

ZPL Series

Industrial Lifts

Service & Parts Manual



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GETTING STARTED

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

ZPL is the model designation for the ZPL Series Industrial Lift. Throughout this service manual the ZPL may be referred to as the “lift”.

INSPECTION

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

SAFETY DEFINITIONS

ECOA uses the following system to identify the degree of risk associated with hazards and unsafe practices.

DANGER - Immediate hazard which will result in **SEVERE PERSONAL INJURY** or **DEATH.**

WARNING - Hazard or unsafe practice which could result in **SEVERE PERSONAL INJURY** or **DEATH** and **PROPERTY DAMAGE.**

CAUTION - Hazard or unsafe practice which could result in **MINOR PERSONAL INJURY** and **PROPERTY DAMAGE.**

SAFETY INSTRUCTIONS

DANGER!

1. **READ THIS MANUAL COMPLETELY BEFORE USING AND THOROUGHLY UNDERSTAND AND FOLLOW ALL SAFETY INSTRUCTIONS.**

2. A falling industrial lift can cause **SEVERE PERSONAL INJURY** or **DEATH.** **NEVER** go under the lift platform until the load is removed and the scissor mechanism is blocked with the maintenance bars.

3. The maintenance bars have been designed for use only when the lift is **UNLOADED.** **NEVER** place any load on the lift platform with the maintenance bars engaged. **SEVERE PERSONAL INJURY** or **DEATH** and **PROPERTY DAMAGE** could result.

4. **DO NOT** attempt to remove or loosen the platform or base frame hinge pins. Loosening or removing these pins could cause the lift to suddenly collapse, **EVEN IF THE MAINTENANCE BARS ARE ENGAGED.** **SEVERE PERSONAL INJURY** or **DEATH** and **PROPERTY DAMAGE** could result.

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

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

WARNING!

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

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

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

4. **PINCH POINT HAZARD**. **ALWAYS** keep hands and feet clear of the underside of the lift platform. **SEVERE PERSONAL INJURY** could result.

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

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

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

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

CAUTION!

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

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

RESPONSIBILITIES OF OWNERS/USERS

It is the responsibility of the Owners/Users to:

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

FUNCTIONAL DESCRIPTION

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

Pressing the "UP" button, starts the motor, (see wiring diagram) which in turn runs the hydraulic pump. The cylinders begin to extend and the platform starts to rise. The platform will rise as long as the "UP" button is pressed. On releasing the button, the platform ceases to rise and will remain at that particular elevation.

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

SCISSOR BLOCKING INSTRUCTIONS

To Engage the Maintenance Bars:

1. REMOVE ALL LOADS from the platform and depress the "up" button to raise the ZPL to its fully raised position.
2. Rotate each maintenance bar until it contacts the base. Ensure both maintenance bars are properly positioned against the (2) end bars.
3. Lower the lift by pressing the "DOWN" button until the rollers stop against the maintenance bars and the lift ceases to come down any further.

To Disengage the Maintenance Bars:

1. Raise the ZPL by pressing the 'up' button until the rollers are well clear of the maintenance bars.
2. Rotate each maintenance bar back to its original position.

WARNING!

MAINTENANCE BARS ARE TO BE USED ONLY WHEN THE LIFT IS UNLOADED. USE OF THE MAINTENANCE BARS TO SUPPORT A FULLY LOADED LIFT COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH.

OPERATING INSTRUCTIONS

The load capacity rating as stamped on the nameplate of your ZPL designates the maximum lifting capacity with a uniformly distributed load. This capacity must never be exceeded, as permanent damage may result. Lowering loads that exceed the rated capacity will result in excessive wear or damage to the lift.

Consult the factory before any modification is performed in the field. NOTE: Any modification of the lift in the field, without the express written consent of ECOA, will void any and all warranties.

The ZPL is furnished with constant pressure ("dead-man" type) push button controls. Pressing the "UP" (or RAISE) button, starts the motor, (see wiring diagram) which in turn runs the hydraulic pump. The cylinders begin to extend and the platform starts to rise. The platform will rise as long as the "UP" button is pressed and the "UP LIMIT SWITCH" (optional) is not activated. On releasing the button, the platform ceases to rise and will remain at that particular elevation.

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

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

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

Some "Tips" to the Operator

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

ROUTINE MAINTENANCE

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

(A) Monthly Inspections

1. Check oil level, It should be about 1" below top of the tank with the lift in fully lowered position. Add oil as required. (See oil specifications.)
2. Check for oil leaks. See Trouble Shooting Section and correct as necessary.
3. Check roller bushings, axle pin, clevis and pivot points for wear.
4. Check for worn or damaged hydraulic hoses or electrical cords. Repair as necessary.
5. Check rollers for looseness and wear, See Trouble Shooting.
6. Check retaining rings at all axles, pivot points and clevis.
7. Never grease rollers or axles.
8. Check for unusual noise. See Trouble Shooting.

(B) Yearly Inspection

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

(C) Winter/Summer Maintenance

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

Oil Viscosity Recommendations

Best performance can be obtained by utilizing ISO-Vg grade 32,46 oil with a viscosity range between 150-250 SUS at 100⁰F (32-54 cSt at 40⁰C). Minimum viscosity at operating temperature is 60 SUS (10 cSt). Maximum start-up viscosity at minimum ambient temperature is 4000 SUS (880 cSt). Maximum recommended operating temperature of hydraulic oil is 150⁰F (65⁰C).

Oil should be non-corrosive, have maximum anti-wear properties, rust and oxidation (treatment) and be non-foaming.

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

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

Note:

1. Do Not use brake fluid.
2. All Lifts requiring oil by ECOA will be supplied with AW-46(200) Hydraulic oil.

HYDRAULIC SECTION

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

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

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

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

FIGURE 1A - HYDRAULIC SCHEMATIC

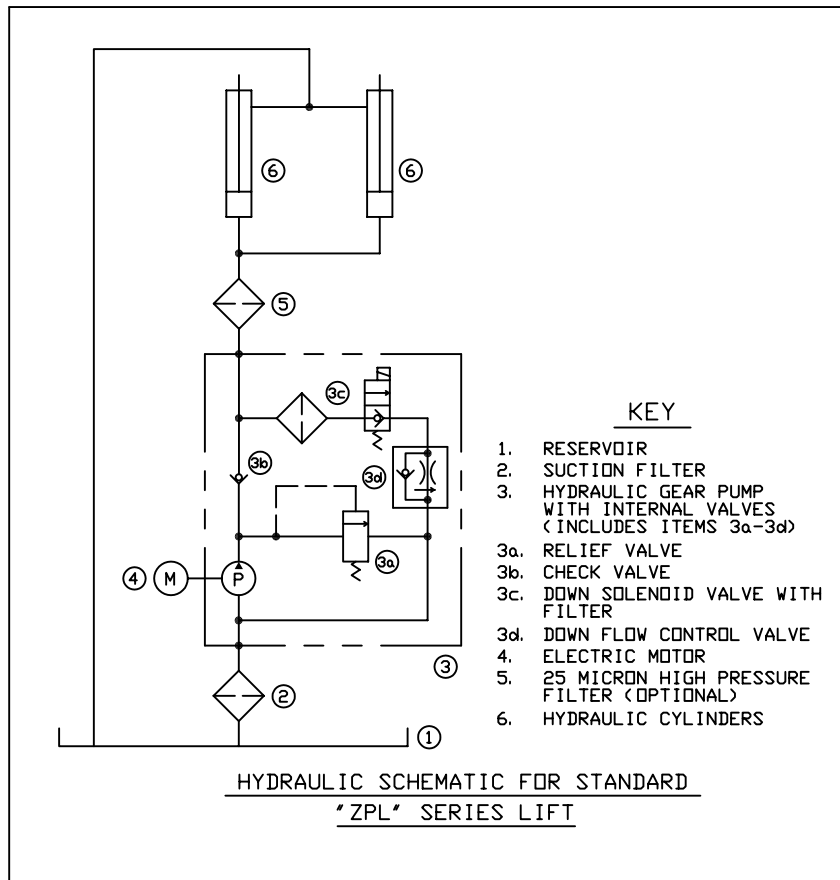
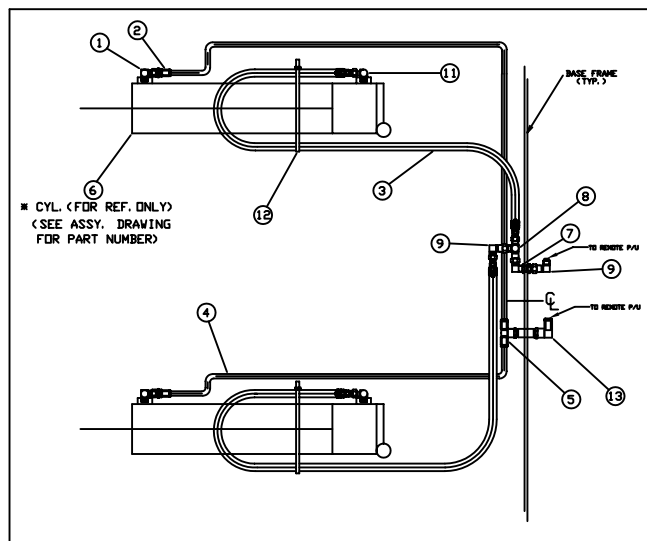


FIGURE 1B - HOSE LAYOUT FOR ALL ZPL MODELS



No.	PART No.	DESCRIPTION	REMOTE POWER UNIT
			QTY.
1	HDS-445-02	90° ELBOW	2
2	HDS-457-19	MALE CONNECTOR	2
3	HDS-101-0550	1/4" HOSE ASSY x 55'	2
4	HDS-20104	TUBE 3/8" OD x 1/4" ID x 48" L.	2
5	HDS-459-15	BRANCH TEE	1
6	*	(SEE NOTE)	*
7	HDS-427-03	90° #6 BULKHEAD	1
8	HDS-465-06	37° FLARE TEE	1
9	HDS-467-06	ADAPTER 37° FLARE ELBOW	2
10	*	NOT USED	*
11	HDS-441-05	90° ELBOW	2
12	999-6087	13' CABLE TIE	2
13	HDS-458-18	ELBOW MALE	1

FIGURE 2 - HYDRAULIC CYLINDER
(REF. CYL-A4861-1025)

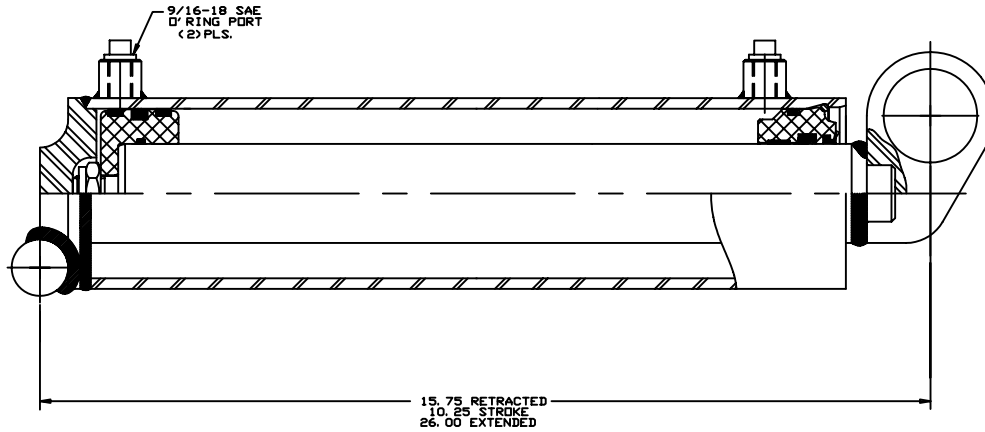
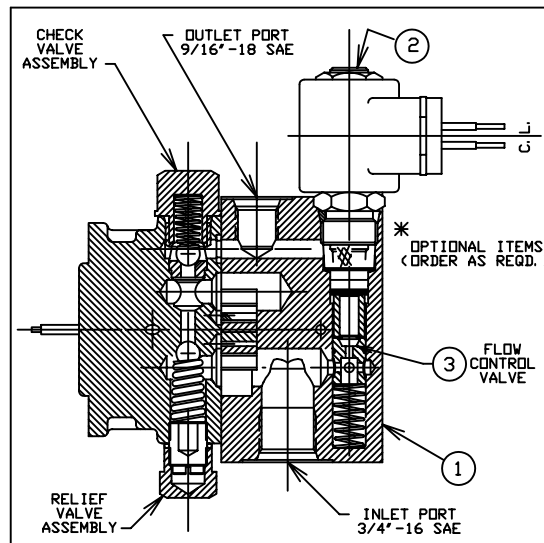


FIGURE 3 - CROSS-SECTIONAL VIEW OF GEAR PUMP USED ON ZPL LIFTS:



ITEM	PART NO.	DESCRIPTION	QTY.
1	HLT-712	HYDRAULIC GEAR PUMP WITH INTERNAL VALVES 2 GPM @ 3450 RPM INCLUDES ITEMS# 2 & 3C	1
2	HLT-751	24VAC SOLENOID COIL W/ 1/2" NPT LEADS	1
3A	HLT-755-100	FLOW CONTROL SPOOL (1 GPM) *	1
3B	HLT-755-200	FLOW CONTROL SPOOL (2 GPM) *	
3C	HLT-755-300	FLOW CONTROL SPOOL (3 GPM) *	
3D	HLT-755-400	FLOW CONTROL SPOOL (4 GPM) *	
3E	HLT-755-500	FLOW CONTROL SPOOL (5 GPM) *	
3F	HLT-755-600	FLOW CONTROL SPOOL (6 GPM) *	

Electrical Section (see pages 13 &14)

The standard power unit is pre-wired according to customer request. For supplied power other than the original configuration, the power unit MUST be re-wired according to the Manufacturer's instruction sheet. Service and Field wiring is the sole responsibility of the end user. ECOA Industrial Products, Inc. assumes no responsibility for incorrect installation or service wiring.

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

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

Specifications:

Magnetic Starter: 24 VAC

Motor: 1.5 HP/208-230-460V/3PH/60HZ or 1.5 HP/115-230V/1PH/60HZ
Thermally protected, automatic reset, internal.

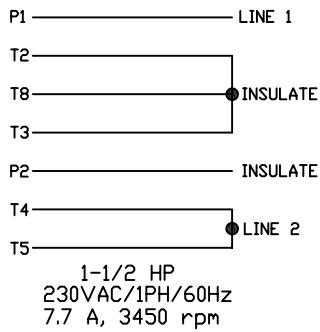
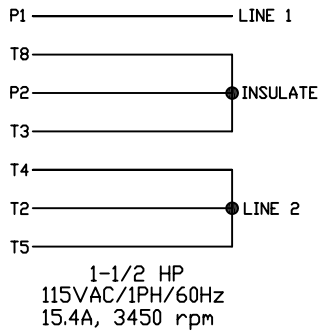
Transformer: 75 VA, 115/208/240/480 VAC Primary, 24 VAC Secondary, manual reset w/ circuit breaker.

Enclosure: NEMA 12 with 5 knockouts (Motor, Solenoid, Power Cord, Control Cord & Limit Switch (optional)).

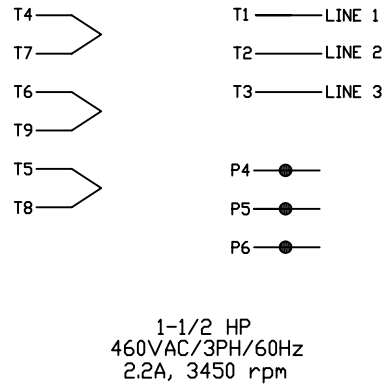
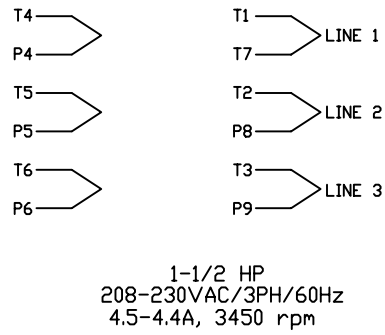
Overall Box Dimensions: 8.25 in. x 6.25in. x 4.25in.

FIGURE 4 - MOTOR LEADS CONNECTIONS:

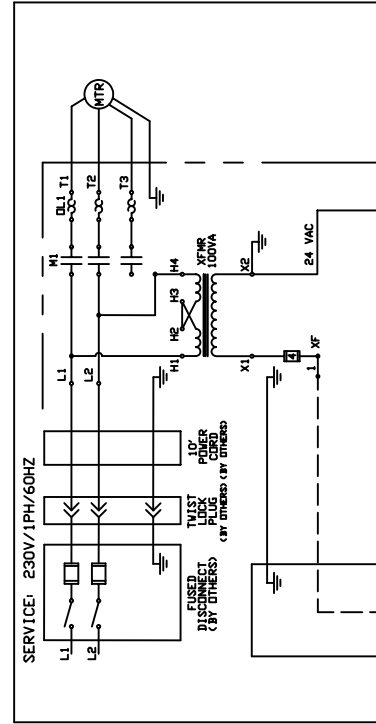
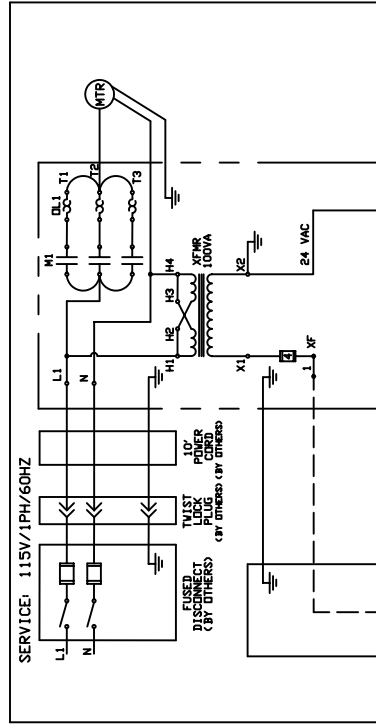
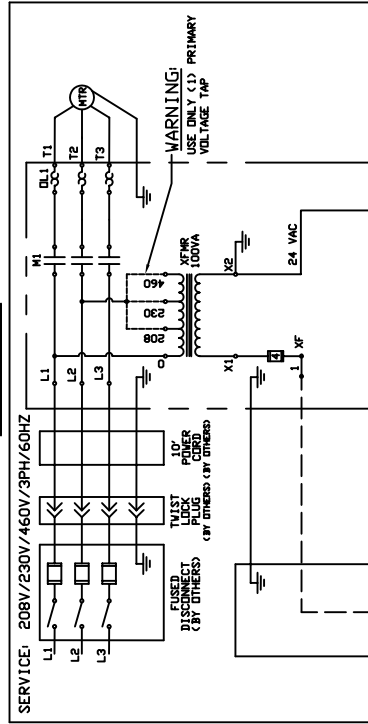
SINGLE PHASE MOTORS



THREE PHASE MOTORS



OPTIONAL



NOTE:
THERMAL OVERLOAD IS USED
IF THE MOTOR IS NOT
THERMALLY PROTECTED.

STANDARD

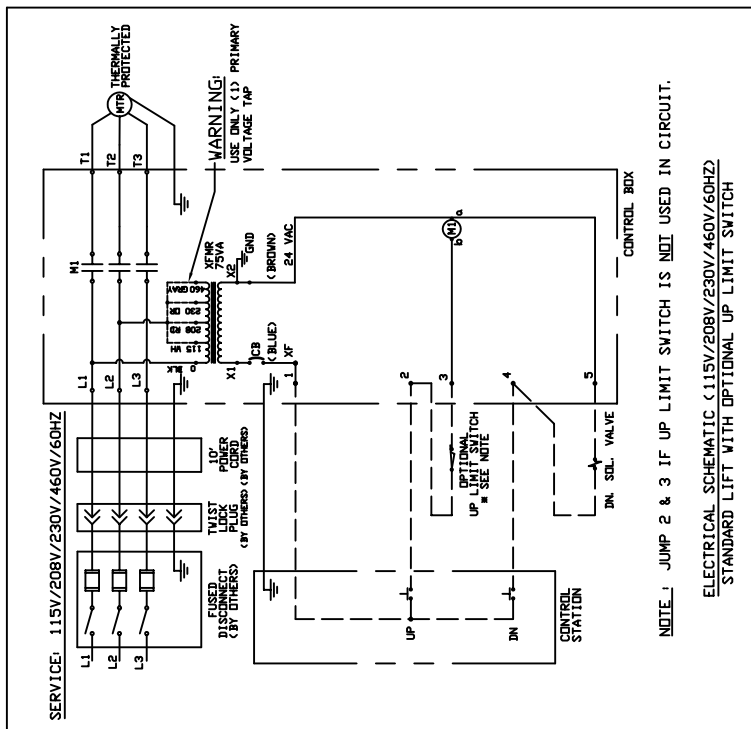


FIGURE 5 - ELECTRICAL SCHEMATIC

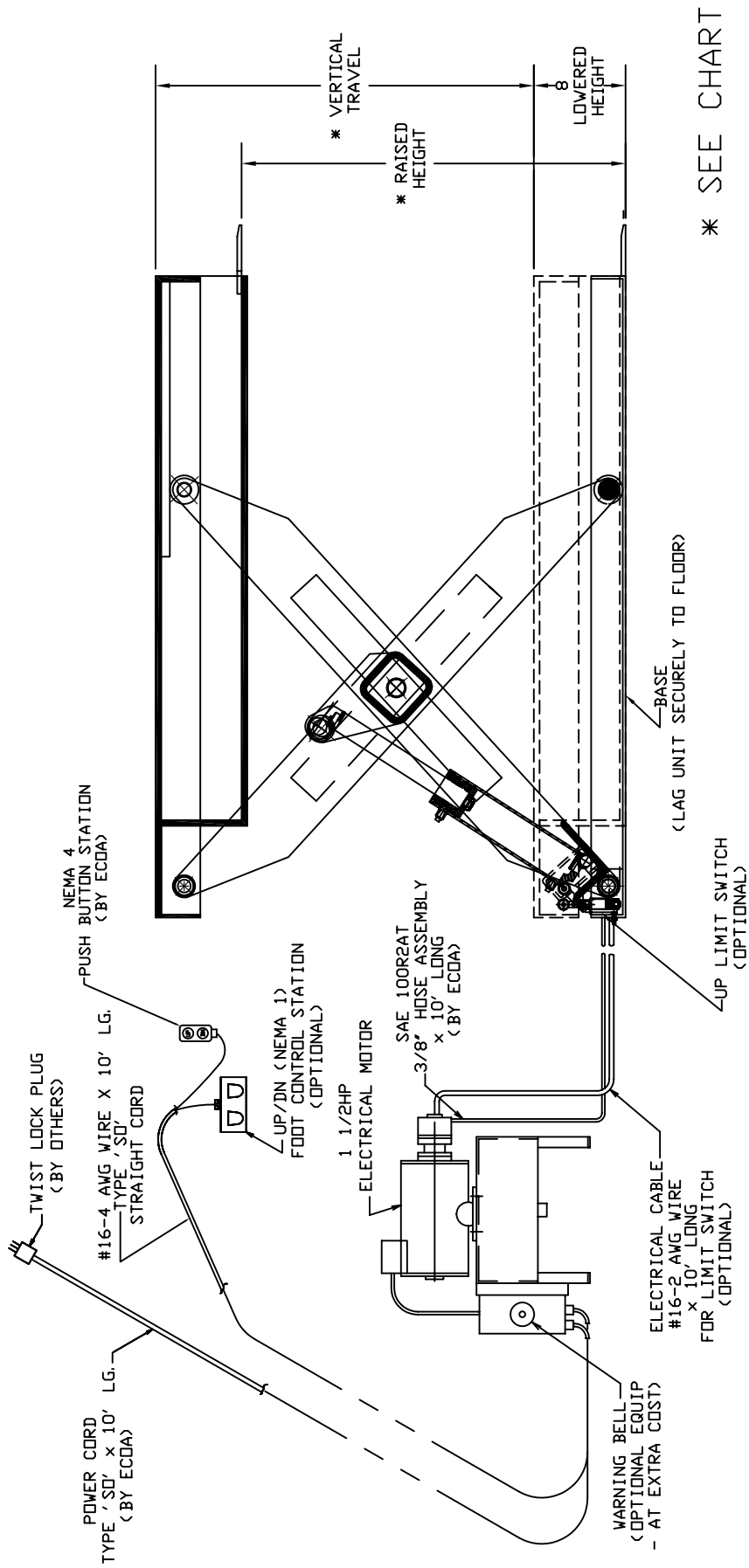
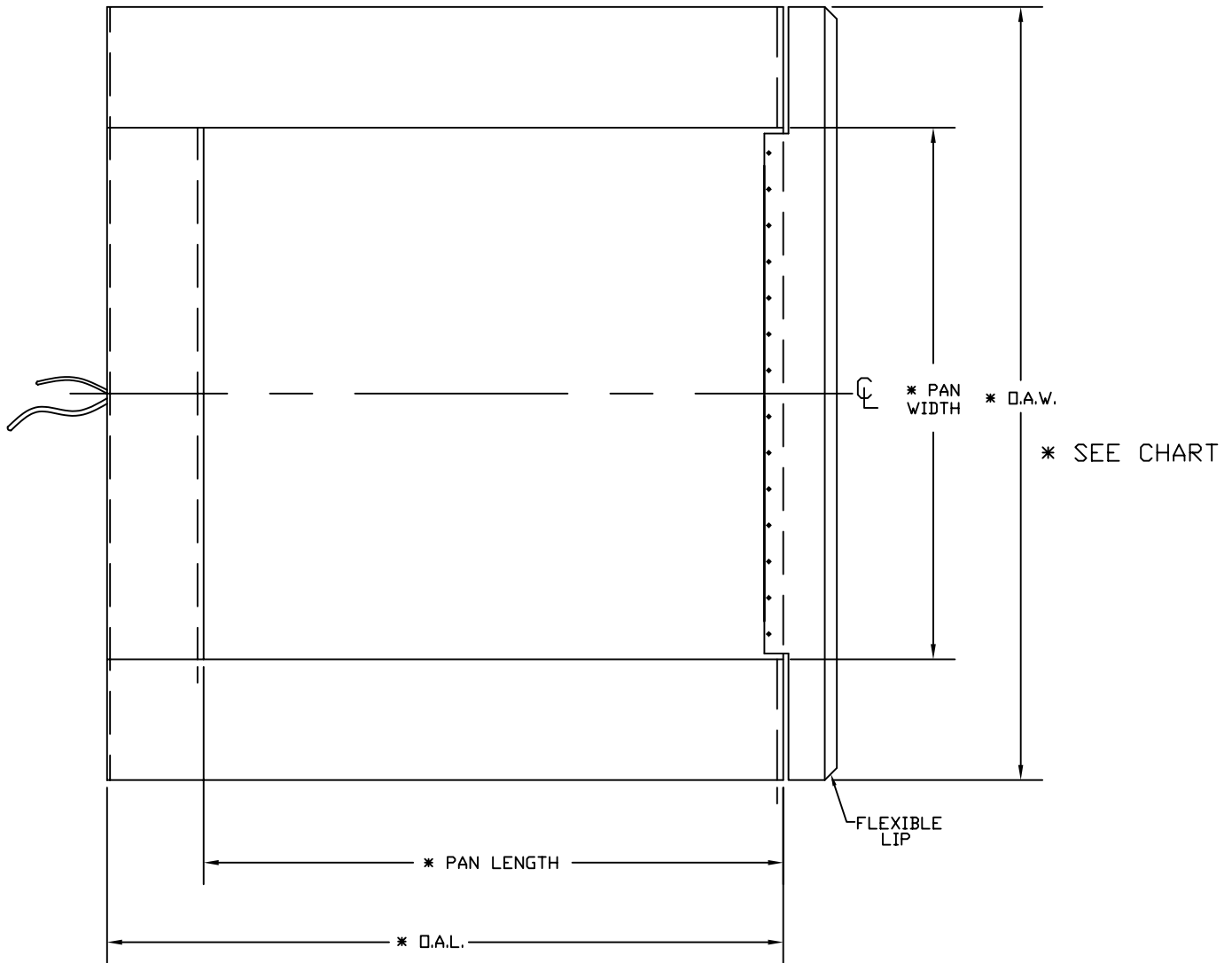


FIGURE 6 - GENERAL LAYOUT-SIDE VIEW

FIGURE 7 - GENERAL LAYOUT-TOP VIEW



ZERO PAN LIFT SPECIFICATIONS
CAPACITIES 2,000 TO 6,000 LBS.

MODEL NUMBER	CAPACITY (POUNDS)	PLATFORM SIZE (INCHES) W x L	OVER ALL DIMENSIONS (INCHES)		LOWERED HEIGHT (INCHES)	TRAVEL (INCHES)	RAISED HEIGHT (INCHES)	MOTOR STD. H.P.	SHIP* WEIGHT (POUNDS)
			WIDTH	LENGTH					NOTE: SHIP WEIGHTS ARE APPROXIMATE
		STANDARD							
ZPL-02-44048	2,000	44 X 48	64	56	3/8	33	33 3/8	1.5	1812
ZPL-02-50048	2,000	50 X 48	70	56	3/8	33	33 3/8	1.5	1860
ZPL-04-44048	4,000	44 X 48	64	56	3/8	33	33 3/8	1.5	1960
ZPL-04-50048	4,000	50 X 48	70	56	3/8	33	33 3/8	1.5	2010
ZPL-06-44048	6,000	44 X 48	64	56	1/2	33	33 1/2	1.5	2310
ZPL-06-50048	6,000	50 X 48	70	56	1/2	33	33 1/2	1.5	2510

TROUBLE SHOOTING

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

4. "Spongy" or "Jerky" Lift operation. Do not confuse spongy operation with small surges caused by foreign material on Lift wheel roller plate.	a. Air trapped in cylinders.	a. Bleed cylinders by lowering Lift fully and hold "DOWN" button for 20-30 seconds more Raise Lift and repeat procedure several times. Bleed cylinders also, by loosening bleeder screws (item #10) until a steady stream of oil comes out.
	b. Oil starvation.	b. See 1(e). (g). (h). (i).
5. Lift lowers too slowly when loaded.	a. Down Valve filter clogged.	a. Remove Solenoid Valve and clean it.
	b. Pinched tube or hose.	b. Correct as necessary. (In case of pipe, check for obstruction inline.)
	c. Oil too thick.	c. See "Oil Viscosity Recommendations"
	d. Foreign material in Flow Limiter.	d. Remove and clean.
	e. Binding cylinders.	e. See 2(f).
6. Lift lowers too quickly.	a. Leaking hoses. Cracked fittings	a. Correct as necessary. Check underground conduit for evidence of fluid.
	b. Check valve stuck open. (The combination of a stuck Check Valve and open Solenoid Valve will cause excessive speeds.	b. Remove Check Valve and clean it. (See Hydraulic Section)
7. Lift rises then lowers slowly.	a. Down Solenoid Valve may be incorrectly wired or is stuck open due to dirt.	a. See 2(a).
	b. Check Valve may be stuck open.	b. Remove and clean. (See Hydraulic Section.)
	c. Check for leaking hoses, fittings, pipes.	c. Correct as necessary.
	d. Cylinder seals may be worn or damaged.	d. Replace seals. (See Cylinder Repair procedure.)
8. Lift has risen, but does not lower.	a. Blown electrical fuse.	a. Check and replace.
	b. Incorrect Down Solenoid Valve wiring.	b. Correct as necessary. (See Wiring Diagram.)
	c. Down Solenoid Valve is stuck.	c. Lightly tap down the Solenoid Coil body to seat it properly. Do not hit hard as it will permanently damage the internal stem. Do not remove the Solenoid Valve from the Block as the unit will come down at a dangerous speed.
	d. Faulty Down Solenoid Coil.	d. Remove and replace.
	e. Maintenance safety bar, or some other object blocking down travel.	e. Raise Lift and remove the safety bar, or whatever object is blocking the down travel, then press the down button.
	f. Binding cylinders.	f. See 2(f).