ADVANCE LIFTS

Dock Lift Owner's Manual

CAUTION!
THIS MANUAL IS AN IMPORTANT DOCUMENT
IT SHOULD BE KEPT 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 FOLLOWNING DOCK LIFT MODEL NUMBERS

1035	1045	1055	2010
2010K	2020	2030	2040
2050	2060	2070	2080
2090	2400	2500	2500K
3200	3210	3220	3230
3240	3250	3260	3270
3280	3300	3310	3320
3330	3340	3350	3360
3370	3380	4100	4120
4130	4140	4150	4160
4170	4180	4200	4210
4220	4230	4240	4250
4260	4270	4280	4300
4310	4320	4330	4340
4350	4360	4370	4380
4400	4410	4420	4430
4440	4450	4460	4470
4480	T-50608	T-50710	T-50808
T-50809	T-50810	T-55609	T-55609
T-55610	T-55708	T-55709	T-60608
6100	6150	6200	6300

OTHER_____

ADVANCE LIFTS

Dock Lift Installation, Operation and Maintenance Manual

In any correspondence with your distributor or the factory 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 S. 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 at $25.00 each.

SECTION 2. INDEX & INTRODUCTION

INTRODUCTION

Congratulations, the equipment that you have purchased is of the highest quality. 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 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 the serial number. Do not remove the nameplate. Be sure that no operator ever exceeds the capacities shown on the nameplate or they may cause damage to the lift or injure personnel. Also, be sure to have the serial number of the lift handy if you have to call the factory. That number identifies your specific lift and will allow, the factory 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: Service Manager

Thank you for purchasing our product.

*Mandatory reading before attempting installation.

SECTION 3. RESPONSIBILITIES OF OWNERS & USERS

Inspection And Maintenance: The lift shall be inspected and maintained in proper working order in accordance with this manual and safe operating practices.

Removal from Service: Any lift not in safe operating condition shall be removed from service until it is repaired to the original manufacturer's standards.

Repairs: Only authorized personnel shall make repairs. All repairs shall be in conformance with the manufacturer's instructions.

Operators: Only trained and authorized personnel shall be permitted to operate the lift. Operators must be alert to the safety hazards of lift operation.

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

1. Read and/or have had explained and understood, the manufacture's operating instructions and safety rules.

2. Inspected the lift for proper operation and condition. Any suspect item shall be carefully examined and a determination made by a qualified person as to whether it constitutes a hazard. All items not in conformance with the manufacturer's specification shall be corrected before further use of the lift.

During Operation: The lift shall be used in accordance with its intended use and within the manufacturer's limitations and safety rules.

Safety rules:

1. Do not overload lift.

2. Insure that all safety devices are operational and in place.

3. Insure that all personnel near an operating lift understand to stand so that no body parts can be pinched by the mechanism or platform and any items that may fall off the lift will not strike them.

Modifications or Alterations: Modifications or alternations of industrial scissors lifts shall be made only with written permission of the original manufacturer, Advance Lifts. These changes shall be in conformance with all applicable provisions of this standard and shall be as safe as the equipment was before modification. These changes shall also satisfy all safety recommendations of the original equipment manufacturer of the particular application of the lift.

SECTION 4. INSTALLATION INSTRUCTIONS

Series 1000, 2000, 2000K, T-Series, 3000, 4000, 6000

Equipment and Supplies Required:

1. Equipment to maneuver the Advance Lift into position. Nylon slings are preferred, but padded alloy chains through the handrail socket holes will also work as rigging.
2. The appropriate gallons of oil and a funnel, for exact quantity see page 8-3. Note that the 2000K, T-Series & 6100 units only require 5 gallons and the 1000 series units, and the 6150 model, are filled with oil at the factory. Series 3000 units require 10 gallons and series 4000 units need 15 gallons.
3. A ½", extra heavy, double wire braid hose (SAE 100R2A) or extra heavy seamless piping from the power unit to the equipment with ½" JIC female fittings on the ends. Advance supplies a ½" JIC male universal connector on the outlet of the power unit and the end of the connector hose on the lift. Note that no hosing or piping is required on the 1000 series lifts and the model 6150, which are supplied with self contained power units. 4000 series lifts require two hoses because of their special piping needs. The model 6000 is supplied with (1) 20-foot hose and the 6200 & 6300 lifts are supplied with (2) 20-foot hoses. If hose or piping length will exceed 35 feet, consult the pressure chart to insure proper sizing. **Caution!** Be sure all hydraulic fittings are rated for hydraulic systems that may peak out at 4000 PSI. Hardware store items can burst at 150 PSI. Only buy from reputable hydraulic outlets.
4. Material for shimming and grouting, and anchor bolts. We recommend "Rawl-Stud Wedge Anchors", "Wej-It" or equivalent bolts in the 5/8" x 6" size. The 3000 and 4000 series and the models 6200 and 6300 will require the 1" x 9" size. The studs must be embedded at least 4 ½" into the concrete.
5. Electrical fused disconnect (if required).
6. Wire and electrical fittings for the branch circuit, pushbutton station, down solenoid, motor and any accessories. See branch and control circuit section of this manual. Note: The 6000 and 1000 series units are totally pre-wired ready to plug into the branch circuit.
7. Standard hand tools for electrical work and hydraulic maintenance.
8. A heavy pry bar for shifting the equipment and a drill for installing the lag down studs.
9. Safety leg maintenance bar. This is supplied by Advance Lifts on all units. Check the maintenance section of this manual for proper usage of each style of safety leg.
10. Pit mounted units will require timbers to temporarily support the unit over the pit.

Installation Procedure:

1. Read the Installation, Operating, and Maintenance instructions completely before attempting installation. You may also find it helpful to read the remaining sections of the manual for a better understanding of how the equipment works.

2. If you are installing a pit mounted unit, check the pit dimensions against the pit drawing for conformity (length, width, and depth including bridge recesses) and be sure to check the diagonal of the pit for square. Also be sure whatever surface the base frame will sit on is flat and level or is shimmed to achieve that end. (See p 4-6 for a typical pit drawing).

3. Locate the power unit, check to insure that there is no water contamination in the reservoir. Fill the reservoir through the breather hole with the appropriate hydraulic fluid (see fluid recommendation section of this manual). Ideally, you should mount the reservoir on a wall approximately 6 ½' above the ground. This prevents people from standing on or placing objects on the power unit. It will free up floor space and because the reservoir is higher than the lift, it will allow any air in the system to naturally rise to the highest point and purge itself from the system.

4. Run the hydraulic lines from the power unit to the lift and flush the lines with clean fluid before connecting them. If the lines must be pushed through chases or enclosures, be sure to cap the lines to prevent contaminates from entering the hose. Cleanliness is the single most important factor in the maintenance of any hydraulic system. Contamination will destroy cylinders, valves and pumps!

5. Following the electrical diagrams in the electrical section of this manual, make the electrical connection to the motor and controls for the unit. **Be sure that you have correct motor rotation!** Continued operation of a hydraulic pump in reverse rotation will destroy it! You can detect the rotation by making short motor jogs and watching the clear suction line from the reservoir to the pump. If the rotation is correct, the fluid will leap up the line into the pump. If the rotation is reversed, there will be no fluid in the suction line. You may change the rotation of a 3-phase motor by simply exchanging the positions of any two of the three power wire connections. With single-phase motors, rotation is set at the factory. Remember to have the discharge end of the hosing secure and discharging into a container or someone may take an oil bath.

Note: Some installers try to arrange all of the above work to be completed before they ever bring a lift to the job site. This allows them to use the crane that is used to offload and position the lift for as short a time as possible.

6. Units such as 1035's, 1045's and those 6000 series lifts with 3 phase motors, are pre-wired at the factory but must still be checked for proper motor rotation when they are plugged in, because this is strictly a function of each individual building's wiring.

Installation Instructions:

7. Figure out the proper orientation of the lift. (Surface mounted units may simply be put into place). Note: All dock lifts are built so that loads are transferred over the hinged (clevis) end of the platform when elevated to truck height and this is the end to which the hinged bridge is usually welded. Occasionally, the bridges are side mounted. Surface mounted units are equipped with approach ramps for transitioning on and off the unit from the ground level. The ramps are usually much larger than the bridge and located on the roller end of the platform and should never ever be used as a bridge to the truck!

8. For pit mounted units, place timbers diagonally across the corners of the pit and with shipping restraints still in place, but shipping blocks removed, place the lift on the timbers. Then you may make temporary hose connections being careful not to over-tighten and crack the hydraulic fittings. Finally, you may remove the timber supports and lower the lift into the pit.

9. You may now break the shipping restraints (banding). Use the lifts power unit to open the lift a few feet and use your crane to raise the clevis end (hinged bridge end) of the lift by hooking the bevel toe guard or use a plate grab attached to the hinged bridge. This will allow you to remove your chains or slings and the banding material from beneath the unit's base frame. The tipping may not be necessary if you hooked your lift chains through the handrail sockets of the platform and the shipping bands slide out from under the lift. **DANGER! Do no allow anyone to get under the unit!**

10. Carefully lower the unit insuring that the platform edges clear the sides of the pit. The heavy pry bar may be used to reposition the unit with even clearance from all pit walls. Note the lowered height in relation to the surrounding pit edges for later shimming adjustments.

11. Once the lift is properly positioned, (whether it is pit mounted or surface mounted), you may begin the lag down procedure. T-Series models have special lag down instructions located on page P 4-5.

12. Raise the unit and position the safety leg or bar as shown in the maintenance section of this manual (pages 6-3 through 6-6). Lower the unit onto the safety leg and press the down button for an extra 10 seconds to relieve all hydraulic pressure. Drill the lag down holes and set the lag bolts. Check the unit for side to side level and then shim or grout the baseframe for <u>continuous</u> support. The shimming should enhance the match between the platform and the surrounding surfaces when fully lowered, but not at the expense of side to side levelness. A slight slope from clevis end to roller end is not a problem, but side to side slope will cause premature wear on all the moving parts of the lift. Tighten the lag bolts.

Installation Instructions:

13. If a temporary hydraulic connection was made to lower the unit into the pit, now is the time to switch to your permanent hydraulic connection. Note: on T-Series models the hose must run under the baseframe, see page 4-5 for pit details. Also, if there are any electrical options such as limit switches or electrical toe guards, now is the time to do that wiring.

14. Check that there are no tools or debris in the pit or beneath the unit, raise the unit and remove the safety leg, then fully lower the unit. On pit mounted units, check that the bridges are flush with their curb angles and that they do not pivot when loads roll over them, shim any movement accordingly.

15. Operate the equipment through several cycles, holding the down button an extra 20 seconds after the lift is fully lowered to bleed air from the cylinders. Check the reservoir fluid level with the unit fully lowered and top off the fluid to 1” from the top of the reservoir on 5-gallon reservoirs and 2.5” from the top of 10-gallon reservoirs.

16. Adjust accessories such as limit switches and if the unit has electric toe guards or roller shades, fasten the hose in the pit so that it does not move and interfere with proper operation.

17. Raise the unit one final time, install the safety leg and thoroughly clean the entire area. Be sure all fluid spills are cleaned up so that they are not later misinterpreted as new fluid leaks. Check all hydraulic fittings for leaks.

18. Meet with the facility manager or maintenance foreman and turn over this maintenance manual with the reminder that no one should be allowed to operate the unit unless they are familiar with the operating instructions. Show them the safety leg and any other safety devices. Point out the metal nametag on the unit with the serial number and capacity ratings. Make it clear that some specific person in their organization must be charged with responsibility for the maintenance of the unit and if they have no further questions, lower the unit and consider your job complete.

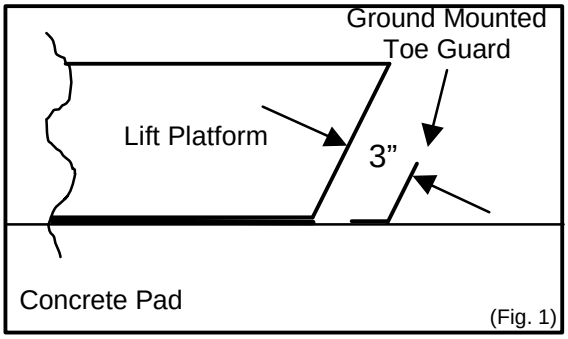
SECTION 4.1 Special instructions for T - Series Only
Ground Mounted Toe Guards (GMTG)

1. T-Series lifts <u>not</u> installed in pits require additional toe guard protection not outlined in the previous instructions. The toe guards are placed around the perimeter of the unit and are used to keep personnel a safe distance from the platform as the unit raises and lowers. All personnel shall stay to the outside of the toe guards when the lift is in operation.

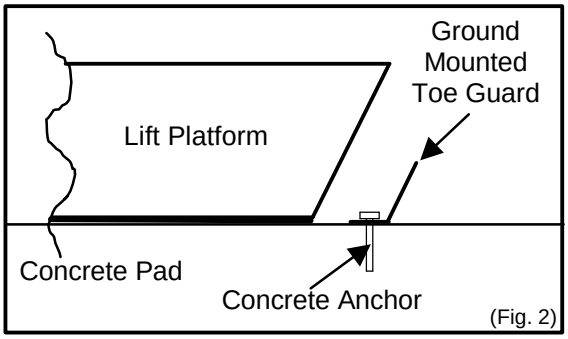
2. Place the toe guards 3" from the lift platform's beveled toe guards as illustrated in figure 1 below. Insure all four corners line up and lag the guards to the concrete through the holes provided using 3/8" concrete anchors as shown in figure 2.

3. Units with 8' platforms require eight (8) concrete anchors and ten (10) anchors are needed for units over 8' in length.

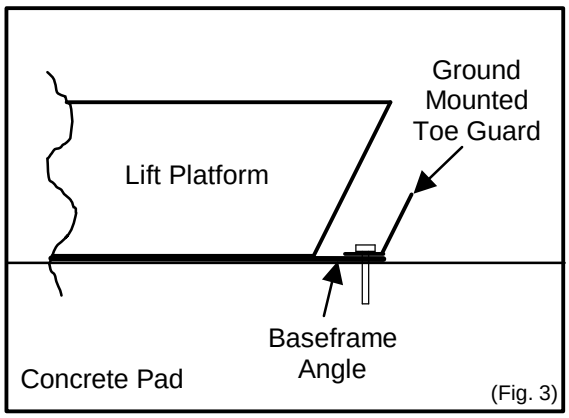
4. One of the guards has ¾" drilled mounting holes in it as opposed to the normal ½" mounting holes. This guard mounts to the baseframe "lag-down angle" as illustrated in figure 3.



(Fig. 1)

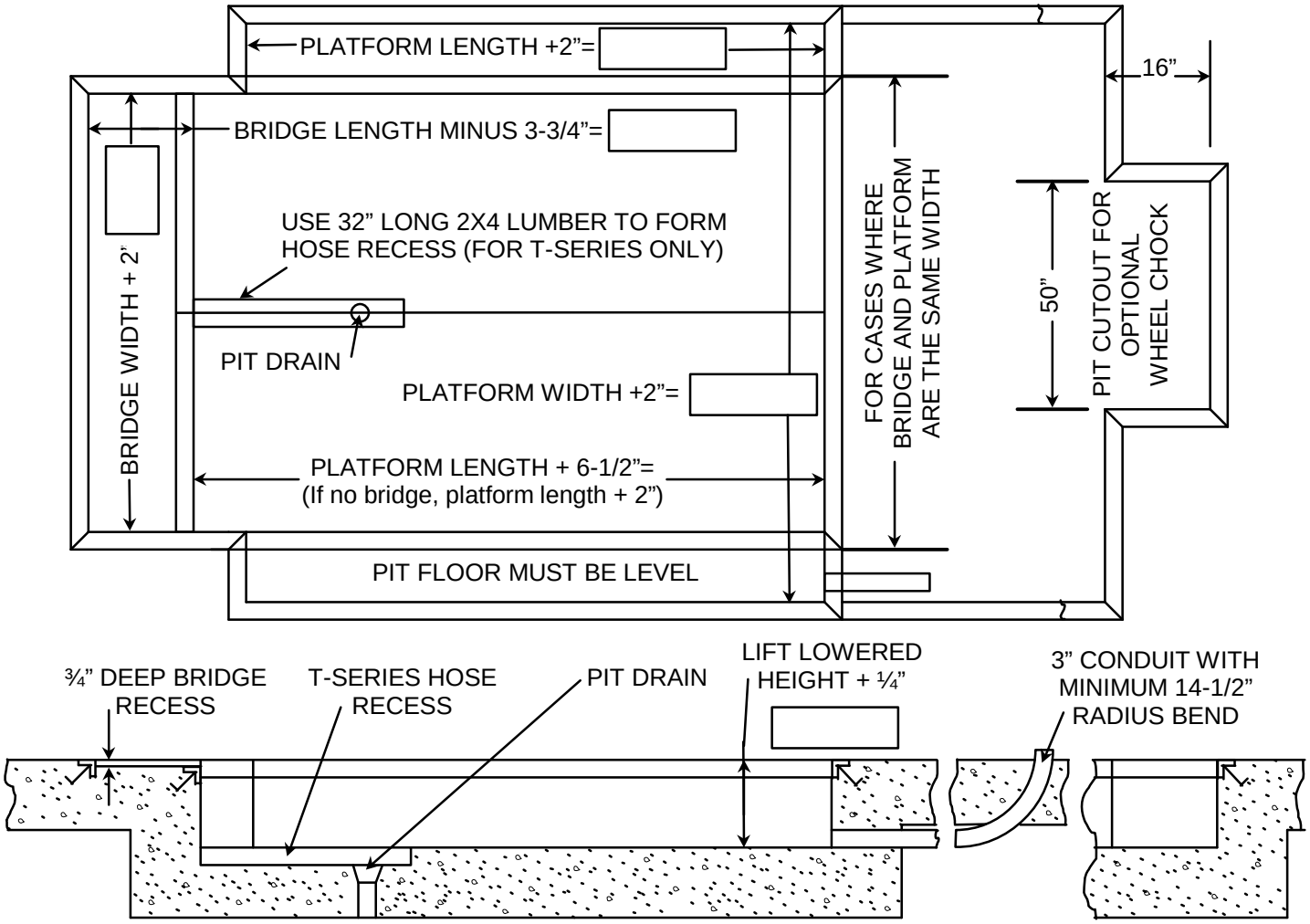


(Fig. 2)



(Fig. 3)

ADVANCE LIFTS PIT DIAGRAM (K's, T's, 2000, 3000, & 4000 SERIES)



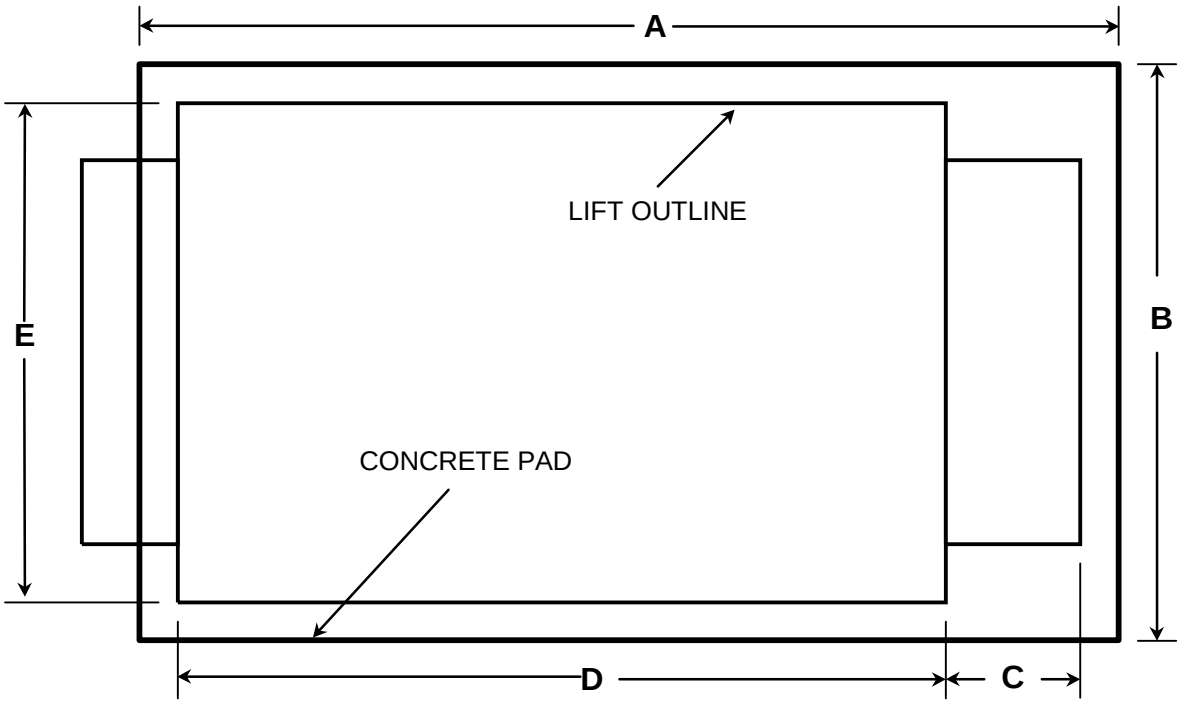
Installation Bill of Material*

1. One (1) Advance Lift Model Number _____.
2. 3" x 3" x ¼" curb angle as required.
3. One (1) 3" conduit from power unit location to pit for hydraulic hose.
4. One (1) electric disconnect switch for 5 HP or 7.5 HP motor.
5. 5 gallons of Chevron Rykon ISO 46 hydraulic fluid for T's & K's, 10 gallons for 2000 & 3000 series and 15 gallons for series 4000 units.
6. One (1) ½" SAE 100R2 hydraulic hose from the power unit location to the lift base with ½" female JIC threads on both ends. (4000 series lifts require two (2) hoses).
7. Concrete anchor bolts and material for shimming and/or grouting.
   *Seller furnishes Advance dock lift only unless otherwise agreed to in writing

Notes:

A. Reinforce concrete to suit local soil conditions.
B. All pit work and materials shown are the responsibility of the owner or his agent (by pit contractor)
C. Installer to run ½" diameter hose(s) through the 3" conduit from the power unit to the lift base.
D. Dimension tolerances are plus ¼", minus 0" (+1/4" – 0).
E. 180º steel hinge bridges require a bridge recess length equal to bridge length minus 2-3/4".
F. 180º aluminum hinge bridges require a bridge recess length equal to bridge length minus 3-3/4" and a pit length equal to platform length plus 7-1/2".
G. Consult factory for bridges longer than 30". (18" on 4000 series).

ADVANCE LIFTS CONCRETE PAD DIAGRAM



*MODEL NUMBER	A = CONCRETE PAD LENGTH	B = CONCRETE PAD WIDTH	C = RAMP LENGTH	D = LIFT LENGTH	E = LIFT WIDTH
1035	10'	6'-6"	2'	7'	5'-6"
1045	9'-6"	8'-6"	2'-6"	6'	7'-8"
6100	11'-6"	7'	2'-6"	8'	6'
6150	12'	7'	3'	8'	7'
6200	15'	8'-6"	4'	10'	7'-6"
6300	18'	8'-6"	5'	12'	7'-6"

*When mounting a "T-Series" lift on a pad it is necessary to supply a cutout in the concrete to allow passage of the hose under the baseframe. T-Series lifts have no clearance between the platform and ground, any hose run through or over the baseframe will be damaged when the platform is lowered.

Bill of Materials*

1. One (1) Advance Superdok Model Number_____
2. One (1) control cord for pushbutton.
3. Hydraulic hose(s) with female JIC fittings for models 6100, 6200, 6300.
4. Metal hose cover for models 6100, 6200, and 6300.
5. One (1) electric disconnect switch for 2 or 5 horsepower motor.
6. One (1) plug receptacle.
7. Rycon® ISO 46 hydraulic fluid: 6100-5 gallons, 6200 & 6300, 10 gallons. Oil included with other models.
8. Concrete anchor bolts and material for shimming and/or grouting.

*Seller furnishes items 1 – 4 only unless otherwise agreed to in writing.

Notes:

A. Reinforce concrete to suit local soil conditions.
B. All concrete work is the responsibility of the owner or his agent.
C. Installer to run ½" diameter hose(s) with female JIC fittings from power unit to lift base (6100, 6200, 6300 models only).
D. Concrete pad must be flat and level.

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 devices provided and be careful not to surprise anyone in the area with the movement of the lift.

The most common accidents that occur are people walking off the end of the lift and people tripping over the hinged bridge or knocking the bridge over onto someone's foot. These are prevented by simply using handrails and safety chains, and by being aware of the bridge position and size. **Be alert!**

Pre-operational checks:

1. Check all electrical wiring and connections to be sure that they are completed properly and are operational.
2. Check for the proper operating condition of all safety devices such as handrails, safety chains, and optional equipment such as electric toe guards, warning bells or automatic chocks.
3. Check for obstructions or debris that may interfere with the safe operation of the lift.
4. Be sure that all personnel in the area are a safe distance away from the lift and aware that you are about to move it.
5. Know the capacity of the lift to be sure not to overload it.

Test operate the equipment:

1. Station yourself so that you always see the equipment and surrounding area when it is in operation. Never operate the equipment in the blind.
2. Raise the equipment and note that the pushbutton is a constant pressure, "dead-man" type. When you release the up or down button, the unit should stop moving immediately and maintain its elevation. If it does not, notify your maintenance personnel immediately.
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 may take several cycles to smooth out the operation. If the operation is not smooth after several cycles, contact your maintenance personnel. If there is any evidence of binding or scraping in the operation you should 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 the engineering department at the factory at 1-800-843-3625.

COMPATIBLE LOADING EQUIPMENT GUIDE:

Each Advance lift is designed with a weight capacity and platform design for specific types of loading equipment. Using the wrong type of loading equipment on a given series of lifts will invite unintentional overloading. For safe operation, follow these guidelines and be careful to never exceed the nameplate.

UNIT	TYPE OF LOADING EQUIPMENT
1000 SERIES (1035/45/55)	Hand carts, four wheeled carts & manual pallet jacks.
2000, T, K, 5000 6100 & 6150	All of the above and small powered jacks.
3000 SERIES MODELS 6200 & 6300	All of the above & straddle stackers, small stand-up & sit-down rider fork trucks.
4000 SERIES	All of the above & medium fork trucks.

Calculate the weight of the heaviest types of loads you expect to handle to be sure that they are within the rated capacity. Beware of surprisingly heavy materials such as liquids, grains, powder and paper; all of which can weigh much more than you suspect because of their density.

A little effort to determine the true weight of your heaviest loads before you start to use your equipment can save damage to your equipment and possible injury to your personnel. If you discover that some loads will exceed the capacity of the unit, make arrangements to have the loads split. All operating personnel should be warned about heavy loads, warning signs should be placed in the dock lift area as a reminder.

Daily operation:

1. All personnel should 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 capacity.
3. Operators must be alert to all personnel in the vicinity of the lift and avoid any surprises to these personnel in regard to movement of or the position of the lift at any time. Never operate the unit if you can not see it and the personnel around it.
4. On the first use of the lift each day, each operator should check to see that the lift is operating properly and smoothly. All safety devices should be in place and operating properly and the hinged bridge should be swung through its full arc of movement. The bridge stops should prevent the bridge from drooping more than 45 degrees below the horizontal in the forward position and the bridge should swing back 20 degrees beyond vertical toward the platform in the upright position. Any problems should be immediately reported to the maintenance personnel.

Daily Operation (Continued)

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. When raising or lowering the lift, the load should be centered on the platform (that is, the load should be evenly distributed and its center of gravity should be at the center of the platform).

7. If a unit is equipped with both a hinged bridge and a hinged ramp, be sure that the operators know the difference and never use the ramp for load transfer in the raised position. The ramps are usually much longer than the bridges which means they can work as a long lever creating severe eccentric loads and they are often positioned on the weakest side of the lift for load movement in the fully lowered position only. **Use ramps in the fully lowered position only!**

8. Do not allow bridges or ramps to “free fall” from near vertical positions to the position against their hinge stops. This type of abuse will definitely cause damage to the stops, hinges, and platform edges, eventually rendering the unit unsafe. Lower ramps by hand and lower bridges to the down stop position with the restraining chains.

Efficient lift usage:

The following procedures will help you maximize the efficient use of your lift in your loading and unloading operations.

1. First it should be noted that there is a long restraining chain on each lift that is designed to run from the hinged bridge to the handrail post farthest away from the bridge. The purpose of this chain is to allow an operator to pull the hinged bridge back from anywhere on the platform with minimal movement, once the bridge is raised to the near vertical position by the truck bed as the lift is lowered.

2. This means that the hinged bridge only has to be manually lifted once in a loading or unloading sequence. It should be raised to the vertical standing position before the lift is raised to truck height. After that, the bridge can be kicked flat into the truck with your foot or loading equipment when you arrive at truck height. Then when you lower the unit, the bridge is allowed to cam up on the truck bed to the near vertical position and then pulled back to a safe resting position with the chain. There is a second snap on the chain that allows you to lock the bridge in the raised position on those rare occasions when the load prevents the bridge from swinging back into a safe resting position. (See illustration at end of section.)

3. If your unit is equipped with an approach ramp, do not raise the ramp on each cycle. In fact, the ramp is intended to be raised only when the lift is being moved to a new location. Many of the ramps are designed with built in wheel chocks which help prevent a wheeled vehicle from rolling off the platform and only work properly when the ramp is lowered.

Model 1045/1055 special instructions:

The special portability features for the Model 1045/1055 are illustrated and explained on page 5-5.

How To Use Superdoks Efficiently

Palletized Loads One (1) man removes pallet from truck places it in storage area and returns for next pallet until truck is offloaded

Non Palletized Loads One (1) man in truck stacks material on pallet or 4 wheeled cart Second (2nd) man removes pallet or cart from truck places it in storage area and returns for next load until truck is unloaded

Objective

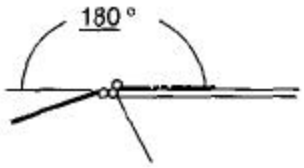
"TO FREE UP THE TRUCK AS QUICKLY AS POSSIBLE"

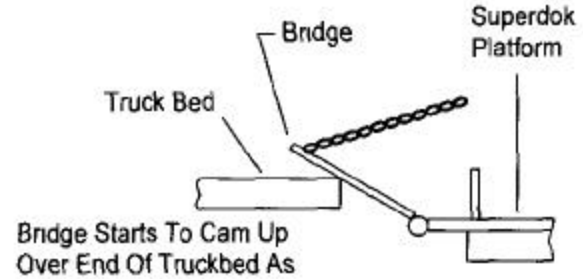
Operation

1 With bridge folded back toward platform raise Superdok to truckbed height
2 Kick bridge over onto truckbed
3 Roll load onto platform
4 Begin to lower Superdok until bridge starts to cam up over end of truckbed
5 With foot, chain or hand, flip bridge back toward platform
6 With bridge folded back toward platform, lower Superdok
7 As required attach snap hook (A) to hold bridge upright

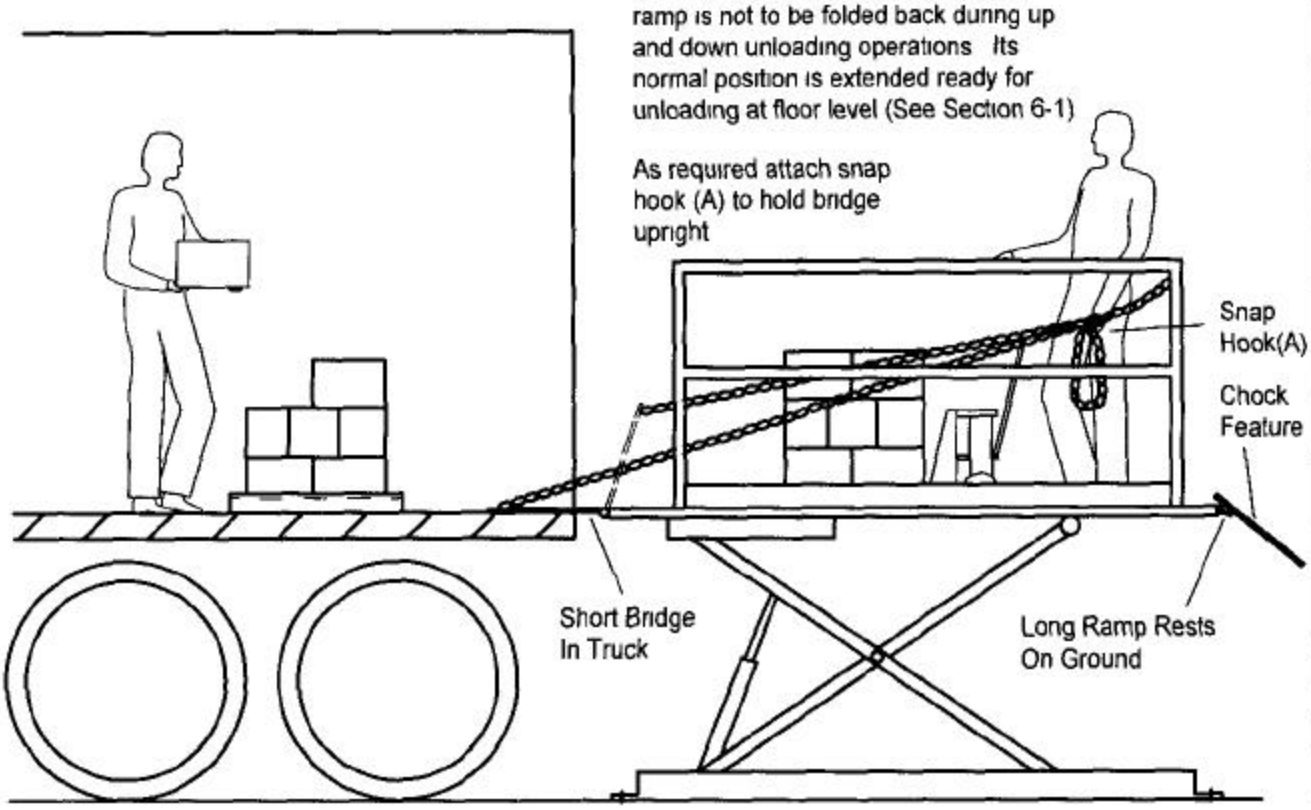
CAUTION

With 180 Degree movement bridges exercise care in steps 5 & 7 as bridge will continue to pivot back flat on the platform





If a unit has a chock ramp the chock ramp is not to be folded back during up and down unloading operations Its normal position is extended ready for unloading at floor level (See Section 6-1)

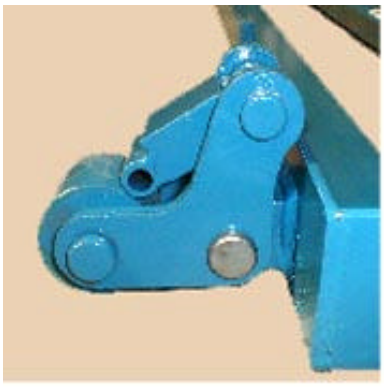


Model 1045/1055 Portability Feature

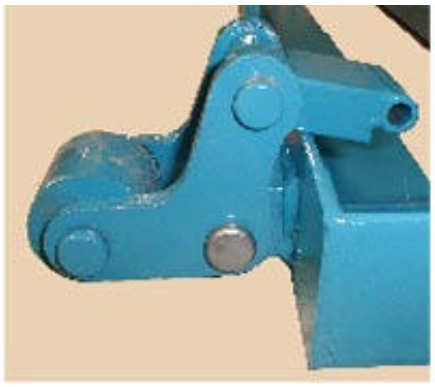
Moving the Equipment with the Casters and Dolly Handle:

1. Raise the lift approximately 3 feet (with no load on the platform) and flip the two caster bars into the caster position as shown. Lower the lift fully, and the lift will raise 1" off the floor on the caster end.

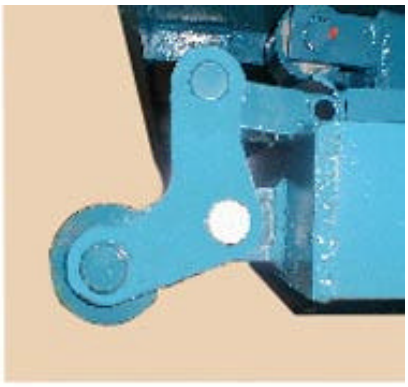
2. Use the Dolly Handle as shown to raise and move the entire lift.



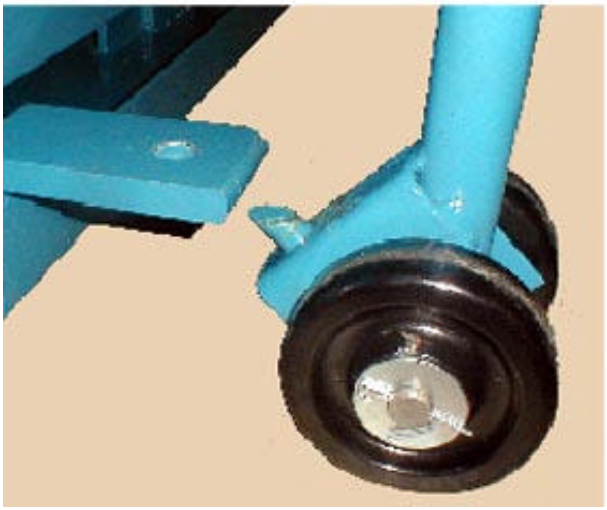
Normal Caster Bar Position



Caster bars in position to raise lift. (BOTH CASTERS MUST BE USED!)



With the platform fully lowered, the lift is automatically raised 1" off the floor.



Insert the dolly handle into the tongue on the baseframe

The unit is now portable. Never load the unit when casters are in use. Casters are for transporting the unit only.

SECTION 6. MAINTENANCE INSTRUCTIONS

The routine maintenance of this equipment is minor and consists of periodic checks.

Weekly: Once a week, or after repetitive operation, the lift should be raised to its full height. This will get rid of cylinder oil seepage build-up and lubricate the upper cylinder barrel.

Monthly: Check that the hydraulic fluid level in the reservoir is 1" to 2" from the top of the tank, depending on model, with the unit fully lowered. It is strongly urged that a maintenance log be maintained with the dates of monthly inspections, the name of the inspector and results of the inspection.

CAUTION:

Be sure the maintenance safety leg is properly engaged before performing maintenance checks 2 through 6 or reaching beneath a raised lift. **(Read all of section 6 for proper maintenance safety leg procedures).**

1. Clean all debris from the pit or the vicinity of floor mounted units in order to avoid interference with the lift mechanism or rollers.
2. Check for presence and proper seating of all snap rings and clips on all axles, cylinders and rollers.
3. Check rollers, pins and bushings for any signs of wear such as flat spots, missing fasteners, or dislodged bearing material.
4. Check the hydraulic fittings for cracks or leaks and clean up any seepage on or beneath the cylinders.
5. Check hoses and electrical lines for abrasions or other abuse and check for snug connections.
6. Operate the unit and check for any abnormal noise or vibrations.
7. Check all safety devices on the unit such as handrails, safety chains, etc. including any options such as electric toe guards or chocks, for proper operation.
8. Check the hinged bridge to insure that its stops are not damaged, allowing it to droop more than 45 degrees below horizontal, check the hinge spools for cracks and or broken welds, be sure the bridge leans back over the platform at least 20 degrees beyond vertical.

Seasonal or semiannual maintenance:

Change hydraulic fluid for ambient temperature changes if appropriate. Check the fluid reservoir to see if there is any evidence of accumulated condensation creating water contamination. The fluid will appear "milky" and light pink in color. Water accumulation will damage the hydraulic pump.

Maintenance Cautions:

1. Always remember that this is a piece of machinery with large moving parts that can seriously hurt you.
2. Read this manual in its entirety before attempting service work.
3. Always use the safety bar or leg if you are going to work on the unit in the elevated position or reach under the platform. (See the illustrations at the end of this section for proper positioning and engagement of the safety supports.)
4. When using the safety support observe the following rules:
   A. There shall be no load on the platform
   B. The safety support shall be properly engaged.
   C. Hold the down button an extra 10 seconds when lowering onto the safety support to be sure that all the weight of the lift is on the support.
   D. Use shoring of blocking as a backup to the safety support.
   E. Disconnect and tag the electricity to the unit to prevent accidental movement of the lift by other personnel.
   F. Spend as little time as possible under the lift.
5. Use only replacement parts recommended by the manufacturer.
6. Do not let the equipment stay in disrepair; fix little problems while they are little problems or some of them may get severe very quickly.
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 a safety support.
9. Never apply a load to the equipment unless the base is continuously supported and non-portable units are securely lagged to the ground.
10. Never expect to hold a leg assembly open by simply lifting one end of a platform.
    A. The roller end of most lifts are not gibbed or captured in any way, so lifting on the roller end simply tilts 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 a spongy and unpredictable manner and could cause serious injury.
    C. The only safe way to hold a lift's legs open other than the factory designed safety support, is to block between the clevis end of the platform and the base frame.

Section 6. (Continued)

Recommended Lift Blocking Procedures

WARNING!

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

DANGER!

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

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

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

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

2. Raise the lift to its fully raised position. If you do not, the maintenance device(s) may not be able to be placed properly in its/their designed blocking position.

3. Remove the maintenance device(s) from its/their storage location and place it/them into the engaged position as shown in Figures 1-9. Read and understand the specific instructions for your equipment before proceeding.

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

Recommended Lift Blocking Procedures (continued)

DANGER!

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

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

WARNING!

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

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

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

DANGER!

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

CAUTION! Read the entire lif blocking procedure and all warning before attempting to use th maintenance bar

ALL MODELS

Never use the safety maintenance bar when the platform has a load. Remove the load first, then brace for service or maintenance. Check that the safety bar is well seated and remains so during heavy wrenching or maintenance operations.

FOR SERIES 2000K AND 610

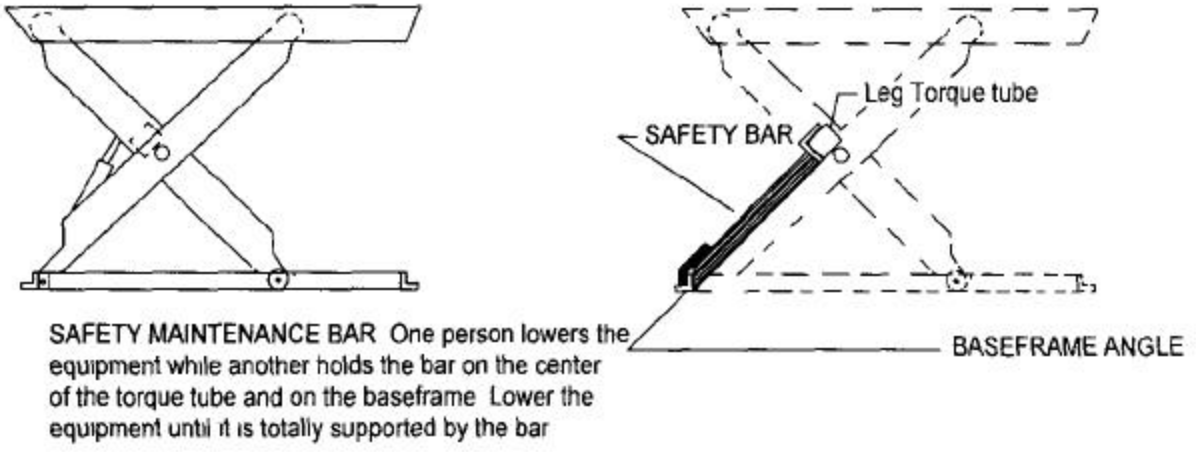
Place the maintenance bar near the center o the torque tube and against the baseframe; be certain the bar is captured on the baseframe angle, and then lower the equipment until it is totally supported by the bar. (Fig. 1)

FOR SERIES 2000 AND 615

Place the maintenance bar near the center o the torque tubes and then lower the equipment until it is totally supported by the bar. (Fig. 2)

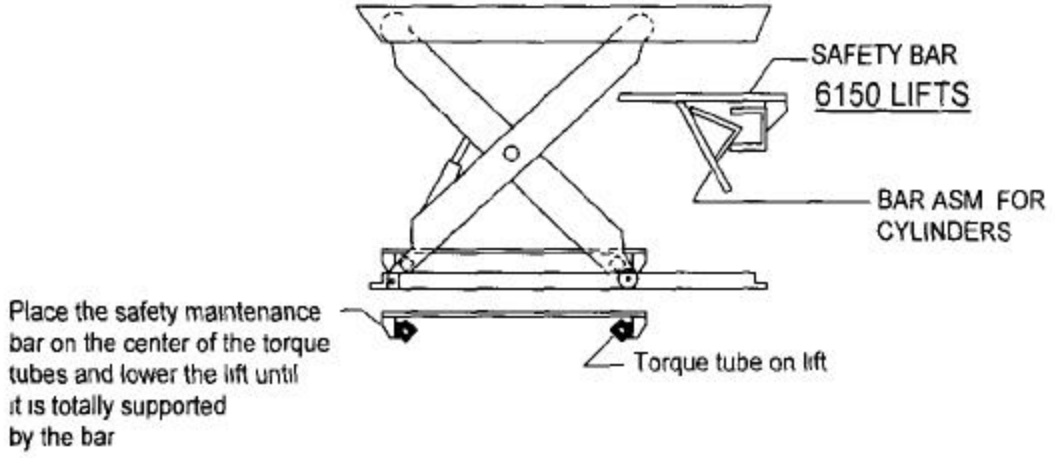
ALL MODELS

Every unit of the above models is supplied with a safety maintenance bar. It is the only factory-approved method of blocking the lif open. If the bar is missing contact your distributor for replacement.



SERIES 2000K & 6100 LIFTS

Fig. 1



SERIES 2000, & 6150 LIFTS

Fig. 2

Safety Maintenance Bar- Series 2000,2000K,6100,6150.

CAUTION! Read the entire lift blockin procedure and all warnings befor attempting to use the maintenance ba

ALL MODELS

Never use the safety maintenance bar when the platform has a load. Remove the load first, ther brace for service or maintenance. Check that the safety bar is well seated and remains so during heavy wrenching or maintenance operations

SERIES 3000

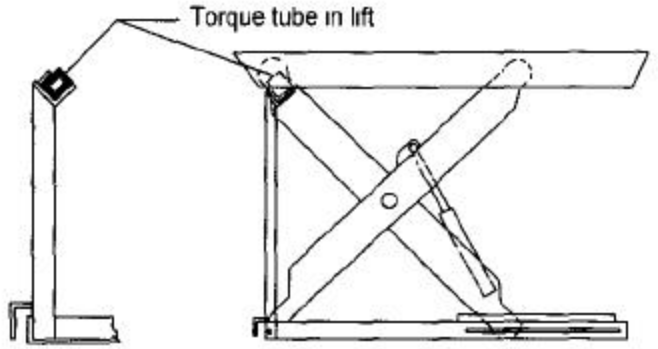
Place the maintenance bar or leg near the cente of the torque tube and on the baseframe, ther lower the equipment until it is totally supported by the bar or leg. (Fig. 3)

SERIES 4000

Place the maintenance bar or leg near the cente of the torque tubes, then lower the equipment unti it is totally supported by the bar or leg. (Fig. 4

SERIES 6200 & 6300

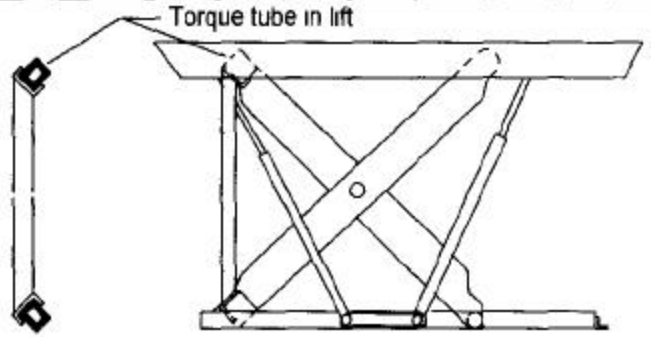
Place the two (2) maintenance bars in the tabs welded to the inside of the baseframe, in line with the bottom roller wheel, then lower the equipmen until the curved member totally engages both roller wheels. Insure the maintenance bars are straight, in line with the wheels, not tilted sideways at and angle. (Fig. 5)



SAFETY MAINTENANCE BAR One person lowers equipment while another holds the bar on the center of the torque tube and on the baseframe Lower the equipment until it is totally supported by the bar

SERIES 3000 LIFT

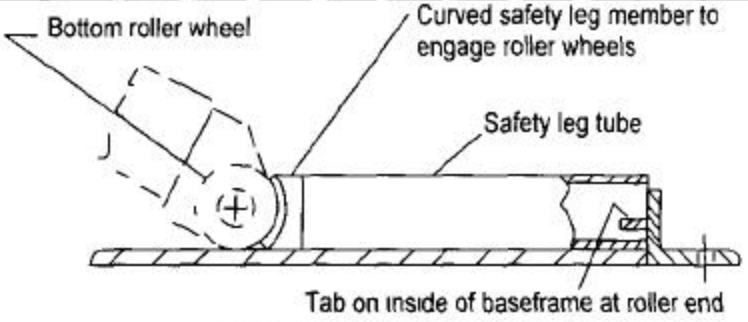
Fig. 3



SAFETY MAINTENANCE BAR One person lowers the equipment while another holds the bar on the center of the torque tubes Lower the equipment until it is totally supported by the bar

SERIES 4000 LIFT

Fig. 4



SERIES 6200 & 6300 LIFTS

Fig. 5

Safety Maintenance Bar-
Series 3000,4000,6200,6300

CAUTION! Read the entire lif blocking procedure and all warning before attempting to use th maintenance bar

ALL MODELS

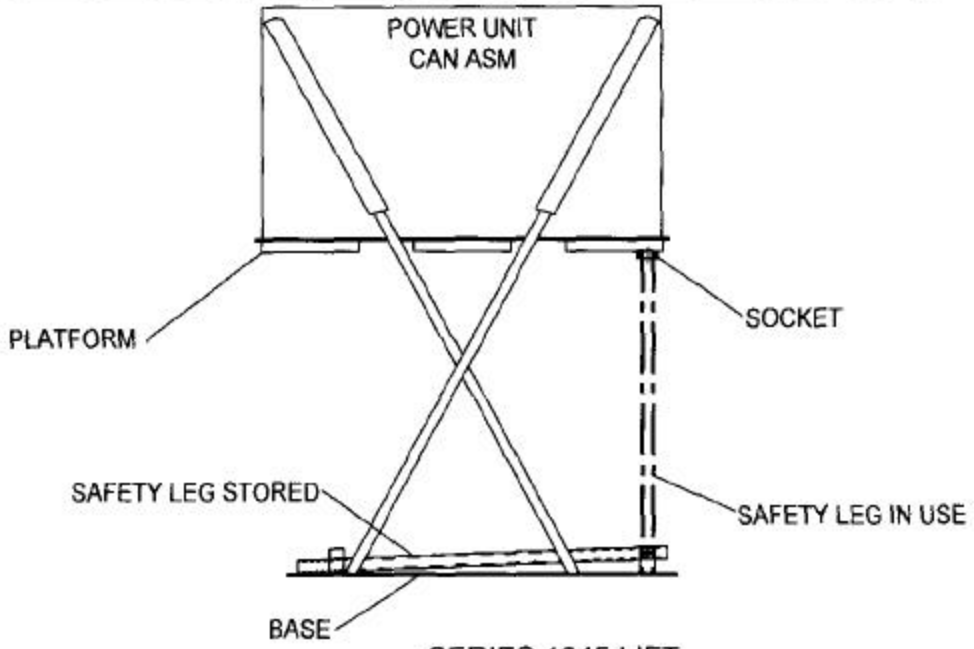
Never use the safety maintenance bar wher the platform has a load. Remove the loac first, then brace for service or maintenance Check that the safety bar is well seated anc remains so during heavy wrenching o maintenance operations.

SERIES 1035

Place the maintenance bar near the center o the torque tubes, then lower the equipment until it is totally supported by the bar. (Fig. 7

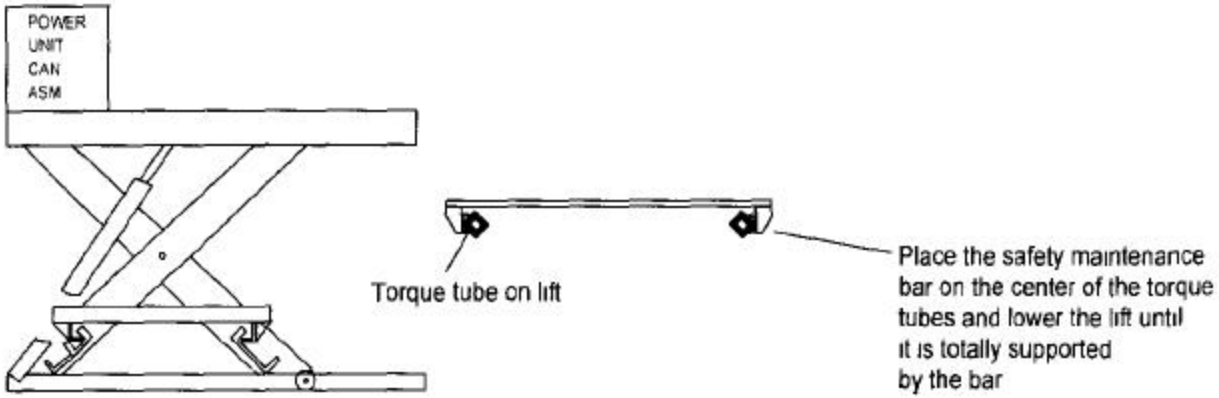
SERIES 1045

Raise the equipment about 40" with no loa on the platform. Reach under the power uni area to release the safety leg. Pivot the entire safety leg assembly up to the vertical position align the safety leg with the socket or platform. Lower the lift until the safety leg supports it. (Fig. 6)



SERIES 1045 LIFT

Fig. 6



SERIES 1035 LIFT

Fig. 7

Safety Maintenance Bar Series 1035,1045.

CAUTION! Read the entire lift blocking procedure and all warnings before attempting to use the maintenance bar.

ALL MODELS

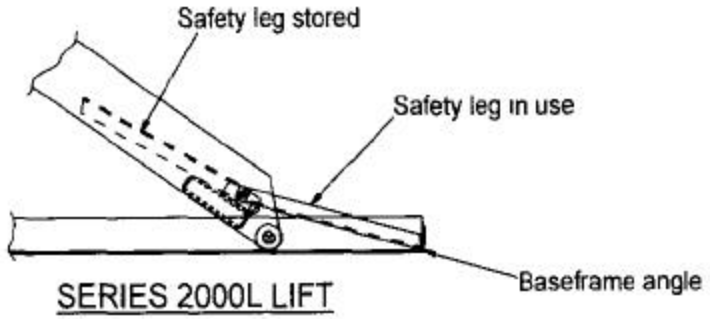
Never use the safety maintenance bar wher the platform has a load. Remove the load first then brace for service or maintenance. Check that the safety bar is well seated and remains so during heavy wrenching or maintenance operations.

SERIES 2000L

Rotate the maintenance legs onto the baseframe angle. Lower the lift until the equipment is completely supported by the safety legs that must be seated in the corner of the baseframe angle. (Fig. 8)

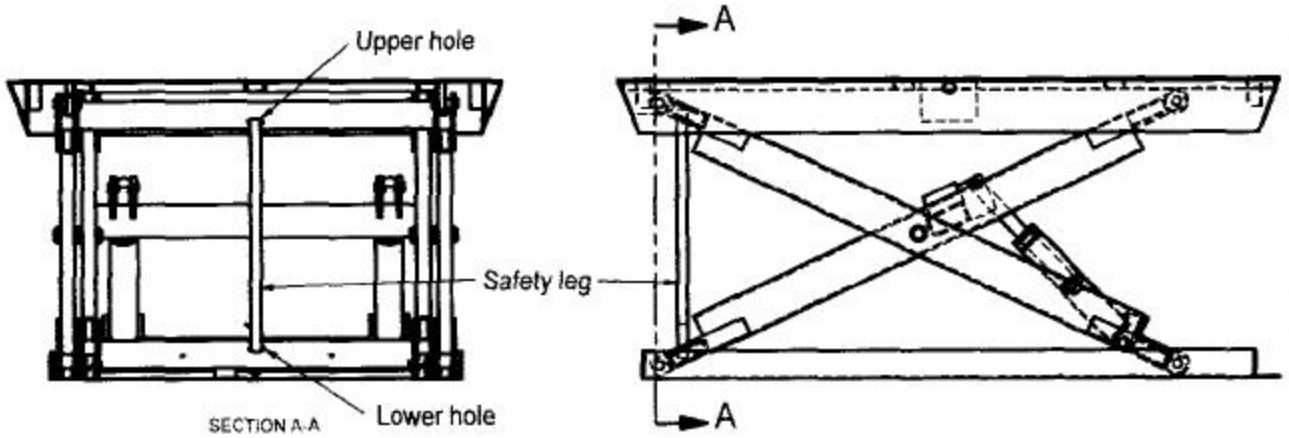
T-SERIES LIFTS

Fully raise equipment and move maintenance bar from the baseframe. Insert on end of the maintenance bar into the hole located on the lower leg tube. Lower unit until the other end of maintenance bar inserts into the hole of the upper leg tube. Be sure fingers stay clear of holes during this process. (Fig. 9)



SERIES 2000L LIFT

Fig. 8



T-Series Lifts

Fig. 9

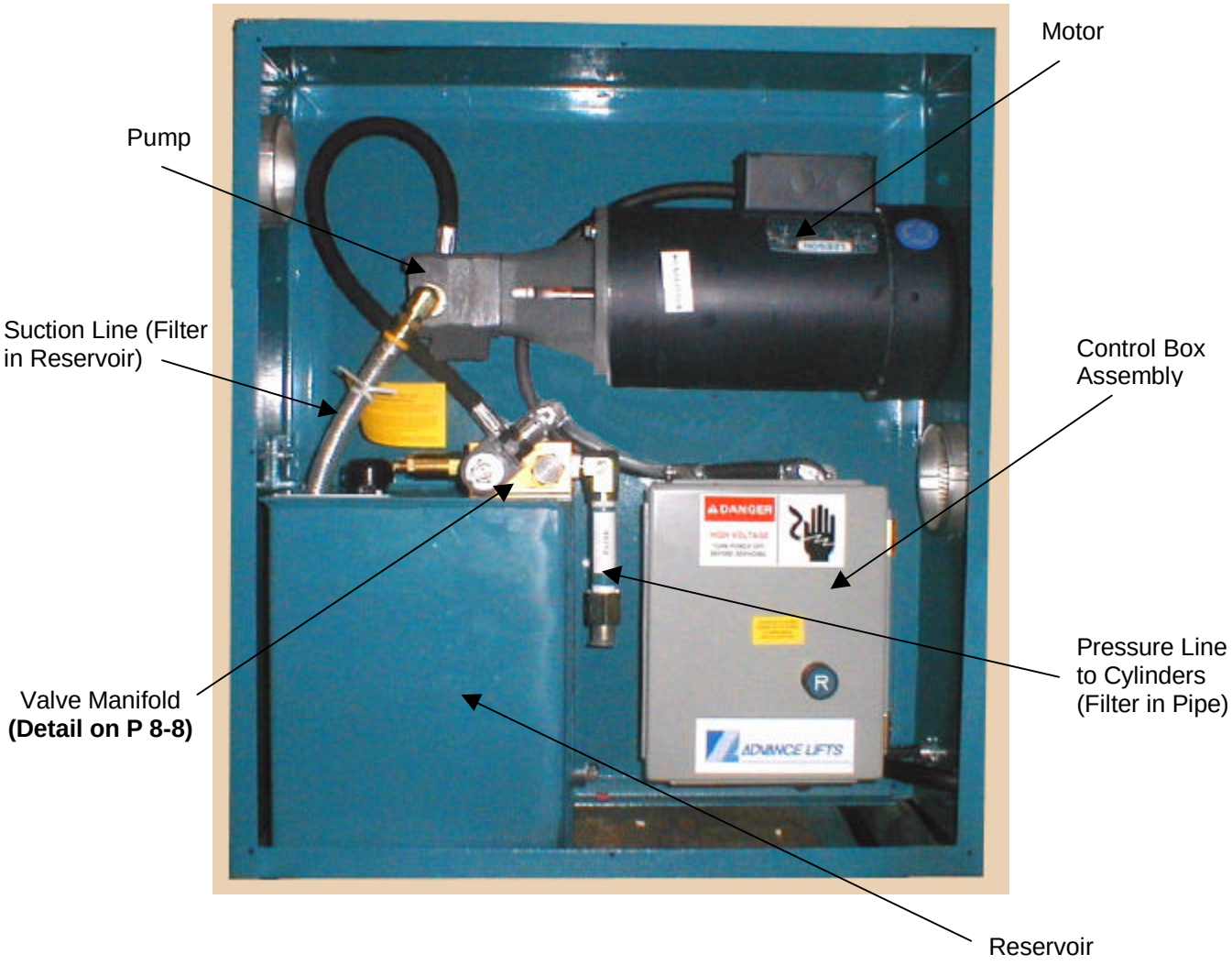
Safety Maintenance Ba
Series 2000L and T-Series Lifts

A

SECTION 7. POWER UNIT ASSEMBLIES

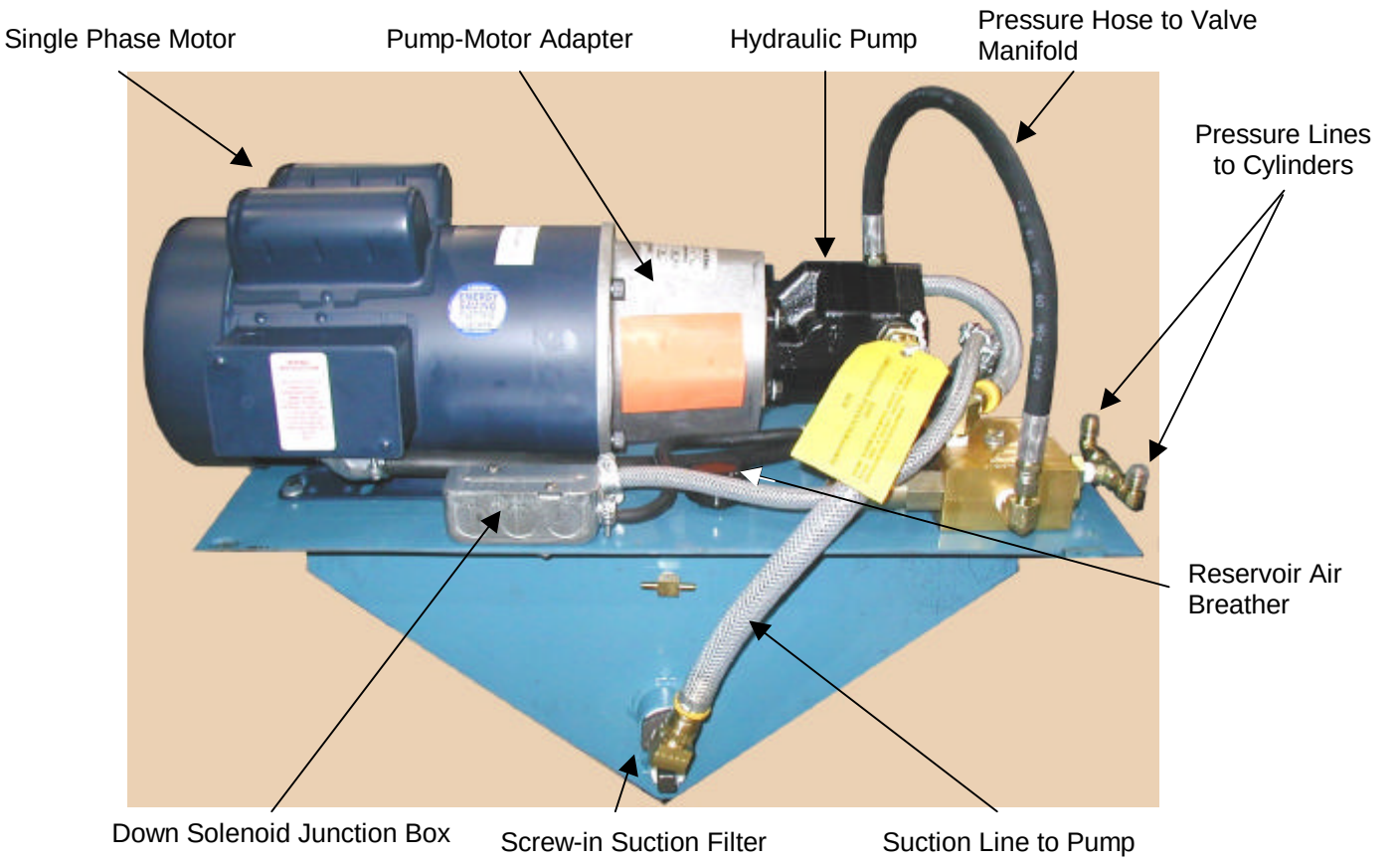
This section contains drawings and photos of completed power units to aid service personnel in identifying each component. Please be careful to match the correct voltage and horsepower as well as model number, when you are trying to identify the power unit for your lift. Advance Lifts uses several different brand name motors and pumps, so the ones shown in the pictures may not be the same exact brands as on your unit. More information about individual components may be available in the hydraulic or electrical sections of this manual. Also note that these illustrations may show options that were not included on your particular unit and the components used may be changed at any time without notice.

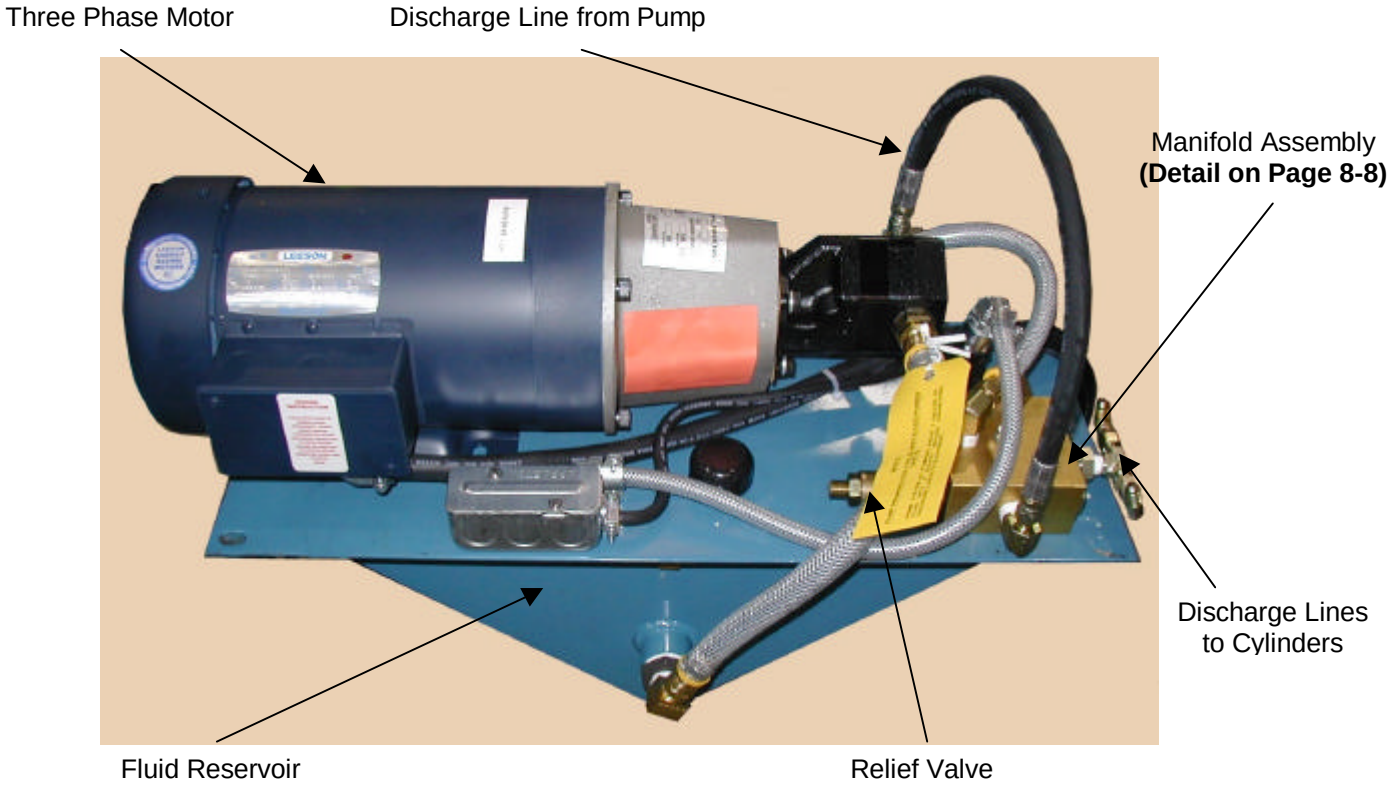
Model 1035 Power Unit



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

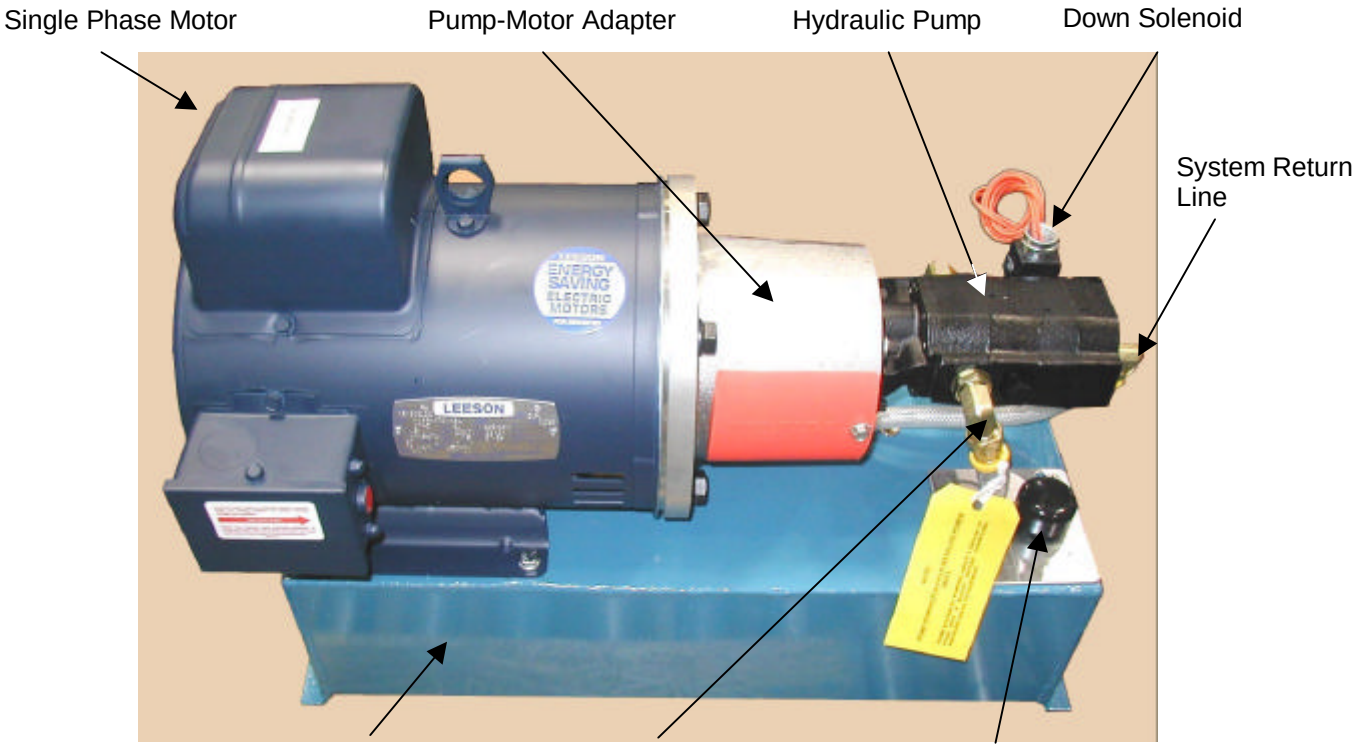
Model 1045/1055 Power Units

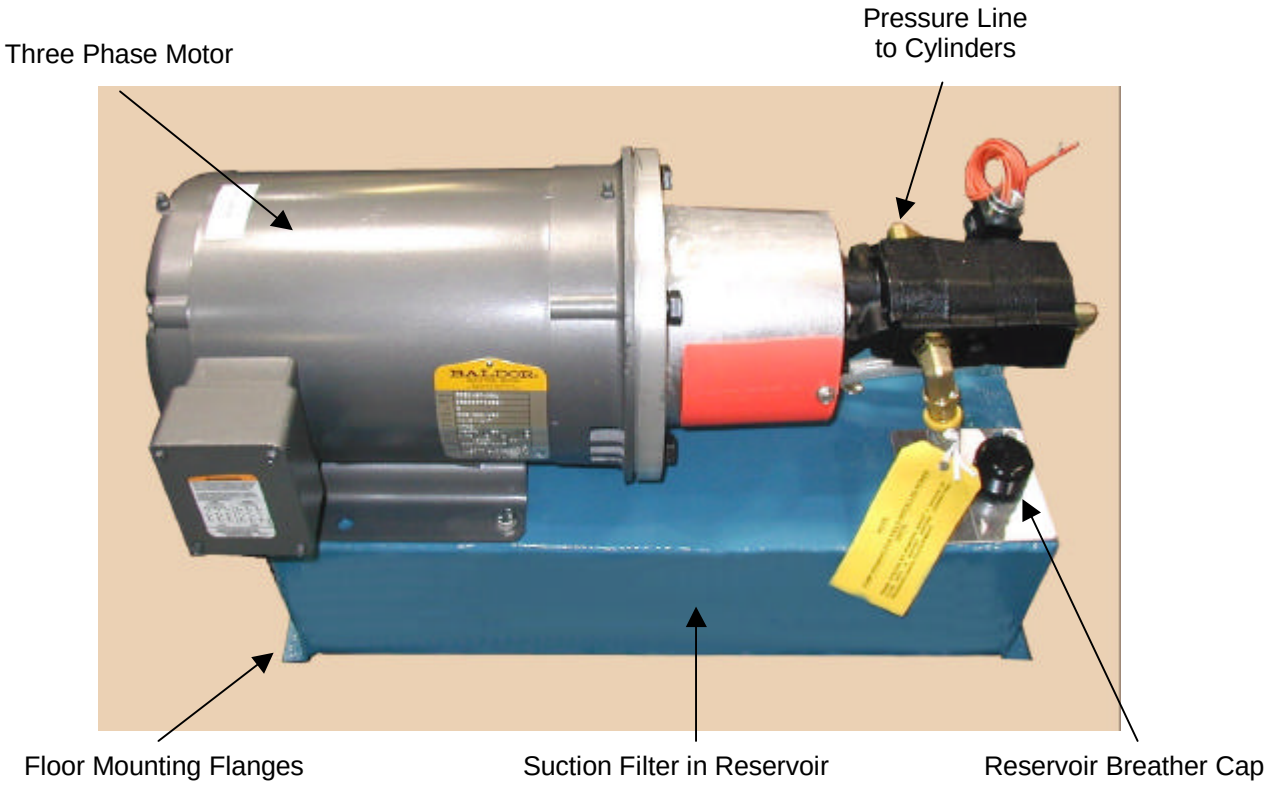




See Page 8-6 for Hydraulic Diagram and Pages 9-3, 4 for Electrical Diagram

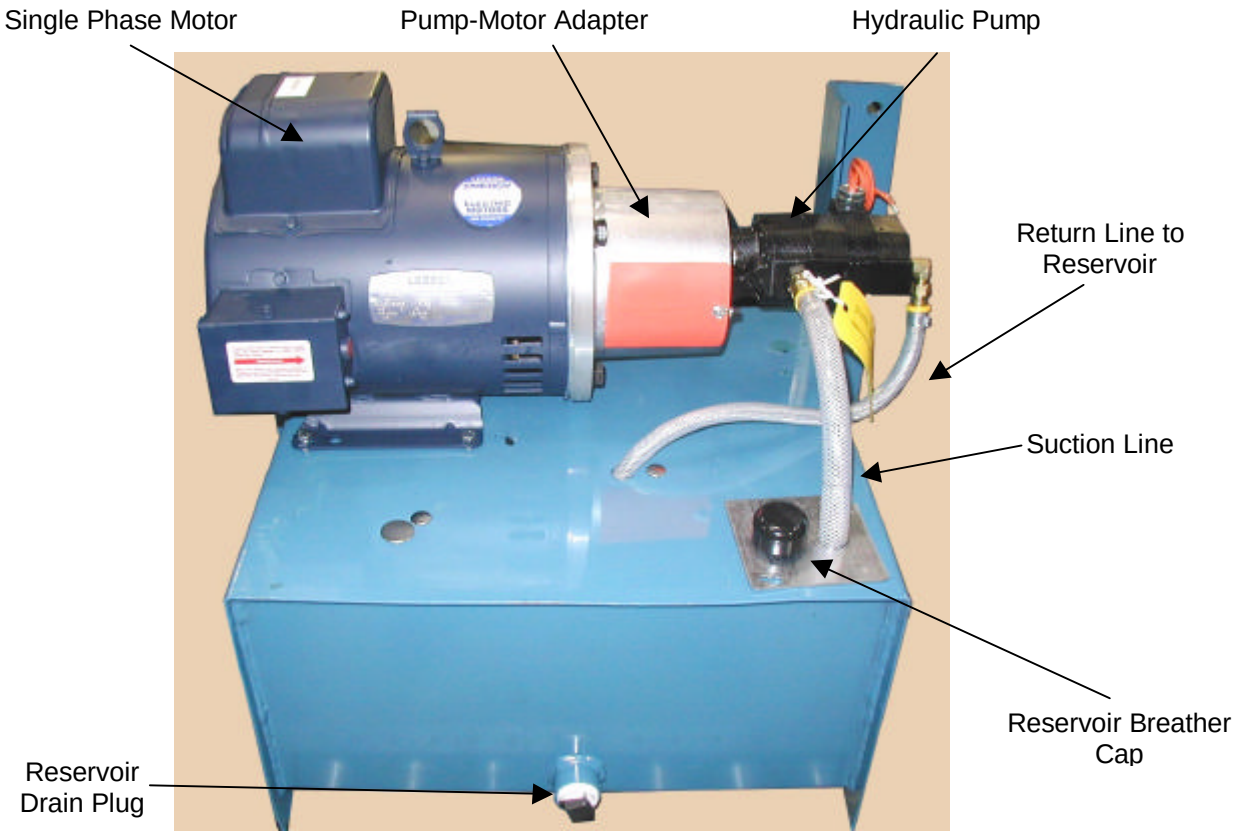
Models 2000K, T-Series and 6100 Power Units

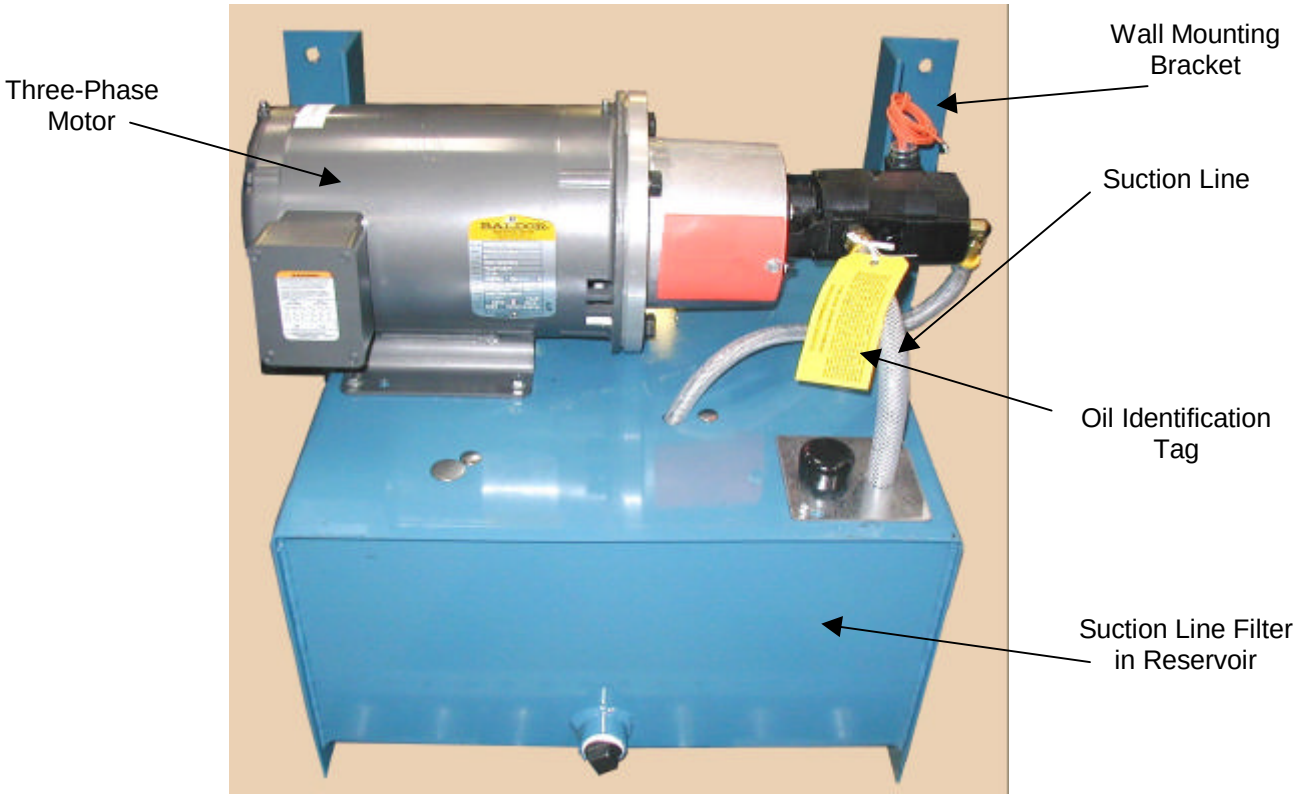




NOTE: Model 6100 Power Unit is pre-wired to a controller mounted above the motor (not shown)

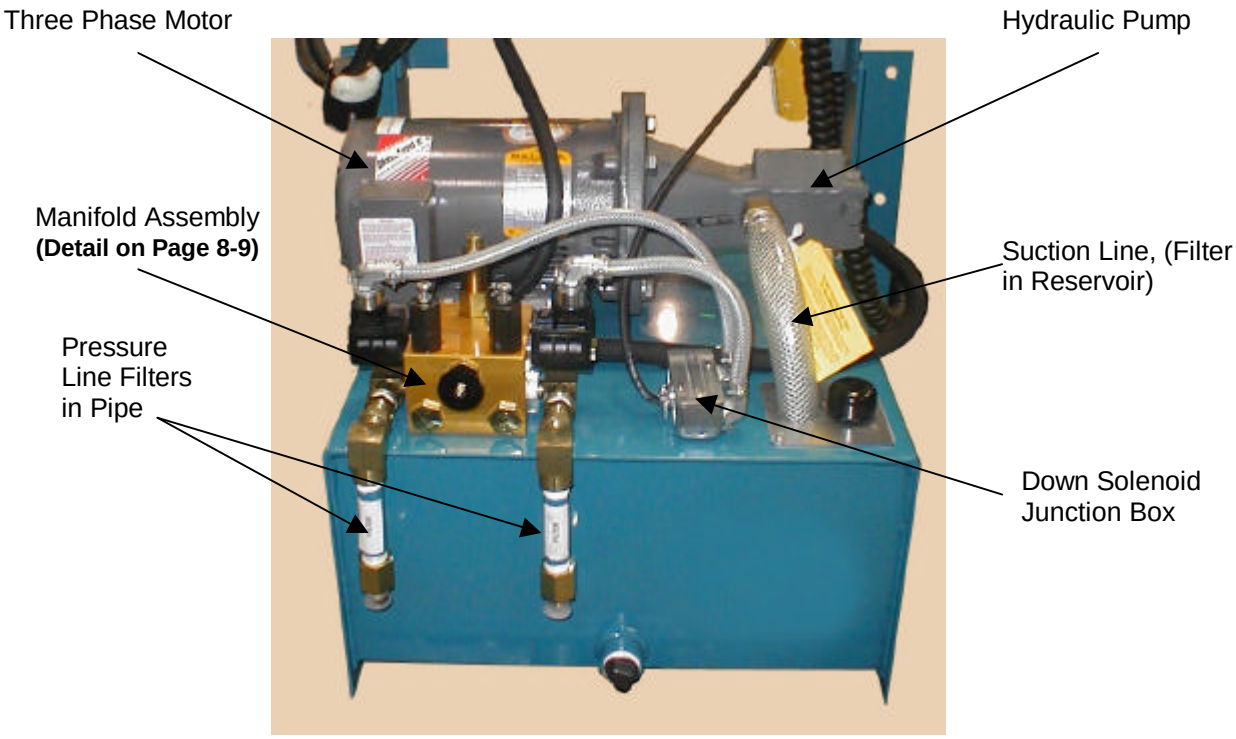
See Page 8-4 For Hydraulic Diagram and Pages 9-3, 9-4 For Electrical Diagram



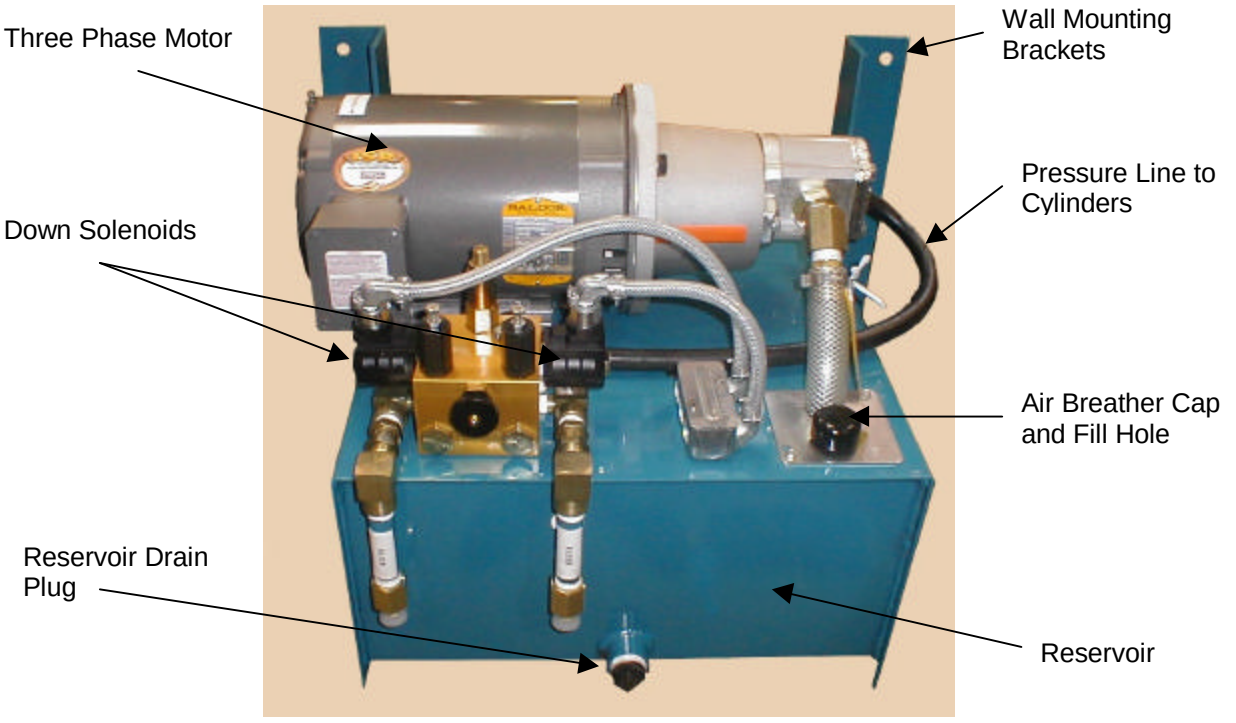


See Page 8-4 for Hydraulic Diagram and Pages 9-3, 9-4 for Electrical Diagram

Series 4000 and Model 6200 & 6300 Power Unit

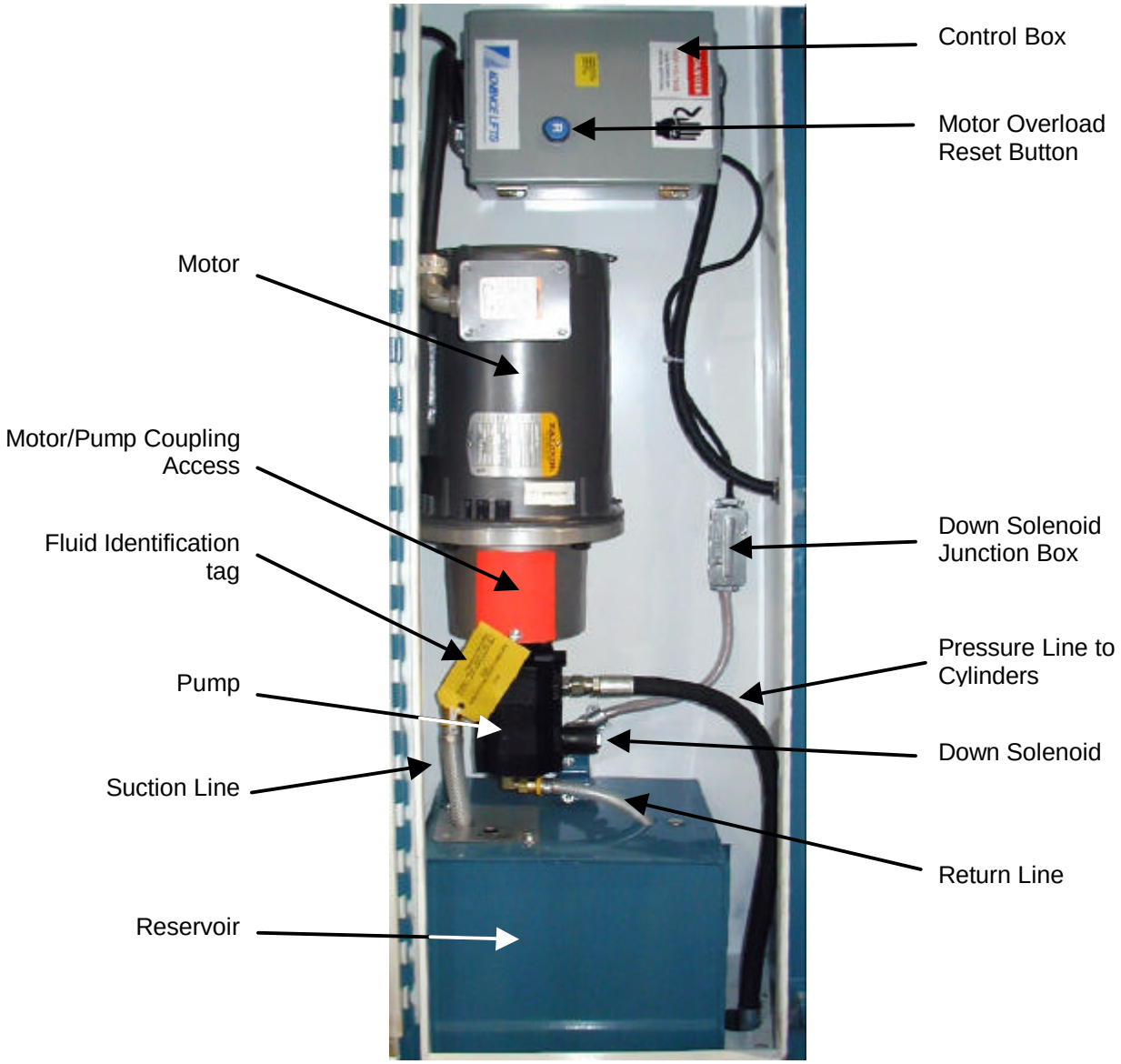


Series 4100 Power Unit



See Page 8-5 for Hydraulic Diagram and Page 9-3 for Electrical Diagram

Model 6150 Power Unit
(Typical)



See Page 8-4 for Hydraulic Diagram and Pages 9-3, 9-4 for Electrical Diagram

SECTION 8. HYDRAULIC DETAILS

1. **General Hydraulic Information:**
   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 normal maintenance just like changing oil in an automotive engine. However, maintenance personnel should 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 that 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. See repacking under cylinder repair procedures.
   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 or retouch part of the lift, cover exposed rods with plastic or soluble grease that can be removed after painting to insure that no paint sticks to the rods and damages packings or seals.

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

3. Hydraulic fitting sealant and torque:
   A. Advance lifts may be equipped with either NPT fittings (tapered), or SAE fittings (with “O” ring seals), depending on age, know the difference!
   B. Be careful when tightening NPT fittings not to over tighten and crack them. Swivel fittings are especially vulnerable and should only be snug 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 degree SAE fitting being mixed with the standard 30 degree NPT fittings, or either one being mixed with SAE 45 degree 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 don’t over apply. Never use sealant or tapes on swivel fittings or SAE o-ring fittings.
   E. Never reuse old Teflon tape. Once a connection has been opened, remove all old tape and apply fresh tape.

Oil Recommendations & Seal Compatibility

Fluids:

1. As of 1/1/03 the current standard hydraulic fluid is Rykon® ISO 46, (group II base) 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 can be identified by its clear color.

2. From 3/25/85 until 12/31/02, Dexron II and Dexron Ill automatic transmission fluids were supplied; the pink coloring can identify it.

3. Older units may be filled with 5W30 motor oil that is suitable for the same temperature range and was supplied by the factory prior to 3/25/85. Be sure not to mix fluids. If you wish to switch from one fluid to another, drain the reservoir and system, then refill with the new fluid.

4. **Caution!** Do not use any fluid that has not been approved by the Advance Lifts engineering department. Brake fluids and other hydraulic fluids may attack the system's seals or hoses.

5. A biodegradable or fire resistant fluid is also available, however you must contact the factory for its name, because it is also necessary to change some seals and/or hoses for total system compatibility, depending upon the specific model lift that you have.

Seals:

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

Options:

1. For extremely cold applications we recommend an oil immersion heater which simply fits in the drain coupling on most units, replacing the drain plug, these are available in appropriate sizes from the factory.

2. For extremely warm temperature ranges over +100 degrees Fahrenheit consult the factory.

Pressure Chart for Hoses & Pipes

Hose	SAE	Working PSI	Bursting PSI
¼"	100-R2A	5000	20000
3/8"	100-R2A	4000	16000
½"	100-R2A	3500	14000
¾"	100-12	4000	16000

Seamless Pipe	Working PSI	Bursting PSI
½" Schedule 80	4100	21000
¾" Schedule 80	3500	17600
1" Schedule 80	3500	15900

Caution: Never use any hose or piping that does not meet or exceed the ratings listed above.

Line Size Calculations

Formula: $P = \frac{V \times Q}{18{,}300 \times D \times D \times D}$

Where: P=PSI loss per foot
Q=GPM flow
V=SUS viscosity @ Operating temp.
D=Inside dia. Of pipe in inches

Example: For a standard Series 2000 lift with a flow rate of approximately 3GPM, we recommend ½" SAE 100R2A hose up to 35 feet and ¾" pipe or hose for distances slightly beyond that. This keeps the line pressure loss at 40 PSI and allows for efficient lowering speeds.

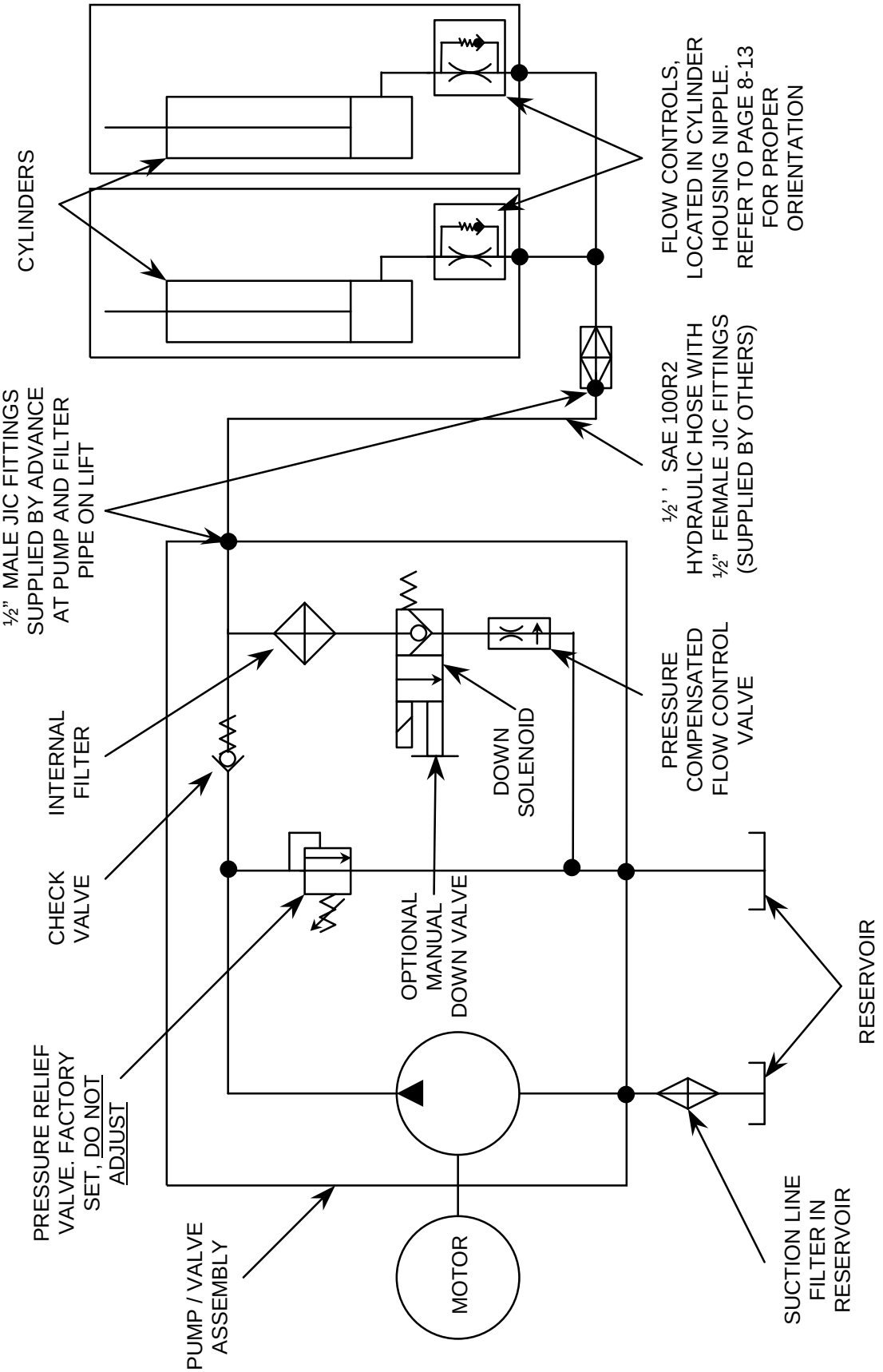
For each T or 90-degree elbow add 3 feet to length.
For each 45-degree elbow add 1 foot to length.

Target the pressure to below 50 PSI. The empty lift going down will see any excess piping losses as restrictions and increase the time it takes the lift to lower.

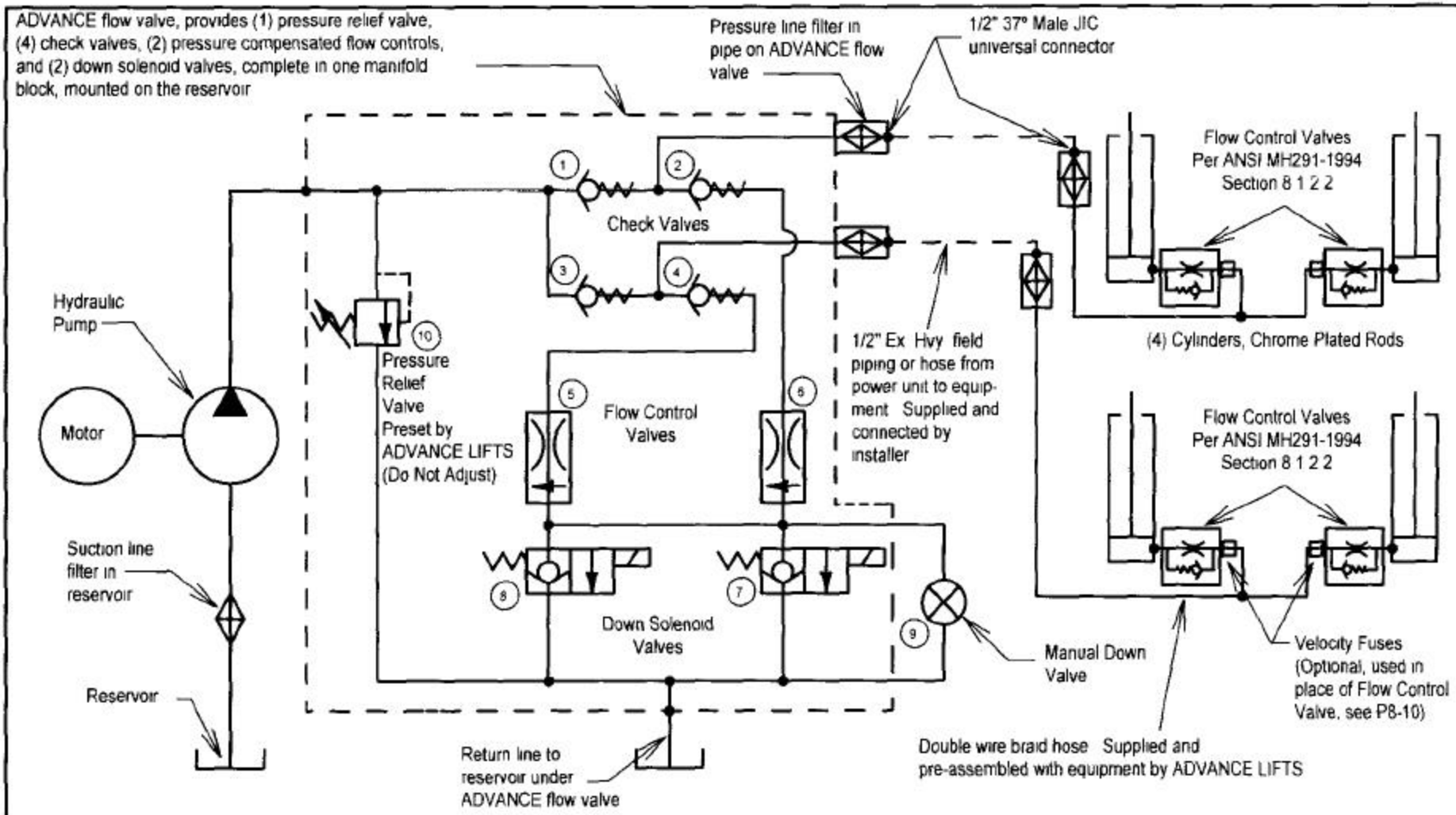
Standard Oil Capacities of Listed Equipment

Model 1035	4.3 Gallons
Model 1045/1055	2.66 Gallons
Series 2000	10 Gallons
Series 2000K,L,T	5 Gallons
Series 3000	10 Gallons
Series 4000	10 or 15 Gallons
Model 6100	5 Gallons
Model 6150	3.8 Gallons
Model 6200	15 Gallons
Model 6300	15 Gallons

HYDRAULIC DIAGRAM FOR UNITS WITH INTERNALLY VALVED PUMPS



HYDRAULIC DIAGRAM FOR THE FOLLOWING MODEL
T-SERIES, 2000-SERIES, 2000K-SERIES, 3000-SERIES, MODEL 6100 & 6150
(MODEL 6100 HAS TWO ADDITIONAL CYLINDERS NOT SHOWN)



NOTE For position of Numbered valves, See "Valve Manifolds"

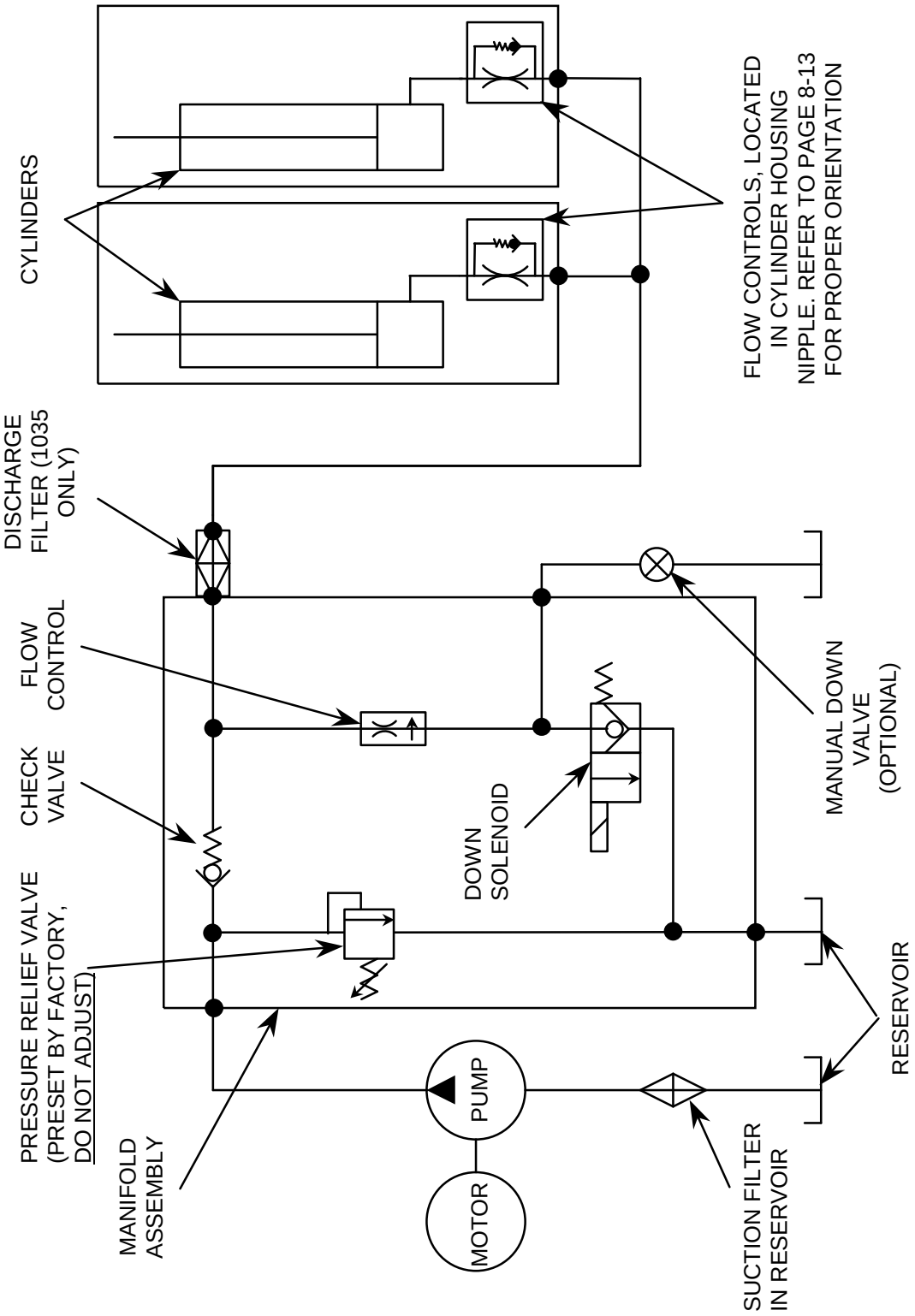
Series	Qty of Cylinders	Relief Pressure	Motor
4000	(4) Ø3 5"	2400	7 5HP @ 3600 RPM
6200	(4) Ø3"	1800	5HP @ 3600 RPM
6300	(4) Ø3"	2200	5HP @ 3600 RPM

STANDARD HYDRAULIC DIAGRAM

(SERIES 4000, 6200, 6300)

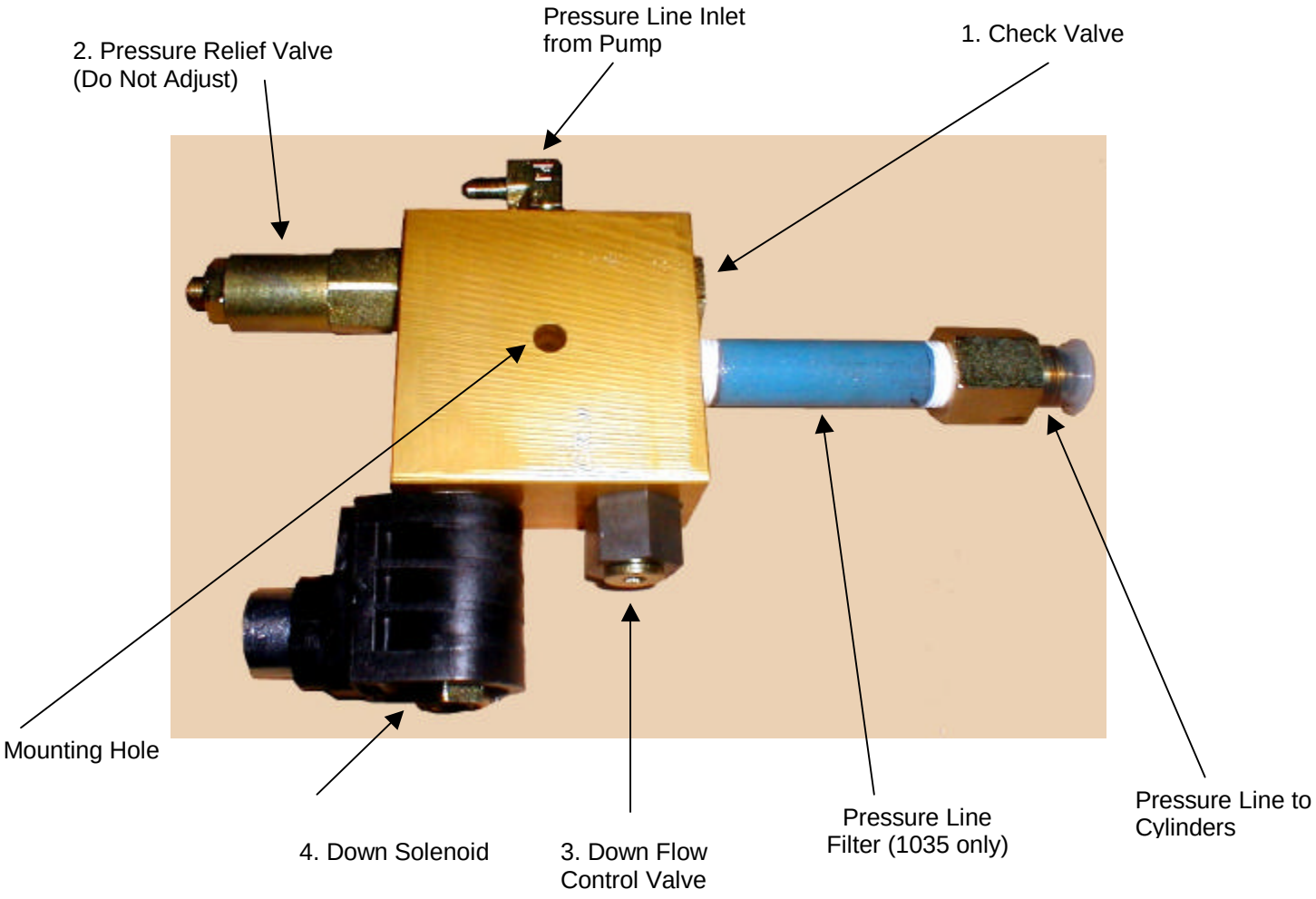
D

HYDRAULIC DIAGRAM FOR UNITS WITH ONE-PIECE MANIFOLDS



HYDRAULIC DIAGRAM FOR MODEL 1035, 1045 & 105

Series 1035, 1045 & 1055
Standard Valve Manifold (Typical)



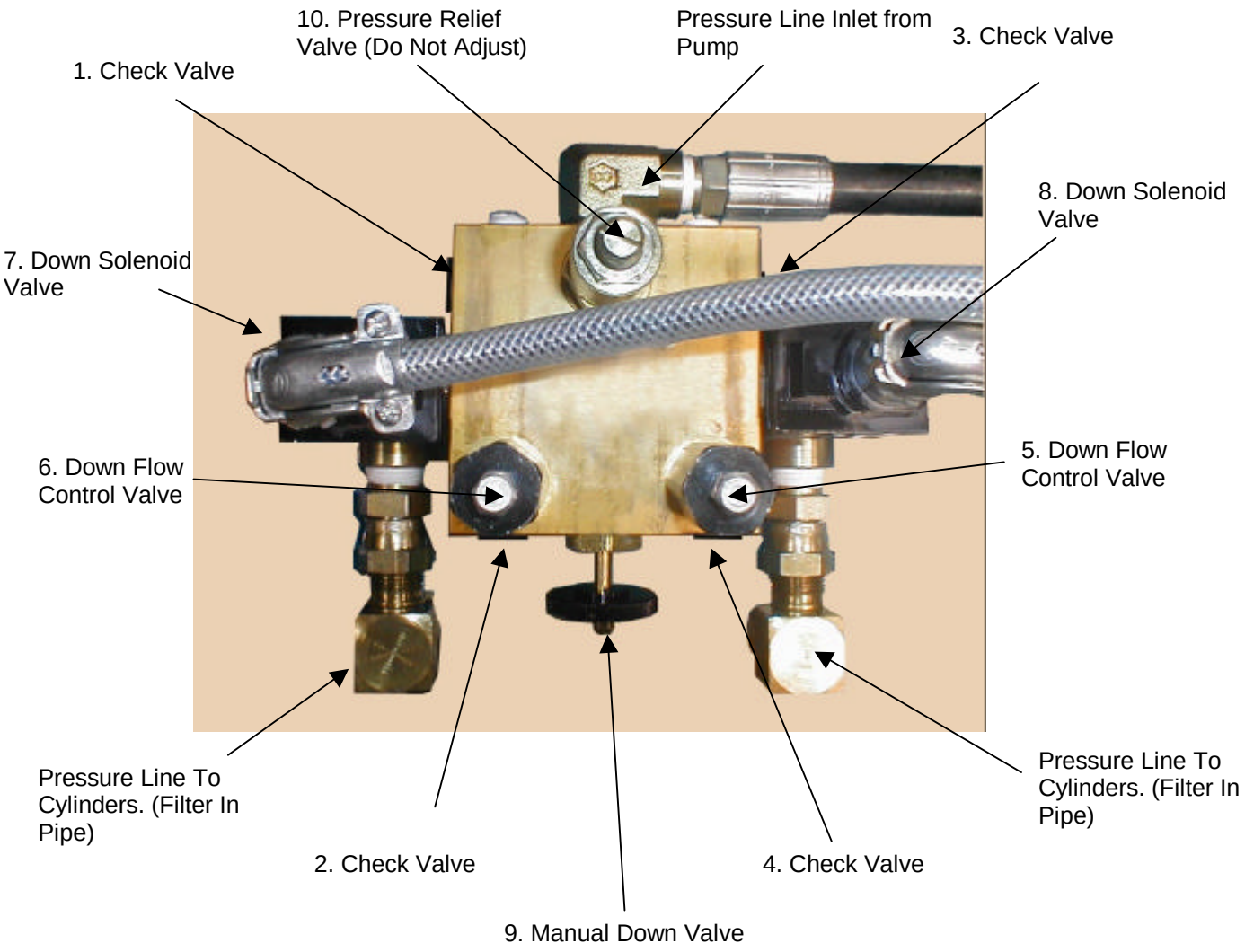
Reference Page 8-10 for Valve Cartridge Details

NOTE: Valve numbers coincide with numbers shown in the hydraulic diagram on Page 8-4.

Part Number Reference

Description	Part Number
1. Check Valve	P-001-262
2. Pressure Relief Valve	P-001-263
3. Down Flow Control Valve	P-001-293
4. Down Solenoid Valve	P-001-279

Series 4000, Model 6200, Model 6300
Standard Valve Manifold

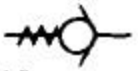


Reference Page 8-10 for Valve Cartridge Details

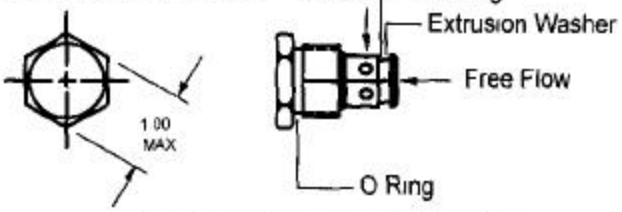
NOTE: Valve numbers coincide with those shown in the hydraulic diagram on Page 8-5

Part Number Reference

Description	Part Number
1-4. Check Valves	P-001-262
5,6. Down Flow Control Valves	P-001-303
7,8. Down Solenoid Valves	P-001-293
9. Manual Down Valve	P-001-277
10. Pressure Relief Valve	P-001-263

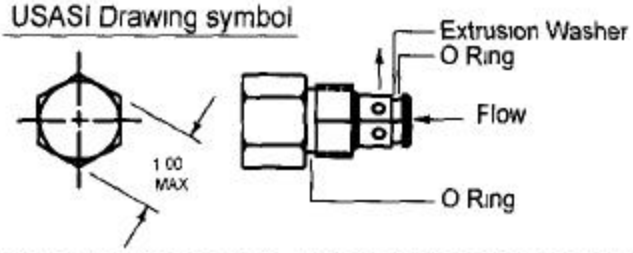


USASI Drawing symbol

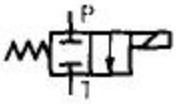


CHECK VALVE POPPET TYPE

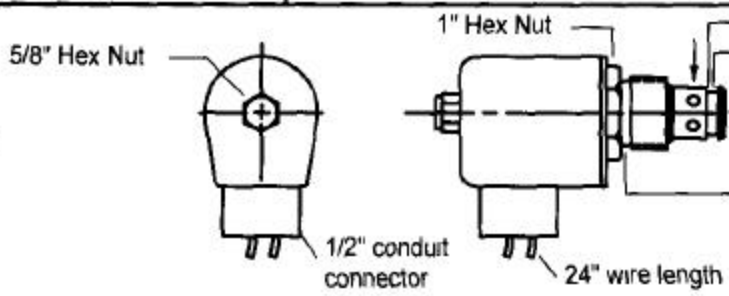
USASI Drawing symbol



FIXED FLOW CONTROL PRESSURE COMPENSATED



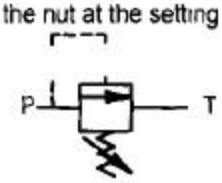
USASI Drawing symbol



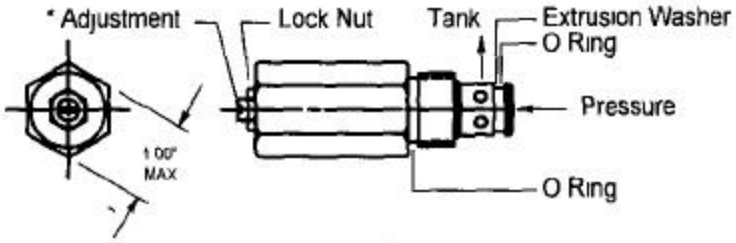
Coil can be removed with 5/8" Hex Nut
without disturbing Hydraulic System
integrity
1" Nut then removes entire valve
To clean Flow Control Down Solenoid Valve and check Valve, use pencil w/ eraser or other
Non-shedding nor sharp object Push in seat at free flow end, repeat several times while
immersed in kerosene then blow dry Inspect O Rings and teflon extrusion washer, then
Re-install

SOLENOID VALVE POPPET TYPE

In the event the Relief Valve setting has been changed the following procedure will approx-
mate the correct setting Lower the equipment completely and hold the down button a few extra
seconds Loosen the locking nut without changing the screw setting Gently turn the screw
clockwise counting the turns until the screw gently bottoms out Return to the original
setting Place a test load on the equipment (if applicable) not exceeding the nameplate
rated load With the equipment fully lowered
turn the adjustment clockwise in 1/8 turn steps
counting the turns until the equipment lifts the rated load
DO NOT bottom out the screw adjustment
lock the nut at the setting



USASI Drawing symbol

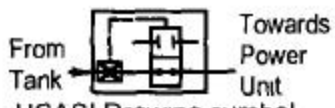


* DO NOT CHANGE FACTORY SETTING
Relief Valve is used to Prevent Overloading Equipment

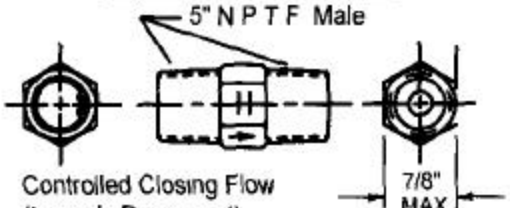
ADJUSTABLE PRESSURE RELIEF VALVE POPPET TYPE

NOTES Velocity Fuse will close in controlled direction
at nominal flow (plus 15% minus 0%) and remain
closed at pressure above 50 PSI
Rated 3000 PSI service material-steel

If Velocity Fuse actuates support the equipment securely
and correct the cause of the high flow rate ie cracked
hose loose fitting etc Then put the hydraulic system
under pressure again to re-set the Velocity Fuse Raise
the equipment remove supports then operation is normal
If Velocity Fuse is to be field installed
Velocity Fuse is piped into Base of each Ram Use elbows
and adapters as needed to hose hydraulic line 90 from
Velocity Fuse laying the hydraulic hose so it will not be
pinched when the equipment is lowered (by installer)



USASI Drawing symbol



(OPTIONAL)
VELOCITY FUSE

Repair Procedures for 3", 3-1/4, 3-1/2", & 4" Cylinders

Cylinders for models 1035, 1045, 1055, 2000K & L, T-Series, 3000, 4000, 6000

Tools & Supplies Required:

(2) Small screwdrivers to remove retaining rings and rod wipers.
(1) snap ring tool (Waldes Truarc external type #S-660 or Industrial pliers #P-104.)
A (5) gallon bucket to collect fluid from the cylinders.
Wrenches to disconnect hydraulic fittings.
Cylinder hone (Craftsman glaze breaker #9K4633 or equivalent).
Emery clothe.
Clean lint free cloths and hose caps.
Clean work surface (butcher paper on top of most surfaces works well), with a means of holding cylinder end fixed position for disassembly and assembly.
"Lubriplate Grease" and hydraulic fluid matching the existing fluid in the system for topping off when finished.
Safety leg supplied with each Advance unit.

Cylinder Removal:

1. Raise the empty lift and settle it securely on its safety leg. (Note that models 1045 &1055 are the only units that will allow cylinder removal in the fully lowered position.)
2. Once settled securely, depress the down button an additional 20 seconds to relieve any pressure from the cylinders. Remove the power connection to the power unit and mark with a warning label or lock the connection out to prevent unintended reconnection.
3. Disconnect the hydraulic hoses from the cylinders, on units made after April 1st 2000 remove the internal "Hexagonal" flow control from the cylinder fitting nipple and cap the hose ends to prevent contamination, refer to page 8-12 for proper orientation.
4. Remove the cylinder from the lift by freeing the upper pin first and swinging the cylinder into an easily supported position then remove the lower pin.
5. 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.
6. Note that if you are going to repack one cylinder on a lift, it is usually a good idea to do all cylinders at the same time. Packings generally wear at the same rate and if you only repack one cylinder, you may have to pull the lift out of service soon thereafter to do the others.

Cylinder Disassembly:

1. Secure the cylinder with a rod through the clevis or cross tube, do not use a vise, which will crush or otherwise damage the housing.
2. Using snap ring pliers (or screwdrivers with spiral type retaining rings), remove the retaining rings in front of the cylinder bearings. Some cylinders also have spacer rings, which are easily removed if the bearing is pushed back into the housing slightly, and these units will have a second retaining ring to remove.

Cylinder Disassembly: (Continued)

3. Carefully remove any debris from the retaining grooves, and then pull out the entire rod, bearing & piston assembly. Note that the groove in the cylinder housing has a sharp edge on the front side and a beveled back edge. The sharp edge is necessary for proper snap ring retention and will probably cut the packing when it is pulled out, but the beveled back edge will allow the new packing to slide in uncut.
4. Remove the hex nut or snap ring adjacent to the piston, then slide the piston and bearing off of the rod. If the hex nut is assembled with Locktite, a small amount of heat may help break the nut loose. Be sure that all components are placed on clean surfaces to avoid contamination.

Repacking and Inspection:

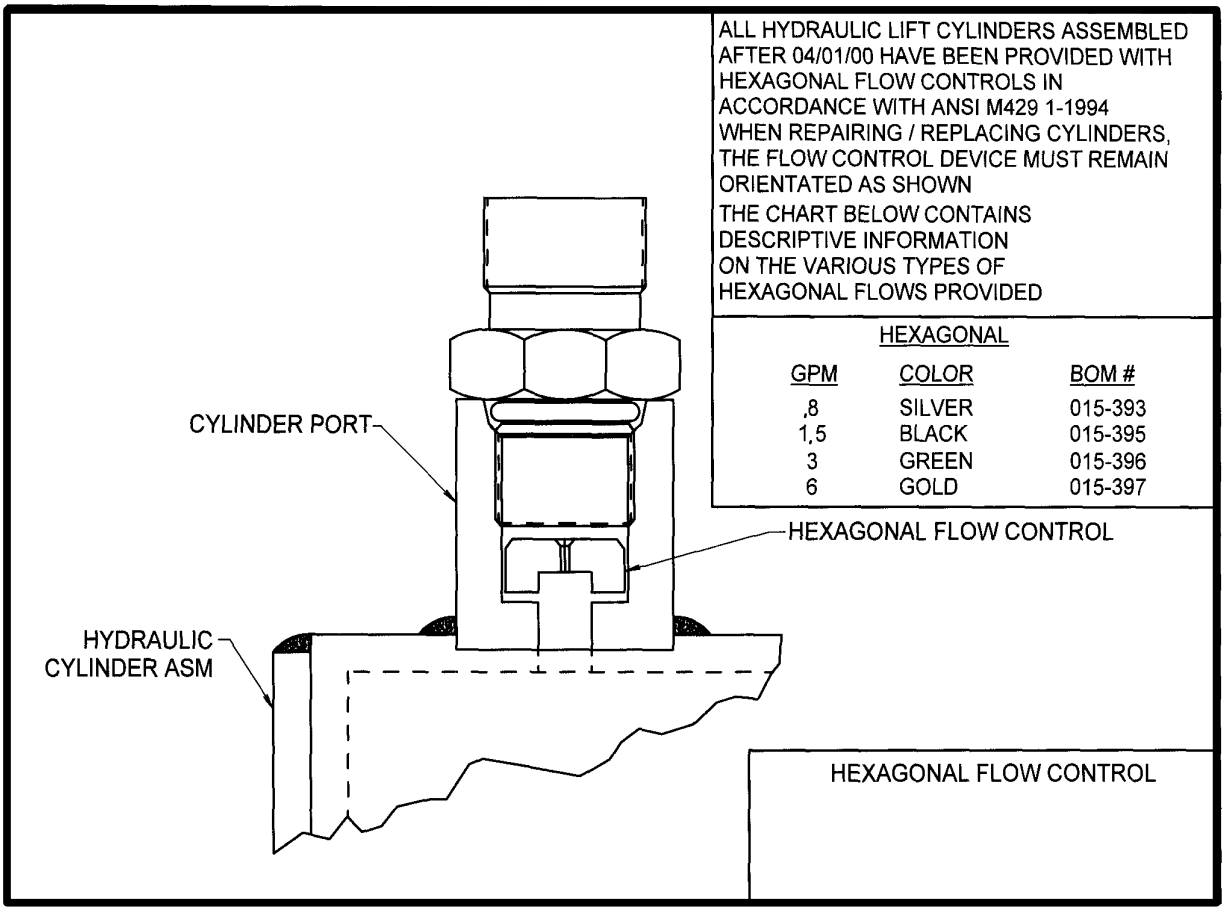
1. Carefully inspect the entire housing with a flashlight, looking for any evidence of rust, scratches or surface blemishes. Small blemishes may be removed with fine emery cloth and larger faults will require the use of the hone listed above. Be sure to thoroughly clean the housing when you are done to avoid contamination.
2. Do not become the victim of a false economy by using only part of a repacking kit. Since you have invested in disassembling the cylinder, use all new packing parts and seals of 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 and remove any debris.
4. Lubricate and insert a new wiper with your fingers, sliding it into its groove. Depending upon temperature, the rod wiper may slide in much 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 repacking the piston by using a screwdriver to carefully remove the old backup rings and seal from the groove. Newer cylinders are also equipped with a wear ring that should be removed at this time. Be careful to leave the grooves nick free and clean.
6. Lubricate the new backup rings, seal and wear ring and gently stretch them into place. Note that the seal fits between the rings.
7. Inspect the static seal groove on the cylinder rod, then lubricate the groove and slide a new static seal in place. Slide the piston back into position noting that the flat side, not the chamfered side, should rest against the retaining ring or nut. Reinstall the retaining ring or nut using Locktite if the fastener is a plain nut.

Assembly:

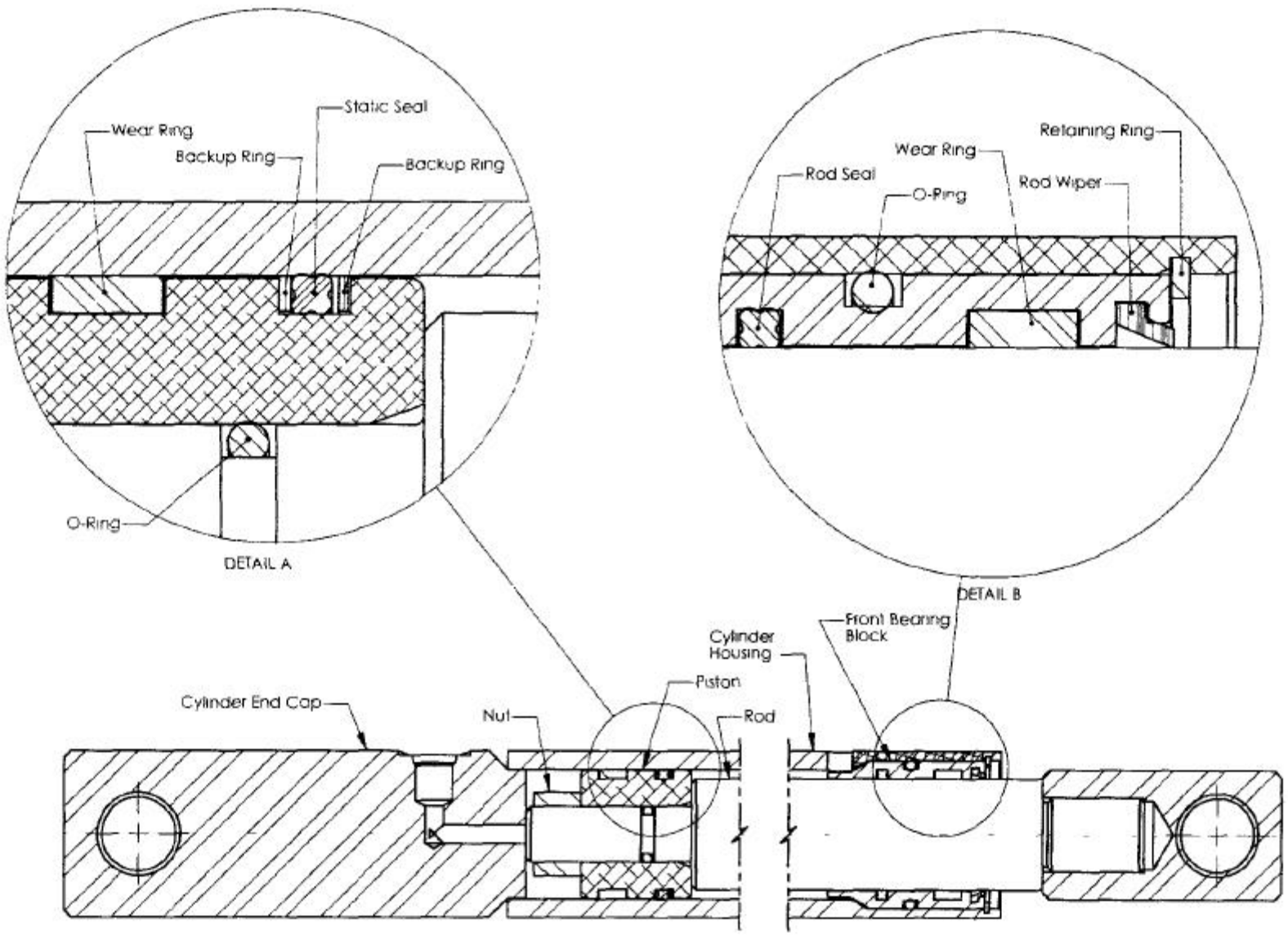
1. Liberally lubricate the outside of the new packing kit and the groove in the cylinder housing, align the piston carefully and slide the entire assembly back into the housing.
2. With 3-1/2” & 4” cylinders you may simply compress the retaining ring and slide the bearing into position and release the ring into its groove. With 3” cylinders you must slide the bearing beyond its normal position to install the inner retaining ring, insert the spacer washer, then install the outer ring. In all cases be sure that the retaining rings are fully seated in their grooves or the cylinders will come apart when fully extended, causing an accident.

Reinstallation:

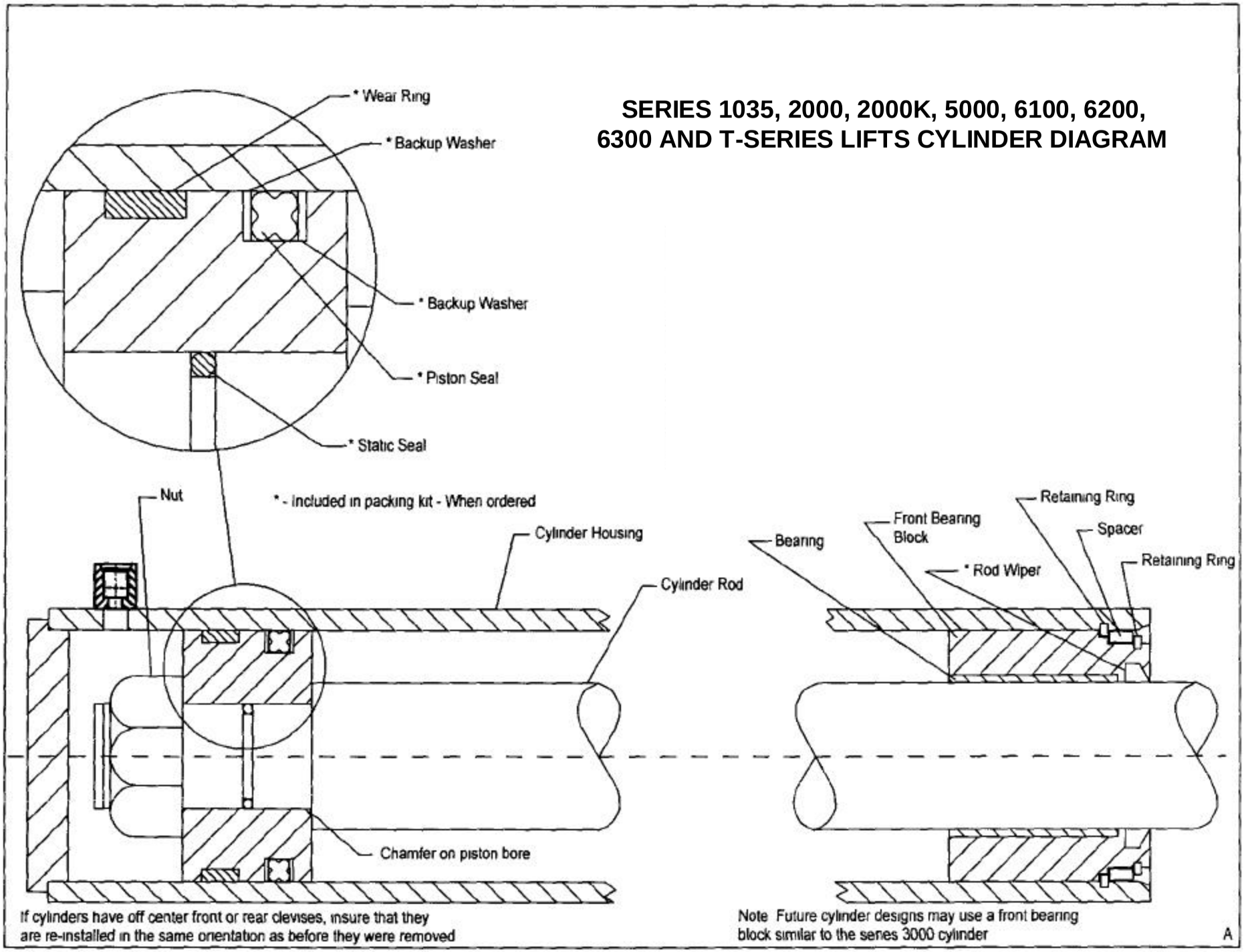
1. Remount the cylinders in the lift.
2. On units made after 4/1/00 reinstall the “Hexagonal” flow controls in the cylinder-housing nipple, care must be taken to insure the flow controls are installed with the flat side visible and the grooved side down as illustrated below.
3. Reattach the hoses with special care to avoid contamination.
4. Clean up any spilled oil to insure that it is not later misinterpreted as a new oil leak.
5. Connect the electrical power and cycle the lift several times, holding the down button an extra 20 seconds each time to help bleed air from the hydraulic system. This will eliminate any “Spongy” operation. Check the oil level and top off ½” from the top of the reservoir with the same type fluid originally used.
6. The lift is now ready to go back into service.



Model 1045/1055 Cylinder

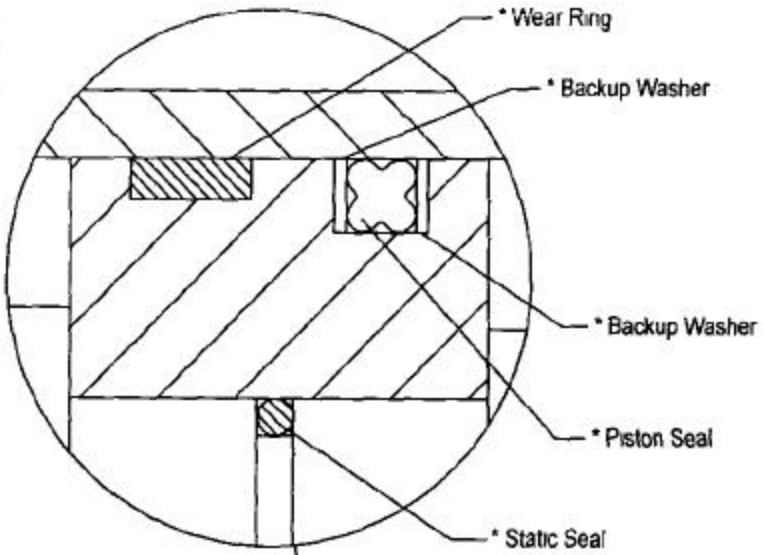


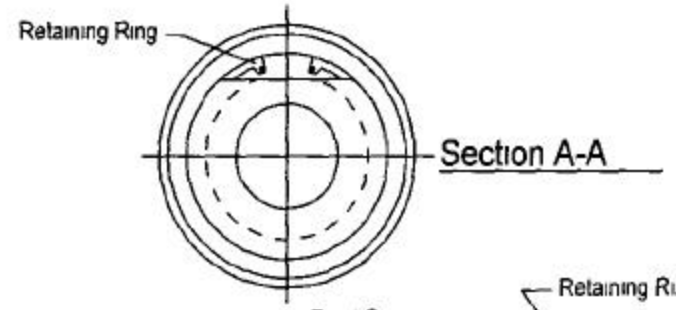
SERIES 1035, 2000, 2000K, 5000, 6100, 6200, 6300 AND T-SERIES LIFTS CYLINDER DIAGRAM



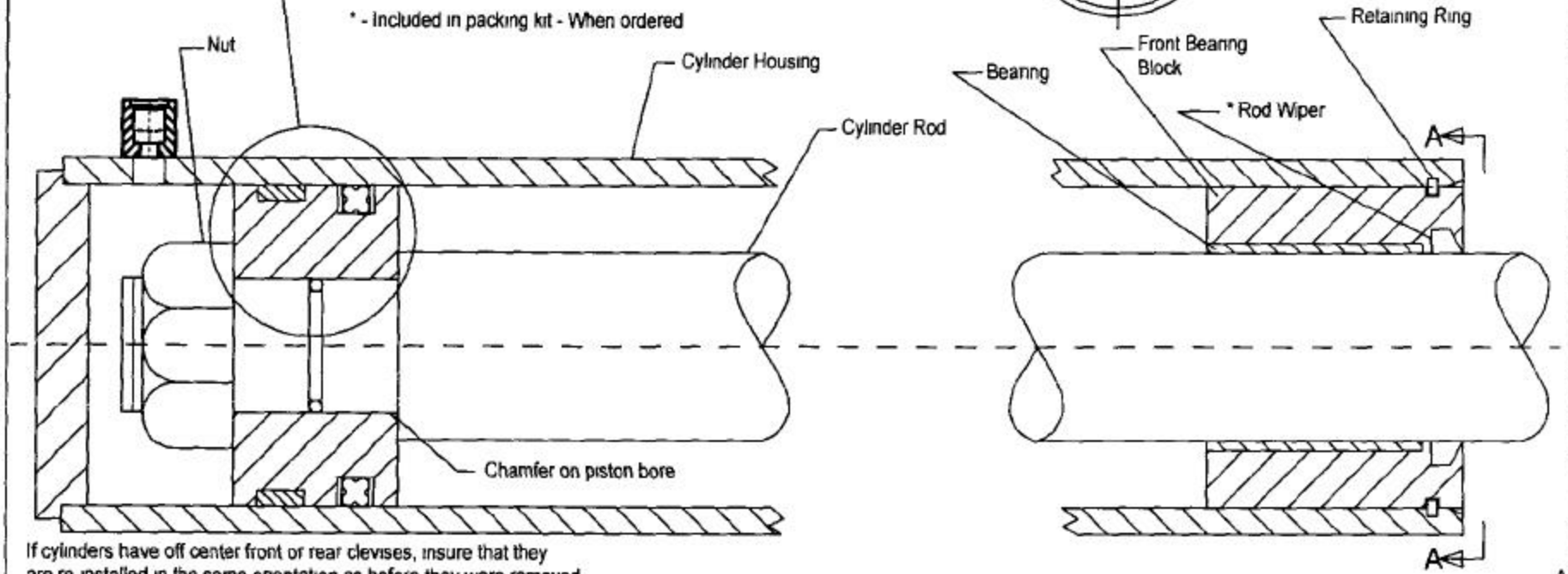
Series 3000, 4000, 6150 Cylinders

Model Number	Capacity	Cylinder Bore	Cylinder Rod Dia
3000	8000	3 1/2"	1 3/4"
3000	10,000	4"	2"
4000	as noted	3 1/2"	2"
6150	5000	3 1/2"	2 1/2"





* - Included in packing kit - When ordered



If cylinders have off center front or rear clevises, insure that they are re-installed in the same orientation as before they were removed

A

Section 9. Electrical Information

The motor supplied as standard is 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 connection 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. There are other motor configurations including single phase 115V & 230V. If you are unsure of the correct voltage or phase, contact the factory before applying line voltage.

If the standard motor is intended for 208V line usage, some caution is advised. If your motor is a 230V 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 208 voltage become very important. If your line voltage varies (due to loads elsewhere in the system, etc.) you may have an advantage by ordering as an option a specific 208V +/-10% motor.

To reverse the direction of rotation on 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:

Advance Lifts' standard electrical supplied is 230V, 3-phase unless otherwise specified. Any field change in supply voltage would entail the following changes.

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.

460V to 230V

A. Change transformer primary connections to 230V.
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 low 230V.
D. Change plug and receptacle for power, if required.

IMPORTANT: When changing voltages, insure motor rotation is correct.

Motor Controllers (Typical)

Specifications:

Motor Starter with adjustable thermal overload.

50VA transformer with 24 VAC secondary fused at 4 amps (Standard)

100VA transformer with 115 VAC secondary fused at 1.6 amps (Optional)

Reset is manual or automatic (manual is standard, automatic is not to be used)

Enclosure is NEMA 12 JIC supplied with (4) conduit openings (motor, down solenoid, power and push button station)

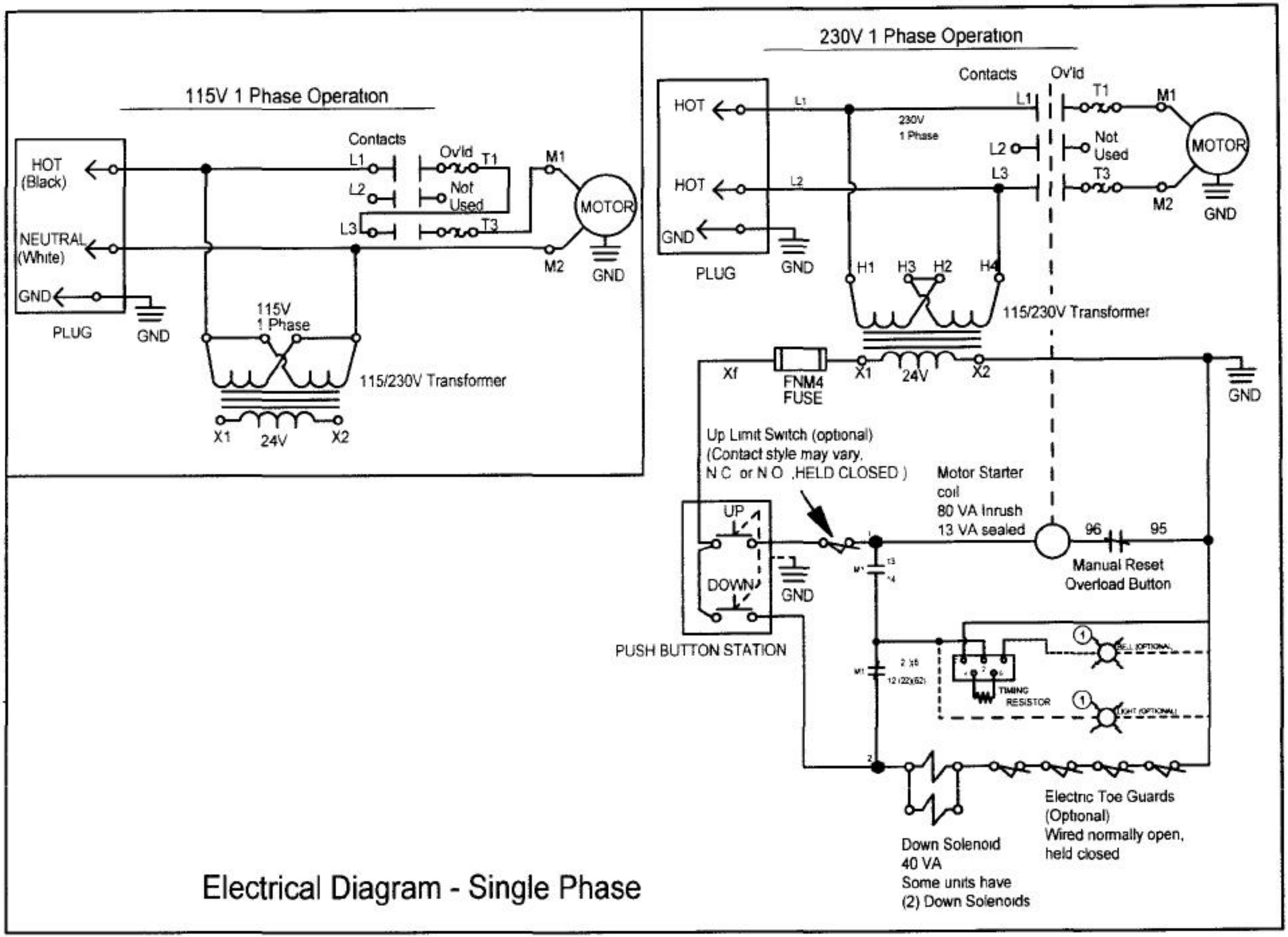
Completely wired with terminal strips for final secondary voltage control connections
All components UL, CSA

Overall dimensions: (approximate)
Metal Enclosures: 9"w x 12"h x 8"d

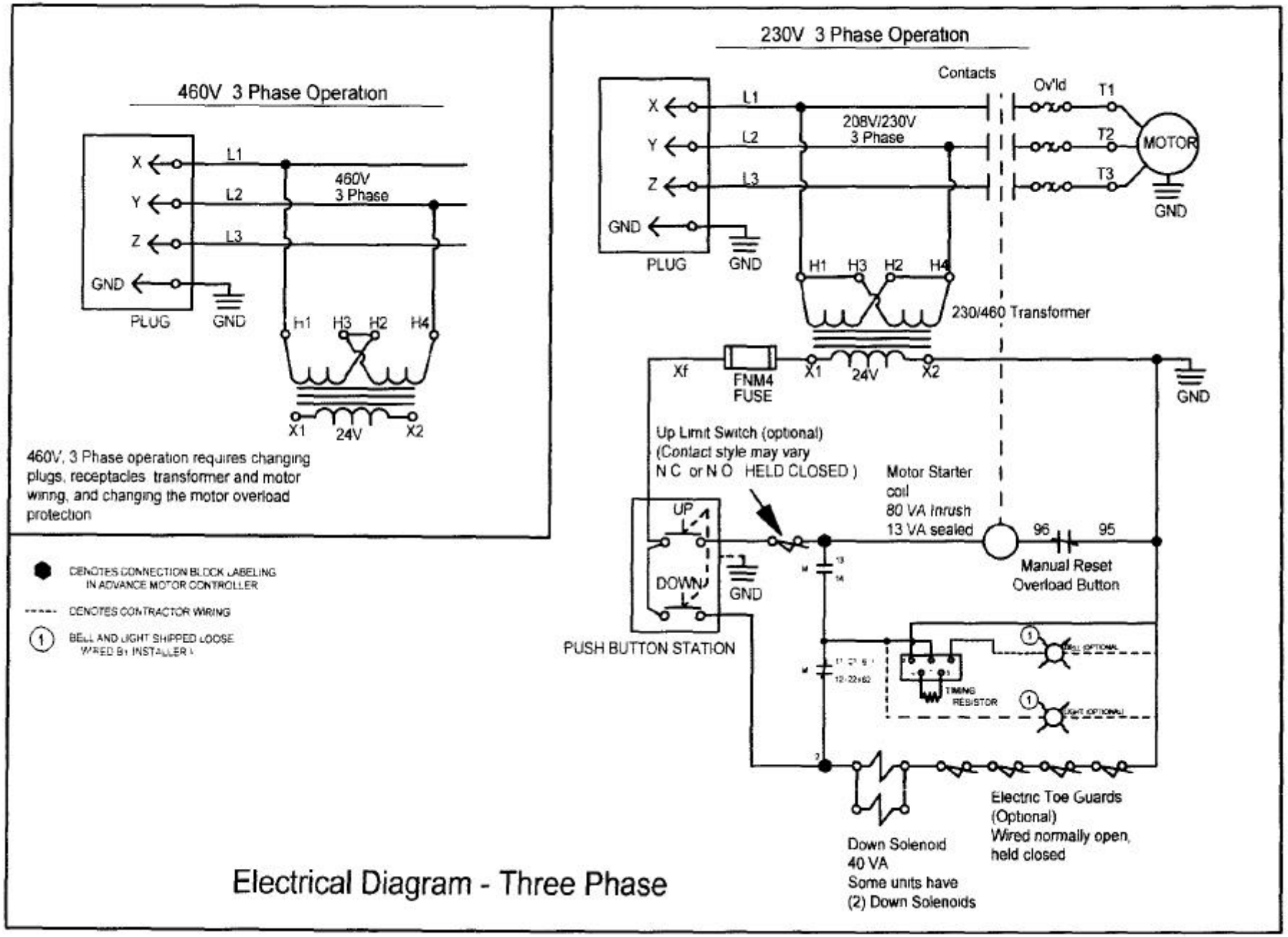
Typical motor controller – appearance may vary.

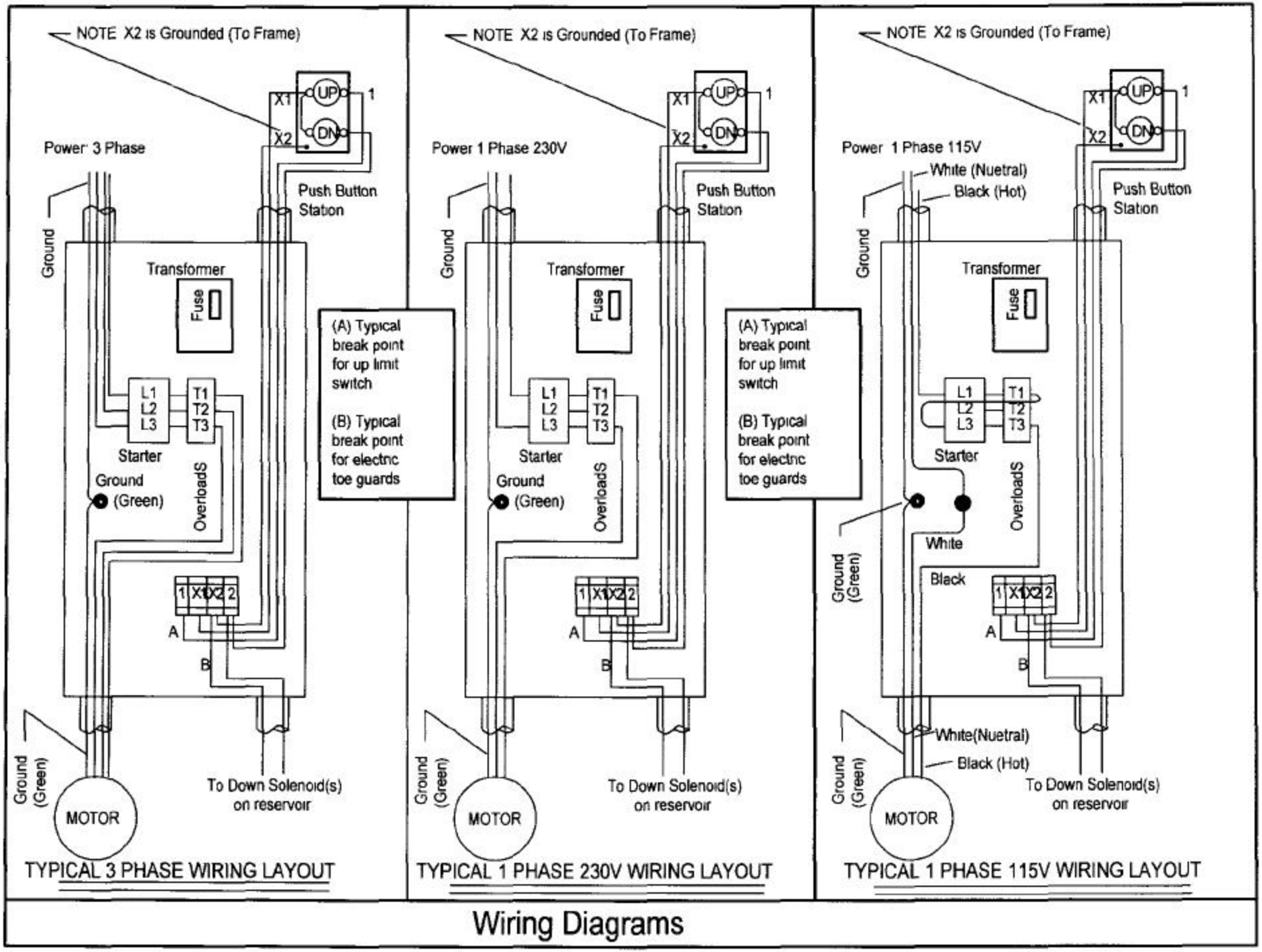
Single Phase

Three Phase



Electrical Diagram - Single Phase


460V 3 Phase Operation
X
Y
Z
GND
PLUG
GND
L1
L2
L3
460V
3 Phase
H1
H3
H2
H4
X1
24V
X2
460V, 3 Phase operation requires changing plugs, receptacles transformer and motor wiring, and changing the motor overload protection
230V 3 Phase Operation
Contacts
Ov'ld
T1
T2
T3
MOTOR
GND
208V/230V
3 Phase
230/460 Transformer
Xf
FNM4
FUSE
Up Limit Switch (optional)
(Contact style may vary
N C or N O HELD CLOSED)
Motor Starter
coil
80 VA Inrush
13 VA sealed
96
95
Manual Reset
Overload Button
UP
DOWN
PUSH BUTTON STATION
TIMING
RESISTOR
Electric Toe Guards
(Optional)
Wired normally open,
held closed
Down Solenoid
40 VA
Some units have
(2) Down Solenoids
DENOTES CONNECTION BLOCK LABELING IN ADVANCE MOTOR CONTROLLER
DENOTES CONTRACTOR WIRING
BELL AND LIGHT SHIPPED LOOSE WIRED BY INSTALLER
Electrical Diagram - Three Phase



Wiring Diagrams

TYPICAL MOTOR INFORMATION

MOTORS

SERIES	HORSEPOWER	SPEED
1035	2	1800
1045	2	1800
1055	2	1800
2000	5	1800
2000K	5	1800
T SERIES	5	1800
3000	5	1800
4100	5	1800
4200	7.5	3600
4300	7.5	3600
4400	7.5	3600
6000	5	1800
6100	5	1800
6150	5	1800
6200	5	3600
6300	5	3600

230 VOLT 3 PHASE					460 VOLT 3 PHASE				
HORSEPOWER	APPROX FULL LOAD AMPS	MIN COPPER WIRE SIZE (75C) THW,THHN,THWN,XHHW	CIRCUIT BREAKER AMPS	DUAL ELEMENT, TIME DELAY FUSE AMPS	HORSEPOWER	APPROX FULL LOAD AMPS	MIN COPPER WIRE SIZE (75C) THW,THHN,THWN,XHHW	CIRCUIT BREAKER AMPS	DUAL ELEMENT, TIME DELAY FUSE AMPS
1	3.6	14	15	5.6	1	1.8	14	15	2.8
1-1/2	5.2	14	15	8	1-1/2	2.6	14	15	4
2	6.8	14	15	10	2	3.4	14	15	5.6
3	9.6	14	20	15	3	4.8	14	15	8
5	15.2	12	30	25	5	7.6	14	15	12
7-1/2	22	10	45	30	7-1/2	11	14	20	17.5
10	28	8	60	40	10	14	12	25	20

115 VOLT 1 PHASE					230 VOLT 1 PHASE				
HORSEPOWER	APPROX FULL LOAD AMPS	MIN COPPER WIRE SIZE (75C) THW,THHN,THWN,XHHW	CIRCUIT BREAKER AMPS	DUAL ELEMENT, TIME DELAY FUSE AMPS	HORSEPOWER	APPROX FULL LOAD AMPS	MIN COPPER WIRE SIZE (75C) THW,THHN,THWN,XHHW	CIRCUIT BREAKER AMPS	DUAL ELEMENT, TIME DELAY FUSE AMPS
1/2	9.8	14	20	15	1/2	4.9	14	15	8
3/4	13.8	12	25	20	3/4	6.9	14	15	10
1	16	12	30	25	1	8	14	15	12
1-1/2	20	10	40	30	1-1/2	10	14	20	15
2	24	10	50	30	2	12	14	25	17.5
3	34	8	70	50	3	17	10	35	25
5	56	-	-	-	5	28	8	60	40

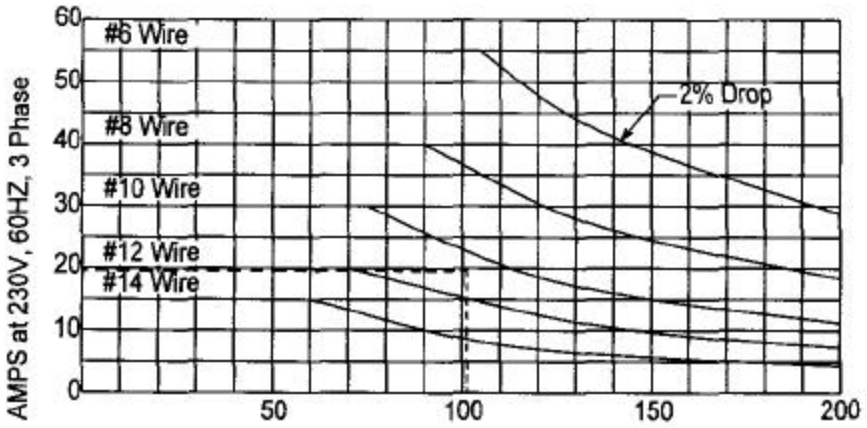
NOTE: These tables are intended as a guideline, not to supersede national or local electrical codes.

Branch Circuit Wire Sizes For 230V & 460V, 3 Phase, 60HZ.*

(Calculated for 2% maximum allowable line voltage drop with copper conductors Table is a guideline, not intended to supersede the National Electrical or local codes)

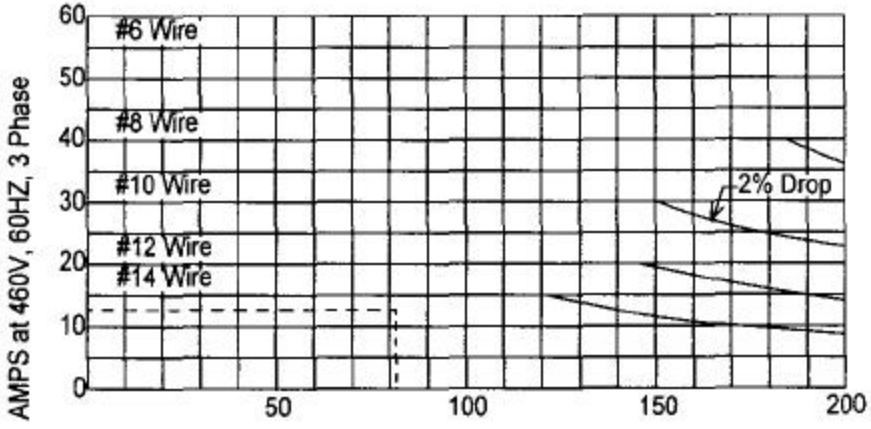
Directions Locate Current on vertical axis, locate wire length on horizontal axis Use wire size above point of intersection

*Note See table listing minimum wire sizes and fusing on motor data page



Length of Wire in Feet

Example 5HP, 230V, 3 phase, 19 6A motor, length of wire run is 102 FT Wire size above point of intersection is #10 (#12 wire would have more than 2% drop)



Length of Wire in Feet

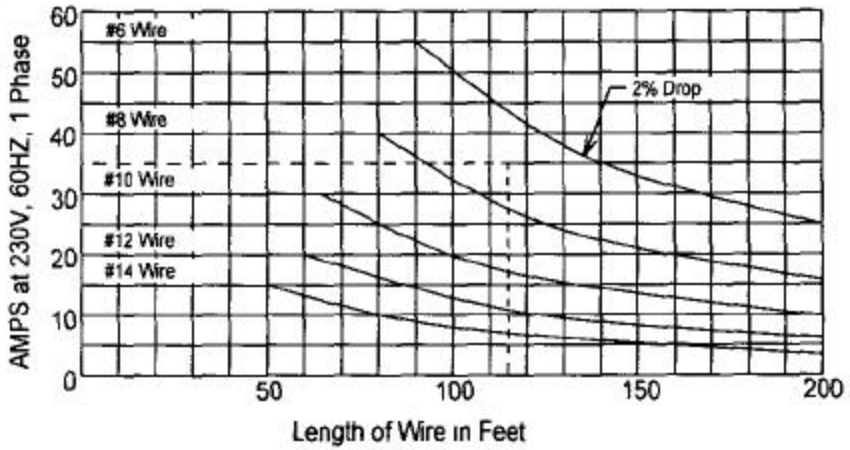
Example 7 5HP, 460V, 3 phase, 12 6A motor, length of wire run is 82 FT Wire size above point of intersection is #14

Long wiring runs with undersized wire will cause voltage drops Voltage measurements should therefore be made at the motor terminals, so that the true voltage supplied to the motor is determined Measure the voltage when the motor is fully loaded (load on lifting equipment and lift leaving the fully lowered position) Measurements with the motor idling (no load) is at low current, and voltage drops will not be apparent under those circumstances Consult the table in this manual for guidelines on wire run sizes Note importance of 208V wire runs as noted in Motor Data

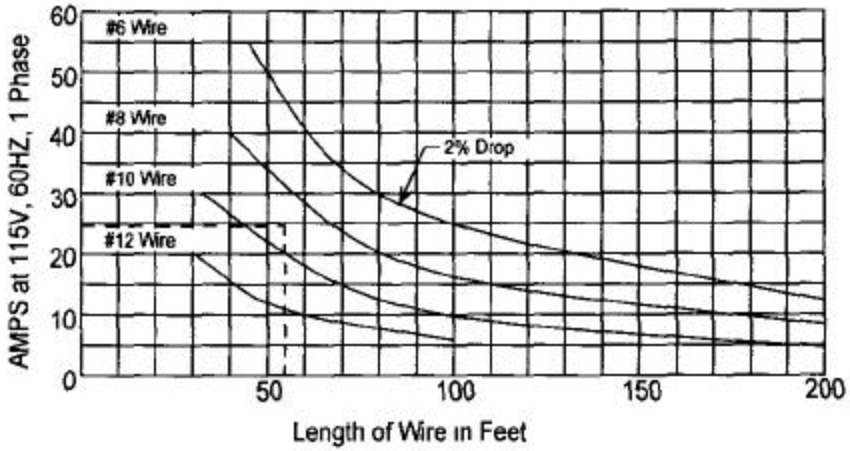
Branch Circuit Wire Sizes For 230V & 115V, 1 PHASE, 60HZ

(Calculated for 2% maximum allowable line voltage drop with copper conductors Table is a guideline, not intended to supersede the National Electrical or local codes)

Directions Locate Current on vertical axis, locate wire length on horizontal axis Use wire size above point of intersection

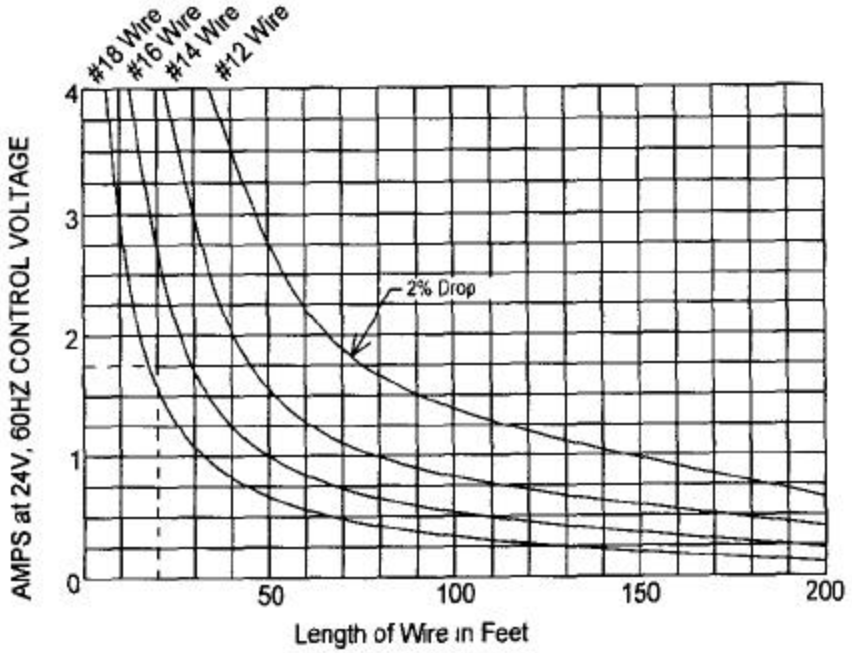


Example 5HP, 230V, 1 phase, 35A motor, length of wire run is 115FT Wire size above point of intersection is #6



Example 1 5HP, 115V, 1 phase, 24A motor, length of wire run is 55FT Wire size above point of intersection is #8

CONTROL CIRCUIT WIRE SIZE FOR 24V, 1 PHASE, 60HZ



Example Down Solenoid Drawing 40VA

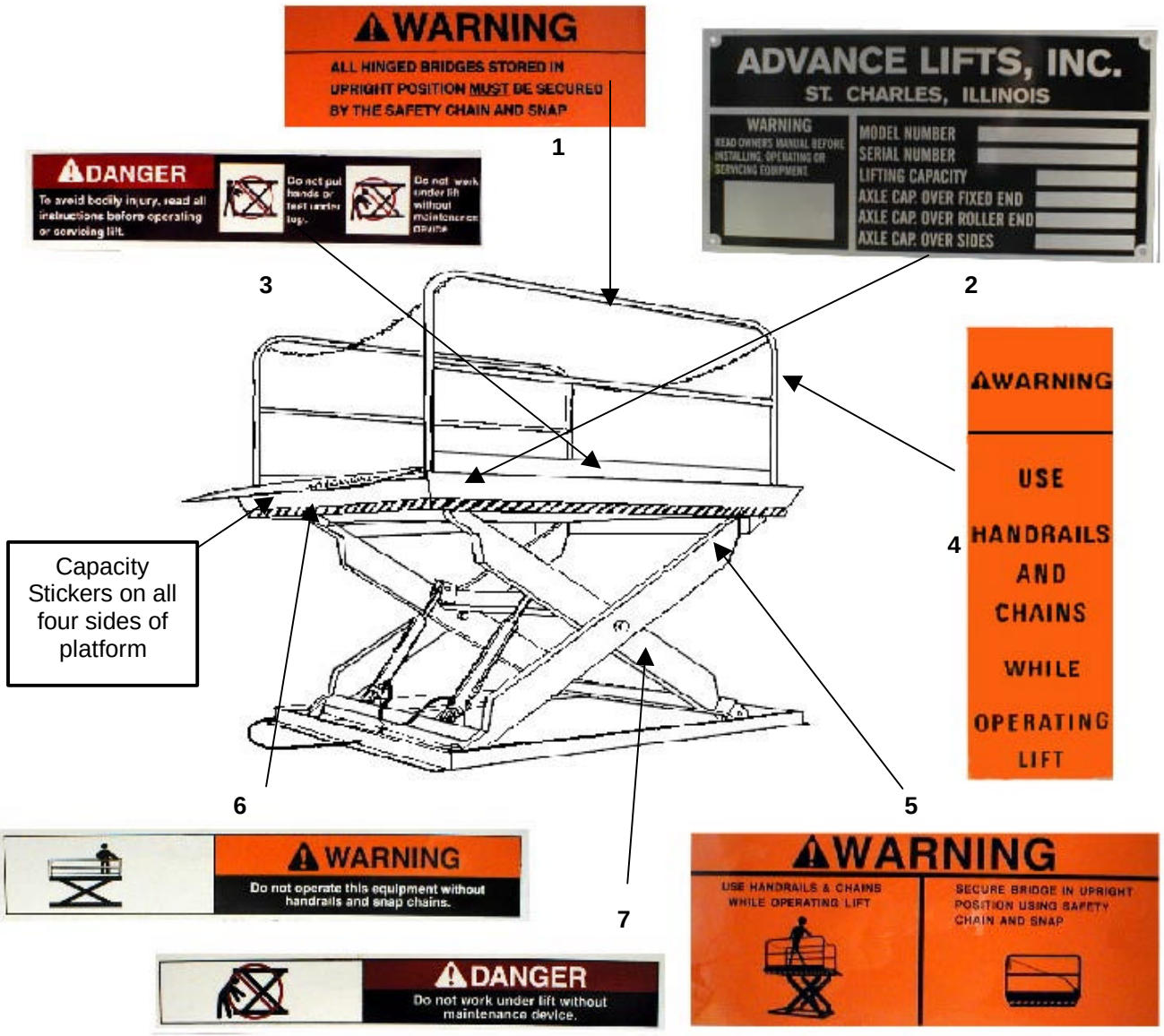
$$\left(I = \frac{W}{E}\right) \quad \frac{40VA}{24A} = 1.7A$$

Length of coil cord is 20FT Wire size above point of intersection is #16

Advance Lifts uses #16-4 wire size when 20FT coil cord is ordered for push button station control

*Graph calculated for 4 wire copper cord, types S, SO, SJ, SJO

SECTION 10. IDENTIFICATION AND LABEL PLACEMENT



TYPICAL PLACEMENT
(EACH DECAL KIT IS SUPPLIED WITH LOCATION INSTRUCTIONS)

No.	Qty.	Location
1.	(2)	Centers of handrail, both sides
2.	(1)	Cylinder end, right side of platform
3.	(4)	Centered on each side of platform
4.	(4)	Upper vertical section of handrail
5.	(2)	Outer leg
6.	(1 per bridge)	Under bridge
7.	(2)	Torque tubes each end

DECAL KITS BY MODEL/SERIES

MODEL 1035 (P-005-765) MODEL 1045/55 (P-004-407) SERIES 2000 (P-004-059) SERIES 2000K (P-003-993)

T SERIES (P-023-350) SERIES 3000 (P-004-261) SERIES 4000 (P-004-375) SERIES 6000 (P-005-564)

SECTION 11. TROUBLESHOOTING

A. Equipment does not rise; pump is running: (see also Section M)

1. The motor rotation may be reversed. See the installation procedure on how to jog the motor to check for proper rotation. If the lift has been installed for some time and the motor is 3-phase, it is possible that the plant wiring “upstream” has been changed during plant maintenance or alteration, and the motor is now running reversed. A hydraulic pump can only run reversed for a short time (possibly 10 to 20 seconds) without causing permanent pump damage.
2. Motor may be single phasing. Check wiring and overloads to be certain that each three-phase line is present at the motor.
3. Voltage at motor terminals may be too low to run the pump at existing load. Check voltage directly at motor terminals while pump is running under load. (Reading source voltage with the pump idling will not give accurate results). Inadequate or incorrect wiring can starve the motor of voltage and current and will show up at the motor terminals when the motor is drawing the higher current that is required while motor is loaded.
4. Check for a hydraulic hose leak or pinching, and correct as necessary.
5. Check under the pump coupling to insure the key way has not slipped off the pump shaft.
6. Check for oil shortage in the reservoir and correct by filling the reservoir. Refer to “Fluid Recommendations” in this manual for the correct fluid for your ambient temperature.
7. The suction filter in the reservoir or the pressure line filters in the pipe outlet of the power unit or the breather cap on the reservoir may be clogged. Clean as required.
8. Check if the load is exceeding equipment ratings causing the relief valve to bypass the fluid back to the reservoir. Never change the relief valve setting, these are 100% tested, adjusted and locked at the factory. Any change in the relief valve setting could cause your equipment either not to lift its capacity, or cause dangerous forces in the equipment, and void your warranty.
9. Check that the suction line fittings are not loose, causing the pump to pull in air instead of fluid. Check for a hairline crack on the suction port of the pump. The clear suction line should stay full of oil at all times, clear, no air. Check that the natural curve of the suction hose in the reservoir doesn’t cause the filter to rise out of the fluid. Re-install the suction line without rotating it and the tension of the hose will free the suction hose to lay against the reservoir wall and the filter to lay flat near the reservoir bottom. If you have the short round “pancake” type of filter with the filter screen on the bottom of the filter, insure that it does not rest against the bottom of the reservoir, as this will restrict the flow to the pump.

10. The down solenoid may be energized due to incorrect wiring, or mechanically stuck open, bypassing fluid.
    A. Check the wiring. Hold a non-magnetized screwdriver to the top of the down solenoid coil and press the up button. If you can feel magnetism, the wiring is faulty.
    B. Lightly tap the down solenoid to seat it properly. Do not bang it hard, as internal stem parts may be permanently damaged. The solenoid coil can be removed, and the down valve removed for cleaning as explained in the hydraulic "Component Information" section.
    C. Disconnect the pressure line from the valve manifold to the equipment. Place a pressure gauge at the valve output, using high-pressure reducers. Press the up button in a short jog and read the pressure. Press the down button to relieve the pressure. If the system will not put out the pressure indicated on the hydraulic diagram, the trouble is either the valves or pump. If a load is not available, then the maximum hydraulic system pressure can be checked on a gauge by raising the unit to its full height momentarily against its physical stops. Proceed to step 11 to determine which place the trouble exists.

11. The hydraulic pump may be inoperative. Disconnect a hydraulic line at the power unit, use a large bucket (5-gallon) and run the pump a short time. If no flow appears either the pump or pump motor coupling inside motor mounting flange is defective, or pump rotation is reversed. Connect a pressure gauge to the outlet of the pump, through a high-pressure tee and bleeder valve with hose to a bucket. Slowly turn the bleeder valve and see if the produces specified pressure. Do not close the valve all the way as the pressure buildup of a good pump could cause the pump to explode. If the pump does not put out the required pressure, then the problem is in other areas, such as a down solenoid valve leaking fluid back to the reservoir, allowing pressure not to be built up in the system. If the pump will not put out the required pressure, replace the pump.

12. Repeated continuous type operation of the equipment may cause thinning of oil due to heat buildup. Feel the side of the reservoir to check the temperature of the oil. The equipment is intended for dock type operation, not elevator type operation that would make the equipment cost several times as much. The thin oil can cause the equipment not to rise, and in time, ruin the hydraulic pump. This type of operation could void the warranty considerations.

B. Equipment raises too slowly:

1. Small amounts of foreign material could stick in the down solenoid, bypassing some of the fluid. Lower equipment and clean the down solenoid valve.
2. Foreign material clogging the suction filter, breather cap, pressure line filter, or a hose that is pinched. See A-4, 5, 6, 7 and 9.
3. Low motor voltage. See A-3.
4. Load exceeding equipment ratings. See A-8.
5. Oil may be too thick (ambient temperature) for proper operation. Refer to " Fluid Recommendations".

6. Equipment in which the cylinders are field installed may have incorrect alignment of cylinders, causing binding. Measure and ascertain that the cylinders are in the correct alignment with the equipment and with each other. Binding cylinders will often cause a “shuddering” vibration when the equipment is operating.
7. Oil may be too thin for ambient temperatures. See A-12

C. Motor labors or heats excessively:

1. Voltage may be too low. See A-3.
2. Wiring may be incorrect. Check that one leg of the motor lines is not open or grounded.
3. Pump may be overheating from oil starvation that develops high internal heat, heating both the motor and the pump, eventually causing pump failure. See A-1 through A-9.
4. Oil may be too thick for ambient temperature. See “ Fluid Recommendations”. Binding cylinders. See B-6.
5. Pump may be overheating due to insufficient lubrication caused by oil being too thin. See A-12.

D. Operation is “spongy”:

1. Bleed the cylinders to release trapped air by lowering the equipment to the fully down position and hold the down button depressed for an additional 20 seconds. Raise lift and repeat this procedure several times. Check that the oil completely fills the clear suction hose at all times. If the level falls back to the reservoir oil level, check suction lines and fittings for an air leak.
2. Check for oil starvation. See A, 1-9.
3. Do not confuse “spongy” operation with small surges caused by foreign material on equipment wheel roller plates.

E. Equipment lowers too slowly:

1. Pressure filter in pipe outlet of power unit may require cleaning. See “ Component Information” for proper procedure.
2. Check for pinched hose, tubing, or obstruction in piping lines.
3. Check “Fluid Recommendations” for your ambient temperature type. Oil may be too thick. See also H-6.
4. Foreign material in flow control valve. With equipment fully lowered, remove and flush out any foreign material. Do not change flow control setting, as equipment could be damaged by high speeds. See “ Component Information” for proper way to remove, clean and install the flow control valve.
5. Equipment having two down solenoid valves and/or flow control valves may have one valve inoperative.
6. Binding cylinders. See B-6.

F. Equipment lowers too fast:

CAUTION! This can develop into a dangerous condition, the equipment reaching destructive speed. Find and correct this condition before allowing use of this equipment.

1. Check for leaking hoses, particularly cracked fittings or other damage caused by equipment motion near the equipment and power unit, over-tightening of fittings until they develop hairline cracks. Check underground conduits for evidence of fluid leaks.
2. Inspect the check valve. The combination of the flow rates of the down flow control valve and a check valve stuck open due to foreign material, could increase the lowering speed. See G-2.
3. If the equipment lowers initially at a normal rate, then speeds up as the equipment lowers, check the flow control valve(s). Foreign material could stick, not allowing the pressure compensated function of the control to operate normally. See “Component Information” for the method of removal and replacement.
4. Oil may be too thin. See A-12.

G. Lift raises then lowers back down:

1. Down valves may be incorrectly wired or stuck open due to dirt in the system. See A-10, a. & b.
2. Check valve may be stuck open due to dirt in the system. See “Component Information” for removal, cleaning and installation. If pump and motor turns backward while the lift is lowering back down, the check valve is certainly inoperative.
3. Cylinder packing may be leaking. Check for oil leakage, see “ General Hydraulic Information” and section on “Cylinder Repair Procedures”.
4. Check for leaking hoses, fittings, or evidence of oil in underground conduit runs.

H. Equipment has raised but will not lower, or lowers partly:

1. Check both main and transformer secondary fuses.
2. Incorrect down solenoid wiring.
3. Stuck down solenoid valve. See A-10b, however do not remove the down solenoid body, as the equipment will come down with nothing to hold it in place.
4. Faulty down solenoid coil. Coil can be removed safely for replacement. As in step 3, do not remove valve body.
5. Down limit switch (if used) or electric toe guards (if used) inoperative or incorrectly wired. If you have electric toe guards, check that the hydraulic hose is secured to the bottom of the pit so it cannot accidentally trip the electric toe guard.
6. Safety maintenance bar or leg or other object blocking down travel. Do not pry out any object blocking down travel, because the hydraulic pressure has already been removed when the down button was pressed, and the equipment will fall at a dangerous speed. Raise the equipment slightly using the up button, remove object, then press the down button.

7. Improper oil for ambient temperatures. Oil may be too thick, causing improper operation of velocity fuses (if used). See “Component Information’ on velocity fuses. Warm the cylinders by wrapping heat tape (of the type used for water pipes) around the cylinder. Later, after operation is normal, change to proper oil as per “Fluid Recommendations”.
8. Binding Cylinders. See B-6

I. Equipment raises slightly, then equipment stops and motor stalls:

Check the suction line filter. Filter may be clogged, allowing slight movement until grime seals off filter. Check the suction filter for buildup of “varnish”. If necessary, remove the suction filter, hold the suction hose down into the oil and try normal up operation of equipment. If operation returns to normal either clean or replace the suction line filter. See the “Component Information” section for procedure and proper placement of the suction hose.

J. Oil leaking or spraying out of the reservoir:

1. Reservoir may be mounted on its side. The motor should sit on top of the reservoir, the mounting bracket positioned vertical for lagging the power unit to the wall.
2. Clogged air breather allowing reservoir to build up positive pressure, then spraying oil. Try unit operation with air breather removed and clean or replace the air breather if this corrects the condition.

K. Equipment will not raise, motor will not run:

1. Control fuse has blown.
2. Motor starter overload has tripped. Depress reset button on controller.
3. Line fuse blown, single phasing motor or motor starter overload tripping. See #2 above.
4. Initial installation: Line voltage 230V and transformer wired for 460V. This will give 12V-control voltage instead of 24V, and motor starter will not operate. Check to make sure motor was not wired for 460V before trying operation. The same situation applies to 115V control voltage. Use a good AC voltmeter to check for proper control voltage.
5. Check transformer for loose screw terminals at the various connection points including jumpers and under the fuse clips.
6. Check push button station for proper operation and its wiring to the controller.

L. Down solenoid or Magnetic Starter Coil burns out routinely:

1. Transformer may be wired wrong. As an example, a 460V line with the transformer and primary wired for 230V will give the control voltage of 48V instead of 24V. (Same doubling voltage applies to 115V control transformers.) This will burnout coils ranging from immediately to several month intervals, depending on the stamina of the coil. Correct the condition. P 10-5
2. The transformer may be defective. Check control voltage with a good AC voltmeter.

3. Although very rare, high voltage spikes may be coming in on the power lines at random, burning out coils. This cannot be detected with a power company recorder, A “Varistor” can be purchased and easily installed on control systems to protect the coils. More severe cases on both 115V or 24V control systems may need a special “ High Insulation Transformer” in place of the standard control transformer.

M. Equipment does not lift rated load, or raises load about 1” then stops:

1. Check troubleshooting section (A), 2 through 11. Check if platform roller wheels roll freely with no binding as lift raises and lowers.
2. Lift may be overloaded. If a lift is listed as capable of fork truck loading, bear in mind that most “sit-down” rider fork trucks weigh at least 5,000 to 7,500 pound empty.
3. Platform may be shifted or damaged from transit or unintentional abuse.
   A. Check if the inside edge of the bevel toe guard is rubbing against the base frame in the fully lowered position. Look for scratch marks on the base frame. Bend back bevel toe guards as required and see “b” below.
   B. Check if the platform roller wheels are running straight on their platform members as the lift raises and lowers and legs or wheels are not rubbing on nearby platform members. Consult Advance Lifts on how to straighten out a platform.
   C. Check that the platform roller wheels are actually rolling as unit raises.
4. There may actually be no problem. Many shipping tickets contain estimated weights much lower than the actual weight. The lift may be seeing a load based on shipping tickets, well above lift capacity. In this case the lift would not generally raise the 1” and stop, generally it will not lift at all from the full lowered position.

SECTION 12. ADVANCE LIFTS INC. PARTS AND LABOR 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 125,000 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.

ADVANCE LIFTS INC PART LISTS

1035 PARTS LIST

GENERAL DESCRIPTION	PART #
MECHANICAL:	
WHEEL	P-005-692
WHEEL PIN (1" x 4-5/8")	P-A-0394
WHEEL PIN SNAP RING	P-001-876
MAIN AXLE PIN (1-3/4" x 8-1/2")	P-A-0401
MAIN AXLE PIN SNAP RING	P-001-063
HANDRAIL	P-005-764
HINGED STEEL BRIDGE (18" x 44")	P-A-0976
HINGED RAMP (30" x 60")	P-D-1747S11
CYLINDER: Lifts manufactured before 4/1/00 require an elbow part # P-010-219 when replacing a complete cylinder assembly.	
COMPLETE CYLINDER	P-D-1747S
CYLINDER PACKING KIT FOR 1035	P-005-754
CYLINDER ROD	P-005-752
CYLINDER PISTON	P-A-1409
CYLINDER BEARING ASSEMBLY	P-003-923
CYLINDER SPACER	P-A-0892
LOWER CYLINDER PIN (1" x 3-5/8")	P-A-4000
UPPER CYLINDER PIN (1" x 4-1/2")	P-A-0410
CYLINDER PIN SNAP RING	P-001-876
FLOW CONTROL CARTRIDGE (6 GPM) PRE 4/00	P-001-305
GOLD HEXAGONAL FLOW CONTROL AFTER 4/00	P-015-397
ADAPTER FITTING (ORB X NPT ELBOW)	P-010-219
HYDRAULIC: (COMMON TO ALL POWER UNITS)	
HYDRAULIC PUMP	P-000-357
MANIFOLD VALVE ASSEMBLY	P-009-024
MANIFOLD BLOCK ONLY	P-D-4900
CHECK VALVE	P-001-262
24V DOWN SOLENOID VALVE AND COIL ASM	P-001-259
24V DOWN SOLENOID COIL ONLY	P-001-260
DOWN SOLENOID VALVE 24V/115V	P-001-279
115V DOWN SOLENOID AND COIL ASM	P-001-296
115V DOWN SOLENOID COIL ONLY	P-001-297
FLOW CONTROL VALVE (6 GPM)	P-001-292
RELIEF VALVE	P-001-263
SUCTION LINE FILTER	P-001-280

GENERAL DESCRIPTION	PART #
COMPLETE CONTROL BOX:	
115V,PRI,1PH,24V,SEC, NO OPTIONS	P-004-399
230V,PRI,1PH,24V,SEC, NO OPTIONS	P-004-800
230V,PRI,3PH,24V,SEC, NO OPTIONS	P-004-802
480V,PRI,3PH,24V,SEC, NO OPTIONS	P-004-806
TRANSFORMER: (SELECT BY VOLTAGE AND OPTIONS)	
100VA transformers used with warning light or bell.	
115-230V,24V, 1 PHASE	P-001-845
240-480V,24V, 3 PHASE	P-001-844
115-230V,24V, 1 PHASE, WITH A BELL OR LIGHT	P-000-746
240-480V,24V, 3 PHASE, WITH A BELL OR LIGHT	P-000-399
CONTACTOR, MOTOR STARTER:	
115V,1PH CONTACTOR	P-000-413
230V,1PH CONTACTOR	P-000-413
230V,3PH CONTACTOR	P-000-430
480V,3PH CONTACTOR	P-000-430
OVERLOAD: (SELECT BY VOLTAGE AND PHASE)	
115V/1PH OVERLOAD	P-000-419
115V/1PH OVERLOAD	P-000-419
230V/1PH OVERLOAD	P-000-763
230V/3PH OVERLOAD	P-000-417
460V/3PH OVERLOAD	P-000-415
MOTOR: (SELECT BY VOLTAGE AND PHASE)	
115/208/230 VOLT, 1 PH	P-000-319
208/230/460/480 VOLT, 3 PH	P-000-318
OPTIONS:	
BELL AND TIMER KIT, 24V	P-005-821
BELL AND TIMER KIT, 110V	P-005-825
STROBE LIGHT, 24V	P-000-805
STROBE LIGHT, 110V	P-001-422
OIL IMMERSION HEATER	P-000-803
BLUE SPRAY PAINT, 16 oz	P-015-173
YELLOW SPRAY PAINT, 16 oz	P-015-174
POWER UNIT DECAL KIT	P-003-868
COMPLETE DECAL KIT FOR A 1035	P-005-765
REPLACEMENT NAME/SERIAL NUMBER TAG	P-001-448

TO ORDER PARTS CALL 800-843-3625
OR E-MAIL PARTS@ADVANCELIFTS.COM

1045/1055 PARTS LIST

GENERAL DESCRIPTION	PART #
MECHANICAL:	
WHEEL	P-A-0074
WHEEL PIN (3/4" x 3-3/4")	P-A-0075
WHEEL PIN SNAP RING	P-001-877
MAIN AXLE PIN (1-3/4" x 10-13/16")	P-A-0073
MAIN AXLE PIN SNAP RING	P-001-063
HANDRAIL	P-004-440
SNAP RING FOR HANDRAIL	P-001-876
SAFETY CABLE 67" SPAN	P-004-387
HINGED STEEL BRIDGE (18" x 60")	P-B-0277
HINGED RAMP (30" x 60")	P-D-2764S6
BASE MOUNTED FLIPPER WHEEL ASSEMBLY	P-D-2764S5
DOLLY HANDLE ASSEMBLY	P-D-1465S11
COVER PANEL FOR POWER UNIT	P-005-778
CYLINDER:	
CYLINDER, 1045/1055	P-D-12752
CYLINDER PACKING KIT FOR 1045/1055	P-026-183
CYLINDER ROD (1-3/4" x 53-1/16")	P-A-10403
CYLINDER BEARING ASSEMBLY	P-A-10405
LOWER CYLINDER PIN (1" x 4-1/8")	P-A-8606
UPPER CYLINDER PIN (1" x 3-5/8")	P-A-0548
CYLINDER PIN SNAP RING	P-001-876
FLOW CONTROL CARTRIDGE (6 GPM) PRE 4/00	P-001-305
GOLD HEXAGONAL FLOW CONTROL AFTER 4/00	P-015-397
HYDRAULIC HOSE (1/4"x 24") M/NPT (2) ENDS	P-001-328
HYDRAULIC HOSE (1/4"x 30") M/NPT (2) ENDS	P-000-449
ADAPTER FITTING (ORB X NPT ELBOW)	P-010-219
HYDRAULIC: (COMMON TO ALL POWER UNITS)	
HYDRAULIC PUMP	P-000-356
MANIFOLD VALVE ASSEMBLY	P-004-420
MANIFOLD BLOCK ONLY	P-D-1140
CHECK VALVE	P-001-262
24V DOWN SOLENOID VALVE AND COIL ASM	P-001-259
24V DOWN SOLENOID COIL ONLY	P-001-260
DOWN SOLENOID VALVE 24V/115V	P-001-279
115V DOWN SOLENOID AND COIL ASM	P-001-296
115V DOWN SOLENOID COIL ONLY	P-001-297
ADJUSTABLE FLOW CONTROL	P-001-265
RELIEF VALVE	P-001-263
SUCTION LINE FILTER	P-001-280
VELOCITY FUSE	P-001-270
COMPLETE POWER UNIT:	
115 VOLT, 1 PH, 24VA, WITH PUSHBUTTON	P-004-403
23O VOLT, 1 PH, 24VA, WITH PUSHBUTTON	P-004-797
230 VOLT, 3 PH, 24VA, WITH PUSHBUTTON	P-004-798
460 VOLT, 3 PH, 24VA, WITH PUSHBUTTON	P-004-799

GENERAL DESCRIPTION	PART #
COMPLETE CONTROL BOX:	
115V,PRI,1PH,24V,SEC, NO OPTIONS	P-004-399
230V,PRI,1PH,24V,SEC, NO OPTIONS	P-004-800
230V,PRI,3PH,24V,SEC, NO OPTIONS	P-004-802
480V,PRI,3PH,24V,SEC, NO OPTIONS	P-004-806
TRANSFORMER: (SELECT BY VOLTAGE AND OPTIONS)	
100VA transformers with a warning light or bell.	
115-230V,24V, 1 PHASE	P-001-845
240-480V,24V, 3 PHASE	P-001-844
115-230V,24V, 1 PHASE, WITH A BELL OR LIGHT	P-000-746
240-480V,24V, 3 PHASE, WITH A BELL OR LIGHT	P-000-399
CONTACTOR, MOTOR STARTER:	
115V,1PH CONTACTOR	P-000-692
230V,1PH CONTACTOR	P-000-692
230V,3PH CONTACTOR	P-000-690
480V,3PH CONTACTOR	P-000-690
OVERLOAD: (SELECT BY VOLTAGE AND PHASE)	
115V/1PH OVERLOAD	P-000-700
230V/1PH OVERLOAD	P-000-698
230V/3PH OVERLOAD	P-000-696
460V/3PH OVERLOAD	P-000-694
MOTOR: (SELECT BY VOLTAGE AND PHASE)	
115/208/230 VOLT, 1 PH, LEESON, 1202274-00	P-000-319
208/230/460/480 VOLT, 3 PH, LEESON 120276-00	P-000-318
OPTIONS:	
BELL AND LIGHT COMBO	P-023-651
BELL AND LIGHT CAGE	P-027-946
STROBE LIGHT, 24V	P-000-805
STROBE LIGHT, 110V	P-001-422
OIL IMMERSION HEATER	P-000-803
BLUE SPRAY PAINT, 16 oz	P-015-173
YELLOW SPRAY PAINT, 16 oz	P-015-174
POWER UNIT DECAL KIT	P-003-868
COMPLETE DECAL KIT FOR A 1045	P-004-407
REPLACEMENT NAME/SERIAL NUMBER TAG	P-001-448

TO ORDER PARTS CALL 800-843-3625
OR E-MAIL PARTS@ADVANCELIFTS.COM

SERIES 2000 PARTS LIST

GENERAL DESCRIPTION	PART #
MECHANICAL:	
WHEEL ASSEMBLY	P-005-244
WHEEL BASE & PLATFORM PIN (1-1/4" x 3-3/4")	P-A-0216
WHEEL, BASE AND PLATFORM PIN SNAP RING	P-001-061
MAIN AXLE PIN (1-3/4" x 6-7/8")	P-A-0227
MAIN AXLE PIN SNAP RING 1-3/4"	P-001-063
UPPER WHEEL PIN ASM (TATTLE-TALE)	P-015-484
UPPER WHEEL PIN PLUG (TATTLE-TALE)	P-A-4258
STEEL HANDRAIL WITH SAFETY CHAIN	P-004-433
SAFETY CABLE, (64-3/4")	P-004-386
STEEL BRIDGE (12" X 72")	P-003-572
CYLINDER: CURRENT STANDARD (5/88 TO DATE)	
Lifts manufactured before 4/1/00 require an elbow part # P-010-219 when replacing a complete cylinder assembly.	
COMPLETE CYLINDER	P-D-0024
CYLINDER PACKING KIT	P-003-514
CYLINDER HOUSING	P-004-053
CYLINDER ROD ASSEMBLY	P-004-054
CYLINDER BEARING ASSEMBLY	P-003-923
CYLINDER PISTON ASSEMBLY	P-A-1409
CYLINDER PIN UPPER	P-A-1951
CYLINDER PIN LOWER	P-A-0209
CYLINDER PIN SNAP RING 1"	P-001-876
FLOW CONTROL CARTRIDGE (BEFORE 4/00)	P-001-302
GREEN HEXAGONAL FLOW CONTROL (AFTER 4/00)	P-015-396
CYLINDER: (PRE 5/88)	
COMPLETE CYLINDER	P-005-755
CYLINDER ROD ASSEMBLY	P-005-756
UPPER CYLINDER PIN, (OLD STYLE)	P-A-0226
LOWER CYLINDER PIN, (OLD STYLE)	P-A-0209
HYDRAULIC: (COMMON TO ALL POWER UNITS)	
HYDRAULIC PUMP	P-000-357
FLOW VALVE	P-004-334
CHECK VALVE	P-001-262
24V DOWN SOLENOID VALVE AND COIL ASM	P-001-259
24V DOWN SOLENOID COIL (ONLY)	P-001-260
24V/115V DOWN SOLENOID VALVE (ONLY)	P-001-279
115V DOWN SOLENOID AND COIL ASM	P-001-296
115V DOWN SOLENOID COIL (ONLY)	P-001-297
FLOW CONTROL VALVE (3.5 GPM)	P-001-293
RELIEF VALVE	P-001-263
BREATHER CAP FOR RESERVOIR	P-001-890

GENERAL DESCRIPTION	PART #
COMPLETE POWER UNIT:	
23O VOLT, 1 PH, 24VA, WITH PUSHBUTTON	P-004-896
230 VOLT, 3 PH, 24VA, WITH PUSHBUTTON	P-003-562
460 VOLT, 3 PH, 24VA, WITH PUSHBUTTON	P-004-895
CONTROL BOX. COMPLETE:	
230 VOLT, 1 PHASE	P-004-790
230 VOLT, 3 PHASE	P-003-966
460 VOLT, 3 PHASE	P-004-783
TRANSFORMER: (SELECT BY VOLTAGE AND PHASE)	
100VA transformers used on lifts with warning light or bell.	
230V, 24V, 1 PHASE	P-001-845
240-460V, 24V, 3 PHASE	P-001-844
230V,24V,1 PHASE, WITH BELL OR LIGHT	P-000-746
240-460V,24V,3 PHASE WITH BELL OR LIGHT	P-000-399
CONTACTOR, MOTOR STARTER:	
230V, 1 PHASE, CONTACTOR	P-000-414
230V, 3 PHASE, CONTACTOR	P-000-413
460V, 3 PHASE, CONTACTOR	P-000-413
OVERLOAD:	
230V, 1 PHASE, OVERLOAD	P-000-420
230V, 3 PHASE, OVERLOAD	P-000-418
460V, 3 PHASE, OVERLOAD	P-000-417
MOTOR: (SELECT BY VOLTAGE AND PHASE)	
208/230V 1 PHASE	P-001-327
208/230/460/480V 3 PHASE	P-003-373
OPTION:	
BELL AND TIMER KIT, 24V	P-005-823
BELL AND TIMER KIT, 110V	P-005-825
STROBE WARNING LIGHT, 24V	P-000-805
STROBE WARNING LIGHT, 110V	P-001-422
FLUID HEATER	P-001-347
BLUE SPRAY PAINT, 16 oz	P-015-173
YELLOW SPRAY PAINT, 16 oz	P-015-174
POWER UNIT DECAL KIT	P-003-868
COMPLETE DECAL KIT FOR 2000K	P-003-993
LIMIT SWITCH ASSEMBLY	P-003-898
INSTALLATION KIT, 20' HOSE AND 10 GAL FLUII	P-006-400
OWNERS MANUAL	P-003-566
REPLACEMENT NAME/SERIAL NUMBER TAG	P-001-448

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T SERIES PARTS LIST

GENERAL DESCRIPTION	PART #
MECHANICAL:	
ROLLER WHEEL	P-023-153
WHEEL, BASE, PLATFORM PIN (1.25 X 3.75)	P-A-0216
WHEEL, BASE, PLATFORM PIN SNAP RING	P-001-061
MAIN AXLE PIN (1-3/4" x 6-7/8")	P-A-0227
MAIN AXLE PIN SNAP RING 1-3/4"	P-001-063
STEEL HANDRAIL WITH SAFETY CHAIN	P-004-433
SAFETY CABLE, (64-3/4")	P-004-386
STEEL BRIDGE (12" X 72")	P-003-572

CYLINDER: T-50608 ONLY	
COMPLETE CYLINDER	P-D-12312
CYLINDER PACKING KIT	P-023-614
CYLINDER HOUSING	P-B-1404
CYLINDER ROD ASSEMBLY	P-023-168
CYLINDER BEARING ASSEMBLY	P-023-173
CYLINDER PISTON	P-A-9910
CYLINDER PIN UPPER	P-A-0219
CYLINDER PIN LOWER	P-001-538
CYLINDER PIN SNAP RING 1.25"	P-001-063
FLOW CONTROL	P-015-396

CYLINDER: ALL EXCEPT T-50608	
COMPLETE CYLINDER	P-D-12311
CYLINDER PACKING KIT	P-004-635
CYLINDER HOUSING	P-B-1403
CYLINDER ROD ASSEMBLY	P-023-168
CYLINDER BEARING ASSEMBLY	P-023-170
CYLINDER PISTON	P-A-1551
CYLINDER PIN UPPER	P-A-0219
CYLINDER PIN LOWER	P-A-9899
CYLINDER PIN SNAP RING 1.25"	P-001-061
FLOW CONTROL	P-015-396

HYDRAULIC: (COMMON TO ALL POWER UNITS)	
HYDRAULIC PUMP	P-000-357
FLOW VALVE	P-003-457
CHECK VALVE	P-001-262
24V DOWN SOLENOID VALVE AND COIL ASM	P-001-259
24V DOWN SOLENOID COIL (ONLY)	P-001-260
24V/115V DOWN SOLENOID VALVE (ONLY)	P-001-279
115V DOWN SOLENOID AND COIL ASM	P-001-296
115V DOWN SOLENOID COIL (ONLY)	P-001-297
FLOW CONTROL VALVE (3.5 GPM)	P-001-293
RELIEF VALVE	P-001-263
BREATHER CAP FOR RESERVOIR	P-001-890

GENERAL DESCRIPTION	PART #
COMPLETE POWER UNIT:	
23O VOLT, 1 PH, 24VA, WITH PUSHBUTTON	P-004-771
230 VOLT, 3 PH, 24VA, WITH PUSHBUTTON	P-003-563
460 VOLT, 3 PH, 24VA, WITH PUSHBUTTON	P-004-770

TRANSFORMER: (SELECT BY VOLTAGE AND PHASE)	
100VA transformers on lifts with a warning light or bell.	
230V, 24V, 50VA, 1 PHASE	P-001-845
240-460V, 24V, 50VA, 3 PHASE	P-001-844
230V,24V, 100VA, 1 PHASE	P-000-746
240-460V,24V, 100VA, 3 PHASE	P-000-399

CONTROL BOX. COMPLETE:	
230 VOLT, 1 PHASE	P-004-790
230 VOLT, 3 PHASE	P-003-966
460 VOLT, 3 PHASE	P-004-783

CONTACTOR, MOTOR STARTER:	
230V, 1PH, CONTACTOR	P-000-414
230V, 3PH, CONTACTOR	P-000-413
460V, 3PH, CONTACTOR	P-000-413

OVERLOAD:	
230V, 1PH, OVERLOAD	P-000-420
230V, 3PH, OVERLOAD	P-000-418
460V, 3PH, OVERLOAD	P-000-417

MOTOR: (SELECT BY VOLTAGE AND PHASE)	
208/230V 1 PHASE	P-001-327
208/230/460/480V 3 PHASE	P-003-373

OPTION:	
BELL AND TIMER KIT, 24V	P-005-823
BELL AND TIMER KIT, 110V	P-005-825
STROBE WARNING LIGHT, 24V	P-000-805
STROBE WARNING LIGHT, 110V	P-001-422
FLUID HEATER	P-001-347
BLUE SPRAY PAINT, 16 oz	P-015-173
YELLOW SPRAY PAINT, 16 oz	P-015-174
POWER UNIT DECAL KIT	P-003-868
COMPLETE DECAL KIT FOR T2000	P-023-582
LIMIT SWITCH ASSEMBLY	P-003-898
INSTALLATION KIT, 20' HOSE AND 5 GAL FLUID	P-006-399
REPLACEMENT NAME/SERIAL NUMBER TAG	P-001-448

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SERIES 2000K PARTS LIST

GENERAL DESCRIPTION	PART #
MECHANICAL:	
WHEEL ASSEMBLY	P-005-244
WHEEL BASE & PLATFORM PIN (1-1/4" x 3-3/4")	P-A-0216
WHEEL, BASE AND PLATFORM PIN SNAP RING	P-001-061
MAIN AXLE PIN (1-3/4" x 6-7/8")	P-A-0227
MAIN AXLE PIN SNAP RING 1-3/4"	P-001-063
STEEL HANDRAIL WITH SAFETY CHAIN	P-004-433
SAFETY CABLE, (64-3/4")	P-004-386
STEEL BRIDGE (12" X 72")	P-003-572
CYLINDER: CURRENT STANDARD (5/88 TO DATE)	
Lifts manufactured before 4/1/00 require an elbow part # P-010-219 when replacing a complete cylinder assembly.	
COMPLETE CYLINDER	P-D-1185
CYLINDER PACKING KIT	P-003-514
CYLINDER HOUSING	P-003-856
CYLINDER ROD ASSEMBLY	P-005-731
CYLINDER BEARING ASSEMBLY	P-003-923
CYLINDER PISTON ASSEMBLY	P-A-1409
CYLINDER PIN UPPER	P-A-1951
CYLINDER PIN LOWER	P-A-0209
CYLINDER PIN SNAP RING 1"	P-001-876
FLOW CONTROL CARTRIDGE (BEFORE 4/00)	P-001-302
GREEN HEXAGONAL FLOW CONTROL (AFTER 4/00)	P-015-396
CYLINDER: (PRE 5/88)	
COMPLETE CYLINDER	P-005-651
CYLINDER ROD ASSEMBLY	P-003-919
UPPER CYLINDER PIN, (OLD STYLE)	P-A-0226
LOWER CYLINDER PIN, (OLD STYLE)	P-A-0209
HYDRAULIC: (COMMON TO ALL POWER UNITS)	
HYDRAULIC PUMP	P-026-106
24V DOWN SOLENOID COIL (ONLY)	P-015-301
24V/115V DOWN SOLENOID VALVE (ONLY)	P-003-106
BREATHER CAP FOR RESERVOIR	P-001-890
COMPLETE POWER UNIT: (SELECT BY VOLTAGE AND PHASE)	
23O VOLT, 1 PH, 24VA, WITH PUSHBUTTON	P-004-771
230 VOLT, 3 PH, 24VA, WITH PUSHBUTTON	P-003-563
460 VOLT, 3 PH, 24VA, WITH PUSHBUTTON	P-004-770
CONTROL BOX. COMPLETE: (SELECT BY VOLTAGE AND PHASE)	
230 VOLT, 1 PHASE	P-004-790
230 VOLT, 3 PHASE	P-003-966
460 VOLT, 3 PHASE	P-004-783

GENERAL DESCRIPTION	PART #
TRANSFORMER: (SELECT BY VOLTAGE AND PHASE)	
100VA transformers used on lifts with warning light or bell.	
230V, 24V, 1 PH	P-001-845
240-460V, 24V, 3 PHASE	P-001-844
230V,24V,1PH, WITH BELL OR LIGHT	P-000-746
240-460V,24V,3PH WITH BELL OR LIGHT	P-000-399
CONTACTOR, MOTOR STARTER:	
230V, 1PH, CONTACTOR	P-000-693
230V, 3PH, CONTACTOR	P-000-692
460V, 3PH, CONTACTOR	P-000-692
OVERLOAD:	
230V, 1PH, OVERLOAD	P-000-701
230V, 3PH, OVERLOAD	P-000-699
460V, 3PH, OVERLOAD	P-000-696
MOTOR: (SELECT BY VOLTAGE AND PHASE)	
208/230V 1 PHASE	P-001-327
208/230/460/480V 3 PHASE	P-003-373
OPTION:	
BELL AND WARNING LIGHT COMBO.	P-005-823
BELL AND LIGHT PROTECTIVE CAGE	P-005-825
FLUID HEATER	P-001-347
BLUE SPRAY PAINT, 16 oz	P-015-173
YELLOW SPRAY PAINT, 16 oz	P-015-174
POWER UNIT DECAL KIT	P-003-868
COMPLETE DECAL KIT FOR 2000K	P-003-993
LIMIT SWITCH ASSEMBLY	P-003-898
INSTALLATION KIT, 20' HOSE AND 5 GAL FLUID	P-006-399
REPLACEMENT NAME/SERIAL NUMBER TAG	P-001-448

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SERIES 3000 PARTS LIST

GENERAL DESCRIPTION	PART #
MECHANICAL:	
WHEEL ASSEMBLY	P-005-244
UPPER WHEEL PIN (1-1/4" X 3-3/4")	P-A-0216
LOWER WHEEL PIN (1-1/4" X 5-3/4")	P-A-0390
WHEEL PIN SNAP RING 1-1/4"	P-001-061
MAIN AXLE PIN (2" x 7")	P-A-0379
MAIN AXLE PIN SNAP RING 2"	P-001-057
BASE AND PLATFORM PIN (1-1/2" X 3-3/4")	P-A-0216
STEEL HANDRAIL WITH SAFETY CHAIN	P-004-433
SAFETY CABLE, (64-3/4")	P-004-386
STEEL BRIDGE (12" X 72")	P-B-0190
CYLINDER:	
Lifts manufactured before 4/1/00 require an elbow part # P-015-683 when replacing a complete cylinder assembly.	
3200 COMPLETE CYLINDER	P-D-1434
3200 CYLINDER PACKING KIT	P-003-515
3200 CYLINDER HOUSING	P-004-267
3200 CYLINDER ROD ASSEMBLY	P-004-268
3200 CYLINDER BEARING ASSEMBLY	P-003-874
3200 CYLINDER PISTON ASSEMBLY	P-A-1551
3300 COMPLETE CYLINDER	P-D-1435
3300 CYLINDER PACKING KIT	P-003-516
3300 CYLINDER HOUSING	P-004-280
3300 CYLINDER ROD ASSEMBLY	P-004-282
3300 CYLINDER BEARING ASSEMBLY	P-004-284
3300 CYLINDER PISTON ASSEMBLY	P-A-1552
CYLINDER PIN (1" X 5-5/16")	P-A-0226
CYLINDER PIN (1" X 7-5/16")	P-A-0416
CYLINDER PIN SNAP RING 1"	P-001-876
FLOW CONTROL CARTRIDGE (BEFORE 4/00)	P-001-302
GREEN HEXAGONAL FLOW CONTROL (AFTER 4/00)	P-015-396
HYDRAULIC: (COMMON TO ALL POWER UNITS)	
HYDRAULIC PUMP	P-000-357
FLOW VALVE	P-004-334
CHECK VALVE	P-001-262
24V DOWN SOLENOID VALVE AND COIL ASM	P-001-259
24V DOWN SOLENOID COIL (ONLY)	P-001-260
24V/115V DOWN SOLENOID VALVE (ONLY)	P-001-279
115V DOWN SOLENOID AND COIL ASM	P-001-296
115V DOWN SOLENOID COIL (ONLY)	P-001-297
FLOW CONTROL VALVE (3.5 GPM)	P-001-293
RELIEF VALVE	P-001-263
BREATHER CAP FOR RESERVOIR	P-001-890
COMPLETE POWER UNIT:	
23O VOLT, 1 PH, 24VA, WITH PUSHBUTTON	P-004-896
230 VOLT, 3 PH, 24VA, WITH PUSHBUTTON	P-003-562
460 VOLT, 3 PH, 24VA, WITH PUSHBUTTON	P-004-895
CONTROL BOX. COMPLETE:	
230 VOLT, 1 PHASE	P-004-790
230 VOLT, 3 PHASE	P-003-966
460 VOLT, 3 PHASE	P-004-783

GENERAL DESCRIPTION	PART #
TRANSFORMER: (SELECT BY VOLTAGE AND PHASE)	
100VA transformers used on lifts with warning light or bell.	
230V, 24V, 1 PH	P-001-845
240-460V, 24V, 3 PHASE	P-001-844
230V,24V,1PH, WITH BELL OR LIGHT	P-000-746
240-460V,24V,3PH WITH BELL OR LIGHT	P-000-399
CONTACTOR, MOTOR STARTER:	
230V, 1PH, CONTACTOR	P-000-414
230V, 3PH, CONTACTOR	P-000-413
460V, 3PH, CONTACTOR	P-000-413
OVERLOAD:	
230V, 1PH, OVERLOAD	P-000-420
230V, 3PH, OVERLOAD	P-000-418
460V, 3PH, OVERLOAD	P-000-417
MOTOR: (SELECT BY VOLTAGE AND PHASE)	
208/230V 1 PHASE	P-001-327
208/230/460/480V 3 PHASE	P-003-373
OPTION:	
BELL AND TIMER KIT, 24V	P-005-823
BELL AND TIMER KIT, 110V	P-005-825
STROBE WARNING LIGHT, 24V	P-000-805
STROBE WARNING LIGHT, 110V	P-001-422
FLUID HEATER	P-001-347
BLUE SPRAY PAINT, 16 oz	P-015-173
YELLOW SPRAY PAINT, 16 oz	P-015-174
POWER UNIT DECAL KIT	P-003-868
COMPLETE DECAL KIT FOR 3000	P-004-261
INSTALLATION KIT, 20' HOSE AND 10 GAL FLUID	P-006-400
OWNERS MANUAL	P-003-566
PLUG 230V, 3 PHASE	P-001-671
PLUG 460V, 3 PHASE	P-000-994
PLUG 230V, 1 PHASE	P-002-049
PUSH BUTTON SWITCH	P-000-802
REPLACEMENT NAME/SERIAL NUMBER TAG	P-001-448

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SERIES 4000 PARTS LIST

GENERAL DESCRIPTION	PART #
MECHANICAL:	
4100,4200,4300,4400 INNER WHEEL	P-A-0499
4100,4200,4300,4400 OUTER WHEEL	P-A-0500
4100,4200,4300,4400 WHEEL PIN (1-3/4"X6-7/8")	P-A-0227
4100,4200,4300,4400 WHEEL PIN SNAP RING	P-001-063
4100,4200,4300,4400 MAIN AXLE PIN (2" x 9")	P-A-0370
4100,4200,4300,4400 MAIN AXLE PIN SNAP RING	P-001-057
4100,4200,4300,4400 BASE AND PLATFORM PIN	P-A-0376
STEEL HANDRAIL ASSEMBLY	P-004-446
SAFETY CABLE, (64-3/4")	P-004-386
STEEL BRIDGE (12" X 72")	P-B-0191
MECHANICAL: 4100 AFTER 1/1/2000	
4100 INNER WHEEL (AFTER 1/00)	P-A-8206
4100 OUTER WHEEL (AFTER 1/00)	P-A-8205
4100 PLATFORM WHEEL PIN (AFTER 1/00)	P-A-8203
4100 BASE FRAME WHEEL PIN (AFTER 1/00)	P-A-8202
4100 BASE AND PLATFORM PIN (AFTER 1/00)	P-A-8201
CYLINDER: MODELS 4100, 4200, 4300, 4400	
Lifts manufactured before 4/1/00 require an elbow part # P-015-683 when replacing a complete cylinder assembly.	
COMPLETE CYLINDER	P-D-0498
CYLINDER PACKING KIT	P-004-365
CYLINDER HOUSING	P-004-361
CYLINDER ROD ASSEMBLY	P-004-363
CYLINDER BEARING ASSEMBLY	P-004-364
CYLINDER PISTON ASSEMBLY	P-A-1551
UPPER CYLINDER PIN (1" X 4-1/2")	P-A-0410
LOWER CYLINDER PIN (1-1/4" X 3-3/4")	P-A-0216
CYLINDER PIN SNAP RING 1"	P-001-876
CYLINDER PIN SNAP RING 1-1/4"	P-001-061
CYLINDER: 4100 AFTER 1/1/00	
4100 COMPLETE CYLINDER	P-D-10162
4100 CYLINDER PACKING KIT	P-004-365
4100 CYLINDER HOUSING	P-004-361
4100 CYLINDER ROD ASSEMBLY	P-006-971
4100 CYLINDER BEARING ASSEMBLY	P-004-364
4100 CYLINDER PISTON ASSEMBLY	P-A-1551
4100 UPPER CYLINDER PIN (1" X 4-1/2")	P-A-0410
4100 LOWER CYLINDER PIN (1-1/4" X 3-3/4")	P-A-0216
4100 CYLINDER PIN SNAP RING 1"	P-001-876
4100 CYLINDER PIN SNAP RING 1-1/4"	P-001-061
HYDRAULIC: (COMMON TO ALL POWER UNITS)	
HYDRAULIC PUMP	P-000-358
HYDRAULIC PUMP 4100 (AFTER 1/00)	P-007-114
FLOW VALVE	P-003-458
CHECK VALVE	P-001-262
24V DOWN SOLENOID VALVE AND COIL ASM	P-001-259
24V DOWN SOLENOID COIL (ONLY)	P-001-260
24V/115V DOWN SOLENOID VALVE (ONLY)	P-001-279
115V DOWN SOLENOID AND COIL ASM	P-001-296
115V DOWN SOLENOID COIL (ONLY)	P-001-297

GENERAL DESCRIPTION	PART #
COMPLETE POWER UNIT WITH PUSHBUTTON:	
4100,4200,4300,4400, 230 VOLT, 3 PH, 24VA	P-004-391
4100,4200,4300,4400, 460 VOLT, 3 PH, 24VA	P-005-485
4100, 230 VOLT, 3 PH, 24VA (AFTER 1/00)	P-006-983
4100, 460 VOLT, 3 PH, 24VA (AFTER 1/00)	P-010-684
CONTROL BOX. COMPLETE:	
4100,4200,4300,4400, 230 VOLT, 3 PHASE	P-005-489
4100,4200,4300,4400, 460 VOLT, 3 PHASE	P-005-494
4100, 230V, 3 PHASE (AFTER 1/00)	P-006-308
4100, 460V, 3 PHASE (AFTER 1/00)	P-007-202
TRANSFORMER:	
240-460V,24V,3PH	P-000-399
CONTACTOR, MOTOR STARTER:	
208,230,460,480V, 3PH, CONTACTOR	P-000-413
OVERLOAD:	
230V, 3PH, OVERLOAD	P-000-419
460V, 3PH, OVERLOAD	P-000-763
230V, 3PH, OVERLOAD 4100 (AFTER 1/00)	P-000-418
460V, 3PH, OVERLOAD 4100 (AFTER 1/00)	P-000-417
MOTOR:	
208,230,460,480V 3 PHASE	P-001-344
208,230,460,480V 3 PHASE, 4100 (AFTER 1/00)	P-003-373
OPTIONS:	
BELL AND TIMER KIT, 24V	P-005-823
BELL AND TIMER KIT, 110V	P-005-825
STROBE WARNING LIGHT, 24V	P-000-805
STROBE WARNING LIGHT, 110V	P-001-422
FLUID HEATER	P-001-347
BLUE SPRAY PAINT, 16 oz	P-015-173
YELLOW SPRAY PAINT, 16 oz	P-015-174
POWER UNIT DECAL KIT	P-003-868
COMPLETE DECAL KIT FOR 4000	P-004-375
INSTALLATION KIT, 20' HOSE AND 15 GAL FLUID	P-006-401
OWNERS MANUAL	P-003-566
PLUG 230V, 3 PHASE	P-001-671
PLUG 460V, 3 PHASE	P-000-994
PUSH BUTTON SWITCH	P-000-802
PRESSURE LINE FILTER	P-001-319
REPLACEMENT NAME/SERIAL NUMBER TAG	P-001-448

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SERIES 6000 PARTS LIST

GENERAL DESCRIPTION	PART #
MECHANICAL:	
6100 WHEEL ASM	P-009-379
6100 WHEEL PIN	P-A-0404
6100 WHEEL PIN SNAP RING	P-001-061
6100 MAIN AXL PIN	P-A-0405
6100 MAIN AXL SNAP RING	P-001-062
6100 BASE PIN	P-A-0378
6100 BASE PIN SNAP RING	P-001-061
STEEL HANDRAIL ASSEMBLY	P-A-2260
SAFETY CABLE, (64-3/4")	P-004-386
STEEL BRIDGE (18"X60")	P-A-0979
SAFETY LEG	P-A-0682
CYLINDER :MODEL 6100 (LONG)	
Lifts manufactured before 4/1/00 require an elbow part # P-015-683 when replacing a complete cylinder assembly.	
COMPLETE CYLINDER	P-D-1597
CYLINDER PACKING KIT	P-005-663
CYLINDER HOUSING	P-005-659
CYLINDER ROD ASSEMBLY	P-005-660
CYLINDER BEARING ASSEMBLY	P-003-923
CYLINDER PISTON ASSEMBLY	P-A-1409
UPPER CYLINDER PIN	P-A-0226
UPPER CYLINDER PIN SNAP RING	P-001-876
LOWER CYLINDER PIN	P-A-0209
LOWER CYLINDER PIN SNAP RING	P-001-876
CYLINDER PIN SNAP RING 1-1/4"	P-001-061
CYLINDER:MODEL 6100 (SHORT)	
COMPLETE CYLINDER	P-D-1586
CYLINDER PACKING KIT	P-005-664
CYLINDER HOUSING	P-005-665
CYLINDER ROD ASSEMBLY	P-005-666
CYLINDER BEARING ASSEMBLY	P-003-923
CYLINDER PISTON ASSEMBLY	P-A-1409
CYLINDER PIN (SHORT)	P-A-0402
CYLINDER PIN (LONG)	P-A-0407
CYLINDER PIN SNAP RING	P-001-876
RAM LINKAGE PIN (SHORT)	P-A-0406
SNAP RING	P-001-877
RAM LINKAGE PIN (LONG)	P-A-0407
SNAP RING	P-001-876
HYDRAULIC: (COMMON TO ALL POWER UNITS)	
HYDRAULIC PUMP	P-000-357
FLOW VALVE ASSEMBLY	P-003-457
CHECK VALVE	P-001-262
24V DOWN SOLENOID VALVE AND COIL ASM	P-001-259
24V DOWN SOLENOID COIL (ONLY)	P-001-260
24V/115V DOWN SOLENOID VALVE (ONLY)	P-001-279
115V DOWN SOLENOID AND COIL ASM	P-001-296
115V DOWN SOLENOID COIL (ONLY)	P-001-297
FLOW CONTROL VALVE(MAIN)	P-001-293
RELIEF VALVE	P-001-263
IN-LINE FILTER	P-001-319

GENERAL DESCRIPTION	PART #
COMPLETE POWER UNIT WITH PUSHBUTTON:	
6100 230 VOLT, 1 PH, 24V	P-012-180
6100 115 VOLT, 1 PH, 24V	
6100 230 VOLT, 3 PH, 24V	P-012-170
6100 460 VOLT, 3 PH, 24V	P-012-176
CONTROL BOX. COMPLETE:	
6100 230 VOLT, 1 PH, 24V	P-004-790
6100 115 VOLT, 1 PH, 24V	
6100 230 VOLT, 3 PH, 24V	P-003-966
6100 460 VOLT, 3 PH, 24V	P-004-783
TRANSFORMER:	
6100 230V/115V, 24 VOLT, 1 PH, 50VA	P-001-845
6100 230V/460V, 24 VOLT, 3 PH, 50VA	P-001-844
6100 230V/115V, 24 VOLT, 1 PH, 100VA	P-000-746
6100 230V/460V, 24 VOLT, 3 PH, 100VA	P-000-399
CONTACTOR, MOTOR STARTER:	
230V/115V, 1 PH STARTER CONTACTOR	P-000-414
230V/460V, 3 PH STARTER CONTACTOR	P-000-413
OVERLOAD:	
115V, 1 PH OVERLOAD	P-000-419
230V, 1 PH OVERLOAD	P-000-420
230V , 3 PH OVERLOAD	P-000-418
460V, 3 PH OVERLOAD	P-000-417
MOTOR:	
115V/230V 1 PHASE	P-001-327
230V/460V PHASE MOTOR	P-003-373
OPTIONS:	
BELL AND TIMER KIT, 24V	P-005-823
BELL AND TIMER KIT, 110V	P-005-825
STROBE WARNING LIGHT, 24V	P-000-805
STROBE WARNING LIGHT, 110V	P-001-422
FLUID HEATER	P-001-347
BLUE SPRAY PAINT, 16 oz	P-015-173
YELLOW SPRAY PAINT, 16 oz	P-015-174
POWER UNIT DECAL KIT	P-003-868
COMPLETE DECAL KIT FOR 6100	P-005-564
INSTALLATION KIT, 20' HOSE AND 15 GAL FLUID	P-006-401
OWNERS MANUAL	P-003-566
PLUG 230V, 3 PHASE	P-001-671
PLUG 460V, 3 PHASE	P-000-994
PUSH BUTTON SWITCH	P-000-802
PRESSURE LINE FILTER	P-001-319
REPLACEMENT NAME/SERIAL NUMBER TAG	P-001-448

TO ORDER PARTS CALL 800-843-3625

OR E-MAIL PARTS@ADVANCELIFTS.COM

Material Safety Data Sheet

Chevron Rykon® Premium Oil

MSDS: 7341 **Revision #:** 3 **Revision Date:** 08/08/01

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION
CHEVRON Rykon Premium Oil

PRODUCT NUMBER CPS255679

CHEVRON Rykon Premium Oil ISO 46

COMPANY IDENTIFICATION EMERGENCY TELEPHONE NUMBERS

Chevron Products Company HEALTH (24 hr): (800)231-0623 or Lubricants and Specialty Products (510)231-0623 (International) 6001 Bollinger Canyon Rd., T3325/B10 TRANSPORTATION (24 hr): CHEMTREC San Ramon, CA 94583 (800)424-9300 or (703)527-3887 www.chevron-lubricants.com Emergency Information Centers are located in U.S.A. Int'l collect calls accepted

PRODUCT INFORMATION: MSDS Request:(800)414-6737 email:lubemsds@chevron.com Environmental, Safety, & Health Info: (925) 842-5535 Product Information: (800) 582-3835

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2. COMPOSITION/INFORMATION ON INGREDIENTS
100.0 % CHEVRON Rykon Premium Oil CONTAINING COMPONENTS AMOUNT LIMIT/QTY AGENCY/TYPE LUBRICATING BASE OIL CONTAINING ONE OR MORE OF THE FOLLOWING > 85.00%

HYDROTREATED DIST., HVY PARA Chemical Name: DISTILLATES, HYDROTREATED HEAVY PARAFFINIC CAS64742547 5 mg/m3 (mist) ACGIH TWA 10 mg/m3 (mist) ACGIH STEL 5 mg/m3 (mist) OSHA PEL

DISTILLATES, HYDROTREATED Chemical Name: DISTILLATES, (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC CAS64742558 5 mg/m3 (mist) ACGIH TWA 10 mg/m3 (mist) ACGIH STEL 5 mg/m3 (mist) OSHA PEL

ADDITIVES INCLUDING THE FOLLOWING < 15.00%

ZINC ALKYL DITHIOPHOSPHATE Chemical Name: PHOSPHORODITHIOIC ACID,O,O-DI-C1-14-ALKYL ESTERS, ZINC SALT CAS68649423 < 1.00% NONE NA

COMPOSITION COMMENT: All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory. This product fits the ACGIH definition for mineral oil mist. The ACGIH TLV is 5 mg/m3, the OSHA PEL is 5 mg/m3.

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3. HAZARDS IDENTIFICATION
IMMEDIATE HEALTH EFFECTS
EYE: Not expected to cause prolonged or significant eye irritation.
SKIN: Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.
INGESTION: Not expected to be harmful if swallowed.
INHALATION: Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit.

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4. FIRST AID MEASURES
EYE: No specific first aid measures are required because this material is not expected to cause eye irritation. As a precaution remove contact lenses, if worn, and flush eyes with water.
SKIN: No specific first aid measures are required because this material is not expected to be harmful if it contacts the skin. As a precaution, remove clothing and shoes if contaminated. Wash skin with soap and water. Wash or clean contaminated clothing and shoes before reuse.
INGESTION: No specific first aid measures are required because this material is not expected to be harmful if swallowed. Do not induce vomiting. As a precaution, give the person a glass of water or milk to drink and get medical advice. Never give anything by mouth to an unconscious person.
INHALATION: If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.
NOTE TO PHYSICIANS: In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

FIRE CLASSIFICATION:
Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.
FIRE COMMENT: Leaks/ruptures in high pressure systems using materials of this type can create a fire hazard when in the vicinity of ignition sources (eg. open flame, pilot lights, sparks, or electric arcs).

FLAMMABLE PROPERTIES:
FLASH POINT: (COC) 338F (170C) Min.
AUTOIGNITION: NDA
FLAMMABILITY LIMITS (% by volume in air): Lower: NA Upper: NA
EXTINGUISHING MEDIA: CO2, Dry Chemical, Foam, Water Fog.
NFPA RATINGS: Health 1; Flammability 1; Reactivity 0.
FIRE FIGHTING INSTRUCTIONS: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
COMBUSTION PRODUCTS: Normal combustion forms carbon dioxide, water vapor and may produce oxides of sulfur and nitrogen. Incomplete combustion can produce carbon monoxide.

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6. ACCIDENTAL RELEASE MEASURES
CHEMTREC EMERGENCY NUMBER (24 hr): (800)424-9300 or (703)527-3887 International Collect Calls Accepted
ACCIDENTAL RELEASE MEASURES: Stop the source of the leak or release. Clean up releases as soon as possible, observing precautions in Exposure Controls/Personal Protection. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.

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7. HANDLING AND STORAGE
DO NOT USE IN HIGH PRESSURE SYSTEMS in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.

Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner, or properly disposed of. Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION
GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS
Use in a well-ventilated area. If user operations generate an oil mist, use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended mineral oil mist exposure limits.

PERSONAL PROTECTIVE EQUIPMENT
EYE/FACE PROTECTION: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
SKIN PROTECTION: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances. Suggested materials for protective gloves include: <Viton> <Nitrile> <Silver Shield>
RESPIRATORY PROTECTION: No respiratory protection is normally required. If user operations generate an oil mist, determine if airborne concentrations are below the recommended mineral oil mist exposure limits. If not wear a NIOSH approved respirator that provides adequate protection from measured concentrations of this material. Use the following elements for air-purifying respirators: particulate.

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9. PHYSICAL AND CHEMICAL PROPERTIES _
PHYSICAL DESCRIPTION: Pale yellow liquid.
pH: NA
VAPOR PRESSURE: <0.01 mm Hg at 100F
VAPOR DENSITY (AIR=1): Heavier than air.
BOILING POINT: >600F (>315C)
FREEZING POINT: NA
MELTING POINT: NA
SOLUBILITY: Soluble in hydrocarbon solvents; insoluble in water.
SPECIFIC GRAVITY: 0.86 - 0.89 @ 15.6/15.6C
VISCOSITY: 28.8 - 198.0 cSt @ 40C (Min.)

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10. STABILITY AND REACTIVITY
HAZARDOUS DECOMPOSITION PRODUCTS: H2S may be released at high temperatures.
CHEMICAL STABILITY: Stable.
CONDITIONS TO AVOID: No data available.
INCOMPATIBILITY WITH OTHER MATERIALS: May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
HAZARDOUS POLYMERIZATION: Polymerization will not occur.

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11. TOXICOLOGICAL INFORMATION
EYE EFFECTS: The eye irritation hazard is based on data for a similar material.
SKIN EFFECTS: The skin irritation hazard is based on data for a similar material.
ACUTE ORAL EFFECTS: The acute oral toxicity is based on data for a similar material.
ACUTE INHALATION EFFECTS: The acute respiratory toxicity is based on data for a similar material.
ADDITIONAL TOXICOLOGY INFORMATION: This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

This product contains zinc alkyl dithiophosphates (ZDDPs). Several ZDDPs have been reported to have weak mutagenic activity in cultured mammalian cells but only at concentrations that were toxic to the test cells. We do not believe that there is any mutagenic risk to workers exposed to ZDDPs.

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12. ECOLOGICAL INFORMATION
ECOTOXICITY: The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.
ENVIRONMENTAL FATE: This material is not expected to be readily biodegradable.

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13. DISPOSAL CONSIDERATIONS
Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

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14. TRANSPORT INFORMATION
The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT SHIPPING NAME: NONE
DOT HAZARD CLASS: NONE
DOT IDENTIFICATION NUMBER: NONE
DOT PACKING GROUP: N/A
ADDITIONAL INFO: Petroleum Lubricating Oil - Not Hazardous by U.S. DOT.
ADR/RID Hazard class - Not applicable.

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15. REGULATORY INFORMATION
SARA 311 CATEGORIES: 1. Immediate (Acute) Health Effects: NO 2. Delayed (Chronic) Health Effects: NO 3. Fire Hazard: NO 4. Sudden Release of Pressure Hazard: NO 5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01=SARA 313 11=NJ RTK 22=TSCA Sect 5(a)(2)
02=MASS RTK 12=CERCLA 302.4 23=TSCA Sect 6
03=NTP Carcinogen 13=MN RTK 24=TSCA Sect 12(b)
04=CA Prop 65-Carcin 14=ACGIH TWA 25=TSCA Sect 8(a)
05=CA Prop 65-Repro Tox 15=ACGIH STEL 26=TSCA Sect 8(d)
06=IARC Group 1 16=ACGIH Calc TLV 27=TSCA Sect 4(a)
07=IARC Group 2A 17=OSHA PEL 28=Canadian WHMIS
08=IARC Group 2B 18=DOT Marine Pollutant 29=OSHA CEILING
09=SARA 302/304 19=Chevron TWA 30=Chevron STEL
10=PA RTK 20=EPA Carcinogen

The following components of this material are found on the regulatory lists indicated.

DISTILLATES, HYDROTREATED HEAVY PARAFFINIC is found on lists: 14,15,17,
DISTILLATES, (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC is found on lists: 02,14,15,17,
PHOSPHORODITHIOIC ACID,O,O-DI-C1-14-ALKYL ESTERS, ZINC SALTS is found on lists: 01,11,

NEW JERSEY RTK CLASSIFICATION: Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL WHMIS CLASSIFICATION: This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

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16. OTHER INFORMATION

NFPA RATINGS: Health 1; Flammability 1; Reactivity 0;
HMIS RATINGS: Health 1; Flammability 1; Reactivity 0;
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT: Changes have been made throughout this Material Safety Data Sheet. Please read the entire document.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT: TLV - Threshold Limit Value TWA - Time Weighted Average STEL - Short-term Exposure Limit TPQ - Threshold Planning Quantity RQ - Reportable Quantity PEL - Permissible Exposure Limit C - Ceiling Limit CAS - Chemical Abstract Service Number A1-5 - Appendix A Categories () - Change Has Been Proposed NDA - No Data Available NA - Not Applicable

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Toxicology and Health Risk Assessment Unit, CRTC, P.O. Box 1627, Richmond, CA 94804

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.