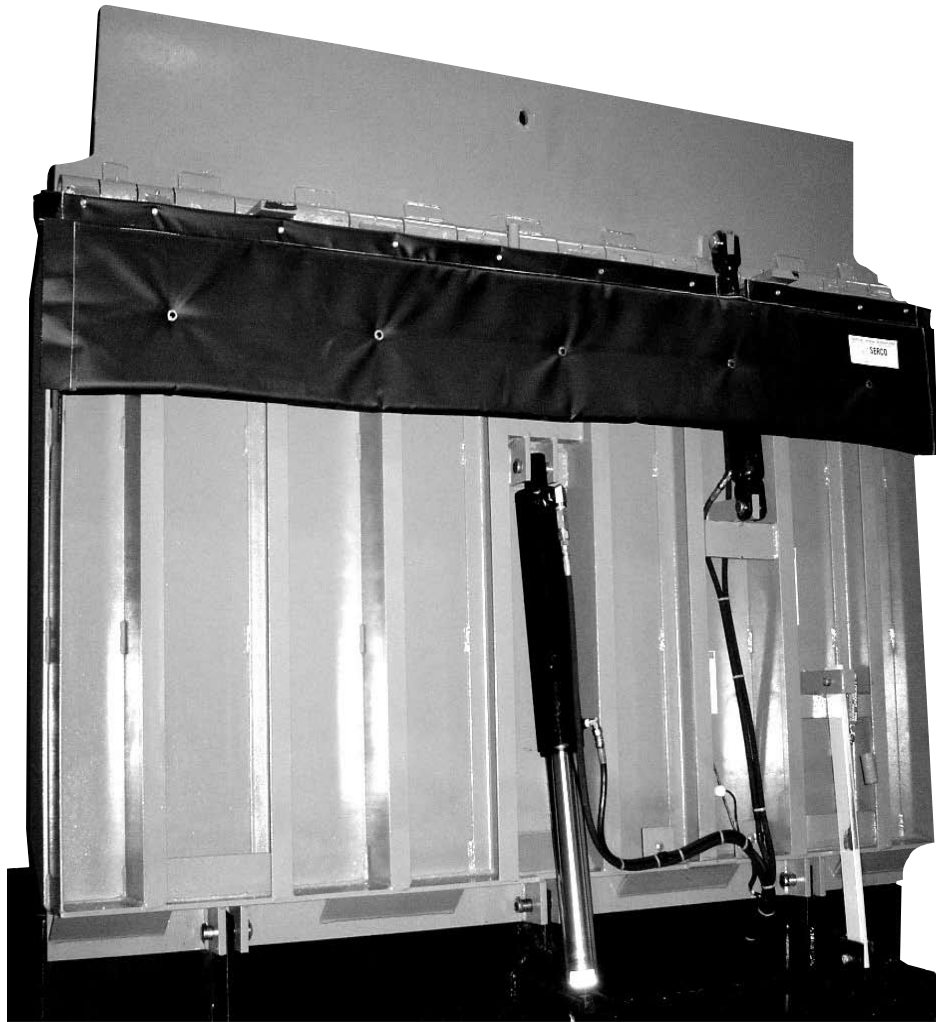


Vertical Hydraulic Dock Leveler

25-50K Capacity



This manual applies to vertical Dock Levelers manufactured beginning November 24, 2003 with the serial numbers 63251 and higher.

WARNING

Do not install, operate or service this product unless you have read and understand the Safety Practices, Warnings, and 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. 6001762B

LIMITED WARRANTY

4Front Engineered Solutions warrants to and for the sole benefit of the original purchaser of dock levelers and vehicle restraints manufactured by 4Front Engineered Solutions (the "Products") that the Products shall be free from defects in material and workmanship, subject to the following expressed provisions:

Base Limited Warranty - All Products are warranted for one year base period ("Base Warranty Period") commencing on the earlier of the date of 4Front Engineered Solutions approved installation or the sixtieth (60th) day after the date of shipment. This limited warranty covers the repair or replacement of the defective Product units or components at 4Front Engineered Solutions' sole election and expense, including reasonable labor, travel and freight. If the Product is sold to the original purchaser through a 4Front Engineered Solutions dealer or distributor, applicable charges for labor, travel and freight shall not exceed those set forth in 4Front Engineered Solutions's dealer reimbursement policy.

Hydraulic Limited Warranty - All cylinders and hydraulic power units of the Products described by 4Front Engineered Solutions as VSL products are warranted to cover the cost of replacement parts only of an extended period of four (4) years after the Base Warranty Period.

Parts & Assembly Limited Warranty - All spare or replacement parts are warranted to cover the cost of replacement parts and freight only for (90) days from the date of shipment.

THE ABOVE LIMITED WARRANTIES ARE IN LIEU OF ANY OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

In no event shall 4Front Engineered Solutions or any of its subsidiaries be responsible for or liable to anyone, including any third parties, for special, indirect, collateral, punitive, incidental or consequential damages. Such excluded damages include, but are not limited to, loss of goodwill, loss of profits, loss of use, interruption of business, or other similar indirect financial loss.

This limited Warranty shall be void and of no effect (i) if a Product is altered or modified from its original condition as installed or as delivered at or from the factory, (ii) to the extent that the Product defect is the direct result of improper installation, operation beyond capacity or other than in accordance with 4Front Engineered Solutions instructions abuse, careless or negligent use, or failure to maintain the Product as recommended by 4Front Engineered Solutions or, (iii) if the original purchaser does not notify 4Front Engineered Solutions's Warranty Department of the defect within (90) days after the Product defect is discovered.

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INTRODUCTION

Welcome and thank you for choosing this dock leveler.

This User's Manual contains information that you need to safely install, operate and maintain the dock leveler. It also contains a complete parts list and information about ordering replacement parts. Please keep and read this User's Manual before using your new dock leveler.

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.

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.

Nameplates, cautions, instructions and posted warnings shall not be obscured from the view of operating or maintenance personnel for whom such warnings are intended.

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.

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 before being placed back in service.

The owner shall see that all nameplates, caution and instruction markings or labels are in place and legible and that the appropriate operating and maintenance manuals are provided to users.

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

When industrial trucks are driven on and off transport vehicles during the loading and unloading operation, the brakes on the transport vehicle shall be applied and wheel chocks or positive restraints that provide the equivalent of wheel chocks engaged.

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 & LIP GRADES

Fig. 1



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
A B O V E D O C K	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
B E L O W D O C K	-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.

SAFETY

You may find safety signal words such as DANGER, WARNING, or CAUTION throughout this Owner'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 injury or death.

! DANGER

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

! CAUTION

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

! WARNING

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

CAUTION

Caution used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

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 call 4Front Engineered Solutions at (972) 466-0707 (USA) or (519) 457-7155 (CAN.).

OPERATION:

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, call 1-800-525-2010 or 972-466-0707 for a free 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 manual, do not use the leveler. Refer to the troubleshooting guide in this manual. If 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 Emergency 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 Emergency 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.

Many trailers have air ride suspension that may cause the trailer to move away from the dock during loading and unloading operations (commonly referred to as trailer walk). The potential for trailer walk caused by air ride suspension may be reduced by exhausting or "dumping" the air from the suspension system before servicing the trailer.

INSTALLATION, MAINTENANCE AND SERVICE:

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 post and bracket on the deck, the Emergency 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 post and the bracket on deck, and secured with a padlock until the leveler is completely wired, tested, and fully operational.

INSTALLATION

INSTALLATION OF DOCK LEVELER

⚠ WARNING

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 post 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.

The installed location of the control panel and hydraulic power unit must be specified on a job specific "Approval Drawing". Check with the general contractor or sales person for this information.

PIT CHECK

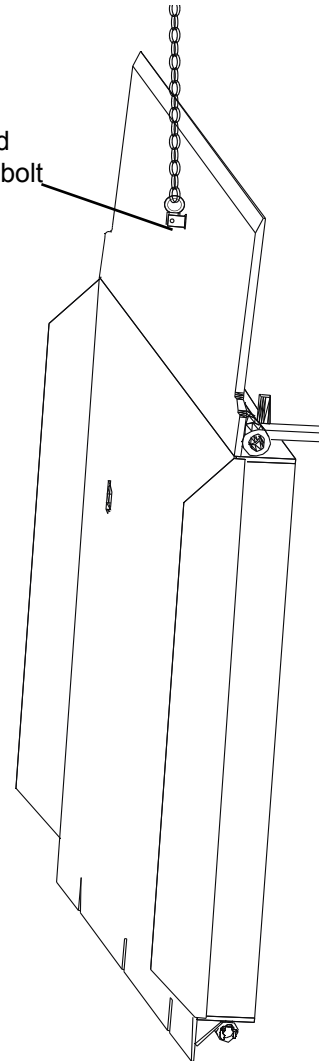
Check the entire dock leveler pit for proper construction according to the job specific approval drawings. Check electrical service running to the control panel to ensure it agrees with the phase and voltage of the motor and control box supplied with the dock leveler. See the wiring diagram located inside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

⚠ 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. 2

3/4" UNC load
centering eyebolt



CAUTION

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

INSTALLATION, continued

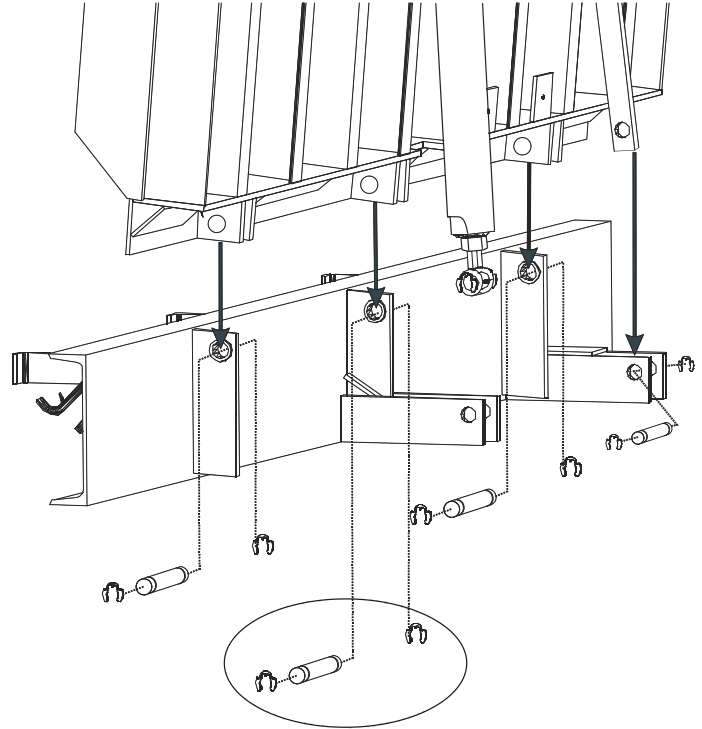
HANDLING AND UNLOADING

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.2.

TO INSTALL

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 pin until the maintenance post has been installed and secured. Fig. 3 shows placement of the pins.
4. Insert the maintenance post bar through the guide bracket on the leveler and secure the lower end to the frame with the pin. **Note: Strut is not symmetric. Larger hole in strut pins to deck.** Insert the pin **from the side without standing in front of or underneath the suspended leveler**. See Fig. 3.
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 post and the bracket on the deck. See Fig. 12, page 18. 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. 3



WARNING

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 post 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. 12 on page 18 for lock-out pin location.

INSTALLATION, continued

6. Install the center hinge pin. Do not force pins through with a hammer as this may damage ring grooves. Secure all three leveler hinge pins and the lower pin of the maintenance post with the retaining clips provided. See Fig.3 for reference.
7. Remove the lifting device from the leveler lip. Leave the lip fully extended.
8. The hydraulic power unit is pre-assembled 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.
9. 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.
10. The electrician can now connect the wiring from the control panel to the motor and solenoid valves.
11. Mark the 3 hydraulic hoses and the leveler stored and maintained float sensor cables (located on the deck) with colored tape or 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 (if equipped).
12. Remove the plugs and make the connections to the correct hose fittings. Refer to Fig. 14 on page 27 and page 37 for the hydraulic hoses connections. These fittings are all JIC type and require no thread sealant. 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, see Fig. 25 on page 36. Connect the leveler stored and maintain float sensor cables to the control panel.

WARNING

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

INSTALLATION, continued

13. Remove shipping plug from the hydraulic reservoir and replace with the breather cap.
14. Pull out the Emergency Stop button. The amber power light should be on. Press and hold the Raise push button 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.
15. Press and hold the Raise push button. 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)
16. 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 14 under Components & Specifications for hydraulic fluid specifications). Continue to run the pump until the main cylinder is fully extended. Add more fluid if required.
17. 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.
18. 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" of the top with the lip plate fully retracted. Add oil if necessary. See page 14 under Components & Specifications for hydraulic fluid specifications. If the oil is foamy, leave for approximately 15 minutes to let the oil settle before checking oil level.
19. 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. Secure the pivot pin with the clips provided. See page 35. Ensure the grease fitting

⚠ WARNING

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

20. Using the 2" wrench to hold the chrome cylinder rod, tighten the jam nut using the 1-1/2" wrench. Turn the chrome cylinder rod clockwise to pull the leveler forward until the pins in the maintenance post move freely.

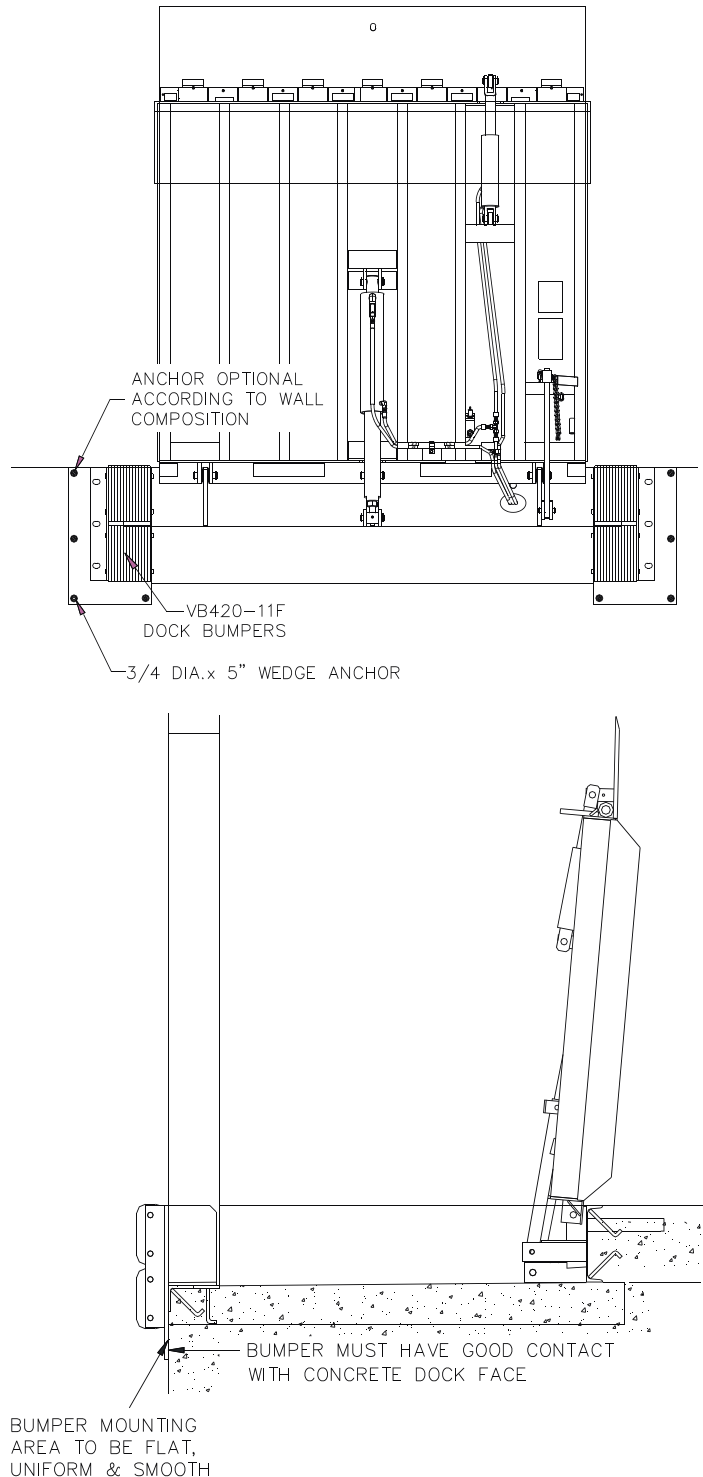
⚠ WARNING

There must not be more than 1-1/2 inches of thread showing on the adjustable rod end below the jam nut. If more than 1-1/2 inches of thread shows, do not proceed.

21. 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 post.**
22. 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 when it reaches the working range, then continue to float down. The Green light on the control panel should be on. Visually check that the ramp stops are resting on the front curb steel. Press the Lip Retract button on the control panel until the lip is pendant.
23. 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. Release the pushbutton. The leveler should remain in position and the alarm should sound.
24. 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 post and bracket on the deck. The pin must insert freely. If there is any resistance, adjust the hydraulic cylinder as described in steps 17 & 18 on page 10.

INSTALLATION, continued

Fig. 4 – Typical Bumper Installation using VB420-11F bumpers



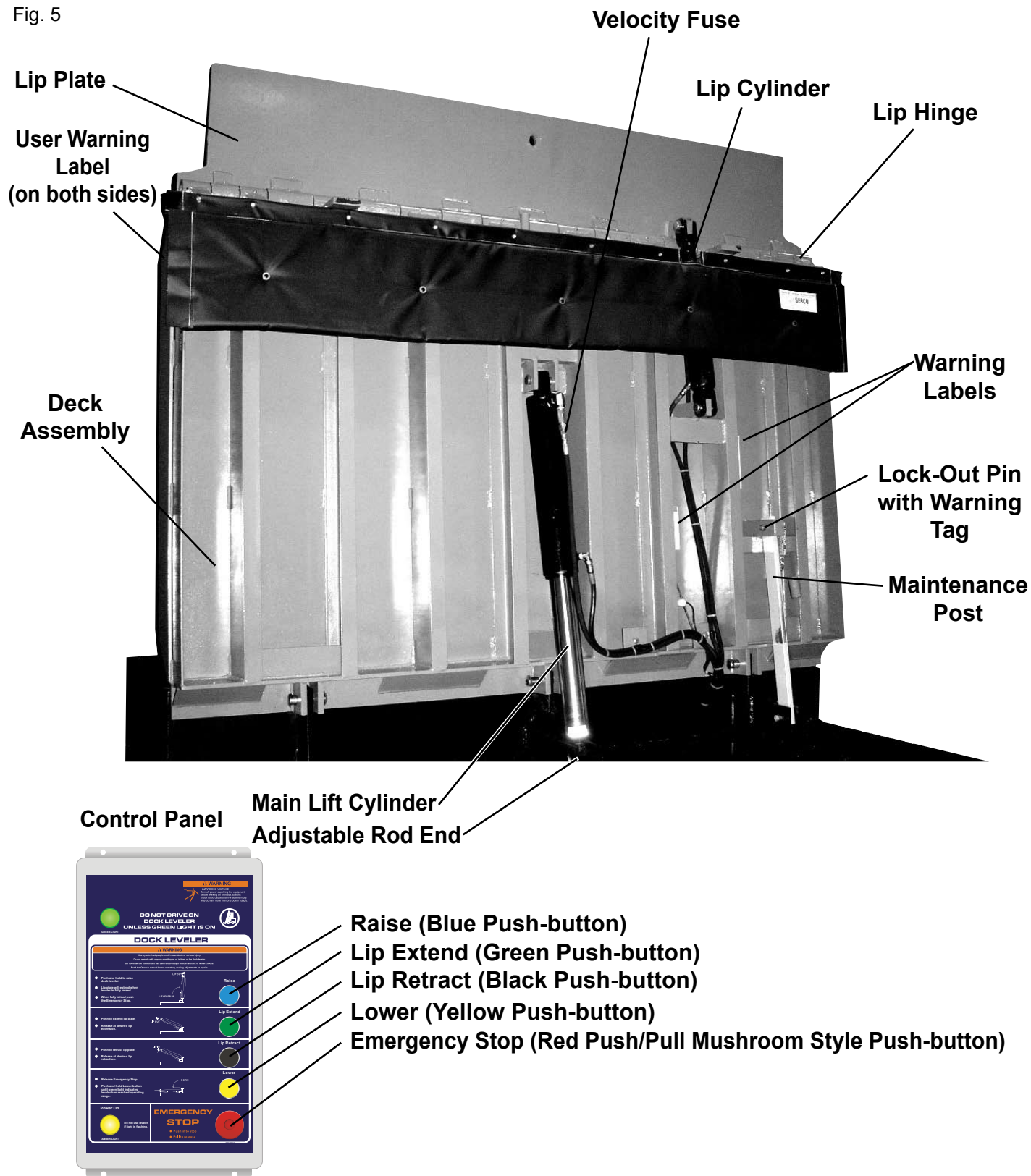
INSTALLATION, continued

25. Remove the lock-out pin and lower the leveler as instructed in step 21. Observe the lowering speed of the leveler after it reaches the working range. The leveler lowering speed should match the leveler power down portion of the lowering. Adjust shuttle valve as necessary, see page 28.
26. 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 seal 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 6" (min. depth). Refer to Fig. 4.
27. Permanently mount the laminated WARNING and OPERATION instruction placard near the dock leveler control panel.

COMPONENTS & SPECIFICATIONS

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

Fig. 5



COMPONENTS & SPECIFICATIONS, continued

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. / 56C frame, 1 h.p. @ 15 mi. duty cycle, single or three phase.

Pump - Fixed displacement gear pump, 1 gpm, primary relief valve factory set at 2000 psi.

Reservoir Capacity - 1 U.S. gal., (3.8 lit.) level measured by dipstick.

Hydraulic Fluid - Acceptable Hydraulic fluids:

Shell Tellus T 15

Mobil Aero HFA (49011)

Exxon Unisolv Grade J13

Texaco Aircraft Oil #1554

U.S. Oil Co., Inc #ZFI-5606 (Low Temp.)

HYDRAULIC SYSTEM OPERATION

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

AUDIBLE ALARM

- Sounds when leveler stops between working range and fully stored position.
- Will silence when Raise, Lower or EMERGENCY STOP is pressed.

EMERGENCY STOP

Push in

- Power cut off to motor circuit.
- Amber pilot light turns off.
- Solenoid valves SV2 and SV3 deenergized preventive leveler movement.

Pull out

- Power connected to motor circuit.
- Amber pilot light turns on.
- Main solenoid valves SV2 and SV3 remains closed except when pump is running or leveler is lowered to working range.

LOWER

- Pump starts and shuttle valve shifts.
- Lower solenoid valve SV1 opens to retract main cylinder. When leveler lowers to working range, the pump stops, the Lower solenoid valve SV1 closes and Main solenoid valves SV2 and SV3 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

- Pump starts and shuttle valve shifts.
- Main solenoid valves SV2 & SV3 open to extend main cylinder.
- Lip solenoid valve SV4 closes to prevent lip from retracting.
- 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

- Pump starts and shuttle valve shifts.
- Main solenoid valves SV2 & SV3 open allowing leveler to raise and lip to retract.
- Green pilot light turns off when leveler raises above the working range.

LIP EXTEND

- Pump starts and shuttle valve shifts.
- Main cylinder solenoid valve is closed.
- Lip solenoid valve opens allowing lip to extend.

WARNING

Before operating the dock leveler, read and follow the Safety practices on page 6.

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, call 1-800-525-2010 or 972-466-0707 for a free 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 Emergency 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.

DO NOT walk in front of dock leveler until you:

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

OPERATING INSTRUCTIONS

INTRODUCTION

The 4Front Engineered Solutions 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 Engineered Solutions vertical dock leveler uses push button 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 Emergency Stop when the leveler is stored to prevent operation. With the dock leveler in its fully stored position, a maintenance post may be secured with a lock-out pin to prevent inadvertent operation.

OPERATING INSTRUCTIONS

⚠ 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 Emergency Stop button pressed after servicing truck.
5. Press **EMERGENCY STOP** button to stop leveler & lip from moving.
6. **DO NOT** walk in front of dock leveler until you:
 - Restore the leveler to its safe stored vertical position with lip extended.
 - Press the Emergency 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 EMERGENCY 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. 7.
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 EMERGENCY 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 EMERGENCY 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. 8.

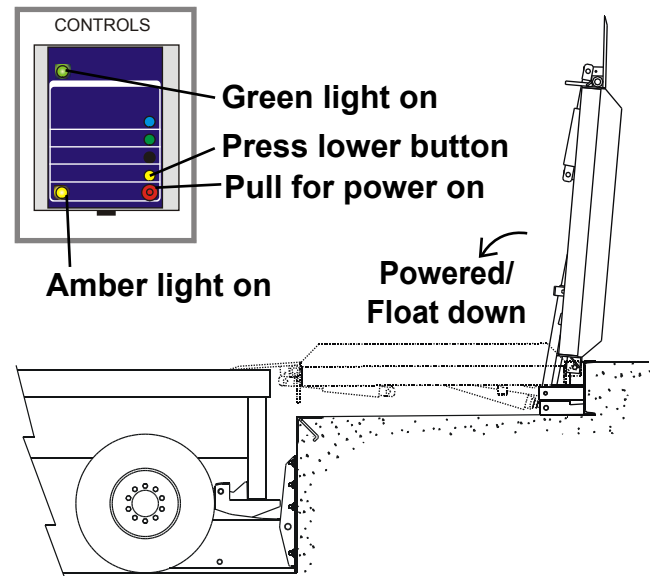


Fig. 7

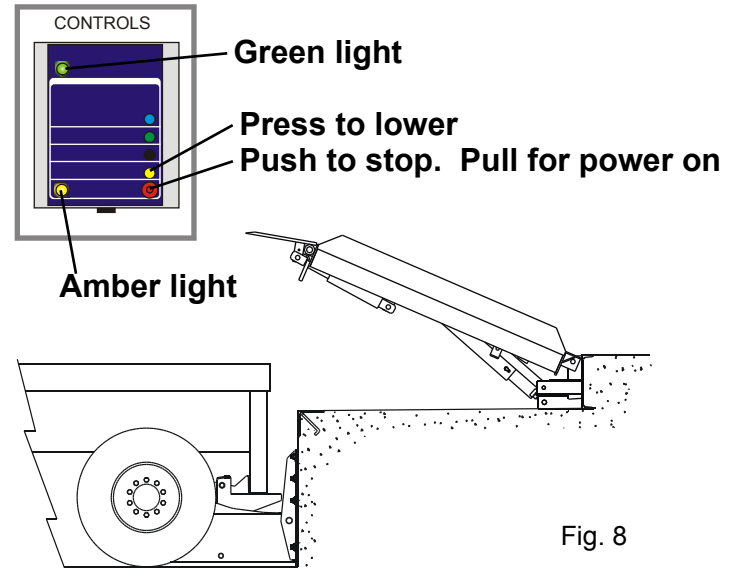


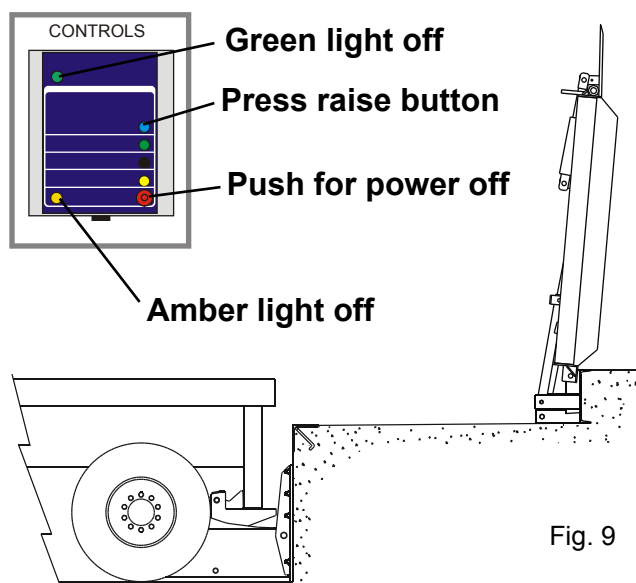
Fig. 8

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

OPERATING INSTRUCTIONS, continued

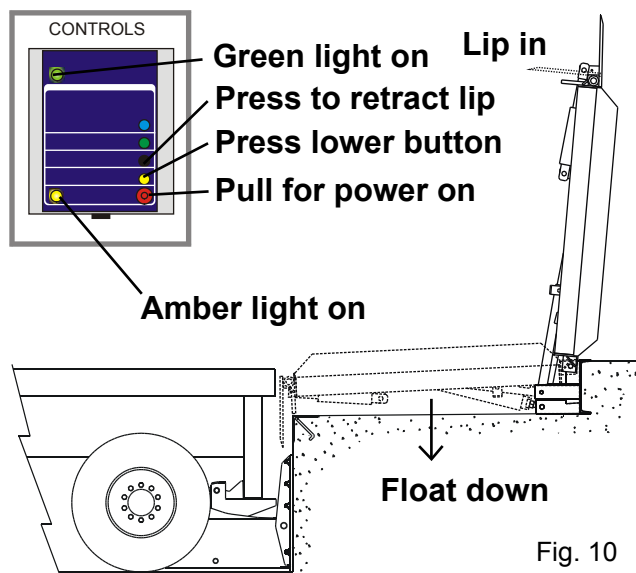
Storing Leveler

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 EMERGENCY STOP button** to turn off power (amber light off). See Fig. 9.

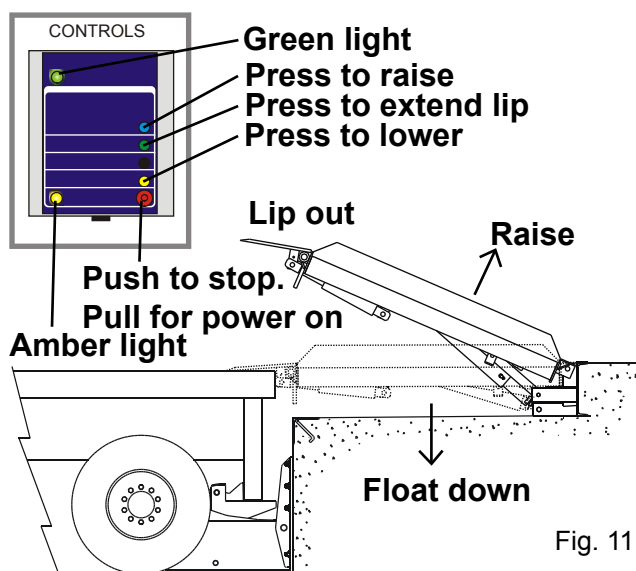


End Loading Operation

1. **Pull the EMERGENCY 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. 10.



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. 11.



SERVICE TOOLS

WARNING

Before servicing the dock leveler, read and follow the Safety Practices on page 6 and the Operation section in this manual.

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 POST AND BRACKET ON DECK.***
- 2) The Emergency Stop button is pressed.***
- 3) Barriers are in place.***

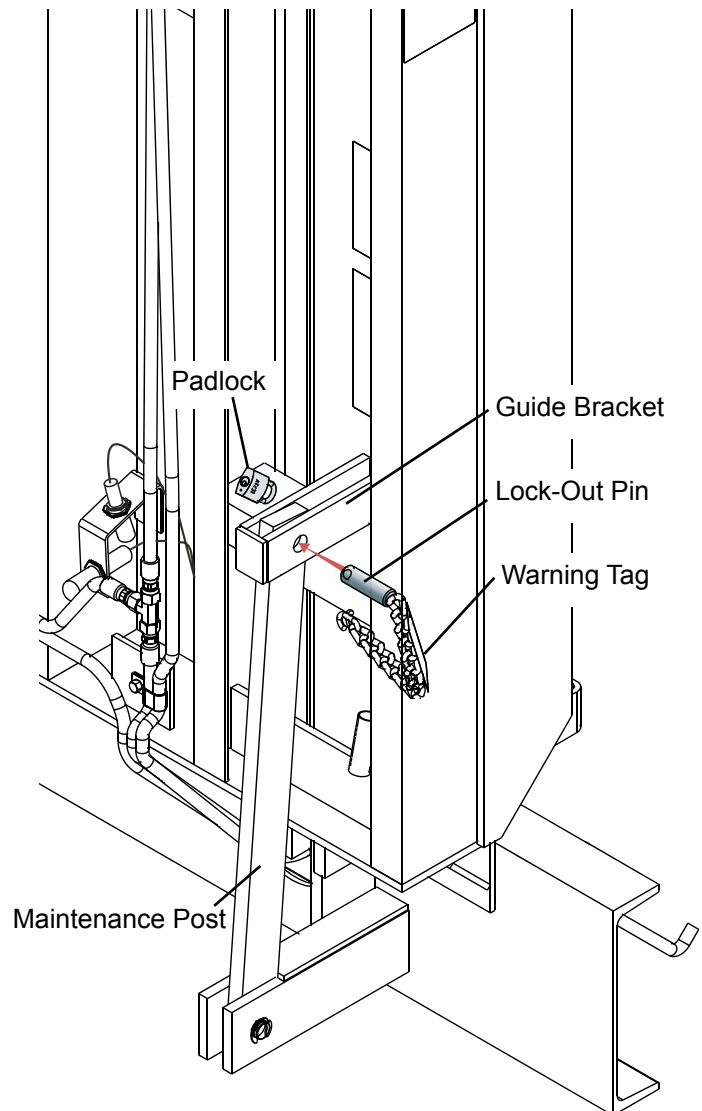
Failure to do so could result in death or serious injury.

Maintenance Post

The vertical dock leveler is equipped with a maintenance post 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 EMERGENCY Stop Button on the control panel.
- 3) Insert the Lock-Out Pin through the maintenance post 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. 12



PREVENTATIVE MAINTENANCE

To ensure the continued good operation of your dock leveler, perform the following preventative maintenance procedures.

WARNING

Before servicing the dock leveler, read and follow the Safety Practices on page 6 and the Operation section in this manual.

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 POST AND BRACKET ON DECK.

2) The Emergency Stop button is pressed.

3) The power is disconnected and properly tagged or locked out.

4) 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 post 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

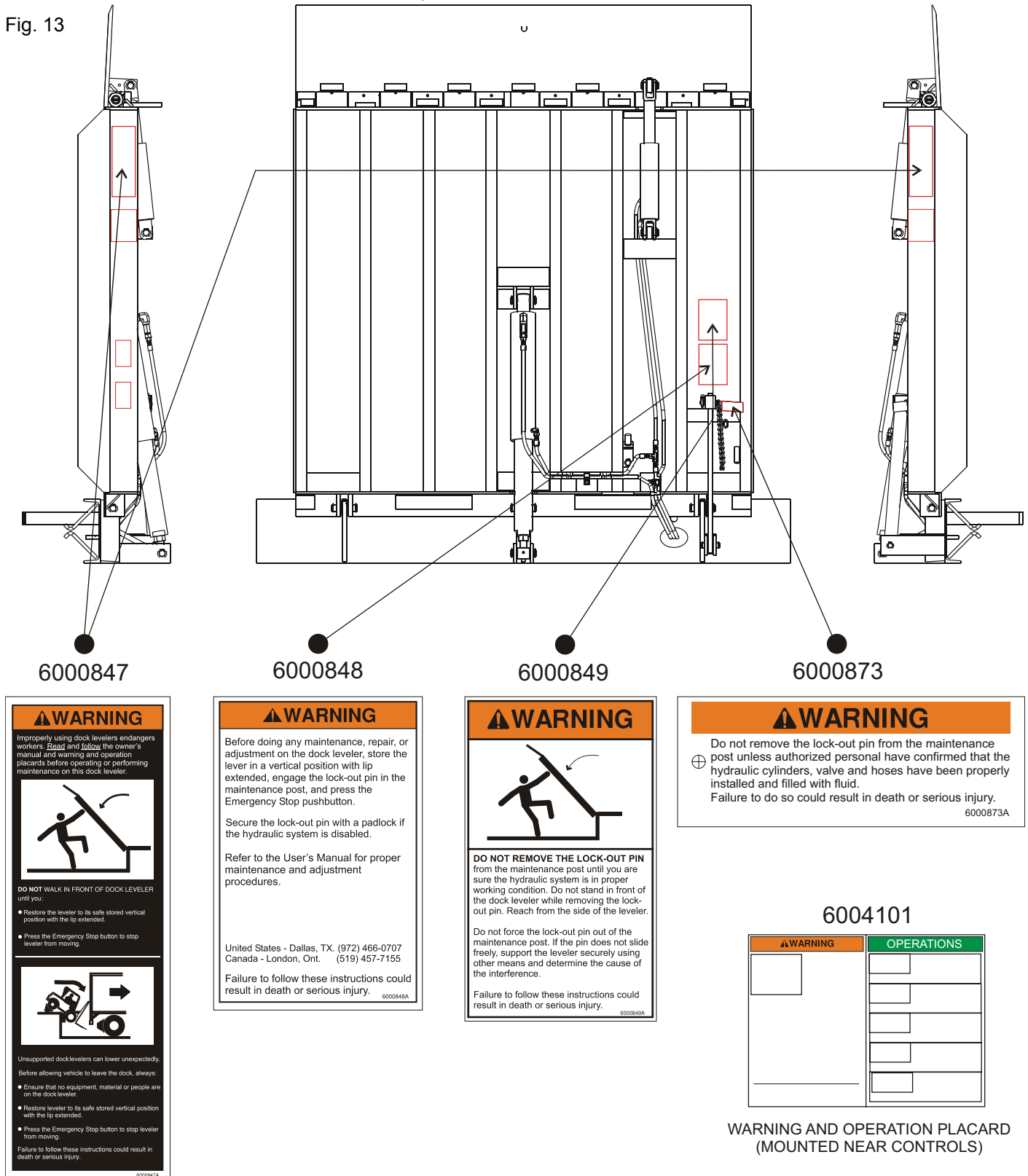
1. Inspect and lubricate all mechanical pivot points on the leveler with S.A.E. 30 oil. Cycle the leveler when lubricating.
2. Inspect the hydraulic cylinders, valves and hoses for any fluid loss and check the reservoir level with the leveler fully lowered with the lip pendant. Add fluid as required (fluid level should be 1/2" from top of reservoir).
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 20 for part numbers and label location.

PREVENTATIVE MAINTENANCE, continued

WARNING LABELS AND OPERATION PLACARD LOCATION

Call 1-800-525-2010 or 972-466-0707 for free replacements.

Fig. 13



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 6 and the Operation section in this manual.

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 POST AND BRACKET ON DECK and 2) The power is disconnected and properly tagged or locked out.

Do not enter 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 post and bracket on deck, the Emergency Stop button is pressed, and barriers are in place.

If the dock leveler will not raise 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 post and bracket on deck before the mechanical lifting means is removed.

If the dock leveler has been raised to the stored position by external means, or if the motor/pump unit or any hydraulic component, or cylinder has been replaced, the lock-out pin must not be removed from the maintenance post until the hydraulic system has been bled of air and all hydraulic functions have been tested. Remove the pin from the main cylinder rod end and perform steps 17 through 24 of the Installation Instructions on pages 10 and 11. If the dock leveler has been raised to the stored position by external means, there may be a vacuum exerting a strong retracting force on the cylinder rod. 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 end.

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

WARNING

Do not disconnect hoses unless the leveler is fully raised with lip extended, the lockout pin is inserted through the maintenance post, Emergency Stop button is pressed, and barriers are in place. After replacing hoses and/or motor/pump, cycle the leveler at least 4 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

WARNING

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 post, Emergency 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 17 through 24 of the Installation Instructions on pages 10 and 11 before removing the lockout pin from the maintenance post 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. b) Electrical connections incorrect or broken. c) No electrical power to PLC. d) PLC not running.	a) Check that voltage is present at terminal connections to the control panel. b) Check that wiring matches the wiring diagram. c) No electrical wiring to the PLC. 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. b) Voltage drop due to long wiring distance from power source.	a) Check all wiring connections from line to motor starter relay, overload and to motor. 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. b) Loss of 1 phase (Three phase only)	a) Set overload to full load current specified for voltage on motor nameplate. 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. b) Loss of 1 phase (Three phase only)	a) See solution 2. b). b) Check for voltage at all three motor connections (T1, T2, T3) at output of overload in control panel.

TROUBLESHOOTING GUIDE, continued

WARNING

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 post, Emergency 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 17 through 24 of the Installation Instructions on pages 10 and 11 before removing the lockout pin from the maintenance post and bracket on deck.

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

Problem	Possible Cause	Solution
5. Leveler does not raise or lower. Motor runs.	<ul style="list-style-type: none"> a) Low fluid in reservoir. b) Main solenoid valves SV2 & SV3 do not open. c) Pump running in reverse (three phase only). d) Pump damaged or broken internally. e) Insufficient pressure. Primary relief valve setting too low. 	<ul style="list-style-type: none"> a) Check fluid level with leveler fully lowered. Oil level should be 1/2-3/4" below top of reservoir with lip pendant. Add oil if required.. b) Check for magnetism at solenoid coil. If magnetism present, remove and inspect valve for contamination and then replace solenoid valve. c) Check motor rotation & reverse electrical connections T1 & T2 if necessary. d) With the leveler safely secured by the lock-out pin inserted in the maintenance post 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) Set primary relief valve to 2000 PSI. See instructions on page 28.
6. Leveler will not lower. Motor runs and leveler raises.	<ul style="list-style-type: none"> a) Lower solenoid valve SV1 does not open. b) Automatic safety stop (velocity fuse) is locked. 	<ul style="list-style-type: none"> a) Check for magnetism at solenoid coil. If magnetism present, remove and inspect valve for contamination and then replace solenoid valve. b) If load was on the leveler, remove the load and jog the RAISE or LOWER buttons to unlock the leveler.

TROUBLESHOOTING GUIDE, continued

WARNING

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 post, Emergency 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 17 through 24 of the Installation Instructions on pages 10 and 11 before removing the lockout pin from the maintenance post and bracket on deck.

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

Problem	Possible Cause	Solution
7. Leveler floats down too fast or too slowly in "Float" range.	a) Shuttle valve requires adjustment.	a) Adjust shuttle valve. Turn counter clockwise to increase lowering speed or clockwise to decrease speed. Lowering speed in "Float" range should equal lowering speed when powered. See page 28.
8. Lip plate will not extend, or extends too slowly.	a) Low fluid level in reservoir. b) Sequence valve pressure set too high. c) Lip hinge binding. d) Primary relief valve pressure set too low.	a) Check fluid level with leveler fully lowered. Oil level should be 1/2"-3/4" below top of reservoir with lip pendant. Add oil if required. b) Decrease sequence valve setting. See page 28. c) Inspect hinge area for damage or trapped debris. d) Set primary relief valve to 2000 PSI. See page 28. Do not adjust relief valve without a pressure gauge.
9. 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 28.
10. Lip plate will not stay out/falls as leveler is lowering.	a) Pilot check valve is leaking. b) Lip cylinder is damaged.	a) Inspect and clean pilot check valve. b) Replace cylinder.
11. Lock-out pin can not be freely inserted through the maintenance post 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 35.

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 push buttons and proximity sensors, and closes the appropriate output relays to the motor, solenoid valves, audible alarm and warning lights.

INPUTS					OUTPUTS				
0	Leveler Stored Sensor	0	Lower Valve SV1		1	Main Valves SV2 & SV3			
1	Float Sensor	1	Main Valves SV2 & SV3		2	Lip Valve SV4			
2	Raise Push Button	2	Lip Valve SV4		3	Motor			
3	Lip Extend Push Button	3	Motor		4	Amber Lamp – (Pilot)			
4	Lip Retract Push Button	4	Amber Lamp – (Pilot)		5	Green Lamp			
5	Lower Push Button	5	Green Lamp		6	Audible Alarm			
6	Leveler STOP	6	Audible Alarm		7	Loading Light Relay			
7	Overload Tripped	7	Loading Light Relay		8	VSL Fault			
8	Restraint Engaged	8	VSL Fault		9	Leveler Stored – (No Alarm Condition)			
	Interlock								
9	Door Opened Interlock								
10	Spare								
11	Spare								
12	Spare								
13	Spare								

Physical layout of Display.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	
														INPUTS
														OUTPUTS
PWR	RUN	ERR	STAT	0	1	2	3	4	5	6	7	8	9	

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

0	1	2	3	4	5	6	7	8	9	10	11	12	13	
●						●		●	●					INPUTS
●	●							●					●	OUTPUTS
PWR	RUN	ERR	STAT	0	1	2	3	4	5	6	7	8	9	

Leveler Stored. No push buttons pressed. Emergency Stop pulled out.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	
					●	●		●	●					INPUTS
●	●			●		●	●	●					●	OUTPUTS
PWR	RUN	ERR	STAT	0	1	2	3	4	5	6	7	8	9	

Leveler Stored. Lower button pressed.

PLC DIAGNOSTICS, continued

0	1	2	3	4	5	6	7	8	9	10	11	12	13	
					●	●		●	●					INPUTS
●	●			●		●	●	●						OUTPUTS
PWR	RUN	ERR	STAT	0	1	2	3	4	5	6	7	8	9	

Leveler between float and stored. Lower button pressed.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	
●		●				●		●	●					INPUTS
●	●				●	●	●	●					●	OUTPUTS
PWR	RUN	ERR	STAT	0	1	2	3	4	5	6	7	8	9	

Leveler stored. Raise button pressed.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	
					●	●		●	●					INPUTS
●	●				●	●		●	●					OUTPUTS
PWR	RUN	ERR	STAT	0	1	2	3	4	5	6	7	8	9	

Leveler in float range. Lower button pressed.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	
●				●		●		●	●					INPUTS
●	●				●		●	●					●	OUTPUTS
PWR	RUN	ERR	STAT	0	1	2	3	4	5	6	7	8	9	

Leveler stored. Lip Retract button pressed.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	
	●					●		●	●					INPUTS
●	●				●			●	●					OUTPUTS
PWR	RUN	ERR	STAT	0	1	2	3	4	5	6	7	8	9	

Leveler in float range. No buttons pressed.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	
●			●			●		●	●					INPUTS
●	●					●	●	●					●	OUTPUTS
PWR	RUN	ERR	STAT	0	1	2	3	4	5	6	7	8	9	

Leveler stored. Lip Extend button pressed.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	
	●	●				●		●	●					INPUTS
●	●				●	●	●	●						OUTPUTS
PWR	RUN	ERR	STAT	0	1	2	3	4	5	6	7	8	9	

Leveler in float range. Raise button pressed.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	
						●		●	●					INPUTS
●	●							●		●				OUTPUTS
PWR	RUN	ERR	STAT	0	1	2	3	4	5	6	7	8	9	

Leveler between float and stored. No push buttons pressed.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	
		●				●		●	●					INPUTS
●	●				●	●	●	●						OUTPUTS
PWR	RUN	ERR	STAT	0	1	2	3	4	5	6	7	8	9	

Leveler between float and stored. Raise button pressed.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	
●	●					●								INPUTS
●	●							F						OUTPUTS
PWR	RUN	ERR	STAT	0	1	2	3	4	5	6	7	8	9	

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

HYDRAULIC POWER UNIT ADJUSTMENT

Fig. 14

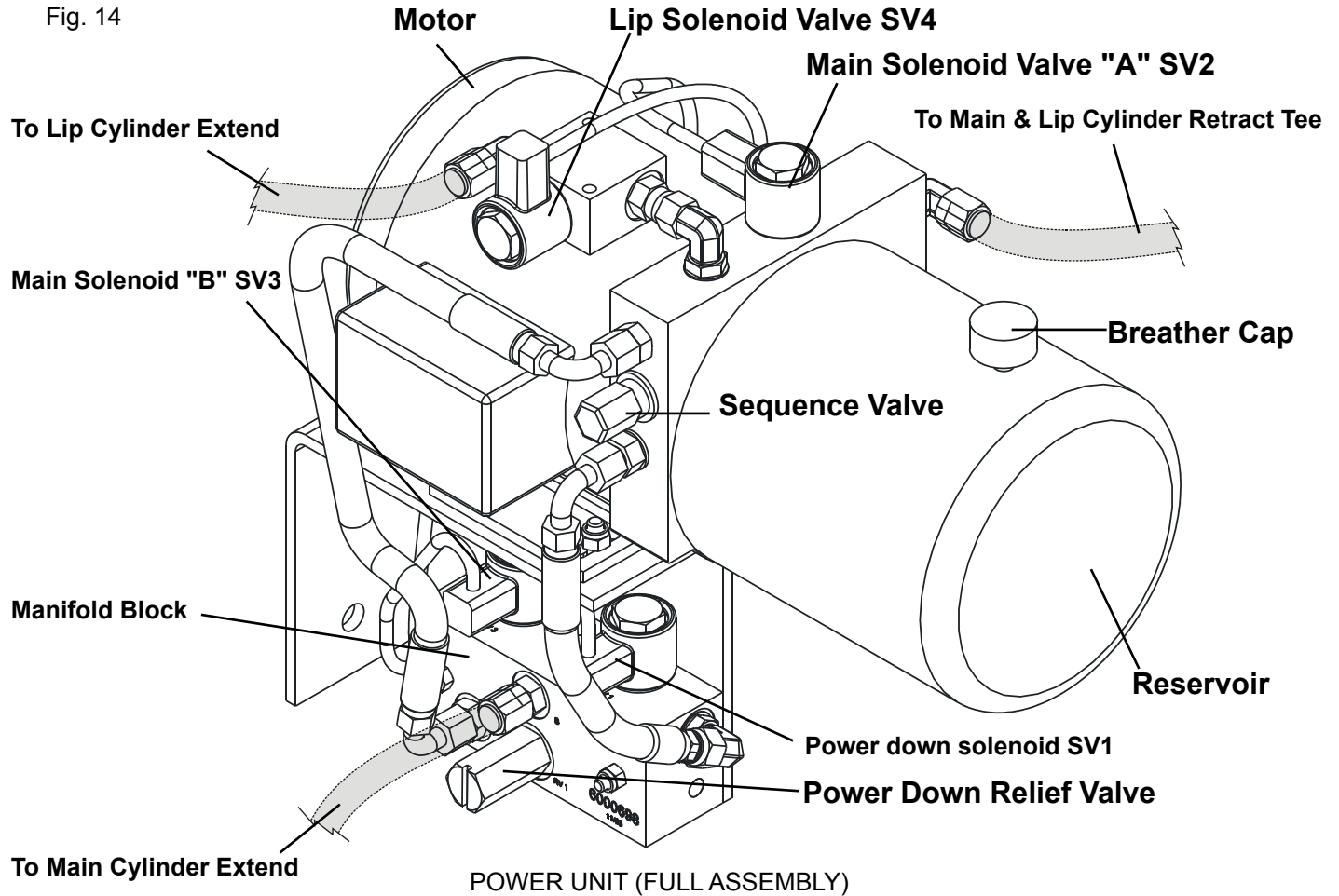
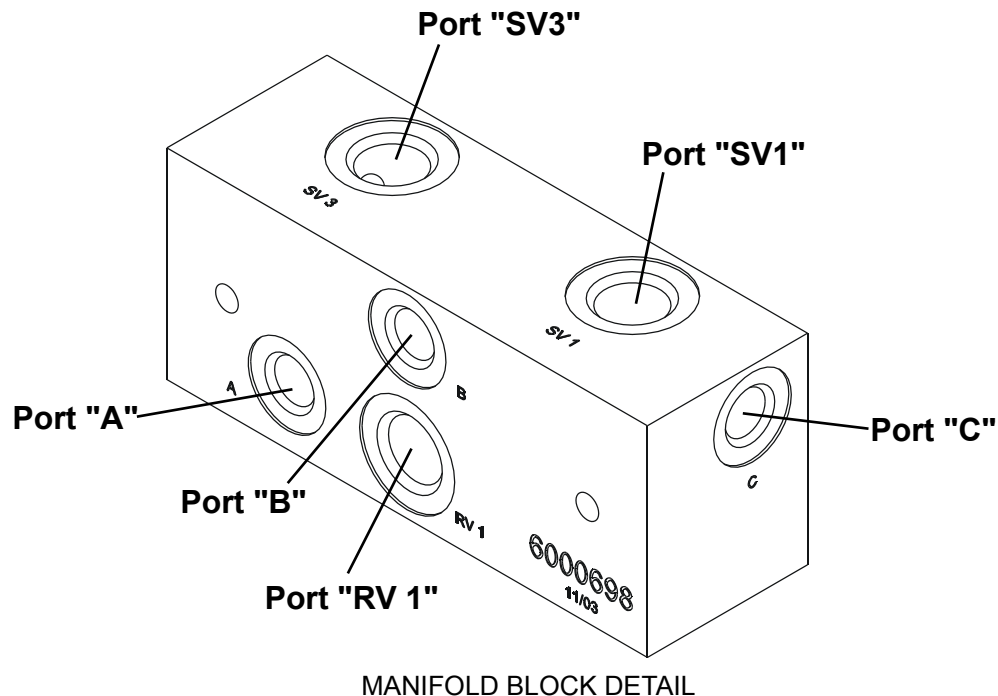


Fig. 15

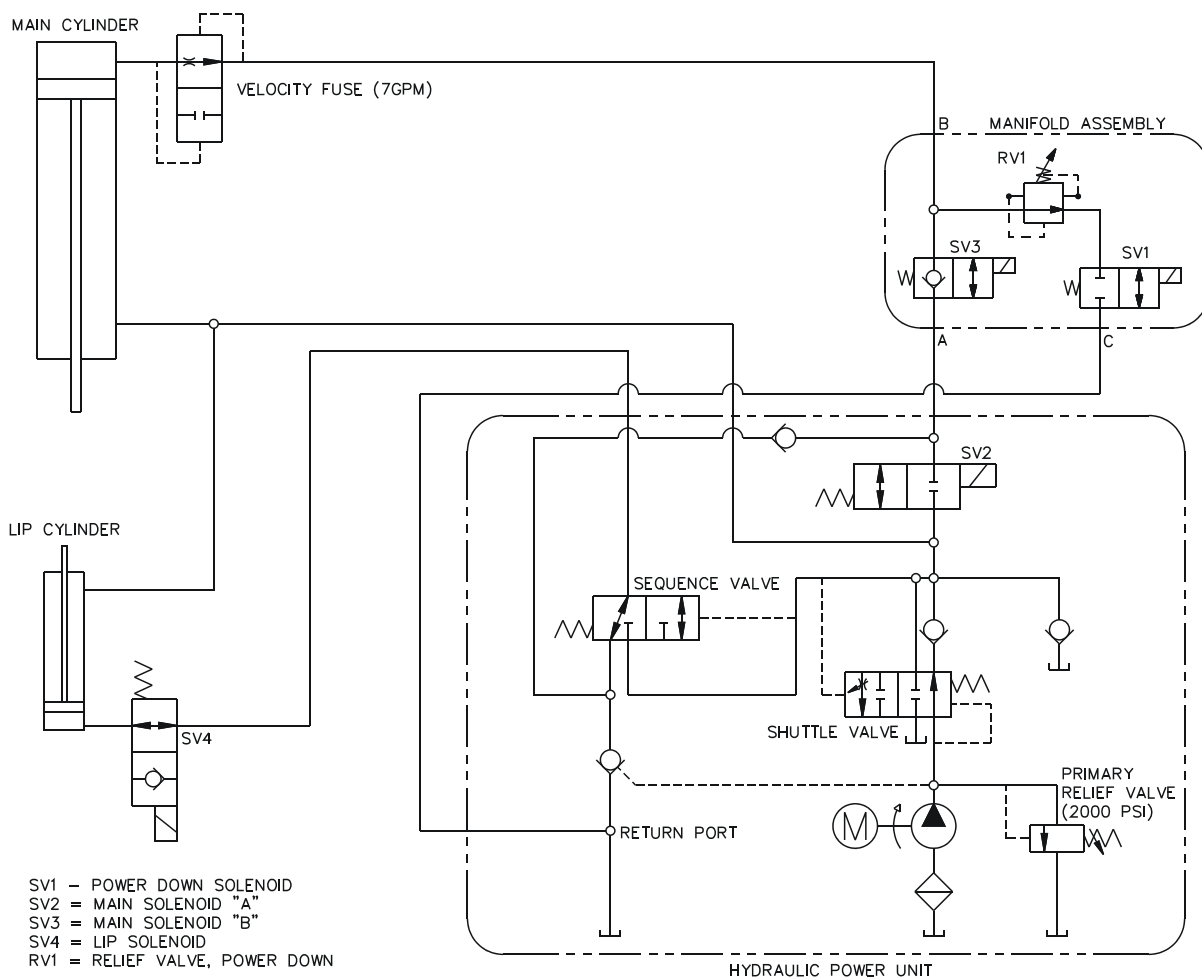


HYDRAULIC POWER UNIT ADJUSTMENT, continued

Description	Purpose	Adjustment
Primary Relief Valve	Controls maximum pressure in the hydraulic system and protects the other components from excessive force.	Remove threaded cap. 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.
Shuttle Valve	Controls the lowering speed of the leveler and directs fluid to the cylinders when the pump is running.	Remove threaded cap. Turn the screw clockwise to decrease lowering speed.
Sequence Valve	Controls lip plate retraction and extension.	Remove threaded cap. 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.

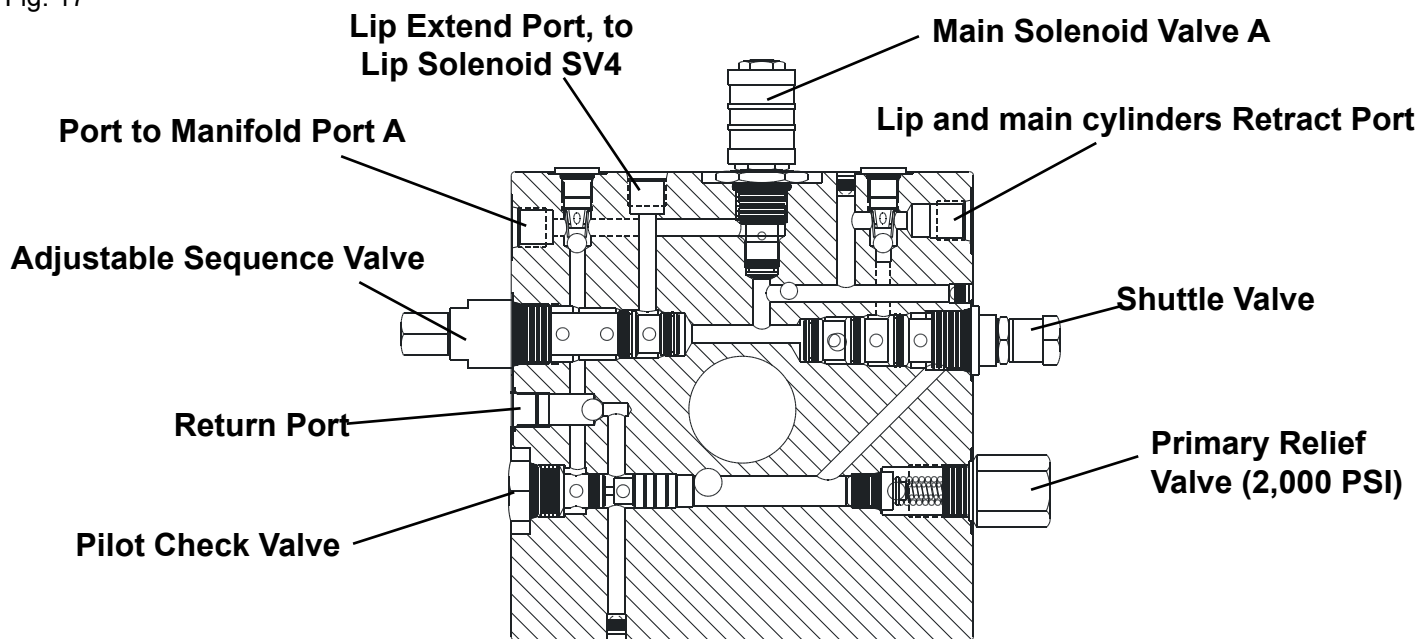
Fig. 16

HYDRAULIC SCHEMATIC



HYDRAULIC VALVE - CROSS SECTION

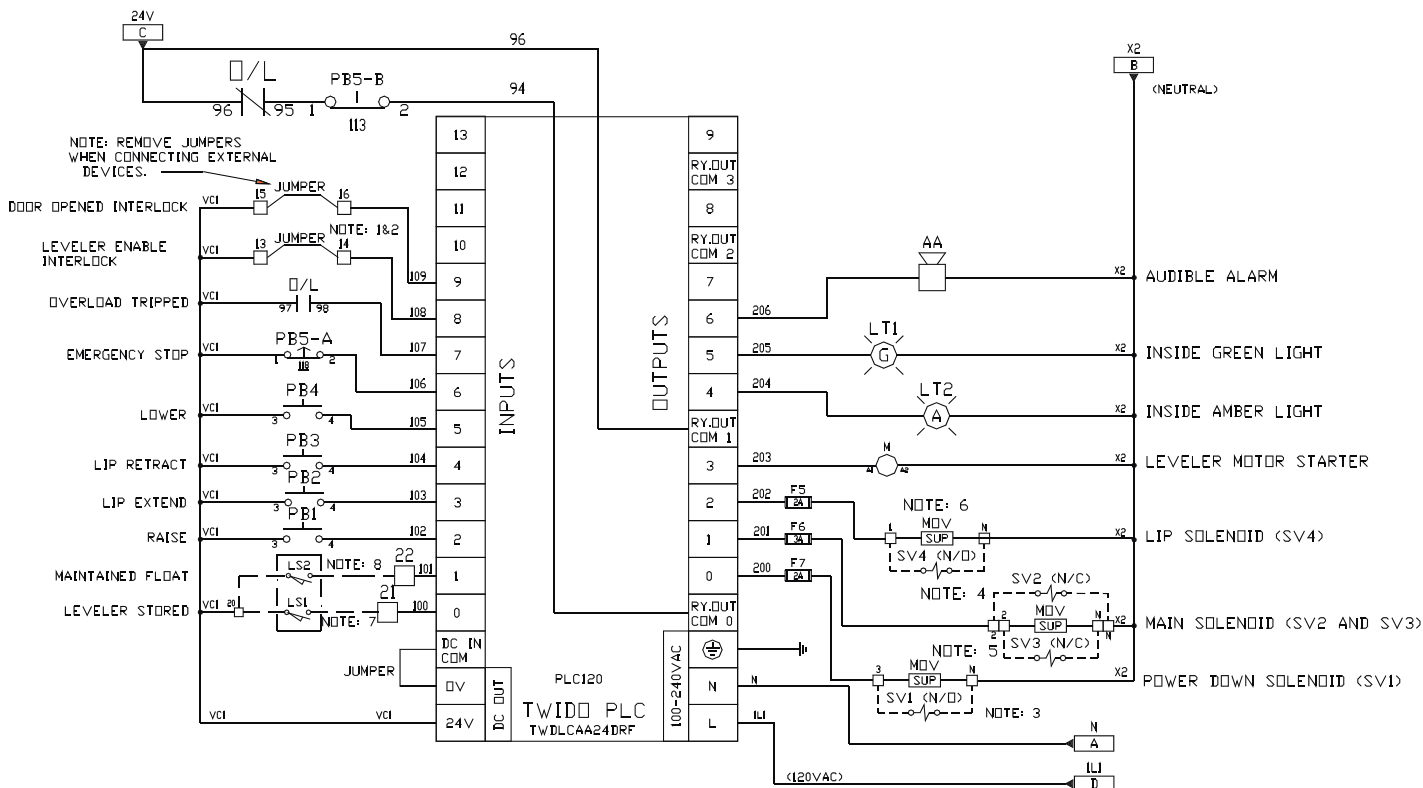
Fig. 17



ELECTRICAL SCHEMATIC - PLC DIAGRAM 120V

Fig. 18

NOTE: BEFORE INSTALLING A VEHICLE RESTRAINT & CONTROL PANEL THAT WILL BE USED WITH A VERTICAL LEVELER AND ITS CONTROL PANEL CONSULT FACTORY.



NOTE: 1 DOOR INTERLOCK (15 , 16) : LEVELER WILL NOT
LOWER UNLESS DOOR IS OPENED
24VDC DOOR SWITCH SUPPLIED BY OTHERS.

NOTE: 2 VEHICLE RESTRAINT INTERLOCK (13 , 14): LEVELER WILL NOT LOWER UNLESS RESTRAINT IS ENGAGED OR HAS BEEN SWITCHED TO LIGHTS ONLY/ OVERRIDE.

NOTE: 3 SVI: SOLENOID (24VAC) N/O VALVE CLOSED WHEN
ACTIVATED. COIL IS MOUNTED WITH VALVE BENEATH
MOTOR ON MOUNTING BRACKET AND WIRED INTO
JUNCTION BOX.

NOTE: 4 SV2: MAIN SOLENOID (24VAC) N/C VALVE OPEN WHEN
ACTIVATED. COIL IS MOUNTED ON MOTOR AND WIRED INTO
JUNCTION BOX.

NOTE: 5 SV3: SOLENOID (24VAC) N/O VALVE CLOSED WHEN ACTIVATED. COIL IS MOUNTED WITH VALVE BENAETH MOTOR ON MOUNTING BRACKET AND WIRED INTO JUNCTION BOX.

NOTE: 6 SV4: SOLENOID (24VAC) N/O VALVE CLOSED WHEN ACTIVATED. COIL IS MOUNTED ON MOTOR AND WIRED INTO JUNCTION BOX. WHEN ENERGIZED THIS VALVE IS DIRECTIONAL, FLUID WILL NOT FLOW OUT OF THE RETRACT PORT.

NOTE: 7 LSI: LEVELER STORED SWITCH 24VDC N/O SWITCH
CLOSED WHEN LEVELER IS STORED. MOUNTED ON
DECK.

NOTE: 8 LS2: MAINTAINED FLOAT SWITCH 24VDC N/O SWITCH
CLOSED WHEN LEVELER IS LOWERED TO 37 DEGREES
FROM DOCK HEIGHT. MOUNTED ON DECK.

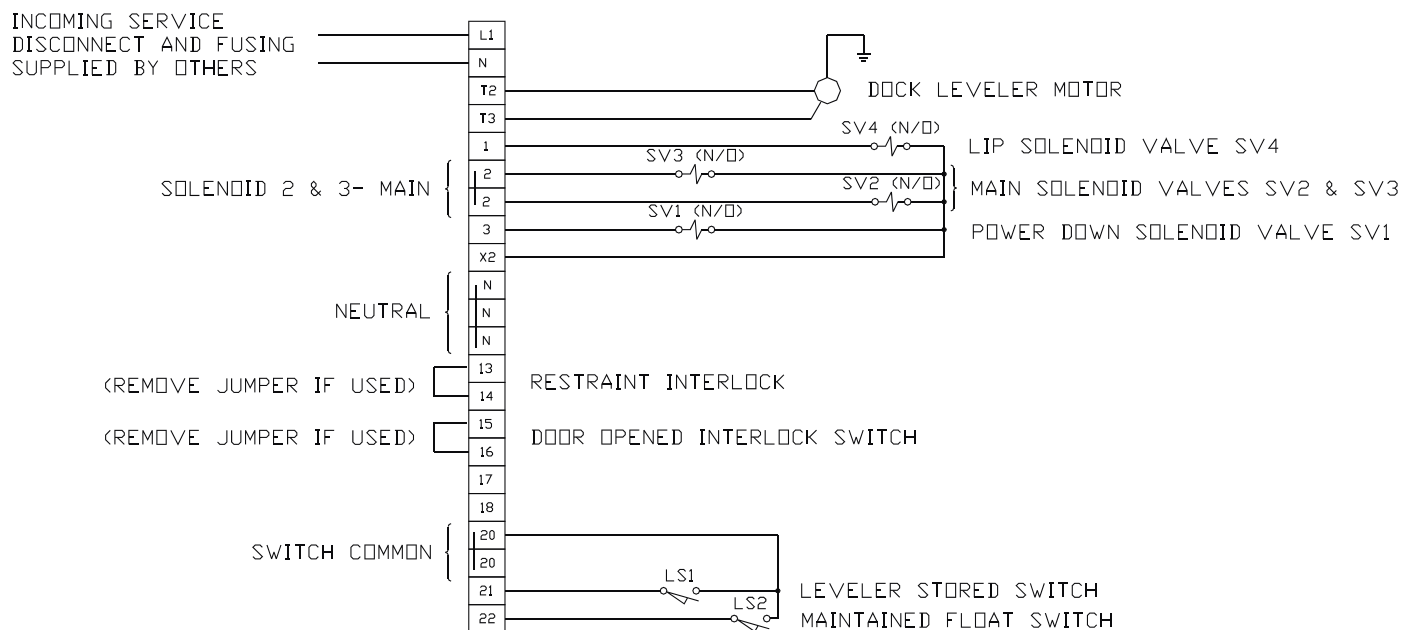
WIRE COLOR LEGEND

120VAC - RED
120VOLT NEUTRAL - WHITE
DRY CONTACTS - YELLOW
24VDC - (+) BLUE
24VDC - (-) BLUE W/ WHITE STRIPE
12VDC - (+) PURPLE
12VDC - (-) PURPLE W/ WHITE STRIPE

LEGEND

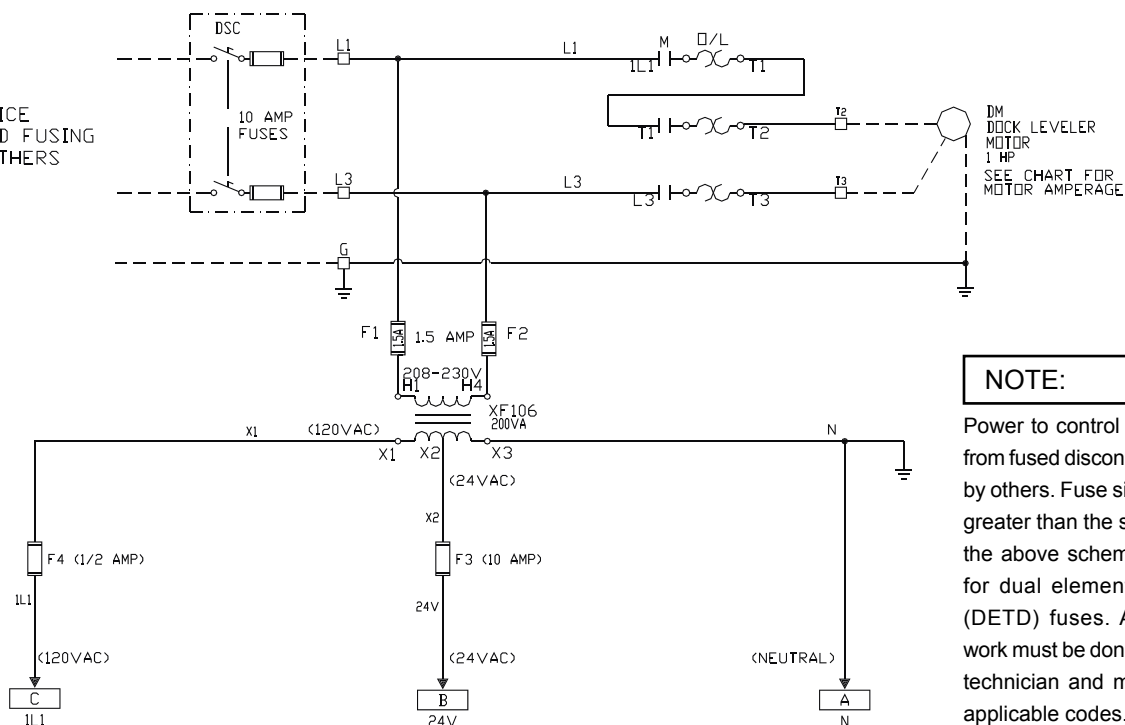
The diagram illustrates the connection between different components in a wiring system. At the top, a horizontal line represents a wire. A box labeled 'XXX' is connected to this line. Two arrows point from the text 'WIRE NUMBER' and 'LINE REFERENCE NUMBER' to the 'XXX' box. Below this, another horizontal line represents 'PANEL TERMINALS'. A box labeled 'XXXX XXXX' is connected to this line, with an arrow pointing from the text 'PANEL TERMINALS' to it. Below the panel terminals, a series of dashed lines represents 'FIELD WIRING'. An arrow points from the 'XXXX XXXX' box to the field wiring.

Fig. 20



SINGLE PHASE MOTOR AMP CHART	
VOLTAGE	AMPERAGE
208	6.4
220	6.2
230	6.1
240	6.0

NOTE:
INCOMING SERVICE
DISCONNECT AND FUSING
SUPPLIED BY OTHERS



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 de-energized state.

NOTE:
INCOMING SERVICE
DISCONNECT AND FUSING
SUPPLIED BY OTHERS



ELECTRICAL SCHEMATIC - 208V to 575V, THREE PHASE

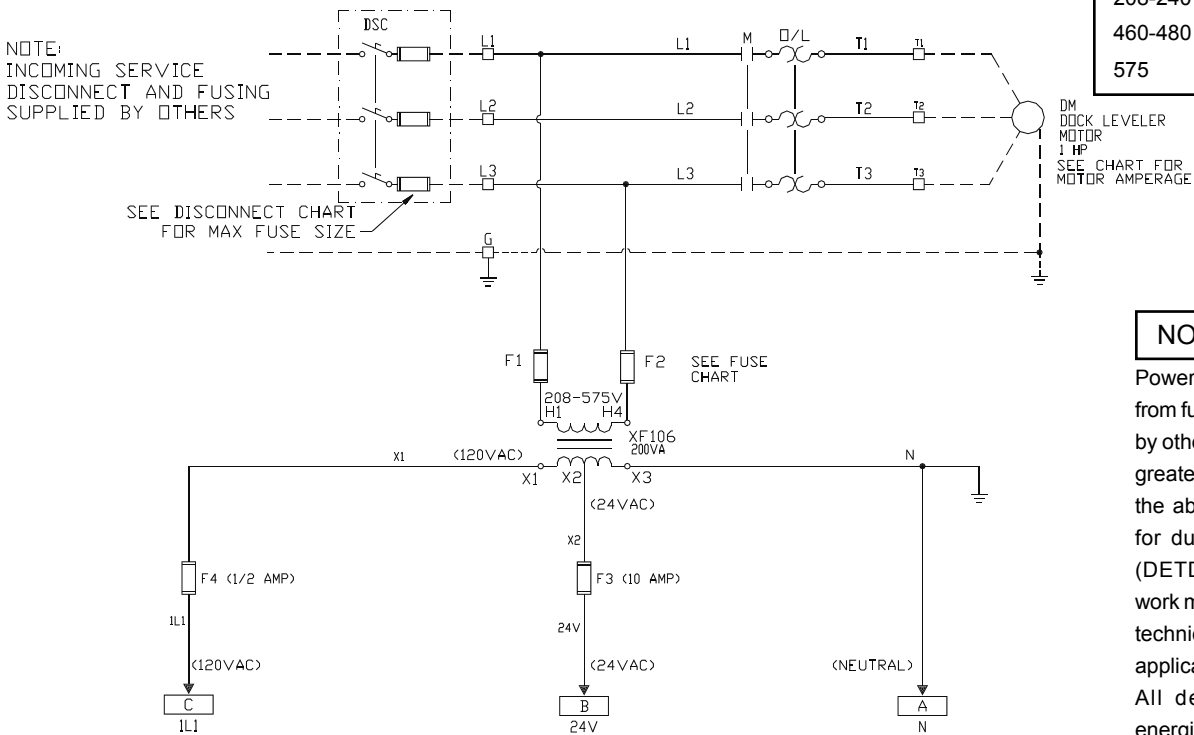
3 PHASE MOTOR AMP CHART	
VOLTAGE	AMPERAGE
208-220	3.3
230-240	3.2
460-480	1.6
575	1.3

XFMR FUSE CHART	
VOLTAGE	FUSE SIZE F1, F2
208-240	1.5
480	1.0
575	0.5

DISCONNECT CHART

VOLTAGE	FUSE SIZE
208-240	6 AMP DETD
460-480	3 AMP DETD
575	3 AMP DETD

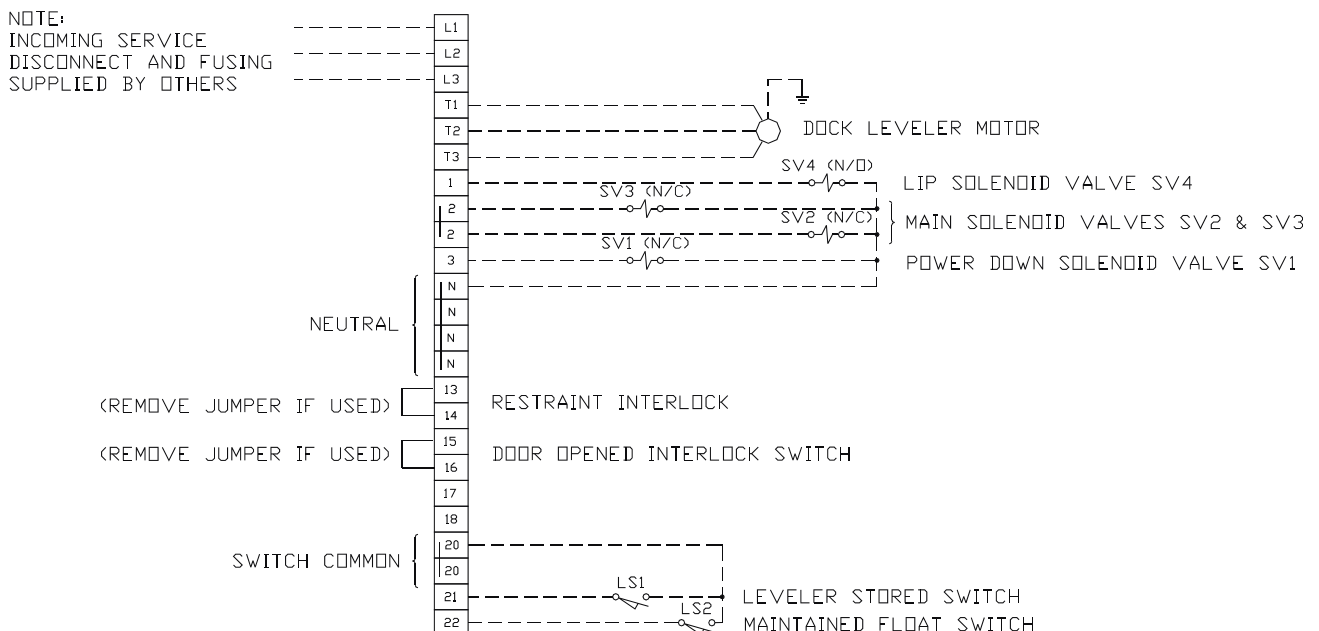
Fig. 22



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 de-energized state.

TERMINAL CONNECTIONS FOR 3 PHASE



MAIN CYLINDER - ADJUSTMENT

WARNING

Before servicing the dock leveler, read and follow the Safety Practices on page 6 and the Operation section in this manual.

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 POST AND BRACKET ON DECK.**
- 2) The Emergency Stop button is pressed.**
- 3) Barriers are in place.**

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

1. This requires a 1-1/2" and 2" open end wrenches.
Loosen the jam nut on the threaded rod end of the main cylinder.
2. Using the 2" wrench to hold the chrome cylinder rod, tighten the jam nut using the 1-1/2" wrench. Turn the chrome cylinder rod clockwise to pull the leveler forward or counter clockwise to push the leveler back until the lockout pin in the maintenance post move freely. See Page 18 for maintenance post operation.

WARNING

There must not be more than 1-1/2 inches of thread showing on the adjustable rod end. If more than 1-1/2 inches of 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.

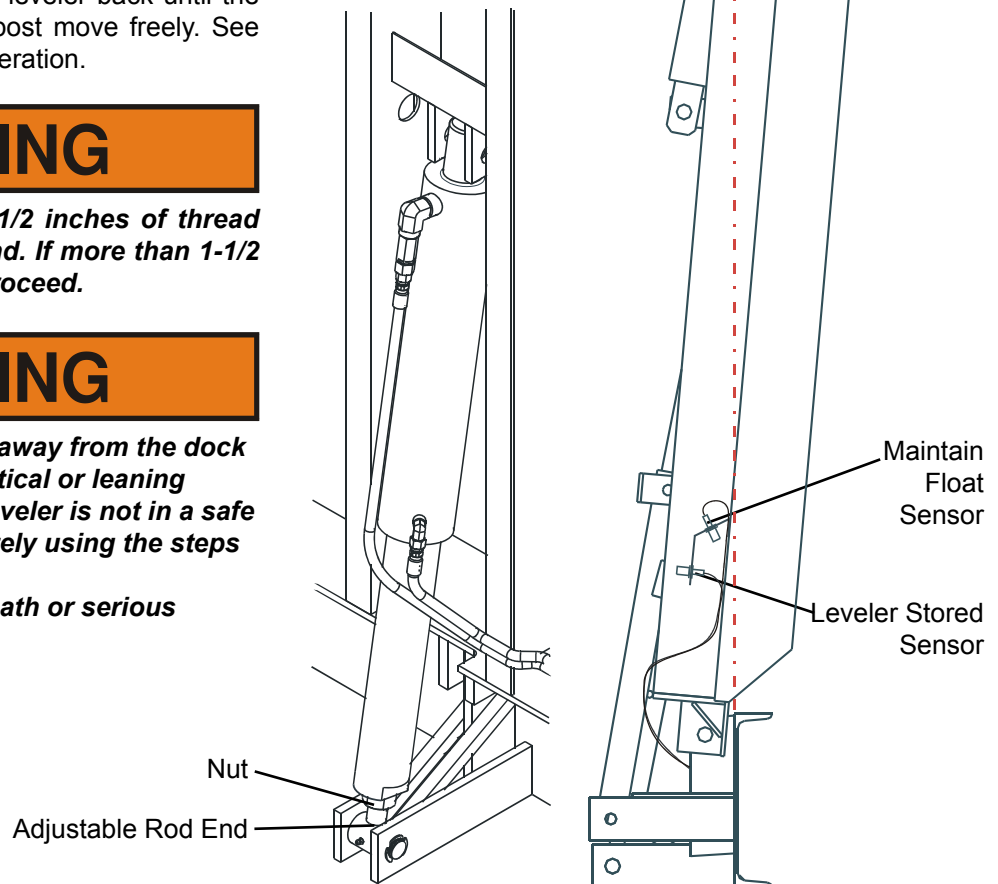
Failure to do so could result in death or serious injury.

VERTICAL LEVELER IN STORED POSITION

Vertical line 

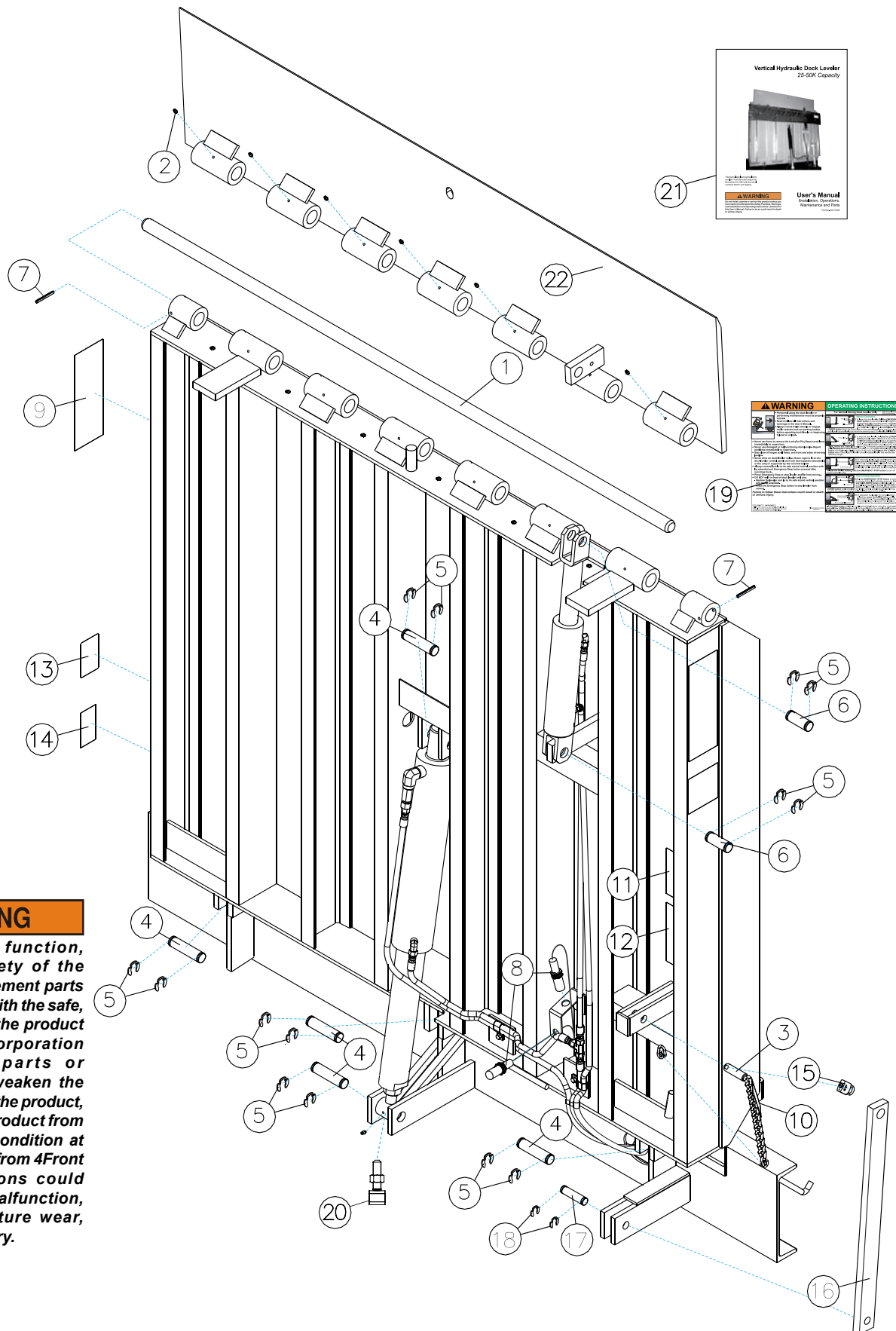
Fig. 24

Fig. 23



PARTS LIST - DOCKLEVELER

Fig. 25



PARTS LIST - DOCKLEVELER, continued

Item	Qty	Part Description	Capacity & Part Number					
			25,000	30,000	35,000	40,000	45,000	50,000
1	1	Hinge Pin 6 ft	586-0017	586-0017	586-0017	586-0287	586-0287	586-0287
	1	Hinge Pin 6.5 ft	586-1494	586-1494	586-1494	586-1495	586-1495	586-1495
	1	Hinge Pin 7 ft.	586-0201	586-0201	586-0201	586-0392	586-0392	586-0392

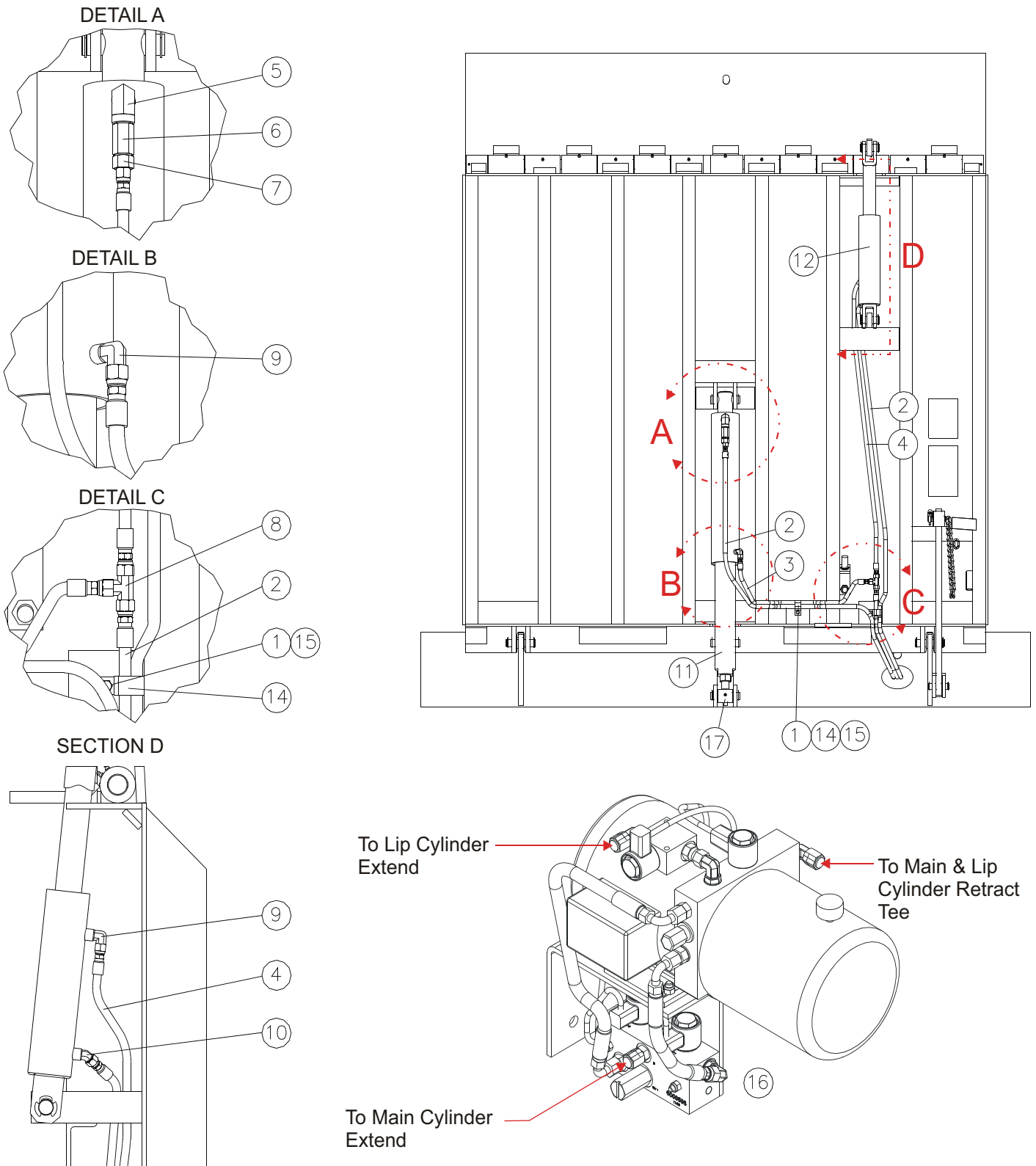
Item	Quantity	Part Description	Part Number
2	*	Drive Fit Grease Fitting	417-113
3	1	Lock-Out Pin Assy.	6000307
4	4	Pin, Rear Hinge, Hyd Cyl.	586-1066
5	8	Klipring - 1" - 5304-100 TRUARC	236-114
6	2	Pin - 1 Dia x 2 3/16 GR RNG	586-1063
7	2	SK Pins 21S-250-1500 or equal (25-35K)	231-123
	2	SLK Pins 21S-250-2250 or equal (40-50K)	231-126
8	2	Float/Store Sensor Assy	6000749
9	2	User Warning Label	6000847
10	1	Lock-Out Tag	6000873
11	1	Warning - Maintenance Label	6000848
12	1	Warning - Lockout Label	6000849
13	1	DP Serial Label	921-017
14	1	Leveler Information Tag	921-142
15	1	PadLock - Toggle Lockout	341-034
16	1	Maintenance Post	6000295
17	1	Vertical Lock Pin	586-1466
18	2	Klipring - 3/4" - 5304-75 TRUARC	236-110
19	1	Wall Mounted Placard – Safety and Operations	6001761
20	1	Rod End Adj. Assy.	6001315
21	1	User's Manual	6001762

PARTS LIST - DOCKLEVELER, continued

Item	Qty	Part Description	Capacity & Part Number					
			25,000	30,000	35,000	40,000	45,000	50,000
22	1	Lip Assy. 6 ft x 16 in	3-3335	3-3344	3-3353	3-3362	3-3371	3-3380
	1	Lip Assy. 6 ft x 18 in	3-3336	3-3345	3-3354	3-3363	3-3372	3-3381
	1	Lip Assy. 6 ft x 20 in	3-3337	3-3346	3-3355	3-3364	3-3373	3-3382
	1	Lip Assy. 6.5 ft x 16 in	3-3338	3-3347	3-3356	3-3365	3-3374	3-3383
	1	Lip Assy. 6.5 ft x 18 in	3-3339	3-3348	3-3357	3-3366	3-3375	3-3384
	1	Lip Assy. 6.5 ft x 20 in	3-3340	3-3349	3-3358	3-3367	3-3376	3-3385
	1	Lip Assy. 6.5 ft x 16 in - 3" Taper	3-3774	3-3777	3-3780	3-3783	3-3786	3-3789
	1	Lip Assy. 6.5 ft x 18 in - 3" Taper	3-3775	3-3778	3-3781	3-3784	3-3787	3-3790
	1	Lip Assy. 6.5 ft x 20 in - 3" Taper	3-3776	3-3779	3-3782	3-3785	3-3788	3-3791
	1	Lip Assy. 7 ft x 16 in - 3" Taper	3-3792	3-3795	3-3798	3-3801	3-3804	3-3807
	1	Lip Assy. 7 ft x 18 in - 3" Taper	3-3793	3-3796	3-3799	3-3802	3-3805	3-3808
	1	Lip Assy. 7 ft x 20 in - 3" Taper	3-3794	3-3797	3-3800	3-3803	3-3806	3-3809
	1	Lip Assy. 7 ft x 16 in - 6" Taper	3-3341	3-3350	3-3359	3-3368	3-3377	3-3386
	1	Lip Assy. 7 ft x 18 in - 6" Taper	3-3342	3-3351	3-3360	3-3369	3-3378	3-3387
	1	Lip Assy. 7 ft x 20 in - 6" Taper	3-3343	3-3352	3-3361	3-3370	3-3379	3-3388
	1	Lip Assy. 7 ft x 16 in - Notch	3-3810	3-3813	3-3816	3-3819	3-3822	3-3825
	1	Lip Assy. 7 ft x 18 in - Notch	3-3811	3-3814	3-3817	3-3820	3-3823	3-3826
	1	Lip Assy. 7 ft x 20 in - Notch	3-3812	3-3815	3-3818	3-3821	3-3824	3-3827

PARTS LIST - HYDRAULIC

Fig. 26

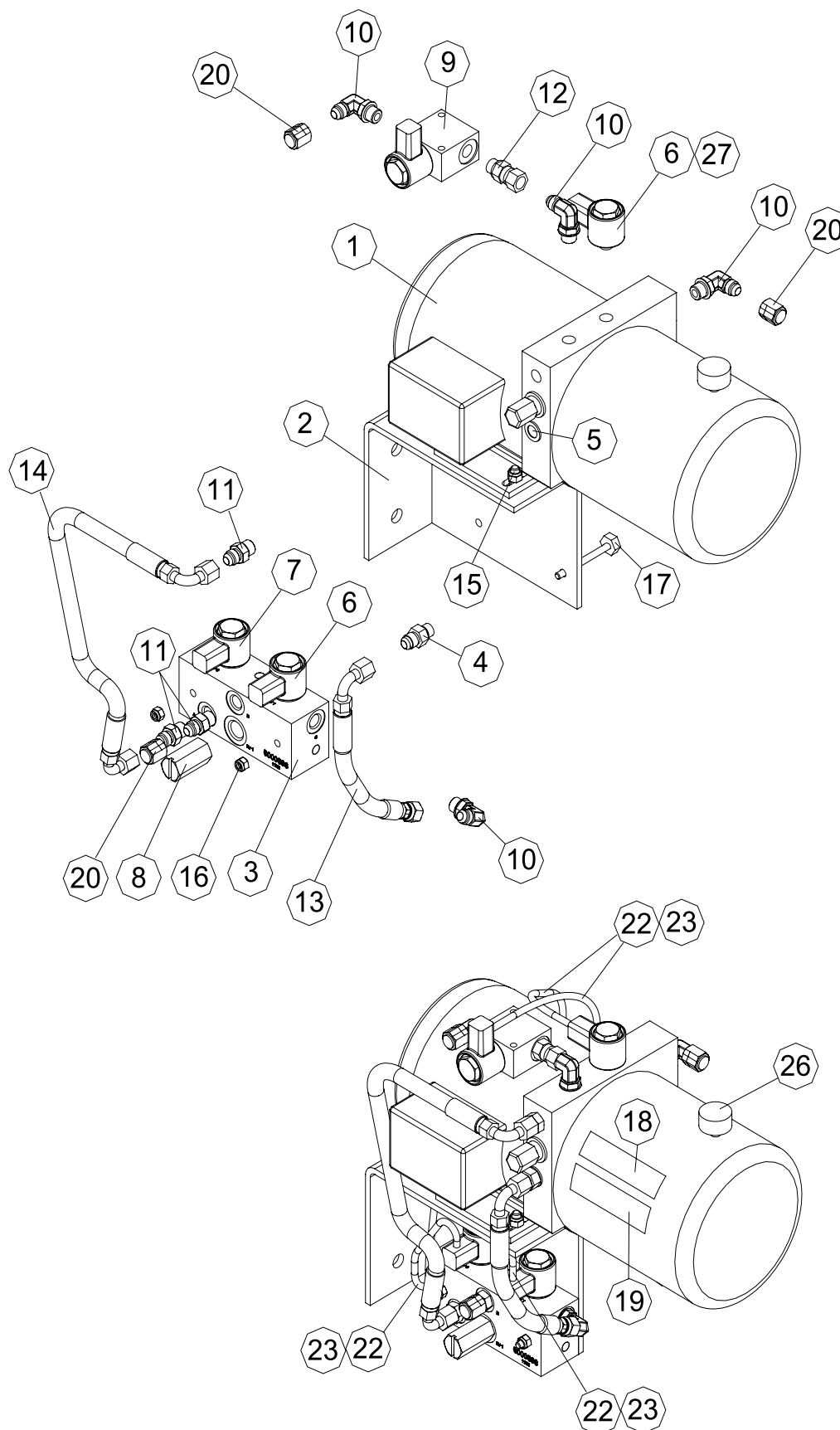


PARTS LIST - HYDRAULIC, continued

Item	Quantity	Part Description	Part Number
1	2	Lock Nut 1/4-20 UNC NYLOCK	214-502
2	3	Hose Assy: 1/2 x 24 ft.	3-1650
3	1	Hose Assy: 1/2 x 24"	3-1961
4	1	Hose Assy: 1/2 x 37" (5ft Leveler) Hose Assy: 1/2 x 48" (6ft Leveler) Hose Assy: 1/2 x 72" (8ft Leveler)	6000722 3-1959 6000724
5	1	Street Elbow 1/2" NPT x #8J1C	313-102
6	1	Velocity Fuse - 7 GPM	313-238
7	1	Tube End Reducer - 8 - 6	313-539
8	1	Tee, Male #6 JIC	6000595
9	2	Male 90° Elbow, 1/4 - NPT x #6 JIC	313-106
10	1	Male 45° Elbow, 1/4 - NPT x #6 JIC	313-219
11	1	Main Cylinder, 3.5x16IN Double Acting	6000620
12	1	Lip Cylinder, 2.5x6 Stroke Double Acting	313-043
13	3	Plug: #6 JIC	313-236
14	2	Dual Hose Clamp - 1/2" Hose	6000837
15	2	HHMS 1/4-20UNC x 1 Zinc	212-005
16	1	Remote Mount Hydraulic Power Unit Assy 120/1/60 Remote Mount Hydraulic Power Unit Assy 208/1/60 Remote Mount Hydraulic Power Unit Assy 240/1/60 Remote Mount Hydraulic Power Unit Assy 208/3/60 Remote Mount Hydraulic Power Unit Assy 240/3/60 Remote Mount Hydraulic Power Unit Assy 480/3/60 Remote Mount Hydraulic Power Unit Assy 575/3/60	6000706 6000707 6000864 6000865 6001382 6000867 6000868
17	1	Rod End Adjustment Assembly	6001315

PARTS LIST - REMOTE MOUNT POWER UNIT ASSEMBLY

Fig. 27

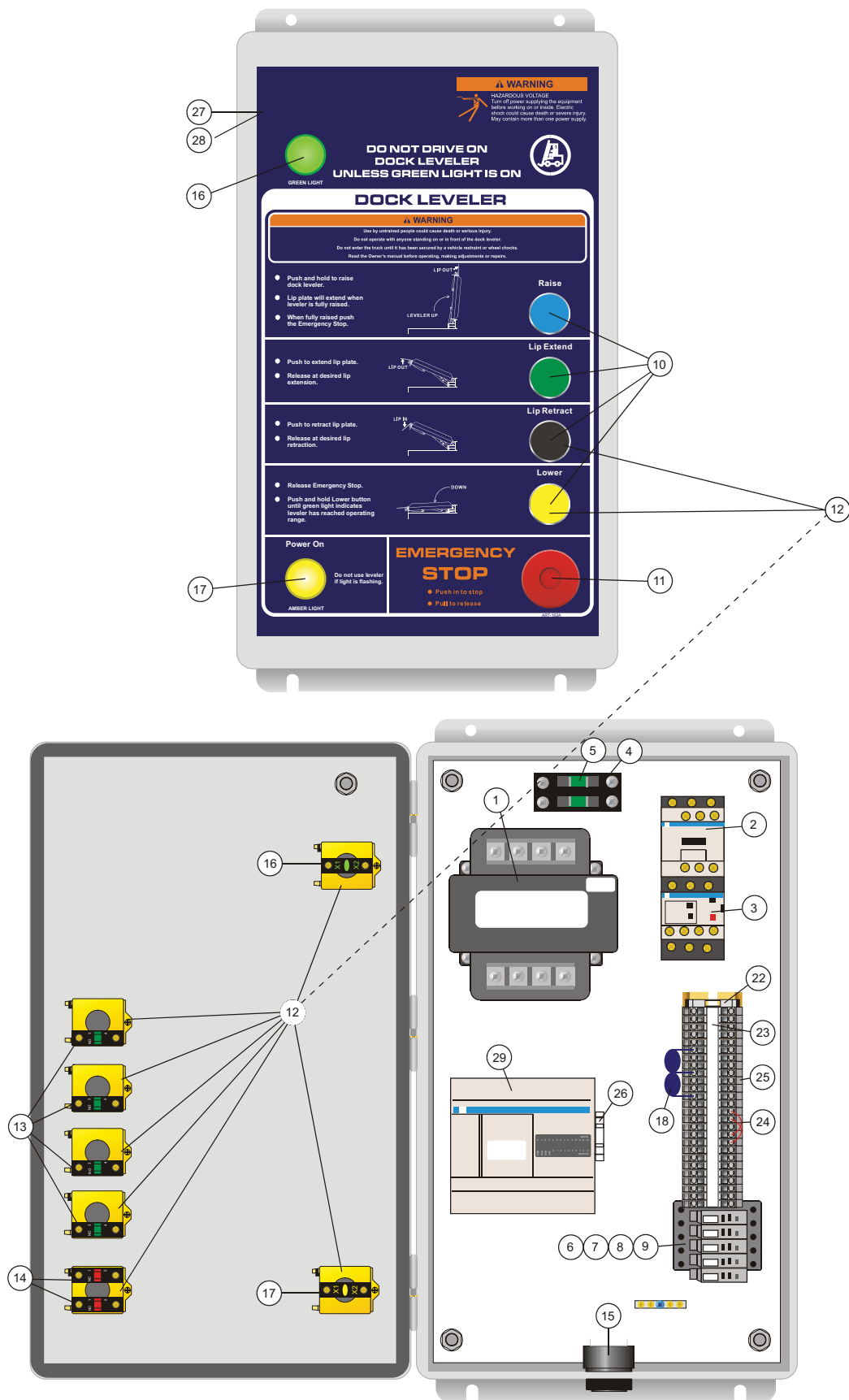


PARTS LIST - REMOTE MOUNT PUMP ASSEMBLY, continued

Item	Quantity	Part Description	Part Number
1	1	Hydraulic Power Unit: 115-230V/1/60 Hydraulic Power Unit: 208-460V/3/60 Hydraulic Power Unit: 575V/3/60	313-548 313-549 313-550
2	1	Bracket, Pump Wall Mount	6000703
3	1	Block, Manifold	6000698
4	1	SAE 5 to JIC 6 Fitting (C5315-6-5)	6000711
5	1	Crush Washer (9900-04)	6000712
6	2	2-Way 2-Port NC Spool Valve (PB-S2G-00-HC25-*)	6000713
7	1	2-Way 2-Port NC Poppet Valve (PB-S2B-00-HC25-*)	6000714
8	1	Relief Valve 0-800 PSI (PB-RVA-00-0800-*)	6000715
9	1	2-Way NO PO Valve (PB-S2D-00-HC25-S)	6000716
10	4	O-Ring Elbow - SAE #6 x JIC #6	313-214
11	3	Fitting, Straight, Male SAE #6	6000717
12	1	Fitting, Male SAE #6 x Female JIC #6	6000718
13	1	Hose Assy, VSL, Tank Return	6000719
14	1	Hose Assy, VSL, Main to Manifold	6000720
15	4	Lock Nut 5/16-18 NYLOK	214-522
16	2	Lock Nut 1/4-20	214-502
17	2	HHMB 1/4-20x2-3/4 GRD 2 Zinc	6000844
18	2	Single Phase Label - Ext (on Pump) Three Phase Label - Ext (on Pump)	921-026 921-027
19	2	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)	921-051 921-050 921-052 921-053 921-054
20	3	Cap - #6 JIC	313-242
21	1	Plug, 3/8" Pipe (discarded at installation)	313-237
22	4	Hirschmann Connector Cord Set	6001351
24	1	Carton, 18 x 12 x 20 DBLW, Fol-Bottom	6000869
25	3	Foam, Expanding Insta-Pak 15x18	6000871
26	1	Cap, Breather	313-290
27	4	Coil Only, 24 VAC Solenoid	313-564

PARTS LIST - CONTROL PANEL

Fig. 28



PARTS LIST - CONTROL PANEL, continued

Complete Control Panel Assy. No →			Where Used / QTY					
			Kelley	6000853	6000854/856/858	6000855/857/859	6000860	6000861
			Serco	6000828	6000829/831/833	6000830/832/834	6000835	6000836
Item	Part Description	Part #	110-120/1/60	208-240/1/60	208-240/3/60	480/3/60	575-600/3/60	
1	Transformer 120V/24 Transformer 480-240/120-24 Transformer 575/120-24	6001045 6001046 6001047	1	1	1	1	1	
2	Contactor Contactor	6000467 6000457	1	1	1	1	1	
3	Overload 12 - 18 AMPS Overload 5.5 - 8 AMPS Overload 2.5 - 4 AMPS Overload 1 - 1.6 AMPS	6000478 6000476 6000474 6000472	1	1	1	1	1	
4	Block, Fuse, 2 Pole	6000556	1	1	1	1	1	
5	2.5 AMP Fuse 600Volt F1,F2 1.5 AMP Fuse 600Volt F1,F2 1 AMP Fuse 600Volt F1,F2	6001048 6001049 6001050	2	2	2	2	2	
6	10 AMP Fuse 24Volt - F3	6001051	1	1	1	1	1	
7	1/2 AMP Fuse 120Volt - F4	6001052	1	1	1	1	1	
8	2 AMP Fuse 120Volt - F5, F7	6001053	2	2	2	2	2	
9	3 AMP Fuse 120Volt - F6	6001054	1	1	1	1	1	
10	Push Button, Universal	6000506	4	4	4	4	4	
11	Push Button, 40mm Red	632-215	1	1	1	1	1	
12	Body, Mounting Collar	6000515	7	7	7	7	7	
13	Block, Contact, NO	632-228	4	4	4	4	4	
14	Block, Contact, NC	632-229	2	2	2	2	2	
15	Alarm	823-109	1	1	1	1	1	
16	Pilot Light, Head, Green, LED	633-001	1	1	1	1	1	
17	Pilot Light, Head, Amber, LED	633-002	1	1	1	1	1	
18	Suppressor	6001055	3	3	3	3	3	
19	Capacitor (not shown)	6000560	1	1	1	1	1	
20	Operating Sticker (not shown)	6000534	1	1	1	1	1	
21	Terminal, Fused (not shown)	6000538	5	5	5	5	5	
22	Terminal, Endplate	6000539	1	1	1	1	1	
23	Plain Marker	6000540	1	1	1	1	1	
24	Jumper, Terminal, 2 way	6000541	2	2	2	2	2	
25	Terminal, 2 conductor	6000542	24	24	24	24	24	
26	End Stop, Screwless (not shown)	6000549	2	2	2	2	2	
27	Control Panel Label (Serco)	ART-162	1*	1*	1*	1*	1*	
28	Control Panel Label (Kelley)	ART-206A	1*	1*	1*	1*	1*	
29	TWIDO PLC 14 in 10 Out	6001056	1	1	1	1	1	

*Brand Specific

[illegible]



NOTES:

Lined area for notes, consisting of 25 horizontal lines.

[illegible]

Please direct questions about your vehicle restraint to your local distributor or to 4Front Engineered Solutions, Inc.

Your local distributor is:

Corporate Head Office:

1612 Hutton Dr. Suite 140
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Fax (972) 323-2661