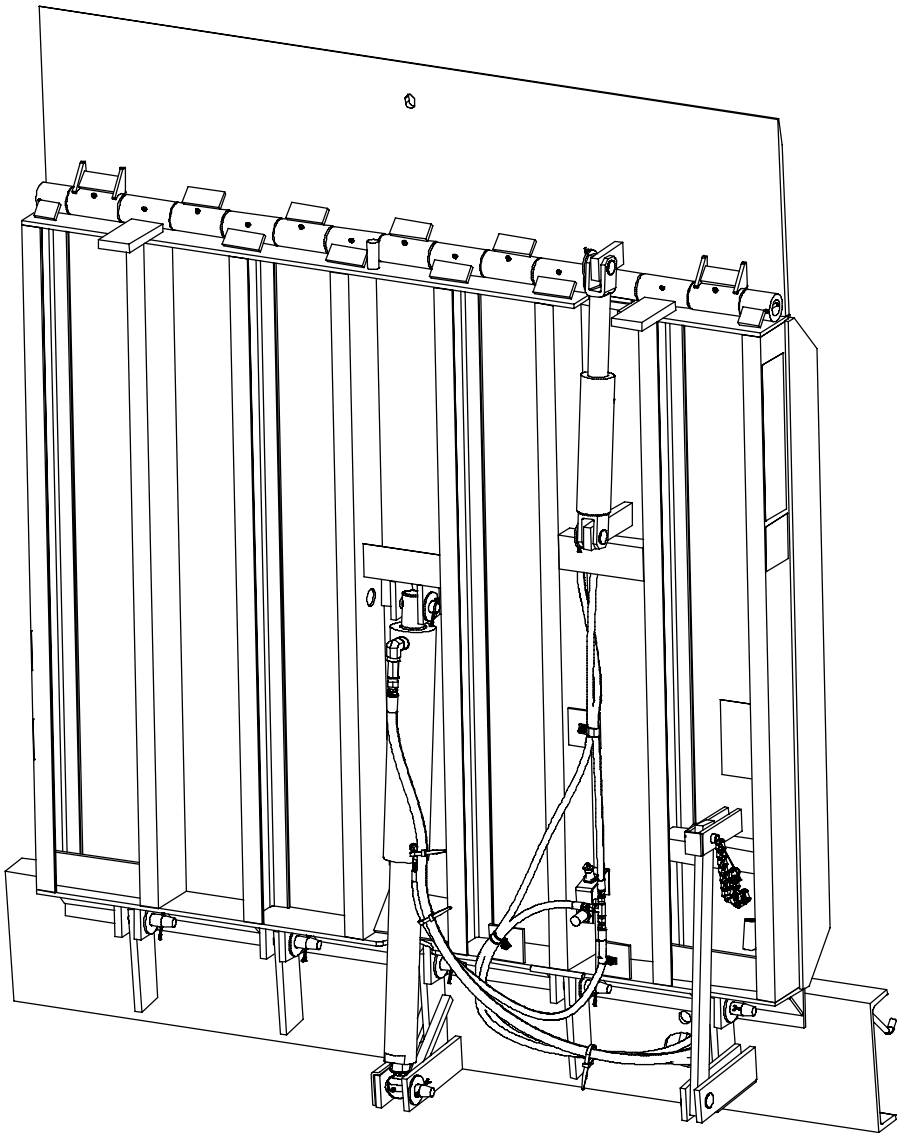
Vertical Hydraulic Leveler
40-50K Capacity



This manual applies to Vertical dock levelers manufactured beginning March 2017 with the serial numbers 61242605 and higher.

⚠WARNING

Do not install, operate or service this product unless you have read and understand the Safety Practices, Warnings, Installation and Operating Instructions contained in this user's manual. Failure to do so could result in death or serious injury.

User's Manual
Installation, Operations, Maintenance and Parts

Part No. 6001762R

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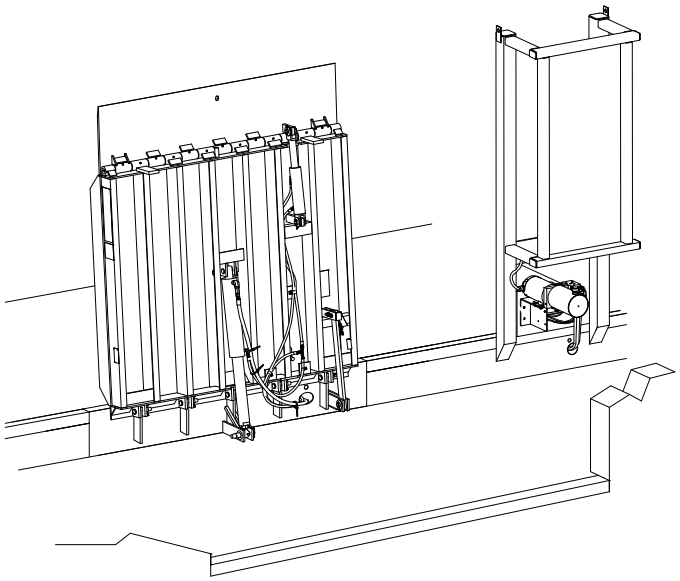
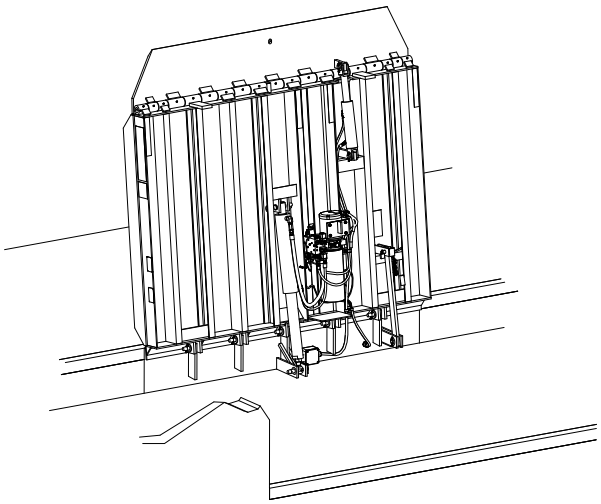
INTRODUCTION



VSL remote mount assembly



VSL deck mount assembly

Welcome and thank you for choosing a VSL dock leveler.

This user's manual contains information that you need to safely install, operate and maintain the VSL model dock leveler. It also contains a complete product description and operating instructions for the VSL remote mounted and VSL deck mounted designs. Product service guides, parts list and information about ordering replacement parts is available in this manual. Please read this user's manual before using your new dock leveler and keep a copy for future reference.

SAFETY SIGNAL WORDS

You may find safety signal words such as DANGER, WARNING, CAUTION or NOTICE throughout this user's manual. Their use is explained below:

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

⚠DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION

Indicates a potentially hazardous situation which, if not avoided may result in minor or moderate injury.

NOTICE

Notice is used to address practices not related to personal injury.

SAFETY PRACTICES

⚠WARNING

Read these safety practices before installing, operating or servicing the dock leveler. Failure to follow the safety practices could result in death or serious injury.

If you do not understand the instructions, ask your supervisor to explain them to you or contact your local distributor.

OPERATION:
Restrict use of dock leveler to trained operators. Follow safe operating procedures described in this user's manual and in the operation placard which was shipped with the leveler. The placard should be posted near the leveler. If either labels or placard is lost, contact your local distributor for replacement.

Do not use the dock leveler to service trailers outside of its intended working range which is 6" above dock and 6" below the building floor.

Do not operate the dock leveler when anyone is in front of it.

Do not operate the dock leveler with equipment, material or people on the ramp or lip.

Stay clear of the dock leveler when it is moving.

KEEP HANDS CLEAR OF HINGES AT ALL TIMES. Do not use hands to position dock leveler ramp or lip, or to store dock leveler.

Do not use the dock leveler if it appears damaged or does not operate properly. Inform your supervisor immediately.

Do not attempt to manually lift the dock leveler ramp or lip. If the dock leveler does not operate correctly using the operational procedures contained in this user's manual, do not use the leveler. Refer to the troubleshooting guide in this user's manual. If the dock leveler still does not operate properly call an authorized service representative.

Do not stand in the driveway between the dock leveler and the backing truck.

Chock truck wheels or lock truck into place with truck restraining device and set brakes before loading or unloading.

Never drive on dock leveler unless Green Light is lit on the dock leveler control panel and the truck bed supports extended lip or ramp is supported by the concrete below.

Always restore leveler to its safe stored vertical position with lip extended and Leveler Stop button pressed after servicing truck.

DO NOT walk in front of dock leveler until you:
- Restore the leveler to its safe stored vertical position with lip extended.
- Press LEVELER STOP button to stop the leveler and lip from moving.

Move all equipment, material or people off the dock leveler and store the dock leveler after use.

Do not use a fork truck or other material handling equipment to lower the leveler.

Before chocking wheels or engaging vehicle restraint, dump air from air ride suspensions and set parking brakes.

SAFETY PRACTICES, continued

INSTALLATION, MAINTENANCE AND SERVICE:

⚠DANGER

Place barricades on the dock floor around the dock leveler and in the driveway in front of the dock leveler while installing, maintaining or repairing the dock.

If the leveler is left in a disabled condition, the lock-out pin must be padlocked in position.

Do not operate the dock leveler when anyone is standing in front of the dock leveler.

Before doing any maintenance or repair under the leveler be certain that the leveler is stored with the lock-out pin inserted through the maintenance strut and bracket on the deck, the LEVELER STOP button is pressed, the power is disconnected and properly tagged or locked out, and barriers are in place.

Disconnect the power and properly tag or lock out before entering the pit or doing any maintenance or repair under the leveler.

All electrical troubleshooting or repair must be done by qualified technician and must meet applicable codes.

If it is necessary to make troubleshooting checks inside the control box with power on, USE EXTREME CAUTION! Do not place fingers or uninsulated tools inside the control box. Touching wires or other parts inside the control box could result in electrical shock, serious injury or death.

Vertical levelers ship partially disassembled and require field assembly. Prior to complete electrical and hydraulic installation, levelers should be stored safely. If leveler is mounted on hinges and stored vertically, the lock-out pin must be inserted through the maintenance strut and the bracket on deck, and secured with a padlock until the leveler is completely wired, tested, and fully operational.

OWNER'S RESPONSIBILITIES

The owner's responsibilities include the following:

The owner should recognize the inherent danger of the interface between dock and transport vehicle. The owner should, therefore, train and instruct operators in the safe use of dock leveling devices, and take appropriate steps to prevent their use by untrained individuals. Further information regarding selecting and training operators can be found in ANSI MH30.1 available at www.mhi.org/lodem. The owner shall verify the manual(s) containing the manufacturer's installation, operation, and maintenance, is made available for instruction and training personnel entrusted with such responsibilities.

When a transport vehicle is positioned at the dock, there shall be at least 4" of overlap between the front edge of the lip of the dock leveler and the edge of the floor or sill of the transport vehicle.

Manufacturer's recommended periodic maintenance and inspection procedures in effect at time of shipment shall be followed, and written records of the performance of these procedures should be kept. Only trained and authorized personnel shall be permitted to maintain, repair, inspect and adjust the dock leveler. Use only original equipment manufacturer parts, manuals, maintenance instructions and labels; or their equivalent.

A dock leveler that is structurally damaged or has experienced a sudden loss of support while under load, such as might occur when a transport vehicle is pulled out from under the dock leveler, shall be removed from service, inspected by the manufacturer's authorized representative, and repaired as needed or recommended by the manufacturer before being placed back into service.

OWNER'S RESPONSIBILITIES, continued

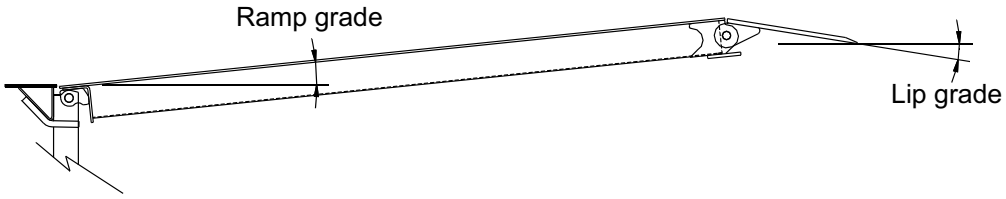
The owner shall see that all nameplates, cautions, instructions, and posted warnings are in place and legible and shall not be obscured from the view of operating or maintenance personnel for whom such warnings are intended.

Modifications or alterations of dock leveling devices shall be made only with written permission of the original manufacturer.

When industrial vehicles are driven on and off transport vehicles during the loading and unloading operation, the brakes on the transport vehicle shall be applied, and whenever possible, air-ride suspension systems should have the air exhausted and wheel chocks or positive restraints that meet the requirements of ANSI MH30.3 shall be engaged. For more detailed information regarding vehicle restraints see "ANSI MH30.3 Vehicle restraining devices: Performance and Testing" available at www.mhi.org/lodem.

The dock leveler should never be used outside its vertical working range or outside the manufacturer's labeled rated capacity. It must also be compatible with the loading equipment and other conditions relating to the dock.

RAMP AND LIP GRADES



TRUCK BED POSITION from DOCK, (in.)		DECK and LIP grades, % for Dock leveler length					
		5' Leveler		6' Leveler		8' Leveler	
		DECK	LIP	DECK	LIP	DECK	LIP
ABOVE DOCK	6.0	11.4	5.2	9.7	3.4	7.4	1.2
	4.0	8.4	2.2	7.2	0.9	5.5	-0.8
	2.0	5.4	-0.8	4.6	-1.7	3.5	-2.7
	0.0	2.4	-3.8	2.1	-4.2	1.6	-4.7
BELOW DOCK	-2.0	-0.6	-6.8	-0.5	-6.7	-0.4	-6.6
	-4.0	-3.6	-9.8	-3.0	-9.3	-2.3	-8.6
	-6.0	-6.6	-12.8	-5.6	-11.8	-4.3	-10.5

Deck and lip grade, 16" lip.

INSTALLATION

⚠DANGER

***Important Installer Responsibility*: Vertical levelers ship partially disassembled and require field assembly. Prior to complete electrical and hydraulic installation, levelers must be stored safely. If leveler is mounted on hinges and stored vertically, maintenance strut must be secured with lock-out pin and padlock until the leveler is completely wired, tested and fully operational. Padlock must not be removed until leveler is completely wired, tested, and fully operational. Failure to follow safety practices could result in death or serious injury.**

GENERAL INFORMATION

The successful installation of a vertical leveler requires good coordination with other trades involved on the site. You must have a clear access to the dock area, inside and out. Ideally, the leveler should not be installed until the control panel is installed, has live power connected to the control panel, and field wiring to the power unit is complete. This will allow the complete installation at one time as opposed to making several trips. The bumper assemblies must not be installed until the leveler is functional as pit construction errors may not be evident until that time. Make sure the customer gets the user's manual and is properly trained.

The installed location of the control panel and hydraulic power unit must be specified on a job specific approval drawing.

PIT CHECK

Check the entire dock leveler pit layout and dimensions to verify conformance with the job specific approval drawings. Check electrical service running to the control panel to ensure it agrees with the phase and voltage of the motor and control box supplied with the dock leveler. See the wiring diagram located inside the control panel. Schematics for standard control panels are provided in this manual.

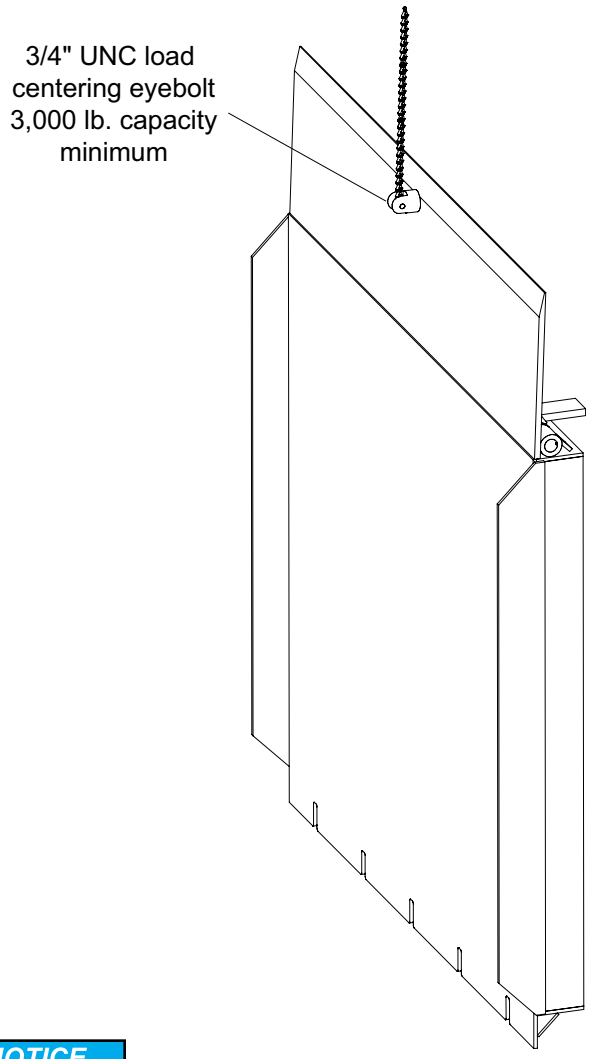
NOTE:

Conduits which stub out through the rear pit wall must not project greater than 1". Saw off to 1" if necessary.

⚠WARNING

Make sure lifting devices are in good condition and have a rated capacity of at least 3000 lb. at the lifting angle they are being used. Stand clear of the dock leveler when it is being placed into the pit. Never allow anyone to stand on or near the dock leveler when it is being lifted or placed into the pit. The dock leveler can tip or swing into bystanders which could result in death or serious injury.

Fig. 1



NOTICE

Take care when moving the dock leveler to ensure that the electrical and hydraulic components are not damaged.

HANDLING AND UNLOADING

The rear fixed hinge channels will be installed first by the concrete contractor. In most cases, these components will have arrived at the site much earlier than the levelers. The levelers will arrive on a truck laid flat with the hydraulic cylinders facing upward. Spacers will be inserted between the levelers to prevent damage to the leveler components. The levelers can be lifted off the truck in stacks of three but using the forks to separate the levelers is not recommended as damage to the hydraulic components may occur. The levelers should be lifted individually by installing a 3/4" UNC load centering eyebolt through the hole supplied in the lip plate. See Fig. 1.

TO INSTALL

NOTE:

Do not install the dock bumpers before the leveler is operational.

1. Mount and wire the control panel in the location as shown on the job specific approval drawing. Ensure that the voltage and phase of the incoming power agrees with the control panel and the decals on the pump and motor. Power to the control must come from a user supplied fused disconnect with correct fuse sizes for the voltage and phase of the motor. See electrical diagram for correct fuse size.

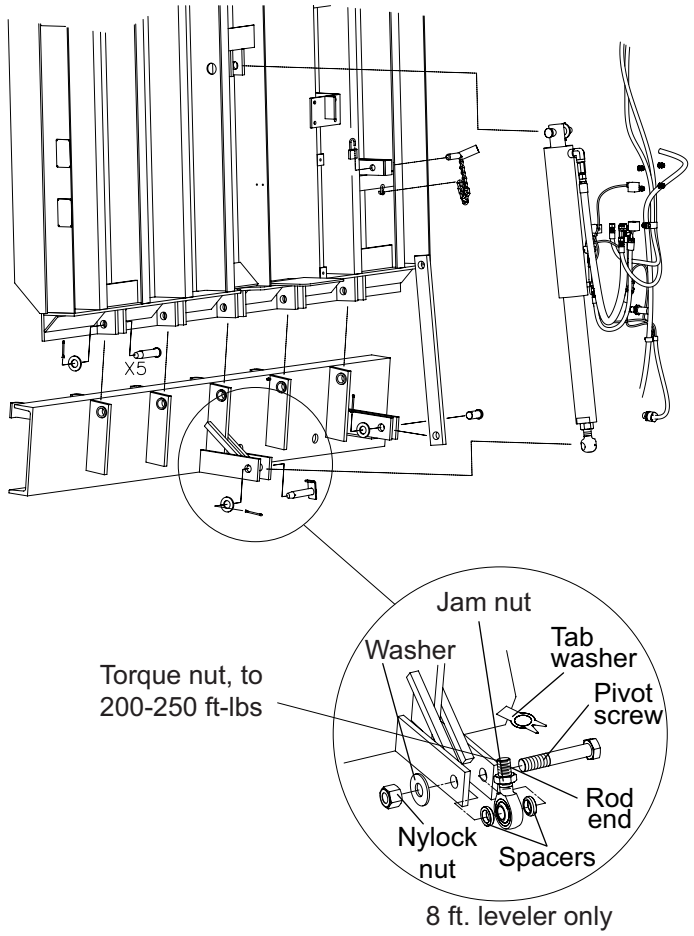
2. Pick up the leveler using the load centering eyebolt, and suspend the leveler vertically as shown in Fig. 2.

3. Align the leveler rear hinges with the fixed hinge section and insert the two outer hinge pins ***from the side without standing in front of or underneath the suspended leveler.*** Do not install the center pins until the maintenance strut has been installed and secured. See Fig. 2 and 15 on page 20.

4. Insert the maintenance strut bar through the guide bracket on the leveler and secure the lower end to the frame with the pin. Insert the pin **from the side without standing in front of or underneath the suspended leveler.** See Fig. 2.

5. Allow the leveler to lean away from the dock door until the lock-out pin can be inserted through the upper end of the maintenance strut and the bracket on the deck. See Fig. 15, page 20. Place a padlock through the hole provided in the lock-out pin. This will prevent any unauthorized activation of the leveler and is essential to the personal safety of anyone near this leveler.

Fig. 2



NOTE:

All pins require flat washers under the cotter pin except for the lockout pin.

⚠DANGER

Ensure that the leveler is leaning away from the dock door. If the leveler is standing vertical or leaning towards the dock door do not proceed with installation.

The lock-out pin must be inserted through the maintenance strut and the bracket on the deck. The pin must be secured with a padlock before the lifting device is removed. Failure to do so could result in death or serious injury.
See Fig. 15 on page 20 for lock-out pin location.

INSTALLATION, continued

6. Install the remaining hinge pins. Secure all five leveler hinge pins and the lower pin of the maintenance strut with the flat washers and cotter pins provided.

7. Remove the lifting device from the leveler lip. Leave the lip fully extended.

8. Lay cardboard or other absorbent material under the hydraulic power unit. This prevents staining the floor in the event of an overflow. Place a pan directly under the reservoir to catch any spilled fluid.

9. The hydraulic power unit is pre-assembled. The deck mounted assembly will have the power unit attached to the deck with the hoses pre-assembled. The remote mounted power unit will be separate on a mounting bracket with all valves attached. This mounting bracket is designed to suit many different applications. The mounting position is specified on the job specific approval drawing for the project. Fasten the power unit mounting bracket as required.

10. Lay cardboard or other absorbent material under the hydraulic power unit. This prevents staining the floor in the event of an overflow. Place a pan directly under the reservoir to catch any spilled fluid.

11. The three hydraulic hoses and the leveler stored and maintained float sensor cables (located on the deck) are marked with numbers for identification. Do not remove the plugs from the hydraulic hoses at this time. Feed the hose assemblies and the sensor cables through the conduit.

12. Remove the plugs and make the connections to the correct hose fittings. See Fig. 3. These fittings are all JIC type and require no thread sealant.

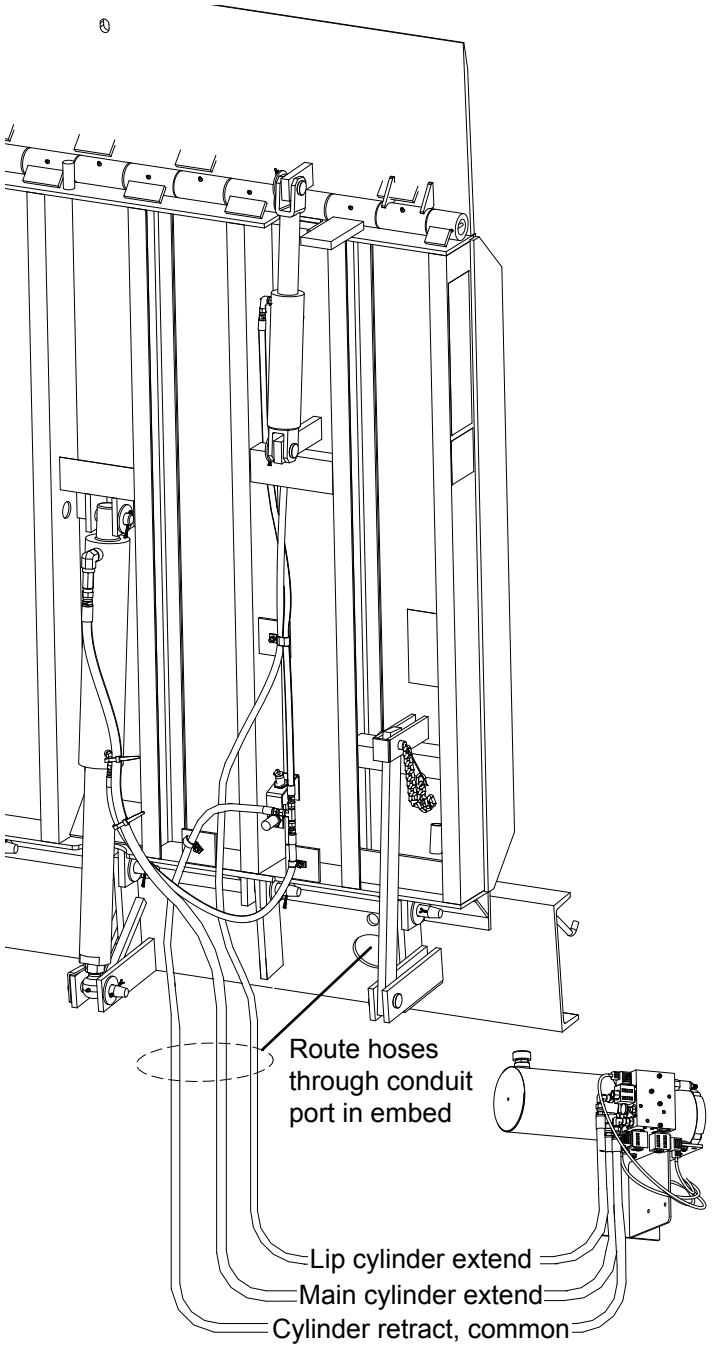
NOTE:

If the hoses are too long, coil the hoses neatly at the bottom of the power unit and secure with plastic ties. Do not leave excess hose under the leveler but leave a loop so hoses are not pulled tight.

13. Install the solenoid home run cable (deck mount only) and route it with the stored and float sensors wires through the conduit to the control panel. Install protective cable wrap over the wires between the deck and conduit port in the embed to the control panel in conduit according to the installation specifications. Allow additional wire in a manner that leaves a service loop.

14. The electrician can now connect the wiring from the control panel to the motor and solenoid valves.

Fig. 3



⚠DANGER

Do not remove the lock-out pin from the maintenance strut until the following steps have been completed to ensure that the leveler is functioning property. Failure to do so could result in death or serious injury.

15. Remove shipping plug from the hydraulic reservoir and replace with the breather breather cap/dipstick..

16. Turn on power to control panel. Pull out the LEVELER STOP button. The Amber power light should be on. Press and hold the RAISE pushbutton for only 5 seconds while looking into the hydraulic reservoir fill hole. If the motor is turning in the correct direction you will immediately see the fluid level drop. If after 5 seconds you see no drop in fluid level, stop the pump and switch wires to reverse the rotation. See troubleshooting guide and electrical schematics in this manual to correct.

17. Press and hold the RAISE pushbutton. The main cylinder will begin to extend in an abrupt motion. Hold the cylinder away from the leveler while extending so that it will extend freely. (The cylinder rod or adjusting end may be damaged by contact with the deck while extending)

18. If the sound of the pump changes before the cylinder reaches its full stroke (16"), stop the pump and add 8 ounces of hydraulic fluid (see page 15 under Components and Specifications for hydraulic fluid specifications). Continue to run the pump until the main cylinder is fully extended. Add more fluid if required.

19. Press the LOWER button and hold until the main cylinder is fully retracted. This will eliminate excess air from the main cylinder. Then press the LIP RETRACT button and hold until the lip is fully retracted. Then press the LIP EXTEND button and hold until the lip is fully extended. Then press the LIP RETRACT button again and hold until the lip is fully retracted. This will eliminate air from the lip cylinder. Run both cylinders in/out a minimum of 4 times until any abrupt motion is eliminated.

20. Oil Inspection — Remote mount assembly: **With both the main cylinder and the lip cylinder retracted, check the oil level in the reservoir. Oil should be clear and within 1/2"-3/4" of the top with the lip plate fully retracted.** Add oil if necessary. See page 15 under Components and Specifications for hydraulic fluid specifications. Deck mount assembly: Inspect the oil level with the deck in the vertical stored position and the lip extended. remove and clean the dipstick. reinsert the cap to the top of the opening and remove to read the oil level on the dipstick. Proper oil level should be between the holes on the dipstick. See Fig. 17 for more information. If the oil is foamy, leave for approximately 15 minutes to let the oil settle before checking oil level.

INSTALLATION, continued

21. **5FT. AND 6FT. LEVELERS:**
This step requires 1-1/2" and 2" open end wrenches. Loosen the jam nut on the threaded rod end of the main cylinder. Press the RAISE button and hold until the main cylinder is fully extended. With the main cylinder rod fully extended, rotate the rod end so that the pivot pin can be inserted freely through the cylinder pivot on the embedded channel frame. Orient the tab on the cylinder pivot pin such that it goes over the top of the cylinder support bar. See Fig. 4. Secure the pivot pin with the pin provided. See Fig 2. Ensure the grease fitting faces the dock door.

8FT. LEVELERS:
This step requires 1-1/2" and 2" open end wrenches. Loosen the jam nut on the threaded rod end of the main cylinder. Press the RAISE button and hold until the main cylinder is fully extended. With the main cylinder rod fully extended, rotate the rod end so that pivot screw and spacers can be inserted freely through the cylinder pivot on the embedded channel frame. Add washer and nylock nut to screw. Torque nut to 200-250 ft-lbs. See Fig 2.

⚠DANGER

Incorrect hydraulic power unit adjustment that allows the leveler to descend rapidly could result in death or serious injury.

22. Using the 2" wrench, turn the chrome cylinder rod clockwise to pull the leveler forward until the lockout pin in the maintenance strut moves freely. Align the cylinder flats to the side for access to the tab washer. Verify the lockout pin in the maintenance strut moves freely. See Fig. 31.

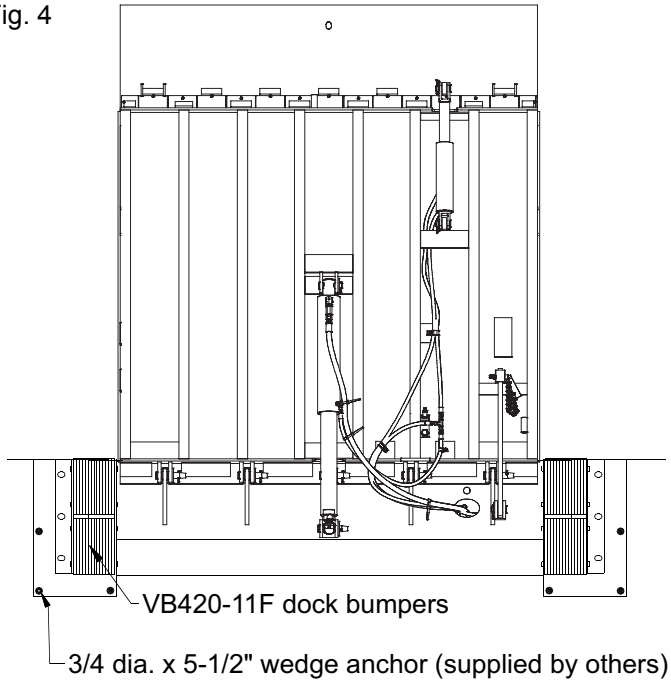
23. Position the tab washer perpendicular to the cylinder flats. Using the 2" wrench to hold the chrome cylinder rod, securely tighten the jam nut using the 1-1/2" wrench.

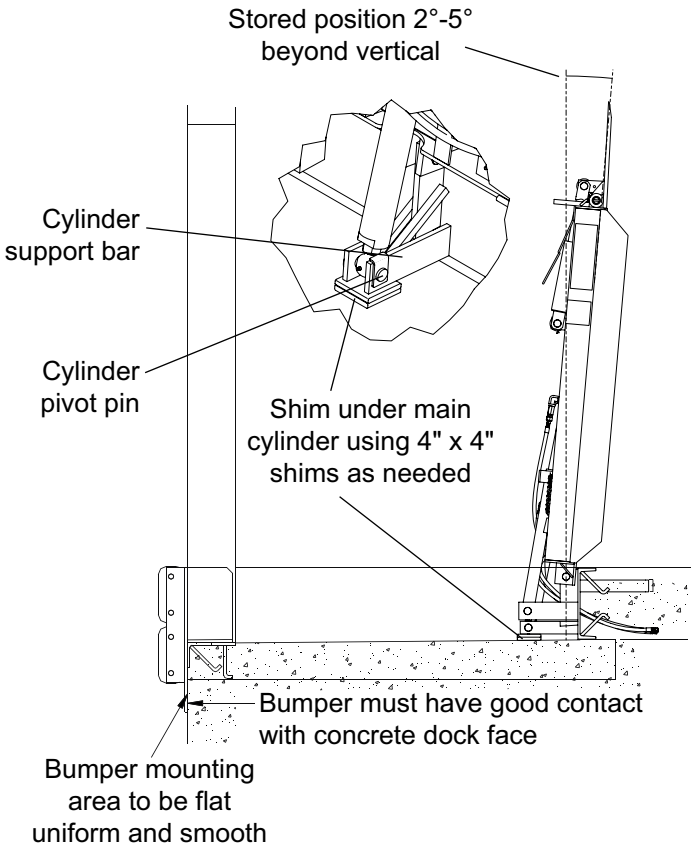
⚠WARNING

There must not be more than (1-1/2" on 5' and 6' dock levelers and 9/16" on 8' dock levelers) of thread showing on. If more than the allowed amount, do not proceed.

24. Ensure that the pit area is clear. Remove the padlock from the lock-out pin. **Stand at the side of the leveler, reach in and remove the lock-out pin from the maintenance strut**.

Fig. 4





25. Press and hold the LOWER button. The pump will run and the leveler will move forward and start to lower. The alarm will sound if the leveler is stopped between the lowered working range and the stored position. Continue to press the LOWER button until the pump stops. The leveler will hesitate momentarily and the Green light will turn on when the maintain float sensor trips. When the green light is on, the leveler is in float. Allow the leveler to fully lower. As soon as the lip begins to fall, press the LEVELER STOP button. Visually check that the ramp stops are resting on the front curb steel. If ramp stops are not in full contact with curb steel, consult factory.

26. Press and hold the RAISE button until the leveler is raised above the working range and the Green light goes off. RELEASE the pushbutton. The leveler should remain in position and the alarm should sound.

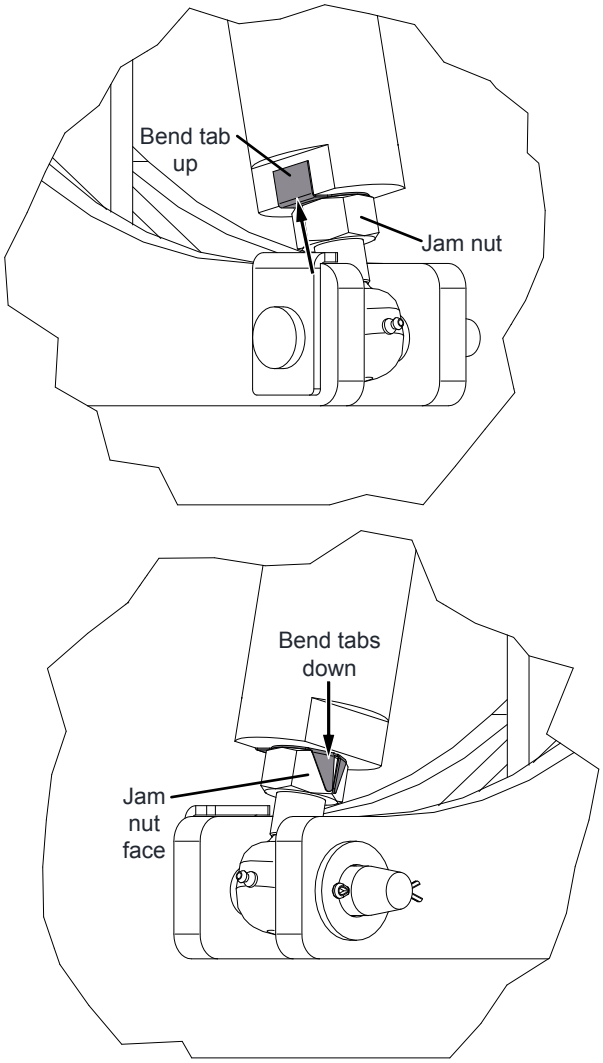
27. Press and hold the RAISE button until the leveler reaches the stored position and the lip is fully extended. The Green light on the control panel should remain off and the alarm should not sound. Insert the lock-out pin through the maintenance strut and bracket on the deck. The pin must insert freely. If there is any resistance, adjust the hydraulic cylinder as described on page 41.

28. Ensure the jam nut is securely tightened. Bend the large tab up over the cylinder flat. Bend small tabs down over jam nut face. See Fig. 5.

29. Ensure that the pit area is clear. Remove the padlock from the lock-out pin. **Stand at the side of the leveler, reach in and remove the lock-out pin from the maintenance strut**.

29. Lower the leveler as instructed in step 24. Observe the lowering speed before and after the green light turns on. The lowering speeds should be approximately the same. If not, the lowering speed after the green light turns on can be adjusted using the needle valve. Adjust needle valve as necessary, see page 32 and 33.

Fig. 5



INSTALLATION, continued

30. With the leveler in the fully lowered position, place each bumper assembly on the floor between the leveler and the door jamb. A 1" space must be present between the side of the leveler and the nearest face of the bumper assembly. This space is important for the bottom pad to work properly. The bumper assemblies must be welded to the front curb steel using proper weld techniques. Vertical down weld passes are not acceptable. All applicable anchors must be 3/4" x 5-1/2" (min. depth) wedge anchors. See Fig. 4.

NOTE:

Reference TSB 2008-1020G for acceptable anchor bolt installation practices.

31. Shim and weld as required under main cylinder bracket. See Fig. 4.

32. Permanently mount the laminated WARNING and OPERATION instruction placard near the dock leveler control panel. Make sure the customer gets the user's manual and is properly trained to operate the dock leveler.

33. Install the bottom pad. Refer to included installation instructions.

INTERLOCK OPTIONS

Door Opened

A door opened interlock can be added by adding a door opened photoeye switch that senses when the door is fully opened. The leveler lower will not be enabled until the door is fully opened. The door opened sensor emits an infrared light beam with a sharp cutoff around 3" beyond the face of the sensor. The sensor should be positioned below the top door opening, (typically 12" below) and on the same side of the door as the control panel. Position the sensor so it “sees” the edge of the door panel and the sensor face is around 2" from the panel. See Fig. 6. Be careful not to let any door parts such as cables, rollers, etc. to touch the sensor or it will be damaged. In some applications, it is necessary to fabricate a simple sheet metal bracket to mount the sensor.

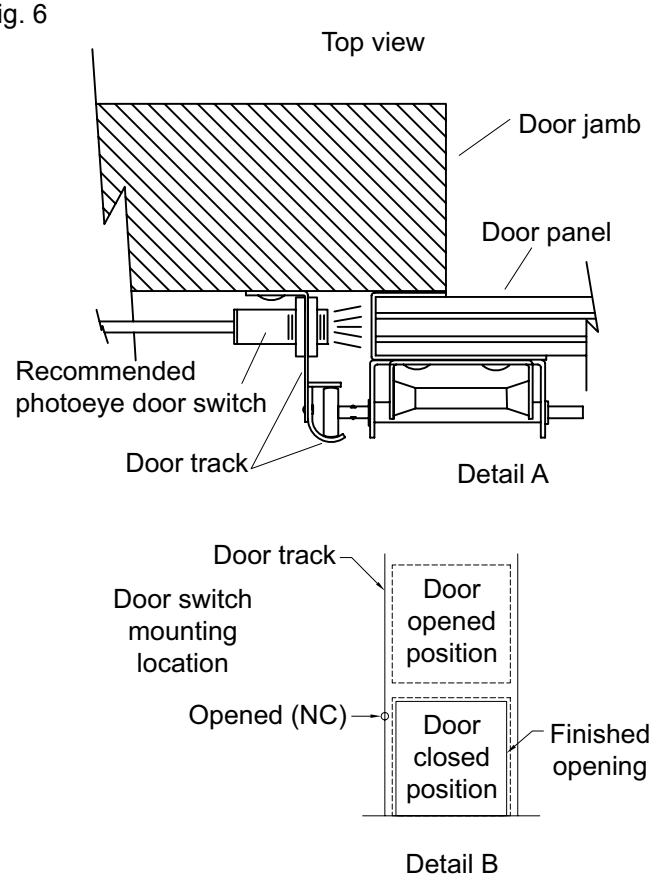
Restraint Interlock

Consult factory.

NOTE:

Position sensor below the top of the door opening for door opened application and above the top of the door opening for door closed applications (12"-24" typical). Position the sensor so that it faces the edge of the door panel with the sensor face approximately 2" from the door.

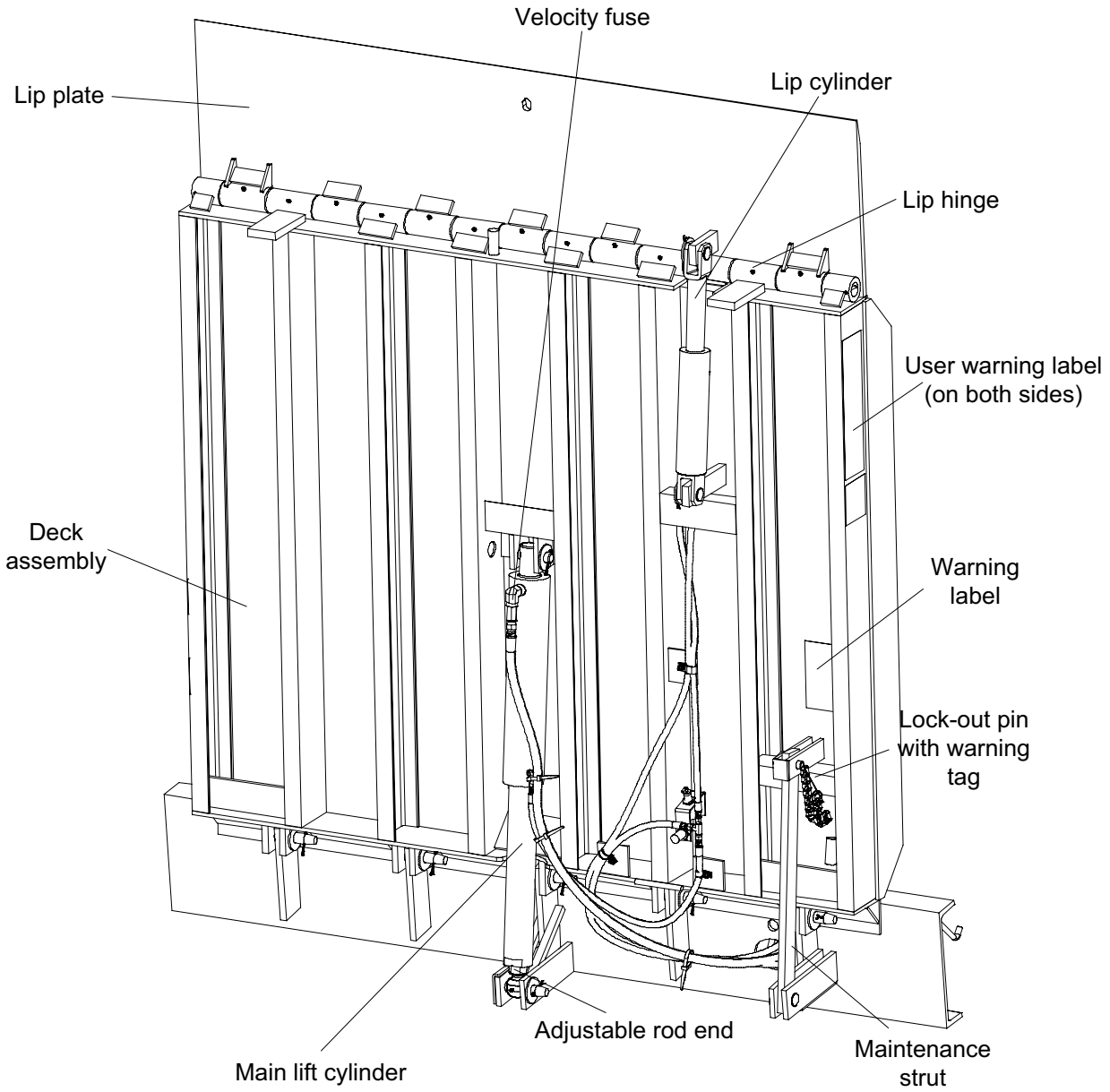
Fig. 6



COMPONENTS AND SPECIFICATIONS — REMOTE MOUNT

The main components of the leveler are shown below. See the Parts List for specific part numbers.

Fig. 7

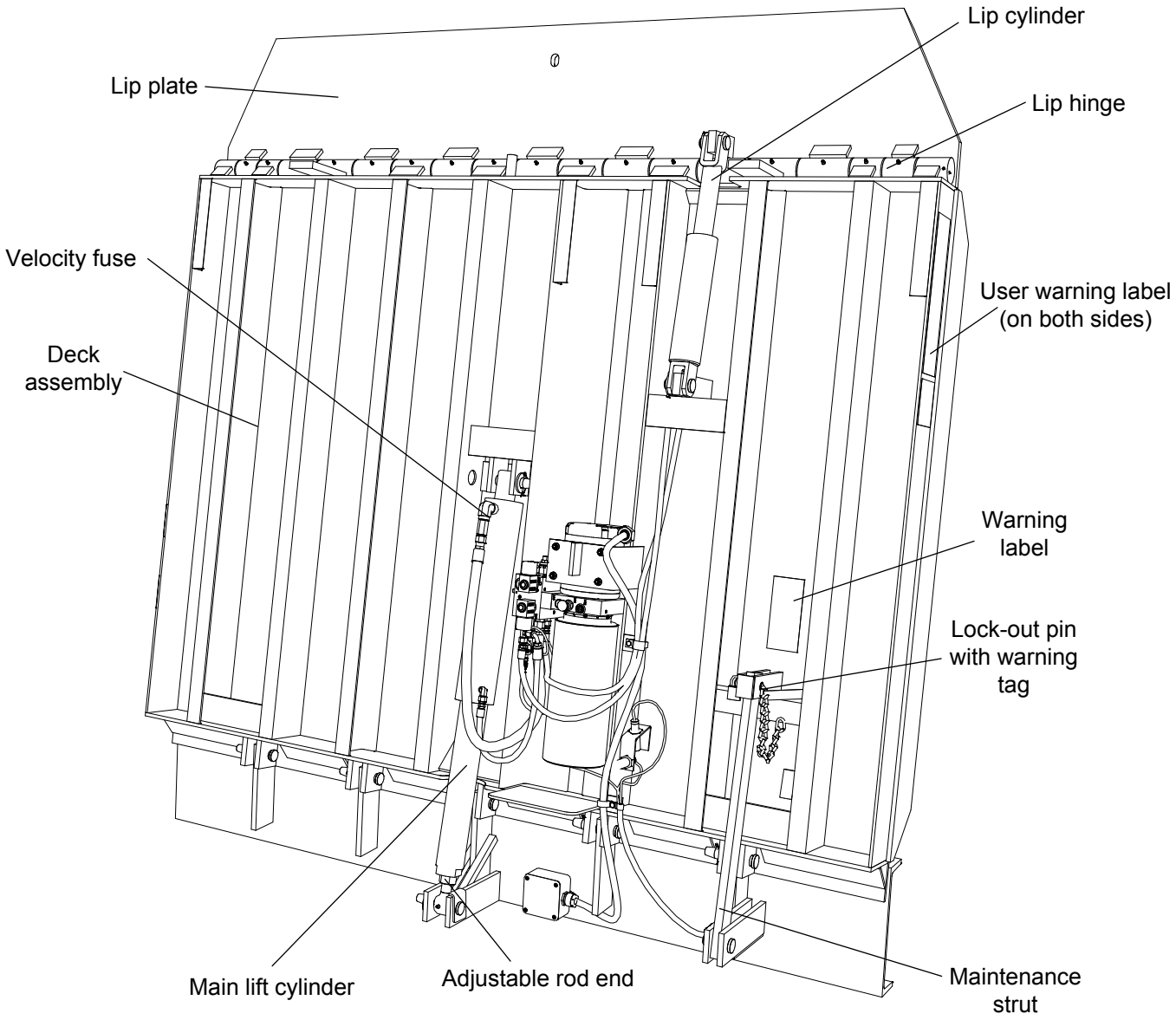


Control Panel (Standard) - NEMA 12, automatic motor starter, thermal overload, resettable control circuit breaker. U.L. approved.
Pilot Light - LED.
Solenoid Valves - 24VAC.
Motor - NEMA Standard T.E.N.V. / 48YZ frame, 1HP @ 15 mi. duty cycle, single or three phase.
Pump - Fixed displacement gear pump, 1 gpm, primary relief valve factory set at 2000 PSI.
Sequence Pressure - 1750 factory set
Hydraulic Fluid - Acceptable Hydraulic fluids:
Shell Tellus T 15
Mobil Aero HFA (49011)
Exxon Univis Grade J13
Texaco Aircraft Oil #1554
U.S. Oil Co., Inc #ZFI-5606 (Low Temp.)
Total Hydraulic Oil Volume: Less than 2 gallons.

COMPONENTS AND SPECIFICATIONS — DECK MOUNT

The main components of the leveler are shown below. See the Parts List for specific part numbers.

Fig. 8



Control Panel (Standard) - NEMA 12, automatic motor starter, thermal overload, resettable control circuit breaker. U.L. approved.
Pilot Light - LED.
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Exxon Univis Grade J13
Texaco Aircraft Oil #1554
U.S. Oil Co., Inc #ZFI-5606 (Low Temp.)
Total Hydraulic Oil Volume: Less than 2 gallons.

HYDRAULIC SYSTEM OPERATION

The following describes the operation of the hydraulic and electrical system when the controls are activated.

AUDIBLE ALARM
- Sounds when leveler stops between float and fully stored position.
- Will silence when RAISE, LOWER or LEVELER STOP is pressed.

LEVELER STOP
Push in
- Control circuit disabled.
- Amber pilot light turns off.
- Solenoid valves SV2 deenergizes preventing leveler movement.

Pull out
- Control circuit enabled.
- Amber pilot light turns on.
- Main solenoid valve SV2 remains deenergized except when RAISE is pressed when pump is running or leveler is lowered to working range.

LOWER PUSHBUTTON
- Pump starts.
- Power down solenoid valve SV1 opens to retract main cylinder. When leveler lowers to working range, the pump stops, the power down solenoid valve SV1 closes and Main solenoid valve SV2 is open to allow leveler to float down to the truck bed.
- Lip solenoid valve SV4 closes to prevent lip from retracting.
- Green pilot light turns on when leveler reaches working range

RAISE PUSHBUTTON
- Pump starts.
- Main solenoid valve SV2 opens to extend main cylinder.
- Lip solenoid valve SV4 closes to prevent lip from retracting.

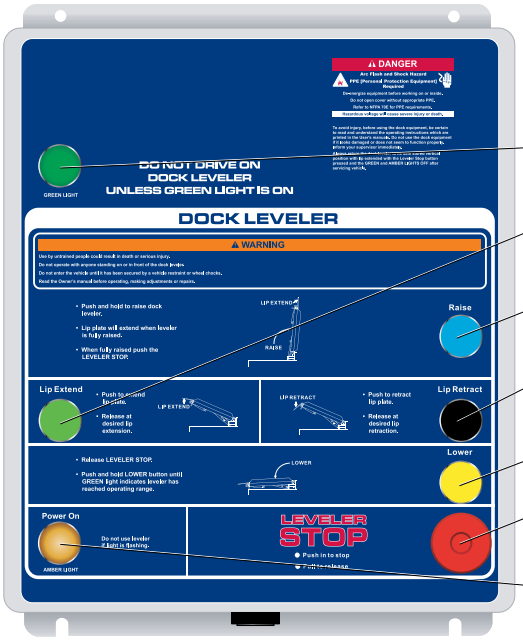
RAISE PUSHBUTTON (continued)
- Green pilot light turns off when leveler raises above working range.

Fully Raised
- Leveler stored sensor closes.
- Pressure increases
- Sequence valve shifts
- Lip cylinder extends.

LIP RETRACT PUSHBUTTON
- Pump starts.
- Main solenoid valve SV2 opens allowing leveler to raise and lip to retract.
- Green pilot light turns off when leveler raises above the working range.

LIP EXTEND PUSHBUTTON
- Pump starts.
- Main cylinder solenoid valve SV2 is closed.
- Sequence valve shifts allowing lip to extend.

Fig. 9



OPERATING INSTRUCTIONS

⚠WARNING

Before operating the dock leveler, read and follow the Safety practices on page 3.

Restrict use of dock leveler to trained operators. Follow safe operating procedures described in this manual and in the operation placard which was shipped with the leveler. The placard should be posted near the leveler. If either labels or placard is lost, contact your local distributor replacement.

DO NOT USE DOCK LEVELER IF IT LOOKS DAMAGED, OR DOES NOT SEEM TO WORK PROPERLY. Inform your supervisor immediately.

Always be certain that the truck wheels are chocked, or that the truck is locked in place by a truck restraining device and the brakes are set before loading or unloading. Trucks pulling away unexpectedly can cause uncontrolled drop of the dock leveler which can result in death or serious injury.

Never drive on dock leveler unless Green Light is lit on the dock leveler control panel and truck bed supports the extended lip or the ramp is supported by the concrete below.

Always return the dock leveler to its safe stored vertical position with lip extended with the LEVELER STOP button pressed after servicing truck.

If the truck pulls away before the dock leveler is stored, the lip will fall to its pendant position and will not be supported. In addition, failure to properly store the dock leveler may leave the leveler in a position below dock level. These conditions may result in unexpected drop of personnel or material handling equipment and result in death or serious injury.

⚠DANGER

If the dock leveler will not raise with the RAISE pushbutton, and it must be raised by external mechanical means to close the dock door, use extreme caution and do not allow anyone to stand in front of the leveler. Ensure that the lock-out pin is inserted through the maintenance strut and bracket on deck before the mechanical lifting means is removed.

⚠DANGER

During lifting of the leveler by mechanical means it is likely that hydraulic fluid will vent itself through the breather of the hydraulic reservoir. Lift the leveler slowly and without getting in front of the leveler, place a container under the reservoir if possible to catch the fluid.

The lock-out pin must not be removed until the hydraulic system has been bled of air and all hydraulic functions have been tested by a qualified service technician.

If the dock leveler has been raised to the stored position by external means, the main cylinder will be full of air and there may be a vacuum exerting a strong retracting force on the cylinder rod. A technician will need to perform a bleed procedure to remove the air from the hydraulic cylinder. With the lock-out pin in place, the technician should loosen the hydraulic hose fitting on the top port of the main cylinder and allow air to fill the vacuum before attempting to remove the pin from the cylinder rod (lower) end. With the lock-out pin in place, the technician must remove the pin from the main cylinder rod (lower) end and perform steps 18 through 25 of the installation instructions on pages 9-13.

Failure to follow this instruction can allow the leveler to free fall rapidly and may result in severe injury or death.

INTRODUCTION

The 4Front Entrematic vertical dock leveler is designed to span and compensate for space and height differences between a loading dock and freight carrier to allow safe, efficient freight transfers.

The 4Front Entrematic vertical dock leveler uses pushbutton controls to position the ramp. Pressing and holding the LOWER button operates a hydraulic pump and retracts a hydraulic cylinder to lower the ramp. When the ramp is lowered to the working range, it floats down to rest on the bed of a trailer forming a bridge. After loading, pressing and holding the RAISE button extends the hydraulic cylinder to raise the ramp to the stored position. When the dock leveler reaches its full raised position, a second hydraulic cylinder extends the dock leveler lip.

Push the LEVELER STOP when the leveler is stored to prevent operation. With the dock leveler in its fully stored position, a maintenance strut may be secured with a lock-out pin to prevent inadvertent operation.

OPERATING INSTRUCTIONS, continued

⚠ WARNING

Safety First:

1. ***Always secure the truck with a vehicle restraint or wheel chocks and set brakes before operating the dock leveler.***
2. ***Do not operate dock leveler with anyone standing on or in front of it.***
3. ***Always keep hands and feet clear of all moving parts.***
4. ***Always restore the leveler to its safe stored vertical position with the lip extended and the LEVELER STOP button pressed after servicing truck.***
5. ***Press LEVELER STOP button to stop leveler and lip from moving.***

⚠ DANGER

DO NOT walk in front of dock leveler until you:

- ***Restore the leveler to its safe stored vertical position with lip extended.***
- ***Press LEVELER STOP button to stop the leveler from moving.***

Failure to do so could result in death or serious injury.

NORMAL OPERATION

1. To lower the dock leveler pull the LEVELER STOP button on control panel to switch on power. Amber light indicates power on. Press and hold LOWER button. The pump will start and the leveler will start to lower. Release the LOWER button when the Green light on the control panel turns on. (Green light on leveler control panel indicates leveler has reached operating range) The leveler will float down to the truck bed. See Fig. 10.

2. To stop the leveler, release the LOWER button. Audible Alarm will sound if the button is released before the leveler is in its operating range. Push the LEVELER STOP button at any time to stop all operation and silence the Audible Alarm. If this condition persists, a short duration tone will sound periodically to remind the operator of the illegal leveler condition. Amber and Green lights will turn off. To resume operation of the leveler, pull the LEVELER STOP button (Amber light on) and press and hold the LOWER button and leveler will float down to the truck bed. Release the LOWER button when Green light on leveler control panel indicates leveler has reached the operating range. See Fig. 11.

Fig. 10

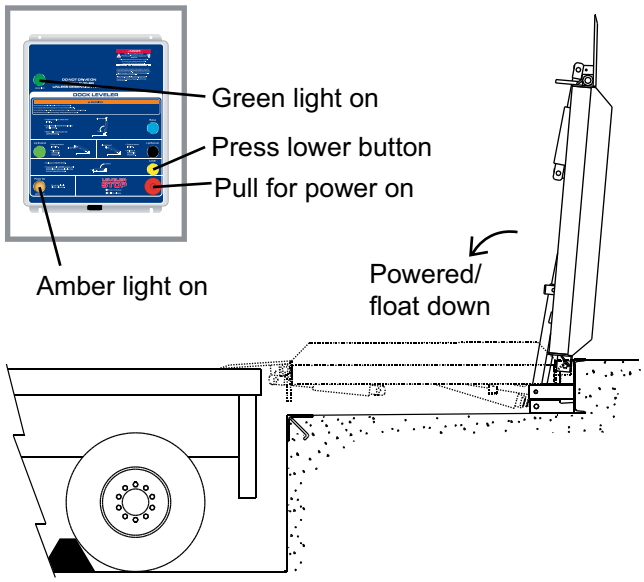
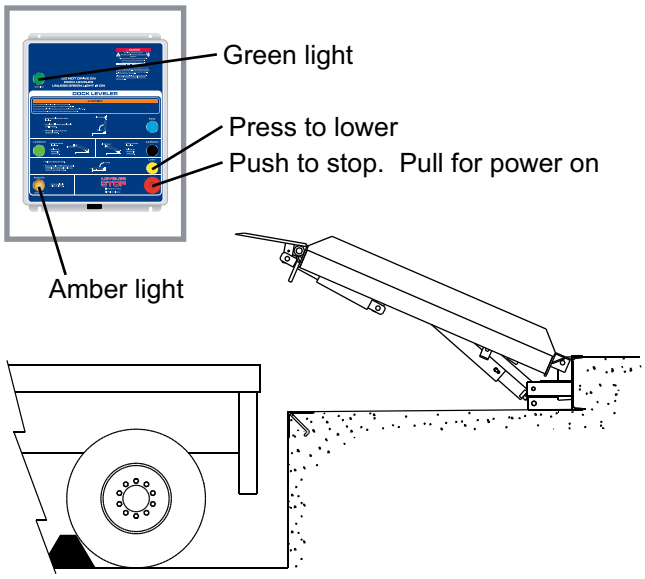


Fig. 11



NOTE:

Audible alarm pulses and green lamp goes off if the LEVELER STOP button is pressed while leveler is in float range. Amber lamp flashes if both LS1 and LS2 are on or an overload condition exists.

STORING LEVELER

3. To return the leveler to its vertical stored position, press and hold the RAISE button. Green light will turn off. Audible Alarm will sound if the button is released before the leveler is fully raised. When the leveler is fully raised and the lip is extended, release the RAISE button. Push the LEVELER STOP button to turn off power (amber light off). See Fig. 12.

END LOADING OPERATION

1. Pull the LEVELER STOP button to switch on power. Amber indicates power on. Press and hold LOWER button until the leveler is partially lowered. Press and hold LIP RETRACT button until the lip is fully retracted. Press and hold LOWER button until Green light on leveler control panel indicates the leveler has reached the operating range. Leveler will float down to the pit floor. See Fig. 13.

2. To reposition the leveler for normal loading/unloading, press the RAISE button until lip is clear of the truck. The Green light will go off and the Audible Alarm will sound if the leveler is stopped above the operating range. Press the LIP EXTEND button until lip is fully extended. If above the operating range press and hold the LOWER button until the Green light on the control panel indicates leveler has reached the operating range. Leveler will float down to the truck bed. See Fig. 14.

Fig. 13

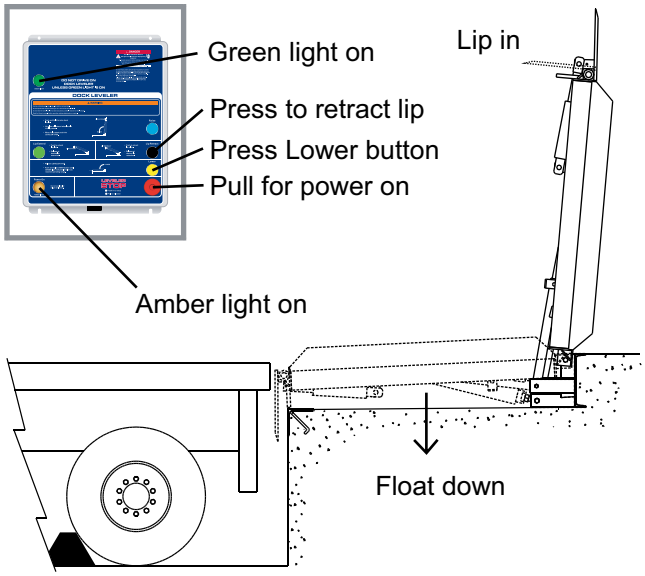


Fig. 12

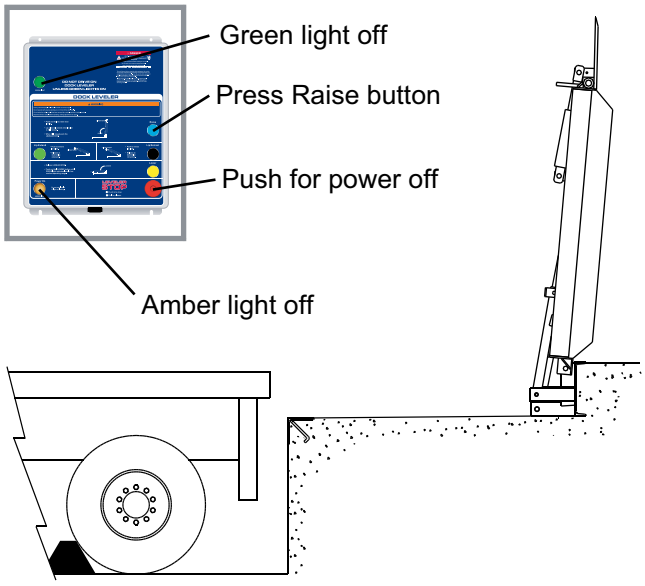
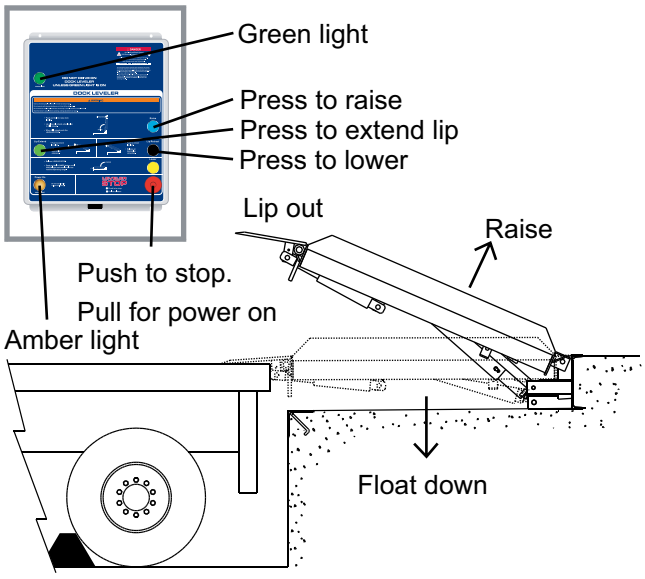


Fig. 14



SERVICE TOOLS

⚠WARNING

Before servicing the dock leveler, read and follow the Safety Practices on page 3 and the Operation section in this manual.

⚠DANGER

Before doing any maintenance or repair on the dock leveler, be certain that:

1) THE LEVELER IS STORED IN A VERTICAL POSITION WITH THE LIP EXTENDED AND THE LOCK-OUT PIN INSERTED THROUGH THE MAINTENANCE STRUT AND BRACKET ON DECK.

2) The LEVELER STOP button is pressed.

3) Barriers are in place.

Failure to do so could result in death or serious injury.

MAINTENANCE STRUT

The vertical dock leveler is equipped with a maintenance strut to hold the leveler in the stored position during maintenance. Always follow the procedure below when performing maintenance or adjustments of any kind to the dock leveler.

1. Raise the leveler to its fully stored position with the lip extended.

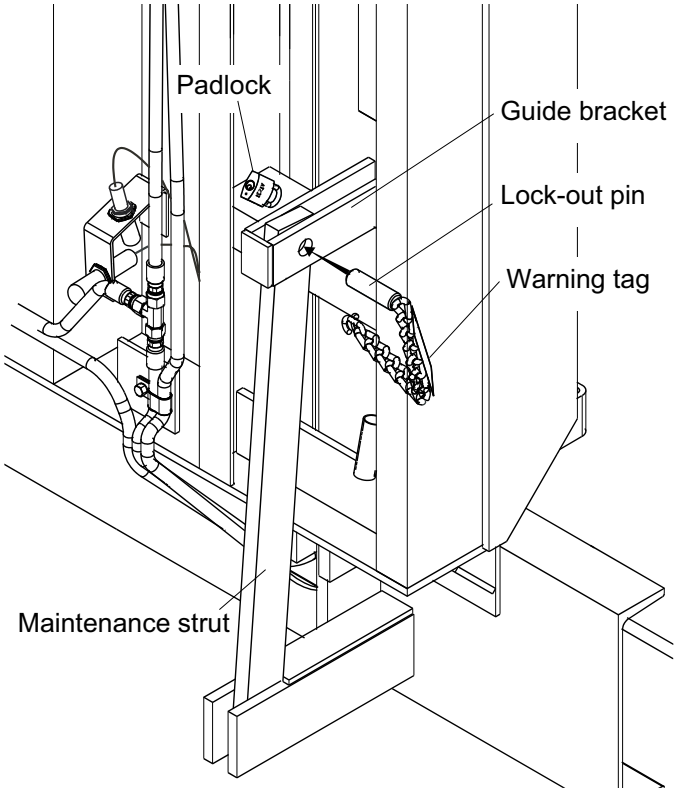
2. Press the LEVELER STOP button on the control panel.

3) Insert the Lock-out pin through the maintenance strut and the bracket on the deck. (Reach from the side of the leveler while inserting Lock-out pin). The Lock-out pin should insert freely.

4) Place a padlock through the hole in the Lock-out pin to prevent accidental activation of the dock leveler.

5) Place barricades around the dock leveler to show leveler is out of service.

Fig. 15



PLANNED MAINTENANCE

To ensure the continued proper operation of your dock leveler, perform the following planned maintenance procedures.

⚠WARNING

Before servicing the dock leveler, read and follow the Safety Practices on page 3 and the Operation section in this manual.

⚠DANGER

Before doing any maintenance or repair on the dock leveler, be certain that:

1) THE LEVELER IS STORED IN A VERTICAL POSITION WITH THE LIP EXTENDED AND THE LOCK-OUT PIN INSERTED THROUGH THE MAINTENANCE STRUT AND BRACKET ON DECK.

2) The LEVELER STOP button is pressed.

3) Barriers are in place.

Failure to do so could result in death or serious injury.

WEEKLY

1. Check that the lock out pin can be freely inserted through the maintenance strut and the bracket on the deck when the leveler is fully raised.

2. Check the full operation of the leveler to ensure there is no hesitation in the hydraulic system. Any loss of fluid will affect the safety valve operation.

3. Inspect that both control panel lights are working and replace bulbs if necessary.

4. Clean away any debris from the pit area. If washing out, take care not to direct spray at any electrical parts.

5. Clean away any dirt and debris from the lip hinge.

QUARTERLY

1. Inspect and lubricate all mechanical pivot points on the leveler with S.A.E. 30 oil. Cycle the leveler when lubricating.

2. Inspect the hydraulic cylinders, valves and hoses for any fluid loss and check the reservoir level. Add fluid as required. See pages 22 and 23 for oil check procedure for your model leveler.

NOTE:

To inspect reservoir level, unscrew dip stick cap, clean stick then insert stick into reservoir. Do not screw in. Read fluid level and replenish as required. Screw in cap when finished.

3. Inspect all welds under leveler for fatigue or failure, particularly the lip plate hinge and under the top plate.

4. Inspect all warning labels and placard. Replace as required. See page 24 for part numbers and label location.

5. Inspect and lubricate the hinge tube and cylinder rod end clevis (5' and 6' only) with molybdenum disulfide NLGI #2 grease. Do not over-grease. Stop when grease begins to ooze out of the tube ends. Wipe off excess grease.

6. Inspect dock bumpers. Four inches (4") of projection is required. Worn, torn, loose or missing bumpers must be repaired or replaced.

PLANNED MAINTENANCE, continued

Fig. 16

REMOTE MOUNTED UNITS

Legend	
Symbol	**Description**
O	**Lubricate - Oil** Light Oil - SAE 30
G	**Lubricate - Grease** Molybdenum Disulfide NLGI #2
	Cleaning (Location - Frequency)
	Visually Inspect (Replace Damaged Or Worn)

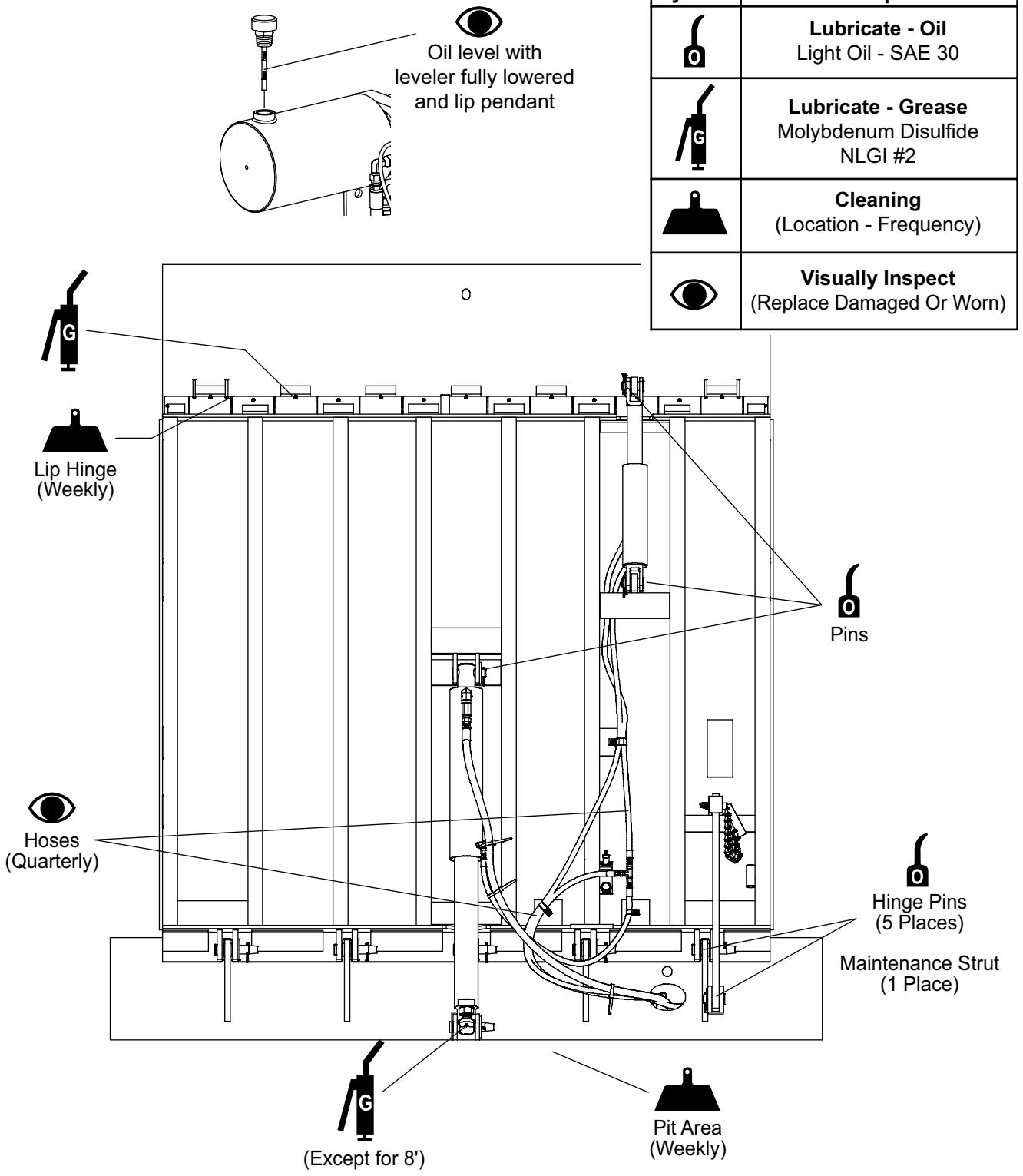
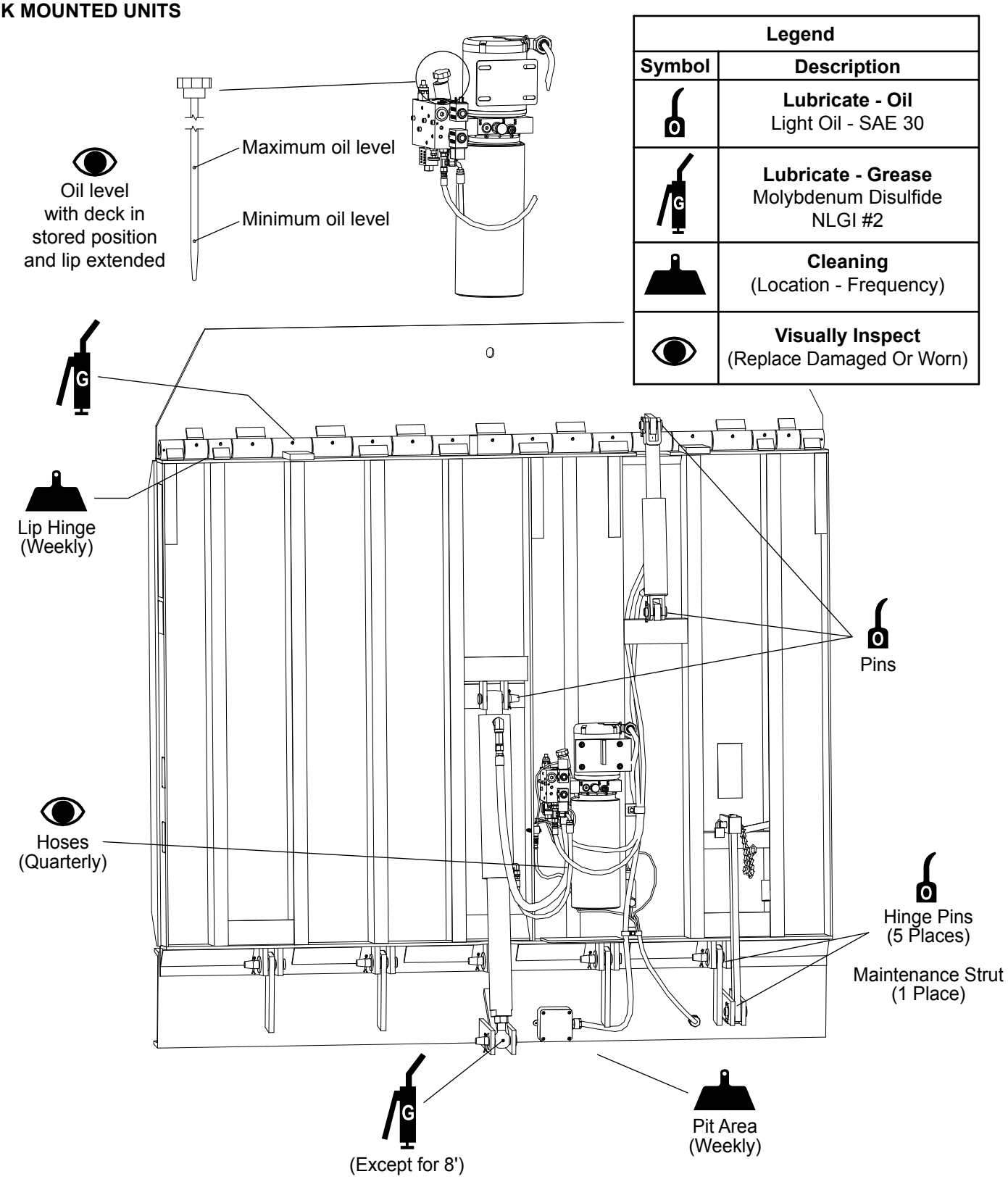


Fig. 17

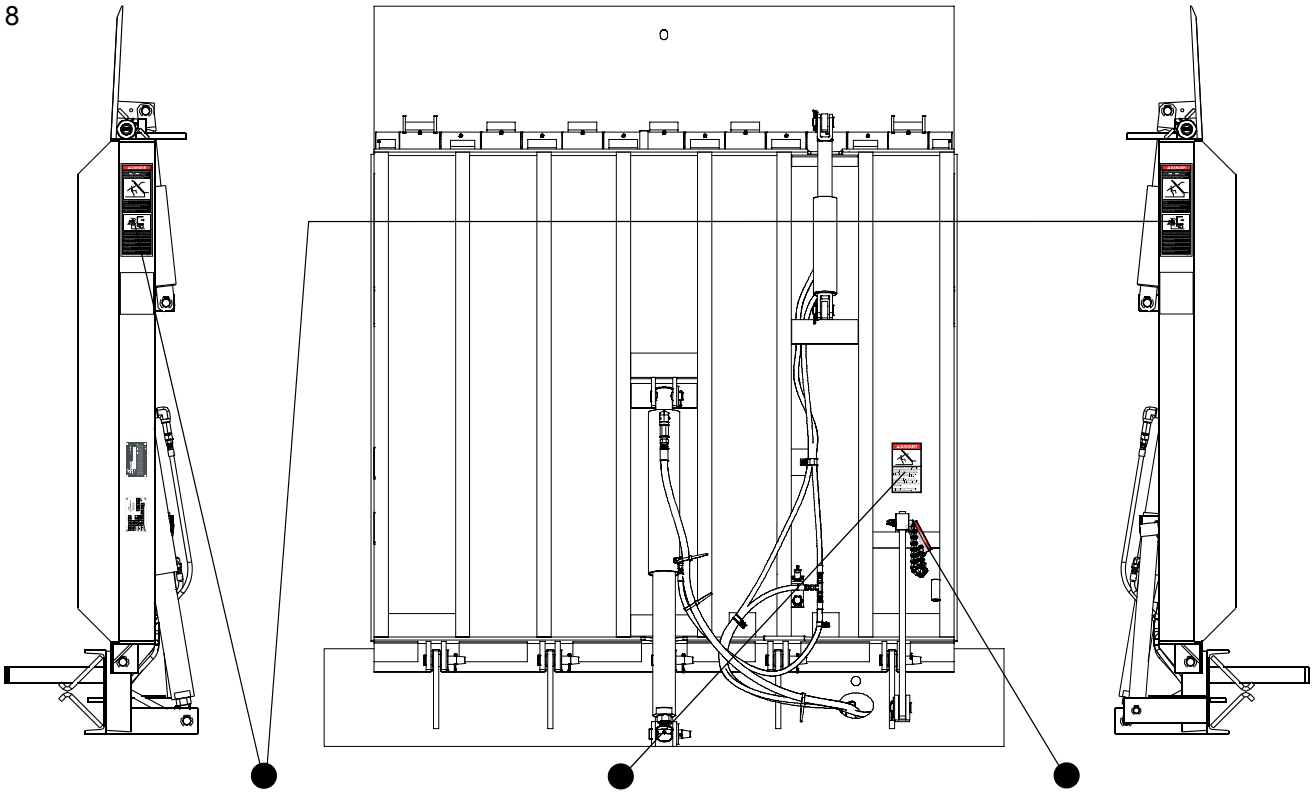
DECK MOUNTED UNITS



PLANNED MAINTENANCE, continued

Every 90 days (quarterly) inspect all safety labels and tags to ensure they are on the dock leveler and are easily legible. If any are missing or require replacement, please call your local distributor for replacements.

Fig. 18



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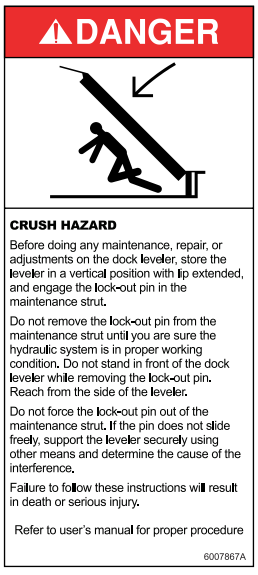

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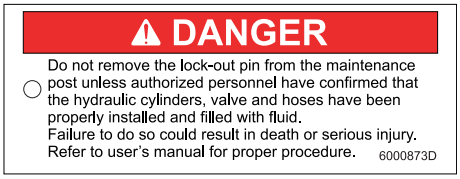

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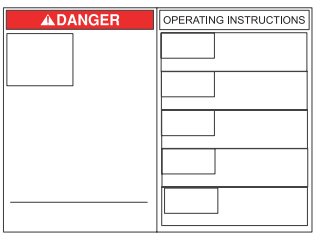


Warning and operation placard (mounted near controls)

TROUBLESHOOTING GUIDE

Use the Troubleshooting Guide if ever the leveler fails to perform properly. Find the condition that most closely matches your situation and make the recommended adjustments. Observe all safety warnings before attempting any maintenance procedure.

⚠ WARNING

Before servicing the dock leveler, read and follow the Safety Practices on page 3 and the Operation section in this manual.

⚠ DANGER

Be certain before doing any maintenance or repair on the dock leveler, that: 1) THE LEVELER IS STORED IN A VERTICAL POSITION WITH THE LIP EXTENDED AND THE LOCK-OUT PIN INSERTED THROUGH THE MAINTENANCE STRUT AND BRACKET ON DECK and 2) The power is disconnected and properly tagged or locked out.

⚠ DANGER

Do not perform any maintenance or repair in the area in front of, or under the leveler unless the leveler is fully raised and lip extended, lock-out pin is inserted through the maintenance strut and bracket on deck, the Leveler Stop button is pressed, and barriers are in place.

If the dock leveler will not raise with the RAISE pushbutton, and it must be raised by external mechanical means to close the dock door, use extreme caution and do not allow anyone to stand in front of the leveler. Ensure that the lock-out pin is inserted through the maintenance strut and bracket on deck before the mechanical lifting means is removed.

During lifting of the leveler by mechanical means it is likely that hydraulic fluid will vent itself through the breather of the hydraulic reservoir. Lift the leveler slowly and without getting in front of the leveler, place a container under the reservoir if possible to catch the fluid.

The lock-out pin must not be removed until the hydraulic system has been bled of air and all hydraulic functions have been tested by a qualified service technician.

If the dock leveler has been raised to the stored position by external means, the main cylinder will be full of air and there may be a vacuum exerting a strong retracting force on the cylinder rod. A technician will need to perform a bleed procedure to remove the air from the hydraulic cylinder. With the lock-out pin in place, the technician should loosen the hydraulic hose fitting on the top port of the main cylinder and allow air to fill the vacuum before attempting to remove the pin from the cylinder rod (lower) end. With the lock-out pin in place, the technician must remove the pin from the main cylinder rod (lower) end and perform steps 18 through 25 of the installation instructions on pages 9-13.

Failure to follow this instruction can allow the leveler to free fall rapidly and may result in severe injury or death.

⚠ DANGER

Do not disconnect hoses unless the leveler is fully raised with lip extended, the lockout pin is inserted through the maintenance strut, Leveler Stop button is pressed, and barriers are in place. After replacing hoses and/or motor/pump, cycle the leveler at least four times to remove air from the cylinder. Check oil and add if required.

Failure to do so could result in death or serious injury.

TROUBLESHOOTING GUIDE, continued

⚠DANGER

Do not disconnect hoses or any hydraulic components unless the leveler is fully raised with lip extended, the lockout pin is inserted through the maintenance strut, LEVELER STOP button is pressed, and barriers are in place.

If you do disconnect any hydraulic components remove the pin from the main cylinder rod end and perform steps 18 through 25 of the Installation Instructions on pages 9-13 before removing the lockout pin from the maintenance strut and bracket on deck.

Failure to do so could result in death or serious injury.

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. Leveler does not raise or lower. Motor not running.	a) No electrical power to control panel.	a) Check that voltage is present at terminal connections to the control panel.
	b) Electrical connections incorrect or broken.	b) Check that wiring matches the wiring diagram.
	c) No electrical power to PLC.	c) No electrical wiring to the PLC.
	d) PLC not running.	d) If the fault light is flashing, replace PLC.
2. Leveler does not raise or lower; motor starts then stops, motor starter relay chatters.	a) Loose wiring connection.	a) Check all wiring connections from line to motor starter relay, overload and to motor.
	b) Voltage drop due to long wiring distance from power source.	b) Check voltage when motor is started. Voltage drop is more often a problem on single phase motors. Verify wire gage is adequate for length of wire.
3. Overload relay tripping (check full load amperage and relay setting).	a) Overload relay set too low.	a) Set overload to full load current specified for voltage on motor nameplate.
	b) Loss of 1 phase (Three phase only)	b) Check for voltage at all three motor connections (T1, T2, T3) at output of overload in control panel.
4. Leveler does not raise or lower. Motor hums.	a) Voltage drop.	a) See solution 2. b).
	b) Loss of 1 phase (Three phase only)	b) Check for voltage at all three motor connections (T1, T2, T3) at output of overload in control panel.

PROBLEM	POSSIBLE CAUSE	SOLUTION
5. Leveler does not raise or lower. Motor runs.	a) Low fluid in reservoir.	a) Check fluid level. See ***Planned Maintenance*** section in this manual for instructions for your specific leveler type.
	b) Main solenoid valve SV2 does not open.	b) Check for magnetism at solenoid coil. If magnetism present, remove and inspect valve for contamination and then replace solenoid valve.
	c) Pump running in reverse	c) Check motor rotation and reverse electrical connections T1 and T2 if necessary.
	d) Pump damaged or broken internally.	d) With the leveler safely secured by the lock-out pin inserted in the maintenance strut and bracket on deck, remove the hose from the upper port of the main lift cylinder and point free end into the reservoir opening. If no fluid is pumped, replace hydraulic power unit.
	e) Insufficient pressure. Primary relief valve (RV1) setting too low.	e) Set primary relief valve to 2000 PSI. See instructions on page 32 and 33.
6. Leveler will not lower. Motor runs and leveler raises.	a) Lower solenoid valve SV1 does not open.	a) Check for magnetism at solenoid coil. If magnetism present, remove and inspect valve for contamination and then replace solenoid valve.
	b) Automatic safety stop (velocity fuse) is locked.	b) If load was on the leveler, remove the load and jog the RAISE or LOWER buttons to unlock the leveler.
	c) NV1 (needle valve) set too tight.	c) Adjust NV1 (needle valve) CCW. See hydraulic power unit adjustment on pages 32 and 33.
7. Leveler floats down too fast or too slowly in “float” range.	a) Float needle (FNV) valve requires adjustment.	a) Adjust float needle valve. Turn counter clockwise to increase lowering speed or clockwise to decrease speed. The speed of the deck, while lowering, in the float range should be equal to the speed in the powered range. See page 32 and 33.
8. Leveler will not raise. Motor runs.	a) Solenoid valve SV1 not closed.	a) Confirm SV1 solenoid coil is de-engergized. Inspect SV1 for contamination and then replace solenoid valve.

TROUBLESHOOTING GUIDE, continued

PROBLEM	POSSIBLE CAUSE	SOLUTION
9. Lip plate will not extend, or extends too slowly.	a) Low fluid level in reservoir.	a) Check fluid level. See ***Planned Maintenance*** section in this manual for instructions for your specific leveler type.
	b) Sequence valve pressure set too high.	b) Decrease sequence valve setting. See page 32 and 33.
	c) Lip hinge binding.	c) Inspect hinge area for damage or trapped debris.
	d) Primary relief valve pressure set too low.	d) Set primary relief valve to 2000 PSI. See page 32 and 33. **Do not adjust relief valve without a pressure gauge.** Reference TSB 2008-0722G for equipment requirements.
10. Lip plate extends too soon.	a) Sequence valve pressure set too low.	a) Turn sequence valve clockwise to increase pressure so the lip plate does not extend until the leveler is fully raised. See page 32 and 33.
11. Lip plate will not stay out/falls as leveler is lowering.	a) Pilot check valve is leaking.	a) Inspect and clean pilot check valve.
	b) Lip solenoid SV4 not energizing or not closing.	b) Inspect SV4 coil for magnetism. Test valve with good coil. Replace if necessary.
	c) Lip Solenoid SV4 may be clogged or damaged.	c) Inspect SV4 valve for contamination, Clean or replace.
12. Lock-out pin can not be freely inserted through the maintenance strut and the bracket on the deck when the leveler is fully raised.	a) Main cylinder adjustable rod end needs adjustment.	a) Adjust as required. See page 41.
13. Audible alarm sounds when leveler is in the stored position.	a) Main cylinder rod end adjuster not adjusted correctly.	a) Adjust main cylinder - see page 41.
	b) Leveler stored proximity sensor damaged or connection to sensor lost.	b) Replace proximity sensor or repair wiring between sensor and control panel.
14. Leveler will not enter "Float" range when lowered (no green light on control panel, alarm continues to sound and leveler stops when in working range).	a) Sensor mounting bracket out of position.	a) Adjust sensor bracket angle.
	b) Leveler float proximity sensor damaged or connection to sensor lost.	b) Replace proximity sensor or repair wiring between sensor and control panel.

PLC DIAGNOSTICS

⚠ WARNING

Do not service this product unless you have read and followed the Safety Practices, Warnings, and Operating Instructions in this manual. Failure to follow these safety practices could result in death or serious injury.

The vertical leveler is controlled by a programmable logic controller (PLC) which reads input signals from pushbuttons and proximity sensors, and closes the appropriate output relays to the motor, solenoid valves, audible alarm and warning lights.

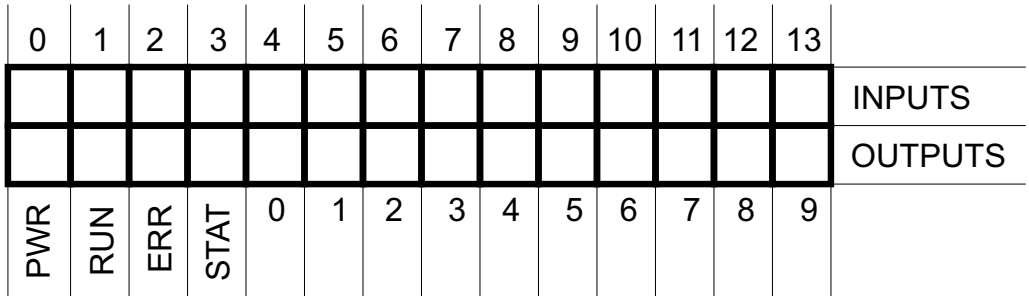
INPUTS

0 Spare
1 Spare
2 Raise PB
3 Lip Extend PB
4 Lip Retract PB
5 Lower PB
6 Stop MB
7 Overload tripped
8 Leveler stored
9 Float
10 Restraint engaged, dip switch #3 (off if used)*
11 Door opened, dip switch #4 (off if used)*
12 Spare
13 Spare

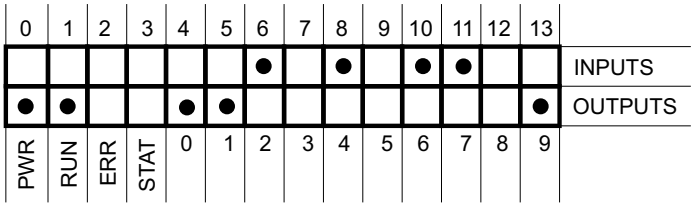
OUTPUTS

0 Loading lamp interlock
1 Pilot lamp (Amber)
2 Pilot lamp (Green)
3 VSL fault
4 SV1
5 SV2
6 SV4
7 Motor
8 Audible alarm
9 Door interlock

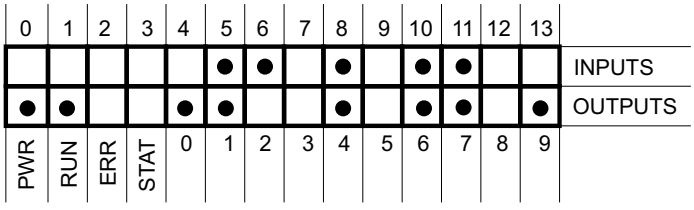
*See interlocks on page 13.



The charts below show all of the valid conditions for the PLC Unit.

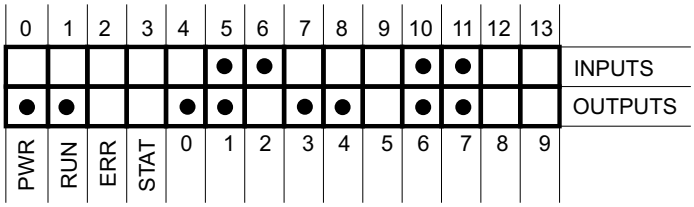


Leveler stored. No pushbuttons pressed. LEVELER STOP pulled out.

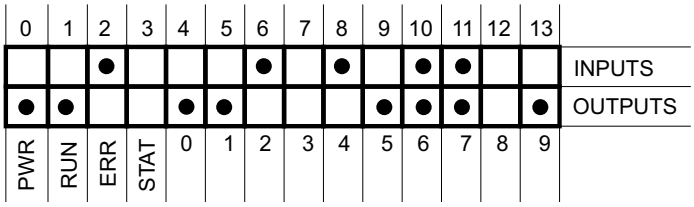


Leveler stored. Lower button pressed.

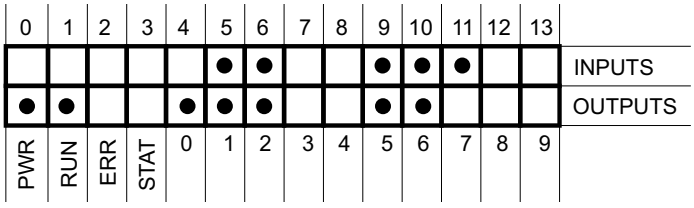
PLC DIAGNOSTICS, continued



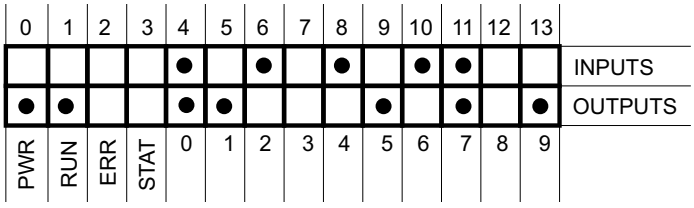
Leveler between float and stored. Lower button pressed.



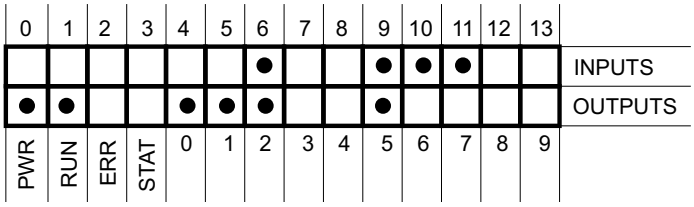
Leveler stored. Raise button pressed.



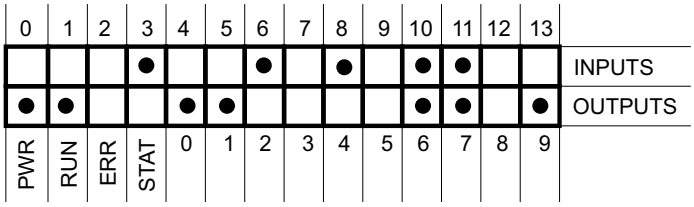
Leveler in float range. Lower button pressed.



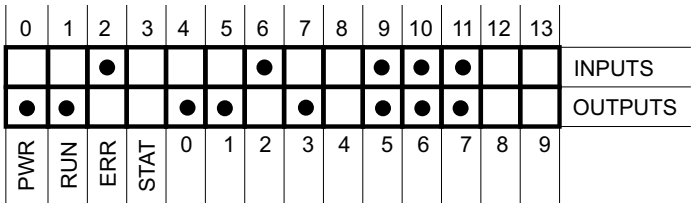
Leveler stored. Lip Retract button pressed.



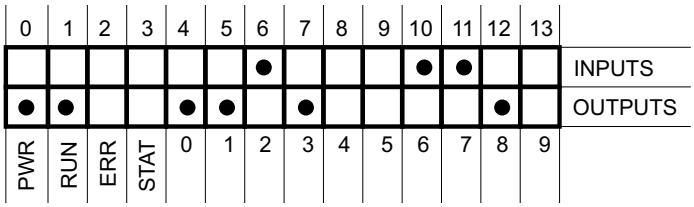
Leveler in float range. No buttons pressed.



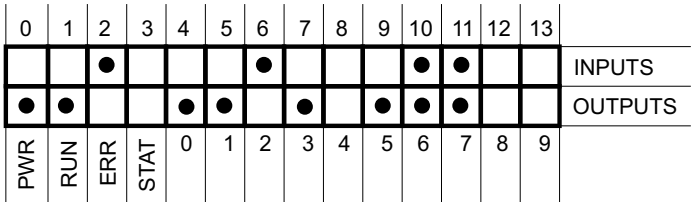
Leveler stored. Lip Extend button pressed.



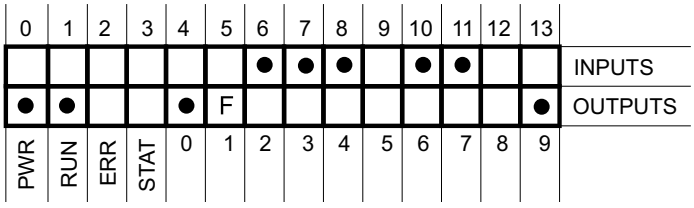
Leveler in float range. Raise button pressed.



Leveler between float and stored. No pushbuttons pressed.



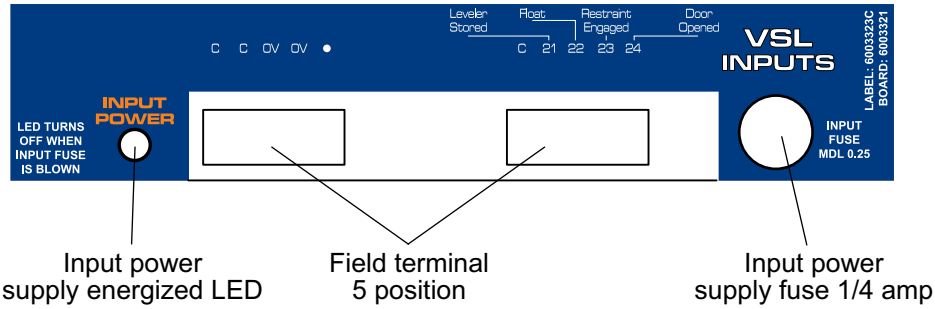
Leveler between float and stored. Raise button pressed.

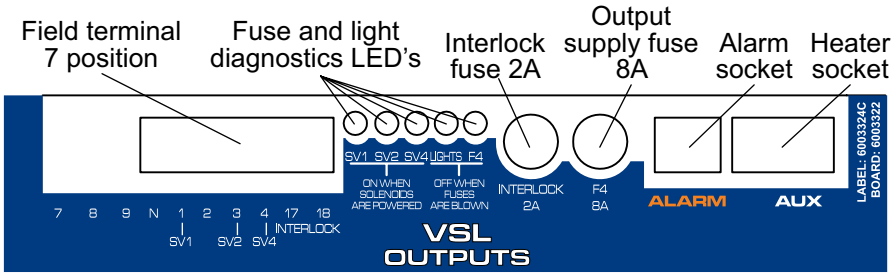


Alarm condition: LS1 and LS2 both on or overload tripped. No buttons pressed

Fig. 19

VSL Input Board





VSL Output Board
Diagnostic LED's

SV1 On when power is being sent to output solenoid 1.
SV2 On when power is being sent to solenoid 2.
SV4 On when power is being sent to solenoid 4.
Lights Off when power supplying the lights is not present.
F4 Off when power supplying all the solenoids and control circuit is off or F4 fuse is blown.
Input Power LED off when PLC input power supply fuse 0.25A is blown.

NOTE:

There is no LED indicator for the 2A interlock fuse.

HYDRAULIC POWER UNIT ADJUSTMENT

Fig. 20
REMOTE MOUNTED UNITS

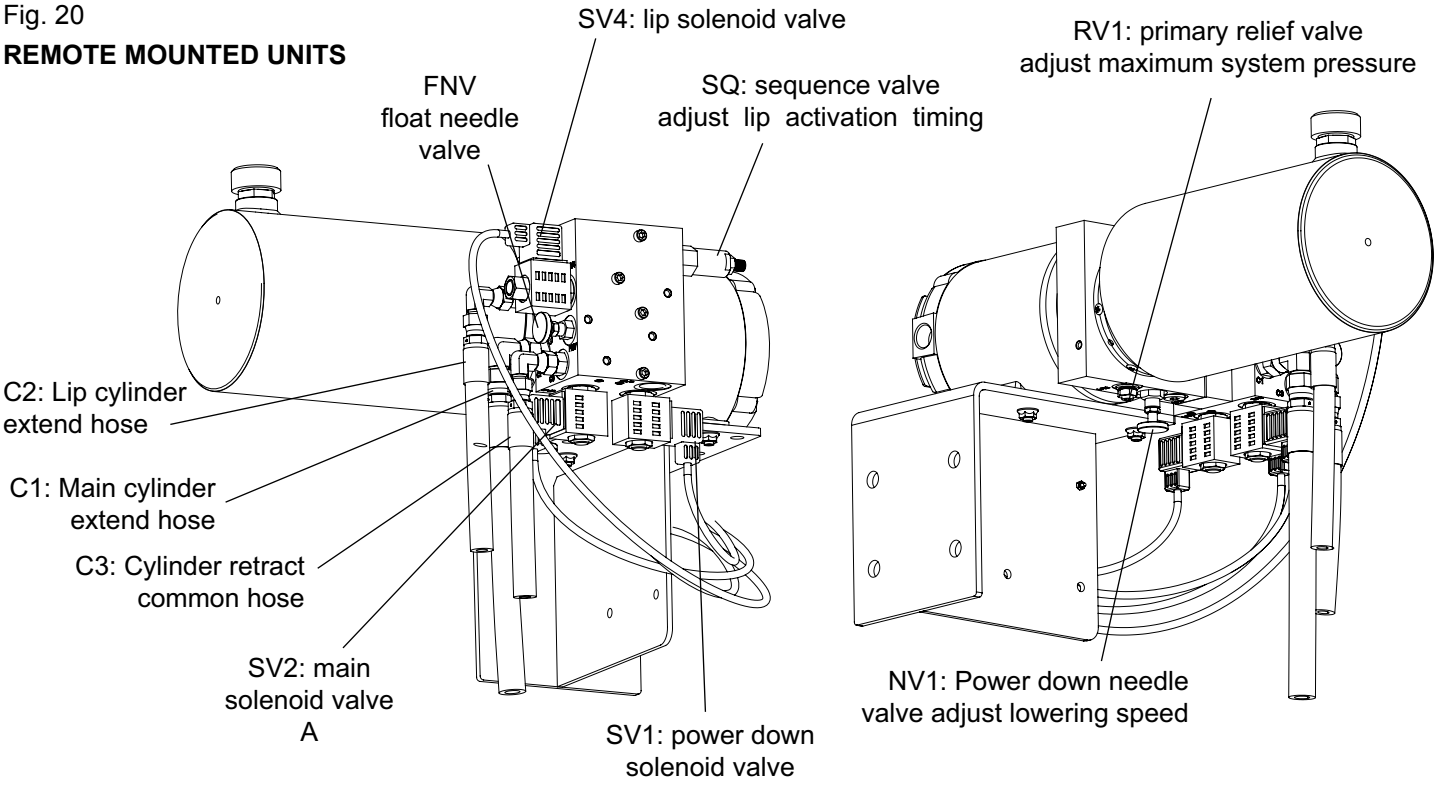
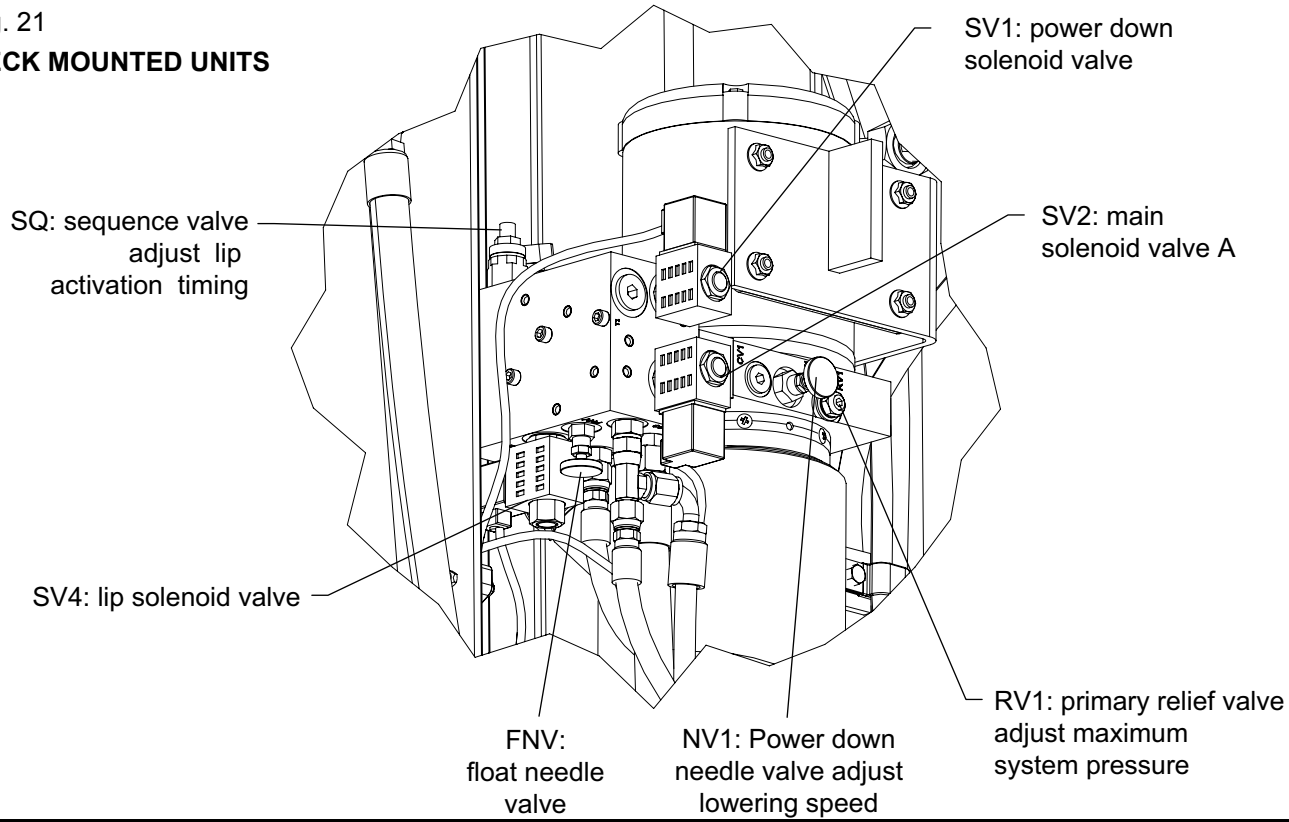


Fig. 21
DECK MOUNTED UNITS



HYDRAULIC POWER UNIT ADJUSTMENT, continued

⚠DANGER

Do not perform any maintenance or repair in the area in front of, or under the leveler unless the leveler is fully raised and lip extended, lock-out pin is inserted through the maintenance strut and bracket on deck, the Leveler Stop button is pressed, and barriers are in place.

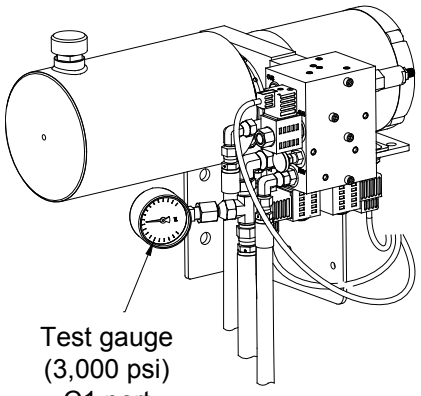
NOTICE

Before making any adjustments to the power unit, always install a hydraulic pressure gauge (3000 psi liquid filled), in line, on the C1 port.

TOOLS REQUIRED

- Pressure gauge (3000 psi, liquid filled)
- 3/16" hex wrench
- 7/16" open end wrench
- 9/16" open end wrench.

Fig. 22

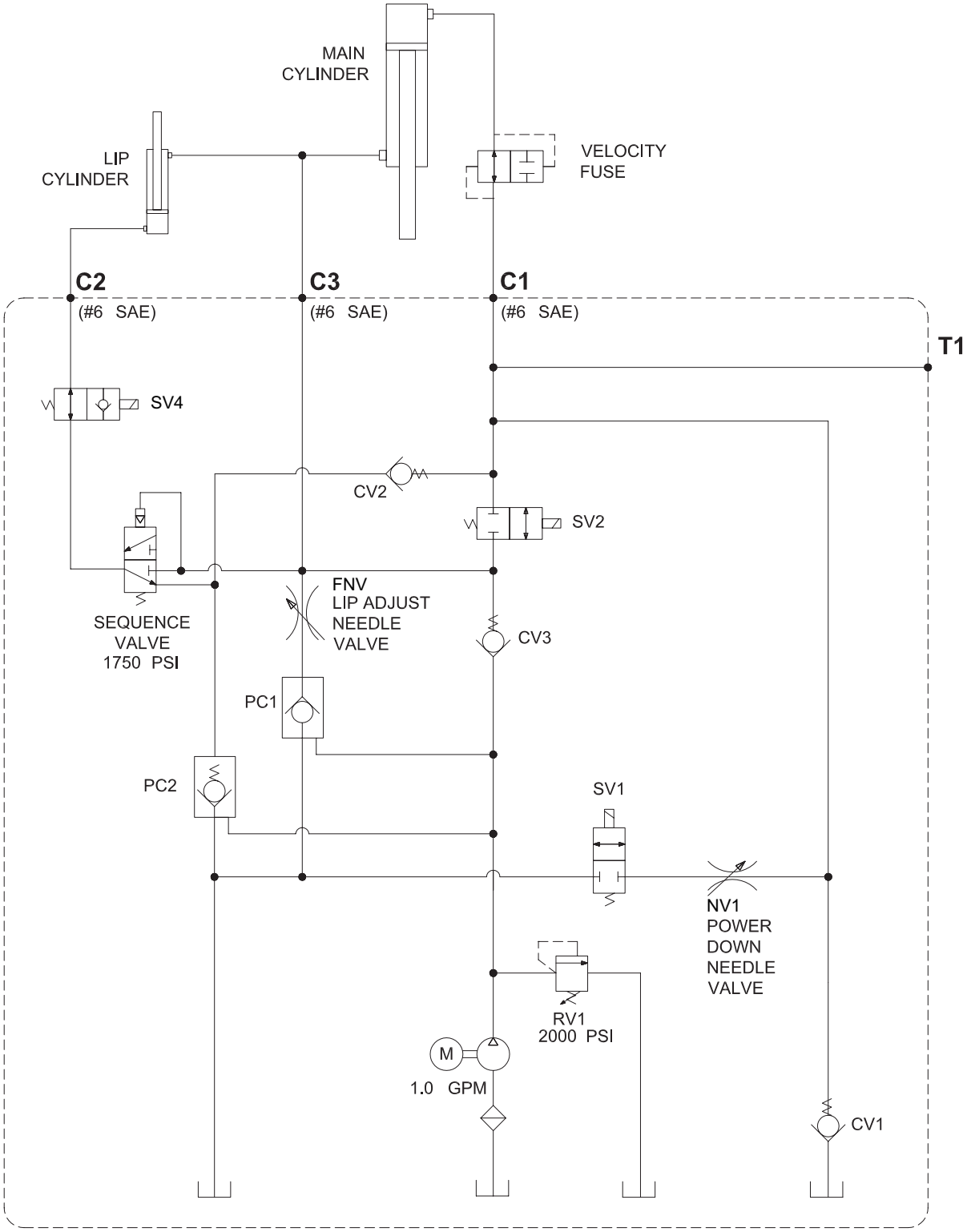


Description	Purpose	Adjustment
Primary relief valve (RV1)	Controls maximum pressure in the hydraulic system and protects the other components from excessive force.	Loosen the lock nut. Turn screw clockwise to increase relief pressure. Relief pressure is factory set at 2,000 PSI and should not require adjustment. Do not adjust without a pressure gauge or pump may be damaged. Reference TSB2009-0722G equipment requirements.
Float needle valve (FNV)	Controls the lowering speed of the leveler in the float range when the green light is on.	Loosen jamb nut with 7/16" wrench. Turn the knob clockwise to decrease lowering speed. The speed of the deck, while lowering, in the float range should be equal to or slower than the speed in the powered range.
Sequence valve	Controls lip plate retraction and extension.	Loosen locknut. turn set screw CW (inward) to increase pressure, CCW (outward) to reduce pressure. If the lip extends before the deck is fully raised, the valve should be turned clockwise. Tightening the valve too far will cause very slow lip extension, or no extension at all.
Power down needle valve (NV1)	Controls the lowering speed of the leveler while under power.	Trial run the leveler, lowering it from stored to below dock position. Record time observed. **NV1 Adjustment:** With the leveler at rest in below dock position, loosen the NV1 needle valve lock nut and turn the knob clockwise to slow lowering speed, or counter-clockwise to increase speed. Hold the adjustment knob in place while tightening the lock nut. Raise the leveler and test lowering speed. Make adjustments in 1/4 to 1/2 turn increments with each test.

Recommended settings	
Leveler Size (ft)	Descent Time (Sec)
5	8-15
6	10-15
8	10-15

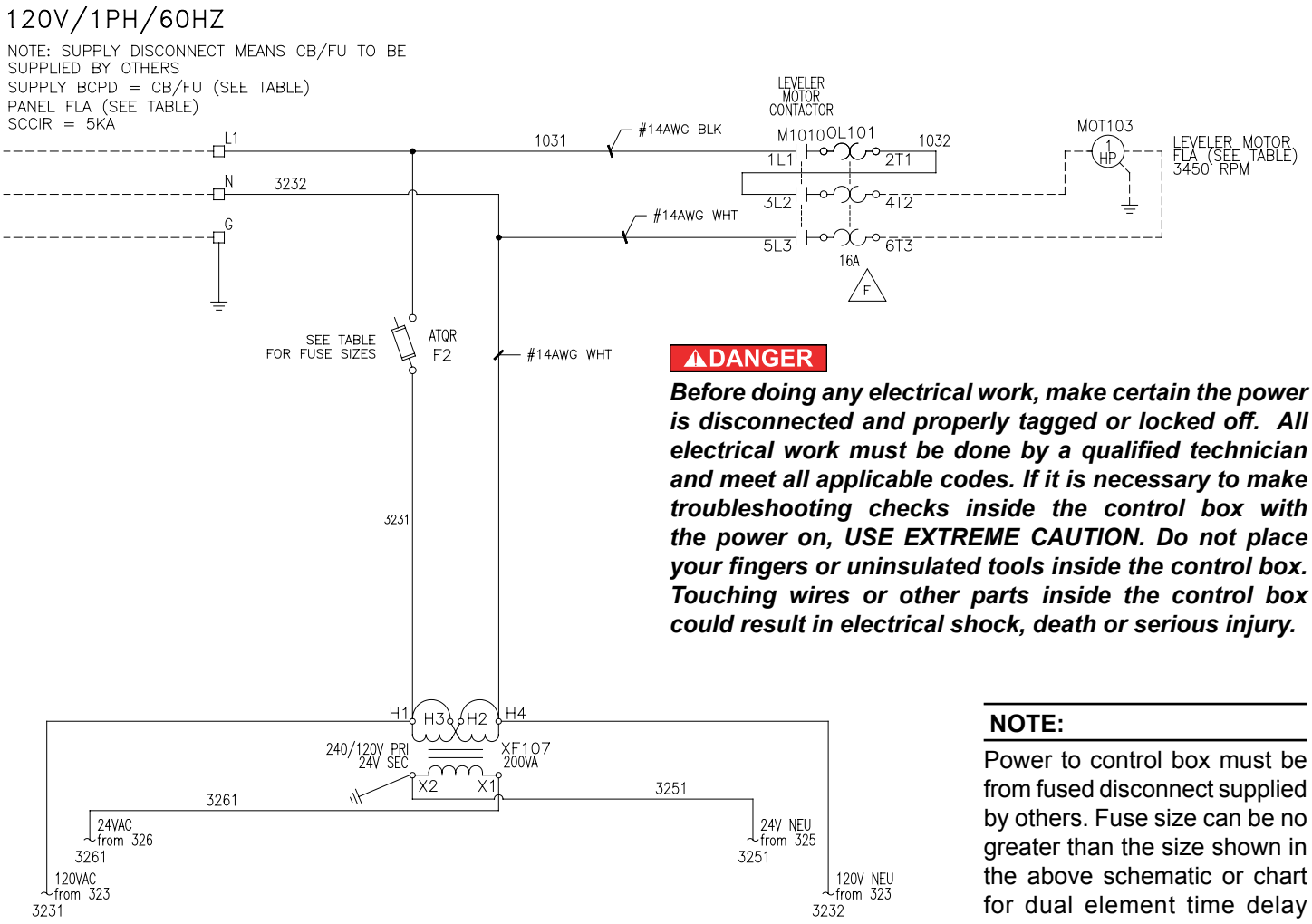
HYDRAULIC SCHEMATIC

Fig. 23



WIRING DETAILS — 120V, 1PH, 60HZ

Fig. 24



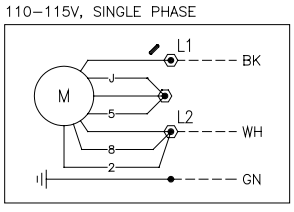
⚠DANGER

Before doing any electrical work, make certain the power is disconnected and properly tagged or locked off. All electrical work must be done by a qualified technician and meet all applicable codes. If it is necessary to make troubleshooting checks inside the control box with the power on, USE EXTREME CAUTION. Do not place your fingers or uninsulated tools inside the control box. Touching wires or other parts inside the control box could result in electrical shock, death or serious injury.

NOTE:

Power to control box must be from fused disconnect supplied by others. Fuse size can be no greater than the size shown in the above schematic or chart for dual element time delay (DETD) fuses. All electrical work must be done by qualified technician and must meet all applicable codes. All devices shown in deenergized state.

MOTOR WIRING DETAILS, SINGLE PHASE



NOTE: VISUALLY CONFIRM MOTOR TAG

SINGLE PHASE PANEL REFERENCE						
VOLTAGE	BCPD	FUSE F2	MOTOR FLA	PANEL FLA	SERCO P/N	KELLEY P/N
115	25A	4A	16.0A	17.67A	6003327V1	6003328V1

* USE CLASS CC TIME DELAY FUSES

WIRE LEGEND

PANEL WIRING
FIELD WIRING (BY OTHERS)

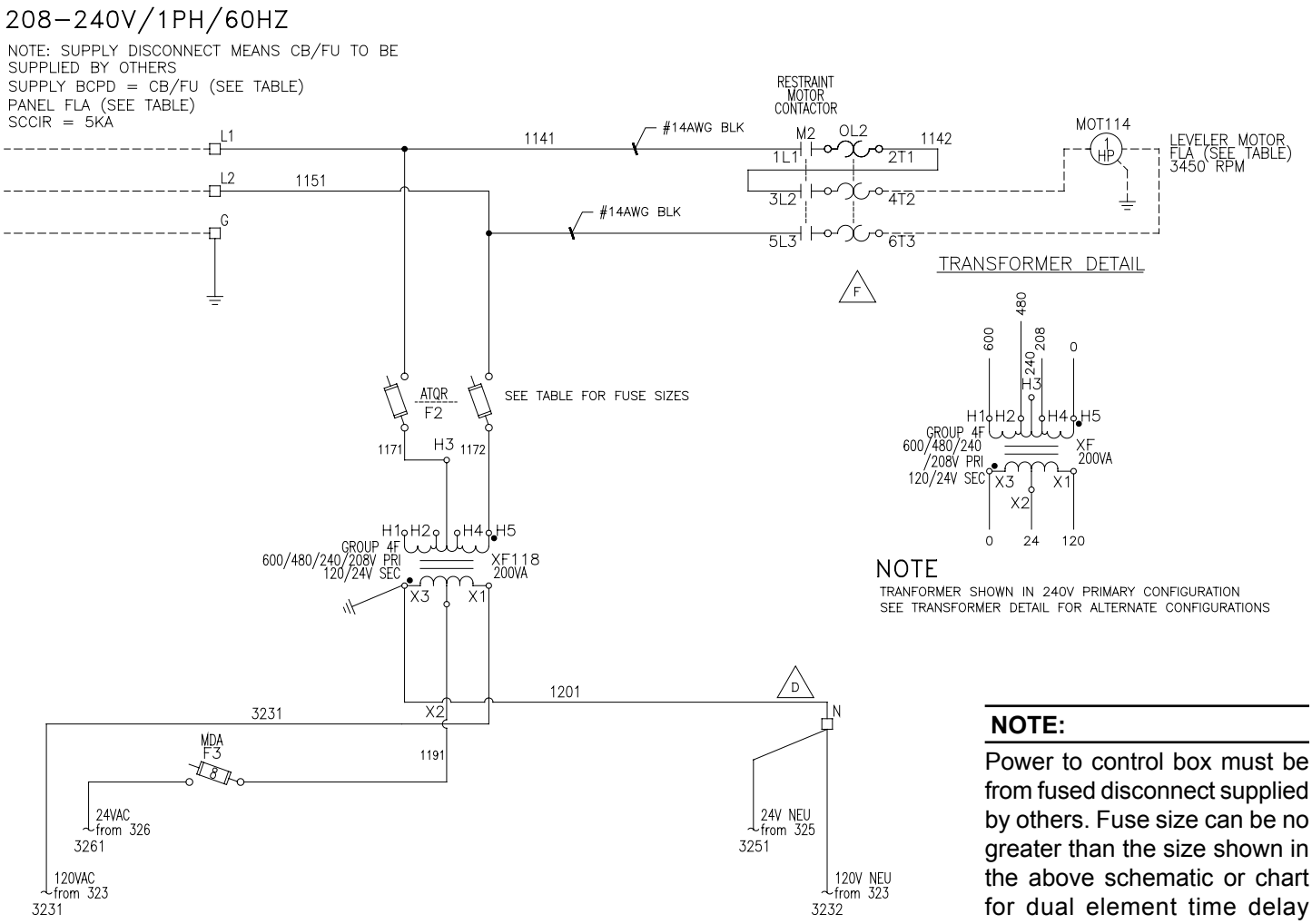
NOTE: PC BOARD TRACES TERMINALS WILL ACCEPT STRANDED WIRE ONLY

WIRE COLOR/GAUGE (NFPA)
(unless otherwise specified)

208–600VAC: #14, BLK
120VAC: #16, RED
24VAC: #16, RED/BLK
NEUTRAL: #16, WHT
GROUND: GRN
24VDC: #18, BLU
24V COM (0VDC): #18, BLU/WHT
12VAC/VDC, #18, VIO
12V COM: #18, VIO/WHT
DRY (UNPOWERED): #18, YLW

WIRING DETAILS — 208-240V, 1PH, 60HZ

Fig. 25

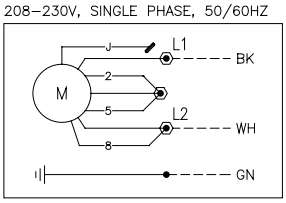


NOTE:

Power to control box must be from fused disconnect supplied by others. Fuse size can be no greater than the size shown in the above schematic or chart for dual element time delay (DETD) fuses. All electrical work must be done by qualified technician and must meet all applicable codes. All devices shown in deenergized state.

MOTOR DETAIL

208–230V, SINGLE PHASE, 50/60HZ



NOTE: VISUALLY CONFIRM MOTOR TAG

WIRE LEGEND

PANEL WIRING
FIELD WIRING (BY OTHERS)

NOTE: PC BOARD TRACES TERMINALS WILL ACCEPT STRANDED WIRE ONLY

WIRE COLOR/GAUGE (NFPA)
(unless otherwise specified)

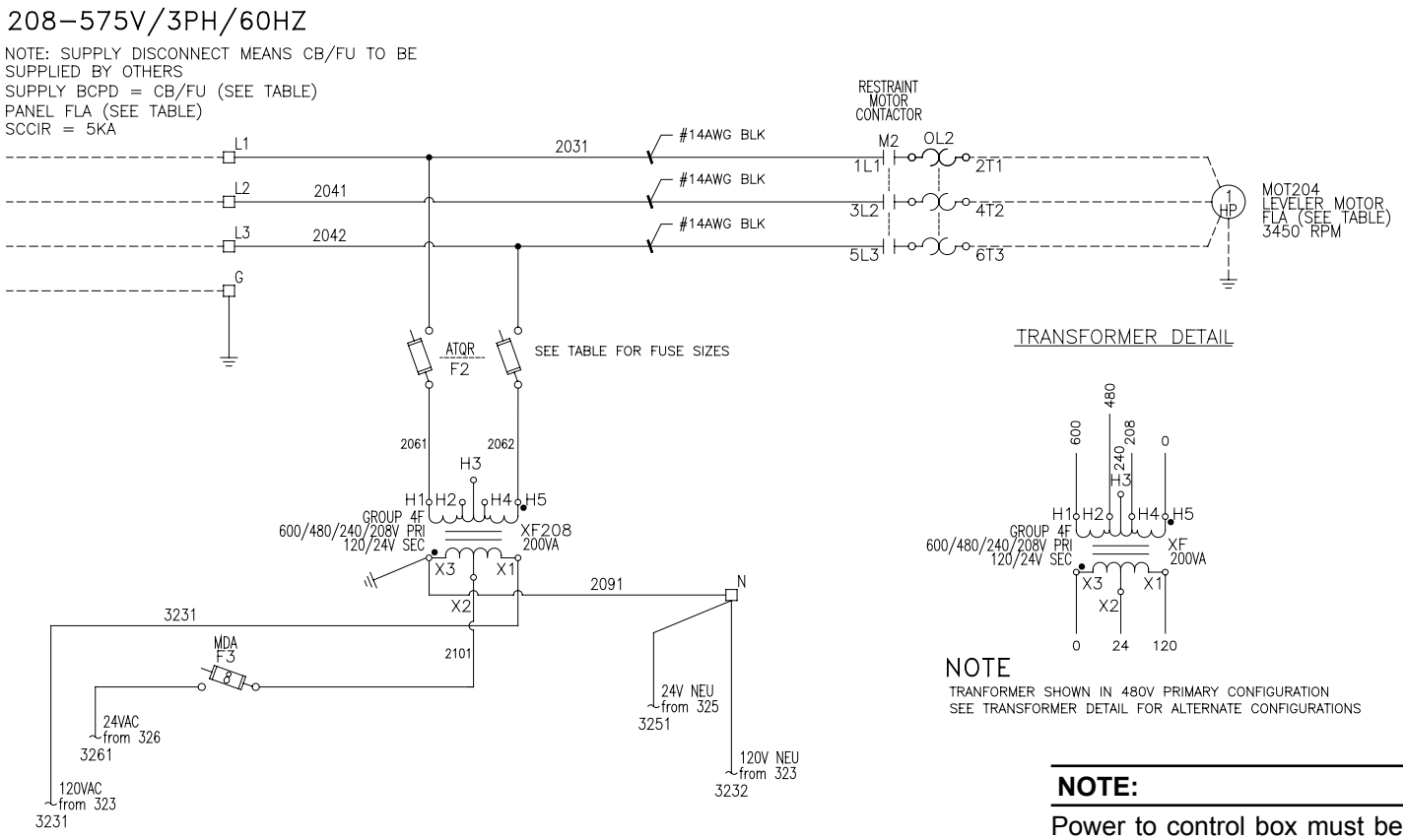
208–600VAC: #14, BLK
120VAC: #16, RED
24VAC: #16, RED/BLK
NEUTRAL: #16, WHT
GROUND: GRN
24VDC: #18, BLU
24V COM (0VDC): #18, BLU/WHT
12VAC/VDC, #18, VIO
12V COM: #18, VIO/WHT
DRY (UNPOWERED): #18, YLW

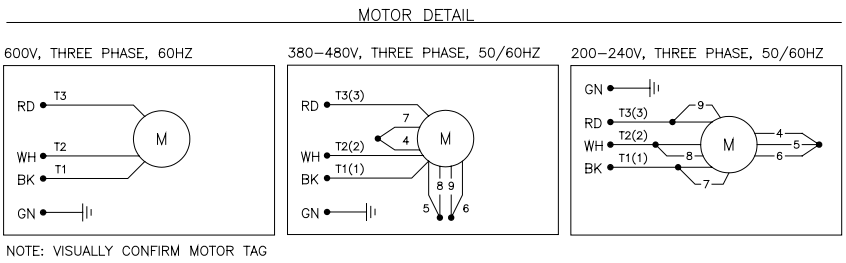
SINGLE PHASE PANEL REFERENCE							
VOLTAGE	BCPD	FUSE F2	MOTOR FLA	PANEL FLA	O/L SETTING	SERCO P/N	KELLEY P/N
208	15A	5A	8.8A	10.5A	8.8A	6003327V2	6003328V2
230	12A	4.5A	8.0A	8.83A	8.0A	6003327V3	6003328V3

* USE CLASS CC TIME DELAY FUSES

WIRING DETAILS — 208-575V, 3PH, 60HZ

Fig. 26





NOTE: VISUALLY CONFIRM MOTOR TAG

NOTE:

Power to control box must be from fused disconnect supplied by others. Fuse size can be no greater than the size shown in the above schematic or chart for dual element time delay (DETD) fuses. All electrical work must be done by qualified technician and must meet all applicable codes. All devices shown in deenergized state.

THREE PHASE PANEL REFERENCE						
VOLTAGE	BCPD	FUSE F2	MOTOR FLA	PANEL FLA	SERCO P/N	KELLEY P/N
208	8A	2.5A	4.6A	5.76A	6003327V4	6003328V4
230	7A	2A	4.2A	5.03A	6003327V5	6003328V5
460	4A	1A	2.1A	2.52A	6003327V7	6003328V7
575	3A	0.8A	1.7A	2.25A	6003327V8	6003328V8

* USE CLASS CC TIME DELAY FUSES

WIRE LEGEND

———— PANEL WIRING
– – – – – – FIELD WIRING (BY OTHERS)
.....

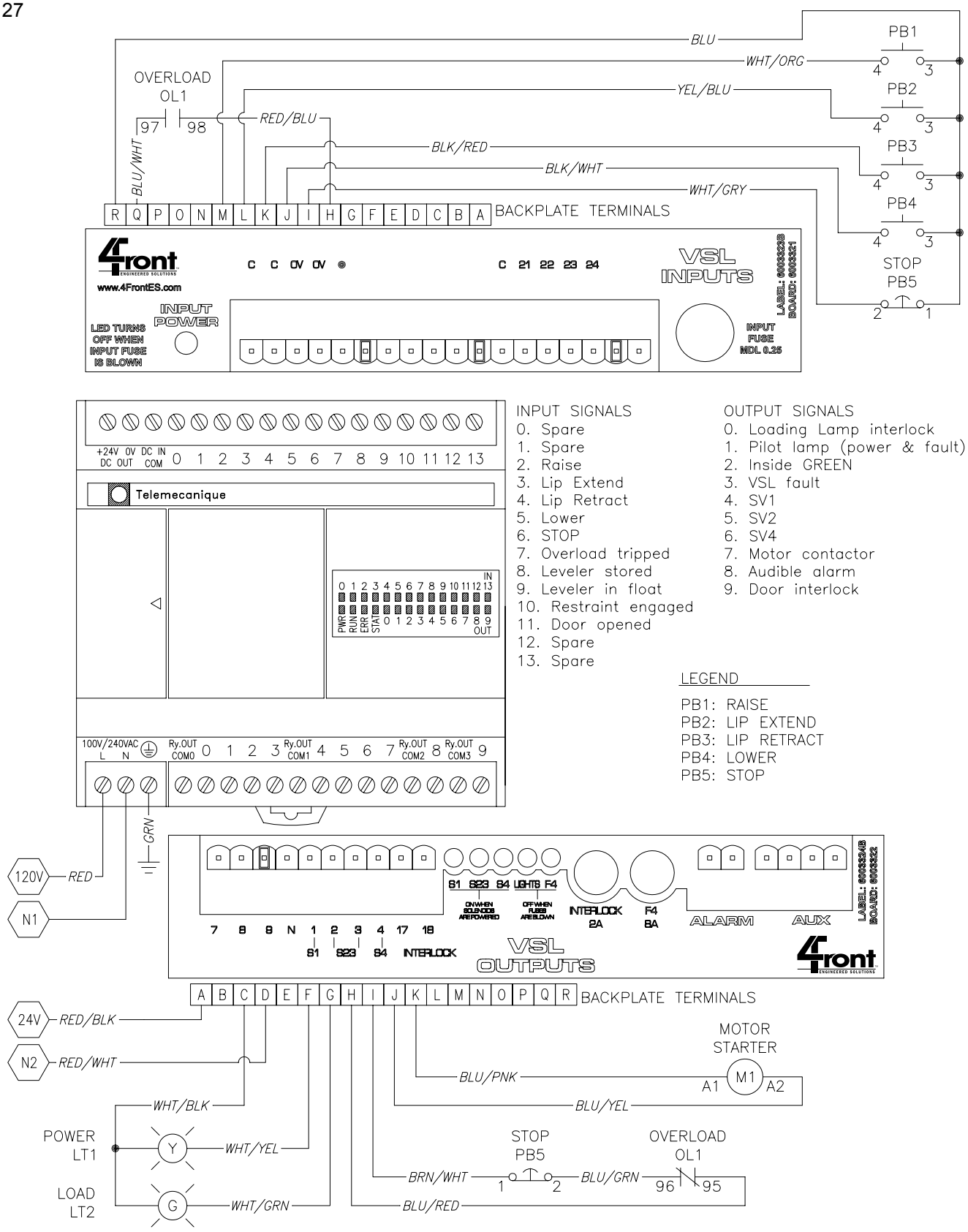
NOTE:
TERMINALS WILL ACCEPT STRANDED WIRE ONLY

WIRE COLOR/GAUGE (NFPA)
(unless otherwise specified)

208–600VAC: #14, BLK
120VAC: #16, RED
24VAC: #16, RED/BLK
NEUTRAL: #16, WHT
GROUND: GRN
24VDC: #18, BLU
24V COM (0VDC): #18, BLU/WHT
12VAC/VDC, #18, VIO
12V COM: #18, VIO/WHT
DRY (UNPOWERED): #18, YLW

WIRING DETAILS — PANEL WIRING

Fig. 27



INPUT SIGNALS
0. Spare
1. Spare
2. Raise
3. Lip Extend
4. Lip Retract
5. Lower
6. STOP
7. Overload tripped
8. Leveler stored
9. Leveler in float
10. Restraint engaged
11. Door opened
12. Spare
13. Spare

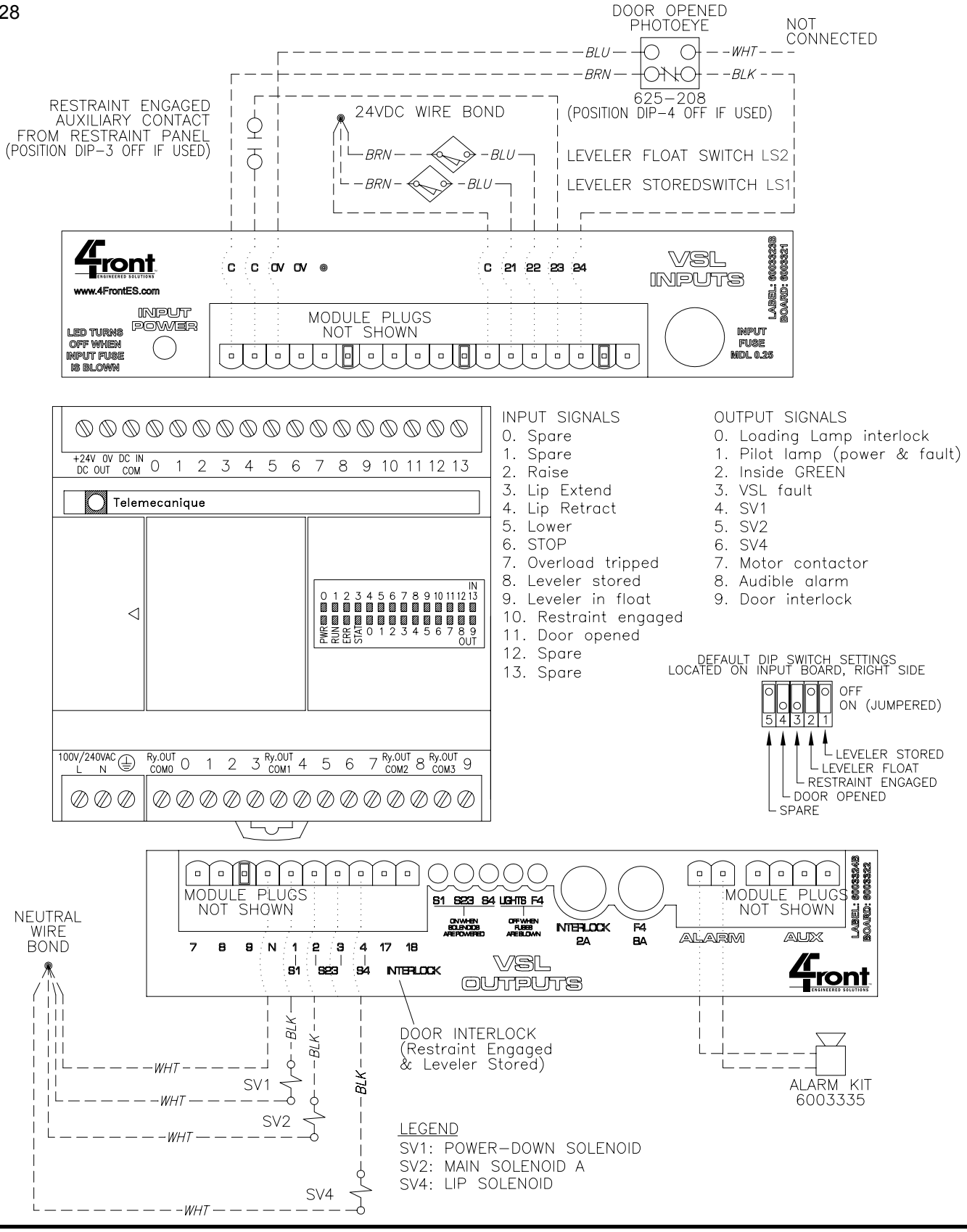
OUTPUT SIGNALS
0. Loading Lamp interlock
1. Pilot lamp (power & fault)
2. Inside GREEN
3. VSL fault
4. SV1
5. SV2
6. SV4
7. Motor contactor
8. Audible alarm
9. Door interlock

LEGEND

PB1: RAISE
PB2: LIP EXTEND
PB3: LIP RETRACT
PB4: LOWER
PB5: STOP

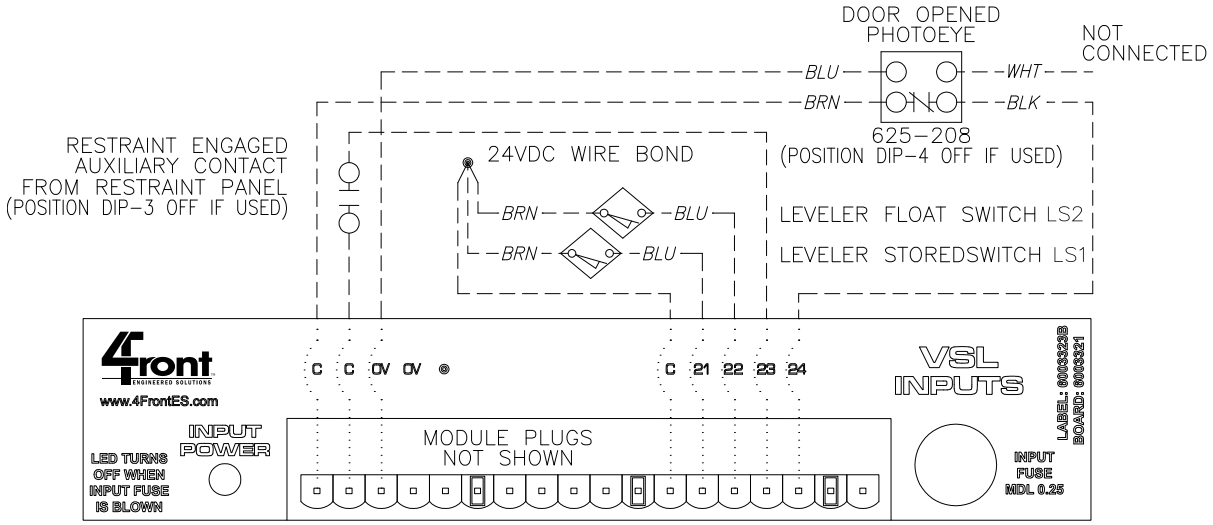
WIRING DETAILS — REMOTE MOUNT FIELD WIRING

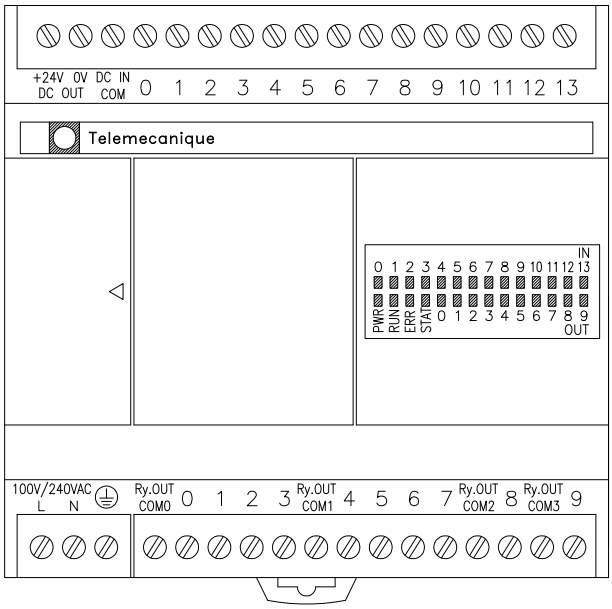
Fig. 28



WIRING DETAILS — DECK MOUNT FIELD WIRING

Fig. 29

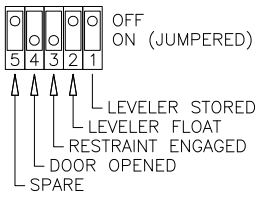


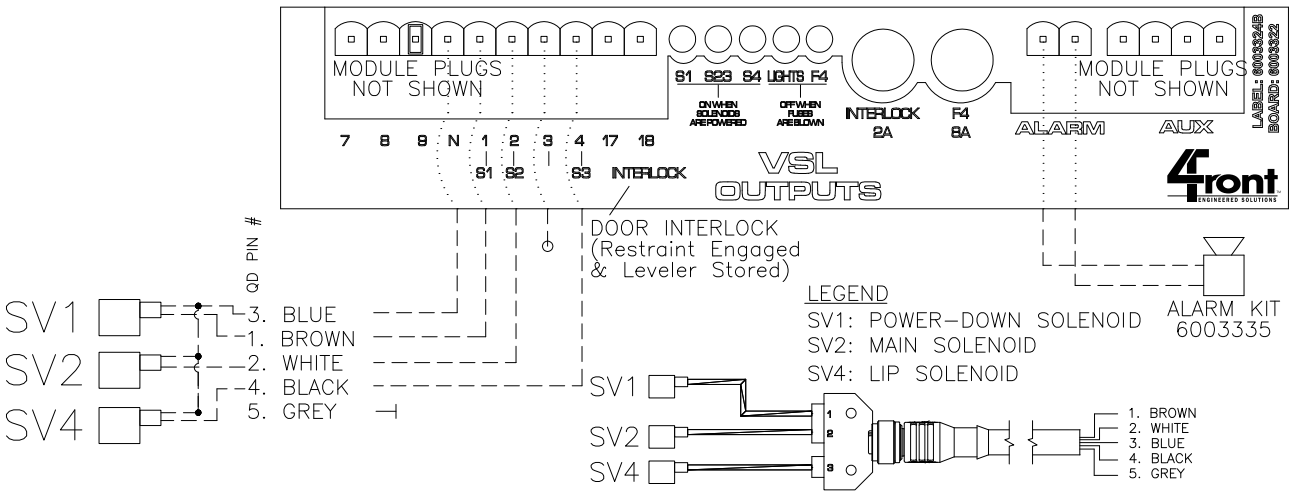


INPUT SIGNALS
0. Spare
1. Spare
2. Raise
3. Lip Extend
4. Lip Retract
5. Lower
6. STOP
7. Overload tripped
8. Leveler stored
9. Leveler in float
10. Restraint engaged
11. Door opened
12. Spare
13. Spare

OUTPUT SIGNALS
0. Loading Lamp interlock
1. Pilot lamp (power & fault)
2. Inside GREEN
3. VSL fault
4. SV1
5. SV2
6. SV4
7. Motor contactor
8. Audible alarm
9. Door interlock

DEFAULT DIP SWITCH SETTINGS
LOCATED ON INPUT BOARD, RIGHT SIDE





MAIN CYLINDER — ADJUSTMENT

⚠WARNING

Before servicing the dock leveler, read and follow the Safety Practices on page 3 and the Operation section in this manual.

⚠DANGER

Be certain before doing any maintenance or repair on the dock leveler, that: 1) THE LEVELER IS STORED IN A VERTICAL POSITION WITH THE LIP EXTENDED AND THE LOCK-OUT PIN INSERTED THROUGH THE MAINTENANCE STRUT AND BRACKET ON DECK and 2) The power is disconnected and properly tagged or locked out.

Failure to do so could result in death or serious injury.

1. Bend large tab on tab washer down and small tabs up. Using a 1-1/2" and a 2" open end wrench, loosen the jam nut on the threaded rod end of the main cylinder.

2. Using the 2" wrench turn the chrome cylinder rod counterclockwise to push the leveler back or clockwise to pull the leveler forward until the lockout pin in the maintenance strut moves freely. Position the tab washer perpendicular to the cylinder flats. See Fig. 31.

3. Using the 2" wrench to hold the chrome cylinder rod, securely tighten the jam nut using the 1-1/2" wrench.

4. After tightening jam nut, bend the large tab up over the cylinder flat. Bend small tabs down over jam nut face. See Fig. 5.

NOTE:

If tab washer is damaged, replace it. See Page 20 for maintenance strut operation.

⚠WARNING

There must not be more than 1-1/2" of thread showing on the adjustable rod end on 5' and 6' long models and 9/16" on 8' long models. If more than specified thread shows, do not proceed.

⚠WARNING

Ensure that the leveler is leaning away from the dock door. If the leveler is standing vertical or leaning towards the dock door than the leveler is not in a safe stored position. Correct immediately using the steps above.

Failure to do so could result in death or serious injury.

Fig. 30

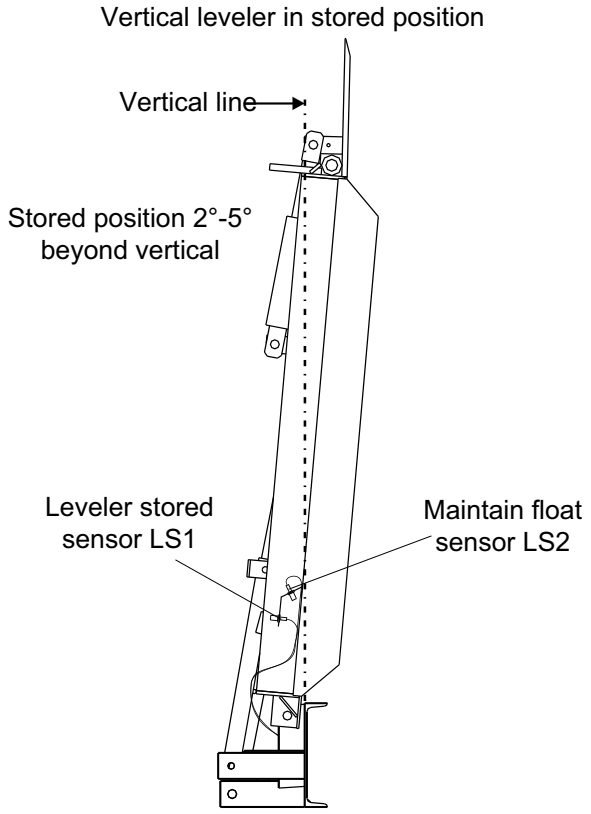
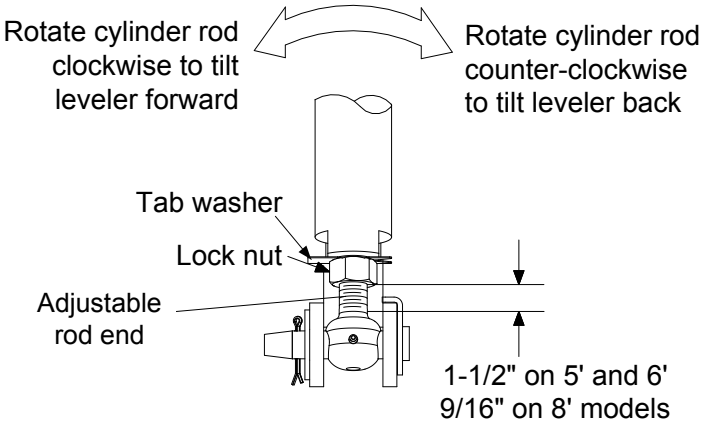


Fig. 31



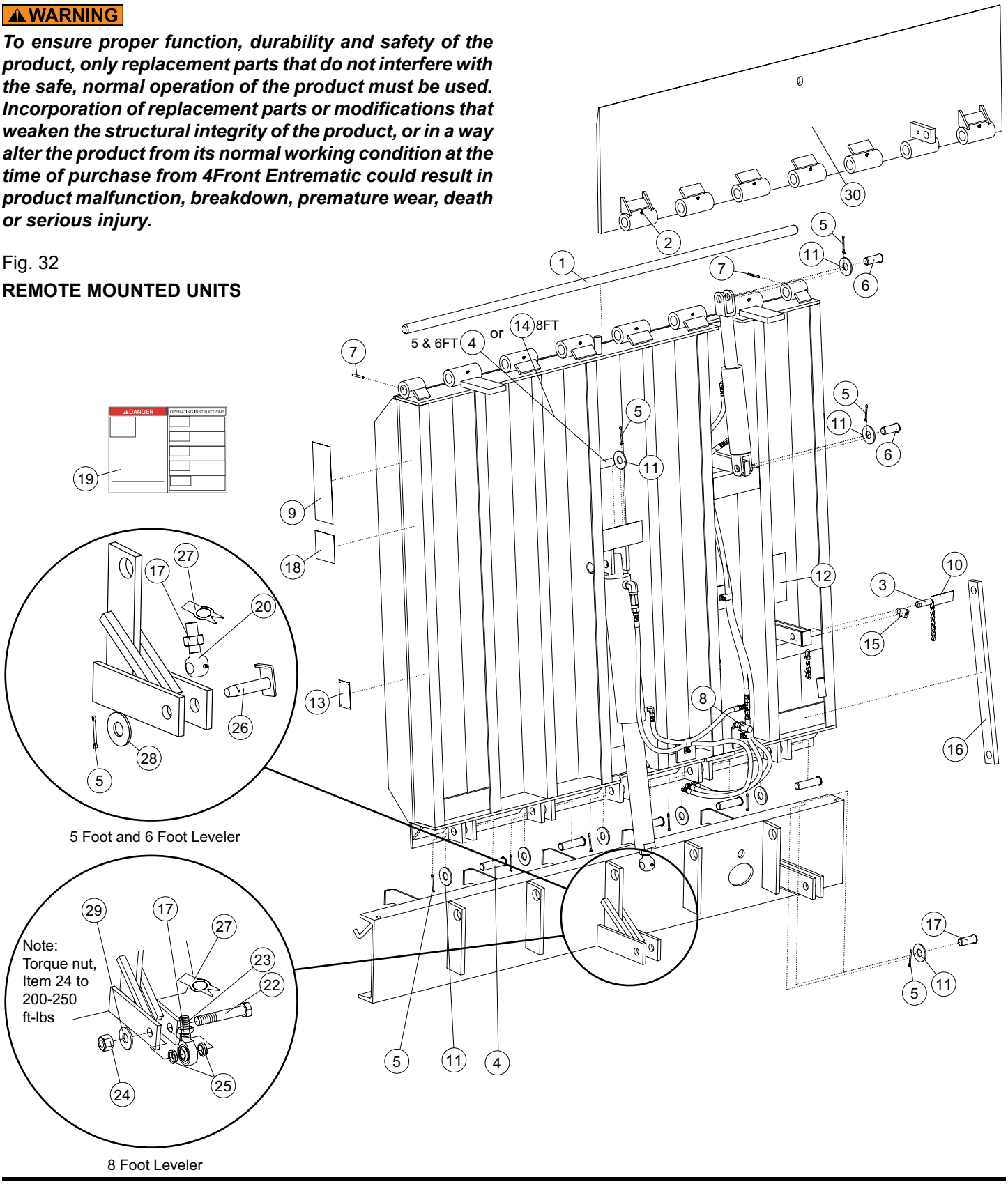
PARTS LIST — DOCK LEVELER

⚠ WARNING

To ensure proper function, durability and safety of the product, only replacement parts that do not interfere with the safe, normal operation of the product must be used. Incorporation of replacement parts or modifications that weaken the structural integrity of the product, or in a way alter the product from its normal working condition at the time of purchase from 4Front Entrematic could result in product malfunction, breakdown, premature wear, death or serious injury.

Fig. 32

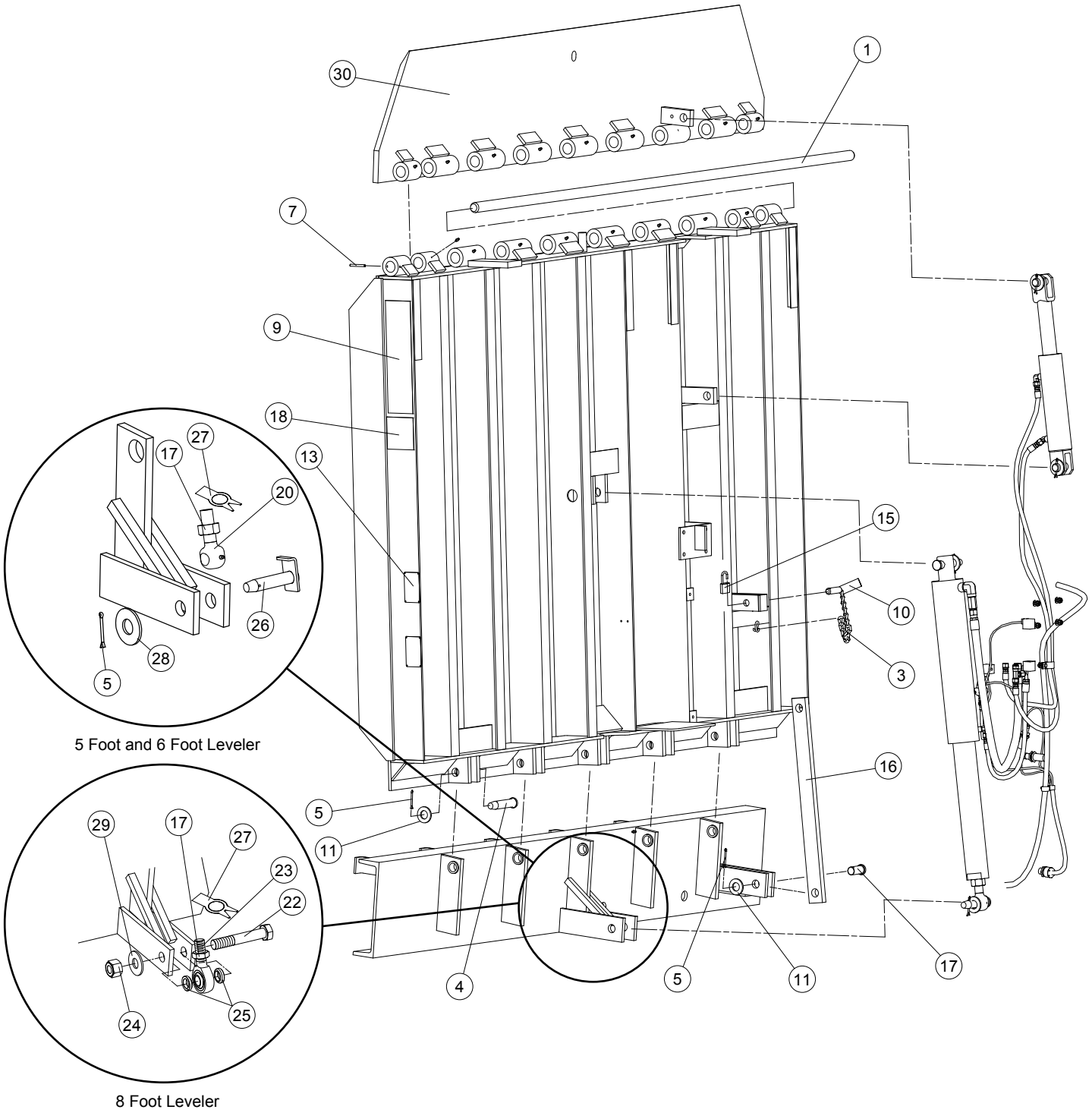
REMOTE MOUNTED UNITS



5 Foot and 6 Foot Leveler

8 Foot Leveler

Fig. 33
DECK MOUNTED UNITS



5 Foot and 6 Foot Leveler

8 Foot Leveler

PARTS LIST — DOCK LEVELER, continued

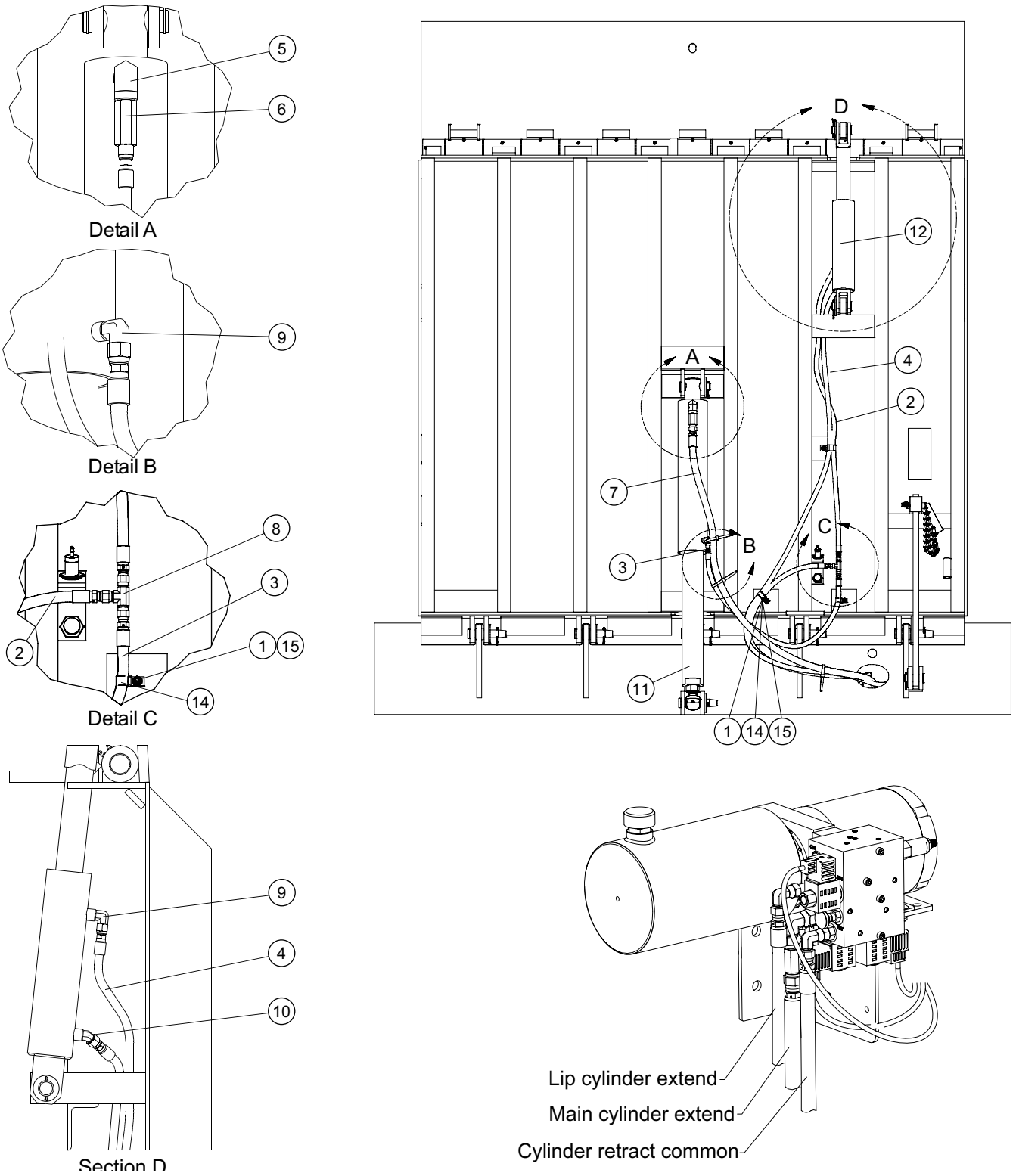
Item	Quantity	Description	Capacity and Part Number		
			40K	45K	50K
1	1	HINGE PIN 6'	5860287	5860287	5860287
	1	HINGE PIN 6-1/2'	5861495	5861495	5861495
	1	HINGE PIN 7'	5860392	5860392	5860392

Item	Quantity	Description	Part Number
2	*	DRIVE FIT GREASE FITTING	417113
3	1	LOCK-OUT PIN ASSY.	6000307
4	6	PIN, REAR HINGE, HYD CYL.	5861066
5	10	PIN, COTTER 5/32 ZINC PLATED	6001832
6	3	PIN, 1X2-1/8, DRILLED	5861063
7	2	SLK PINS 21S-250-2250 OR EQUAL (40-50K)	231126
8	2	FLOAT/STORED SENSOR ASSY	6000749
9	2	USER HAZARD LABEL	6000847
10	1	LOCK-OUT TAG	6000873
11	9	PLATED WASHER, 1-1/16" HOLE	234093
12	1	DANGER - WARNING LABEL	6007867
13	1	SERIAL TAG	6009761
14	1	PIN CLEVIS UPPER 8' VSL	6009400
15	1	PADLOCK	341034
16	1	MAINTENANCE STRUT	6002009
17	1	HEX HEAD JAMNUT 1-8UNC — 5' AND 6' LONG HEX HEAD JAMNUT 1-8UNC — 8' LONG	214341 6009441
18	2	BRAND LABEL — SERCO BRAND LABEL — KELLEY	6001712 6001713
19	1	WALL MOUNTED PLACARD – SAFETY AND OPERATIONS	6001761
20	1	ROD END ADJ. ASSY. (5' AND 6' UNITS ONLY)	6002566
21	1	USER'S MANUAL	6001762
22	1	HEX HEAD SCREW 1-8UNC GR8 (8' UNIT ONLY)	6008648
23	1	ROD END ASSY 1-8" (8' UNIT ONLY)	6008650
24	1	NYLOCK NUT 1-8UNC (8' UNIT ONLY)	6009440
25	2	SPACER BUSHING VSL ROD END (8' UNIT ONLY)	6008649
26	1	VSL PIN ANTI-ROTATE WDMT	6013879
27	1	TAB WASHER	6016613
28	1	PLATED WASHER — 5' AND 6' LONG	234093
29	1	PLATED WASHER — 8' LONG	234161

Item	Quantity	Description	Capacity and Part Number		
			40K	45K	50K
30	1	LIP ASSY. 6 FT X 16 IN	3-3362	3-3371	3-3380
	1	LIP ASSY. 6 FT X 18 IN	3-3363	3-3372	3-3381
	1	LIP ASSY. 6 FT X 20 IN	3-3364	3-3373	3-3382
	1	LIP ASSY. 6.5 FT X 16 IN	3-3365	3-3374	3-3383
	1	LIP ASSY. 6.5 FT X 18 IN	3-3366	3-3375	3-3384
	1	LIP ASSY. 6.5 FT X 20 IN	3-3367	3-3376	3-3385
	1	LIP ASSY. 6.5 FT X 16 IN - 3" TAPER	3-3783	3-3786	3-3789
	1	LIP ASSY. 6.5 FT X 18 IN - 3" TAPER	3-3784	3-3787	3-3790
	1	LIP ASSY. 6.5 FT X 20 IN - 3" TAPER	3-3785	3-3788	3-3791
	1	LIP ASSY. 7 FT X 16 IN - 3" TAPER	3-3801	3-3804	3-3807
	1	LIP ASSY. 7 FT X 18 IN - 3" TAPER	3-3802	3-3805	3-3808
	1	LIP ASSY. 7 FT X 20 IN - 3" TAPER	3-3803	3-3806	3-3809
	1	LIP ASSY. 7 FT X 16 IN - 6" TAPER	3-3368	3-3377	3-3386
	1	LIP ASSY. 7 FT X 18 IN - 6" TAPER	3-3369	3-3378	3-3387
	1	LIP ASSY. 7 FT X 20 IN - 6" TAPER	3-3370	3-3379	3-3388
	1	LIP ASSY. 7 FT X 16 IN - NOTCH	3-3819	3-3822	3-3825
	1	LIP ASSY. 7 FT X 18 IN - NOTCH	3-3820	3-3823	3-3826
	1	LIP ASSY. 7 FT X 20 IN - NOTCH	3-3821	3-3824	3-3827

PARTS LIST — REMOTE MOUNT HYDRAULIC

Fig. 34

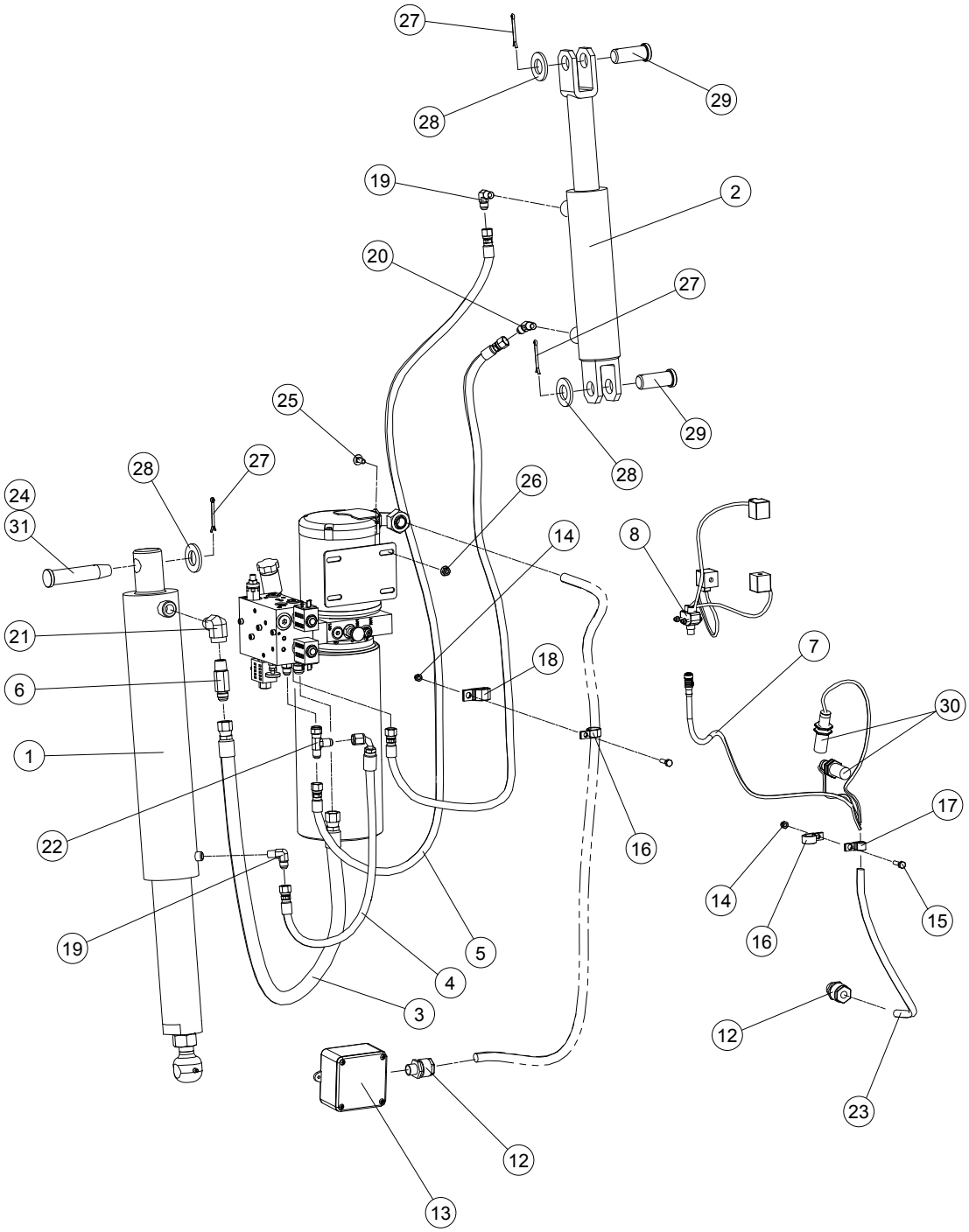


PARTS LIST — REMOTE MOUNT HYDRAULIC, continued

Item	Quantity	Description	Part Number
1	2	LOCK NUT 1/4-20 UNC NYLOCK	214-502
2	2	HOSE ASSY: 1/4 X 24 FT.	31650
3	1	HOSE ASSY: 1/4 X 31.5"	31960
4	1	HOSE ASSY: 1/4 X 37" (5FT LEVELER) HOSE ASSY: 1/4 X 48" (6FT LEVELER) HOSE ASSY: 1/4 X 72" (8FT LEVELER)	6000722 31959 6000724
5	1	STREET ELBOW 1/2" NPT X #8J1C	313102
6	1	VELOCITY FUSE - 10 GPM	313239
7	1	HOSE ASSY: 1/2" ID X 24', 100R2	6006657
8	1	TEE, MALE #6 JIC	6000595
9	2	MALE 90º ELBOW, 1/4 - NPT X #6 JIC	313106
10	1	MALE 45º ELBOW, 1/4 - NPT X #6 JIC	313219
11	1	MAIN CYLINDER, 3.5X16 STROKE DOUBLE ACTING	6000620
12	1	LIP CYLINDER, 2.5X6 STROKE DOUBLE ACTING	313043
13	3	PLUG: #6 JIC — NOT SHOWN	313236
14	2	DUAL HOSE CLAMP - 1/2" HOSE	6000837
15	2	HHMS 1/4-20UNC X 1 ZINC	212-005

PARTS LIST — DECK MOUNT HYDRAULIC

Fig. 35



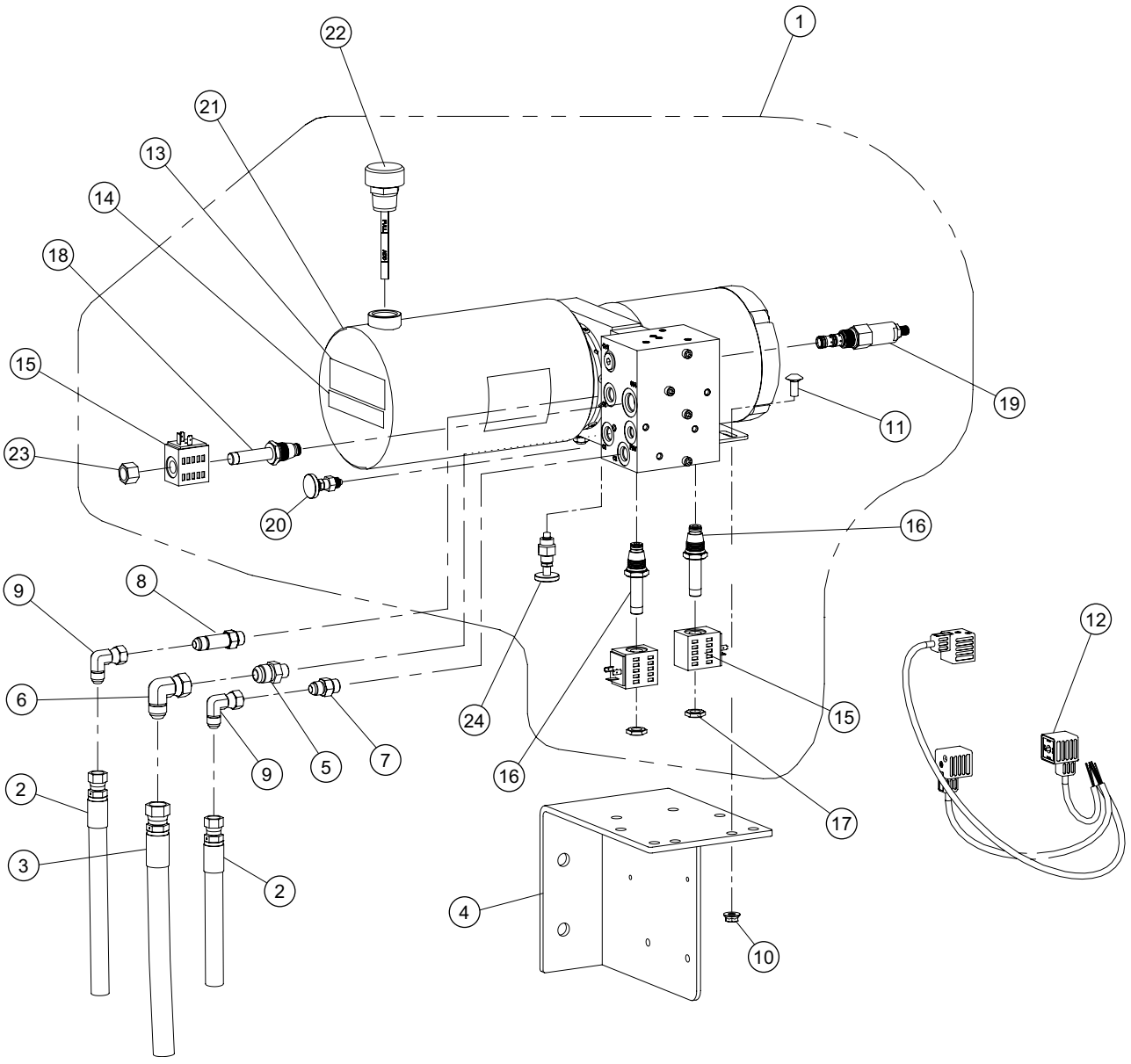
PARTS LIST — DECK MOUNT HYDRAULIC

Item	Quantity	Description	Part Number
1	1	MAIN CYL, 3.5 X 16" STK, DBL ACTION	6000620
2	1	LIP CYL, 2.5 X 6"ST, DBL ACTION	313043
3	1	HOSE ASSY : 1/2 ID X 36" LOA -8 STR-FS X 8STR-FS	6013450
4	1	HOSE ASSY: 1/4 ID X 19" LOA -6 EL90 JIC FS X 6 STR-FS	6003818
5	2	HOSE ASSY: 1/4 ID X 45" LOA -6 STR-FS X 6 STR-FS (5FT LEVELER) HOSE ASSY: 1/4 ID X 57.5" -6 STR-FS X 6 STR-FS (6FT LEVELER) HOSE ASSY: 1/4 ID X 75.5" -6 STR-FS X 6 STR-FS (8FT LEVELER)	6001021 31245 31247
6	1	VELOCITY FUSE - 10GPM	313239
7	1	HOME RUN CABLE QD, 5 LEADS	6010347
8	1	CORD SET, QD, SLP, SV1-SV4	6010346
9	2	#8-32 X 7/8" LG, PAN HEAD MACHINE SCREW	6011671
10	2	LN, #10-24 UNC, ZP	6001878
11	1	HANGER BRACKET, WIRE HARNESS	6013451
12	2	CONN CGB195	533424
13	1	4X4XS J-BOX, VSLW DM	6002002
14	2	NYLON LOCK NUT, 1/4-20UNC, ZINC	214502
15	2	HHMS 1/4-20UNC X 1 ZINC	212005
16	2	CLAMP, TUBE, INSULATED, 7/8"ID	6006655
17	1	CLAMP, TUBE, INSULATED, 1/2"ID	6006656
18	1	CLAMP, DOUBLE TUBE, 9/16" DIA.	6000837
19	2	FTG, ELBOW NIPPLE -1/4"NPTM X 6 JIC-M	313106
20	1	FTG, MALE 45 DEG ELBOW:1/4" NPTM X 6 JIC-M	313219
21	1	FTG, STREET ELBOW - 1/2 NPTM X 1/2 NPTF	313102
22	1	FTG, RUN SW TEE, 6 JIC-M X 6 JIC-F SW X 6 JIC-M	313105
23	2 FT.	SPIRAL WRAP - 3/8 ID	532320
24	1	PIN CLEVIS UPPER MAIN (8FT LEVELER ONLY)	6009400
25	4	5/16-18 X 3/4" LG ROUND HEAD CARRIAGE BOLT	6010662
26	4	5/16-18 HEX NUT FLANGED- SERRATED	6010661
27	4*	PIN,COTTER 5/32X2 ZINC PLT	6001832
28	4*	PW, 1" BOLT SIZE 1-1/16 HOLE	234093
29	2	PIN 1IN DIA X 2-3/16 LG	5861063
30	2	FLOAT/STD SENSOR ASSY, V2	6000749
31	1	PIN 1" X 3 1/2 LG, TAPER, DRILLED (5FT AND 6FT LEVELER ONLY)	5861066

*Quantity: 3 on 8FT levelers.

PARTS LIST — REMOTE MOUNT POWER UNIT

Fig. 36

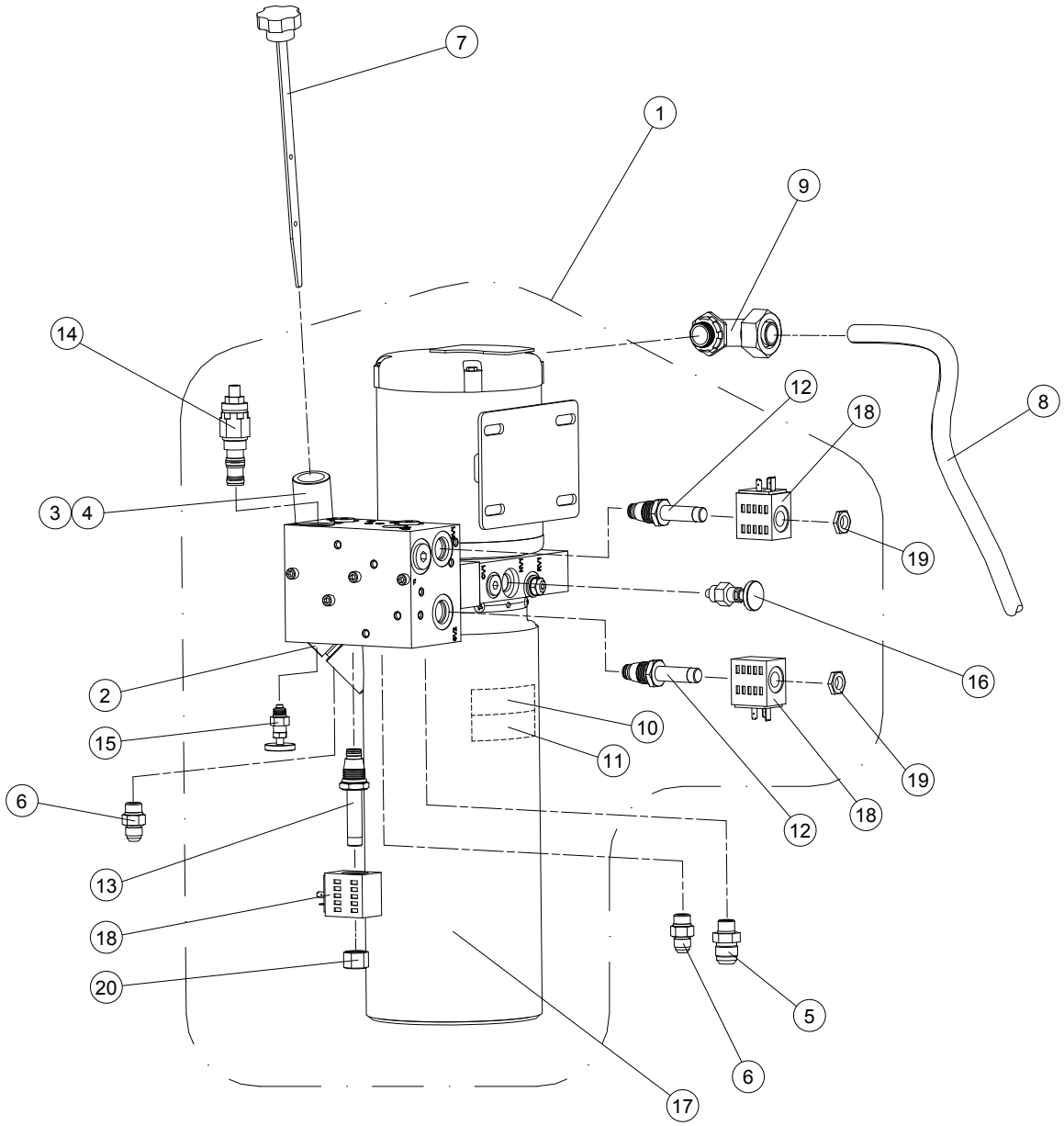


PARTS LIST — REMOTE MOUNT POWER UNIT, continued

Item	Quantity	Description	Part Number
1	1	HYDRAULIC POWER ASSY, VSL, 120-220V/1/50-60 HYDRAULIC POWER ASSY, VSL, 208-480V/3/50-60 HYDRAULIC POWER ASSY, VSL, 575V/3/60	6012602 6012603 6012604
2	2	HOSE ASSY : 1/4 ID X 24 FT .LG , 6 JIC SWIVEL END FTG	31650
3	1	HOSE ASSY : 1/2 IN X 24 FT LG , 8 JIC SWIVEL END FTG	6006657
4	1	BRACKET WDMT, PUMP WALL MOUNT - BHGR	6012018
5	1	FTG, STR THD CONN, 8-JIC-M X 6-SAE ORB-M, STL	6006640
6	1	FTG.,ELBOW- 90 SWIVEL NUT, 8-JIC-M X 8-JIC-F STL	6011446
7	1	FTG, STR THD CONN, 6-JIC-M X 6-SAE ORB-M , STL	6000717
8	1	FTG, LNG STR THD CONN ,6-JIC-M X 6-SAE-ORB, STL	6012007
9	2	FTG.,ELBOW- 90 SWIVEL NUT,6-JIC-M X 6-JIC-F STL	313595
10	4	SERRATED FLANGE HEX LOCKNUT, 5/16-18UNC, ZP	6010661
11	4	5/16-18UNC X 1" LG ROUND HEAD CARRIAGE BOLT, ZP	6010662
12	3	MOLDED SOLENOID CORD SET, DIN 43650, 2M	6001351
13	1	120 VOLT LABEL - EXT. (ON PUMP) 208 VOLT LABEL - EXT. (ON PUMP) 240 VOLT LABEL - EXT.(ON PUMP) 480 VOLT LABEL - EXT. (ON PUMP) 575 VOLT LABEL - EXT. (ON PUMP)	921051 921050 921052 921053 921054
14	1	SINGLE PHASE LABEL- EXT. (ON PUMP) THREE PHASE LABEL- EXT. (ON PUMP)	921026 921027
15	3	COIL, SOLENOID 24VAC	6011937
16	2	VALVE, NC SPOOL SOL. VALVE, SV1, SV2	6011935
17	3	SOLENOID NUT, 1/2, SM	6011725
18	1	VALVE, NO 2 WAY POPPET SOL. VALVE, SV4	6011480
19	1	VALVE, PRESS. SEQ., DIRECT ACT CARTRIDGE	6011698
20	1	VALVE, NEEDLE, CARTRIDGE, ADJ, SAE THRD FNV	6011699
21	1	RESERVOIR KIT, 0.94 GAL STEEL TANK	6012633
22	1	BREATHER CAP, DIPSTICK	6012637
23	1	SOLENOID NUT , 1/2", LG	6011726
24	1	NEEDLE VALVE ASSEMBLY NV1	6012012

PARTS LIST — DECK MOUNT POWER UNIT

Fig. 37



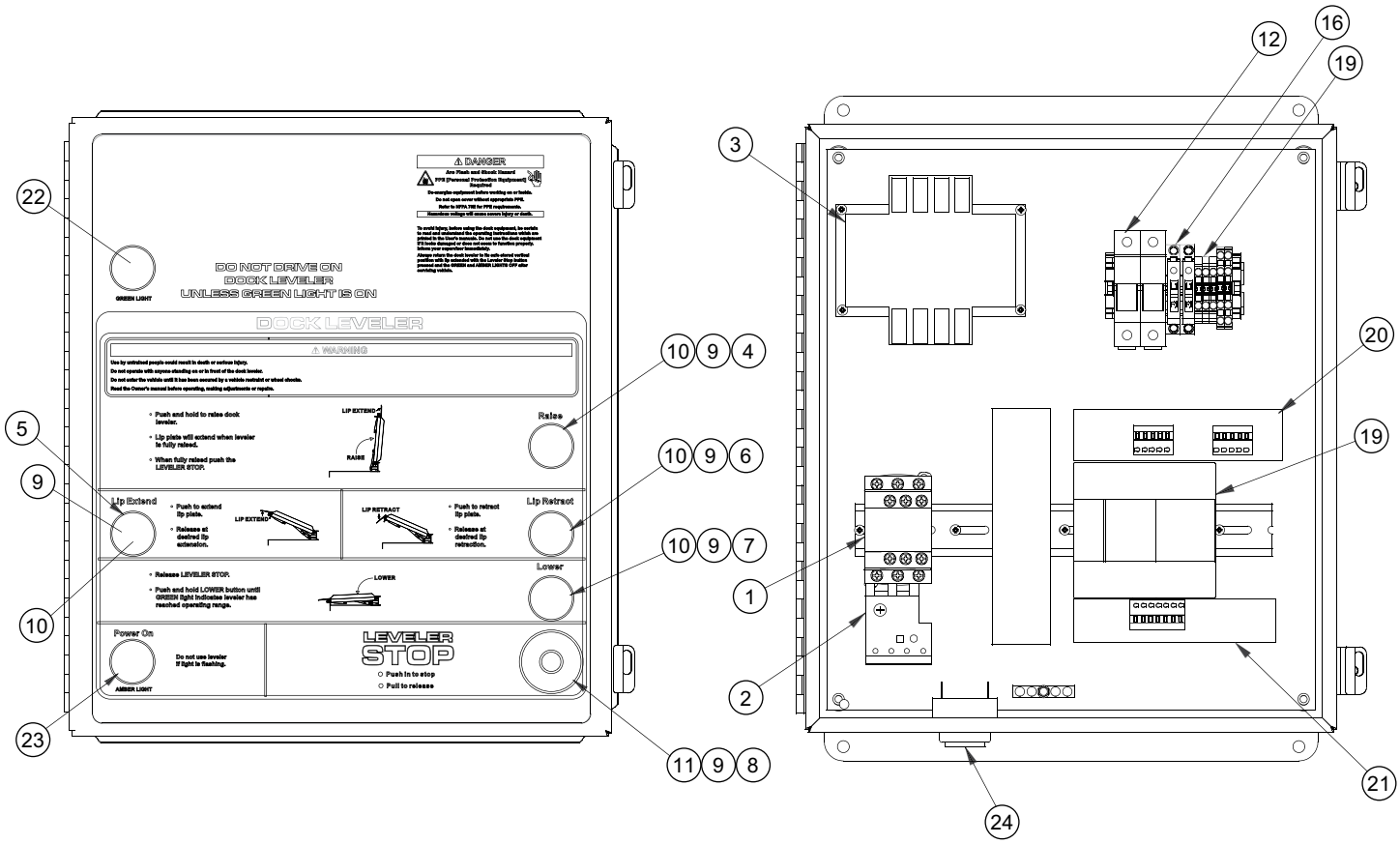
PARTS LIST — DECK MOUNT POWER UNIT

Item	Quantity	Description	Part Number
1	1	POWER UNIT, VSL -DM,120-220V/1/50-60 -BHGR POWER UNIT, VSL -DM, 240-480V/3/50-60 -BHGR POWER UNIT, VSL -DM,575V/3/50-60 -BHGR	6012949 6012950 6012951
2	1	FTG, 45° PIPE ELBOW 3/4-CD45	6013449
3	1	FTG, PIPE NIPPLE, 3/4" NPT X 4" LG, STEEL	6012997
4	1	FTG, PIPE COUPLING, 3/4" NPT, STEEL	6012998
5	1	FTG, STR THD CONN, 8-37° FLARE-M X 6-SAE OR-M, STL	6006640
6	2	FTG, STR THD CONN, 6-37° FLARE MALE X 6-SAE OR-M , STL	6000717
7	1	DIPSTICK ASSEMBLY	6012934
8	1	POWER CABLE, SO 14/4 X 60" LG POWER CABLE, SO 14/3X 60" LG	172603 172607
9	1	STRAIN RELIEF CONNECTOR, 90 DEG , 1/2 IN, -5/8 CBL	145084
10	1	VOLTAGE LABEL - EXT. (ON PUMP) 120 VOLT VOLTAGE LABEL - EXT. (ON PUMP) 240 VOLT VOLTAGE LABEL - EXT. (ON PUMP) 480 VOLT VOLTAGE LABEL - EXT. (ON PUMP) 575 VOLT	921051 921052 921053 921054
11	1	PHASE LABEL- EXT. (ON PUMP) "SINGLE PHASE" PHASE LABEL- EXT. (ON PUMP) "THREE PHASE"	921026 921027
12	2	SOLENOID VALVE, 2W2P, #8, NC, SPOOL (SV1 & SV2)	6011935
13	1	SOLENOID VALVE, 2W2P, #8, NO, POPPET (SV4)	6011480
14	1	VALVE, PRESS. SEQ. DIRECT ACT CARTRIDGE	6011698
15	1	VALVE, NEEDLE, CARTRIDGE, ADJ, SAE 4 THRD (FNV)	6011699
16	1	VALVE, NEEDLE, CARTRIDGE, ADJ, SAE 4 THRD (NV1)	6012012
17	1	RES KIT, 0.94 GAL, STEEL (TANK, FILTER O-RING, RET. SCREWS)	6012633
18	3	COIL, 1/2 SOLENOID 24VAC, DELTROL SERIES 8 COIL, 1/2 SOLENOID 125VAC, DELTROL SERIES 8	6011937 6011938
19	2	RETAINING NUT, 1/2" SOLENOID	6011725
20	1	RETAINING NUT, 1/2" SOLENOID,LONG	6011726

PARTS LIST — CONTROL PANEL

480V shown (typical)

Fig. 38



PARTS LIST — CONTROL PANEL, continued

			Where Used/Quantity				
		Complete Control Panel Assy. Number Kelley	6003328V1	6003328V2	6003328V3	6003328V4-V5	6003328V7-V8
		Serco	6003327V1	6003327V2	6003327V3	6003327V4-V5	6003327V7-V8
Item	**Part Description**	**Part Number**	120V/1/60	208/1/60	240/1/60	208-240V/3/60	480/575V/3/60
1	CONTACTOR, NR, 18A 24V COIL 50/60 HZ, 1NO	6012550	1				
	CONTACTOR, NR, 9A 24V COIL 50/60 HZ, 1NO	6012924		1	1	1	1
2	OVERLOAD RELAY, 1.6-2.5A	6012557					1
	OVERLOAD RELAY, 5.5-8A	6012559			1		
	OVERLOAD RELAY, 9-13A	6012560		1			
	OVERLOAD RELAY, 12-18A	6013781	1				
	OVERLOAD RELAY, 4-6A	6013883				1	
3	XFMR, 120/240V TO 24V, 200VA	6014593	1				
	XFMR, 208/240/480/600V TO 120/24V, 200VA	6012568		1	1	1	1
4	PUSH BUTTON, BLUE	6013066	1	1	1	1	1
5	PUSH BUTTON-GREEN	6013065	1	1	1	1	1
6	PUSH BUTTON, BLACK	6012561	1	1	1	1	1
7	PUSH BUTTON, YELLOW	6013067	1	1	1	1	1
8	MUSHROOM PUSH/PULL BTN	6012566	1	1	1	1	1
9	BODY MOUNTING COLLAR	6012562	5	5	5	5	5
10	CONTACT BLOCK SWITCH, NO	6012563	4	4	4	4	4
11	CONTACT BLOCK SWITCH, NC	6012564	2	2	2	2	2
12	BLOCK, FUSE, 1 POLE, FINGERSAFE	6006849	1				
	BLOCK,FUSE,2 POLE,FINGERSAFE	6006850		1	1	1	1
13	FUSE, 2A CLASS CC	6009546	1				
14	FUSE, 1A CLASS CC	6011963		2	2	2	
15	FUSE, 1/2A, CLASS CC	6011358					2
16	TERMINAL BLOCK, FUSED DISC	6000538	2	2	2	2	2
17	FUSE, TIME DELAY MDA-1, 250V	6011302	1	1	1	1	1
18	FUSE, TIME DELAY MDA-8, 250V	6014595		1	1	1	1
19	TWIDO PLC 14 INPUTS,10 OUTPUTS	6001056	1	1	1	1	1
20	VSL INPUT BOARD ASSY	6003321	1	1	1	1	1
21	VSL OUTPUT BOARD ASSY	6003322	1	1	1	1	1
22	PILOT LIGHT LED GREEN 24VAC/DC	6014257	1	1	1	1	1
23	PILOT LIGHT LED AMBER 24VAC/DC	6014259	1	1	1	1	1
24	AUDIBLE ALARM	6003335	1	1	1	1	1
25	PANEL DECAL, SERCO	6006289	1	1	1	1	1
	PANEL DECAL KELLEY	6006288	1	1	1	1	1

NOTES

LIMITED WARRANTY

THIS LIMITED WARRANTY IS 4FRONT'S SOLE AND EXCLUSIVE WARRANTY WITH RESPECT TO THE DOCK LEVELER AND IS IN LIEU OF ANY OTHER GUARANTEES OR WARRANTIES, EXPRESS OR IMPLIED.

4Front warrants that this DOCK LEVELER will be free from flaws in material and workmanship under normal use for a period of one (1) year from the earlier of 1) 60 days after the date of initial shipment by 4Front, or 2) the date of installation of the DOCK LEVELER by the original purchaser, provided that the owner maintains and operates the DOCK LEVELER in accordance with this User's Manual.

Hydraulic Limited Warranty – The hydraulic power unit and cylinders for this dock leveler are warranted to cover the cost of replacement parts only for an extended period of four (4) years after the initial 1 yr. warranty period.

In the event that this DOCK LEVELER proves deficient in material or workmanship within the applicable Limited Warranty period, owner shall so notify 4Front, and 4Front will, at its option:

1. Replace the DOCK LEVELER, or the deficient portion(s) thereof, without charge to the owner; or

2. Alter or repair the DOCK LEVELER, on site or elsewhere, without charge to the owner.

This Limited Warranty does not cover any failure caused by improper installation, abuse, improper operation, negligence, or failure to maintain and adjust the DOCK LEVELER properly. Parts requiring replacement due to damage resulting from vehicle impact, abuse, or improper operation are not covered by this warranty. 4FRONT DISCLAIMS ANY RESPONSIBILITY OR LIABILITY FOR ANY LOSS OR DAMAGE OF ANY KIND (INCLUDING WITHOUT LIMITATION, DIRECT, INDIRECT, CONSEQUENTIAL OR PUNITIVE DAMAGES, OR LOST PROFITS OR LOST PRODUCTION) arising out of or related to the use, installation or maintenance of the DOCK LEVELER (including premature product wear, product failure, property damage or bodily injury resulting from use of unauthorized replacement parts or modification of the DOCK LEVELER). 4Front's sole obligation with regard to a DOCK LEVELER that is claimed to be deficient in material or workmanship shall be as set forth in this Limited Warranty. This Limited Warranty will be null and void if the original purchaser does not notify 4Front's warranty department within ninety (90) days after the product deficiency is discovered.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF, INCLUDING, BUT NOT LIMITED TO, A WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, ALL OF WHICH 4FRONT HEREBY DISCLAIMS.

Please direct questions about your dock leveler to your local distributor or to 4Front Entrematic

Your local distributor is:

Corporate Head Office:

1612 Hutton Dr. Suite 140
Carrollton, TX. 75006
Tel. (972) 466-0707
Fax (972) 323-2661

4Front Engineered Solutions®

Part No. 6001762R