AIR TECHNICAL INDUSTRIES

Making the job easier.

ZERO-LOW 3-POINT ENTRY LIFT TABLE

Operation & Maintenance Manual

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All ZL3P Models

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Responsibilities of Owners/Users

Deflection

It is the responsibility of the user/purchaser to advise the manufacturer where deflection may be critical to the application.

Inspection and Maintenance

The table shall be inspected and maintained in proper working order in accordance with the manufacturer's operating/maintenance manual and safe operating practices.

Only trained personnel and authorized personnel shall be permitted to perform maintenance/service operations on the table.

Maintenance/service personnel shall have:

- Read and/or have explained and understood, the manufacturer's operating/maintenance manual, and all safety rules and labels, prior to performing any maintenance/service operations on the equipment.
- Full time unlimited access to the manufacturer's operating/maintenance manual.

Removal from Service

Any table not in safe operating condition such as, but not limited to, excessive leakage, missing rollers, pins, or fasteners, any bent or cracked structural members, cut or frayed electric, hydraulic, or air lines, damaged or malfunctioning controls or safety devices, etc. shall be removed from service until it is repaired to the original manufacturer's standards.

Repairs

All repairs shall be made by qualified personnel in conformance with the manufacturer's instructions.

Operators

Only trained personnel and authorized personnel shall be permitted to operate the table.

Before Operation

Before using the table, the operator shall have:

- Read and/or have explained, and understood, the manufacturer's operating instructions and safety rules.
- Inspected the table 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 table.

During Operation

The table shall only be used in accordance with the manufacturer's operating/maintenance manual.

- Do not overload the table.
- Ensure that all safety devices are operational and in place.

Modifications or Alterations

Modifications or alterations of equipment shall be made only with written permission from the original manufacturer. These changes shall be in conformance with all applicable provisions of applicable standards and shall be as safe as the equipment was before modification. These changes shall also satisfy all safety recommendations of the original equipment manufacturer for the particular application of the table.

Special Warnings, Cautions & Restrictions

Inspection

Upon receipt of the equipment, inspect thoroughly for damage sustained in transit. Make note of any noticeable or potential damage on the bill of lading. After un-packaging, inspect for any concealed damage and report immediately to the freight carrier.

Safe Operation

WARNING LABELS

General Information

You are now the proud owner/user of an Air Technical Industries, Zero Low type, hydraulic-cylinder operated table.

The Zero Low, hydraulic-cylinder operated table, with its many tabletop configurations and options, is a highly versatile machine that is designed to perform a wide range of lifting, feeding, accumulating, aligning, transporting, upending, rotating, tilting and moving operations. All Zero Low tables can be manually operated, electric motor powered or air motor powered. On all powered tables there are three control options: (1) pedestal control mounted on the unit, (2) foot operated remote control or (3) push button remote control.

The Zero Low lifts have the load capacity rating and serial number typed on a label plate attached to one side of the lift platform. The capacity is a net capacity rating for a lift furnished with the standard steel top. The relief valve of the hydraulic pump has been set to raise the rated capacity, plus a small amount for overload. If there are other fixtures, conveyors, etc. Mounted to the platform-deduct the weight of these from the load rating to obtain the net capacity. Lifts should not be overloaded beyond the established capacity: as damage may result.

NOTE: The Zero Low lift is not for lifting personnel unless it is specifically intended for that purpose. The equipment is not intended for lifting objects over personnel. The Zero-Low lift is not an elevator and therefore, does not comply with local or national elevator codes.

OPERATING CHARACTERISTICS

The stand alone hydraulic system, consists of a directly coupled motor-pump combination, oil reservoir, solenoid operated lowering valve and all necessary plumbing. The hydraulic pump is a positive displacement design, and operates at a usual working pressure of 1500-1800 PSI. A fine mesh screen is provided for protection of the pump. This screen is located adjacent to the output port of the reservoir. A pre-adjusted, built-in, relief valve protects the pump discharge from the effects of overloading.

The operating principle provides that the pump is operated to raise the table and the pump is stopped when the table attains the desired raised height. A check valve between the pump holds the hydraulic cylinder at the raised height.

FOR LOWERING THE TABLE

The solenoid is energized to allow fluid to return from the hydraulic cylinder to the reservoir. An adjustable flow control valve is connected in the return line to limit the lowering speed under full load conditions.

All automatic controls, added to the lift table, must include provisions for immediately shutting off the pumping unit at the top travel of the table and de-energizing the solenoid at the bottom travel of the table.

BASIC OPERATING INSTRUCTIONS

MANUAL OPERATION:

TO RAISE TABLE: Close lowering valve located next to the hand pump and actuate pump handle.

TO LOWER TABLE: Slowly open the lowering valve

ELECTRIC OR AIR OPERATION:

TO RAISE TABLE:

(1) Ensure unit is connected to the correct power source

(2) Depress “up” button or foot pedal-unit, the unit will raise and continue until the button or foot pedal is released

CAUTION: DO NOT CONTINUE TO OPERATE BEYOND THE FULL EXTENSION OF THE CYLINDER

TO LOWER TABLE: Depress “down” button or pedal, the unit will lower and continue to lower until the button or foot pedal is released.

INSTALLATION SUGGESTIONS:

PERMANENTLY ANCHORED OR BOLTED TO FLOOR

Permanent installation of hydraulic lifts may be subject to local codes, rules and regulations, permits and inspection. Check your local and national codes and regulations first.

Maintenance Instructions

Zero- Low lifts are designed to give many years of trouble free service and requires only the following routine maintenance procedures:

Daily before operating

1. Check all controls
2. Visually inspect chains for kinks or damage
3. Check limit switches
4. Check to see that all bolts are tight
5. Check hydraulic fitting are snug
6. Make sure that all cables are intact and undamaged
7. Check to see that hoses are intact and undamaged

Weekly

Do a quick visual inspection of the unit:

1. Check for leaks
2. Hoses and control cables are intact and undamaged

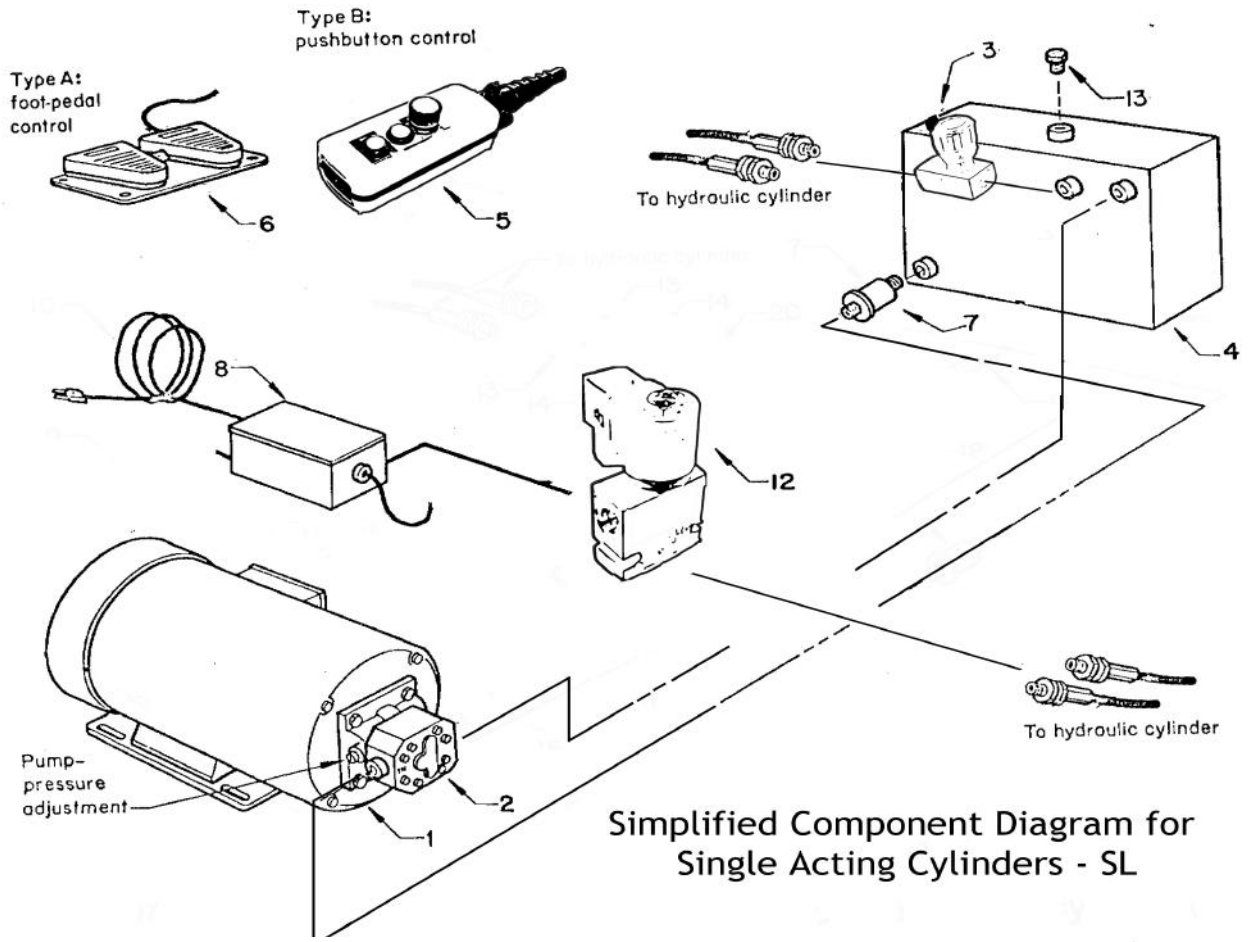
Monthly

1. Check chains for nick, cuts, or damage
2. Check fluid level of hydraulic tank – units are furnished with Citgo AW-46 hydraulic fluid.
3. Check belly button switch making sure that when depressed the unit stops and moves forward (if applicable)

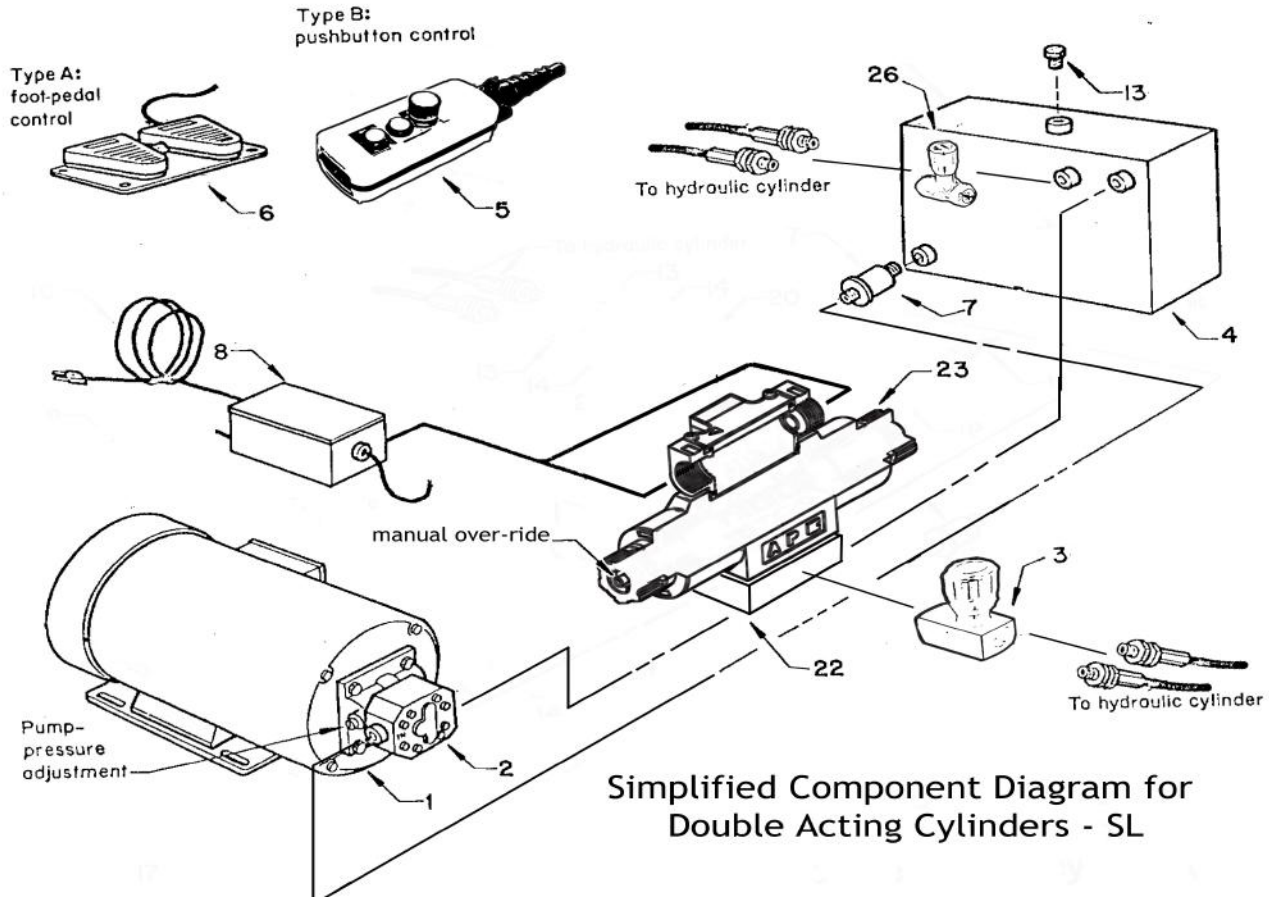
Semi Annual

1. Grease any pivot points and or grease zerks
2. Run cylinders on unit to limits in and out to check for leaks

Inspect control cables on pendant control for nicks, cuts, or damage



Simplified Component Diagram for
Single Acting Cylinders - SL



Simplified Component Diagram for
Double Acting Cylinders - SL

ITEM 1		Motor				
HP	QTY	VOLTS	PHASE	TYPE	Part Number	PRICE
1	1	110	1	TANG	PETM11110	
1	1	220/440	3	TANG	PETM13220	
1	1	110	1	SHAFT	PESM11110	
1	1	220/440	3	SHAFT	PESM13110	
1	1	575	3	SHAFT	PESM13575	
2	1	110	1	TANG	PETM21110	
2	1	220/440	3	TANG	PETM23220	
2	1	110	1	SHAFT	PESM21110	
2	1	220/440	3	SHAFT	PESM23220	
2	1	380	3	SHAFT	PESM23380	
2	1	575	3	SHAFT	PESM23575	
3	1	110	1	TANG	PETM31110	
3	1	220/440	3	TANG	PETM33220	
3	1	110	1	SHAFT	PESM31110	
3	1	220/440	1	SHAFT	PESM31220	
3	1	220/440	3	SHAFT	PESM33220	
3	1	380	3	SHAFT	PESM33380	
3	1	575	3	SHAFT	PESM33575	
5	1	220/440	3	TANG	PETM53220	
5	1	220/440	3	SHAFT	PESM53220	
7.5	1	220/440	3	SHAFT	PESM75322	
7.5	1	380	3	SHAFT	PESM75338	
7.5	1	575	3	SHAFT	PESM75357	
10	1	220/440	3	SHAFT	PESM10322	
10	1	575	3	SHAFT	PESM10357	
4AM	1	AIR MOTOR		SHAFT	PN4AM0000	
6AM	1	AIR MOTOR		SHAFT	PN6AMFRV0	
8AM	1	AIR MOTOR		SHAFT	PN8AMFRV0	

ITEM 2		PUMP		
HP	QTY	SIZE	TYPE	Part Number
1	1	0.48	Tang	PHP0048T0
1	1	0.48	Shaft	PHP0048S0
2	1	0.96	Tang	PHP0096TO
2	1	0.96	Shaft	PHP0096S0
2	1	1.44	Tang	PHP0144T0
2	1	1.44	Shaft	PHP0144S0
3	1	1.93	Tang	PHP0193T0
3	1	1.93	Shaft	PHP0193S0
3	1	2.41	Tang	PHP0241T0
3	1	2.41	Shaft	PHP0241S0
5	1	2.89	Tang	PHP0289T0
5	1	2.89	Shaft	PHP0289S0
5	1	3.86	Tang	PHP0386T0
5	1	3.86	Shaft	PHP0386S0
7.5	1	5.30	Shaft	PHP0561C0
7.5	1	6.55	Shaft	PHP0672C0
10	1	7.87	Shaft	PHP0787C0
10	1	8.96	Shaft	PHP0883C0
15	1	12.31	Shaft	PHP120000
20	1	13.44	Shaft	PHP1344C0

ITEM 3		FLOW CONTROL VALVE	
1	1/4"	FLOW CONTROL	PH02MFCV0
2	1/4"	FLOW CONTROL	PH02MFCV0
3	1/4"	FLOW CONTROL	PH02MFCV0
5	3/8"	FLOW CONTROL	PH03MFCV0
7.5	3/8"	FLOW CONTROL	PH03MFCV0
10	3/8"	FLOW CONTROL	PH03MFCV0
15	1/2"	FLOW CONTROL	PH04MFCV0

ITEM 4	TANK	CONSULT FACTORY

ITEM 5	PUSHBUTTON	
2	2 BUTTON	PE2STAPB0
4	4 BUTTON	PE4STAPB0
6	6 BUTTON	PE6STAPB0
8	8 BUTTON	PE8STAPB0

ITEM 6		FOOT PEDAL	
SINGLE ACTING		2 PEDAL	PETWINFP0
DOUBLE ACTING		2 PEDAL	PETWINFP2
AIR MOTOR		2 PEDAL	PNAFP34F0

ITEM 7	TANK STRAINER	PH0403STR

ITEM 8	HANDY BOX	
LID		PEPC2X400
BOX		PE224HB00

ITEM 9		MOTOR CORD		
1'-6"	110VOLT	1 PHASE	16--3	PEEW03160
1'-6"	110VOLT	1 PHASE	12--3	PEEW03120
1'-6"	220/440	3 PHASE	12--4	PEEW04120

ITEM 10		POWER CORD		
8'-0"	110VOLT	1 PHASE	16--3	PE316AC80
8'-0"	110VOLT	1 PHASE	12--3	PEEW03120
8'-0"	220/440	3 PHASE	12--4	PEEW04120

ITEM 11	DIN CONNECTOR W/CORD	W/ LOWERING VALVE
ITEM 12	LOWERING VALVE WITH DIN CONNECTOR	
12 VOLT	1/4" NPT	M2HLV0122DIN
110 VOLT	1/4" NPT	M2HLV110VDIN
110 VOLT	3/8" NPT	M2HLV1103DIN

ITEM 13	VENT PLUG	PH03VENT0

ITEM 14		HYDRAULIC HOSE	
1/4"	10"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE020100
	12"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE020120
	16"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE020160
	18"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE020180
	24"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE020240
	36"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE020360
	48"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE020480
	60"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE020600
	72"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE020720
	84"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE020840
	96"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE020960
3/8"	12"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE030120
	16"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE030160
	18"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE030180
	24"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE030240
	36"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE030360
	48"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE030480
	60"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE030600
	72"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE030720
	84"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE030840
	96"	HYDRAULIC HOSE WITH M/F ENDS	M2HOSE030960

ITEM 15	3/8" x1/4" O-RING ADAPTER	PH6405060400
ITEM 16	2 3/8" FL X 1/4" NPT M RN-T	PH2605060406
ITEM 17	1/4" NPT M X 1/4" F 90 ELL	PH5502040400
ITEM 18	1/4" CLOSE NIPPLE	PH5404N04CLS
ITEM 19	3/8" FLARE X 3/8" O-RING ELL	PH6801060600
ITEM 20	3/8" NPT M X 1/4" NPT F 90 ELL	PH5502060400
ITEM 21	3/8" NPT F ALL THREE SIDES	PH5605060606

ITEM 22	VALVE BASE		
HVY/VK		1/4"	PHSP02D03
BOSCH		3/8"	PHSP03D03
SPERRY		3/8"	PHSP03PRT

ITEM 23	HYDRAULIC VALVE		
BOSCH		12 VOLT	PHV4W1201
BOSCH		24 VOLT	PHV4W2401
BOSCH		110 VOLT	PHV4W1150

ITEM 24	1/4" X 1 1/2" NIPPLE	PH5404N04150
ITEM 25	3/8" NPT F THREE SIDES	PH5605060606
ITEM 26	PRESSURE RELIEF VALVE	
1/4"		PHMPRRV10
3/8"		PHMPRRV20
ITEM 27	PNUEMATIC VALVE	PNUMATIC0
ITEM 28	PNUEMATIC SOLENOID VALVE	
DOERING	SINGLE ACTING	PHAVSA000
HYVAIR	DOUBLE ACTING	PHAVDA000

ITEM 29	MOTOR/PUMP COUPLINGS	
LOVEJOY	.4375" BORE	PTL090070
LOVEJOY	.5" BORE	PTL090080
LOVEJOY	.625" BORE	PTL090100
LOVEJOY	.875" BORE	PTL090140
LOVEJOY	.5" BORE	PTL100080
LOVEJOY	.625" BORE	PTL100100
LOVEJOY	.75" BORE	PTL100120
LOVEJOY	.875" BORE	PTL100140
LOVEJOY	1" BORE	PTL100180
LOVEJOY	1.125" BORE	PTL100180
LOVEJOY	1.25" BORE	PTL100200
LOVEJOY	1.375" BORE	PTL100220
LOVEJOY	1.4375" BORE	PTL100230
LOVEJOY	.625" BORE	PTL110100
LOVEJOY	.75" BORE	PTL110340
LOVEJOY	.875" BORE	PTL110140
LOVEJOY	1.625" BORE	PTL110158

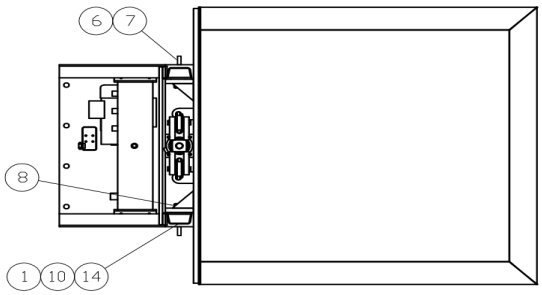
ITEM 30	1	AIR LINE	PNAFAH400

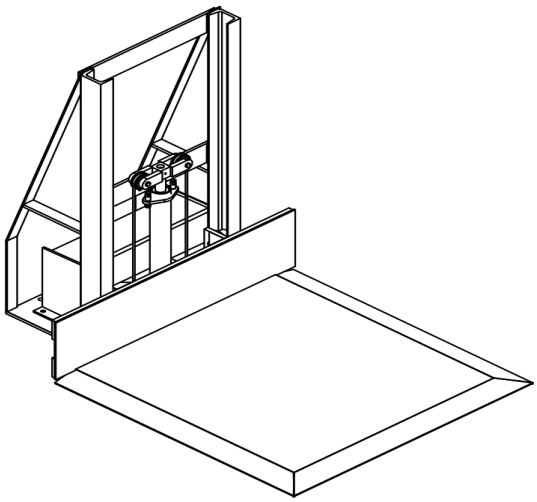
ITEM 31	INLINE PRESSURE RELIEF VALVE	
	1/4"	PH021PREL
	3/8"	PH031PREL

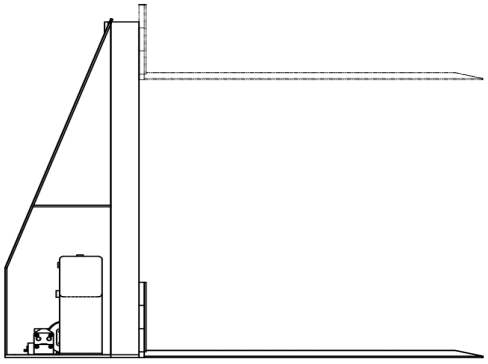
ITEM 32	FLOW DIVIDER	
	2 PORT	PHFDPM200
	4 PORT	PHFDPM230
	6 PORT	PHFDPM600

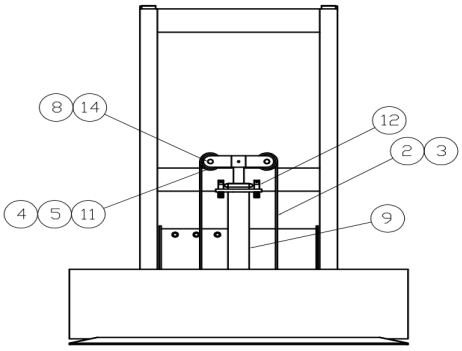
ITEM 33	3/8" FL X 1/4" NPT M ELL	PH2501060400

REV	DATE	ENG	DESCRIPTION









Air Technical Industries
7501 CLOVER AVE. – MENTOR,OHIO

TITLE: STRUCTRUAL PARTS LIST DIAGRAM

ZL3P

DWG. Type	MATERIAL		
DRAWN: RHC	DATE: 06/15/15	SCALE: N.T.S.	REVISION: –

STRUCTURAL PARTS LIST

ITEM	QTY	PART	DESCRIPTION	PART NUMBER
1	4	BEARING FOR CHANNEL ROLLER	1" ID X 1 3/4" OD X 1" LG.	PTB202816
2	2	LIFT CHAIN	5/8" PITCH LEAF CHAIN, 48" LG.	PTCHBL523
3	4	CHAIN LINK	3/4" PITCH	PTCLSPCLO
4	2	NEEDLE BEARING, OIL GROOVE, FOR CHAIN ROLLER	1" BORE X 1 1/4" OD X 1" LG.	PTB161600
5	2	INNER RACE, OIL GROOVE	3/4" BORE X 1" ID X 1" LG.	PTBIR1216
6	4	GUIDE CAM ROLLER	1 1/2" DIA X 7/16" BORE	PTYR11200
7	4	BOLT	7/16-14 UNC BOLT X 1 1/2" LG.	PF0714065HHC
8	4	GREASE FITTINGS	90°, 1/8NPT	PTGF00600
9	1	CYLINDER	2 1/2" BORE, 32" C.C., 23" STR.	M5YCC184256T
10	4	CHANNEL ROLLER (#38)	TAPERED ROLLER, 4" OD X 2" LG.	M1TCR0320160
11	2	CHAIN ROLLER (#39)	GROOVED ROLLER, 3" OD X 2" WIDE	M1GCHROL2416
12	4	CHAIN ANCHOR BOLT (#41)	3/4-10 UNC GRADE 8 BOLT	M1CAB06GR824
13	2	CHAIN ROLLER PIN (#40)	3/4" DIA CRS X 3 1/4" LG.	M1SRP0602600
14	4	INNER RACE, OIL GROOVE, FOR CHANNEL ROLLER BEARING	1 1/4" BORE X 1 1/2" OD X 1" LG	PTBIR1601
NOTE: FOR STRUCTURAL ASSEMBLIES, CONSULT FACTORY				

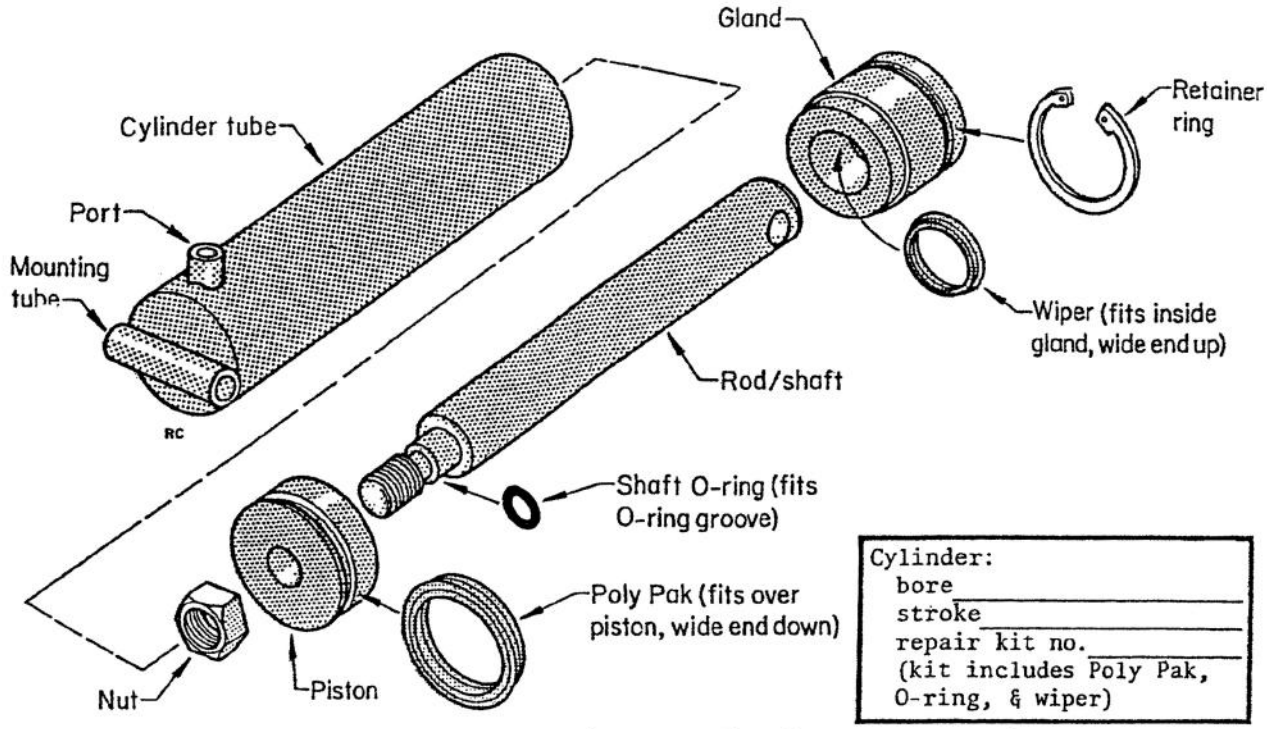
Troubleshooting

Symptoms	Check
Lift will not raise	1. Check the power supply and electrical circuit – Pump motor starter (if provided) On new installations of the 3 phase motors, if the lift does not start raising in approximately 10 seconds, reverse line leads. **WARNING: Do not run the pump backwards or with hydraulic oil.** 2. Check oil level (WARNING: do not overfill.) – With lift in full up position, oil level should be 1 to 2 inches above bottom of the tank. 3. Lowering valve stuck in open position – Flush lowering valve by operating up and down controls simultaneously.
Lift raises slower than specified rate or will raise only partial load	1. Check line voltage under load condition – Low voltage affects speed and capacity. 2. Suction line may leak – Tighten fittings. 3. Relief valve may leak – Remove foreign matter from the valve and adjust to ¼ turn beyond what is required to lift load. 4. Inspect Lowering valve – Disassemble valve and look for foreign material under valve seat. 5. Check filter in tank for foreign material
Lift slowly settles with lowering valve closed	1. Inspect check valve- remove cap, spring, and ball, and inspect for foreign matter. 2. Flush lowering valve- by operating up and down controls simultaneously. This should be done with no load. 3. Disassemble lowering valve- look for

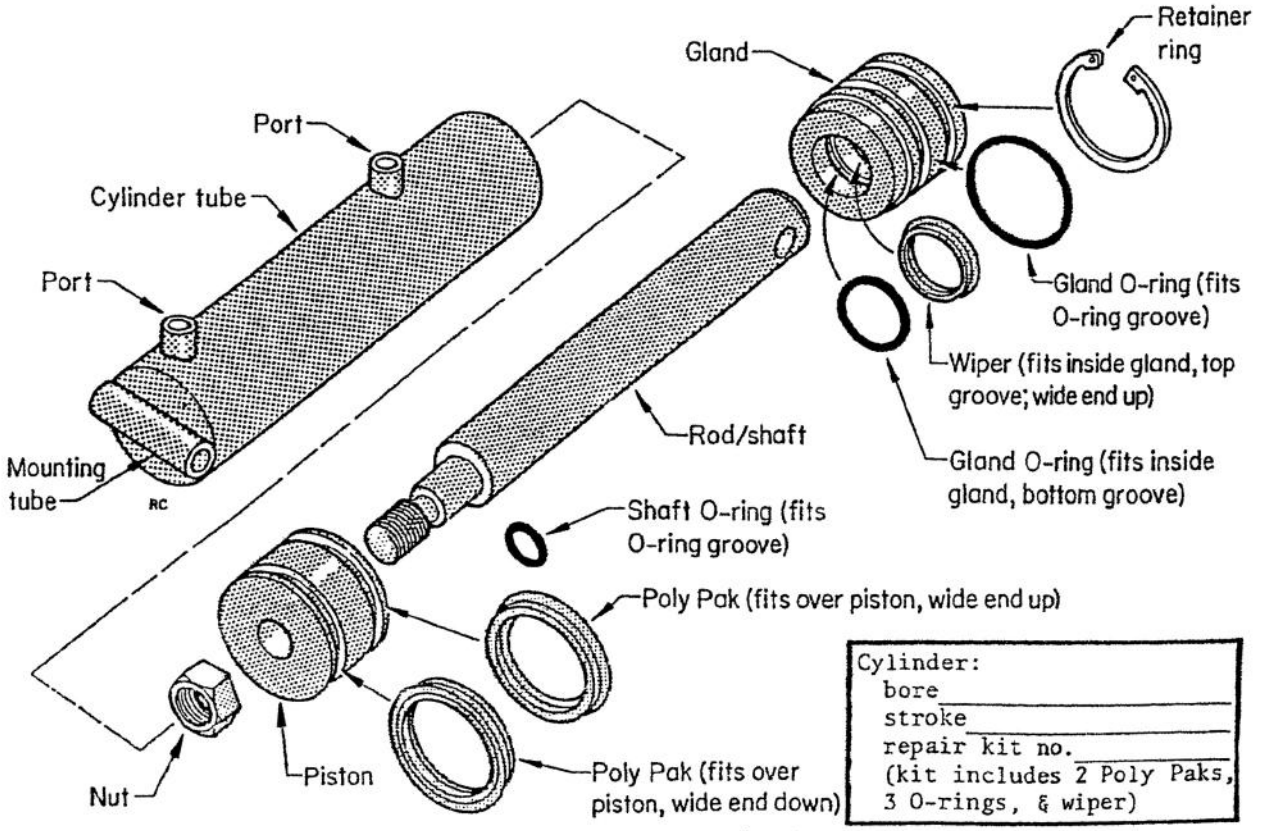
	foreign material under valve seat.

Troubleshooting Continued

Symptoms	Check
Lift will not lower	1. Ensure lowering valve is closed -Open valve and adjust for lowering speed. 2. Test valve coil for operation -Check voltage at coil. 3. Velocity fuses -Flow adjustment instructions for velocity fuses.
Lift will not maintain height and lowers slowly when down button is not depressed	1. Check the pressure relief valve, due to an overload on the tables, the relief valve may have activated. Debris can be entrapped, not allowing the valve to close. Take the relief valve apart and clean it completely. Reassemble and adjust to_ turn beyond what is required to lift load. 2. The check valve may need cleaning or replacement. 3. Clean the strainer in the tank of foreign matter. 4. Check and clean the lowering valve for debris.
Lift does not lower smoothly	1. Run lift up and down -Under load to purge air from hydraulic system. 2. Grease the mast channels to reduce friction from carriage rollers.



Typical Single-acting cylinder assembly



Typical Double-acting cylinder assembly

Disassembling the Hydraulic Cylinder

1. Disconnect the hydraulic hose at the cylinder port; catch leaking fluid in a container.

2. Disconnect rod/shaft end of the cylinder from top cylinder-shaft bracket (yoke).

3. Disconnect cylinder at bottom cylinder mounting bracket. Place cylinder in vise and tighten firmly but not enough to damage cylinder tube;

NOTE: if a vise is not available, the cylinder can be left connected at the bottom cylinder mounting bracket. Work can be performed after tilting the cylinder tube to a convenient working angle.

4. Pull cylinder rod/shaft out until piston touches gland. NOTE: Care must be taken to avoid damaging rod/shaft.

5. Using retainer ring tool, grip the retainer ring, tighten, and remove retainer ring and gland at the same time. Pull rod straight out and all components will become visible, the piston will have pushed all the components out.

6. Remove nut at end of the rod/shaft to replace O-ring when rebuilding cylinder. Cylinder rebuilding kits from ATI contain all necessary wipers and O-rings to completely rebuild your cylinder.

Model number and single or double acting cylinder description would be required.

7. Following the illustration, determine where all the parts go and reinstall each component without mixing new and used parts. Double check to see that wipers are installed with the wide end facing the proper direction.

Reassembling the Hydraulic Cylinder

1. Make sure all components are on rod shaft and nut is tightened.

2. Add light grease around inside lip of cylinder tube to help insert piston.

3. Place rod/shaft assembly over cylinder tube and push rod/shaft until piston is halfway down inside of tube. Slide gland with retainer ring into position. Using the retainer ring tool, grip retainer ring snap on inside of cylinder tube groove.

4. Reconnect cylinder to lift brackets. Reconnect all hydraulic hoses. Hook up to power source and check operation. You will notice that cylinder operation will be much “tighter” than before.

Warranty and Service

Air Technical Industries warrants that its products shall be free from defects in materials and workmanship under normal and ordinary usage when owned by the original purchaser for a period of twelve months from the date such products are shipped from Air Technical Industries. Hydraulic and electrical components are warranted for 90 days. The Customer must cease use of the product pending Air Technical Industries' substantiation of any warranty claim. In the event that a product defect shall occur during the warranty period, Air Technical Industries will provide replacement parts free of charge. Any unauthorized repairs on said products will render the warranty null and void. By accepting product delivery, purchaser agrees to the terms of this warranty. Due to their design and construction, Air Technical Industries' products are not crated. Contact us for specific crating charges. No product can be returned unless or until a Return Authorization Form is submitted with required signature of the customer. The following schedule of charges will apply for return of standard units:

Less than 2 weeks:	**25% restocking fee plus shipping charges**
More than 2 weeks – up to 90 days:	**40% restocking fee plus shipping charges**

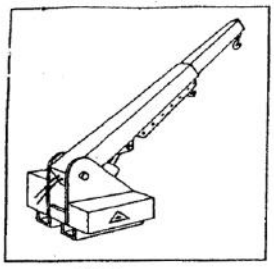
No returns will be accepted after 90 days.

AT NO TIME WILL A CASH REFUND BE ISSUED. CREDITS ISSUED MAY ONLY BE APPLIED TOWARDS THE PURCHASE OF NEW EQUIPMENT.

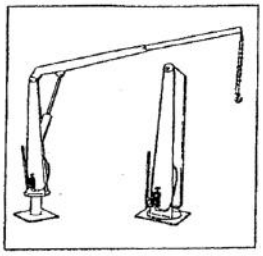
Service is available in many cases through local Dealers and Service Centers in the USA; please contact Air Technical Industries Customer Service for appropriate contacts and arrangements.

For locations outside of the USA, Air Technical Industries Customer Service will work with the customer over the phone, email, and/or facsimile to resolve any usage or equipment problems and make available parts and information to assist the customer's technical staff to effect needed changes. In most situations, issues can be resolved in this manner. In some instances, where major damage has been encountered, the unit will need to be returned to Air Technical Industries for inspection, correction, and re-certification to new condition. Please contact Air Technical Industries Customer Service for details and any charges that may apply.

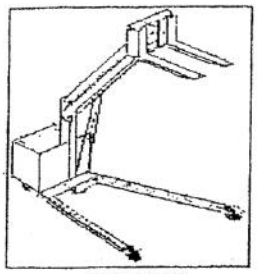
ATI Customer Service and Parts – (440) 951-5191 (ext. 327)



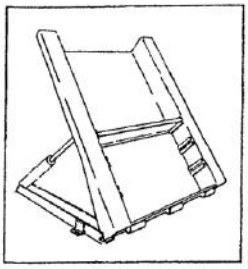
JibMaster



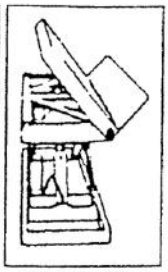
Truck mounted Foldable Crane



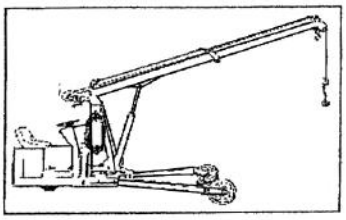
Universal Lift



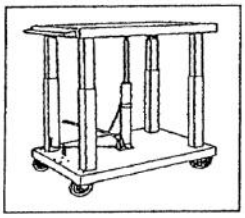
Zero-Low Crate Positioners



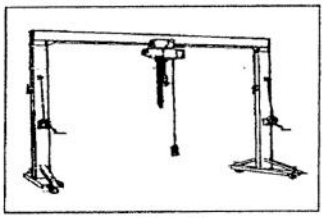
Lift & Tilt Tables



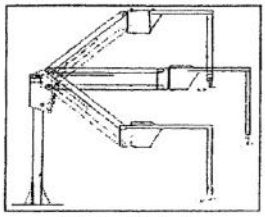
Port-O-Giant



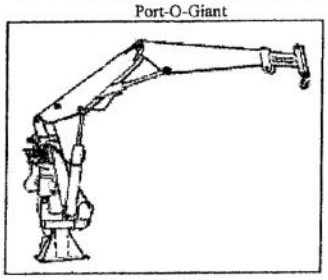
Post Tables



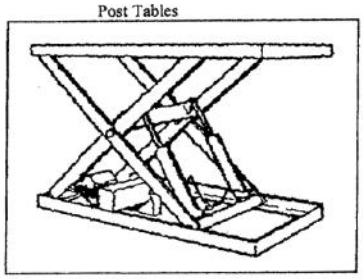
Gantry Cranes



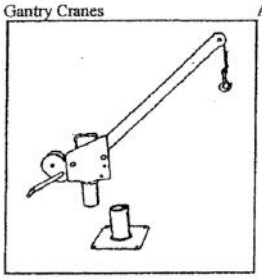
Articularm Manipulator



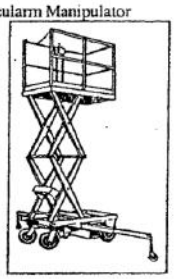
Knuckle Cranes



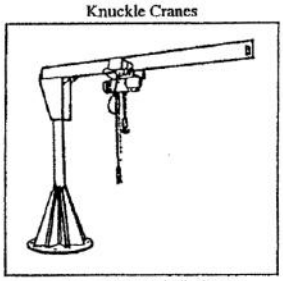
Scissor Lift Tables



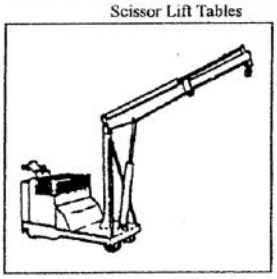
Truck Mounted Pick-Up Crane



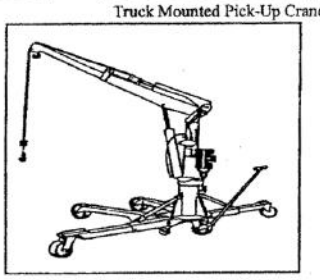
Maintenance Lifts



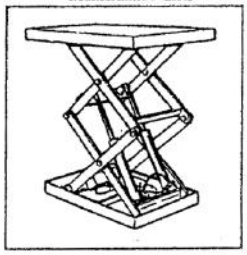
Floor Mounted Jib Cranes



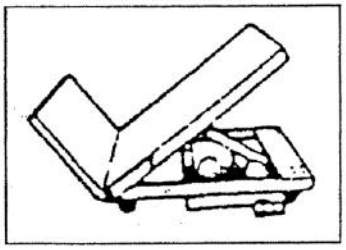
Reversible Boom Crane



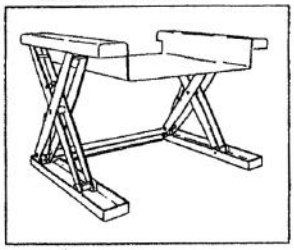
Super Master



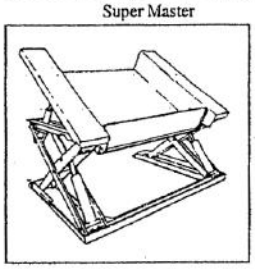
Double Scissor Lift Table



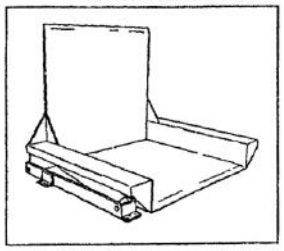
Crate Positioner



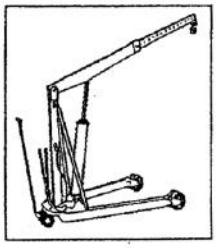
Zero-Low Lift Table



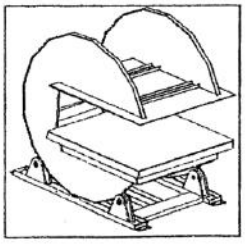
Zero-Low Lift & Tilt



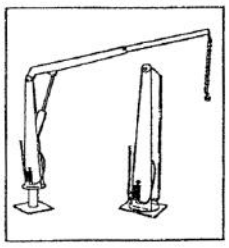
Zero-Low Up-Ender/Positioner



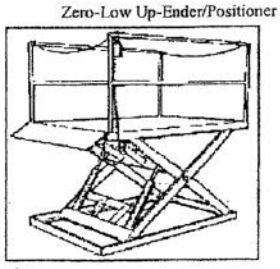
Husky Master



Upender-Inverter



Truck Mounted Foldable Crane



Magic Dock Scissor Lift