



Hydraulic Elevating Cart BZ-BDSL Series

IMPORTANT INFORMATION

The information in our literature is accurate at the time of printing, but it could change the next day due to improvements and or changes in our products. Be very specific about your needs and do not assume travel, speeds, physical sizes, and voltage etc. or anything required by your customer as standard. Only the quote that you receive from our sales department, is the product that you will receive.

Make sure it's correct!

We are proud of our warranty and absolutely stand behind it. We require you to read it and understand our obligations and the obligations that are your responsibility.

It's BEACON's goal to stand behind all of the equipment that we build and we expect that you, the dealer, will support our position as BEACON will support you. Truthful, accurate and detailed information helps to expedite all warranty issues.

Thank you and we appreciate your business.

**BDSL, BTSL & BQSL
Series
Industrial Lifts**

**Service & Parts
Manual**



**BEACON INDUSTRIES INC.
12300 OLD TESSON RD.
ST. LOUIS, MO 63128**

Table of Contents

GETTING STARTED, INSPECTION, SAFETY DEFINITIONS, & SAFETY INSTRUCTIONS	3
RESPONSIBILITIES OF OWNERS/USERS.....	6
FUNCTIONAL DESCRIPTION.....	8
SCISSOR BLOCKING INSTRUCTIONS FOR BDSL, BTSL & BQSL	8
INSTALLATION INSTRUCTIONS: SURFACE MOUNTED LIFT	10
INSTALLATION INSTRUCTIONS: PIT MOUNTED LIFT.....	15
OPERATING INSTRUCTIONS.....	17
ROUTINE MAINTENANCE.....	18
LIMIT SWITCH ADJUSTMENTS.....	20
HYDRAULIC SECTION	20
ELECTRICAL SECTION (MODELS WITH 1 HP)	27
ELECTRICAL SECTION (MODELS WITH 5 HP).....	35
TROUBLE SHOOTING.....	52-53

Figures

1a-1b-1c – BDSL , BTSL & BQSL (STANDARD)	5
2 – GENERAL LAYOUT OF INDUSTRIAL LIFT SERIES	7
3 – MAINTENANCE BAR OPERATING DETAIL FOR BDSL, BTSL & BQSL	9
4 – LAGGING HOLES QUANTITY LIST	12
5 – GENERAL LAYOUT OF INDUSTRIAL LIFT SERIES	13
6 – LIMIT SWITCH ASSEMBLY.....	19
7 – HYDRAULIC SCHEMATIC FOR STANDARD INDUSTRIAL LIFT SERIES (w/ 1 HP POWER UNIT).....	21
8 – HYDRAULIC SCHEMATIC FOR STANDARD INDUSTRIAL LIFT SERIES (w/ 5 HP POWER UNIT).....	22
9a-9b-9c-10a-10b-10c – HOSE LAYOUT & PARTS LIST FOR BDSL, BTSL & BQSL.....	23-24
11a-11b – CYLINDERS USED ON BDSL LIFTS.....	25
12-13 – CYLINDERS USED ON BTSL & BQSL LIFTS	26
14 – GENERAL LAYOUT OF INDUSTRIAL LIFT SERIES, REMOTE 1 HP POWER UNIT (THREE PHASE).....	28
15 – PARTS LIST FOR INDUSTRIAL LIFT SERIES, REMOTE 1 HP POWER UNIT (THREE PHASE).....	29
16 – POWER UNIT PART NUMBERS FOR INDUSTRIAL LIFT SERIES, REMOTE 1 HP POWER UNIT (THREE PHASE).....	29
17 – ELECTRICAL SCHEMATIC STD. FOR INDUSTRIAL LIFT SERIES, REMOTE 1 HP POWER UNIT (THREE PHASE) ...	30
18 – GENERAL LAYOUT OF INDUSTRIAL LIFT SERIES, REMOTE 1 HP POWER UNIT (SINGLE PHASE)	31
19 – PARTS LIST FOR INDUSTRIAL LIFT SERIES, REMOTE 1 HP POWER UNIT (SINGLE PHASE)	32
20 – POWER UNIT PART NUMBERS FOR INDUSTRIAL LIFT SERIES, REMOTE 1 HP POWER UNIT (SINGLE PHASE).....	32
21-22 – ELECTRICAL SCHEMATIC STD. FOR INDUSTRIAL LIFT, REMOTE 1 HP POWER UNIT (SINGLE PHASE)	33-34
23-27 – ELECTRICAL SCHEMATICS FOR INDUSTRIAL LIFT, REMOTE 5 HP POWER UNIT (STD. & OPTIONAL)	36-40
28-29 – MOTOR WIRING DIAGRAMS, REMOTE 5 HP (THREE & SINGLE PHASE)	41
30-31-32-33 – TYPICAL REMOTE 5 HP POWER UNIT & PARTS LIST.....	42-45
34-35 – CYLINDER CHARTS FOR BDSL, BTSL & BQSL.....	46-47
36-37-38 – EXPLODED VIEWS & PARTS LIST OF STANDARD BDSL, BTSL & BQSL.....	48-51

GETTING STARTED

PLEASE READ THE INSTALLATION INSTRUCTIONS CAREFULLY BEFORE INSTALLING, USING OR SERVICING THE INDUSTRIAL LIFT SERIES. The safety of all persons installing, using or servicing the Industrial Lift Series is of utmost importance to us. The Industrial Lift Series is capable of supporting heavy loads and is capable of causing **SEVERE PERSONAL INJURY** if used improperly or certain safety precautions are not taken. When properly used and maintained, the Industrial Lift Series will provide many years of safe, trouble free service. If you have any questions about any of the instructions in this manual or about the use of this product, PLEASE contact us or your DEALER.

- BDSL is the model designation for the Beacon's Double Scissor Lift Industrial Lift Series.
- BTSL is the model designation for the Beacon's Triple Scissor Lift Industrial Lift Series.
- BQSL is the model designation for the Beacon's Quadruple Scissor Lift Industrial Lift Series.

The Industrial Lift Series have been re-designed for improved quality and functionality. Throughout this service manual the Industrial Lift Series may be referred to as the "Industrial Lift" or the "lift".

INSPECTION

IMMEDIATELY upon receipt of the Industrial Lift Series, remove all packing and strapping material and visually inspect the unit for damage. Any damage to the lift **MUST BE NOTED** on the delivery receipt. After the preliminary inspection is conducted, the lift should be thoroughly inspected for any concealed damage that was not readily apparent during the preliminary inspection. Any concealed damage found that was not noted on the delivery receipt should be IMMEDIATELY reported in writing TO THE DELIVERING CARRIER.

SAFETY DEFINITIONS

We use the following system to identify the degree of risk associated with hazards and unsafe practices.

- DANGER -** Immediate hazard which will result in **SEVERE PERSONAL INJURY** or **DEATH**.
- WARNING -** Hazard or unsafe practice which could result in **SEVERE PERSONAL INJURY** or **DEATH** and **PROPERTY DAMAGE**.
- CAUTION -** Hazard or unsafe practice which could result in **MINOR PERSONAL INJURY** and **PROPERTY DAMAGE**.

SAFETY INSTRUCTIONS – DANGER!

1. **READ THIS MANUAL COMPLETELY BEFORE USING, AND THOROUGHLY UNDERSTAND AND FOLLOW ALL SAFETY INSTRUCTIONS.**
2. A falling industrial lift can cause **SEVERE PERSONAL INJURY** or **DEATH**. **NEVER** go under the lift platform until the load is removed and the scissor mechanism is blocked with the maintenance bars.
3. The maintenance bars have been designed for use only when the lift is **UNLOADED**. **NEVER** place any load on the lift platform with the maintenance bars engaged. **SEVERE PERSONAL INJURY** or **DEATH** and **PROPERTY DAMAGE** could result.
4. **DO NOT** attempt to remove or loosen the platform or base frame hinge pins. Loosening or removing these pins could cause the lift to suddenly collapse, **EVEN IF THE MAINTENANCE BARS ARE ENGAGED**. **SEVERE PERSONAL INJURY** or **DEATH** and **PROPERTY DAMAGE** could result.

5. The lifts electrical circuits use voltages which can cause **SEVERE PERSONAL INJURY or DEATH**. **DO NOT** work with the electrical components unless you are a **QUALIFIED ELECTRICIAN**.

6. The lift's electrical components can create sparks. **DO NOT** install the lift, the power unit or the controls in an area where potentially explosive dusts, gases, or vapors may be present. Failure to comply may result in an explosion and cause **SEVERE PERSONAL INJURY or DEATH**.

WARNING!

1. The Industrial Lift Series is designed for use with **stable, uniformly distributed** loads on a solid level floor. **DO NOT** concentrate the load at one point on the pallet or platform. **ALWAYS** uniformly distribute the load over the supporting surface. **DO NOT** use the Industrial Lift Series for any purpose other than its intended use.

2. **SHEARING HAZARD. ALWAYS** keep hands and feet clear of the scissor mechanism and all moving components. **DO NOT** put hands or feet under the lift platform when in use. **SEVERE PERSONAL INJURY** could result.

3. **CRUSHING HAZARD. ALWAYS** keep hands and feet clear of all moving components. **DO NOT** put feet in the pit or on the base frame when in use. **SEVERE PERSONAL INJURY** could result.

4. **PINCH POINT HAZARD. ALWAYS** keep hands and feet clear of the underside of the lift platform and bridge plate (where used). **SEVERE PERSONAL INJURY** could result.

5. **ALWAYS** ensure the handrails and safety chains (where used) are in place and secure **BEFORE** lifting personnel. **ALWAYS** use a handrail to maintain balance while raising or lowering the lift. **SEVERE PERSONAL INJURY** could result.

6. **NEVER** leave the loaded lift unattended unless the lift platform is in the fully lowered position.

7. **ALL** lift servicing must be performed by qualified personnel. Unauthorized modifications to this lift may compromise the performance and safety of the system. **UNDER NO CIRCUMSTANCES** should you attempt any repair or service that is not covered in the service manual or authorized by the factory.

8. **ALWAYS** ensure all safety warning labels are in place and legible. If not, remove the industrial lift from service and replace the required labels.

9. **ALWAYS** securely anchor the base frame to the floor to ensure maximum stability and the proper operation of the lift.

CAUTION!

1. **DO NOT** continue to operate the hydraulic pump if a squealing noise is heard coming from the pump. The pressure relief valve is operating. Continued operation of the pump with the relief valve operating will cause permanent damage to the pump.

2. **DO NOT** change the relief valve setting. The relief valve is installed to protect the operator and the lift.

FIGURE 1a - BDSL (STANDARD):



FIGURE 1b - BTSL (STANDARD):



FIGURE 1c - BQSL (STANDARD):

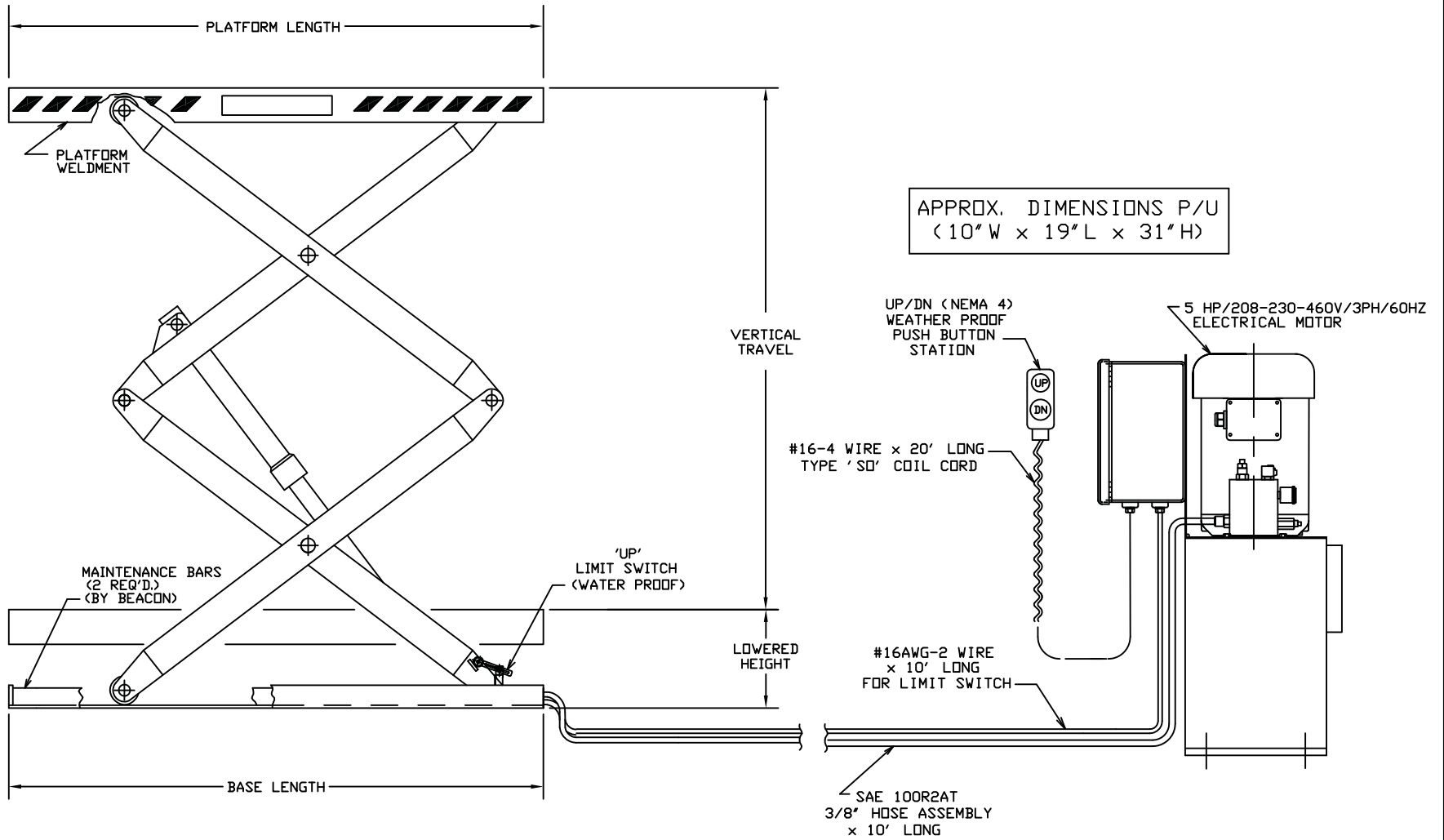


RESPONSIBILITIES OF OWNERS/USERS

It is the responsibility of the Owners/Users to:

1. Advise us or the DEALER, when deflection or creep is critical to the lift application and of any unique application information.
2. Ensure the lift is properly installed and used in accordance with the guidelines provided in this manual.
3. Ensure the lift is inspected and maintained in proper working order in accordance with the operation/maintenance instructions provided in this manual.
4. Ensure any lift not in safe operating condition such as, but not limited to excessive hydraulic leakage, missing rollers, pins or fasteners, bent or cracked structural members, cut or frayed hydraulic lines, damaged or malfunctioning controls or safety devices, etc. shall be removed from service until it is repaired to our standards.
5. Ensure all repairs are made by qualified personnel in conformance with the instructions provided by the factory.
6. Ensure only trained and authorized personnel are permitted to operate the lift and that all operators understand the operating instructions, safety rules and hazards associated with this lift. Ensure modifications or alterations of any lift are made only with the written permission of the factory.
7. Ensure that the power unit is wired correctly for the available power supply, according to the enclosed Manufacturer's instruction sheet.

**FIGURE 2 - GENERAL LAYOUT OF INDUSTRIAL LIFT SERIES:
SURFACE (FLOOR) MOUNTED, WITH EXTERNAL POWER UNIT (5HP/208-230-460V/3PH/60HZ)**



FUNCTIONAL DESCRIPTION

A general layout for Industrial Lifts Series (surface mounted) is shown in Figure 2, Page 7.

The Industrial Lifts Series have been primarily designed for industrial, ergonomic assistance applications. The most important advantage of the Industrial Lifts Series is that it is finitely adjustable in height. The installation of this lift provides full flexibility, allowing lifting and accurate positioning of the load anywhere within the lift's travel range.

Industrial Lifts Series are available in 2000 lb, 3000 lb, 4000 lb, and 6000 lb models. 60", 72", 90", 96", 108", 120", 144", 162", 180", 216", 240" and 288" vertical travels are available.

General specifications for the Industrial Lifts Series models are as shown in the In-Plant Lifting Equipment catalog. Specifications are subject to change without notice.

Depressing the "UP" control actuates the hydraulic power unit, and pumps hydraulic fluid to the piston side of the hydraulic cylinder(s). The cylinder rod extends, and opens the scissor leg assembly, raising the platform.

Depressing the "DN" control opens a solenoid valve within the power unit, which allows hydraulic fluid to flow back to reservoir. A pressure compensated flow control valve controls the lowering speed.

SCISSOR BLOCKING INSTRUCTIONS

To Engage the Maintenance Bars (see Figure 3a) for BDSL 60" thru 72" V.T. only:

- 1- **REMOVE ALL LOADS** from the platform and depress the "up" button to raise the Industrial Lift to its fully raised position.
- 2- Rotate each maintenance bar until it contacts the inside of the roller channel. Ensure both maintenance bars are properly positioned with respect to the roller channel.
- 3- Lower the Industrial Lift by pressing the "DOWN" button until the scissor legs stop against the maintenance bars and the lift ceases to come down any further. Ensure that BOTH maintenance bars are fully and correctly engaged against the scissor leg structure. The maintenance bars **MUST NOT** be angled inwards towards the center of the lift.

To Disengage the Maintenance Bars (see Figure 3a) for BDSL 60" thru 72" V.T. only:

- 1- Raise the Industrial Lift by pressing the "UP" button until the rollers are well clear of the maintenance bars.
- 2- Rotate each maintenance bar back to its original position.

To Engage the Maintenance Bars (see Figure 3b) for BDSL 90" thru 144" V.T. & BTSL 72" thru 144" V.T. only:

- 1- **REMOVE ALL LOADS** from the platform and depress the "up" button to raise the Industrial Lift to its fully raised position.
- 2- Rotate each maintenance bar until it hits the inside of the roller channel. Ensure both maintenance bars are properly positioned against the roller channel.
- 3- Lower the Industrial Lift by pressing the "DOWN" button until the scissor legs stop against the maintenance bars and the lift ceases to come down any further.

To Disengage the Maintenance Bars (see Figure 3b) for BDSL 90" thru 144" V.T. & BTSL 72" thru 144" V.T. only:

- 1- Raise the Industrial Lift by pressing the "UP" button until the rollers are well clear of the maintenance bars.
- 2- Rotate each maintenance bar back to its original position.

To Engage the Maintenance Bars (see Figure 3c) for BTSL 162" thru 216" V.T. & BQSL 240" thru 288" V.T. only:

- 1- **REMOVE ALL LOADS** from the platform and depress the "up" button to raise the Industrial Lift to its fully raised position.
- 2- Position each removable maintenance bar so that it hits the inside of the base and the lower side of the assembly leg. Ensure that the both removable maintenance bars are between the base assembly and the leg assembly.
- 3- Lower the Industrial Lift by pressing the "DOWN" button until the scissor legs stop against the maintenance bars and the lift ceases to come down any further.

To Disengage the Maintenance Bars (see Figure 3c) for BTSL 162" thru 216" V.T. & BQSL 240" thru 288" V.T. only:

- 1- Raise the Industrial Lift by pressing the "UP" button until the rollers are well clear of the maintenance bars.
- 2- Remove each maintenance bar back to its original position.

FIGURE 3a - MAINTENANCE BAR OPERATING DETAIL FOR BDSL 60" THRU 72" V.T. ONLY:



FIGURE 3b - MAINTENANCE BAR OPERATING DETAIL FOR BDSL 90" THRU 144" V.T. & BTSL 72" THRU 144" V.T. ONLY.

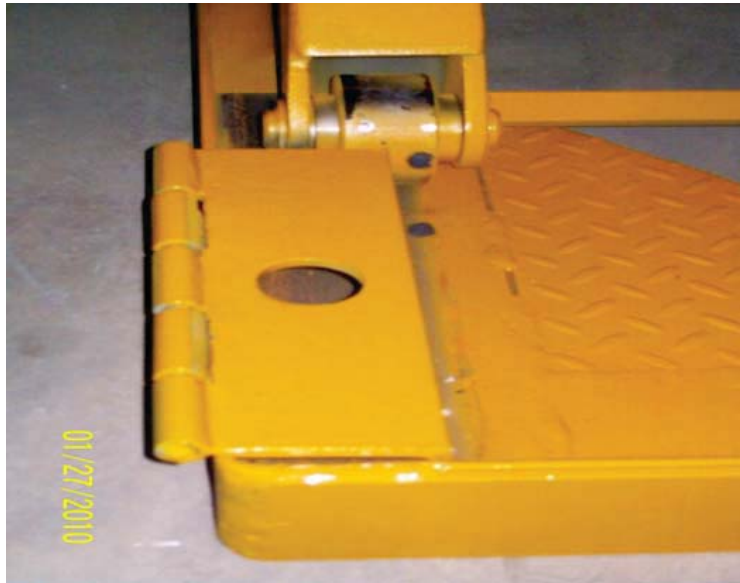


FIGURE 3c - MAINTENANCE BAR OPERATING DETAIL FOR BTSL 162" THRU 216" V.T. & BQSL 240" THRU 288" V.T. ONLY :



INSTALLATION INSTRUCTIONS FOR SURFACE MOUNTED LIFT:

1. Locate the power unit, install and check oil level. It will require approximately 3-14 gallons, depending on model. (See oil specification for type of oil required).

Note: Hydraulic oil is supplied with the equipment. The optional installation kit (pressure hose assembly and up limit switch SO cord) are not part of the standard Industrial Lift Series (length and size depending on customer request order).

2. All hydraulic lines must be flushed with clean oil.

3. Remove the skid and all steel strapping. Most of the units come with four (4)-lifting tabs fitted on the platform. These are to be used for lifting the unit with a crane or a fork truck.

4. Remove the two (2) shipping bolts. Lift the Industrial Lift with the help of a fork truck. Make sure that the base frame assembly remains on the ground and that the scissor legs open properly.

Engage the maintenance safety bars as explained in "Scissor Blocking Instructions" section.

Check to ensure that the maintenance safety bars are securely in place.

5. After flushing the hydraulic lines, proceed as follows:

Connect the 3/8" or 1/2" hydraulic hose coming from the conduit to the # 6 SAE 37° Flare or # 8 SAE 37° Flare bulkhead fitting (depending on model) on the base frame assembly.

Note: The 3/8" or 1/2" I.D. pressure hose is not typically supplied by us. Hose and tubing supplied by others must conform to manufacturer's specifications.

6. The upper travel limit switch is factory installed to the bracket on the base frame at the scissor leg clevis hinge. Make sure the upper limit switch cord runs to the control box on the external power unit. Locate (model with 1hp) or add (model with 5hp) the power cord to the external power unit (depending on Industrial Lift model). A power plug is not supplied with the lift due to the many different types of electrical receptacles and installation options.

Have a QUALIFIED ELECTRICIAN install a plug of the proper style and rating.

Press the "UP" button until the cylinders are filled with oil and the lift rises. At this point, do not raise the lift to the maximum height. Check the motor rotation for models with 3 phase.

7. Disengage the maintenance safety bars as explained in "Scissor Blocking Instructions" section. Completely lower the platform by pressing the "DOWN" button until the unit is in fully lowered position. (Note: Motor runs only when the Lift is rising. Only the Solenoid operates when the Lift is lowering.)

8. Operate the lift through a few cycles holding the "DOWN" button on for 10-20 seconds after the lift is fully lowered position. This procedure will bleed any remaining air that may be in the cylinders and hydraulic lines.

9. Raise the lift again and set the upper limit switch (normally closed contact) so that the motor shuts off when the platform reaches the desired height from the ground.

10. Note to Installer: In order to ensure a clean, trouble free, hydraulic system and to prevent the filter (optional) from clogging due to foreign particles in the pipe, the installer must run the lift "UP" and "DOWN" at least 15 times. Lower the lift and turn off the power supply. Remove the solenoid valve from the valve block and clean thoroughly, making sure that the dirt does not enter the valves. This procedure will ensure trouble free operation of the lift.

11. Check the oil level of the reservoir with the lift fully lowered. Add oil if necessary.

12. Clean up spilled oil and debris from the area.

Note to installer: Spilled oil left in the area may be misinterpreted as a leak and may cause a needless "call-back".

13. Raise the lift again and engage the maintenance safety bars as explained in "Scissor Blocking Instructions" section. The Industrial Lift base has holes for lagging the lift securely to the floor (see Figure 4, Page 12 for quantity). Using the Industrial Lift base as a template, drill 1/2" or 3/4" diameter hole, 3 1/4" minimum depth at each location.

(Continued)

The floor surface should be level, and the holes drilled perpendicular to the floor. If required, move the position of the lift with a forklift, exercising proper care, to allow room for drilling of the holes. Drill the holes, and when complete, reposition the lift.

14. Prepare the ½” or ¾” diameter x 4” long anchor bolts. USE type SUP-R-STUD #26-12400 or equivalent. Assemble the washer and nut on the anchor bolt. The nut should be screwed onto the anchor bolt by approximately ½ the nut height. Drive the assembled anchor through the lift base lagging holes into the concrete until the washer is flush with the lift base structure. Expand the anchor shield by tightening the nut as required for a tight fit, approximately three (3) to five (5) turns. Repeat for the other anchors.

NOTE: Ensure that expanded bolt extends through the lift base by no more than ¾”.
Interference with the scissor leg mechanism will result from bolts that extend through the base by more than ¾”.

NOTE: Correct installation and functionality of the anchor bolts is the responsibility of the lift owner, and/or installation contractor.

WARNING: The lift base frame MUST be fully supported. USE shims or concrete grout, if necessary, to ensure that the underside surface of the base frame is completely supported. Failure to completely support the base frame may cause structural damage to the lift, which may result in severe personal injury or property damage.

15. Insert the power plug into the receptacle and/or turn on the lift power supply. Raise the lift again and disengage the maintenance safety bars as explained in “Scissor Blocking Instructions” section.

16. The Industrial Lift is now ready for operation. Refer to “Operating Instructions” section for further information.

FIGURE 4 - LAGGING HOLES QUANTITY LIST

MODEL	QUANTITY PER BASE	HOLES ON BASE
BDSL-20-060-XXYYY	4	ø 9/16"
BDSL-40-060-XXYYY		
BDSL-60-060-XXYYY		
BDSL-20-072-XXYYY		
BDSL-40-072-XXYYY		
BDSL-60-072-XXYYY		
BDSL-20-090-XXYYY		
BDSL-40-090-XXYYY		
BDSL-60-090-XXYYY		
BDSL-20-108-XXYYY		
BDSL-40-108-XXYYY		
BDSL-60-108-XXYYY		
BDSL-20-120-XXYYY		
BDSL-40-120-XXYYY		
BDSL-60-120-XXYYY		
BDSL-20-144-XXYYY		
BDSL-40-144-XXYYY		
BDSL-60-144-XXYYY		

MODEL	QUANTITY PER BASE	HOLES ON BASE		
BTSL-30-072-XXYYY	4	ø 9/16"		
BTSL-60-072-XXYYY				
BTSL-30-096-XXYYY				
BTSL-60-096-XXYYY				
BTSL-30-120-XXYYY				
BTSL-60-120-XXYYY				
BTSL-30-144-XXYYY				
BTSL-60-144-XXYYY				
BTSL-30-162-XXYYY			12	ø 13/16"
BTSL-60-162-XXYYY				
BTSL-30-180-XXYYY				
BTSL-60-180-XXYYY	8	ø 13/16"		
BTSL-120-180-XXYYY				
BTSL-30-216-XXYYY	12	ø 13/16"		
BTSL-60-216-XXYYY				

MODEL	QUANTITY PER BASE	HOLES ON BASE
BQSL-30-240-XXYYY	12	ø 13/16"
BQSL-60-240-XXYYY		
BQSL-30-288-XXYYY		
BQSL-60-288-XXYYY		

MODEL NUMBER FORMAT

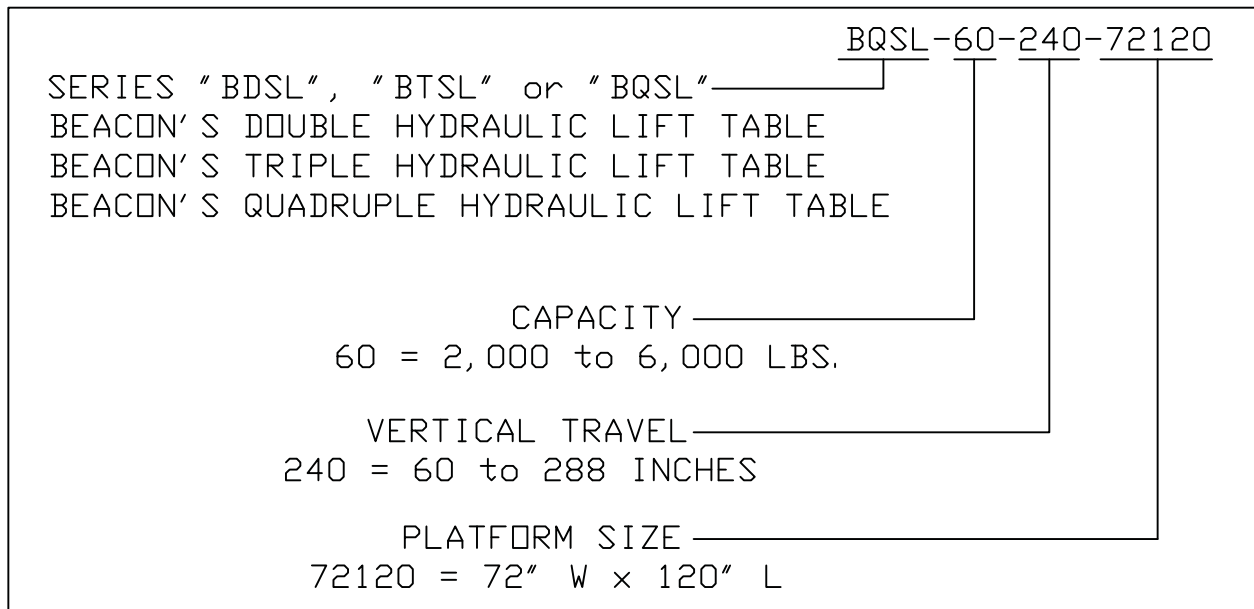
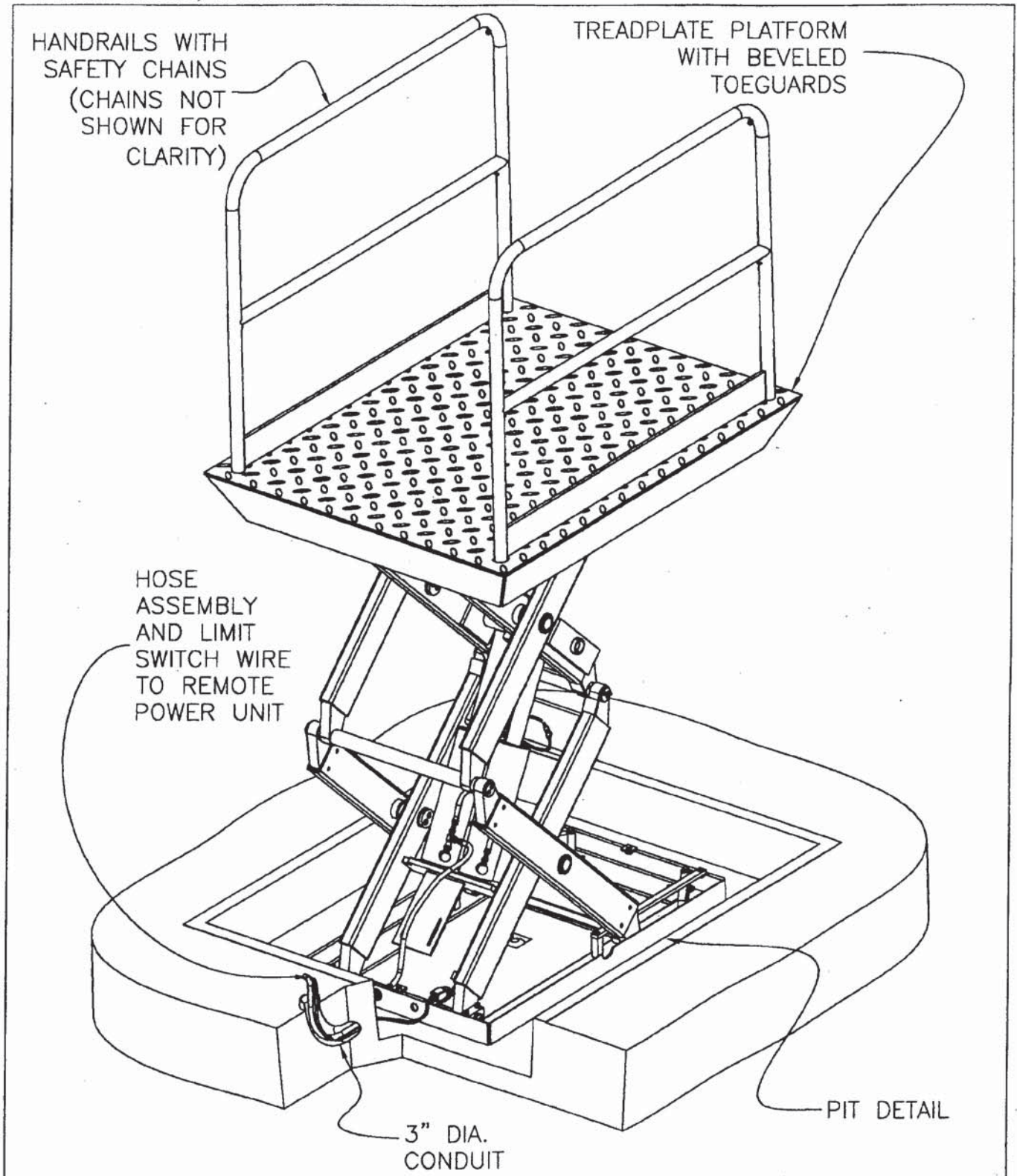


FIGURE 5 - GENERAL LAYOUT OF INDUSTRIAL LIFT SERIES:
PIT MOUNTED, WITH REMOTE POWER UNIT



A general layout for a typical pit mounted Industrial Lift Series is shown in Figure 5. Specific pit details and recommended dimensions are available from us upon the purchase of a pit mounted lift.

Note that pit details and dimensions are for recommendation and reference only. Actual pit design, details and dimensions, are the responsibility of the owner, and/or pit contractor.

General Notes
Supplied by Owner or Contractor

1. Provide 3" dia. conduit with 12" minimum radius bends from Power Unit location to lift pit. As shown in Figure 5, the conduit entry should be to the power unit end of the lift installation.
2. Provide hydraulic hose or ASA steel tubing and fittings (*minimum bursting pressure 12000 PSI*) from the power unit location into the hinge end of the lift pit. For proper connection to the power unit and lift, the hose must have a # 6 (9/16-18) 37° flare (SAE J514) female swivel fitting or # 8 (3/4-16) 37° flare female swivel fitting on each end (depending on model). Size and construction of the hose should be as follows:
 - (a) For hose lengths up to 50 feet, use 3/8" ID hydraulic hose
 - (b) For hose lengths greater than 50 feet, use 1/2" ID hydraulic hose
3. Provide a #16 AWG 2-wire conductor (*type SO*) from the control box to the upper limit switch located within the lift base frame.
4. Ensure the concrete is reinforced to suit local soil conditions. All pit construction including the bumper posts, curb angles, conduit, hydraulic oil, hydraulic connections and electrical hook-up are the responsibility of the owner and/ or the pit contractor.
5. Pit drains are to be installed to suit local code and weather conditions.
6. Service wiring and/or relocation of the power unit controls are the responsibility of the contractor and/or the owner.

It must be clearly noted that the sole purpose of the pit details and dimensions supplied with the purchase of a pit mounted lift, is to document the configuration of the equipment built by us and any specific installation data pertinent to the satisfactory operation thereof. It is not the Intent of us to provide installation details such as concrete thickness and reinforcing, routing of electrical and hydraulic lines, component location and orientation, position of adjacent structures, etc., but rather, to make recommended construction drawings for the specific job requirement.

INSTALLATION INSTRUCTIONS: PIT MOUNTED LIFT

1. Check pit for conformity to reference installation drawing provided, or architect's plans if applicable.
2. Locate the power unit, install and check oil level. It will require approximately 3-14 gallons, depending on model (See oil specification for type of oil required).
Note: It is suggested that power unit be installed prior to the installation of the lift. This allows the electrical work to be completed ahead of time. Also, it permits flushing of the hydraulic lines with the power unit prior to connecting the lift.
Note: Hydraulic oil is supplied with the equipment. The optional installation kit (pressure hose assembly and up limit switch SO cord) length and size depending on customer request.
3. All underground hydraulic lines must be flushed with clean oil.
4. Remove the skid and all steel strapping. The unit comes with four (4)-lifting tabs fitted on the platform. These are to be used for lifting the unit with a crane or a fork truck. At this point DO NOT remove the two (2) shipping bolts.
5. Using a crane or fork truck, lift the Industrial Lift unit and position it in the pit. Note that the scissor leg pivot end is the same end as the oil line recess in the pit.
6. Remove the two (2) shipping bolts. Lift the Industrial Lift with the help of a fork truck. Make sure that the base frame assembly remains on the ground and that the scissor legs open properly. Engage the maintenance safety bars as explained in "Scissor Blocking Instructions" section. Check to ensure that the maintenance safety bars are securely in place.
7. After flushing the hydraulic lines, proceed as follows:
Connect the 3/8" or 1/2" I.D. pressure hydraulic hose coming from the conduit to the # 6 (9/16-18) SAE 37° Flare or # 8 (3/4-16) SAE 37° Flare bulkhead union on the base frame assembly.
8. The upper limit switch (standard) will be already installed within the lift base. Connect the limit switch to the #16-2 AWG type 'SO' straight cord coming from the conduit. Make sure the limit switch wire runs through the conduit to the control box.
9. Locate (model with 1hp) or add (model with 5hp) the power cord to the external power unit (depending on Industrial Lift model). A power plug is not supplied with the lift due to the many different types of electrical receptacles and installation options. Have a QUALIFIED ELECTRICIAN install a plug of the proper style and rating.
10. Press the "UP" button until the cylinders are filled with oil and the lift rises. At this point, check the motor rotation for models with 3 phase (external power unit). DO NOT RAISE THE LIFT TO THE MAXIMUM HEIGHT.
11. Disengage the maintenance safety bars as explained in "Scissor Blocking Instructions" section. Completely lower the platform by pressing the "DN" button until the unit is in the fully lowered position. (Note: Motor runs only when the Lift is rising. Only the Solenoid operates when the Lift is lowering.)
12. Position the lift so that there are proper clearances around the edges (Refer to Figure 5 on page 13).

(Continued)

13. Raise the lift completely and engage the maintenance bars. Mark the base frame lag down holes; shift the position of the lift to allow room for drilling, then drill. When complete, reposition the lift, shim until level. Install anchors, lagging the lift securely to the floor (Make sure that base angles are fully supported along their entire length with shims or concrete grout). Note: Anchoring holes may be drilled through existing holes using the base frame as a template. See “Installation Instructions – Surface Mounted Lift” section on pages 10-11 above.
14. Disengage the maintenance safety bars and lower the lift to check for proper height. The platform should be flush with the curb angles around the pit.
15. Operate the lift through a few cycles holding the "DN" button on for 10-20 seconds after the lift is fully lowered. This procedure will bleed any remaining air that may be in the hydraulic lines. **DO NOT RAISE THE LIFT TO THE MAXIMUM HEIGHT.**
16. Raise the lift again and engage the maintenance safety bars (only for safety to the installer). Now, set the upper limit switch (normally closed contact) so that the motor shuts off when the platform reaches the desired height from the ground.
17. Note to Installer: In order to ensure a clean, trouble free, hydraulic system and to prevent the suction filter from clogging due to foreign particles in the pipe, the installer must run the lift "UP" and "DN" at least 15 times. Lower the lift and turn off the power supply. Remove the solenoid valve from the valve block and clean thoroughly, making sure that the dirt does not enter the valves. This procedure will ensure trouble free operation of the lift.
18. Check the oil level of the reservoir with the lift fully lowered. Add oil if necessary.
19. Clean up spilled oil and debris from the area.
Note to installer; Spilled oil left in the area may be misinterpreted as a leak and may cause a needless "call-back".
20. The Industrial Lift is now ready for operation. Refer to “Operating Instructions” section for further information.

OPERATING INSTRUCTIONS

The load capacity rating as stamped on the nameplate of your Industrial Lift Series designates the maximum lifting capacity with a uniformly distributed load. This capacity must never be exceeded, as permanent damage may result. The maximum rollover capacity in the fully lowered position is the lifting capacity of the lift; lowering loads that exceed the rated capacity will result in excessive wear or damage to the lift.

Consult the factory before any modification is performed in the field.

NOTE: **ANY** modification of the lift in the field, without the express written consent of us, will void any and all warranties.

The Industrial Lift Series is furnished with constant pressure ("dead-man" type) push button controls. Pressing the "UP" button, starts the motor, (see wiring diagram) which in turn runs the hydraulic pump. The cylinders begin to extend and the platform starts to rise. The platform will rise as long as the "UP" button is pressed. On releasing the button, the platform ceases to rise and will remain at that particular elevation.

When the lift reaches its full vertical travel, the cylinders have extended to its maximum limit. The platform will no longer travel up due to the mechanical stops in the platform. At this point the relief valve will open because of pressure build up and oil will bypass into the reservoir. Do not continue to operate the lift as it will create excessive wear on the pump.

In the event that the lift is overloaded, the relief valve will open because of excessive pressure build up, and oil will bypass into the reservoir. When the lift reaches a preset vertical travel the "upper limit switch" (standard) will be actuated. This shuts off the power to the motor. At this point, pressing the "UP" button will have no effect. The platform will remain stationary at the desired elevation.

When pressing the "DN" button, the Down Solenoid Valve is energized. The cylinders start retracting as the oil returns to the reservoir and, upon releasing the button, the platform ceases to lower, remaining at that particular elevation.

Always remember that the motor runs only when the "UP" button is pressed and the Down Solenoid Valve is energized only when the "DOWN" button is pressed.

Some "Tips" to the Operator

1. Always load the lift properly by centering the load on the platform as much as possible.
2. Never use the lift if it is in need of repairs, or in the case of a malfunction.
3. Notify your maintenance personnel if you notice anything out of the ordinary, such as binding, odd pump noises, etc.
4. Do not continue to press the "UP" button if the lift is not rising. You can permanently damage the motor or pump by doing so.
5. Ensure that handrails and chains (where applicable) are in place before operating the lift.

ROUTINE MAINTENANCE

Raise the lift and engage the maintenance safety bars before beginning any inspection or work on the unit.

(A) Monthly Inspections

1. Check oil level. Add oil as required. (See oil specifications).
2. Check for oil leaks. See Trouble Shooting Section and correct as necessary.
3. Check roller bushings, axle pin, clevis and pivot points for wear.
4. Check for worn or damaged hydraulic hoses or electrical cords. Repair as necessary.
5. Check rollers for looseness and wear, See Trouble Shooting.
6. Check retaining caps and screws, at all axles, pivot points and clevises.
7. Never grease rollers or axles. Roller tracks may be greased, if desired.
8. Check for unusual noise. See Trouble Shooting.

(B) Yearly Inspection

Oil in reservoir should be changed at least once yearly, or sooner if the oil darkens or becomes gritty. Presence of water is indicated if the oil turns milky.

(C) Winter/Summer Maintenance

Change the oil as per 'Oil Viscosity Recommendations' depending on the ambient temperatures prevailing in your area.

Oil Viscosity Recommendations

Best performance can be obtained by utilizing ISO-Vg grade 32,46 oil with a viscosity range between 150-250 SUS at 100⁰F (32-54 cSt at 40⁰C). Minimum viscosity at operating temperature is 60 SUS (10 cSt). Maximum start-up viscosity at minimum ambient temperature is 4000 SUS (880 cSt). Maximum recommended operating temperature of hydraulic oil is 150⁰F (65⁰C). Oil should be non-corrosive, have maximum anti-wear properties, rust and oxidation (treatment) and be nonfoaming.

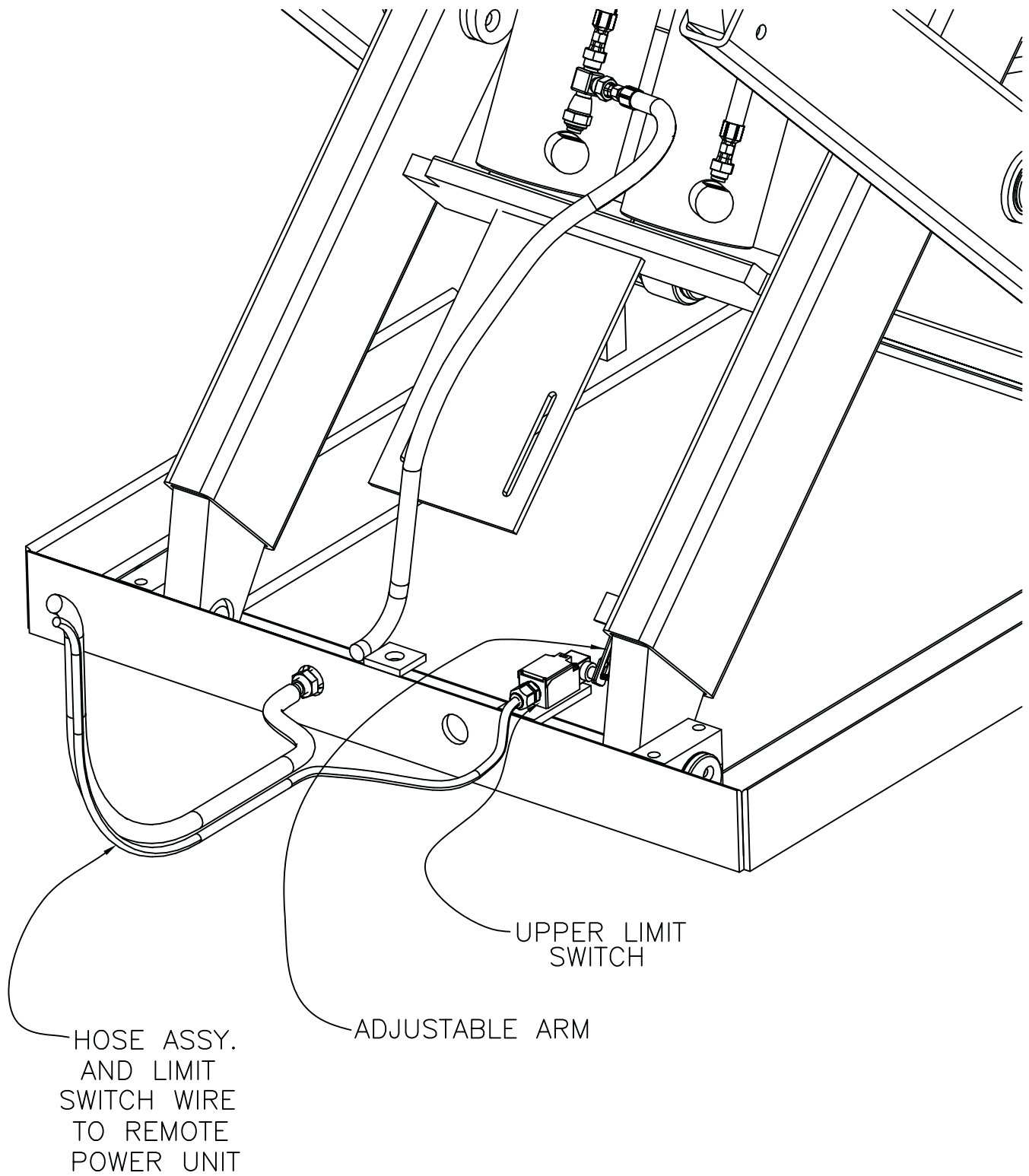
Recommended list of oils for an ambient temperature range of -10⁰F to 100⁰F (-23⁰C to 38⁰C) are as follows:

- | | |
|------------------------------|---|
| 1. Amoco Oil Co. | Rycon Oil No.32, 46
Amoco AW 32, 46 |
| 2. Cities Service Oil Co. | Citgo AW Hyd. Oil 32,46
Citgo All Temp. Hyd. Oil |
| 3. Chevron USA | Chevron EP Hyd. Oil 32,46 |
| 4. Fina Oil Co. | Fina AW 32,46
Fina Automatic Transmission Fluid
Oexron II |
| 5. Gulf Oil Corporation | Gulf Harmony 32 AW, 46 AW |
| 6. Mobil Oil Corporation | DTE 15,24,25,
Mobil Fluid #300 Transmission Fluid |
| 7. Sentinel Lubricants Corp. | Sentinel SH-10 Hydraulic Oil |
| 8. Shell Oil Co. | Tellus Hyd. Oil 32,46
Tellus "1" Hyd. Oil 32,46 |
| 9. Texaco Inc. | Rando Oil Hd-32, 46 |
| 10. Union 76 | XCeI AW 46 (200) |

Note:

1. DO NOT use brake fluid.
2. All Lifts requiring oil by us will be supplied with AW-46(200) Hydraulic oil.

FIGURE 6 - LIMIT SWITCH ASSEMBLY:



LIMIT SWITCH ADJUSTMENTS

At times it is necessary to change the vertical travel so that the platform top levels with a surrounding structure. Adjusting the Limit Switch arm position will vary the vertical travel. The limit switch arm position is adjusted by utilizing an Allen wrench. Loosen the screw on the arm, using the Allen wrench, while maintaining the arm in a fixed position. DO NOT allow the arm to turn while loosening the screw. Loosen the screw sufficiently so that the roller arm may be adjusted, maintaining the rotator screw in a fixed position. DO NOT allow the arm to turn while adjusting the screw, or re-tightening the screw. The roller arm effective length may also be adjusted by utilizing an Allen wrench. At this point, be sure the Limit Switch arm (head-arm) is aligned with the activator welded on the leg of your Industrial Lift. The Limit Switch Assembly is shown in Figure 6, Page 19.

HYDRAULIC SECTION

When the operator wants to raise the platform, he or she presses the “UP” button. This starts the electric motor, which runs the hydraulic pump. Oil from the reservoir is sucked in through the suction filter and into the pump. The pump delivers the pressurized oil through the internal check valve before entering the cylinders. The function of the check valve is to allow the oil to flow in one direction i.e. towards the cylinders. It also prevents the flow of oil back into the pump circuit when the pump stops running. This holds the oil in the cylinders and maintains the desired elevation.

If the load is excessive, and the "UP" button is still pressed, pressure will build up in the circuit between the pump and the cylinders. This forces the "ball" or "poppet" in the relief valve to unseat and the pump output returns into the reservoir through the return pipe.

When the operator desires to lower the lift, he or she presses the “DN” button. This energizes the down solenoid valve. The poppet in the solenoid valve is unseated and oil now returns from the cylinders through the flow control valve, the solenoid valve, and into the reservoir.

The flow control valve controls the down speed of the lift.

Releasing the “DN” button will de-energize the solenoid, closing the valve poppet. This prevents the oil from returning to the reservoir and the cylinders will stop retracting. The lift is now maintained at that particular elevation.

A flow limiter is installed at the base of each cylinder. In the event of a hydraulic hose failure, the platform lowers at a fast rate. As soon as the descent speed exceeds the preset speed, the flow limiter will shut off the oil flow and the platform will come down at a very slow speed until pressure is reapplied. This safety feature reduces the possibility of accidental personal injury or damage to the lift.

A complete Hydraulic Schematic is shown in Figure 7, Page 21 (for models with 1 HP) & Figure 8, Page 22 (for models with 5 HP).

The complete Hydraulic Assembly, are shown in Figures 9a, 9b, 10a & 10b (pages 23 & 24).

FIGURE 7 - HYDRAULIC SCHEMATIC FOR STANDARD INDUSTRIAL LIFT SERIES

(WITH 1 HP POWER UNIT)

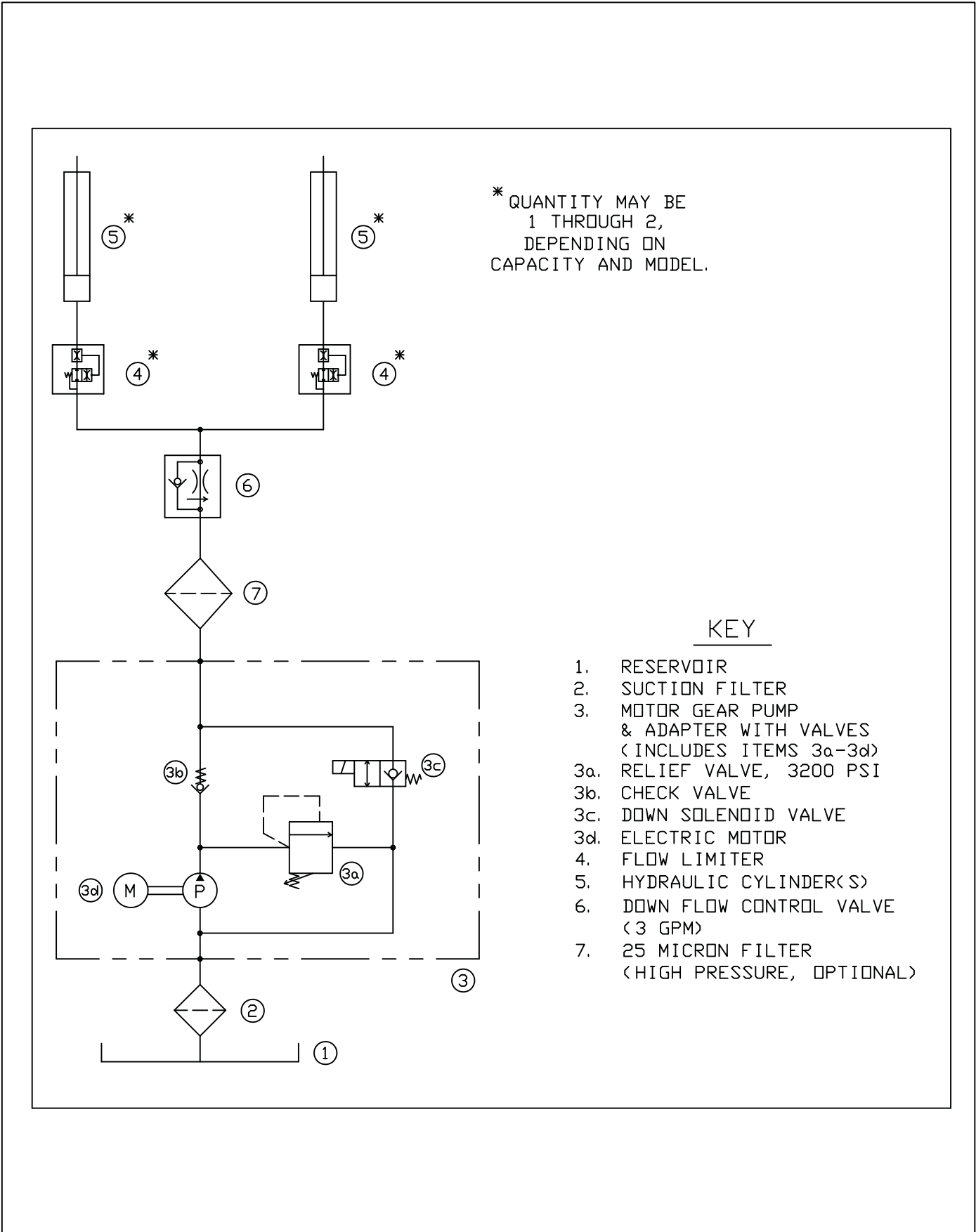


FIGURE 8 - HYDRAULIC SCHEMATIC FOR STANDARD INDUSTRIAL LIFT SERIES

(WITH 5 HP POWER UNIT)

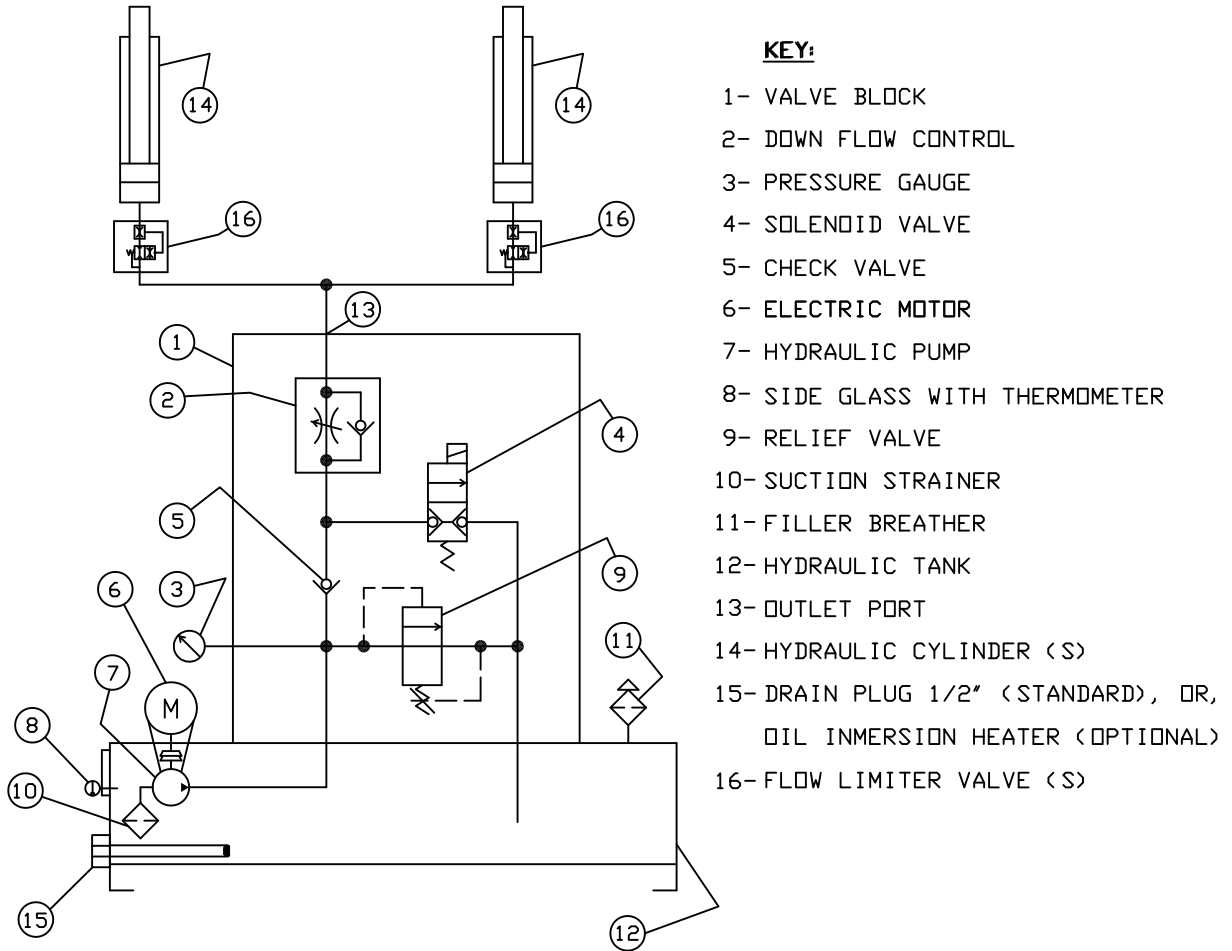


FIGURE 9a & 9b - HOSE LAYOUT FOR BDSL 2,000 - 6,000 LBS.; 60" - 72" V.T.:

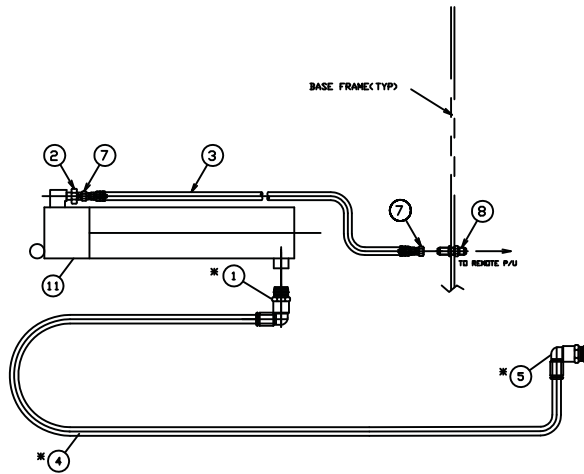
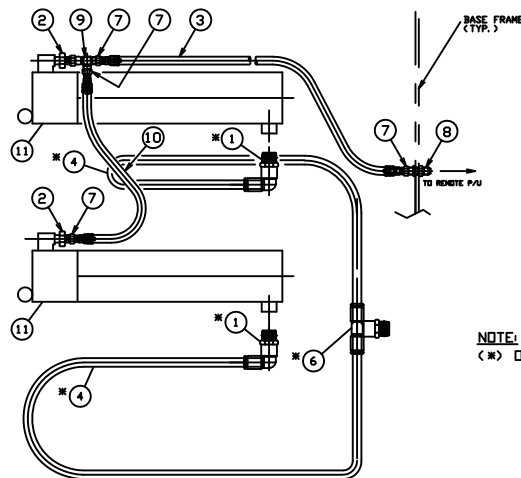


FIGURE "9a" (SEE CHART)
HOSE LAYOUT FOR SINGLE CYLINDERS MODELS WITH REMOTE POWER UNIT



NOTE:
(*) OPTIONAL, DEPENDING ON CYLINDER.

FIGURE "9b" (SEE CHART)
HOSE LAYOUT FOR TWO (2) CYLINDER MODELS WITH REMOTE POWER UNIT

FIGURE 9c - PARTS LIST FOR BDSL MODELS:

No.	PART No.	DESCRIPTION	REMOTE POWER UNIT	
			1 CYL. FIG. "9a"	2 CYL. FIG. "9b"
1	HDS-458-14	MALE ELBOW 3/8" NPT / 1/4" OD HOSE	1	2
2	HY-101-06-04	FLOW LIMITER #6 ORB / #6 JIC	1	2
3	HDS-25106-XXXX	3/8" HOSE (HIGH PRESSURE) x XXXX" LENGTH	1	1
4	HLT-9163	TUBE 1/4" OD x 1/8" ID x XXXX" LENGTH	1	2
5	HDS-458-13	MALE ELBOW 1/4" NPT / 1/4" OD HOSE	1	-
6	HDS-459-10	BRANCH TEE 1/4" HOSE 1/4" NPT	-	1
7	HDS-312-06-06	HOSE END #6 FEM SW / #6 HOSE	2	4
8	HDS-466-06	BULKHEAD MALE 37° FL / MALE 37° FL	1	1
9	HDS-465-06	ADAPTER M 37° FL SW / M 37° FL / M 37° FL TEE	-	1
10	HDS-25106-XXXX	3/8" HOSE (HIGH PRESSURE) x XXXX" LENGTH	-	1
11	*	SEE PAGE #46 FOR CYLINDER PART NUMBER (S)	*	*

FIGURE 10a & 10b - HOSE LAYOUT FOR BDSL 2,000 - 6,000 LBS.; 90" - 144" V.T.;
 BTSL 3,000 - 6,000 LBS.; 72" - 216" V.T. &
 BQSL 3,000 - 6,000 LBS.; 240" - 288" V.T.:

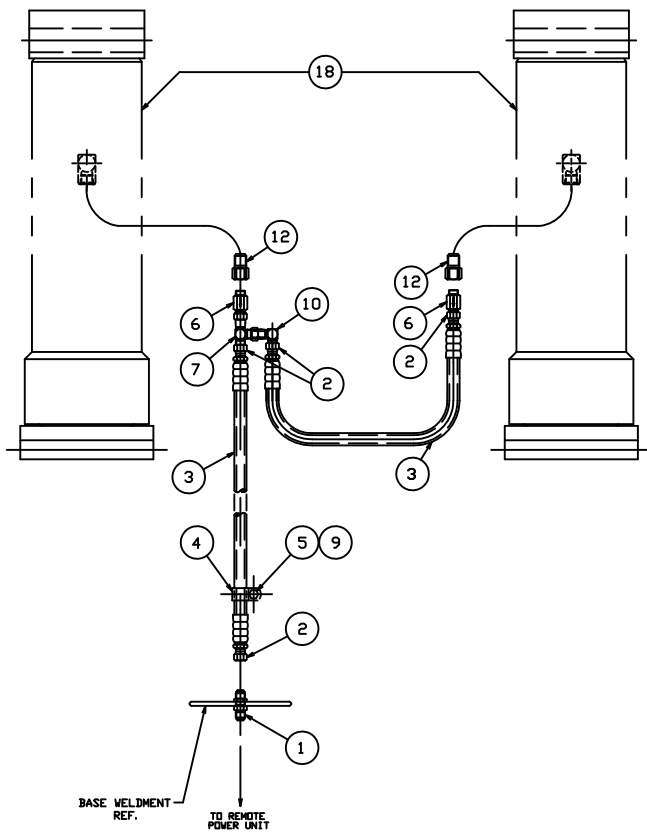


FIGURE "10a" (SEE CHART)
 2 CYL. HOSE ARRANGEMENT
 USED ON BDSL 2,000-6,000 LBS.; 90"-144" V.T. &
 BTSL 3,000-6,000 LBS.; 72"-144" V.T.

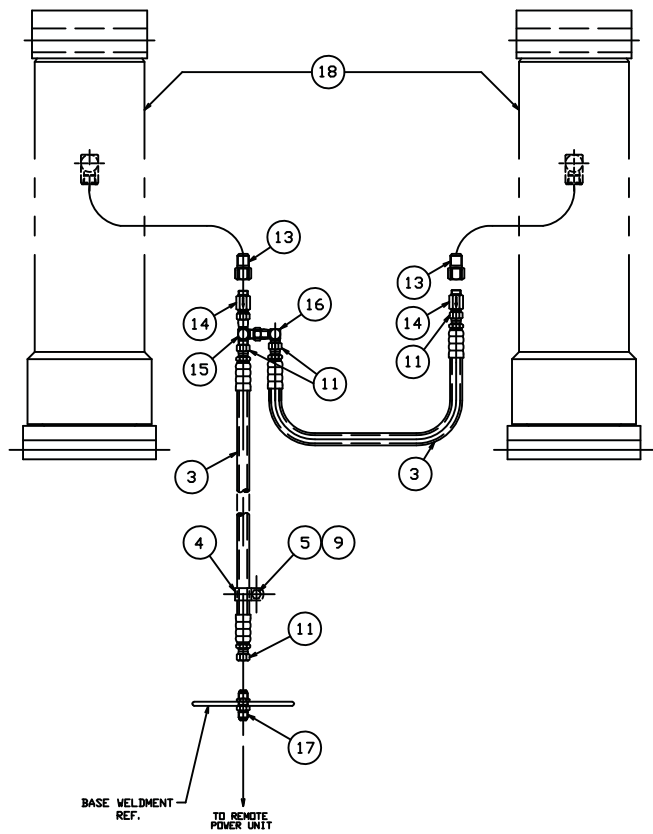


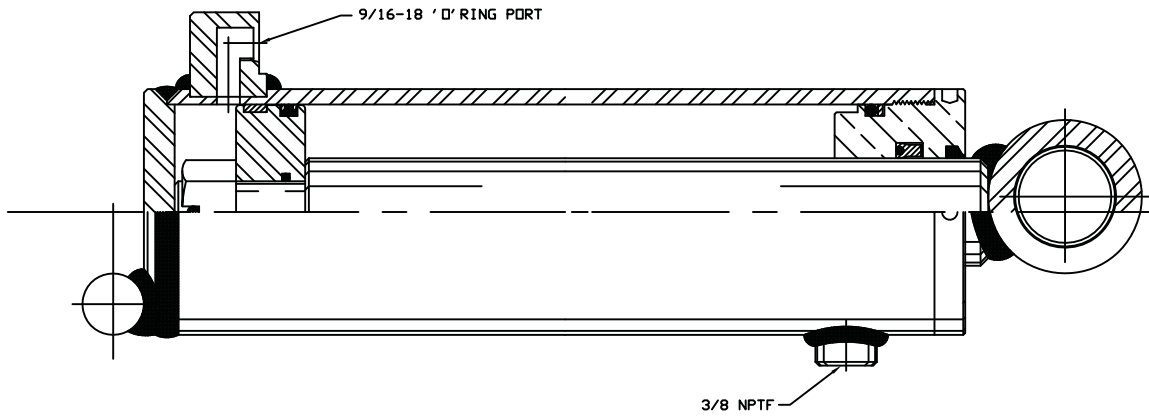
FIGURE "10b" (SEE CHART)
 2 CYL. HOSE ARRANGEMENT
 USED ON BTSL 3,000-6,000 LBS.; 162"-216" V.T. &
 BQSL 3,000-6,000 LBS.; 240"-288" V.T.

FIGURE 10c - PARTS LIST FOR BDSL, BTSL & BQSL MODELS:

NO.	PART NO.	DESCRIPTION	2 CYL. MODELS	
			FIGURE "10a"	FIGURE "10b"
			QTY.	
1	HDS-466-06	BULKHEAD FITTING #6-#6	1	-
2	HDS-312-06-06	HOSE END #6 FEM SW/#6 HOSE	4	-
3	HDS-25106-XXXX	3/8" HOSE x XX, XX' LG.	2	2
4	HL-D-0988	HOSE CLAMP	1	1
5	MS27183-12	WASHER, FLAT, 11/32" I. D.	1	1
6	HYD-101-06-04	FLOW LIMITER VALVE 0.1-4.0 GPM	2	-
7	HDS-465-06	TEE, #6	1	-
8	NOT USED	*	-	-
9	MS35690-502	NUT, HEX, 5/16-18UNC	1	1
10	HDS-467-06	ADAPTER, ELBOW #6	1	-
11	HDS-312-06-08	#8 FEM SWIVEL - #6 HOSE END	-	4
12	HDS-446-10	MALE 1/2-14NPT / 9/16-18 O-RING	2	-
13	HDS-446-11	MALE 1/2-14NPT / 3/4-16 O-RING	-	2
14	HYD-101-08-10	FLOW LIMITER VALVE (10 GPM)	-	2
15	HDS-465-08	TEE, #8	-	1
16	HDS-467-08	ADAPTER, ELBOW #8	-	1
17	HDS-466-08	BULKHEAD #8-#8	-	1
18	*	SEE PAGE #47 FOR CYLINDER PART NUMBERS	*	*

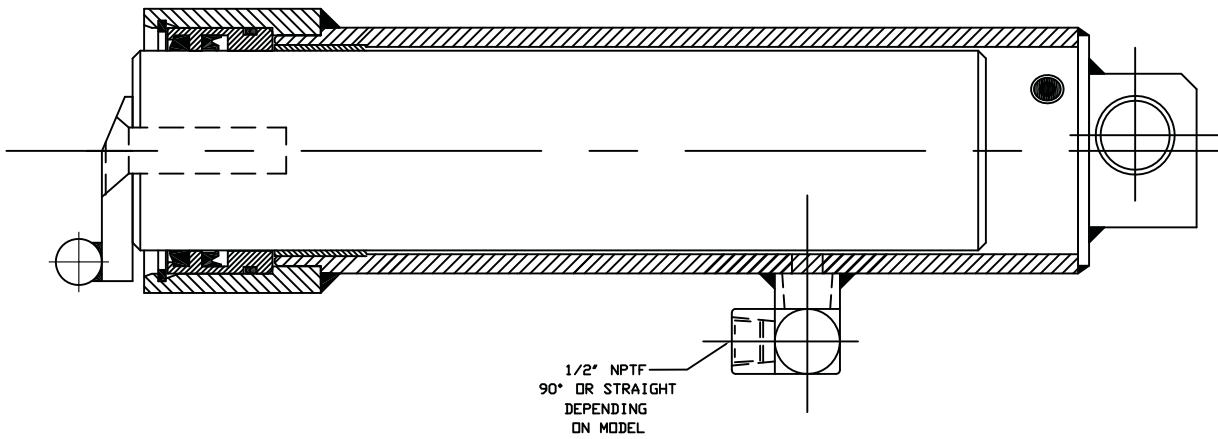
FIGURE 11a & 11b - CYLINDERS USED ON BDSL LIFTS:

CYL-A5670/6470/5675/6475-XXXX SERIES CYLINDER



CYL-A5670-RK }
CYL-A6470-RK } REPAIR KIT
CYL-A5675-RK }
CYL-A6475-RK }

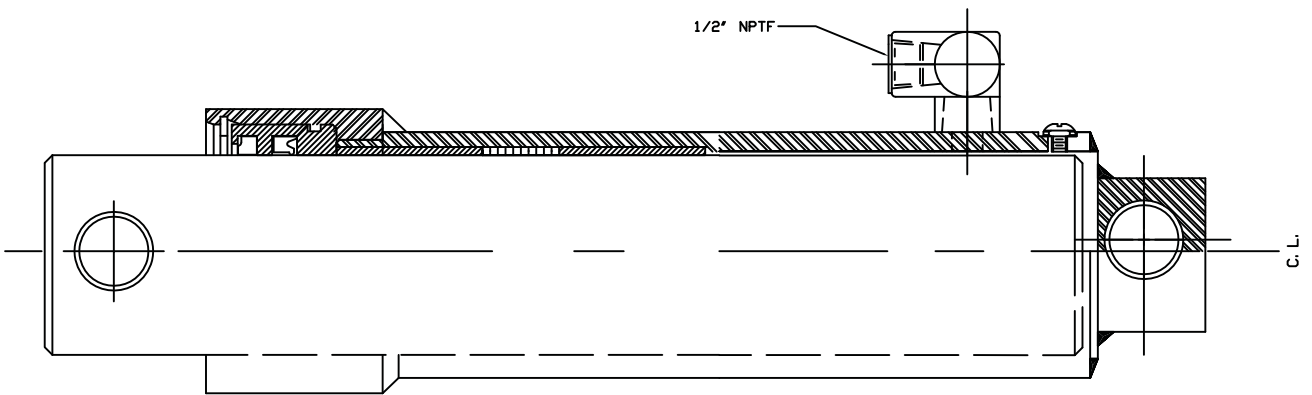
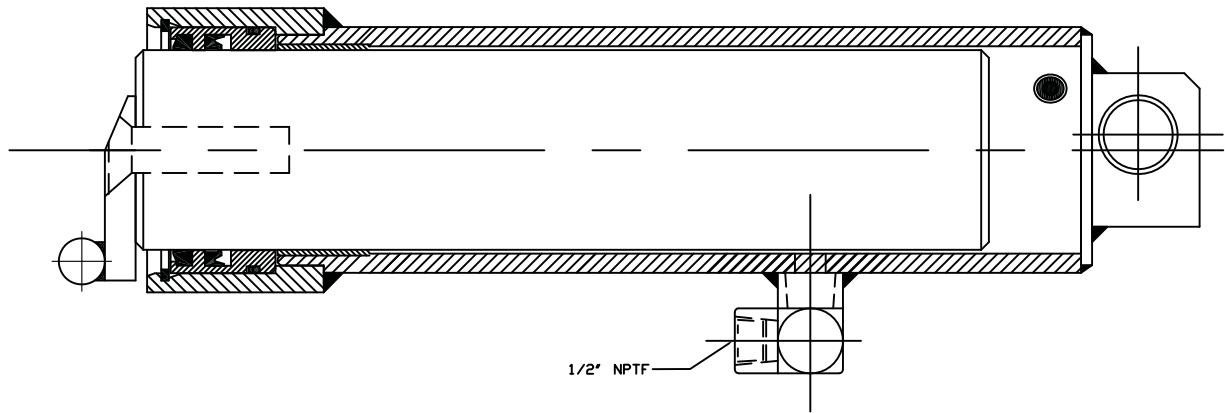
CYL-A5201/5202/6401-XXXX SERIES CYLINDER



CYL-A5201-RK }
CYL-A5202-RK } REPAIR KIT
CYL-A6401-RK }

FIGURE 12 & 13 - CYLINDERS USED ON BTSL & BQSL LIFTS:

CYL-A5202/6402/6401/5205/6405-XXXX SERIES CYLINDER



- CYL-A5202-RK
 - CYL-A6402-RK
 - CYL-A6401-RK
 - CYL-A5205-RK
 - CYL-A6405-RK
- } REPAIR KIT

ELECTRICAL SECTION (MODELS WITH 1 HP)

The standard power unit is pre-wired according to customer request. For supplied power other than the original configuration, the power unit **MUST BE** re-wired according to the Manufacturer's instruction sheet (see Electrical Schematics). Service and Field wiring is the sole responsibility of the end user. We assume no responsibility for incorrect installation or service wiring.

Install the power lines to conform to National Electrical Code (NEC) 480-22 and the local codes.

Given below are the various electrical components used on the Industrial Lift Series. A brief description of each is also given:

STANDARD REMOTE POWER UNIT (THREE PHASE) **1HP/208-230-460V/3PH/60HZ**

Power Supply: 208-230-460V/3PH/60HZ

Magnetic Starter: 24VAC Coil.

Transformer: Primary 208-230-460VAC, 75 VA; Secondary 24VAC w/ circuit breaker.

Solenoid: 24VAC

Motor: 1HP/208-230-460V/3PH/60HZ; 3450 RPM; Thermally protected.

Control Box Dimensions: 8" W x 6" H x 4" DP

Enclosure: NEMA 12 with 5 knockouts (Motor, Solenoid, Power Cord, Control Cord, and 1 spare).

STANDARD REMOTE POWER UNIT (SINGLE PHASE) **1HP/115-230V/1PH/60HZ**

Power Supply: 115-230V/1PH/60HZ/20A

VFD: 115-230V/1PH Input; 230V/3PH Output.

Circuit Breaker: 2A.

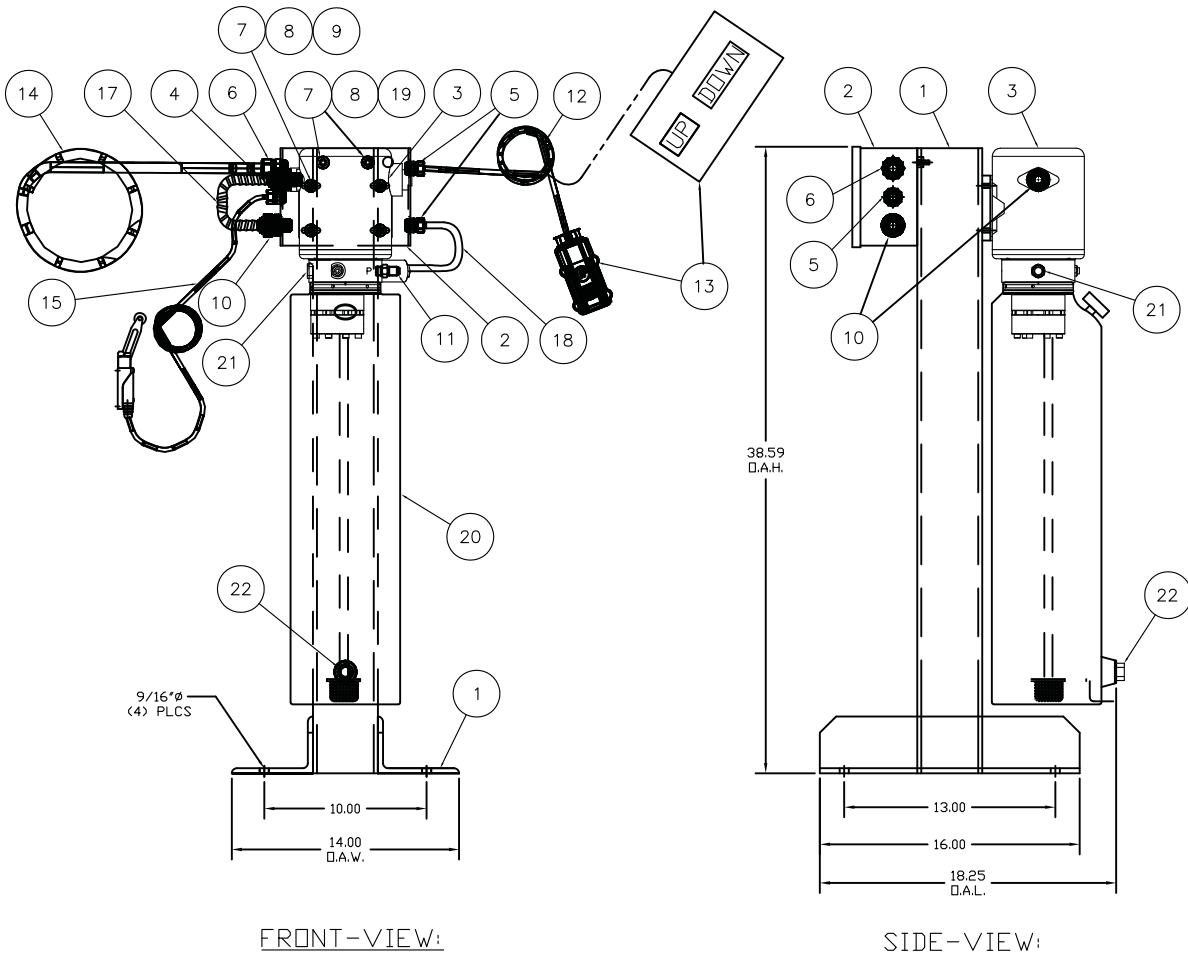
Solenoid: 115 or 230VAC (depending on input power supply).

Motor: 1HP/230V/3PH/60HZ; 3450 RPM; Thermally protected.

Control Box Dimensions: 8" W x 6" H x 4.5" DP

Enclosure: NEMA 12 with 5 knockouts (Motor, Solenoid, Power Cord, Control Cord, and 1 spare).

**FIGURE 14 - GENERAL LAYOUT OF INDUSTRIAL LIFT SERIES:
WITH REMOTE 1 HP POWER UNIT (THREE PHASE)**



FRONT-VIEW:

SIDE-VIEW:

ONLY ITEMS #1, #2, #3, #5, #6, #10, #21 & #22 ARE SHOWN IN THIS VIEW FOR CLARITY.

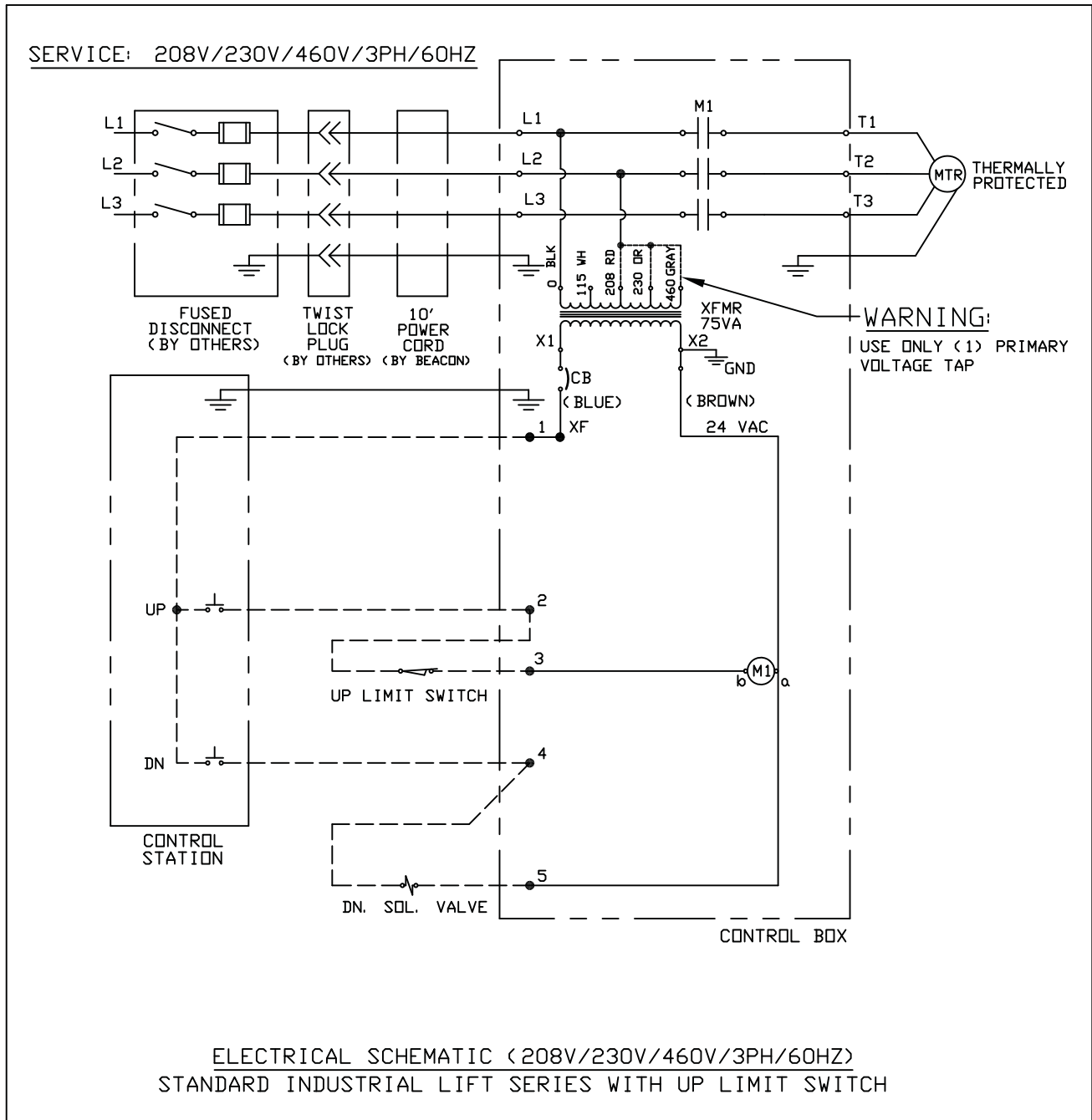
**FIGURE 15 - PARTS LIST FOR INDUSTRIAL LIFT SERIES:
WITH REMOTE 1 HP POWER UNIT (THREE PHASE)**

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTE
1	GEN-0104 RB	PEDESTAL MOTOR BRACKET	1	*
2	ELC-160-XXX-X RA	CONTROL BOX	1	*
3	H2-0643-XXX-3	MOTOR & PUMP ASSEMBLY	1	3 PHASE
4	ELC-134-04	KNOCKOUT COVER	1	3/4" OD
5	ELC-105-14	CONNECTOR	3	*
6	ELC-105-10	CONNECTOR	1	*
7	MS27183-11	WASHER, FLAT	6	5/16' ID
8	MS35338-44	WASHER, LOCK	6	1/4"
9	MS35291-6	SCREW, CAP, HEXAGON HEAD	4	1/4-20UNC x 3/4"
10	ELC-105-34	CONNECTOR	2	*
11	HOS-413-05	ADAPTER	1	9/16-18 ORB, 9/16-18 JIC
12	999-6008	#16-4 TYPE SO CORD x 8' lg.	1	PUSH BUTTON CORD
13	ELC-107-02 ELC-108-08	PUSH BUTTON STATION, 2 BUTTON FOOT CONTROL TWIN W/ GUARD	1	(STANDARD) NEMA 4 (OPTIONAL)
14	999-6002	#14-4 TYPE SO CORD x 10' lg.	1	POWER CORD
15	999-6004	#16-2 TYPE SO CORD x XX' lg	1	LIMIT SWITCH CORD
16	ELC-109-09 RB	LIMIT SWITCH	1	STANDARD
17	ELC-130-03	1/2" CONDUIT x 10" lg	1	*
18	999-6004	#16-2 TYPE SO CORD x 1' lg	1	*
19	MS35690-402	NUT	2	1/4-20UNC
20	GEN-9509	TANK KIT ASSY.	1	(FOR VERTICAL POWER UNIT)
21	HOS-P440-04	"O" RING BOSS/PLUG	1	3/4-16
22	HOS-437-05	EXTERNAL PIPE PLUG	1	3/4-14 NPT

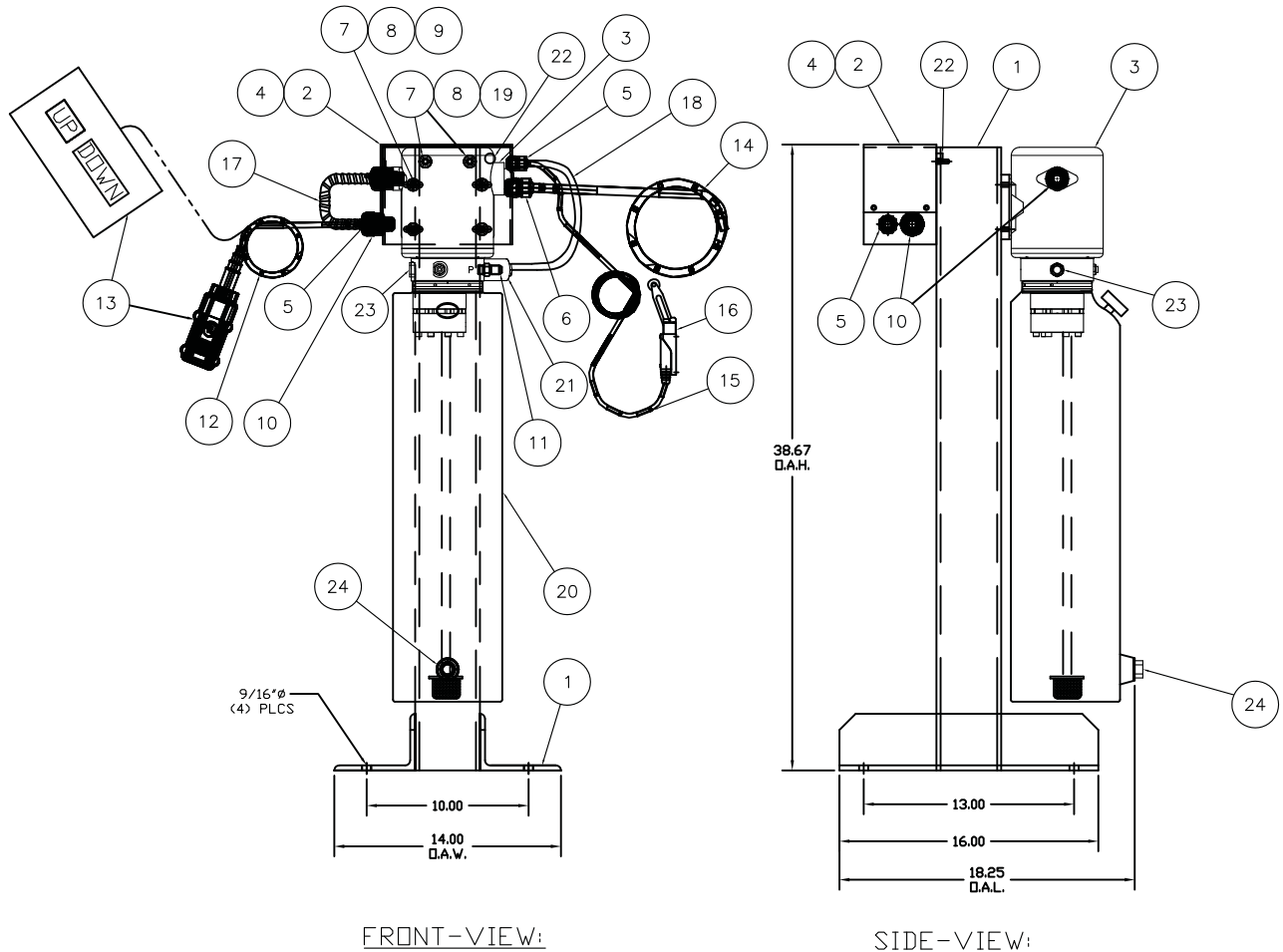
**FIGURE 16 - POWER UNIT PART NUMBERS FOR INDUSTRIAL LIFT SERIES:
WITH REMOTE 1 HP POWER UNIT (THREE PHASE)**

PART No.	POWER SUPPLY-INPUT
PU-0100-208-3-01	1HP, 208V, 3PH, 60HZ
PU-0100-230-3-01	1HP, 230V, 3PH, 60HZ
PU-0100-460-3-01	1HP, 460V, 3PH, 60HZ

**FIGURE 17 - ELECTRICAL SCHEMATIC STD. FOR INDUSTRIAL LIFT SERIES:
WITH REMOTE 1 HP POWER UNIT (THREE PHASE)**



**FIGURE 18 - GENERAL LAYOUT OF INDUSTRIAL LIFT SERIES:
WITH REMOTE 1 HP POWER UNIT (SINGLE PHASE)**



ONLY ITEMS #1, #2, #3, #4, #5,
#10, #22, #23 & #24 ARE SHOWN IN
THIS VIEW FOR CLARITY.

FIGURE 19 - PARTS LIST FOR INDUSTRIAL LIFT SERIES:

WITH REMOTE 1 HP POWER UNIT (SINGLE PHASE)

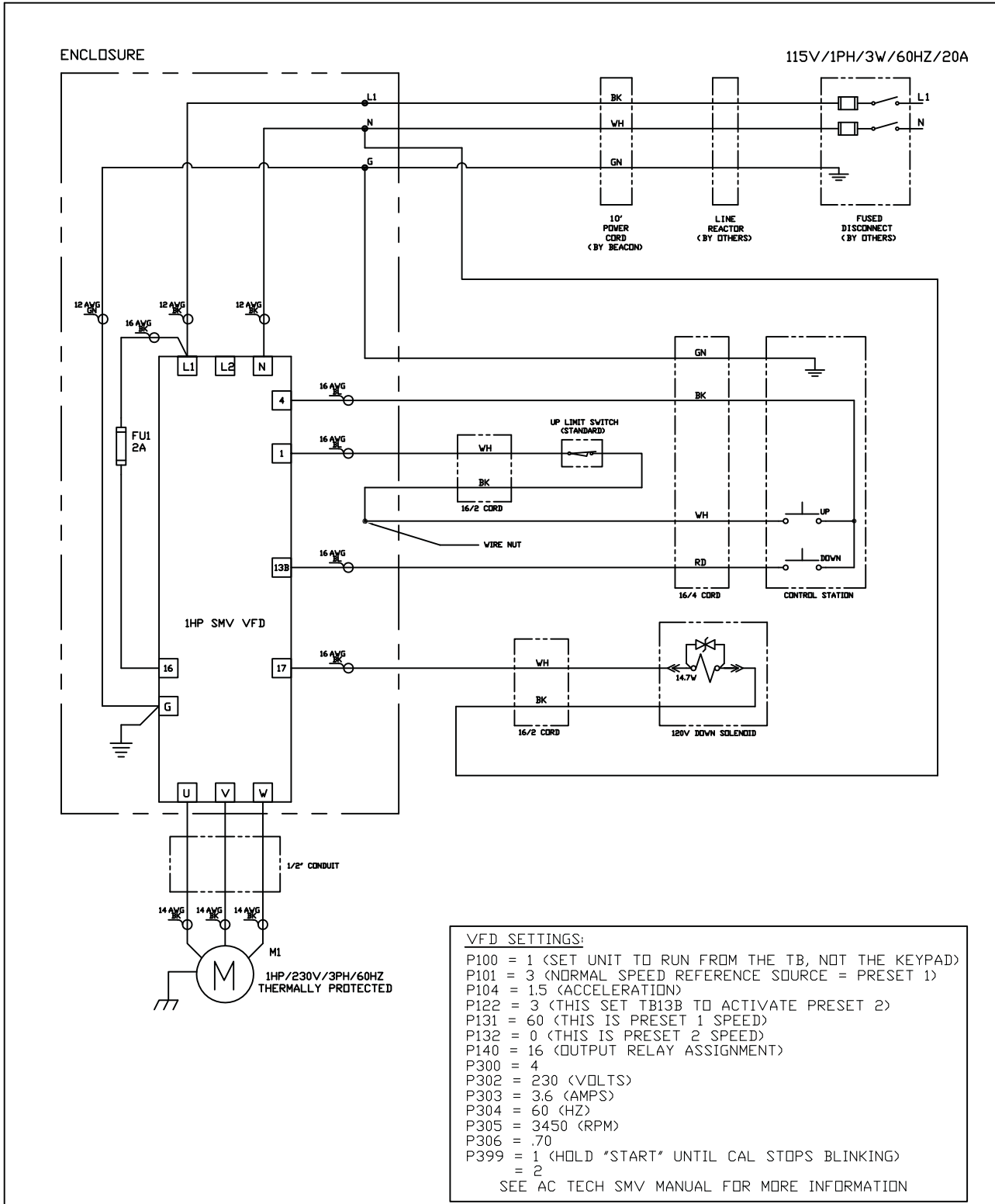
ITEM	PART NUMBER	DESCRIPTION	QTY	NOTE
1	GEN-0104 RB	PEDESTAL MOTOR BRACKET	1	*
2	ELC-103-24	ENCLOSURE	1	8 x 6 x 4.5 W
3	H2-0643-XXX-3	MOTOR & PUMP ASSEMBLY	1	3 PHASE
4	ELC-139-01	VFD ESV112N01SB	1	115-230V/1PH INPUT
5	ELC-105-14	CONNECTOR, STRAIGHT	4	FOR #16-2 & #16-4 CORD
6	ELC-105-15	CONNECTOR, STRAIGHT	1	FOR #10-3 CORD
7	MS27183-11	WASHER, FLAT	6	5/16' ID
8	MS35338-44	WASHER, LOCK	6	1/4"
9	MS35291-6	SCREW, CAP, HEXAGON HEAD	4	1/4-20UNC x 3/4"
10	ELC-105-34	CONNECTOR, STRAIGHT	2	FOR 1/2" CONDUIT
11	HOS-413-05	ADAPTER, MALE	1	9/16-18 ORB, 9/16-18 JIC
12	999-6008	#16-4 TYPE SO CORD x 8' lg.	2	FOR PUSH BUTTON
13	ELC-107-02 ELC-108-08	PUSH BUTTON STATION, 2 BUTTON FOOT CONTROL TWIN W/ GUARD	1	(STANDARD) NEMA 4 (OPTIONAL)
14	999-6003	#10-3 TYPE SO CORD x 10' lg.	1	FOR POWER
15	999-6004	#16-2 TYPE SO CORD x XX' lg	1	LIMIT SWITCH CORD
16	ELC-109-09 RB	LIMIT SWITCH	1	STANDARD
17	ELC-130-03	1/2" CONDUIT x 16" lg	1	FOR MOTOR
18	999-6004	#16-2 TYPE SO CORD x 3' lg	1	FOR SOLENOID
19	MS35690-402	NUT	2	1/4-20UNC
20	GEN-9509	TANK KIT ASSY.	1	(FOR VERTICAL POWER UNIT)
21	HLT-0750 HLT-0762	SOLENOID COIL, 115 VAC SOLENOID COIL, 240 VAC	1	1/2" CONDUIT, 18ga LEADS 1/2" CONDUIT, 18ga LEADS
22	ELC-122-11	CIRCUIT BREAKER	1	2 AMPS
23	HOS-440-04	"O" RING BOSS/PLUG	1	3/4-16
24	HOS-437-05	EXTERNAL PIPE PLUG	1	3/4-14 NPT

FIGURE 20 - POWER UNIT PART NUMBERS FOR INDUSTRIAL LIFT SERIES:

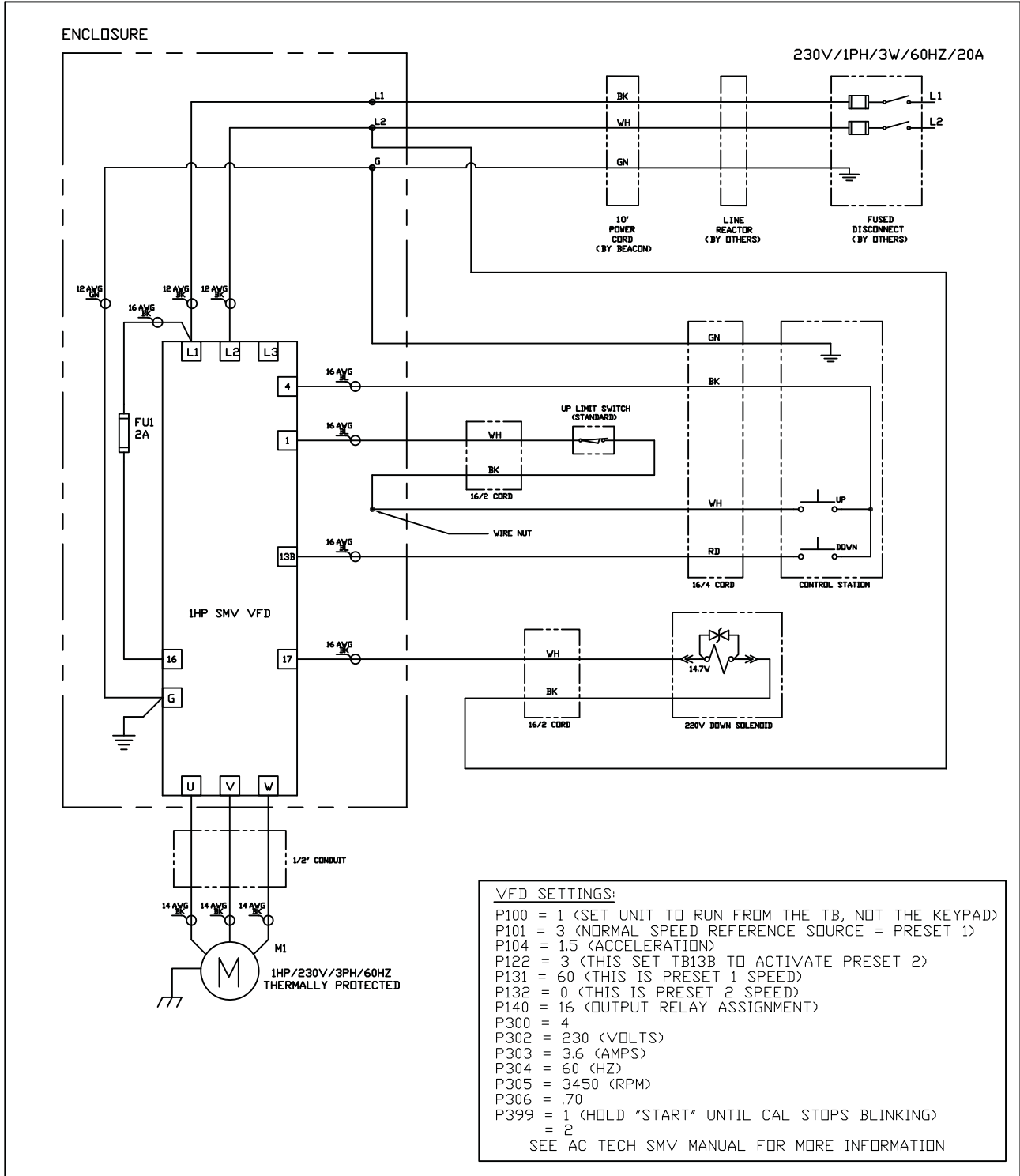
WITH REMOTE 1 HP POWER UNIT (SINGLE PHASE)

PART No.	POWER SUPPLY-INPUT
PU-0100-115-1-01	1HP, 115V, 1PH, 60HZ
PU-0100-230-1-01	1HP, 230V, 1PH, 60HZ

**FIGURE 21 - ELECTRICAL SCHEMATIC STD. FOR INDUSTRIAL LIFT SERIES:
 REMOTE 1 HP POWER UNIT (115V/1PH/3W/60HZ/20A) WITH VFD & STANDARD
 UP LIMIT SWITCH**



**FIGURE 22 - ELECTRICAL SCHEMATIC STD. FOR INDUSTRIAL LIFT SERIES:
 REMOTE 1 HP POWER UNIT (230V/1PH/3W/60HZ/20A) WITH VFD & STANDARD
 UP LIMIT SWITCH**



ELECTRICAL SECTION (MODELS WITH 5 HP)

The standard power unit is pre-wired according to customer request. For supplied power other than the original configuration, the power unit **MUST BE** re-wired according to the Manufacturer’s instruction sheet (see Electrical Schematics). Service and Field wiring is the sole responsibility of the end user. We assume no responsibility for incorrect installation or service wiring.

Install the power lines to conform to National Electrical Code (NEC) 480-22 and the local codes.

NOTES:

1- The standard **5 HP** power unit is usable at **208VAC/3PH/60Hz**.

Given below are the various electrical components used on the Lift. A brief description of each is also given.

1. Standard Control Box for 5 HP & 7 ½ HP Power Units:

Specifications:

Magnetic Starter - 24VAC Coil, size 1

Thermal overload -3 pole

Transformer - 50KVA

Primary: 240V/480V/60Hz

Secondary: 24VAC

Fuse in Secondary Circuit – 2.5 A.

Reset - Automatic or Manual

Enclosure - NEMA 12 with 5 knockouts (Motor, Solenoid, Limit Switch, Power and Push Button Control).

Overall Box Dimensions: 12 in. x 10 in. x 6 in.

2. Standard 5 & 7 ½ HP Electric Motor Specifications:

ITEM	PART NUMBER	DESCRIPTION	FULL LOAD CURRENT (Amperes) (VOLTAGE/PHASE)
1	ELC-126-40	5HP, 230V/1PH/60Hz, 1725 RPM	25 (230/1)
2	ELC-126-39	5 HP, 230V/460V/3PH/60Hz, 1725 RPM	13.2 6.6 (230/3) (460/3)
3	ELC-126-15	7 ½ HP, 230V/460V/3PH/60Hz, 1725 RPM	20 10 (230/3) (460/3)

3. Standard Pendant Push Button Control Station:

The standard Control Station supplied with the standard Industrial Lift Series is a NEMA 4 weather proof pendant type, with “UP” and “DN” momentary contact, “dead-man” type operation. The pendant station is also mechanically interlocked, so that operation of one button locks-out operation of the other.

FIGURE 23: ELECTRICAL CIRCUIT

REMOTE 5 HP POWER UNIT 208-230V/3PH/60Hz
STANDARD INDUSTRIAL LIFT SERIES

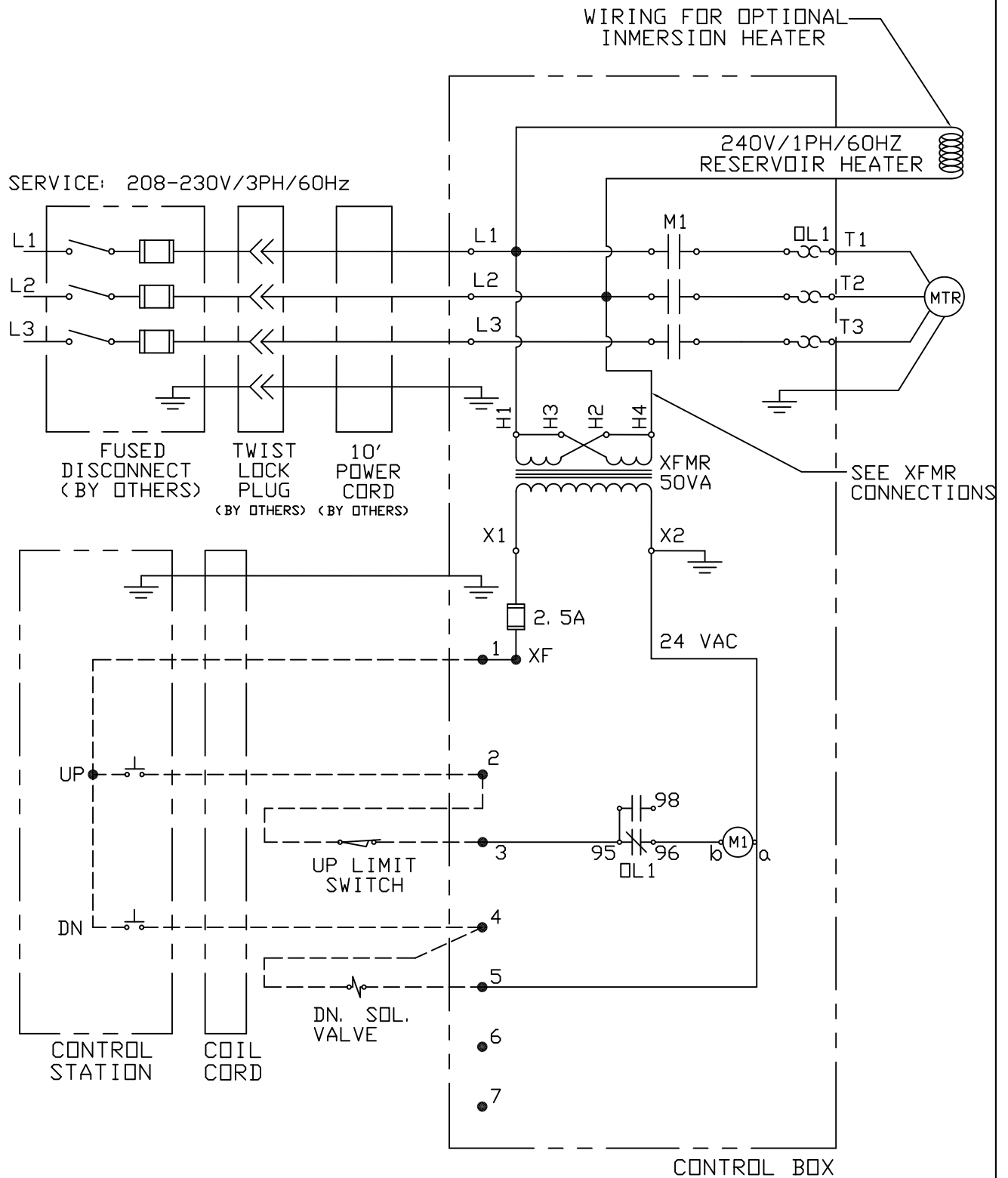
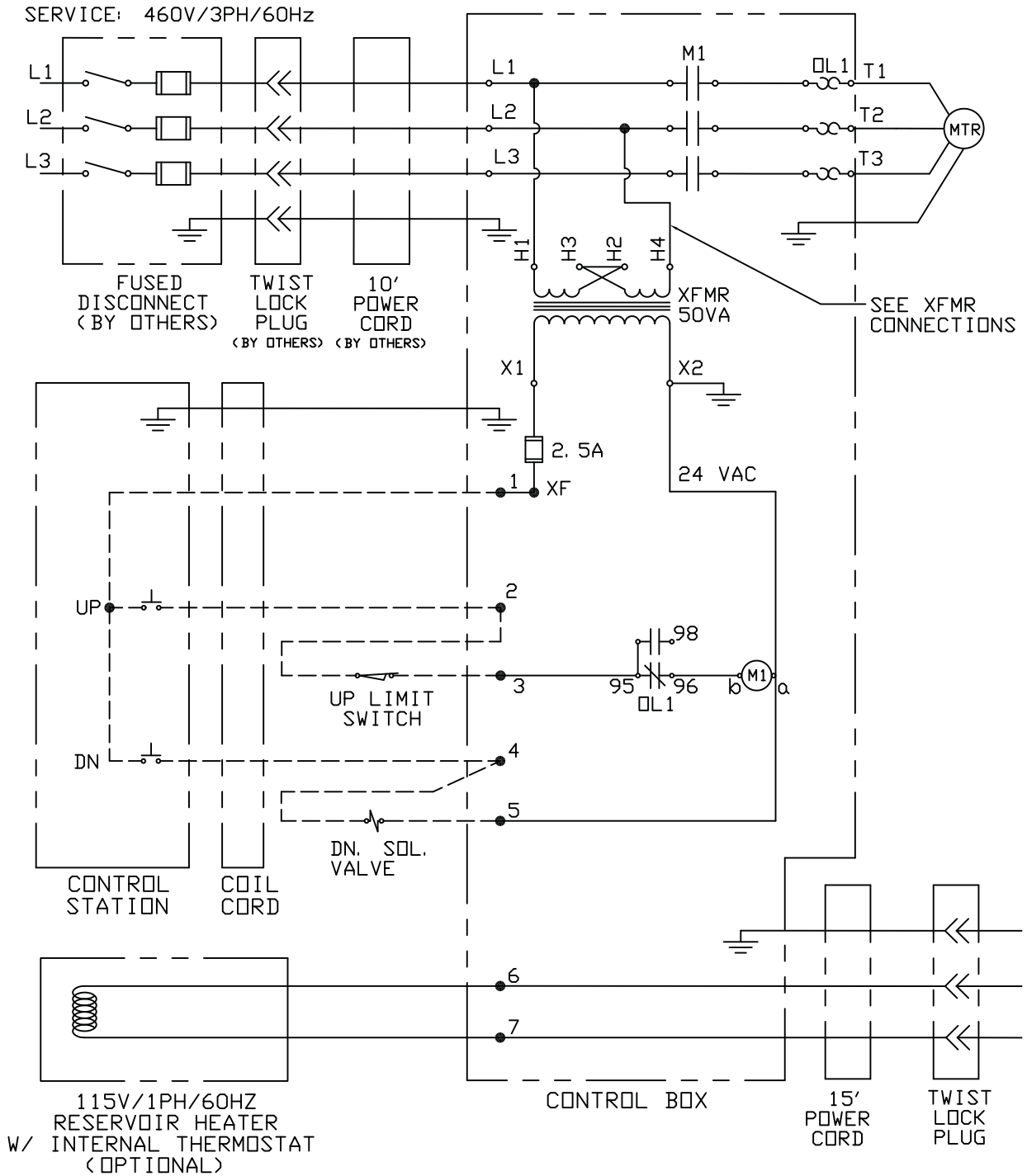


FIGURE 24: ELECTRICAL CIRCUIT

REMOTE 5 HP POWER UNIT 460V/3PH/60Hz
STANDARD INDUSTRIAL LIFT SERIES



NOTE:
CUSTOMER MUST SUPPLY
SEPARATE 115VAC
SOURCE FOR OIL
IMMERSION HEATER.

FIGURE 25: ELECTRICAL CIRCUIT
 REMOTE 5 HP POWER UNIT 230V/1PH/60Hz
 STANDARD INDUSTRIAL LIFT SERIES

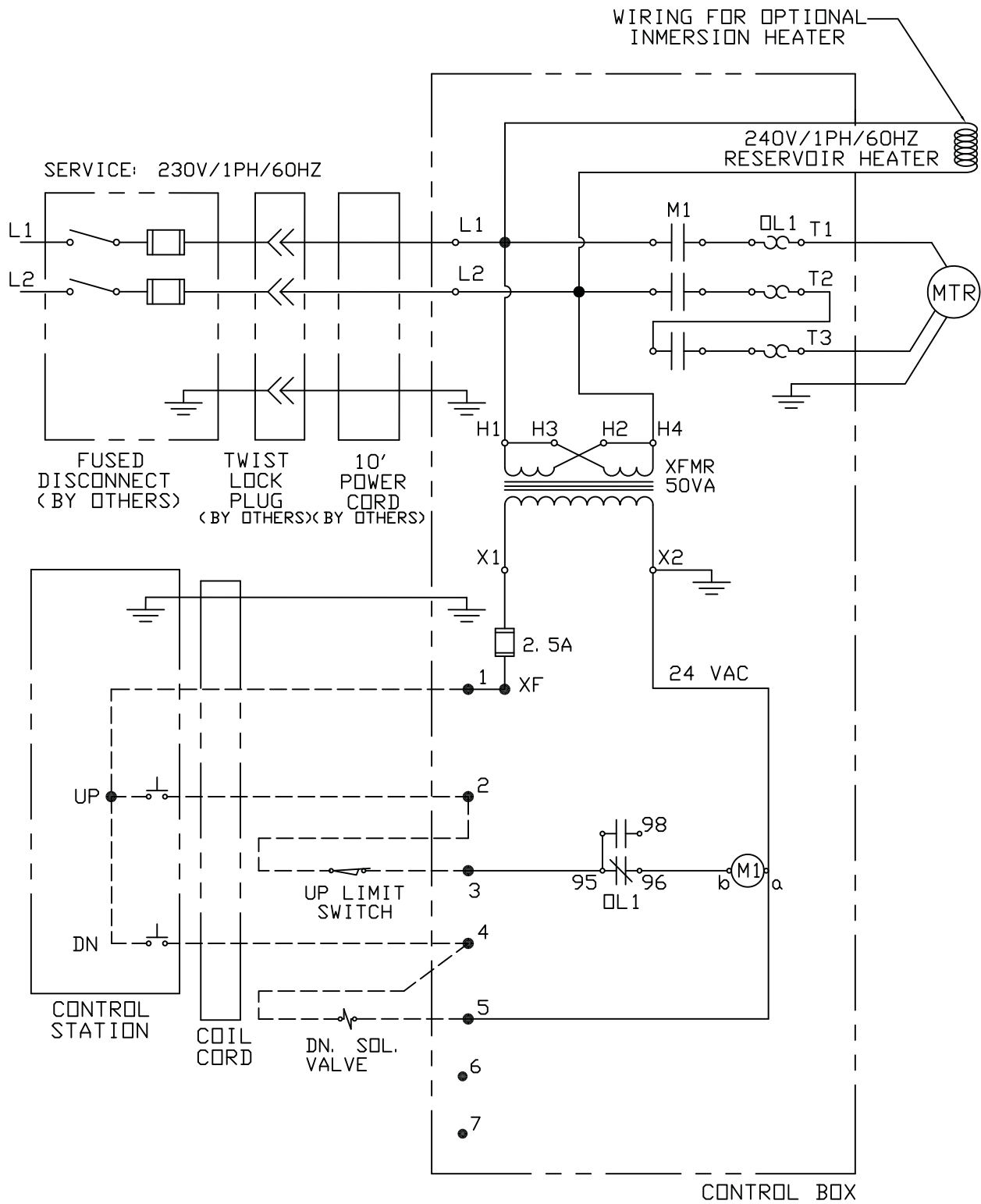


FIGURE 26: ELECTRICAL CIRCUIT

REMOTE 5 HP POWER UNIT 208-230-460V/3PH/60HZ
STANDARD INDUSTRIAL LIFT SERIES w/ TAPE SWITCHES

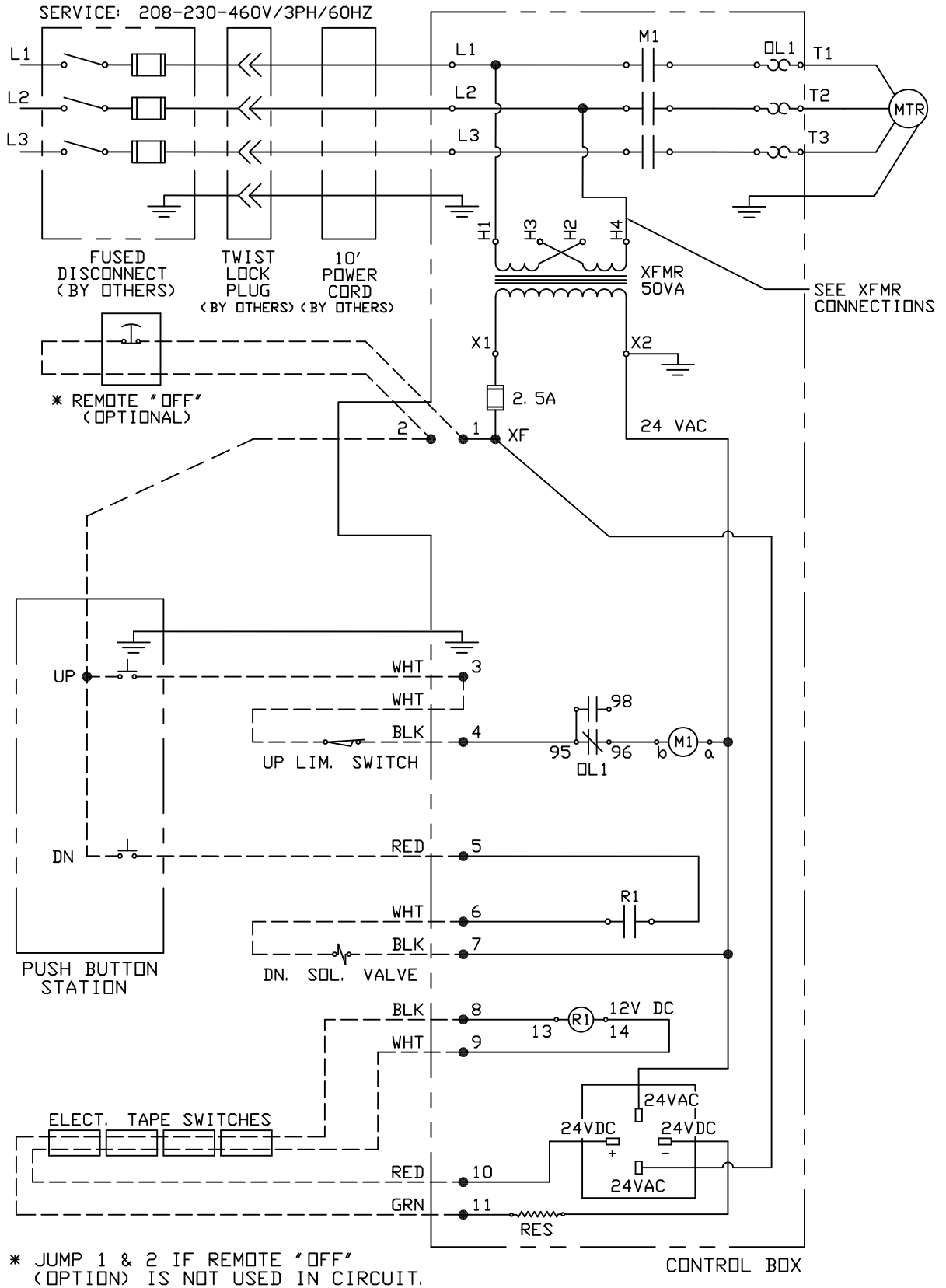
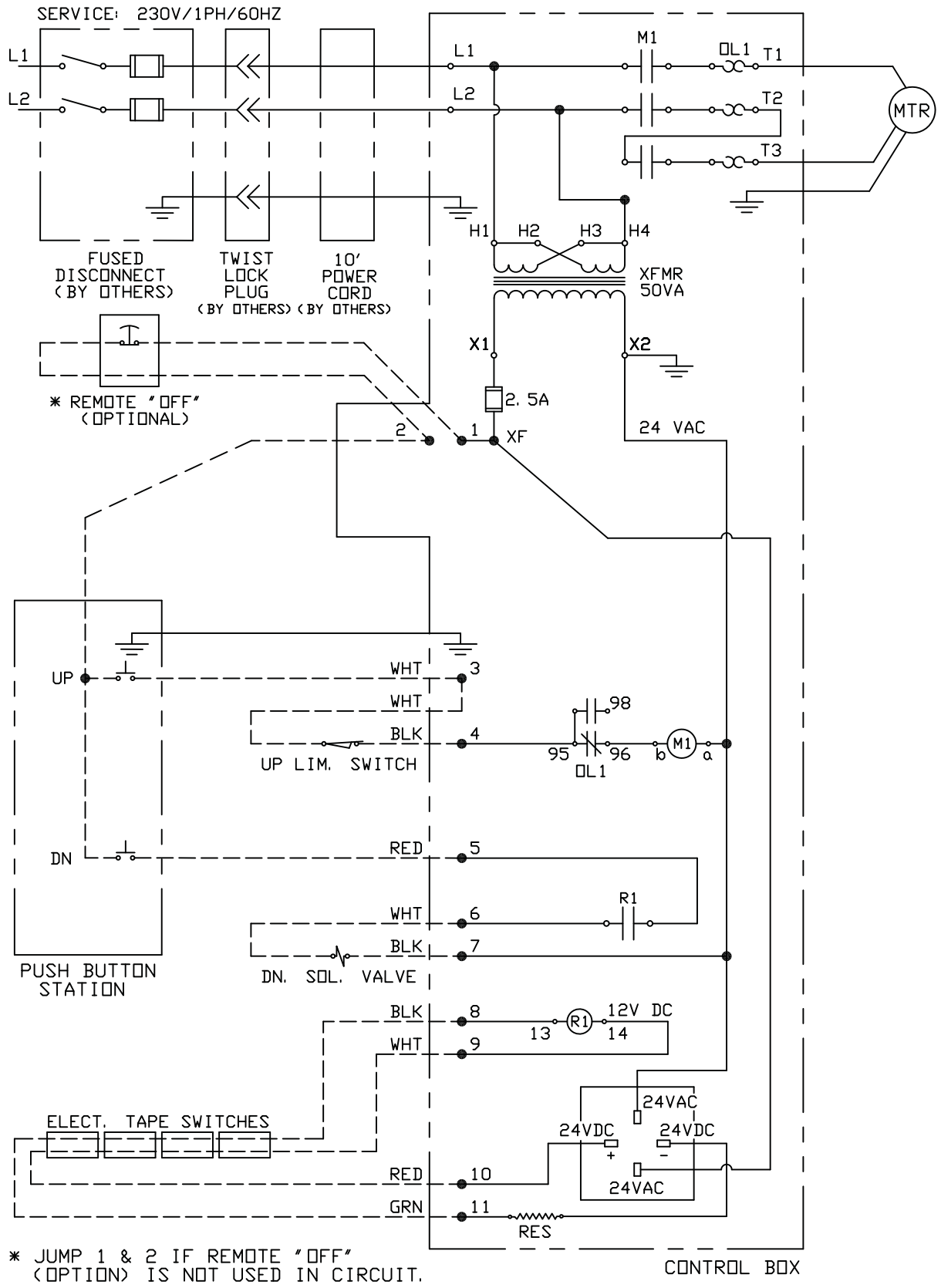


FIGURE 27: ELECTRICAL CIRCUIT

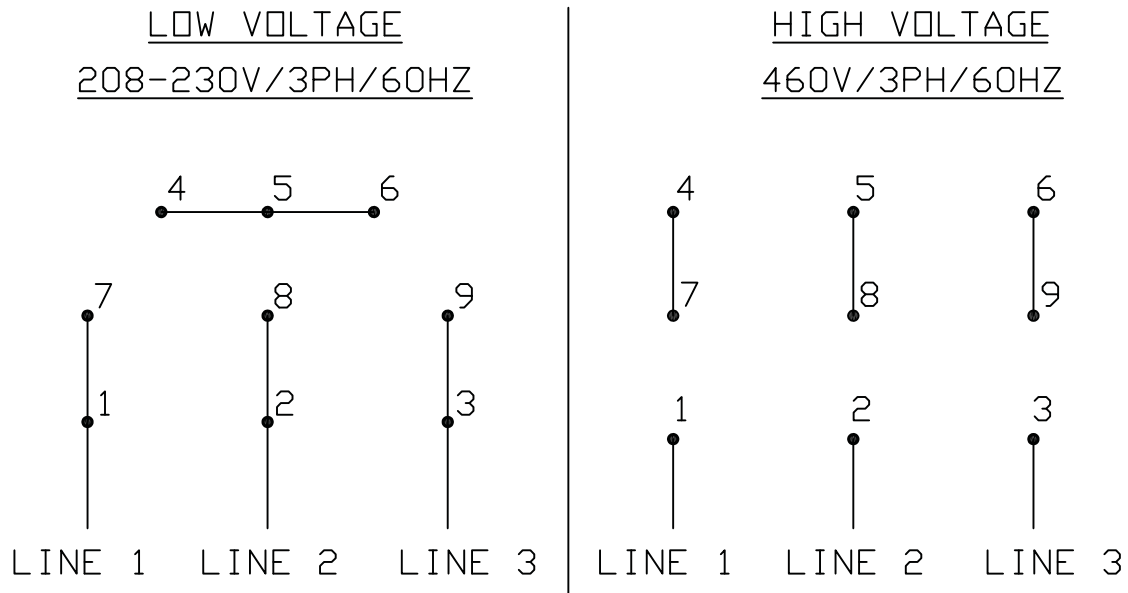
REMOTE 5 HP POWER UNIT 230V/1PH/60Hz
STANDARD INDUSTRIAL LIFT SERIES w/ TAPE SWITCHES



* JUMP 1 & 2 IF REMOTE "OFF" (OPTION) IS NOT USED IN CIRCUIT.

FIGURE 28: MOTOR WIRING DIAGRAMS

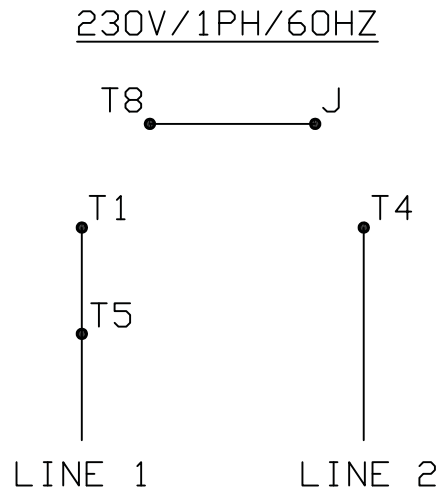
REMOTE 5 HP 208-230-460V/3PH/60Hz
STANDARD INDUSTRIAL LIFT SERIES



NOTE: INTERCHANGE ANY TWO LINE LEADS
TO REVERSE ROTATION.

FIGURE 29: MOTOR WIRING DIAGRAMS

REMOTE 5 HP 230V/1PH/60Hz
STANDARD INDUSTRIAL LIFT SERIES



NOTE: TO REVERSE ROTATION, SEE
WIRING DIAGRAM ON MOTOR.

FIGURE 30: TYPICAL REMOTE 5 HP POWER UNIT

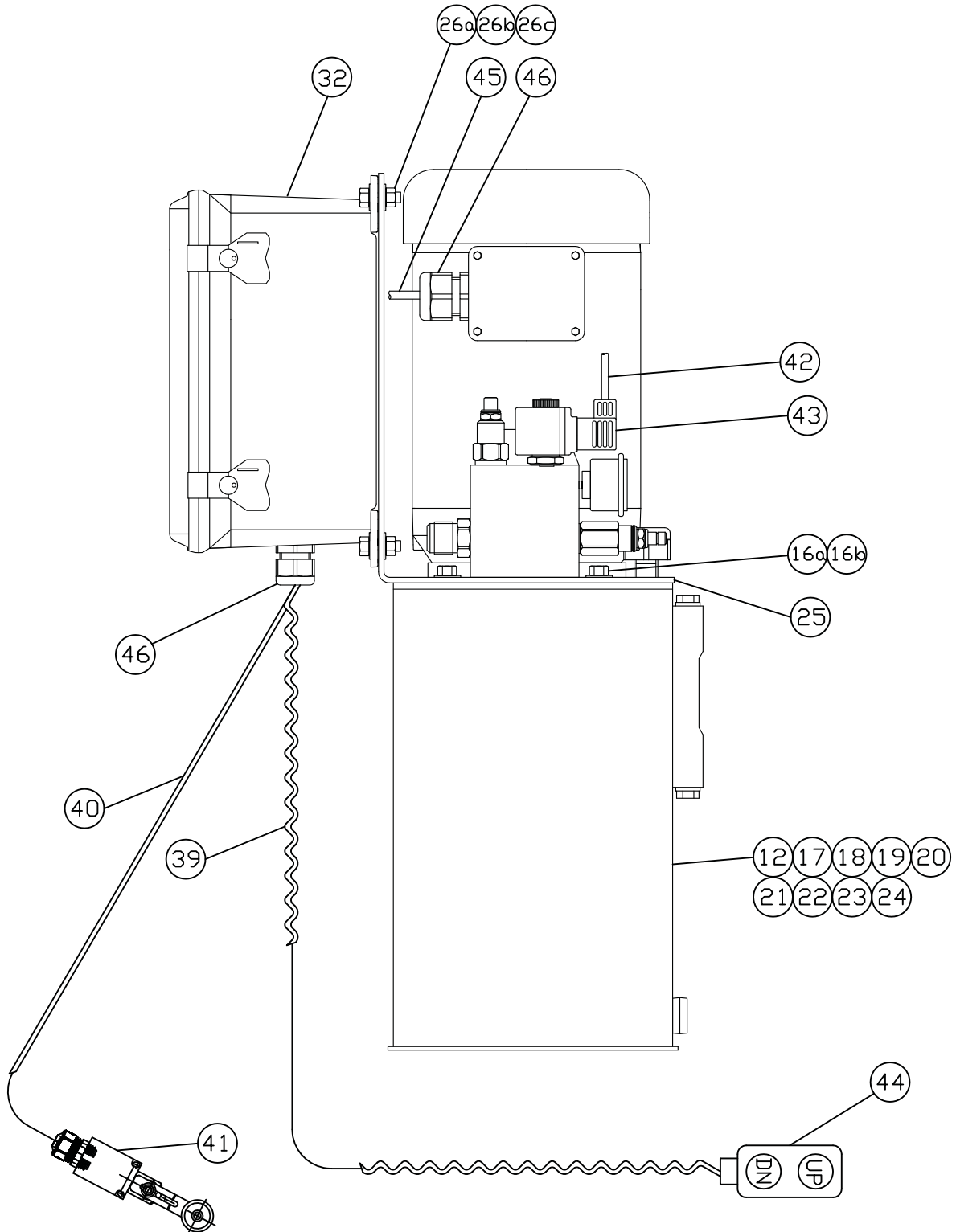


FIGURE 31: TYPICAL REMOTE 5 HP POWER UNIT
CONTROL BOX ASSEMBLY

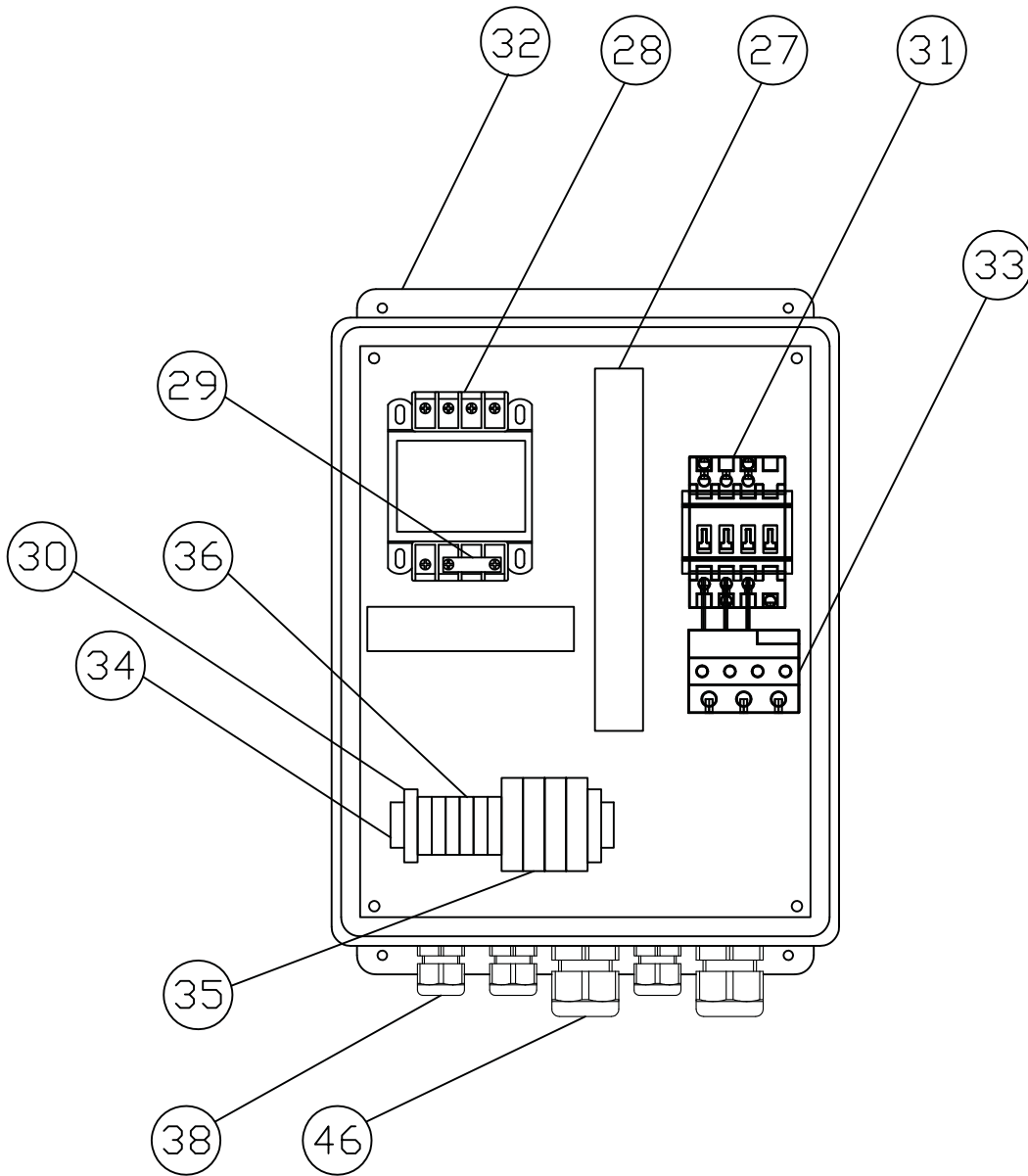


FIGURE 32: TYPICAL REMOTE 5 HP POWER UNIT

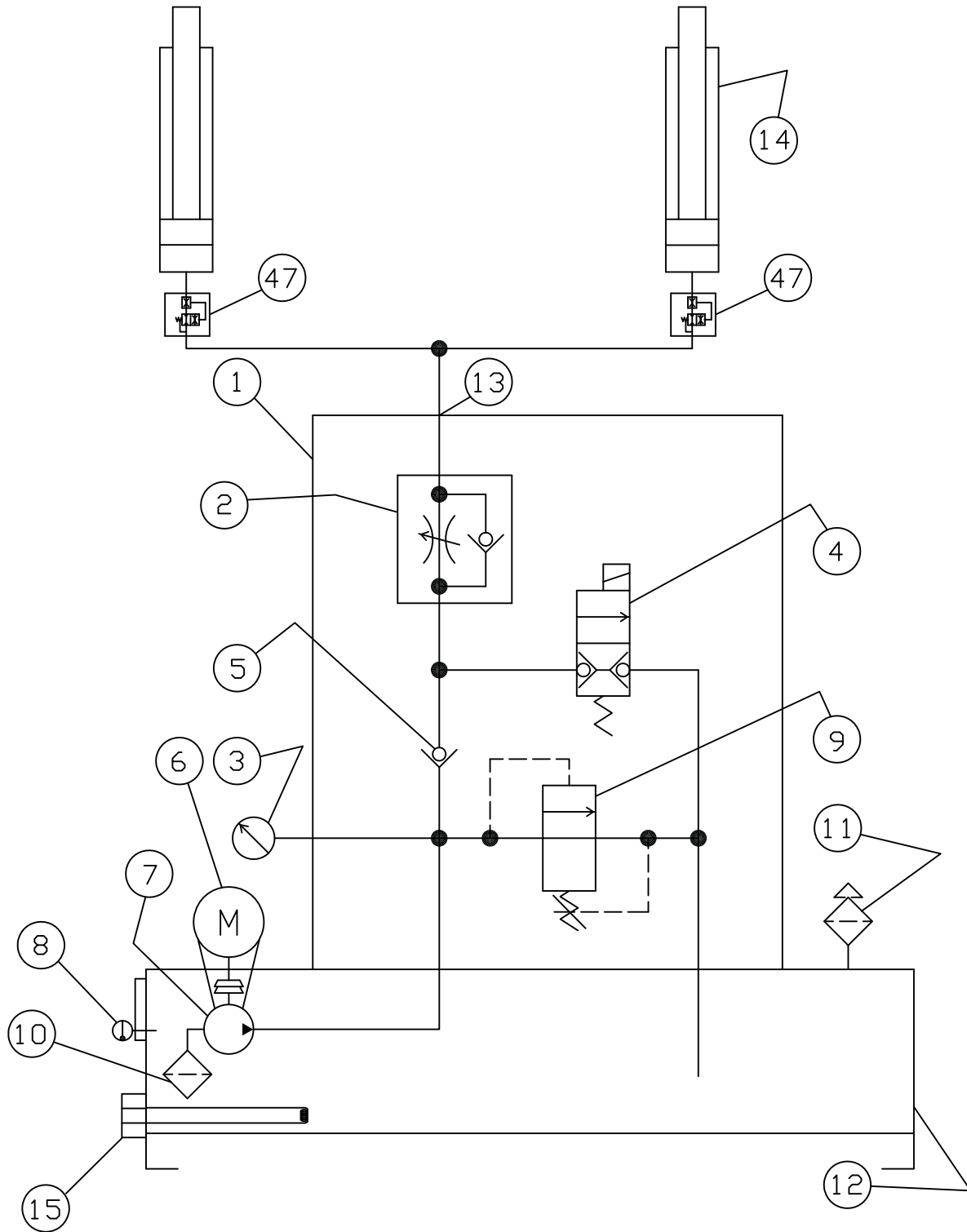


FIGURE 33: STANDARD REMOTE 5 HP POWER UNIT PARTS LIST

ITEM	ECOA PART NUMBER	DESCRIPTION	QTY.
1	HYD-0603	VALVE BLOCK	1
2	HYD-0110	DOWN FLOW CONTROL	1
3	HYD-0059	PRESSURE GAUGE	1
4	HYD-0060	SOLENOID VALVE	1
5	HYD-0061	CHECK VALVE	1
6	ELC-126-39	ELECTRIC MOTOR - 5 H.P. / 3 PH.	1
	ELC-126-40	ELECTRIC MOTOR - 5 H.P. / 1 PH.	
7	HYD-0708	HYDRAULIC PUMP	1
8	HYD-0048	SIDE GLASS WITH THERMOMETER	1
9	HYD-0062	RELIEF VALVE	1
10	HYD-0051	SUCTION STRAINER	1
11	HYD-0046	FILLER BREATHER	1
12	HYD-0058	HYDRAULIC TANK	1
13	*	OUTLET PORT	1
14	BY MODEL	HYDRAULIC CYLINDER (S)	*
15	HDS-435-04	DRAIN PLUG 1/2" (STANDARD)	1
	ELC-133-04	OIL IMMERSION HEATER (OPTIONAL)	
16a	MS35291-60	BOLT 3/8-16 x 1 HHCS	4
16b	MS27183-13	3/8 WASHER	4
17	HYD-0047	PUMP-MOTOR ADAPTER	1
18	HYD-0049	SUCTION ELBOW	1
19	HYD-0050	SUCTION PIPE	1
20	HYD-0052	SUCTION FITTING	1
21	HYD-0053	PRESSURE FITTING	1
22	HYD-0054	PUMP COUPLING 5/8" x 5/32"	1
23	HYD-0055	RUBBER SPIDER	1
24	HYD-0056	MOTOR COUPLING 7/8" x 3/16"	1
25	HYD-0057	CUSTOM COVER PLATE	1
26a	MS35291-33	BOLT 5/16-18 x 7/8	4
26b	MS35338-45	LOCK WASHER 5/16 dia.	4
26c	MS35690-502	5/16-18 HEX NUT	4
27	ELC-131-03	1 X 1 1/2 WIRING DUCT	3
28	ELC-116-14	XFMR 50VA 240V/480V PRI. / 24V SEC.	1
29	ELC-122-10	SHAWMUT 2-1/2 AMP MIDGET FUSE	1
30	ELC-119-08	TERM BLOCK END STOP	1
31	ELC-117-02	24VAC CONTACTOR	1
32	ELC-103-23	NEMA 12 ENCLOSURE	1
33	ELC-118-01	OVERLOAD 12-18 FLA (230V/3PH)	1
	ELC-118-02	OVERLOAD 7-11 FLA (460V/3PH)	
	ELC-118-06	OVERLOAD 24-34 FLA (230V/1PH)	
34	ELC-119-09	DIN RAIL	1
35	ELC-119-10	CON TERMINAL BLOCK 22-12GA	3
36	ELC-119-11	CON TERMINAL BLOCK 22-14AWG	6
37	ELC-119-12	GROUND TERMINAL 22-8 GA	1
38	ELC-105-14	PG13.5 ST RELIEF 3-9MM GRAY	4
39	ELC-112-03	COIL CORD SJD 18/3 - 20' FT	1
40	999-6004-240	CORD SJD 18/2 - 20' FT.	1
41	ELC-109-11	LIMIT SWITCH	1
42	999-6004-31	CORD SJD 18/2 - 31 IN	1
43	ELC-123-05	DIN CONNECTOR / RECTIFIER 24 VDC	1
44	ELC-107-02	PENDANT CONTROL STATION	1
45	999-6003-21	CORD SJD 10/3 - 21 IN.	1
46	ELC-105-10	NPT 3/4" ST RELIEF 7-16MM GRAY	3
47	BY MODEL	FLOW LIMITER VALVE	*

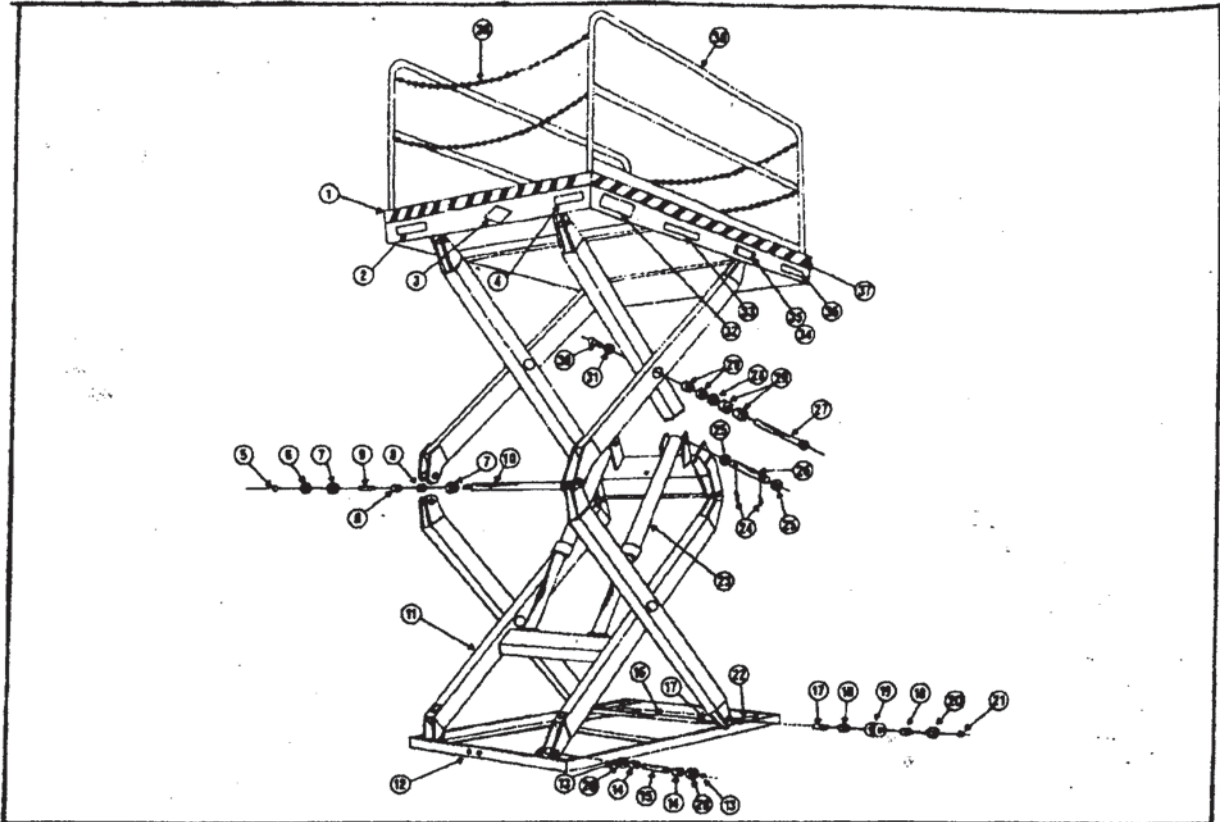
FIGURE 34: BDSL CYLINDER CHART 2,000 - 6,000 LBS.; 60” – 144” V.T.:

MODEL	CYLINDER ASSY FOR DSL MODELS	
	QTY	PART No.
BDSL-20-60-XXYYY	1	CYL-A5670-1275
BDSL-40-60-XXYYY	1	CYL-A6470-1275
BDSL-60-60-XXYYY	2	CYL-A5670-1275
BDSL-20-72-XXYYY	1	CYL-A5675-1675
BDSL-40-72-XXYYY	1	CYL-A6475-1675
BDSL-60-72-XXYYY	2	CYL-A5675-1675
BDSL-20-90-XXYYY	2	CYL-A5202-1675
BDSL-40-90-XXYYY		CYL-A6401-1875
BDSL-60-90-XXYYY		CYL-A6401-1875
BDSL-20-108-XXYYY	2	CYL-A5201-2800
BDSL-40-108-XXYYY		CYL-A6401-3000
BDSL-60-108-XXYYY		CYL-A6401-3000
BDSL-20-120-XXYYY	2	CYL-A5201-2800
BDSL-40-120-XXYYY		CYL-A6401-3000
BDSL-60-120-XXYYY		CYL-A6401-3000
BDSL-20-144-XXYYY	2	CYL-A5201-2800
BDSL-40-144-XXYYY		CYL-A6401-3000
BDSL-60-144-XXYYY		CYL-A6401-3000

**FIGURE 35: CYLINDER CHART FOR BTSL 3,000 – 6,000 LBS.; 72” – 216” V.T.
 BQSL 3,000 – 6,000 LBS.; 240” – 288” V.T.:**

MODEL	CYLINDER ASSY.	
	QTY.	PART No.
BTSL-30-072-XXYYY	2	CYL-A5202-0950
BTSL-60-072-XXYYY		CYL-A6402-1200
BTSL-30-096-XXYYY	2	CYL-A5202-1250
BTSL-60-096-XXYYY		CYL-A6402-1500
BTSL-30-120-XXYYY	2	CYL-A5202-2000
BTSL-60-120-XXYYY		CYL-A6401-1575
BTSL-30-144-XXYYY	2	CYL-A5202-1675
BTSL-60-144-XXYYY		CYL-A6401-1875
BTSL-30-162-XXYYY	2	CYL-A5205-4950
BTSL-60-162-XXYYY		
BTSL-30-180-XXYYY	2	CYL-A5205-5500
BTSL-60-180-XXYYY		
BTSL-120-180-XXYYY		CYL-A6405-5100
BTSL-30-216-XXYYY	2	CYL-A5205-6575
BTSL-60-216-XXYYY		CYL-A6405-6150
BQSL-30-240-XXYYY	2	CYL-A5205-5500
BQSL-60-240-XXYYY		
BQSL-30-288-XXYYY	2	CYL-A5205-6575
BQSL-60-288-XXYYY		CYL-A6405-6150

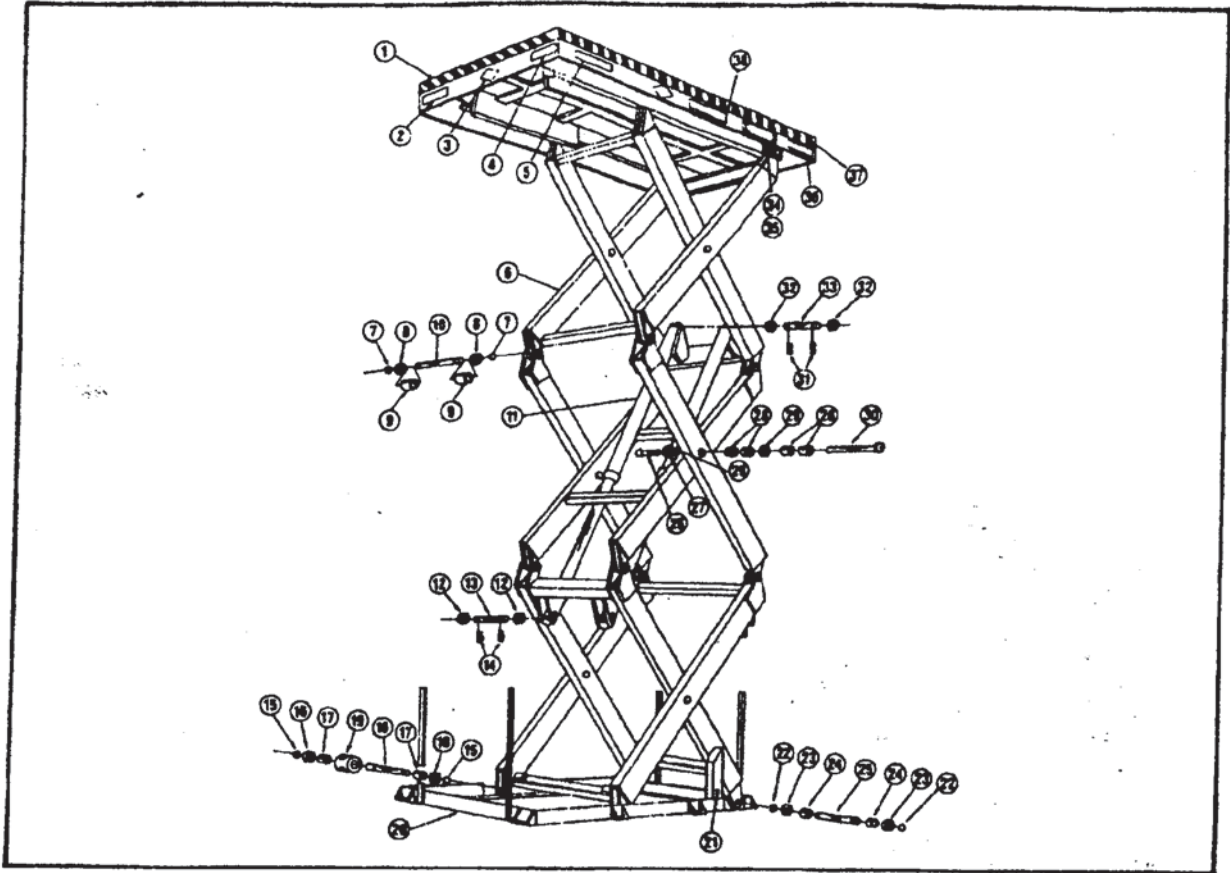
FIGURE 36: EXPLODED VIEW OF STANDARD BDSL MODELS WITH CAPACITY 1-6,000 LBS. AND VERTICAL TRAVEL 60" THROUGH 144".



Item	Part Number	Description	Quantity Required												
			60" Vertical Travel		72" Vertical Travel		90" Vertical Travel		108" Vertical Travel		120" Vertical Travel		144" Vertical Travel		
			1-2,000 Capacities	3,000 Capacities	4-4,000 Capacities	1-2,000 Capacities	3,000 Capacities	4-4,000 Capacities	1-4,000 Capacities	5-4,000 Capacities	1-4,000 Capacities	5-4,000 Capacities	1-4,000 Capacities	5-4,000 Capacities	
1		Platform Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1
2	L-66	Decal - "Remove Shipping Bolts. ."	2	2	2	2	2	2	2	2	2	2	2	2	2
3	L-155	Logo	2	2	2	2	2	2	2	2	2	2	2	2	2
4	L-73	Decal - "Danger - Keepout from under lift"	2	2	2	2	2	2	2	2	2	2	2	2	2
5	HLT-P972	Retainer Ring	4	4	4	4	4	4	4	4	4	4	4	4	4
6	HLT-P970	Washer	4	4	4	4	4	4	4	4	4	4	4	4	4
7	DBL-P9502	Spacer	8	8	8	8	8	8	8	8	8	8	8	8	8
8	HLT-P950	Bearing	8	8	8	8	8	8	8	8	8	8	8	8	8
9	DSL-P9023	Pin - inner leg	1	1	-	1	1	-	-	-	-	-	-	-	-
	DSL-P9024	Pin - outer leg	1	1	-	1	1	-	-	-	-	-	-	-	-
	DSL-P9048	Pin - inner leg	-	-	1	-	1	-	-	-	-	-	-	-	-
	DSL-P9049	Pin - outer leg	-	-	1	-	1	-	-	-	-	-	-	-	-
	DSL-P9011	Pin - inner leg	-	-	-	-	-	1	1	-	-	-	-	-	-
	DSL-P9012	Pin - outer leg	-	-	-	-	-	1	1	-	-	-	-	-	-
	DSL-P9007	Pin - inner leg	-	-	-	-	-	-	-	1	1	-	-	-	-
	DSL-P9008	Pin - outer leg	-	-	-	-	-	-	-	1	1	-	-	-	-
	DSL-P9005	Pin - inner leg	-	-	-	-	-	-	-	-	-	1	1	-	-
	DSL-P9006	Pin - outer leg	-	-	-	-	-	-	-	-	-	1	1	-	-
10	DSL-P9516	Spacer tube - inner leg	1	1	-	1	1	-	-	-	-	-	-	-	-
	DSL-P9515	Spacer tube - outer leg	1	1	-	1	1	-	-	-	-	-	-	-	-
	DSL-P9524	Spacer tube - outer leg	-	-	1	-	1	-	-	-	-	-	-	-	-
	DSL-P9526	Spacer tube - inner leg	-	-	-	-	-	1	1	-	-	-	-	-	-
	DSL-P9511	Spacer tube - outer leg	-	-	-	-	-	-	-	1	1	-	-	-	-

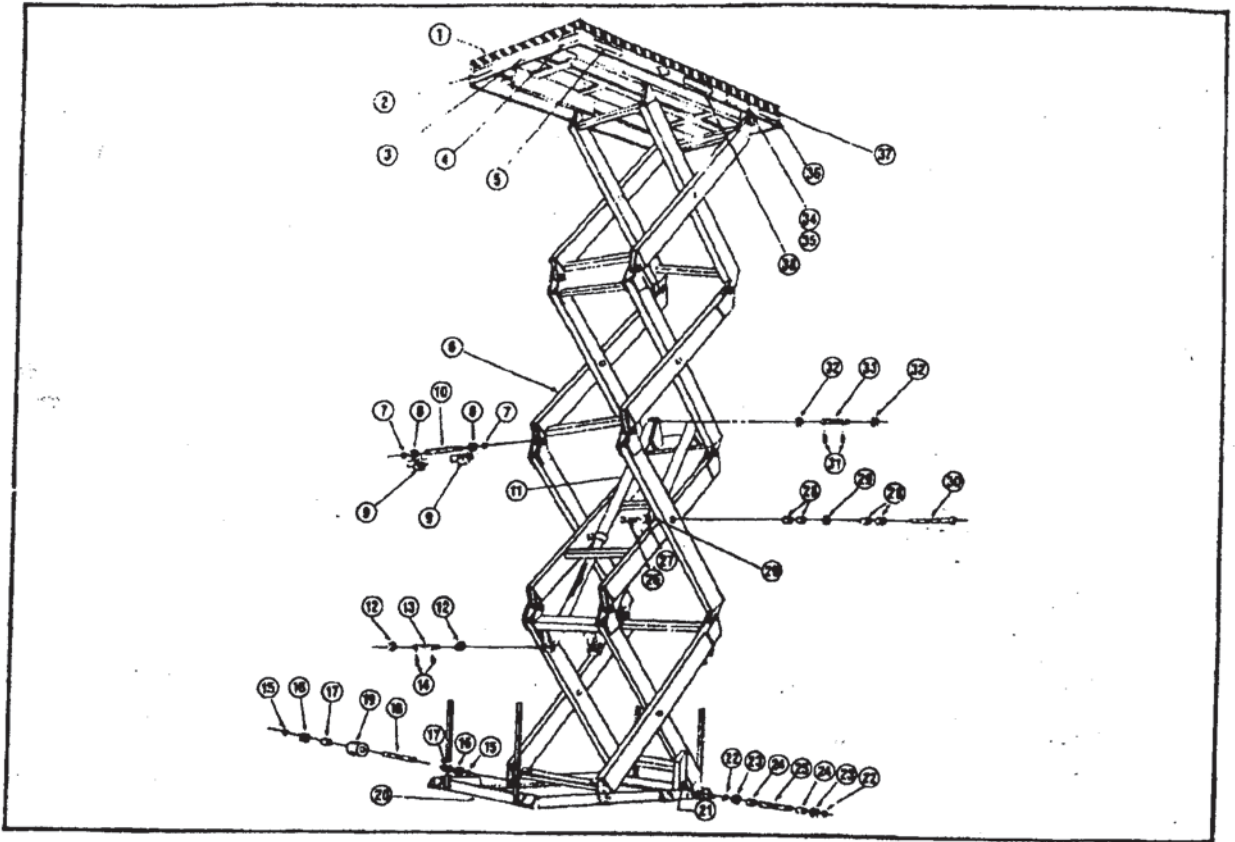
Item	Part Number	Description	Quantity Required													
			60" Vertical Travel		72" Vertical Travel		90" Vertical Travel		108" Vertical Travel		120" Vertical Travel		144" Vertical Travel			
			1-2,000 Capacities	3,000 Capacities	4-6,000 Capacities	1-2,000 Capacities	3,000 Capacities	4-6,000 Capacities	1-4,000 Capacities	5-8,000 Capacities	1-4,000 Capacities	5-8,000 Capacities	1-4,000 Capacities	5-8,000 Capacities		
10	DSL-P9508	Spacer tube - inner leg	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DSL-P9509	Spacer tube - outer leg	-	-	-	-	-	-	-	-	-	1	-	1	-	1
	DSL-P9505	Spacer tube - inner leg	-	-	-	-	-	-	-	-	-	1	-	1	-	1
	DSL-P9506	Spacer tube - outer leg	-	-	-	-	-	-	-	-	-	1	-	1	-	1
11	*	Leg Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	*	Base Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	HLT-P972	Retainer Ring	8	8	8	8	8	8	8	8	8	8	8	8	8	8
14	HLT-P966	Bearing	8	8	8	8	8	8	8	8	8	8	8	8	8	8
15	DSL-P9032	Clevis Pin	4	4	-	4	4	-	-	-	-	-	-	-	-	-
	DSL-P9013	Clevis Pin	-	-	4	-	-	4	4	4	4	-	-	4	-	-
	HLDP910	Clevis Pin	-	-	-	-	-	-	-	-	-	-	4	-	4	4
16	DSL-P9522	Roller Spacer Tube	2	2	2	2	2	2	-	-	-	-	-	-	-	-
	DSL-P9525	Roller Spacer Tube	-	-	-	-	-	-	2	2	-	-	-	-	-	-
	DSL-P9528	Roller Spacer Tube	-	-	-	-	-	-	-	-	-	2	-	2	-	-
	DSL-P9529	Roller Spacer Tube	-	-	-	-	-	-	-	-	-	2	-	2	2	-
17	DSL-P9043	Roller Pin	2	2	2	2	2	2	-	-	-	-	-	-	-	-
	DSL-P9051	Roller Pin	-	-	-	-	-	-	2	2	-	-	-	-	-	-
	DSL-P9067	Roller Pin	-	-	-	-	-	-	-	-	2	2	2	2	2	-
	HLDP912	Roller Pin	-	-	-	-	-	-	-	-	-	-	-	-	-	4
18	HLT-P959	Bearing	8	8	8	8	8	8	8	8	8	8	8	8	8	8
19	DSL-P9362	Roller	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	HLDP932	Roller	-	-	-	-	-	-	-	-	-	-	-	-	-	4
20	HLT-P970	Washer	12	12	12	12	12	12	12	12	12	12	12	12	12	16
21	HLT-P972	Retainer Ring	12	12	12	12	12	12	12	12	12	12	12	12	12	18
22	TAD-P1491	Maintenance Safety Angle	2	2	2	2	2	2	2	2	2	2	2	2	2	2
23	*	HYDRAULIC CYLINDER	SEE FIGURE 34 ON PAGE 46 FOR CYLINDER PART NUMBERS													
24	WFC-P121	Hair Pin	2	2	2	2	2	2	4	4	4	4	4	4	4	4
25	HLT-P970	Washer	2	2	2	2	2	2	4	4	4	4	4	4	4	4
26	DSL-P9056	Cylinder Mounting Pin	1	-	-	1	-	-	2	-	2	-	2	-	-	-
	DSL-P9055	Cylinder Mounting Pin	-	1	-	-	1	-	-	-	-	-	-	-	-	-
	DSL-P9054	Cylinder Mounting Pin	-	-	1	-	-	1	-	-	-	-	-	-	-	-
	DSL-P9052	Cylinder Mounting Pin	-	-	-	-	-	-	-	-	2	-	2	-	2	-
	DSL-P9068	Cylinder Mounting Pin	-	-	-	-	-	-	-	-	-	-	-	-	2	-
27	DSL-P9058	Axle Pin	4	4	-	4	4	-	-	-	-	-	-	-	-	-
	DSL-P9060	Axle Pin	-	-	4	-	-	4	-	-	-	-	-	-	-	-
	DSL-P9063	Axle Pin	-	-	-	-	-	-	4	-	4	-	4	-	-	-
	DSL-P9065	Axle Pin	-	-	-	-	-	-	-	4	-	-	-	-	-	-
	HLDP919	Axle Pin	-	-	-	-	-	-	-	-	-	-	-	-	-	4
28	HLT-P970	Washer	4	4	-	4	4	-	-	-	-	-	-	-	-	-
	HLDP990	Washer	-	-	4	-	-	4	-	4	-	4	-	4	4	4
	HLT-P971	Washer	-	-	-	-	-	-	-	-	-	-	-	-	-	4
29	HLT-P960	Bearing	16	16	-	16	16	-	-	-	-	-	-	-	-	-
	HLDP953	Bearing	-	-	16	-	-	16	-	16	-	16	-	16	16	16
	HLT-P951	Bearing	-	-	-	-	-	-	16	-	16	-	16	-	16	16
30	MS24667-76	Hex. Soc. F/H Screw	4	4	4	4	4	4	4	4	4	4	4	4	4	4
31	HLT-P9101	Retainer Washer	4	4	-	4	4	-	-	-	-	-	-	-	-	-
	DSL-P9081	Retainer Washer	-	-	4	-	-	4	-	4	-	4	-	4	4	-
	DSL-P9084	Retainer Washer	-	-	-	-	-	-	4	-	4	-	4	-	-	-
	DSL-P9082	Retainer Washer	-	-	-	-	-	-	-	-	-	-	-	-	-	4
32	L-97	Decal - "Lifting Capacity"	2	2	2	2	2	2	2	2	2	2	2	2	2	2
33	L-140	Decal - "CAUTION"	2	2	2	2	2	2	2	2	2	2	2	2	2	2
34	L-71	Name Plate	1	1	1	1	1	1	1	1	1	1	1	1	1	1
35	MS21318-48	Rivet	4	4	4	4	4	4	4	4	4	4	4	4	4	4
36	L-73	Decal - "DANGER"	1	1	1	1	1	1	1	1	1	1	1	1	1	1
37	HLDPST-2	Yellow and Black Safety Stripe	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
38	HLDP450-XX	Handrail Assembly (Optional Equipment)	2	2	2	2	2	2	2	2	2	2	2	2	2	2
39	HLDP499-YY	Safety Chains (Optional Equipment)	4	4	4	4	4	4	4	4	4	4	4	4	4	4

FIGURE 37: EXPLODED VIEW OF STANDARD BTSL MODELS WITH CAPACITY 3-6,000 LBS. AND VERTICAL TRAVEL 180" THROUGH 216".



Item	Part Number	Description	Quantity Required							
			180" Vertical Travel		216" Vertical Travel		240" Vertical Travel		288" Vertical Travel	
			3,000 Capacities	6,000 Capacities	3,000 Capacities	6,000 Capacities	3,000 Capacities	6,000 Capacities	3,000 Capacities	6,000 Capacities
1	*	Platform Assembly	1	1	1	1	1	1	1	1
2	L-99	Decal - "Remove Shipping Bolts"	2	2	2	2	2	2	2	2
3	L-155	Logo	2	2	2	2	2	2	2	2
4	L-73	Decal - "Danger - Keepout of under lift"	2	2	2	2	2	2	2	2
5	L-97	Decal - "Lifting Capacity"	2	2	2	2	2	2	2	2
6	*	Leg Assembly	1	1	1	1	2	2	2	2
7	HLT-P972	Retainer Ring	16	16	16	16	24	24	24	24
8	HLT-P970	Washer	16	16	16	16	24	24	24	24
9	HLT-P960	Bearing	16	16	16	16	24	24	24	24
10	DSL-P9078	Pin	8	8	8	8	12	12	12	12
11	*	HYDRAULIC CYLINDER	SEE FIGURE 35 ON PAGE 47 FOR CYLINDER PART NUMBERS							
12	HLT-P970	Washer	8	8	8	8	8	8	8	8
13	DSL-P9080	Cylinder Mounting Pin - Rod End	2	2	2	-	2	2	2	-
	DSL-P9088	Cylinder Mounting Pin - Rod End	-	-	-	2	-	-	-	2
14	WFC-P121	Hair Pin	4	4	4	4	4	4	4	4
15	HLT-P972	Retainer Ring	8	8	8	8	8	8	8	8
16	HLT-P970	Washer	8	8	8	8	8	8	8	8
17	HLT-P960	Bearing	8	8	8	8	8	8	8	8
18	DSL-P9078	Roller Pin	4	4	4	4	4	4	4	4

FIGURE 38: EXPLODED VIEW OF STANDARD BQSL MODELS WITH CAPACITY 3-6,000 LBS. AND VERTICAL TRAVEL 240" THROUGH 288".



Item	Part Number	Description	Quantity Required							
			180" Vertical Travel		216" Vertical Travel		240" Vertical Travel		288" Vertical Travel	
			3,000 Capacities	6,000 Capacities	3,000 Capacities	6,000 Capacities	3,000 Capacities	6,000 Capacities	3,000 Capacities	6,000 Capacities
19	HLD-P832	Roller	4	4	4	4	4	4	4	4
20		Base Frame Assembly	1	1	1	1	1	1	1	1
21	DSL-P2563	Maintenance Safety Bar	2	2	2	2	2	2	2	1
22	HLT-P872	Retainer Ring	8	8	8	8	8	8	8	8
23	HLT-P870	Washer	8	8	8	8	8	8	8	8
24	HLT-P850	Bearing	8	8	8	8	8	8	8	8
25	DSL-P8039	Clevis Pin	4	4	-	-	4	4	-	-
	DSL-P8075	Clevis Pin	-	-	4	4	-	-	4	4
26	MS24687-76	Hex Socket F/H Screw	6	6	6	6	-	-	4	4
27	DSL-P8081	Retainer Washer	6	6	6	6	8	8	8	8
28	HLD-P833	Bearing	24	24	24	24	32	32	32	32
29	HLD-P890	Washer	12	12	12	12	16	16	16	16
30	HLD-P818	Axle Pin	6	6	6	6	8	8	8	8
31	WFC-P121	Hair Pin	4	4	4	4	4	4	4	4
32	HLT-P870	Washer	4	4	4	4	4	4	4	4
33	DSL-P8088	Cylinder Mounting Pin - Cap End	2	2	2	-	2	2	2	-
	DSL-P8062	Cylinder Mounting Pin - Cap End	-	-	-	2	-	-	-	2
34	L-71	Name Plate	1	1	1	1	1	1	1	1
35	MS21318-48	Rivet	4	4	4	4	4	4	4	4
36	L-73	Decal - "Danger - Keepout from under lift"	1	1	1	1	1	1	1	1
37	HLD-ST-2	Black and Yellow Safety Striping	AR	AR	AR	AR	AR	AR	AR	AR
38	L-140	Decal - "CAUTION"	2	2	2	2	2	2	2	2

TROUBLE SHOOTING

Observation	Possible Cause	Remedy
1. Lift does not raise but pump is running	a. Motor rotation maybe reversed. or humming	a. Change motor rotation per notes in Electrical Section. If Lift has been running properly for some time, then it is possible that plant wiring has been changed and the motor is now running reversed.
	b. Motor may be single phasing, (humming).	b. Check wiring and overloads, fuses, etc., to ascertain that all 3 phase lines are present at the motor.
	c. Voltage at motor terminals may be too low to run pump at existing load.	c. Measure voltage at motor terminals, or as near as possible, while pump is running under load. If voltage is sufficient, check for inadequate or incorrect wiring as this can starve the motor. Correct as necessary.
	d. Hose or hydraulic line is leaking.	d. Correct as necessary.
	e. Oil level in reservoir is low.	e. Add oil.
	f. Load exceeds capacity requirements. Relief Valve is bypassing the oil back into tank.	f. Do not change Relief Valve setting. Instead, reduce the load to rated capacity.
	g. Suction filter is clogged, starving pump.	g. Remove and clean.
	h. Suction line may be leaking air, due to loose fittings.	h. Check fittings.
	i. Filler/Breather capon tank may be clogged.	i. Remove and clean.
	j. Down Valve may be energized by faulty wiring, or stuck open.	j. Remove Solenoid Valve, check and clean. (See Hydraulic Section.)
	k. Hydraulic pump may be inoperative.	k. Disconnect hydraulic line at power unit. Put hose end in a large container and run pump again. If no output, check motor rotation as per 1(a) above. If pump is worn, replace with a new pump.
2. Lift rises too slowly.	a. Foreign material stuck in Down Solenoid, causing some oil to bypass back into tank.	a. Lower the Lift. Remove the Solenoid Valve and clean it. (See Hydraulic Section)
	b. Foreign material clogging suction filter, breather cap, pressure line filter, or a pinched hose.	b. Correct as necessary. (See also 1(g), (i).)
	c. Low Motor voltage.	c. See 1(c).
	d. Lift overloaded.	d. See 1(f).
	e. Oil is too thick for proper operation.	e. Refer to "Oil Viscosity Recommendations"
	f. Lift operates with a shuddering vibration.	f. Cylinder may be binding. Check with factory.
	g. Pump is inoperative	g. See 1(k).
3. Motor labors or heats excessively.	a. Voltage may be low.	a. See 1(c).
	b. Incorrect wiring	b. Check that one leg of the motor lines is not connected to ground.
	c. Oil starvation causes pump to bind. High internal heat is developed if this occurs, pump may be permanently damaged.	c. See 1(e). (g). (h). (i). (k).
	d. Binding cylinders.	d. See 2(f).
	e. Oil may be too thick.	e. See "Oil Viscosity Recommendations"

4. "Spongy" or "Jerky" Lift operation. Do not confuse spongy operation with small surges caused by foreign material on Lift wheel roller plate.	a. Air trapped in cylinders.	a. Bleed cylinders by lowering Lift fully and hold "DOWN" button for 20-30 seconds more Raise Lift and repeat procedure several times. Bleed cylinders also, by loosening bleeder screws until a steady stream of oil comes out.
	b. Oil starvation.	b. See 1(e). (g). (h). (i).
5. Lift lowers too slowly when loaded.	a. Down Valve filter clogged.	a. Remove Solenoid Valve and clean it.
	b. Pinched tube or hose.	b. Correct as necessary. (In case of pipe, check for obstruction inline.)
	c. Oil too thick.	c. See "Oil Viscosity Recommendations"
	d. Foreign material in Flow Limiter.	d. Remove and clean.
	e. Binding cylinders.	e. See 2(f).
6. Lift lowers too quickly.	a. Leaking hoses. Cracked fittings	a. Correct as necessary. Check underground conduit for evidence of fluid.
	b. Check valve stuck open. (The combination of a stuck Check Valve and open Solenoid Valve will cause excessive speeds.	b. Remove Check Valve and clean it. (See Hydraulic Section)
7. Lift rises then lowers slowly.	a. Down Solenoid Valve may be incorrectly wired or is stuck open due to dirt.	a. See 2(a).
	b. Check Valve may be stuck open.	b. Remove and clean. (See Hydraulic Section.)
	c. Check for leaking hoses, fittings, pipes.	c. Correct as necessary.
	d. Cylinder seals may be worn or damaged.	d. Replace seals. (See Cylinder Repair procedure.)
8. Lift has risen, but does not lower.	a. Blown electrical fuse.	a. Check and replace.
	b. Incorrect Down Solenoid Valve wiring.	b. Correct as necessary. (See Wiring Diagram.)
	c. Down Solenoid Valve is stuck.	c. Lightly tap down the Solenoid Coil body to seat it properly. Do not hit hard as it will permanently damage the internal stem. Do not remove the Solenoid Valve from the Block as the unit will come down at a dangerous speed.
	d. Faulty Down Solenoid Coil.	d. Remove and replace.
	e. Maintenance safety bar, or some other object blocking down travel.	e. Raise Lift and remove the safety bar, or whatever object is blocking the down travel, then press the down button.
	f. Binding cylinders.	f. See 2(f).