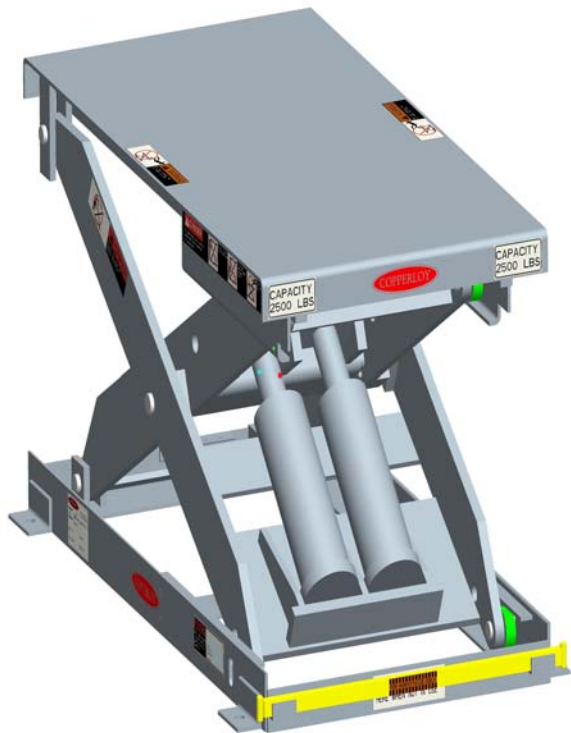
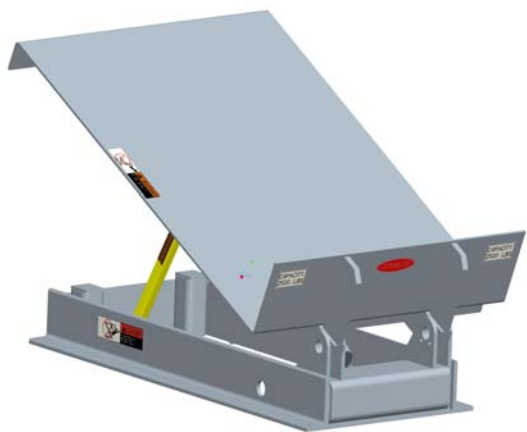




Inplant Lift, Tilt, and Rotate

Installation, Operation
&
Service Manual



by

JH INDUSTRIES, INC.

Model # _____
Serial # _____
Date: _____

1981 E. Aurora, Rd.
Twinsburg, Ohio 44087
(330) 963-4105 (Phone)
www.copperloy.com



Do not install, operate or service this product unless you have read and understand the Safety Practices, Warnings, Installation and Operating Instructions contained in this manual. Failure to do so could result in serious injury or death.



WARRANTY

ALL WARRANTY CLAIMS MUST HAVE PRE-APPROVED RATES, TIMES AND AUTHORIZATION NUMBERS PRIOR TO ANY FIELD WORK, IN ORDER TO BE ACCEPTED BY JH INDUSTRIES, INC.

JH Industries, Inc. expressly warrants that any Lift Table sold by it will be free from defects in material and workmanship under normal use for a period of one (1) year on all structural parts and six (6) months on all electrical and hydraulic parts from the earlier of, 1) sixty (60) days after the date of shipment, or 2) the date of installation of the Lift Table by the original purchaser, provided the purchaser maintains and operates the Lift Table in accordance with the Owners Manual. In the event that the Lift Table proves to be defective in materials or manufacturing workmanship within the applicable period, JH Industries, Inc. will at its option:

1. Replace the Lift Table or the defective portion thereof without charge to the purchaser, or
2. Alter or repair the Lift Table, on side or elsewhere, without charge to the purchaser.

This warranty IS EXCLUSIVE AND IS IN LIEU OF ALL GUARANTEES AND WARRANTIES, EXPRESSED OR IMPLIED BY ANYONE OTHER THAN JH Industries, Inc. sole warranty obligation shall be as set forth above.

The warranty does not cover any failure caused by improper installation, abuse, misapplication, overloading, negligence, or failure to lubricate and maintain the Lift Table properly. Parts requiring replacement due to damage resulting from vehicle impact, abuse, improper operation or lack of proper protection are not covered by this warranty. Seller assumes no responsibility or liability for (1) consequential damages of any kind which result from the use or misuse of the Lift Table; (2) damage or failure resulting from the use of unauthorized replacement parts or modification to the Lift Table; (3) damage resulting from the misuse of the Lift Table. THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION ABOVE. THERE IS NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

JH Industries, Inc. warranties extend only to the product itself.

JH Industries, Inc. DISCLAIMS all liability arising out of the workmanship, methods and materials used by the installer.

JH Industries, Inc. DISCLAIMS all liability for premature wear, product failure, property damage or bodily injury arising from improper installation or maintenance.

WARRANTIES, whether expressed or implied, relating to workmanship and materials used in connection with the installation of JH Industries, Inc. products are specifically DISCLAIMED.



This manual is only intended to be used for inplant lift, tilt and rotate tables only. Dock lifts are not covered under this manual set. For correct manuals contact factory for a copy. Failure to do so could cause serious injury or death.



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SAFETY

A product safety sign or label should alert persons to a specific hazard, the degree or level of hazard seriousness, the probable consequence of involvement with the hazard, and how the hazard can be avoided. **SIGNAL WORD** is a word or words that designate a degree or level of hazard seriousness. The signal words for product safety signs are “**DANGER, WARNING, CAUTION**” and “**NOTICE**”. Below is each of these signal words along with their definitions as directly referenced from *ANSI Z535.4-1998*.



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.



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



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE!

“NOTICE” is the preferred signal word to address practices not related to personal injury. The safety alert symbol shall not be used with this signal word. As an alternative to “NOTICE”, the word “CAUTION” without the safety alert symbol may be used to indicate a message not related to personal injury.

Verify that this is the most current Installation, Operation and Service Manual. To obtain an updated version please contact:

JH Industries Inc.
 1981 E. Aurora Rd.
 Twinsburg, Ohio 44087
 (330) 963-4105 (Phone)

Or visit our website under Lift Tables to download and print an up to date Version.
www.copperloy.com

SAFETY PRACTICES



Read these safety practices before installing, operating or servicing Lift Table. Failure to follow these safety practices could result in property damage, serious injury or death.

READ AND FOLLOW THE OPERATING INSTRUCTIONS CONTAINED IN THIS MANUAL BEFORE OPERATING THE LIFT TABLE. If you do not understand the instructions, ask your supervisor to teach you how to use the Lift Table.

This equipment should be used and maintained only by qualified personnel.

Before doing any maintenance or repair on the Lift Table **SECURE WITH THE MAINTENANCE BAR**. See Figure 3. on page 3.

FOR ALL MODELS

Never exceed the rated capacity of lift table.

Never exceed the rated end or side load capacity.

Do not operate the lift table while under the influence of drugs or alcohol.

Do not operate the lift table with equipment, material, or people around or under lift table. Always be aware of your surrounding while operating and keep the lift table in your sight.

Stay clear of the lift table when it is moving, keep hands and feet clear of moving parts at all time. Do not reach under or go under lift table with out the maintenance bar properly secured. Consult the factory if there is a need to maintain the safety of people or debris from entering the underside of the lift table. Optional side skirts are available.

Lift table is not designed to carry personnel or other material handling equipment. Do not walk on, drive on or ride on the lift table at any time.

Maintain equipment to safe working condition at all times during service. See maintenance section for servicing schedule.

Do not use the lift table if it looks broken or does not seem to work right. Tell your supervisor it needs repair right away.

Do not use this unit for any other use outside its intended design use.

Do not attempt to lift the lift table by any means other than that described in the operating procedures contained in this manual. Never use fork trucks or other material handling equipment to raise the lift. If the lift table does not operate correctly when using the operating procedures contained in this manual, **DO NOT USE THE LIFT TABLE**.

If you have any problems or questions using or operating the lift table, contact your supervisor for assistance.

Do not operate the lift table if operation causes undue physical strain or if physical impairments could lead to undue strain in back, muscles, limbs, or joints.

Loads should be kept uniform as possible to insure safe operation and maintain even wear on all moving parts.

If equipped with a traveling electrical cord, caution must be taken to insure that it is kept away from the lift as it is raised and lowered.

Keep area around lift table free of oil, obstructions, and debris that could cause slipping or stumbling into equipment.

Never disconnect any hydraulic or electrical lines, or remove any part of the lift table unless the maintenance bar is engaged and the electrical power supply is turned off and locked out.

Do not modify or change the design of this equipment.

If lift is not supplied or ordered with skirts

Never install a lift table in a pit unless it is supplied with the toe guards option on the table top. If this is required call factory for details.



INSTALLATION



Read and follow this instruction manual. Failure to do so could result in serious injury or death.

READ AND FOLLOW THE INSTALLATION INSTRUCTIONS CONTAINED IN THIS MANUAL BEFORE INSTALLING THE LIFT TABLE. If you have any questions concerning this manual or its contents please contact your dealer or JH Industries.

Permanent installation of lift table may be subject to local code, rules and regulations. Check local codes and regulations first. It is the owners or installers responsibility to obtain any necessary permits and inspections.



During Storage and shipping protect the power unit from weather and moisture. Verify before installation that all electrical components are dry and have not been damaged by moisture. Failure to do so could cause personnel injury or death.

The Electrical motor or power pack can give off sparks and does not qualify as explosion proof. Verify the area where the motor will be installed is free from flammable gasses. Personal injury or death could occur.

1. Read all installation and maintenance instructions and manuals. Read and understand all warnings if there are any questions please contact the manufacturer.
2. If this is a pit mounted lift visually inspect the pit for any issues that could interfere with the installation or use of the lift. Contact builder or owner with any issues that you may see. Verify the pit is square and that the walls are vertical with the floor of the pit. Use a carpenters square or diagonally measure the pit for square.

3. Unskid and remove all shipping material from the Lift Table. Make sure that there was no damage to the lift during shipping. If damage has occurred contact the owner and/or manufacturer. Do not install lift table if damage has occurred.



Do not install lift table if damage has occurred. Personal injury or death could occur.

For Proper Installation the lift must be installed on a stable surface. Failure to do so could cause the lift to be unstable resulting in personnel injury or death.

4. The lift table can be either surface mounted or pit mounted with the use of anchors to a secured foundation to help maintain stability.
5. The lift table can be moved with a lift truck or slings placed around the base frame.



Caution should be used not to deform the frame or platform. Do not attach slings or use the top of the table to move the lift, this could damage the lift.

6. When positioning the lift table in a pit, position the lift and align the frame carefully so a 1" clearance is maintained around the deck or platform, level the unit and place solid shims and grout under the base frame as required. (See Figure #1)
7. Lift tables with platform sizes larger than the advertised minimum, require anchoring using the supplied anchor tabs attached to the base frame.
8. Drill anchor hole 1/2" to 1" deeper than anchor embedment.
9. With nut and washer in place insert anchor and tap into position.
10. Tighten to manufacturers specifications. All anchor bolt lengths must suit local codes and conditions. Type and depth of concrete will determine type and length of anchor bolts required. (See Figure #2)

INSTALLATION

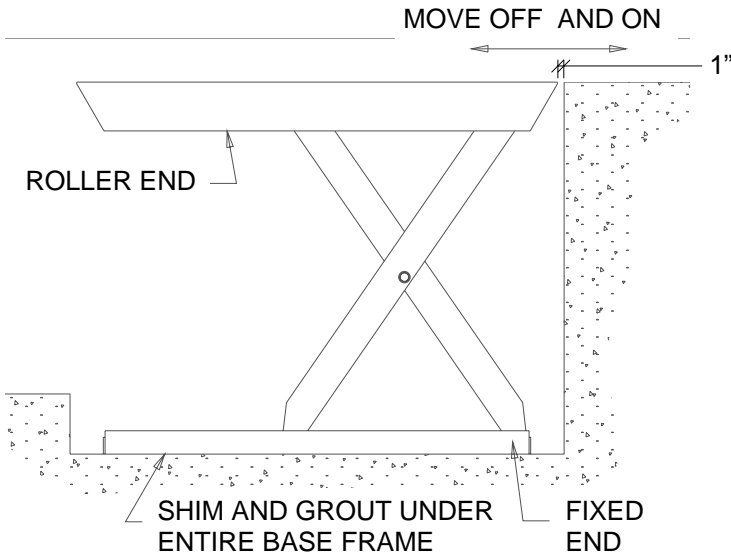
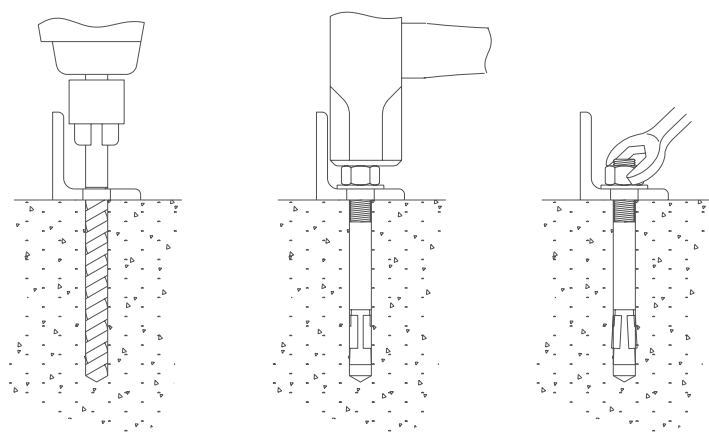


Figure #1– Pit Mounted Lift Installation



Note: Above diagram is to be used as a general guide line. Consult anchor manufacture for specific installation instructions.

Figure #2– Lag Bolt Attachment Methods

⚠ WARNING

All anchor bolts must be installed in accordance with the manufacturer’s instructions & local code rules and regulations. Improper installation may result in serious injury or death. Do not install anchor bolts in cracks or expansion joints in concrete. Installation in

cracks or expansion joints may cause the anchors to come loose and pull out. Use of improperly installed anchor bolts may result in serious injury or death.

Hydraulic Connections

(For External Power Units Only)

11. Begin by blowing out all hydraulic lines with compressed air before connecting at all connections.
12. Locate the location for the power unit and mount as required. Make sure the unit is in an area that will not be prone to moisture. Do not install where flammable gasses tend to collect.

⚠ CAUTION

Keep all hydraulic oil and lines free of dirt, moisture and any type of contamination. Be sure to flush all hydraulic lines before connecting External Power lines as they could have become contaminated during shipping or installation.

13. Replace the Solid shipping plug on the hydraulic fluid tank with the vented plus supplied.
14. Connect all hydraulic lines as required. Make sure to blow out all lines prior to connection.

⚠ WARNING

Make sure that all hydraulic lines are free of the lift table during operation. A pinched or cut hydraulic line could cause the lift table to lower suddenly. Serious injury or death could occur.

Electrical Connections

⚠ WARNING

The lift may be powered by a power supply of up to 480 VAC. Do not work with any electrical parts unless you are a qualified electrician. Serious injury or death could occur.

INSTALLATION

15. See fusing table (*Table #1 Page*) for correct fuse connection. Always use the correct fuse and wire size for connections.



Use the correct fusing requirements for each motor to avoid fire danger or electrical shock. Serious injury or death could occur.

16. Always verify that in all 3-phase motors the motor is turning in the correct direction as shown on the motor housing or pump. If the motor is not turning in the correct direction STOP, do not operate. Change any two of the three-phase leads to change motor direction. If this does not solve the issue See the trouble shooting section or contact the factory.



If the motor is rotating in the incorrect direction this could cause damage to the pump. Never let the motor run longer than 3 seconds in the incorrect direction. Always verify that the motor is turning in the correct direction after installation.

17. Follow all wiring diagrams located in this manual to make permanent electrical connections.



Do not use the maintenance bar to support any load other than the Lift Table. Remove all loads prior to engaging the maintenance devices. Failure to follow these instructions will result in permanent damage to the lift table and could result in serious injury or death.

18. Raise the lift table to it's full raised position.
 19. Remove the maintenance bar from the storage brackets located on the front of the base frame and engaged in vertical slots in base frame. (See *Figure #3*)
 20. Lower the lift table onto the maintenance bar. (For single-acting cylinders only) Continue to depress the down button for 10 seconds to relieve all pressure in the hydraulic system.

21. Visually check the hydraulic fluid level and add as required. (*See Oil Recommendations Section*)
 22. Clean up and clear the entire area around the lift. Remove any material that is not necessary for the use or function of the lift table. Make sure to remove all hydraulic oil from the area. Hydraulic oil can cause unsafe work areas and can be a fire hazard.



Any time the lift table is to be used make sure the area is clear and let all personnel around the area know that the lift table will be in use. Make sure all material or debris is cleared from the area. Failure to do so could cause serious injury or death.

23. Remove the maintenance device and verify the area is clear. Warn all personnel the lift table will be in use and operate the lift table through its full range of travel. Raise and lower the lift a few times to verify that all air is purged from the system. Make sure the motor is running smoothly and quietly. The lift should raise smoothly. If there is an issue with the lift table follow the instructions to re-install the maintenance strut and review the "Trouble Shooting" area. If the issue cannot be solved contact the factory.



At all times during the lift's movement there are "pinch points" that are created (See *Figure #4*). If any part of your body is caught in the lift you may be seriously injured. Maintain a safe distance from the lift table during operation.

24. Once the lift table has been tested fill in the serial number, Model Number and Date on the front cover of this Manual. On the back cover fill in your company information date installed and contact number or company information. By doing this you are agreeing that the lift was installed as per the instruction manual's directions and per local codes and regulations.

CAPACITY

The load capacity rating as stamped on the name plate of your lift table designates the gross capacity, assuming uniformly distributed load. This capacity must never be exceeded, as permanent damage may result. The relief valve has been preset to raise the indicated capacity plus an overload. In the case where special tops, gravity roll sections, etc. are installed on the lift after leaving our factory, deduct the weight of these from the load rating (*gross capacity*) to obtain the net capacity.

The maximum rollover capacity in fully lowered position is to be the maximum rated lifting capacity. Applying loads exceeding the rated capacity can result in excessive wear or damage to the lift and injury to personnel.

For end and side loading, reduce the end and side loading capacity by 2% for every inch added to

the standard minimum length or width. I.E.: _ _ _
4000# 24"x48" = 4,000# gross capacity. As a
24"x60" =3,040# end load, 4,000# side load. As a
48"x72" = 2,080# end load, 2,080# side load. Reduce the end or side loading capacity by 33% if the loads are going to be rolled onto the platform when the lift is other than fully lowered.



Do not exceed lift table capacity. Over loading could result in serious injury or death.

OPERATION



Before operating the lift table, read and follow Safety Practices on page iv .

Use by untrained people could result in serious injury or death. Read and follow complete Operation instructions. DO NOT USE THE LIFT TABLE IF IT LOOKS BROKEN OR DOES NOT SEEM TO WORK RIGHT. Tell your supervisor it needs repair.

Always use common sense and take responsibility for the safety of everyone near the lift table.

Keep all body parts clear of any moving parts travel path while raising or lowering the lift table. Never go under a lift table with out maintenance bar properly positioned and secured. Failure to follow these and other provided warnings could result in serious injury or death.

All electrical wiring and connections should be done by a qualified electrician.



To avoid damage to load and lift table do not operate unit if any obstructions or debris may interfere with the safe operation of the lift table.

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.

INTRODUCTION

The function of a lift table is to raise, lower, rotate, tilt, or position loads within the specified capacity to a desired height or position. Lifting or positioning is provided through hydraulic cylinders. Upon application of hydraulic power, the cylinder extends or retracts uniformly, either lifting, lowering, rotating or tilting the platform.

Hydraulic power is supplied through a combination pump motor assembly. The power unit incorporates a pressure relief valve, load holding check valve, lowering valve, and oil reservoir.

MAINTENANCE

⚠ WARNING

This equipment should be used and maintained only by qualified personnel. Failure to do so could result in property damage, serious injury or death.

READ AND FOLLOW THE OPERATING INSTRUCTIONS CONTAINED IN THIS MANUAL BEFORE OPERATING THE LIFT TABLE. If you have any questions concerning this manual or it's contents please contact your dealer or JH Industries.

Always use common sense and take responsibility for the safety of everyone near the lift table.

The following are the only factory-approved practices for working under the Lift Table. At **ALL** times while working under the Lift Table these instructions need to be followed.

If any of the safety or maintenance devices seem to be damaged or are missing, **STOP** immediately and contact your dealer or JH Industries for assistance. Your failure to use the approved and provided procedures and maintenance devices is not the liability of the manufacturer.

⚠ WARNING

Do not use the maintenance bar to support any load other than the Lift Table. Remove all loads prior to engaging the maintenance devices. Failure to follow these instructions will result in permanent damage to the lift table and could result in serious injury or death.

1. Raise the lift table to it's full raised position.
2. Remove the maintenance bar from the storage brackets located on the front of the base frame and engaged in vertical slots in base frame. (See Figure #3)
3. Lower the lift table onto the maintenance bar. (For single-acting cylinders only) Continue to depress the down button for 10 seconds to relieve all pressure in the hydraulic system.
4. Disconnect power source and follow OSHA electrical lock out/ tag-out to prevent lift operation.

⚠ DANGER

HIGH VOLTAGE! - Prior to any maintenance or installation disconnect power source and/ or lock out to prevent lift operation. Verify that all power sources are removed and no stored power source exists. Failure to do so will result in death.

6. Once all work is complete, follow the safety practices in reverse to raise the lift to remove the maintenance bar and reinstall all safety and maintenance devices back into their designated storage areas.

⚠ WARNING

At all times during the lift's movement there are "pinch points" that are created (See Figure #4 & #5). If any part of your body is caught in the lift you may be seriously injured. Maintain a safe distance from the lift table during operation.

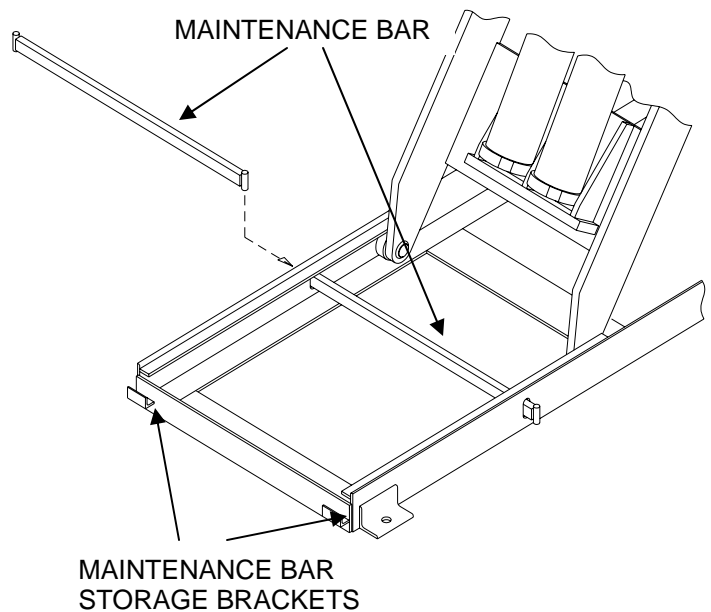


FIGURE #3- Maintenance Bar Installation

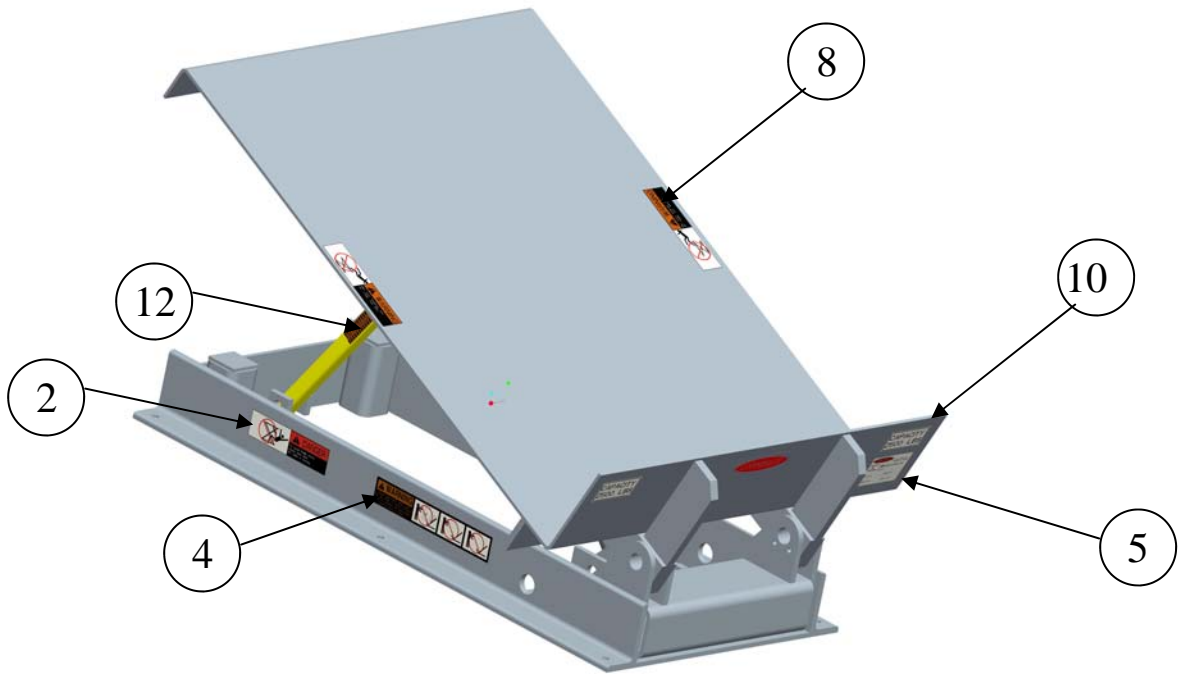


FIGURE #4- TILT TYPE TABLE

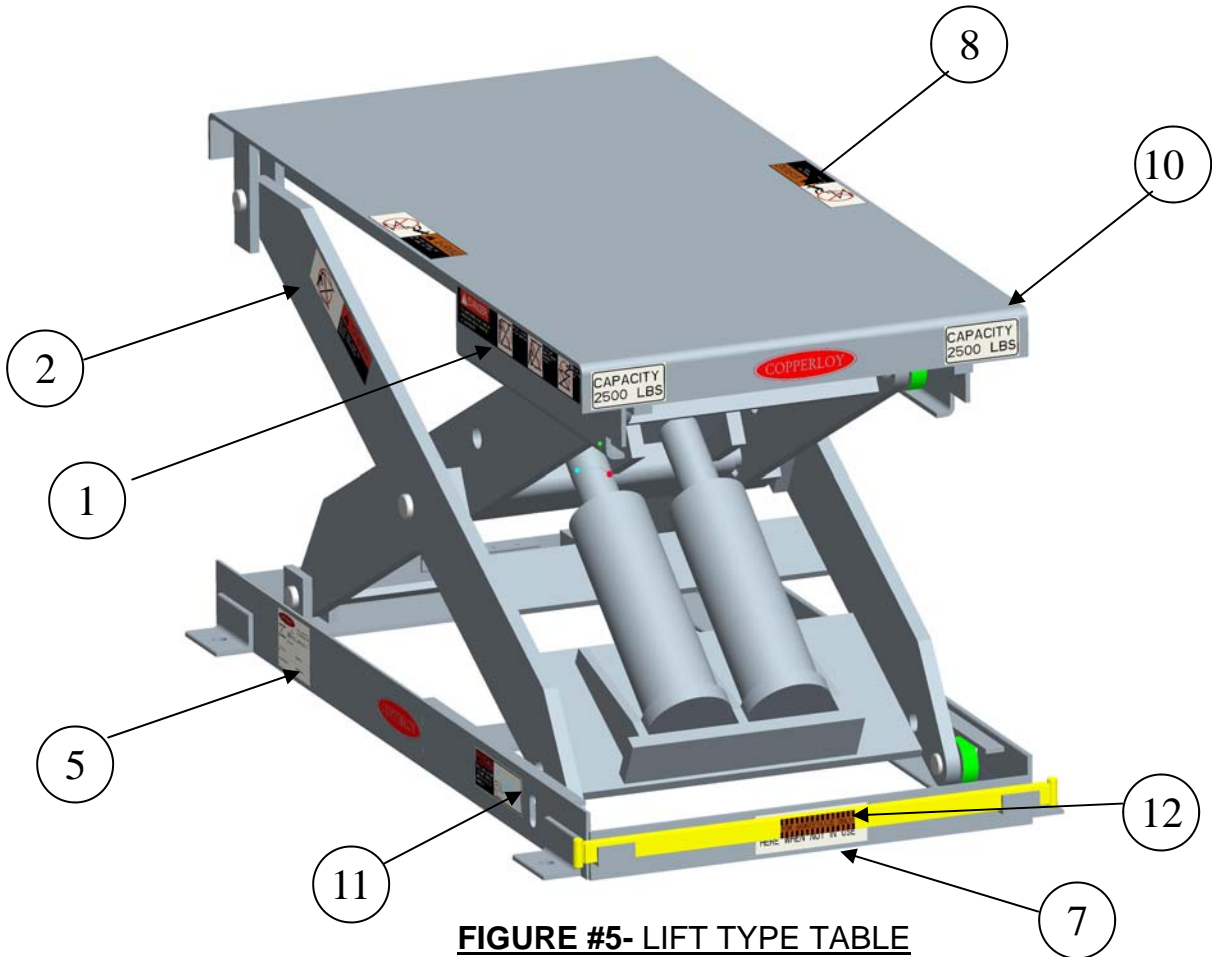


FIGURE #5- LIFT TYPE TABLE



- ① One on each side of lift platform (Requires (2))



- ② One on each side of the lift base near each scissor arm (Requires (2))



- ③ To be placed on the control station by installer (Requires (1))



- ④ To be placed on each side of the tilter table platform (Requires (2))

Copperloy		SERIAL #
1981 E. Aurora Rd. Twinsburg, OH 44097		JH INDUSTRIES INC.
MODEL #	CAPACITY	
EW-040-36-48x48-48x48	4000 LBS	
SIDE LOAD	END LOAD	
2000 LBS	2000 LBS	

- ⑤ To be placed on the Front of the lift platform (Requires (1))



- ⑥ To be placed on all control panels or electrical boxes

PLACE MAINTENANCE STRUT HERE WHEN NOT IN USE

- ⑦ To be placed on the front side of the lift base (Requires (1))



- ⑧ To be placed on the top surface of the lift platform (Requires (1))



- ⑨ To be placed on handrails and each side of the lift platform (Requires (4)) Only for Dock Lifts

CAPACITY
5000 LBS

- ⑩ To be placed at both corners front and back of the lift platform (Requires (4))



- ⑪ To be placed at Maintenance Strut Mounting Locations (Requires (2))



- ⑫ To be placed on maintenance strut at center (Requires (2))



- ⑬ Attached to shipped Lift Table, to be removed by installer after installation is complete (Requires (1))

OIL RECOMMENDATIONS



Do not use brake fluid or any other fluids not approved by the manufacturer. Use of fluids not approved by the manufacturer may attack the hydraulic systems seals and hoses.

FLUIDS

1. The first choice for fluid is Citco AW-46(200) hydraulic fluid. This is the fluid normally supplied by the factory and is suitable for a ambient temperature range of – 10° to +100° Fahrenheit (-23°C to +38°C).
2. Following is a recommended list of oils with a compatible ambient temperature range.
 - A. Amoco Oil Co.
Rycon Oil No. 32, 46
Amoco AW 32, 46
 - B. Cities Service Oil Co.
Citgo AW Hyd. Oil 32, 46
Citgo All Temp. Hyd. Oil
 - C. Chevron USA
Chevron EP Hyd. Oil 32, 46
 - D. Fina Oil Co.
Fina AW 32, 46
Fina Automatic Transmission Fluid
Dexron II
 - E. Gulf Oil Corporation
Gulf Harmony 32 AW, 46 AW
 - F. Mobil Oil Corporation
DTE 15, 24, 25
Mobil Fluid #300 Transmission Fluid
 - G. Sentinel Lubricants Corp.
Sentinel SH-10 Hydraulic Oil
 - H. Shell Oil Co.
Tellus Hyd. Oil 32, 46
Tellus "T" Hyd. Oil 32, 46
 - I. Texaco Inc.
Rando Oil Hd-32, 46
 - J. Union 76
Xcel AW 46 (200)

SEALS

Generally, the seals are Buna-N-Nitrile and polyurethane. The hoses are braided wire type. Always consult factory regarding special fluids rather than make assumptions on your own.

NOTICE

For extreme cold applications we recommend an oil immersion heater.

For extreme warm temperature ranges of +20° to +140° Fahrenheit, you may switch to 10W30 motor oil. If ambient temperatures are expected above 140°, consult factory.

HYDRAULIC CYLINDER MAINTENANCE



Before servicing the lift table, read and follow Safety Practices on page iii.

Always be certain the lift table is in the raised position, SECURED WITH THE MAINTENANCE BAR (see Figure 3.) before doing any maintenance or repairs under the lift table. Failure to do so could result in serious injury or death.

Be sure the hydraulic system is not under pressure before loosening or doing any maintenance to the hydraulic hose and fittings.

CYLINDER REMOVAL

1. Raise the lift table to full raised position.
2. Install maintenance bar. See Figure 3.
3. Lower the lift table onto maintenance bar. Depress the down button for an additional 20 second to relieve any pressure from the cylinders.
4. Disconnect power source and lock out to prevent lift operation.
5. Disconnect the hydraulic hoses from the cylinder and cap the hose ends to prevent contamination.
6. Remove the upper cylinder pin first then the lower pin (if applicable).
7. Remove the cylinder from the lift, being careful not to damage the surface finish of the rod.
8. Place the hose connection end of the cylinder in a container or bucket and force the cylinder closed to

NOTICE

If Lift Table is equipped with multiple cylinders it is recommended to rebuild all cylinders at the same time. Seals generally wear at the same rate, if you only rebuild one cylinder, you may have to pull the lift out of service soon thereafter to do the others.

CYLINDER DISASSEMBLY

1. Secure the cylinder on a work bench. (Do not use a vise or clamp on the cylinder housing, this could damage the housing.

2. Remove the snap ring retaining the cylinder gland. See Figure 4 & 5.
3. Carefully pull out the entire rod, gland and piston assembly.
4. Remove the hex lock nut retaining the piston, then slide the piston off of the rod. (*Be sure all components are placed on a clean surface to avoid contamination.*)
5. 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 a hone. Thoroughly clean the housing before re-assembling to avoid contamination.
6. Remove all old seals and wear rings. Clean the piston, rod and gland. Inspect for any possible damage and replace if necessary.

CYLINDER REASSEMBLY

1. Reinstall new seals and wear rings, use some lubricant to aid in ease of assembly. See Figure 4 & 5 for correct seal placement and direction.



To avoid damage to the new seals and wear rings do not use any sharp or pointy tools that may rip or damage any of the new seals or wear rings.

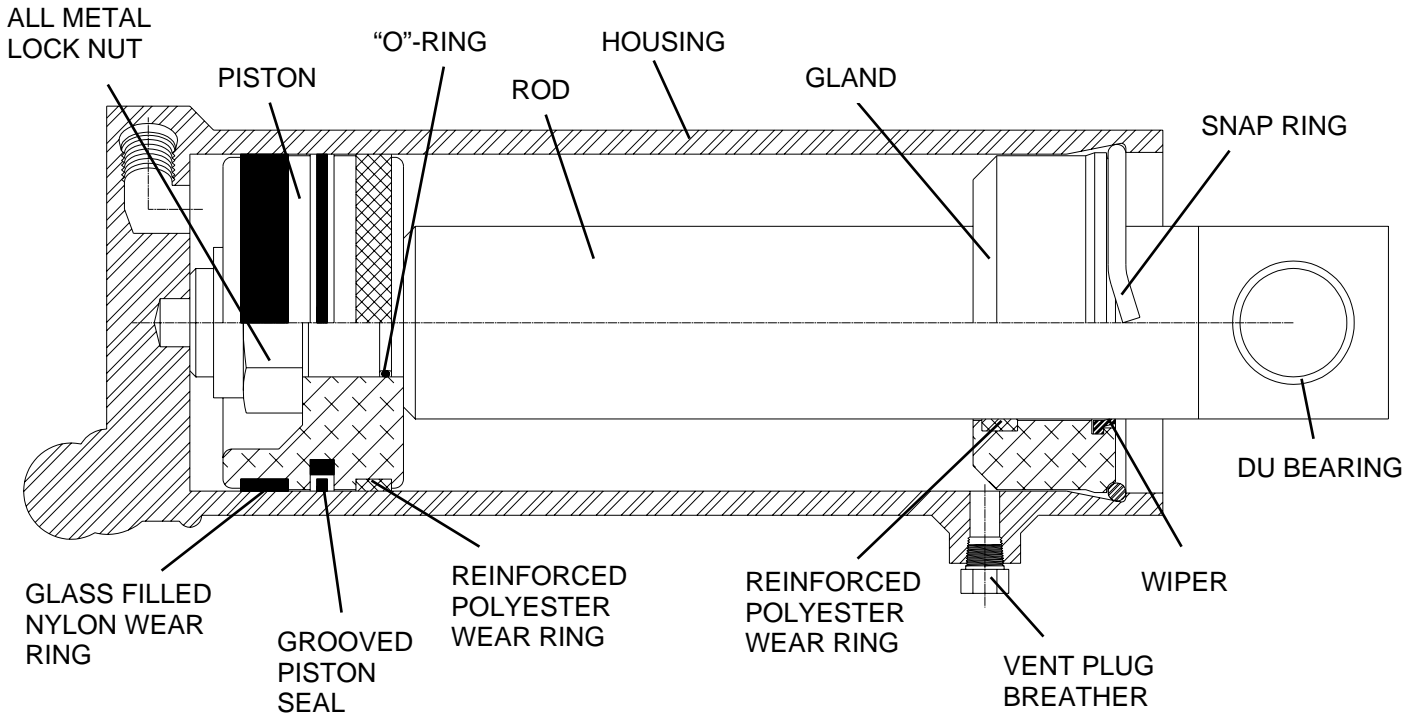
2. assemble the gland and piston back on and secure with a new lock nut.
3. Liberally lubricate the outside of the new seals and inside of cylinder housing, align the piston carefully and slide the entire assembly back into the housing.
4. Install the snap ring back in place, being sure that it is fully seated in its groove.

CYLINDER REINSTALLATION

1. Remount cylinder in lift and reattach all hoses.
2. Clean up any spilled oil so as not to misinterpret later as a new leak.
3. Reconnect power, remove maintenance bar and cycle the lift table several times to get all air out of the hydraulic system. Check the oil and top off as needed. See page 4 for oil recommendations.
4. The lift is now ready to go back into service.

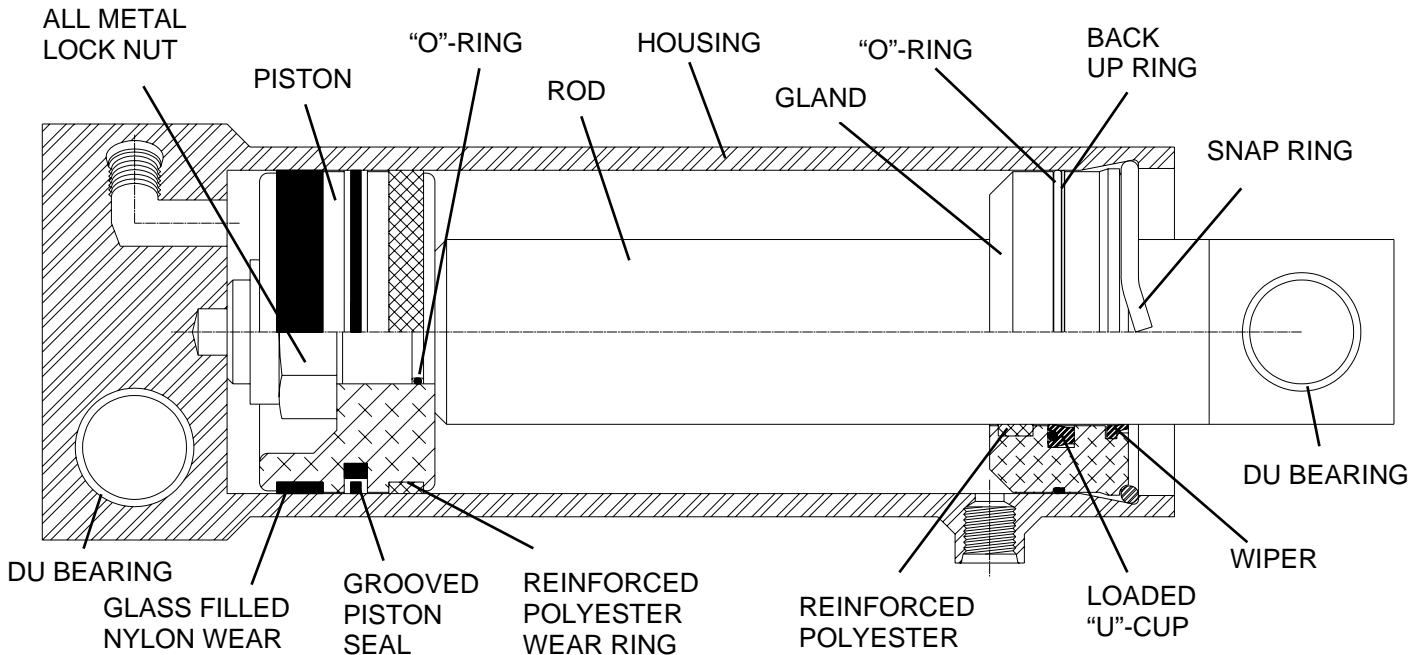
SINGLE ACTING CYLINDER

FIGURE 6



DOUBLE ACTING CYLINDER

FIGURE 7



WIRING DIAGRAM

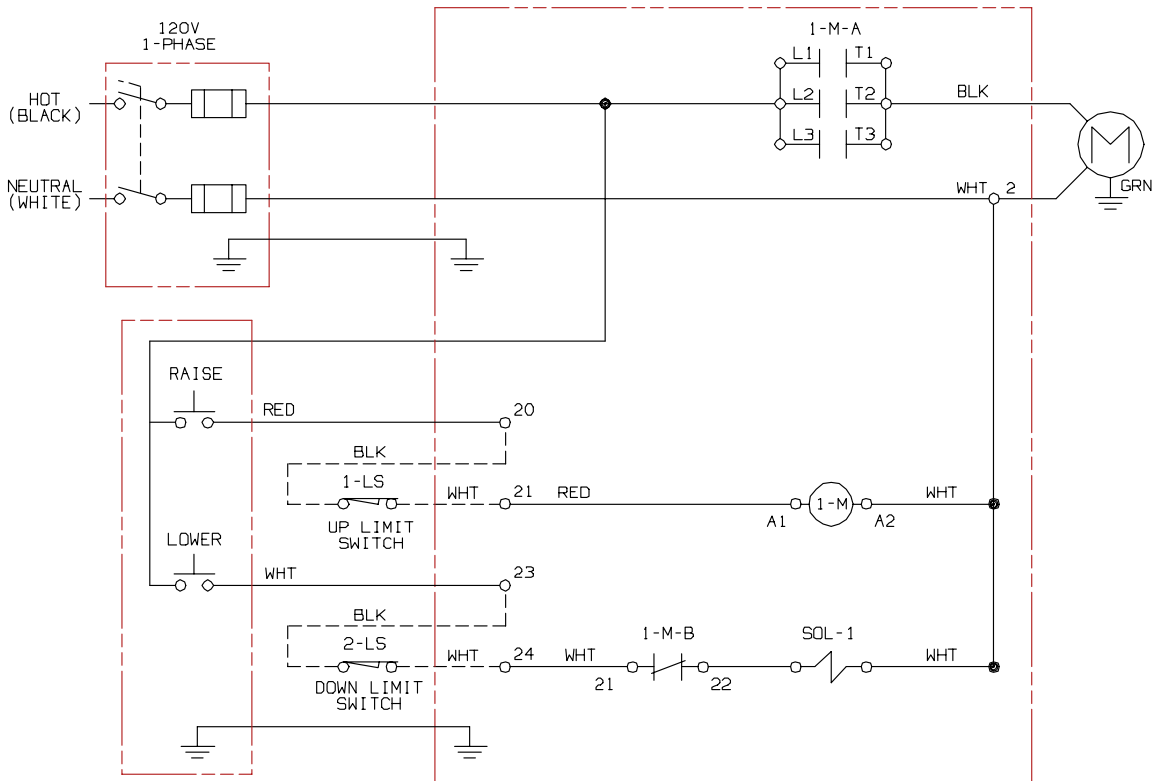
WIRING DIAGRAM



Before doing any electrical work, make certain the power is disconnected and properly tagged or locked off. All electrical work must be done by a qualified technician and meet all applicable codes. If it is necessary to make trouble shooting checks inside the control box with the power on, **USE EXTREME CAUTION**. Do not place your fingers or un-insulated tools inside the control box. Touching wires or other parts inside the control box could result in electrical shock, death or serious injury.

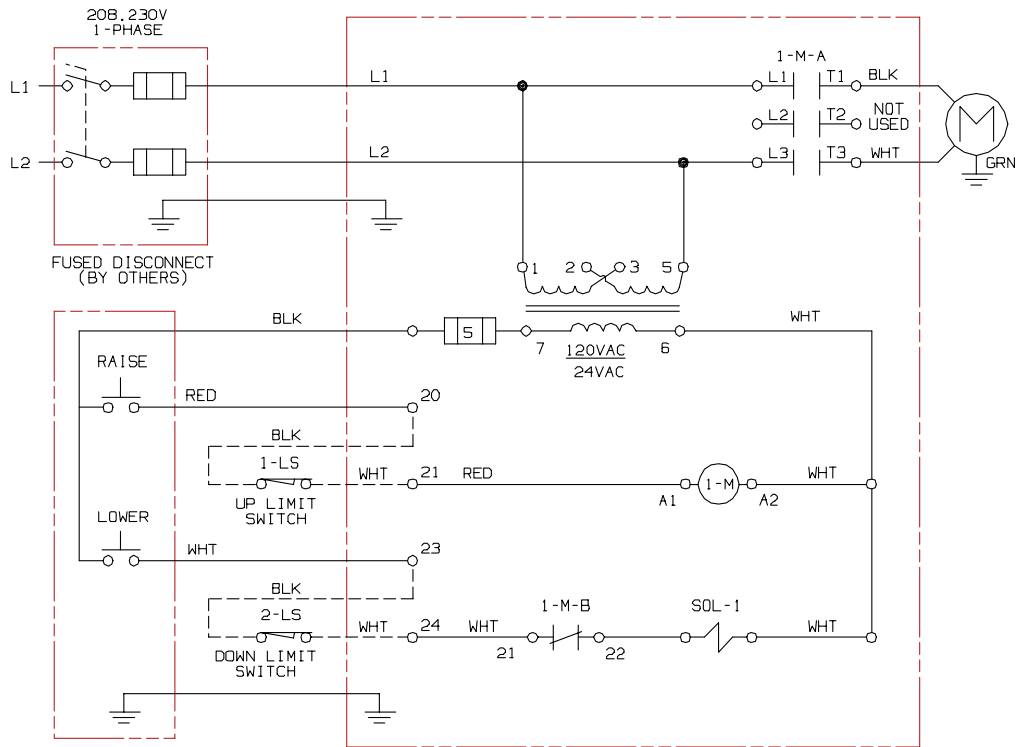
120VAC SINGLE PHASE (SINGLE ACTING, SINGLE FUNCTION OPERATION)

FIGURE 8



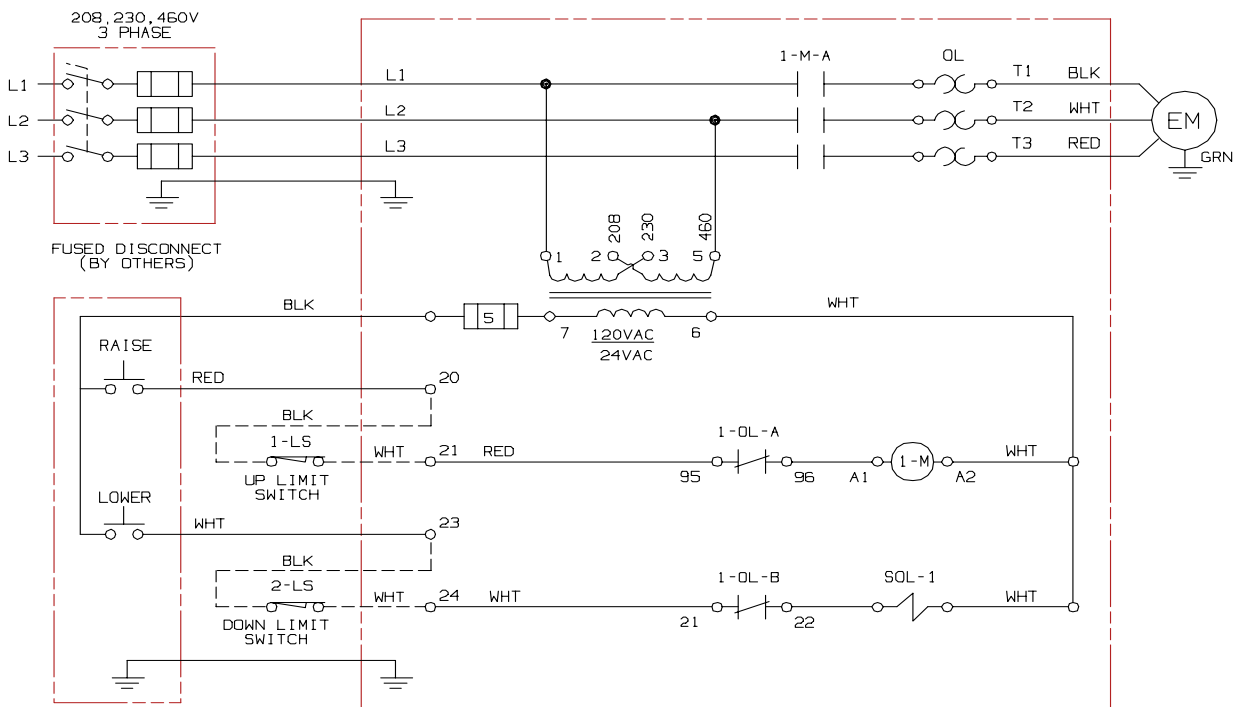
208/230VAC SINGLE PHASE (SINGLE ACTING, SINGLE FUNCTION OPERATION)

FIGURE 9



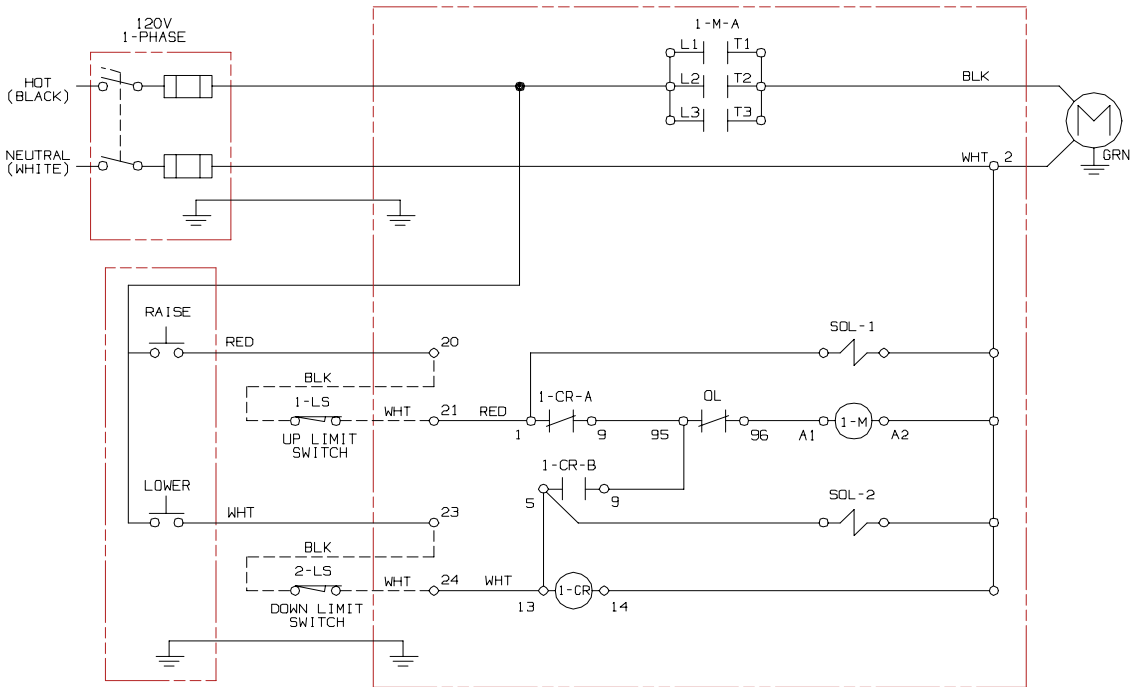
208/230/460VAC THREE PHASE (SINGLE ACTING, SINGLE FUNCTION OPERATION)

FIGURE 10



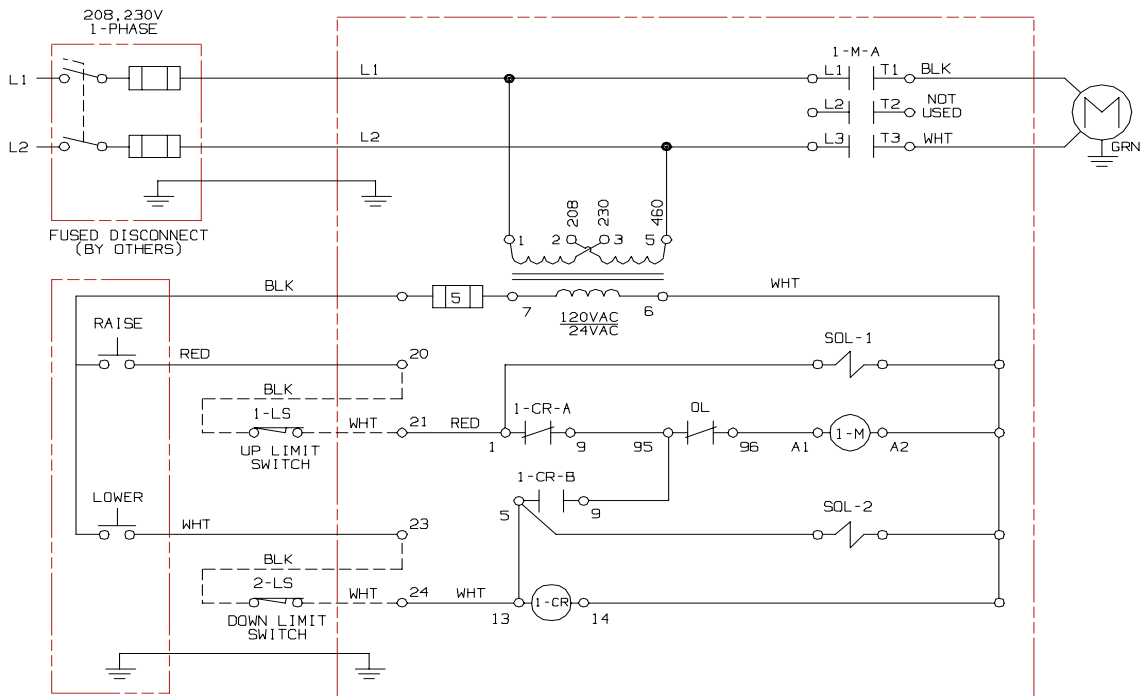
120VAC SINGLE PHASE (DOUBLE ACTING, SINGLE FUNCTION OPERATION)

FIGURE 11



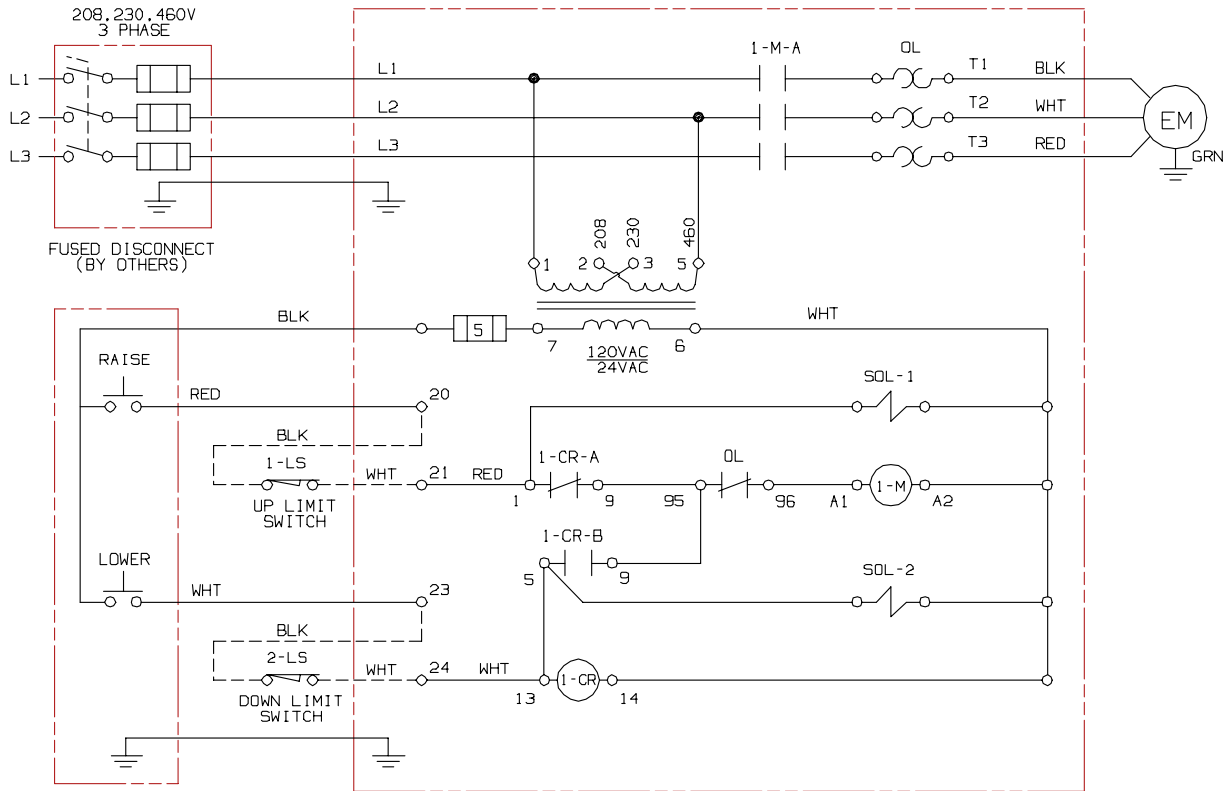
208/230VAC SINGLE PHASE (DOUBLE ACTING, SINGLE FUNCTION OPERATION)

FIGURE 12



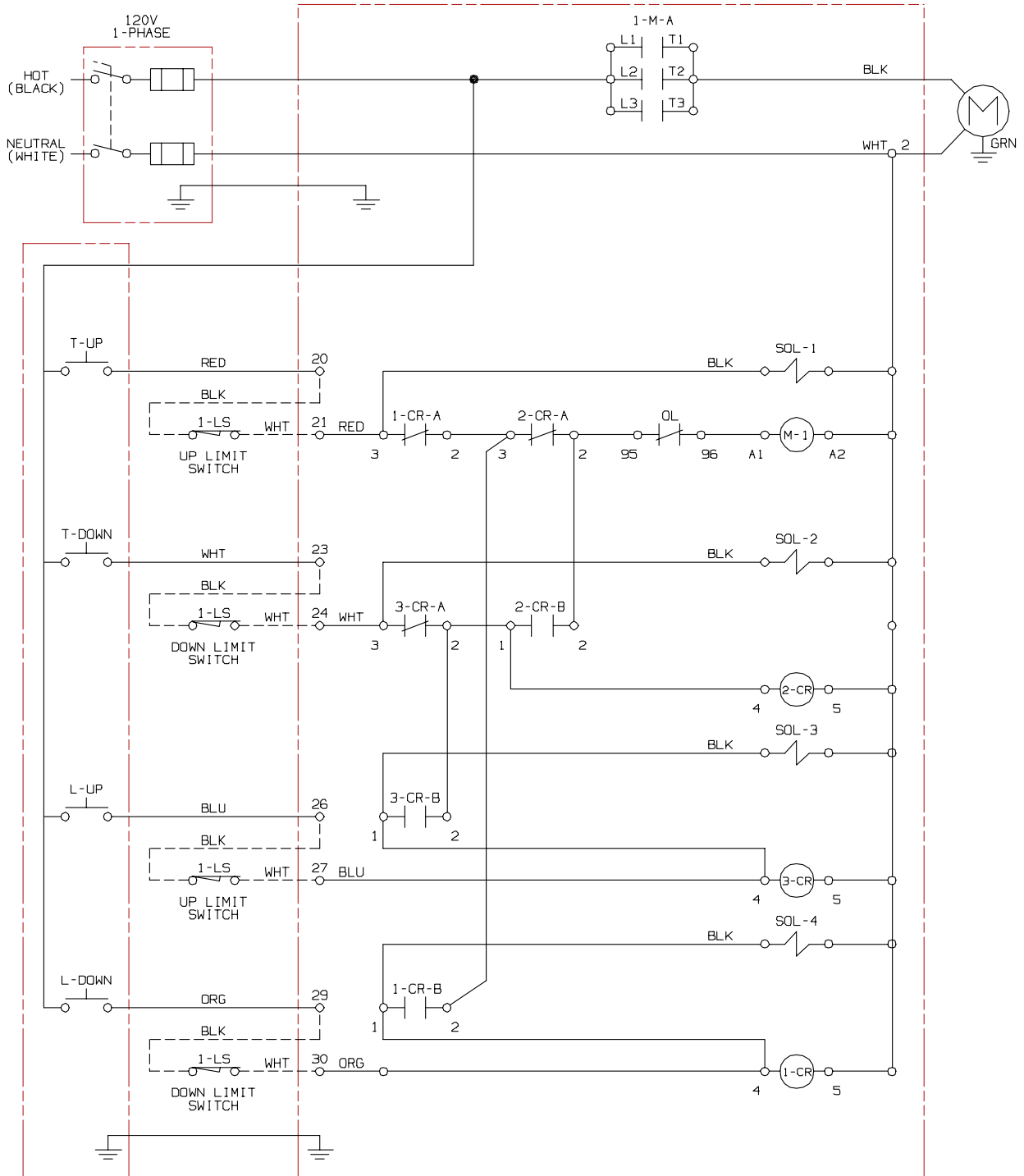
208/230/460VAC THREE PHASE (DOUBLE ACTING, SINGLE FUNCTION OPERATION)

FIGURE 13



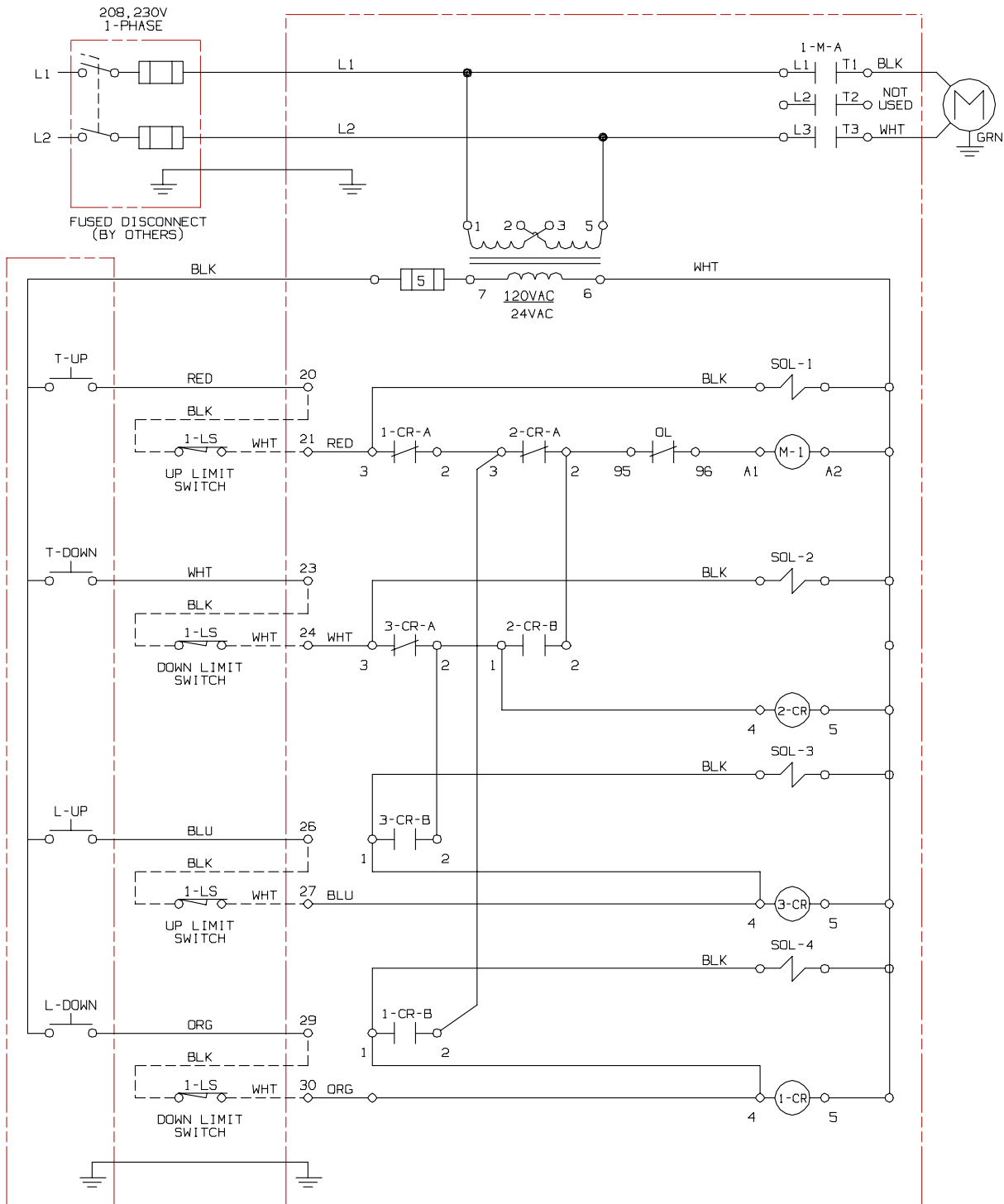
120VAC SINGLE PHASE (DOUBLE ACTING, DOUBLE FUNCTION OPERATION)

FIGURE 14



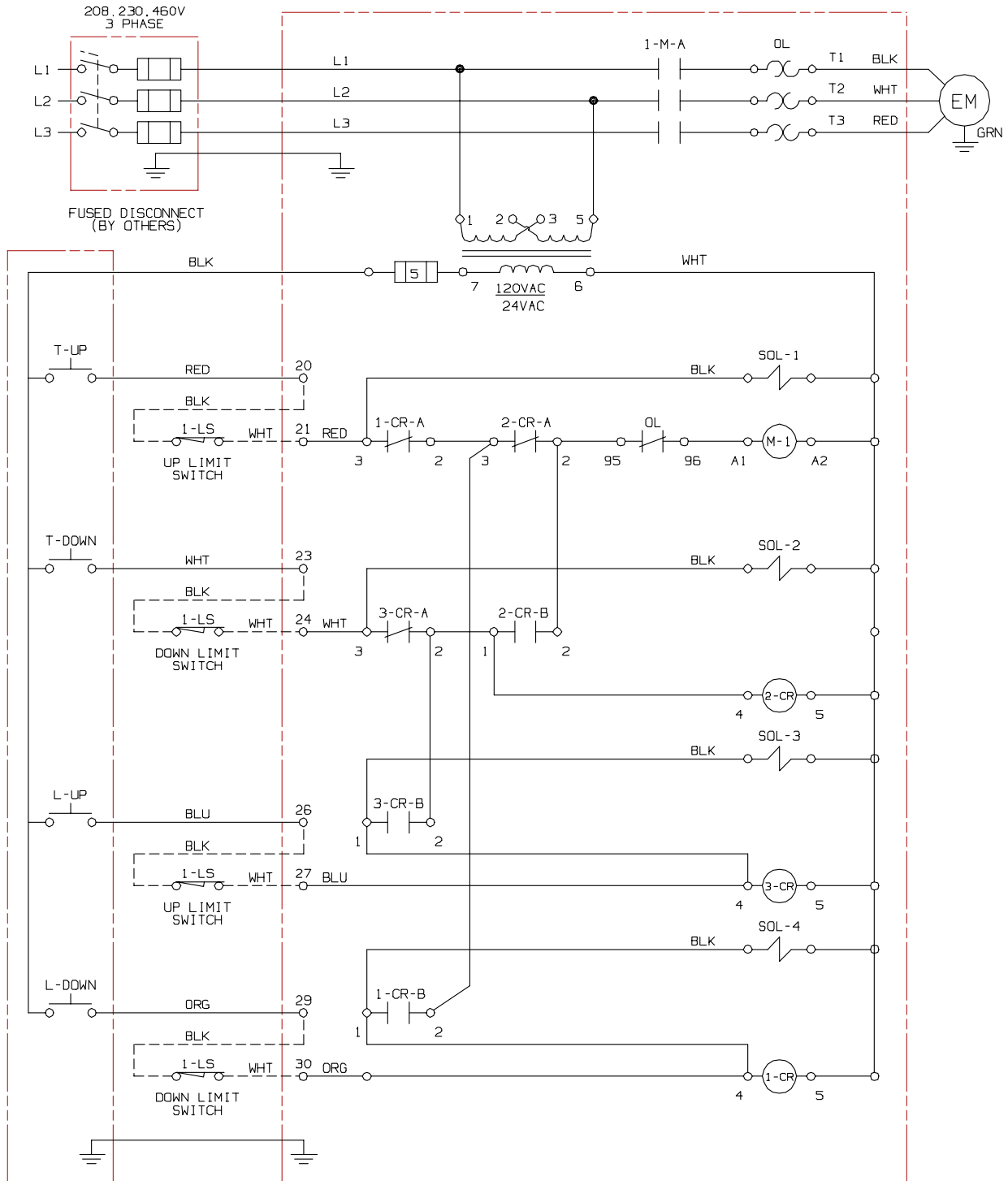
208/230VAC SINGLE PHASE (DOUBLE ACTING, DOUBLE FUNCTION OPERATION)

FIGURE 15



208/230/460VAC THREE PHASE (DOUBLE ACTING, DOUBLE FUNCTION OPERATION)

FIGURE 16



HYDRAULIC DIAGRAM

HYDRAULIC DIAGRAM



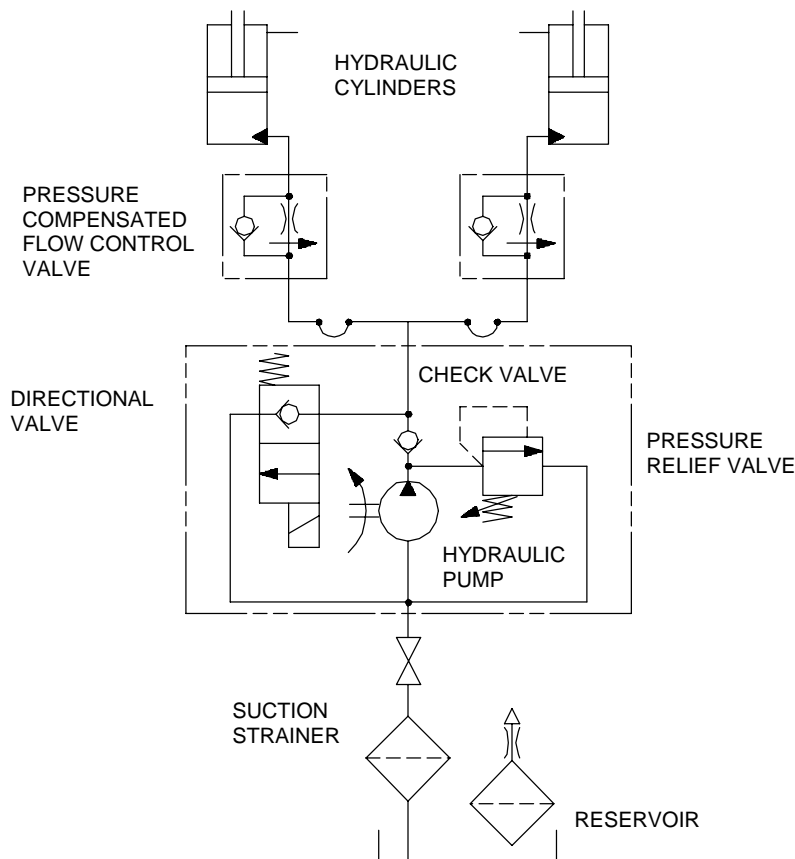
Before servicing the lift table, read and follow Safety Practices on page iii.

Always be certain the lift table is in the raised position, SECURED WITH THE MAINTENANCE BAR (see Figure 3.) before doing any maintenance or repairs under the lift table. Failure to do so could result in serious injury or death.

Be sure the hydraulic system is not under pressure before loosening or doing any maintenance to the hydraulic hose and fittings.

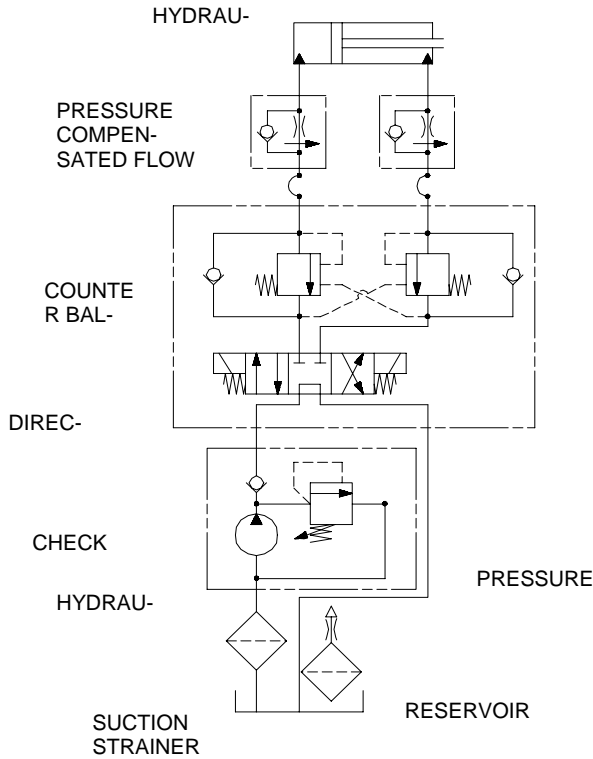
SINGLE ACTING, SINGLE FUNCTION OPERATION

FIGURE 17



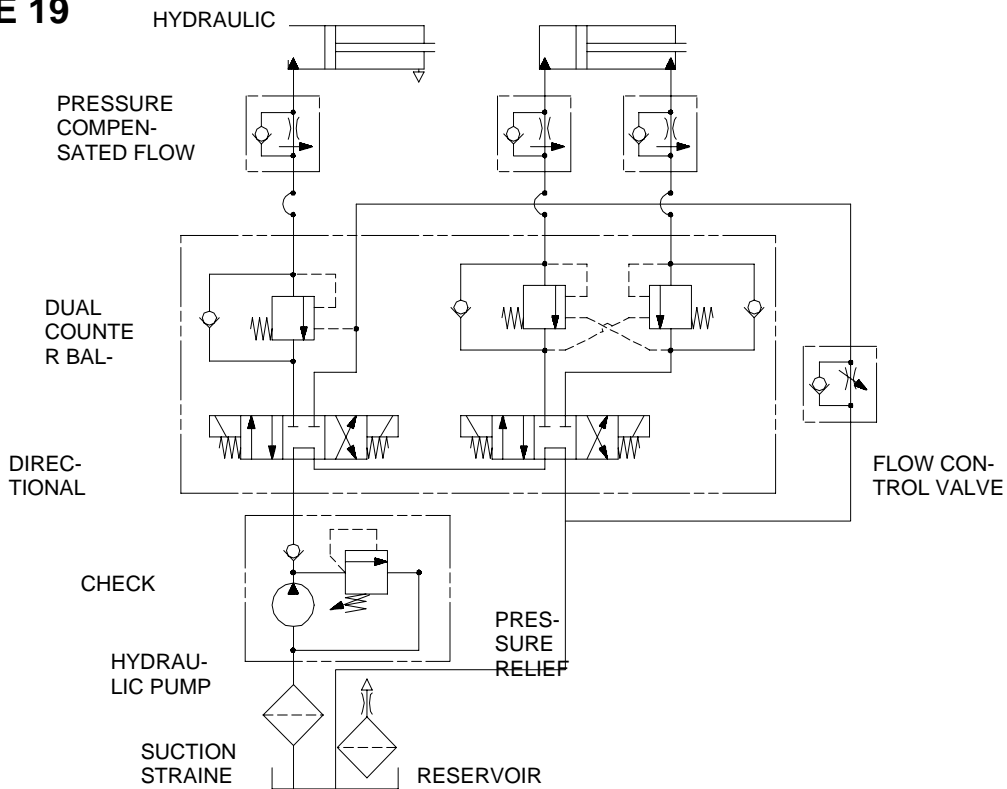
DOUBLE ACTING, SINGLE FUNCTION OPERATION

FIGURE 18



DOUBLE ACTING, DOUBLE FUNCTION OPERATION

FIGURE 19





Trouble Shooting

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



Trouble Shooting

Observation	Possible Cause	Remedy
4. "Spongy" or "Jerky" Lift operation. Do not confuse spongy operation with small surges caused by foreign material on lift wheel roller plate.	a. Air trapped in cylinders.	a. Bleed cylinders by lowering lift fully and hold "Lower" button for 20-30 seconds more. Raise lift and repeat procedure several times. Bleed cylinders also, with maintenance bar in place. Loosen fittings on cylinder(s) until a steady stream of oil comes out.
	b. Oil starvation.	b. See 1(e), (g), (h), (i).
5. Lift lowers too slowly when loaded.	a. Down Valve filter clogged.	a. Remove Solenoid Valve and clean filter.
	b. Pinched tube or hose.	b. Correct as necessary. (In case of pipe, check for obstruction inline.)
	c. Oil is too thick.	c. See "Oil Viscosity Recommendations" for your ambient temperatures.
	d. Foreign material in Flow Control Valve.	d. Lower lift, remove Flow Control Valve and clean. (See Hydraulic Section.)
	e. Binding cylinders.	e. See 2(f).
	f. Foreign material in Velocity Fuse.	f. Remove and clean.
	g. Pressure Compensated Flow Control Valve is defective.	g. Remove and replace.
6. Lift lowers too quickly.	a. Leaking hoses, cracked fittings.	a. See 2(a).
	b. Check valve stuck open. (The combination of a stuck Check Valve and open Solenoid Valve will cause excessive speeds.	b. Remove Check Valve and clean it. (See Hydraulic Section.)
	c. Foreign material stuck in Flow Control Valve.(In this case, lift lowers initially at a normal rate then speeds up as the platform descends.	c. Remove Flow Control and clean it. (See Hydraulic Section.)
7. Lift raises then lowers slowly.	a. Down Solenoid Valve may be incorrectly wired or stuck open due to dirt.	a. See 2(a).
	b. Check Valve may be stuck open.	b. Remove and clean. (See Hydraulic Section.)
	c. Check for leaking hoses, fittings, pipes.	c. Correct as necessary.
	d. Cylinder packing may be worn or damaged.	d. Replace packings. (See Cylinder Repair procedure.)
8. Lift has raised, but does not lower.	a. Blown electrical fuse.	a. Check and replace.
	b. Incorrect Down Solenoid Valve wiring.	b. Correct as necessary. (See Wiring Schematic.)
	c. Down Solenoid Valve stuck.	c. Lightly tap down Solenoid Coil body to seat it properly. (Do not hit hard as it will permanently damage the internal stem.) Do not remove the Solenoid Valve from the pump or block as the unit will come down at a dangerous speed.
	d. Faulty Down Solenoid Coil.	d. Remove and replace.
	e. Maintenance safety bar, or some other object blocking down travel.	e. Raise lift an remove the safety bar, or whatever object is blocking the down travel, then press the lower button.
	f. Binding cylinders.	f. See 2(f).



Trouble Shooting

Observation	Possible Cause	Remedy
	g. In case of excessive down speeds, the Velocity Fuse will become operative and shut off oil flow from cylinders, thus the platform will remain stationary.	g. To unlock, re-pressurize the hydraulic system.
	h. Check if the Limit Switch is inoperative and the platform has raised all the way so that the mechanical stops are in operation. If mechanical stops are in operation, velocity fuses have been locked up.	h. Put maintenance safety bar in place and unscrew plug the fitting going into the cylinders. This will relieve the pressure inside the cylinder. After the platform by a few inches reset the Limit Switch to cut off motor at set vertical travel.
	i. If Limit Switch is operative, and the platform has not raised all the way to the mechanical stops, the Pressure Compensated Flow Control Valve may have locked itself because of air.	i. See note in the Installation Section of this manual on how to remove the air lock from the valve.
9. Table raises then slowly drifts back down.	a. Lowering valve may be stuck open.	a. See 2(a).
	b. Check Valve stuck open.	b. See 7(b).
10. Lift will not raise full vertical travel.	a. Low oil level.	a. Check oil level and fill as required.
	b. Leak in the suction line of pump.	b. Check for leaks and repair as needed.



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