

HALLCOTM
INDUSTRIES, INC.

Owner's Manual:

i-2000 and i-3000 SERIES

LIVE FLOORTM CONVEYING SYSTEMS

One-Way (i-2100/i-3100) and Two-Way (i-2200/i-3200)

West Coast USA
6605 Ammunition
Road

P.O. Box 505
Tillamook, OR 97141
Ph. 800-542-5526
Ph. 503-842-8886

Central USA
8276 Hwy. 16
North

Poteet, TX 78065
Ph. 877-425-5261

East Coast USA
480 Millrun Rd.
Salisbury, NC

28144
Ph. 800-230-0190

Hydraulic Module Specifications

| | i-2000 | i-3000 |
|-------------------|-----------------------|------------------------|
| One Way | i-2100 | i-3100 |
| Two Way | i-2200 | i-3200 |
| Shaft Diameter | 1.5 inch [38.1 mm] | 1.5 inch [38.1 mm] |
| Cylinder Diameter | 3 inches [76.2 mm] | 3.5 inches [88.9 mm] |
| Stroke | 9-1/4 inches [235 mm] | 9-1/4 inches [235 mm] |
| Maximum Pressure | 3000 psi [207 Bar] | 3000 psi [207 Bar] |
| Maximum Flow Rate | 25 gal/min [95 l/min] | 30 gal/min [114 l/min] |
| Load Capacity | 15 Ton [13 Tonne] | 20 Ton [18 Tonne] |

Theoretical Unload Times

| 28 ft. [8.5 m] Container. Actual unload times vary. | | | | | | |
|---|-------------------------|--------|-------------------------------------|-------------|-----------------------------|--------|
| Oil Flow (GPM [LPM]) | Cycle Time (seconds) | | Convey Speed (ft./min. [m/min.]) | | Unloading Time (minutes) | |
| | i-2000 | i-3000 | i-2000 | i-3000 | i-2000 | i-3000 |
| 10 [38] | 8.9 | N/A | 5.2 [1.59] | N/A | 5.5 | N/A |
| 11 [42] | 8.0 | N/A | 5.8 [1.75] | N/A | 4.8 | N/A |
| 12 [45] | 7.5 | N/A | 6.2 [1.88] | N/A | 4.5 | N/A |
| 13 [49] | 6.9 | N/A | 6.7 [2.05] | N/A | 4.2 | N/A |
| 14 [53] | 6.4 | N/A | 7.3 [2.21] | N/A | 3.8 | N/A |
| 15 [57] | 5.9 | 8.4 | 7.8 [2.38] | 5.5 [1.68] | 3.6 | 5.1 |
| 16 [61] | 5.5 | 7.9 | 8.4 [2.55] | 5.9 [1.79] | 3.3 | 4.8 |
| 17 [64] | 5.3 | 7.4 | 8.8 [2.67] | 6.2 [1.90] | 3.2 | 4.5 |
| 18 [68] | 5.0 | 7.0 | 9.3 [2.84] | 6.6 [2.01] | 3.0 | 4.2 |
| 19 [72] | 4.7 | 6.6 | 9.9 [3.01] | 7.0 [2.13] | 2.8 | 4.0 |
| 20 [76] | 4.4 | 6.3 | 10.4 [3.18] | 7.3 [2.24] | 2.7 | 3.8 |
| 21 [79] | 4.3 | 6.0 | 10.8 [3.30] | 7.7 [2.35] | 2.6 | 3.6 |
| 22 [83] | 4.1 | 5.7 | 11.4 [3.47] | 8.1 [2.46] | 2.5 | 3.5 |
| 23 [87] | 3.9 | 5.5 | 11.9 [3.63] | 8.4 [2.57] | 2.3 | 3.3 |
| 24 [91] | 3.7 | 5.2 | 12.5 [3.80] | 8.8 [2.69] | 2.2 | 3.2 |
| 25 [95] | 3.6 | 5.0 | 13.0 [3.97] | 9.2 [2.80] | 2.1 | 3.1 |
| 26 [98] | N/A | 4.8 | N/A | 9.5 [2.91] | N/A | 2.9 |
| 27 [102] | N/A | 4.7 | N/A | 9.9 [3.02] | N/A | 2.8 |
| 28 [106] | N/A | 4.5 | N/A | 10.3 [3.13] | N/A | 2.7 |
| 29 [110] | N/A | 4.3 | N/A | 10.6 [3.25] | N/A | 2.6 |
| 30 [114] | N/A | 4.2 | N/A | 11.0 [3.36] | N/A | 2.5 |

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Safety & Operational Decals

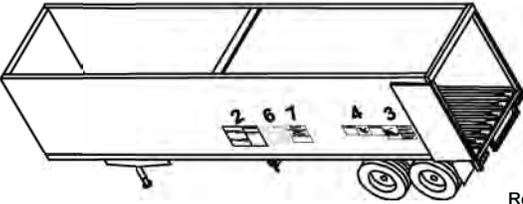


Before operating the LIVE FLOOR™ system make sure the safety and operational decals that come with kit #99-4397 are installed on the container per the decal placement guide found with the kit.

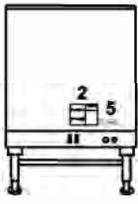
The placement guide looks like this:



Safety & Operational Decal Placement Guide For Hallco Live Floors®

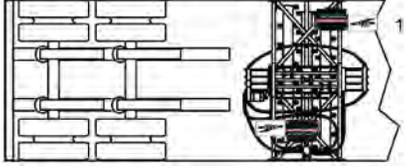


Place danger decals on/near the cross-drives

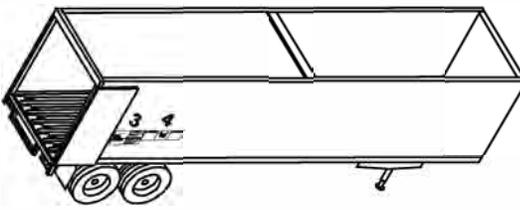


Trailer front

Rear decals should be applied so they are completely visible with the doors open.



Trailer Underneath 1



99-4400



1

Qty 2

99-4806



2

Qty 2

99-4807



3

Qty 2

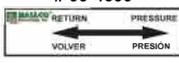
99-4808



4

Qty 3

99-4399



5

Qty 1

99-4398



6

Qty 1

99-4401



7

Qty 1

99-4809



8

Qty 1

99-4813



9

Qty 1

Extra Logo Sticker

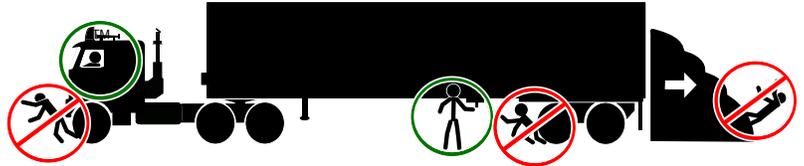
Large logo decal should be placed on the rear door.

AVOID the product hazards shown on this page DURING FLOOR MOVEMENT or personal injury or death WILL occur.

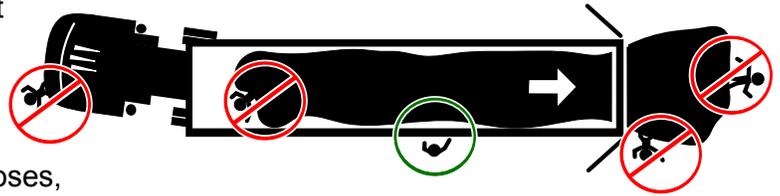


Product Hazards

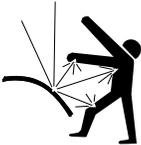
The discharge end of a Live Floor conveyor and in front of the vehicle during operation when a load is at the discharge end.



The space between the front wall and an object or pile on the floor that is near the front wall.



Damaged or cut hydraulic hoses, fittings or tubing. A small hole in a hose or fitting will produce a stream of fluid that can pierce the skin injecting oil into your blood.



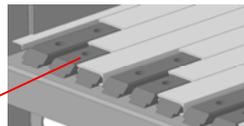
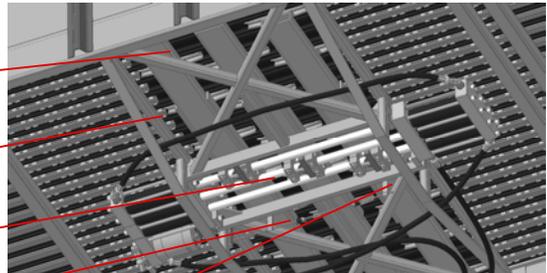
The space between cross-drive beams.

The space between shoe ends and the subdeck ends.

The area between clamps.

The area between the triggers and the switching rod bumpers.

The area between the triggers and the surrounding framework.



The bolt hole in the hold down blocks.

The end of the slats and the front wall.



AVOID the product hazards listed on this page while hydraulic FLUID IS FLOWING TO the floor system or personal injury or death MAY occur.





NOTICE

Take the following actions to prevent property damage:

For warranty purposes, get approval from the Original Equipment Manufacturer prior to welding or drilling on their product (trailer, etc.).

Cover the shaft chrome before welding or painting nearby. Remove covering before operating the system.

Support hoses and protect them against abrasion from contact between other components.

Install a filter in the return line as close to the tank as possible before operating the floor system.

Install a high pressure filter in the pressure line between the pump and the conveyor system before operation.

Make sure the system pressure never exceeds the maximum pressure specified in this manual.

Monitor the oil temperature during operation to prevent it from exceeding 180 deg. F (82 deg. C).

Operate the Live Floor in the unload mode only when the discharge doors are open.

Watch the space between the front wall and the load while operating the Live Floor in the load mode. Stop the conveyor if it is in the load mode and the load is touching the front wall.

Deck bolts must be re-torqued after the first 5-10 loads! Failure to do this will result in damage to the slats and drive unit!!!

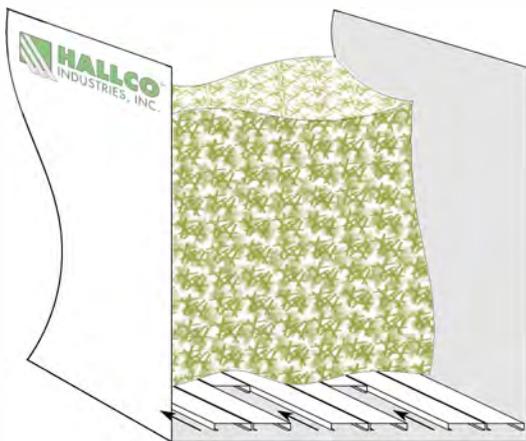
What a Live Floor™ Conveyor Is and How it Works



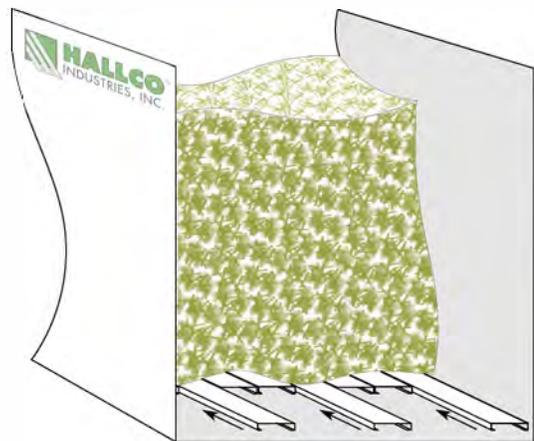
A Live Floor conveyor is made of multiple slats or boards that are as long as the conveyor. The slats are arranged side by side and all at the same level so they cover the entire width of the floor. They don't move up and down or side to side, only back and forth.

Entire trailer loads are unloaded at once by: Conveying all of the slats together in one direction for a stroke; Keeping two thirds of the slats stationary and retracting one third at a time under the load to their original position; Then conveying all of the slats together again.

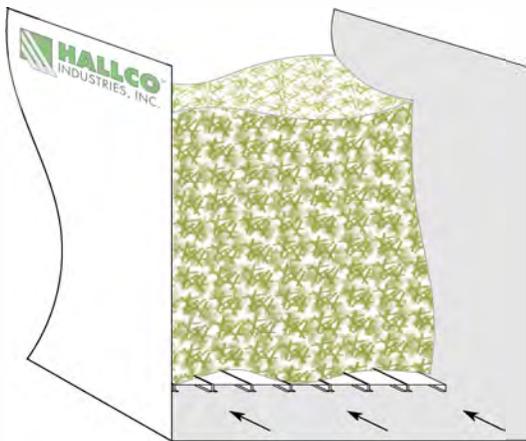
The slats are divided into three groups and each group is driven by a hydraulic cylinder. There are very few moving parts.



First Group Retract



Second Group Retract

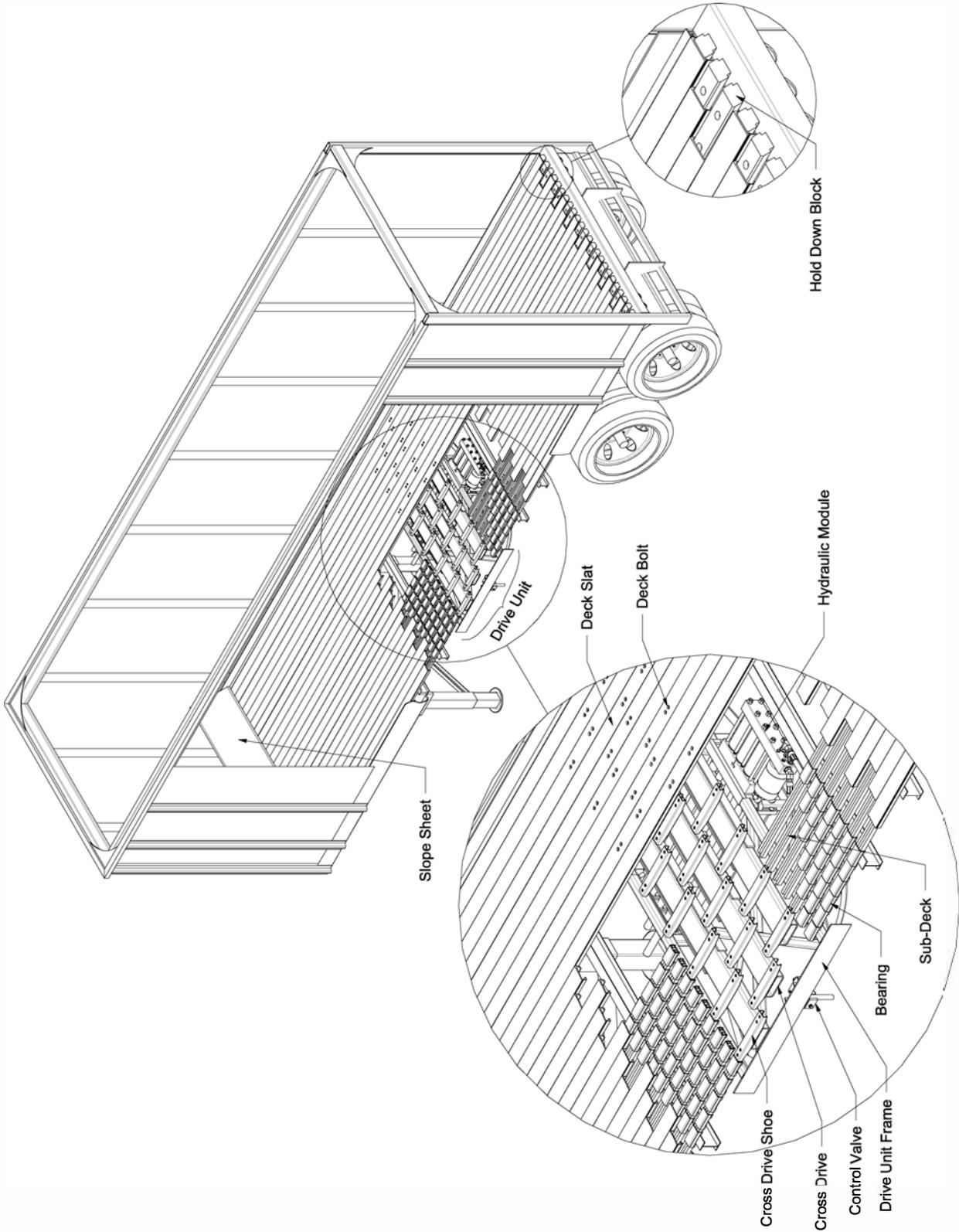


Third Group Retract

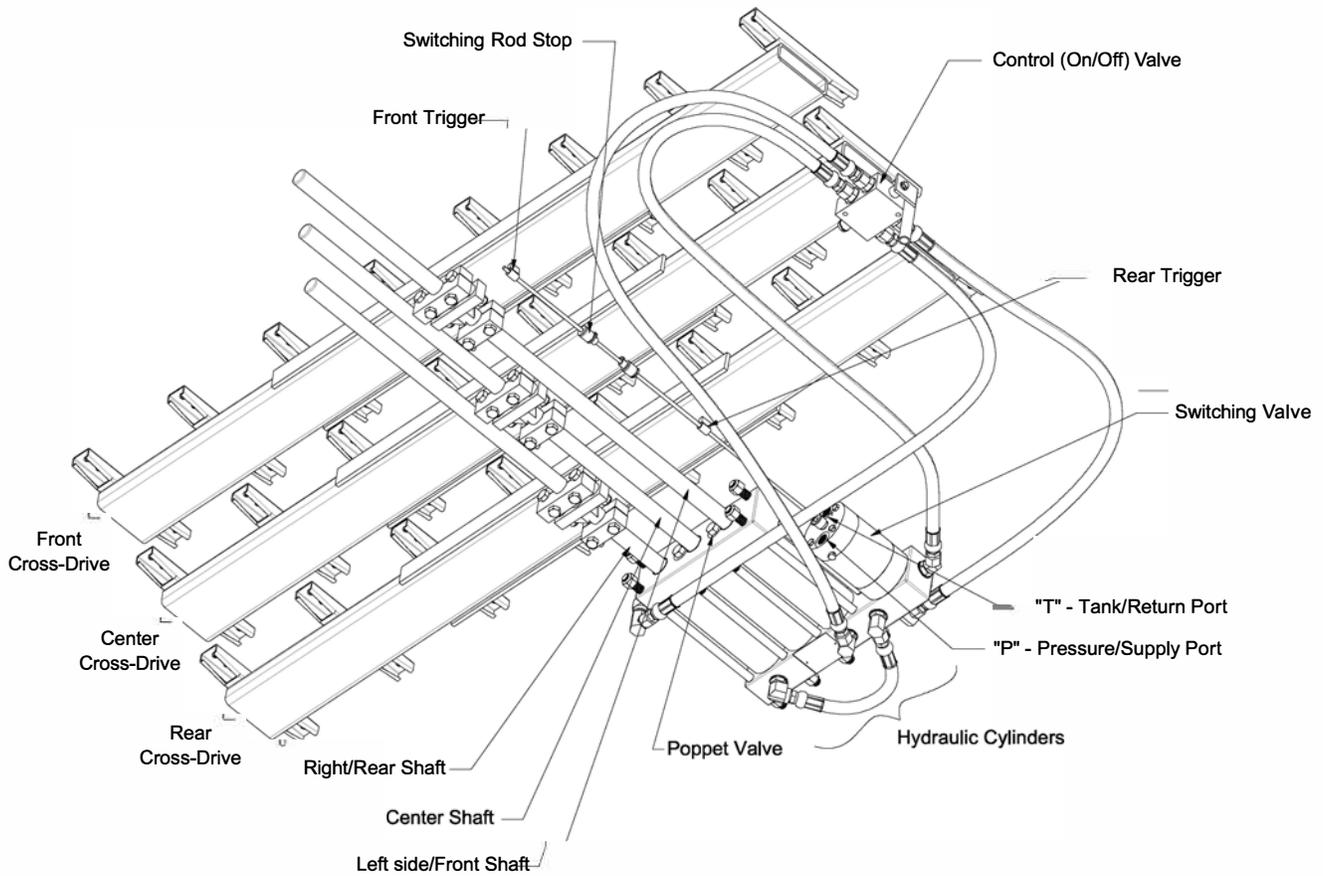


All Groups Convey Together

What a Live Floor™ Conveyor Is and How it Works



What a Live Floor™ Conveyor Is and How it Works



Drive Unit

Operation & Maintenance

⚠ DANGER Avoid these hazards when the floor is moving:



The space between cross-drive beams.

The space between shoe ends and the subdeck ends.

The end of the slats and the front wall.



Damaged or cut hydraulic hoses, fittings or tubing. A small hole in a hose or fitting will produce a stream of fluid that can pierce the skin injecting oil into your blood.

Unloading

Turn the hydraulic power on and pull the control valve handle to the UNLOAD position (see sketch to the right). The floor may begin to move erratically at first while it is clearing out air pockets, but after a few seconds should begin to sequence properly. Look for the following indications that the floor is operating properly in UNLOAD position:

1. Left side/front shaft and cross-drive move forward.
 2. Center shaft and cross-drive move forward.
 3. Right/rear shaft and cross-drive move forward.
 4. All shafts and cross-drives move rearward together.
- Cycle repeats...

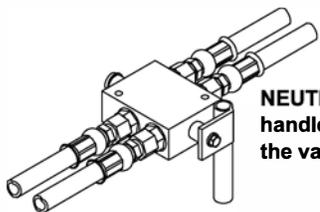
Neutral

Move the control handle to the NEUTRAL position:
The floor should not move.

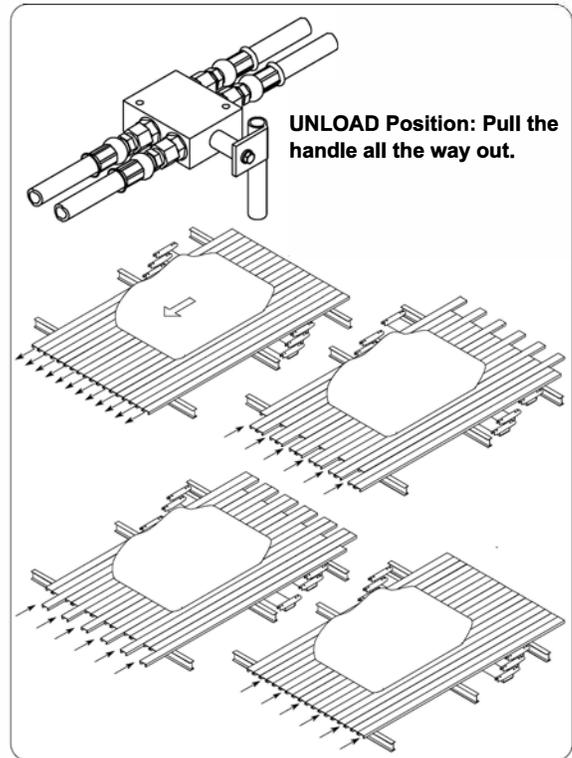
Loading

Turn and push the control handle to the LOAD position (two-way models only). Look for the following indications that the floor is operating properly in LOAD position:

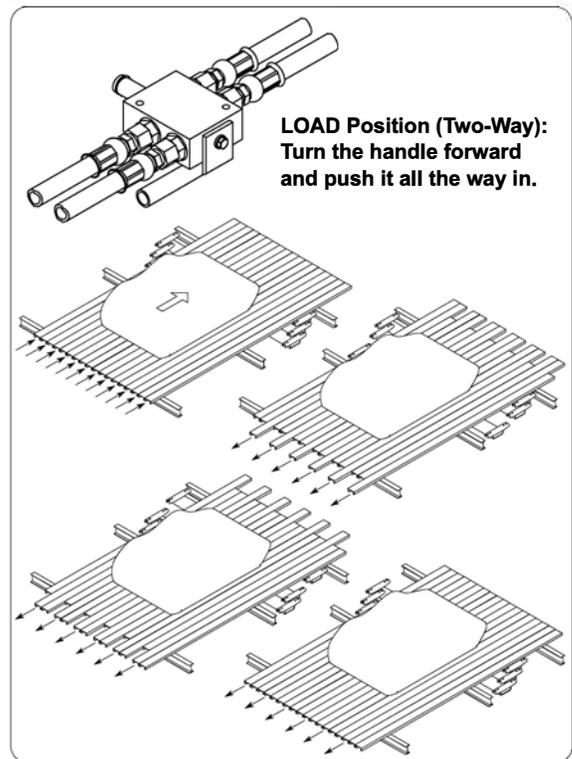
1. Right side/rear shaft and cross-drive move rearward.
 2. Center shaft and cross-drive move rearward.
 3. Left side/front shaft and cross-drive move rearward.
 4. All shafts and cross-drives move forward together.
- Cycle repeats...



NEUTRAL Position: Push the handle in until it hits the valve body



UNLOAD Position: Pull the handle all the way out.



LOAD Position (Two-Way): Turn the handle forward and push it all the way in.

Operation & Maintenance

Inspect your floor regularly in order to monitor wear of your floor and to prevent further damage, if damage has already occurred. The following is a list of critical areas to inspect:

Deck Bolts:

The deck bolts connecting the deck slats to the cross drives must be kept tight at all times! Loose deck bolts will damage your deck and cross-drive shoes. The torque of the deck bolts must be checked on a regular basis and at least after the first 5 to 10 loads. Re-torque from underneath to one of the following torques:

3/8" [9.5 mm] diameter bolts torque to 35 ft-lbs [47 N-m].
1/2" [13 mm] diameter bolts torque to 55 ft-lbs [75 N-m].

Decking:

Inspect for wear or damage.

Bearings:

Inspect for wear or damage.

Hydraulic Plumbing:

Inspect the hydraulic system for leaks and abrasion. Maintain reservoir minimum/maximum levels.

Floor Structure:

Inspect the floor structure including hydraulic module mount and framework, hydraulic shafts, shaft-to-cross drive connections, cross drives, and sub-deck for damage and wear.

Hydraulic Module:

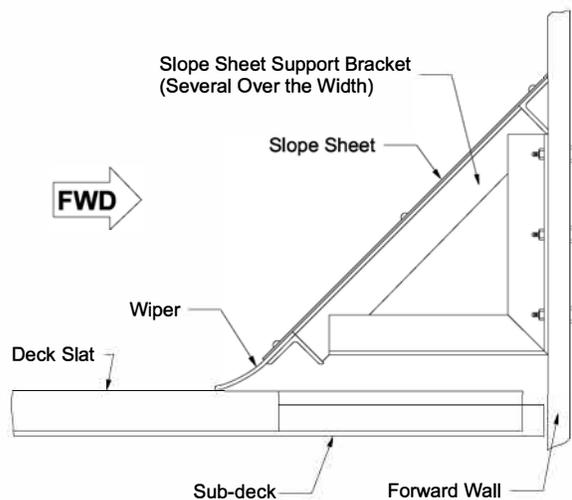
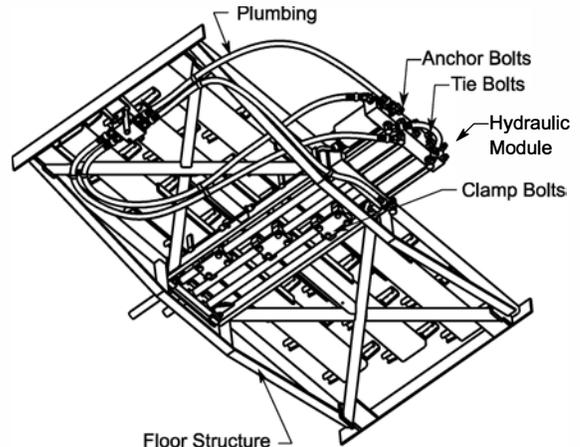
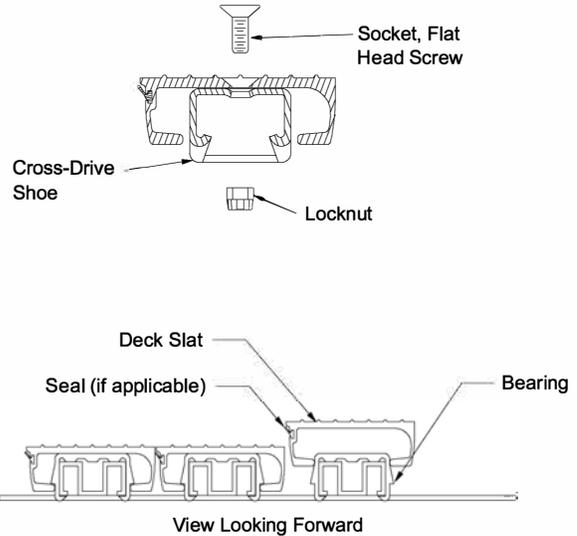
Inspect the hydraulic module for leaks, loose mounting bolts, loose manifold bolts, worn wipers and seals, and pitted/worn/damaged shafts.

Check the torque of the tie bolts, anchor bolts and clamp bolts regularly and at least after the first 5-10 loads.

Tie Bolts Torque: 150 ft-lbs [203 N-m]
Anchor Bolts Torque: 150 ft-lbs [203 N-m]
Clamp Bolts Torque: 120 ft-lbs [163 N-m]

Sloped Sheet & Wiper:

Make sure the sloped sheet is in good condition and that the wiper attached to the sloped sheet is keeping the gap between the forward wall and the end of the decking clear of material which could cause the floor to bind.



Troubleshooting

In the "Trouble" column below, find the description that best matches the trouble you are experiencing with the Live Floor™ system. The Item # columns refer to the pictures on the following page. A dark cell means that the item is a suspected cause of the trouble described in that row.

If the suspect is a hydraulic part, measure its temperature using an infrared thermometer or similar device while the system is running to see if it is warmer than the other hydraulic parts. A hydraulic component that is damaged and bypassing oil will heat up a lot faster than the other hydraulic parts in the system.

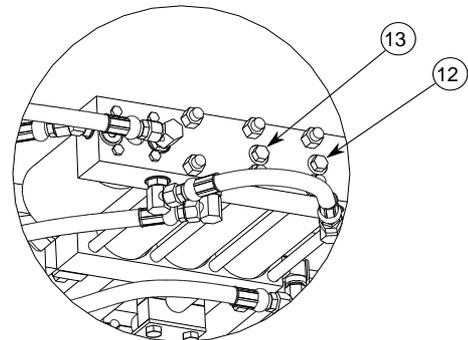
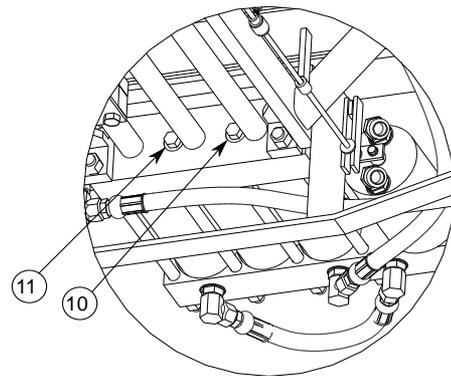
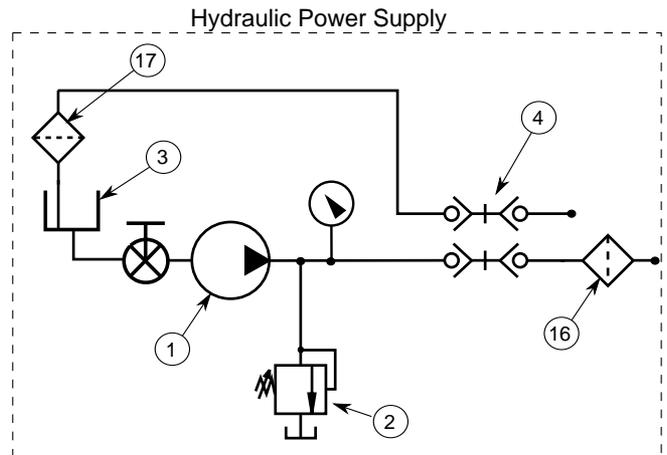
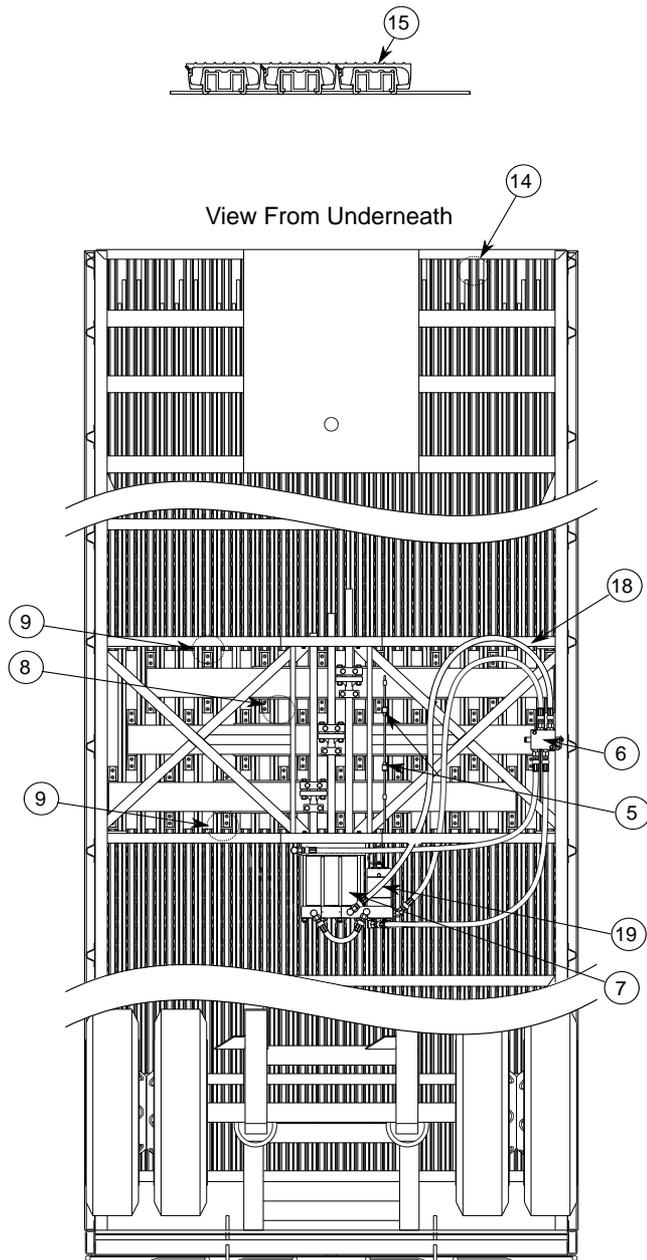
Check the performance of each suspected component. Verify that it meets the minimum requirements listed for it in this manual. Check it for visible damage and/or interference from other parts.

| Trouble | Item # | Hydraulic Pump | Pressure Relief Valve | Tank/Reservoir | Quick Connect Couplers | Switching Rod Bumpers | Control Valve | Pistons/Cylinders | Cross-Drive Beams | Drive Shoes and Sub-deck | Front Poppet #1 | Front Poppet #2 | Rear Poppet #1 | Rear Poppet #2 | Slat ends at front wall. | Slats | Pressure Filter | Return Filter | Hose Routing (Plumbing) | Switching Valve | |
|---|--------|----------------|-----------------------|----------------|------------------------|-----------------------|---------------|-------------------|-------------------|--------------------------|-----------------|-----------------|----------------|----------------|--------------------------|-------|-----------------|---------------|-------------------------|-----------------|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | |
| The slats won't move and the floor is loaded. I don't want to use a shovel! | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | | | | ✓ | | | | | ✓ | |
| The slats move much slower than normal when the floor is loaded. The speed looks fine when there is no load. | | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | | | | | | | | | | | ✓ |
| The slats move seperately when they should travel together. * | | | | | | | ✓ | | | | | | | | | ✓ | | | | | |
| When the slats should be retracting separately, the first cross-drive retracts, the second retracts and the third tries to move and can't or moves very slowly. Everything works fine when the control valve is switched to move the load in the opposite direction. | | | | | | | | | | | | ✓ | | ✓ | | | | | | | |
| When the slats should be retracting separately, the first cross-drive retracts, then the second cross-drive tries to move and can't or moves very slowly. Everything works fine when the control valve is switched to move the load in the opposite direction. | | | | | | | | | | | ✓ | | ✓ | | | | | | | | |
| The hydraulic fluid is overheating within 15 minutes of operation. | | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | | | | | | | | | | | ✓ |
| The slats reach their end of stroke and nothing happens. When I shut the power to the system off and turn it back on, the floor may cycle or move once but it always gets stuck at one end even though the pump sounds like it is pumping fluid at the maximum pressure. | | | | | | ✓ | | | | | | | | | | | | | | | |
| The slats move together all the time. It doesn't make a difference if I push the control valve handle all the way in or pull it all the way out. | | | | | | | ✓ | | | | | | | | | | | | | | ✓ |

* The load on the floor works to keep the slats all moving together. If there is no load on the floor it doesn't take much extra friction on one cross-drive to keep it from moving with the rest. Most of the time this trouble is fixed by loading the floor.

Troubleshooting Pictures

1. Hydraulic Pump.
2. Pressure Relief Valve.
3. Tank/Reservoir.
4. Quick Connect Couplers.
5. Switching Rod Bumpers.
6. Control Valve.
7. Pistons/Cylinders.
8. Cross-Drive Beams.
9. Shoes and Sub-deck.
10. Front Poppet #1.
11. Front Poppet #2.
12. Rear Poppet #1.
13. Rear Poppet #2.
14. Slat ends at front wall.
15. Slats.
16. Pressure Filter.
17. Return Filter.
18. Hose Routing (Plumbing).
19. Switching Valve



Switching Rod Adjustment

TIP The switching rod stops are typically pre-set at the factory. If the drive unit has been pre-assembled and the switching rod stop collars are tight, you may skip this section.

- a. Release and move stops "A" and "B" away from the front and rear triggers.
- b. Move the switching rod rearward toward the switching valve until it stops.

⚠ DANGER Avoid these hazards when the floor is moving:



The space between cross-drive beams.

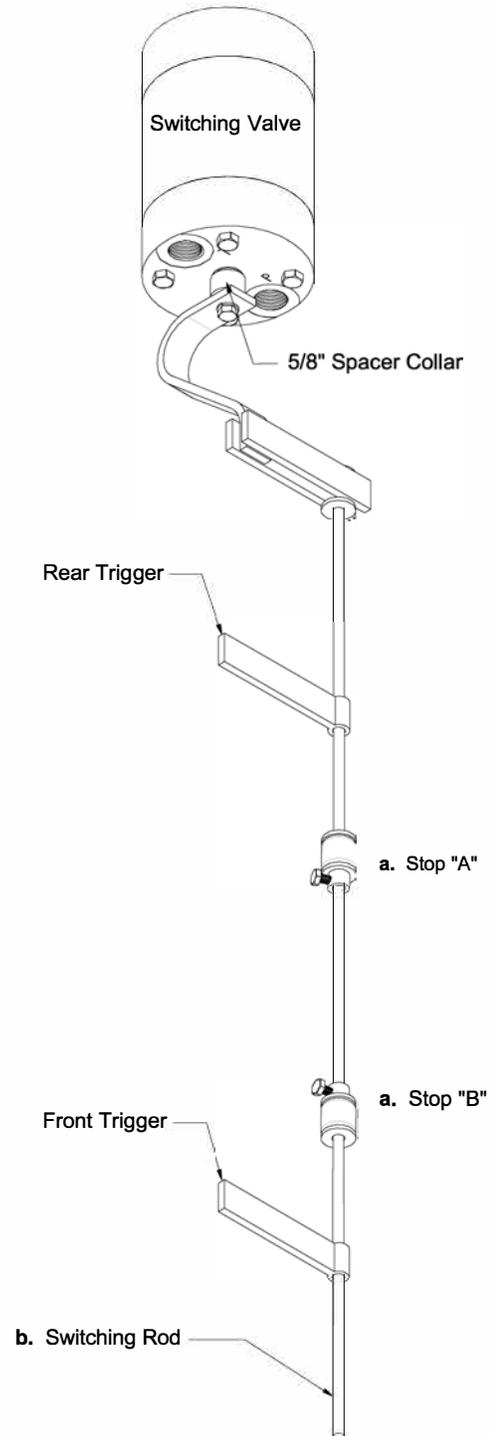
The space between shoe ends and the subdeck ends.

The end of the slats and the front wall.



Damaged or cut hydraulic hoses, fittings or tubing. A small hole in a hose or fitting will produce a stream of fluid that can pierce the skin injecting oil into your blood.

- c. Apply hydraulic pressure (load or unload mode) until the shafts are fully extended forward away from the switching valve, then shut off pressure.
- d. Move the switching rod away from the switching valve until it stops. Move and set stop "A" firmly against the rear trigger.
- e. Apply hydraulic pressure until the shafts are fully retracted rearward towards the switching valve, then shut off pressure.
- f. Move the switching rod rearward toward the switching valve until it stops. Move and set stop "B" firmly against the front trigger.
- g. Mark the positions of stops "A" and "B" on the switching rod.
- h. Apply hydraulic pressure to the cylinders until the triggers are free from the stops by at least 3/8". Shut off the pressure. Move stop "A" 3/8" [10 mm] toward the rear trigger and tighten firmly. Move stop "B" 3/8" [10 mm] toward the front trigger and tighten firmly.



Hydraulic System Requirements



Anti-Wear (AW). Viscosity of ISO 46 or 68 Petroleum OR Mineral base. Moisture content, H₂O < 1%

< 180°F [82°C]
Fluid Temperature:



Pump:

Pump must be a Gear, Vane or Piston type that will pump no more than 25 gpm [95 Lpm] at a full 3000 psi [207 Bar].
Pump must be matched to its power source. Drive it directly or through a PTO. Consult a hydraulic expert to determine the required motor/engine power.

Summary:
Flow ≤ 25 gpm [95 Lpm]
Pressure ≥ 3000 psi [207 bar]
Power Source ≥ Enough for the Flow and Pressure
Speed: Motor or PTO ↔ Pump

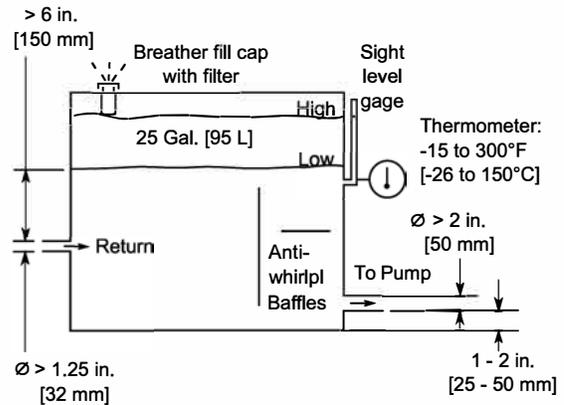


Tank/
Reservoir:

Use a reservoir that has all of these features:

- 25 gal. [95 L] minimum capacity.
- Inlet diameter greater than 1.25 in [32 mm].
- Outlet diameter greater than 2 in [50mm].
- Turbulence reducer on Return inlet.
- Pump supply outlet near the bottom.
- Whirlpool prevention on the outlet.
- Filler cap with breather and filter.
- Visible fluid level gage.
- Visible thermometer.

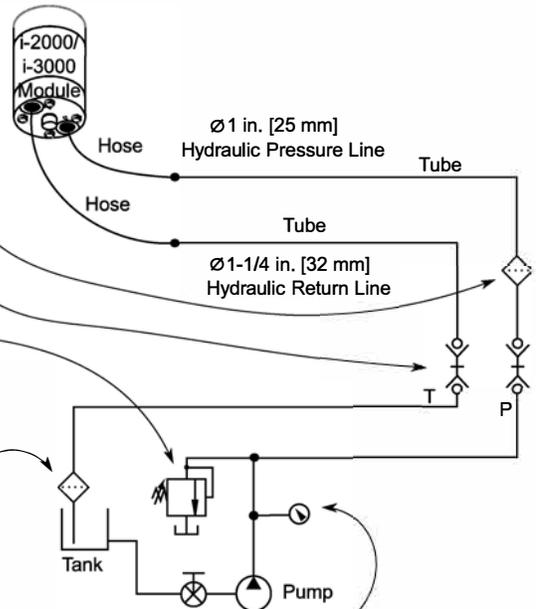
Location and specification information is shown in the sketch to the right.



Hydraulic
Supply
Circuit

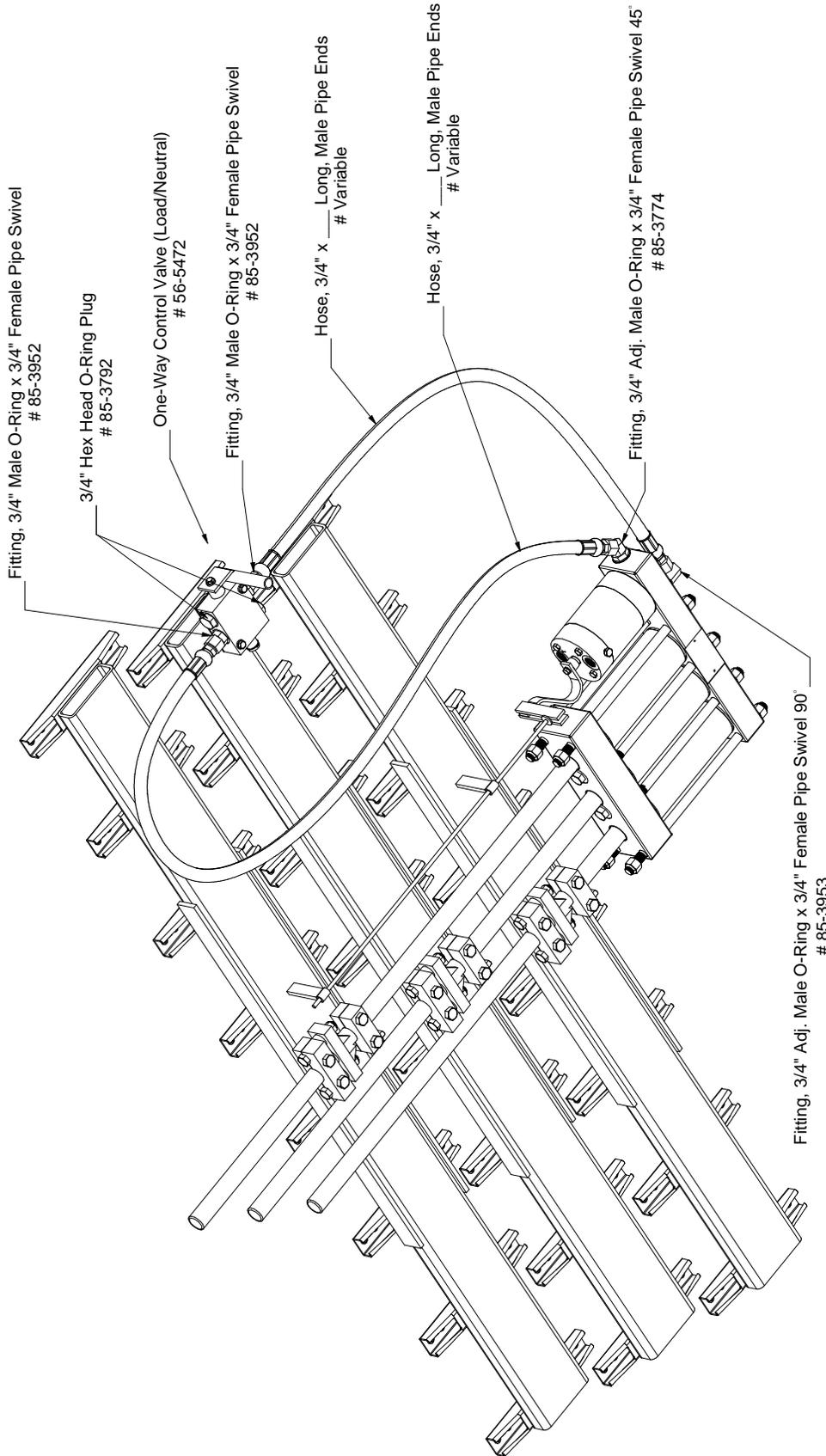
Use all of these features.

- (Optional) 75 micron Pressure Filter rated to handle the maximum system pressure and flow.
- Quick Connects that are matched and rated for the maximum system pressure and flow rate.
- Pressure Relief Valve set at 3000 psi [207 Bar] and rated to handle at least the maximum pump output flow.
- 25 micron Return Filter rated to handle more than 1.5 times the maximum pump flow and at least 750 psi pressure. Place it as close to the tank as possible. Make the hydraulic line between the filter and the tank at least 1-1/4" [32 mm] diameter and as short as possible to prevent filter failure.
- Visible Pressure Gage. 0 to 5000 psi [0 to 350 bar]. Glycerin filled.



Hallco recommends consulting a hydraulic specialist to design the hydraulic supply system.

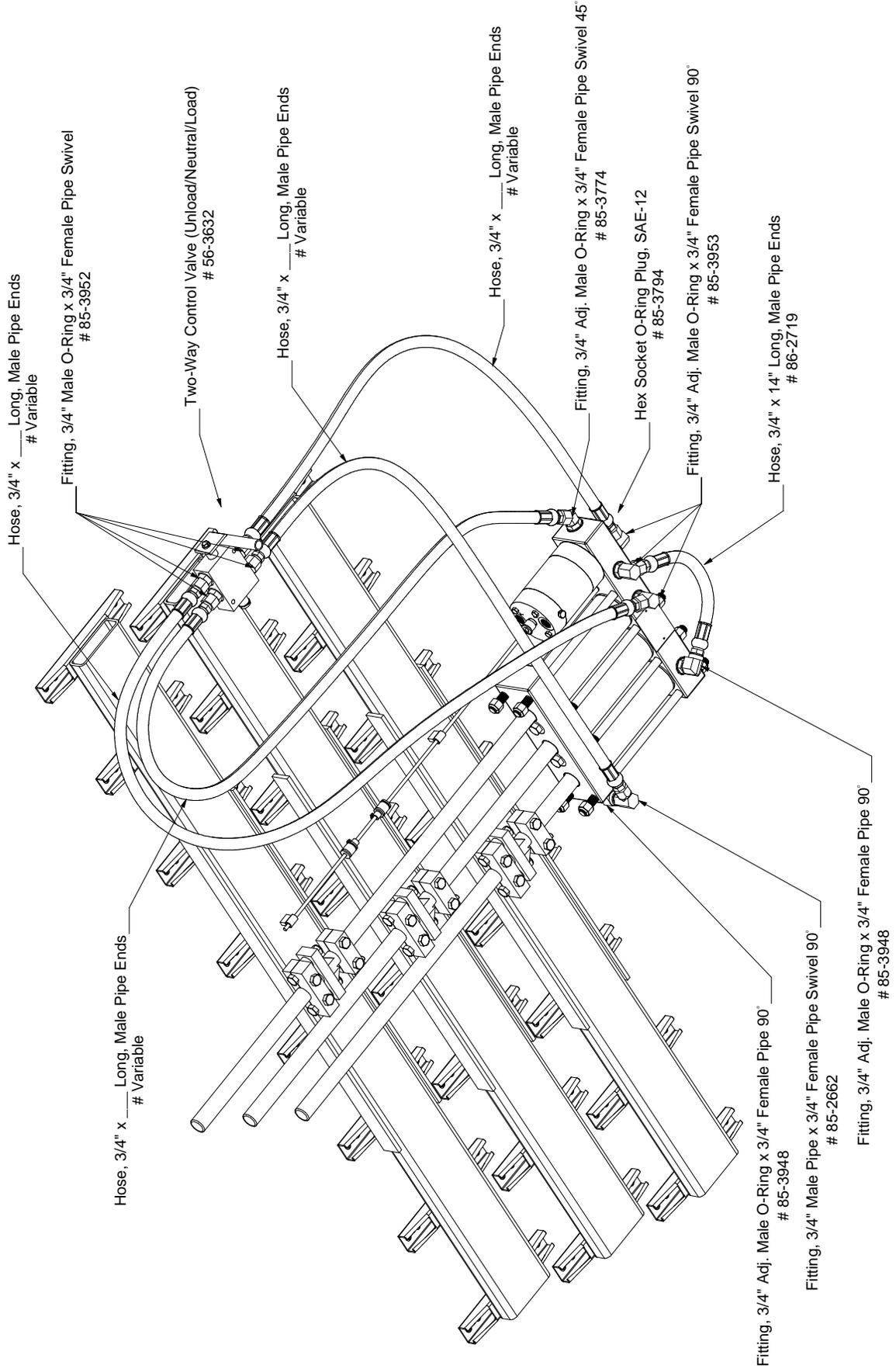
Parts Lists - Plumbing One-Way



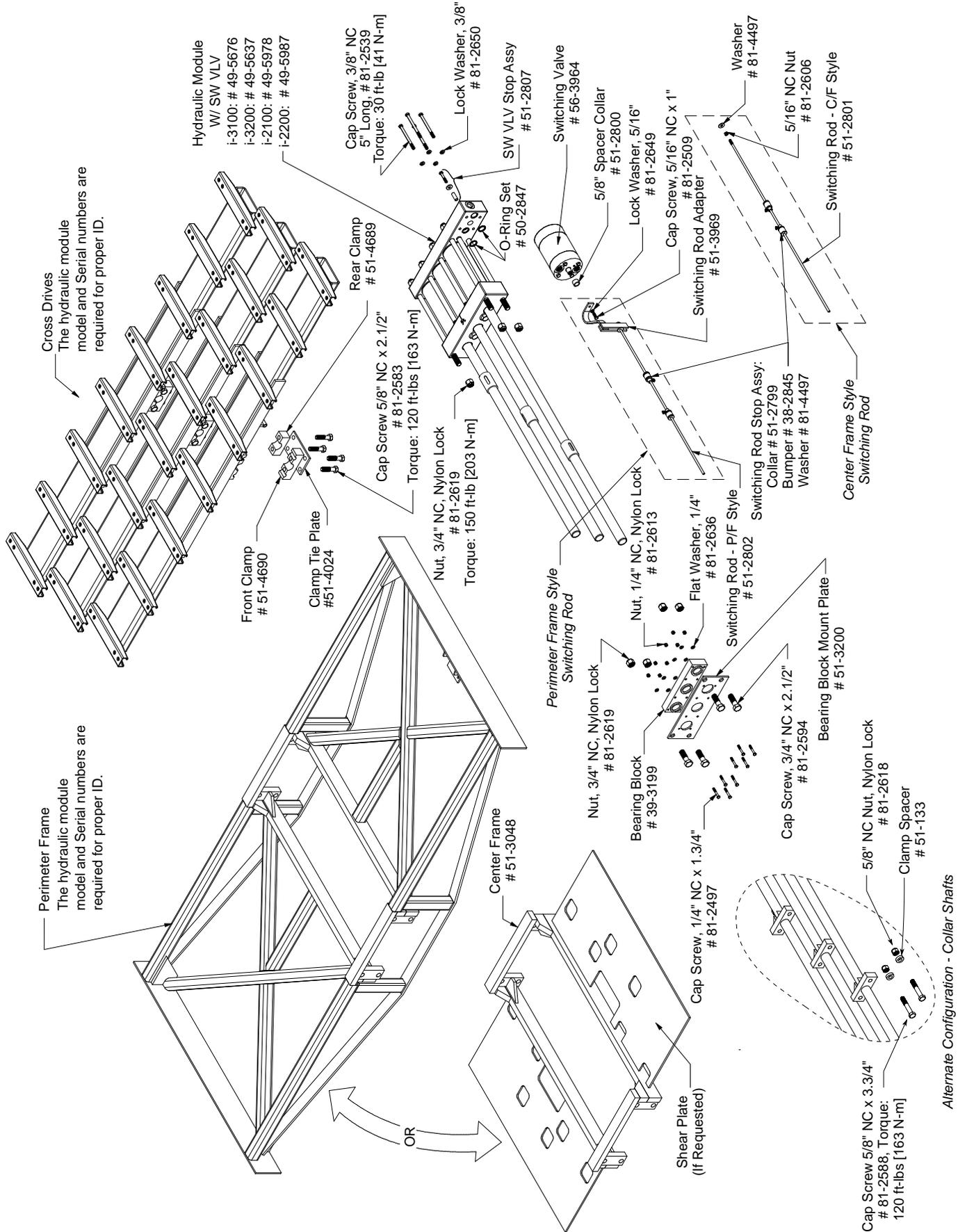
NOTE:

The control valve and hoses shown may be excluded and the manifold ports plugged, if the pressure supply to the switching valve is controlled by another method.

Parts Lists - Plumbing Two-Way

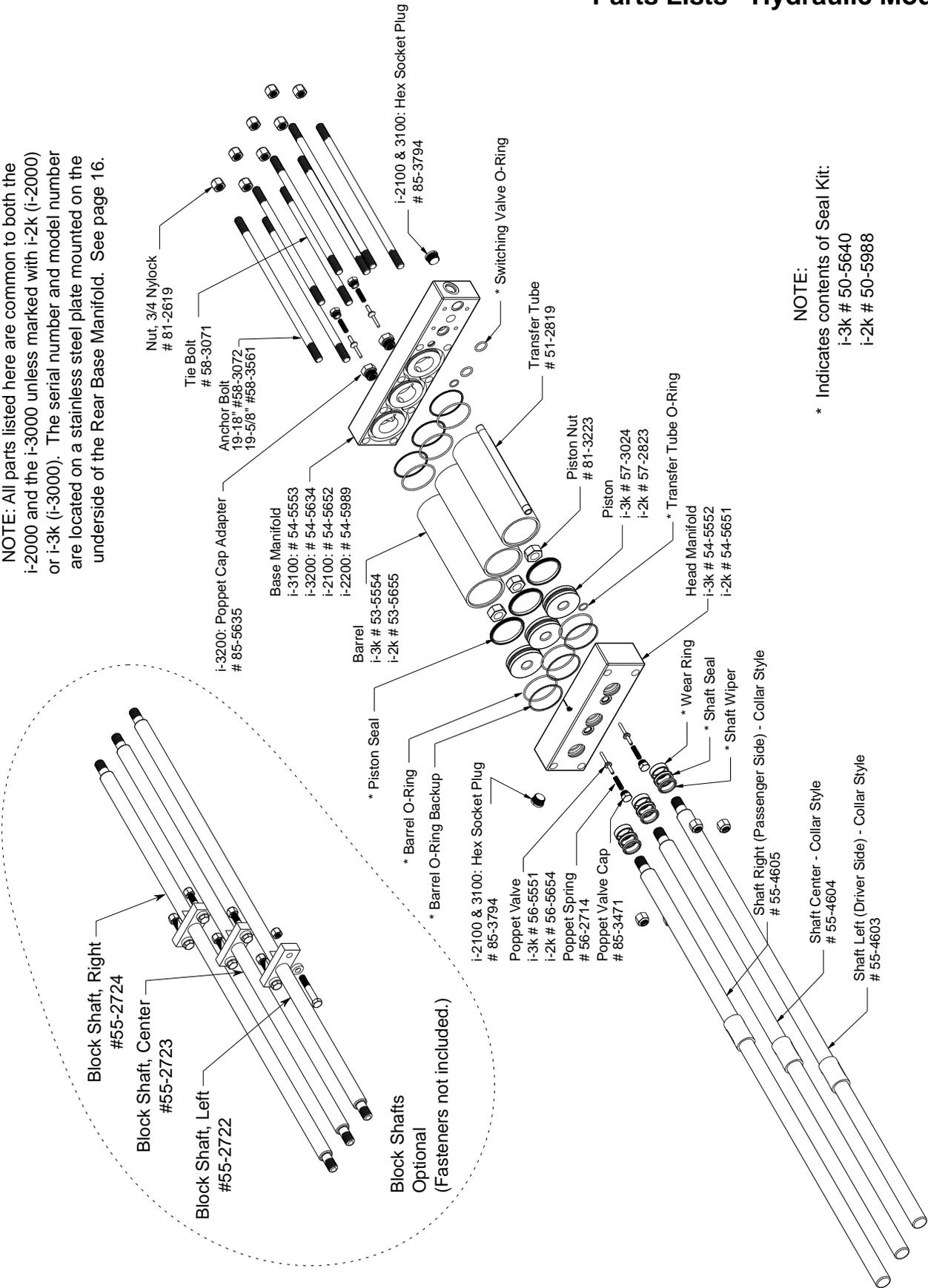


Parts Lists - Drive Unit



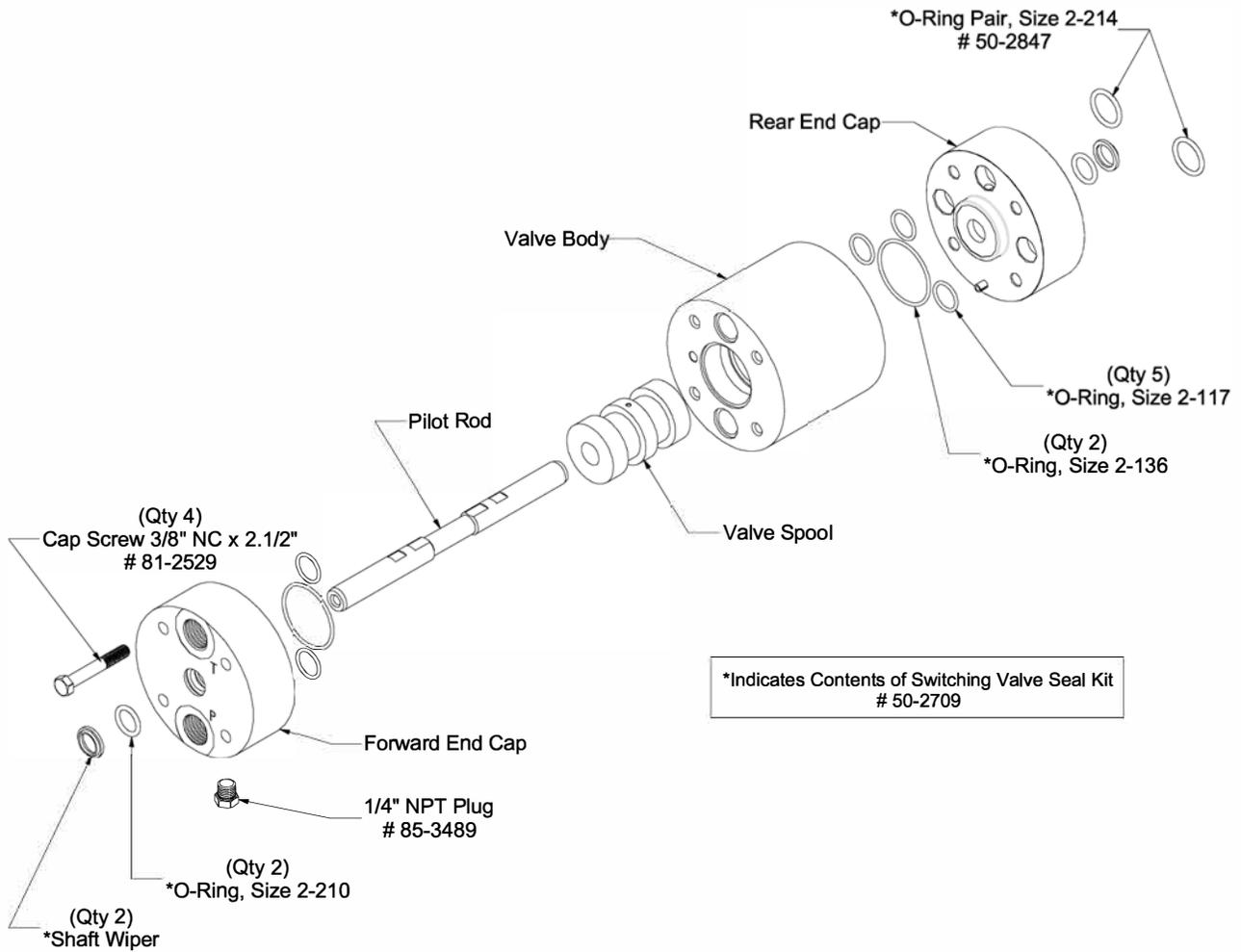
Parts Lists - Hydraulic Module

NOTE: All parts listed here are common to both the i-2000 and the i-3000 unless marked with i-2k (i-2000) or i-3k (i-3000). The serial number and model number are located on a stainless steel plate mounted on the underside of the Rear Base Manifold. See page 16.



NOTE:
 * Indicates contents of Seal Kit:
 i-3k # 50-5640
 i-2k # 50-5988

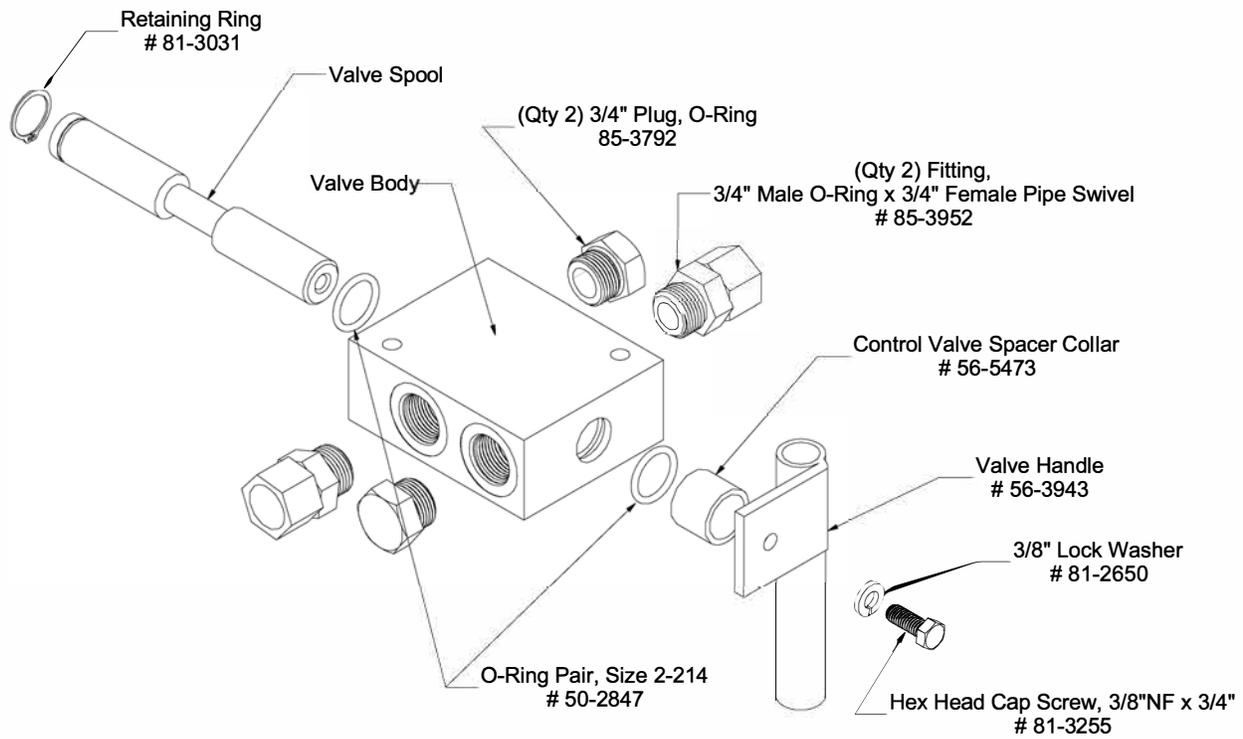
Parts Lists - Switching Valve



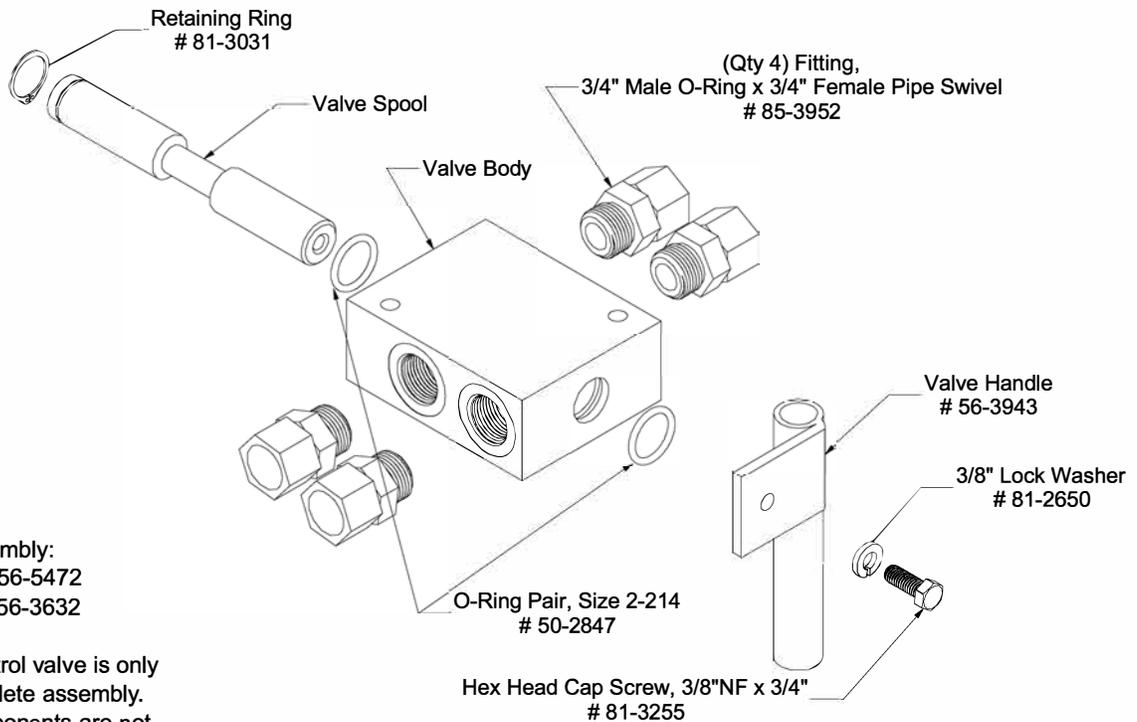
Complete Assembly: P/N 56-3964

Note: The switching valve is only sold as a complete assembly. Individual components are not sold separately.

Parts Lists - Control Valve



One-Way Control Valve



Two-Way Control Valve

Complete Assembly:
 One-Way: P/N 56-5472
 Two-Way: P/N 56-3632

Note: The control valve is only sold as a complete assembly. Individual components are not sold separately.

Repair Guide - Hydraulic Module

Recommended Tools for Overhaul & Repairs

| Part Number | Description | Comment |
|-------------|--|---------------------------------|
| 93-4333 | Head Manifold Installation Tool | Included in tool kit, 93-4356 |
| 93-5500 | Hydraulic Module Rebuild Fixture, i-Series | For bench-top overhauls |
| 56-3712 | Poppet Seating Tool, i-Series | Included in tool kit, 93-4356 |
| 86-2972 | Pressure Gauge, 0-5000 PSI | Included in tool kit, 93-4356 |
| 93-4311 | Rod Seal Insertion Tool | Included in tool kit, 93-4356 |
| 93-4708 | 3/4" Tie Bolt Installation Tool | For quick-driving the tie bolts |

Hydraulic Module Overhaul

If the hydraulic module is accessible from below, it may be overhauled in-place. An advantage of doing this is that the shafts are kept from rotating by the cross drive clamps. This is useful since the piston nuts must be tightened with 300 ft-lbs [407 N-m] of torque. Some other advantages are that no heavy lifting is required and the shafts are always kept in proper alignment with the cross-drives.

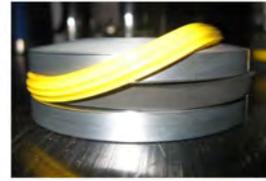
Depending on shop equipment available and the extent of the overhaul, it may be more convenient to remove the entire hydraulic module. An advantage of this is that the majority of the work would be done in a comfortable place away from the dirty underside of the conveyor.

Hydraulic modules may be shipped to Hallco for overhaul. Hallco recommends keeping the switching valve assembled in order to allow Hallco to fully test the overhauled module.

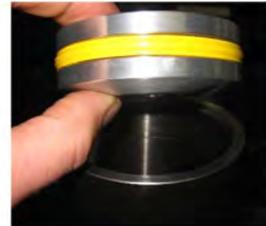
The following pages illustrate the assembly of a hydraulic module.

Repair Guide - Hydraulic Module Overhaul

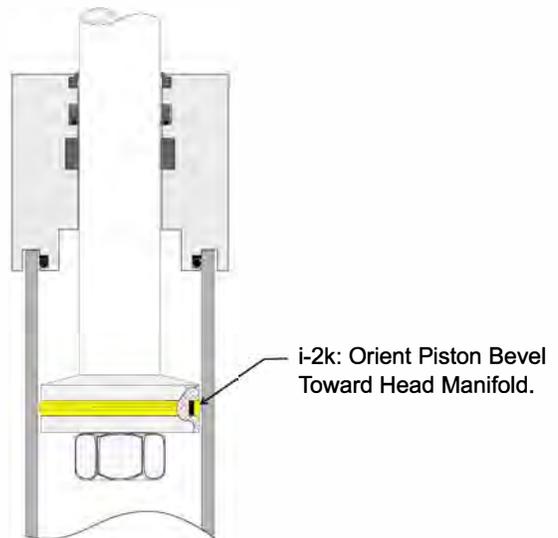
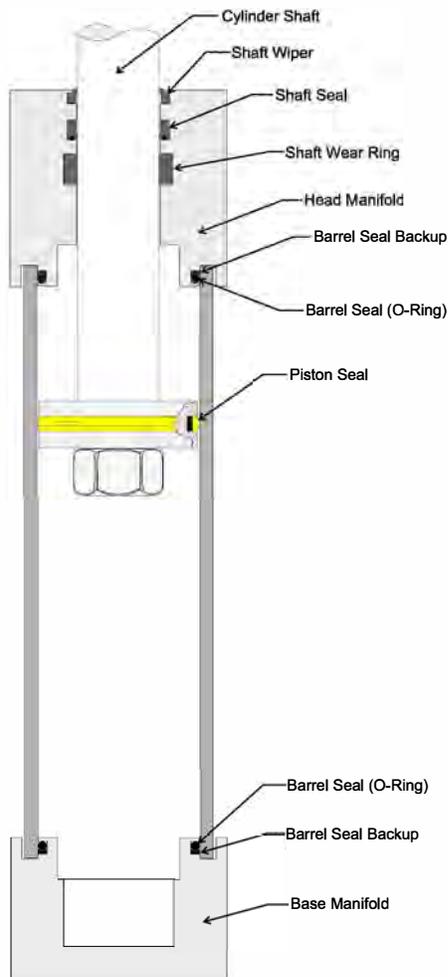
Slip the two part piston seals into the groove on each piston. The black base goes on first.



Apply oil to the piston seal before inserting into the barrel. Put the bevel side of the piston into the barrel first so that it is toward the head manifold when the barrel is placed over the shaft and onto the head.



Use a hydraulic press or other tool to push the piston into the barrel/cylinder. The flat surface of the piston should be around 1/2 inch [13mm] inside the barrel to make space for the o-ring boss on the base manifold.



Repair Guide - Hydraulic Module Overhaul

Before installing any seal be sure to inspect the seal and sealing surface/groove and remove any debris or rough surface.

Stretch a parabolic backup ring into each o-ring boss groove on the head and base manifolds. The cupped surface should face toward the inside of the barrel.

Then stretch an o-ring into the grooves so that the o-ring will be furthest toward the inside of the barrel. Be sure that the o-ring is sitting down in the groove all the way and not resting on the backup ring.

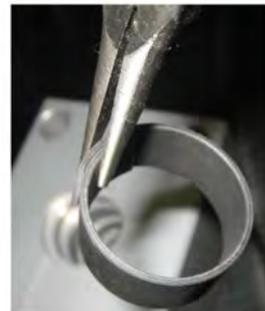
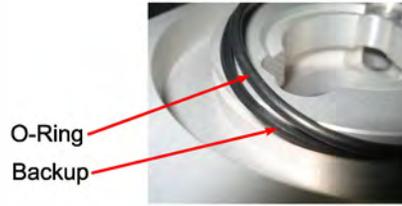
Wipe oil onto the o-rings. If they are not oiled the o-rings could be damaged when the barrel is slid over the o-ring boss.

Wipe oil onto the transfer tube o-rings and then insert them into the transfer tube grooves in the head and base manifolds.

Use the poppet seat tool and a hammer to form the seat for the poppet to seal against.

Fold the wear rings and insert them into the wide groove in the shaft holes.

Use the rod seal insertion tool to fold the shaft seal as shown. Insert the seal into the next groove up from the wear ring in the shaft holes. Orient the seal so that the wiper lip is toward the barrels.



Repair Guide - Hydraulic Module Overhaul

Use the rod seal insertion tool again to fold and install the shaft wiper seals. Orient the seal so that the wiper lip is directed away from the barrels.



Insert the poppet, spring and cap into the poppet ports in the head manifolds as shown. Apply oil to the poppet cap o-rings before inserting the caps.



Clean the portion of the shafts that will be inside the cylinder barrels. Inspect the chrome surface for dents, missing chrome or any other defect that would damage the seals.



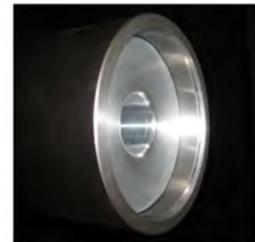
Apply oil to the shaft seals and slide the heads onto the shafts. Orient the heads so that the centerline marks both face in the same direction.



Use the head installation tool to draw the shafts through the shaft seals. Slide the heads onto the shafts so that the inside face of the heads is 11-1/4" [285 mm] from the end of the shafts.



Take a barrel with a piston installed in one of its ends and slide the open end without the piston over a shaft and push it over an o-ring boss. The threaded end of the shaft will slide into the piston hole. The end of the barrel should seat against the bottom of the o-ring boss slot. Do this on all of the shafts.



Thread the piston nuts on the shafts and tighten to 300 ft-lbs [407 N-m] torque against the pistons. The assembly jig is very helpful in keeping the shafts from turning when torquing the piston nuts!



Repair Guide - Hydraulic Module Overhaul

Insert the transfer tubes into the head manifolds.

Insert the tie bolts through the four holes in the center of the bases and thread them into the heads. The tie bolt insertion tool makes it easier to turn the tie bolts. Sink the tie bolts into the heads as far as they will go.

Insert the base manifold o-ring bosses into the barrels and the transfer tubes into the base. Orient the bases so that the transfer tubes from the heads line up with the transfer tube ports in the bases.

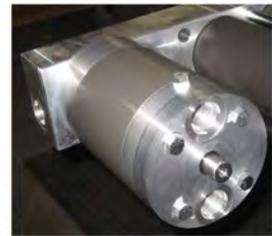
Tighten the tie bolt nuts but do not torque them until installing the module into the frame.



NOTICE Make sure that the transfer tube is inserted into both the head and the base before tightening the tie bolt nuts!



Insert the o-rings into the switching valve ports on the base then insert the four switching valve bolts through the base. Orient the switching valve so that the pressure gage port comes out toward the opposite side from the centerline marks on the head manifolds. Slide the switching valve onto the bolts and tighten the bolts to 30 ft-lbs [41 N-m].



Thread the switching valve stop assembly into the spool of the switching valve. Don't worry about torquing it yet.



Apply oil to the o-rings of each fitting before installing it. Use the plumbing illustrations on page 14 or 15 as a guide for the placement and orientation of each fitting.

Apply teflon tape to any non-swivel pipe thread joint.



Repair Guide - Hydraulic Module Overhaul

Coat the steel mounting flanges with a galvanic corrosion inhibitor such as * ECK® corrosion prevention coating.

Move the module into place near the cross-drives. Orient the module so that the long base manifold is closest to the discharge end of the conveyor and the centerline markings on the head manifolds are facing up. Loosely fit the anchor bolts into the module before moving it into place.

It may be necessary to cut the bridge strap on the perimeter frame in order to install the module. If this is necessary insure that there is very little load on the floor in the area over the frame. Then cut the strap near the vertical posts. After the module has been installed and tested, the strap that was removed must be welded back in place with reinforcement. It must be as strong as the original configuration.

Fit the clamps over the shafts around the collars or blocks. Loosely thread the clamp bolts into place. Insert the anchor bolts into the mounting frame.

Torque the cross-drive clamp bolts to the value shown in the exploded view on page 18.

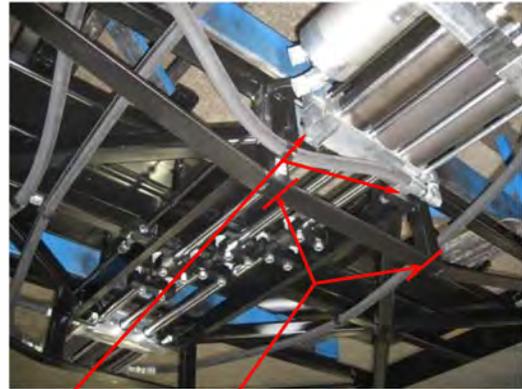
Tighten the tie and anchor bolts a little at a time following a cross pattern as illustrated so that the manifolds remain parallel as they are pressed towards each other. Torque the anchor bolts and tie bolts to 250 ft-lbs [339 N-m].

Thread the switching rod through the trigger nearest the switching valve. Slide the switching rod bumper assemblies in place as shown here. Continue threading the switching rod through the next trigger.

Place the 5/8" [16 mm] collar onto the switching rod end of the pilot rod. Slide the switching rod adapter (if working on a perimeter frame) onto the switching rod and bolt the adapter to the end of the pilot rod. Or install a nut and washer on the end of the switching rod and thread it into the end of the pilot rod (if working on a center frame). The bolt on the other end of the pilot rod may be held to keep the rod from rotating while the switching rod is tightened onto the pilot rod.

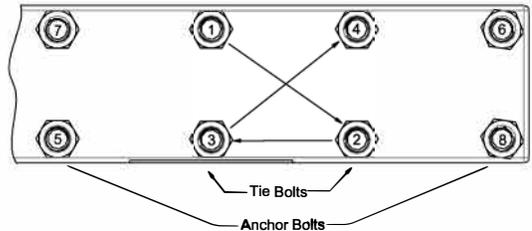
Hang the control valve in place insuring that the plastic spacer plate is between the steel hanger and the aluminum valve body. Torque the bolts to 30 ft-lbs [41 N-m].

Attach the hydraulic hoses using the illustrations on page 16 or 17 as a guide.



Coat this area with ECK or other anti-corrosion.

Cut Strap if Necessary. Reinforce When Replacing it.



Tighten the tie and anchor bolts using a cross pattern.



* ECK is a registered trademark of VAN NAY, LLC Corp. 389 Sundown Rd S. Elgin, IL 60177

Repair Guide - Switching Valve Overhaul

The **switching valve** can be overhauled to correct external seal leakage only — not bypass. If any of the major components require replacement, the entire valve will need to be replaced.

If the switching valve is a lot hotter than the other hydraulic components during operation then a large amount of oil is being bypassed. Send the switching valve to Hallco for testing or replace the valve entirely.

Disassembling the Switching Valve

Remove the cap screws which attach the end caps to the valve body.

Slide the end caps away from the valve body.

Remove the pilot rod and the spool.

Remove the o-rings and shaft wipers.

Inspecting the Switching Valve Components

Inspect the spool, pilot rod, spool bore, and pilot rod bores for scoring and burrs.

Inspect all the remaining seal areas. The seal areas must be smooth and free of scoring and burrs.

Inspect the fasteners and threaded holes for good thread engagement.

Reassembly of the Switching Valve

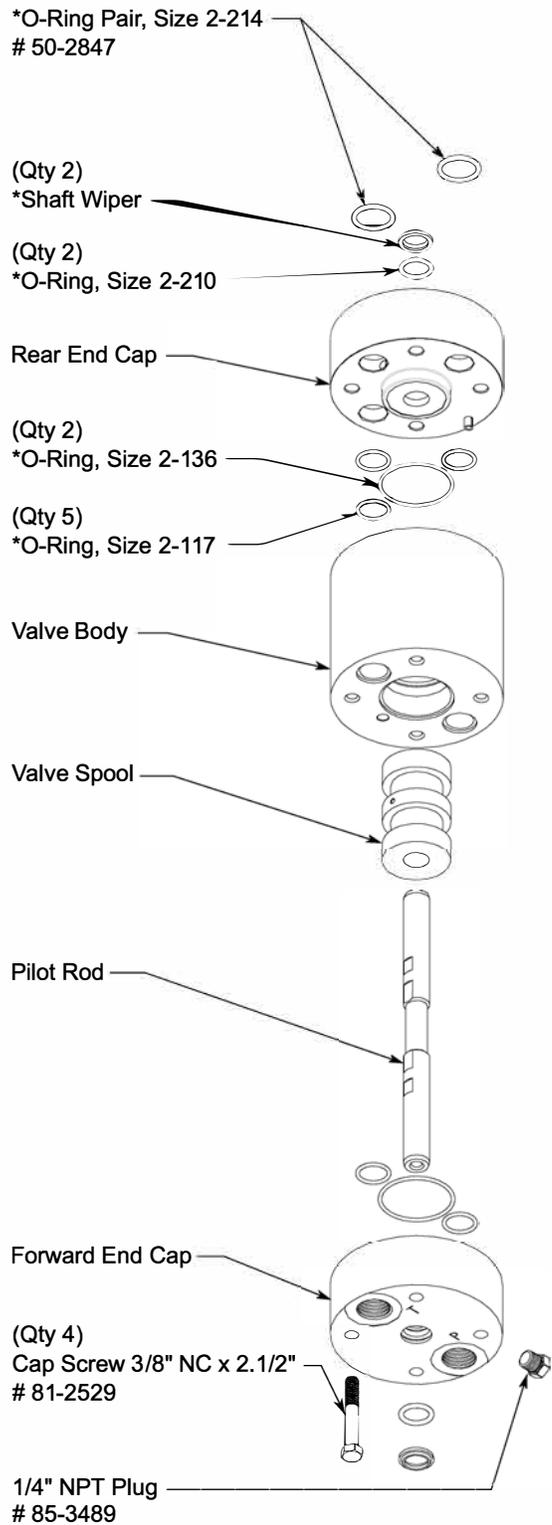
Hallco recommends replacing all the switching valve seals when overhauling the switching valve.

Lubricate the shaft wipers and o-rings with hydraulic fluid and install them in the end caps.

Lubricate the valve spool and pilot rod with hydraulic fluid and insert the spool into the valve body and the pilot rod into the spool. Center them on the valve body.

Place the o-rings which go between one of the end caps and the body in their respective seal grooves and slide on the end cap. Note the location of the alignment pin. Repeat for the other end cap.

Install the cap screws which hold the forward end cap on, snug them up, then torque them to 30 ft-lbs [41 N-m]. Use two of the same size cap screws to hold the rear end cap snug until it is ready to be installed on the hydraulic module.



*Indicates Contents of Switching Valve Seal Kit # 50-2709

Complete Switching Valve Assembly #56-3964

Repair Guide - Control Valve Overhaul

The control valve can be overhauled to correct external leakage only. If the valve has excessive internal bypass, it will need to be replaced entirely.

Disassembling the Control Valve

Remove the cap screw and lock washer which attach the valve handle to the spool. Note: If the spool turns so that the screw cannot be removed, hold the end of the spool at the opposite end beyond the retaining ring with locking pliers or similar. Do not grip the area which slides in the valve body.

Remove the spacer collar (one-way only).

Remove the spool by sliding it toward the retaining ring side. Note that the retaining ring does not have to be removed.

Remove the two o-rings from the valve body.



Reassembling the Control Valve

Prior to reassembly inspect all components for wear and damage. Do not reinstall defective components.

Replace the two o-rings in the valve body with new o-rings. Lubricate the o-rings with hydraulic fluid before installing them.

Install the retaining ring on the spool, if it was removed.

Lubricate the spool with hydraulic fluid and insert it into the valve body.

Attach the valve handle with the cap screw and lock washer.



NOTICE Deck bolts and drive unit tie and mounting bolts must be re-torqued after the first 5-10 loads! Failure to do this will result in damage to the slats and drive unit!!!



i-4000 / i-6000 Series Limited Warranty

HALLCO Industries, Inc. hereby warrants, only to the first owner of a new Hallco i-4000 or i-6000 Series system from the factory or selling distributor, that the product shall be free from defects in material and workmanship for a period of **two years** after delivery to the first owner. **Hydraulic components shall be warranted as free from defects in material and workmanship for a period of three years after delivery to the first owner with a HALLCO approved high-pressure filter installed by an authorized OEM or Dealer before the system goes into service. This warranty does not cover normal wear and tear and maintenance and is not to be construed as a service contract.**

Owner's Obligation: To qualify for warranty coverage, a Warranty Card must be completed and returned to Hallco Industries, Inc. within ten (10) days of delivery. 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 as stated in the owner's manual. For stationary installations, "normal use and service" means the conveying of uniformly distributed, non-corrosive, with weights not in excess of factory-rated capacity.

Sole and Exclusive Remedy: If the product covered hereby fails to conform to the above Warranty, **Hallco Industries, Inc.'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 **Hallco Industries Inc.** Contact Hallco Industries, Inc. for the closest Authorized Dealer. This is the owner's sole and exclusive remedy for all contract claims, and all tort claims including those based on strict liability in tort and/or negligence. Any defective part (s) must be shipped freight prepaid to **Hallco Industries, Inc.,** Tillamook, Oregon.

EXCEPT AS EXPRESSLY SET FORTH ABOVE, HALLCO INDUSTRIES, INC. MAKES NO WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, SPECIFICALLY: NO WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR WARRANTIES OF MERCHANTABILITY ARE MADE. FURTHER, HALLCO INDUSTRIES, INC. 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 ANY OTHER CLAIM OR REASON.

Tort Disclaimer: **Hallco Industries, Inc.** shall not have any liability in tort with respect to the products, including any liability based on strict liability in tort and/or negligence, or any other theory.



Warranty conditions are as follows:

- The warranty period is for the first equipment owner only.
- A warranty period is (2) two years for the entire HALLCO i-Series 4000 or 6000 and BRUTE 8000 from the date of delivery to the first purchaser.
- **A warranty period of (3) three years for the hydraulic components with an approved high-pressure filter installed by an authorized OEM or Dealer prior to the system going into service from date of delivery to the first purchaser.**
- The i-4000 or i-6000 Series and BRUTE 8000 system must be installed by the trailer manufacturer according to HALLCO installation procedures located in the Installation Manuals.
- Purchaser must follow recommended maintenance and control procedures.
- In the case of a malfunction, trailer manufacturer or HALLCO must be informed within 10 business days.

The following components are not covered by the warranty:

- Malfunction of equipment, or caused by equipment, which was not supplied by HALLCO Industries, Inc.
- Malfunction caused by the use of dirty oil, or oil of the wrong type as stated in the owner's manual.
- Malfunction caused by overheated oil: maximum temperature 82 °C or 180°F.
- Malfunction caused by corrosive materials.
- Malfunction caused by overloading or improper use.
- Malfunction caused by repair work performed by an unauthorized third party. Contact Hallco Industries for the closest authorized dealer.
- Filter elements and components, which are subject to wear-and-tear.
- Defects in electrical components due to incorrect connection and/or incorrect voltage levels.

The Warranty is void if:

- The i-4000 or i-6000 Series and BRUTE 8000 system is used for purposes which have not been recommended by HALLCO Industries, Inc.
- The wet kit does not meet HALLCO system recommendations.
- The HALLCO i-4000 or i-6000 Series and BRUTE 8000 system is not installed properly.
- Loads in excess of stated limits or legal limits are moved with the system without written permission from HALLCO Industries, In



Warranty Registration Process.

Warranty registration will be the responsibility of the selling party to the end user, (The Dealer or Manufacture of the trailer or bin).

A warranty registration form will be available online on our Web-Site (www.hallcoindustries.com) for easy access. It can be printed or downloaded. Once it is completely filled out they can mail it to Hallco Industries, Inc. corporate office or e-mailed it to info@hallcoindustries.com .

Hallco Industries, Inc. will enter the information into the database to activate the warranty.



PLEASE FILL OUT AND RETURN IMMEDIATELY TO HALLCO INDUSTRIES, INC.

OR SUBMIT COMPLETED FORM ON OUR WEB-SITE.

The warranty registration card must be completed and on file at Hallco Industries, Inc. in order for the warranty period to begin on the date of delivery. (Date purchaser actually takes delivery of Trailer). The beginning of the warranty will be the date of manufacture if the warranty card is not completed and sent to Hallco Industries, INC.

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

Please print or Type

HALLCO INDUSTRIES, INC. Warranty Registration Card

| | |
|---|---------------------------------|
| Purchaser: | E-Mail: |
| Company: | Phone: |
| Address: | State: |
| City: | Postal Code: |
| Country: | |
| Date of delivery: | Trailer Manufacturer: |
| Hallco Model Number: | Trailer VIN # : |
| Hallco Serial Number: | Dealer Name: |
| Type of Material Unloaded: | Dealer Location: |
| Hallco approved high pressure filter installed. (yes or no): | Trailer Leased or Owned: |

I have fully read the HALLCO INDUSTRIES, INC. 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 Hallco Industries, Inc. within ten (10) business days of [delivery to original end customer](#).

For your convenience this form is available on line at www.hallcoindustries.com.

Please fax, mail, or email this warranty registration information to Hallco Industries, Inc. at:

Hallco Industries, Inc.

Phone: 503-842-8746

PO Box 505

Fax: 503-842-4866

Tillamook, Or 97141

Email: info@hallcoindustries.com



Warranty Claim Process.

When a warranty issue arises the customer needs to contact a Hallco Industries, Inc. Dealer or Hallco Industries, Inc. (Tommy Menius or Ron McMurphy). At that time we will determine if it is a warranty issue or direct them to a Hallco Industries, Inc. Dealer to evaluate the issue. Once it is determined to be a warranty issue they will need to send in a warranty request form with all the information entered to Tommy Menius. They will receive a warranty claim number to reference on their invoice for the repairs. After repairs are completed they will send a copy of the invoice to Tommy Menius to approve and submit for payment.

Hallco Industries, Inc. will supply any Hallco parts needed for all warranty repairs. If the authorized repair center uses Hallco parts from their parts inventory, Hallco will send them the parts to replace their inventory.

Hallco Industries, Inc. has set labor rates and labor hours that we will pay for any approved warranty repairs. Any additional charges will have to be discussed and approved before invoiced to Hallco and payment is made to the repair center.