ADVANCE LIFTS

P – Series Owner's Manual

NOTICE

This manual is an important document. Keep it with the machine or located where readily available to operators and maintenance personnel for reference purposes.

ADVANCE LIFTS

Installation, Operation and Maintenance Manual for the Following Equipment:

All P - Series Lifts

☐ This manual contains specific information for your equipment, see manual insert.

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

Model Number_____ Serial Number_____

Installation location: _____

_____

_____

NOTICE

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 South 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

Identification Sheet…… **Section 1**

Index & Introduction…… **Section 2**

***Responsibilities of Owners & Users**…….…….. **Section 3**

***Installation Instructions**…….…….. **Section 4**

***Operation Instructions**…… **Section 5**

***Maintenance Instructions**…….. … **Section 6**
*Maintenance Device(s) Placement

Warning Label Specifications & Locations ……. **Section 7**

Hydraulic Details…….. **Section 8**
General hydraulic information
Oil recommendation & seal compatibility
P Series power unit photographs
Hydraulic schematics
Hydraulic component lists
P - Series
P - Series cylinder drawings and parts lists
Cylinder repair procedures

Electrical Details…….. **Section 9**
General electrical information
Typical controller photograph
Electrical schematics
Wire size recommendations

Mechanical Details…….. **Section 10**
Basic Part Descriptions

Troubleshooting Hints…… **Section 11**

Warranty…… **Section 12**

Attachments: Material Safety Data Sheets & Parts List……. **Section 13**

***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, insure the floor is clean and level prior to final placement. If slings are used, encircle the entire lift, not just the platform.

2. Apply proper voltage to the equipment, 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.

NOTICE

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.

NOTICE

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

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 base frame, not just the corners. Lag the unit in place using ½" x 5", "Rawl-Studs" or wedge anchors in the holes provided.

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 startup, there may be some air in the lines or the cylinders may be dry due to storage so it may take several cycles to smooth out the operation. If the operation is not smooth after several cycles, contact your maintenance personnel. Immediately stop using the lift if there is any evidence of binding or scraping in the operation.
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 sections (Sections 3 & 5) 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.

Daily operation (continued):

⚠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.**

3. 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.
4. 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.
5. 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

General Information Notes:

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. Always use the maintenance device(s) when working on the unit in the elevated position or reaching under the platform. (See photos 6-1, 6-2, 6.3 and 6.4 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. Follow all applicable lockout/tag out procedures.
   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. The only safe way to hold a lift’s legs open is the factory designed maintenance device(s).

⚠CAUTION

Never expect to hold the leg assemblies open by simply lifting one end of a platform. The roller end of most lifts is not “gibbed” or captured in any way. Lifting the roller end will simply tilt the platform. 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.

Routine Maintenance: (All lifts)

Weekly: Raise the lift 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:

⚠WARNING

Before performing any service under the lift, make certain the maintenance devices are in place per the instructions in this document.

1. Check the hydraulic fluid level. When checking fluid levels, make sure the unit is in the full-up position, with the maintenance device(s) in place.
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 6-1, “General Information Notes” for more information on changing fluid.

MAINTENANCE DEVICE INSTRUCTIONS

⚠ DANGER

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.

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.

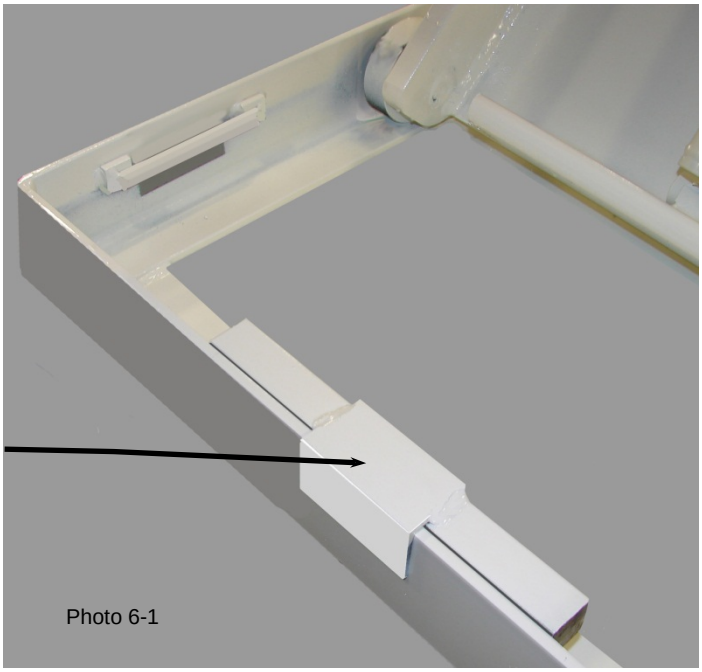
All Other Units:

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 in place and engaged with support bar before working under lift.

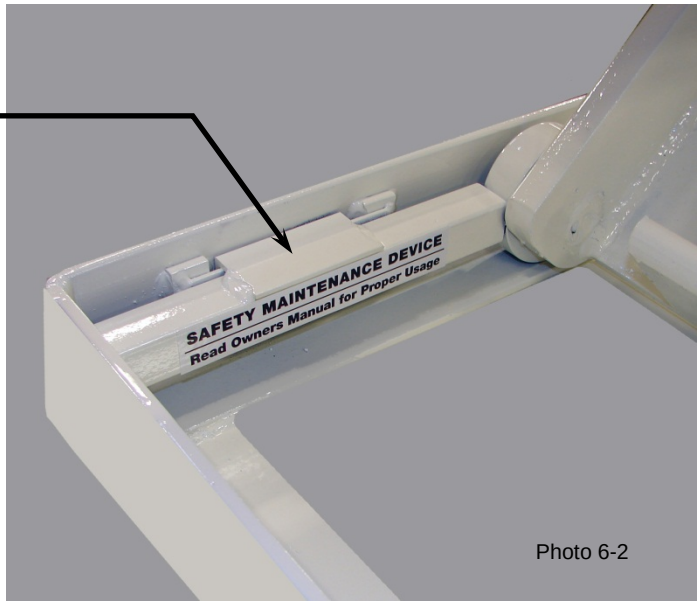
NOTICE

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

24” Travel Units Only



Maintenance Device in Stored Position



Maintenance Device in Use

Store the maintenance device centered on the base frame as shown in photo 6-1. Failure to do so would allow the moving scissors leg or leg roller wheel to impact the Maintenance device.

All Other P-Series Units

Maintenance Device in Stowed Position

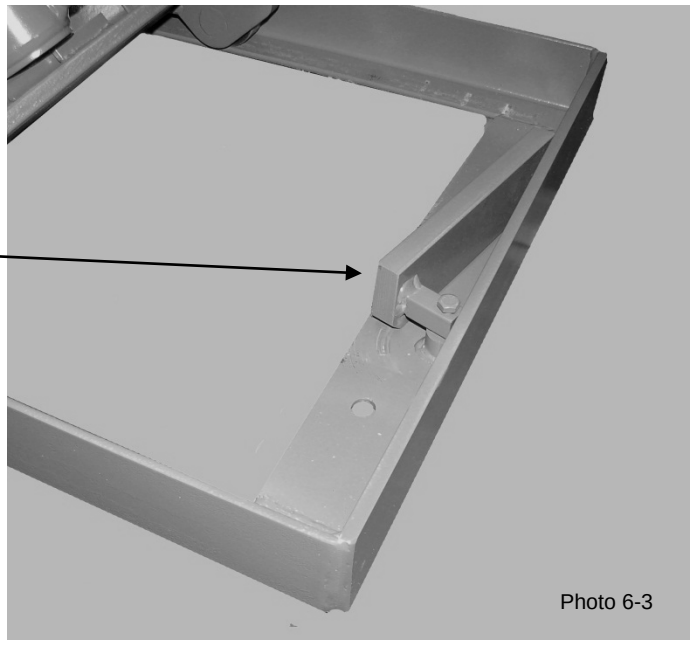


Photo 6-3

Maintenance Device in Contact with Support Bar

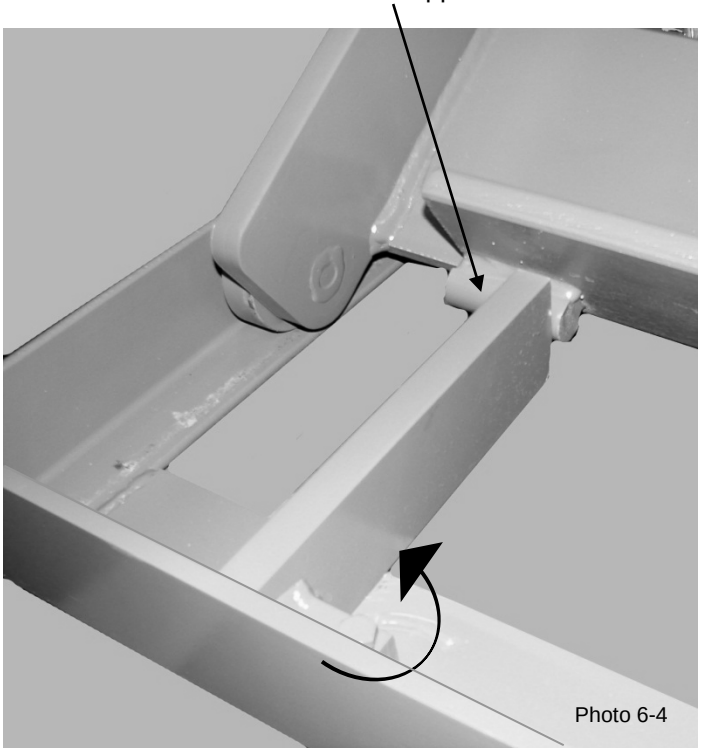


Photo 6-4

⚠ DANGER

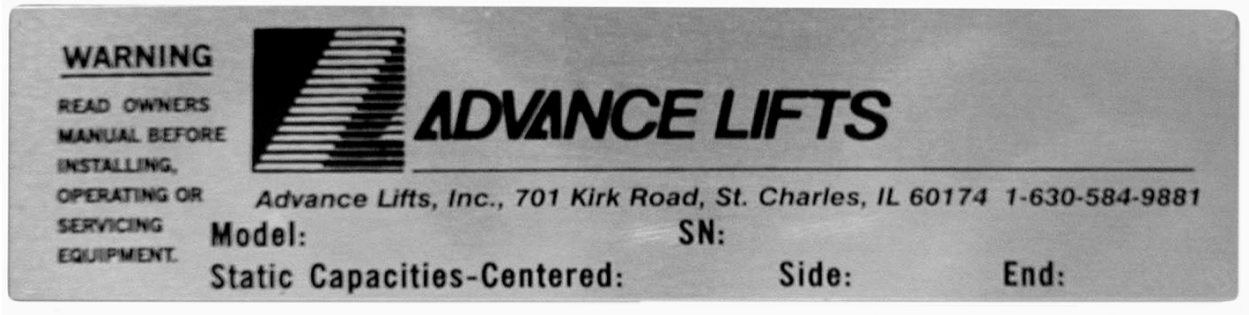
Maintenance device(s) must be fully rotated to position shown in photo 6-4 for proper usage. Failure to properly position maintenance device(s) could potentially allow the device to slip out of place.

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.

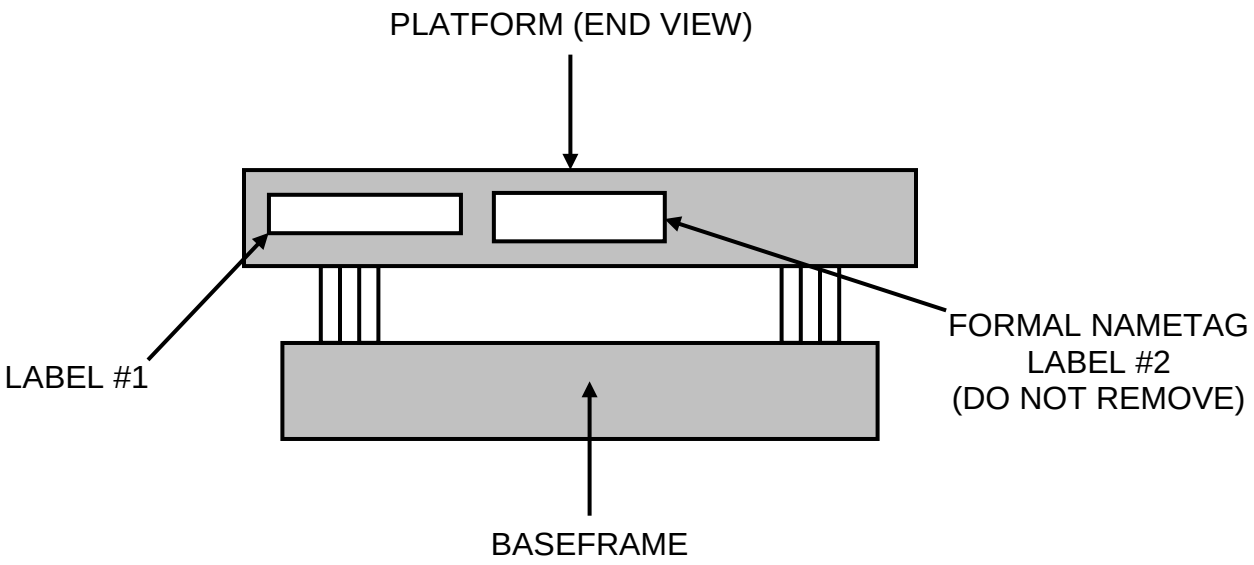
Label 2: This is the formal nameplate and it shall not be removed from the unit. The serial number on this nameplate is critical in identifying the specific unit for correct parts and service information. This plate also informs all readers of the proper capacity limits of the unit.

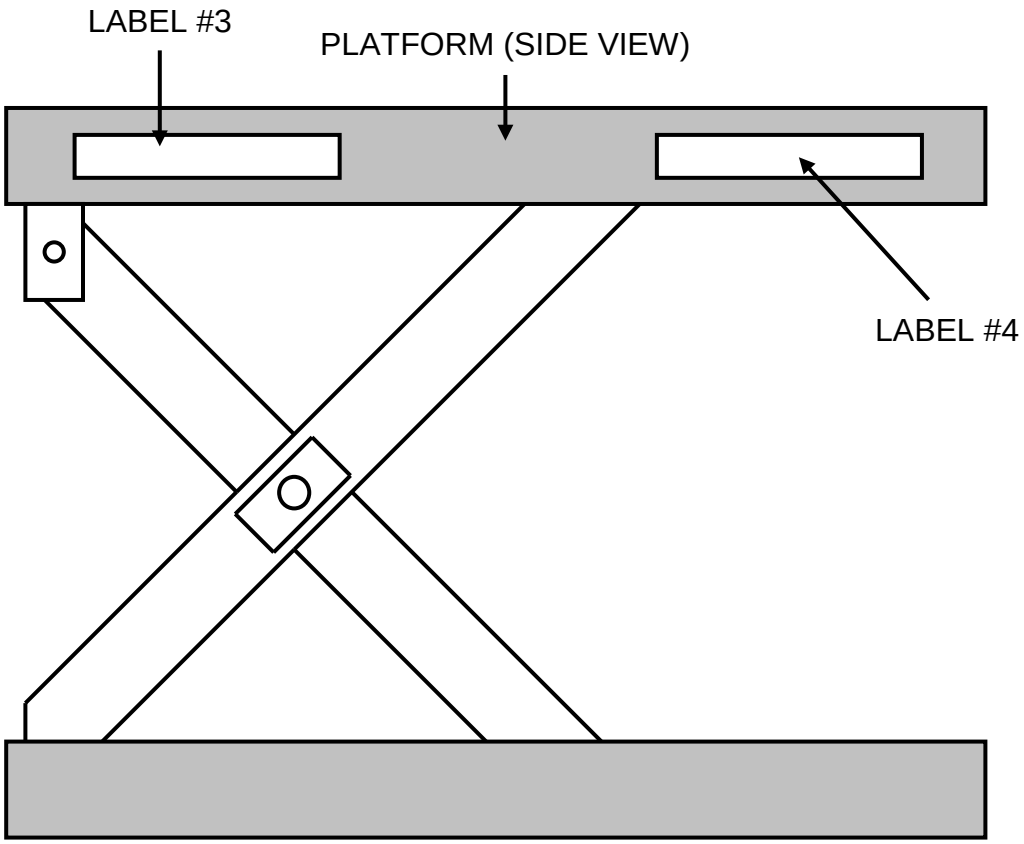


Label 3:

Label 4:

WARNING LABEL LOCATIONS





SECTION 8. HYDRAULIC DETAILS

1. Weepage and Leakage:

A. All hydraulic cylinders will require the replacement of 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 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 housing, as this may cause damage to cylinder seals.

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 seals.

2. General precautions:

⚠CAUTION

RELIEVE ALL HYDRAULIC PRESSURE BEFORE DISASSEMBLING HYDRAULIC COMPONENTS. THE SUDDEN DISCHARGE OF HIGH PRESSURE OIL COULD CAUSE INJURY.

A. 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 “Loctite”, 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:

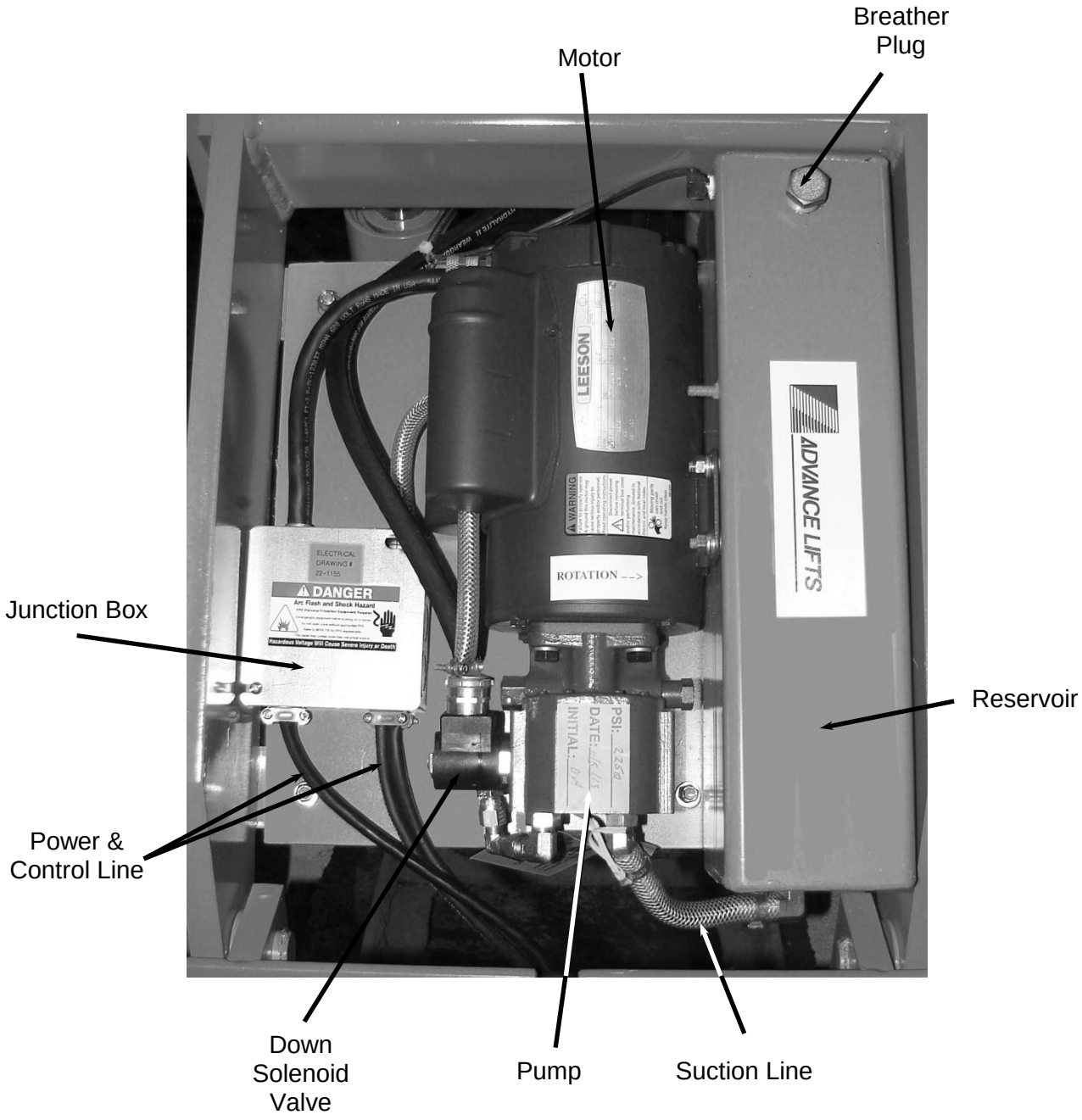
For extremely warm temperature ranges of 120º to 140º degrees Fahrenheit, you may switch to 10W30 motor oil. If ambient temperatures are expected above 140º degrees, consult the factory.

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.

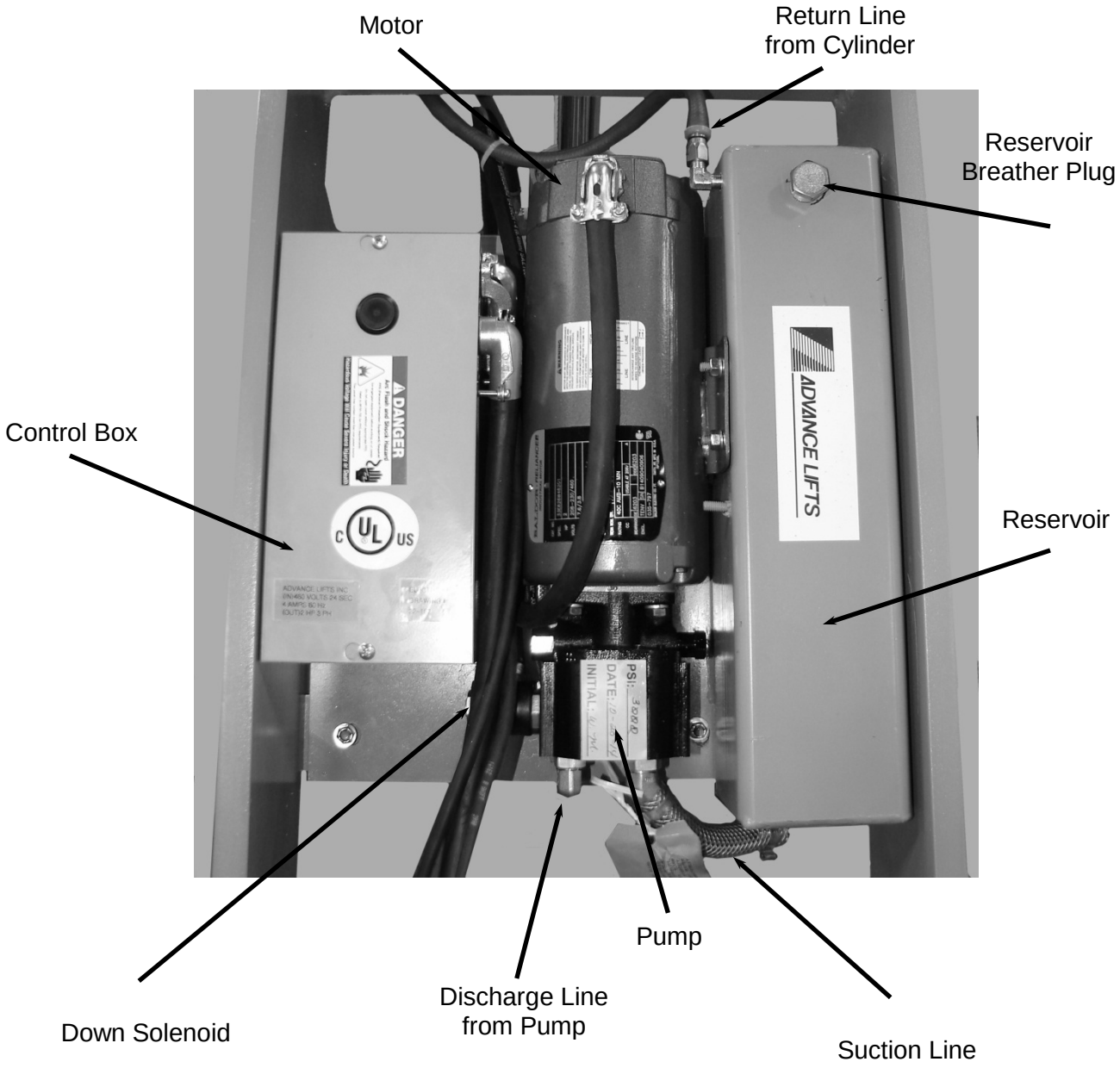
STANDARD SINGLE PHASE POWER UNIT



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

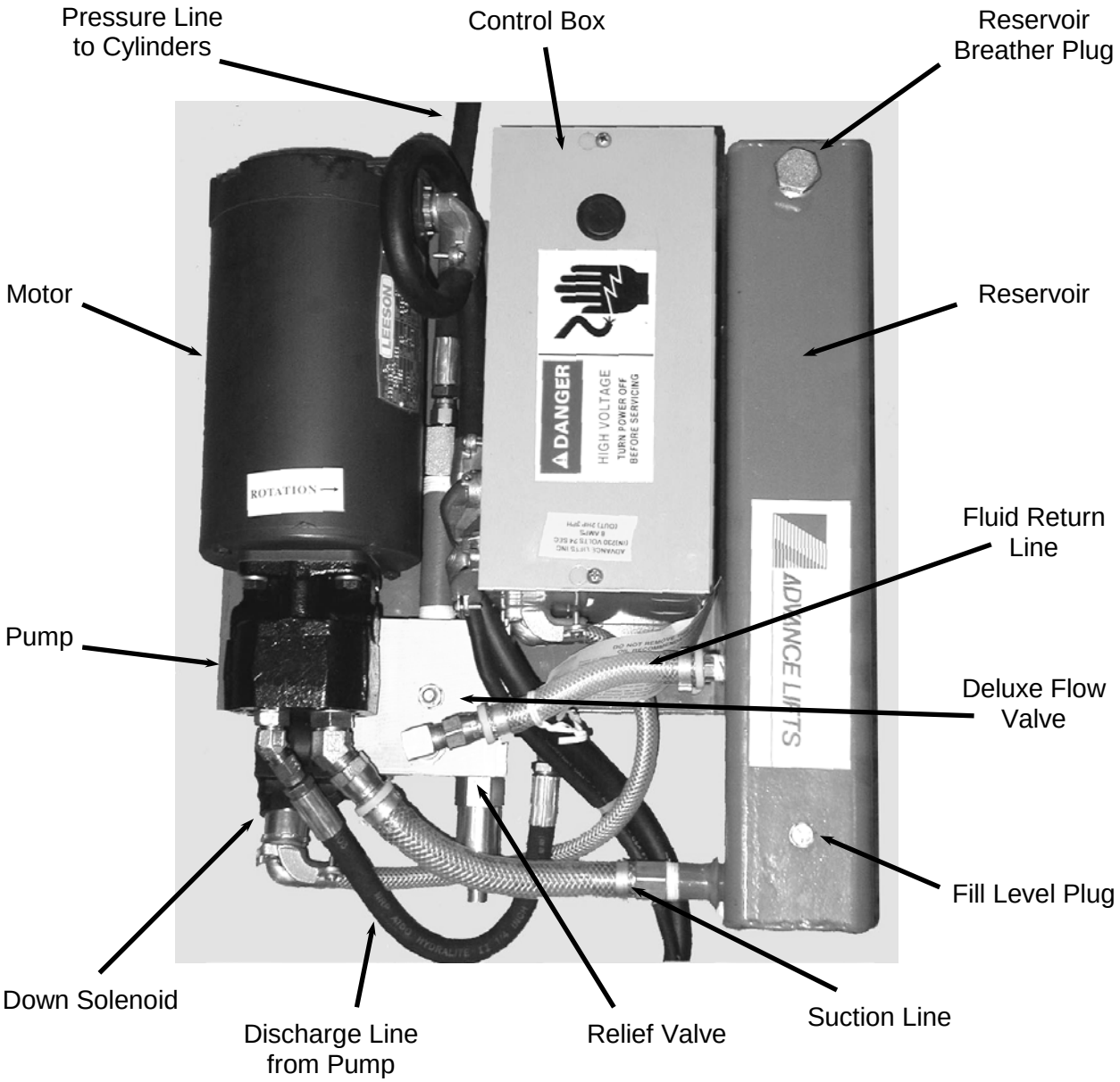
P SERIES POWER UNIT

TYPICAL, THREE-PHASE POWER UNITS

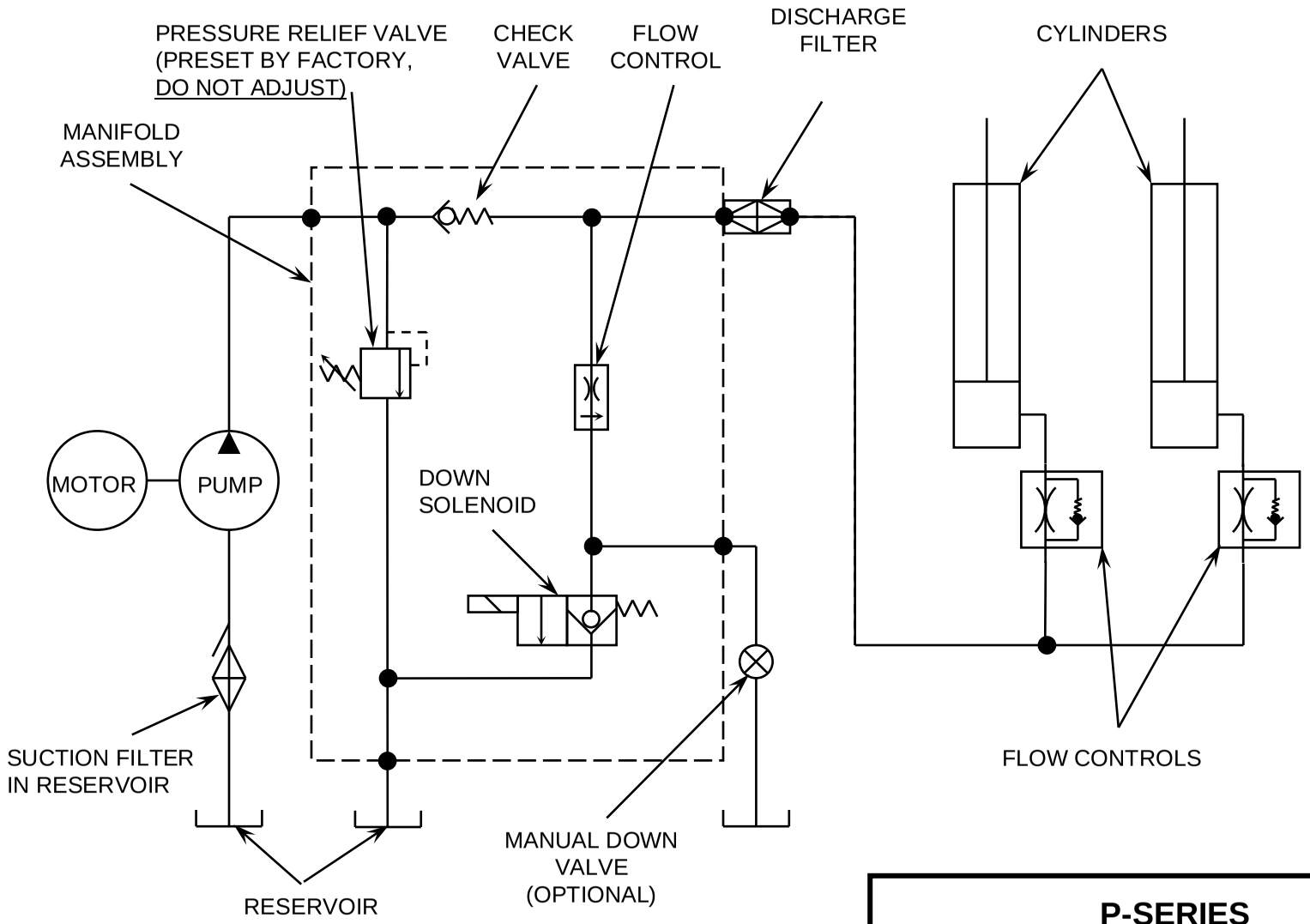


See Page P 8-6 for Hydraulic Diagram and Pages 9-3 & 9-4 for Electrical Diagrams

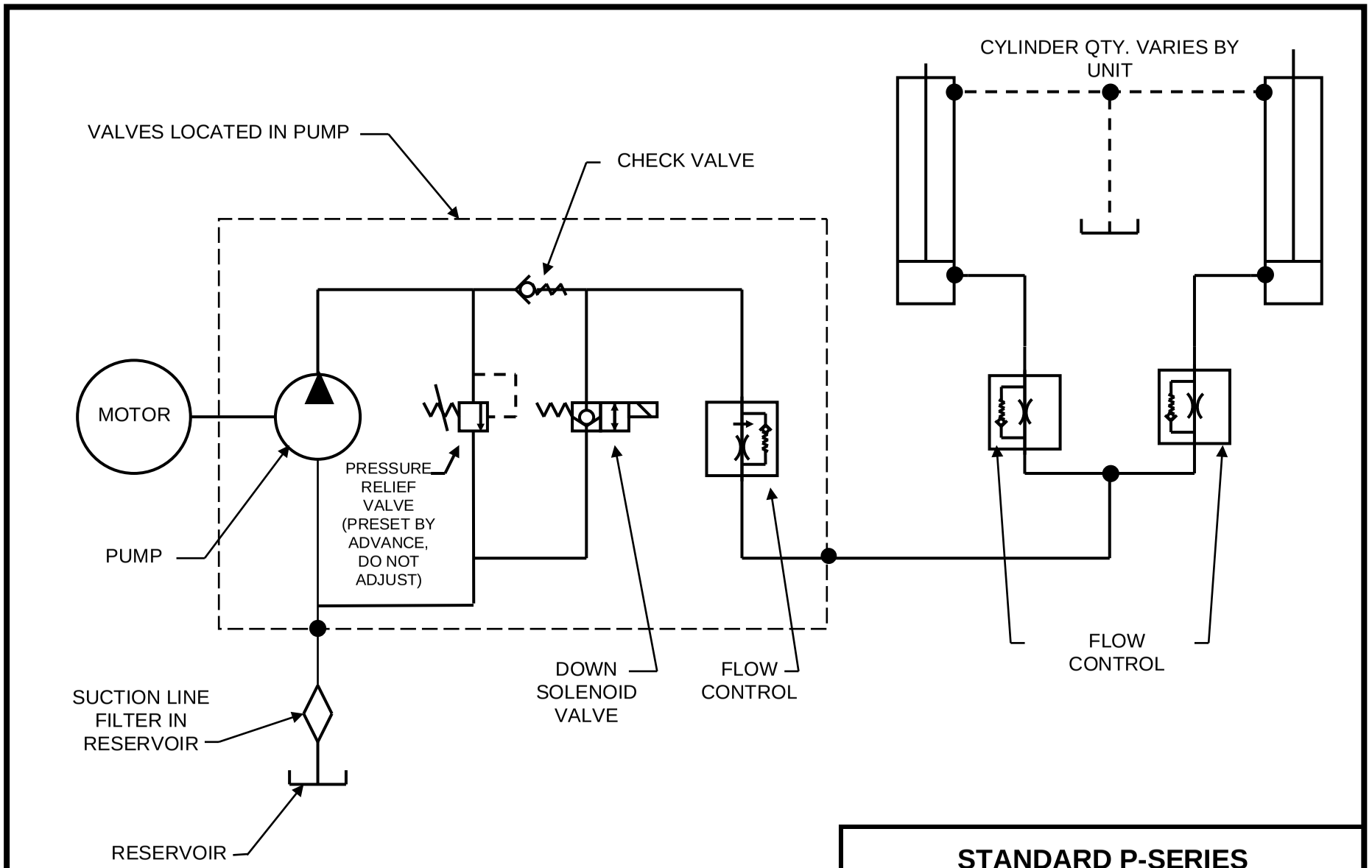
TYPICAL, DELUXE POWER UNITS



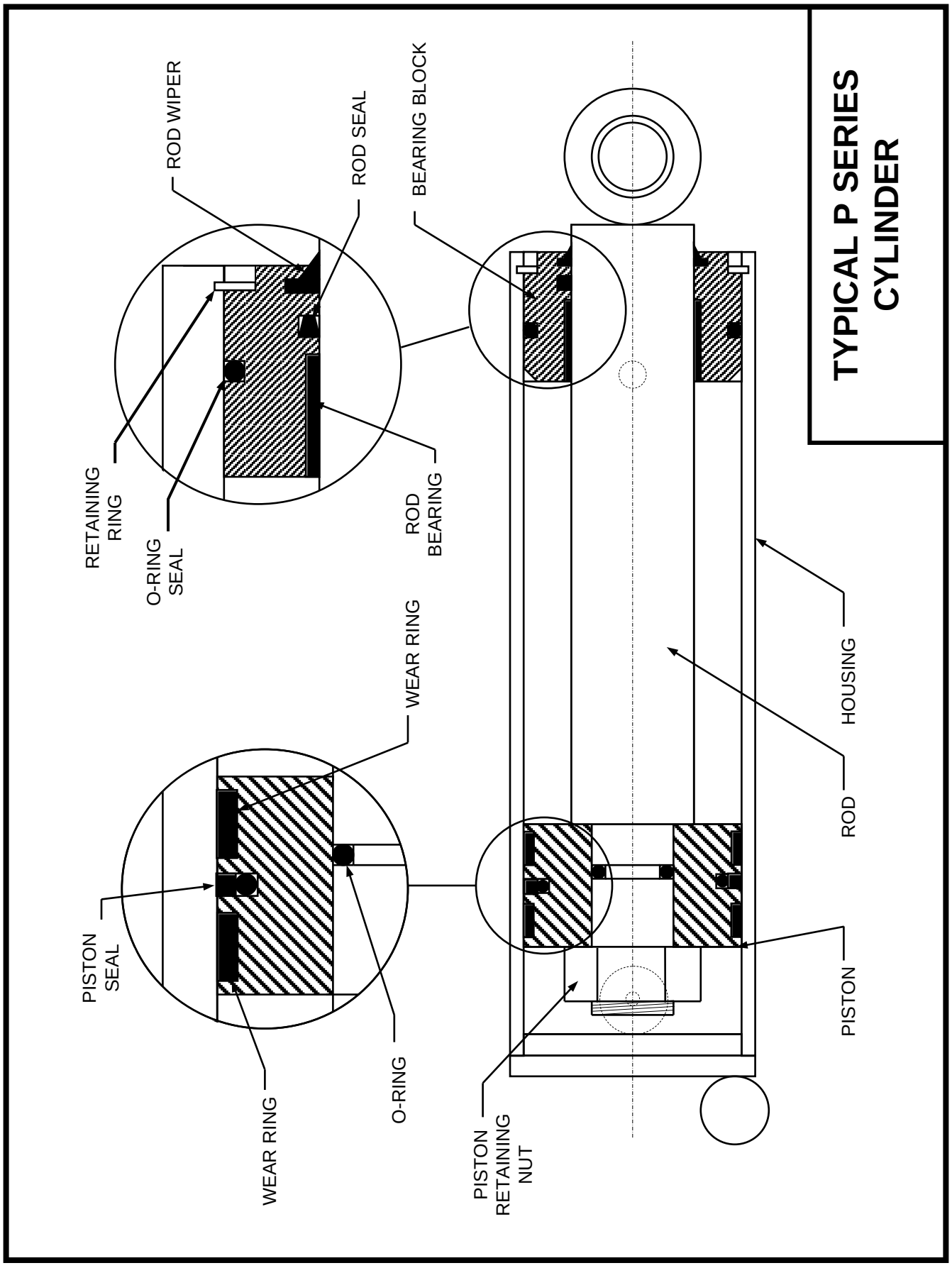
See Page P 8-6 for Hydraulic Diagram and Pages 9-3 & 9-4 for Electrical Diagrams



P-SERIES
HYDRAULIC SCHEMATIC WITH
DELUXE POWER UNIT
OPTION



STANDARD P-SERIES HYDRAULIC SCHEMATIC


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

REPAIR PROCEDURES FOR P-SERIES CYLINDERS

Tools & Supplied required:

Hydraulic fluid (**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.
Maintenance Device(s) supplied with each Advance unit.
Snap ring pliers
Miscellaneous hand tools

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 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.
7. Reverse steps 5-4 to install cylinder.

Cylinder Seal Replacement: All Advance Lifts cylinders use a high-grade, two-piece seal design comprised of a standard size O-ring with a glass-filled PTFE cap. These seals are not replaceable in the field without specialized tools. Advance recommends that you consult with a professional who has the necessary tools to properly install seals.

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 concern 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.

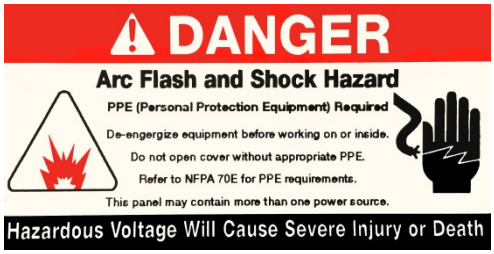
To reverse the direction of rotation of a 3-phase motor, reverse any two of the three power leads to the motor. On single-phase motors, see wiring diagram on motor.

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

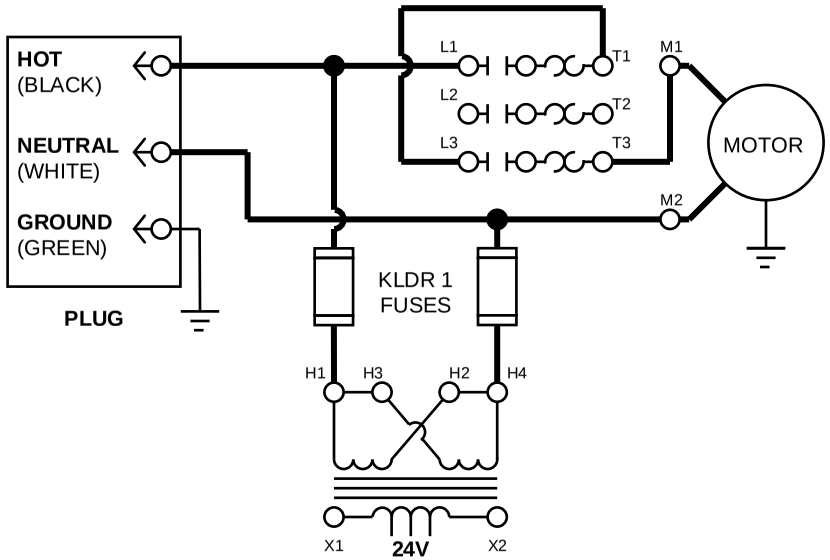
A. Change transformer primary connections to 460V.
B. Change overload protection to proper value as per currents in motor tables. Order new overload; adjust new overload to motor full load current setting. Insure the overload is set to “manual” reset, not “automatic” to insure the equipment cannot re-start 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):

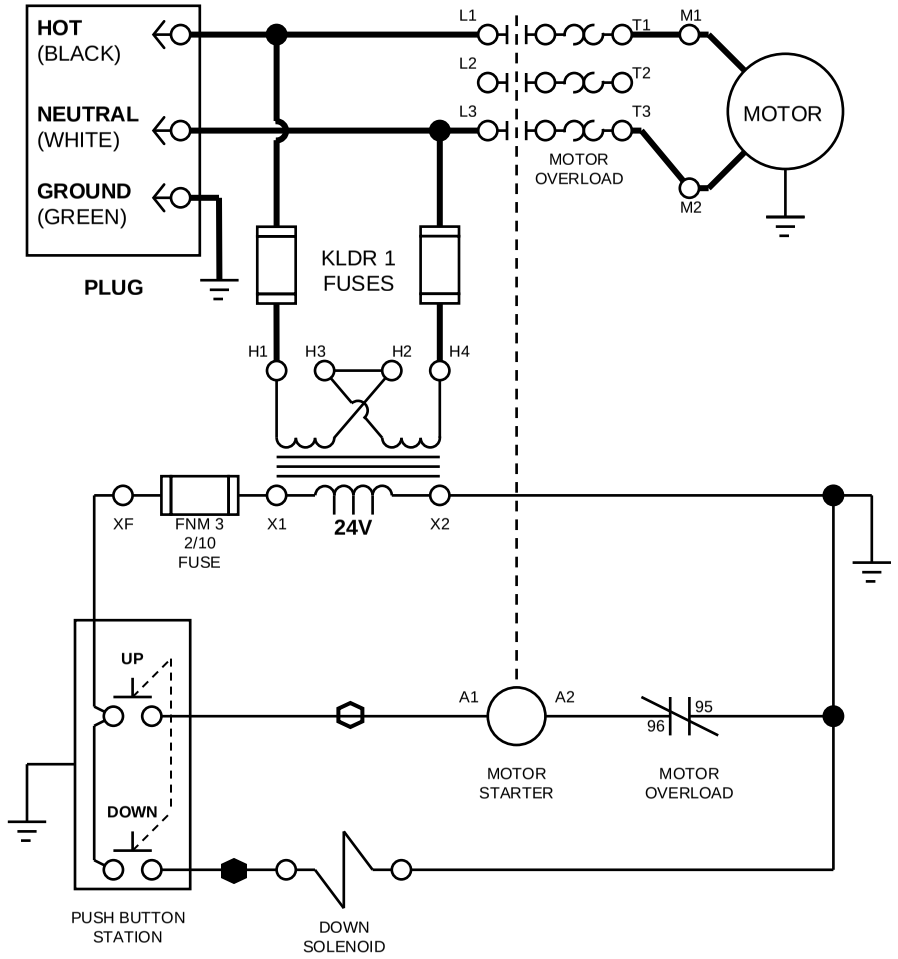
A. Change transformer primary connections to 230V.
B. Change overload protection to proper value as per currents in motor table. Order new overload; adjust new overload to motor full load current setting. Insure the overload is set to “manual” reset, not “automatic” to insure the equipment cannot re-start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



115V 1Ø OPERATION



230V 1Ø OPERATION

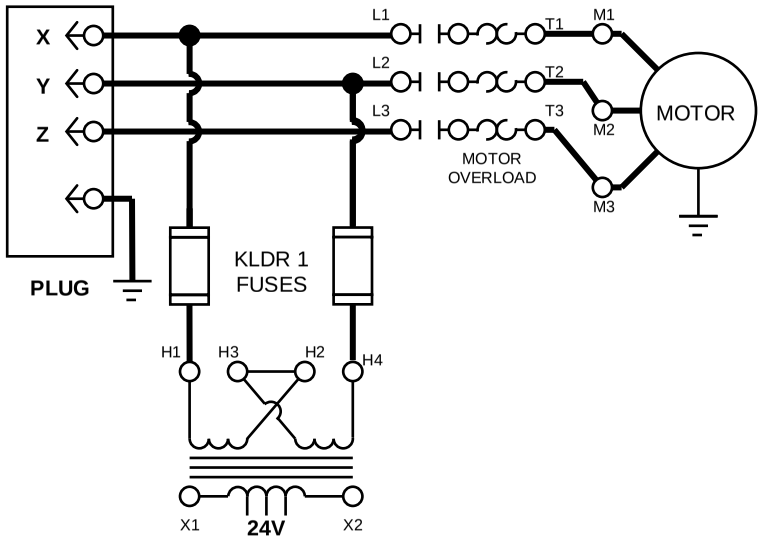


⬡ Typical break point for upper limit switch

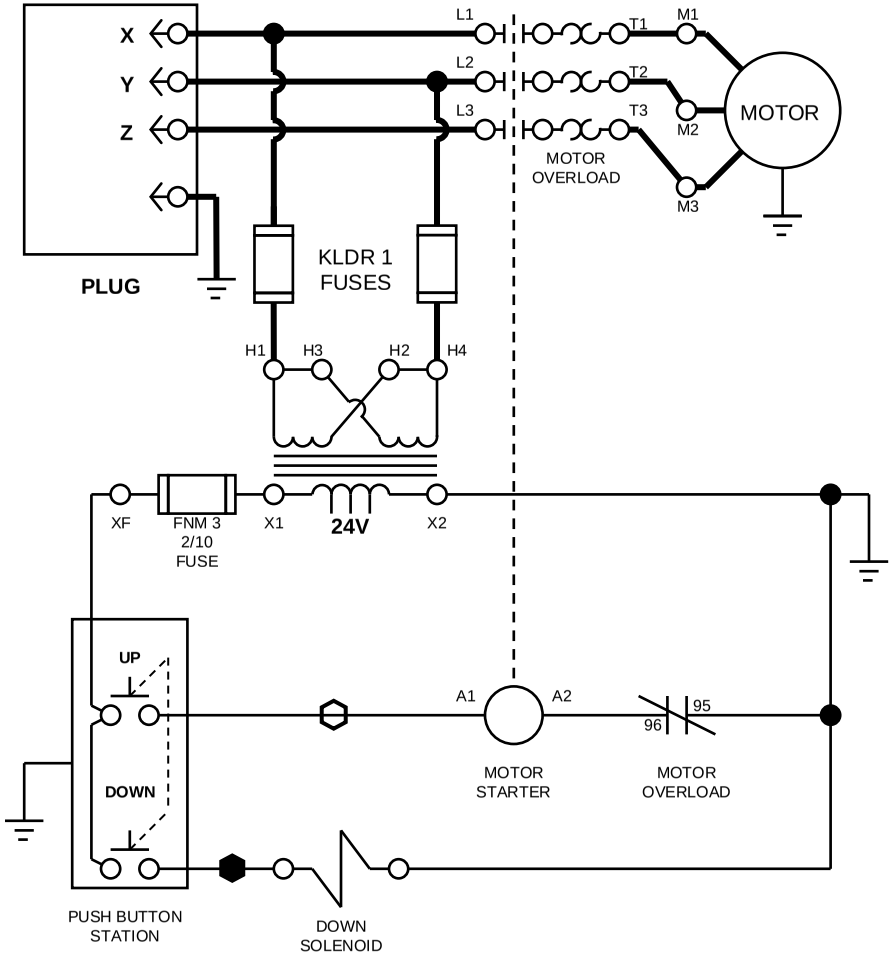
⬢ Typical break point for lower limit switch

SINGLE PHASE ELECTRICAL DIAGRAM

460V 3Ø OPERATION



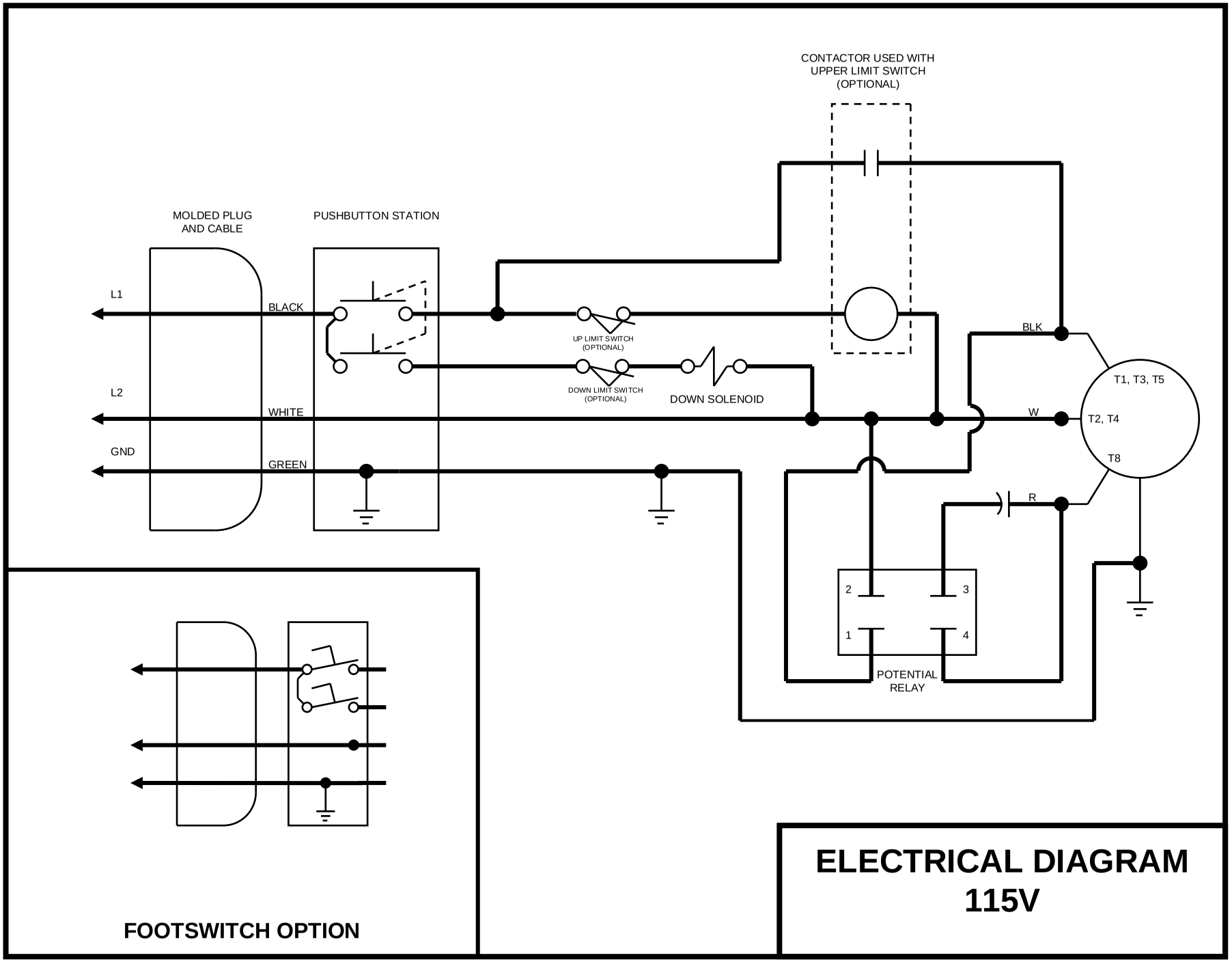
230V 3Ø OPERATION

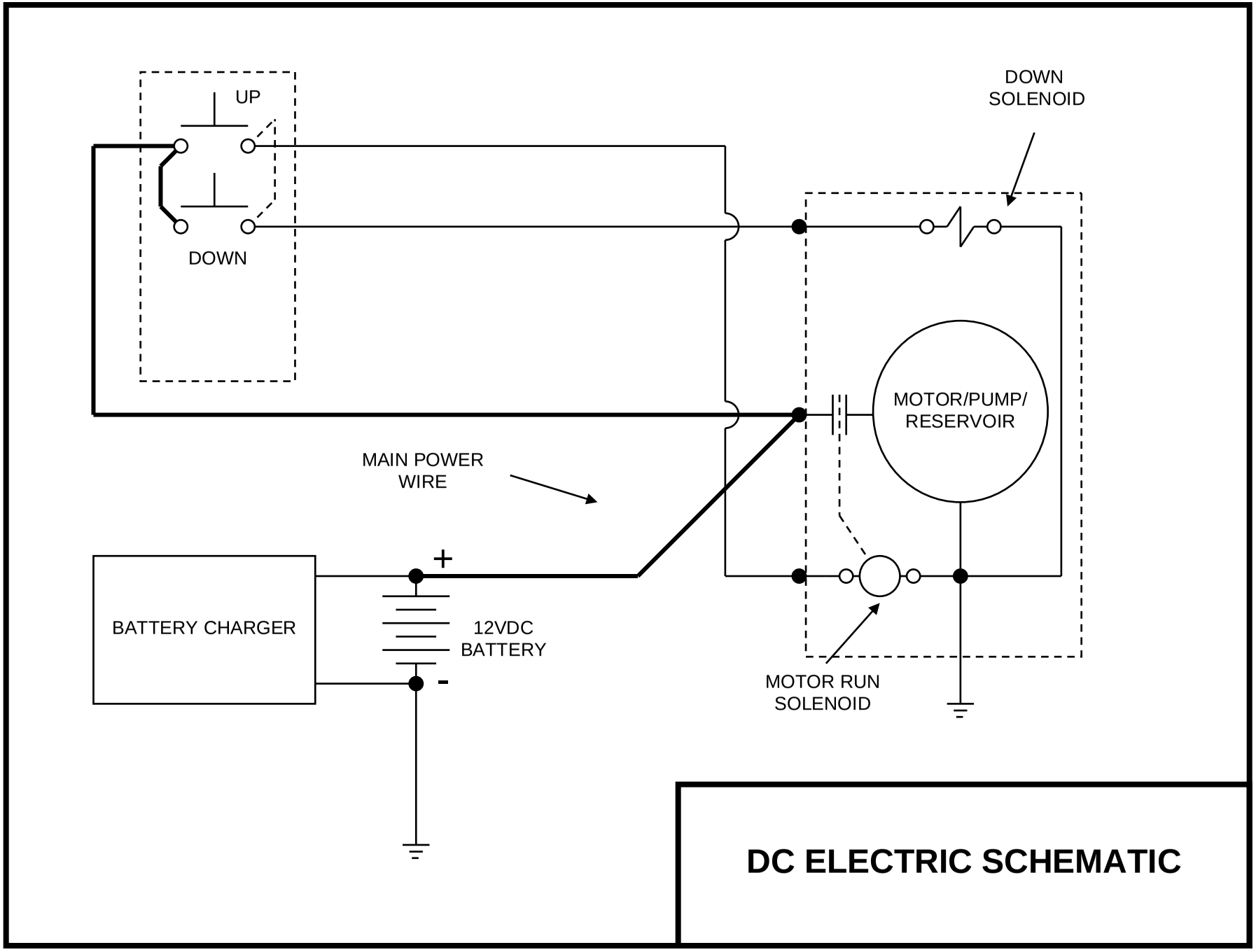


⬡ Typical break point for upper limit switch

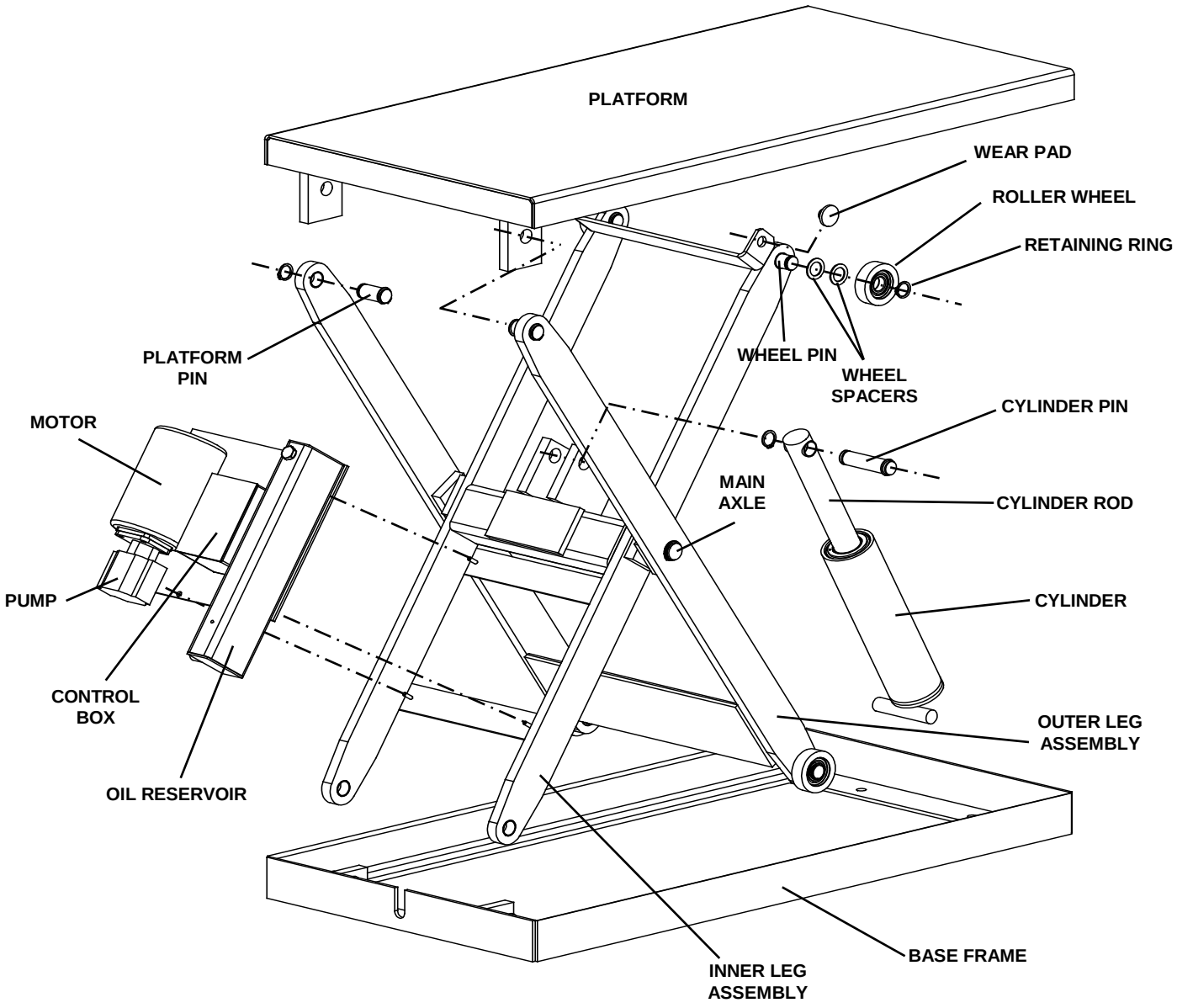
⬢ Typical break point for lower limit switch

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



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,1/1,115,24,10X8X6	004-744
2524,4024,6024, 230V, 1 PHASE	CT,P,TELE,1/1,230,24,10X8X6	004-752
2524,4024,6024, 230V, 3 PHASE	CT,P,TELE,1.5/3,230,24,10X8X6	004-684
2524,4024,6024, 460V, 3 PHASE	CT,P,TELE,1.5/3,460,24,10X8X6	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

SAFETY DATA SHEET

Dual Range HV 46

Section 1. Identification

GHS product identifier Dual Range HV 46

Product code 460278-CA01

SDS # 460278

Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/ mixture Hydraulic fluid.
For specific application advice see appropriate Technical Data Sheet or consult our company representative.

Manufacturer BP Lubricants USA Inc.
1500 Valley Road
Wayne, NJ 07470
Telephone: +1-888-CASTROL
Product Information: +1-877-641-1600

Supplier Wakefield Canada Inc.
3620 Lakeshore Blvd West
Toronto, Ontario, Canada M8W 1P2
Phone Number - 416-252-5511

EMERGENCY HEALTH INFORMATION: +1-800-447-8735

EMERGENCY TELEPHONE NUMBER 1 (613) 996-6666 CANUTEC (Canada)
+1-800-424-9300 (CHEMTREC USA)
+1-703-527-3887 (CHEMTREC outside the US)

Section 2. Hazard identification

Classification of the substance or mixture Not classified.

GHS label elements

Signal word No signal word.

Hazard statements No known significant effects or critical hazards.

Precautionary statements

Prevention Not applicable.

Response Not applicable.

Storage Not applicable.

Disposal Not applicable.

Other hazards which do not result in classification Defatting to the skin.
Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency.
See 'Notes to physician' under First-Aid Measures, Section 4 of this Safety Data Sheet.

Section 3. Composition/information on ingredients

Substance/mixture Mixture

Ingredient name	CAS number	% (w/w)
Base oil - highly refined	Varies - See Key to abbreviations	≥90
Base oil - highly refined	Varies - See Key to abbreviations	≤3

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First-aid measures

Description of necessary first aid measures

Eye contact In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.

Skin contact Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.

Inhalation If inhaled, remove to fresh air. Get medical attention if symptoms occur.

Ingestion Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Protection of first-aiders No action shall be taken involving any personal risk or without suitable training.

Most important symptoms/effects, acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician Treatment should in general be symptomatic and directed to relieving any effects.

Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discolored and extremely painful with extensive subcutaneous necrosis.
Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimize tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.

Specific treatments No specific treatment.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media In case of fire, use foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media Do not use water jet.

Specific hazards arising from the chemical In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products Combustion products may include the following:
carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)

Section 5. Fire-fighting measures

Special protective actions for fire-fighters Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling.

For emergency responders If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Base oil - highly refined	**CA Alberta Provincial (Canada).** 15 min OEL: 10 mg/m³ 15 minutes. Issued/Revised: 7/2009 Form: Mist 8 hrs OEL: 5 mg/m³ 8 hours. Issued/Revised: 4/2004 Form: Mist **CA Quebec Provincial (Canada).** STEV: 10 mg/m³ 15 minutes. Issued/Revised: 1/2000 Form: mist TWAEV: 5 mg/m³ 8 hours. Issued/Revised: 1/2000

Section 8. Exposure controls/personal protection

Base oil - highly refined	Form: mist **CA Alberta Provincial (Canada).** 15 min OEL: 10 mg/m³ 15 minutes. Issued/Revised: 7/2009 Form: Mist 8 hrs OEL: 5 mg/m³ 8 hours. Issued/Revised: 4/2004 Form: Mist **CA Quebec Provincial (Canada).** STEV: 10 mg/m³ 15 minutes. Issued/Revised: 1/2000 Form: mist TWAEV: 5 mg/m³ 8 hours. Issued/Revised: 1/2000 Form: mist

Appropriate engineering controls All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. 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 workstation location.

Eye/face protection Safety glasses with side shields.

Skin protection

Hand protection Wear protective gloves if prolonged or repeated contact is likely. Wear chemical resistant gloves. Recommended: Nitrile gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Body protection Use of protective clothing is good industrial practice.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.

Section 8. Exposure controls/personal protection

Other skin protection Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection In case of insufficient ventilation, wear suitable respiratory equipment. The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Section 9. Physical and chemical properties

Appearance

Physical state Liquid.

Color Purple.

Odor Not available.

Odor threshold Not available.

pH Not available.

Melting point Not available.

Boiling point Not available.

Flash point Closed cup: >190°C (>374°F) [Pensky-Martens.]

Pour point -42 °C

Drop Point Not available.

Evaporation rate Not available.

Flammability (solid, gas) Not applicable. Based on - Physical state

Lower and upper explosive (flammable) limits Not available.

Vapor pressure Not available.

Vapor density Not available.

Density <1000 kg/m³ (<1 g/cm³) at 15°C

Relative density Not available.

Solubility insoluble in water.

Partition coefficient: n-octanol/water Not available.

Auto-ignition temperature Not available.

Decomposition temperature Not available.

Viscosity Kinematic: 45.9 mm^2/s (45.9 cSt) at 40°C
Kinematic: 8.15 mm^2/s (8.15 cSt) at 100°C

Section 10. Stability and reactivity

Reactivity No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.

Chemical stability The product is stable.

Possibility of hazardous reactions Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid Avoid all possible sources of ignition (spark or flame).

Incompatible materials Reactive or incompatible with the following materials: oxidizing materials.

Section 10. Stability and reactivity

Hazardous decomposition products Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Aspiration hazard

Name	Result
Base oil - highly refined	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure Routes of entry anticipated: Dermal, Inhalation.

Potential acute health effects

Eye contact No known significant effects or critical hazards.

Skin contact Defatting to the skin. May cause skin dryness and irritation.

Inhalation Vapor inhalation under ambient conditions is not normally a problem due to low vapor pressure.

Ingestion No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact No specific data.

Inhalation No specific data.

Skin contact Adverse symptoms may include the following:
irritation
dryness
cracking

Ingestion No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects Not available.

Potential delayed effects Not available.

Long term exposure

Potential immediate effects Not available.

Potential delayed effects Not available.

Potential chronic health effects

General No known significant effects or critical hazards.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Teratogenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

No testing has been performed by the manufacturer.

Persistence and degradability

Expected to be biodegradable.

Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

Mobility in soil

Soil/water partition coefficient (K_{OC})	Not available.
Mobility	Spillages may penetrate the soil causing ground water contamination.

Other ecological information Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

Section 13. Disposal considerations

Disposal methods The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

Special precautions for user Not available.

Section 14. Transport information

Transport in bulk according to Annex II of MARPOL and the IBC Code Not available.

Section 15. Regulatory information

Other regulations

Australia inventory (AICS)	All components are listed or exempted.
Canada inventory	All components are listed or exempted.
China inventory (IECSC)	All components are listed or exempted.
Japan inventory (ENCS)	All components are listed or exempted.
Korea inventory (KECI)	All components are listed or exempted.
Philippines inventory (PICCS)	All components are listed or exempted.
Taiwan Chemical Substances Inventory (TCSI)	Not determined.
United States inventory (TSCA 8b)	All components are listed or exempted.
REACH Status	For the REACH status of this product please consult your company contact, as identified in Section 1.

Section 16. Other information

History

Date of issue/Date of revision	30/10/2017
Date of previous issue	06/01/2017.
Version	2.03
Prepared by	Product Stewardship
Key to abbreviations	ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor CAS Number = Chemical Abstracts Service Registry Number GHS = Globally Harmonized System of Classification and Labelling of Chemicals HPR = Hazardous Products Regulations IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation [Regulation (EC) No. 1907/2006] UN = United Nations Varies = may contain one or more of the following 101316-69-2, 101316-70-5, 101316-71-6, 101316-72-7, 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64741-97-5, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-8, 64742-64-9, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1, 74869-22-0, 90669-74-2
References	Not available.

Indicates information that has changed from previously issued version.

Notice to reader

Section 16. Other information

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.