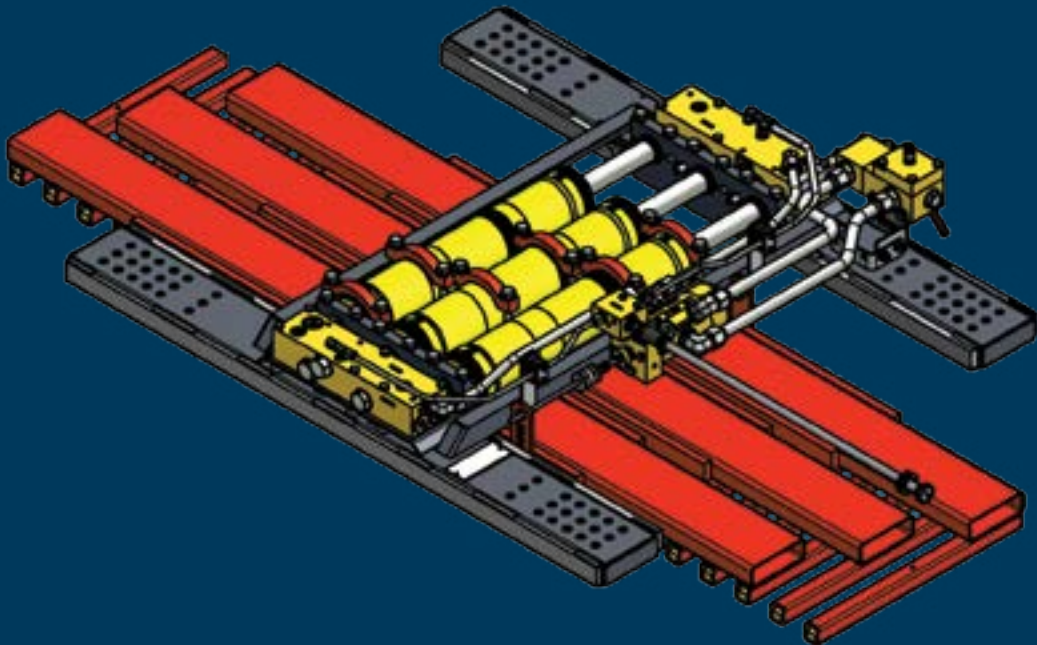


KEITH Mfg. Co.
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KEITH® KFD Series OWNERS MANUAL Original Instructions

- *Durable and dependable construction
- *Simple Installation
- *Low maintenance
- *Compact and powerful design
- *Aluminum protected with chromated finish

- *Interchangeable Cylinders
- *Shorter Drive Unit
- *Inline Bolt Pattern on Drive Shoes Allow
Pre-Drilling of Aluminum Flooring

OPERATION

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We at KEITH Mfg. Co. thank you for having chosen the KEITH® *WALKING FLOOR*® unloading system. Installing a *WALKING FLOOR*® system in your equipment provides you with the versatility to unload virtually any type of material.

The following pages contain information on the operation and maintenance of your KEITH® KFD-Series drive unit. Also included is a troubleshooting guide and detailed views of the various parts contained in the KFD-Series system. In addition, we maintain a website at www.keithwalkingfloor.com which serves as a resource from which manuals can be downloaded.

We have provided information on the type of hydraulic wet kit that will be needed to operate the system. Please be sure to use the recommended pumps, filters and pressure relief valves listed, or approved equivalent equipment. It is critical to adhere to the outlined hydraulic wet kit specifications. Failing to follow the guidelines concerning required operation pressures can lead to your system not operating properly.

Please review the entire manual before operating the KEITH® KFD-Series unloading system. If you have any questions or concerns, do not hesitate to contact our trained personnel at 800-547-6161 or via email to Techdept@keithwalkingfloor.com and we will be happy to assist you.

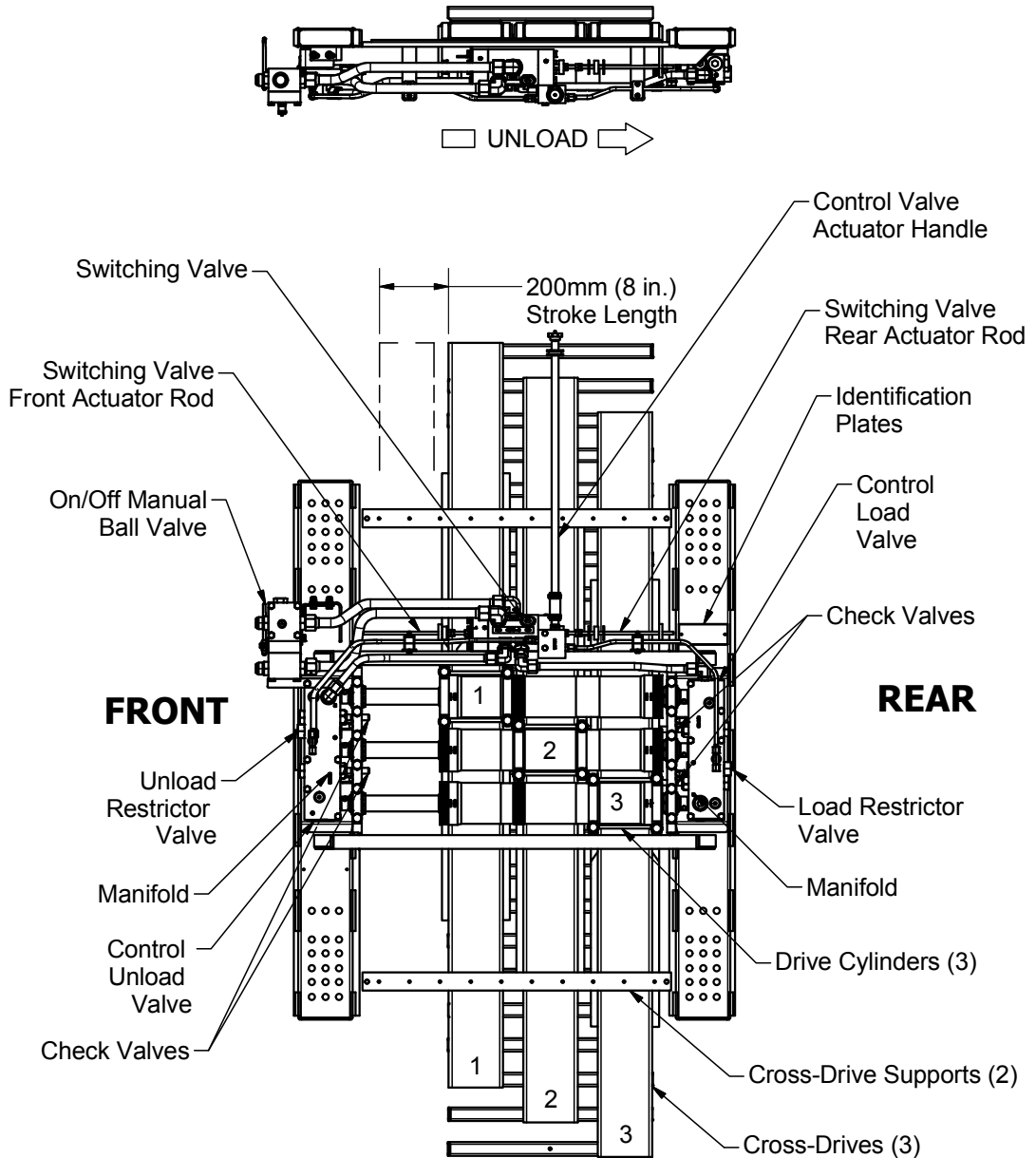
Thank you again for choosing *WALKING FLOOR*® products.

Sincerely,

Keith Foster
Founder

Mark Foster
President

KFD-SERIES BASIC PARTS IDENTIFICATION



N.B.: Cylinder 1 is the cylinder on the driver's side, for vehicles driving on the right.

60031E

**WARNING:**

The large forces exerted by the floor when moving can result in damage to equipment which may result in serious injury or death. Always ensure that this manual has been read and fully understood by the operator. We advise that the operator keeps this manual with the vehicle at all times. Always ensure that 'best practice' is employed when using our systems. If in any doubt do NOT use this equipment and seek further assistance from your company's safety officer.

2.1 Use of the *WALKING FLOOR*® system

The system is built up from a number of separate components. These components are assembled in such a way that they are only suitable for the conveying purpose described in this manual or any sales agreement. Should you wish to convey other materials then please contact the supplier of your trailer.

2.2 Operation of the *WALKING FLOOR*® system

The KEITH® *WALKING FLOOR*® system can be used for loading and unloading most materials.

Moving the load with the system is based on the friction between the load and the floor. The floor consists of a number of floor slats placed side-by-side (the width of the floor determines the precise number of slats required).

1. Cross-Drive (3)
2. Cross-Drive Shoe
3. On / Off Valve (Ball Valve)
4. Load / Unload Actuator
5. Switching Valve
6. Cylinder (3)

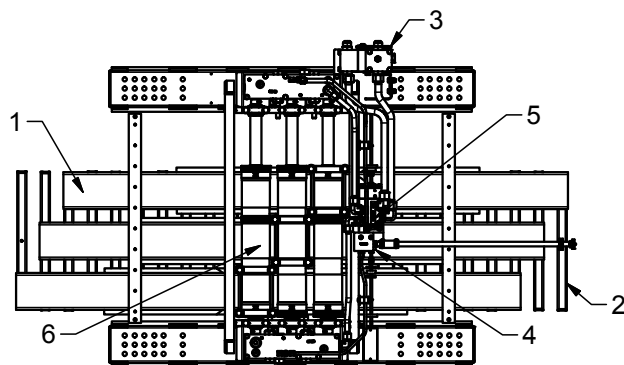


Figure 1.1: KEITH® *WALKING FLOOR*® KFD-Series drive-unit

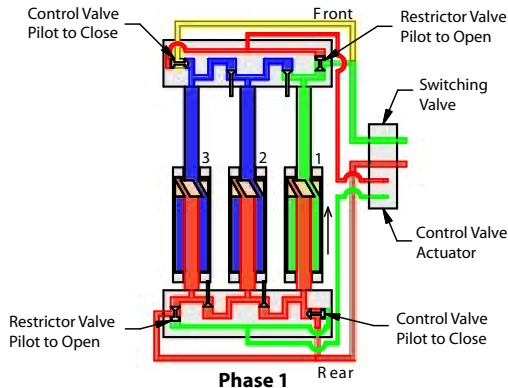
Three double-acting hydraulic cylinders move the floor slats in a cycle with four phases. The forces exerted by the cylinders are transferred to the slats by three cross-drives. Each cross drive moves 1/3 of the total number of floor slats.

The floor slats slide over plastic bearings that support both the upper and lower part and the sides of the slat. Different floor slats, varying in width, surface area and material, have been developed to provide optimum operation with various types of load. The unloading cycle is composed of the following four phases, the loading cycle is the opposite. (See page 5.)

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

■ Pressure ■ Return ■ Blocked Return ■ Standing Oil

Looking from under the trailer up at the drive

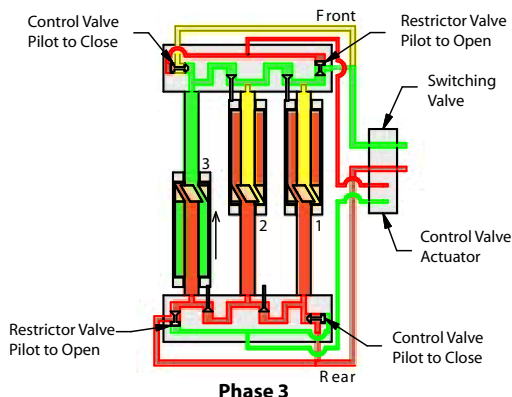


Phase 1: All three cylinders receive pressure through the rear manifold to the front of the cylinders. The Control Valve Actuator is sending pressure (via the 3/8" hydraulic line) to the front manifold to close the Control (Load/Unload) Valve and open the Restrictor Valve. The return oil in the #1 Cylinder is free to tank through the opened restrictor valve. #1 Cylinder moves to front of trailer. In Cylinders #2 & #3, return oil is blocked by the check valves in the front manifold.

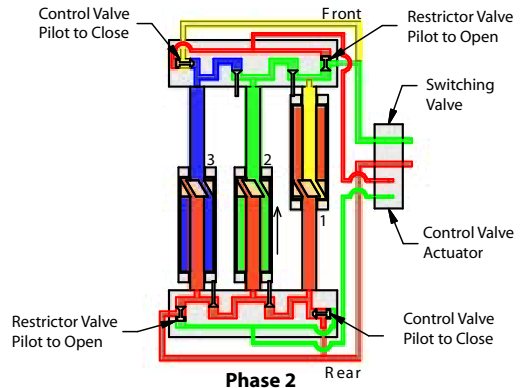
If the Control (Load/Unload) Valve in the front manifold is not closed properly, all three cylinders will travel together to the front of the trailer.

Solution: 1) Remove the end cap off of the 6803-6-6 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 O-Ring.

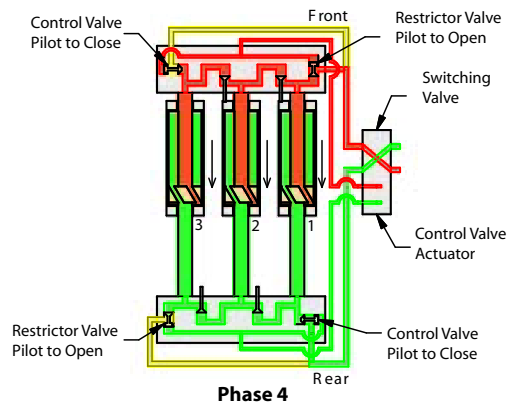
If the Restrictor Valve is not opening properly, none of the cylinders will move. **Solution:** 1) Remove the end cap off of the 6803-6-6 Branch Tee on the rear manifold and attach a pressure gauge to see if there is pressure coming from the Control Valve Actuator. If there is no pressure, check the Control Valve Actuator. 2) Check the Restrictor Valve in the front manifold for foreign material or break in the O-Ring.



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



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



Phase 4: All three cylinders are now receiving oil through the front manifold to the rear of the cylinders. The Control Valve Actuator is letting the signal oil from the rear manifold (via the 3/8" hydraulic line) go to tank, opening the Control (Load/Unload) Valve and closing the Restrictor Valve. The return oil from the front end of the #1 Cylinder is free to tank. The #2 Cylinder return oil has to float open the #2 Check Valve in rear manifold to get to tank (restricting flow). The #3 Cylinder's return oil has to float open the #2 and the #3 Check Valves in rear manifold to get to 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 the #1 and #2 Cylinders will stack up against the #3 cross-drive and make them all travel at the same time.

The position of the two control valves and two restrictor valves (internal) determines the loading or the unloading cycle. A manual or electrical load - unload valve operates these valves.

The (un)loading time is determined by the speed of action of the cylinders, which depends on oil flow to the cylinders and the cylinder size. The force the cylinder's transfer to the floor determines the maximum load that can be (un)loaded. The cylinder force is dependent on the oil pressure and the cylinder size.

The pump determines both the flow and the maximum oil pressure, and therefore the (un)loading time and the weight that can be handled. To protect the system, the pressure relief valve, set at 210 bar (3045 PSI) for the $\varnothing 108\text{mm}$ [$\varnothing 4.25''$] or 250 bar (3625 PSI) for the $\varnothing 101\text{mm}$ [$\varnothing 4''$], limits the pressure.

NOTE:

- For faster (un)loading, the oil flow must be increased; pressure has no influence on (un)loading time.
- The system's operating pressure is determined by the load resistance and not by the pressure relief valve setting of the pump.
- Conveying products for which the system has not been designed, can cause damage to the system. We therefore advise you to contact your supplier about this first.

Drive Specs.

Cylinders	3	
Bore	ø101mm [ø 4"]	250 bar [3625 PSI] max.
Bore	ø108mm [ø 4.25"]	210 bar [3045 PSI] max.
Stroke	200mm [8"]	
Capacity		(legal load limit)

3.1 Specifications of the hydraulic installation

Always consult the supplier of your drive unit to ensure you choose the correct hydraulic power unit. Figure 3.1 shows the components of the hydraulic installation in a hydraulic diagram.

1	Bleed	5	PTO	9	Return Filter
2	Hydraulic reservoir	6	Return line from filter, Min. 32 mm [1¼"]	10	Return / Pressure tubing 25mm [1"]
3	Suction tubing, Min 50mm [2"]	7	Exhaust tubing, Min. 19mm [¾"]	11	Quick coupling (M)
4	Pump	8	Pressure relief valve, MAX 250 bar [3625 PSI] or MAX 210 bar [3045 PSI]	12	Quick coupling (F)

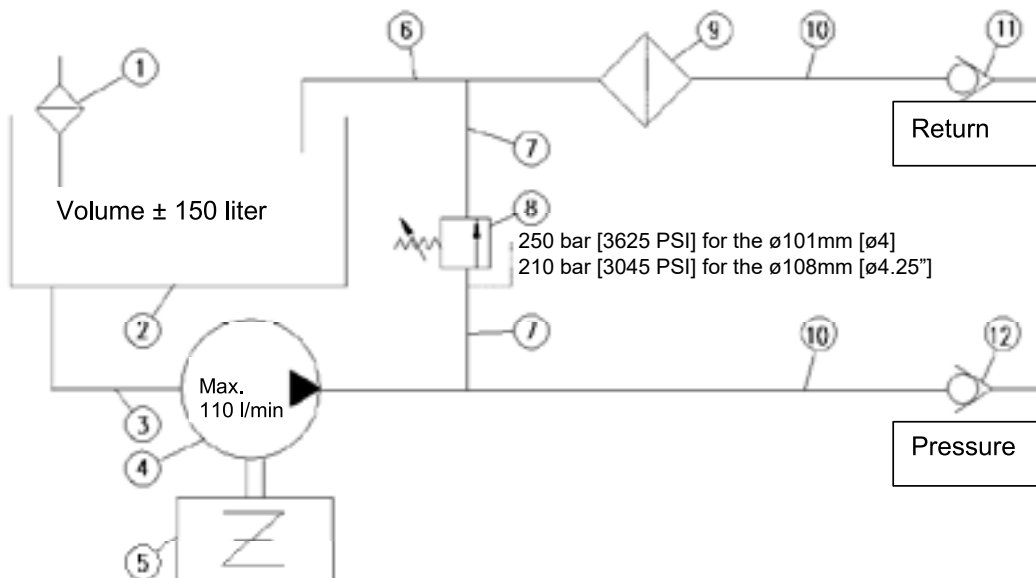


Figure 3.1: Hydraulic diagram

The hydraulic installation must meet the following requirements:

PUMP/ PTO: The quantity of oil that will be pumped in the system determines the loading and unloading time; the oil pressure determines the maximum total weight that can be handled. Return line filter required unless system is equipped with inline pressure filter.

The KEITH® *WALKING FLOOR*® KFD-Series System is designed for a recommended maximum oil flow of 110 l/min. (30 gal/min.)

A high power take-off (PTO) ratio (greater than 1:1) reduces the size of the pump for a given rotational speed. This is generally the best alternative, technically as well as financially. Compare the performance of the motors in order to be certain that the motor can drive the pump. Also, check that the rotational speed of the motor will not be greatly reduced by the load. Compare the maximum permitted loading of the PTO with that of the pump.

OIL:	The hydraulic oil must be of high quality, suitable for a pressure of 250 bar (3625 PSI). The ISO viscosity must be 46 (for example Chevron AW 46 hydraulic oil), while in cold conditions a viscosity of 32 must be used. Conditions of extreme cold demand hydraulic fluids of aviation quality.
RESERVOIR:	The volume of oil in the reservoir must be equal to or greater than the oil flow per minute. The reservoir must be filled to a level of 80-90%. Suction and return tubing must be placed so that cavitations will be prevented. The filler cap must have a bleed capability.
PRESSURE RELIEF VALVE	The hydraulic installation must have a pressure relief valve that is adjusted to 210 bar (3045 PSI) for the $\varnothing 108\text{mm}$ [$\varnothing 4.25"$] or 250 bar (3625 PSI for the $\varnothing 101\text{mm}$ [$\varnothing 4"$]. Ensure that the pressure relief valve is capable of sustaining the oil flow.
	WARNING: The correct adjustment of the pressure relief valve is very important. If this is too low, it is possible that the system will not load or unload; if it is too high, the system may be damaged.
MEASURES TO FOLLOW:	
FILTER:	The filter in the return tubing must have a degree of filtration of 10 microns. In conditions of extreme cold it is better to use filtration of 25 microns. Ensure that the nominal flow volume of the filter is the same as the maximum oil flow that can occur in the system.
HYDRAULIC PLUMBING:	All hoses must be suitable for a pressure of at least 300 bar (4350 PSI). <u>Suction plumbing:</u> in order to prevent cavitations, the oil flow to the suction inlet of the pump must be unhindered. This requires suction tubing with a sufficient diameter (at least 50mm or 2") that is as short as possible (not more than 1.5 m (5ft), without constrictions. Cavitations can also be caused by bends or elbows in the pipe work – a straight line is best. Ensure that the hose cannot collapse with the suction. <u>Pressure plumbing:</u> the hose from the tractor to the trailer must be 25mm or (1") . <u>Return plumbing:</u> the hose from the trailer to the filter must also be 25mm (1"). The hose from the return filter to the reservoir must be at least 32 mm (1¼").
QUICK-COUPINGS:	<u>Tractor:</u> male on return (to the reservoir) female on pressure (from the pump) <u>Trailer:</u> female on return male on pressure

WARNING:

The large force exerted by the floor can result in damage to equipment and serious injury or death. Always ensure that this manual has been read and understood by the operator. Take the following precautionary measures:

- ✓ First open the doors before switching on the pump.
- ✓ Make sure that nobody is under the system when the pump is switched on.
- ✓ Ensure that during unloading no people or animals are in the immediate location where the load will discharge. We suggest that no one should be within 5m (16ft) of the discharge danger zone.
- ✓ Ensure that there is always someone close to the emergency switch during loading and unloading.
- ✓ Always switch off the pump during maintenance or service activities.
- ✓ Always switch off the pump when the vehicle is being driven and when the system is not in use.

Two modes of operation are possible: manual and electrical; the person operating the system during loading or unloading must be able to see the place where the load will be placed.

GENERAL TIPS:

- Depending on the type of load, some material may remain on the floor after the unloading operation.
- This can be prevented by the use a hydraulic CleenSweep® tarp system (a moving headboard or a piece of canvas, possibly attached to a moving headboard or attached to the front bulkhead with clips).
- In order to limit the effect of friction between the floor and the load or the floor, (a piece of canvas can be laid over the whole floor and fixed at the front.) With a simple arrangement it is possible to roll it up at the rear during unloading.
- The speed of the floor can be changed by changing the speed of the pump. Ensure that the maximum permitted pumping rate is not exceeded.
- Ensure that the material can be freely unloaded: do not use the floor to push against the material that is already unloaded.
- Take care that the load does not damage the front wall. The force exerted by the moving load can be considerable!
- In frosty conditions, stop the three cylinders at the beginning of the unloading movement. As soon as unloading starts, the floor slats will move together to the tail end of the trailer and will detach the load from the side walls.

4.1 Manual operation

Starting the floor operation:

1. Open the trailer doors.
2. Attach the hydraulic quick couplings.
3. Turn on the PTO and bring the engine to the desired number of revolutions (revolutions per minute).

Unloading / Loading:

1. Select the desired operation to be performed by the system; unload / load.
2. Set the on/off handle in position; on. The floor will now begin to function.

Stopping:

1. Set the on/off handle in the position; off. The floor will now stop.

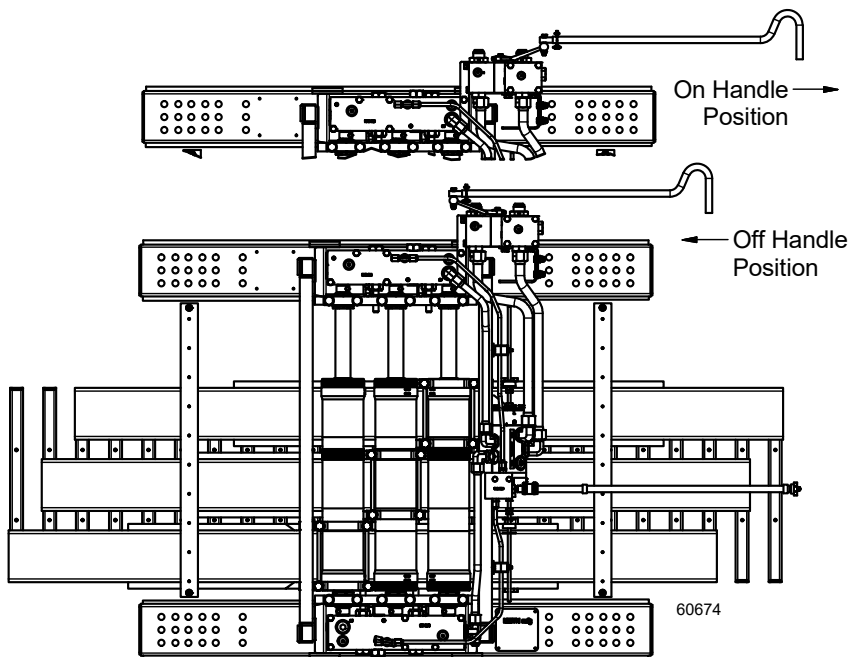


Figure 4.1: Manual operation

1. Manual Load/Unload handle
2. Manual On/Off valve handle

4.2 Electric operation

Starting the floor operation:

1. Open the trailer doors.
2. Attach the hydraulic quick couplings.
3. Turn on the PTO and bring the engine to the desired number of revolutions per minute (RPM).

Unloading / loading:

1. Set the switch button for the system in the desired position; unload / load.
2. Set the on/off switch in the position; on
The floor will now begin to function.

Stopping:

1. Set the on/off switch in the position; off

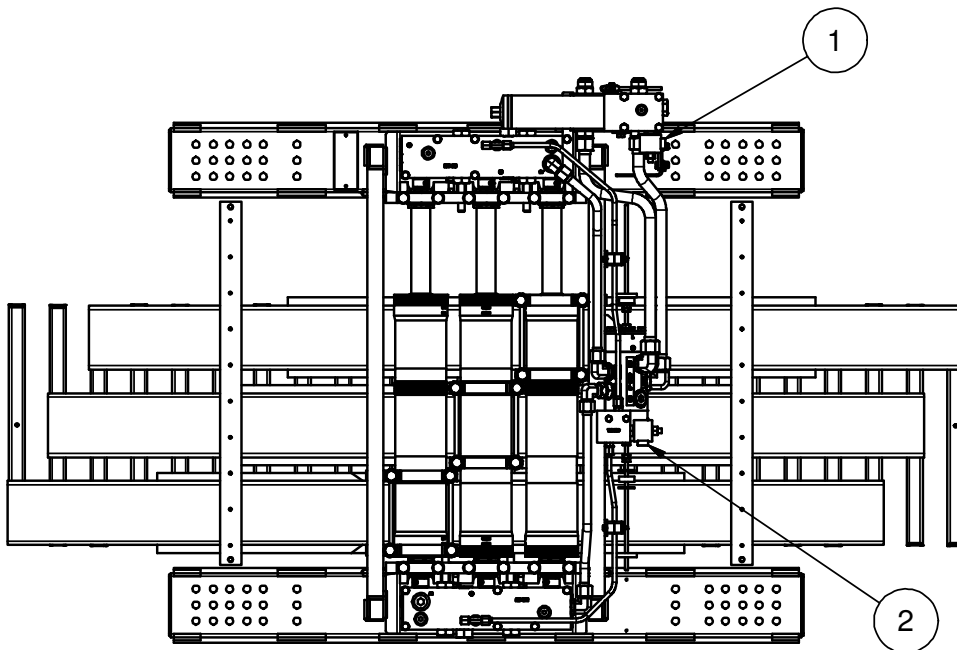


Figure 4.2: Electric operation

1. Electric On/Off valve (Ball Valve)
2. Electric Load/Unload valve (Control Valve)

4.2 Electric Operation Continued

Emergency stop

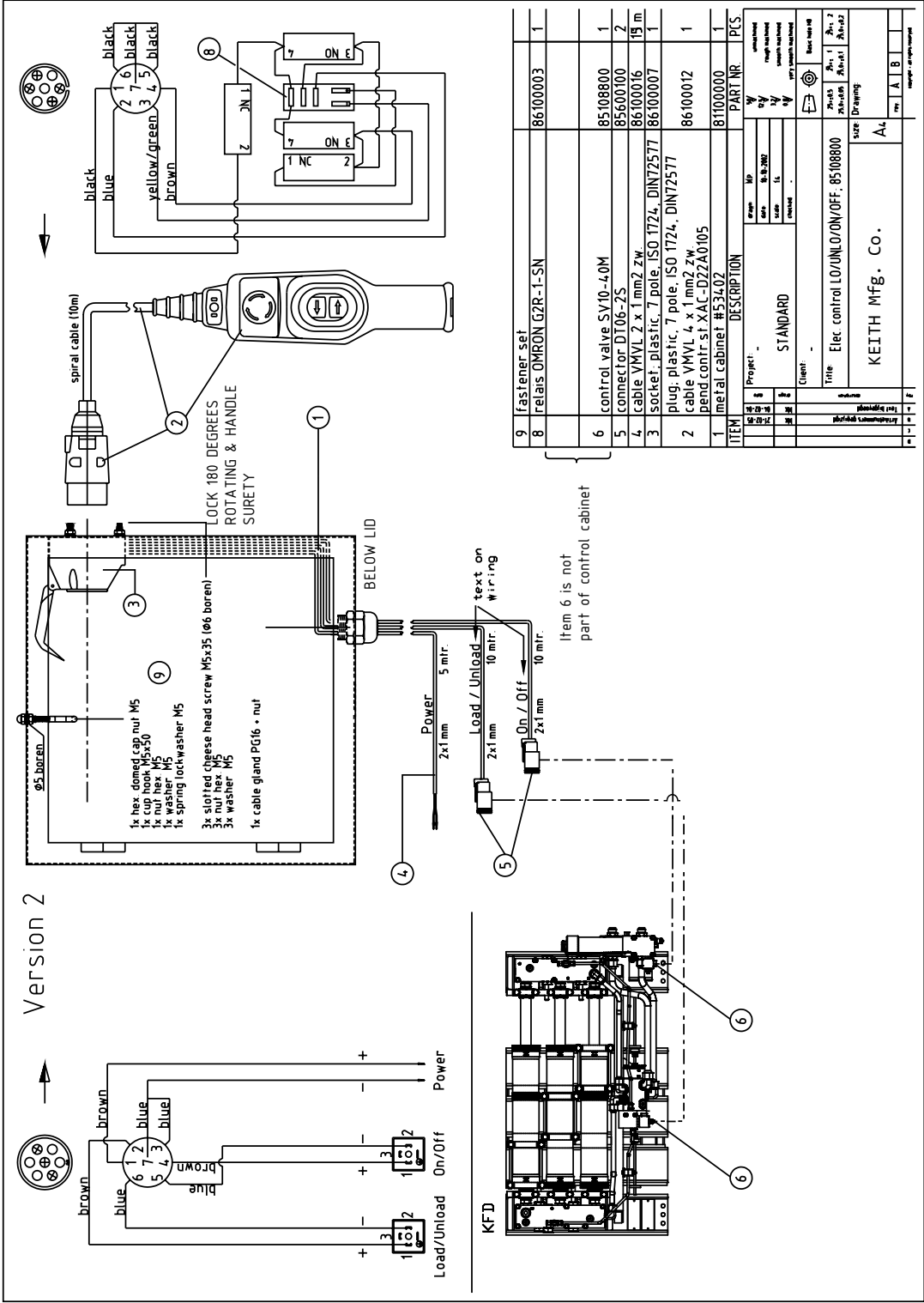
The system with an optional KEITH® electrical control box is provided with an emergency stop push button. If a dangerous situation arises during the operation of the floor it can be stopped immediately with the emergency stop.

In case of an interruption in the electrical power supply, the system can be switched on/off manually. Operate the handle on the electric on/off valve between the pressure and return connection.

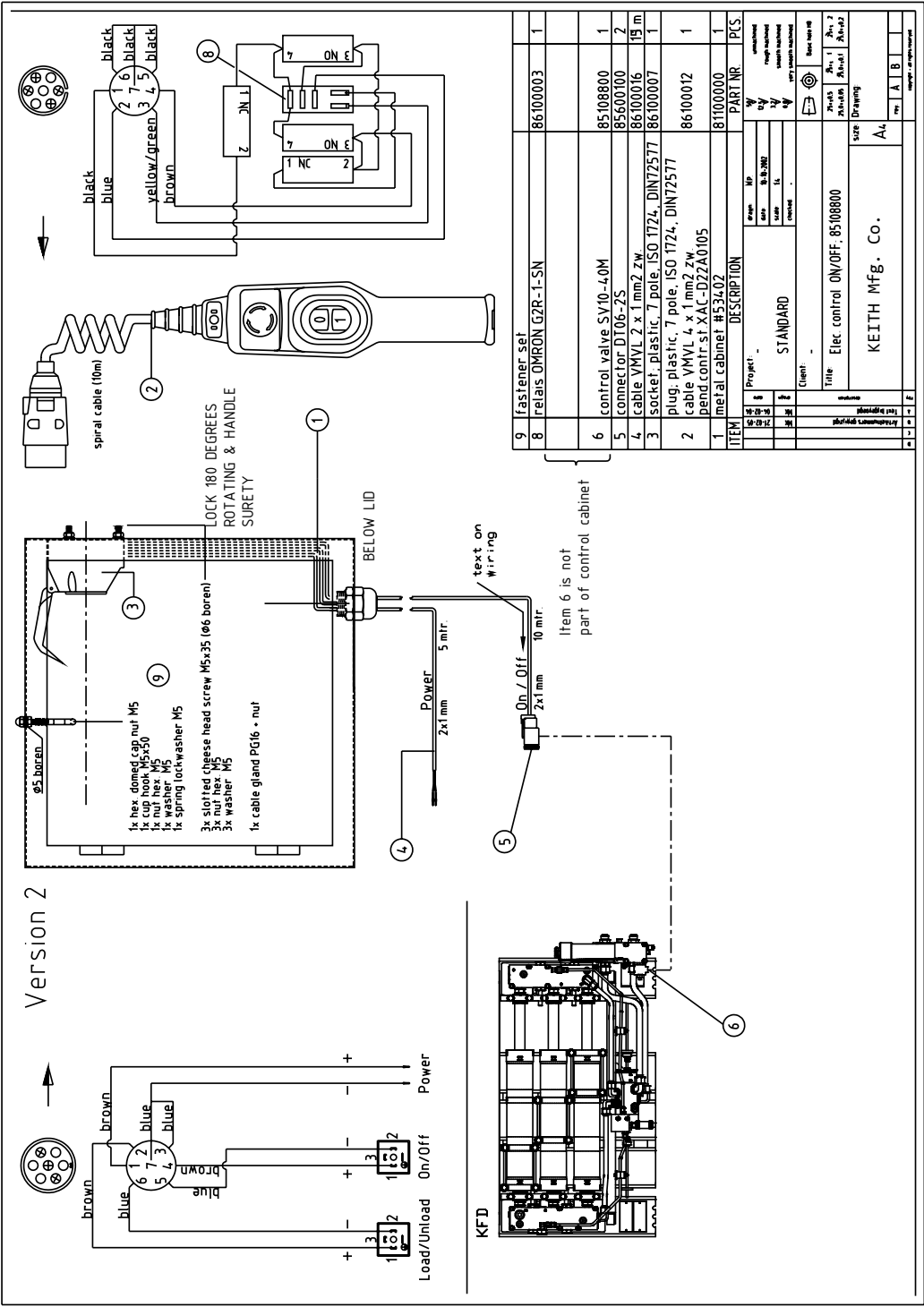
Switching off

1. Stop the floor
2. Switch the PTO off and uncouple the quick couplings, if necessary

4.2.1 Electrical control Load / Unload / On / Off



4.2.2 Electrical control On / Off



WARNING:

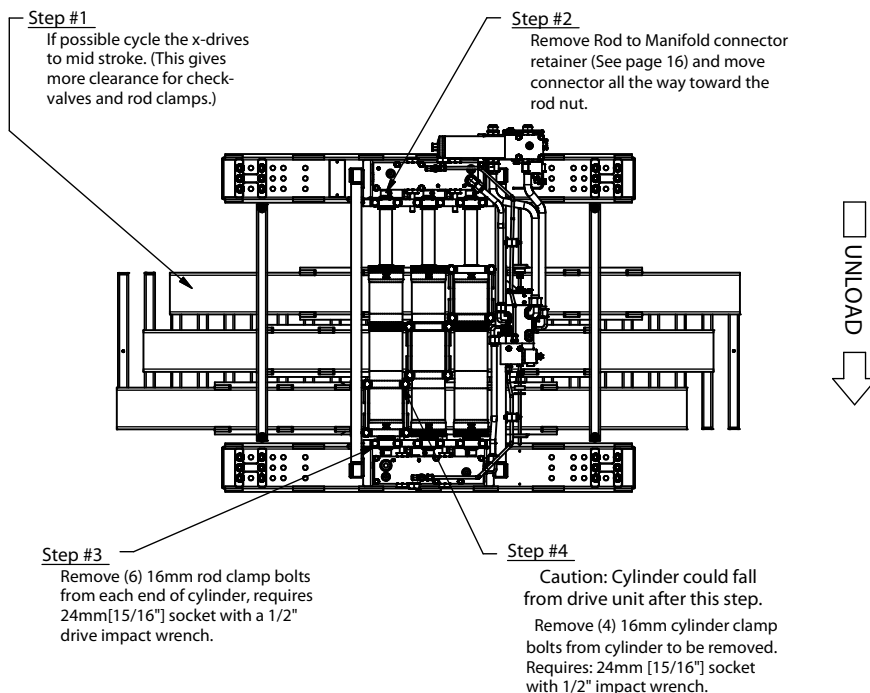
The large force and pressure caused by the hydraulic forces in the system can cause serious injuries. Always switch off the pump during maintenance or service work.

5.1 The cylinder

The three cylinders are the drive elements in the KEITH® WALKING FLOOR® system.

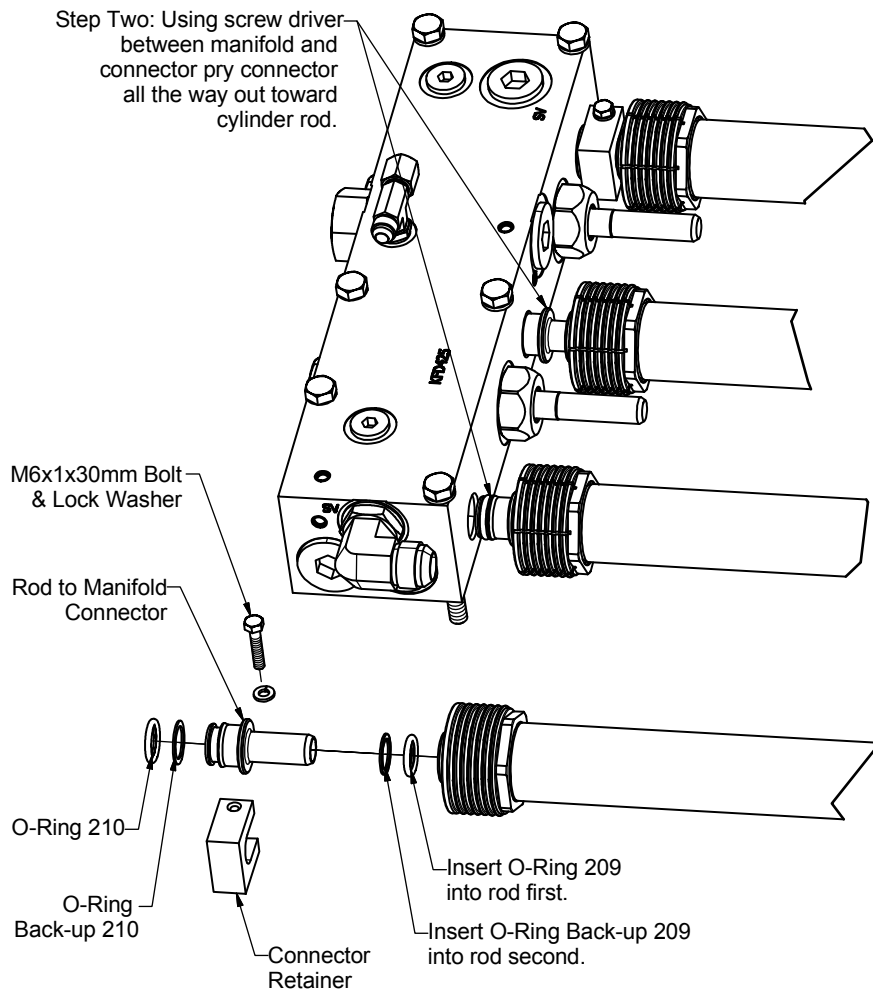
The cylinders are attached to the frame with a clamp on each end of the rod. Each cylinder is attached to a cross drive with two clamps. The clamp attached to the cross drive over the grooved portion of the cylinder is a larger diameter than the clamp over the smooth portion of the cylinder. (See Replacing a cylinder figure 5.1a, 5.1b and 5.1c)

Figure 5.1a:
Replacing a cylinder (Removing)



After replacement of a cylinder, followed by a full sequence of loading and/or unloading at full load:

- ✓ Check the torque of the bolts with which the rod is attached to the frame
- torque 244 Nm [180 ft/lbs]
- ✓ Check the torque of the bolts in the cylinder clamps - torque 183 Nm [135 ft/lbs]
- ✓ Check the system for leaks.

Replacing a cylinder figure 5.1b

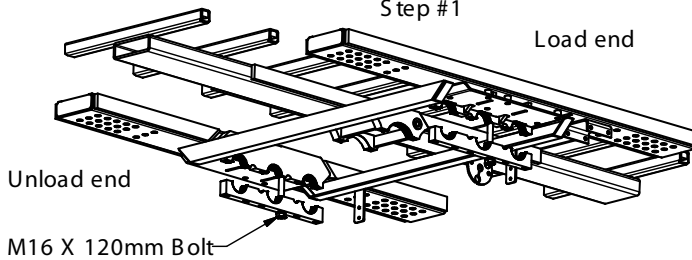
Replacing a cylinder figure 5.1c

Replacing a Cylinder Procedure: For clarification when installing in trailer, procedure is shown with bare frame, one cross-drive and one cylinder.

Stationary Rod Nut with no slots to unload end

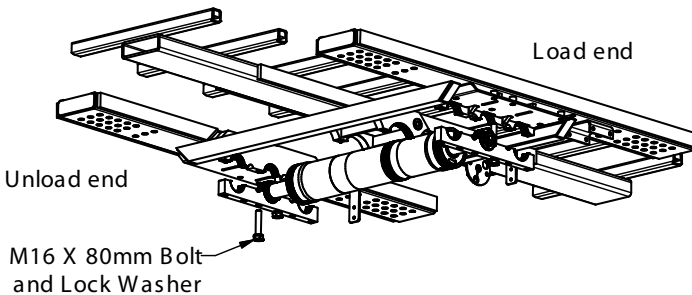
Adjustable Rod Nut with slots to load end

Step #1



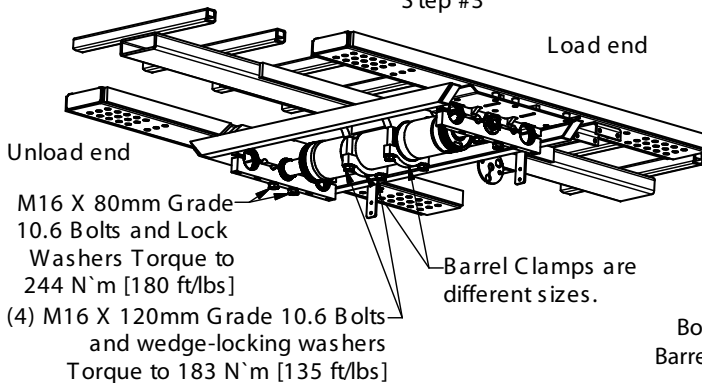
Step #1: Install Lower Rod Clamp using (1) of the M16 X 120mm Barrel Clamp Bolts to make cradle to hold Cylinder while adjusting the barrel location and the adjustable rod nut.

Step #2



Step #2: Lay the Cylinder in the rod clamps with the stationary Rod nut to the unload end of drive. Raise the lower rod clamp up on the unload end and screw the M16 X 80mm bolt and lock washer loosely into rod clamp. Take out the M16 X 120mm bolt and replace it with the M16 X 80mm bolt and screw in loosely, so the grooves inter lock and you are still able to raise the load end of the cylinder up and down to adjust the barrel location and the adjustable rod nut.

Step #3



Step #3 Raise the load end of cylinder to check the alignment of Barrel and Adjustable Rod Nut. Using a Rubber Mallet move the Barrel to align with cross-drive barrel clamp and rotate the adjustable rod nut to align with rod clamp. The alignment has to be so grooves are mated precisely. Screw in M16 X 80mm bolt and lock washer and replace M16 X 120mm with 80mm bolt. Torque Rod Clamp Bolts to 244 N·m [180 ft/lbs] and torque Barrel Clamp Bolts to 183 N·m [135 ft/lbs].

5.2 The check valve

The four check valves are the sensors of the KEITH® WALKING FLOOR® system. The check valve detects when the cylinder has reached the end of its stroke and opens in order to allow the oil from the following cylinder to flow to the reservoir. The check valves are located in the front and rear manifolds.

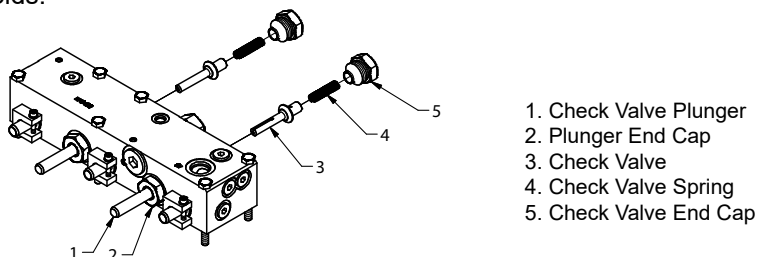


Figure 5.2: The check valves and the manifold

5.3 The switching valve

The only function of the switching valve is to change the pressure from one side of the cylinders to the other side. This ensures that the cylinders move in the opposite direction. The switching valve is mechanically operated at the end of the stroke of cylinder No.1 and cylinder No. 3.

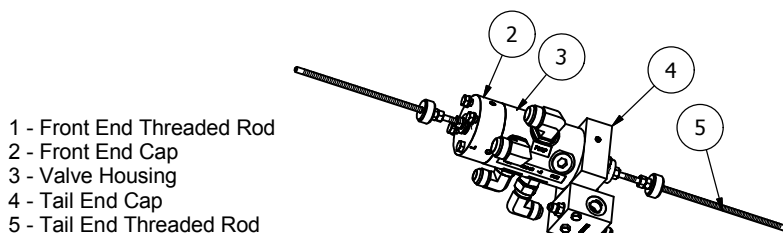


Figure 5.3: The Switching Valve

5.4 The On / Off valve

The valve, manually and/ or electrically operated, sets the floor in operation. In the <OFF> position the oil flows via the valve directly back to the reservoir. The system will not operate if the pressure and return plumbing is not correctly connected.

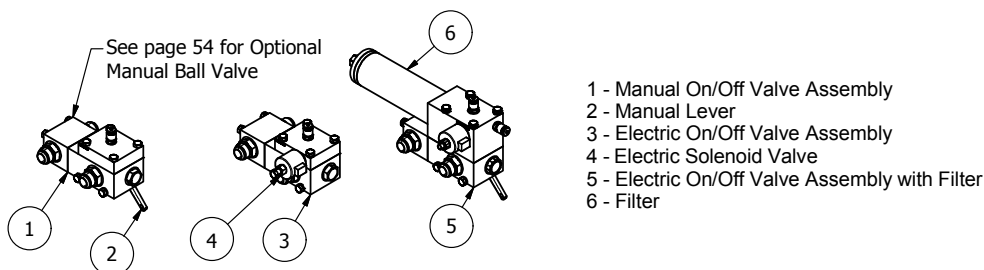


Figure 5.4: The On/Off Valve

Note: Need to order Solenoid separately.
Not included in assembly.

5.5a The Manual Control (Load/Unload) Valve

This valve, which is manually operated, determines the direction of movement of the system. The valve has two positions:

- Turn Clockwise ; unloading
- Turn Counter Clockwise; loading.

Before the floor system is started the correct direction must be set.

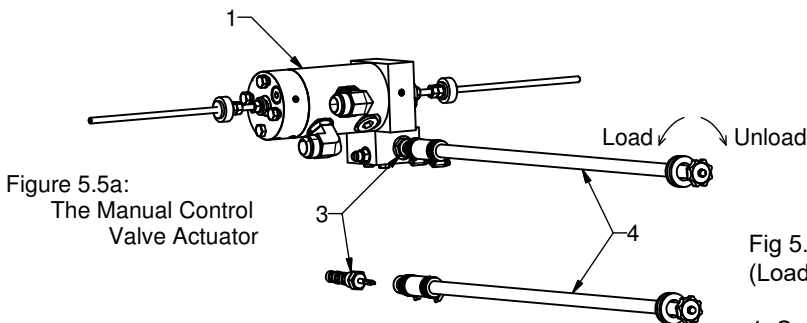


Figure 5.5a:
The Manual Control
Valve Actuator

Fig 5.5a Manual Control
(Load/Unload) Valve

1. Switching Valve
2. Load/Unload Switching
Valve End Cap
3. Manual Cartridge Valve
4. Manual Control Handle

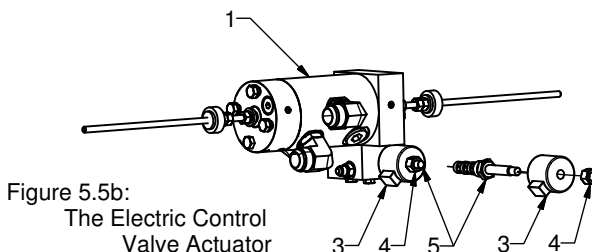


Figure 5.5b:
The Electric Control
Valve Actuator

Fig 5.5b Electric Control
(Load/Unload) Valve

1. Switching Valve
2. Load/Unload Switching
Valve End Cap
3. Electric Coil
4. Retainer Nut
5. Electric Cartridge Valve

5.5b Electric Control (Load/Unload) Valve

This valve, which is electrically operated, determines the direction of movement of the system. The valve has two positions:

- No power: Unloading
- Power: Loading

Manual override:

Red knob in: Unloading

Red knob out: Loading

5.6 The Control Valve and the Restrictor Valve

When the Control Valve Actuator is in the Unload Position

The Manifold on the load end has the control valve in the closed position and the restrictor valve in the open position. The manifold on the unload end has the control valve in the open position and the restrictor valve in the closed position.

When the Control Valve Actuator is in the Load Position

The manifold on the load end has the control valve in the open position and the restrictor valve in the closed position. The manifold on the unload end has the control valve in the closed position and the restrictor valve in the open position.

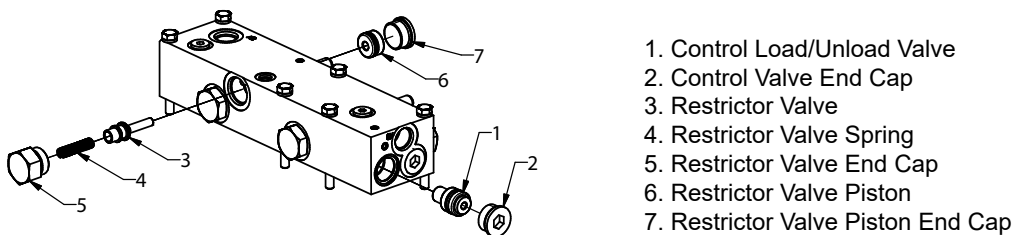


Fig. 5.5c: Control Valve & Restrictor Valve

5.7 The Hydraulic Plumbing

A considerable part of the hydraulic circuit is internal; the external plumbing for both manual and electrical operation are shown on page 41. When work is being carried out on the system, make sure that all couplings, covers and plugs make a good seal ("O" – ring or flat seal).

6. WALKING FLOOR® KFD-Series system maintenance



WARNING: The large force and pressure can cause serious injuries. Always switch off the pump during maintenance or service work.

Two conditions that extend the life of the KEITH® WALKING FLOOR® system are:

Clean oil, free from contamination

Correct torque for the bolts. The bolts of the cylinder clamps and of the floor profiles must be checked regularly.

The following maintenance must be carried out:

after the system has been working for six hours of operation and then every six months or after every 150 operating hours, whichever is sooner.

1. General inspection of the system and the floor.
 - Inspect the system for damage.
 - Check for oil leaks.
 - Check the system for smooth operation.
 - Check the temperature. No single part may be warmer than 60°C (it must be possible to touch all parts with the bare hand).
2. Change the oil filters if the optional filter is used.
 - a. Filter in the return plumbing of the hydraulic installation.
 - b. Filter in the pressure plumbing (FA 20ME MXW2-GDL20, 20 microns).
 - Unscrew the filter housing. Clean up any oil that has leaked. Fit a new filter.
3. Check the torque of the cylinder bolts.
 - a. Cylinder clamps: Torque: 183 Nm. [135 ft/lbs]
 - b. Bolts which connect the cylinder to the frame : 244 Nm [180 ft/lbs]

7. KFD-Series Troubleshooting



WARNING: The large force and pressure can cause serious injuries. Always switch off the pump during maintenance or service work.

If you experience problems with the operation of your KEITH® *WALKING FLOOR*® system, this section can help you to find a solution and to make small adjustments. Before you go further, first check whether one of the following most frequently encountered problems is applicable:

- oil*	is the reservoir full?
- pump*	does it pump the necessary quantity of oil at 250 bar [3625 PSI]?
- connections*	is the system connected as shown in the hydraulic diagram (Fig. 3.1)?
- pressure relief valve*	is this adjusted to 210 bar [3045 PSI] for the ø108mm [ø4.25"] or 250 bar [3625 PSI] for the ø101mm [ø4"]
- PTO*	is this switched on?
- quick couplings	are they properly connected?
- on/ off valve	is this on?
- electrical operation	is there sufficient voltage? is the emergency push-button pulled out?

* see the specification for the hydraulic installation (Page 8).

IMPORTANT: When you perform welding on the system, the part on which welding is performed must be directly connected to earth (properly grounded.)

N.B.: Cylinder 1 is the cylinder on the driver's side, for vehicles driving on the right.

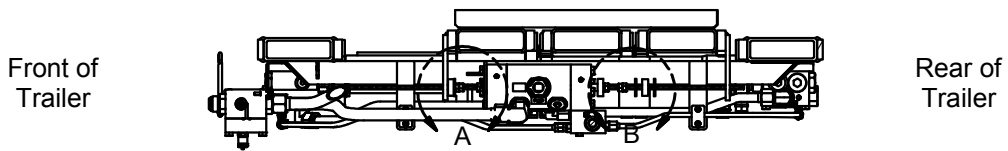


Fig. 7.01

Note: This view is from the drivers 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

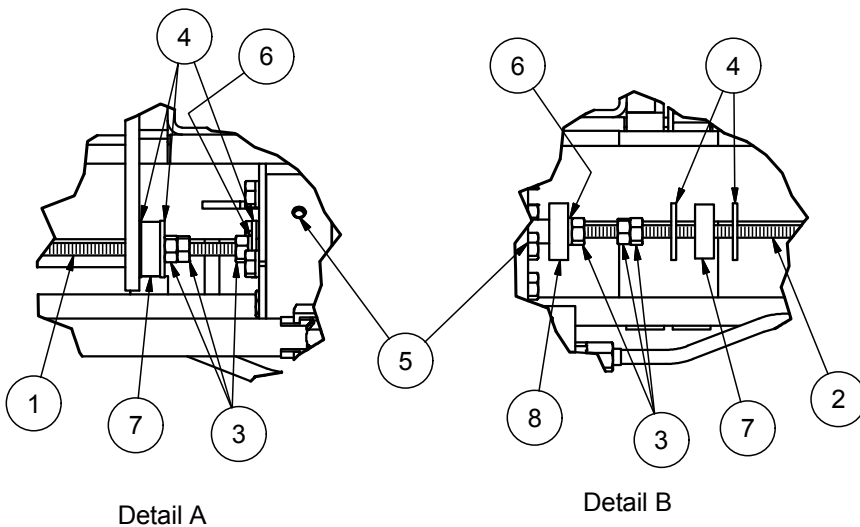


Fig. 7.02

Switching Valve Adjustment

Tools needed: (2) 17mm open-end wrenches

Most switching valves are changed because they are out 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. Move the ball valve handle toward the outside of the trailer, which will allow the hydraulic oil to by-pass the drive unit.
2.	Loosen the M10 nuts located on the threaded rods on each end of the switching valve. On each threaded rod there are two flat washers and a rubber grommet. The M10 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 P.T.O. Let the clutch out slowly. Move the ball valve handle toward the center of the trailer. 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 move the ball valve handle toward the outside 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 P.T.O.
5.	Push the threaded rod in the direction that the cylinders are bottomed. Slide the washers and rubber grommet out toward the loop on the cross drives. Turn the M10 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 lock the two tighter, setting the jam nuts.
6.	Engage P.T.O.
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 move the ball valve handle to the outside of the trailer.
8.	Disengage P.T.O.
9.	Slide the washers and rubber grommet out toward the loop on the cross drives. Turn the M10 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 lock the two tighter, setting the jam nuts.

The switching valve adjustment is completed.

Troubleshooting the Switching Valve

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:	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.
Problem:	All three cylinders move toward the rear of the trailer; then the system stops.
Cause:	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.
Problem:	Floor runs fine empty or with a light load, but will not cycle with a heavy load.
Cause:	The nuts on the threaded rod are slightly out of adjustment, or there is not enough hydraulic pressure. (See note.)
Solution:	Break the two nuts apart and adjust them away from the Switching Valve body.
Problem:	After installing a new switching valve, the floor will not move.
Solution:	The switching valve is out of adjustment or the new-style switching valve will not work if the pressure and return lines are backward.
Problem:	The cross-drives cycle to the front correctly—cross-drive (#1), followed by (#2) then (#3). Then, as all three cross-drives begin to move toward the rear, (#3) cross-drive and cylinder move two to three inches back and forth.
Solution:	The switching valve loop on the cross-drive is bent and binding against the threaded rod. Bend the loop away from the threaded rod so that it will enable the threaded rod to travel freely.

***Note:** (If floor stops in the full rear position and the switching valve has switched, you may not have enough oil pressure. Less pressure is required to move the load than to pull the slats 1/3 at a time under the load.)

Troubleshooting Check Valves

The internal check valve is designed to vent oil from the return side of the cylinder. It does not direct pressurized oil into the cylinder.

Unloading

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:	Rebuild or replace the check valve.
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:	Rebuild or replace the check valve.
Problem:	All three cylinders extend together toward the front of trailer.
Cause:	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:	Rebuild or replace the check valves or Control Valve.

Loading

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:	Rebuild or replace the check valve.
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:	Rebuild or replace the check valve.
Problem:	All three cylinders extend together toward the rear of trailer.
Cause:	The checks 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.
Solution:	Rebuild or replace the check valves or control valve.

See page 18

The check valves at the rear of the cylinders (discharge end) do nothing when you are unloading. The check valves at the rear are used for loading only.

Note: When empty, some trailers will cycle in sequence forward 1-2-3, then back 3-2-1, (instead of all slats moving back together.) This is not a malfunction; no repairs are needed. When a load is put on a trailer, the drag will cause the floor to sequence properly.

7.1 Emergency Provision

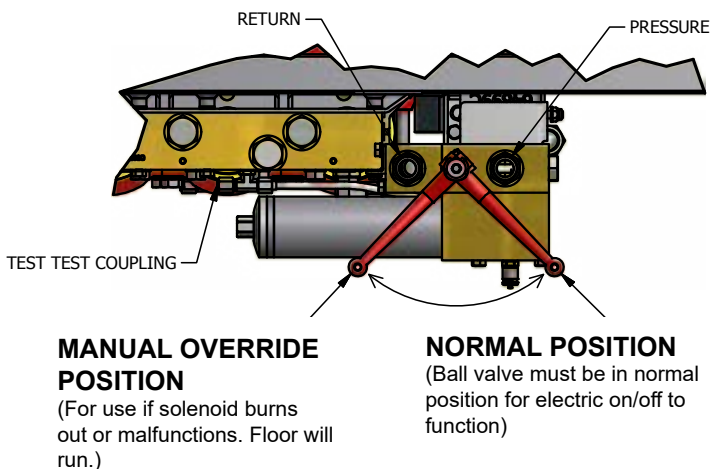
The Electric On / Off valve:

The on/ off valve, controlled electrically, starts and stops the operation of the floor. In the <OFF> position, the oil flows via the valve directly back to the oil reservoir. NOTE: The system will not work if the pressure- and return hydraulic piping are not correctly connected.

Problem : It is not possible to control the electric on/ off valve.

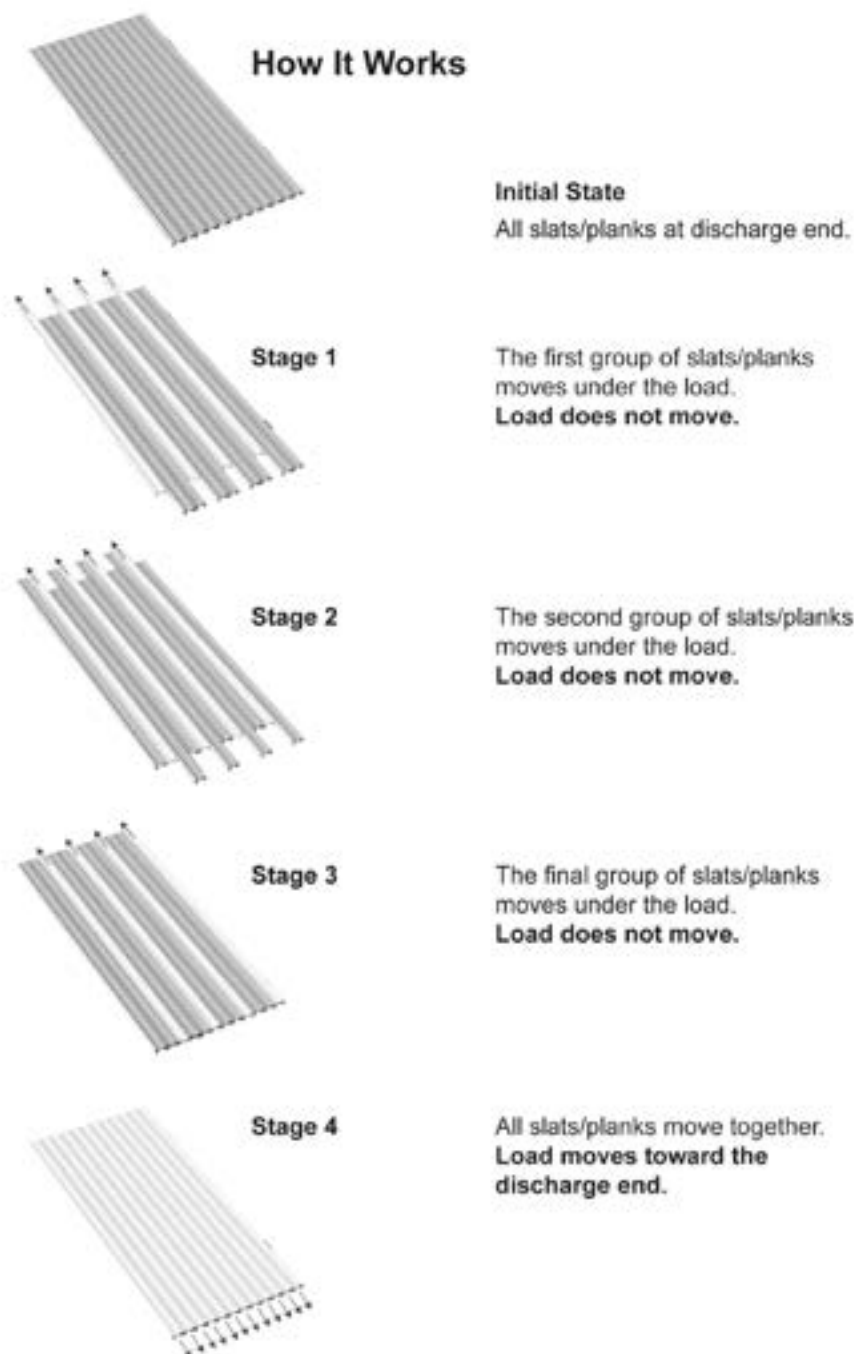
Solution : Place the red handle so it is pointing to the center of the trailer; in other words the manual override position (see figure 7.2). The oil shall now flow directly through the system. The floor will start moving if the pump is switched on. The system will now unload. The floor can be switched into the loading direction by pressing and turning the red button of the coil of the electric control valve. By pressing and turning the red button to the right, the floor will unload again. This will only work when there is no electric power on the coil of the electric load / unload valve. If the red handle is placed in its normal position, meaning pointing toward the outside of the trailer, then the oil flow is blocked and the floor movement will stop.

Figure 7.1 : The electric on / off



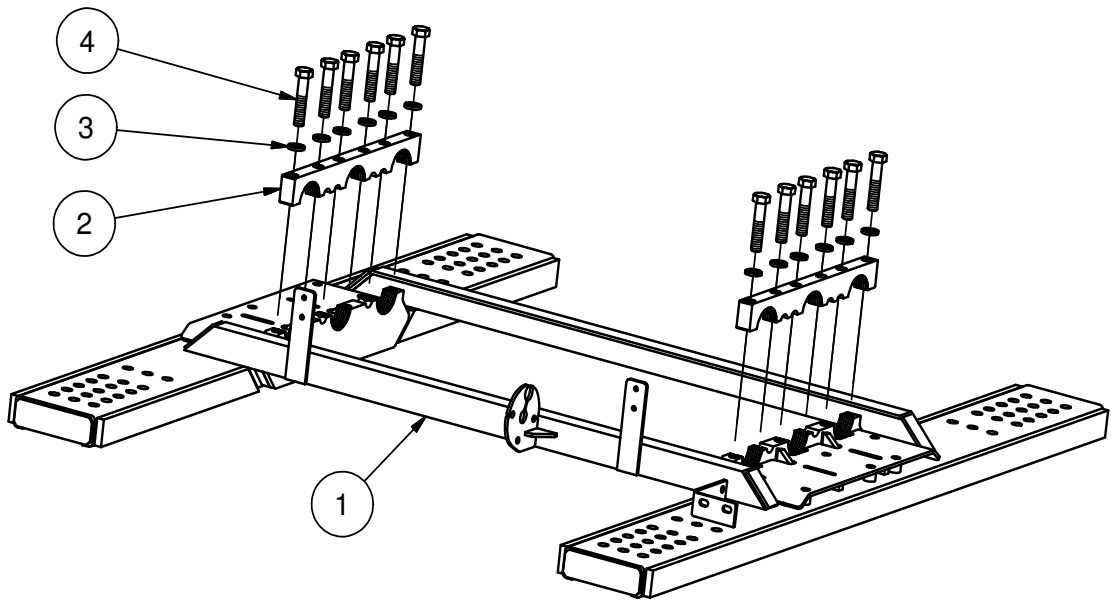
MANUAL OVERRIDE Button

Press button in and turn clockwise for electric, or turn counter clockwise and pull out for manual.

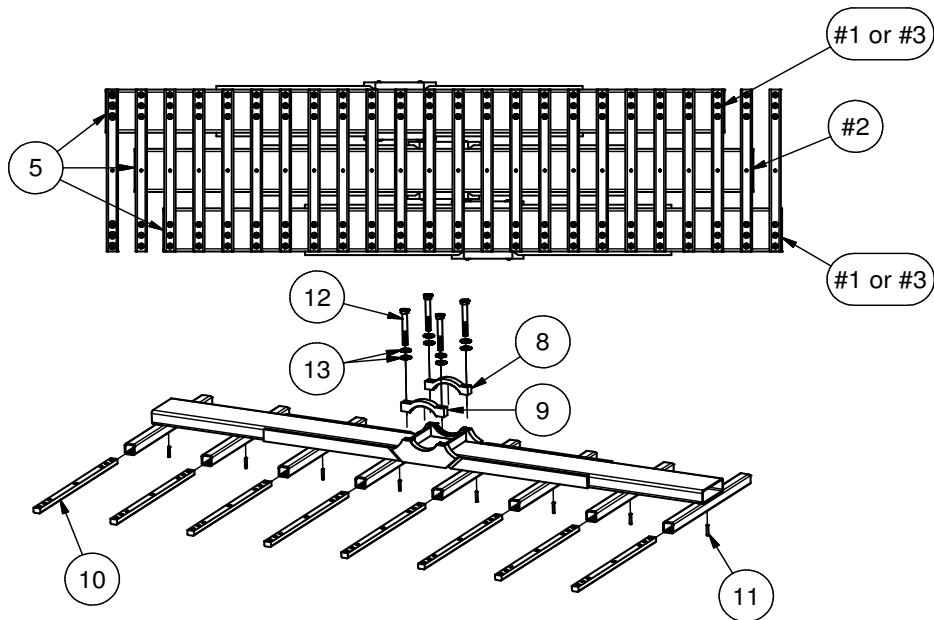


(Stages 1, 2 & 3 require more pressure than stage 4.)

KFD-Series Drive Assembly



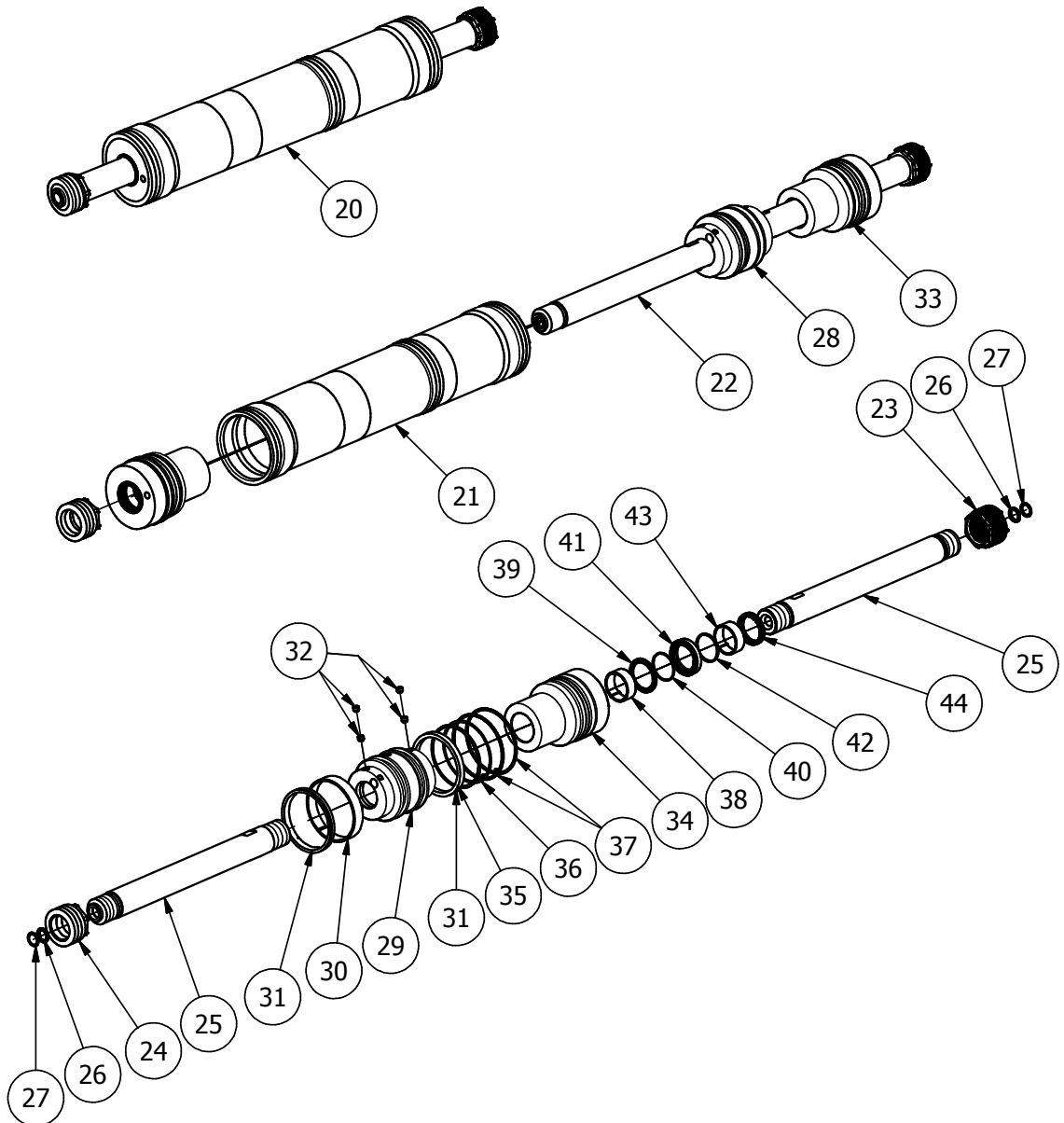
Drive Assembly			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
-	1	Drive Assembly	-
-	1	Drive Assembly 400	05902402
-	1	Drive Assembly 425	06199002
1	1	KFD 400 Drive	05902401
1	1	KFD 425 Drive	06099001
2	2	Clamp Lower Rod KFD 400	06231401
2	2	Clamp Lower Rod KFD 425	06200901
3	12	Washer Lock M16	87078000
4	12	Bolt Hex M16mmx2x80mm Gr. 10.9	87017010

KFD-Series Cross-Drives Parts List

Cross-Drives available only in multiples of 3 ie: 21, 24, 27 Metric or SAE.

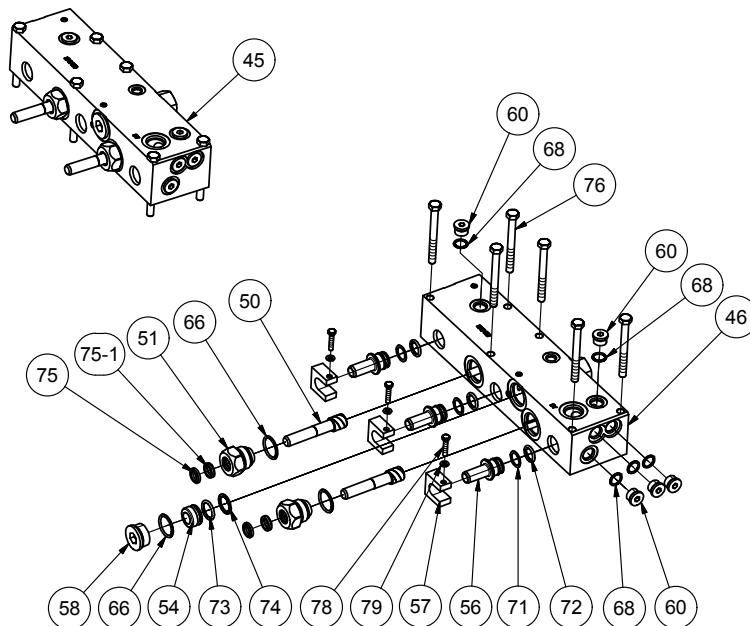
Cross-Drive Assembly			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
5	1	Cross-Drive 21 Slat KFD 400 97mm Flooring Set	06087803
		Cross-Drive 21 Slat KFD 400 97mm Flooring Set #1 & #3	06087801
		Cross-Drive 21 Slat KFD 400 97mm Flooring Set #2	06087802
5	1	Cross-Drive 24 Slat KFD 400 97mm Flooring Set	05836802
		Cross-Drive 24 Slat KFD 400 97mm Flooring Set #1 & #3	05836402
		Cross-Drive 24 Slat KFD 400 97mm Flooring Set #2	05836502
5	1	Cross-Drive 27 Slat KFD 400 97mm Flooring Set	05963903
		Cross-Drive 27 Slat KFD 400 97mm Flooring Set #1 & #3	05963901
		Cross-Drive 27 Slat KFD 400 97mm Flooring Set #2	05963902
5	1	Cross-Drive 21 Slat KFD 400 112mm Flooring Set	06202803
		Cross-Drive 21 Slat KFD 400 112mm Flooring Set #1 & #3	06202801
		Cross-Drive 21 Slat KFD 400 112mm Flooring Set #2	06202802
5	1	Cross-Drive 21 Slat KFD 400 SAE Flooring Set	05964003
		Cross-Drive 21 Slat KFD 400 SAE Flooring Set #1 & #3	05964001
		Cross-Drive 21 Slat KFD 400 SAE Flooring Set #2	05964002
5	1	Cross-Drive 24 Slat KFD 400 SAE Flooring Set	06119503
		Cross-Drive 24 Slat KFD 400 SAE Flooring Set #1 & #3	06119501
		Cross-Drive 24 Slat KFD 400 SAE Flooring Set #2	06119502
5	1	Cross-Drive 27 Slat KFD 400 SAE Flooring Set	06121303
		Cross-Drive 27 Slat KFD 400 SAE Flooring Set #1 & #3	06121301
		Cross-Drive 27 Slat KFD 400 SAE Flooring Set #2	06121302
5	1	Cross-Drive 21 Slat KFD 425 97mm Flooring Set	06246103
		Cross-Drive 21 Slat KFD 425 97mm Flooring Set #1 & #3	06246101
		Cross-Drive 21 Slat KFD 425 97mm Flooring Set #2	06246102
5	1	Cross-Drive 24 Slat KFD 425 97mm Flooring Set	06200103
		Cross-Drive 24 Slat KFD 425 97mm Flooring Set #1 & #3	06200101
		Cross-Drive 24 Slat KFD 425 97mm Flooring Set #2	06200102
5	1	Cross-Drive 27 Slat KFD 425 97mm Flooring Set	06203003
		Cross-Drive 27 Slat KFD 425 97mm Flooring Set #1 & #3	06203001
		Cross-Drive 27 Slat KFD 425 97mm Flooring Set #2	06203002
5	1	Cross-Drive 21 Slat KFD 425 112mm Flooring Set	06201903
		Cross-Drive 21 Slat KFD 425 112mm Flooring Set #1 & #3	06201901
		Cross-Drive 21 Slat KFD 425 112mm Flooring Set #2	06201902
5	1	Cross-Drive 21 Slat KFD 425 SAE Flooring Set	06246203
		Cross-Drive 21 Slat KFD 425 SAE Flooring Set #1 & #3	06246201
		Cross-Drive 21 Slat KFD 425 SAE Flooring Set #2	06246202
5	1	Cross-Drive 24 Slat KFD 425 SAE Flooring Set	06234403
		Cross-Drive 24 Slat KFD 425 SAE Flooring Set #1 & #3	06234401
		Cross-Drive 24 Slat KFD 425 SAE Flooring Set #2	06234402
5	1	Cross-Drive 27 Slat KFD 425 SAE Flooring Set	06234503
		Cross-Drive 27 Slat KFD 425 SAE Flooring Set #1 & #3	06234501
		Cross-Drive 27 Slat KFD 425 SAE Flooring Set #2	06234502
5	1	Cross-Drive 18 V-Slat, KFD425-LG, 5.25" Flooring Set	06494803
		Cross-Drive 18 V-Slat, KFD425-LG, 5.25" #1 & #3	06494801
		Cross-Drive 18 V-Slat, KFD425-LG, 5.25" #2	06494802
-	-	Includes items 6-11	-
8	3	Clamp KFD 400 Lower Cross-Drive Grooved	05731601
8	3	Clamp KFD 425 Lower Cross-Drive Grooved	06200701
9	3	Clamp KFD 400 Lower Cross-Drive Smooth	05739501

9	3	Clamp KFD 425 Lower Cross-Drive Smooth	06200801
10	24	Bolt Bar Drive Shoe KFD	05755202
11	24	Roll Pin 1/4"x 1/2"	86651450
12	12	Bolt Hex M16x2x120mm Gr. 10.9	87018510
13	12	Washer Wedge Locking M16	86559090

KFD-Series Cylinder Assembly

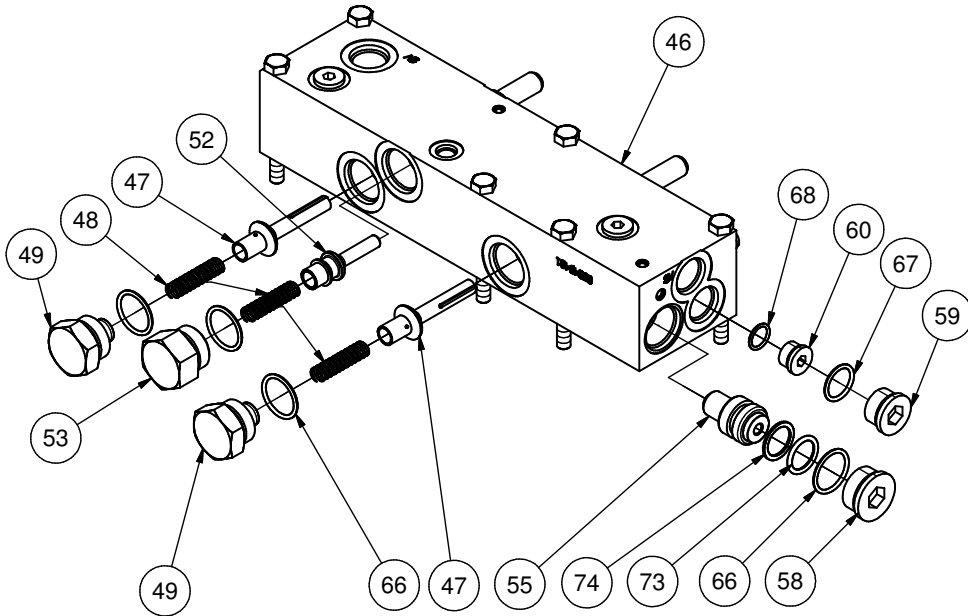
Cylinder Assembly			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
20	1	Cylinder 400 Assembly	05821201
20	1	Cylinder 425 Assembly	06201001
-	-	Includes items 21-40	-
21	1	Barrel 400 Cylinder	05754201
21	1	Barrel 425 Cylinder	06201101
22	1	Rod W/Piston & Head KFD 400 Assembly	06032901
22	1	Rod W/Piston & Head KFD 425 Assembly	06247601
-	-	Includes items 23-28	-
23	1	Nut Rod Adjustable	05730101
24	1	Nut Rod Stationary	05732001
25	2	Rod 45mm	05828002
26	2	O-Ring 209	84380000
27	2	O-Ring Back-up 209	84390400
28	1	Piston 400 Assembly Cylinder	05852301
28	1	Piston 425 Assembly Cylinder	06201301
-	-	Includes items 29-32	-
29	1	Piston 400 Cylinder	05754101
29	1	Piston 425 Cylinder	06201401
30	1	Wear Ring Piston Cylinder 400	84405400
30	1	Wear Ring Piston Cylinder 425	84403852
31	2	Seal Piston Cylinder 400	84352500
31	2	Seal Piston Cylinder 425	84352510
32	4	Set Screw Cup Point M10x1.5x8mm	87007990
33	2	Head 400 Assembly Cylinder	05842801
33	2	Head 425 Assembly Cylinder	06201501
-	-	Includes items 34-40	-
34	1	Head 400 Cylinder	05729901
34	1	Head 425 Cylinder	06201601
35	1	O-Ring 240 (KFD 400)	84385000
35	1	O-Ring 242 (KFD 425)	84385230
36	1	O-Ring Backup 8-240 (KFD 400)	84393200
36	1	O-Ring Backup 8-242 (KFD 425)	84393230
37	2	Lock Wire 400 Head Cylinder	03812107
37	2	Lock Wire 425 Head Cylinder	06201701
38	1	Wear Ring Rod Cylinder 45mm	84401105
39	1	Buffer Seal Rod Cylinder 45mm	84400201
40	1	Buffer Seal Back-Up Rod Cylinder 45mm	w/Buffer Seal
41	1	Seal Rod Cylinder 45mm	84354200
42	1	Seal Back-Up Rod Cylinder 45mm	w/Seal
43	1	PTFE Wear Ring Rod Cylinder 45mm	84401205
44	1	Wipe Rod Cylinder 45mm	84426605
	1	Seal Kit 400 Cylinder	06076701
	1	Seal Kit 425 Cylinder	06201801
-	-	Includes items 30, 31 & 35-40	-

KFD-Series Manifold Assembly - Inside Detail



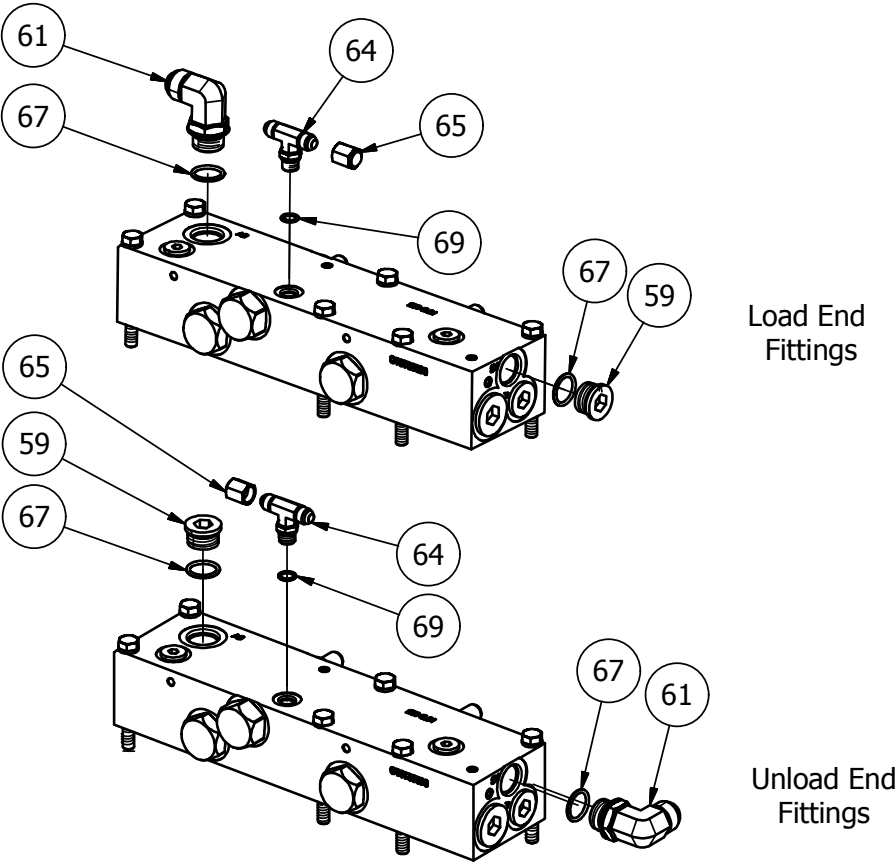
Manifold Assemblies Inside Detail			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
45	2	Manifold Assembly KFD 400	05849402
45	2	Manifold Assembly KFD 425	06202001
-	-	Includes items 46, 50, 51, 54, 56-58, 60, 66, 68, 70-79	-
46	1	Body Manifold KFD 400	05849401
46	1	Body Manifold KFD 425	06202101
50	2	Plunger Check Valve	06970701
51	2	End Cap Plunger Check Valve	06969801
54	1	Piston Restrictor Valve	05793301
56	3	Rod/Manifold Connector	05828201
57	3	Rod/Manifold Connector Retainer	05828301
58	2	6409-16 M O-Ring Socket Plug	84687900
60	6	6409-08 M O-Ring Socket Plug	84687500
66	7	O-Ring 916	84387800
68	6	O-Ring 908	84387000
71	3	O-Ring 210	84380200
72	3	O-Ring Backup 8-210	84390600
73	2	O-Ring 213	84381200
74	2	O-Ring Backup 8-213	84391200
75	2	Plunger Wiper Check Valve External	84426800
75-1	2	Seal Rod 5/8" Check Valve	84352200
76	6	Bolt Hex M10x1.5x100mm Gr. 10.9	87011000
	1	Seal Kit Manifold (includes 66-75)	06074501
78	3	Bolt hex M6x30mm	87004100
79	3	Washer Lock M6	87004130

KFD-Series Manifold Assembly - Outside Detail

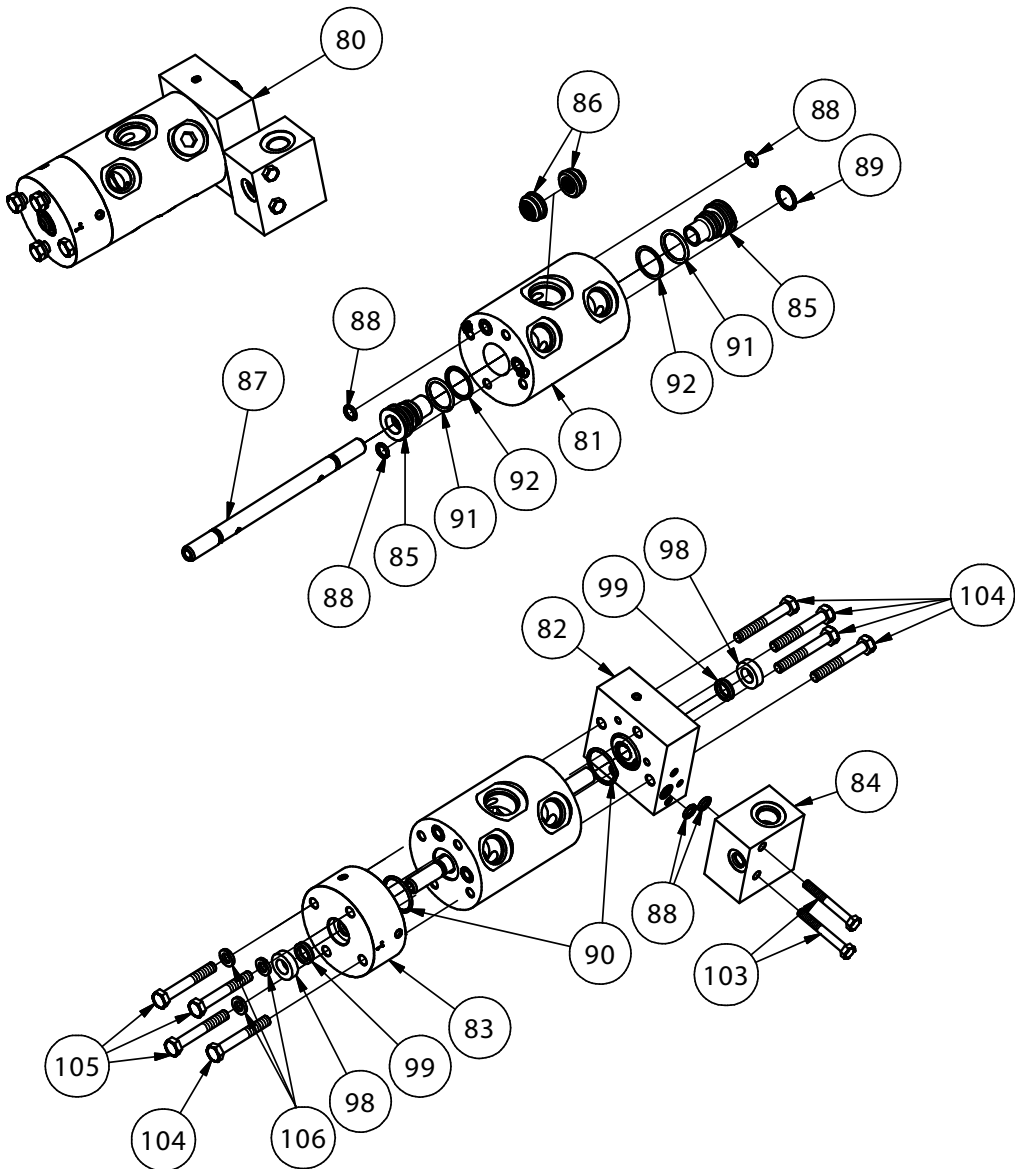


Manifold Assembly Outside Detail			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
46	1	Body Manifold KFD 400	05849401
46	1	Body Manifold KFD 425	06202101
47	2	Rod Check Valve External	01766901
48	3	Spring Check Valve External Large #B-18273	84453400
49	2	End Cap Spring Check Valve	05754801
52	1	Restrictor Valve	05793401
53	1	End Cap Spring Restrictor Valve	05849001
55	1	Control Valve	05849801
58	2	6409-16 M O-Ring Socket Plug	84687900
59	2	6409-12 M O-Ring Socket Plug	84687700
60	6	6409-08 M O-Ring Socket Plug	84687500
66	7	O-Ring 916	84387800
67	3	O-Ring 912	84387400
68	6	O-Ring 908	84387000
73	2	O-Ring 213	84381200
74	2	O-Ring Backup 8-213	84391200
75	-	Check Valve Assembly	07335401
-	-	Includes items 47-51, 66, 75 + 75-1	-

KFD-Series Manifold Assembly - Fittings

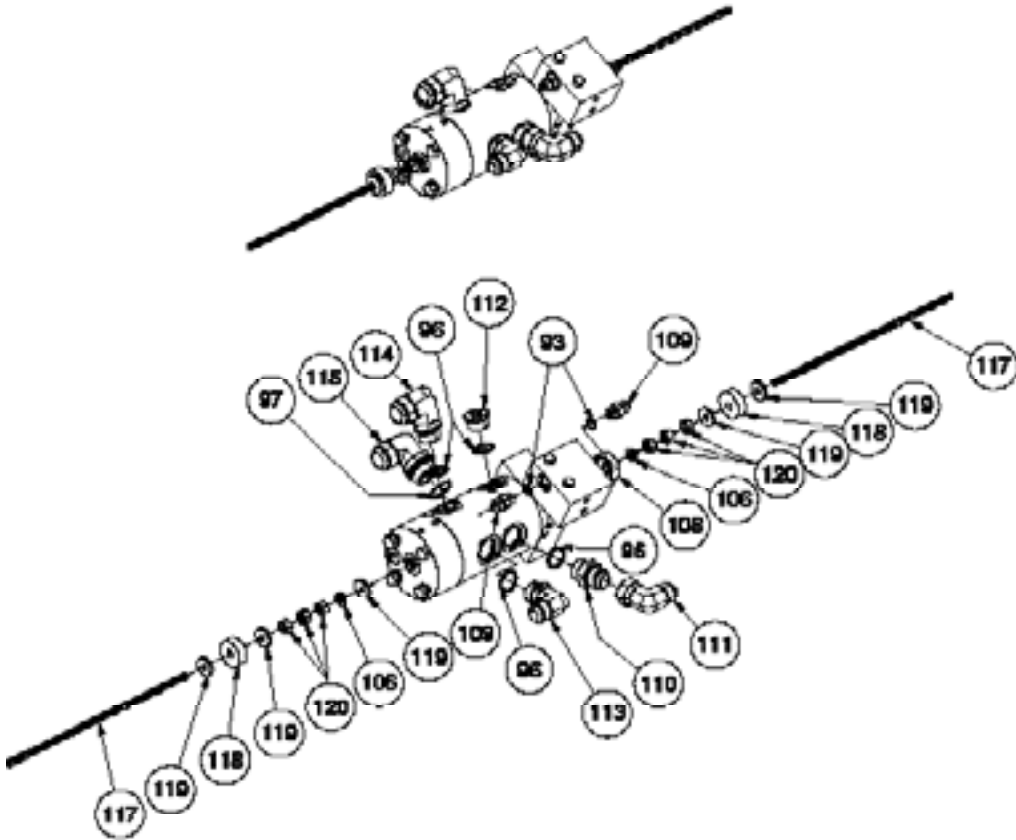


Manifold Assemblies Fittings			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
59	1	6409-12 M O-Ring Socket Plug	84687700
61	1	6801-12-12 90°	84691500
64	1	6803-6-6-6 Branch Tee	84692000
65	1	Nut Cap 304C-6	84703300
67	2	O-Ring 912	84387400
69	1	O-Ring 906	84386800

KFD-Series Switching Valve Assembly - Inside Detail

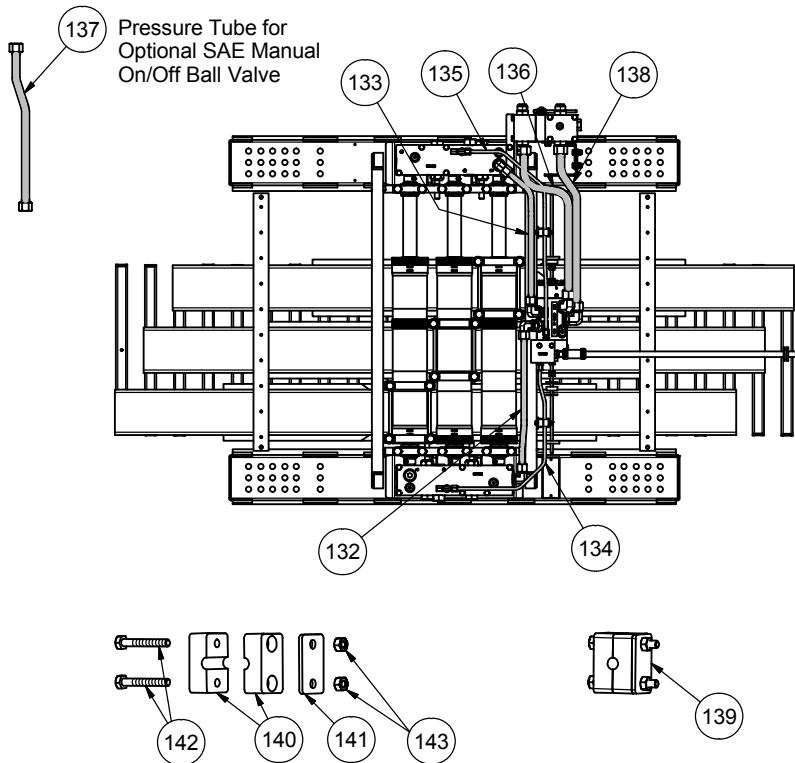
Switching Valve Assembly Inside Detail			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
80	1	Switching Valve Assembly Metric KFD	05852102
-	-	Includes Items 81-106	-
81	1	Body Switching Valve Metric KFD	04504602
82	1	End Cap Right Switching Valve Metric KFD	06204201
83	1	End Cap Left Switching Valve Metric KFD	04504801
84	1	Control Valve Actuator Housing	06204301
85	2	Poppet Switching Valve	03718901
86	2	Ring Poppet Switching Valve	03718801
87	1	Rod Control Switching Valve Metric	01335502
	1	Seal Kit Switching Valve	06076601
-	-	Includes items 88-99	-
88	5	O-Ring 111	84376200
89	1	O-Ring 117	84377000
90	2	O-Ring 126	84378200
91	2	O-Ring 216	84382200
92	2	O-Ring Backup 8-216	84391600
97	1	O-Ring 916	84387800
98	2	Wiper Canned 5/8" Rod	84427200
99	2	Seal Rod 5/8"	84352200
103	2	Bolt Hex Head M8x1.25x65mm	87006300
104	5	Bolt Hex Head M10x1.5x65mm	87009000
105	3	Bolt Hex Head M10x1.5x75mm	87009750
106	3	Washer Lock M10	87076500

KFD-Series Switching Valve Assembly - Outside Detail



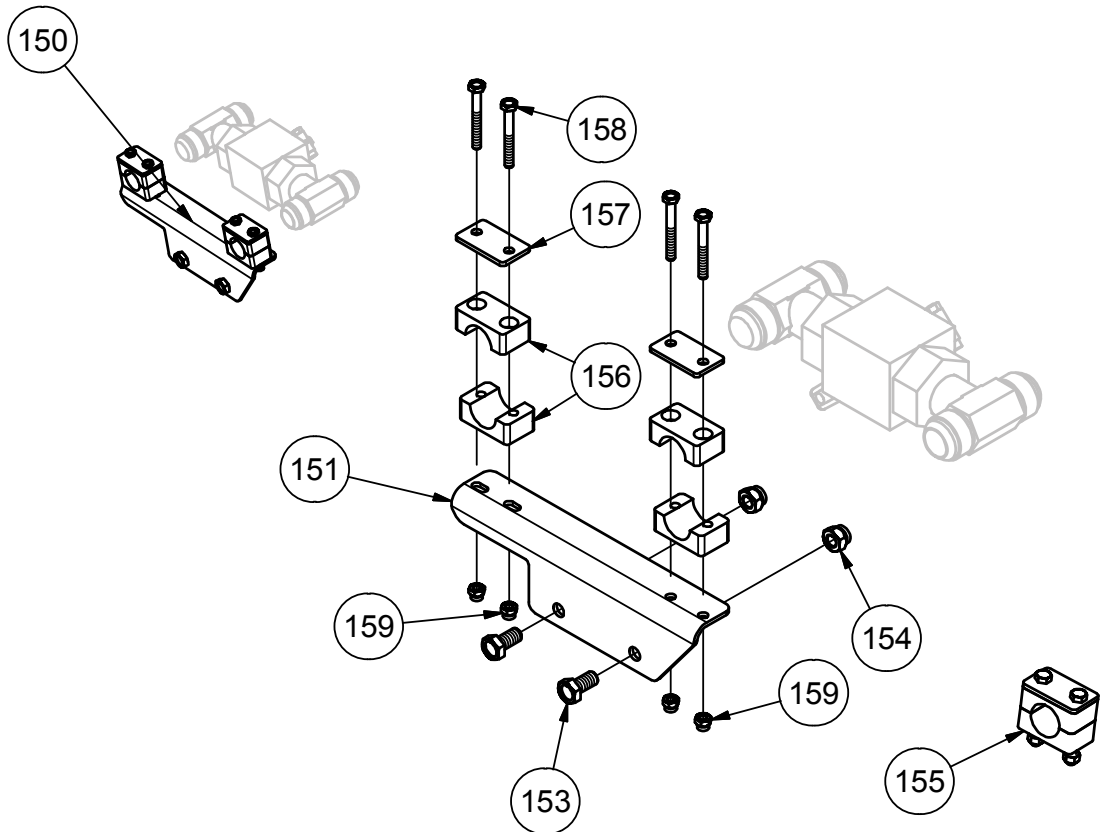
Switching Valve Assembly Outside Detail			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
93	2	O-Ring 906	84386800
95	1	O-Ring 910	84387200
96	4	O-Ring 912	84387400
97	1	O-Ring 916	84387800
108	1	Cap Limit Switching Valve	02552101
109	2	6400-06-06 Straight	84684000
110	1	6400-12-12 Straight	84685000
111	1	6500-12-12 90°	84688600
112	1	6409-12 M O-Ring Socket Plug	84687700
113	1	6801-12-12 90°	84691500
114	1	6801-16-12 90°	84691700
115	1	6801-16-16 90°	84691800
116	2	Rod Threaded Assembly Switching Valve Metric KFD	06076802
-	-	Includes items 108, 117-121	-
117	2	Threaded Rod M10x1.5	87150500
118	2	Switching Valve Grommet	83217500
119	5	Washer Large OD 3/8"	86553500
120	6	Nut Hex M10x1.5	87101500
121	2	Washer Lock M10	87076500

KFD-Series Hydraulic Tubing



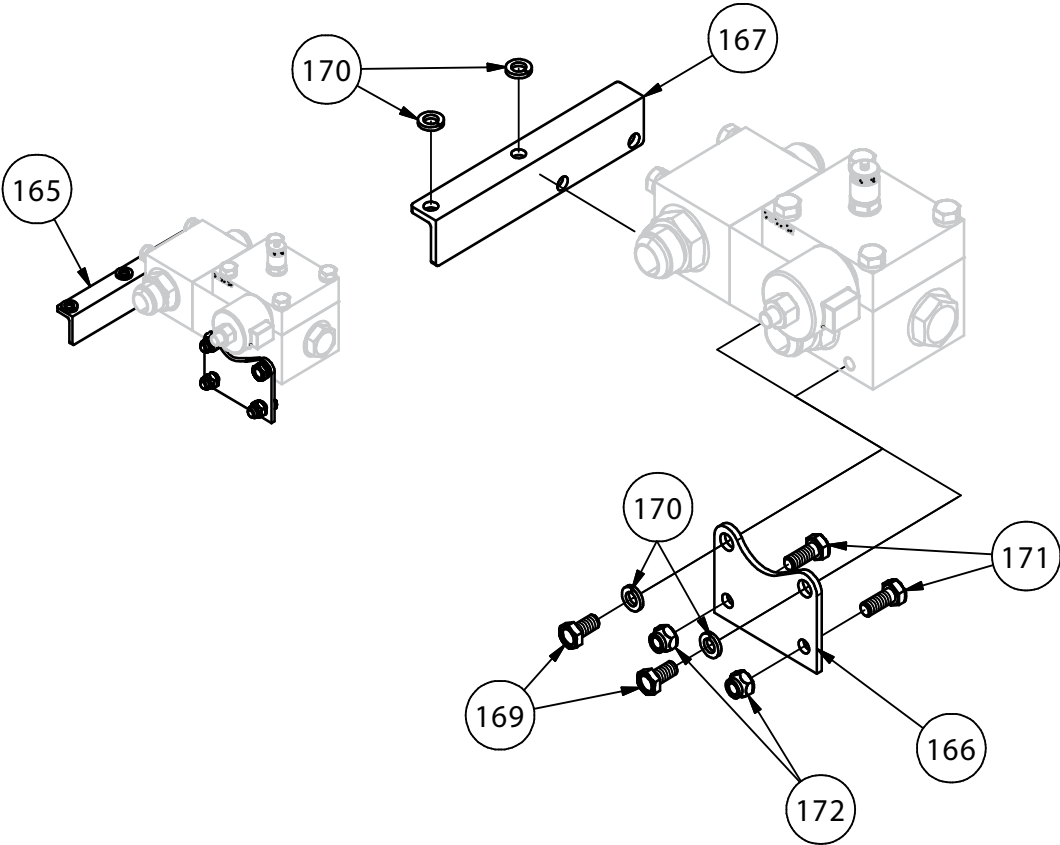
Hydraulic Tubes			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
130	1	Ball Valve Tube Assemblies Manual Replacement	06085401
		Includes items 132-137	
131	1	Ball Valve Tube Assemblies Electric Replacement	06085501
		Includes items 132-136 + 138	
132	1	Switching Valve to Unload End Manifold 3/4"	05852401
133	1	Switching Valve to Load End Manifold 3/4"	05852501
134	1	Control (Load/Unload) Valve to Unload End Manifold 3/8"	05852601
135	1	Control Valve (Load/Unload) to Load End Manifold 3/8"	05852701
136	1	Switching Valve Return to Ball Valve 1"	05842501
137	1	Switching Valve Pressure to Ball Valve Manual 1"	05842201
138	1	Switching Valve Pressure to Ball Valve Electric 1"	05842401
139	2	Clamp Set Hydraulic Tube 3/8"	05910401
		Includes items 140-143	
140	1	Clamp Hydraulic Tube 1038-PP	84750000
141	1	Plate Clamp Tube Top COP-1 1/4"	84748960
142	2	Bolt Hex M6x1x55mm	87004510
143	2	Nut Hex Nylock M6x1	87100510

KFD-Series Optional SAE Manual ON/OFF Ball Valve Mounting Kit



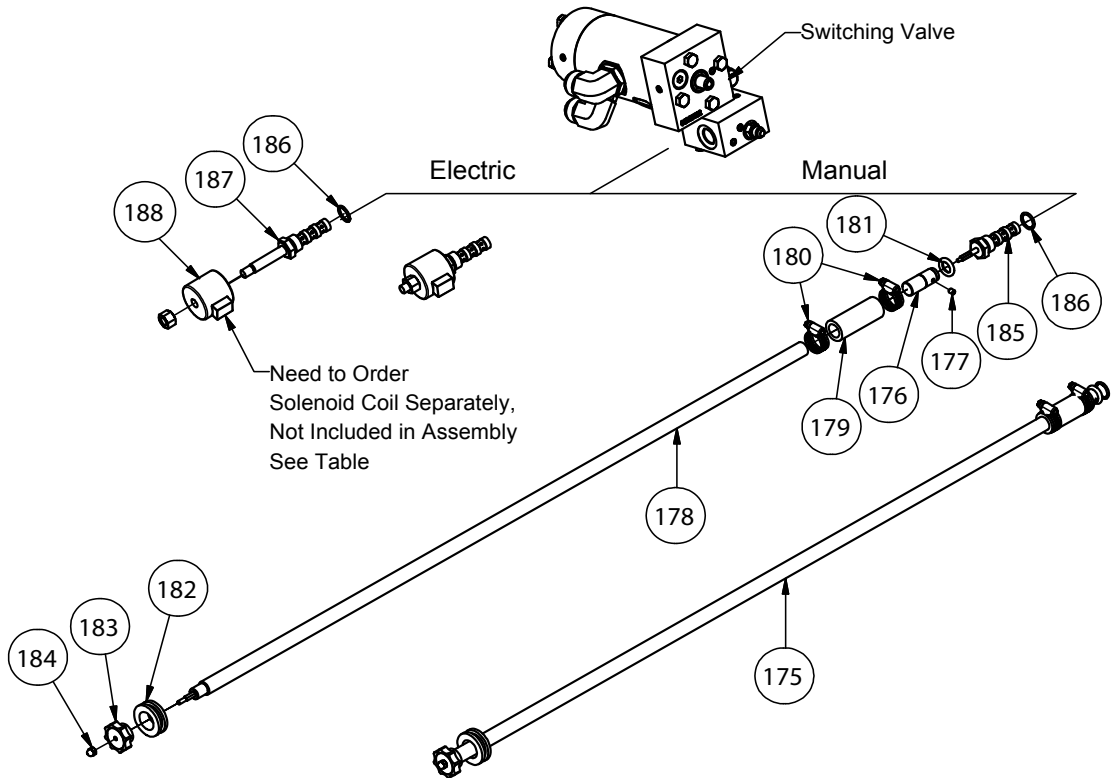
SAE Manual Ball Valve Mounting Kit			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
150	1	SAE Manual Ball Valve Mounting Kit	07316101
-	-	Includes Items 151-155	-
151	1	Mounting Bracket Ball Valve Manual	05841602
153	2	Bolt Hex M10x1.5x35mm	87008510
154	2	Nut Nylock M10x1.5	87102000
155	2	Clamp Set Hydraulic Tube 1"	06088801
-	-	Includes items 156-159	-
156	1	Clamp Hydraulic Tube 1"	84750300
157	1	Plate Clamp Tube Top COP-1 1/4"	84748960
158	2	Bolt Hex M6x1x55mm	87004510
159	3	Nut Hex Nylock M6x1	87100510
160	1	SAE Manual Ball Valve Conversion Kit	05841601
-	-	Includes items 137 + 150	-

KFD-Series ON/OFF Ball Valve Mounting Kit



On/Off Ball Valve Mounting Kit			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
165	1	Ball Valve Kit	07321201
-	-	Includes items 166-172	-
166	1	Mounting Bracket Rear Ball Valve Electric	05890101
167	1	Mounting Bracket Side Ball Valve Electric	05890201
169	2	Bolt Hex M10x1.5x20mm	87008470
170	4	Washer Lock M10	87076500
171	2	Bolt Hex M10x1.5x35mm	87008510
172	2	Nut Hex Nylock M6x1	87100510
173	1	On/Off Ball Valve Conversion Kit	05890103
-	-	Includes items 138 + 165	-

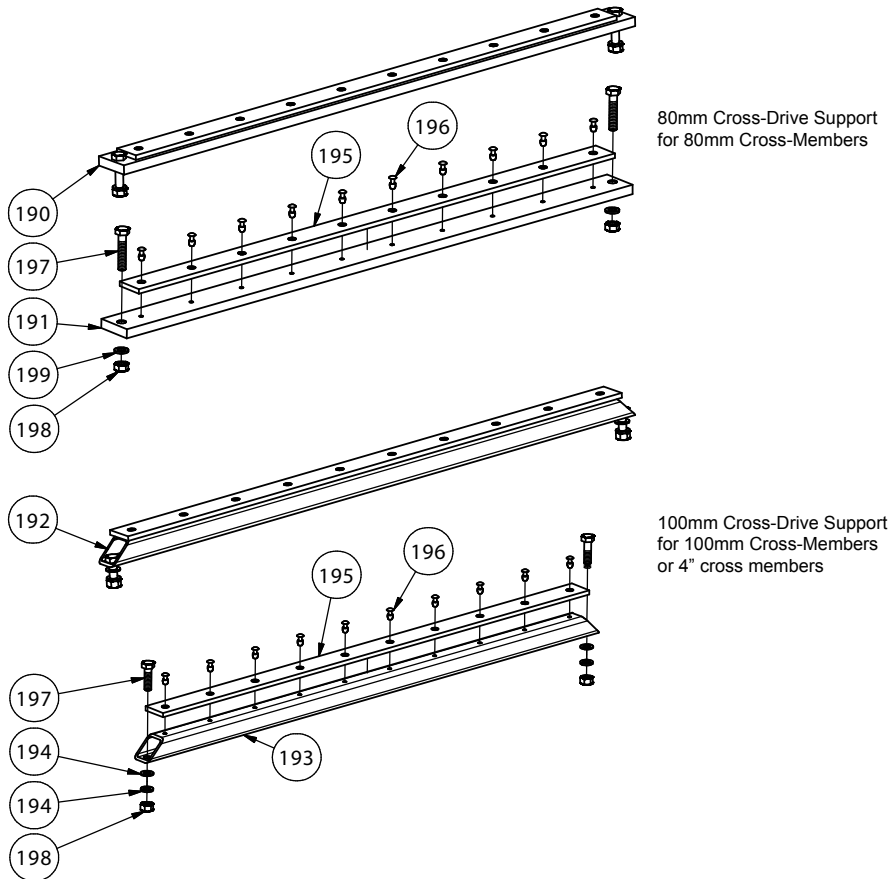
KFD-Series Manual or Electric Load/Unload Conversion Kit



Load/Unload Conversion Kit Manual or Electric			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
175	1	Load/Unload Extension Kit Manual (MRV4 not included)	01903202
		Includes items 176-184	
176	1	Handle Adaptor Manual	03500002
177	1	Set Screw Cup Point M10x1.5x8mm	87007990
178	1	Handle Extension Manual	06069601
179	1	Hose Swivel Joint	06069501
180	2	Clamp Hose	84750840
181	1	O-Ring 312	84385700
182	1	Valve Grommet	83217510
183	1	Knob Valve Manual Cartridge	84801600
184	1	Nut Knob Valve Manual Cartridge	86625500
185	1	Manual Cartridge Valve MRV4-10	85105200
186	1	O-Ring 910	84387200
187	1	Solenoid Control Valve SV10-40	85108800
188 ⁽¹⁾	1	Coil (call for information)	-

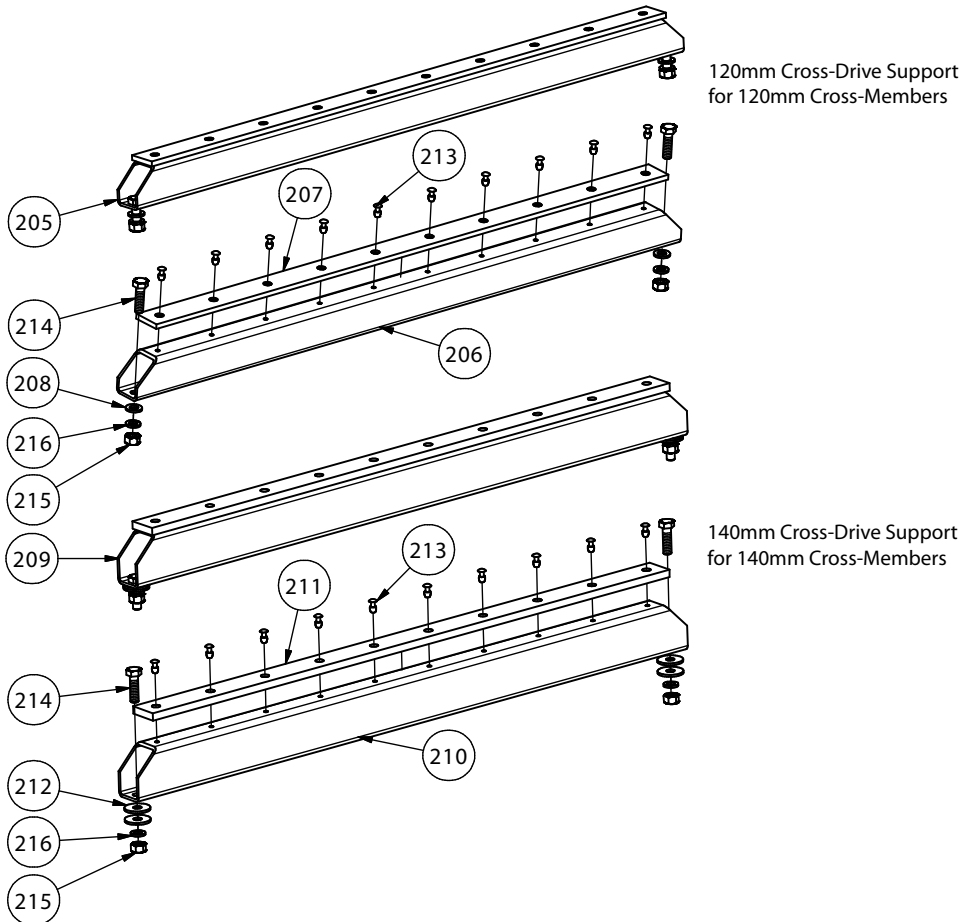
⁽¹⁾ Part numbers and descriptions vary.

KFD-Series Cross-Drive Supports for 80mm, 100mm or 4" Cross Members



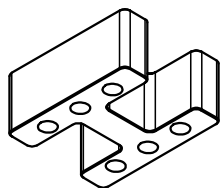
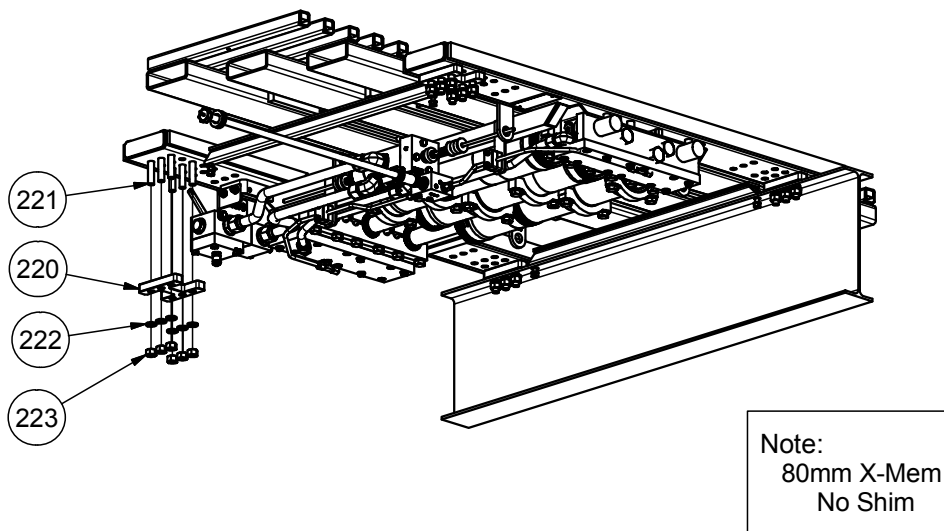
Cross-Drive Support Assemblies 80mm & 100mm			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
190	2	Cross-Drive Support Assembly 80mm	06000802
-	-	Includes items 191, 195-199	-
191	1	Cross-Drive Support 1/2"x2"	06000701
192	2	Cross-Drive Support Assembly 100mm or 4.0"	05999901
-	-	Includes items 193-199	-
193	1	Cross-Drive Support 1-1/4"x1-1/4"	05999801
194	2	Washer Flat M10	87076000
195	1	Wear Bearing UHMW 1/4"	06001101
196	10	Rivet 3/16"x1/2"	86528150
197	2	Bolt Hex M10x1.5x50mm	87008530
198	2	Nut Hex M10x1.5	87101500
199	2	Washer Lock M10	87076500

KFD-Series Cross-Drive Supports for 120mm & 140mm Cross Members

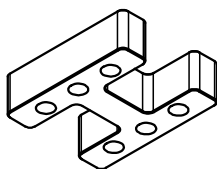


Cross-Drive Support Assemblies 120mm & 140mm			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
205	2	Cross-Drive Support Assembly 120mm	06002602
-	-	Includes items 206- 208 and 213- 216	-
206	1	Cross-Drive Support 1-1/2"x2"	06002501
207	1	Wear Bearing UHMW 1/4"	06001101
208	2	Washer Flat M10	87076000
209	2	Cross-Drive Support Assembly 140mm	06001002
-	-	Includes items 210- 216	-
210	1	Cross-Drive Support 1-1/2"x2-1/2"	06000901
211	1	Wear Bearing UHMW 3/8"	06002801
212	2	Washer Fender 3/8"	86554700
213	10	Rivet Aluminum 3/16"x1/2"	86528150
214	2	Bolt Hex M10x1.5x50mm	87008530
215	2	Nut Nylock Hex M10x1.5	87101500
216	2	Washer Lock M10	87076510

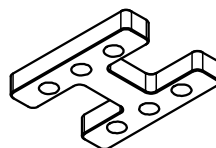
KFD-Series Drive Frame Shim Stock 140mm, 120mm, 100mm and 4" Cross-members



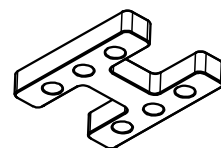
140mm X-Mem
60mm Shim
05746301



120mm X-Mem
40mm Shim
06034901



100mm X-Mem
20mm Shim
06035001

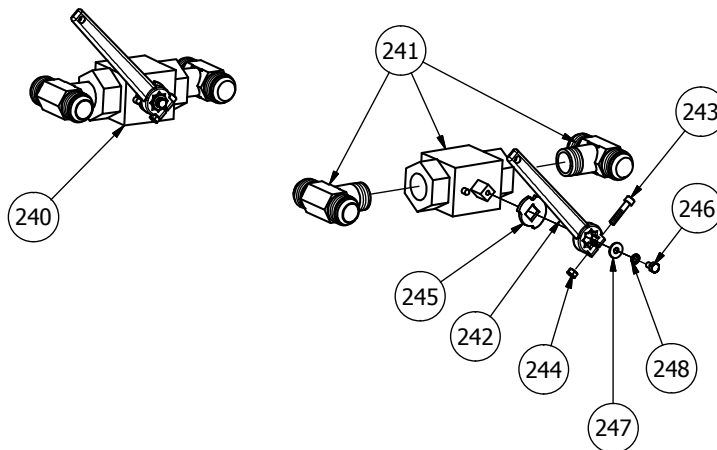


4" X-Mem
.85" shim
06035201

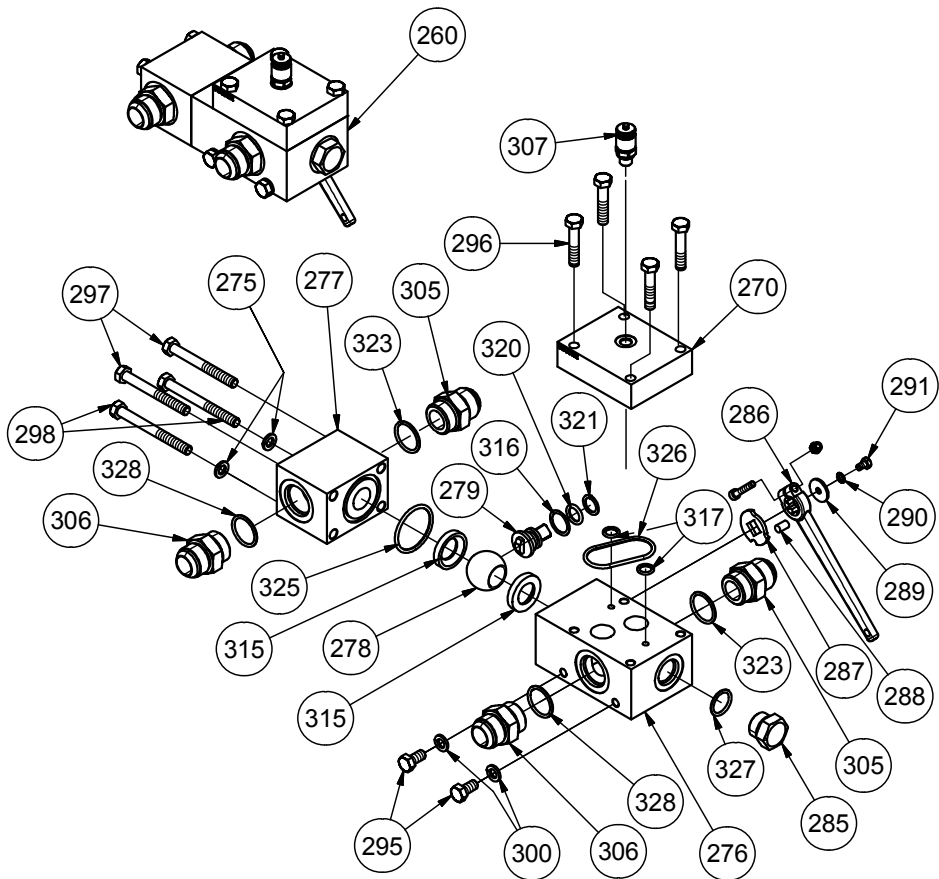
Drive Frame Shim Stock 140mm, 120mm, 100mm Cross-members

ID #	QUANTITY	DESCRIPTION	PART NUMBER
220	4	Frame Shim 140mm Cross-Member	05746301
220	4	Frame Shim 120mm Cross-Member	06034901
220	4	Frame Shim 100mm Cross-Member	06035001
220	4	Frame Shim 4.0" Cross-Member	06035201
221	24	Bolt Hex M16x2x120mm Gr. 10.9 (140mm Cross-Member)	87018225
221	24	Bolt Hex M16x2x100mm Gr. 10.9 (120mm Cross-Member)	87017890
221	24	Bolt Hex M16x2x80mm Gr. 10.9 (100mm & 4.0" Cross-Member)	87017000
221	24	Bolt Hex M16x2x60mm Gr. 10.9 (80mm Cross-Member)	87016550
222	24	Nut Nylock M16x2	87103010
223	24	Washer Lock M16	87078000

KFD-Series Optional SAE Manual On/Off Ball Valve Assembly

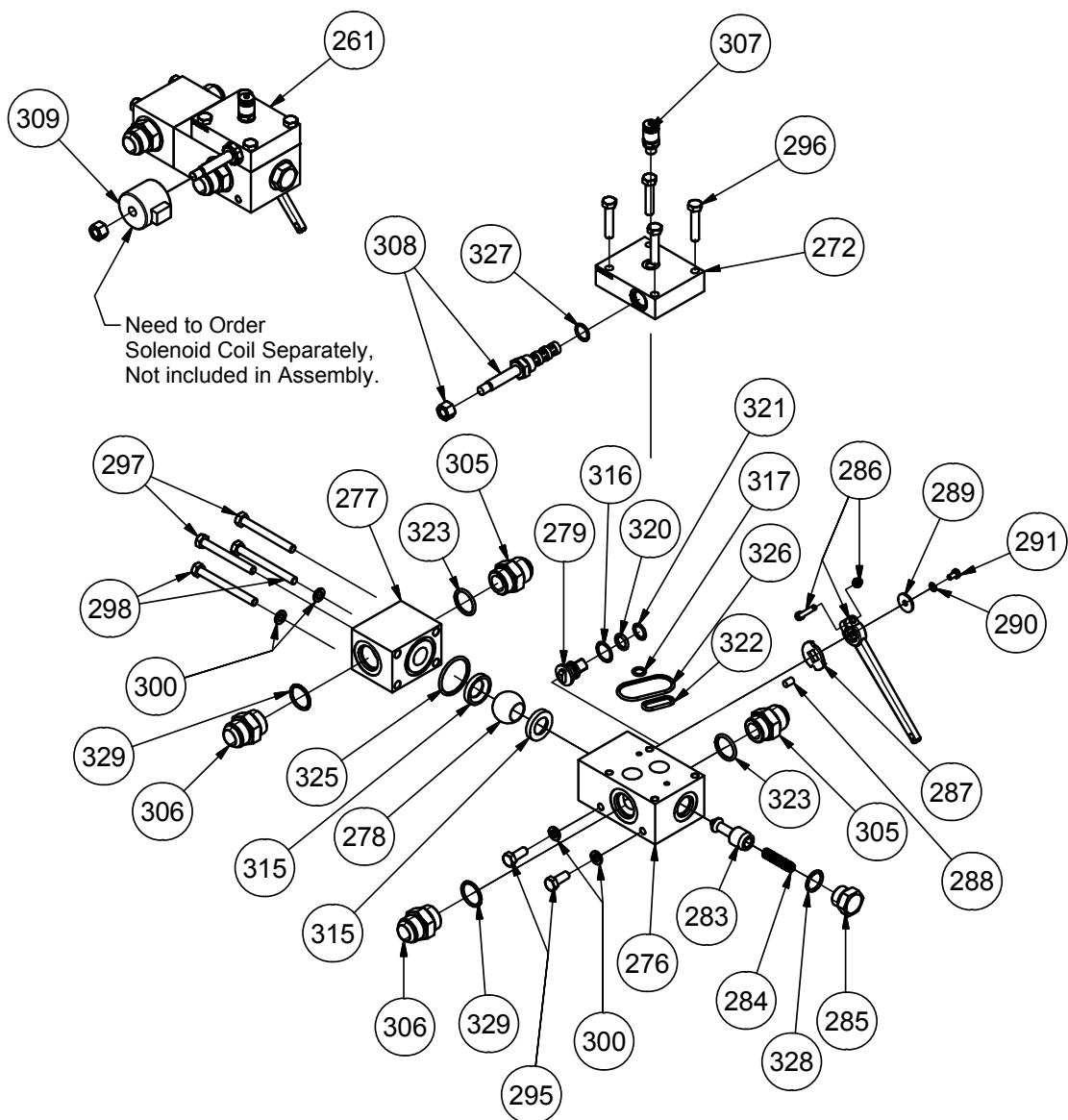


Optional SAE Manual On/Off Ball Valve Assembly			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
240	1	Optional SAE Manual On/Off Ball Valve Assembly	07329602
-	-	Includes items 241-248	-
241	1	Ball Valve Assembly 1" w/Tees	84802603
242	1	Handle Ball Valve Assembly	06475402
243	1	Bolt Socket Head M6x1x30mm	w/Handle
244	1	Nut Hex M6x1	w/Handle
245	1	Dentent	w/Ball Valve
246	1	Bolt Hex M6x12mm	87002460
247	1	Washer Fender 6mm	87075410
248	1	Nut Hex M6 External Tooth	87075501

KFD-Series Manual On/Off Ball Valve Assembly

Manual On/Off Ball Valve Parts List			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
260	1	Manual On/Off Ball Valve Assembly	06830802
-	-	Includes items 271 - 310	-
271	1	Manual Cover Plate On/Off Ball Valve	04796402
276	1	Valve Housing	04436602
277	1	Non Valve Housing	04437902
278	1	Ball Valve Ball	04337301
279	1	Spud Shaft	04438101
285	1	6408-12 O-Ring Plug w/#912 O-Ring	84686900
286	1	Handle Ball Valve w/Bolt and Nut	06475402
287	1	Spud Stop	86651500
289	1	Washer Fender 6mm	87075400
290	1	Washer Lock 6mm External Tooth	87075501
291	1	Bolt Hex M6 x 10mm	87002450
295	2	Bolt Hex M10 x 20mm	87002500
296	4	Bolt Hex M10 x 50mm	87008530
297	2	Bolt Hex M10 x 90mm	87010500
298	2	Bolt Hex M10 x 100mm	87011000
300	4	Lock Washer 10mm	87076500
305	2	2404-16-16 BSPP Straight Fitting w/#217 O-Ring	84671400
306	2	6400-16-16 Straight Fitting w/#916 O-Ring	84685400
307	1	Test Coupling SMK20-G1/4VC	06932301
310	1	Seal Kit On/Off Manual Ball Valve	06932301
-	-	Includes items 315 - 329	-
315	2	Ball Valve Seal Bushing	04337301
316	1	Spud Wear Washer	04337601
317	2	O-Ring 112 Buna 90	84376300
318	2	O-Ring 147 Buna 90 (Not use on this Valve)	84388447
319	1	O-Ring Back-up 8-147 (Not use on this Valve)	84389047
320	1	O-Ring 208 Buna 90	84379600
321	1	O-Ring Back-up Buna 90	84390100
322	1	O-Ring 216 Buna 90 (Not use on this Valve)	84382200
323	2	O-Ring 217 Buna 90	84382600
324	2	O-Ring 218 Buna 90 (Not use on this Valve)	84382800
325	1	O-Ring 225 Buna 90	84383800
326	1	O-Ring 228 Buna 90	84384000
327	1	O-Ring 910 (Not use on this Valve)	84387200
328	1	O-Ring 912	84387400
329	2	O-Ring 916	84387800

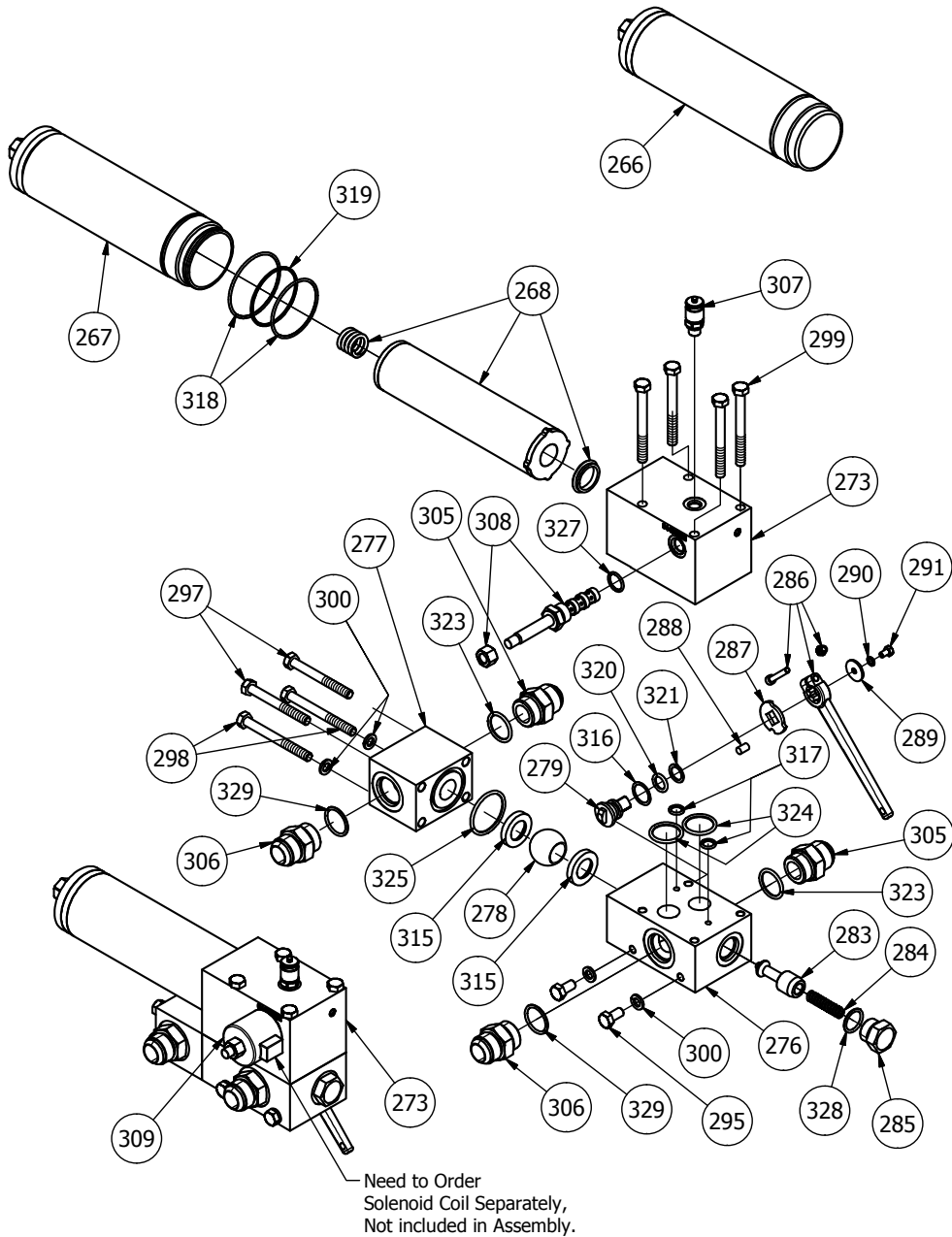
KFD-Series Electric ON/OFF Ball Valve Assembly



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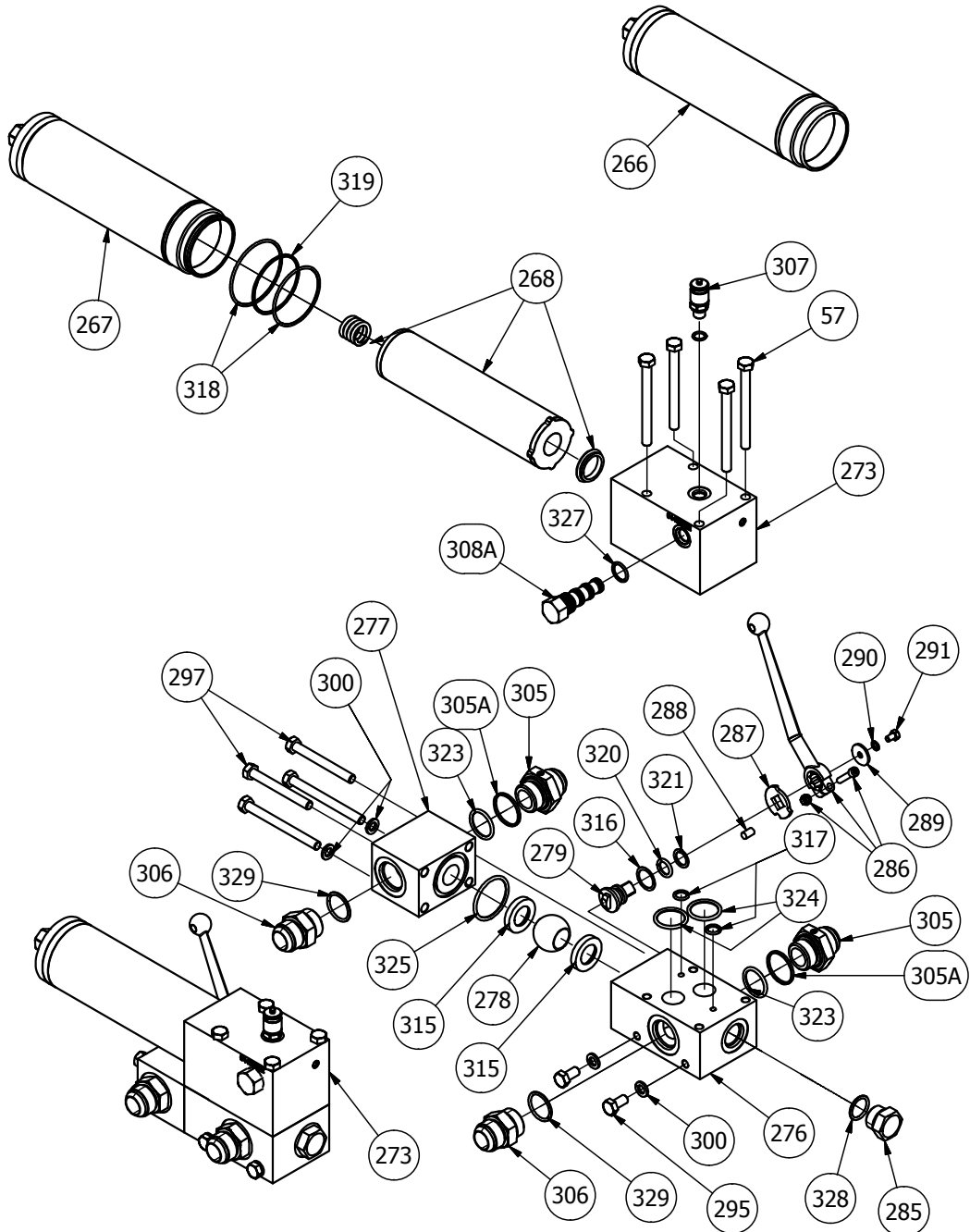
Electric ON/OFF Ball Valve Assembly			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
261	1	Electric ON/OFF Ball Valve Assembly	06525902
-	-	Includes items 272 - 310	-
272	1	Electric Cover Plate On/Off Ball Valve	04795702
276	1	Valve Housing	04436602
277	1	Non Valve Housing	04437902
278	1	Ball Valve Ball	04337301
279	1	Spud Shaft	04438101
283	1	Poppet On/Off	04438401
284	1	Spring Check Valve External Large #B-18273	84453400
285	1	6408-12 O-Ring Plug Hex	84686900
286	1	Handle Ball Valve w/Nut & Bolt	06475401
287	1	Spud Stop	84802910
288	1	Dowel Pin 5/16" x 1/2"	86651500
289	1	Washer Fender 6mm	87075400
290	1	Washer Lock 6mm External Tooth	87075501
291	1	Bolt Hex M6 x 12mm	87002460
295	2	Bolt Hex M10 x 1.5 x 20mm	87002500
296	4	Bolt Hex M10 x 1.5 x 50mm	87008530
297	2	Bolt Hex M10 x 1.5 x 90mm	87010500
298	2	Bolt Hex M10 x 1.5 x 100mm	87011000
300	2	Washer Lock 10mm	87076500
305	2	2404-16-16 BSPP Straight Fitting w/O-Ring	84671400
306	2	6400-16-16 Straight Fitting w/O-Ring	84685400
307	1	Test Coupling SMK20-G1/4VC	84904000
308	1	Solenoid Cartridge Valve SV10-40	85108800
309	1	Coil - Call for Imformation	-
310	1	Seal Kit On/Off Electric Ball Valve	06932301
-	-	Includes items 315 - 329	-
315	2	Ball Valve Seal Bushing	04337301
316	1	Spud Wear Washer	04337601
317	2	O-Ring 112 Buna 90 (One Only use on this Valve)	84376300
318	2	O-Ring 147 Buna 90 (Not use on this Valve)	84388447
319	1	O-Ring Back-Up 8-147 (Not use on this Valve)	84389047
320	1	O-Ring 208 Buna 90	84379600
321	1	O-Ring Back-Up Buna 90	84390100
322	1	O-Ring 216 Buna 90	84382200
323	2	O-Ring 217 Buna 90	84382600
324	2	O-Ring 218 Buna 90 (Not use on this Valve)	84382800
325	1	O-Ring 225 Buna 90	84383800
326	1	O-Ring 228 Buna 90	84384000
327	1	O-Ring 910	84877200
328	1	O-Ring 912	84387400
329	2	O-Ring 916	84387800

KFD-Series Electric ON/OFF Ball Valve Assembly with Filter



65131-1

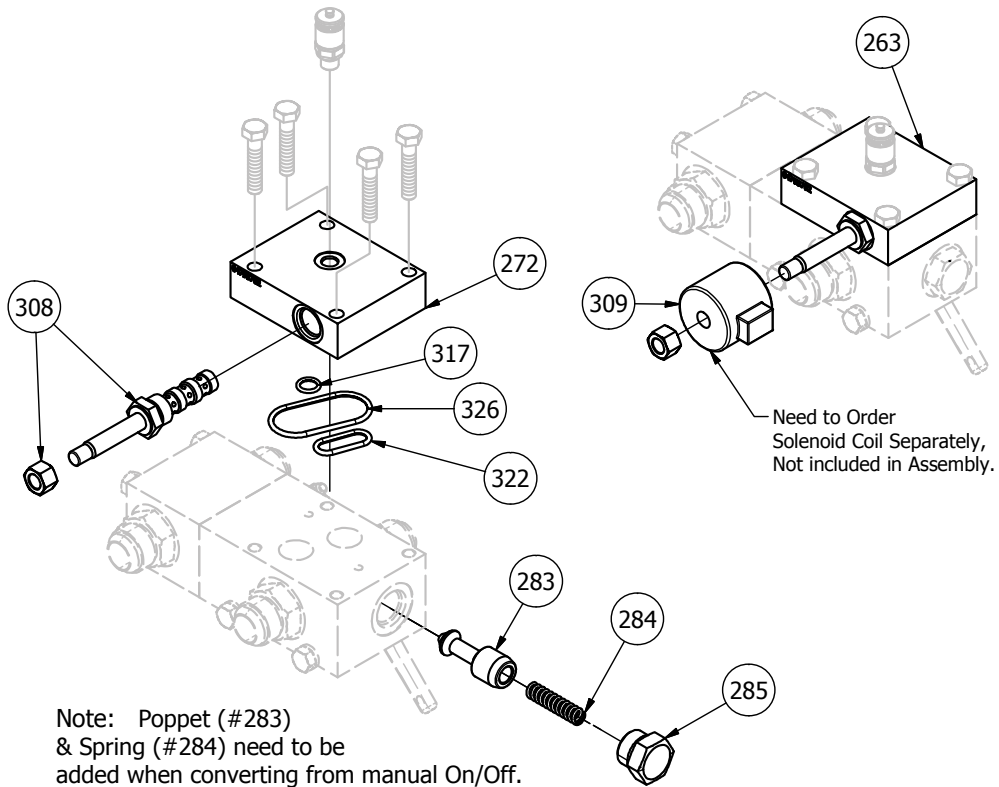
Electric ON/OFF Ball Valve Assembly with Filter			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
262	1	Electric On/Off Ball Valve with Filter Ass'y	06513102
-	-	Includes items 266, 273 - 310	-
266	1	Welded Filter Canister Assembly	06151502
-	-	Includes items 267, 268, 318 & 319	-
267	1	Welded Filter Canister	06151501
268	1	Filter Element Fairley Arlon #MXW2-GDL20	84006520
273	1	Filter Block Fairley Arlon	04436501
276	1	Valve Housing	04436602
277	1	Non Valve Housing	04437902
278	1	Ball Valve Ball	04337101
279	1	Spud Shaft	04438101
283	1	Poppet On/Off	04438401
284	1	Spring Check Valve External Large #B-18273	84453400
285	1	6408-12 O-Ring Plug	84686900
286	1	Handle Ball Valve w/Nut & Bolt	06475401
287	1	Spud Stop	84802910
288	1	Dowel Pin 5/16" x 1/2"	86641500
289	1	Washer Fender 6mm	87075400
290	1	Washer Lock 6mm External Tooth	87075501
291	1	Bolt Hex M6 x 12mm	87002460
295	2	Bolt Hex M10 x 1.5 x 20mm	87002500
297	2	Bolt Hex M10 x 1.5 x 90mm	87010500
298	2	Bolt Hex M10 x 1.5 x 100mm	87011000
299	4	Bolt Hex M10 x 1.5 x 110mm	87011500
300	4	Washer Lock 10mm	87076500
305	2	2404-16-16 BSPP Straight Fitting	84671400
306	2	6400-16-16 Straight Fitting w/#916 O-Ring	84685400
307	1	Test Coupler SMK20-G1/4VC	84904000
308	1	Solenoid Cartridge Valve SV10-40	85108800
309	1	Coil - Call for Information	-
310	1	Seal Kit On/Off Ball Valve	06932301
-	-	Includes items 315 - 329	-
315	2	Ball Valve Seal Bushing	04337301
316	1	Spud Wear Washer	04337601
317	2	O-Ring 112 Buna 90	84376300
318	2	O-Ring 147 Buna 90	84378447
319	1	O-Ring Back-up 8-147	84389047
320	1	O-Ring 208 Buna 90	84379600
321	1	O-Ring 208 O-Ring Back-up Buna 90	84390100
322	1	O-Ring 216 Buna 90 (Not used on this Valve)	84382200
323	2	O-Ring 217 Buna 90	84382600
324	2	O-Ring 218 Buna 90	84382800
325	1	O-Ring 225 Buna 90	84383800
326	1	O-Ring 228 Buna 90 (Not used on this Valve)	84384000
327	1	O-Ring 910	84877200
328	1	O-Ring 912	84387400
329	2	O-Ring 916	84387800

Manual On/Off Ball Valve W/Integrated Filter

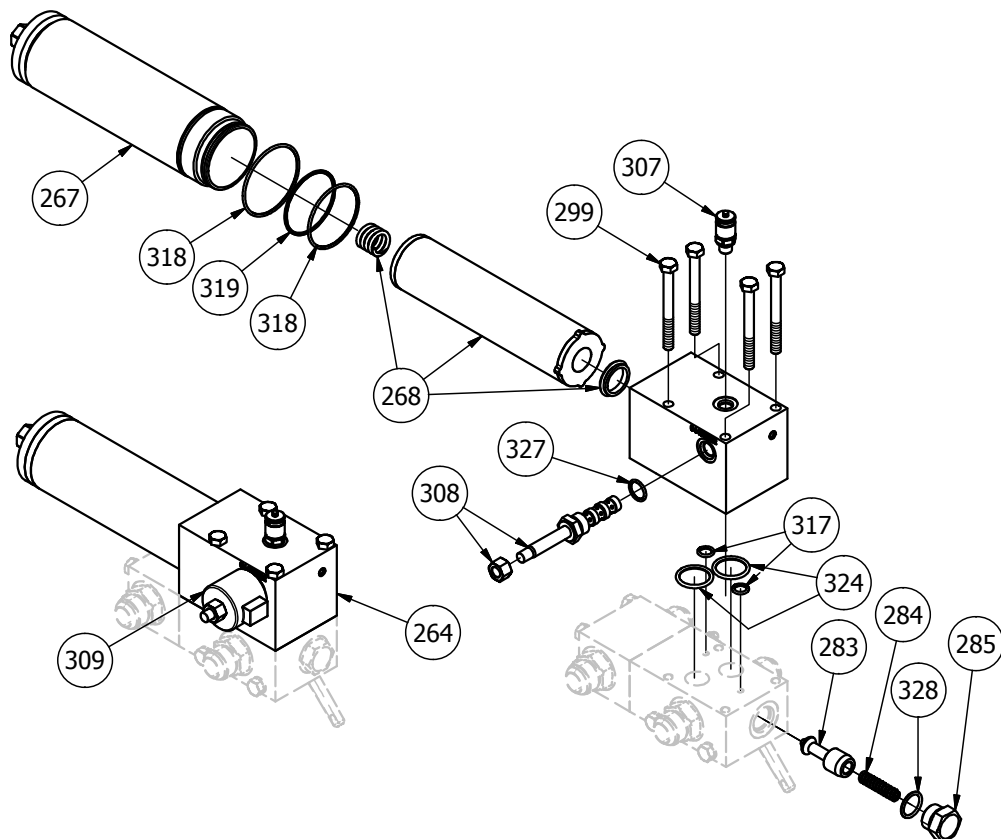
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Manual On/Off Ball Valve W/Integrated Filter			
#ID	Qty	Description	Part Number
262	1	Electric On/Off Ball Valve with Filter Ass'y	06513102
-	-	Includes items 266, 273 - 310	-
266	1	Welded Filter Canister Assembly	06151502
-	-	Includes items 267, 268, 318 & 319	-
267	1	Welded Filter Canister	06151501
268	1	Filter Element Fairley Arlon #MXW2-GDL20	84006520
273	1	Filter Block Fairley Arlon	04436501
276	1	Valve Housing	04436602
277	1	Non Valve Housing	04437902
278	1	Ball Valve Ball	04337101
279	1	Spud Shaft	04438101
283	1	Poppet On/Off	04438401
284	1	Spring Check Valve External Large #B-18273	84453400
285	1	6408-12 O-Ring Plug	84686900
286	1	Handle Ball Valve w/Nut & Bolt	06475401
287	1	Spud Stop	84802910
288	1	Dowel Pin 5/16" x 1/2"	86641500
289	1	Washer Fender 6mm	87075400
290	1	Washer Lock 6mm External Tooth	87075501
291	1	Bolt Hex M6 x 12mm	87002460
295	2	Bolt Hex M10 x 1.5 x 20mm	87002500
297	2	Bolt Hex M10 x 1.5 x 90mm	87010500
298	2	Bolt Hex M10 x 1.5 x 100mm	87011000
299	4	Bolt Hex M10 x 1.5 x 110mm	87011500
300	4	Washer Lock 10mm	87076500
305	2	2404-16-16 BSPP Straight Fitting	84671400
305A	2	O-Ring Retainer Ring Included w/pt 305	
306	2	6400-16-16 Straight Fitting w/#916 O-Ring	84685400
307	1	Test Coupler SMK20-G1/4VC	84904000
308	1	Solenoid Cartridge Valve SV10-40	85108800
308A	1	C10-4 Plug	03673611
309	1	Coil - Call for Imformation	-
310	1	Seal Kit On/Off Ball Valve	06932301
-	-	Includes items 315 - 329	-
315	2	Ball Valve Seal Bushing	04337301
316	1	Spud Wear Washer	04337601
317	2	O-Ring 112 Buna 90	84376300
318	2	O-Ring 147 Buna 90	84378447
319	1	O-Ring Back-up 8-147	84389047
320	1	O-Ring 208 Buna 90	84379600
321	1	O-Ring 208 O-Ring Back-up Buna 90	84390100
322	1	O-Ring 216 Buna 90 (Not used on this Valve)	84382200
323	2	O-Ring 217 Buna 90	84382600
324	2	O-Ring 218 Buna 90	84382800
325	1	O-Ring 225 Buna 90	84383800
326	1	O-Ring 228 Buna 90 (Not used on this Valve)	84384000
327	1	O-Ring 910	84387200
328	1	O-Ring 912	84387400
329	2	O-Ring 916	84387800

KFD-Series Electric ON/OFF Ball Valve Conversion Kit



Electric On/Off Ball Valve Conversion Kit			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
263	1	Electric On/Off Ball Valve Conversion Kit	04839502
-	-	Includes all items listed below	-
272	1	Electric Cover Plate On/Off Ball Valve	04795702
283	1	Poppet On/Off	04438401
284	1	Spring Check Valve External Large #B-18273	84453400
285	1	6408-12 O-Ring Hex Plug	84686900
308	1	Solenoid Cartridge Valve SV10-40	85108800
309	1	Coil - Call for Information	-
317	1	O-Ring 112 Buna 90	84376300
322	1	O-Ring 216 Buna 90	84382200
326	1	O-Ring 228 Buna 90	84384000

KFD-Series Electric ON/OFF Conversion Kit With Filter

Electric On/Off Ball Valve Conversion Kit with Filter			
ID #	QUANTITY	DESCRIPTION	PART NUMBER
264	1	Electric On/Off Ball Valve Conversion Kit with Filter	04839602
-	-	Includes all items listed below	-
267	1	Welded Filter Canister	06151501
268	1	Filter Element Fairley Arlon #MXW2-GDL20	84006520
283	1	Poppet On/Off Valve	04438401
284	1	Spring Check Valve External Large #B-18273	84453400
285	1	6408-12 O-Ring Plug	84686900
299	4	Bolt Hex M10 x 1.5 110mm	87011500
307	1	Test Coupler SMK20-G1/4VC	84904000
308	1	Solenoid Cartridge Valve SV10-40	85108800
309	1	Coil - Call for Information	-
317	2	O-Ring 112 Buna 90	84376300
318	2	O-Ring 147 Buna 90	84378447
319	1	O-Ring Back-up 8-147	84389047
324	2	O-Ring 218 Buna 90	84382800
327	1	O-Ring 910	84387200
328	1	O-Ring 912	84387400

KEITH Mfg. Co. hereby warrants,

Only to the first owner of a new KEITH® *WALKING FLOOR*® unloader from the factory or selling distributorship that the product shall be free from defects in material and workmanship for,

A period of one year after delivery to the first registered owner or two years after May 1st, 2011.

This warranty does not cover normal wear and tear and maintenance, and is not to be construed as a service contract.

Owners Obligation:

To qualify for warranty coverage,

A warranty card must be completed and on file at KEITH Mfg. Co. and,

The equipment must be subject to normal use and service only.

Definition of Normal Use and Service:

Normal use and service 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, non-corrosive materials, with weights not in excess of factory rated capacity.

Sole and Exclusive Remedy:

If the product covered hereby fails to conform to the above stated warranty, KEITH Mfg. 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 Mfg. Co.

This is the owner's sole and exclusive remedy for all contract claims, and

All tort claims including those based on the strict liability in tort and negligence.

Any defective part(s) must be shipped freight prepaid to the facility authorized by KEITH Mfg. Co.

Except As Expressly Set Forth Above, KEITH Mfg. Co. Makes No Warranties:

Express, implied or statutory, specifically no warranties of fitness for a particular purpose or warranties of merchantability are made.

Further, KEITH Mfg. Co. will not be liable for incidental damages or consequential damages such as, but not limited to,

Loss of use of the product, damage to the product, towing expenses, attorney's fees and the liability you may have in respect to other reasons.

9.1 Tort Disclaimer:

KEITH Mfg. Co. shall not have any liability in tort with respect to the 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.

8.1 Warranty conditions

This guarantee applies to the free-of-charge provision of replacement components, provided;

- In the case of a malfunction KEITH® *WALKING FLOOR*® Europe must be informed first.
- The KEITH® *WALKING FLOOR*® system has been installed by your installer in accordance with our installation specifications.
- Our maintenance and operating instructions have been observed.

Not covered by the guarantee:

- Malfunctions of/caused by equipment supplied by third parties.
- Malfunctions of/caused by the use of contaminated and/or incorrect oil.
- Malfunctions of/caused by injudicious use.
- Malfunctions of/caused by repairs/additions carried out by third parties.
- Normal wear and tear of components and filter elements.
- Defects of electrical parts resulting from bad connections and/or incorrect voltages.
- Labor costs.

The guarantee will lapse if:

- The KEITH® *WALKING FLOOR*® system is used for material other than that for which the original was intended.
- The KEITH® *WALKING FLOOR*® system has not been installed correctly by your installer so that the operation of the system is negatively influenced.

**PLEASE FILL OUT AND RETURN IMMEDIATELY TO
KEITH Mfg. Co.**

The warranty registration card must be completed and on file at KEITH Mfg. 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 be the date of the manufacture if no other date can be determined.

Please make sure the serial number listed on the card coincides with the serial number plate on the drive unit.

**Please print or type
KEITH® KFD Series Warranty Registration Card**

Purchaser		
Address		Phone
City		State/Prov.
Country		Postal Code
Original Purchase Date of System		
KEITH Model No.		
KEITH Serial No.		
Installed in:	New Trailer	Used Trailer
Dealer Name & Location		
Type of Material Unloaded		

**I have fully read the KEITH Mfg. Co. warranty information and I/
we fully understand and agree to the terms of the warranty.**

Signature

Date

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

**Please fax, mail or email this warranty registration information to
KEITH Mfg. Co. at:**

Warranty Registration
KEITH Mfg. Co.
P.O. Box 1
Madras, OR 97741-0001
Fax: (541) 475-2169
Email: techdept@keithwalkingfloor.com

KEITH WALKING FLOOR Europe
NETHERLANDS
Harselaarseweg 113
3771 MA Barneveld
eurosales@keithwalkingfloor.com

!!CAUTION!!
To prevent Possible Injury or Death

DO NOT:

1. Operate the floor with the doors closed.
2. Stand behind the trailer or in the discharge area when floor is operating.
3. Make adjustments to the unloading mechanism with floor operating.
4. Operate the unloader when protective covers and screens are not in place.
5. Go underneath the trailer when floor is operating.
6. Leave the trailer unattended while the unloader is in operation.

ALWAYS:

1. Disengage the trailer from the hydraulic power unit (P.T.O.) before service and maintenance.
2. Shut off the power supply before going underneath the trailer.
3. Stay away from any oil leaks when hydraulic pressure is high.
4. Shut off the hydraulic power take off unit (P.T.O.) before moving the trailer.

!!Keep your hands, body parts and loose clothing away from the floor slats and drive mechanism when the unloading system is in operation!!

