ADVANCE LIFTS

Installation, Operation and Maintenance Manual for the Following Equipment:

All “P” Series Lifts

☐ This manual contains specific information for your equipment, see options on P 2-1.

In any correspondence with your distributor, you will need the following information:

Model Number_____ Serial Number_____

Installation location: _____

_____

_____

CAUTION ⚠

At Initial Installation, determine proper motor/pump rotation by starting the motor in very short intervals to prevent permanent pump damage. Running the pump backwards will damage it. See the Installation Instructions, Section 4, for proper procedure.

Distributor Information: _____

_____

_____

Advance Lifts, Inc.
701 Kirk Road
St. Charles, IL 60174-3428
Toll Free 1-800-843-3625
Sales Fax 1-630-584-9405
Parts and Service Fax 1-630-584-6837
E-mail: Parts@advancelifts.com

*Advance Lifts, Inc. furnishes one manual with each unit. Additional manuals are available for $25.00 each.

SECTION 2. INDEX & INTRODUCTION

***Mandatory reading before attempting installation.**

Congratulations, the equipment that you have purchased is of the highest quality available. Your Advance Lift will provide you with many years of trouble free service in return for the minimal maintenance described in this manual.

Please be sure that no individual is allowed to operate the lift until they have been fully familiarized with the operating instructions in this manual. Also, insure that at least one person at the lift site is familiar with the maintenance section of this manual and is assigned responsibility for doing the maintenance on a regular basis.

Please note that the lift has a metal nameplate attached to it that contains information such as the model number, capacities, and serial number. Do not remove the nameplate. Be sure that no operator ever exceeds the capacities shown on the nameplate or they may injure personnel or cause damage to the lift.

Also, be sure to have the serial number of the lift handy if you have to call your distributor. That number identifies your specific lift and will allow your distributors personnel to give you the most thorough and timely assistance possible.

This manual is under constant review and we would appreciate any constructive suggestions that may enhance its usefulness. Please send your suggestions to Advance lifts, Inc. Attn: Customer Service Department.

Thank you for purchasing our product.

SECTION 3. RESPONSIBILITIES OF OWNERS & USERS

Basic Principles: Owners/users shall apply sound principles of safety**,** training, inspection, maintenance, and expected operating environment.
It shall be the responsibility of the owner/user to advise the manufacturer where deflection may be critical to the application.
Manuals: Owners/users shall keep and maintain a copy of the operating and maintenance manual(s) and ensure its availability to operating and maintenance personnel.
Inspection and Maintenance: It shall be the responsibility of the users to inspect and maintain the industrial scissors lift as required to ensure proper operation. The frequency of inspection and maintenance shall be based upon the manufacturer's recommendations and be compatible with operating conditions and the severity of the operating environment.
Industrial scissors lifts that are not in proper operating condition shall be immediately removed from service until repaired. Maintenance and repairs shall be made by a qualified person and the repairs shall be in conformance with the manufacturer's recommendations.
Maintenance Safety Precautions: Before adjustments and repairs are started on an industrial scissors lift, the following precautions shall be taken as applicable:

1. Remove the load from the platform.
2. Lower platform to the full down position, if possible or secure by maintenance device and/or blocking as described by the manufacturer to prevent unintended platform movement.
3. Relieve system pressure from all circuits before loosening or removing any components.
4. All controls in the "off' position and all operating features secured from inadvertent motion by brakes, blocks, or other means.
5. Disconnect power and follow established owner/user lockout/tag out policies.
6. Follow precautions and directions as specified by the manufacturer.

Replacement Parts: When parts or components are replaced, they shall be replaced with parts or components approved by the original manufacturer of the industrial scissors lift.
Maintenance Training: The owner/user shall ensure only qualified personnel inspect and maintain the industrial scissors lift in accordance with the sections: Inspection and Maintenance, Replacement Parts and Operator Training and the manufacturer's recommendations as described in the maintenance manual.
Operator Training: An owner/user, who directs or authorizes an individual to operate an industrial scissors lift, shall ensure that the individual has been:

1. Trained in accordance with the manufacturer's operating manual.
2. Made aware of the responsibilities of operators as outlined under the Operators Section of this manual.
3. Retrained, if necessary, based on the owners/user's observation and evaluation of the operator.

Modifications: Modifications and additions shall not be performed without the manufacturer's prior written approval. Where such authorization is granted, capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

SECTION 3. RESPONSIBILITIES OF OWNERS & USERS

Responsibility of Operators

Basic Principles: Operators shall apply sound principles of safety and good judgment in the application and operation of the scissors lift, with consideration given to its intended use and expected operating environment. Since the operator is in direct control of the industrial scissors lift, conformance with good safety practices is the responsibility of the operator. The operator shall make decisions on the consideration for the fact that his or her own safety as well as the safety of other personnel on or near the scissors lift is dependent on those decisions.

General Training: Only personnel who have received general instructions regarding the inspection, application and operation of industrial scissors lifts, including recognition and avoidance of hazards associated with their operation, shall operate an industrial scissors lift. Such topics covered shall include, but not necessarily be limited to, the following issues and requirements:

1. A pre-start inspection
2. Responsibilities associated with problems or malfunctions affecting the operation of the industrial scissors lift
3. Factors affecting stability
4. The purpose of placards and decals
5. Workplace inspection
6. Safety rules and regulations
7. Authorization to operate
8. Operator warnings and instructions
9. Actual operation of the industrial scissors lift. Under the direction of a qualified person, the trainee shall operate the industrial scissors lift for a sufficient period of time to demonstrate proficiency in actual operation of the industrial scissors lift.

Prestart Inspection: Before use each day or at the beginning of each shift, the industrial scissors lift shall be given a visual inspection and functional test including but not limited to the following:

1. Operating and emergency controls
2. Safety devices
3. Air or hydraulic system leaks
4. Electrical cables and wiring harness
5. Loose or missing parts
6. Wheels and casters
7. Nameplates, precautionary and instructional markings and/or labeling
8. Guardrail system
9. Items specified by the manufacturer

Problem or Malfunctions: Any problems or malfunctions that affect the safety of operations shall be repaired prior to the use of the industrial scissors lift.

Before Operations: The operator shall:

1. Read and understand the manufacturer’s operating instruction(s) and user’s safety rules or have them explained
2. Understand all labels, warnings, and instructions displayed on the industrial scissors lift or have them explained

Responsibility of Operators

Workplace Inspections: Before the industrial scissors lift is used and during use, the operator shall check the area in which the industrial scissors lift is to be used for possible hazards such as, but not limited to:

1. Bumps, floor obstructions and uneven surfaces
2. Overhead obstructions and electrical hazards
3. Presence of unauthorized persons
4. Other possible unsafe conditions as noted in the operating manual.

Operator Warnings and Instructions: The operator shall ensure the operation of the industrial scissors lift is in compliance with the following:

1. **Slope**. The industrial scissors lift shall only be operated on flat and level surfaces.
2. **Guardrail system**. Guardrails shall be installed and positioned, and access gates or openings shall be secured per the manufacturer's instructions.
3. **Distribution of load**. The load and its distribution on the platform and any platform extension(s) shall be in accordance with the manufacturer's rated capacity for that specific configuration.
4. **Maintaining overhead clearance**. The operator shall ensure that adequate clearance is maintained from overhead obstructions and energized electrical conductors and parts.
5. **Point of Operation.** The operator shall not place any part of their body under the platform.
6. **Personnel footing**. Personnel shall maintain firm footing on dock lifts and work access lifts while working thereon. Climbing by occupants on the guardrail system is prohibited. The use of planks, ladders, or any other devices on the platform for achieving additional height is prohibited.
7. **Precaution for moving equipment**. When other moving equipment or vehicles are present, special precautions shall be taken to comply with the safety standards established for the workplace.
8. **Reporting problems or malfunctions**. The operator shall immediately report to a supervisor any problem(s) or malfunction(s) that become evident during operation. The operator shall ensure all problems and malfunctions that affect the safety of operations are repaired prior to continued use.
9. **Capacity limitation**. Rated capacity shall not be exceeded when loads are transferred to the platform at any level.
10. **Work area**. The operator shall ensure the area surrounding the industrial scissors lift is clear of personnel and equipment before lowering the platform.
11. **Battery charging**. Batteries shall be charged in strict accordance with the lift manufacturer's instructions.
12. **Securing the industrial scissors lift.** The operator shall comply with the means and procedures provided to protect against use by an unauthorized person(s).
13. **Altering safety devices**. Safety devices shall not be altered or disabled.
14. **Modifications**. Modifications or alterations of an industrial scissors lift or the fabrication and attaching of frameworks or the mounting of attachments for holding tools or materials onto the platform or the guardrail system shall only be accomplished with prior written permission of the manufacturer.
15. **Assistance to the operator**. If an operator encounters any suspected malfunction or any hazard or potentially unsafe condition relating to capacity, intended use or safe operation the operator shall cease operation of the industrial scissors lift and request further instruction from the owner/user.
16. **Problems or malfunctions**. Any problem(s) or malfunction(s) that affect the safety of operations shall be repaired prior to the use of the industrial scissors lift.

SECTION 4. INSTALLATION INSTRUCTIONS

Floor mounted units:

1. Move the lift to the usage area; insuring the floor is clean and level. If slings are used, encircle the entire lift, not just the platform.

Caution! Before securing the unit to the floor, shim or grout the entire baseframe assembly. Continuous baseframe support is essential for proper installation.

2. Once proper voltage is applied, using the pushbutton control or footswitch, push the "up" button in short jogs to see if the lift will rise. If the unit does not rise, check the motor rotation. On 3 phase systems, swap any two of the three power wires to reverse the motor rotation.

Caution! Operating a hydraulic pump in reverse, even for brief periods, can cause permanent pump damage.

3. Raise the lift halfway several times then fully lower it, holding the down control an extra 10 seconds each time the lift is lowered to bleed air from the unit.

4. Lag the unit in place using ½" x 5", "Rawl-Studs" or wedge anchors in the holes provided.

5. Clean any debris or spilled fluid as they may later be misinterpreted as mechanical trouble or a hydraulic leak. While highly unlikely, it may be necessary to tighten some hydraulic fittings due to the rigors of shipping. Remove maintenance device(s) and lower the unit.

6. Instruct user(s) in the proper operation of the lift, safety precautions, and equipment capacity. Supply maintenance personnel with this service manual.

Pit mounted units:

1. Check all pit dimensions for accuracy.

2. Attach a temporary electrical line through the pit conduit to the lift. Check for correct motor rotation; (see paragraph 2 in "floor mounted installation").

3. Using slings, encircle the entire lift, not just the platform and lower the lift into the pit, centering it for 1" minimum clearance on all sides to the pit wall.

4. Raise the lift with the pushbutton or footswitch and remove the slings. Run the unit up and down several times to remove air from the hydraulic system.

5. Level and center the lift by shimming and grouting the entire baseframe, not just the corners. Lag the unit in place using ½" x 5", "Rawl-Studs" or wedge anchors in the holes provided.

Caution! Failure to support the entire base frame properly will shorten the life of the equipment and void the product warranty.

6. With the lift fully elevated, disconnect the main power and complete the permanent electrical wiring.

7. Follow the instructions outlined in paragraphs 5 and 6 under "Floor mounted installation". To complete the installation.

SECTION 5. OPERATING INSTRUCTIONS

Hydraulic scissors lifts have an excellent safety record overall, but as with all moving equipment, they can be dangerous. Operators must use common sense and take responsibility for the safety of everyone near the lift. They must use the safety devices provided and be careful not to surprise anyone in the area with the movement of the lift.

Pre-operational checks:

1. Check all electrical wiring and connections to be sure that they are completed properly and are operational.
2. Check for obstructions or debris that may interfere with the safe operations of the lift.
3. Be sure that all personnel in the area are a safe distance away from the lift and aware that you are about to operate it.
4. If there are any optional safety devices such as bellows or electric toe guards, check them for proper operation.

Test operating the equipment:

1. Station yourself so that you will always see the equipment when it is in operation. Never operate the equipment blind!
2. Raise the equipment and note that the control is a constant pressure, “dead-man” type. When you release the up or down switch the unit should stop moving immediately and maintain its elevation. If it does not, contact your maintenance personnel.
3. Cycle the equipment several times to be sure that it is operating smoothly with no jerking or sudden movement. On initial start up there may be some air in the lines or the cylinders may be dry due to storage so it my take several cycles to smooth out the operation. If the operation is not smooth after several cycles, contact your maintenance personnel. Any evidence of binding or scraping in the operation shall cause you to immediately stop using the lift.
4. Check all safety devices for proper operation.
5. If you elect to test load the equipment be sure that you do not exceed the capacities shown on the nameplate. Overloading may cause structural stresses that may not show up for some time, but will diminish the life and capacity of the unit. If you have any questions about testing the unit, call our customer service department at 1-800-843-3625.

Daily operation:

1. All personnel shall be required to read the entire operating instruction section of this manual prior to operating the lift.
2. Operators must know the capacity of the unit and be aware of any loads that may exceed the capacity.
3. **WARNING!** Operators must be alert to personnel in the vicinity of the lift. Avoid any surprises to these personnel in regard to movement of or the position of the lift. Never operate unit if you cannot see it and the personnel around it.

Daily operation (continued):

4. On the first use of the lift each day, the operator shall check to see that the lift is functioning properly and smoothly. All safety devices shall be in place and operating correctly.

5. If the unit has a traveling electrical cord, the operator must insure that it is kept away from the lift as it raises and lowers.

6. Loads shall be centered before raising or lowering the lift as this will help insure even wear on all moving parts

SECTION 6. MAINTENANCE INSTRUCTIONS

1. Always remember that machinery with large moving parts can seriously injure you.
2. Read and understand this manual before attempting any service work.
3. **WARNING!** Always use the maintenance device(s) when working on the unit in the elevated position or reaching under the platform. (See photos 6-1 and 6-2, at the end of this section for proper positioning and engagement of the maintenance device(s)).
4. When using the maintenance device(s), adhere to the following rules:
   A. The unit must be unloaded.
   B. Be sure the maintenance device(s) are properly engaged.
   C. Depress the “Down” button or foot pedal for an extra 10 seconds when lowering onto the maintenance device(s), to be sure that all the weight of the lift is on the device and hydraulic pressure is relieved.
   D. Disconnect and tag the electricity to the unit to prevent accidental movement of the lift by other personnel.
   E. Spend as little time as possible under the lift.
5. Only use replacement parts recommended by the manufacturer.
6. Do not let the equipment stay in disrepair; fix small problems before they become big problems. A unit in disrepair can become a severe hazard if left unattended.
7. Inspect the equipment on a regular schedule, preferably monthly.
8. Never work on the hydraulics or electrical systems unless the unit is fully lowered or properly sitting on the maintenance device(s).
9. Never apply a load to the equipment until the base frame is continuously supported.
10. **WARNING!** Never expect to hold the leg assemblies open by simply lifting one end of a platform.
    A. The roller end of most lifts is not “gibbed” or captured in any way, so lifting on the roller end will simply tilt the platform.
    B. Even if you raise the clevis end of the platform, if the base frame is not firmly lagged to the ground or held down by some other means, the legs will come up with the platform in an unpredictable manner and could cause personal injury.
    C. The only safe way to hold a lift’s legs open is the factory designed maintenance device(s).

Routine Maintenance: (All lifts)
Weekly: Once a week or after repetitive operation, the unit shall be raise to its full height. This will get rid of cylinder oil seepage buildup and lubricate the upper cylinder barrel. On all units this fluid will be returned to the reservoir via the breather lines.
Monthly:
1. Check the hydraulic fluid level. Caution! When checking fluid levels, make sure the unit is in the full-up position, with the maintenance device(s) in place.

WARNING! Be sure the maintenance device(s) are properly engaged before performing maintenance checks 2 through 6 or reaching beneath a raised lift. (See instructions 3, 4 and 10 above).

2. Clean all debris from the vicinity of floor and pit mounted units in order to avoid interference with the lift mechanism or rollers.
3. Check for presence and proper seating of all snap rings and clips on all axles, cylinder and rollers.
4. Check rollers, pins and bushings for any signs of wear such as flat spots, missing fasteners, or dislodged bearing material.
5. Check the hydraulic fittings for cracks or leaks and clean up any weepage on or beneath the cylinder.
6. Check hoses and electrical lines for abrasions or other abuse and check for snug connections.
7. Operate the unit and check for any abnormal noise or vibrations.
8. Check all safety devices on the unit such as the condition of the pleated bellows or smooth operation of the electric toe guards.

Seasonal or Semiannual Maintenance: Change hydraulic fluid for ambient temperature change if appropriate or if there is any evidence of accumulated condensation creating water contamination. See page P 5-2, paragraph number 1, under the heading “General Information Notes” for more information on changing fluid.

MAINTENANCE DEVICE INSTRUCTIONS

WARNING! Always use the maintenance device(s) for any service or maintenance. **Never** go or reach under the lift unless the maintenance device(s) are securely in place and the power to the unit has been disconnected to prevent others from operating the lift. **Never** use the maintenance device(s) with a load on the platform.

CAUTION! Never use the lift unless the maintenance device(s) are properly stored or damage may occur to the equipment.

24" Travel Unit Only:

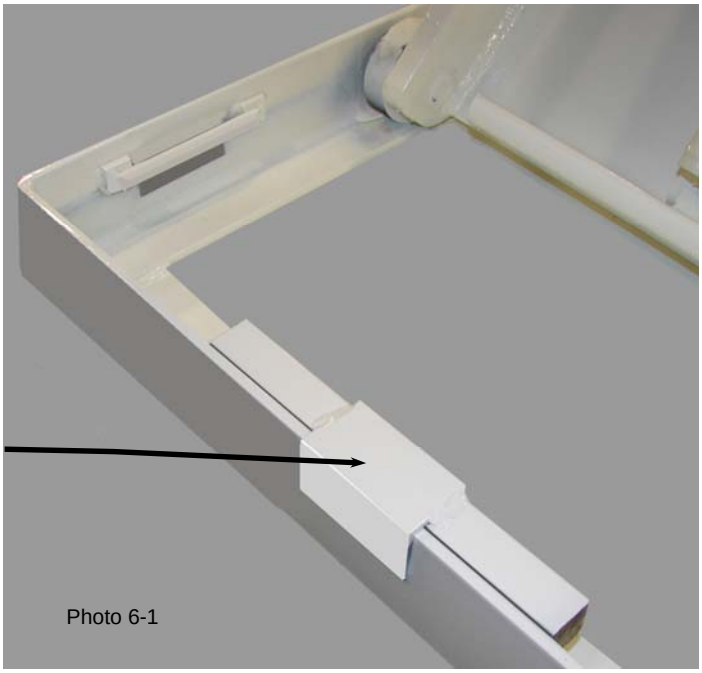
1. Raise the lift to full travel, and place the device as shown on page P 6-4. (See photos numbered 6-1 and 6-2). If there is more than one device, use all.
2. Lower the lift onto the device(s) and continue to hold the down button to relieve system pressure. Make certain the devices are in place and engaged with the roller wheels before working under the lift.
3. To disengage the maintenance device(s) raise the lift to move the roller wheels off the maintenance device(s) and make sure lift operates correctly. If assistance is required in removal of the maintenance device(s), lightly tap with a hammer to break it loose. Store the maintenance device(s) in their original position.

All Other Units:

1. Raise the lift to full travel and rotate the device into place as show on page P 6-5, (see photos numbered 6-3 and 6-4) if there is more than one device, use all.
2. Lower lift onto the device(s) and continue to hold the down button to relieve system pressure. Make certain the device(s) are

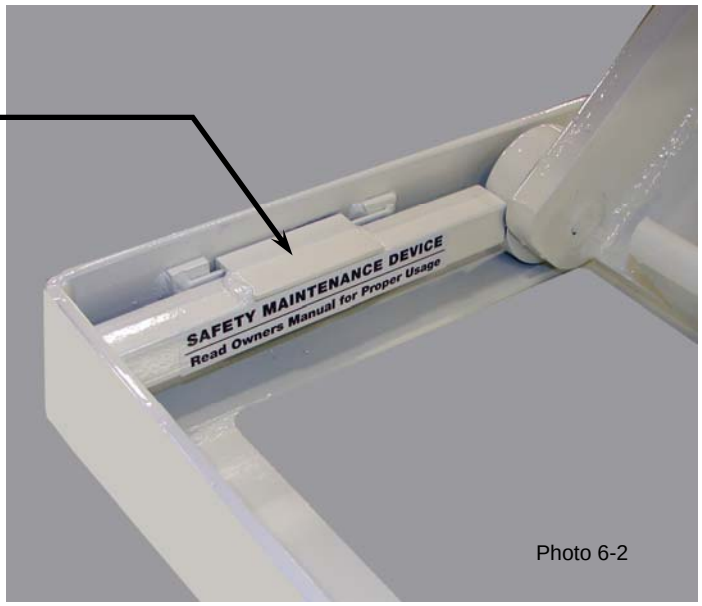
24” Travel Units Only

Maintenance Device in Stored Position



Maintenance Device in Stored Position

Maintenance Device in usage position



Maintenance Device in Use

Store the maintenance device(s) as far forward as the retaining wire will allow. Failure to do so would allow the moving leg roller wheel to impact the Maintenance Device(s) when the lift is full up, or the leg boss when the lift is full down. Also see page P 6-2 for description of Maintenance Device usage.

All Other P-Series Units

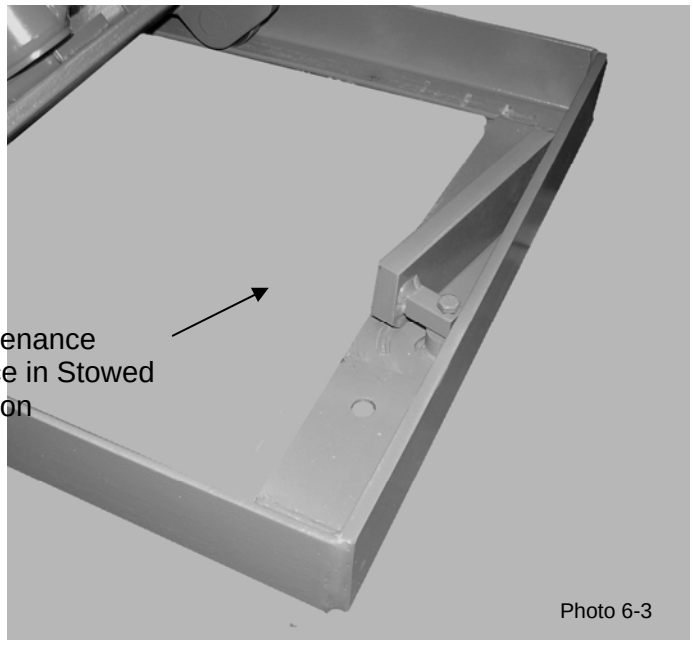


Photo 6-3

Danger! Maintenance device(s) must be fully rotated to position shown in photo 6-4 for proper usage. Failure to properly position maintenance device(s) could potentially allow the device to slip out of place.

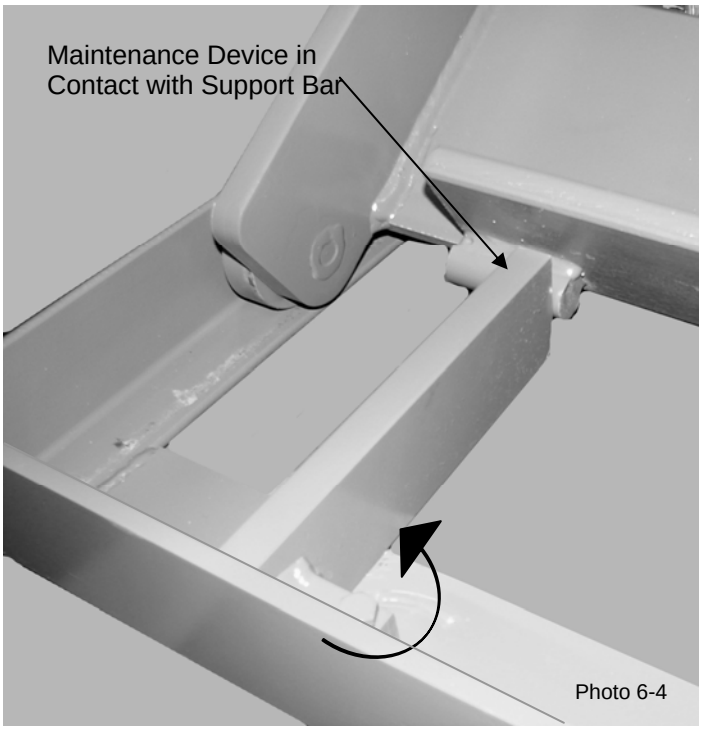


Photo 6-4

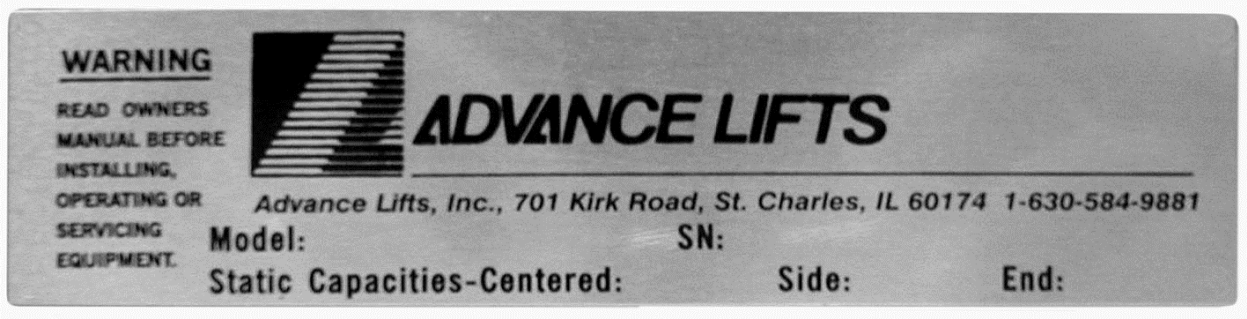
SECTION 7. WARNING LABEL SPECIFICATIONS & LOCATIONS

WARNING LABEL LOCATIONS & SPECIFICATIONS

The warning and informational labels normally attached to P Series lifts, are shown below and their proper mounting locations are shown on page 7-2. Descriptions of the labels are as follows:

Label 1: This is simply a promotional label identifying the unit as Advance Lifts unit.

Label 2: This is the formal nameplate and it shall not be removed from the unit. The serial number on this nameplate is critical in identifying the specific unit for correct parts and service information. This plate also informs all readers of the proper capacity limits of the unit.

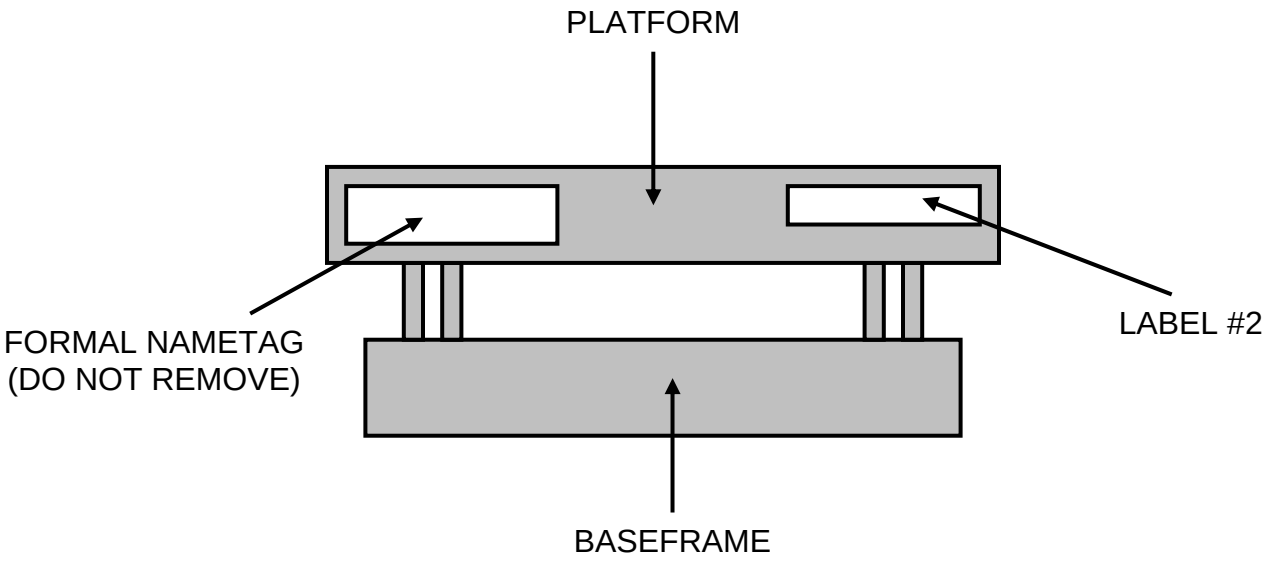


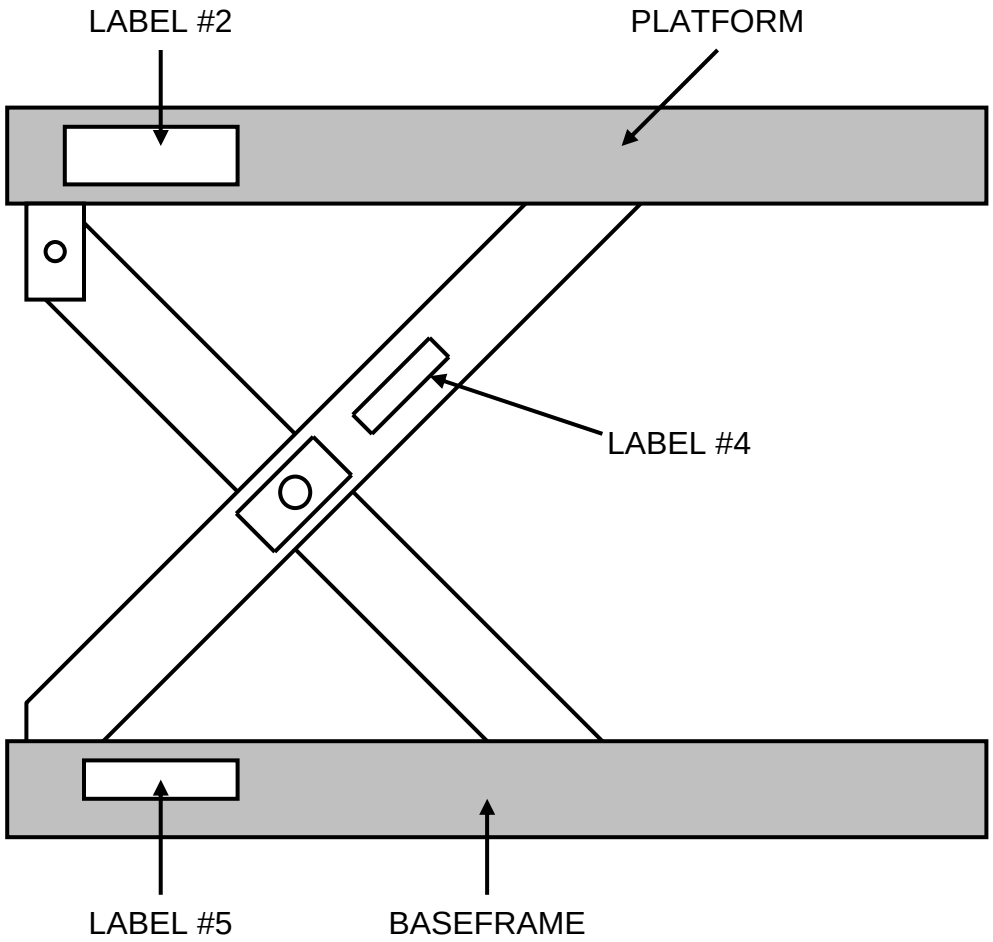
Label 3: This is an important “Danger” label that warns users of the three greatest hazards.

Label 4: This is a “Warning” label to not ride on the unit.

Label 5: This is a “Danger” label reinforcing the need to use maintenance device(s).

WARNING LABEL LOCATIONS





SECTION 8. HYDRAULIC DETAILS

1. **Weepage and Leakage:**
   A. All hydraulic cylinders will require the replacement of packings and seals after a period of time depending on usage and environmental conditions. It is considered normal maintenance. However maintenance personnel shall recognize the difference between leakage and weepage.
   B. Weepage is the normal accumulation of fluid that passes the seals in the course of operations, as the hydraulic fluid properly performs its lubrication function on cylinder walls and piston rods. It may be occasionally observed squirting from cylinder breathers, but should stop squirting after several cycles of full stroke when the small accumulation is cleared.
   C. Leakage is the fluid, which leaks past worn or cut packings and seals. It too may be observed squirting, but does not stop after several cycles and the lift will probably not hold position under load.
   D. All units have breather lines that return any weepage or leakage of fluid from the cylinder to the reservoir. It is important that the return lines do not get pinched or kinked or they may dislodge from the fittings.
   E. Always be careful when working around cylinders, not to nick the extended rod or dent the cylinder casing, as this may cause damage to cylinder seals or packings.
   F. If you elect to repaint any part of the lift, cover exposed rods with plastic or soluble grease, which can be removed after painting to insure that no paint sticks to the rods and damages the packings or seals.

2. **General precautions:**
   A. **Caution!** Be sure that all pressure is relieved from the hydraulic system before disassembling any components. Continue to hold the “down” control for several seconds after fully lowering the unit on its maintenance device(s) or the ground, before opening a hose line or hydraulic component.
   B. Always be careful to avoid contamination entering the system. Be especially careful with the ends of hoses, which may fall into oil dry, or dirt. If you suspect contamination, flush the system and components.

3. **Hydraulic fittings, sealant and torque’s:**
   A. Advance Lifts may be equipped with either NPT fittings (tapered), or SAE fittings (with O-ring seals), or JIC fittings (37-1/2˚ tapered). Know the difference.
   B. Be careful when tightening NPT fittings not to over-tighten and crack them. Swivel fittings are especially vulnerable and shall only be tightened enough to stop leaking.
   C. If leakage persists after tightening the fittings fairly hard, inspect fittings for burrs on the mating edges or the possibility of a 37-1/2˚ SAE fitting being mixed with 30˚ NPT fittings or either one being mixed with SAE 45˚ fittings.

D. When using Teflon tape on NPT fittings, be sure the tape is started 1-1/2 threads back from the leading edge and only use 2 wraps to be sure that tape does not break off and contaminate the system. You may substitute pipe sealant with Teflon paste from “Pro Lock” or “Locktite”, but again do not over apply. Never use sealant or tapes on JIC, O-Ring Boss or swivel fittings.
E. Be extremely careful not to over-tighten ORB fittings, thread the fitting finger tight and then tighten the jamb nut on the fitting.
F. Never reuse old Teflon tape. Once a connection has been opened, remove all tape and apply fresh tape.

OIL RECOMMENDATIONS AND SEAL COMPATIBILITY

Fluids:

1. The current standard hydraulic fluid is a multi viscosity ISO-46 group II base oil hydraulic fluid. This is the fluid normally supplied by the factory and is suitable for a temperature range of –10 to +100 degrees Fahrenheit. When replacing or adding fluid to an Advance Lift, use only ISO 46 hydraulic fluid that is manufactured with a group II base oil. ISO 46 hydraulic fluid is normally clear; we have the fluid dyed purple for better visibility.

2. Unless approved by the Advance lifts, do not use any other fluid. Brake fluids and other hydraulic fluids may damage the system’s seals or hoses. If it is required to switch from one fluid to another, drain the reservoir and system completely, and then refill with the new fluid.

3. Biodegradable and fire retardant fluids are available. Contact the factory for specifications. It may be necessary to change some seals and/or hoses for total system compatibility, depending upon the specific model lift and the requested fluid.

Options:

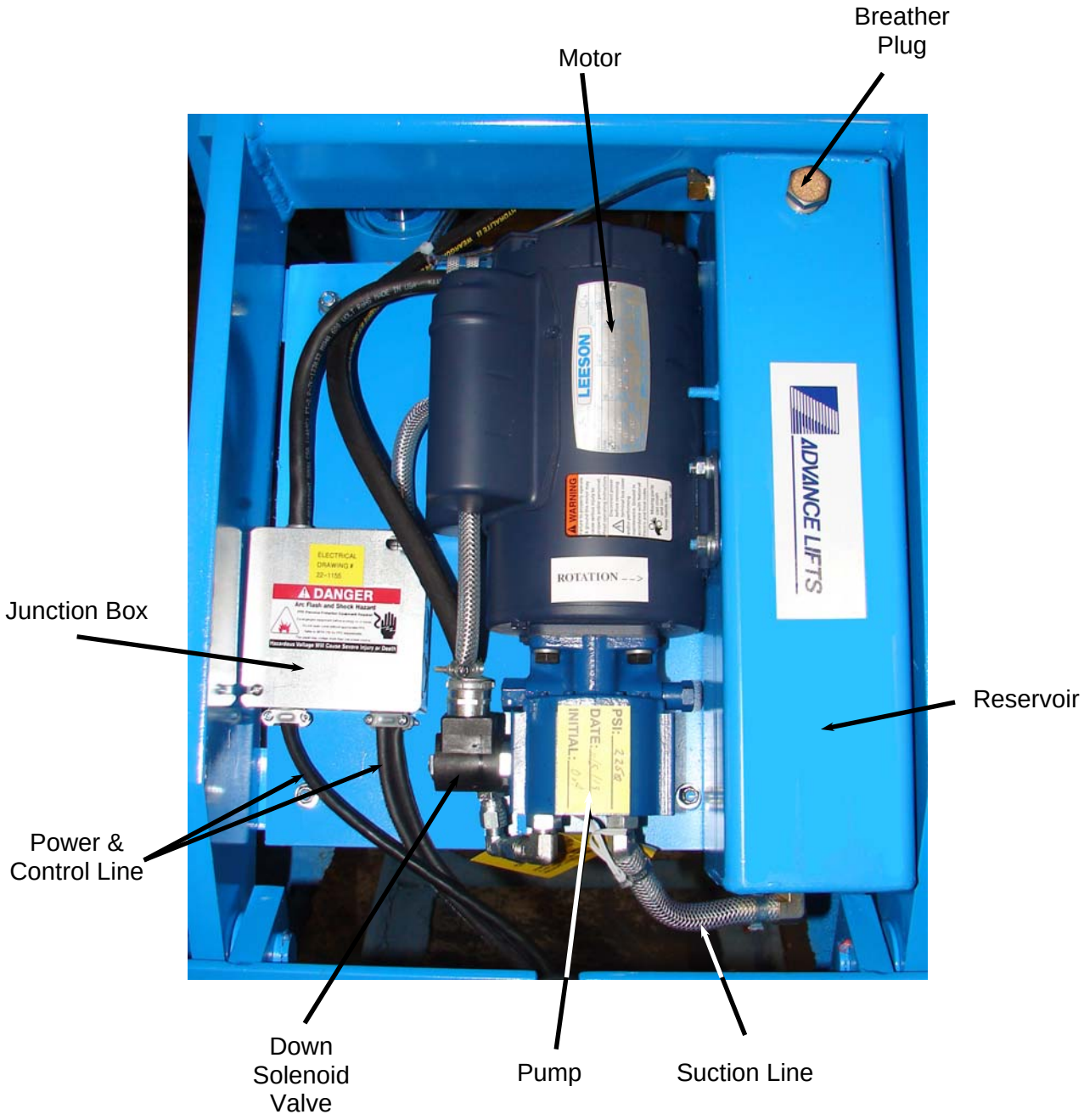
For extremely warm temperature ranges of 120º to 140º degrees Fahrenheit, you may switch to 10W30 motor oil. If ambient temperatures are expected above 140º degrees, consult the factory.

For extremely cold temperature ranges, Advance Lifts recommends the use of a fluid heater, contact your distributor for more information and specifications.

Seals:

Generally, the seals in the unit are Buna-N-Nitrile and polyurethane. The hoses are either PVC for suction lines or braided wire for pressure lines. Always call the factory about special fluids rather than make assumptions on your own.

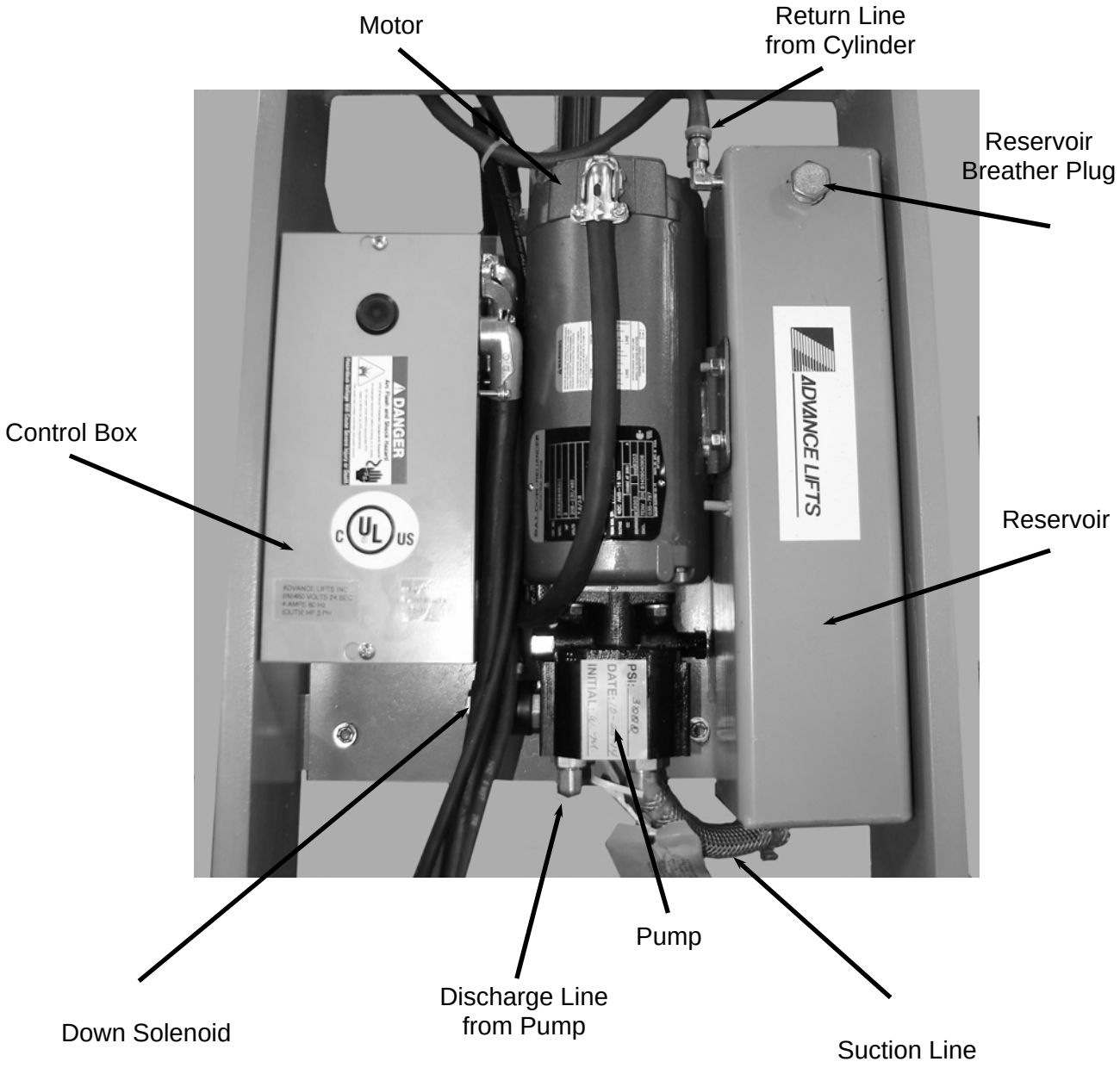
STANDARD SINGLE PHASE POWER UNIT



See Page P 8-6 for Hydraulic Diagram and Pages 9-2 & 9-4 for Electrical Diagrams

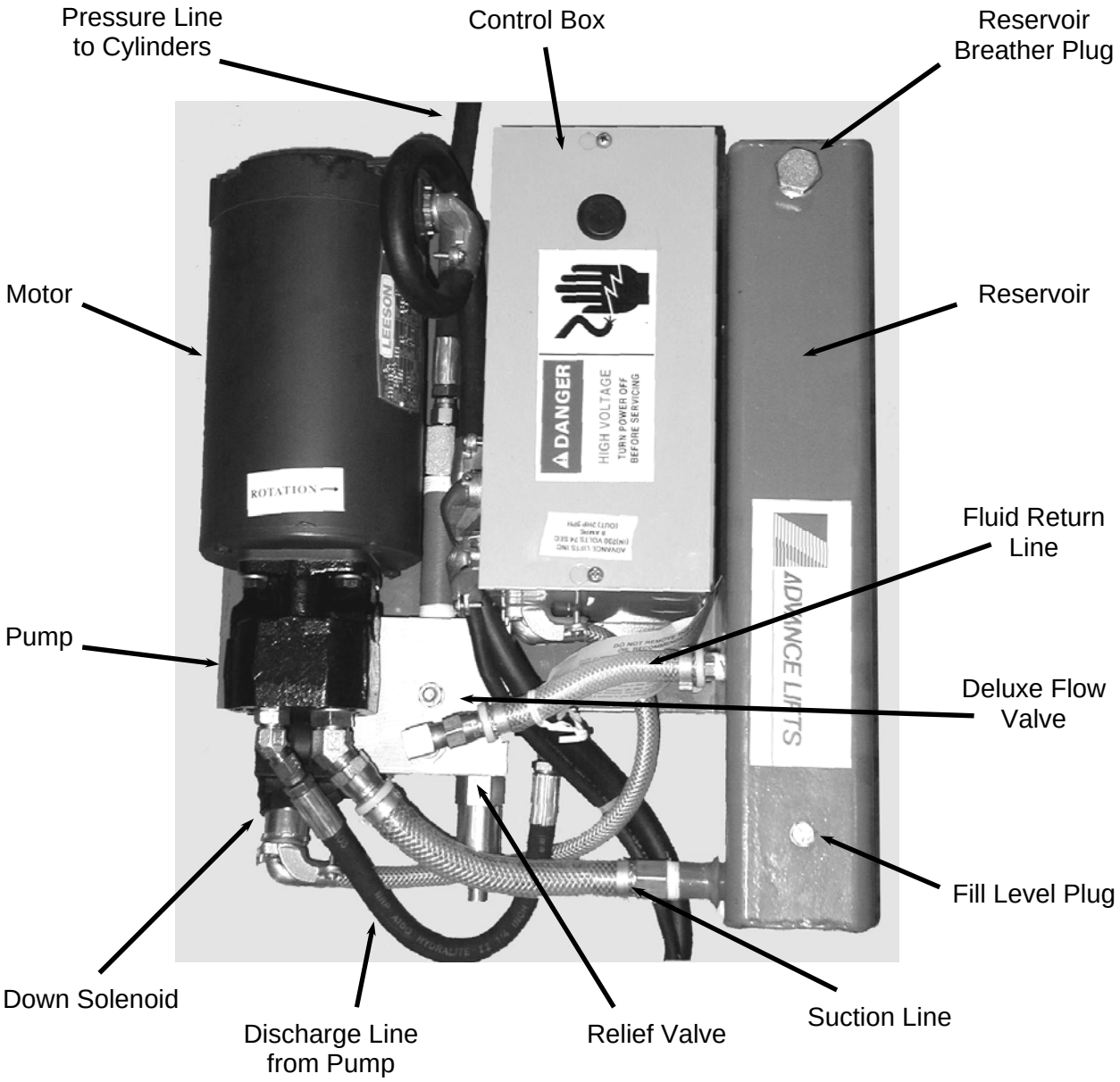
P SERIES POWER UNIT

TYPICAL, THREE-PHASE POWER UNITS

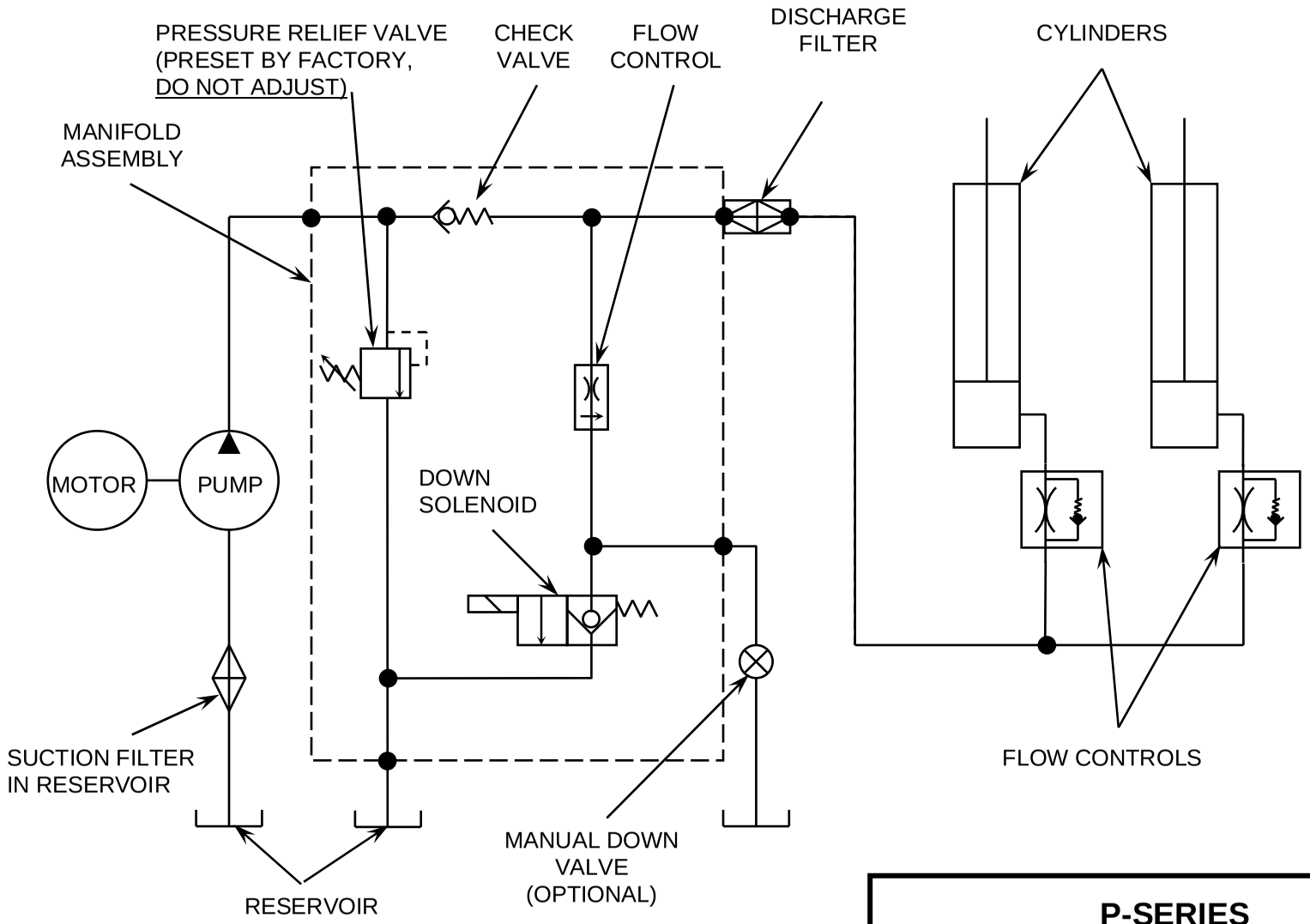


See Page P 8-6 for Hydraulic Diagram and Pages 9-3 & 9-4 for Electrical Diagrams

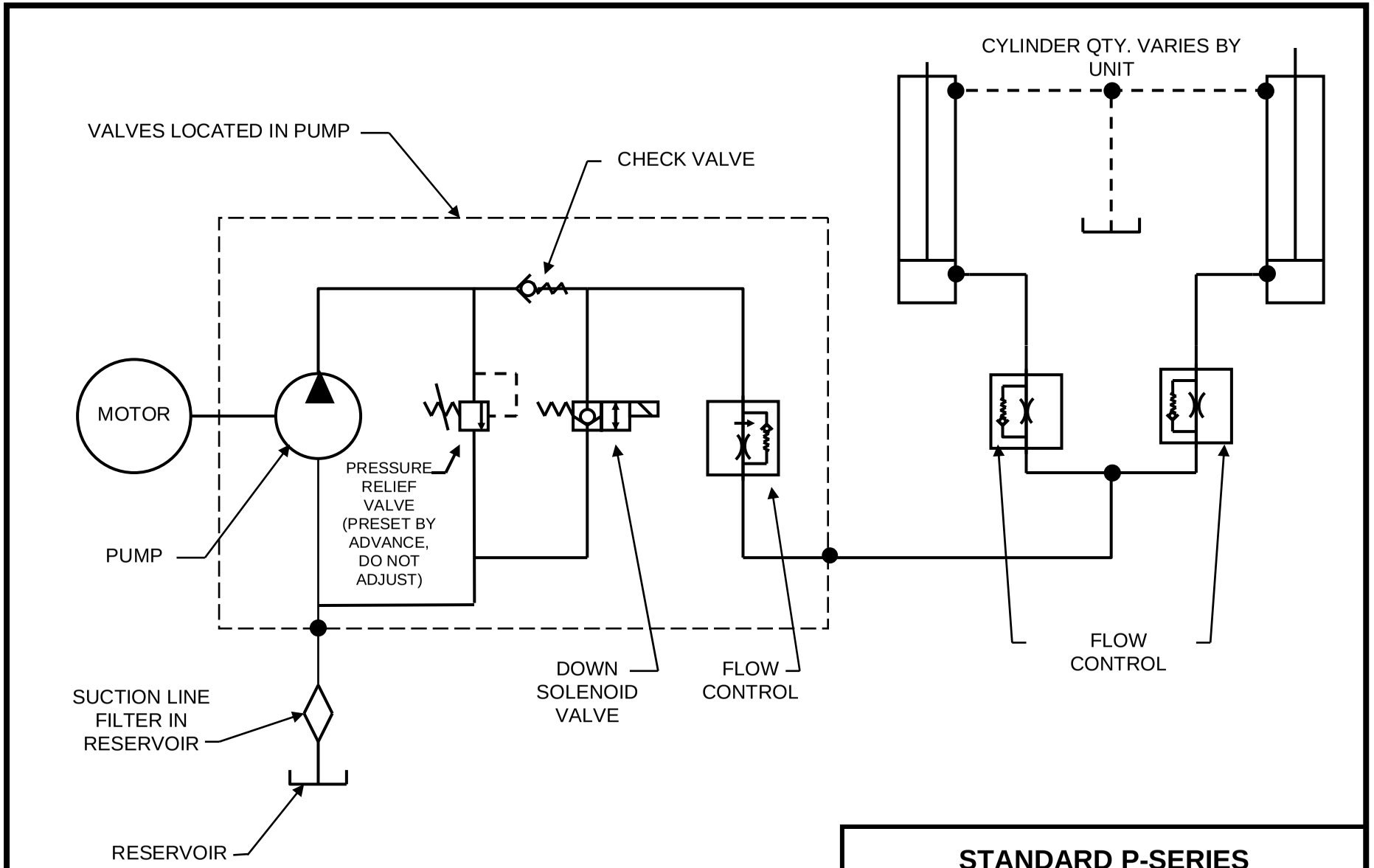
TYPICAL, DELUXE POWER UNITS



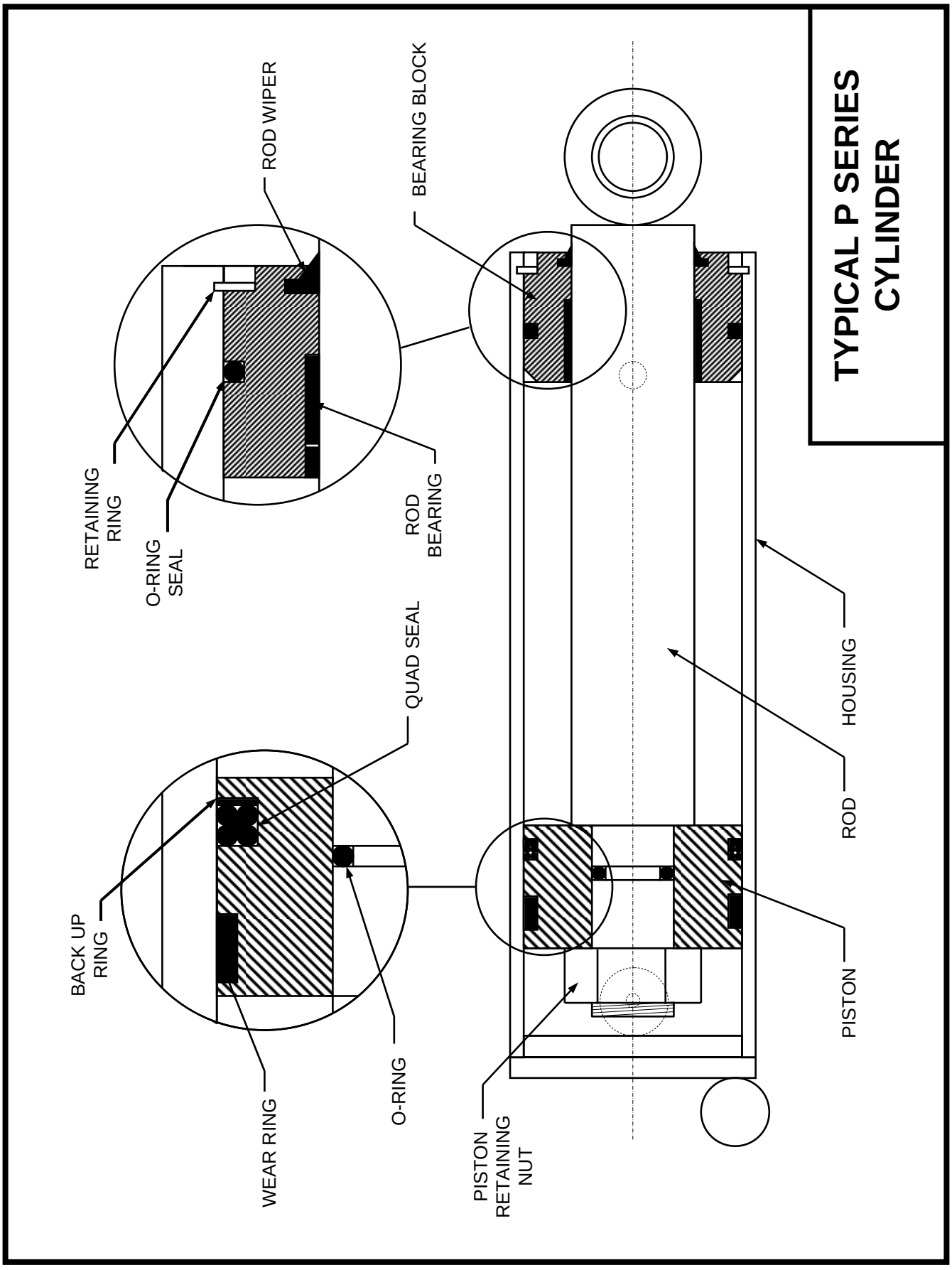
See Page P 8-6 for Hydraulic Diagram and Pages 9-3 & 9-4 for Electrical Diagrams



P-SERIES
HYDRAULIC SCHEMATIC WITH
DELUXE POWER UNIT
OPTION



STANDARD P-SERIES HYDRAULIC SCHEMATIC


TYPICAL P SERIES CYLINDER
ROD WIPER
BEARING BLOCK
RETAINING RING
O-RING SEAL
ROD BEARING
QUAD SEAL
HOUSING
ROD
PISTON
BACK UP RING
WEAR RING
O-RING
PISTON RETAINING NUT

REPAIR PROCEDURES FOR P-SERIES CYLINDERS

Tools & Supplied required:

"Lubriplate" and hydraulic fluid matching the existing fluid in the system for topping off the reservoir when finished. (**Current standard fluid is ISO 46 Hydraulic fluid**)
A five- (5) gallon bucket to collect fluid from the cylinders.
Wrenches to disconnect hydraulic fittings.
Emery cloth.
Clean lint free cloths and hose caps.
Clean work surface (butcher paper on top of most surfaces works well), with a means of holding the cylinder in a fixed position for disassembly and re-assembly.
Maintenance Device(s) supplied with each Advance unit.
A small screwdriver or pick to remove the retaining clip.

Cylinder Removal:

1. Read and understand all of Section 6 in the owners' manual before performing any service.
2. Raise the empty lift and settle it securely on its maintenance device(s).
3. Once settled securely, depress the down control an additional 20 seconds to relieve any pressure from the hydraulic system. Remove the power connection to the power unit and mark with a warning label or lock the connection out to prevent unintended reconnection. (Check your company lockout and tag Standard Operating Procedures.)
4. Disconnect the hydraulic hose from the cylinder and cap/plug the hose to prevent contamination.
5. Remove the cylinder from the lift by freeing the upper pin and swinging the cylinder into an easily supported position, then lift from the assembly.
6. Place the hose connection end of the cylinder in a 5-gallon bucket and force the cylinder closed to drain the hydraulic fluid from the cylinder. Do not reuse the fluid unless you are sure it is contamination free by careful straining.

Cylinder Disassembly:

1. Observe the retaining ring and locate the notched end. Insert a small screwdriver or pick into the notch and lift the retaining ring inward and upward simultaneously. Continue to lift upward while working the retaining ring out in a clockwise fashion until the retaining ring has been removed.
2. Pull out the rod, bearing and piston assembly. The retaining ring groove in the housing can cut the piston seal upon removal, clean the groove thoroughly before assembly.
3. Remove the hex nut adjacent to the piston, then slide the piston and bearing off the rod. The hex nut can be very tight, if difficulty is encountered in removal a small amount of heat can be applied to help break the nut loose. Clean all the parts and place them on a clean surface to avoid contamination.

Re-packing and Inspection:

1. Carefully inspect the entire housing with a flashlight, for any evidence of rust, scratches or surface blemishes. Small blemished may be removed with fine emery cloth and lager faults will require the use of the hone listed on the previous page. Be sure thoroughly clean the housing when you are done to avoid contamination.
2. Do not become the victim of a false economy by using only part of a re-packing kit. Use all new packing parts and seals or the reused old parts may fail in the near future causing a repeat of the whole exercise.
3. Remove the rod wiper on the bearing by using a screwdriver to bend the seal inward to collapse and remove it. Inspect the groove.
4. Lubricate and insert a new wiper with your fingers, sliding it into its groove. Depending upon temperature, the rod wiper may slide in mush easier if it is warmed in hot water, then dried, lubricated, and inserted. The bearing may now be slid back onto the rod.
5. Begin re-packing the piston by using a screwdriver to carefully remove the old backup rings and seal from the groove. The cylinder is also equipped with a wear ring that shall be removed at this time. Be careful to leave the grooves nick free and clean.
6. Place the static O-ring seal into the clean and dry groove on the cylinder rod. Lubricate the seal surfaces and the I.D. of the piston bore. Slide the piston back into position noting that the flat side, not the chamfered side, shall rest against the retaining ring or nut. Reinstall the retaining ring or nut using Locktite if the fastener is a plain nut; torque the nut to 600ft. /lbs.
7. Clean the grooves on the piston. Place the packing kits and wear ring in place into the clean and dry grooves. Lubricate the OD of the piston seals, wear ring and the housing snap ring grooves, then slide the entire assembly into the housing.
8. Re-assemble the bearing block in the reverse manner that it was disassembled. In all cases, be sure the retaining rings(s) are fully seated into their grooves or the cylinders will come apart when fully extended, causing an accident.

SECTION 9. ELECTRICAL DETAILS

General Electrical Information (P-Series Units):

The motor supplied as standard on P-Series units is a 208/230/460v 3-phase motor, with connection diagrams on the outside of the motor for low voltage (230V) or high voltage (460V). This motor is also rated for 208V. As any standard motor is rated for ±10% of voltage variation, this motor will operate properly, within ratings, at 208, 220, 230, 240, 440,460, and 480V, 3-phase supply.

If motor is intended for 208V line usage, some caution is advised, if your motor is a 230 volt motor, and your 208V line voltage drops to 207 volts, (a drop of only ½%), the motor will be operating at –10% in a marginal region. Wiring runs and actual voltage become very important. If you line voltage will be varying (due to loads elsewhere in the system, etc.) you may have an advantage by ordering as an option a 208V +/-10% motor.

To reverse the direction of rotation of a 3-phase motor, reverse any two of the three power leads to the motor. On single-phase motors, see wiring diagram on motor.

Field Changes in Voltage, 3-Phase (230V to 460V):

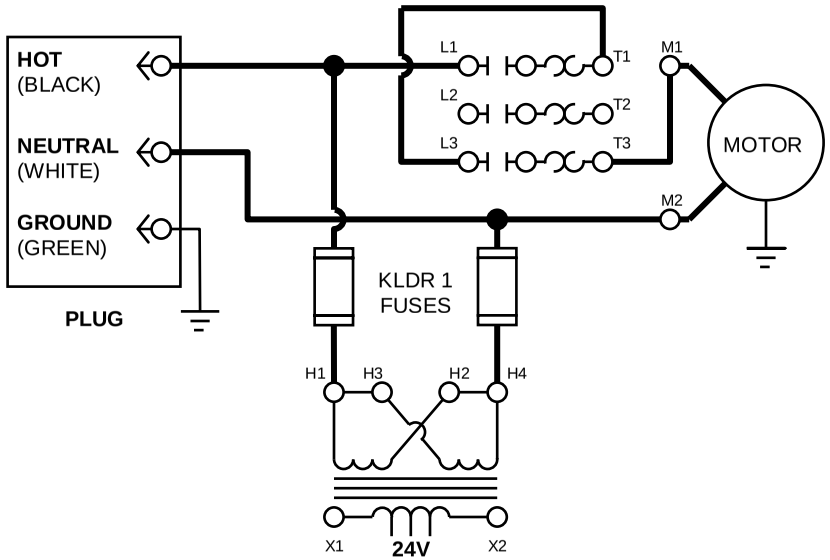
A. Change transformer primary connections to 460V.
B. Change overload protection to proper value as per currents in motor tables. Order new overload; adjust new overload to motor full load current setting. Insure the overload is set to “manual” reset, not “automatic” to insure the equipment cannot re-start automatically.
C. Change motor connections for high (460V).
D. Change plug and receptacle for power, if required.

Field Changes in Voltage, 3-Phase (460V to 230V):

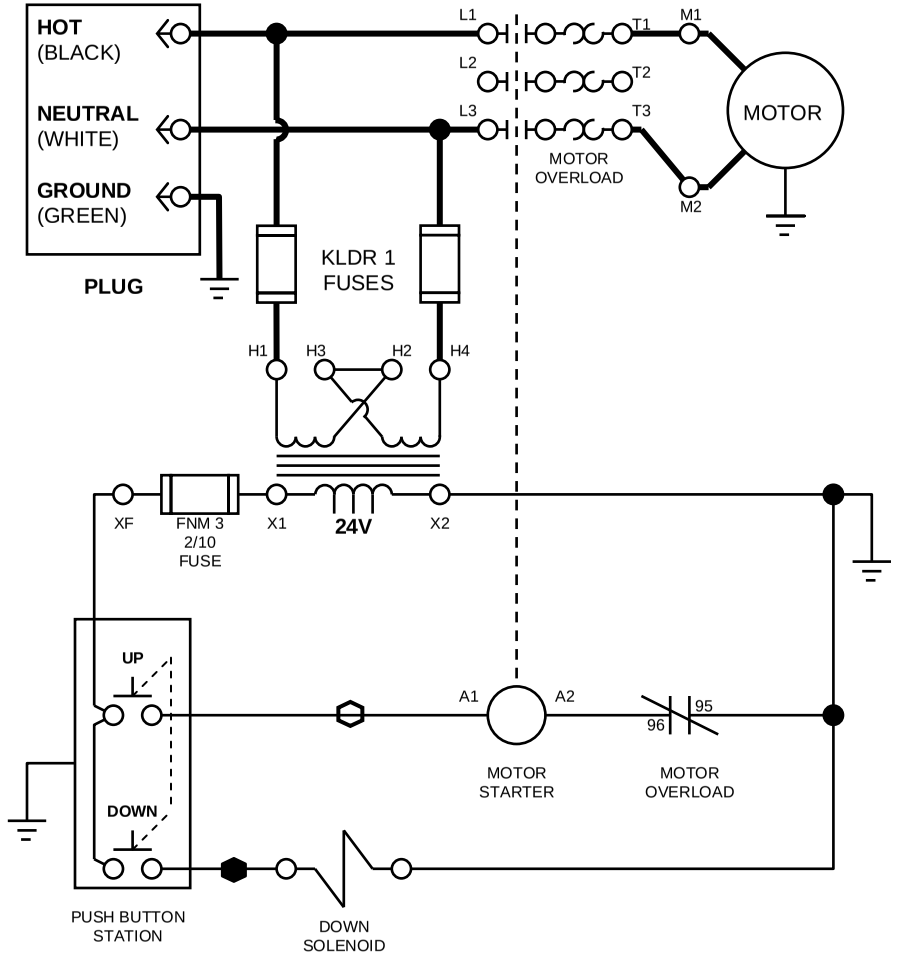
A. Change transformer primary connections to 230V.
B. Change overload protection to proper value as per currents in motor table. Order new overload; adjust new overload to motor full load current setting. Insure the overload is set to “manual” reset, not “automatic” to insure the equipment cannot re-start automatically.
C. Change motor connections for low (230V).
D. Change plug and receptacle for power, if required.

IMPORTANT: When making voltage changes, insure motor rotation is correct.

115V 1Ø OPERATION



230V 1Ø OPERATION

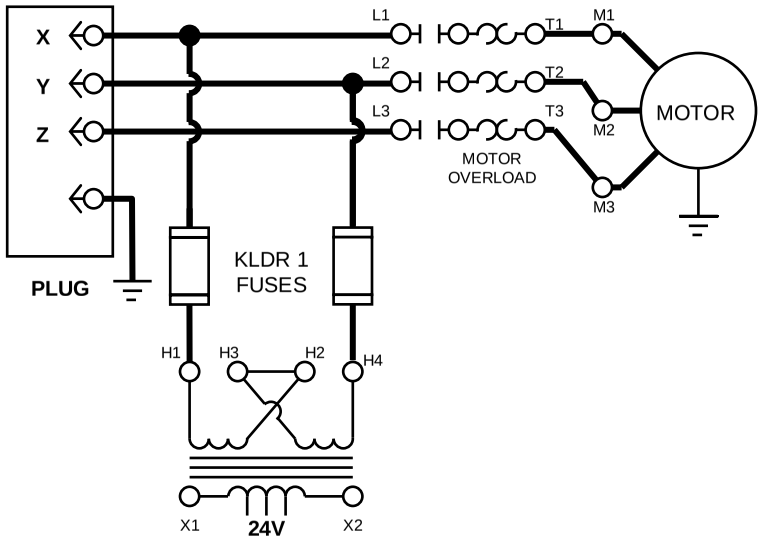


⬡ Typical break point for upper limit switch

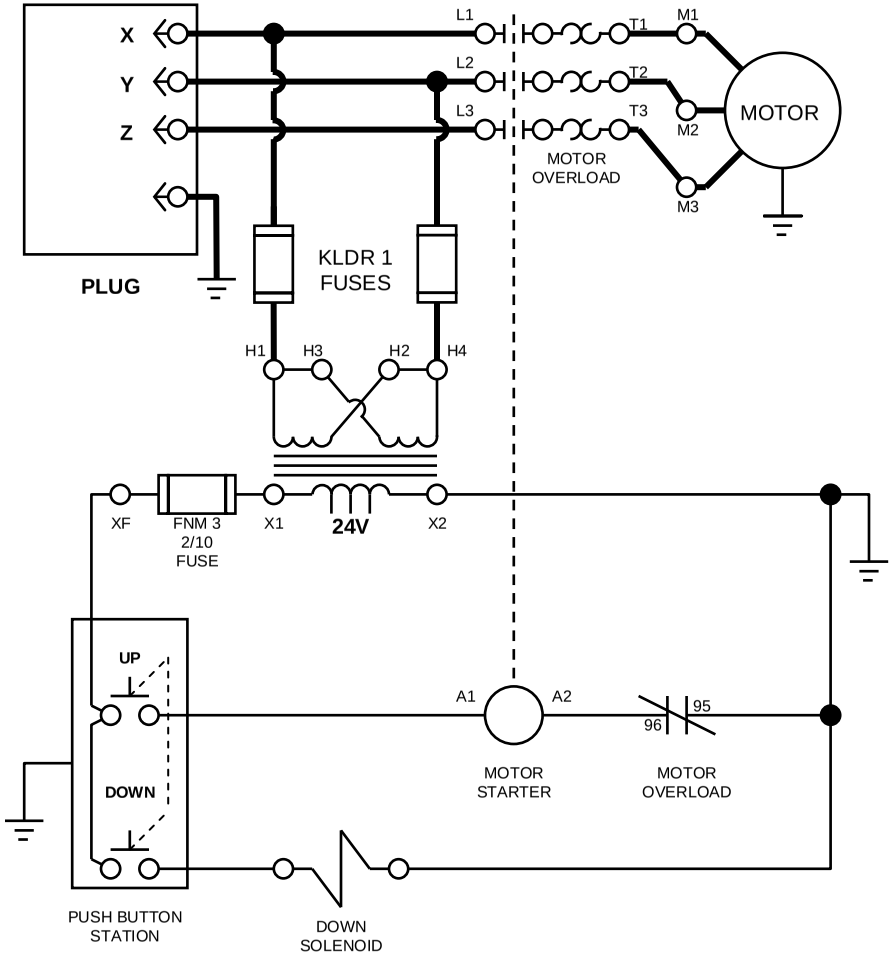
⬢ Typical break point for lower limit switch

SINGLE PHASE ELECTRICAL DIAGRAM

460V 3Ø OPERATION



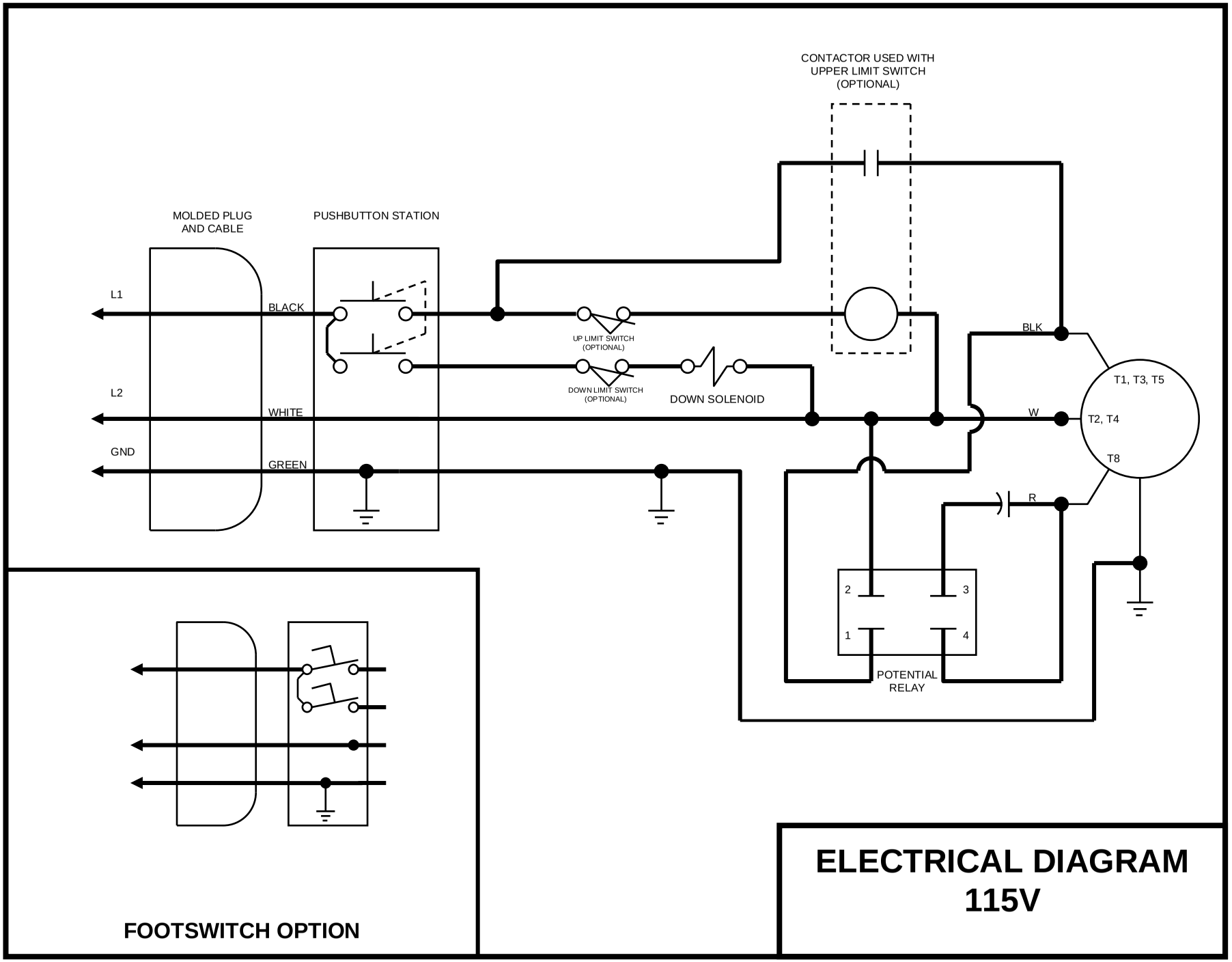
230V 3Ø OPERATION

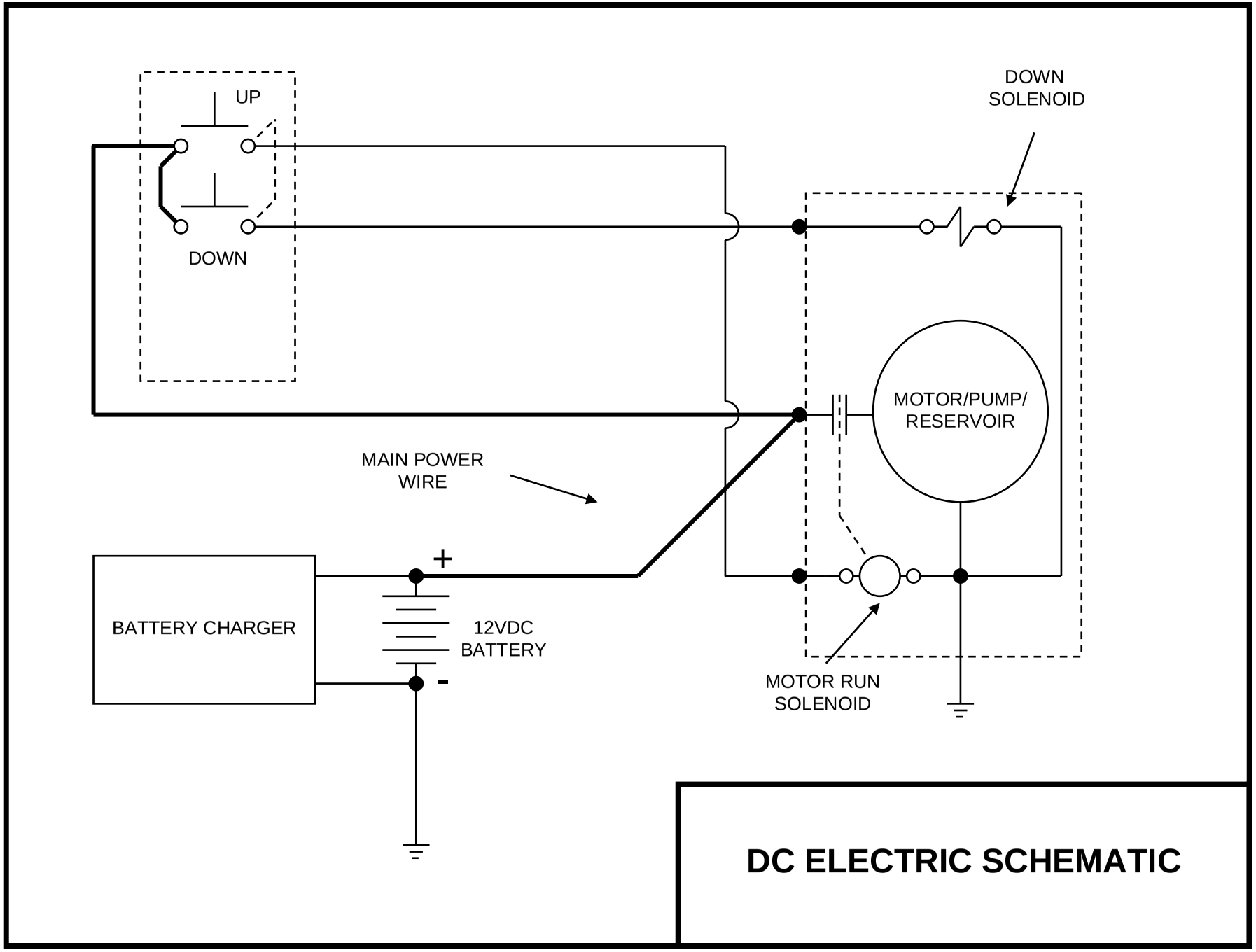


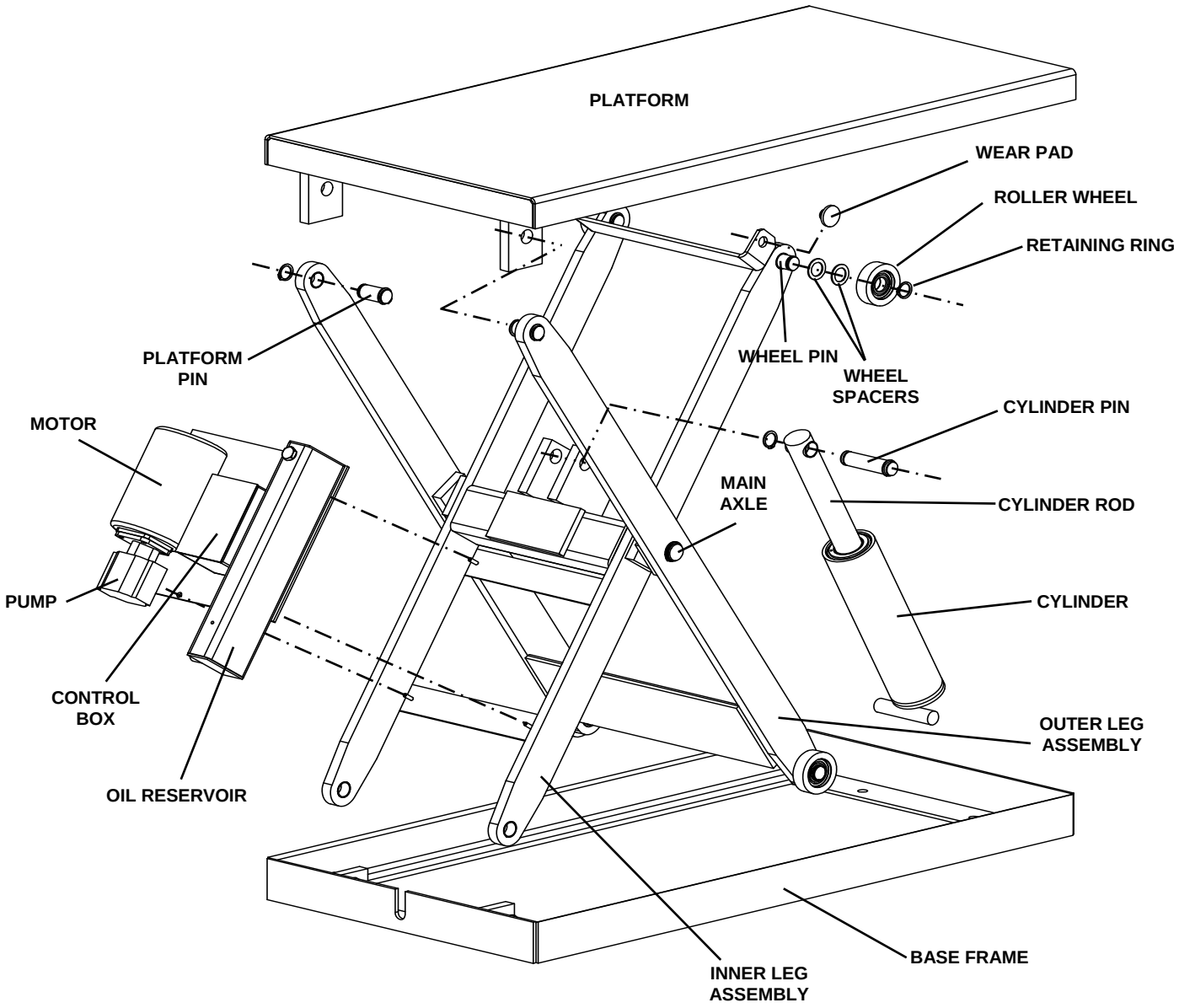
⬡ Typical break point for upper limit switch

⬢ Typical break point for lower limit switch

THREE PHASE ELECTRICAL DIAGRAM


CONTACTOR USED WITH
UPPER LIMIT SWITCH
(OPTIONAL)
MOLDED PLUG
AND CABLE
PUSHBUTTON STATION
L1
BLACK
L2
WHITE
GND
GREEN
UP LIMIT SWITCH
(OPTIONAL)
DOWN LIMIT SWITCH
(OPTIONAL)
DOWN SOLENOID
BLK
W
R
T1, T3, T5
T2, T4
T8
2
3
1
4
POTENTIAL
RELAY
FOOTSWITCH OPTION
ELECTRICAL DIAGRAM
115V


UP
DOWN
DOWN SOLENOID
MOTOR/PUMP/ RESERVOIR
MAIN POWER WIRE
+
BATTERY CHARGER
12VDC BATTERY
-
MOTOR RUN SOLENOID
DC ELECTRIC SCHEMATIC


PLATFORM
WEAR PAD
ROLLER WHEEL
RETAINING RING
PLATFORM PIN
WHEEL PIN
WHEEL SPACERS
MOTOR
CYLINDER PIN
MAIN AXLE
CYLINDER ROD
PUMP
CYLINDER
CONTROL BOX
OUTER LEG ASSEMBLY
OIL RESERVOIR
INNER LEG ASSEMBLY
BASE FRAME

SECTION 11. TROUBLESHOOTING HINTS

Warning! Only qualified service personnel shall undertake service work on hydraulic lifts. The service person shall be able to read and understand wiring and hydraulic diagrams, know how to safely troubleshoot live electrical circuits and be familiar with this manual and all safety devices on the lift. Contact your distributor if you need assistance in troubleshooting your equipment.

Warning! No work shall be performed beneath a raised lift platform unless the maintenance device(s) is installed in accordance with Section 6 of this manual

Symptom	Probable Cause	Corrective Action
Equipment does not raise, motor is running	Load is too heavy	Reduce weight to rated load
	Motor rotation is reversed	On three phase units, have an electrician reverse any two power leads on the power plug to reverse rotation. (Note: that the hydraulic pump can not be run backwards for more than a few seconds without suffering severe damage).
	Motor may be single-phasing	Check wiring and overloads to determine that all three phase lines are present at the motor.
	Low voltage at motor terminals	Check voltage at motor terminals while unit is under full load. If current is below requirements in Section 9 of this manual, correct the wire size or run length.
	Pinched hydraulic line	Check to see that no lines are pinched. Correct as necessary.
	Low oil level in reservoir	Check oil level and correct as necessary. If oil is low, check for leaks also.
	Clogged reservoir breather	Check that air can pass freely through filter and correct as necessary.
	Clogged suction line	Observe the clear suction line to be sure that it remains full of oil with no air bubbles at anytime. If there are any bubbles, check for a loose fitting, cracked ports or a clogged suction filter.

Symptom	Probable Cause	Corrective Action
Equipment does not raise (continued)	Down solenoid wired Incorrectly to energize with up circuit	Hold screwdriver on down solenoid and press “up” switch. If you feel magnetism correct the lift wiring.
	Down solenoid stuck open	Remove the down solenoid and check for free movement of the plunger.
	Pump failure	Place gauge on pump and if it does not produce 3200 psi., replace pump.
Equipment raises too slowly	Load is too heavy	Reduce weight to rated
	Pinched hydraulic line	Check to see that no lines are pinched. Correct as necessary.
	Dirt in down solenoid	Clean the down so that it may fully close.
	Wrong oil for ambient temperature	See oil recommendations in Section 8 of the manual.
	Dirt in reservoir breather	Clean air breather.
	Low voltage at motor	Check voltage at motor terminals while unit is under full load. If current is below requirements in section 9 of this manual, correct the wire size or run length.

Symptom	Probable Cause	Corrective Action
Equipment raises too slowly (continued)	Clogged suction line.	Observe the clear suction line to be sure it remains full of oil with no air bubbles at anytime. If there are any bubbles, check for loose fittings, cracked ports or clogged suction filter.
Motor heats or labors excessively.	Low voltage at motor terminals.	Check voltage at motor terminals while unit is under full load. If current is below requirements in Section 9 of this manual, correct the wire size or run length.,
	Wrong oil for ambient temperature.	See oil recommendations in Section 8 of manual.
	Load is too heavy.	Reduce load to rated load.
Operation is spongy.	Air in cylinders.	Bleed the cylinders to remove air trapped in them. If this reoccurs, check for air bubbles in the suction line and air leaks.
Equipment lowers too slowly.	Pinched hydraulic line.	Check to see that no lines are pinches. correct if necessary.
	Dirt in flow control valve.	Remove and clean flow control valve.
Equipment lowers too fast.	Dirt in check valve.	Remove and clean check valve.
	Dirt in flow control valve.	Remove and clean flow control valve.

Symptom	Probable Cause	Corrective Action
Lift raises, then Lowers.	Dirt in check valve.	Remove and clean check valve.
	Down solenoid wired Incorrectly.	Hold screwdriver on down solenoid and if you feel magnetism correct the lift wiring.
	Leaking cylinder packings.	Repack cylinders.
Lift raises, but will not lower.	Faulty solenoid valve	Replace valve.
	Down solenoid incorrectly wired.	Rewire per diagram in Section 9 of this manual.
	Faulty solenoid coil.	Replace coil.
	Obstruction in baseframe.	Raise lift to clear obstruction then remove.
Oil spraying out of reservoir.	Clogged air breather.	A dirty breather filter may build up positive pressure which will spray oil. Clean air breather.
Lift will not raise and motor will not run.	Control voltage fuse blown.	Replace fuse.
	Motor starter overload	Reset motor starter.
	Wrong voltage to unit.	Check wiring to confirm wiring is compatible with available power.
	Transformer connections loose.	Check and tighten terminal screws on transformer.
	Transformer defective.	Replace transformer.
	Pushbutton defective	Replace pushbutton
	DC units:	See Battery charging instructions.

SECTION 12. ADVANCE LIFTS INC. WARRANTY

For a period of one year from date of shipment from the Company's plant, the Company agrees to replace or repair, free of charge, any defective parts, material, or workmanship on new equipment. This shall include electrical and hydraulic components.

For a period of ten years or 250,000 cycles (whichever occurs first) from date of shipment from Company's plant, the Company agrees to replace or repair any defective structure.

Company authorization must be obtained prior to the commencement of any work. The Company reserves the right of choice between effecting repairs in the field or paying all freight charges and effecting the repairs at the Company's plant. The Company further reserves the right of final determination in all warranty considerations. Evidence of overloading, abuse, or field modification of units without Company approval shall void this warranty. No contingent liabilities will be accepted.

Damage incurred in transport is the responsibility of the carrier and is not covered by this warranty. Any damage detected upon receipt of equipment should be immediately reported to the carrier. If you need assistance filing your claim, please contact Advance Lifts.

ADVANCE LIFTS PARTS LIST

P SERIES

CONFIRM PART NUMBERS WITH YOUR DISTRIBUTOR BEFORE ORDERING

GENERAL DESCRIPTION	DETAIL DESCRIPTION	PART #
MECHANICAL: (COMMON TO ALL UNITS, SELECT BY DATE OF MANUFACTURE)		
WHEEL (BEFORE 1/1/02)	P,SL-232,AL,SAL,WHEEL ASM,3,.875	006-223
WHEEL (AFTER 1/1/02)	P,SAL,BALL BRG WHEEL ASM,3,.875	023-878
WHEEL BUSHING FOR 023-878, 2 REQUIRED	FA,MACH/BSNG,1.0X1.5X14GA,8	001-483
WHEEL PIN (BEFORE 1/1/02)	PIN,1,1.658,GRVD END,BVLD END	A-0230
WHEEL PIN (AFTER 1/1/02)	P,BALL BRG RLLR WHL PIN	A-9708
WHEEL PIN SNAP RING 1" (ALL)	RR,ROTO-CLIP,SHR-98-1IN	001-876
PLATFORM PIN (1" X 2") (ALL)	PIN,1,2.092,GRVD ENDS	A-0234
PLATFORM PIN SNAP RING 1" (ALL)	RR,ROTO-CLIP,SHR-98-1IN	001-876
LEG TO BASEFRAME PIN (1" X 1-7/8") (ALL)	PIN,1,1.875,BVLD END	A-0235
LEG TO BASEFRAME PIN SNAP RING 1" (ALL)	RR,ROTO-CLIP,SHR-98-1IN	001-876
MOTOR: (SELECT BY VOLTAGE AND PHASE)		
115/208/230 VOLT, 1 PH	MR,LEESON,1,17,1,092032.00	000-330
208/230/460/480 VOLT, 1.5 HP, 3 PH	MR,LEESON,1.5,17,3,092062.00	001-450
208/230/460/480 VOLT, 2 HP, 3 PH	MR,LEESON,2,17,3,092139.00	001-451
PUMP: (SELECT BY MODEL NUMBER)		
2524,4024,6024, WITH 1 PHASE MOTOR	HP,.1,.097,2PORT,1003723	040-019
2524,4024,6024, WITH 3 PHASE MOTOR	HP,1,.161,17,INT,1003219	000-344
2536,4036,6036 WITH 1 PHASE MOTOR	HP,HALDEX,1,.097,INT,2PORT,1003723	040-019
2536,4036,6036 WITH 3 PHASE MOTOR	HP,HALDEX,1,.226,INT,2PORT,1003724	040-661
2548,4048,6048 WITH 1 PHASE MOTOR	HP,1,.161,17,INT,1003219	000-344
2548,4048,6048 WITH 3 PHASE MOTOR	HP,HALDEX,1,.226,INT,2PORT,1003724	040-661
2560,4060,6060 WITH 1 PHASE MOTOR	HP,HALDEX,1,.097,INT,2PORT,1003723	040-019
2560,4060,6060 WITH 3 PHASE MOTOR	HP,HALDEX,1,.226,INT,2PORT,1003724	040-661
2572,4072,6072 WITH 3 PHASE MOTOR	HP,HALDEX,1,.226,INT,2PORT,1003724	040-661
CYLINDER PARTS: (SELECT BY BORE I.D. AND ROD O.D.)		
CYLINDER PACKING KIT FOR 3" BORE, 1.75" ROD	40XX,CYL PKG KIT,3.0B,1.75R	004-167
CYLINDER PACKING KIT FOR 3" BORE, 1.5" ROD	PS-XXXX,CYL PKG KIT,3.0B,1.5R	047-090
CYLINDER PACKING KIT FOR 3-1/2" BORE	P,PS, UNIV CYL PKG KIT,3.5B,1.75R	046-794
CYLINDER PACKING KIT FOR "P-Z" MODELS	T-Z,P-2536+Z,CYLINDER PKG KITS	028-886
CYLINDER PIN (BEFORE 1/1/02)	PIN,1,4.875,GRVD ENDS	A-1951
CYLINDER PIN (AFTER 1/1/02)	PIN,1,4.625,GRVD ENDS	A-9717
CYLINDER PIN, 6000 LBS. CAP. LIFTS (AFTER 1/1/02)	PIN,1,4.813,GRVD ENDS,140KSI MU	A-9707
CYLINDER PIN, P-2536 (AFTER 4/9/10)	PIN,1,6.875,GRVD ENDS	A-8774
CYLINDER PIN, P-4036 (AFTER 4/9/10)	PIN,1,8.313,1 BEVELED END,1 GROOVE	A-15186
CYLINDER PIN SNAP RING 1" (ALL YEARS)	RR,ROTOCLIP,SHR-98-1IN	001-876
FLOW CONTROL CARTRIDGE, 1.5 GPM	HV,VONBERG,FIXED 1.5,1302-1-1.5	040-498
HYDRAULIC: (COMMON TO ALL UNITS)		
MANIFOLD VALVE ASSEMBLY	VALVE MANIFOLD ASM	004-420
CHECK VALVE	HV,DELTA,CHECK VALVE,85002355	001-262
24V DOWN SOLENOID VALVE AND COIL ASM	HV,DELTA,DOWN SOLENOID W/24V COIL	001-259
24V DOWN SOLENOID COIL ONLY	HV,DELTA,24V COIL, 36910038	001-260
DOWN SOLENOID VALVE 24V/115V	HV,DELTA,DOWN SOLENOID,85002355	001-279
115V DOWN SOLENOID COIL ONLY	HV,DELTA,115V COIL,39670035	001-261
24V BARNES DOWN SOLENOID COIL	HV,BARNES,24VAC COIL,6316024	015-301
115V BARNES DOWN SOLENOID COIL	HV,BARNES,115V COIL,6315115	001-741
BARNES 115V/24V DOWN SOLENOID VALVE	HV,BARNES,SOLNOID CART,SV08-20S0N0	003-106
ADJUSTABLE FLOW CONTROL VALVE	HV,DELTA,ADJ FLOW,85002019	001-265

ADVANCE LIFTS PARTS LIST

P SERIES

CONFIRM PART NUMBERS WITH YOUR DISTRIBUTOR BEFORE ORDERING

COMPLETE CYLINDER: (SELECT BY MODEL AND MANUFACTURE DATE)

*Cylinder will also require an SAE to NPT elbow part # 010-219

NOTE: (Left and right cylinder ports are described as viewed from the roller end of the lift)

MODEL#	DETAIL DESCRIPTION	
P-2524 (BEFORE 1/1/02)	2524,6024,CYL ASM,LT,3.5B,1.75R	003-479
P-2524 (FROM 1/1/02 TO 10/1/13)*	P25/6024,CYL ASM,LT,3.5B,1.75R,4.5S	022-068
P-2524 (AFTER 10/1/13)	PS-2524,CYL ASM,3B,1.5R,5.82S	D-19847
P-2536 RIGHT PORT (BEFORE 11/1/09)*	2536,6036,CYL ASM,RT,3.5B,1.75R	003-482
P-2536 (AFTER 11/1/09)	PS-25/4036,CYL ASM,RT,3B,1.5R,8.13S	042-385
P-2548 (BEFORE 3/1/10)*	2548,6048,CYL ASM,RT,3.5B,1.75R	003-486
P-2548 (AFTER 3/1/10)	PS-25/4048,CYL ASM,R,3B,1.5R,12.76S	042-387
P-2560 (BEFORE 1/1/02)*	2560/6060,CYL ASM,RT,3.5B,1.75R	020-231
P-2560 (FROM 1/1/02 TO 1/10/12)*	2560/6060,CYL ASM,RT,3.5B,1.75R	022-017
P-2560 (AFTER 10/2012)	PS-25/4060,CYL ASM,R,3B,1.5R,18.76S	045-170
P-4024 RIGHT PORT (BEFORE 1/1/02)*	4024,CYL ASM,RT,3.0B,1.75R	003-480
P-4024 LEFT PORT (BEFORE 1/1/02)*	4024,CYL ASM,LT,3.0B,1.75R	003-481
P-4024 RIGHT PORT (FROM 1/1/02 TO 12/18/13)	4024,CYL ASM,RT,3.0B,1.75R	021-984
P-4024 LEFT PORT (FROM 1/1/02 TO 12/18/13)	4024,CYL ASM,LT,3.0B,1.75R	021-987
P-4024 (AFTER 12/18/13)	PS-4024,CYL ASM,3.5B,1.75R,5.44S	D-19849
P-4036 RIGHT PORT (BEFORE 1/1/10)*	4036,CYL ASM,RT,3.0B,1.75R	004-222
P-4036 LEFT PORT (BEFORE 1/1/10)*	4036,CYL ASM,LT,3.0B,1.75R	004-223
P-4036 (AFTER 1/1/10)	PS-25/4036,CYL ASM,3B,1.5R,8.13S	D-17187
P-4048 RIGHT PORT (BEFORE 2/1/10)*	4048,CYL ASM,RT,3.0B,1.75R	003-488
P-4048 LEFT PORT (BEFORE 2/1/10)*	4048,CYL ASM,LT,3.0B,1.75R	003-489
P-4048 RIGHT PORT (AFTER 2/1/10)	PS-25/4048,CYL ASM,R,3B,1.5R,12.76S	042-387
P-4048 LEFT PORT (AFTER 2/1/10)	PS-25/4048,CYL ASM,L,3B,1.5R,12.76S	042-388
P-4060 RIGHT PORT (BEFORE 1/1/02)*	4060,CYL ASM,RT,3.0B,1.75R	020-343
P-4060 LEFT PORT (BEFORE 1/1/02)*	4060,CYL ASM,LT,3.0B,1.75R	020-344
P-4060 RIGHT PORT (FROM 1/1/02 TO 11/1/13)	4060,CYL ASM,RT,3.0B,1.75R	022-006
P-4060 LEFT PORT (FROM 1/1/02 TO 11/1/13)	4060,CYL ASM,LT,3.0B,1.75R	022-010
P-4060 RIGHT PORT (AFTER 11/1/13)	PS-25/4060,CYL ASM,R,3B,1.5R,18.76S	045-170
P-4060 LEFT PORT (AFTER 11/1/13)	PS-25/4060,CYL ASM,L,3B,1.5R,18.76S	045-171
P-6024 RIGHT PORT (BEFORE 1/1/02)*	2524,6024,CYL ASM,RT,3.5B,1.75R	003-478
P-6024 LEFT PORT (BEFORE 1/1/02)*	6024,CYL ASM,LT,3.5B,1.75R	003-479
P-6024 RIGHT PORT (AFTER 1/1/02)	6024,CYL ASM,RT,3.5B,1.75R	022-066
P-6024 LEFT PORT (AFTER 1/1/02)	P2524,6024,CYL ASM,LT,3.5B,1.75R	022-068
P-6036 RIGHT PORT (BEFORE 6/1/11)*	2536,6036,CYL ASM,RT,3.5B,1.75R	003-482
P-6036 LEFT PORT (BEFORE 6/1/11)*	6036,CYL ASM,LT,3.5B,1.75R	003-483
P-6036 RIGHT PORT (AFTER 6/1/11)	PS-6036,CYL ASM,RT,3.5B,1.75R,8.13S	043-456
P-6036 LEFT PORT (AFTER 6/1/11)	PS-6036,CYL ASM,LT,3.5B,1.75R,8.13S	034-457
P-6048 RIGHT PORT (BEFORE 12/1/11)*	2548,6048,CYL ASM,RT,3.5B,1.75R	003-486
P-6048 LEFT PORT (BEFORE 12/1/11)*	6048,CYL ASM,LT,3.5B,1.75R	003-487
P-6048 RIGHT PORT (AFTER 12/1/11)	PS-6048,CYL ASM,R,3.5B,1.75R,12.69S	044-778
P-6048 LEFT PORT (BEFORE 12/1/14)	PS-6048,CYL ASM,L,3.5B,1.75R,12.69S	044-779
P-6060 RIGHT PORT (BEFORE 1/1/02)*	2560/6060,CYL ASM,RT,3.5B,1.75R	020-231
P-6060 LEFT PORT (BEFORE 1/1/02)*	6060,CYL ASM,LT,3.5B,1.75R	020-230
P-6060 RIGHT PORT (FROM 1/1/02 TO 8/1/13)	2560/6060,CYL ASM,RT,3.5B,1.75R	022-017
P-6060 LEFT PORT (FROM 1/1/02 TO 8/1/13)	2560/6060,CYL ASM,LT,3.5B,1.75R	022-011
P-6060 RIGHT PORT (AFTER 8/1/13)	PS-6060,CYL ASM,R,3.5B,1.75R,18.5S	045-407
P-6060 LEFT PORT (AFTER 8/1/13)	PS-6060,CYL ASM,L,3.5B,1.75R,18.5S	045-408
P-6072 RIGHT PORT (ALL)	PS-6072,CYL ASM,R,3.5B,1.75R,23.6S	046-583
P-6072 LEFT PORT (ALL)	PS-6072,CYL ASM,L,3.5B,1.75R,23.6S	046-584

ADVANCE LIFTS PARTS LIST

P SERIES

CONFIRM PART NUMBERS WITH YOUR DISTRIBUTOR BEFORE ORDERING

CONTROL BOX:(SELECT BY MODEL, VOLTAGE AND PHASE)		
2524,4024,6024, 115V, 1 PHASE	CT,P,TELE,1/1,115,24,10XBX6	004-744
2524,4024,6024, 230V, 1 PHASE	CT,P,TELE,1/1,230,24,10XBX6	004-752
2524,4024,6024, 230V, 3 PHASE	CT,P,TELE,1.5/3,230,24,10XBX6	004-684
2524,4024,6024, 460V, 3 PHASE	CT,P,TELE,1.5/3,460,24,10XBX6	010-176
2536,4036,6036, 115V, 1 PHASE	CT,P,TELE,1/1,115,24,10X4X4	004-757
2536,4036,6036, 230V, 1 PHASE	CT,P,TELE,1/1,230,24,10X4X4	004-759
2536,4036,6036, 230V, 3 PHASE	CT,P,TELE,2/3,230,24,10X4X4	004-083
2536,4036,6036, 460V, 3 PHASE	CT,P,TELE,2/3,460,24,10X4X4	004-718
2548,4048,6048, 115V, 1 PHASE	CT,P,TELE,1/1,115,24,10X4X4	004-757
2548,4048,6048, 230V, 1 PHASE	CT,P,TELE,1/1,230,24,10X4X4	004-759
2548,4048,6048, 230V, 3 PHASE	CT,P,TELE,2/3,230,24,10X4X4	004-083
2548,4048,6048, 460V, 3 PHASE	CT,P,TELE,2/3,460,24,10X4X4	004-718
TRANSFORMER: (SELECT BY VOLTAGE AND OPTIONS)		
115-230V,24V, 1 PHASE	CT,XFMR,115/230/24,50VA	029-921
240-480V,24V, 3 PHASE	CT,XFMR,240/480/24,50VA	029-919
CONTACTOR, MOTOR STARTER: (SELECT BY VOLTAGE AND PHASE)		
115V,1PH CONTACTOR	CT,TESYS,CONTACTOR,LC1D25B7	000-692
230V,1PH CONTACTOR	CT,TESYS,CONTACTOR,LC1D25B7	000-692
230V,3PH CONTACTOR	CT,TESYS,CONTACTOR,LC1D09B7	000-690
460V,3PH CONTACTOR	CT,TESYS,CONTACTOR,LC1D09B7	000-690
OVERLOAD: (SELECT BY VOLTAGE AND PHASE)		
115V/1PH OVERLOAD	CT,TESYS,OVERLOAD,17-25,LRD22	000-700
230V/1PH OVERLOAD	CT,TESYS,OVERLOAD,9-13,LRD16	000-698
230V/3PH OVERLOAD	CT,SQD,TESYS,OVERLOAD,7-10,LRD14	000-697
460V/3PH OVERLOAD	CT,SQD,TESYS,OVERLOAD,4-6,LRD10	000-695
OPTIONS:		
BLUE SPRAY PAINT, 4.5 OZ	PS,PAINT,BRIGHT BLUE,4.5OZ SPRAY	028-672
YELLOW SPRAY PAINT, 4.5 OZ	PS,PAINT,SAFETY YELLOW,4.5OZ SPRAY	028-673
POWER UNIT DECAL KIT	XXXX,PU DECAL KIT	004-142
COMPLETE DECAL KIT	XXXX,HD-XXXX,DETAIL DECAL KIT	004-138
OWNERS MANUAL	XXXX,OWNERS MANUAL	004-143
PLUG 230V, 3 PHASE	ES,LEVITON,PLUG,250V,20A,3PH,2421	001-671
PLUG 460V, 3 PHASE	ES,LEVITON,PLUG,480V,30A,3PH,2731	000-994
PLUG 115V, 1 PHASE	ES,LEVITON,PLUG,125V,30A,1PH,2611	000-998
PLUG 230V, 1 PHASE	ES,LEVITON,PLUG,250V,20A,1PH,2321	000-996
PUSH BUTTON SWITCH	ME,SQD,PNDNT PSH BTTN,XAC A201	000-802
COIL CORD	ME, EXCEL, COIL CORD, 16/4 SJT, 20FT	000-788
FOOT SWITCH 115V, 1 PHASE	P,FT SWITCH W/PWR CORD 115,1PH	004-913
FOOT SWITCH 230V, 3 PHASE	P,FT SWITCH W/PWR CORD 230,3PH	004-122
FOOT SWITCH 460V, 3 PHASE	P,FT SWITCH W/PWR CORD 460,3PH	004-909
REPLACEMENT NAME/SERIAL NUMBER TAG	SS,NAMEPLATE,ASSY,1-1/2X6-1/4 APT	049-863

Material Safety Data Sheet

1. Chemical product and company identification

Product name	CASTROL DUAL RANGE HV 46 HYDRAULIC FLUID
MSDS #	460278
Historic MSDS #:	None.
Code	460278
Product use	Hydraulic fluid For specific application advice see appropriate Technical Data Sheet or consult our company representative.
Supplier	BP Lubricants USA Inc. 9300 Pulaski Highway Baltimore, Maryland 21220-2495
EMERGENCY HEALTH INFORMATION:	1 (800) 447-8735 Outside the US: +1 703-527-3887 (CHEMTREC)
EMERGENCY SPILL INFORMATION:	1 (800) 424-9300 CHEMTREC (USA)
OTHER PRODUCT INFORMATION	1 (866) 4 BP - MSDS (866-427-6737 Toll Free - North America) email: bpcares@bp.com

2. Composition/information on ingredients

Ingredient name	CAS #	% by weight
Distillates (petroleum), hydrotreated, heavy paraffinic (Highly refined mineral oil)	64742-54-7	85 - 90
Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based, high viscosity (Highly refined mineral oil)	72623-85-9	5 - 15
White mineral oil, petroleum (Highly refined mineral oil)	8042-47-5	1 - 5
Proprietary performance additives.	proprietary	5 - 10

3. Hazards identification

Physical state	Liquid.
Color	Purple.
Emergency overview	CAUTION! MAY CAUSE EYE IRRITATION. MAY CAUSE SKIN IRRITATION. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.
Routes of entry	Skin contact. Eye contact. Inhalation. Ingestion.
Potential health effects	
Eyes	May cause eye irritation.
Skin	Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis. High pressure skin injections are serious medical emergencies. Injury will not appear serious at first; within a few hours, tissue will become swollen, discolored and extremely painful.
Inhalation	Mist : May cause respiratory tract irritation.

Ingestion	Causes gastrointestinal irritation and diarrhea.
Medical conditions aggravated by over-exposure	None identified.

See toxicological information (section 11)

4. First aid measures

Eye contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin contact	Immediately wash exposed skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops. Accidental high pressure injection through the skin requires immediate medical attention.
Inhalation	If inhaled, remove to fresh air. Get medical attention if symptoms appear.
Ingestion	Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately.

5. Fire-fighting measures

Flammability of the product	May be combustible at high temperature.
Flash point	232 °C (Open cup) Cleveland.
Products of combustion	These products are carbon oxides (CO, CO_2).
Unusual fire/explosion hazards	This material is not explosive as defined by established regulatory criteria.
Fire-fighting media and instructions	In case of fire, use water fog, foam, dry chemicals, or carbon dioxide. Do not use water jet.
Protective clothing (fire)	Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

6. Accidental release measures

Personal precautions	Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (See Section: "Exposure controls/personal protection"). Follow all fire fighting procedures (See Section: "Fire-fighting measures").
Environmental precautions and clean-up methods	If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) scoop up material and place in a sealed, liquid-proof container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Avoid contact of spilled material with soil and prevent runoff entering surface waterways. See Section 13 for Waste Disposal Information.
Personal protection in case of a large spill	Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

7. Handling and storage

Handling	Avoid contact with eyes. Avoid contact with skin and clothing. Wash thoroughly after handling.
Storage	Keep container tightly closed. Keep container in a cool, well-ventilated area. Empty containers may contain harmful, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

8. Exposure controls/personal protection

Occupational exposure limits

Ingredient name	Occupational exposure limits
Distillates (petroleum), hydrotreated, heavy paraffinic (Highly refined mineral oil)	**ACGIH (United States).** STEL: 10 mg/m^3 15 minute(s). Form: Oil mist, mineral TWA: 5 mg/m^3 8 hour(s). Form: Oil mist, mineral **OSHA (United States).** TWA: 5 mg/m^3 8 hour(s). Form: Oil mist, mineral
Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based, high viscosity (Highly refined mineral oil)	**ACGIH (United States).** STEL: 10 mg/m^3 15 minute(s). Form: Oil mist, mineral TWA: 5 mg/m^3 8 hour(s). Form: Oil mist, mineral **OSHA (United States).** TWA: 5 mg/m^3 8 hour(s). Form: Oil mist, mineral
White mineral oil, petroleum (Highly refined mineral oil)	**ACGIH (United States).** STEL: 10 mg/m^3 15 minute(s). Form: Oil mist, mineral TWA: 5 mg/m^3 8 hour(s). Form: Oil mist, mineral **OSHA (United States).** TWA: 5 mg/m^3 8 hour(s). Form: Oil mist, mineral
Proprietary performance additives.	None assigned.

Control Measures Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits.

Hygiene measures Wash hands after handling compounds and before eating, smoking, using lavatory, and at the end of day. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the work-station location.

Personal protection

Eyes Avoid contact with eyes. Chemical splash goggles.

Skin and body Avoid prolonged or repeated contact with skin. Wear protective clothing if prolonged or repeated contact is likely.

Respiratory None required; however, use of adequate ventilation is good industrial practice. If heated and ventilation is inadequate, use a NIOSH certified respirator with an organic vapor cartridge and P95 particulate filter.

Hands Wear protective gloves if prolonged or repeated contact is likely.

Consult your supervisor or S.O.P. for special handling directions

Consult local authorities for acceptable exposure limits.

9. Physical and chemical properties

Physical state Liquid.

Color Purple.

Pour Point -45 °C

Specific gravity 0.8697

Solubility Insoluble in cold water.

Viscosity Kinematic: 46.5 mm^2/s (46.5 cSt) at 40°C
Kinematic: 7.9 mm^2/s (7.9 cSt) at 100°C
SUS: 216 SUS at 37.7°C

Viscosity Index 141

10. Stability and reactivity

Stability and reactivity	The product is stable.
Conditions to avoid	Keep away from heat, sparks and flame. Keep away from sources of ignition.
Incompatibility with various substances	Reactive with oxidizing agents.
Hazardous decomposition products	Products of combustion: carbon oxides (CO, CO_2).
Hazardous polymerization	Will not occur.

11. Toxicological information

Acute toxicity

Toxicity testing not conducted.

At normal ambient temperatures this product will be unlikely to present an inhalation hazard because of its low volatility. May be harmful by inhalation if exposure to vapor, mists or fumes resulting from thermal decomposition products occurs.

Unlikely to cause harm if accidentally swallowed in small doses, though larger quantities may cause nausea and diarrhea.

Chronic toxicity

Carcinogenic effects	No component of this product at levels greater than 0.1% is identified as a carcinogen by ACGIH or the International Agency for Research on Cancer (IARC). No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program (NTP) or the U.S. Occupational Safety and Health Act (OSHA).
Mutagenic effects	No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a mutagen.
Reproductive effects	No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a reproductive toxin.
Teratogenic effects	No component of this product at levels greater than 0.1% is classified by established regulatory criteria as teratogenic or embryotoxic.

12. Ecological information

Ecotoxicity No testing has been performed by the manufacturer.

13. Disposal considerations

Waste information Avoid contact of spilled material and runoff with soil and surface waterways. Consult an environmental professional to determine if local, regional or national regulations would classify spilled or contaminated materials as hazardous waste. Use only approved transporters, recyclers, treatment, storage or disposal facilities.

Consult your local or regional authorities.

14. Transport information

Not classified as hazardous for transport (DOT, TDG, IMO/IMDG, IATA/ICAO)

15. Regulatory information

U.S. Federal regulations

US INVENTORY (TSCA): In compliance.

TSCA 12(b) one-time export notification:: naphthalene; naphthalene; mequinol

This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: CASTROL DUAL RANGE HV 46 HYDRAULIC FLUID: Immediate (Acute) Health Hazard

SARA 313

Form R - Reporting requirements

This product does not contain any hazardous ingredients at or above regulated thresholds.

Supplier notification

This product does not contain any hazardous ingredients at or above regulated thresholds.

CERCLA Sections 102a/103 Hazardous Substances (40 CFR Part 302.4):: naphthalene: 100 lbs. (45.36 kg); Cumene: 5000 lbs. (2268 kg); Benzene: 10 lbs. (4.536 kg); Toluene: 1000 lbs. (453.6 kg); Xylene: 100 lbs. (45.36 kg); naphthalene: 100 lbs. (45.36 kg); phosphorodithioc acid, O,O - di-C1-14- alkyl esters zinc salts ; phenol: 1000 lbs. (453.6 kg); Ethyl acrylate: 1000 lbs. (453.6 kg); Lead: 10 lbs. (4.536 kg); Arsenic: 1 lbs. (0.4536 kg); Cadmium: 10 lbs. (4.536 kg);

State regulations

No products were found.

WARNING: This product contains a chemical known to the State of California to cause cancer. naphthalene; naphthalene; Ethyl acrylate; Arsenic

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
Toluene

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.
Lead; Cadmium; Benzene

Inventories

AUSTRALIAN INVENTORY (AICS): Not determined.

CANADA INVENTORY (DSL): In compliance.

CHINA INVENTORY (IECS): Not determined.

EC INVENTORY (EINECS/ELINCS): Not determined.

JAPAN INVENTORY (ENCS): Not determined.

KOREA INVENTORY (ECL): Not determined.

PHILIPPINE INVENTORY (PICCS): Not determined.

16. Other information

Label requirements

CAUTION!

MAY CAUSE EYE IRRITATION.
MAY CAUSE SKIN IRRITATION.

HMIS® Rating :

Health	**1**
Flammability	**1**
Physical Hazard	**0**
Personal protection	**X**

National Fire Protection Association (U.S.A.)

History

Date of issue 07/07/2005.

Date of previous issue 07/02/2005.

Prepared by Product Stewardship

Notice to reader

NOTICE : This Material Safety Data Sheet is based upon data considered to be accurate at the time of its preparation. Despite our efforts, it may not be up to date or applicable to the circumstances of any particular case. We are not responsible for any damage or injury resulting from abnormal use, from any failure to follow appropriate practices or from hazards inherent in the nature of the product.