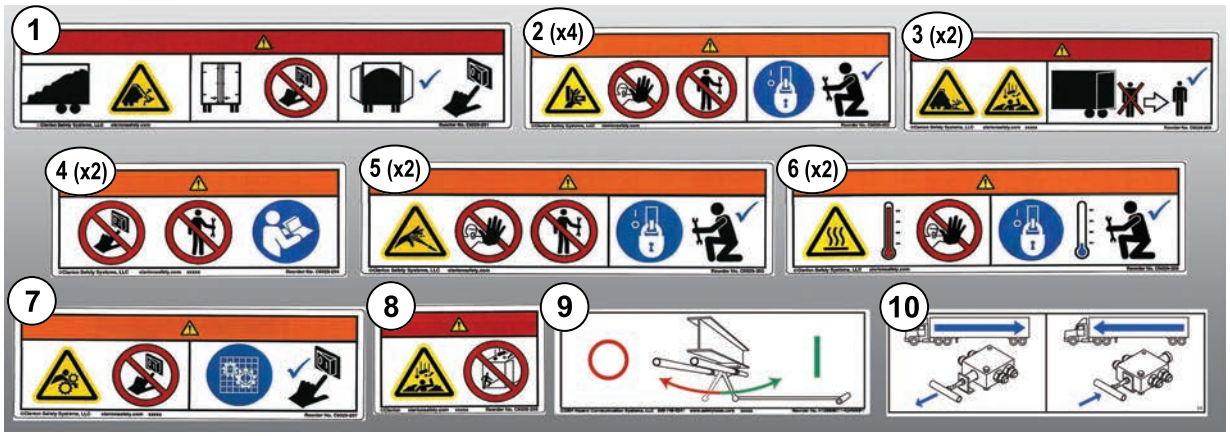
1.1.4.4. Use only designated appropriate fill and drain ports for the oil.

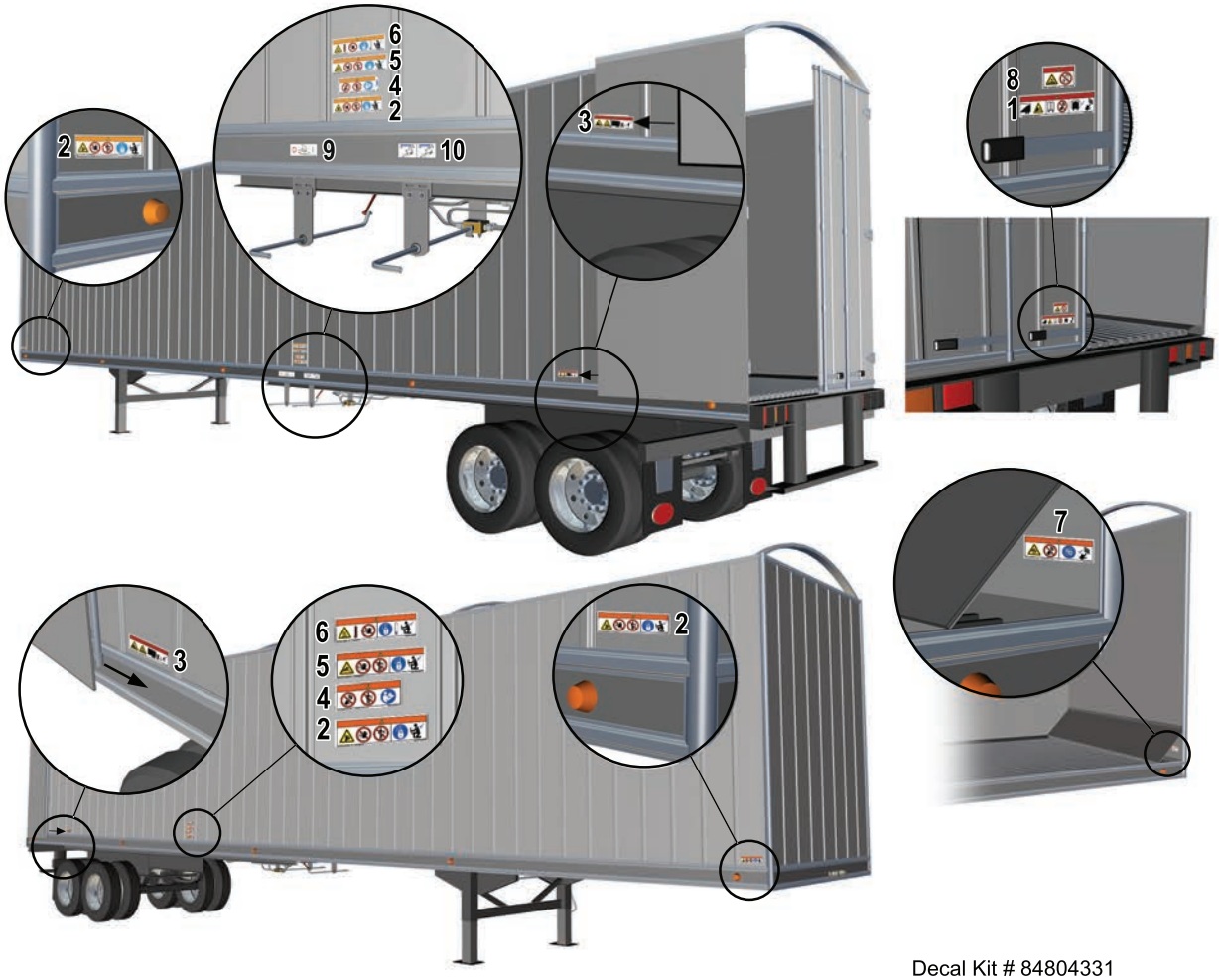


1.2 Marking of Machinery

1.2.1 Safety Decals

Safety Decal Placement Guide: RUNNING FLOOR II® w/Manual Control Valve (Left Side Controls)





Decal Kit # 84804331

KEITH Manufacturing Co. www.KeithWalkingFloor.com 84804319 Rev A

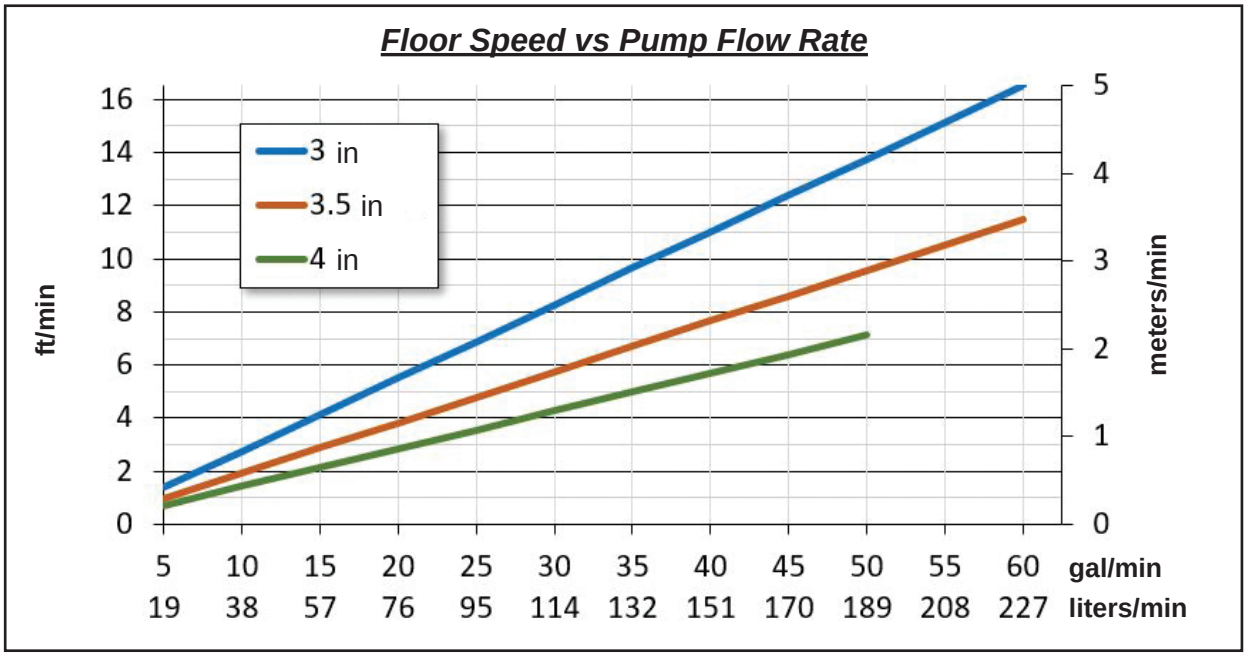
2.0 Specifications

2.1 Hydraulic Drive Unit

Drive Style:		KRFII-3	KRFII-3.5	KRFII-4
Cylinder Bore Diameter:		3.0 in [76 mm]	3.5 in [89 mm]	4 in [102 mm]
Cylinder Stroke Length:		6.0 - 10.0 in [152 - 254 mm]	6.0 - 10.0 in [152 - 254 mm]	6.0 in [152 mm]
Required Relief Valve Pressure Range:	Min:	2,800 PSI [195 bar]	2,800 PSI [195 bar]	2,800 PSI [195 bar]
	Max:	3,000 PSI [210 bar]	3,000 PSI [210 bar]	3,000 PSI [210 bar]
Load Capacity:		35 tons [31.75 tonnes]	50 tons [45.5 tonnes]	75 tons [68 tonnes]
Pump Flow Rate:		5 - 60 gal/min [19 - 227 liters/min]	5 - 60 gal/min [19 - 227 liters/min]	5 - 50 gal/min [19 - 189 liters/min]
Recommended Pump Flow Rate:		40 - 45 gal/min [151 - 170 liters/min]	40 - 45 gal/min [151 - 170 liters/min]	40 - 45 gal/min [151 - 170 liters/min]
* Floor Speed:		1 - 16.5 ft/min [0.3 - 5 meters/min]	1 - 11.5 ft/min [0.3 - 3.5 meters/min]	1 - 8.5 ft/min [0.3 - 2.6 meters/min]
Max Temperature:		140 °F [60 °C]	140 °F [60 °C]	140 °F [60 °C]
** Drive Weight:		850 - 1700 lbs [386 - 771 kg]	950 - 1825 lbs [431 - 828 kg]	1500 - 2100 lbs [680 - 953 kg]

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

** Varies by drive configuration and application.



2.2 General Wet Kit Specifications

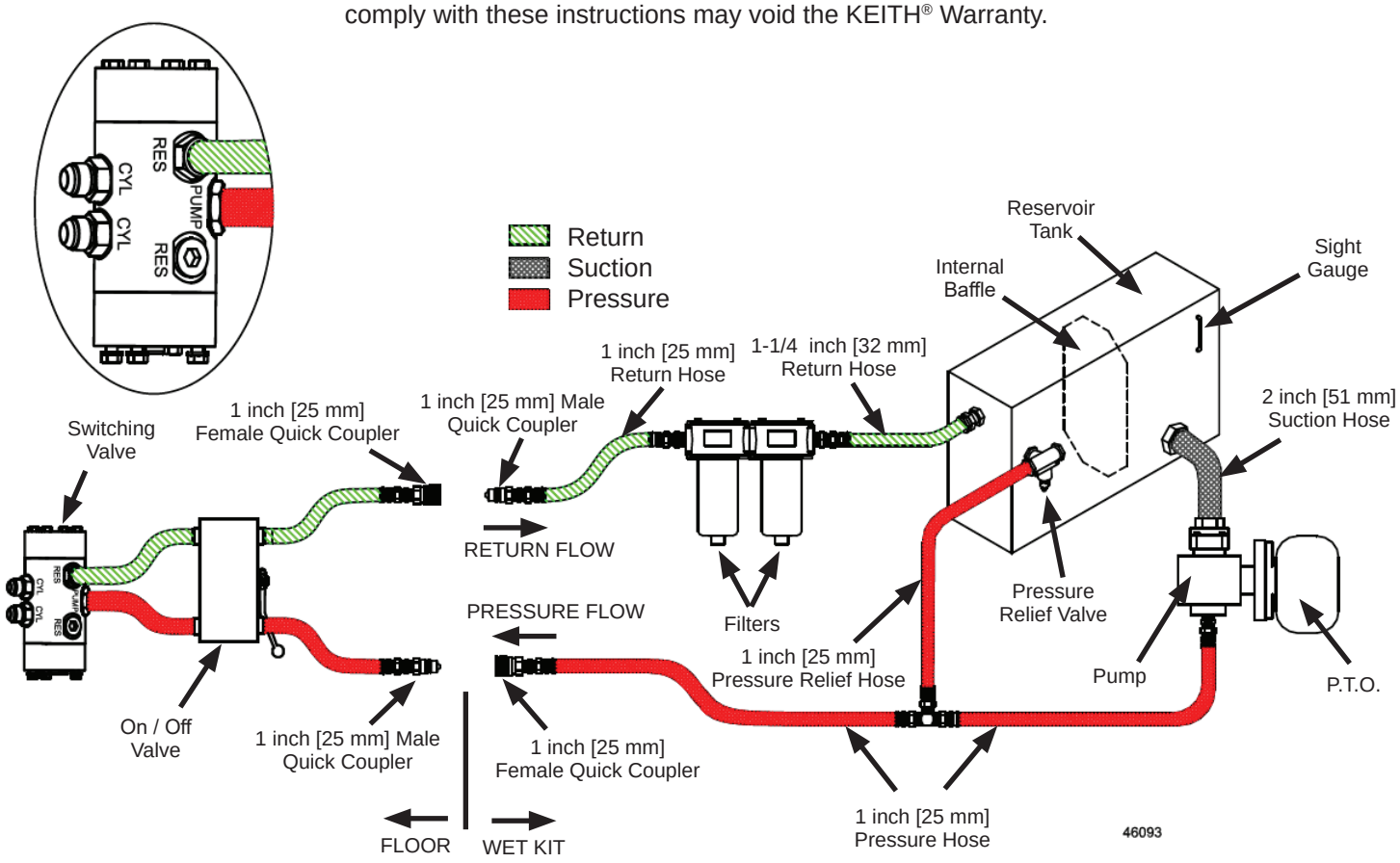
Oil	ISO-L-HM 46 hydraulic oil (As per ISO 11158). If operating the system below 32 °F [0 °C], AW ISO 32 hydraulic oil is recommended.
*** PTO & Pump**	The PTO and Pump must be capable of producing a minimum flow rate of 5 gal/min at 3000 PSI [19 liters/min at 210 bar] to make the system run. (See chart on previous page) **NOTE:** Dump wet kit systems will not properly operate the *WALKING FLOOR*® unloader. **NOTE:** Pumps with built-in pressure relief valves are NOT recommended. See the Wet Kit RUNNING FLOOR II® document available on the KEITH website https://www.keithwalkingfloor.com/support/troubleshooting/ or contact a KEITH Manufacturing Co. representative for specific recommendations on selecting a wet kit. Do not exceed the maximum pressure.
Filter	Filter should be double element, 10 micron, on the return line. (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). KEITH recommends, but does not require, installing an inline pressure filter to increase the life of the system.
Hydraulic Reservoir	Sized to desired flow rate. Should hold approximately 1 gallon [1 liter] of oil for every gallon per minute [liter per minute] you plan to pump, i.e. 40 gal/min [151 liters/min] = 40 gallon [151 liter] reservoir. Minimum size 40 gallons [151 liters]
Suction Line	Unless tank is mounted above the pump, the suction line from the tank to the pump should be no more than 5 ft [1.5 m] in length with a minimum inside diameter of 2 inch [51 mm] [-32]. Must use **suction** hose *ONLY*!
Pressure Line	Hose from truck to trailer should be rated at 3000 PSI [210 bar] minimum with a minimum inside diameter of 1 inch [25 mm] [-16].
Return Lines	Hose from trailer to wet kit filter should be rated at 3000 PSI [210 bar] minimum with a minimum inside diameter of 1 inch [25 mm] [-16]. Hose from wet kit filter to reservoir tank should be rated at 3000 PSI [210 bar] minimum with a minimum inside diameter of 1¼ inch [31.5 mm] [-20].
*** Pressure Relief Valve**	High quality valve, capable of relieving maximum pump flow rate at 3000 PSI [210 bar]. Relief valve must be set above cracking pressure ~2800 PSI [195 bar] and no higher than full open relief pressure ~3000 PSI [210 bar]
Contact KEITH in your region for specific recommendations and advice regarding wet kits.	

* 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 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.

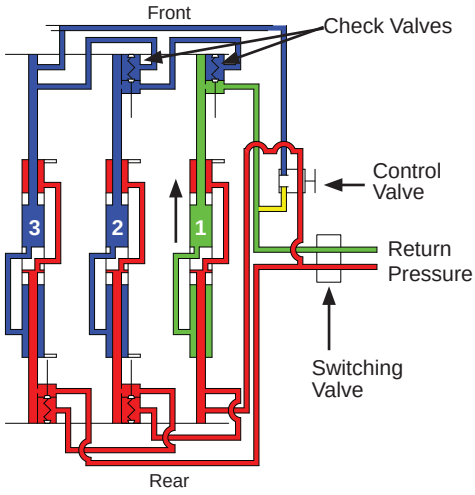


3.0 Operation

3.1 Oil Flow Diagrams

UNLOADING CYCLE

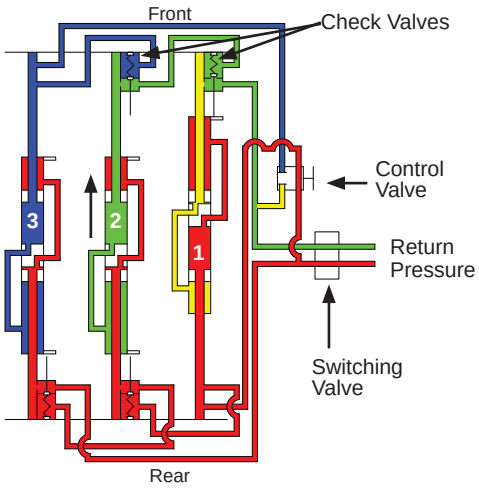
Pressure | Return | Blocked Return Oil | Standing Oil



Stage 1

- Pressure in the rear of all cylinders.
- Cylinder #1 is open to return, causing it to move. (Load does not move.)
- Blocked by check valves.

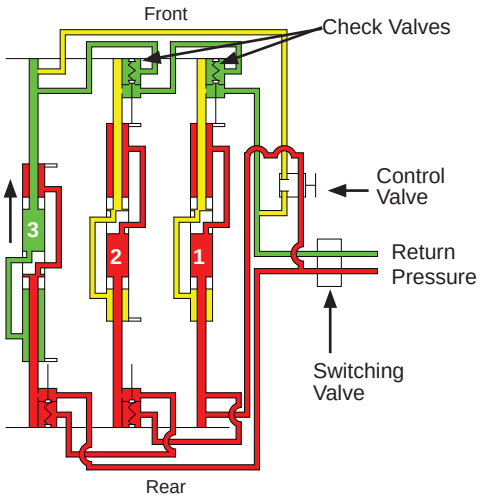
Note: Stage 1 requires more pressure than stage 4.



Stage 2

- Pressure still in rear of all cylinders.
- Cylinder #1 completes its full stroke, opening the check valve, allowing the oil in cylinder #2 to escape, causing it to move. (Load does not move.)
- Blocked by check valve.

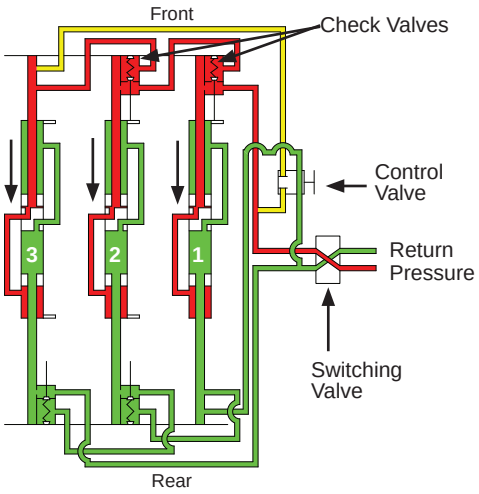
Note: Stage 2 requires more pressure than stage 1.



Stage 3

- Pressure still in rear of all cylinders.
- Cylinder #2 completes its full stroke, opening the check valve, allowing the oil in cylinder #3 to escape to return, causing it to move. (Load does not move.)

Note: Stage 3 requires more pressure than stage 2.



Stage 4

- Cylinder #3 completes its stroke, shifting the switching valve, which reverses pressure and return, transferring the pressure to the front of all cylinders.
- All cylinders are now open to return and move to the rear of the trailer together, moving the load.

  As the cylinders complete their stroke, cylinder #1 shifts the switching valve, which reverses pressure and return, transferring the pressure to the rear of all cylinders again and the cycle starts over.

Note: Stage 4 requires less pressure than stages 1, 2, or 3.

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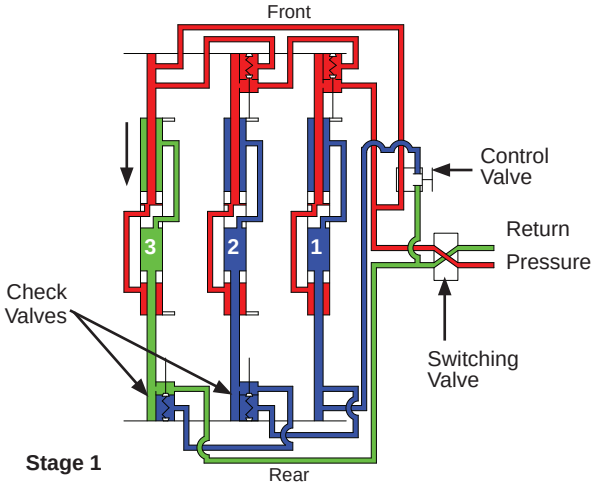
LOADING CYCLE

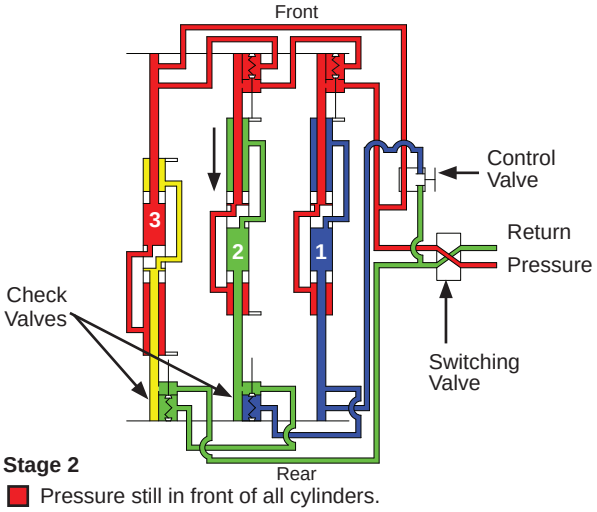
Pressure | Return | Blocked Return Oil | Standing Oil



Stage 1

- Pressure in the front of all cylinders.
- Cylinder #3 is open to return, causing it to move. (Load does not move.)
- Blocked by check valves.

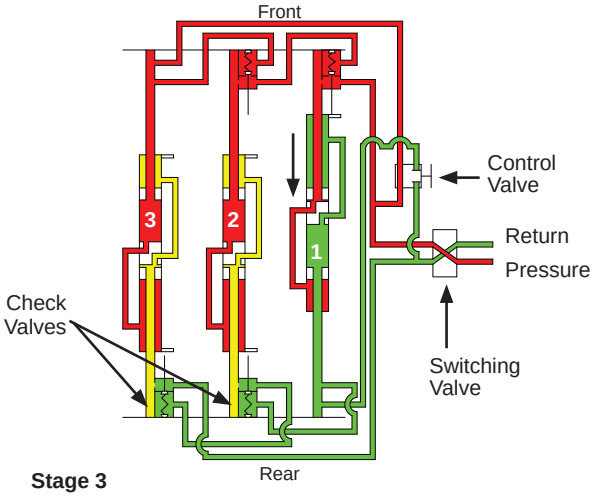
Note: Stage 1 requires more pressure than stage 4.



Stage 2

- Pressure still in front of all cylinders.
- Cylinder #3 completes its full stroke, opening the check valve, allowing the oil in cylinder #2 to escape, causing it to move. (Load does not move.)
- Blocked by check valve.

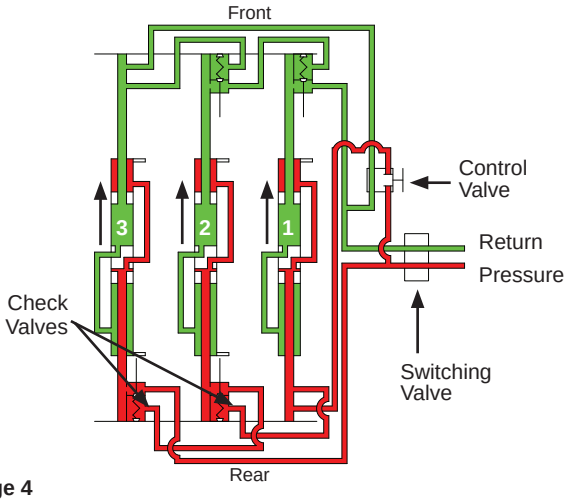
Note: Stage 2 requires more pressure than stage 1.



Stage 3

- Pressure still in front of all cylinders.
- Cylinder #2 completes its full stroke, opening the check valve, allowing the oil in cylinder #1 to escape to return, causing it to move. (Load does not move.)

Note: Stage 3 requires more pressure than stage 2.



Stage 4

- Cylinder #1 completes its stroke, shifting the switching valve, which reverses pressure and return, transferring the pressure to the rear of all cylinders.
- All cylinders are now open to return and move to the front of the trailer together, moving the load.

  As the cylinders complete their stroke, cylinder #3 shifts the switching valve, which reverses pressure and return, transferring the pressure to the front of all cylinders again and the cycle starts over.

Note: Stage 4 requires less pressure than stages 1, 2, or 3.

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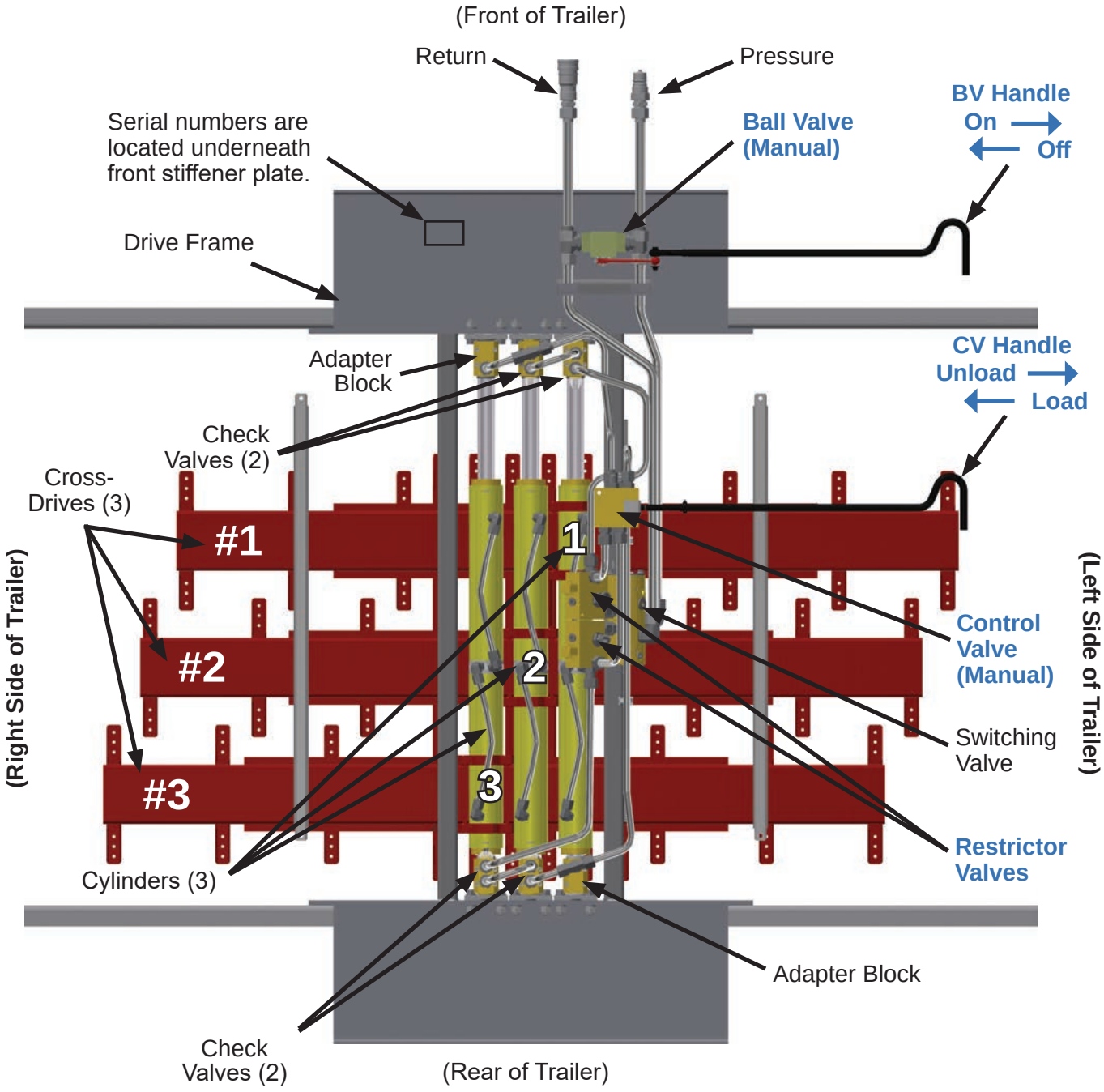
3.2 Component Location Guides

RUNNING FLOOR II® DX

Manual Controls (Left Side)
Restrictor Valves (If Required)



View From Underneath Trailer

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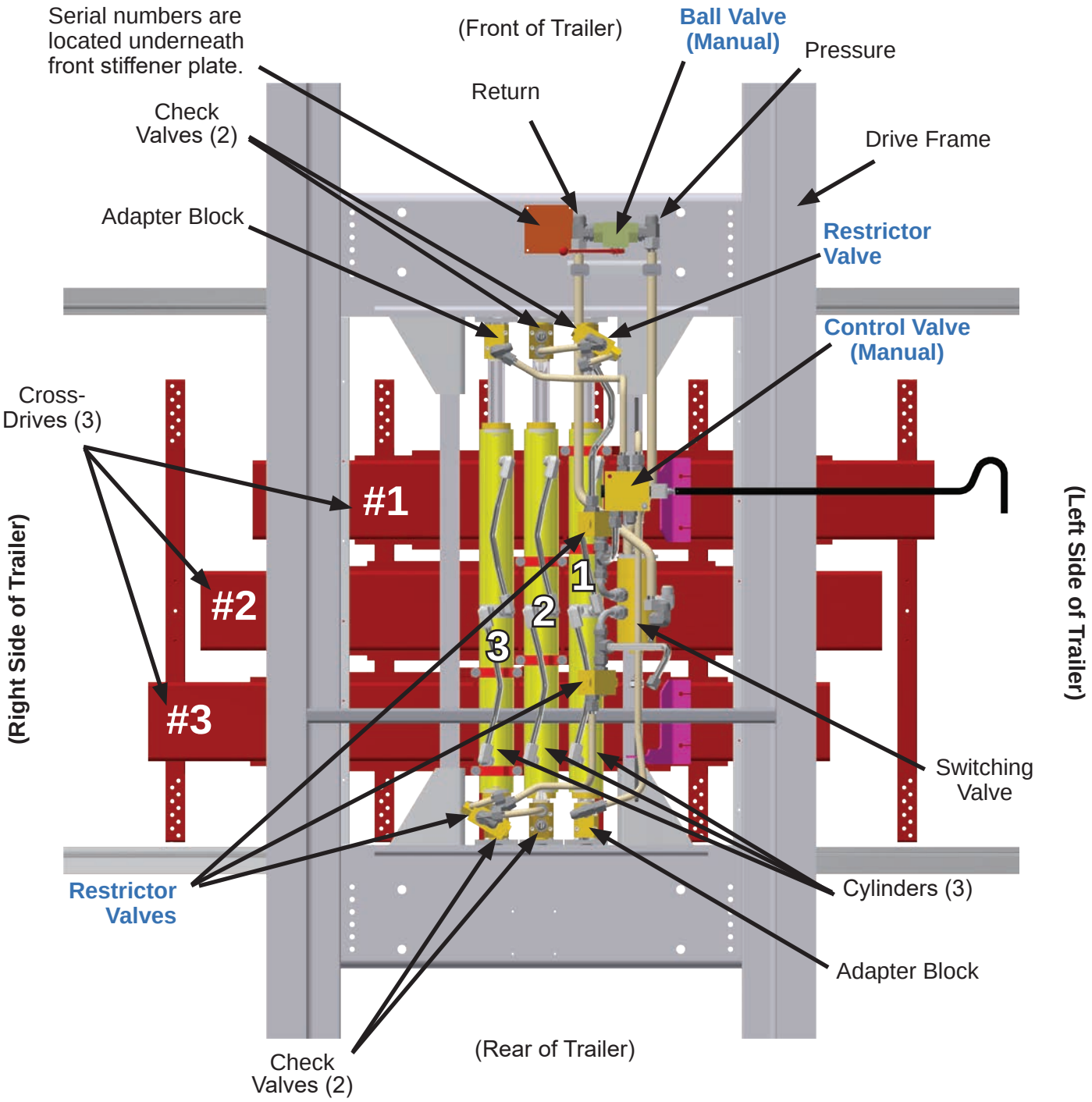
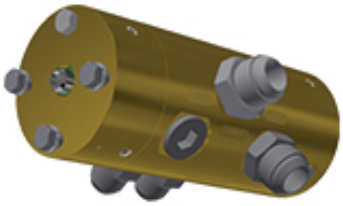
RUNNING FLOOR II® DX for V-Floor

Manual Controls
Restrictor Valves (If Required)



View From Underneath Trailer

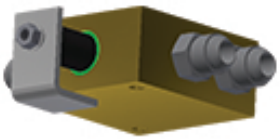
3.3 Component Identification



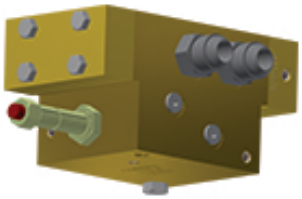
Switching Valve

Check Valve

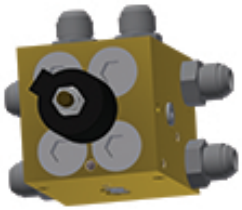
Adapter Block



Control Valve



Control Valve
(Manual or Electric)



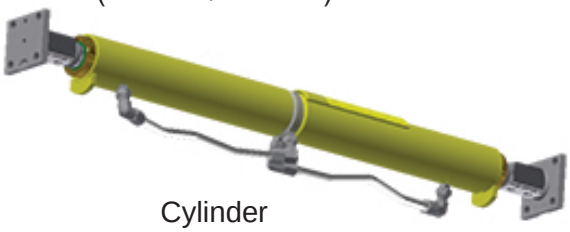
Control Valve
(Electric)

Ball Valve

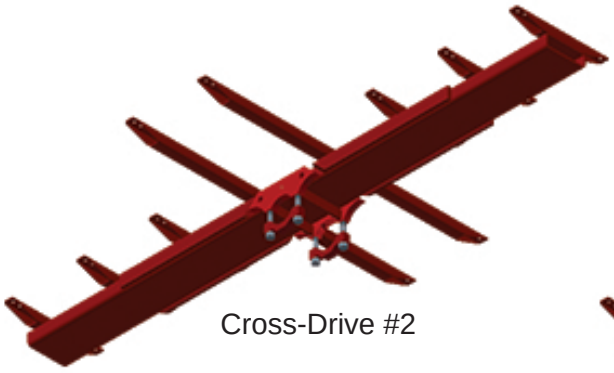
Ball Valve
(Electric / Manual)

Restrictor Valve

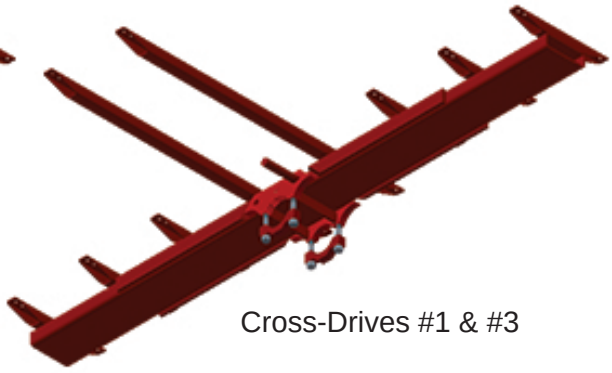
Restrictor Valve



Cylinder



Cross-Drive #2



Cross-Drives #1 & #3

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

3.4 Start Up

3.4.1 Before Initial Start-Up

- Read through the RUNNING FLOOR DX/DXE Owner/Operator Manual. If there is any confusion, contact KEITH to resolve any concerns before operating this system (See 6.0 Contact Information section).
- Ensure that the hydraulic reservoir has the recommended amount of oil as well as the correct type of oil (See 2.2 Specifications section or visit our website for additional details).
- Torque cylinder barrel clamp bolts and floor bolts. (See 4.3 Maintenance section for special values and instructions.) Loose cylinder barrel clamp bolts and flooring bolts are the most common cause of severe damage to the drive or flooring.
- Familiarize yourself with section 4.2 Preventative Maintenance in this manual. Following the maintenance schedule will significantly improve the life of the system.

3.4.2 After initial 6 working hours (first week of operation)

- 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 in the start-up will not prematurely wear out your system.
- Torque cylinder barrel clamp bolts and floor bolts. (See 4.3 Maintenance section for special values and instructions.) Loose cylinder barrel clamp bolts and flooring bolts are the most common cause of severe damage to the drive or flooring. Any bolts that were loose should be checked weekly until found to be tight.

3.5 Pre-Trip Checklist

- ✓ Inspect hoses and quick connectors for damage and contamination. Clean all dirt and water from connectors before hooking up (if applicable).
- ✓ Inspect drive unit for leaking fittings or 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). Operate the floor and inspect for leaks. Test the On/Off for proper operation. Test the load/unload for proper operation.
- ✓ 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: 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.**

⚠ **WARNING: Do not attempt to make adjustments or repairs without consulting with a trained service technician from your company or KEITH (See 5.4 Technical Support section for contact information.)**

3.6 Standard Operating Procedures

3.6.1 Manual Controls

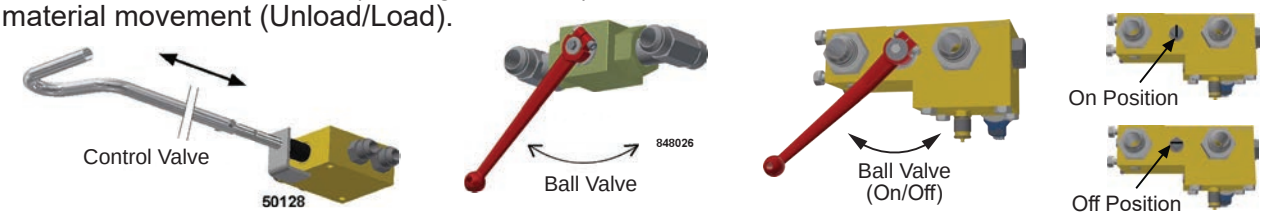
⚠ **DANGER: ALWAYS have doors fully open! NEVER, under any circumstances, engage the *WALKING FLOOR*® unloader with the doors of the truck/trailer closed. Catastrophic failure to the truck/trailer, as well as serious injury or death may occur.**

⚠ **DANGER: Use caution when opening doors. Material can become compacted against doors and they can open violently causing serious injury or death.**

⚠ **DANGER: NEVER allow anyone to stand or move through the area where the load is being discharged or go under truck/trailer body or enter truck/trailer while the system is operating. Burial, loss of limb or life may occur.**

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

1. Set parking brake on the truck/trailer and follow the Pre-Trip Check List.
2. Inspect hydraulic hoses and quick connects for contamination or damage (if applicable), then connect the floor to the truck wet kit.
3. If the load is covered with a tarp, remove and secure the tarp prior to engaging the floor.
4. Manually open truck/trailer rear door(s) fully and secure door(s) with provided chains or loop rings.
5. Place control valve handle (See figure below) in the required position for the desired direction of material movement (Unload/Load).



6. Push ball valve handle in (See figure above) to the fully open (OFF) position. The floor will not operate! Ball Valve handle is located between the pressure and return lines. **NOTE:** The ball valve controls On/Off and is used as an emergency stop.
7. Engage PTO (Do NOT increase engine RPM's from idle). This allows hydraulic oil to start flowing through the pump and warming up before engaging the floor (ideally to 80 °F [27 °C]).
8. Fully open hydraulic cover and/or hydraulic rear truck/trailer door(s) (if equipped).
9. Pull out the ball valve handle to the fully closed (ON) position. **The floor will start to operate!**
10. Increase truck engine RPM's to predetermined setting to achieve desired flow rate from the wet kit.
11. When unloading, material will begin to pile up behind the truck/trailer. The load will stop moving when the pile of material gets too high. Reduce engine RPM's and move the truck/trailer forward (load will begin to move again). Repeat until the material is completely unloaded.
12. After loading/unloading is completed, reduce engine RPM's to idle and stop the floor with all slats in the forward position by pushing the ball valve handle in to the fully open position.
13. Fully retract KEITH® *WALKING FLOOR*® Sweep System (if equipped) to the front of the truck/trailer.
14. Close and secure the rear truck/trailer door(s).
15. Disengage PTO.

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

- Disengage the PTO.
- Push the ball valve fully open.

4.0 Maintenance

⚠ **DANGER: 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) and manually push the ball valve to the fully open position during maintenance and/or service work.**

4.1 Life Extending Practices

- Follow the Start-Up procedures in this manual.
- Use only clean oil, free from contamination.
- Regularly inspect the system for loose bolts. Loose cylinder barrel clamp bolts and flooring bolts are the most common cause of severe damage to the drive or flooring.
- 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 ºF [60 °C] while the system is running.
- Torque cylinder barrel clamp bolts and floor bolts. (See 4.3 Maintenance section for special values and instructions.) Any bolts that were loose should be checked weekly until found to be tight.
- Pressure wash drive unit, sub-deck, and slats (recommended quarterly, minimum twice per year).

4.2.2 6-Month Service (150 operating hours)

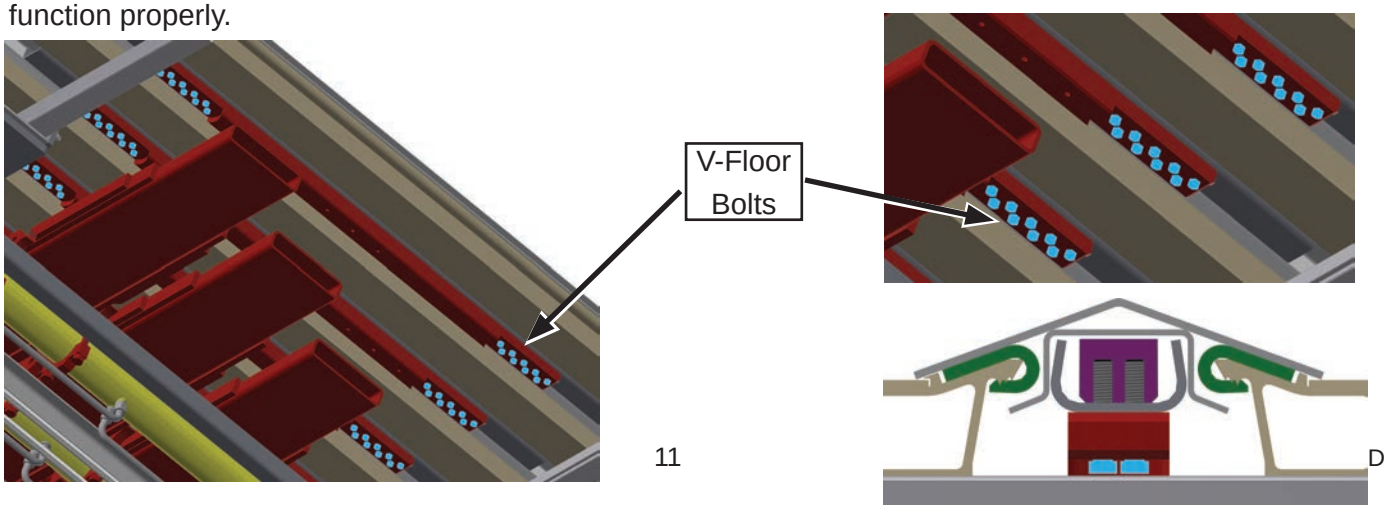
- Change the oil filters.
- Cycle the system briefly in both directions and observe to ensure proper operation. Do NOT allow material to compact against the front of the trailer or against the rear doors.
- Inspect cross-drive support bearings, wearpads, tubes and shoes for wear. (See 4.4 Cross-Drive Wear Component Diagram section). Replace as needed.
- Inspect floor wear bearings and seals for excessive wear (especially above the tires). (See 4.5 Flooring 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.

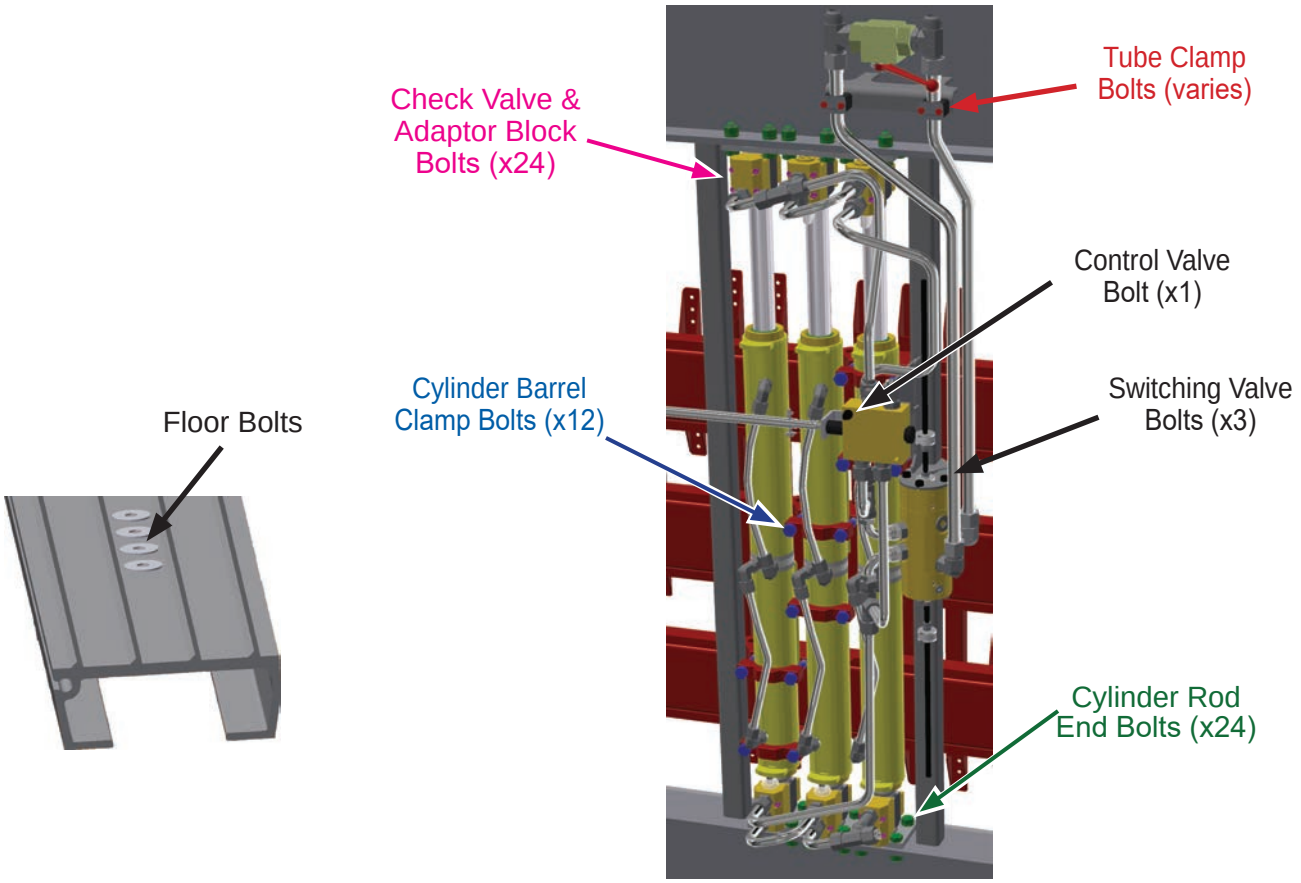
4.3 Bolt Torque Requirements

Description	Size	Quantity	Torque Values
Tube Clamp Bolts	1/4 in GR5 HCS M6 CL8.8 HCS	Varies	Snug
Check Valve & Adapter Block Bolts	5/16 in A574 SHCS M8 CL12.9 SHCS	4 per valve/block	20 ft-lbs [27 N·m]
Ball Valve Bolts	3/8 in GR8 HCS M10 CL10.9 HCS	3	45 ft-lbs [61 N·m]
Control Valve Bolts	3/8 in GR8 HCS M10 CL10.9 HCS	1-2	45 ft-lbs [61 N·m]
Switching Valve Bolts	3/8 in GR8 HCS M10 CL10.9 HCS	3	45 ft-lbs [61 N·m]
Cylinder Rod End Bolts (Requires anti-seize LB8060)	5/8 in GR8 HCS M16 CL10.9 HCS	8 per cylinder	135 ft-lbs [183 N·m]
3 in & 3.5 in Cylinder Barrel Clamp Bolts	5/8 in GR8 HCS M16 CL10.9 HCS	4 per cylinder	135 ft-lbs Max ** [183 N·m] Max **
* 4 in Cylinder Barrel Clamp Bolts (Requires blue Loctite 243)	3/4 in GR8 HCS M20 CL10.9 HCS	4 per cylinder	180 ft-lbs Max ** [244 N·m] Max **
Floor Bolts (Flat Head)	5/16 in GR8 FHCS (82°) M8 CL10.9 FHCS (90°)	Varies	20 ft-lbs [27 N·m]
Floor Bolts (Flat Head)	3/8 in GR8 FHCS (82°) M10 CL10.9 FHCS (90°)	Varies	31 ft-lbs [42 N·m]
* Flooring w/Nut Bar Shoes (Requires blue Loctite 243)	M12 CL10.9 FHCS (90°)	Varies	83 ft.-lbs [113 N·m]
V-Floor Bolts	3/8 in GR8 HCS	18 per shoe	45 ft-lbs [61 N·m]
V-Floor Bolts	1/2 in GR8 HCS	8 per shoe	83 ft-lbs 113 N·m]

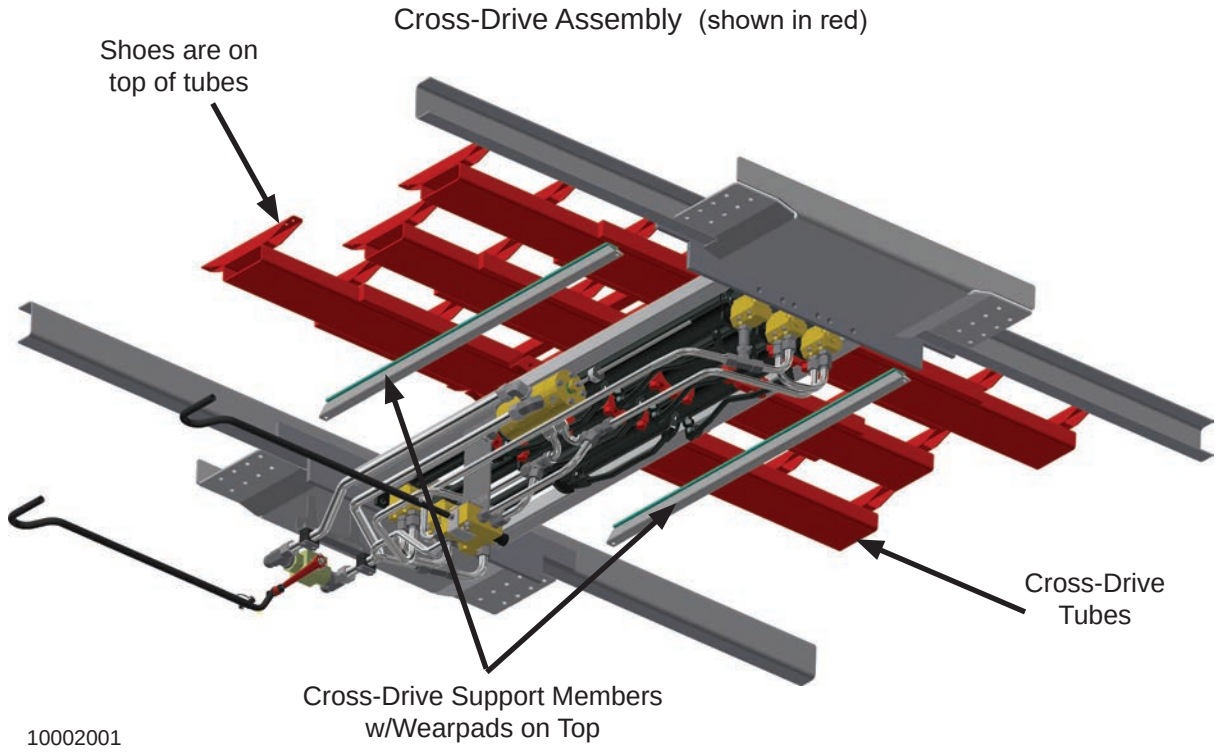
* Bolts installed using thread lock should be checked using a setting that is 5 ft-lbs [7 Nm] less than the above specified value. If the bolt moves then you should remove it, clean it, apply new loctite to the threads and torque it to the full specified value.

** Over tightening the barrel clamp bolts can deform the cylinder barrel shape causing the system to not function properly.



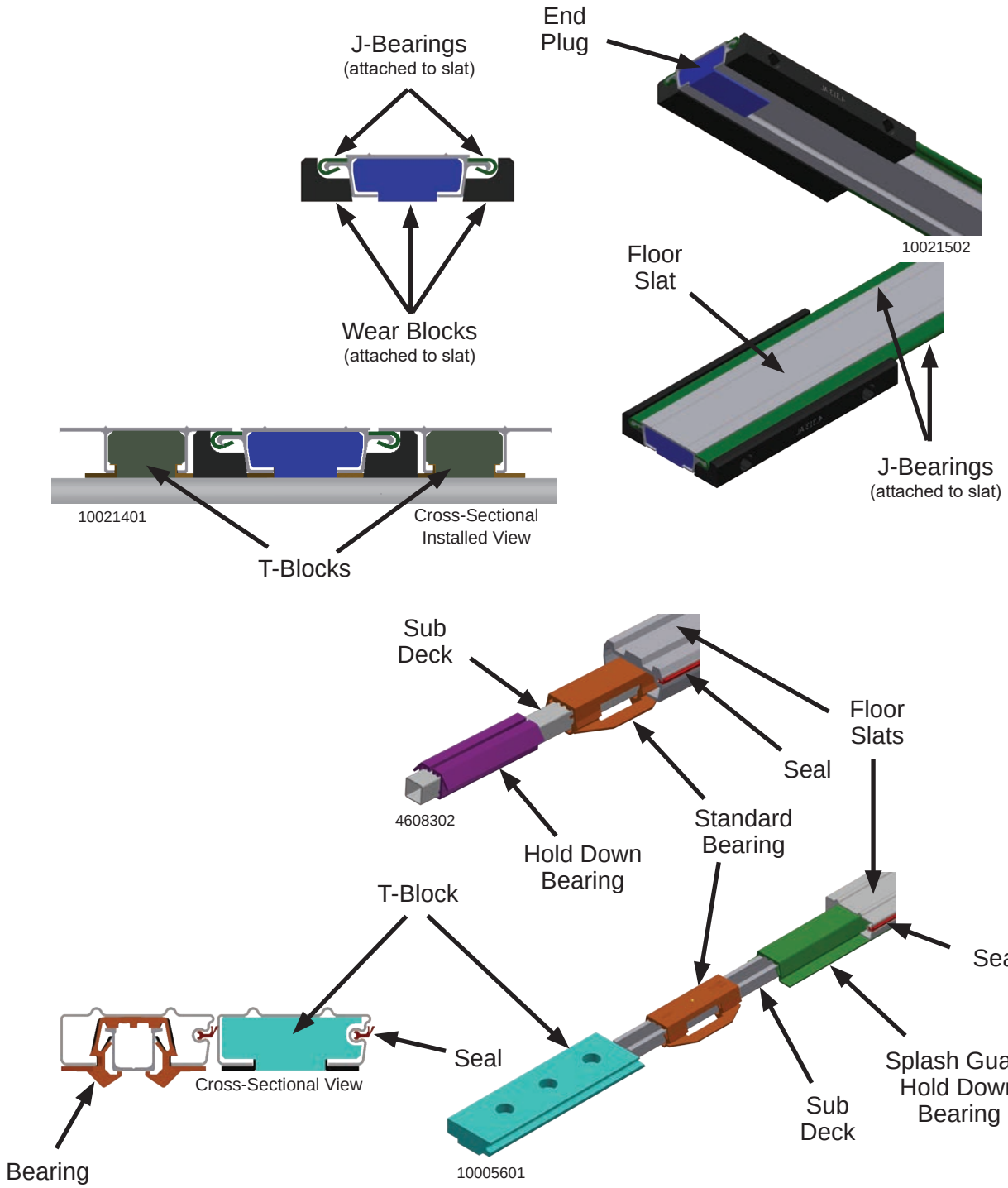


4.4 Cross-Drive Wear Component Diagram



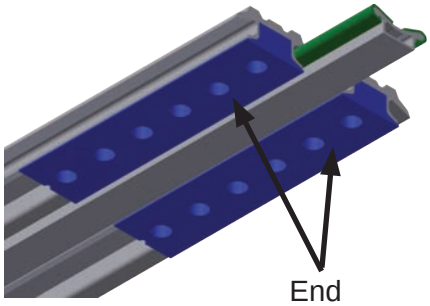
4.5 Flooring Wear Component Diagrams

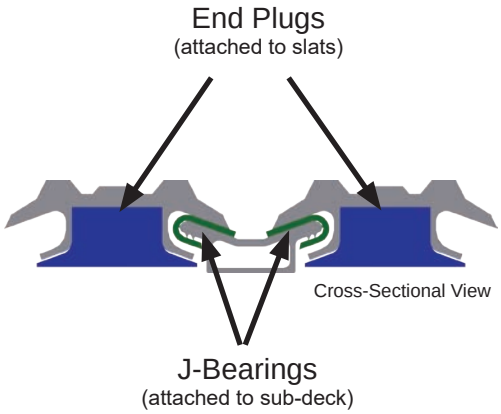
Floor Wear Bearings & Seals *

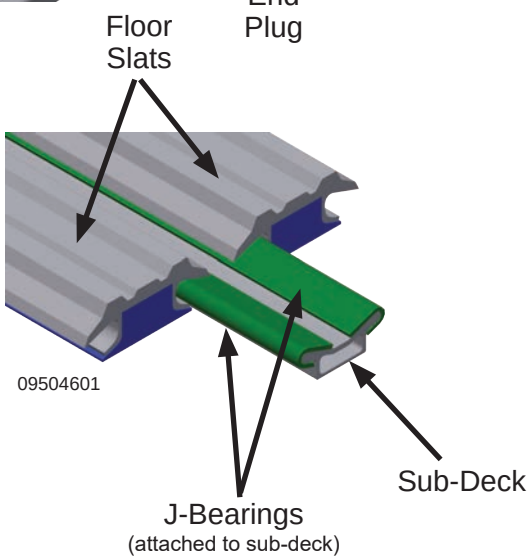


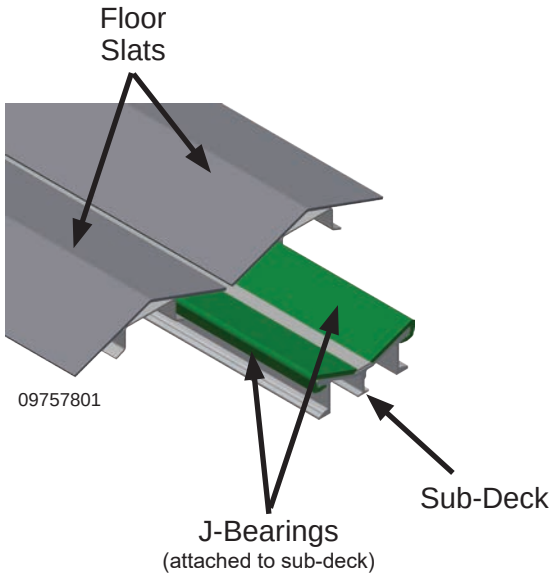
* These images are for illustrative purposes with colors modified for clarity.
Style and quantity of wear bearings & seals varies by design.
Wear bearings & seals are non-metallic and run the length of the floor.
(They are designed to be replaced to extend the life of the floor.)

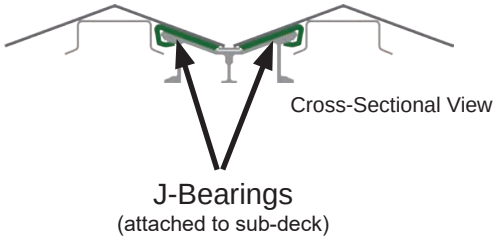
Floor Wear Bearings & Seals *











* 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

!!!PLEASE REVIEW THESE IMPORTANT ITEMS!!!

Confirm that your pumping system meets the requirements for the proper operating parameters for flow and pressure for the KEITH RUNNING FLOOR II® system. Pumping systems are often destroyed by operating the system with a pressure relief valve set too low, resulting in high pressure bypass in the relief valve. Low oil flow will require the system to operate longer than necessary to complete the unloading operation. This will generate excessive heat within the hydraulic system resulting in internal component failure of the drive system, as well as the power unit pumping system. Keeping the hydraulic system supplied with clean, filtered and cool hydraulic oil is essential for reliable operation of the KEITH RUNNING FLOOR II® system.

ALWAYS CHECK DRIVE UNIT COMPONENTS FOR EXCESSIVE HEAT FIRST. Use an infrared heat detector to check for excessive heat. Usually the component that exhibits the highest heat will be the component that will need repair or replacement. Never touch any component of the RUNNING FLOOR II® system while it is operating. Always shut the system down.

Please check the following items before calling your supplying dealer or KEITH Manufacturing Co. for assistance.

- ✓ Confirm the relief valve is set for a relief pressure of 3000 PSI.
- ✓ Confirm the oil flow rate is within the acceptable range.
- ✓ Confirm the Ball Valve is in the closed position and the Control Valve is in the unload position.
- ✓ Confirm the PTO is engaged.
- ✓ Confirm the proper oil level in the reservoir.
- ✓ Confirm the hose connectors are properly connected (pressure/return) and are of the same size and type. Mismatched connections will result in operational issues related to the flow of oil.
- ✓ Confirm that all plumbing tubes and hoses are connected correctly. Incorrect plumbing can cause a variety of drive failures and incorrect operation.

If these preceding checks have not resolved the problem, please answer the following questions and refer to the Troubleshooting Guide.

Have any component parts been replaced, or repairs performed on the hydraulic drive unit? If so, which components and for what reason?

Was the problem present before or after the components were replaced or repaired?

If calling KEITH Manufacturing Co. for assistance, please describe the **SPECIFIC** problem and provide pictures or cell phone videos when possible. This will help speed the troubleshooting process.

The following guide covers the basic hydraulic components of the RUNNING FLOOR II® drive system, their description, function, possible operational issues and resolutions. Online documents and videos are available on the KEITH website:

https://www.keithwalkingfloor.com/support/troubleshooting/

5.1 Service Information

- Use hydraulic oil or Vaseline to lubricate seals. Do NOT use grease.
- If a component is leaking hydraulic oil, but otherwise functioning properly the seals need to be replaced.
- Do NOT use Teflon tape on any hydraulic components.
- When welding on drive frame, ground specifically to what you are welding on, otherwise it can short across component assemblies damaging seals and gaskets.
- KEITH sells flow meters, pressure testers for troubleshooting and several tools to aid in resealing components and drives.
- Use the following chart for tightening tubes and fittings.

Sizes	Tube Nuts	Swivel Nuts or Hose Ends
-6 JIC	2-1/2 FFWR	2 FFWR
-8 JIC	2-1/2 FFWR	2 FFWR
-12 JIC	1-1/2 FFWR	1-1/2 FFWR
-16 JIC	1 FFWR	1-1/2 FFWR
-6 ORFS	1/2 FFWR	3/4 FFWR
-8 ORFS	1/2 FFWR	3/4 FFWR
-12 ORFS	1/2 FFWR	1/2 FFWR
-16 ORFS	1/2 FFWR	1/2 FFWR

- FFWR (Flats From Wrench Resistance)
- JIC (Joint Industry Council, 37° flare seating surface)
- ORFS (O-Ring Face Seal)

⚠ **DANGER: 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) and manually push the ball valve to the fully open position during maintenance and/or service work.**

5.2 Problems & Potential Causes

	Problem	***Potential Causes***											
		PTO / Pump / Pressure / Flow	***Ball Valve***	***Control Valve***	***Switching Valve***	***Check Valve***	***Cylinder***	***Unbalanced drive / Load***	***Trailer Overloaded***	***Floor Slats Jammed***	***Load is Jammed/Stuck/Frozen***	***Restrictor Valve***	***System Plumbing***
1	System won't move.	**1**	**2**	**3**	**4B**				**5**	**6**	**7**		**4A**
2	All cylinders move together in one direction and then move together in the other direction (no restaging sequence occurs).			**2**									**1**
3	All cylinders move in one direction and then stop.	**2**			**1**				**3**				
4	Cylinders switch direction before completing full travel to front or rear of trailer (short cycling).				**1**								
5	System operates properly with light loads but not heavy loads.	**2**			**1**								
6	As one cylinder is restaging a second cylinder is moving along with it.					**1**							**2**
7	Cylinder(s) moves slowly while the other cylinder(s) move at normal speed.						**1**						
8	Cylinder moves faster while other cylinders move at normal speed.							**1**				**2**	
9	During restaging, cylinders stop moving before engaging the check valve.	**2**					**1**		**3**				
10	During restaging, the cylinders stop moving after engaging check valves #1 or #2.	**1**					**2**						
11	All Cylinders stall at mid stroke.	**1**							**2**				

* Numbered by priority of potential cause.

Problems, Potential Causes & Solutions

Problem #1	**System won't move.**
Cause #1:	PTO is not engaged.
Solution:	Engage PTO
Cause #1B:	There is not enough oil in the reservoir. The pressure relief valve is not set appropriately. The oil flow rate is not high enough. The hoses are not connected appropriately.
Solution:	See Specifications section and Wet Kit Diagram
Cause #2:	Ball Valve is not engaged.
Solution:	Engage Ball Valve.
Cause #3:	Control Valve is not fully engaged in either direction (load/Unload) and is not allowing oil to flow through the system.
Solution:	Ensure the control valve is either completely pushed in or completely pulled out.
Cause #4:	The new-style switching valve will not work if the pressure and return lines are backward or the switching valve is out of adjustment.
Solution:	Verify that the pressure and return lines are connected appropriately (See Wet Kit Reference Diagram). Adjust switching valve per instructions.
Cause #5:	Trailer is overloaded with material.
Solution:	Remove some of the load.
Cause #6:	Floor slats are jammed.
Solution:	Remove any material under the front slope shield. Repair/replace damaged slats.
Cause #7A:	Material is jammed or stuck.
Solution:	Use the control valve to reverse the direction of material movement for 1-2 cycles to break the jammed material loose.
Cause #7B:	Load material is frozen.
Solution:	Allow material to thaw
Problem #2	**All cylinders move together in one direction and then move together in the other direction (no restaging sequence occurs).**
Cause #1:	Plumbing tubes are not connected correctly.
	Verify that plumbing tubes are connected appropriately.
Cause #1:	Incorrect hose connections to control valve.
Solution:	If the control valve is mounted on the outboard side of the trailer with hoses, check for the proper routing of the hoses. (Consult the Floor To Wet Kit Diagram for proper routing).
Cause #2:	Failure of the control valve.
Solution:	Replace control valve.
Problem #3	**All cylinders move in one direction and then stop.**
Confirm:	ALL switching valve components are present and installed appropriately. See Switching Valve section.

Problems, Potential Causes & Solutions

Specific Problem:	Cylinder (#1) moves toward the front of the trailer. Cylinder (#2) moves toward the front of the trailer. Cylinder (#3) moves toward the front of the trailer; then the system stops.
Cause #1A:	The threaded rod nuts on the discharge end of the switching valve are not adjusted correctly.
Solution:	Break the two nuts apart and adjust toward the rear of the trailer.
Specific Problem:	All three cylinders move toward the rear of the trailer; then the system stops.
Cause #1B:	The threaded rod nuts on the forward end of the switching valve are not adjusted correctly, or there is not enough hydraulic pressure. (See *Note.)
Solution:	Break the two nuts apart and adjust toward the front of the trailer.
Cause #2:	Insufficient pressure.
Solution:	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. (See Specifications section and Wet Kit Diagram.
Cause #3:	Trailer is overloaded with material.
Solution:	Remove some of the load.
Problem #4	**Cylinders switch direction before completing full travel to front or rear of trailer (short cycling or rapid cycling).**
Specific Problem:	The cylinders cycle to the front correctly— cylinder (#1), followed by (#2) then (#3). Then, as all three cylinders begin to move toward the rear, (#3) cross-drive and cylinder move two to three inches back and forth rapidly.
Cause #1:	The switching valve loop on the cross-drive is bent and binding against the threaded rod.
Solution:	Bend the loop away from the threaded rod so that it will enable the threaded rod to travel freely.
Problem #5	**Floor runs fine empty or with a light load, but will not cycle with a heavy load.**
Cause #1:	The nuts on the threaded rod are slightly out of adjustment.
Solution:	Break the two nuts apart and adjust them away from the Switching Valve body.
Cause #2:	Insufficient pressure.
Solution:	Check the pressure and adjust the pressure relief valve, if necessary. (see Specifications section)
Problem #6	**As one cylinder is restaging a second cylinder is moving along with it.**
	Unloading of Material
Specific Problem:	Cylinders (#1) and (#2) extend together toward the front of trailer.
Cause:	The check valve at the forward end of cylinder (#1) has malfunctioned.
Solution:	Replace the check valve.

Problems, Potential Causes & Solutions

Specific Problem:	Cylinders (#2) and (#3) extend together toward the front of trailer.
Cause:	The check valve at the forward end of cylinder (#2) has malfunctioned.
Solution:	Replace the check valve.
Specific Problem:	All three cylinders extend together toward the front of trailer.
Cause #1:	The check valves at the forward end of cylinders (#1) and (#2) have malfunctioned (Unlikely) or oil is leaking in the control valve and "floating" the check valves.
Solution:	Replace the check valves or control valve.
Cause #2:	Incorrect plumbing
Solution:	Verify all plumbing hoses and tubes are connected appropriately.
	Loading of Material
Specific Problem:	Cylinders (#2) and (#3) extend together toward the rear of trailer.
Cause:	The check valve at the rear end of cylinder (#3) has malfunctioned.
Solution:	Replace the check valve.
Specific Problem:	Cylinders (#1) and (#2) extend together toward the rear of trailer.
Cause:	The check valve at the rear end of cylinder (#2) has malfunctioned.
Solution:	Replace the check valve.
Specific Problem:	All three cylinders extend together toward the rear of trailer.
Cause #1:	The check valves at the rear end of cylinders (#2) and (#3) have malfunctioned (Unlikely) or oil is leaking in the control valve and "floating" the check valves.
	Replace the check valves or control valve. (See Check Valve Replacement)
Cause #2:	Incorrect plumbing
Solution:	Verify all plumbing hoses and tubes are connected appropriately.
Problem #7	**Cylinder(s) moves slowly while the other cylinder(s) move at normal speed.**
Specific Problem:	In the Unload mode in empty tailer: As all three cylinders travel toward the rear of the trailer, cylinder #3 moves faster than #1 or #2.
Cause #1:	Cylinder #2 is slowed down because it is bypassing internally.
Solution:	Check each end of the cylinder barrel or rod for a temperature differential. If one end is noticeably hotter than the other end, there is an internal bypass. Replace the cylinder.
Cause #2:	Cylinder #2 is slowed down because it has a mechanical restriction.
Solution:	There is not enough restriction on cylinder (#3). It is recommended to install a restrictor valve between the switching valve and cylinder or a check valve with a heavier internal spring.
Specific Problem:	Cylinder (#1) moves fine, (#2) moves fine, (#3) will start to move then suddenly stop. (#3) will then travel four to five inches and move fast.
Cause:	The cylinder (#3) clamp is too tight. This could happen on any one of the three cylinders.
Solution:	Re-torque lower cylinder clamp bolts (See Cylinder Installation Location Guide)

Problems, Potential Causes & Solutions

Problem #8	**Cylinder #3 moves faster while other cylinders move at normal speed.**
Cause #1:	Drive is unbalanced.
Solution:	Install restrictor valves.
Cause #2:	Restrictor valve failure.
Solution:	Replace restrictor valve.
Problem #9	**During restaging, cylinders stop moving before engaging the check valve.**
Specific Problem:	After (#1) cylinder, the left side cylinder, has been changed, the system is operated. (#1) moves to the check valve and opens the check valve. (#2) moves forward, but stops before it reaches the check valve and the hydraulics are at high pressure. (NOTE: This could happen when any of the cylinders are replaced, but not installed in the correct position.)
Cause #1:	Cylinder (#1) was not installed in the correct position. This is not allowing (#2) to travel the distance needed to open the (#2) check valve.
Solution:	Reinstall cylinder in the correct location. (See Cylinder Installation Location Chart)
Cause #2:	Insufficient pressure.
Solution:	Check the pressure and adjust the pressure relief valve, if necessary. (see Specifications section)
Cause #3:	Trailer is overloaded with material.
Solution:	Remove some of the load.
Problem #10	**During restaging, the cylinders stop moving after engaging check valves #1 or #2.**
Cause #1:	Insufficient pressure.
Solution:	Check the pressure and adjust the pressure relief valve, if necessary. (see Specifications section)
Cause #2:	Cylinder may be bypassing.
Solution:	Check cylinder for excessive heat compared to the other cylinders.
Problem #11	**All Cylinders stall at mid stroke.**
Cause #1:	Insufficient pressure.
Solution:	Check the pressure and adjust the pressure relief valve, if necessary. (see Specifications section)
Cause #2:	Trailer is overloaded with material.
Solution:	Remove some of the load.

5.3 Component Identification / Function / Problems / Solutions

5.3.1 Ball Valve (On /Off)

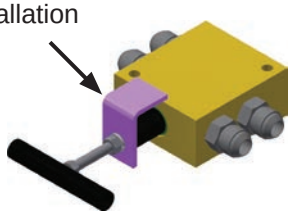
- A closed ball valve routes hydraulic oil flow to the drive system (floor On).
- An open ball valve redirects hydraulic oil flow back to tank (floor Off).
- Emergency Stop

Problem: System will not operate or operates slowly.

✓ Check to make sure the ball valve is fully closed (pulled out).

✓ Check for sound of high-pressure oil bypass and/or excessive heat being generated. Teflon ball seats could be damaged by heat (replace ball valve)

5.3.2 Control Valve (Load/Unload)



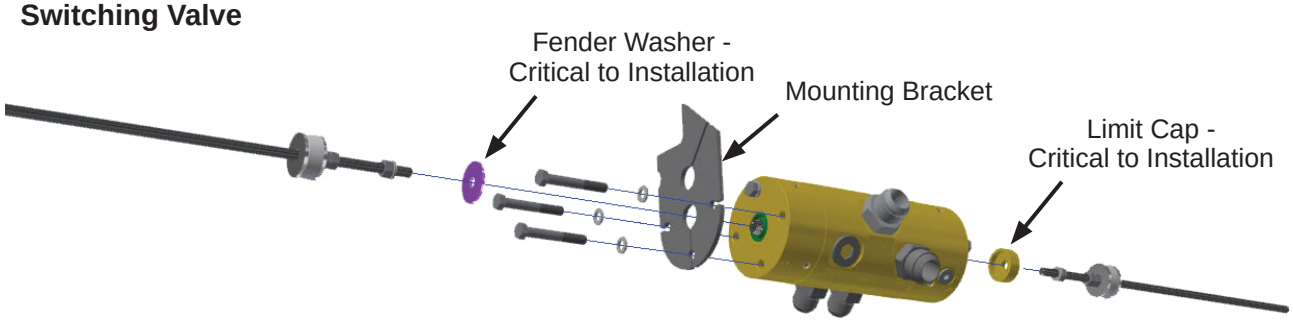
- Controls which check valves are active, determining the direction of material movement (Load or Unload).
- Valve pulled out is in unload mode (material offloads).
- Valve pushed in is in the load mode (material loads).

Note: Control valves rarely fail under normal use, but may develop seal leaks over time. These leaks can be eliminated by installing new seals in the valve body. If damage or excessive wear is visible to the valve body or the valve spool, the valve must be replaced. If the valve has not been used for an extended period, it may become frozen in place due to contaminants on the valve spool. Do not operate the valve until it has been thoroughly cleaned of all contaminants and lubricated. Do not force the valve to operate. Doing so may cause internal damage to the valve body and spool. Stop plate is critical to assembly for proper operation.

Problem:

All cylinders move together to the front of the trailer and then all cylinders move together to the rear of the trailer. If this continues in both the unload and load cycles, the valve may be in the beginning stage of failure. Replace the valve. If the control valve is mounted on the outboard side of the trailer with hoses, check for the proper routing of the hoses. (Consult the Floor To Wet Kit Diagram for proper routing).

5.3.3 Switching Valve



- Switches the hydraulic pressure from one end of the cylinders to the opposite end of the cylinders, which causes the cylinders to change from the restage sequence to moving the material then the sequence repeats.

✓ Confirm all switching valve components are installed in the correct orientation as shown above.

NOTE: Many switching valves are unnecessarily replaced when they are only in need of adjustment. Switching valves almost always fail when they switch (all cylinders to the front or to the rear of the trailer), **NOT** during the restage cycle or unload cycle.

Problem:

- (Unloading) All cylinders restage 1, 2, 3 to the front of the trailer and then the system stops.
- (Unloading) All cylinders move to the rear of the trailer and then the system stops.

✓ Does the system show evidence of high-pressure bypass?

If so, the switching valve may not have switched. Check the threaded rods to see if they have fully actuated the switching valve. If not, readjust the switching valve. Be mindful that the front rod adjustment controls the timing of the restage cycle of the cylinders to the front of the trailer. The rear rod controls the timing of the cylinders for the unloading cycle. The same operating sequence happens, but in reverse during the loading cycle.

NOTE: If all the cylinders have stopped to the front or the rear of the trailer and the switching valve has been switched, try readjusting the switching valve first. If the system still does not work properly after adjustment, there is a high probability of switching valve failure and it needs to be replaced.

Problem:

- The system short cycles or switches before completing full travel to the front or the rear of the trailer.

✓ Check the switching valve loop on the cross drive for binding against the all thread rod.

Problem:

- The system operates with light loads, but will not cycle with a heavy load.

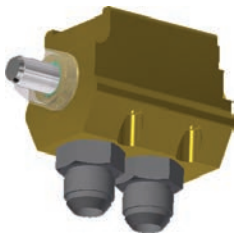
✓ Check the switching valve for proper adjustment.

✓ Confirm proper oil flow and relief valve setting is 3000 PSI.

NOTE: The hydraulic drive system requires less pressure to move all three cylinders together than it requires to move the individual cylinders during restaging 1, 2, 3.

✓ If a switching valve has been replaced on the system and the system will not operate properly check the oil flow direction. Switching valves built after the year 2000 will not operate with reverse oil flow.

5.3.4 Check Valves



- Blocks oil flow, determining the cylinder restaging sequence.
- Check valves at the front of the drive are only functional when unloading material.
- Check valves at the rear of the drive are only functional when loading material

The Running Floor II system is equipped with four (4) check valves. Two valves are installed at the front of the drive unit. One on #1 cylinder (driver side) and one on #2 cylinder (center). Two valves are installed on the rear of the drive unit. One on #3 cylinder (curb side) and one on #2 cylinder (center).

Problem:

Unloading Material (Cylinders are restaging to front of trailer.)

- Cylinders #1 & #2 restage together (move at the same time) to the front of the trailer.

There is a failure of the check valve on the front end of #1 cylinder.

- Cylinders #2 & #3 restage together (move at the same time) to the front of the trailer.

There is a failure of the check valve on the front end of #2 cylinder.

- All three cylinders restaging at the same time to the front of the trailer (not necessarily together, but slowly at the same time).

There is a failure of the check valves on the front end of cylinders #1 & #2 (Unlikely) or oil is leaking in the control valve and “floating” the check valves. This could also happen if the check valve was replaced and the plumbing was not correctly reinstalled.

Loading Material (Cylinders are restaging to the rear of the trailer.)

- Cylinders #3 & #2 restage together (move at the same time) to the rear of the trailer.

There is a failure of the check valve on the rear end of #3 cylinder.

- Cylinders #2 & #1 restage together (move at the same time) to the rear of the trailer.

There is a failure of the check valve on the rear end of #2 cylinder.

- All three cylinders restaging at the same time to the rear of the trailer (not necessarily together, but slowly at the same time).

There is a failure of the check valves on the rear end of cylinders #2 & #3 (Unlikely) or oil is leaking in the control valve and “floating” the check valves. This could also happen if the check valve was replaced and the plumbing was not correctly reinstalled.

NOTE: Two check valves or all four check valves simultaneously failing rarely happens.

- Malfunctioning check valves should be replaced. Check valves that are leaking, but function properly can be resealed.

5.3.5 Cylinders

- Cylinders move the cross drives with slats that are attached to them.
- Each cylinder barrel encases two rod piston assemblies. The connecting rods are held stationary at each end of the drive. The cylinder barrel, attached to the internal heads, moves horizontally as the heads move along the rods, resulting in movement of the cross-drive and slats.
- Cylinders restage to the front of the drive in unloading mode.

Problem:

- (Unloading) The #1 cylinder restages slowly to the front of the drive and engages the check valve. The #2 and #3 cylinders restage separately at normal speed to the front of the drive and engage the check valves. The system then switches to the unload cycle and the #2 and #3 cylinders move to the rear of the drive at normal speed, but the #1 cylinder moves slowly to the rear of the drive.

The #1 cylinder may have an internal bypass. Check each end of the cylinder barrel or rod for a temperature differential. If one end is noticeably hotter than the other end, there is an internal bypass. Replace the cylinder.

Note: Any of the cylinders may exhibit this symptom of slow operation. (examples: #1 & #3 move normally and #2 moves slowly or #1 & #2 move normally and #3 moves slowly)

Problem:

- Cylinder or cylinders that restage to the front of the drive (unloading) and stop before engaging the check valve or switching valve.

The cylinder may have an internal bypass or there may be an issue with the pressure relief setting, low oil flow or a pump issue. Check the cylinders as described above and the pumping system for proper operational parameters.

This problem can also be caused by improper placement of the cylinder in the cross-drive whether by improper installation or slipping from loose barrel clamps. The cylinder was not installed in the correct position and is physically stopping the next cylinder from reaching it's check valve. Ensure check valve plunger is activated on previous cylinder and check physical position on cylinder in cross drive. (See cylinder installation instructions)

This problem could also be caused by the type flooring or material that is being transported. The flooring and floor bearings should cleaned and inspected.

NOTE: It requires more pressure to restage each cylinder independently to the front or rear of the trailer under loaded conditions than it requires to move all cylinders together to the rear of the trailer (unload) or front of the trailer (load).

The pressure relief valve setting must be set at 3000 PSI. Oil flow rate should be within the acceptable range. If cylinders fail due to being exposed to excessive operational heat, it is suggested to replace all three cylinders.

Check all the cylinders for temperature differentials (front end of cylinder vs rear end of cylinder Or one cylinder vs the other two cylinders) before replacing any one cylinder. Replace cylinders that have been exposed to excessive heat.

Problem:

- (Unloading) The #3 cylinder moves faster to the rear of the trailer than cylinders #1 and #2.
- (Loading) The opposite condition will occur with the #1 cylinder moving faster to the front than cylinders #2 and #3.

This problem could occur with any drive system due to an unbalanced frictional load on the drive unit.

This mainly occurs on new units when the system is operating empty (no load) and usually stops when the system is loaded and after a period of operation. KEITH systems that have unbalanced systems have two restrictor valves installed to compensate for this condition in both the unload and load operation. If the drive unit is equipped with the restrictor valves, one of the valves may have failed. Refer to the drive diagram to find the restrictor valve locations.

Problem:

- A cylinder that has been replaced exhibits slow or hesitation in movement (starts to move then stops, then starts to move again).

The cylinder barrel clamps may have been over tightened causing the barrel to compress, restricting piston movement. Loosen and retighten the barrel clamps. (See Bolt Torque Requirements section). If the system has been operated or continues be operated with over torqued clamps, damage to the piston seals and barrel will occur resulting in an internal bypass in the cylinder.

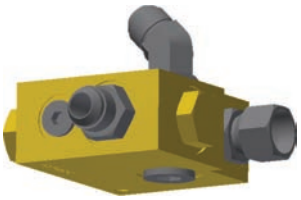
Initial hesitation in movement after installation could be caused by air in the system. Running the floor for 3-5 minutes in forward and reverse should remove the air from the system.

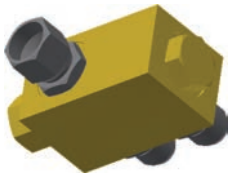
Problem:

- After a cylinder has been replaced, it moves properly and engages the check valve, but the next cylinder stops before reaching the check valve.
- Cylinder #1 or #2 restage normally but cylinder #2 or #3 restages very slowly and makes a loud noise when it engages the check valve.

The cylinder was not installed in the correct position and is physically stopping the next cylinder from reaching it's check valve. Ensure check valve plunger is activated on previous cylinder and check physical position on cylinder in cross drive. (See cylinder installation instructions)

5.3.6 Restrictor Valves





- During the convey stage of the drive cycle, when all three cylinders are moving together, the return oil in the leading cylinder has two paths back to the tank. One path goes directly to the switching valve tank port and the other goes through the check valves and then to the switching valve tank port. On systems where the load is not balanced between the cylinders, there is potential for the leading cylinder to “runaway” during the convey stage. The restrictor valve meters flow in the return line directly to the switching valve which slows the leading cylinder and keeps the cylinders together during the convey stage.

Problem:

- Leading cylinder moves faster “running away” from other cylinders.

1. If the drive is experiencing unusually high pressures or if the leading cylinder is running away, the restrictor valve spool (donut) may be stuck in either the closed or open position respectively. Remove the restrictor valve internals and clean and inspect for contamination or damage to the spool (donut) and guide rod. Verify the spool moves freely on the guide rod and inside the valve body. Reassemble and test for function.
2. The restrictor valves add pressure to the system during normal function. If the system is going over relief, verify the relief is set to 3000 psi. Then try lowering RPMs of the truck and see if the system will unload. If this doesn’t work or is not possible, remove the internals from the restrictor valves and reinstall the caps without the spring, spool (donut) and guide rod. This will remove the added pressure from the restrictor valves and may be enough to allow the system to unload.
3. The restrictor valves may not create enough pressure to keep the leading cylinder from running away. Washers can be added between the spring and the end cap to increase spring pressure which will increase oil pressure and help hold back the leading cylinder. Note that increasing spring pressure can potentially cause the previous issue of the system going over the relief valve with heavy loads or higher flow rates (truck RPM)

5.4 Adjustments & Replacements

Several service related videos are also now available:

KEITH Website: https://www.keithwalkingfloor.com/support/troubleshooting/

KEITH YouTube: https://www.youtube.com/user/KeithMfgCo

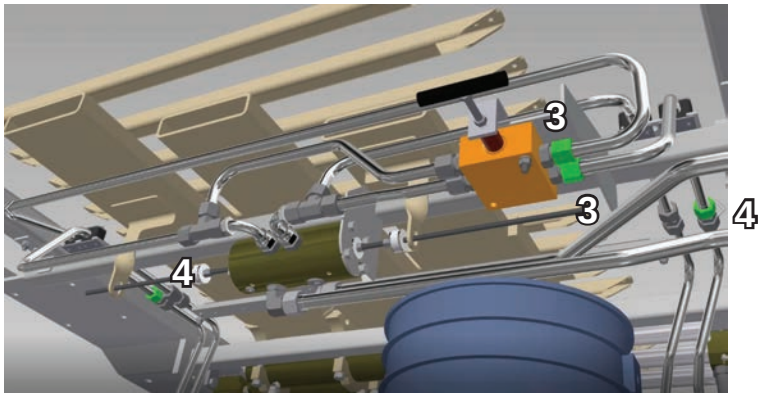
5.4.1 Control Valve Replacement

Video available: https://www.keithwalkingfloor.com/support/troubleshooting/

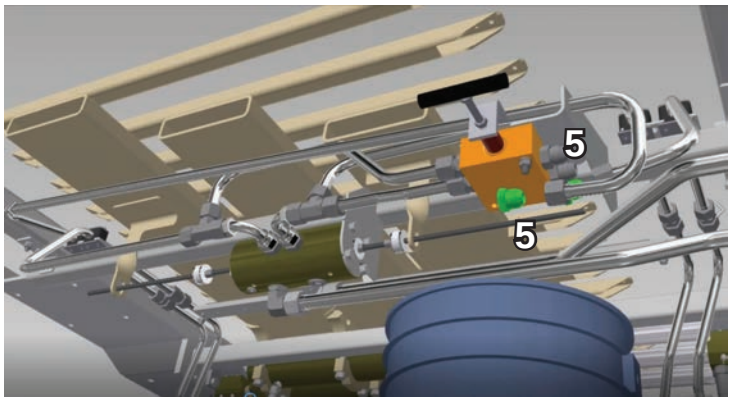
Tools: (1) 1-1/8” [29 mm] Open Ended Wrench
(1) 1-1/4” [32 mm] Open Ended Wrench
(2) 9/16” [17 mm] Open Ended Wrenches
(1) 9/16” [17 mm] Socket with Torque Wrench

Control Valve Removal:

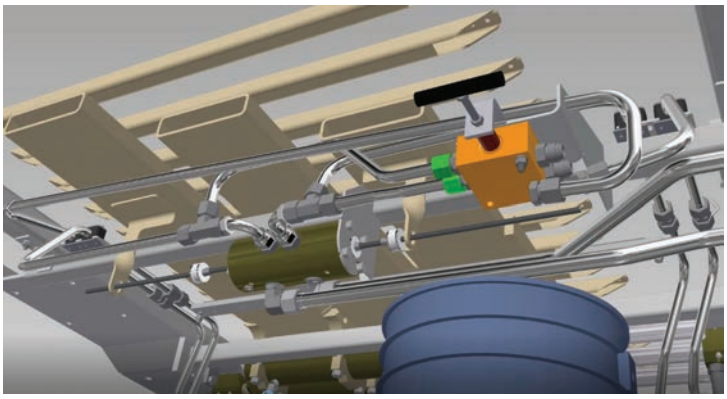
1. Stop the floor and lockout/tagout for safety.
2. Clean the area with a shop rag and place a bucket underneath to catch hydraulic oil.
3. Loosen the tube nuts attached to the control valve on the outside of the control valve (away from the switching valve).
4. Loosen the tube nuts on the opposite ends of those tubes and rotate the tubes away from the control valve.



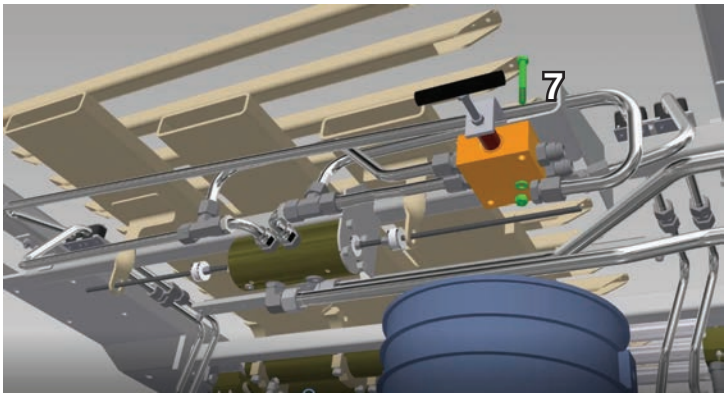
5. Plug the tube ends to keep them clean and from leaking fluid.



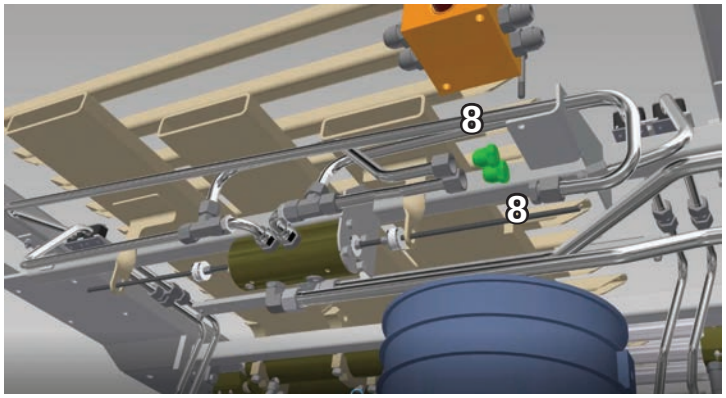
6. Loosen the tube nuts on the opposite side of the control valve.



7. Remove the bolts attaching the control valve to the drive frame and remove the control valve.



8. Plug the remaining tube ends to keep them clean and from leaking fluid.



Control Valve Installation:

9. Install the new control valve and torque the (4) bolts. (See Bolt Torque Requirements)
10. Remove the plugs from the tube ends, reconnect the tubes and tighten (See Service Information chart).
11. Run the floor and check for leaks.

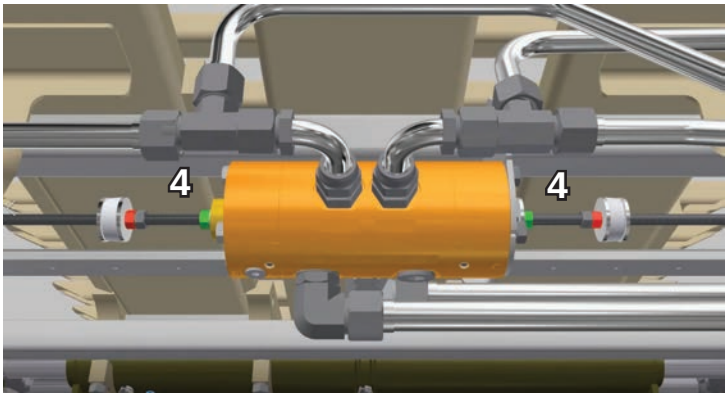
5.4.2 Switching Valve Replacement

Video available: https://www.keithwalkingfloor.com/support/troubleshooting/

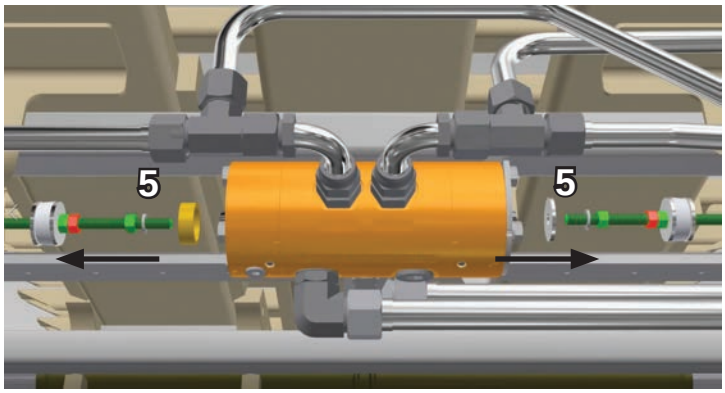
Tools: (1) 1-1/8” [29 mm] Open Ended Wrench
(1) 1-1/4” [32 mm] Open Ended Wrench
(1) 1-5/16” [34 mm] Open Ended Wrench
(1) 1-1/2” [38 mm] Open Ended Wrench
(2) 9/16” [17 mm] Open Ended Wrenches
(1) 9/16” [17 mm] Hex Socket with Driver
(1) 9/16” [17 mm] Hex Socket with Torque Wrench

Switching Valve Removal:

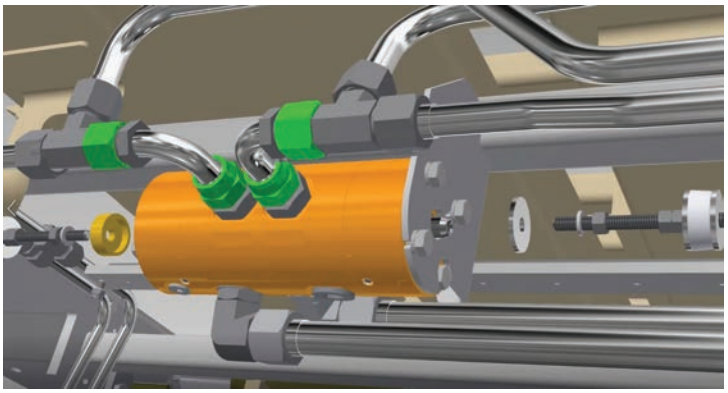
1. Cycle the floor until all three of the cross drives are approximately in the center of the drive.
2. Stop the floor and lockout/tagout for safety.
3. Clean the area with a shop rag and place a bucket underneath to catch hydraulic oil.
4. While holding the red nut still, break the green nut loose and turn it away from the switching valve center rod. Do this on both sides of the switching valve.

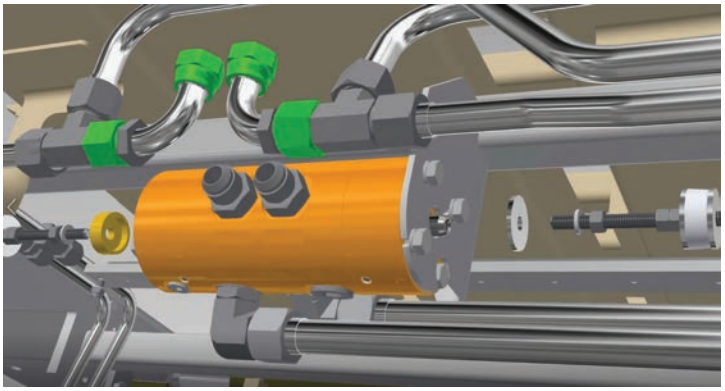


5. Use the red nuts to remove the threaded rod assemblies from both sides of the switching valve.

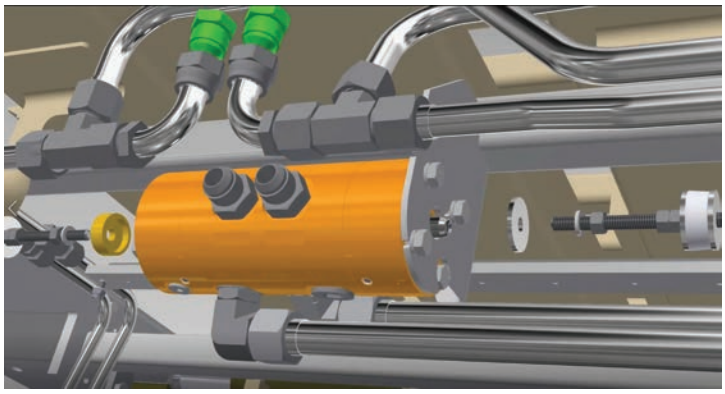


6. Loosen both ends of the elbow fittings that are attached to the CYL ports and turn the ends away from the switching valve.

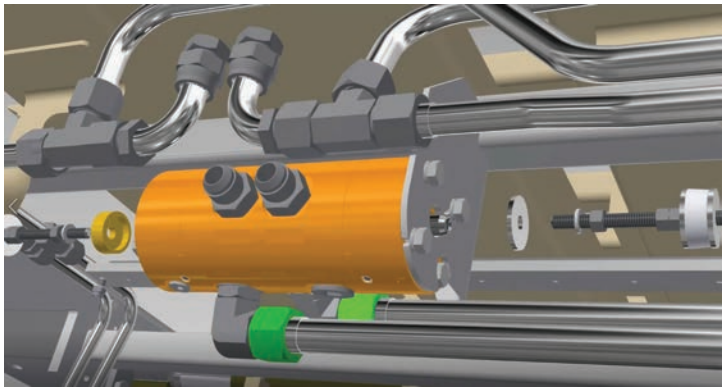




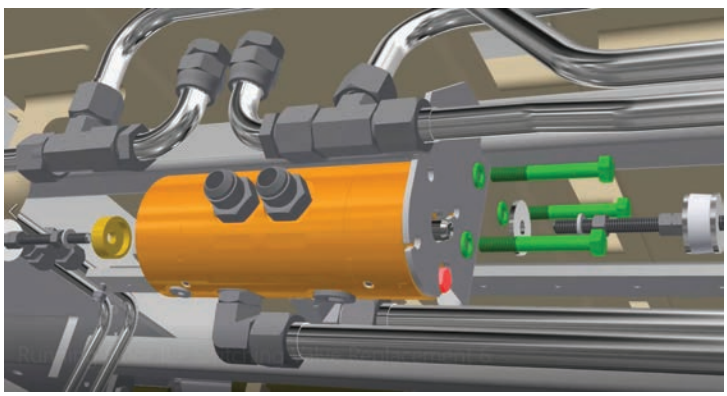
7. Plug the loose ends of the fittings to keep them clean and from leaking fluid.



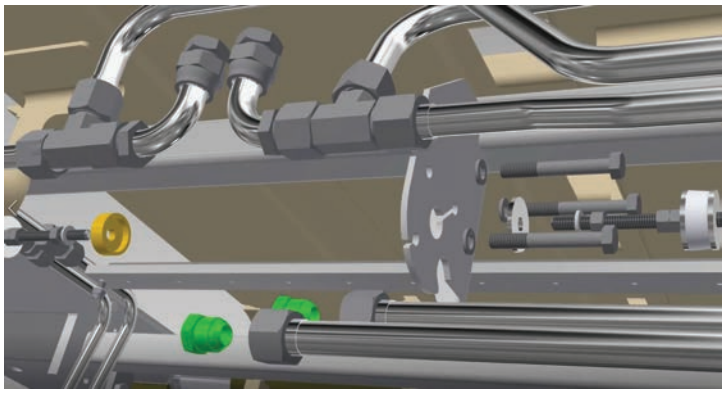
8. Loosen the ends of the tubes connected to the PUMP & RES ports.



9. Support the switching valve (14 lbs [6.35 kg]) and only remove the (3) bolts securing the switching valve to the drive frame bracket and then remove the switching valve.

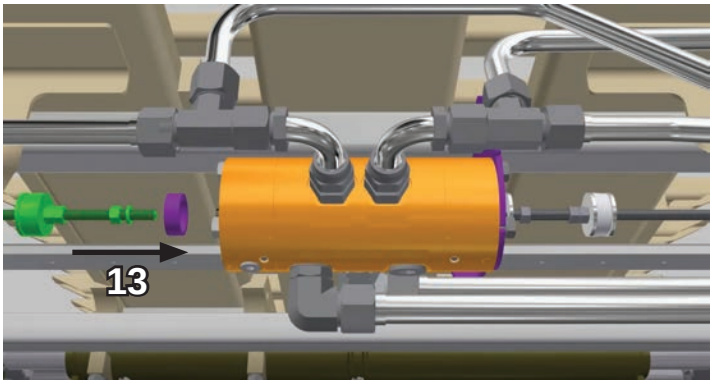


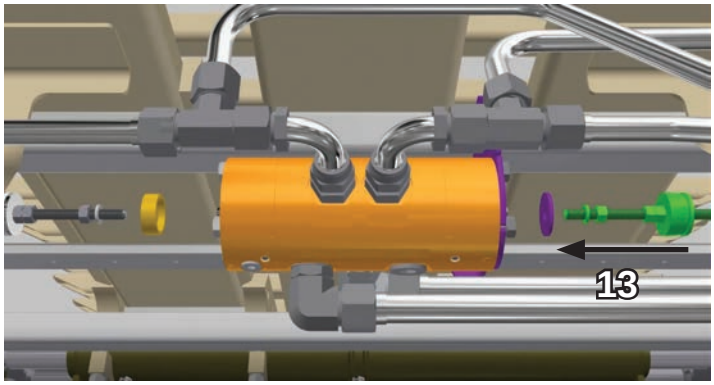
10. Plug the loose ends of the tubes to keep them clean and from leaking fluid.



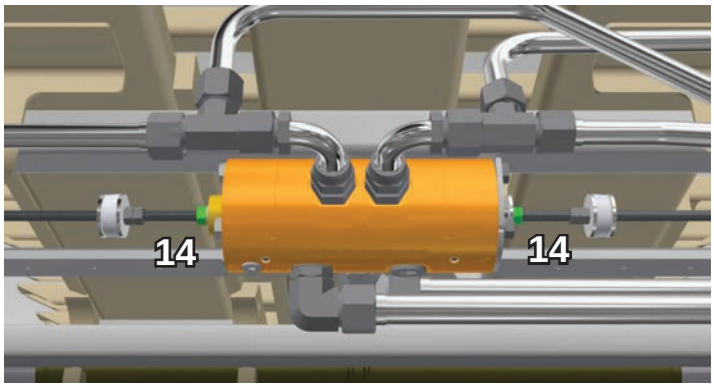
Switching Valve Installation:

11. Install the new switching valve and torque the (3) bolts. (See Bolt torque Requirements)
12. Remove the plugs from the tube ends, reconnect the tubes and tighten (See Service Information chart).
13. Install the threaded rod with the limit cap on the opposite side of the switching valve from the mounting bracket. Install the threaded rod with the large fender washer on the side of the switching valve against the mounting bracket.





14. Tighten the nuts up against the switching valve center rod on both sides.
15. Run the floor and check for leaks.
16. The switching valve will then need to be adjusted. (See Switching Valve Adjustment Instructions)

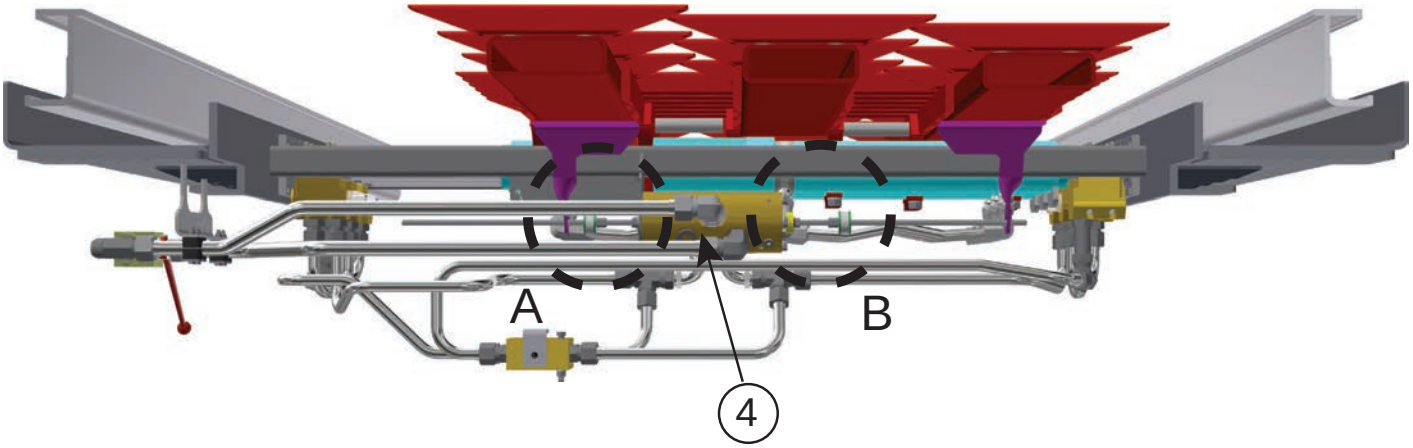


5.4.3 Switching Valve Adjustment

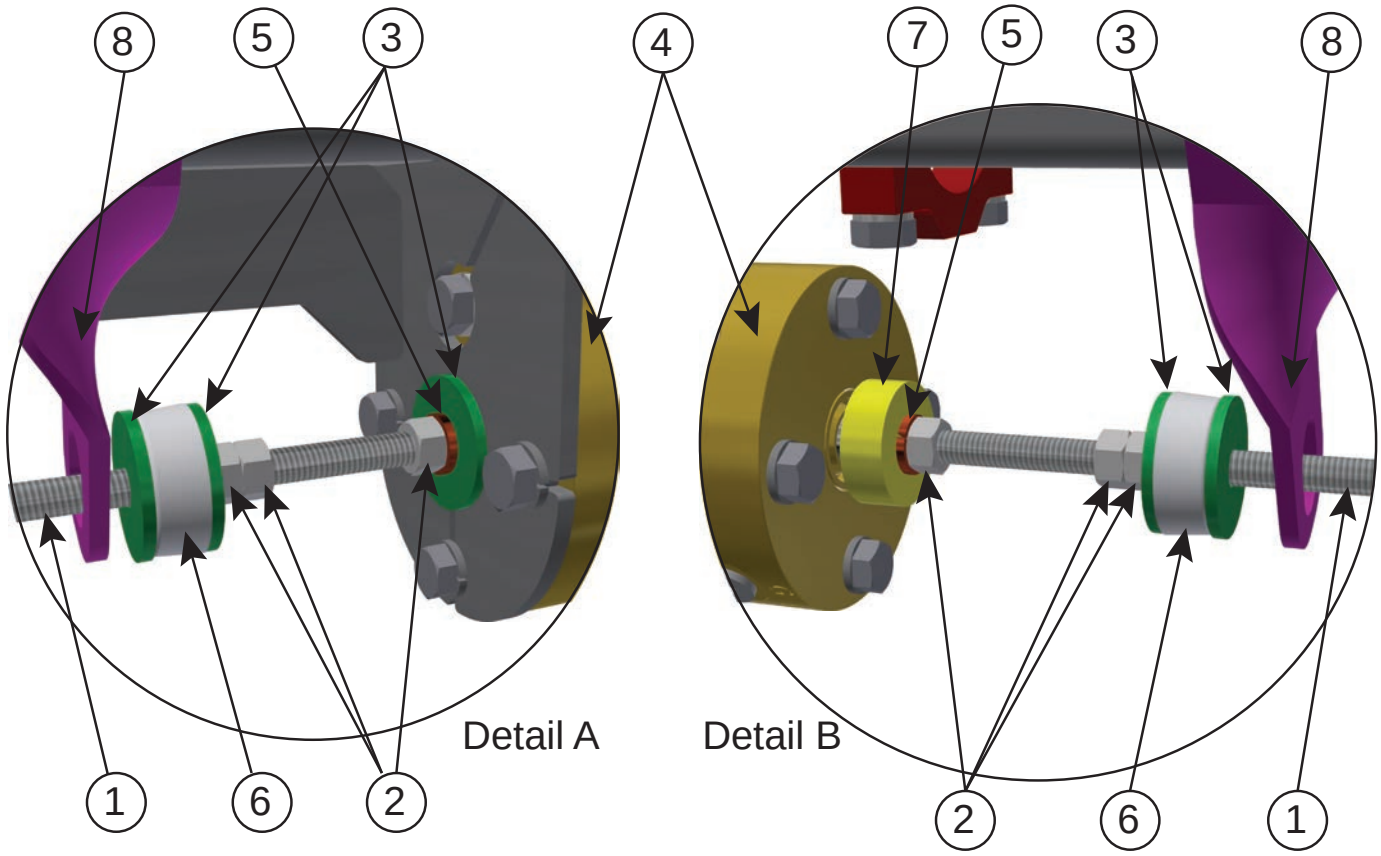
Video available: https://www.keithwalkingfloor.com/support/troubleshooting/

1. Use the ball valve to stop the drive unit. The ball valve (On/Off) 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 3/8” [10 mm] 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 3/8” [10 mm] 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 out to start the drive unit. 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 in toward the center of the trailer to stop the drive unit. 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 3/8” [10 mm] jam nuts out until they are tight against the washers. Then turn the first nut one extra turn. Bring the second nut up to the first nut and tighten the two together, setting the jam nuts.
6. Engage PTO
7. Pull the ball valve handle out to start the drive unit, causing the hydraulic cylinders to travel to the opposite direction. Let the cylinders travel until they lock up. Then immediately push the ball valve handle in toward the center of the trailer to stop the drive unit.
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 3/8” jam nuts out until they are tight against the washers. Then turn the first nut one extra turn. 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



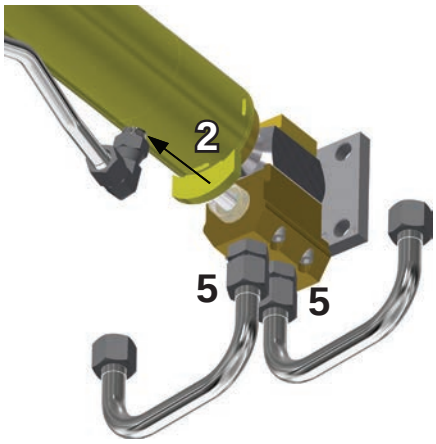
1. 3/8” [10 mm] Threaded Rod (2)
2. 3/8” [10 mm] Nuts (6)
3. 3/8” [10 mm] Flat Washers (5)
4. Switching Valve Assembly
5. 3/8” [10 mm] Lock Washers (2)
6. Switching Valve Grommet (2)
7. Limit Cap
8. Actuator Tab



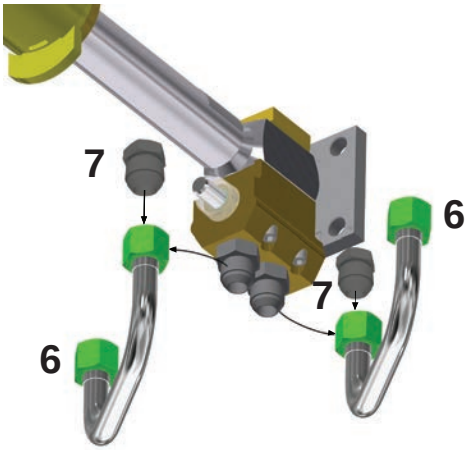
5.4.4 Check Valve Replacement

Video available:

https://www.keithwalkingfloor.com/support/troubleshooting/

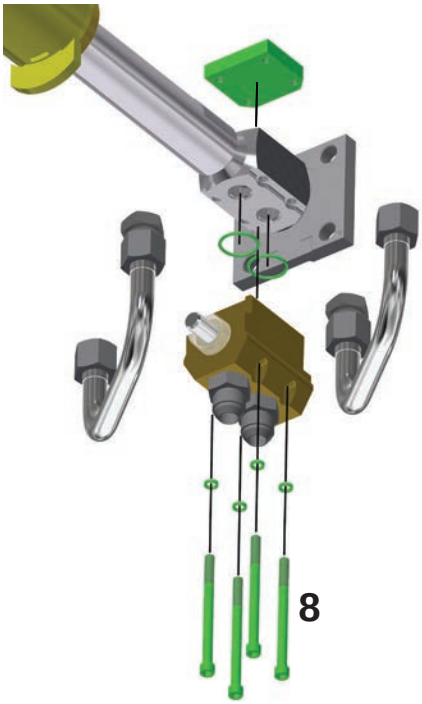


Tools: (2) 1-1/4” [32 mm] Open Ended Wrenches
(1) 1/4” [6 mm] Hex Bit and Driver
(1) 1/4” [6 mm] Hex Bit with Torque Wrench



Check Valve Removal:

1. Identify the check valve to be removed.
2. Cycle the floor until the cylinder is moved away and the check valve is free.
3. Stop the floor and lockout/tagout for safety.
4. Clean the area with a shop rag and place a bucket underneath to catch hydraulic oil.
5. Loosen the tube nuts attached to the check valve.
6. Loosen the tube nuts on the opposite ends of those tubes and rotate the tubes away from the check valve.
7. Plug the tube ends to keep them clean and from leaking fluid.
8. Loosen the (4) bolts and remove the check valve.



Check Valve Installation:

9. Make sure all surfaces are clean and the o-rings are in good condition and in the proper places. Use hydraulic oil or vasoline to lubricate seals. Do NOT use grease.
10. Install the new check valve, ensuring that the top clamp plate is oriented correctly with the corner notches toward the rod end bolt heads and install the (4) check valve bolts.
11. Torque the (4) bolts using a criss-cross pattern. (See Bolt torque Requirements)
12. Reconnect the tubes and tighten (See Service Information chart).
13. Run the floor and check for leaks.

5.4.5 Cylinder Replacement

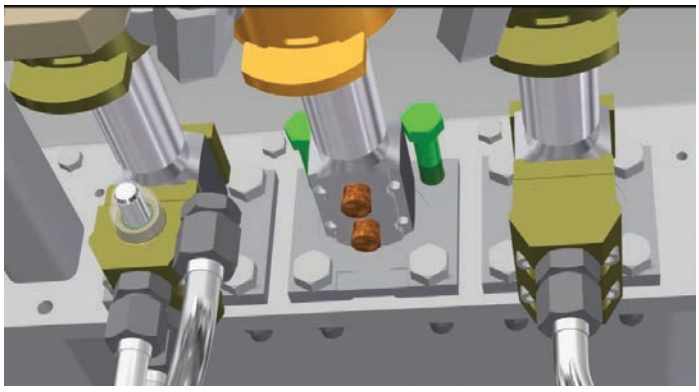
Video available: https://www.keithwalkingfloor.com/support/troubleshooting/

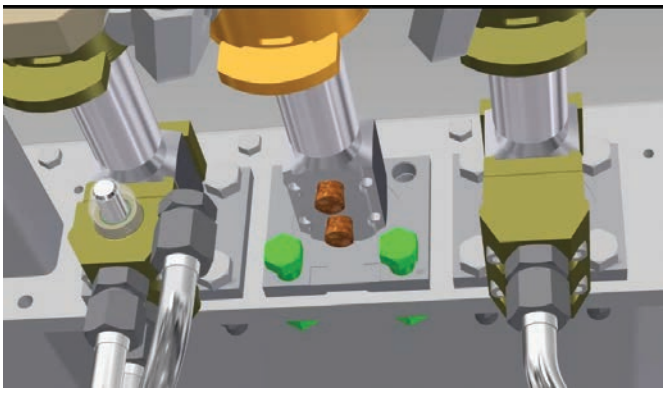
Refer to the Cylinder Sizing Chart before ordering replacement cylinders.

Tools: (2) 1-1/4” [32 mm] Open Ended Wrenches
(2) 1-1/8” [29 mm] Open Ended Wrenches
(2) 15/16” [24 mm] Open Ended Wrenches
(1) 15/16” [24 mm] Hex Socket with Driver
(1) 1/4” [6mm] Hex Bit with Driver
(1) 1/4” [6mm] Hex Bit with Torque Wrench
(1) 9/16” [17 mm] Hex Socket with Driver
(1) 9/16” [17 mm] Hex Socket with Torque Wrench
(1) Pry Bar
(1) Hoist or Extra Person

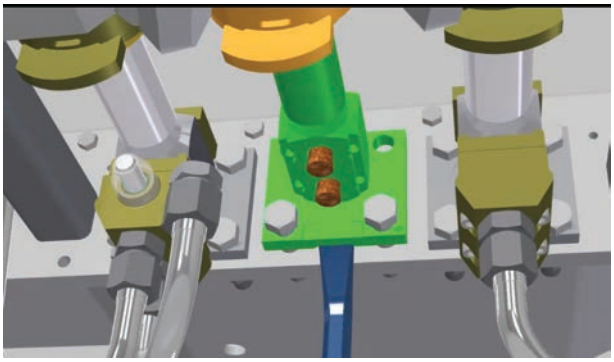
Cylinder Removal:

1. Cycle the floor until all cylinders are approximately in the center of the drive.
2. Stop the floor and lockout/tagout for safety.
3. Clean the area with a shop rag and place a bucket underneath to catch hydraulic oil.
4. Follow procedure for removing the check valves at both ends of the cylinder.
5. Plug the ports, fittings and the loose ends of the tubes to keep them clean and from leaking fluid.
6. At each end, remove the top (2) rod end bolts and loosen the bottom (2) bolts, but leave them in place to support the cylinder.

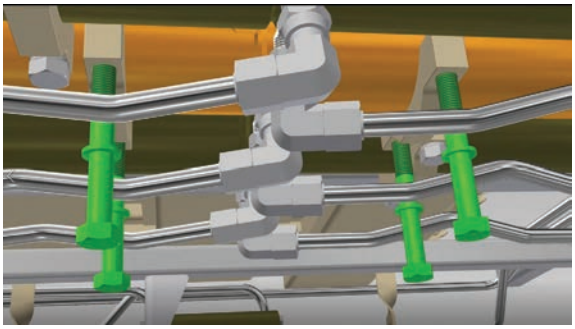


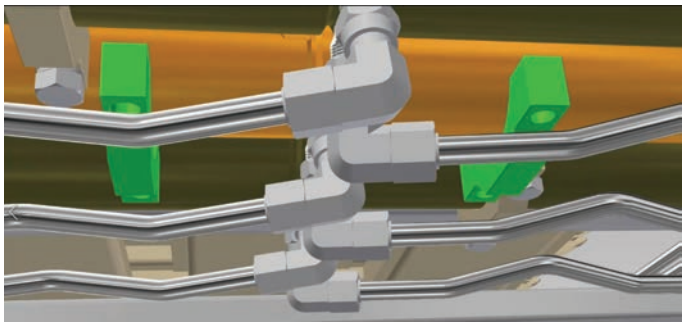


7. With a pry bar loosen the rod end plates from drive frame just enough to free them, but allowing the bolts to still hold the cylinder in place.

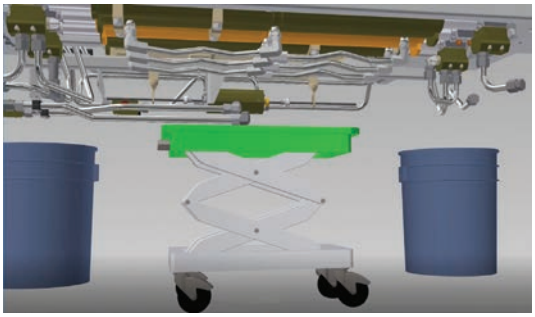


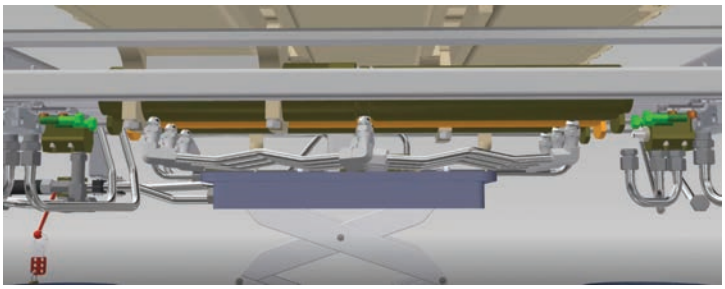
8. Remove the (4) lower cylinder barrel clamp bolts and the (2) lower cylinder barrel clamps.





9. The cylinder is very heavy! 84 lbs [38 kg] Two people or a hoist are needed! When ready, remove the remaining (2) rod end bolts at each end of the cylinder and lower the cylinder out of the drive.





Cylinder Installation:

10. Use two people or a hoist to lift the cylinder up into place and loosely install the (2) lower rod end bolts at each end of the cylinder.
11. Use the Cylinder Installation Location Guide to verify that the cylinder is positioned accurately and that the threaded pad is mated appropriately with the upper threaded cylinder barrel clamp.
12. Use anti-seize on the upper rod end bolts before threading them into the aluminum nut bar by hand.
13. Hand tighten all (4) bolts on each rod end then torque. (See Bolt Torque Requirements)

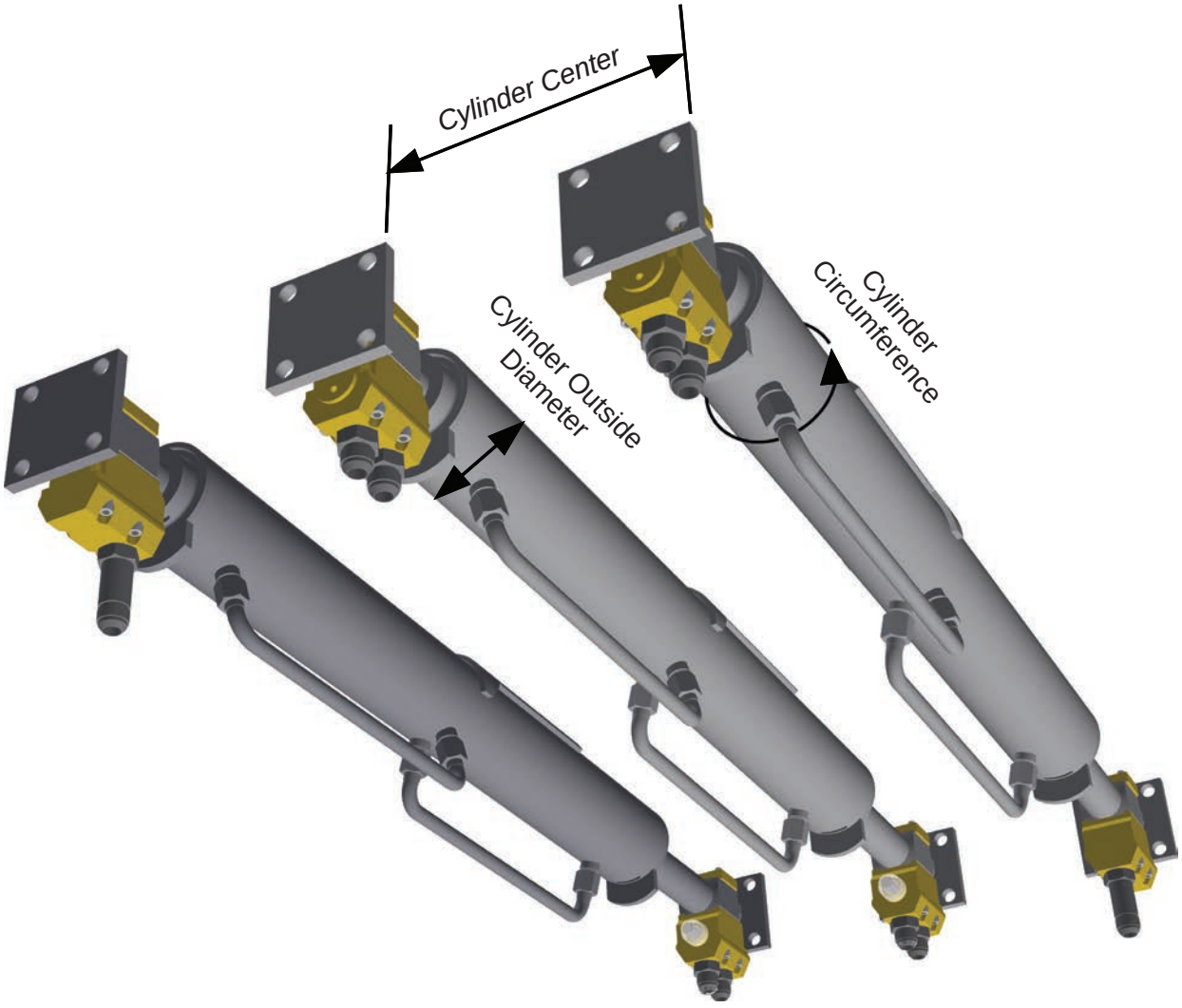
14. Install all (4) lower cylinder barrel clamp bolts, each with (2) piece Nordlock washers and hand tighten first, then torque. (See Bolt torque Requirements)
15. Follow procedure for installing check valves at both ends of the cylinder.
16. Run the floor and check for leaks.

5.4.6 Cylinder Size Reference Chart

- Cylinder spacing can be determined by measuring the distance from the same side of two adjacent cylinder rod end plates (left side to left side or right side to right side).
- Cylinder bore size can be determined by measuring the circumference of the cylinder or measuring the outside diameter of the cylinder and referencing the following chart.

Cylinder Size Reference Chart			
Standard Cylinder Centers	**Cylinder Bore Size (Inside Diameter)**	**Cylinder Outside Diameter**	**Cylinder Circumference**
4.50”	3.000”	3.50”	11.00”
5.00”	3.500”	4.00”	12.57”
6.00”	4.000”	4.50”	14.14”

NOTE: Drives with V-Floors can have cylinder centers of 5.00”, 9.50”, 10.00” and10.50”



5.4.7 Cylinder Installation Location Guide

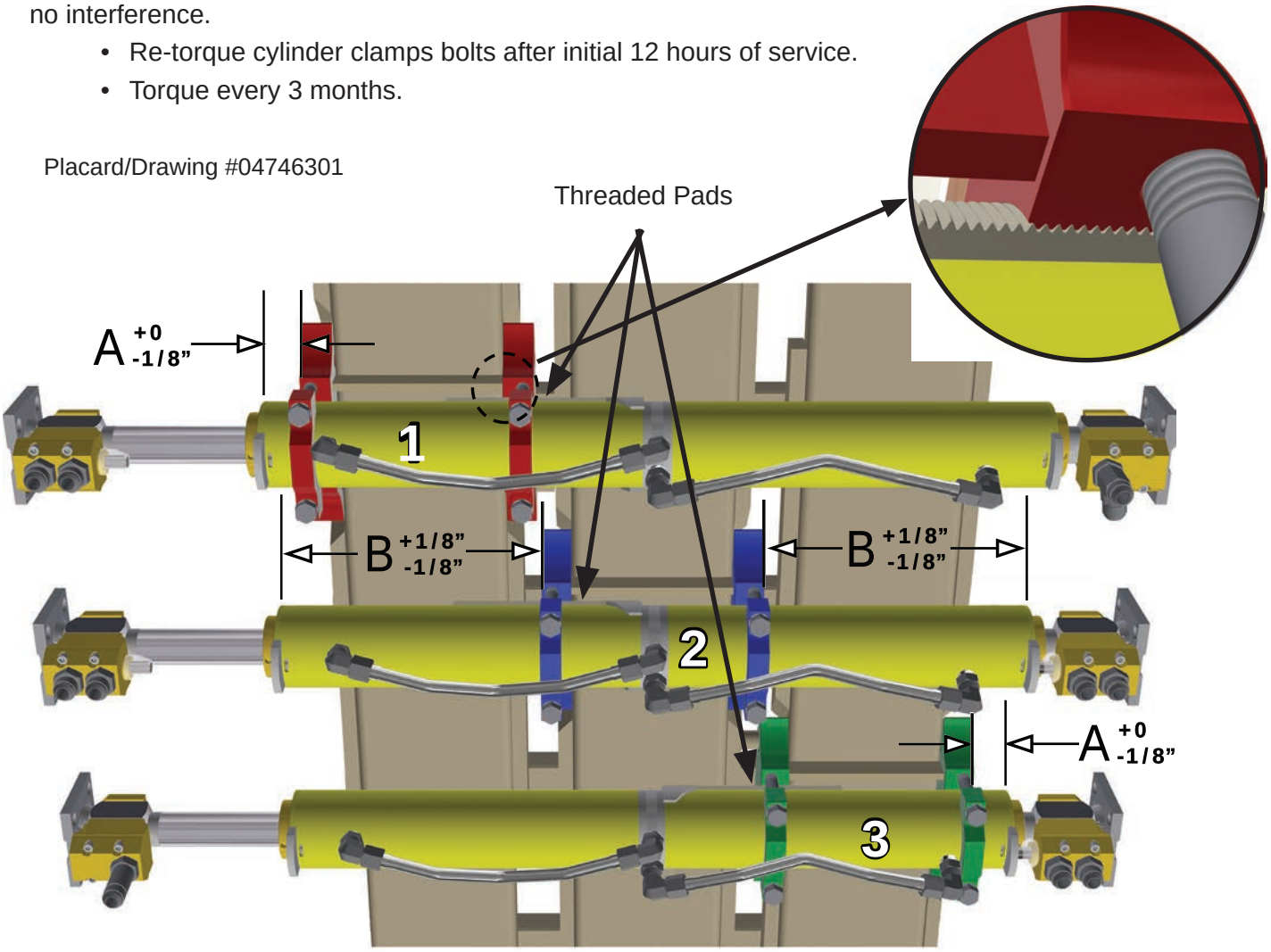
Cylinder placement and thread engagement are crucial to the floor's proper operation. Follow the alignment chart for your specific drive and flooring and be sure not to over torque the lower cylinder clamp bolts.

	3.0" Cylinders		***3.5" Cylinders***		***4.0" Cylinders***	
Flooring Type	**A - Cyl #1 & #3**	**B - Cyl #2**	**A - Cyl #1 & #3**	**B - Cyl #2**	**A - Cyl #1 & #3**	**B - Cyl #2**
Standard	1-1/2"	14-1/4"	1-1/2"	12-3/4"	1-1/4"	13.0"
Nutbar Shoe	6.0"	14-1/4"	1-1/2"	12-3/4"	-	-
Pressure Seal	1-5/16"	12-5/8"	1-5/16"	12-5/8"	-	-
Pressure Seal Lite	1-1/2"	14-1/4"	1-1/2"	12-3/4"	-	-
V-9	1-1/2"	12-13/16"	1-1/2"	12-13/16"	1-3/8"	13.0"
V-18	1-1/2"	14-1/4"	1-1/2"	12-3/4"	-	-
Cylinder Clamp Bolt Torque:	135 ft-lbs (5/8"-11 UNC Bolts)				180 ft-lbs (3/4"-10 UNC Bolts)	

NOTE: In rare cases setting the #1 and #3 cross-drive clamps at 1-1/2" from the edge of the barrel will put the clamps partially on top of a weld. Move the clamps as little as possible away from the weld so there is no interference.

- Re-torque cylinder clamps bolts after initial 12 hours of service.
- Torque every 3 months.

Placard/Drawing #04746301



6.0 Technical Support

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

- Model Number (Located on the Serial Plate of the drive unit) (See 3.3 Component Location Diagram)
- Serial Number (Located on the Serial Plate on the drive unit) (See 3.3 Component Location Diagram)
- Quantity & length of floor slats
- Vehicle make and unit installer

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Toll-Free: 800-547-6161

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