BARRON
EQUIPMENT COMPANY INC.
OVERHEAD DOORS

OWNER'S MANUAL

LS Series Lift Tables

LS, LSD, LST, LSW & PPH Models

Model # _____

Serial # _____

Date placed in Service _____

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This owner's manual covers the following models:

LS series,
Single leg set lift table.

LSW series,
Wide base leg sets

LSD series,
Dual leg sets side by side

PPH series,
Single leg set with turntable ring mounted to the top.

LST series,
Tandem leg sets end to end

For clarity, the LS series single leg set is shown throughout the manual.

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INTRODUCTION

Southworth's LS series is our basic lift table line, containing over 400,000 combinations of load capacity, vertical travel, table size, power source, and other characteristics. The LS line, and this manual, also include the LST (tandem) lifts, LSD (dual), PPH and the LSW (wide-base) styles. LS lift tables can also be supplied with a large assortment of optional accessories and modifications to suit the customer's needs. Some variations use an air motor to power the hydraulic pump. "High cycle" units are designed for especially heavy cycle use, greater than 50,000 cycles per year. If your life has a configuration outside of what is described in this manual please contact Barron Equipment Customer Service for lift specific drawings such as the top level, electrical schematic and hydraulic schematic to supplement this manual.

This manual contains information to acquaint you with the safe and proper installation, use, and upkeep of a standard LS series lift table. You should ensure that this manual is available to personnel working with and on the lift table and require its use by these personnel.

LS lift tables are designed for lifting and vertical positioning of equipment and materials in a wide variety of industrial settings. The instructions set forth in this manual are not necessarily all-inclusive, as Barron Equipment cannot anticipate all conceivable or unique situations.

Please read all of this manual carefully, and be familiar with its contents before you install, use, or service the LS Lift Table. If you have any questions about any of the instructions in this manual, please contact Barron Equipment and Overhead Doors.

Southworth's product warranty and return policy is shown on the back cover of this manual. This instruction manual is **not intended to be or to create any other warranty, express or implied, including any implied warranty of merchantability or fitness for a particular purpose, all of which are hereby expressly excluded.**

As set forth more specifically in the product warranty, Southworth's obligation under that warranty is **limited** to the repair or replacement of defective components, which shall be the buyer's **sole remedy**, and Barron Equipment shall not be liable for any loss, injury, or damage to persons or property, nor for any direct, indirect, or consequential damage of any kind resulting from the LS lift table.

Responsibility of Owners and Users

Inspection and Maintenance
The device shall be inspected and maintained in proper working order in accordance with Southworth's owner's manual.

Removal from Service
Any device not in safe operating condition such as, but not limited to, excessive leakage, missing rollers, pins, or fasteners, any bent or cracked structural members, cut or frayed electric, hydraulic, or pneumatic lines, damaged or malfunctioning controls or safety devices, etc. shall be removed from service until it is repaired to the original manufacturer's standards.

Deflection
It is the responsibility of the user/purchaser to advise the manufacturer where deflection may be critical to the application.

Repairs
All repairs shall be made by qualified personnel in conformance with Southworth's instructions.

Operators
Only trained personnel and authorized personnel shall be permitted to operate the lift.

Before Operation
Before using the device, the operator shall have:

- Read and/or had explained, and understood, the manufacturer's operating instructions and safety rules.
- Inspected the device for proper operation and condition. Any suspect item shall be carefully examined and a determination made by a qualified person as to whether it constitutes a hazard. All items not in conformance with Southworth's specification shall be corrected before further use of the equipment.

During Operation
The device shall only be used in accordance with this owner's manual.

- Do not overload.
- Ensure that all safety devices are operational and in place.

Modifications or Alterations
Modifications or alterations to any Southworth industrial positioning equipment shall be made only with written permission from Southworth.

SAFETY ALERT SYMBOLS AND SIGNAL WORDS

The safety of all persons operating, maintaining, repairing, or in the vicinity of this equipment is of paramount concern. This is a powerful machine with moving parts, and is capable of causing personal injury if proper precautions are not taken. Therefore, throughout this manual, certain hazards have been identified which may occur in the use of the machine, and there are appropriate instructions or precautions which should be taken to avoid these hazards. In some cases, there are consequences which may occur if instructions or precautions are not followed. Below are the symbols and signal words along with their definitions referenced from ANSI Z535.4 - Product Safety Signs and Labels.

4.11 Safety Alert Symbols: A symbol that indicates a hazard. It is composed of an equilateral triangle surrounding an exclamation mark. The safety alert symbol is only used on hazard alerting signs. It is not used on safety notice and safety instructions signs.

A) B) C) D) E)

A): for use with DANGER signal word; (safety white triangle, safety red exclamation mark, safety red background)
B): for use with WARNING signal word; (safety black triangle, safety orange exclamation mark)
C): for use with CAUTION signal word; (safety black triangle, safety yellow exclamation mark)
D) and E): for use with DANGER, WARNING, or CAUTION signal word; (D: is a safety yellow triangle with a black border and safety black exclamation mark; E: is a safety yellow triangle with a safety black exclamation mark and a safety yellow border around a safety black band)
NOTE: D and E are provided to allow for consistency with certain ISO standards such as ISO 3864-1 and ISO 3864-2.

4.14 Signal Words: The words used in the signal word panel. The signal words for hazard alerting signs are “DANGER,” “WARNING,” and “CAUTION.” Safety notice signs use the signal word “NOTICE.” Safety instruction signs use signal words that are specific to the situation.

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

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

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE is used to address practices not related to physical injury.

SAFETY INSTRUCTIONS (or equivalent) signs indicate specific safety-related instructions or procedures.

NOTE: DANGER, WARNING or CAUTION should not be considered for property damage accidents unless personal injury risk appropriate to these levels is involved.

SAFE SERVICING OF THE LIFT

⚠WARNING

Only authorized personnel should perform inspection or maintenance and service procedures. Unauthorized personnel attempting these procedures do so at the risk of severe injury or death.

⚠DANGER

Failure to properly adhere to lift blocking procedures is to risk the sudden and uncontrolled descent of the lift during maintenance or inspection. A falling lift can cause severe injury or death.

This procedure describes the only factory-approved method of working under a lift. Follow these instructions EVERY time you plan to reach or crawl beneath the lift to perform service or maintenance – no matter how momentary that might be.

If the factory-provided maintenance device is damaged or missing, stop immediately and consult the factory for assistance. The manufacturer is not liable for your failure to use the approved maintenance device(s) and procedures that have been provided.

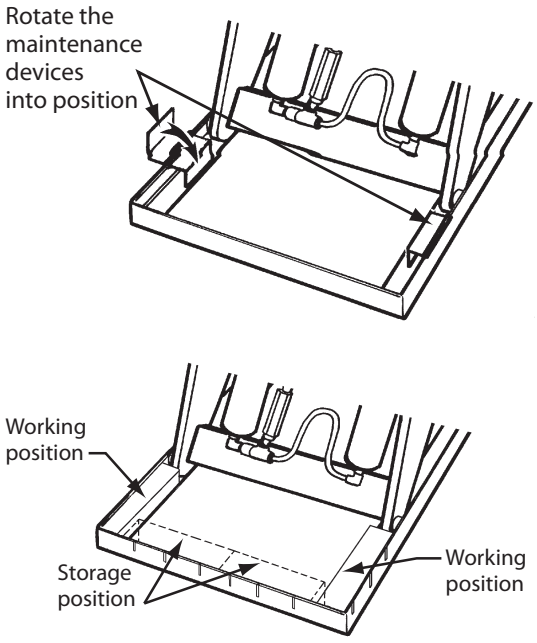


Figure 1: Safe Servicing of Lift

1. Any load must be removed from the lift prior to engaging the maintenance device(s). These devices are designed to support an unloaded lift only. Failure to remove the load from the lift prior to blocking could cause the failure of the maintenance device(s) and allow the lift to fall unexpectedly. This can result in personal injury or death, or permanent damage to the maintenance device(s) and/or the lift.

2. Raise the lift to its fully raised position. If you do not, the maintenance device(s) may not be able to be placed properly in its/their designed blocking position. Please note that this may require electrically by-passing the up limit switch, ensure that doing so will not operate the up limit switch beyond its physical limits. This should only be done by qualified maintenance personnel. If electrical by-pass is not possible and the up limit switch needs to be moved in order to place the unit on the maintenance devices then the lift will need to be supported before working on the switch, support the top and leg set with a crane, fork truck, or blocking from floor to the table top. Ensure that the switch is properly set and functions once complete.

3. Remove the maintenance device(s) from its/their storage location and place it/them into the engaged position as shown in Figure 1. Note: For LST models ensure all supplied maintenance devices are utilized.

4. Lower the lift until it makes complete contact with the maintenance device(s). Re-check to ensure that all provided devices are fully and securely engaged. If the device(s) is/are not fully engaged the lift could fall unexpectedly, resulting in permanent damage to the device(s) or the lift.

⚠DANGER

If for any reason you are unable to lower the lift completely onto the maintenance device(s), stop immediately and consult the factory. Failure to properly use the factory approved maintenance device(s) could result in severe injury or death.

5. (For single-acting hydraulic, and pneumatic lifts) Once the maintenance device(s) is/are properly and securely engaged, continue to press the down button, valve or switch for an additional 5-10 seconds to relieve all pressure in the operating system

⚠WARNING

Failure to relieve operating system pressure could result in the sudden and unexpected release of high pressure fluids (or air) during maintenance and/or repair of the lift and result in severe injury or death.

Note: In some cases the upper travel limit switch may need to be overridden to utilize the maintenance devices

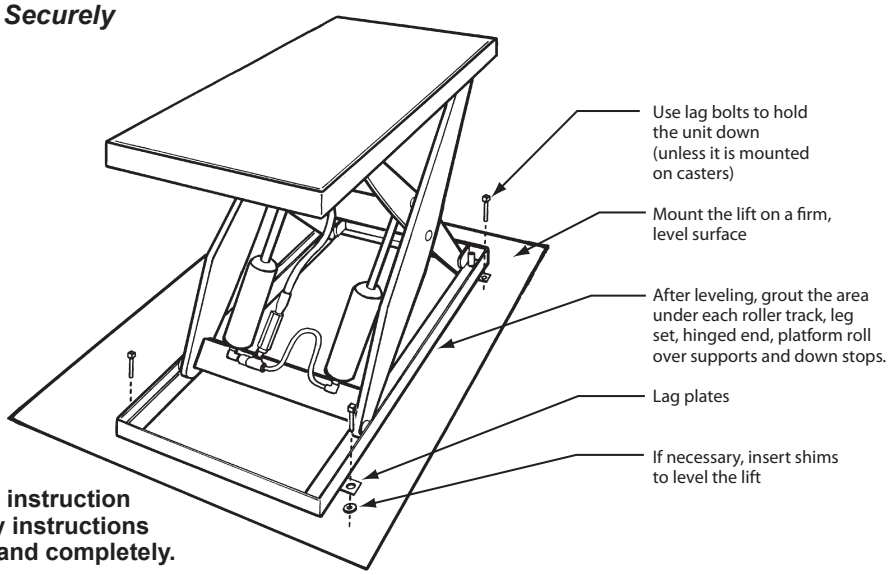
6. Follow OSHA electrical lock-out/tag-out procedures. Disconnect and tag all electrical and/or other power sources to prevent an unplanned or unexpected actuation of the lift.

7. Once inspection or work is complete, reverse the performance of the steps above to raise the lift off the maintenance device(s) and place the device(s) back into its/their designated storage position(s).

⚠DANGER

HIGH VOLTAGE ! – Disconnect and/or lock out the electrical supply to the power unit prior to any installation or maintenance being performed.

Figure 2 – Mount the Lift Securely



Please read and follow this instruction manual, including all safety instructions and precautions, carefully and completely.

INSTALLATION INSTRUCTIONS

Preparation

1. Before you start to install the lift, check for local codes and ordinances that may apply. It is your responsibility to obtain any necessary permits.

2. **Read all of these installation instructions carefully. Be sure to read and understand all of the warnings!**

3. If your unit is designed to be installed in a pit, check the pit before you start to install the lift. Measure the length and width of the lift table, then measure the pit, and be sure the pit allows adequate clearance, there is a 3/4" or less gap between the platform and the pit wall all the way around. Does the pit have 90° angles at each corner? To check, measure across the opposite corners of the pit. The measurement on each diagonal should be the same, within 1/2 inch. The walls of the pit should be vertical. Check with a carpenter's square.

4. If the power unit will be mounted away from the lift ("external power unit"), check the mounting arrangement for the power unit. The power unit must be sheltered from the weather. It should be mounted within 30 feet of the lift to minimize the pressure drop in the hydraulic system. Be sure the hydraulic lines have been installed properly.

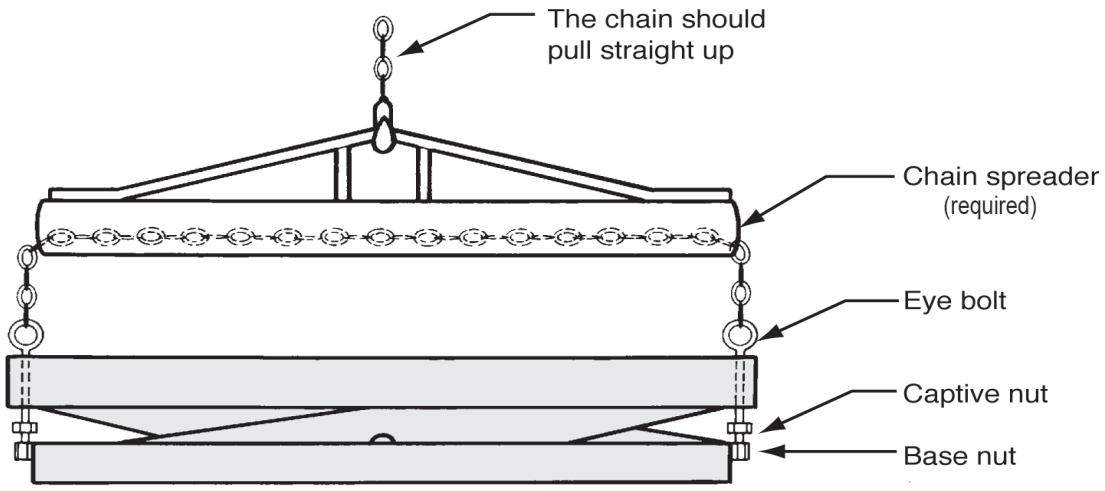
⚠WARNING

Protect the power unit from rain or moisture. If the electrical parts in the power unit get wet, workers may be hurt by electrical shock. The electrical parts may fail if they are wet.

⚠WARNING

The electric motor in the lift can create sparks. Do not install the power unit in an area where flammable gases may be present.

Figure 3 – Using Lifting Eyes



5. If the power unit is mounted within the lift (“internal power unit”), you will need these tools:
   - A crane or lift truck that can lift the unit safely.
   - Shims and lag bolts – see the pit plan if the lift will be mounted in a pit. Concrete grout may be required, see figure 2.
   - A masonry drill and bit to drill the holes for the lag bolts.
   - A power supply with the specified voltage, including fuses or circuit breakers as specified in Figures 16 through 20.

If the power unit will be mounted away from the lift (“external power unit”), you will also need:

- A compressed air source for clearing the hydraulic lines.
- Extra hydraulic oil for flushing the underground lines and refilling the tank. See Table 1 for the oil specifications.

Positioning the Lift

6. Remove the shipping material and unskid the lift. On the front of this manual, write down the model number, serial number, and date the lift is placed in service. You can find the model number and serial number on the name plate as shown in Figure 10. You cannot see the name plate without lifting the table top. Use an overhead crane or fork truck to do this. Lift the hinged end of the table top.

7. Move the lift into position, supporting the base of the lift. Install the lift as shown in Figure 2. Unless the lift is mounted on casters, lag the lift to the floor.

⚠CAUTION

Do not hang the lift from the table top. This can damage the lift.

⚠WARNING

If the lift is mounted on an unstable surface, it may tip over when it is in use. You may be hurt, and the lift and load may be damaged.

If your lift has lifting eyes, as shown in Figure 3, use these when you move the lift. It is best to use a chain spreader, so the chain sections pull straight up. (You must supply the chain and spreader.) Remove the lifting eyes once you have positioned the lift.

NOTICE

Be sure to install the vented plug in the hydraulic tank, if not the pump may be damaged.

Table 1 – Hydraulic Oil Specifications

If the lift will be used at normal ambient temperatures, Southworth supplies the unit with Conoco AW 32 oil. This may be replaced by any other good quality oil with 150 SSU at 100° F and rust and oxidation inhibitors and anti-wear properties. If the lift will be used at ambient temperatures below 0°F, use aircraft hydraulic oil. Use Type 15 aircraft hydraulic oil.

The following are equivalent to CONOCO AW 32:

TYPE	MANUFACTURER
DTE 24	EXXON/MOBIL
NUTO H32	EXXON/MOBIL
AMOCO AW32	CHEVRON (AMOCO CO.)
AW32	CITGO

NOTICE

It is very important to keep the hydraulic oil free of dirt, dust, metal chips, water, and other contamination. Most of the problems with hydraulic systems are caused by contamination in the oil.

Hydraulic Connections

(External Power Units Only – If Internal Power Unit, proceed to step 10.)

8. Install the power unit. Install the hydraulic pressure and the vent line between the power unit and the lift as shown on the pit plan.

9. Blow out the hydraulic line with compressed air before connecting it to the power unit. Replace the solid plug on the hydraulic fluid tank with the vented plug supplied, then attach the vent line to the vented plug.

⚠WARNING

Be sure that the hydraulic line will not be pinched by the lift as it raises or lowers. If you allow the line to be pinched, the lift may not work properly. A hose may break, the lift table may drop suddenly, and someone may be hurt.

NOTICE

It is very important to keep the hydraulic oil free of dirt, dust, metal chips, water, and other contamination. Most of the problems with hydraulic systems are caused by contamination in the oil. Be sure to flush all hydraulic lines before connecting remote power units.

Electrical Connections

120 volt single phase lift will require a dedicated 20 amp circuit serving no other electrical devices.

Do not operate this lift with an extension cord.

⚠DANGER

The lift may use a power supply of up to 575 Volts AC. This voltage can kill you. Do not work with the electrical parts unless you are a qualified electrician.

10. Make temporary electrical connections to the lift, as shown in Figure 17 or 18 (for single-phase AC) or Figure 19 (for three-phase AC). This temporary set-up will allow you to raise the lift. (Some lifts may ship with a temporary use pigtail.)

⚠WARNING

The fusing requirements are shown in Table 2. To avoid fire danger, follow these requirements.

11. On a lift designed for three-phase AC, you must be sure the pump motor is turning in the right direction.

The lift table should start to move quickly when you press the “up” button. If the lift table does not move in 2 or 3 seconds, don’t try to operate the lift! If this does not correct the problem, see the troubleshooting instructions for additional information. ***Note: If lift is battery powered see page 12 for charger use information.***

NOTICE

If you have a unit designed for three-phase AC and you connect the power so the motor runs backwards, the lift will not operate, and you may damage the pump. Do not operate the lift for more than 2 or 3 seconds if you think the motor might be turning backwards.

12. Raise the lift and insert the maintenance devices, as shown in Figure 1.

13. Make the permanent electrical connections as shown in Figure 17 or 18 (for single-phase) or Figure 19 (for three-phase).

14. Check the level of the hydraulic fluid. On most models, when the lift is fully elevated, the oil should be about 3/4 inch above the bottom of the tank. Use a dipstick to check the oil level, and add oil as necessary. Do not fill tank when lift is raised.

Testing

15. Clear the area around the lift. Remove any loose wires, lumber, or other materials that might get in the way of the lift as it raises or lowers.

16. Remove the maintenance devices and warn others to stay away from the lift. Operate the lift through its full range of travel. The lift should rise smoothly with a quiet humming sound, and lower smoothly and quietly. Raise and lower the lift a few times to check the clearances around the lift table.

⚠WARNING

As the lift table moves up and down, “pinch points” are created at the places shown in Figure 6. If you are standing too close to the lift when it is moving, your arm or leg may be caught in the moving parts, and you may be hurt. Stay away from the pinch points when the lift is moving.

Preparing to Charge a Battery

1. Be sure area around the lift and battery is well ventilated while the battery is being charged.
2. Shut off Battery Disconnect if so equipped.
3. The battery terminals, connections, and wiring including the plug in the battery box and charger connections should be clean and free of corrosion. When cleaning any of these components wear a face shield or other suitable protective eyewear.
4. Read, understand, and follow all battery and battery charger manufacturer’s specific precautions while working with and/or charging batteries.

Locating the Charger

1. Locate the charger as far away from the battery as the cables permit above floor level.
2. Do not operate charger in a closed area or restrict ventilation in any way.

PRECAUTIONS FOR GROUNDING AND AC POWER CORD CONNECTION

Charger should be grounded to reduce risk of electric shock. The charger is equipped with an electric cord having an equipment-grounding conductor and grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

⚠DANGER

Never alter the AC cord or plug provided. If it will not fit the outlet, have a proper outlet installed by a qualified electrician. Improper connection can result in a risk of electric shock.

Completing Installation

17. Once you are sure the lift is positioned correctly, mark the locations of the lag holes in the base frame, and drill the holes. If necessary, insert metal shims to level the base of the lift. Insert and tighten the lag bolts to secure the lift. Grout under the base to prevent vibration and distortion of the base frame, as shown in Figure 2.

18. If the lift is lowering too quickly or too slowly, you can change the "down speed" by adjusting the flow control.

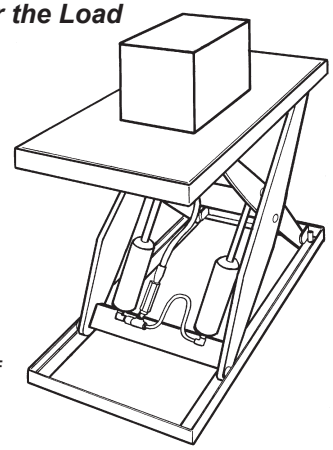
⚠WARNING

When adjusting the flow control, always raise the lift table and insert the maintenance devices, as shown in Figure 1. Do not try to adjust the flow control while pressing the "down" button. If you try this, the lift table may drop suddenly, and you may be hurt.

It is important that you follow these steps when adjusting the flow control:

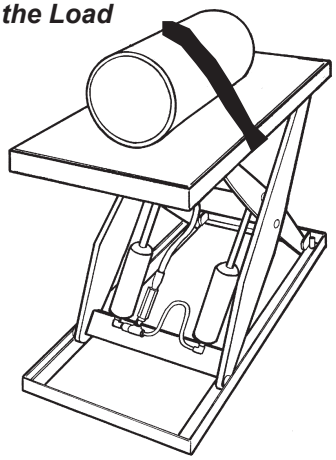
- **Raise the lift table and insert the maintenance devices**, as shown in Figure 1.
- If you want the lift to lower more slowly, turn the control clockwise up to 1/4 turn at a time. If you want the lift to lower more quickly, turn the control counterclockwise up to 1/4 turn. Do not move the control more than 1/4 turn at a time.
- Remove the maintenance devices, and check the descent speed.
- Every time you want to change the adjustment again, raise the table again and insert the maintenance devices as shown in Figure 1.

Figure 4 – Center the Load



Always place the load in the center of the lift table. Do not allow a load to be off centered or hanging off the side.

Figure 5 – Secure the Load



Note: If load can roll or move insert chocks or fasten the load.

19. Test the lift with the rated load. If the lift does not rise, and you hear a loud squealing noise, the pressure relief valve is operating. Contact Southworth for instructions.

⚠WARNING

Do not continue to use the lift if this happens – the pump will overheat very quickly, and may be permanently damaged. Do not try to adjust the relief valve. If you change the setting on the relief valve, you may overwork the lift. This can cause the lift to fail suddenly, and you may be hurt.

20. As a final step, clean up all spilled hydraulic fluid. Spilled hydraulic oil is slippery, and may present a fire hazard.

OPERATING INSTRUCTIONS

1. Before operating the lift, read and understand this entire section.

⚠DANGER

The lift may use a power supply of up to 575 Volts AC. This voltage can kill. Do not work with the electrical parts unless you are a qualified electrician!

2. Locate the lift on a firm, flat surface as shown in Figure 2. Stationary lifts should be lagged to the floor.

⚠WARNING

If you place the lift on a soft surface, it may tip over, especially when it is loaded or raised. Someone may be hurt, and the lift and load may be damaged.

3. Load the lift correctly.

- Be sure that the load weighs no more than the maximum rated for the lift. The maximum rated load is shown on the platform skirt.

⚠WARNING

Do not try to lift a load that exceeds the maximum rating. If you try this, the lift may fail suddenly. Someone may be hurt, and the lift and load may be damaged.

- Place the load in the center of the lift table, as shown in Figure 4.
- Do not try to load the lift while the lift table is moving.
- If you are lifting pipes or other objects which may be able to roll or move, fasten them down, or chock them as shown in Figure 5.

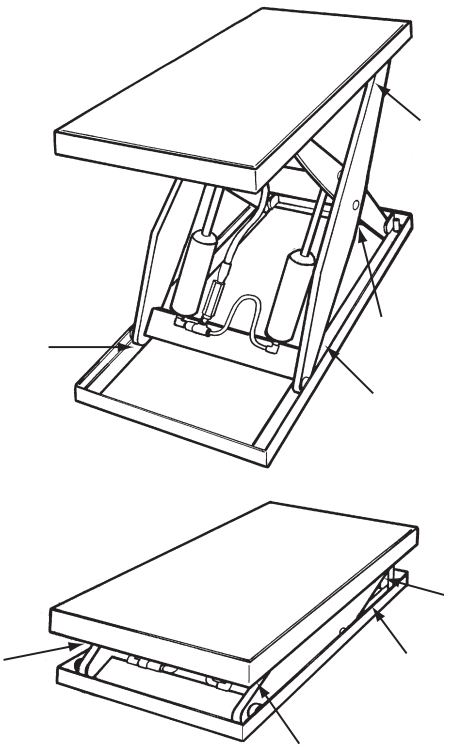


Figure 6 – Pinch Points

4. Be sure all workers are clear of the lift. Remove any lumber or other material which may fall onto the lift.

⚠WARNING

As the lift table moves up and down, "pinch points" are created as shown in Figure 6. Stay away from these pinch points! Part of your body or clothing may become caught, and you may be hurt.

5. To operate the lift., press and hold the "up" button to raise the lift, and "down" to lower it. If the lift does not operate right away, turn off the lift and call a qualified maintenance worker. If you hear a squealing noise from the pump, the pressure relief valve is operating. Do not continue to use the lift! The pump will overheat very quickly, and may be permanently damaged. The relief valve is included to protect the machine operators – do not change the relief pressure setting.

6. Wait until the lift table has stopped. Unload the lift.

⚠WARNING

The warning labels on the lift are there for your safety. If you find that the labels are worn or missing, or have been painted over, ask Maintenance to replace the labels before you use the lift. The labels are shown in Figures 7 and 8.

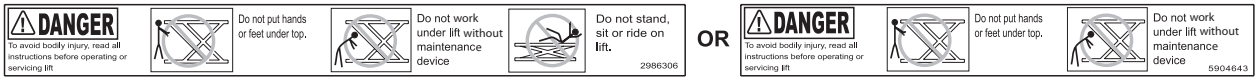
If your machine is equipped with a flush mount turntable:

⚠WARNING

Do not drop the load on the turntable. If you do this while the turntable is moving, the load may shift. You may be injured, or the mechanism may be damaged.

Stay clear of the turntable while it is rotating. As the pallet turns, a part of the load may rotate around and hit you.

PLATFORM PRECAUTIONARY DECALS



FOR NON-PERSONNEL LIFTS LOCATE ITEM NO. 2986306 ON PLATFORM SIDES.
NOTE: USE ON STANDARD PLATFORMS.

FOR PERSONNEL LIFTS LOCATE ITEM NO. 5904643 ON PLATFORM SIDES.

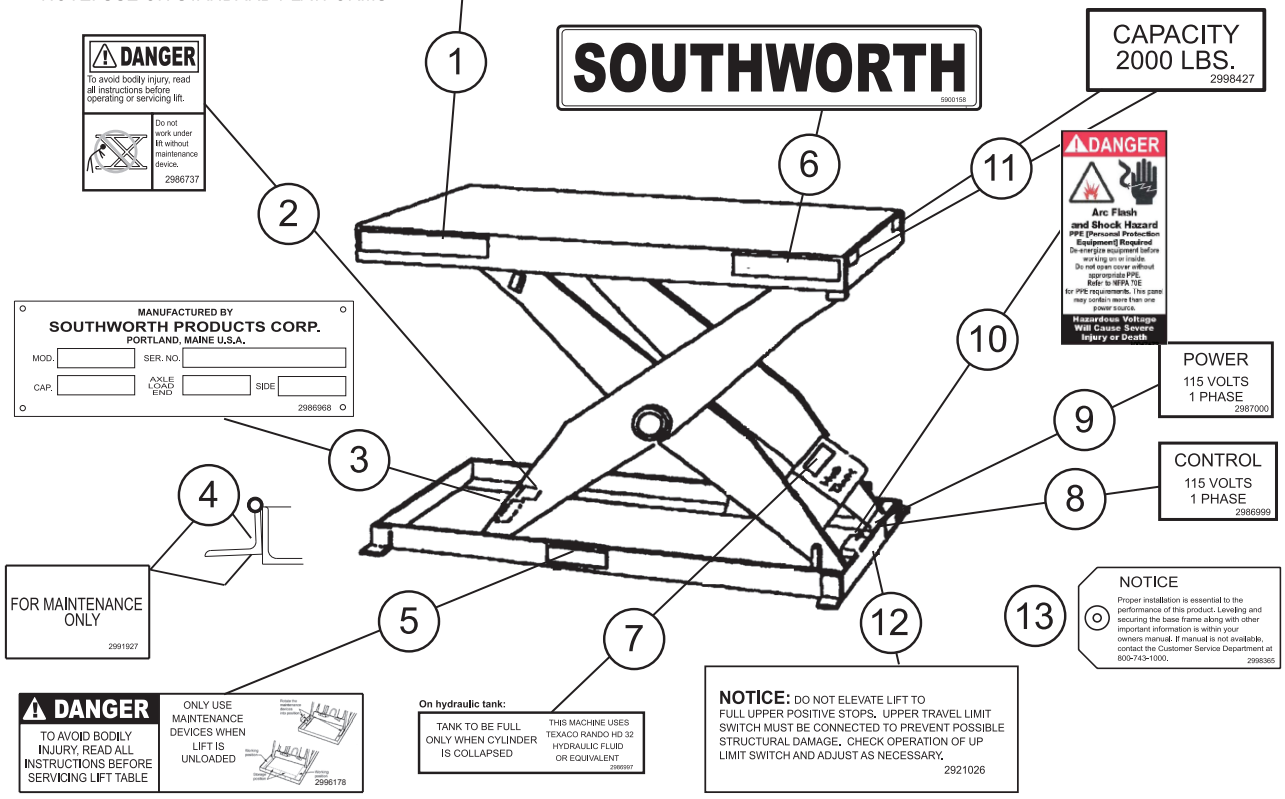


Figure 7 – Labels and Precautionary Markings (straight skirt and bevel toe guard platforms)

Item	Part#	Location
*1	2986306	On both sides of platform
	or	(use for standard platforms)
	5904643	On both sides of platform (use for platforms with handrails)
2	2986737	On lower strongback between legs
3	2986968	On lower strongback between legs
4	2991927	On both sides of maintenance devices, both sides of base
5	2996178	On both sides of base, as close to maintenance device as possible
*6	5900158	On both sides of platform
7	2986997	On hydraulic tank
8	Control decals:	
	2986999 (115/1/60)	2986998 (24/1/60)
	5900167 (110/1/50)	5900166 (24 VDC)
	Place one decal on base end plate, where the control wire exits the base.	
9	Power decals:	
	2987000 (115/1/60)	2991783 (12VDC)
	5900160 (230/1/60)	5900161 (24VDC)

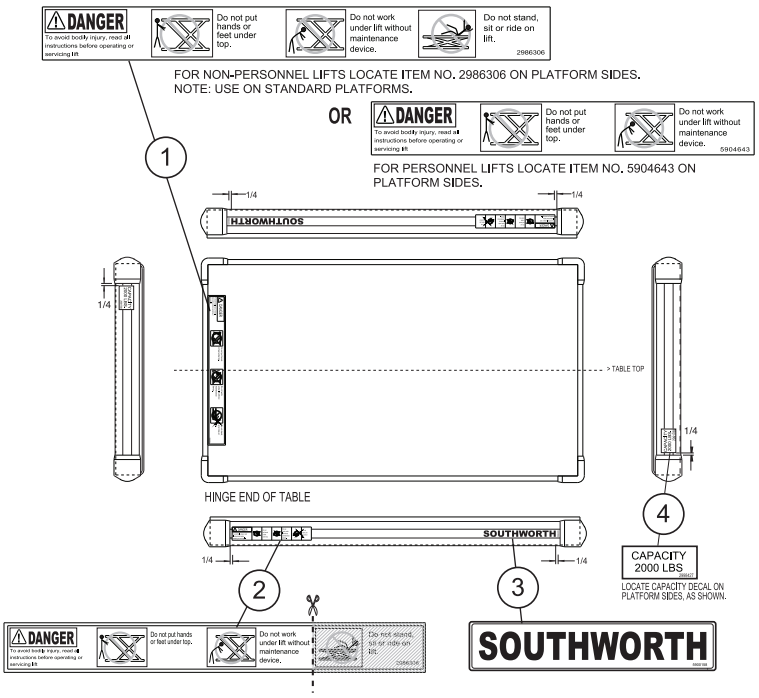
Item	Part#	Location
9	2987001 (208/3/60)	5900163 (110/1/50)
	2987002 (230/3/60)	5900164 (220/1/50)
	2987003 (460/3/60)	2999416 (380/3/50)
	5900162 (575/3/60)	5900165 (415/3/50)
	Place one decal on base end plate, where power wire exits the base.	
10	10047672. On junction box cover (alt: base end plate)	
*11	Capacity decals:	
	2998433 (500#)	2998437 (3500#)
	2998425 (1000#)	2998426 (4000#)
	2998434 (1500#)	2998442 (5000#)
	2998427 (2000#)	2998428 (6000#)
	2998435 (2500#)	5900159 (Other)
	2998436 (3000#)	
	Place decals on platform ends, two per end.	
12	2921026	Machines with up limit only: Locate on end of base.
13	2998365	Fasten to flow control located on the hydraulic arrangement.

Note: If tabletop has comfort edge refer to figure 8 on the next page. Use other decals and locations in place of the ones above with an asterisk "*" in front of their number.

Figure 8 – Labels and Precautionary Markings for Comfort Edge Tabletops

Tabletops with Comfort Edge Kits

Item	Part#	Location
1	2986306.....	On end of tabletop as shown on machines without handrails or
	5904643.....	On end of tabletop as shown on machines with handrails
2	2986307.....	One on each side as shown. Cut off last picture and word message if tabletop has handrail.
3	2998429.....	One on each side as shown.
4	Capacity decals: On platform ends, one per:	2998433 (500#) 2998425 (1000#) 2998434 (1500#) 2998427 (2000#) 2998435 (2500#) 2998436 (3000#) 2998437 (3500#) 2998426 (4000#) 2998442 (5000#) 2998428 (6000#) 5900159 (Other)



Maintenance Warnings

⚠WARNING

If you are going to repair the center pivot pins and bushings, you must support the lift table in a special way. Each set of leg plates, on both sides of the unit, must be clamped together firmly, using large C-clamps. You cannot use the maintenance devices shown in Figure 1 – with the pivot pins removed, they will not support the table top. If you do not support the lift table correctly, the top may drop suddenly when you remove the pivot pins. Please contact Southworth for instructions.

If a hydraulic fitting becomes loose, or if a hydraulic hose breaks, the hydraulic fluid may escape from the system under pressure. If the lift is raised when this happens, it can drop quickly. Someone may be hurt, or the lift or load may be damaged.

NOTICE

It is important to use hydraulic fluid with the correct grade and properties. See the hydraulic oil specification in this manual, Table 2.

If you continue to use fluid after it has "worn out," the moving parts in the system will wear more quickly.

MAINTENANCE

All servicing should be done by qualified personnel. Qualified personnel should be able to read and understand wiring and hydraulic diagrams. They should be able to troubleshoot live electrical circuits safely and in accordance with accepted practice. **For safety's sake**, if in doubt, please contact your dealer or Southworth's Customer Service Department at (207) 878-0700 or (800) 743-1000. Before servicing the lift, read and understand this entire section and the section entitled "Operating Instructions."

Hazards

There are several hazards you should be aware of as you service the lift:

⚠ DANGER

The lift may use a power supply of up to 575 Volts AC. This voltage can kill. Do not work with the electrical parts unless you are a qualified electrician!

⚠WARNING

- **As the lift moves up and down, "pinch points" are formed as shown in Figure 6. Keep hands, feet, and loose clothing away from these pinch points. If your hand or arm or a part of your clothing is caught, you may be hurt.**

- **A falling lift can cause severe personal injury. Before working under the lift remove any load from the platform, raise the lift and insert the maintenance devices, as shown in Figure 1. Do this every time you work under the lift!**

⚠WARNING

- **Do not change the setting on the relief valve. If you do change the setting, this may cause a hydraulic part to fail. The lift may drop suddenly. Someone may be hurt, and the lift and the load may be damaged. The hydraulic parts in the lift are designed to handle a certain amount of pressure. The relief valve is set to relieve this pressure before it becomes too great. The relief valve has been included for the protection of all of the workers who use the lift.**

- **Release of fluids under high pressure can cause personal injury. Before you open any part of the hydraulic system, be sure to release the hydraulic pressure, see page 7, item 5.**

- **The warning labels on the lift are there for the safety of the operators. See Figures 7 and 8. If the labels are worn or missing, or have been painted over, replace them before releasing the lift for operation.**

If the lift will not raise:

NOTICE

Do not continue to hold the "up" button for more than 2 or 3 seconds. You may damage the pump.

⚠WARNING

Do not change the relief valve setting. This valve has been included for the protection of workers who install, use, or service the lift. If it is ever necessary to repair or reset the valve, contact Southworth Products Corp. for instructions.

⚠WARNING

It maybe necessary to electrically by-pass the up limit switch to place the lift on the chocks. Ensure that doing so will not operate the switch beyond its arms physical limits. This needs to be done by qualified maintenance personnel. If electrical by-pass is not possible the up limit switch needs to be moved in order to place the unit on the maintenance devices, then the lift platform and legs will need to be supported before working on the switch, support the top and leg sets with a crane, fork truck or blocking from the floor to table top. Ensure switch is properly reinstalled any any electrical by-pass is removed before operating the lift. Any final adjustment of limit switch needs to occur with the legset and platform supported whil working under the lift. If you do by-pass or remove the switch, when the lift platform moves up, it may not stop at the

correct point. If the platform rises above the normal stopping point, the frame of the unit may be damaged. People working nearby may be hurt.

NOTICE

If cavitation is allowed to continue, the pump may be damaged, and may have to be replaced.

If the lift elevates, but fails to hold a load:

⚠WARNING

Failure to insert the maintenance devices may result in damage to the lift and severe personal injury!

If the lift fails to lower:

⚠WARNING

Failure to insert the maintenance devices may result in damage to the lift and severe personal injury!

⚠DANGER

Do not try to adjust the flow control while pressing the "down" button. If you try this, the lift table may drop suddenly, and you may be hurt.

TROUBLESHOOTING WARNINGS

All servicing should be done by qualified personnel. Qualified personnel should be able to read and understand wiring and hydraulic diagrams. They should be able to troubleshoot live electrical circuits safely and in accordance with accepted practice. **For safety's sake**, if in doubt, please contact your dealer or Southworth Products Corp. Before servicing the lift, **read and understand this entire section and the section entitled "Operating Instructions."**

WARNING!
Before working underneath the lift, always raise the lift and insert the maintenance devices, as shown in Figure 1. Failure to do so may result in damage to the lift and severe personal injury!

Routine Periodic Maintenance

Suggested Preventative Maintenance Schedule (ensure that lift is properly chocked as required.

Weekly	Inspect leg rollers, center pivot pins and bushings, leg hinge pins and bushings for evidence of wear. loose bolts or broken cotter pins or keepers. Repair or replace as required.
Monthly	Apply a light oil or PTFE lubricant to non-greased pivot points or rollers described above.
	Check the appearance of the hydraulic fluid.
	Check all the hydraulic fittings and hoses.
	Make all weekly checks, check limit switch if applicable.
Every 6 months or 500 hours of operation	Check all the hydraulic fittings and hoses, and repair the connections.
	Inspect cylinder return line and rod. Appearance of considerable fluid in the vent lines indicates a need to repack the cylinder.
	Disassemble the down valve. Blow the plunger clean wih compressed air. Reassemble and install.
	Change oil in reservoir, clean the suction screen and vent cap. Replace pressure line or return line filter element.
	Make all weekly, and monthly checks, check all electrical connections..
	NOTE: If bushings at the main pivot points are neglected and allowed to oblong, major structural prolems will develop and extensive repairs will be needed.
Minimum Required Maintenance for Units with High Cycle Package	Every 10,000 cycles, visually inspect the entire lift. Replace all worn or broken parts. Lubricate all pivot points and clean the roller track.
	Every 30,000 cycles, visually inspect the entire lift. Check the motor starter contacts and limitswitches. Clean and lubricate all pivot points. Inspect for worn or broken parts, and replace as necessary.
	Every 90,000 cycles, visually inspect the entire lift. Check the hydraulic tank and the hydraulic lines. Clean and lubricate all pivot points. Inspect for worn or broken parts, and replace as necessary. Repack the cylinder(s), and replace the hydraulic oil and filter.
	NOTE: If lubrication points will not take grease, ensure that the load has been removed from the platform, and ensure the grease fittings are not plugged and will take grease, or the weight of the lift may need to be removed from the greaseable joint. A fork truck or overhead crane may be necessary to remove any weight off of the greaseable joints. Contact Southworth's Service Department for further instructions if the machine is still unable to accept grease.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	CHECK THIS
Lift will not raise	Weight of load too heavy	Check the actual weight of the load
	Motor not running	Check the main disconnect switch, fuses, and wiring to the motor. A 20 amp, designated braker must be supplied for 115 single phase.
	Motor runing but not moving (three phase)	Swap any two phases
	Hydraulic oil level low	When lift is raised as far as possible, oil level should be 3/4" from bottom of tank. When lift is down, 3/4" from top. Ensure chocks on lift before working under it.
	Lift has reached its upper limit	Upper limit switch may need to be adjusted
	Motor may be "single phasing"	If motor hums but does not turn, check motor wiring and line fuses.
	Motor voltage too low	Supply voltage should be +/- 5% of the rating aor single phase and 10% for 3 phase units.
	Tank vent plugged	If supplied, remove solid plug from tank, insert vent plug.
	Suction filter clogged	Clean suction filter as described in periodic maintenance
	Vacuum leak in suction line	Check all fittings in suction line
	Down valve may be energized	Check wiring to down valve, and solenoid in the valve
	Missing coupling	Check to insure the coupling has been installed between the pump and motor as required by pump, see figure 15.
The lift fails to hold	Down valve may be leaking	Remove down valve and inspect for debris which may be preventing it from closing.
	Down valve may be energized	Check the solenoid in the valve with a volt meter.
	Cylinder may be leaking	Check for oil in cylinder in the vent line.
Lift will not lower	Down valve may be de-energized	Check the solenoid in the valve with a volt meter
	Flow control needs adjustment	Adjust flow control as needed
Lift raises too slowly	Voltage may be low	Check voltage at motor to ensure proper voltage is being supplied
	Foreign material clogging suction filter, breather cap or pressure line	Remove necessary components and clean
	Pump may be overheating due to insufficient oil	Check oil level and oil viscosity
Lift lowers too slowly	Down valve may not be fully open or stuck closed	Remove down valve and clean
	Flow control may need adjustment	Adjust flow control as needed

If the steps listed above do not solve the problem, please call the Southworth's Customer Service Department.

ORDERING REPLACEMENT PARTS

Southworth has carefully chosen the components in your lift to be the best available for the purpose. Replacement parts should be identical to the original equipment. **Southworth will not be responsible for equipment failures resulting from the use of incorrect replacement parts or from unauthorized modifications of the machine.**

Southworth will gladly supply you with replacement parts for your Southworth lift. Key parts are identified in Figures 8 through 15. With your order, **please include the model number and the serial number of the lift.** You can find these numbers on the name plate, which is located on the crossbar at the base of the cylinder(s). When you are ordering parts for a cylinder, also include the cylinder number. This is stamped on the base of the cylinder housing.

To order replacement parts, please call the Parts Department.

Parts are shipped subject to the following terms:

- FOB factory
- Returns only with the approval of our parts department.
- Payment net 30 days (except parts covered by warranty).
- Freight collect (except parts covered by warranty).
- The warranty for repair parts is 30 days from date of shipment.

Parts replaced under warranty are on a “charge-credit” basis. We will invoice you when we ship the replacement part, then credit you when you return the worn or damaged part, and we verify it is covered by our warranty. Labor is not covered under warranty for Parts orders.

Parts Department
Southworth Products Corp.
Telephone 207) 878-0700 or (800) 743-1000
FAX : (207) 797-4734
repairparts@SouthworthProducts.com
www.SouthworthProducts.com

Many procedures for replacement parts can be found on our website.
www.SouthworthProducts.com/Parts

Table 2 – Electrical Interface, Supplied by Customer

Motor Voltage	Required Fuse 1.0 HP Motor	Required Fuse 3.2 HP Motor	Wire Gauge
*115/1/60	20 AMP	—	12 AWG
208/1/60	20 AMP	—	12 AWG
240/1/60	20 AMP	—	12 AWG
208/3/60	10 AMP	12 AMP	14 AWG
240/3/60	10 AMP	10 AMP	14 AWG
480/3/60	5 AMP	5 AMP	14 AWG
575/3/60	5 AMP	5 AMP	14 AWG

** This lift requires a dedicated 20 amp circuit servicing no other electrical devices. Do not operate this lift with an extension cord.*

Figure 11 – Parts Identification View of Motor and Pump

(The layout of components varies from model to model)

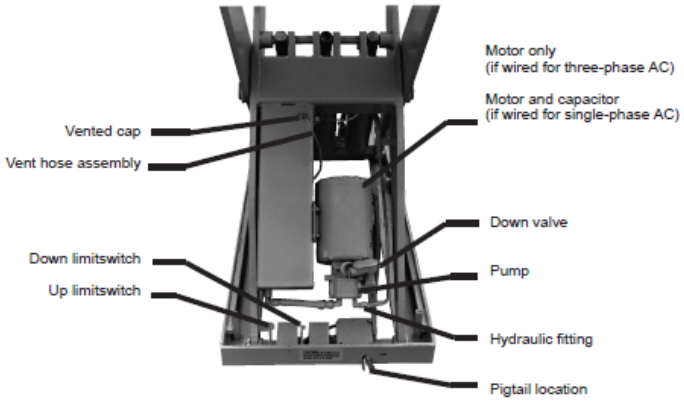


Figure 12 – Parts Identification, LS-2 Models

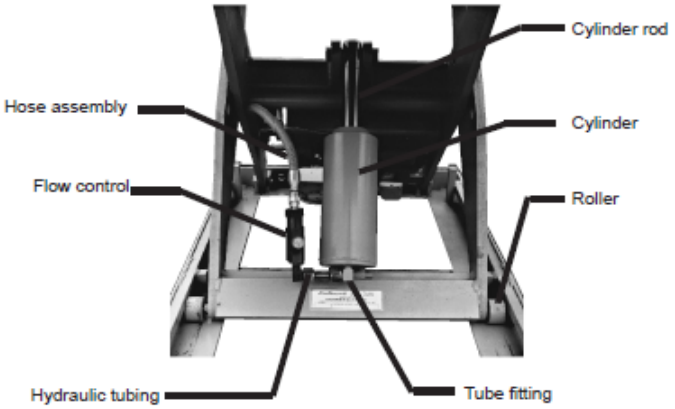


Figure 13 – Parts Identification, LS-4 Models

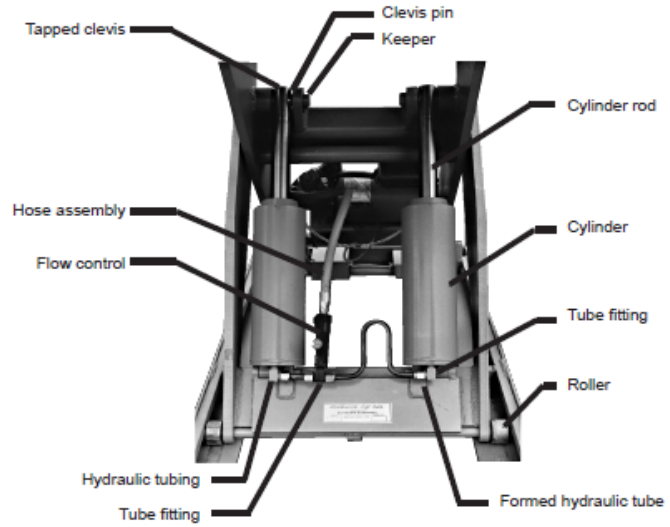


Figure 14 – Parts Identification, LS-6 Models

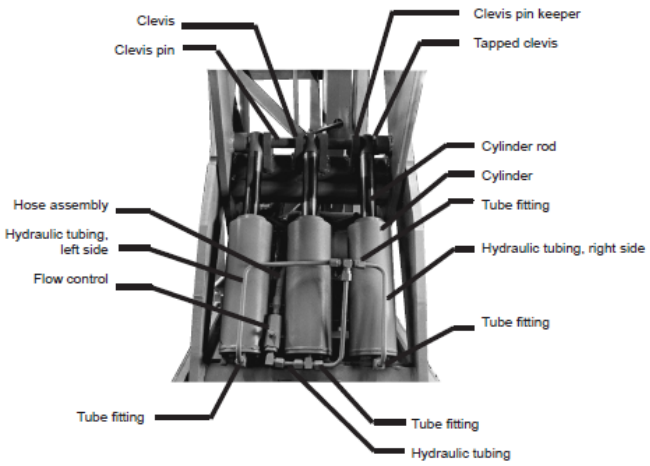
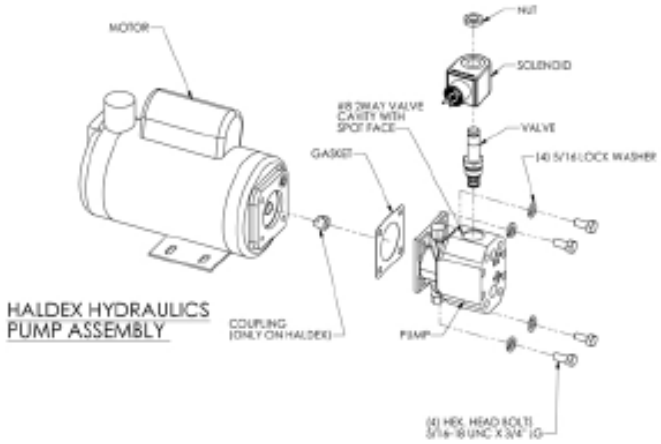
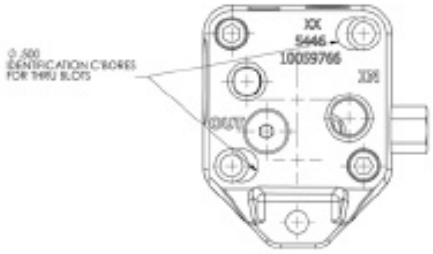
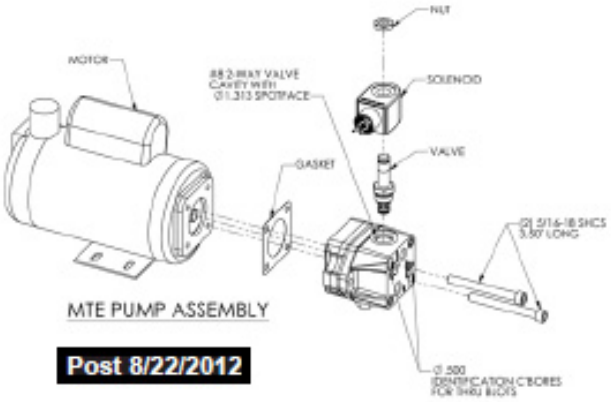


Figure 15 – Hydraulic Pump and Down Valve



Pre 8/22/2012



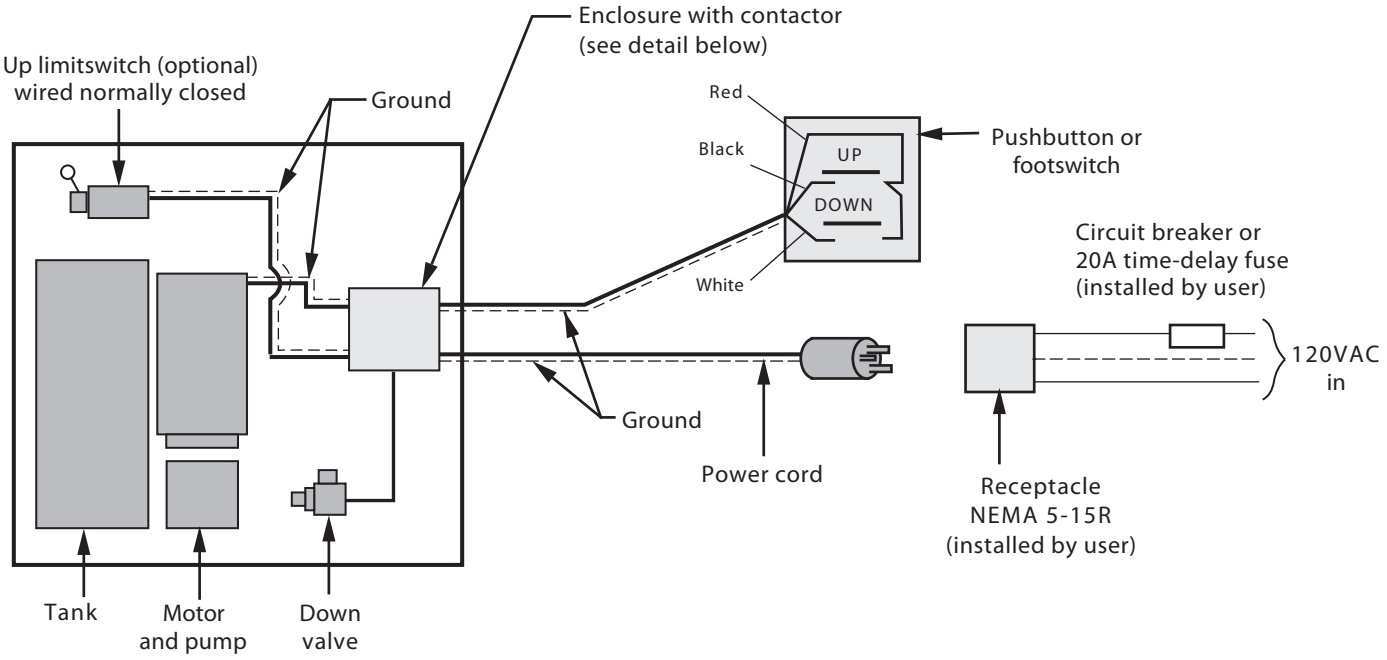


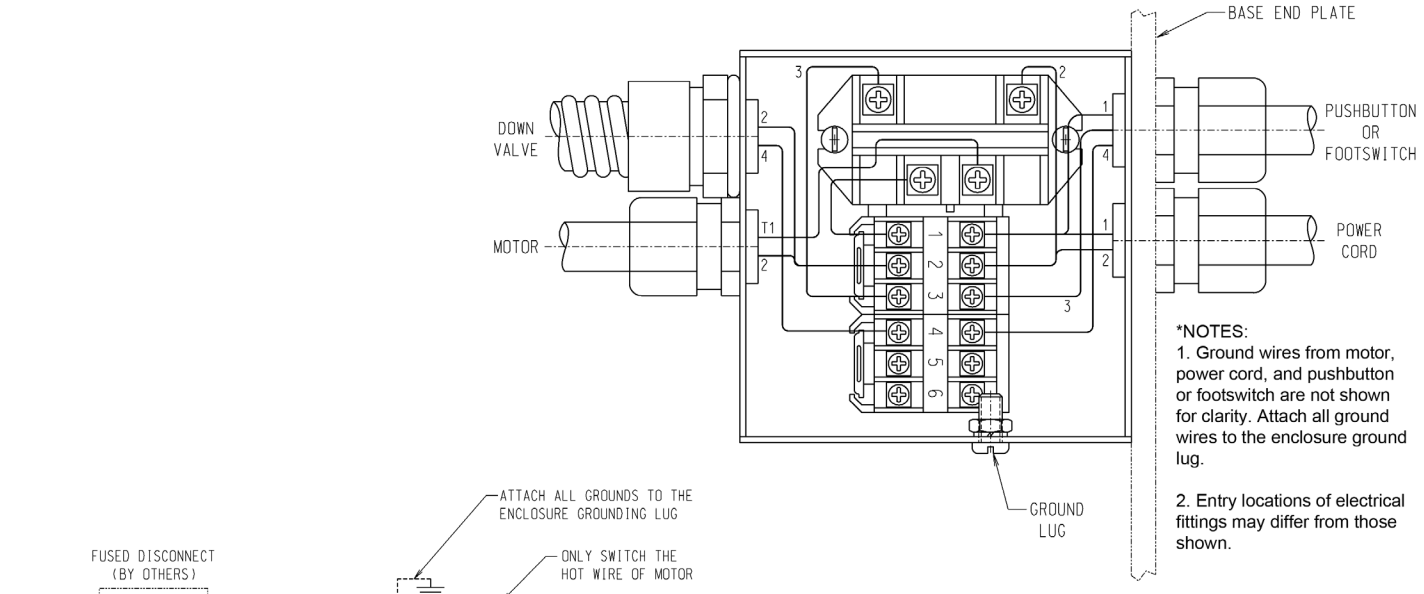
Post 8/22/2012

Electrical Connections for Single-Phase AC

Figure 16 – Electrical Connections, Lifts Wired for Single-Phase AC

Connections shown above are for lifts operating on 120 VAC. For lifts operating on 230 VAC, a NEMA L6-15R receptacle is required. The pump, motor, and down valve may be mounted on the lift unit itself (internal power unit) or in a separate location (external power unit). Note: Lift structure to be grounded, see ground lug in J-Box in drawings below.





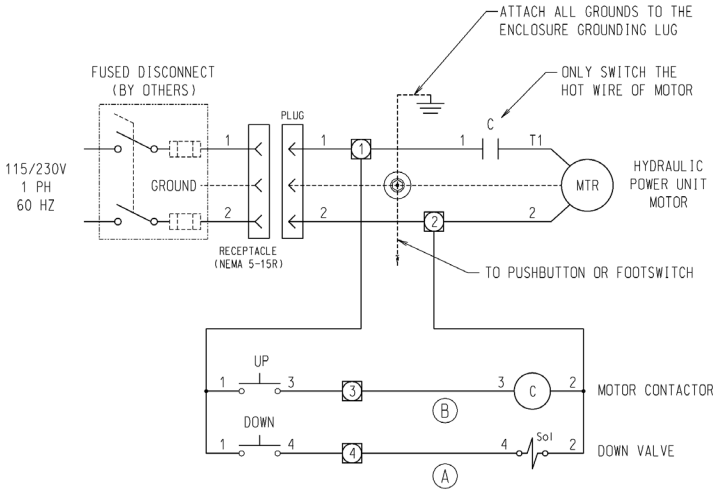
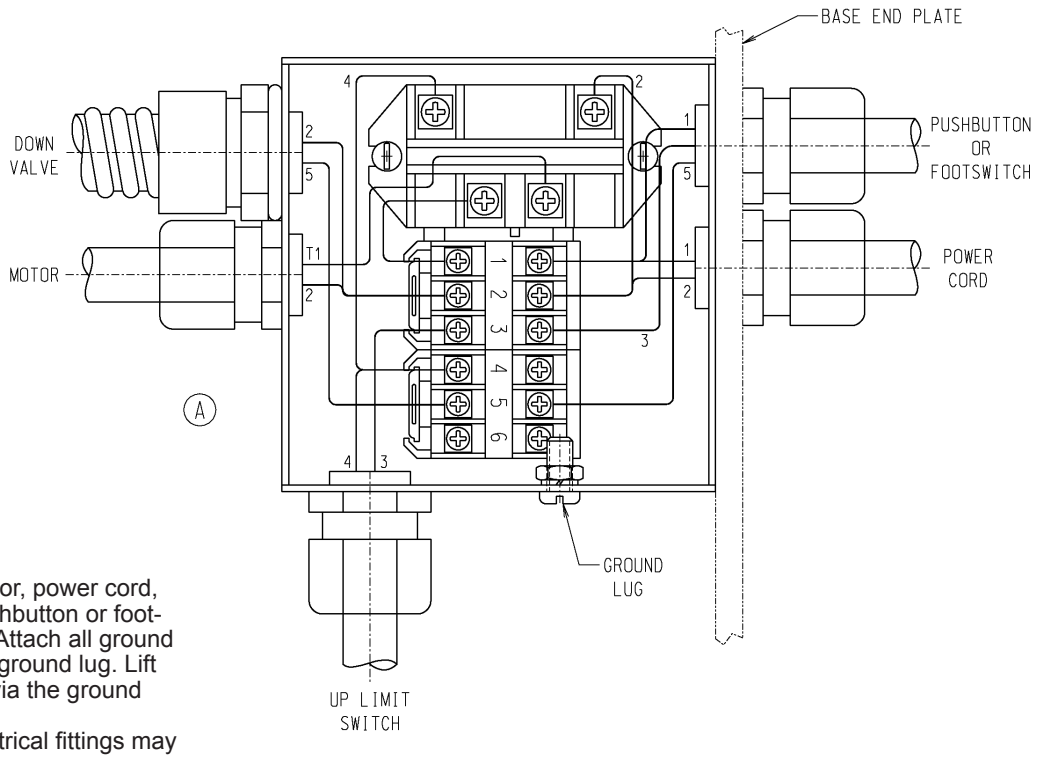


Figure 17 – Wiring Diagram, Lifts Wired for Single-Phase AC – without limit switch

Electrical Connections for Single-Phase AC, continued



*NOTES:
1. Ground wires from motor, power cord, up limit switch and pushbutton or foot-switch are not shown. Attach all ground wires to the enclosure ground lug. Lift structure is grounded via the ground lug.
2. Entry locations for electrical fittings may differ from those shown.

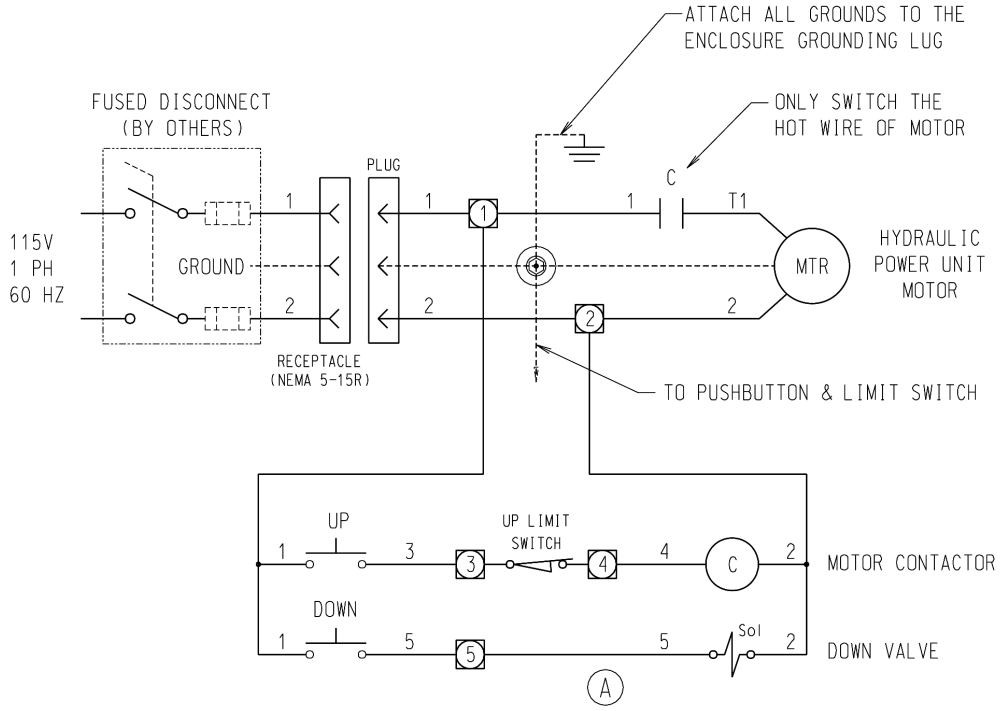
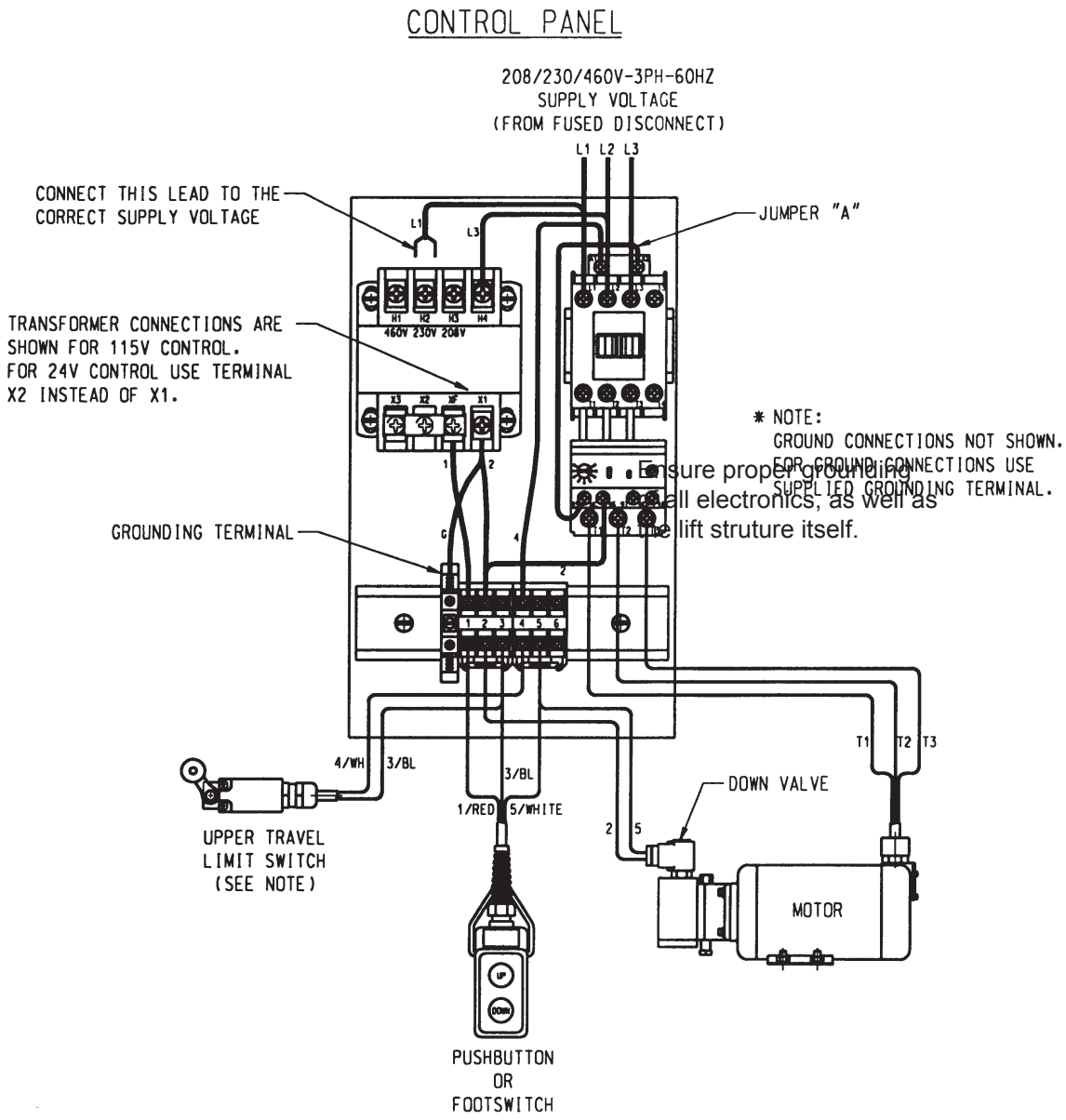


Figure 18 – Wiring Diagram, Lifts Wired for Single-Phase AC – with up limit switch

Electrical Connections for Three-Phase AC



Ensure proper grounding
all electronics, as well as
lift struture itself.

Figure 19 – Electrical Connections, Lifts Wired for Three-Phase AC

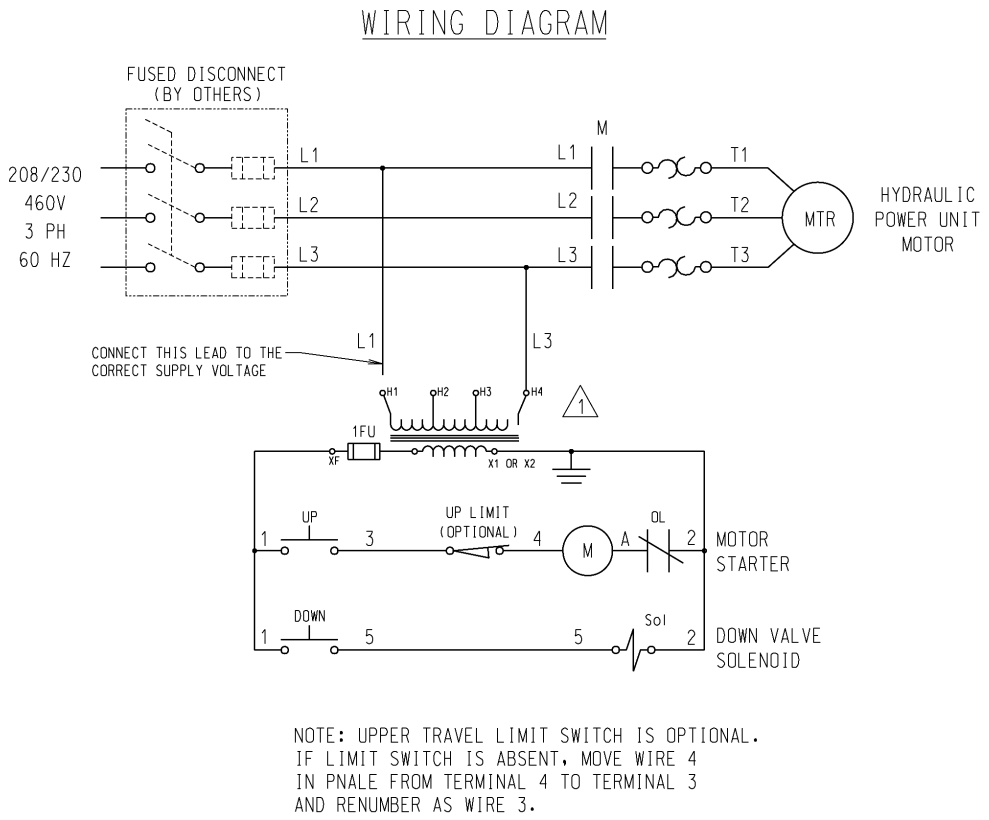
Connect the power ground control wiring to the proper terminals located in the control panel. The pump, motor and valve may be mounted on the lift unit itself (internal power unit) or in a separate location (external power unit). The control panel may be wall mounted.

CAUTION!

If on power-up the motor rotates in the wrong direction, don't continue to operate the lift. You may damage the pump. To correct the problem, interchange any two of the motor leads (T_1, T_2 or T_3).

Electrical Connections for Three-Phase AC, continued

Figure 20 – Schematic, Lifts Wired for Three-Phase AC



Note: Ensure lift structure is grounded per electrical code requirements as required by lift electrical configuration, i.e. lift contains mounted electrical components.

Figure 21 – Hydraulic Connections

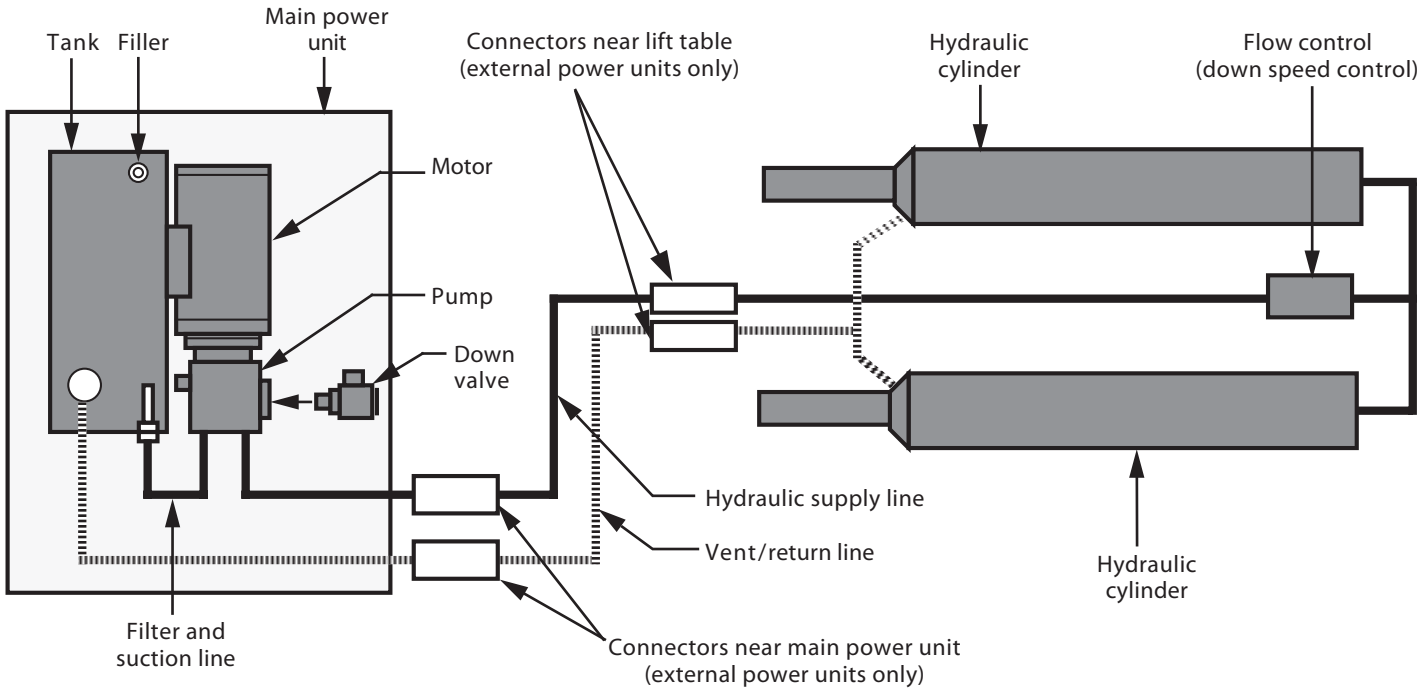


Figure 22 – Hydraulic Diagram - Unit Powered by Electric Motor

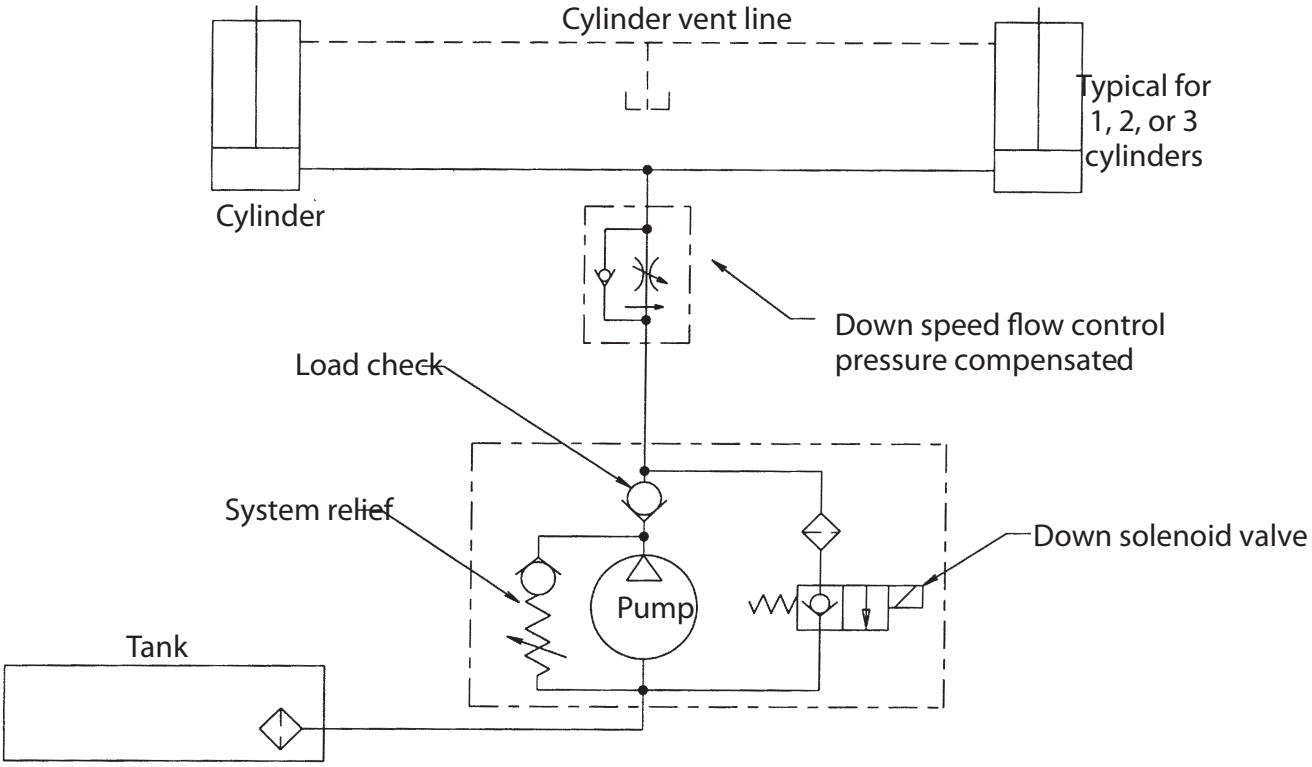
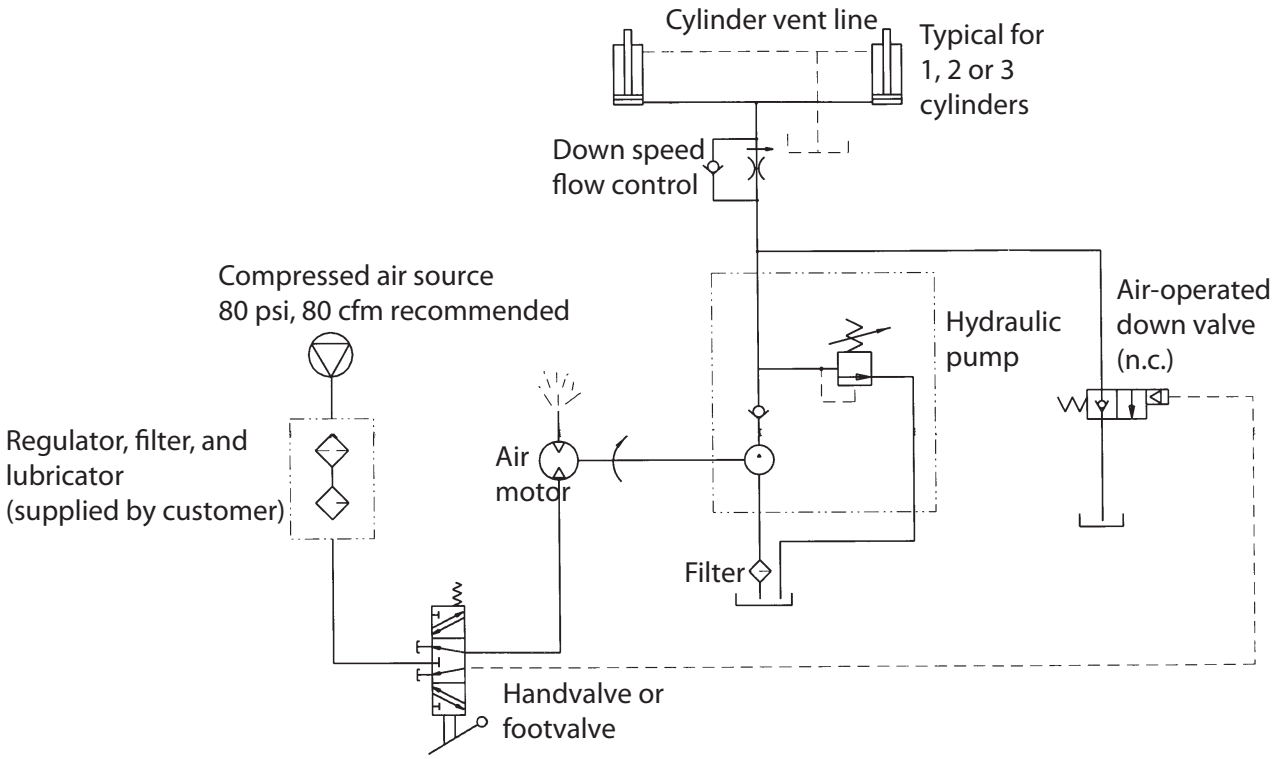
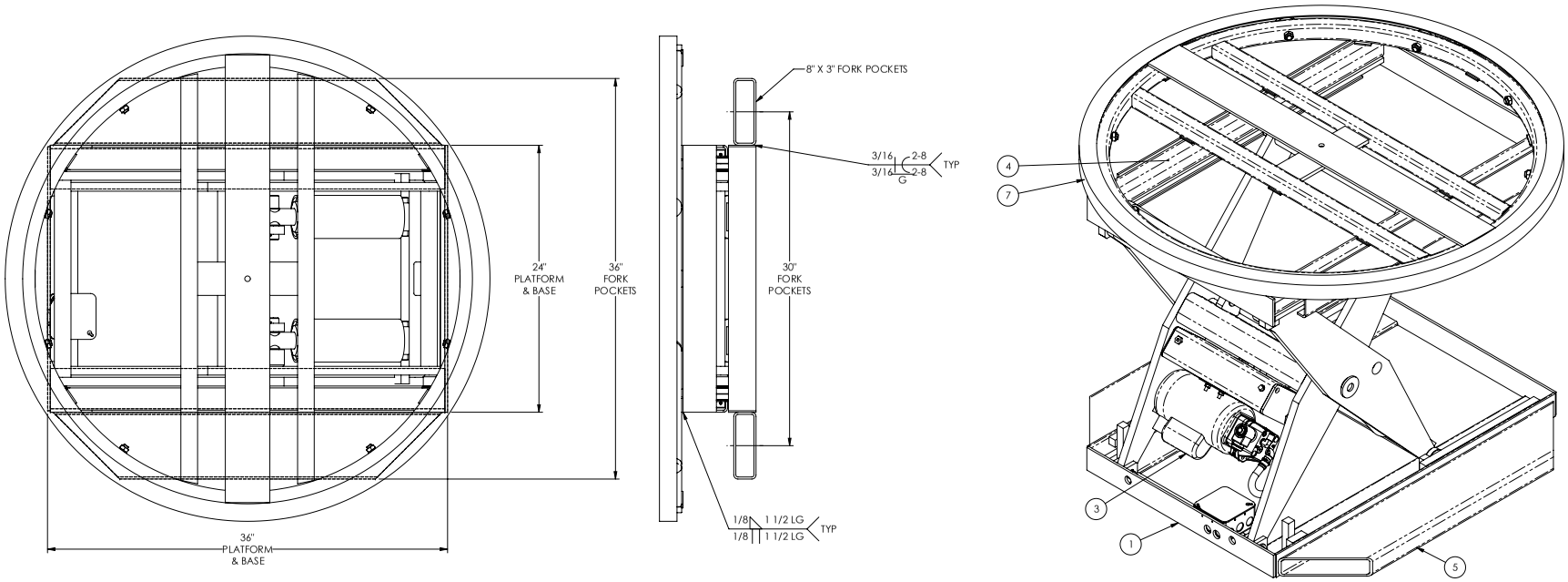


Figure 23 – Hydraulic Diagram - Unit Powered by Air Motor





GENERAL DESCRIPTION:
1. MODEL: PPH4-24
2. CAPACITY: 4,000 LBM UNIFORM LOAD.
3. ELEVATING TIME: APPROX. 28 SECONDS.
4. LOWERING TIME: ADJUSTABLE W/ PRESSURE COMPENSATED FLOW CONTROL.
5. POWER UNIT: INTERNAL 1.0 HP.
6. PRIMARY VOLTAGE: 220/1/50.
7. CONTROL VOLTAGE: 220/1/50.
8. FINISH: RED MACHINERY ENAMEL WITH TURNTABLE RING AND FORK POCKETS PAINTED SAFETY YELLOW. CAUTION TAPE ON FORK POCKETS.

MANUFACTURING NOTES:
1. RELOCATE FLIP STYLE MAITENANCE CHOCKS ABOVE FORK POCKETS.
2. SERIAL TAGS NEED TO HAVE ENGRAVED ON THEM:
   - WHERE UNITS ARE MADE
   - COUNTRY OF ORIGIN

END USER NOTES:
1. MANUFACTURED BY SOUTHWROTH PRODUCTS, PORTLAND, MAINE, USA NAME PLATE LOCATED ON LOWER STRONGBACK.

ITEM NO.	QTY.	U/M	DESCRIPTION	PART NO.
10		REF	EL WIRING DIAG 115/230 AC NO XFMR	60002817
9		REF	HY PLUMBING SCHEMATIC	3007039
8	1	EA	LD DCL 2.00X3.00 SOUTHWORTH SERIAL ID BL	10079929
7	1	EA	ACT TNT ASSY PPAL 4000# 43.62D	60025620
6	1	EA	EL FS UP/DN STD CONINT 892-2460-06	3032144
5	2	EA	MMP TRC STEEL 6.00X2.00X.12X35.00 SIDE T	2985683
4	1	EA	TP PF LIFT 24.00X36.00 STR LSX-24	60012444
3	1	EA	HY PU I 115V 1P 1.0HP .85GPM .56UGAL	60060639
2	1	EA	HY ARR I LS4-24 3P 1.0HP 24W	3001920
1	1	EA	BA B&L ASSY LSX-24 610.00X914.00	60021325

STATUS: Released

3RD ANGLE PROJECTION

FRACTIONS ± 1/8
XXX ± .005
XX ± .02
ANGLES: ± 1°
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES

PROJECT: 96515-1

USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

06328 CAGE CODE

SOUTHWORTH PRODUCTS CORP.
P.O. Box 1380 Portland Maine 04104-1380

DR. /BCH DATE 12/29/
WT. 547 LB SCALE 3:16
REF 45003878

TITLE: TL PPH4-24 24.00X36.00 220I FS TNT

DWG NO. 45006221

SIZE D MODEL SHEET 1 OF 1

Figure 23 – PPH4-24 24.00X36.00 220I FS TNT

TWO YEAR WARRANTY

Southworth Products Corp warrants this product to be free from defects in material or workmanship for a period of 2 years of single shift usage from date of shipment, providing claim is made in writing within that time period. This warranty shall not cover modified designs for special applications, failure or defective operation caused by misuse, misapplication, negligence or accident, exceeding recommended capacities, failure to perform required maintenance or altering or repairing, unless alteration is authorized by Southworth Products Corp. Except as set forth herein, there are no other warranties, express or implied, including the warranties of merchantability and fitness for a particular purpose, all of which are hereby excluded.

All batteries have a 90 day parts and labor warranty, this warranty covers any defects in material and workmanship from the date of shipment.

Southworth Products Corp makes no warranty or representation with respect to the compliance of any product with state or local safety or product standard codes, and any failure to comply with such codes shall not be considered a defect of material or workmanship under this warranty. Southworth Products Corp shall not be liable for any direct or consequential damages arising out of such noncompliance.

Southworth Products Corp's obligation under this warranty is limited to the replacement or repair of defective components at its factory or another location at Southworth Products Corp's discretion. The Southworth Warranty is for product sold with in North America. For products shipped outside of North America the warranty will be for replacement of defective parts only. Labor is not included. This is buyer's sole remedy. Except as stated herein, Southworth Products Corp will not be liable for any loss, injury or damage to persons or property, nor for direct, indirect, or consequential damage of any kind, resulting from failure or defective operation of said product.

This warranty may be altered only in writing by Southworth Products Corp, Portland, Maine.

BARRON
EQUIPMENT COMPANY INC.
OVERHEAD DOORS

Barron Equipment Inc.

4710 N Brady St., Davenport, IA 52806

Telephone: (563) 391-1052 or (800) 397-6690

Fax: (563) 391-1321

www.barroneq.com

Email: sales@barroneq.com