



TPE 125

Service Manual



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Our policy is one of continuous research and development.

Dimensions and technical information are subject to change without notice.

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MANUAL OVERVIEW

GENERAL INFORMATION

The Enclosed Tech-Pivot is a pneumatically driven mechanism which produces rotational motion.

This Tech-Pivot Maintenance Manual contains Tech Rim Standard's suggested:

- Safety Precautions
- Lockout Precautions
- Maintenance
- Tech-Pivot Refurbishing Program

ASSISTANCE

If assistance is required during the installation of preventative maintenance or repair procedures, or if you wish to take advantage of the Tech-Pivot Refurbishing program, please call the Tech Rim Standards team at 1-248-454-1977.

Please have the model number and serial number available when you call.

NOTE: Any modification or repair other than that authorized by Tech Rim in writing shall void the Limited Warranty contained on page 12 of this User's and Maintenance Manual.

CAUTION: Complete the Lock-Out Procedures **BEFORE** performing any maintenance on the automation tooling.

TECHNICAL OVERVIEW

Item Weight: 65 kg, [143.5 lbs]

Overall Dimensions: 933mm x 36mm x 220mm (dimensions vary depending on options)

Rotation Angle(s): 0 to 120° rotation with 15° increments [15°, 30°, 45°, 60°, 75°, 90°, 105°, 120°]

Pneumatic Cylinder: 125 mm bore, 230 mm stroke (for full 120° rotation)

Operating Pressure: 4-6 bar [58-87 psi]

PERFORMANCE CHARACTERISTICS

Max Torque by Load @ 4.5 bar [65 psi] 0 to 105°: 225 N-m [166 lbf-ft]

Air Pressure: 162 N-m [119 lbf-ft]

Operating Speed 105° to 120° @ 100% Loading Capacity: 2 seconds to open, 4 seconds to close

Operating Speed 0 to 120° @ 25% Loading Capacity: 1.6 seconds to open, 2.5 seconds to close

CAUTION: Operating the unit faster than the recommended limits will cause premature wear and may cause failure.

FLOW CONTROLS: Required

CAUTION: Flow controls are required to regulate the speed of the unit while opening and closing. Flow controls **MUST** be adjusted properly to provide smooth motion within the actuation times indicated above.

SHOCKS: Included

CAUTION: Shock adjustment is provided on the rear of each shock. Shocks **MUST** be adjusted properly to avoid excessive impact, “slamming”, or bouncing when the unit opens and closes.

SAFETY PRECAUTIONS

Automation can be extremely hazardous.

There may be rapid, sudden motion anywhere within the normal work area.

It is mandatory that power down and lock out procedures be strictly followed.

Guards and interlocks must be fully operational and in place prior to any use .

- The greatest safety hazard in operating and servicing automation is the pinch/trap/crush potential. Never place yourself in a position where you could be trapped by the automation.
- All equipment should be guarded and interlocked for safe operation. Control panels, disconnects and emergency stops should be located and identified for each of the individual work stations prior to any use or maintenance of automation. Check that all interlocks, overloads (breakers), over travels (limits), and disconnects are fully operational.
- Read and understand all manuals, warning plates, and labels on the automation before operating or maintaining the automation. Replace any worn labels.
- Check all warning lights on the console or other areas of the automation before operating the automation. Contact the maintenance supervisor if necessary.
- If possible, always lower lifts to the lowest possible position, engage manual locking pins, and exhaust all air out of the counterbalance system.
- Disconnect and lock out all main electrical power and turn off and bleed the air supply lines before beginning any maintenance.
- Only trained, qualified, and authorized personnel should operate and maintain the automation.
- Always wear protective glasses and shoes when working around the automation. Do not wear jewelry or loose-fitting or torn clothing when working on the automation.
- Never replace electrical components while the automation's main disconnect switch is on.
- Make sure all shields, clamps, and guards are installed correctly.
- Do not operate the automation if any part of the automation has sustained an impact or collision.
- Support any subassemblies (such as carriage plates, motors, cylinders, etc.) that you are removing from the automated equipment.
- To avoid injury, use a hoist when lifting components weighing 50 lbs. (23 kg) or more.
- Modifications and additions which affect capacity and operation of the automation should not be performed by the customer or user without the manufacturer's prior written approval. Modifying the automation may cause personal injury and will void the warranty.
- Make sure all personnel are clear of the automation area before operating the automation.

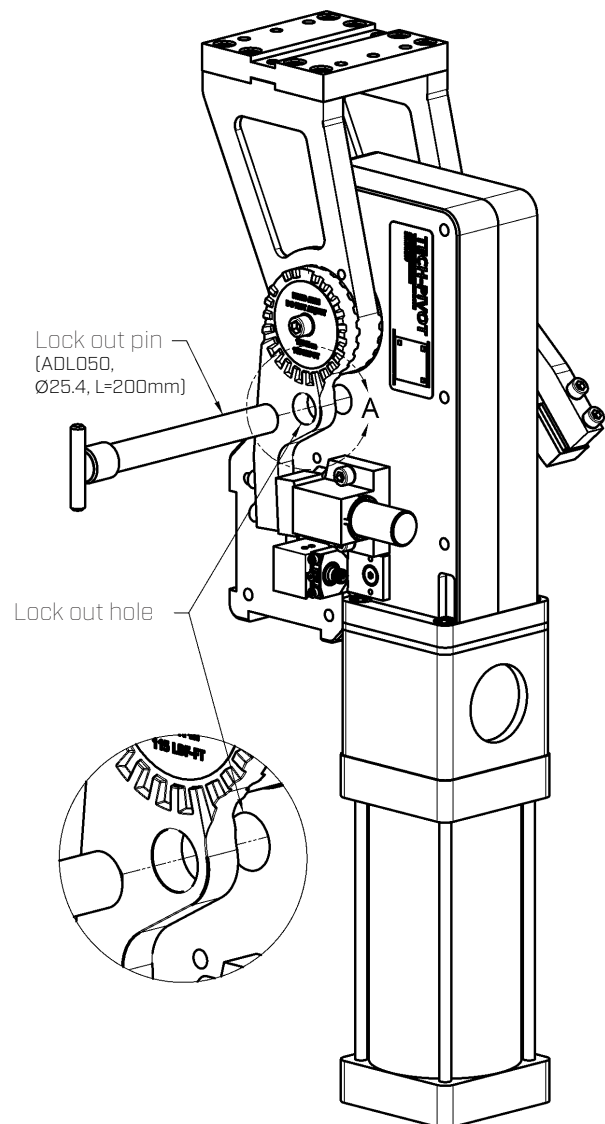
LOCK-OUT PRECAUTIONS

The key to safely operating any automated equipment is to use common sense and to adhere to all safety procedures of your plant.

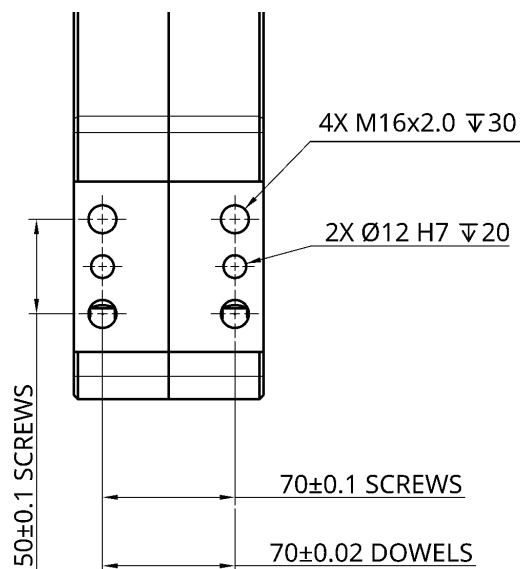
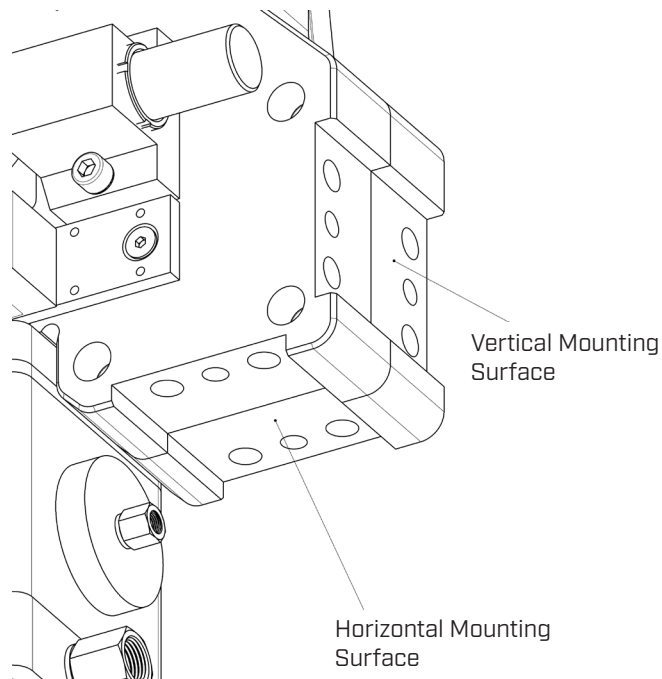
Before maintaining any Tech Rim Standards equipment, perform the following lockout precautions.

CAUTION: The following procedures are intended to supplement the safety rules of your plant, NOT to replace them. Always follow the safety rules of your plant when working on Tech Rim Standards equipment.

- Power down and lock out electrical systems. Check voltage and current gauges to ensure that all power is removed.
- De-pressurize pneumatic systems. Check pressure gauges to ensure that all residual pressure is removed.
- De-pressurize hydraulic systems (if included). Check pressure gauges to ensure that all residual pressure is removed.
- Follow your plant lock out procedures when working on the automation and hang a lock-out tag on the control enclosures main disconnect switch and pneumatic lock out valve.
- Mechanically lock out the automated equipment. Insert lock out pins, as shown in the image, to prevent lifts and shuttles from moving.
- Engage a lock out pin through the lock out hole prior to working on any Tech-Pivot or any other automation using a Tech-Pivot.



MOUNTING SPECIFICATIONS



SPECIFICATION	INSTRUCTION
Fastener Size	M16x2.0 [4x]
Thread Engagement Requirement	25-30mm
Installation Torque Requirement	250N-m [185lbf-ft]
Driver Size	14mm Hex
Dowel Pin Size	\varnothing 12mm [2x]

PREVENTATIVE MAINTENANCE

The preventative maintenance intervals listed in this section should be used as a general guide. Your production and plant environment may determine that more frequent preventative maintenance is necessary.

Use the following summary table for preventative maintenance scheduling information.

PREVENTATIVE MAINTENANCE TASKS

NO.	PROCEDURE	TOOL REQUIRED	PREVENTATIVE MAINTENANCE
1	Test Lock-Out Procedures		Quarterly
2	Inspect Shock Absorbers	Visual	Quarterly
3	Inspect Cylinder	Visual	Quarterly
4	Test Unlock Procedure		Quarterly

CAUTION: Complete the Lock-Out Procedures **BEFORE** performing any maintenance on the automation tooling.

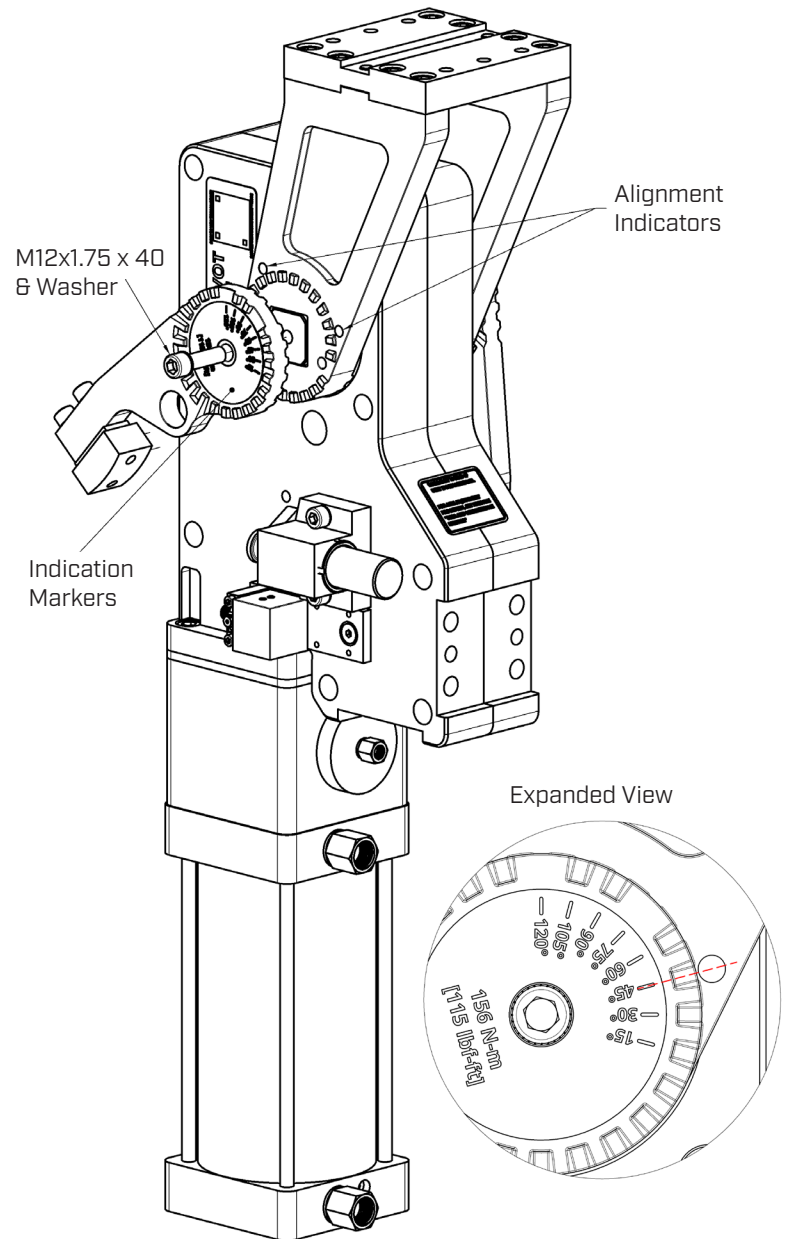
SPARE PARTS TABLE

ITEM	PART DESCRIPTION	QTY / UNIT
48A01174	125mm Locking Cylinder	1
TPE125-SA6-SP	Spare Arm & Stop Block	2
ADL039	Spare Shock (ACE ML3325M)	2
39A01276	Pepperl_Fuchs Cube Switch, +24VDC PNP Output [NRB20-L3M-A2-C3-V1]	2
39A01277	Turck Cube Switch, +24VDC PNP Output [BI20U-CA40-AP6X2-H1141]	2
ADL050	Lock Out Pin	1

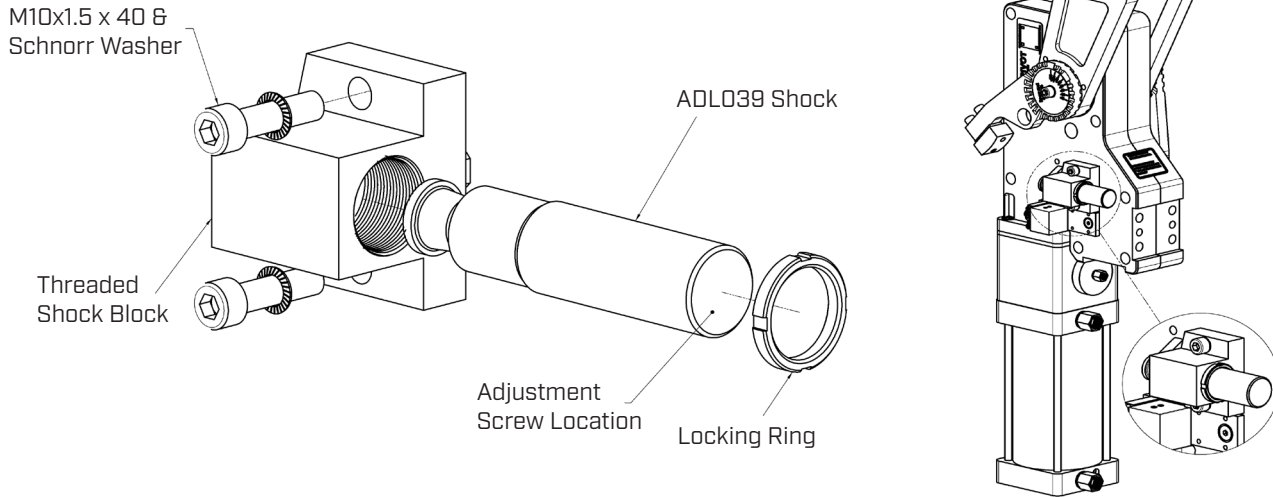
ARM OPENING ANGLE CHANGE

PROCEDURE:

- Identify the adjustable arm.
- Loosen and remove M12x40 fastener and washer located at the pivot axis of the arm.
- Pull back on arm and stop block sub-assembly and rotate to desired opening angle, shown on the label of the arm.
- Line up the angle indication notches on the label of the arm to the appropriate alignment indicator on the saddle of the TPE125.
 - ★ **Note:** the appropriate alignment indicator will vary based on selected saddle orientation.
- Push arm and stop block assembly back into place.
- Install M12x40 fastener into the arm and stop block assembly. Tighten fastener to 156 N-m as indicated on the label.
- Adjusted angle is shown to be 45 degrees in the image to the right.



SHOCK REPLACEMENT



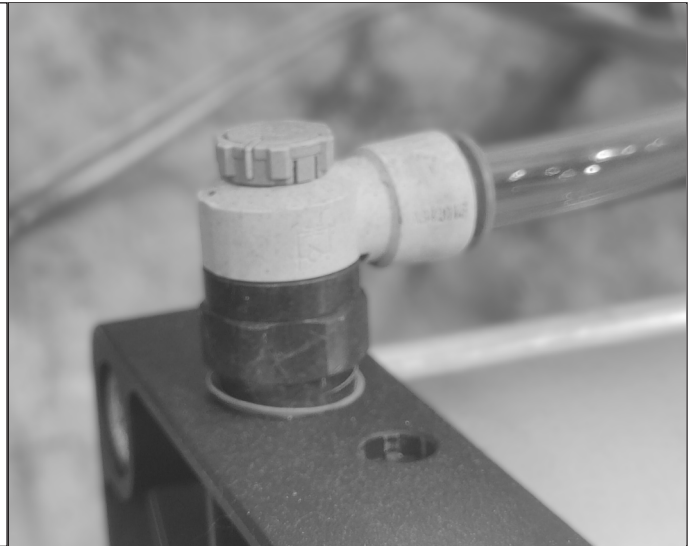
TO REPLACE SHOCK:

- Remove threaded shock, ADL039, from shock block
- Remove locking ring using a hook spanner wrench (Ø39.6mm, McMaster Carr part #6975A16)
- Insert new ADL039 shock into threaded shock block
- Install locking ring onto shock block from the rear of the shock. Adjust to desired location and tighten with hook spanner wrench tool.
- Adjust the shock so that the top face of the shock extends past the top face of the shock block by approximately 23.5mm.

Note: Alterations done to the location of the fixed arm and adjustable arm (changing between mirrored and standard shock orientation) will result in a required mounting location and/ or mounting direction change to the shock blocks, shocks, and switches.

Please refer to 'Mirrored Ordering Options' section in the data brochure for additional information.

ADJUSTMENT FOR APPLICATIONS (SHOCKS AND FLOW CONTROLS)

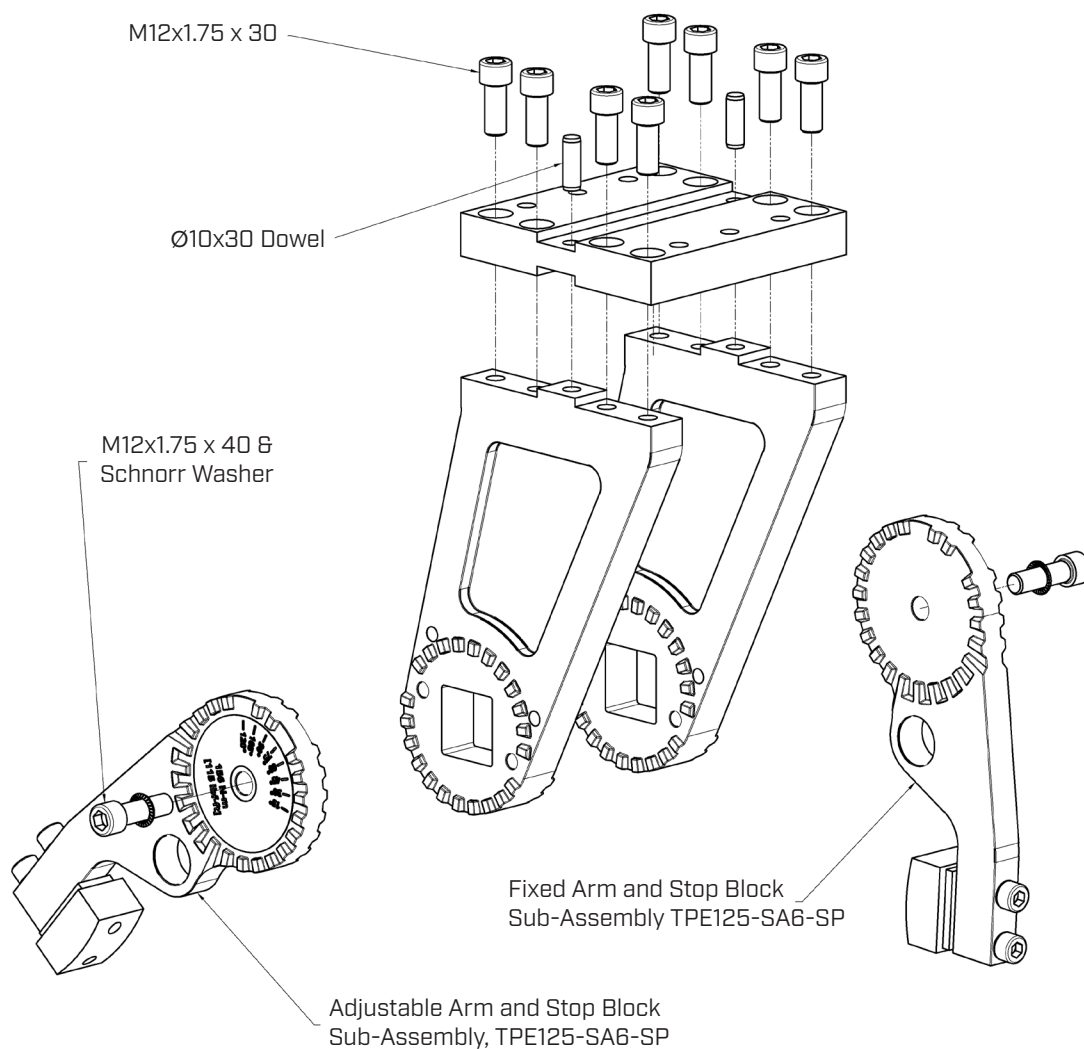


- See dial ranging from 0 to 9 on the rear of the shock with adjustment screw indicating the current setting. Use 4mm hex key to adjust.
- Initially set the shock dial to mid-way position (to a value approximately 5)
- Initially set flow controls all the way in (closed)
- Initially set cushions all the way out (open)
- Manually actuate pivot open/close multiple times while adjusting flow controls until you reach desired speed and smooth operations.
- If the flow control adjustment alone isn't quite dialing it in, adjust the shocks until you get a smooth operation and speed
 - To achieve hard impact, adjust dial towards 9.
 - To achieve soft impact, adjust dial towards 0.
- Adjust until the optimum deceleration (no hard impact at either the beginning or the end of the stroke) is achieved.

Note: Cushions rarely need to be adjusted for pivot applications. Adjust cushions only if the above procedure fails to yield satisfactory results.

SADDLE ASSEMBLY

Refer to the data brochure “Saddle Orientation Options” section for more information on alternative saddle orientations.



Note: TPE125-SA6-SP can be used as the adjustable arm or the fixed arm. Apply supplied labels appropriately upon installation.

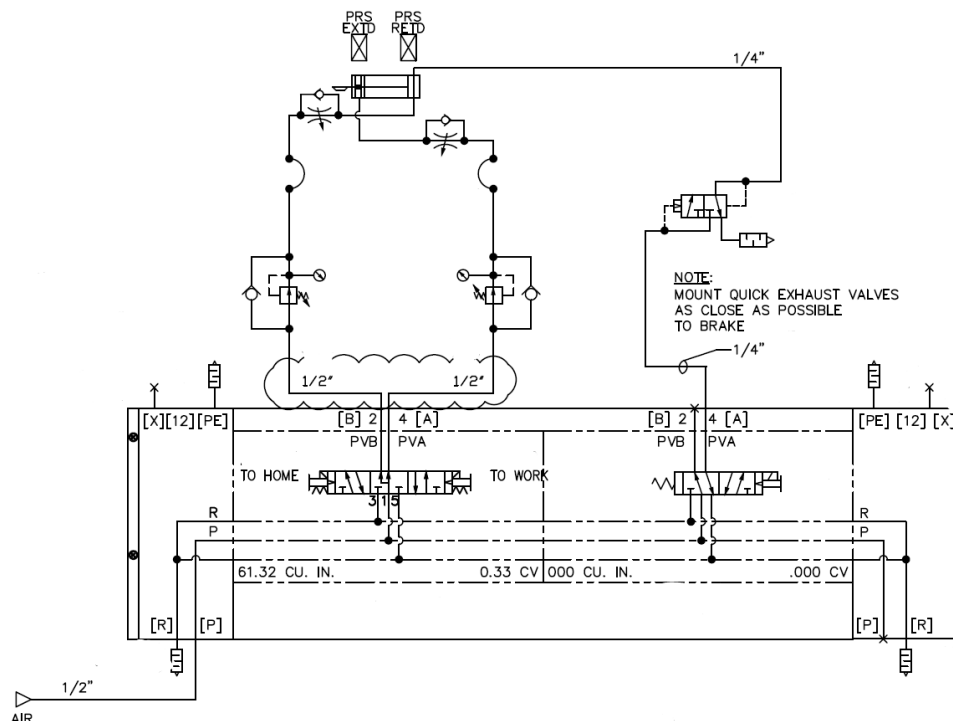
TPE125 CYLINDER PRECAUTIONS

ADJUSTMENT

1. Do not open the cushion valve beyond the stopper. As a retaining mechanism for the cushion valve, a retaining ring is installed. If not operated in accordance with these precautions, the cushion valve may be ejected from the cover when air pressure is supplied.
2. Adjust the cylinder's air balance. Balance the load by adjusting the air pressure in the front and rear sides of the cylinder with the load connected to the cylinder and the lock released. Lurching of the cylinder when unlocked can be prevented by carefully adjusting this air balance.

PNEUMATIC CIRCUIT

1. Be certain to use an air pressure circuit which will apply balancing pressure to both sides of the piston when in a locked stop. In order to prevent cylinder lurching after a locked stop, when restarting or when manually unlocking, a circuit should be used which will apply balancing pressure to both sides of the piston, thereby cancelling the force generated by the load in the direction of piston movement
2. Use a solenoid valve for unlocking which has a large effective sectional area, as a rule 50% or more of the effective sectional area of the cylinder drive solenoid valve.
3. Place the solenoid valve for unlocking close to the cylinder, and no farther than the cylinder drive solenoid valve. The less distance there is from the cylinder (the shorter the piping), the shorter the overrun amount will be, and stopping accuracy will be improved.
4. Allow at least 0.5 seconds from a locked stop until release of the lock. When the locked stop time is too short, the piston rod (and load) may lurch at a speed greater than the control speed of the speed controller.
5. When restarting, control the switching signal for the unlocking solenoid valve so that it acts before or at the same time as the cylinder drive solenoid valve. If the signal is delayed, the piston rod (and load) may lurch at a speed greater than the control speed of the speed controller



LIMITED WARRANTY

LIMITED WARRANTY. All product [“Equipment”] manufactured by TechRim Standard’s, LLC [“TechRim”] is warranted against defects in workmanship and materials under normal use and service for 365 days from the date of delivery (the “Limited Warranty”) or at the end of 2,000 hours running, whichever comes earlier. This warranty applies only when installed and operated in accordance with the User’s and Maintenance Manual. If any failure to conform to this Warranty appears during the warranty period, TechRim shall, upon notification and substantiation that the equipment have been used in accordance with the User’s Manual, correct such defects by either suitable repair, replacement, or purchase price refund at TechRim’s option and expense, provided BUYER returns the defective Equipment to TechRim, freight prepaid. Compliance with this provision by BUYER shall be a condition of this Limited Warranty. Any Equipment modification or repair other than that authorized by TechRim in writing shall void the Limited Warranty. This Limited Warranty does not cover any warranty of components incorporated into the Equipment that is manufactured by third-parties, such as but not limited to pneumatic cylinders.

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