

OPERATION AND MAINTENANCE MANUAL

FOR PEMSERTER® SERIES LT4™

PNEUMATIC PRESS

SERIAL NUMBER LT/4(T) -

NOTE: Your New PEMSERTER® Series LT4™
Pneumatic Press has been assigned
a Serial Number as indicated above

This Number Must Be Referenced
In All Correspondence

PennEngineering®
5190 OLD EASTON ROAD
DANBORO, PENNSYLVANIA 18916
1-800-523-5321 • 1-215-766-8853

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Read Manual Before Operating Press!

FOREWORD

Thank you for purchasing a PEMSERTER® Series LT4™ press. With the proper care and maintenance, your press will install countless fasteners safely, quickly and consistently. The press has a maximum 6000 lbs./ 27kN capacity with a 9.84 in. / 250mm throat. It is totally pneumatically controlled and operated. No electric power is required.

The press is covered with a two (2) year warranty.

Should any questions or problems arise concerning your Series LT4™ press, contact the PennEngineering® Service Department. The **toll-free telephone number is 1-800-523-5321 (in North America) or 215-766-8853 (Outside the U.S.).**

Set-up, Training and Repair Service is available to you as long as you own your press. Free telephone instruction and service is available for the lifetime of your press by calling the PennEngineering® Service Department.

SHIPPING DAMAGE

The PEMSERTER® Series LT4™ press has been shipped to you packaged to withstand normal handling during transit. Upon receipt, the unit should be checked for any damage that may have occurred during shipment due to improper handling. Should any damage be found the transportation company who delivered the unit must be immediately notified, as should the PennEngineering® Service Department.

SECIFICATIONS:

Ram Force	400 to 6,000 (1.8 to 27 kN)
Air Requirements	90 to 100 PSI (6 to 7 BAR)
Air Line	1/2" (12mm) I.D. minimum line flow
Throat Depth.....	9.84" (25cm)
Weight	380 lbs (172 kg)
Ambient Temperature	-20° F to 120° F (-29° C to 49° C)
Ambient Humidity.....	0% to 80% (Not reflective of inlet air)
Air Consumption	Approx. 1.5 liters/sec at 1 atm (2.3 scfm) 20 insertions per minute at 20 kN (4500 lbf)



SAFETY

The Series LT4™ was designed to conform to applicable ISO, ANSI, OSHA, CEN and CSA safety standards.

The Series LT4™ is compliant to applicable European Union (EU) directives and bears the CE Mark.

The Series LT4™ conforms to the essential requirements of the following directives: EN 98/37/EC (June 22, 1998) Machinery Directive.

Please read and follow the safety precautions listed below.



SAFETY PRECAUTIONS

- ◆ Always use safety goggles when operating or maintaining the press.
- ◆ Ear Protection is recommended.
- ◆ Before using the press, make sure that a shutoff device has been fitted on the air supply line and the location is easily accessible, so that the air supply to the press can be shut off in an emergency.
- ◆ Check the air hose and fittings regularly for wear.
- ◆ Use only approved parts for maintenance and repairs.
- ◆ Do not use chipped, cracked or damaged accessories and tools.
- ◆ Attach air line securely.
- ◆ Keep body parts away from moving parts.
- ◆ Never wear jewelry, loose clothing or anything that could get caught in moving parts.
- ◆ If a new user is operating the press, be sure these instructions are readily available.
- ◆ Do not use the press in any way, other than for its intended purposes.
- ◆ Do not modify the press in any way.



WARNING:

The PEMSERTER® Series LT4™ press is equipped with a point-of-operation safety device to protect the operator from potential injury. A detailed explanation of the safety system can be found in Section 4 – “Operator Safety” of this manual. ANSI specification Number B11.1-1982, Section 5 states "It is the employer's responsibility to ensure the usage of a point-of-operation safety or guard or a properly applied and adjusted point-of-operation safety device on every operation performed on a press production system." It is important that employers ensure that their operators understand and are trained to properly set-up the Series 4 safety system before operation.

WARRANTY

PennEngineering® warrants that this product, when correctly used according to directions and under normal operating conditions, will be free from defects in material and workmanship for a period of two (2) years from the date of purchase.

This warranty shall not apply to any product which has been altered, changed or repaired, normal maintenance excluded, except as authorized PennEngineering®. This warranty shall not apply to any product that has been subject to misuse, negligence or accident.

The purchaser's exclusive and sole remedy shall be limited to repair, modification or replacement at the discretion of PennEngineering®. In no event shall PennEngineering® be liable for the cost of any indirect or consequential damage. In no case PennEngineering®'s liability exceed the purchase price of the product.

This warranty is exclusive and in lieu of all other warranties. No oral or written information by PennEngineering®, its employees, representatives, distributors or agents shall increase the scope of the above warranty or create any new warranty.

PEMSERTER® SERIES LT4™ PRESS

OPERATION MANUAL

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AIR SUPPLY PREPARATION

AIR SUPPLY PREPARATION

Recommended Air Supply Hook-Up Arrangement

Proper air supply is very important to the performance and maintenance of the press. Following these simple guidelines will ensure good press performance.

- **Air Quality** - The quality of the air supply is very important. The air must be clean and dry. Moisture and debris will contaminate the oil and valve systems and lead to press performance and maintenance problems.
- **Air Supply Flow** - Use a minimum 12mm (1/2") inside diameter line and fittings from the compressed air source to the press. Shop pressure ranging between 6 to 7 BAR (90 psi to 100 psi) is acceptable. Inadequate air flow will affect press performance.
- **Air Consumption** – Average air consumption running at 20 kN (4500 lbf) at 20 insertions per minute is about 1.5 liters/sec at 1 atm. (2.3 scfm). Air Supply Flow requirements are higher than those reflected by these values as air is not being consumed during the entire cycle time.
- **Piping Installation** – Proper piping hookup will help achieve the above requirements. See figure 1-0 on the next page.

Connect to your supply line with a pipe pointing upwards that curves over and down. This arrangement will help prevent water and compressor oil from entering the press.

Connect to that drop with your supply fitting for a 12mm (1/2") or larger hose. Continue the end of the drop to a drain valve. This will help collect additional water and oil and allow the system to be purged.

If your factory air supply falls short of the above recommendations, an air reservoir tank of an appropriate size for your location can be used.

An auxiliary filter/separator installed immediately outside the machine is recommended.



CAUTION: Before connecting air supply to the press, ensure initial press set-up is complete and the ram force is set at the minimum (Ram Force knob turned completely counter-clockwise).

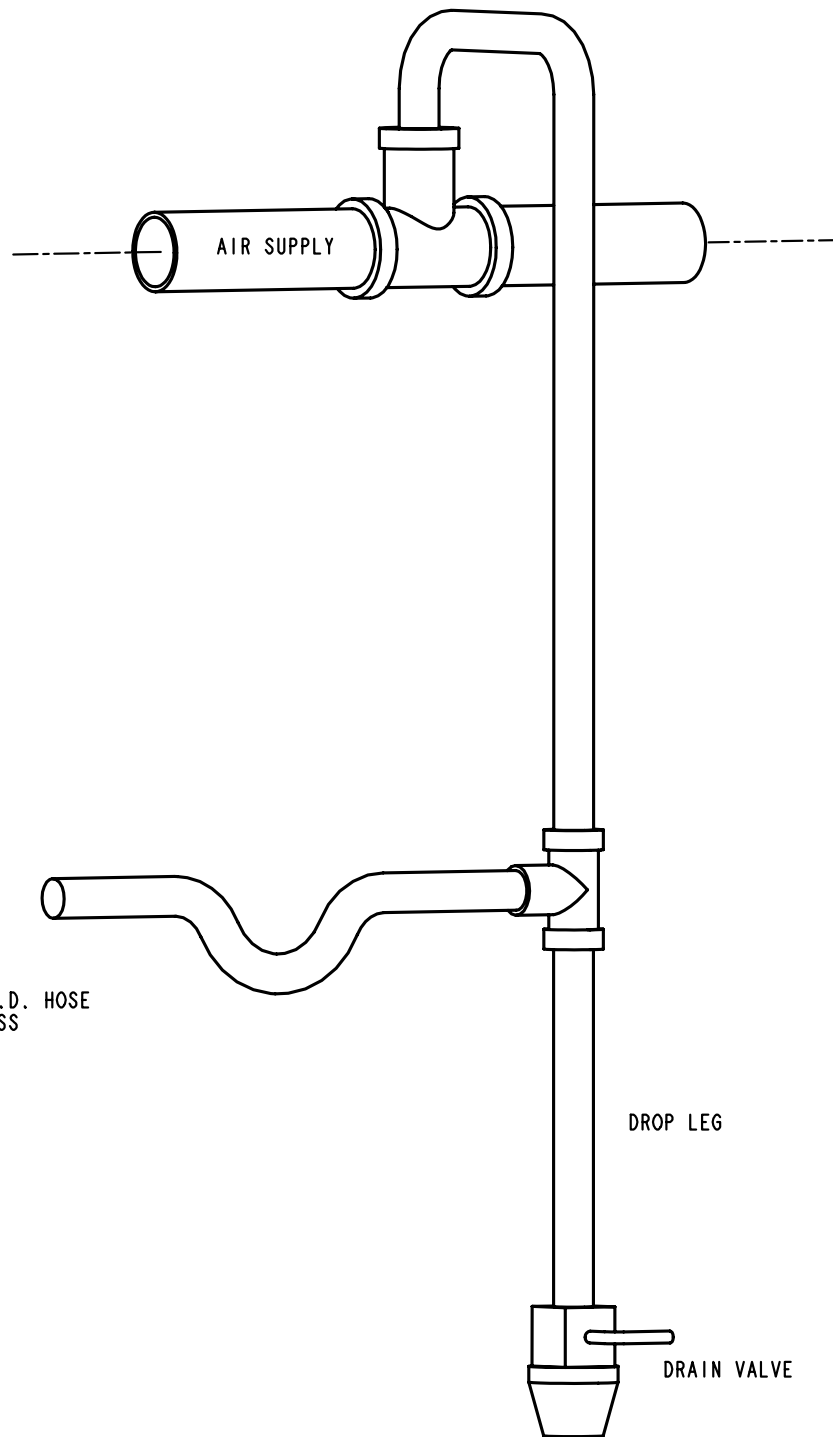


FIGURE 1.0
AIR SUPPLY

**UNPACKING
AND
INITIAL SET-UP**

UNPACKING AND INITIAL SET-UP

Select a clean, well-lit area to place your Series LT4™ press. Provide an area around the press that will allow for the removal of the top cover and clearance for opening the back door. A minimum of (2) feet / 60 cm along each side and (2) feet / 60 cm behind the press is recommended (Figure 2.0).

Carefully remove the crating and packing materials from around the press and remove stand from its own box (Stand is optional), follow enclosed assembly instructions. Remove the box strapped to the crate containing assembly hardware, footswitch, tooling, etc. After stand assembly, position the stand with the press facing as shown (Figure 2.0). If the optional stand was not purchased, place the press on a flat, sturdy surface. Remove the top cover from the press. Observe the red warning tags. Follow the instructions and remove only the items required for shipping.



CAUTION: Do not remove the remaining warning tags until all instructions are read and understood.

Insert the ½-13 eyebolt, provided in the maintenance kit, into the tapped hole in the top of the press. Use a single chain sling with a sling style hook to lift the press with this eyebolt (Figure 3.0). The press weighs approximately 291 pounds / 132 kg. Unbolt, then lift the press from the pallet and attach it securely to the stand with the hardware provided, or lag bolt the press through the feet to a solid workbench. Remove the chain sling, eyebolt, and secure the top cover. Connect the orange foot-valve to the quick-connect ports at the bottom-rear of the press (Figure 3.3).



WARNING: Do not lift the assembled press and stand by the stand. The assembled press and stand is top heavy and may fall.

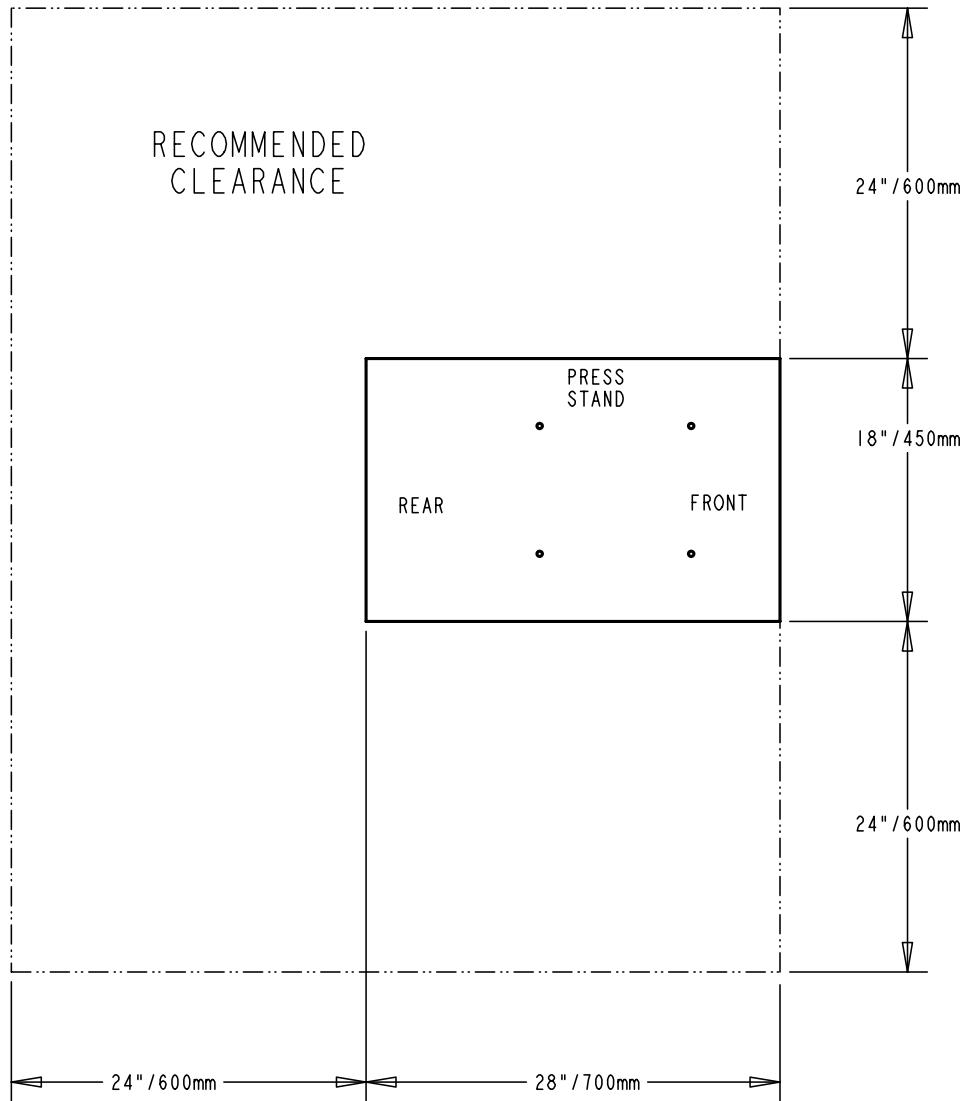
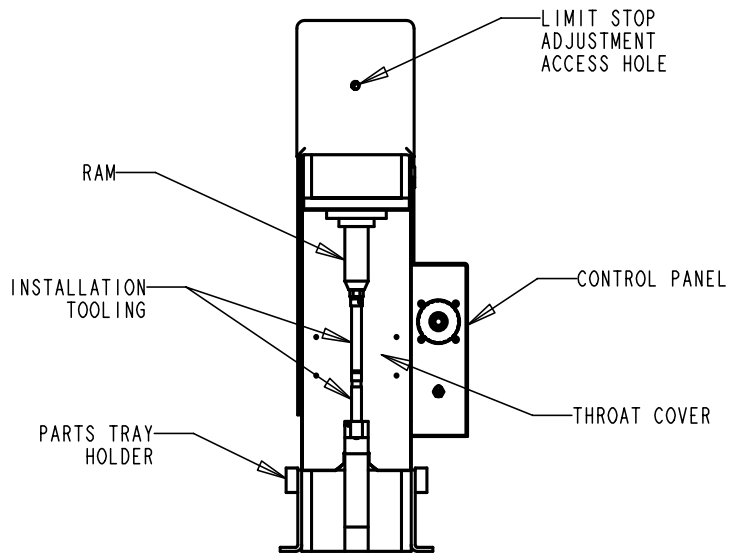


FIGURE 2.0
 TOP VIEW
 STAND PLACEMENT AND RECOMMENDED CLEARANCE

PRESS

FAMILIARIZATION



PRESS FRONT

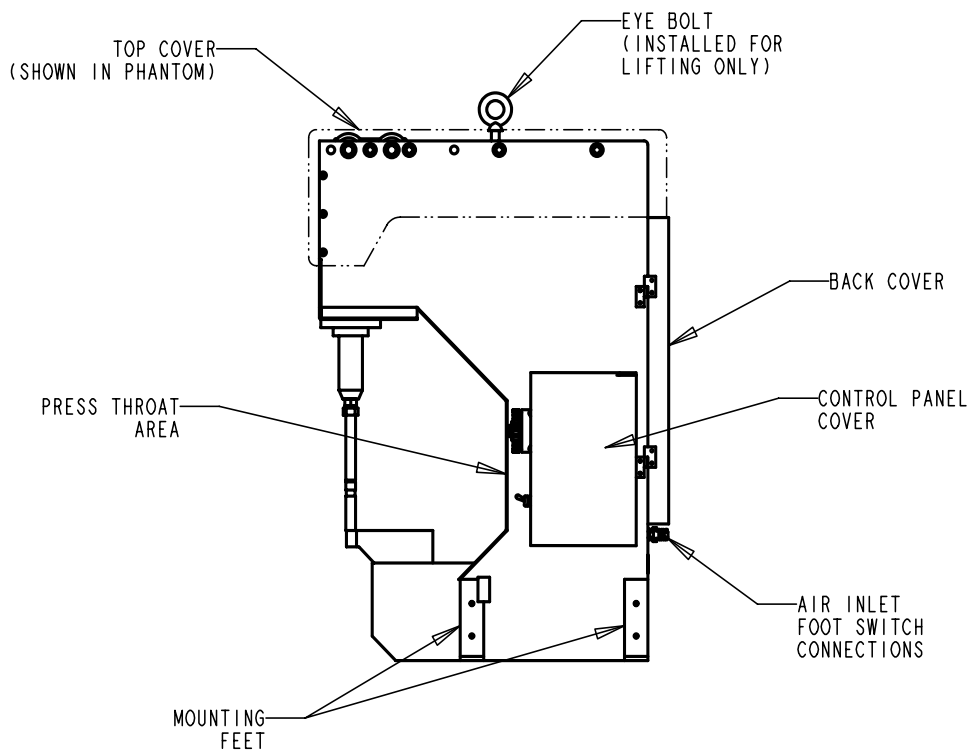


FIGURE 3.0
PRESS RIGHT SIDE

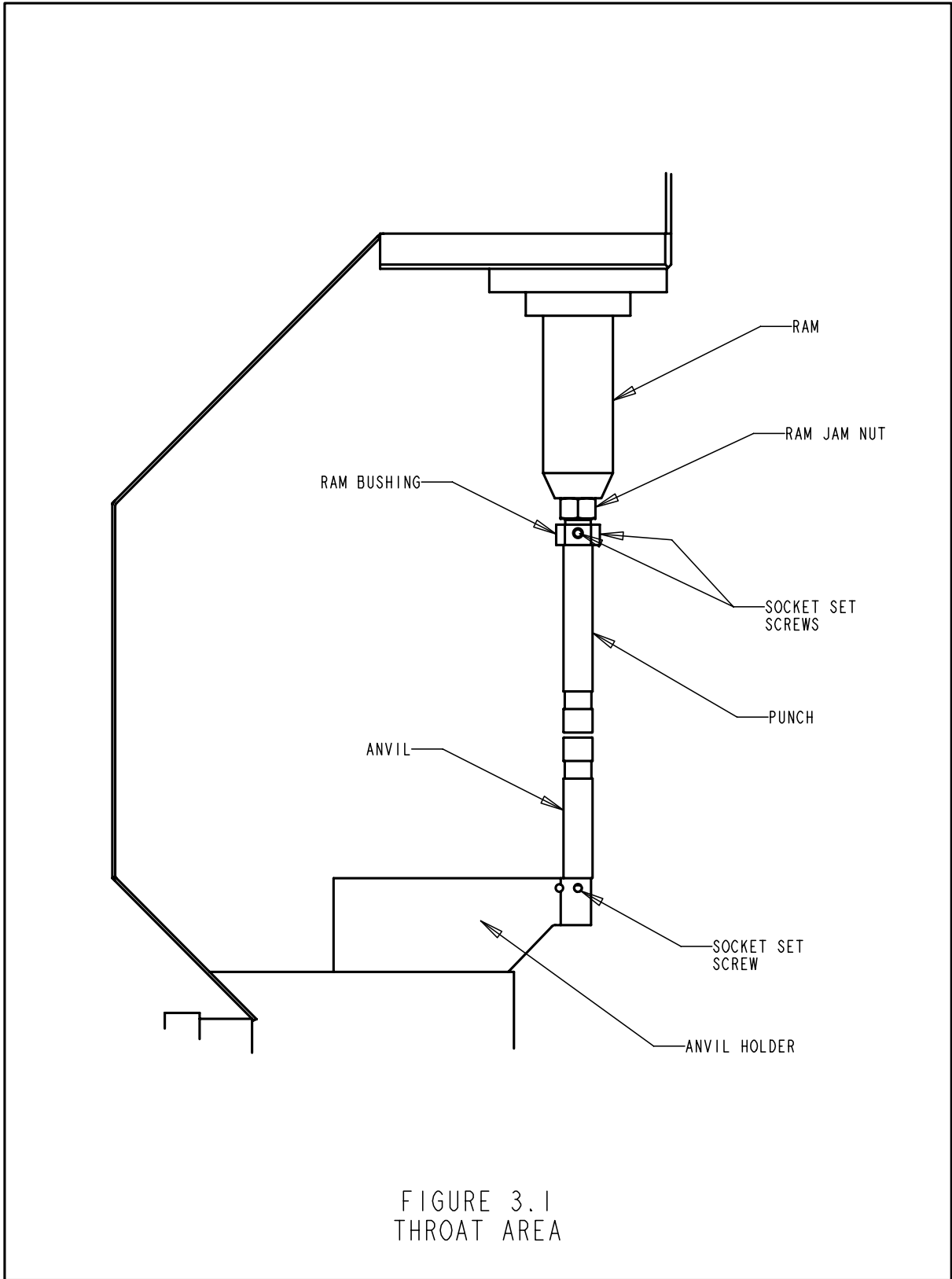
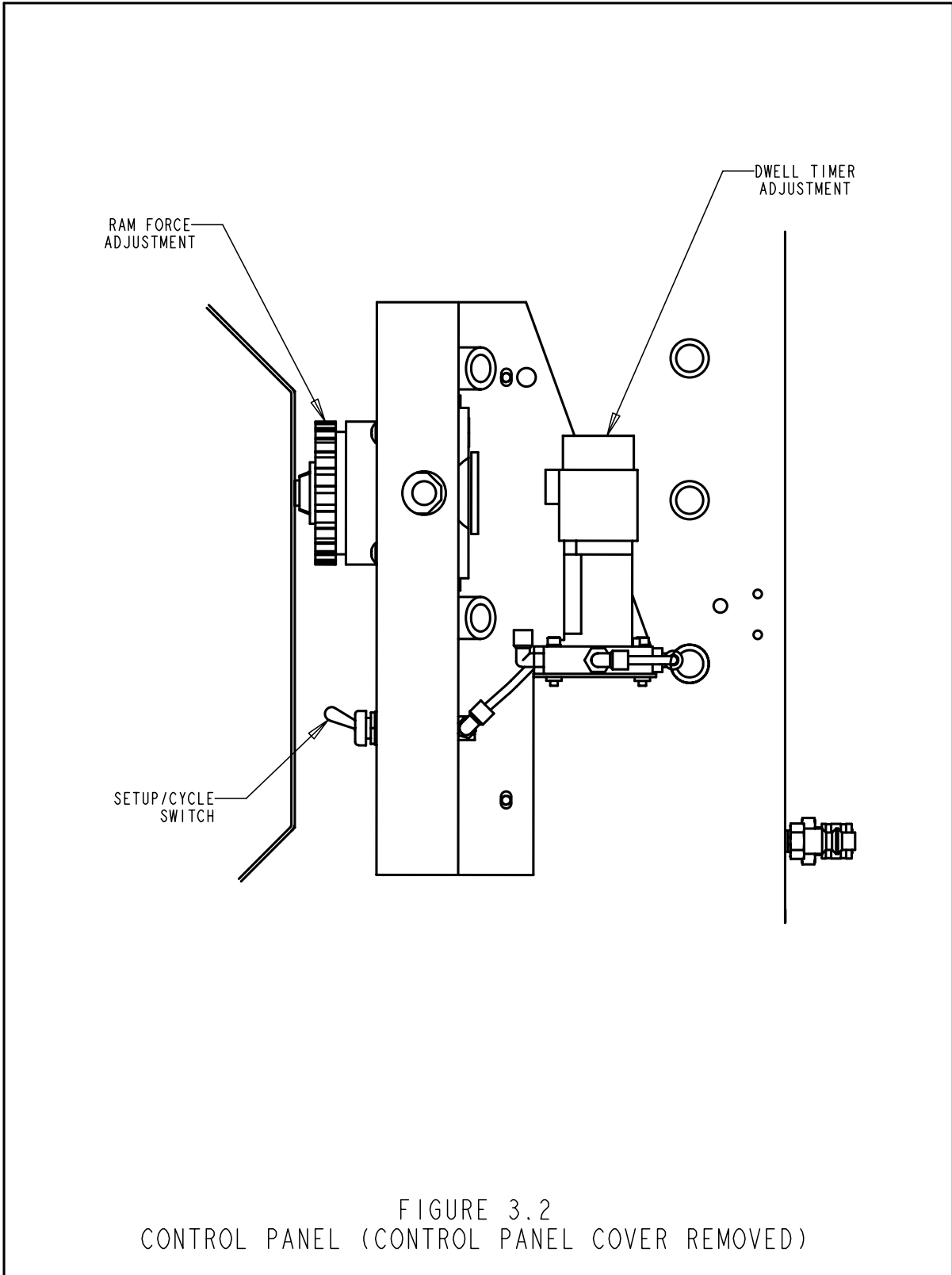


FIGURE 3.1
THROAT AREA



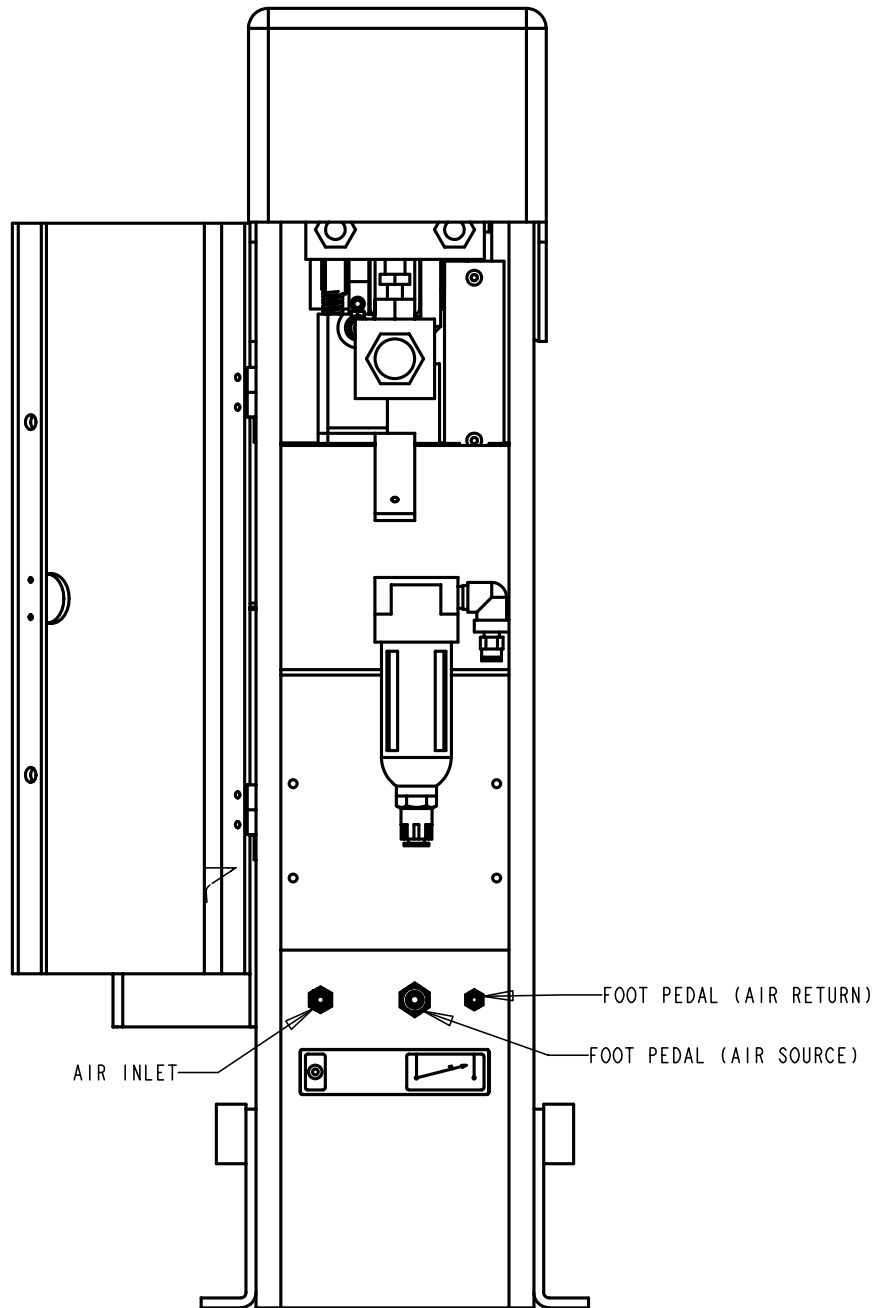
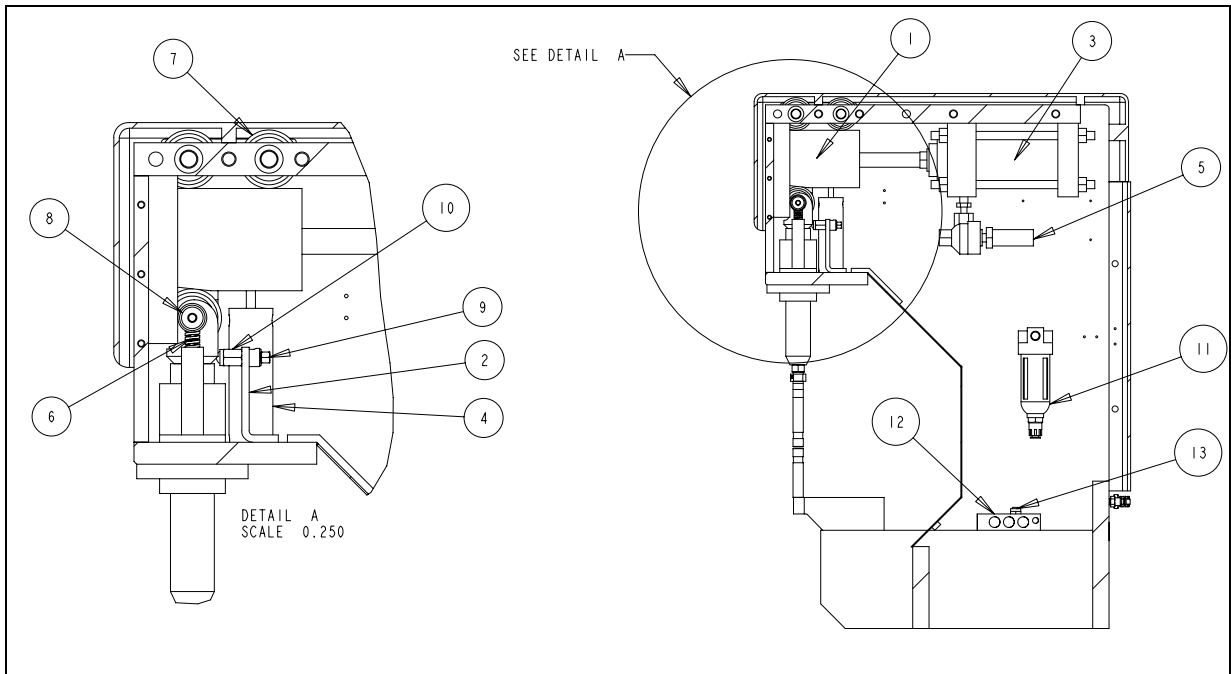


FIGURE 3.3
BACK (SHOWN WITH BACK COVER OPEN)



ITEM	PART NUMBER	DESCRIPTION	QTY
1	8012071	WEDGE LT4	1
2	8012086	BRACKET SWITCH LT4	1
3	8012089	CYLINDER 100MM BORE X 95ST STR	1
4	9800393032	CYL,9/16BOR,3"ST,DBL.ACT,SPRG	1
5	8013655	QUICK EXHAUST VALVE	1
6	8012135	SPRING DIE G13 X 65L	1
7	8012137	CAM FOLLOWER LT4	3
8	8012136	CAM FOLLOWER LT4	2
9	980039005	VALVE N/C POPPET	1
10	980039006	ACTIVATOR BALL MINIATURE	1
11	8012100	FILTER 3/8"-A/3/8"	1
12	9800393037	VALVE 3/8NPT AIR PILOTED	1
13	8012107	VALVE SHUTTLE	1

FIGURE 3.4
PRESS ASSEMBLY



OPERATOR

SAFETY



OPERATOR SAFETY

An important feature of the PEMSERTER® Series LT4™ press is its "Point of Operation" safety. When the footswitch is depressed, the ram extends by gravity. At the end of the ram stroke, the ram cap actuates the ball valve causing the installation force to be applied to the ram assembly and punch. If an obstruction greater than the set up gap between the punch and the anvil is encountered the ball valve will not be actuated and the installation force will not be applied.



Important: The gap must not exceed 7/32 of an inch (5,5 mm) set gap between the punch and anvil, with the ram fully extended by gravity, to comply with most major safety standards which set the limit at ¼" or 6mm. These include standards published by ISO, ANSI, OSHA, CEN and CSA. (Figure 4.0).

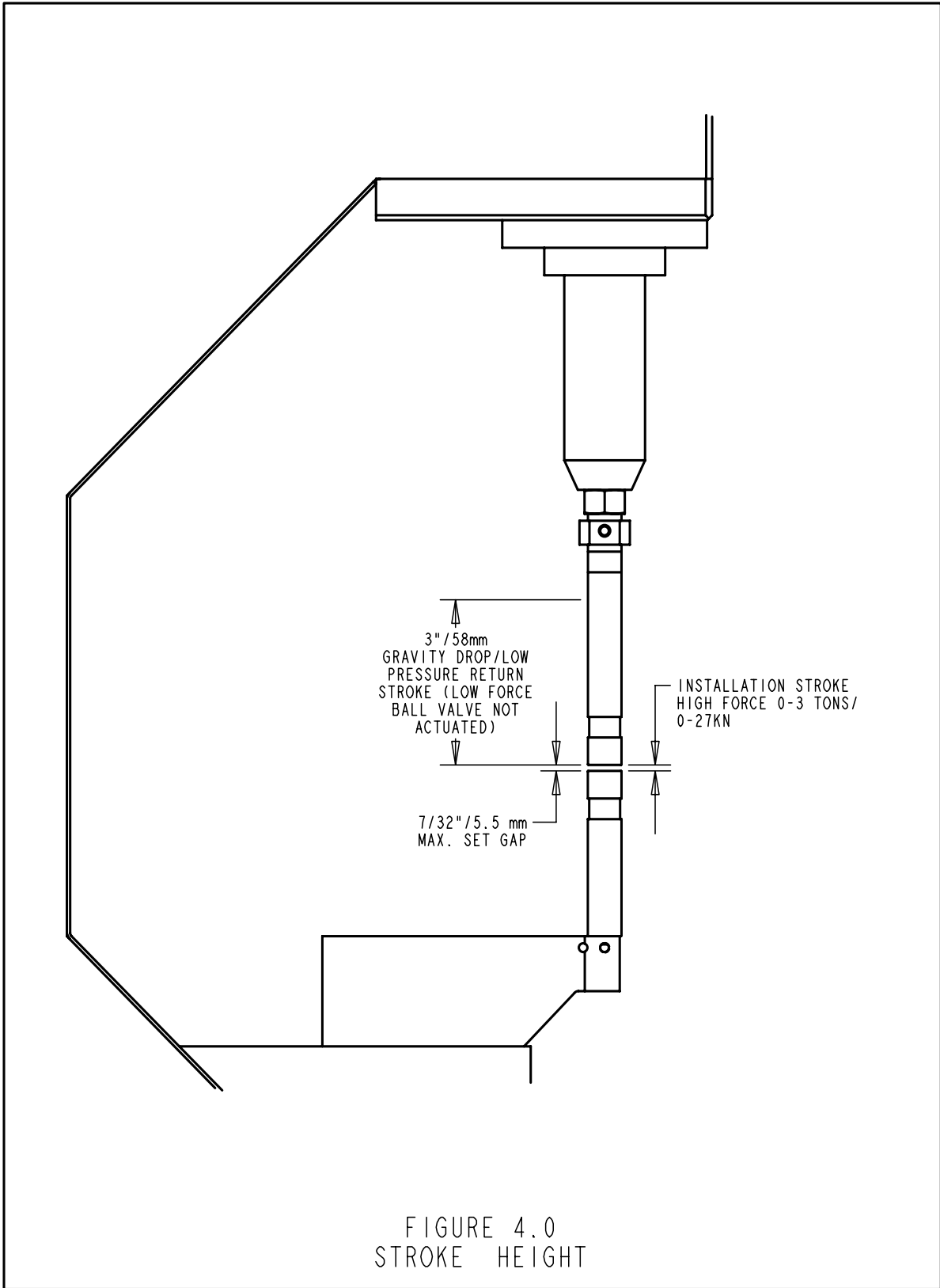
OSHA Standard 1910.217 Mechanical Power Presses

ANSI Standard B11.1-1988

Mechanical Power Presses -
Safety requirements for care,
construction and use


ISO Standard 13854

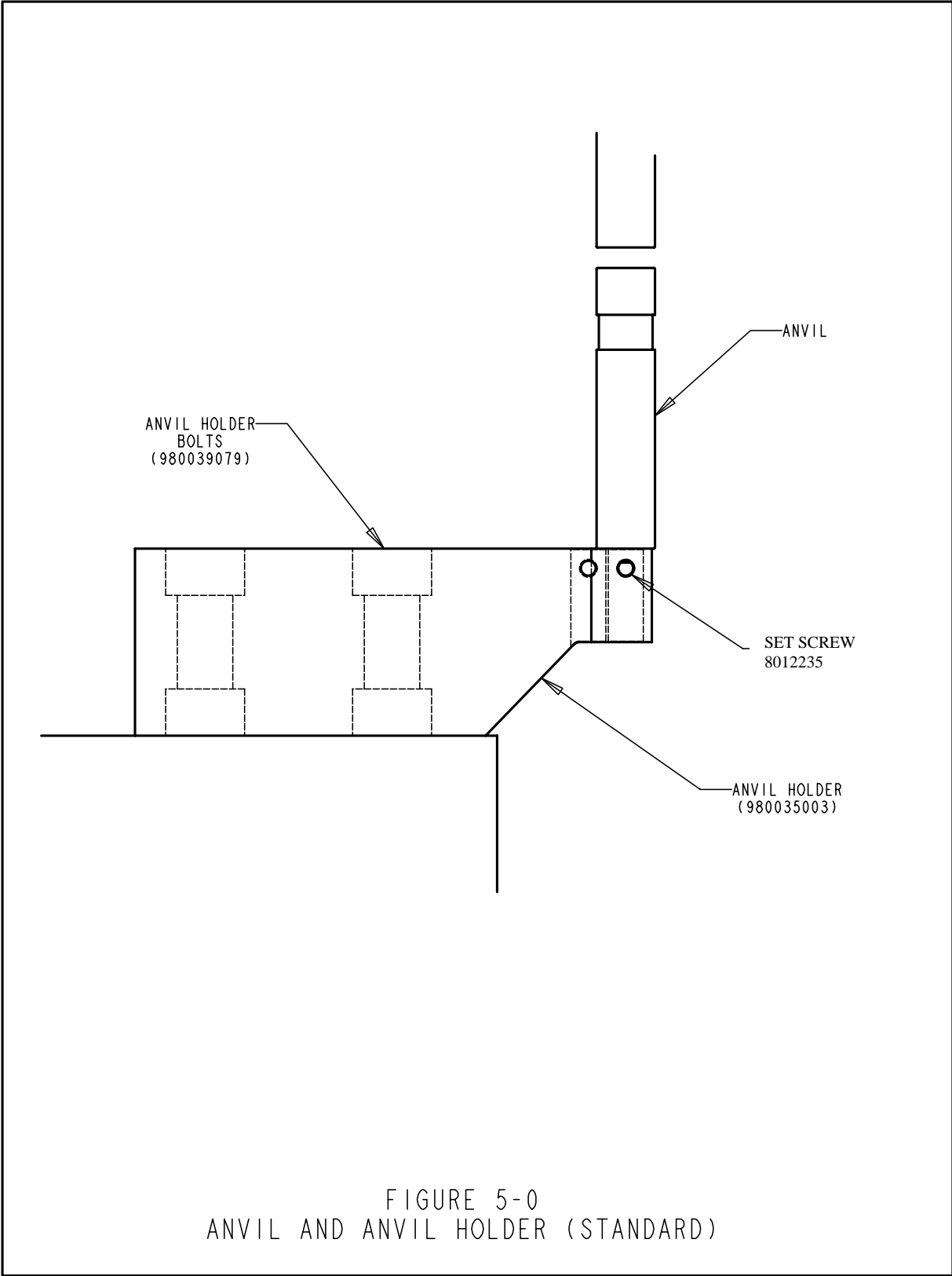
Safety of Machinery –
Minimum gaps



**PRESS SET-UP
AND
OPERATION**

STANDARD PUNCH AND ANVILS

1. Refer to the tooling guide for the appropriate punch and anvil for the fastener being installed.
2. Disconnect the air supply to the press. The ram will extend by gravity. Remove the punch by loosening the (2) set screws in the ram bushing. Install the new punch and tighten the (2) set screws.
3. Connect the air supply to the press. The ram will retract.
 **Note:** Make sure that the foot pedal is connected prior to connecting air supply.
4. Loosen the set screw in the side of the anvil holder and remove the anvil. Install the new anvil into the anvil holder and tighten the set screw.
5. Disconnect the air supply to the press. Check the alignment of the outside diameters of the punch and anvil. If necessary, align the anvil to the punch. Loosen the bolts in the anvil holder, reposition the anvil holder and then torque the anvil holder bolts to 100 foot pounds / 136 Nm (Figure 5.0).



PRESS SET-UP AND OPERATION

1. Set Force to OFF



2. Switch to Set-up Mode



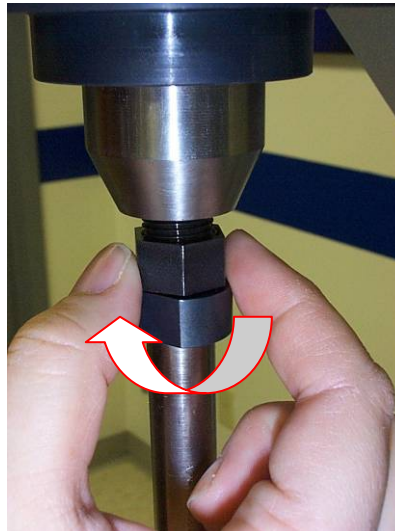
3. Connect Air



4. Loosen Ram Lock Nut



5. Turn Ram Lock Nut Down



6. Turn Ram Bushing Out until about 5/8" (15mm) of threads are exposed.



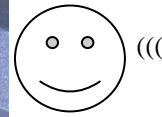
7. Place Fastener and Workpiece on Anvil



8. Press the Foot pedal and Hold and
Ram will Drop and Contact Workpiece and Fastener



9. Turn Ram Bushing In,
Until Valve Actuation
is Heard.
Turn ½ Turn More In



+ 1/2

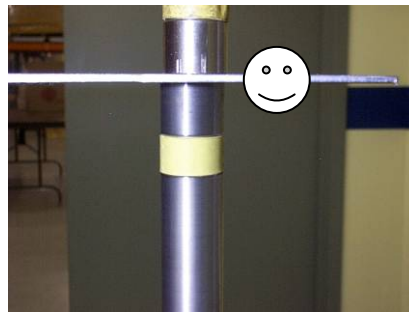
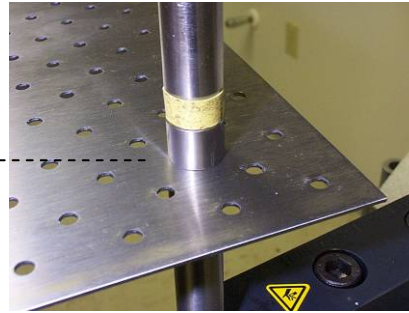
10. Turn the Lock
Nut Up to The Ram



11. Watch the installation and

Slowly turn the Force Up.

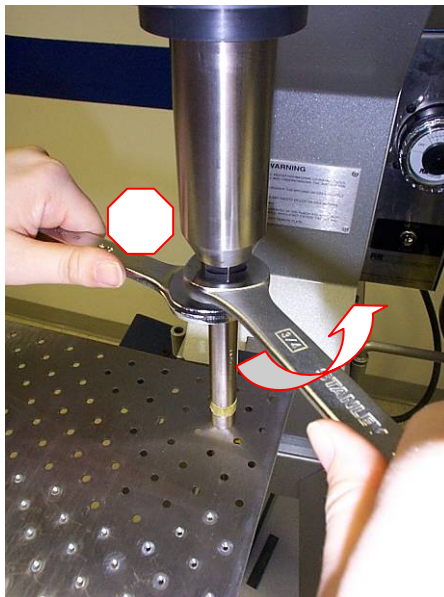
Until Fastener is Installed



12. Lift Off Foot From Footpedal



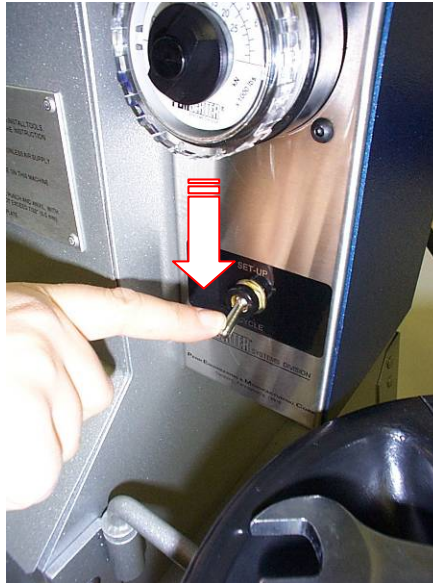
13. Tighten the Ram Lock Nut while holding the bushing.



14. Press Down Footpedal Again



15. Switch To Cycle Mode



16. Lift Off Foot from Footpedal
Ram will Lift Up



17. Check Lock Nut
is Tight



NOTE: Caution must be taken that the press does not actuate with a gap between the surfaces of the punch and anvil greater than $7/32''$ / 5.5 mm to comply with safety standards.

LIMIT STOP ADJUSTMENT

The limit stop adjustment is a feature which limits the force stroke of the press for the prevention of over-insertion of self clinching fasteners specifically designed for insertion into electronic circuit board material. **Follow the procedure above for proper set up of the safety system.**

After Step 13 do Step 13a. shown below.

The limit stop feature is effective for sheets up to .1" (2.54 mm) thick. **DO NOT attempt to use the limit stop for sheets greater than .1" (2.54 mm) thick.**

13a. Use the Hex-wrench provided and turn the limit stop screw until the head of the screw contacts the front plate. The force stroke is now limited to the current distance set.



... continue to Step 14.

IMPORTANT: Keep the limit stop screw in the back position when not using the limit stop feature. Not doing so may result in damage to your press.



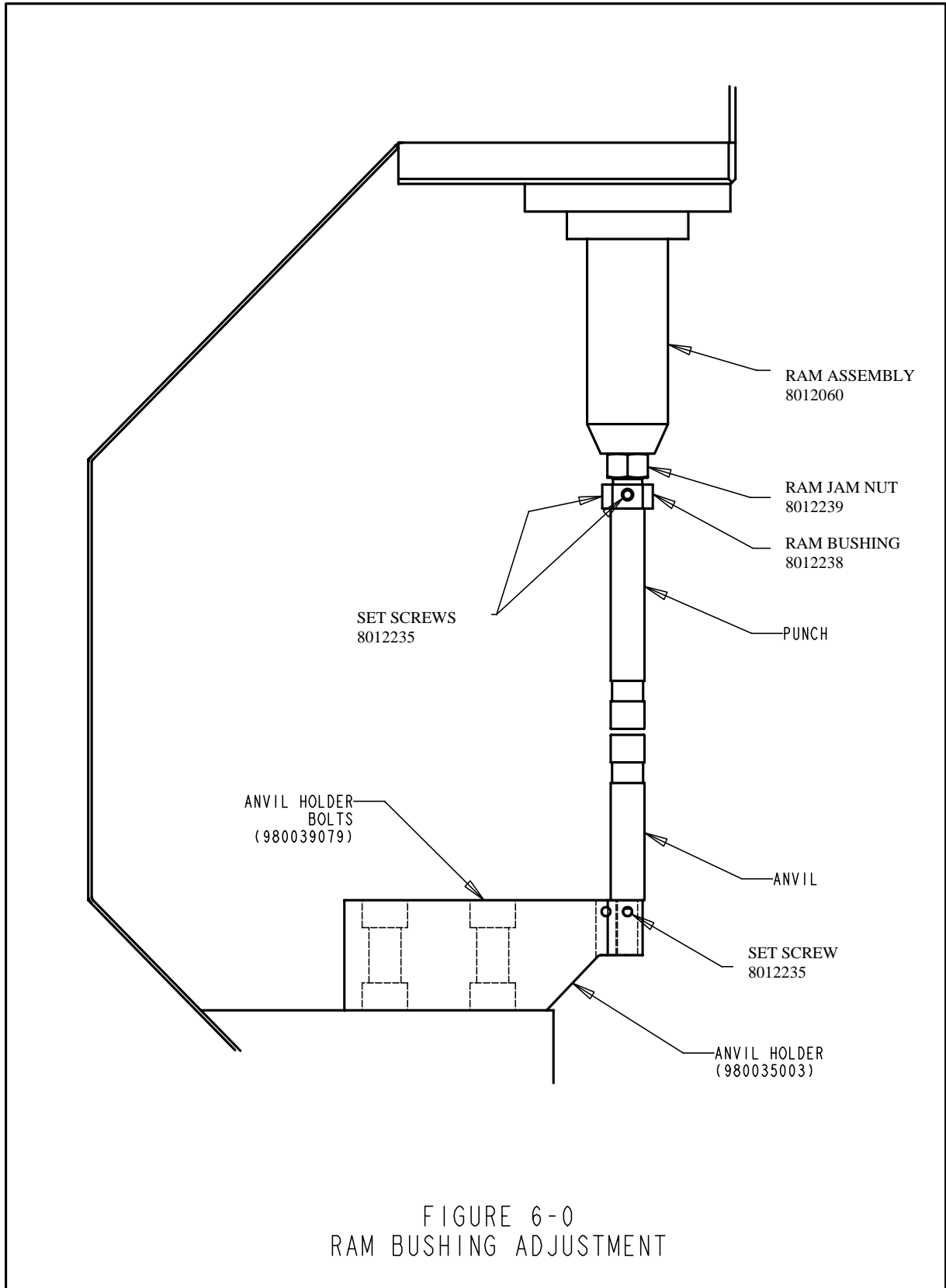


FIGURE 6-0
RAM BUSHING ADJUSTMENT

1.

PRESS MAINTENANCE AND ADJUSTMENTS

PRESS MAINTENANCE



WARNING: DISCONNECT THE AIR SUPPLY BEFORE PERFORMING ANY MAINTENANCE.



IMPORTANT: COMPLETE THE FOLLOWING MAINTENANCE EVERY WEEK.

1. Spray the upper and lower portion of the ram with WD-40, CRC 5-56 or equivalent. Wipe clean with a cloth and re-spray with a light coat.
2. The MAIN AIR FILTER is equipped with a manual drain (Figure 7.0). If an excessive amount of liquid (over 1/2" / 12mm) is in the filter bowl, manual draining and cleaning is required to clean the filter bowl. Remove the filter bowl and clean with a clean cloth and soap. Wipe the bowl dry and re-install. Never clean the filter bowl with solvents. Solvents may weaken the bowl material resulting in bowl deterioration.

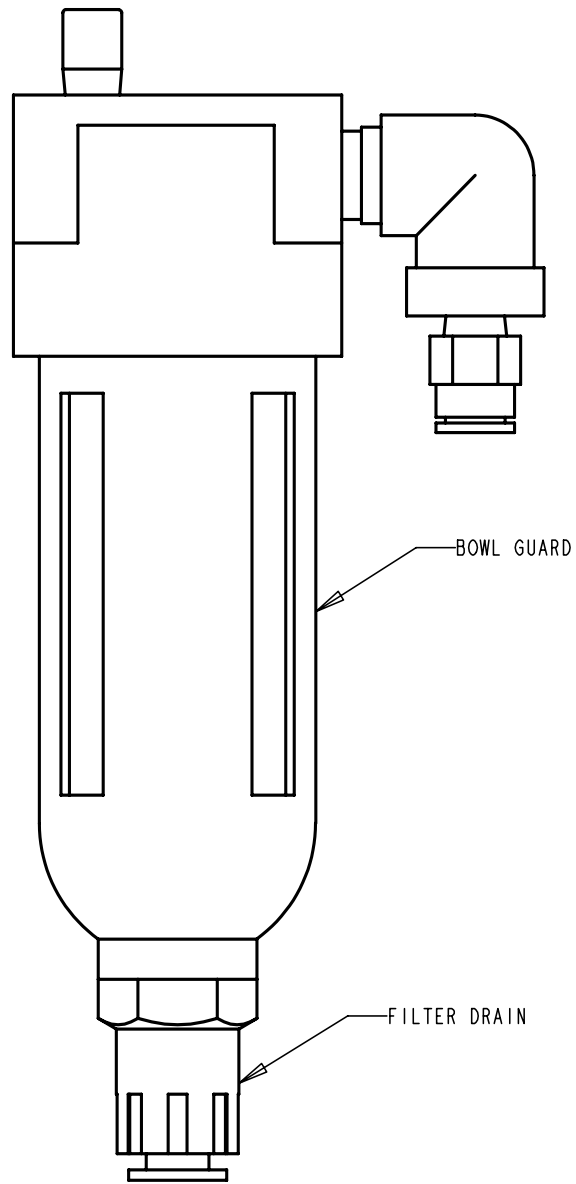


FIGURE 7-0
MAIN AIR FILTER



WARNING: DISCONNECT THE AIR SUPPLY BEFORE PERFORMING ANY MAINTENANCE.



IMPORTANT: COMPLETE THE FOLLOWING MAINTENANCE EVERY (6) MONTHS.

1. **TIMER FILTER** - Open rear cover and remove thumb screw that holds control box cover. Remove control box cover (Figure 3.0). Remove the timer assembly from the base (Figure 7.1) using a straight blade screwdriver. Remove the small o-ring, then the plastic spacer. Grasp the small brass stem on the filter element and pull straight out. Clean the filter element in solvent, blow dry, and reassemble.

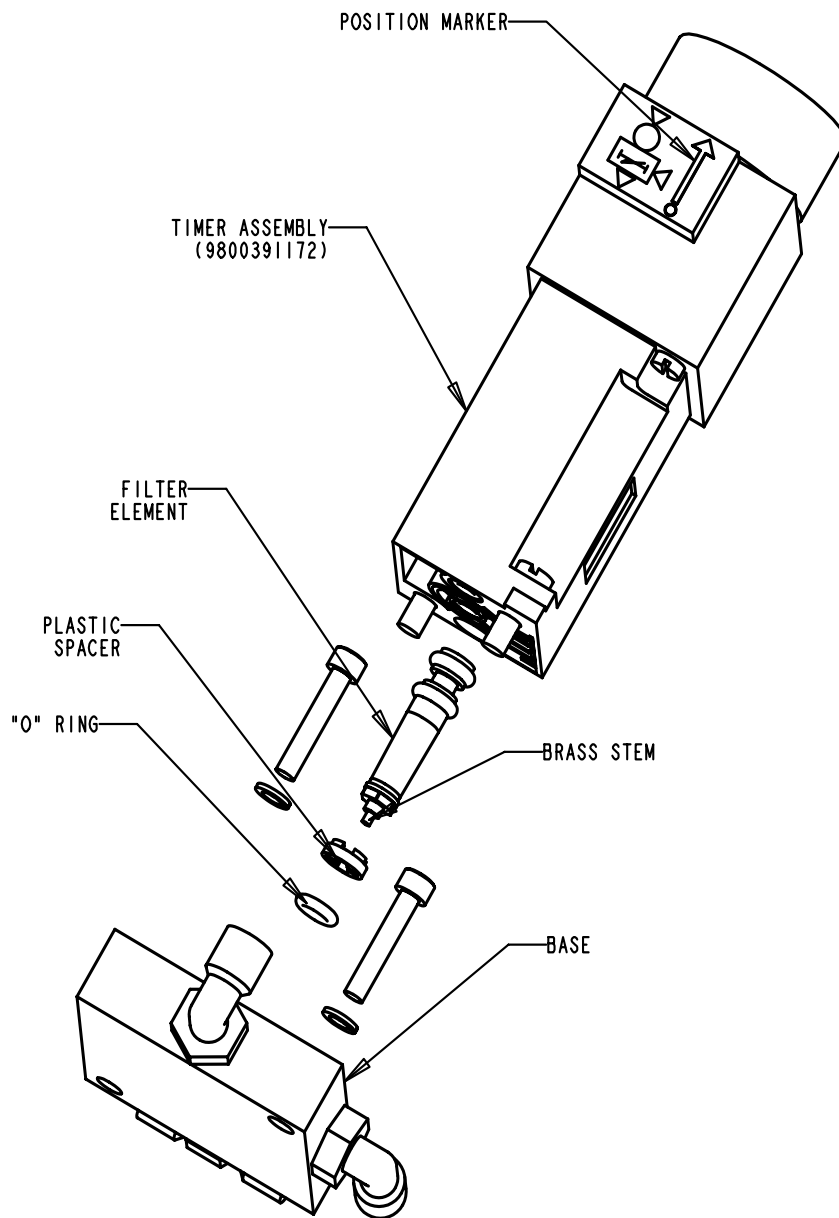


FIGURE 7.1
TIMER DISASSEMBLY

**TROUBLE
SHOOTING
GUIDE**

TROUBLE SHOOTING GUIDE		
PROBLEM	CAUSE	CORRECTIVE ACTION
Punch will not descend.	Footswitch not operating.	Remove footswitch air connection from press. If press cycles, replace footswitch.
	Footswitch hose kinked.	Unkink footswitch hose.
Ram will not retract.	No air supplied to press.	Verify Air Supply Connection.
	Set-Up/Cycle switch in "Set-Up" position.	Place switch in "Cycle" position.
	Clogged Timer Filter.	Clean all air filters. Replace Timer if necessary.
	Exhaust Muffler clogged on Pilot Valve Assembly.	Replace Exhaust Muffler.
	Timer adjustment required.	Remove control box cover. Set Timer dial to "A" setting. Cycle press and readjust if necessary. Turn dial clockwise to increase Ram extension time, and turn dial counter-clockwise to decrease Ram extension time.
	Footswitch not properly connected.	Connect footswitch.
	Valve at footswitch is not returning	Remove footswitch cover and make sure footswitch lever properly actuates the valve.
Fastener will not install.	Ram Bushing improperly adjusted.	Adjust Ram Bushing per Tooling Set-Up and Operation section.

TROUBLE SHOOTING GUIDE		
PROBLEM	CAUSE	CORRECTIVE ACTION
Fastener will not install. (continued)	Incorrect fastener installation hole size in workpiece, or hole contamination, paint, etc.	Measure hole size and compare with PEM [®] fastener catalog specification.
	Workpiece material too hard.	Check hardness of workpiece and compare with PEM [®] fastener catalog specifications.
	Punch and anvil lengths incorrect.	Combined length of punch and anvil must total 7" / 178 mm.
	Timer adjustment required.	Remove control box cover. Set Timer dial to "A" setting. Cycle press and readjust if necessary. Turn dial clockwise to allow enough time for pressure to reach its set point.
	Timer not operating.	Remove Timer and clean Timer filter. Replace Timer if necessary.
Punch descends too slowly.	Ram Module Assembly dirty.	Clean and lubricate Ram Module Assembly as described in Maintenance section.
	Footswitch not operating.	Remove footswitch cover and make sure footswitch lever properly actuates the valve.

TROUBLE SHOOTING GUIDE		
PROBLEM	CAUSE	CORRECTIVE ACTION
Tooling leaves marks on workpiece.	Excessive Ram force.	Reduce Ram force. Refer to Tooling Set-Up and Operation section.
	Sharp edge on punch or anvil.	Break edge of punch or anvil .015" X 45°/.38 mm X 45° maximum.

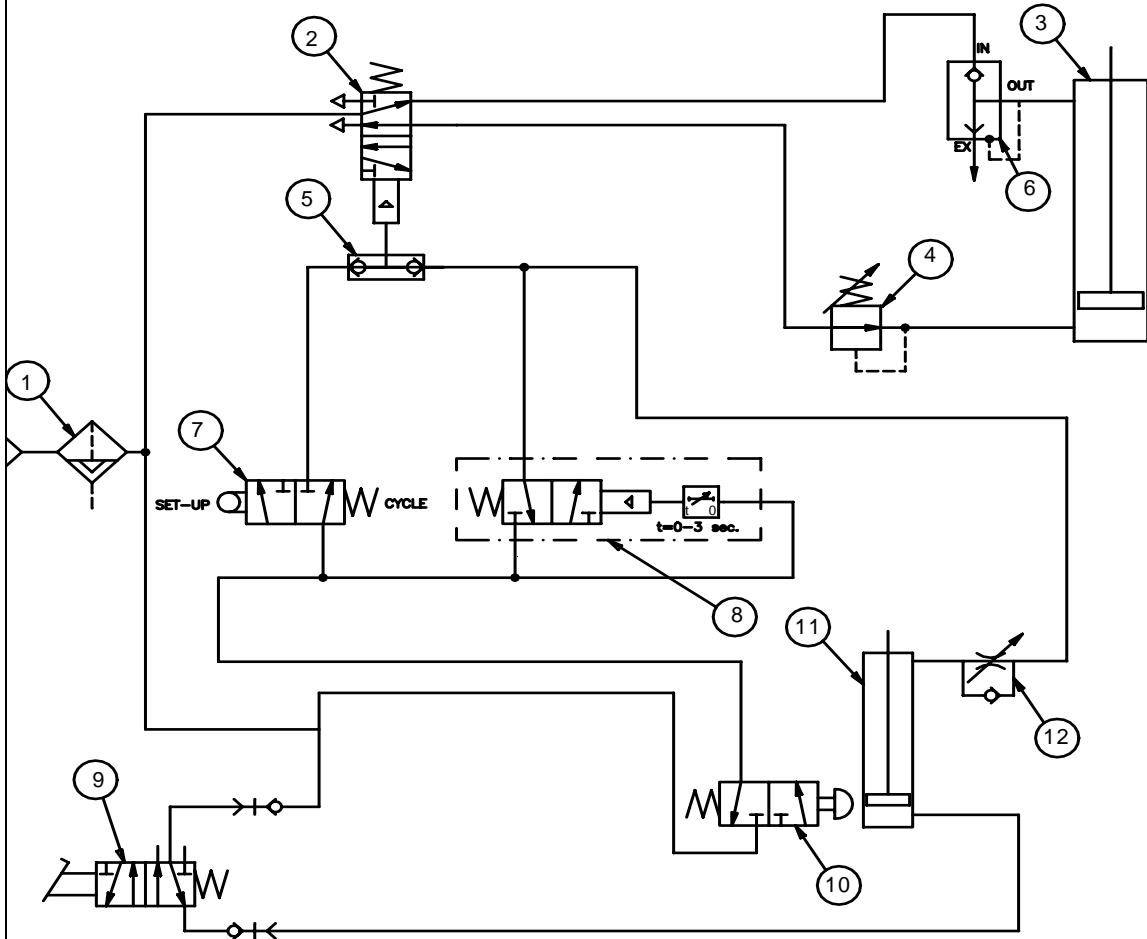
**RECOMMENDED
SPARE PARTS**

**RECOMMENDED SPARE PARTS
FOR PEMSERTER® SERIES LT4™ PRESS**

PART NUMBER	DESCRIPTION	QUANTITY
980039006	ACTIVATOR BALL MINIATURE	1
980039005	VALVE N/C POPPET	1
9800393037	VALVE 3/8NPT AIR PILOTED	1
8012107	VALVE SHUTTLE	1
8012135	SPRING DIE G13 X 65L	1
980039302	CYL,9/16BOR,3"ST,DBL.ACT,SPRG	1

PNEUMATIC DIAGRAM

PNEUMATIC DIAGRAM SERIES LT/4 PRESS



ITEM	PART NO.	DESCRIPTION	QTY
1	8012100	FILTER 3/8"-A/3/8"	1
2	9800393037	VALVE 3/8NPT AIR PILOTED- 4J	1
3	8012089	CYLINDER 100MM BORE X 95ST STR	1
4	9800393045	1-TURN REGULATOR 3/8NPT-4J	1
5	8012107	VALVE SHUTTLE SER4	1
6	8013655	QUICK EXHAUST VALVE	1
7	980039016	VALVE TOGGLE AIR	1
8	9800391172	RELAY TIME DELAY	1
9	8012139	FOOTSWITCH LT4	1
10	980039005	VALVE N/C POPPET	1
11	9800393032	CYL,9/16BOR,3"ST,DBL.ACT,SPRG	1
12	8012216	STRAIGHT THD 10MM DIA X 032TUB	1