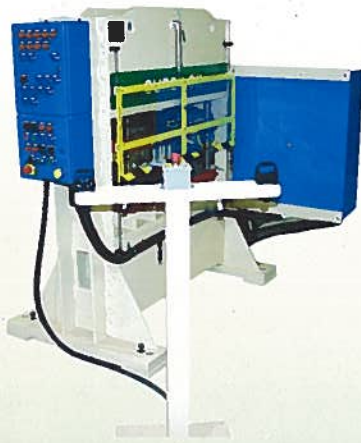


Operating & Maintenance Manual



Foot P — 200446
\$ 250.00

RR21, 566 Fishermills Rd., Cambridge, Ontario. N3C 2V3
Specialist in Stamping Operations

Phone: 519-651-3371 Fax: 519-651-0791
Specialist in Safety Systems

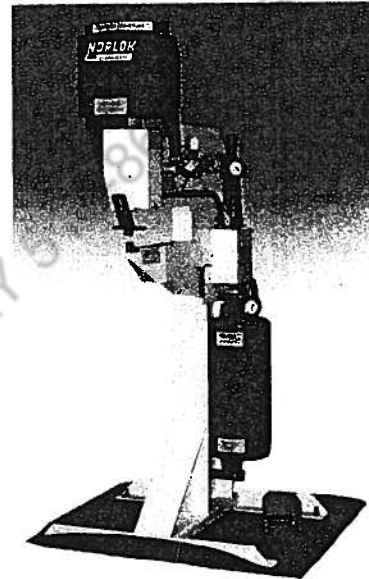
Certificate of Conformity

to the CSA Z432-04 dated January 20, 2005

Issued to: Norlok Technology Inc
26 Adams Blvd.,
Brantford, Ontario
N3S 7V2

Product: Surelok II

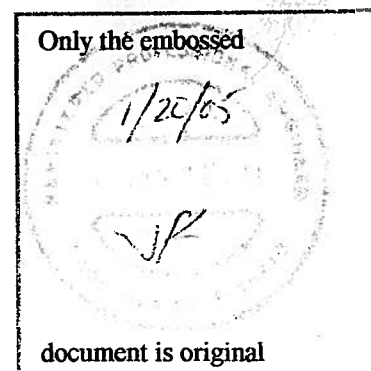
The above unit was tested for compliance with CSA Z432-04 "Safeguarding of Machinery". If the machine is operated with all its guards installed and within the limits of the machine rating then it conforms to the requirements of the CSA standard. Details of the inspection are recorded in the technical file kept at Industrial Automation Inc.



Industrial Automation Inc., its agents, or employees cannot be held responsible for any and all liability arising from oversights, omissions, or misinterpretations of the code. The information presented herein is based on observations made while inspecting the equipment and is our interpretation of the CSA Codes. It is the responsibility the manufacturer of this equipment to ensure that future production of the equipment conforms to the information recorded in the technical file.

Cambridge, Ontario.


Jim Van Kessel P.Eng



Surelok II Operating & Maintenance Manual:

Operation:

Safety Precautions		2
Operator Safety Notice		3
Surelok II Details	-Press layout	4
	-Specifications	5
	-Frame & Tooling detail	6
Setup & Initial Operation		7
Operation Basics	-“WAMP” power unit	8
	-Clinchlok Basics	9
	-Punch Adjustment	10
	-Materials	10
	-Die selection	11
Clinchlok Joints	-Typical Strengths	12
	-Joint Failure	13
	-View of Clinchlok Joints	14
	-Testing Joint Strength	15
Punch Adjustment	-“E” Series tooling	16
	-“P” Series tooling	18
	-Modular tooling	20
Replacing Die		22
Die insert Assembly		23
Replacing Punch	-“E” series tooling	24
	-“P” series tooling	26
	-Modular tooling	28

Maintenance:

Maintenance schedule		31
Safety stroke – testing and adjustments		31
Pressure, regulator and upper tooling adjustment		33
Open height adjustment		34
Auto return adjustment		35
Laser adjustments		36
High Speed Control		37
WAMP Unit	-Diagnosing air leak	39
	-Replacing chamber assemblies	39
	-Replacing clamp bands & diaphragms	40
Spare Parts List	-Tooling	44
	-WAMP, misc.	45

Troubleshooting:

Press Problems	46
Joint Problems	47
Warranty Information	48
Appendices	

WARNING

This equipment is designed to be operated with all covers secured in place. Operation without these safeguards may result in conditions that are hazardous to the operator and observers.

Disconnect air and drain all air from the system when:

- Doing any kind of maintenance to the machine
- During any set-up changes
- Moving the machine
- When leaving machine unattended

SAFETY GUIDELINES

Before operating the machine, study and follow all safety guidelines in this manual, these precautions are intended to prevent injury to you and your fellow workers. Please use EXTREME CAUTION before performing any procedure or operation.

SAFETY PRECAUTIONS BEFORE OPERATING THE MACHINE

Protect yourself. Keep your work area clear of all scrap, oil spills, rags, tools, and other obstructions, which could cause you to slip, trip or fall.

- Wear safety glasses at all times.
- Be familiar with procedures of disconnecting and draining air from system.
- Make sure hydraulic and pneumatic pressures are at specified levels before operating this equipment.
- Be sure all guards and covers are in place.
- KEEP FINGERS AND HANDS AWAY FROM THE PINCH POINT AREAS. (Between the punch stem and die, i.e., upper and lower tooling)
- Keep this equipment properly maintained.
- Check for worn or broken parts, do not attempt to operate machine with broken parts present or if it is making unusual noises.
- Be aware of the location of the air shutoff/exhaust valve and electrical disconnects (if installed) or the emergency stop button in the case of an electrically operated machine.
- Keep this manual near the machine for the operator's reference when necessary.
- Always wear eye protection when operating or maintaining machinery.

OPERATOR SAFETY NOTICE:

The Surelok II is designed as a safe and reliable machine.

However, as with any punching machine, the critical danger area is the pinch point between the punch and die.

Keep fingers and limbs away from this critical pinch point.

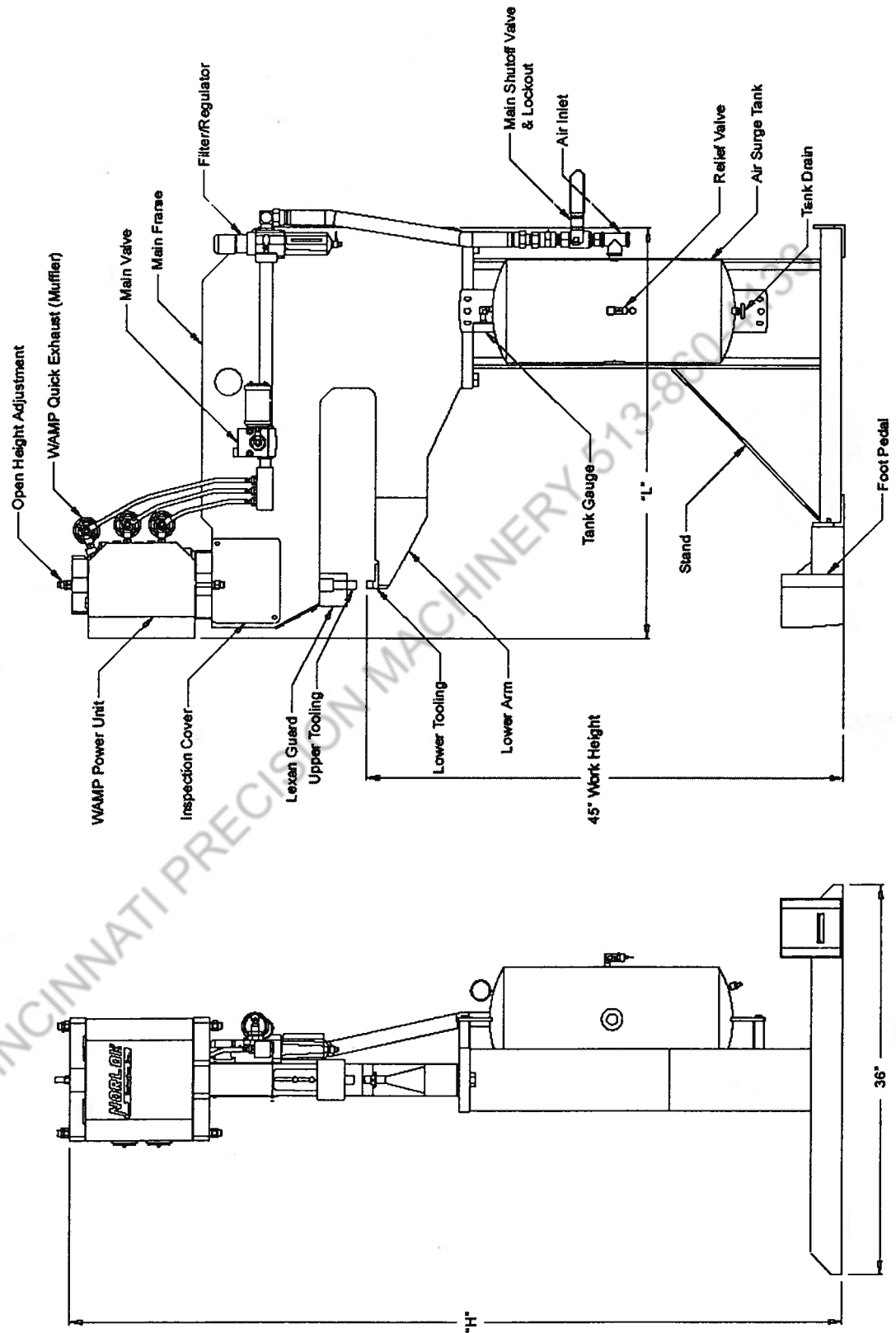
Never operate this machine without all covers and guards in place.

The national safety council reminds us that many accidents are caused by failure to follow fundamental safety rules.

This is the reason that a careful operator is the best guarantee of an accident free work place.

- 1) Disconnect and drain air before making any adjustments or servicing any Surelok components.
- 2) Always be alert whenever operating any machinery.
- 3) Only one person should control the machine(s). Never allow anyone to operate the controls while you are working on this equipment. In addition to disconnecting power, always use lockouts and warning signs to indicate that you are working on the machine(s).
- 4) Keep your hands and arms away from internal workings of the machinery when starting, running or stopping.
- 5) Never override or disable any safety switch or safety interlock.
- 6) Use extreme caution if maintenance or adjustments have to be performed with power on and the machine in operation.
- 7) Always wear eye protection when operating or maintaining machinery.

Surelok II Press Layout



SPECIFICATIONS – SURELOK II

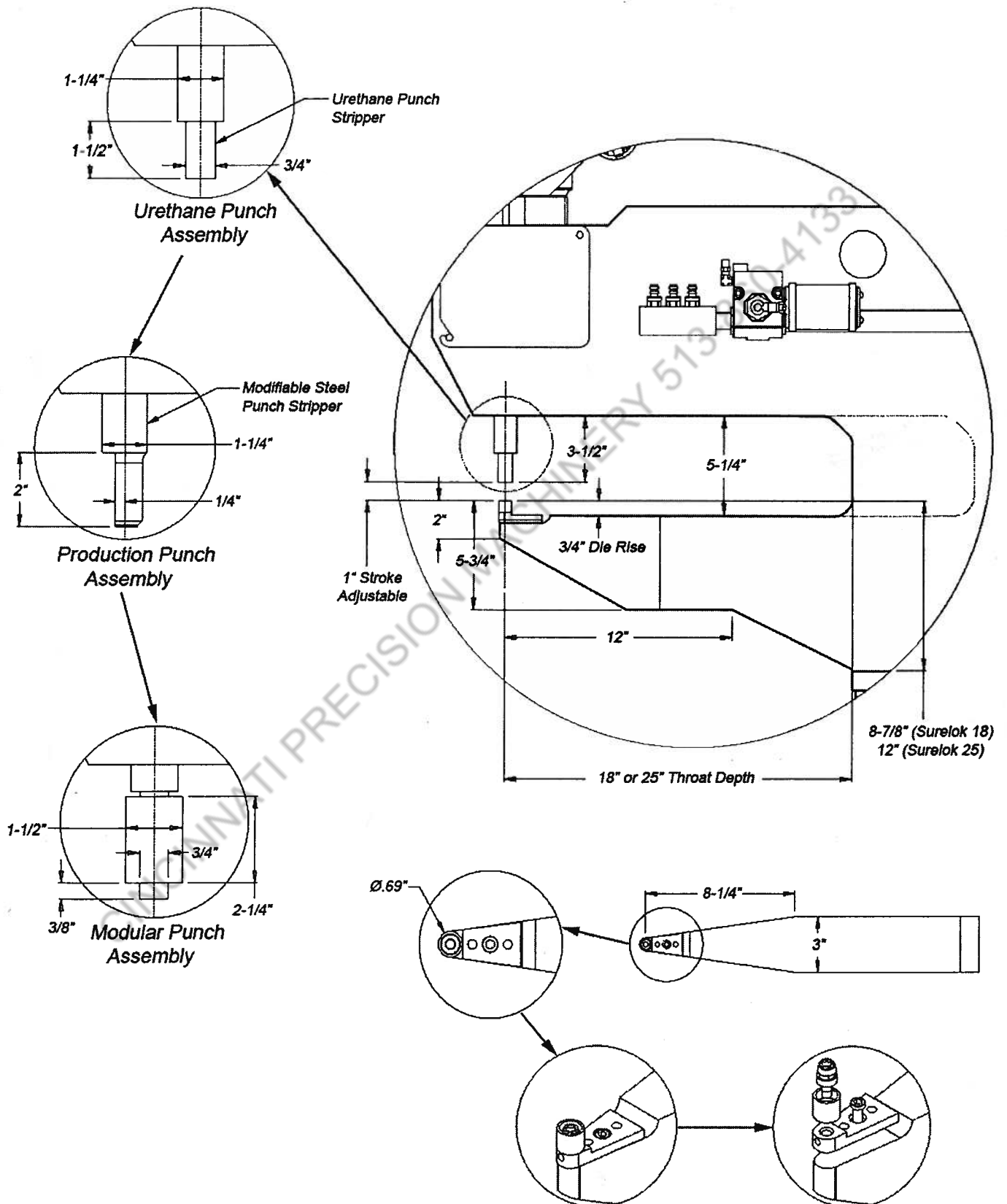
Press Design:	Solid 3" steel "C" frame.
Features:	WAMP pneumatic power unit. Air surge tank and regulator Foot pedal operated
Stroke:	1" max. (Adjustable)
Throat:	18" or 25"
Work Height:	45"
Upper Tooling:	Quick change punch Adjustable for material thickness 3 types available (see feature chart)
Lower Tooling:	Die insert in a 2-piece hardened die plate.
Capacity:	MAX: Two ply 0.075" mild steel. MIN: Two ply 0.010" mild steel.
Cycle speed:	60-80 cycles/minute (standard) Up to 160 cycles/minute with options
Air Requirements:	80psi to 125psi 125psi (recommended) Approx. 0.6 cu ft free air per cycle. (5 HP @ 60 clinches per minute)

	SL18	SL 25
Width	36"	36"
Length	39"	51"
Height	73"	73"
Weight (lbs)	870	1290

Pipe diameter	Die reach into Pipe
3" Ø	1 3/8"
4" Ø	3 1/4"
5" Ø	5"
6" Ø	12 1/4"
7" Ø	13 5/8"
8" Ø	15 7/8"
9" Ø	18 1/8"
10" Ø	20 1/2" *
11" Ø	22 3/4" *
12" Ø	25" *

*SL25 Model Only

Surelok II Frame & Tooling Detail



Uncrating:

- 1) Remove the machine from the shipping crate. It may be picked up with a chain hoist from either the 2" diameter hole in the top of the frames or by attaching a 3/4" NC eye bolt to the top of the "C" frame. **DO NOT LIFT BY THE STAND!**
- 2) Locate the following items that may have been packed separately;
 - a) Manual.
 - b) Laser locator (if supplied).
 - c) Spare punches and dies (if ordered).
 - d) Foot Pedal
- 3) Check the condition of the press and record the serial number for reference.

SERIAL # ____ - ____

Leveling and bolting down machine:

- 1) Locate the machine at its operating position.
- 2) Level the machine by shimming the legs of the stand.
- 3) Secure the stand to the floor with the four bolt down holes located on the ends of the legs.
- 4) **INSTALL ALL GUARDS AND SAFETY DEVICES IF THEY HAVE BEEN REMOVED.**

Installing air supply:

- 1) Make sure that the foot pedal is not activated.
- 2) Make sure that the main air supply valve is turned OFF.
- 3) Make sure that the tank drain valve is CLOSED.
- 4) Supply the air tank inlet with 125 psi (max) - 80 psi (min) of clean dry air. Use a filter / regulator on the inlet line if necessary. We recommend a minimum of 1/2" diameter air line.

Initial testing:

- 1) Ensure that all guards are in place.
- 2) Slowly open the main air supply valve and check the pressure at the regulator on the air tank.
For **Medium Duty Tooling**, the air tank regulator should be set at 100 psi.
If the gauge does not read the correct pressure, adjust and lock the regulator.
NOTE! The tank pressure must be higher than the required regulator pressure in order to set the regulator pressure.
- 3) **WARNING! THIS ACTION ACTIVATES THE HIGH PRESSURE CLINCHING STROKE.**
Operate the foot pedal and hold down. On "P" and "U" series machines, the tooling will retract automatically. On "E" series machines, the operator must remove his foot from the pedal
- 4) The clinching stroke is factory set for a 1 second automatic return. If the foot pedal is released before the automatic return the clinching stroke will end as a safety feature.
If the automatic return is too fast or too slow the automatic return valve must be adjusted - see maintenance section.
- 5) The foot pedal must be released and re-activated to repeat the clinching stroke.

Operation Basics:

"WAMP" Unit:

- 1) The press is powered by a multi stacked air diaphragm unit known as a "WAMP" unit.
- 2) This power unit is very reliable and can be serviced by the user if required. If necessary it may be removed from the press and serviced or exchanged by the factory.
- 3) The clinching stroke is operated by a guarded foot pedal.
 - For "P" series machines, the pneumatic system features a single shot automatic return. The machine operates through a single clinching stroke each time the foot pedal is activated and held down. The automatic return is set to about 1 second on "P" series machines. If set too fast a good joint may not be formed. If set too slow, production will be reduced. The clinching stroke will be terminated before the automatic return cycle is complete if the foot pedal is released before the auto return cycle is complete on "P" series machines.
 - For "U" series machines, the pneumatic system will operate faster, and operates on a pressure feedback principle. A single touch of the foot pedal will initiate a complete clinch cycle. The stop button can be used to return the tooling.
 - For "E" series machines, the pneumatic system returns when the operator removes his foot from the foot pedal.

The open height (the gap between the upper punch and lower die) may be reduced by adjusting a screw in the center of the top of the WAMP unit, as described in a later section of the manual. This adjustment is used to eliminate any "pinch point" between the punch and die and does not effect any other press adjustments or alter the quality of the Clinchlok joint.

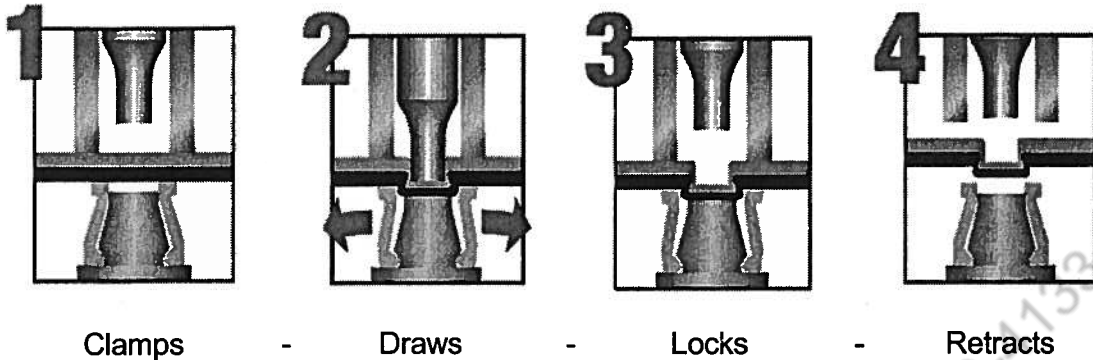
Tooling:

- 1) The clinching punch and stripper are located in the upper tooling and operate through the stroke of the machine (Usually 1" or 1/2"). The punch may be easily adjusted (see pages 22-28)
- 2) The clinching die is located in the lower arm of the machine. Different dies may be selected, and easily installed to suit different material thicknesses. See illustration page 13.
- 3) Both the punch and die are of a very special design and should not be sharpened.
- 4) Under normal operation both punch and die should last for approximately 200,000 to 300,000 cycles.

Air Tank:

- 1) The air reservoir tank is located on the side of the machine.
- 2) The air surge tank features a 3/4" filter/regulator, which is set to 100 psi. for the Medium Duty tooling and 80 psi. for the Light Duty tooling.
The filter should be drained regularly and cleaned as required.
- 3) There is a safety blowout valve mounted on the tank set at 135 psi. Do not remove this valve. If the valve blows out reduce the inlet pressure to the tank to 125 psi.
- 4) Drain moisture from the tank daily using the drain valve located at the base of the tank.

Clinchlok Principle:



What is "Clinching"?

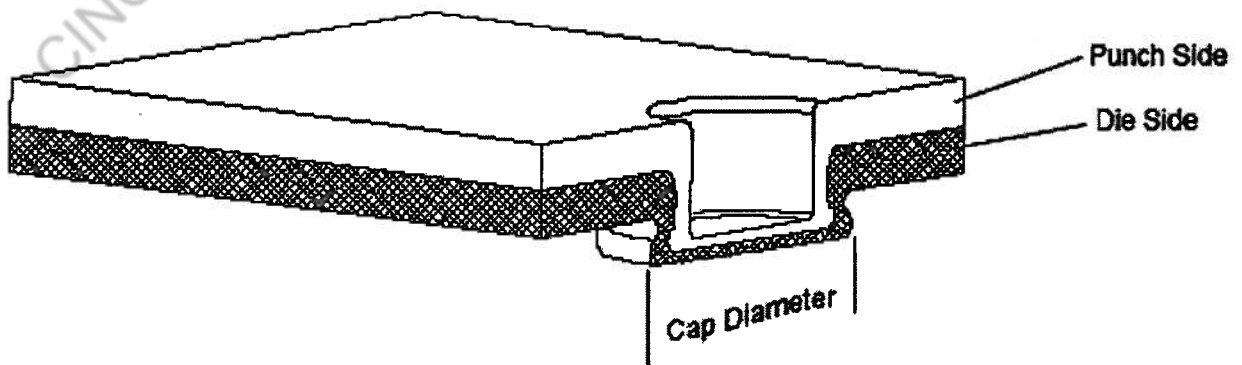
- i) Clinching is a method of fastening sheet metal together without the use of heat, rivets, fasteners or adhesives.
- ii) It is fast, clean, and reliable and does little or no damage to painted surfaces.
- iii) It is ideal for fastening galvanized, aluminum, pre-painted & coated mild steel, as well as brass, copper & stainless steel.
- iv) Clinching can fasten two-ply from 10 gauge (0.130") to 32 gauge (0.012"), with a strong, leak-proof joint.

How does it work?

- a) The clinchlok joint is formed when the punch squeezes the two-ply material between itself and a special die.
- b) As the punch squeezes the material the two layers "mushroom" out, forming a strong joint.
- c) The die features spring-loaded "blades" that allow the material to be drawn down by the punch, and then expand outwards to form the joint.

Step-by-step clinching method:

- 1. Two-ply material is laid on the die in desired location.
- 2. Punch stripper and die holder clamp material.
- 3. Punch begins to penetrate.
- 4. The material is drawn down into the die.
- 5. Material is squeezed between the punch & die anvil. This causes an outward flow of material. The die blades spread to allow extrusion to occur.
- 6. Punch and stripper retract, and material can now be easily removed from the die.



Punch Adjustment:

- 1) The amount of joint squeeze is controlled by adjusting the punch either towards the punch or away from the punch with the punch adjusting screw.
- 2) For thin material the punch will have to be lowered (moved towards the die) and for thick material the punch will have to be raised (moved away from the die).
- 3) The correct punch adjustment is the most critical adjustment on the Surelok II. Please read the punch adjustment instructions in a later section of this manual.

Materials To Be Joined:

- 1) The Surelok II is capable of joining commercial quality mild steel as follows;
 - a) Medium Duty Two-ply 0.010" to two-ply 0.075"
 - b) Light Duty Two-ply 0.010" to two-ply 0.032"

For best results both ply of material should be of the same or similar thickness. For extremely thin materials (0.010"+0.010"), a larger diameter punch (Ø0.200", 0.015" PTR) may be required for optimal strength (PN#400346).

- 2) If different thicknesses are to be joined the best results will normally be found with the thicker material on the upper (punch) side of the two ply although this is not always possible.
- 3) The thicker material should not be more than twice the thickness of the thinner material and the combined thickness of the two-ply should not exceed 0.150" for MD machines and 0.064" for LD machines.
- 4) Other materials can be joined with the Surelok II as long as they are not harder than commercial quality mild steel. In most cases both ply should be of the same hardness, but if a different hardness is used for each ply, the harder material should be on the upper (punch side) if possible.

- 5)

<u>Common materials:</u>	<u>Capacity (MD):</u>	<u>Capacity (LD):</u>
Commercial quality steel	0.075" + 0.075" max	0.032" + 0.032" max
Galvanized steel	0.075" + 0.075" max	0.032" + 0.032" max
Drawing quality steel	0.075" + 0.075" max	0.032" + 0.032" max
Aluminum	0.075" + 0.075" max	0.032" + 0.032" max
Copper	0.075" + 0.075" max	0.032" + 0.032" max
Brass	0.075" + 0.075" max	0.032" + 0.032" max
Stainless steel	Consult Factory	
High carbon steel	Consult Factory	
- 6) Other options may be available, please consult factory for details.

Die Selection:

- 1) There are three sizes of dies required to cover the complete range of material that the Surelok II can fasten.
- 2) As a general rule, the punch in the upper tooling does not need to change when different material is joined.
- 3) The die selection chart can be used to find which die will be most suitable for your application, however the chart is a guide only, different types of material may require a different size of die.
- 4) Two charts are shown below.
One is for Medium Duty machines (3/16" punch diameter, 5/8" die diameter)
One is for Light Duty Machines (1/8" punch diameter, 7/16" die diameter)

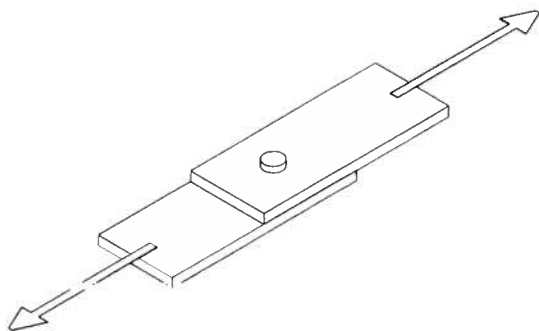
MD Die size	Material thickness (punch + die side)	LD Die size	Material thickness (punch + die side)
MD #50 (Red)	0.075" + 0.075" 0.062" + 0.062" 0.062" + 0.052" 0.062" + 0.040" 0.052" + 0.052" 0.052" + 0.040"	LD #30 (Yellow)	0.032" + 0.032" 0.032" + 0.028" 0.028" + 0.028" 0.028" + 0.022" 0.022" + 0.022"
MD #40 (Blue)	0.040" + 0.040" 0.040" + 0.034" 0.040" + 0.028" 0.034" + 0.034" 0.034" + 0.028" 0.034" + 0.022" 0.028" + 0.028" 0.028" + 0.022"	LD #25 (White)	0.022" + 0.022" 0.022" + 0.019" 0.019" + 0.019" 0.019" + 0.016" 0.016" + 0.016"
MD #30 (Yellow)	0.022" + 0.022" 0.022" + 0.018" 0.022" + 0.014" 0.018" + 0.018" 0.018" + 0.014" 0.014" + 0.014" 0.010" + 0.010"	LD #20 (Purple)	0.016" + 0.016" 0.016" + 0.013" 0.013" + 0.013" 0.013" + 0.010" 0.010" + 0.010"

100 PSI

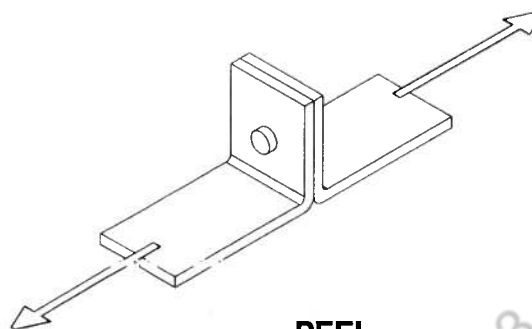
hold pedal

adjustment ps 17, 20 no clinch

Joint strength:



PULL



PEEL

- 1) There are two ways to measure the strength of a Clinchlok joint, pull and peel (see diagram).
- 2) Pull is almost always stronger than peel and is less sensitive to die adjustment.
- 3) Typical joint strengths for properly adjusted tooling are given for commercial quality mild steel.
- 4) These should be used as a guide only; different material will affect the joint strength.
If the material is softer than mild steel these strengths will be reduced according to the strength of the material.

MEDIUM DUTY

Material thickness
Each / two ply

	PULL	Joint strength PEEL	Recommended Die
0.075"	550 lb.	190 lb.	MD #50
0.060"	475 lb.	175 lb.	MD #50
0.050"	430 lb.	150 lb.	MD #50
0.040"	400 lb.	120 lb.	MD #40
0.030"	375 lb.	100 lb.	MD #40
0.020"	285 lb.	70 lb.	MD #30

LIGHT DUTY

Material thickness
Each / two ply

	PULL	Joint strength PEEL	Recommended Die
0.030"	200 lb.	35 lb.	LD #30
0.025"	185 lb.	28 lb.	LD #30
0.020"	175 lb.	24 lb.	LD #25
0.015"	150 lb.	18 lb.	LD #20
0.010"	120 lb.	15 lb.	LD #20

Joint failure:

- 1) If pulled hard enough any clinchlok joint will pull apart.
- 2) There are normally two ways for a clinchlok to pull apart:
 - a) **NON TEARING FAILURE**
The two halves of the joint will pull apart leaving a male joint half (punch side) and a female joint half (die side).
 - b) **TEARING FAILURE**
The joint will tear out of the punch side layer leaving a hole in it. The joint will remain in the die side layer.
- 3) A correctly formed joint will usually fail by tearing (b) in the pull test. The joint strength usually increases as the punch is adjusted towards the die. However it is easy to over adjust the punch and overload the punch and die reducing their life.
- 4) In the peel test, an under adjusted joint (punch too far away from the die) will pull apart as a non tearing fail (A) and an over adjusted button (punch too close to the die) will pull apart as a tearing fail (B).
- 5) The correct adjustment is when the joint fails in peel sometimes as non-tearing and sometimes as tearing. This will give the greatest peel strength.
- 6) If the peel strength of a correctly adjusted joint is less that shown in the joint strength chart, and the **joint tends to fail by tearing apart**, the incorrect die (too deep) may have been selected;
MD: Change #50 die to #40 die. Change #40 die to #30 die.
LD: Change #30 die to #25 die. Change #25 die to #20 die.

If this does not improve the peel strength of the joint, - either, the punch tip radius is too sharp, or the material is not suitable for clinching (probably too hard). Consult factory.
- 7) If the peel strength of a correctly adjusted joint is much less that shown in the chart above, and the **joint tends to fail as a non tearing failure**, the incorrect die (too shallow) may have been selected;
MD: Change #30 die to #40 die. Change #40 die to #50 die.
LD: Change #20 die to #25 die. Change #25 die to #30 die.
- 8) If this does not improve the peel strength of the joint then - either the punch tip radius is too large, or the material is not suitable for clinching (probably too soft). Consult factory.

Views of the Clinchlok Joints:

1

**Tooling
under
adjusted**



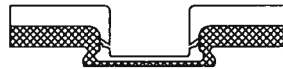
2

**Tooling
adjusted
correctly**



3

**Tooling
over
adjusted**

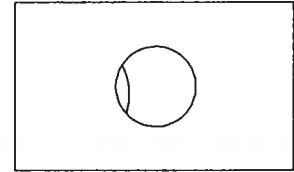
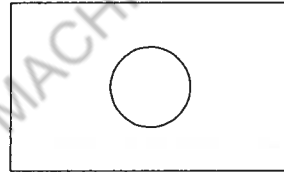
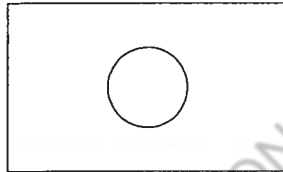
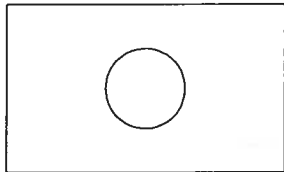


4

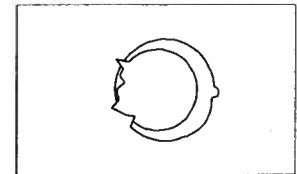
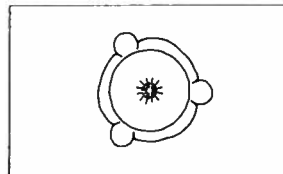
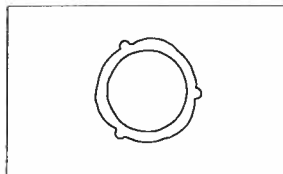
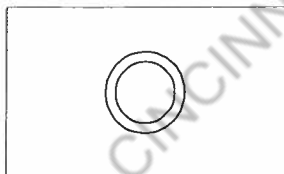
**Tooling
chipped
or broken**



Cross section of joint



Top view of joint (punch side)

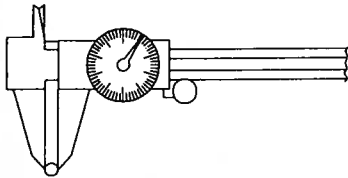


Bottom view of joint (die side)

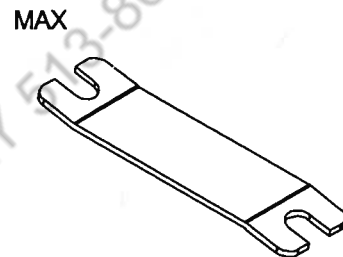
Testing Joint Strength:

- 1) The best method of testing joint strength is to pull the joint apart in both pull and peel and measure the force required with a pull tester.
- 2) In production however an indication of the joint strength can be found by measuring the diameter of the button cap (the "mushroom") on the die side of the joint.
- 3) If a joint is tested in pull and peel with a pull tester and the upper and lower limits of joint strength are found, the cap diameters for these two limits can be measured. Calipers or a GO - NOGO gauge can then be used in production to see if the cap diameter is within the measured limits.

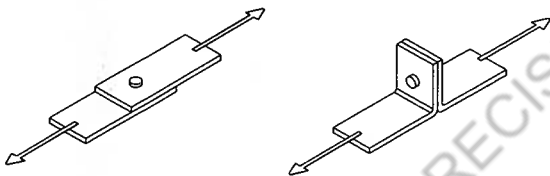
NOTE! a) If the material changes or the die # is changed the cap diameters will change.
b) When using the button cap diameter shear and peel tests should also be used occasionally to confirm strengths.



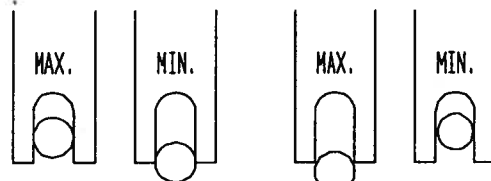
Checking Button Cap Dia.
With a Caliper



Tolerance gauge



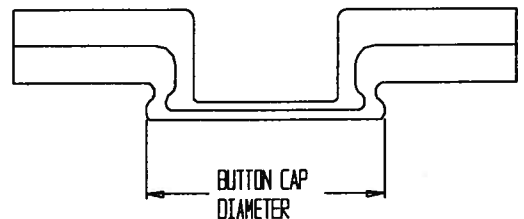
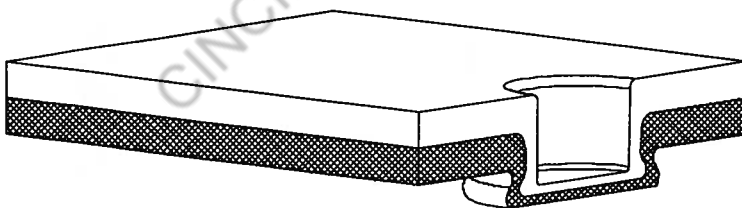
Pull and peel testing.



Good Joint

Not Acceptable

Testing button cap diameter.

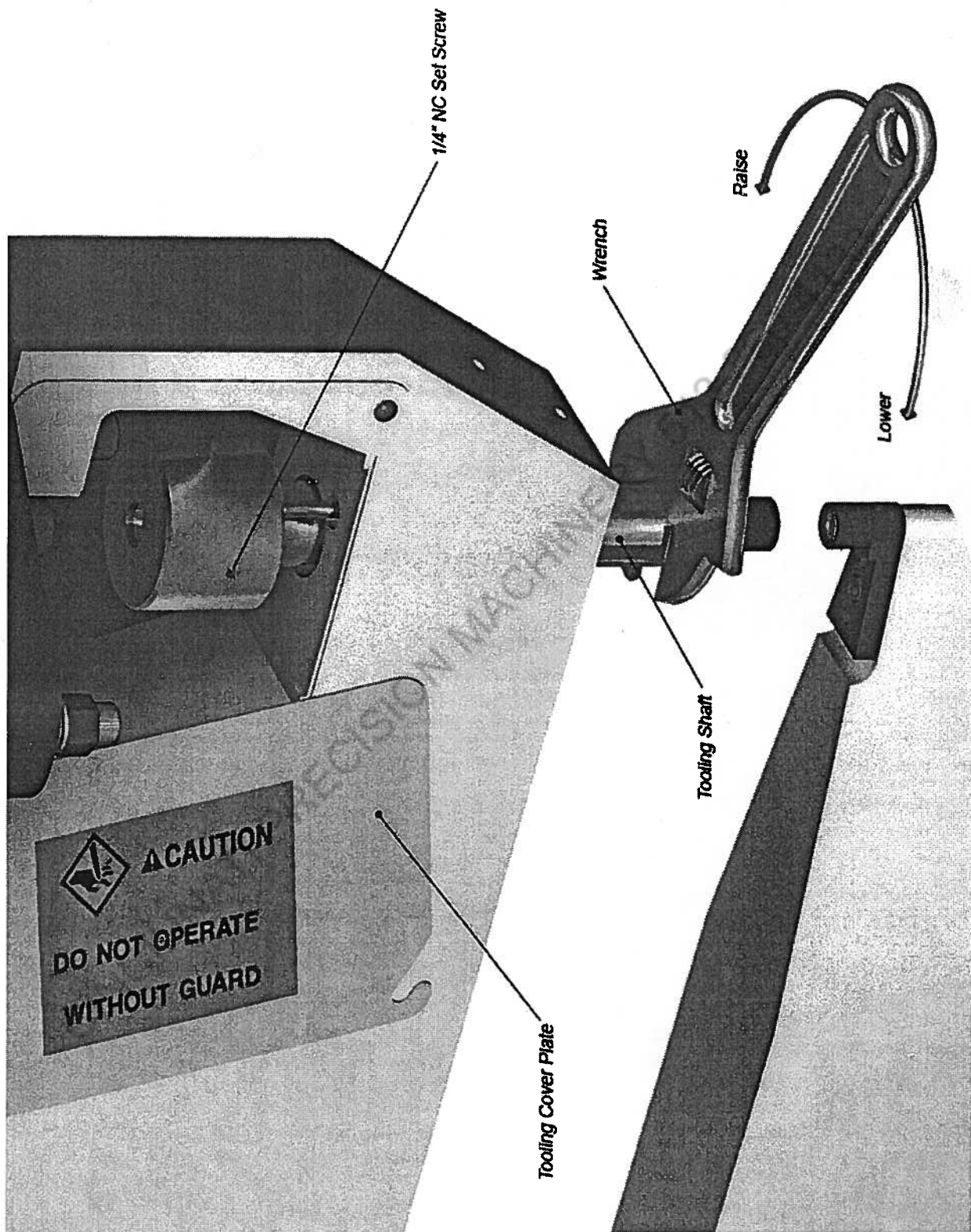


"E" Series Punch Adjustment Procedure: (See illustration on page 17)

- The punch must be adjusted to produce the correct amount of "squeeze" between the punch and die when the joint is made.
- As described earlier, the correct punch adjustment is very important for producing a good joint and to maximize punch and die life.
- The aim of punch adjustment is to produce minimum "squeeze" that will produce a good joint.
- The basic procedure is to set the punch too high (not enough "squeeze") to produce a good joint and then to slowly lower the punch by 1/6th of a turn (or less) to produce a good joint.

BEFORE MAKING ANY ADJUSTMENTS OR REMOVING ANY COVERS OR GUARDS, TURN OFF THE AIR SHUT-OFF VALVE SO THAT THE PRESS WILL NOT OPERATE.

- 1) Make sure that the correct punch & die have been selected for the material to be fastened.
 - 2) If equipped with an automatic return, make sure it is set correctly. The punch cannot be set correctly if the automatic return is set too fast. If in doubt slow the return to a 3-second delay when setting the die adjustment. (See maintenance section for adjustment)
 - 3) Make sure that the pressure on the inlet filter is set correctly.
 - 4) Loosen (do not remove) tooling cover plate securing screw, and rotate the cover plate to the left. For safety reasons, the cover plate must not be removed from the barrel. Loosen the punch adjuster set screw.
 - 5) Using a wrench, rotate the punch shaft counter-clockwise, raising the punch until it is too high to produce a strong joint (not enough squeeze). There is a limit as to how far the punch adjustment can be turned up. If the punch cannot be raised up far enough to make a weak joint then a tooling shim will be required.
 - 6) **OBSERVE ALL SAFETY PRECAUTIONS, AND MAKE SURE ALL GUARDS AND COVER PLATES ARE IN PLACE. TURN ON AIR SHUT-OFF VALVE.**
 - 7) Make a sample clinch joint using the correct material.
 - 8) The joint should be too weak because the punch will be too high (not enough "squeeze").
 - 9) Turn the punch shaft clockwise 1/8 turn, lowering the punch.
 - 10) Make a joint and check the joint strength.
 - 11) If the joint is still weak lower the punch by 1/8 turn and repeat the procedure.
 - 12) Once a good joint has been made the punch should be raised by 1/16th of a turn, and the joint strength checked.
 - If the joint produced at this new setting is weaker than the original reset the punch downward by 1/16th turn.
 - If the joint produced at this new setting is as strong as the original, raise the punch by another 1/16th turn and repeat the process.
 - 13) Tighten the locking setscrew and replace the barrel cover.
 - 14) Readjust automatic return (if altered).
- REMEMBER - SET THE PUNCH TO THE HIGHEST SETTING THAT WILL PRODUCE A GOOD JOINT.**



"E" Series Tooling Adjustment

"P" Series Punch Adjustment Procedure: (See illustration on page 19)

- The punch must be adjusted to produce the correct amount of "squeeze" between the punch and die when the joint is made.
- As described earlier, the correct punch adjustment is very important for producing a good joint and to maximize punch and die life.
- The aim of punch adjustment is to produce minimum "squeeze" that will produce a good joint.
- The basic procedure is to set the punch too high (not enough "squeeze") to produce a good joint and then to slowly lower the punch by 1/6th of a turn (or less) to produce a good joint. Note that this adjustment moves the position of the punch within the upper tooling, not the height of the upper tooling.

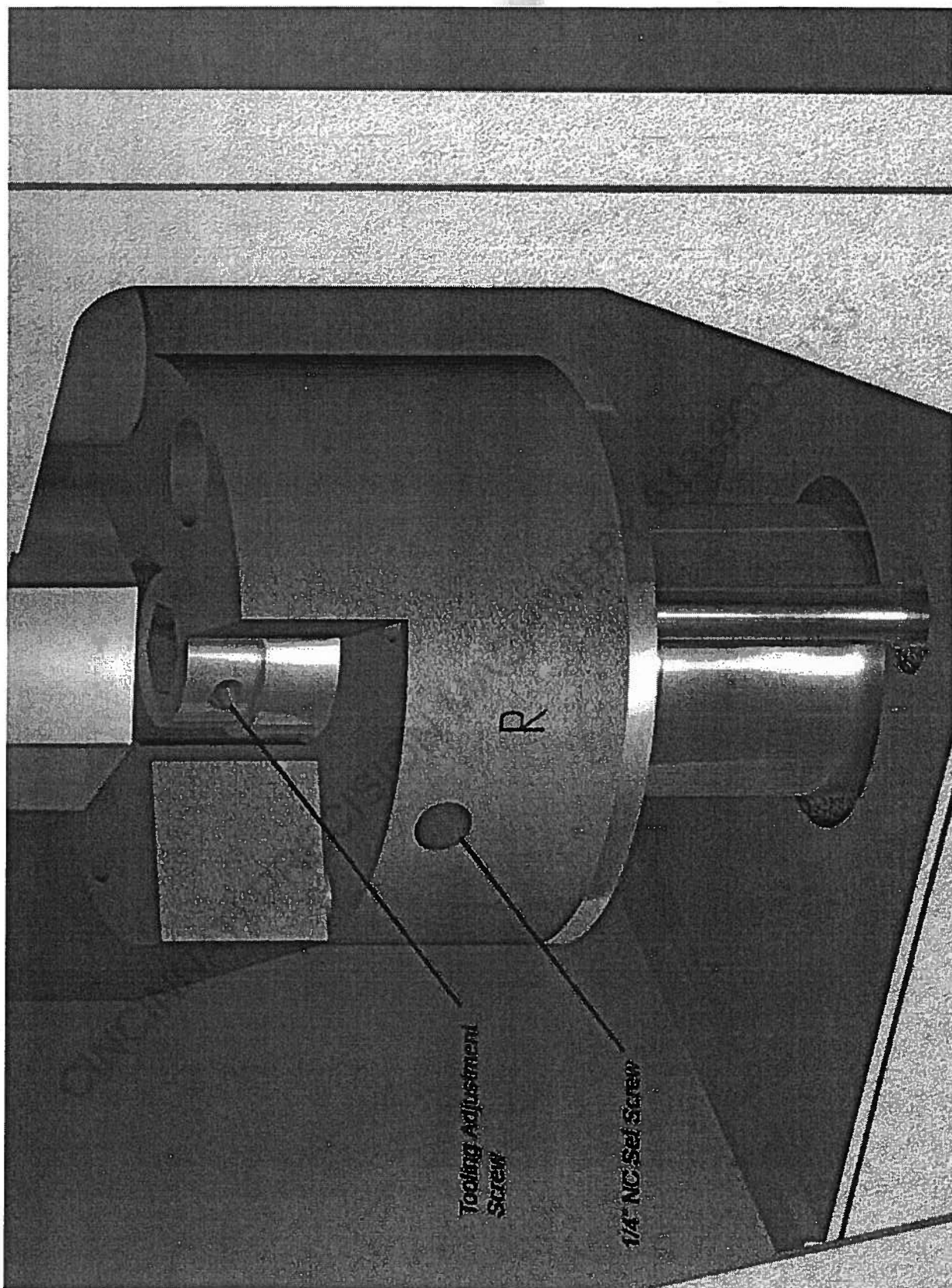
BEFORE MAKING ANY ADJUSTMENTS OR REMOVING ANY COVERS OR GUARDS, TURN OFF THE AIR SHUT-OFF VALVE SO THAT THE PRESS WILL NOT OPERATE.

- 1) Make sure that the correct punch & die have been selected for the material to be fastened.
- 2) If equipped with an automatic return, make sure it is set correctly. The punch cannot be set correctly if the automatic return is set too fast. If in doubt slow the return to a 3-second delay when setting the die adjustment. (See maintenance section for adjustment)
- 3) Make sure that the pressure on the inlet filter is set correctly.
- 4) Loosen (do not remove) tooling cover plate securing screw, and rotate the cover plate to the left. For safety reasons, the cover plate must not be removed from the barrel. Loosen the punch adjuster set screw.
- 5) Using a hex wrench, turn the tooling adjustment screw towards the right (R). This raises the punch. Raise the punch until it is too high to produce a strong joint (not enough squeeze). There is a limit as to how far the punch adjustment can be turned up.

OBSERVE ALL SAFETY PRECAUTIONS, AND MAKE SURE ALL GUARDS AND COVER PLATES ARE IN PLACE.

- 6) Make a sample clinch joint using the correct material.
- 7) The joint should be too weak because the punch will be too high (not enough "squeeze").
- 8) Turn the tooling adjustment screw 1/6 turn towards the left (L). This will lower the punch.
- 9) Make a joint and check the joint strength.
- 10) If the joint is still weak lower the punch by 1/6 turn and repeat the procedure.
- 11) Once a good joint has been made the punch should be raised by 1/12th of a turn, and the joint strength checked.
 - If the joint produced at this new setting is weaker than the original reset the punch downward by 1/12th turn.
 - If the joint produced at this new setting is as strong as the original, raise the punch by another 1/12th turn and repeat the process.
- 12) Tighten the locking setscrew and replace the barrel cover.
- 13) Readjust automatic return (if altered).

REMEMBER - SET THE PUNCH TO THE HIGHEST SETTING THAT WILL PRODUCE A GOOD JOINT.



"P" Series Tooling Adjustment

Modular Tooling Punch Adjustment Procedure: (See illustration on page 21)

- The punch must be adjusted to produce the correct amount of "squeeze" between the punch and die when the joint is made.
- As described earlier, the correct punch adjustment is very important for producing a good joint and to maximize punch and die life.
- The aim of punch adjustment is to produce minimum "squeeze" that will produce a good joint.
- The basic procedure is to set the punch too high (not enough "squeeze") to produce a good joint and then to slowly lower the punch by 1/6th of a turn (or less) to produce a good joint.

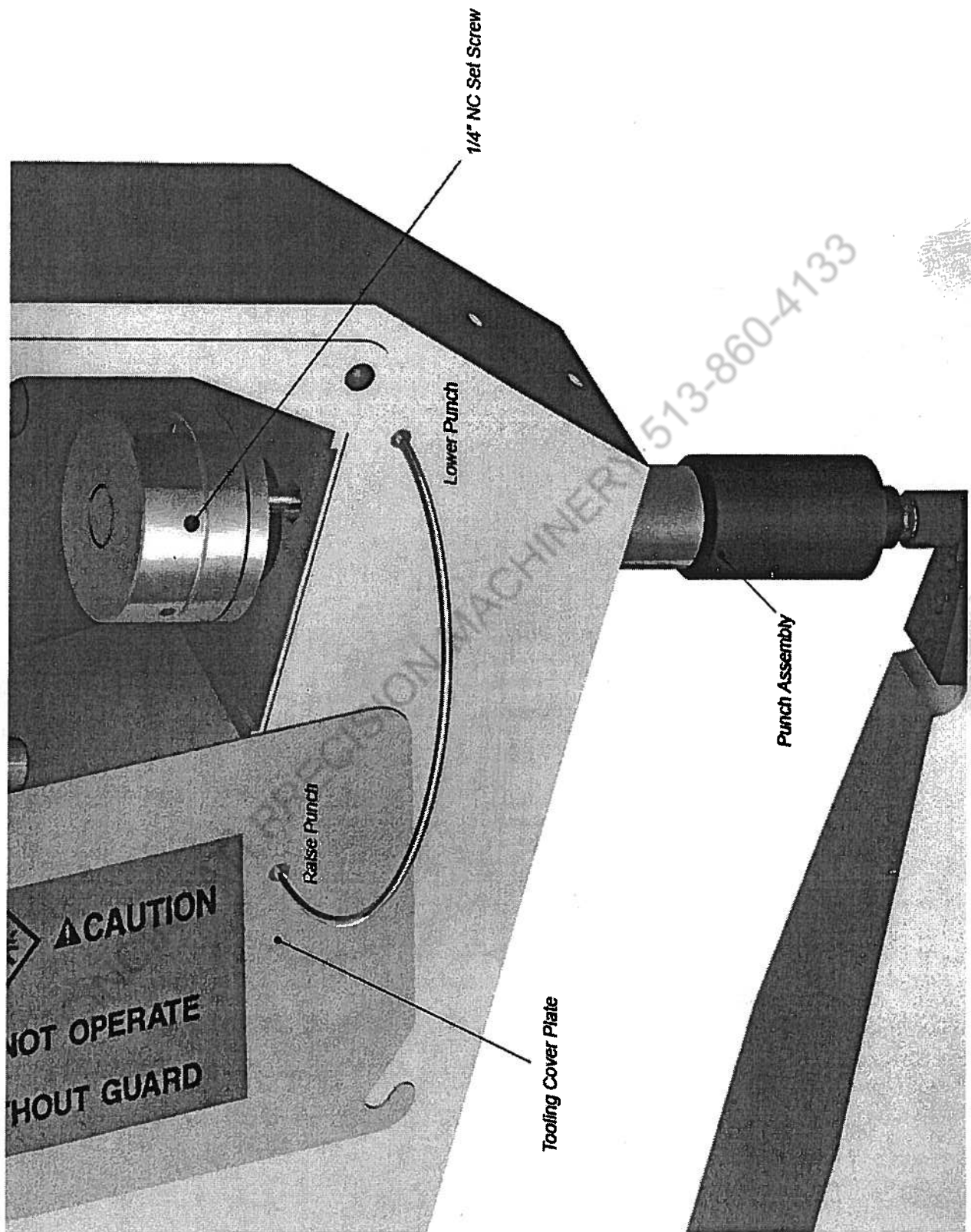
BEFORE MAKING ANY ADJUSTMENTS OR REMOVING ANY COVERS OR GUARDS, TURN OFF THE AIR SHUT-OFF VALVE SO THAT THE PRESS WILL NOT OPERATE.

- 1) Make sure that the correct punch & die have been selected for the material to be fastened.
- 2) If equipped with an automatic return, make sure it is set correctly. The punch cannot be set correctly if the automatic return is set too fast. If in doubt slow the return to a 3-second delay when setting the die adjustment. (See maintenance section for adjustment)
- 3) Make sure that the pressure on the inlet filter is set correctly.
- 4) Loosen (do not remove) tooling cover plate securing screw, and rotate the cover plate to the left. For safety reasons, the cover plate must not be removed. Loosen the punch adjuster set screw.
- 5) Using a hex wrench, rotate the punch shaft counter-clockwise, raising the punch until it is too high to produce a strong joint (not enough squeeze). There is a limit as to how far the punch adjustment can be turned up.

OBSERVE ALL SAFETY PRECAUTIONS, AND MAKE SURE ALL GUARDS AND COVER PLATES ARE IN PLACE. TURN ON AIR SHUT-OFF VALVE.

- 6) Make a sample clinch joint using the correct material.
- 7) The joint should be too weak because the punch will be too high (not enough "squeeze").
- 8) Turn the punch shaft clockwise 1/8 turn, lowering the punch.
- 9) Make a joint and check the joint strength.
- 10) If the joint is still weak lower the punch by 1/8 turn and repeat the procedure.
- 11) Once a good joint has been made the punch should be raised by 1/16th of a turn, and the joint strength checked.
 - If the joint produced at this new setting is weaker than the original reset the punch downward by 1/16th turn.
 - If the joint produced at this new setting is as strong as the original, raise the punch by another 1/16th turn and repeat the process.
- 12) Tighten the locking setscrew that is closest to you, and replace the barrel cover.
- 13) Readjust automatic return (if altered).

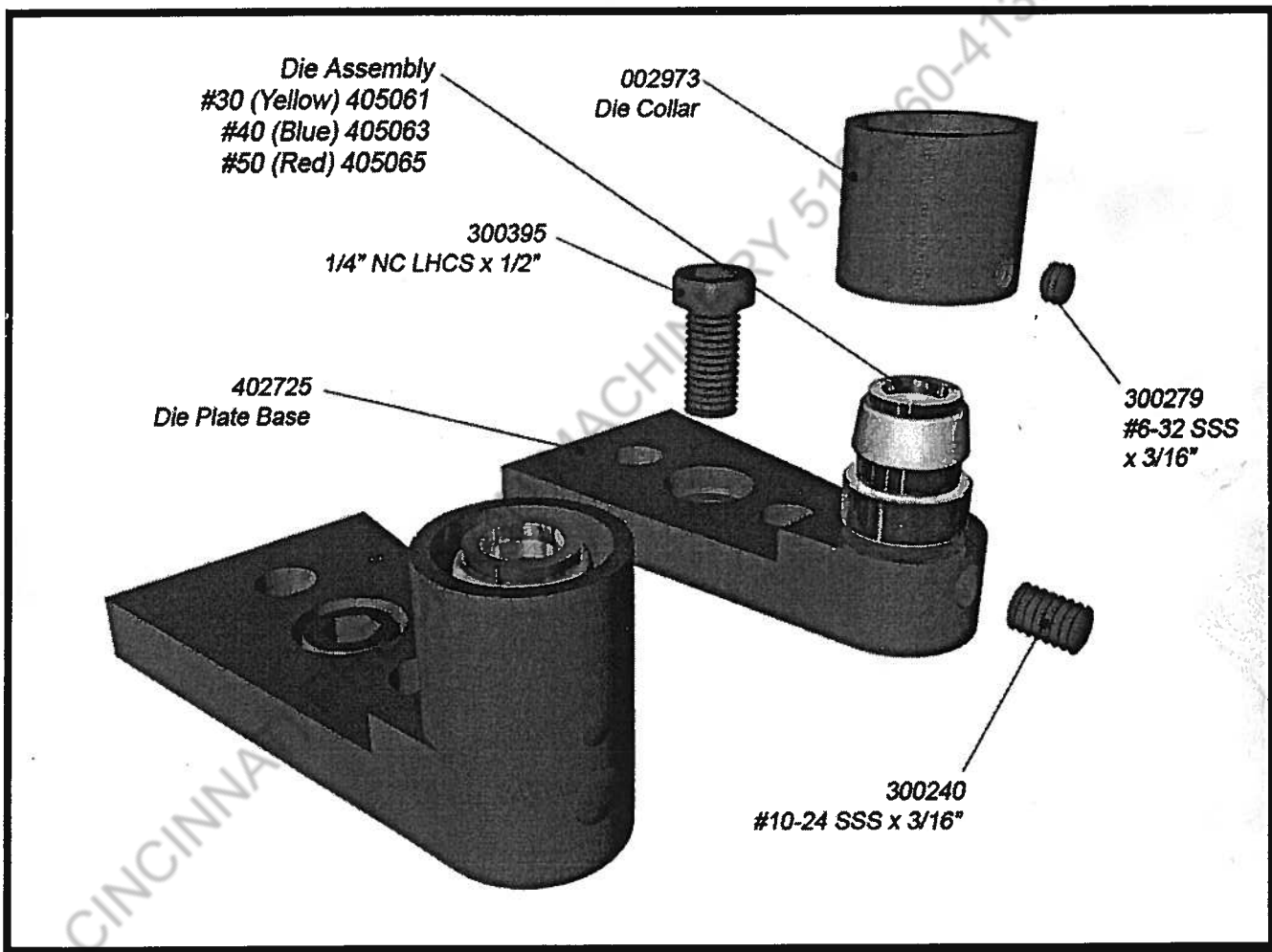
REMEMBER - SET THE PUNCH TO THE HIGHEST SETTING THAT WILL PRODUCE A GOOD JOINT.



Modular Tooling Adjustment

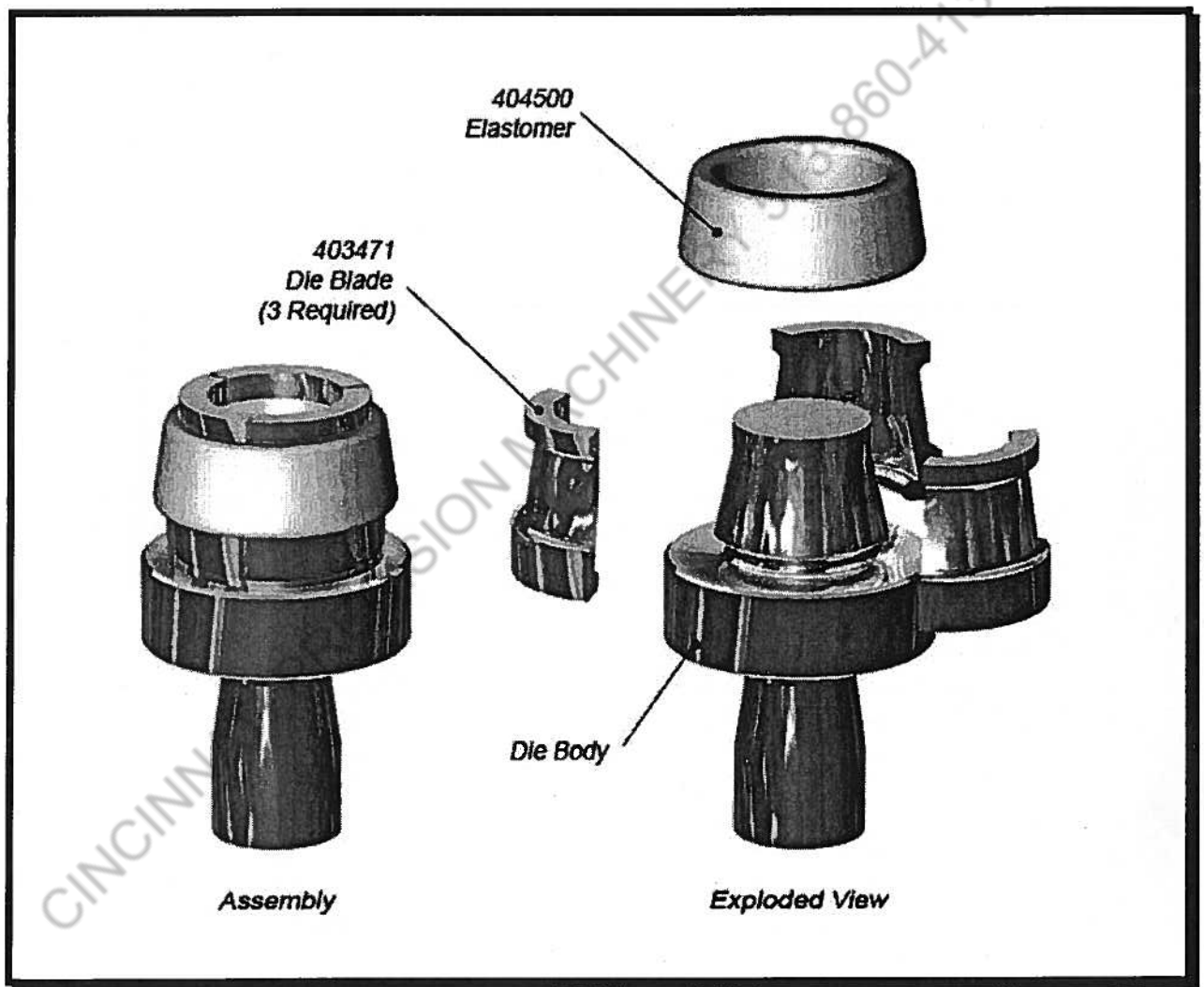
Replacing Die:

- 1) Remove the air supply to the press and drain all the air from the air tank.
- 2) Loosen the die-securing setscrews (300240) and (300279).
- 3) Remove the die collar (002973) by pulling up from the die plate.
- 4) Remove the die from the die collar.
- 5) Clean and oil the new die and install on the die plate. The new die should sit flush on the die plate.
- 6) Replace the die collar and retighten the die-securing setscrews.
- 7) REPLACE THE LEXAN GUARD if it has been removed.
- 8) Connect air supply.
- 9) Test the joint and set punch adjustment as described previously in the manual.



Die Insert Assembly:

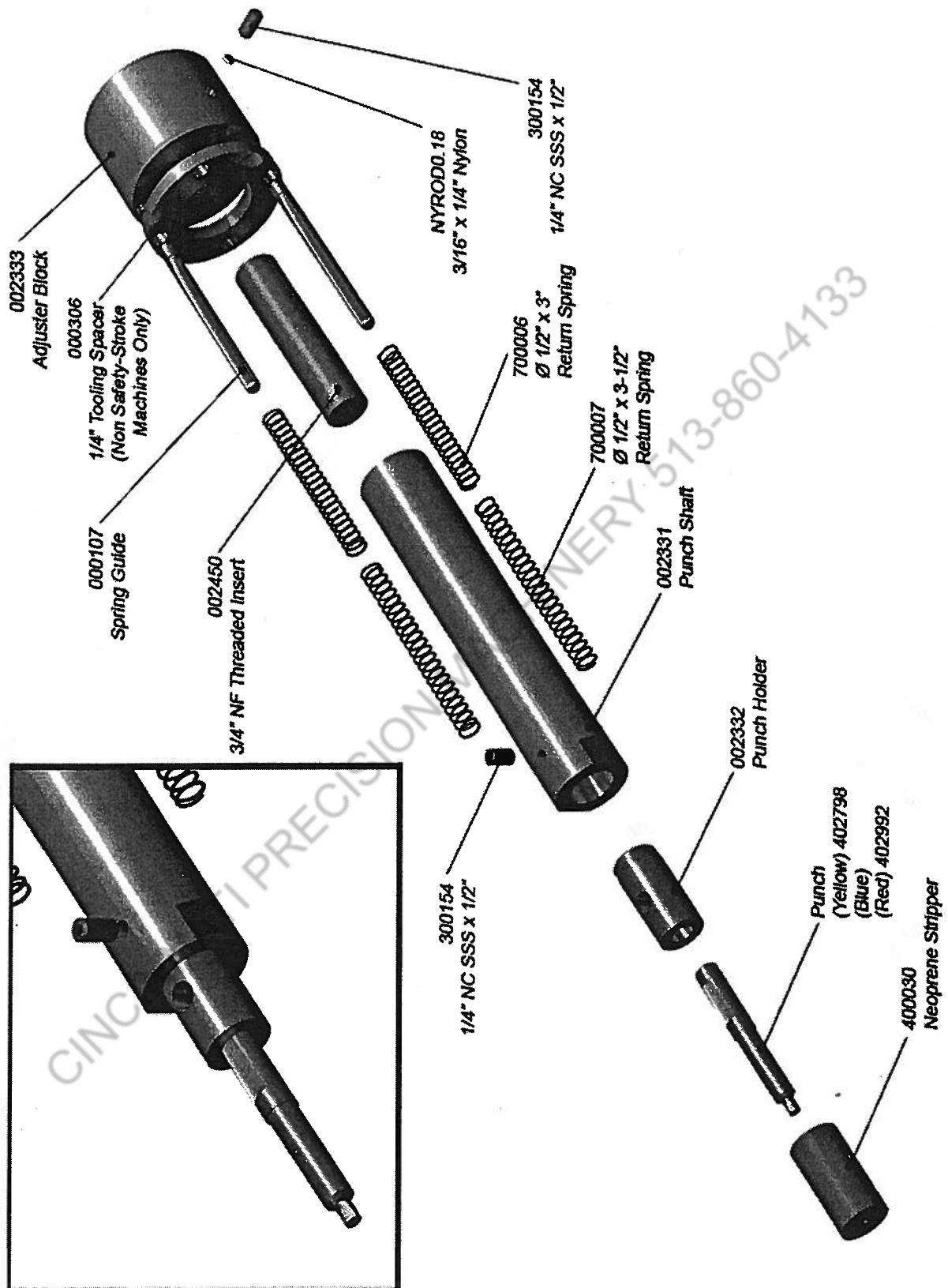
- 1) Remove the Die Insert as described above.
- 2) Remove and discard the old elastomer.
- 3) Set new blades around the die anvil and hold in place.
- 4) Press new elastomer over the die blades pushing it down until it slips into the groove on the outside of the die blades.
- 5) Install Die Insert Assembly in the die can.



Replacing Punch:

"E" Series Punch Replacement: (see illustration page 25)

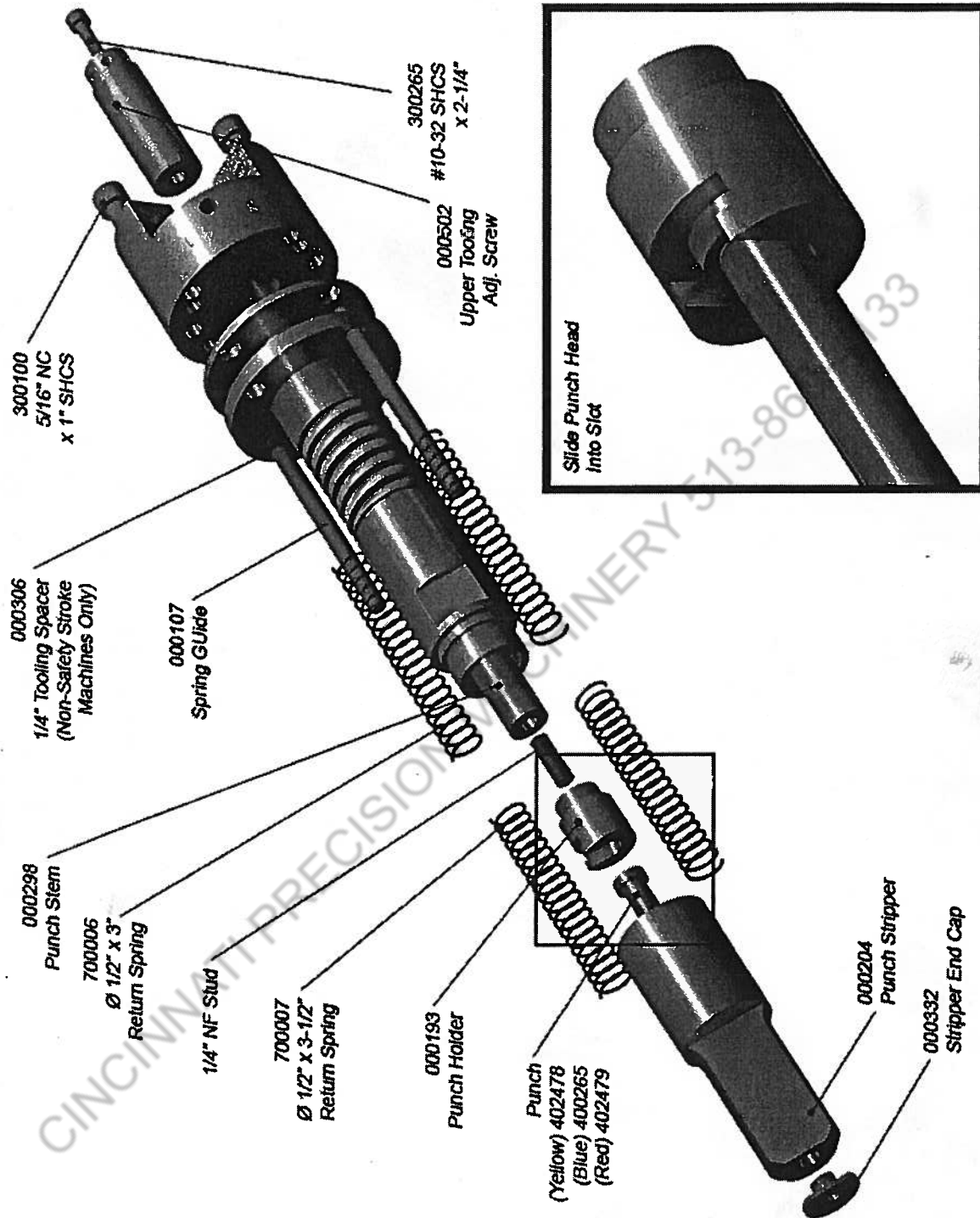
- 1) **Turn off air supply and drain all the air from the air tank.**
- 2) Remove the lexan punch guard. Remove the die can to make access easier. Wind the Open Height Adjustment Screw to achieve maximum open height (page 34).
- 3) Remove the punch stripper, punch holder and punch by removing the setscrew threaded into the lower portion of the tooling shaft.
- 4) Pull the punch stripper down towards the lower arm and slide the punch stripper and exposed punch out of the punch holder (it will only slide one way).
- 5) Remove the punch stripper and punch from the machine and remove the punch from the stripper.
- 6) Clean the stripper and install a new, greased punch, making sure that the punch shoulder is exposed above the punch stripper.
- 7) Slide the punch and punch stripper back onto the punch guide.
- 8) Inspect the stripper for wear or cracks and replace if necessary.
- 9) If it has been removed, install the die plate and tighten the die plate securing screw.
- 10) Install the lexan punch guard and re-connect the air supply.
- 11) The tooling may have to be adjusted to suit the new punch, so check the joint quality before putting the press back into production.



"E" Series Punch Assembly

"P" Series Punch Replacement: (see illustration page 27)

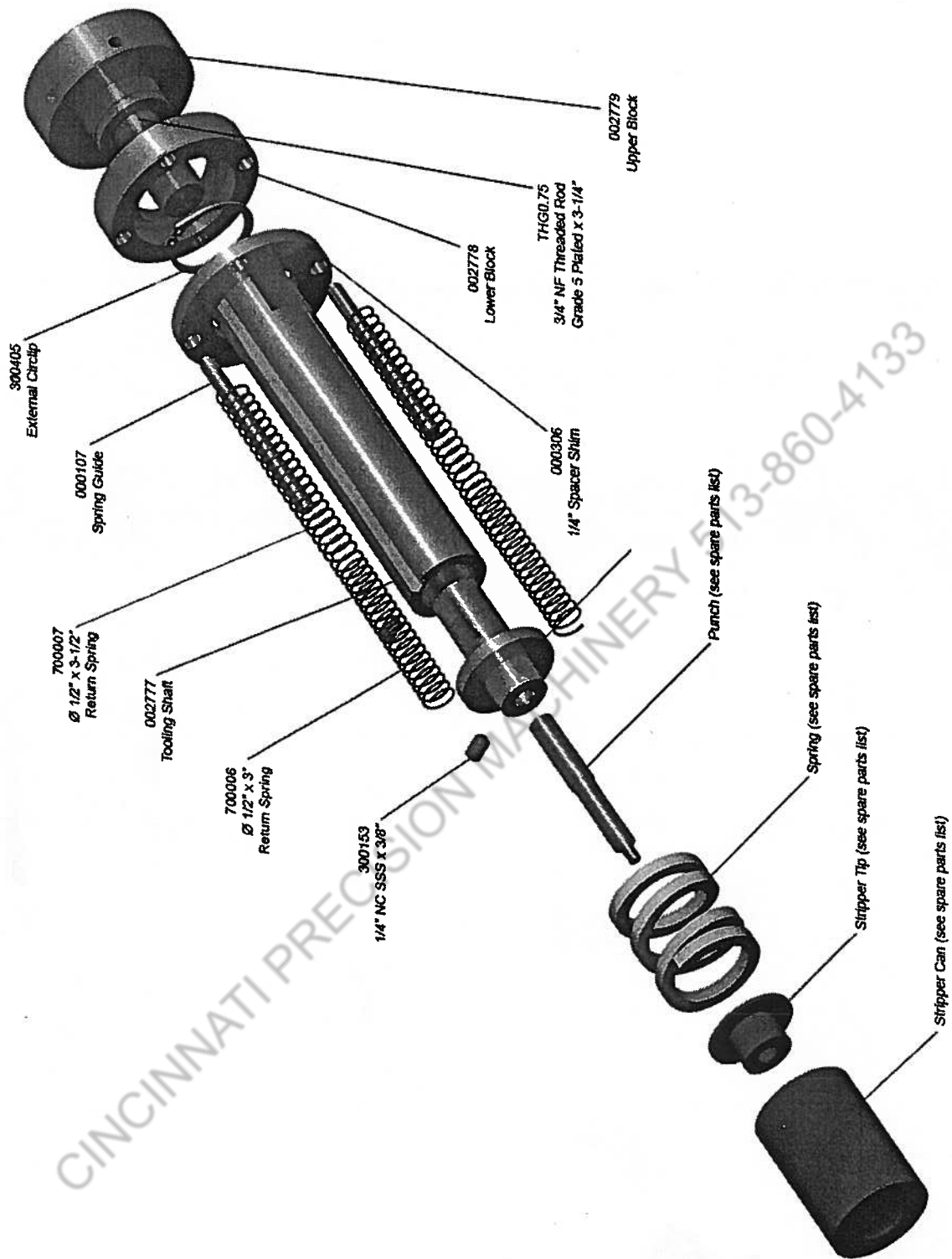
- 1) **Turn off air supply and drain all the air from the air tank.**
- 2) Remove the lexan punch guard.
Wind the Open Height Adjustment Screw to achieve maximum open height (page 34).
- 3) Remove the punch stripper by using a wrench on the punch stripper flat and striking the wrench smartly with a mallet, counter clockwise.
If the entire upper tooling rotates instead of the punch stripper unscrewing it will be necessary to prevent the upper tooling from rotating as follows;
 - a) Using the open height adjustment screw, lower the upper tooling.
 - b) A wrench flat will be visible on the exposed portion of the upper tooling.
 - c) Using a 1" wrench, hold the upper tooling by the flats and loosen the punch stripper as described.
 - d) Wind the open height adjustment screw to achieve maximum open height.
- 4) Pull the punch stripper down towards the lower arm and slide the punch stripper and exposed punch out of the punch holder (it will only slide one way).
- 5) Remove the punch stripper and punch from the machine and remove the punch from the stripper.
- 6) Clean the stripper and install a new, greased punch, making sure that the punch shoulder is exposed above the threaded end of the punch stripper.
- 7) Slide the punch and punch stripper back onto the punch guide.
- 8) Tighten the stripper onto the punch guide and re-adjust the daylight gap if it has been altered.
- 9) If it has been removed, install the die plate and tighten the die plate securing screw.
- 10) Install the lexan punch guard and re-connect the air supply.
- 11) The tooling may have to be adjusted to suit the new punch, so check the joint quality before putting the press back into production.



"P" Series Punch Assembly

Modular Tooling Punch Replacement: (see illustration page 29)

- 1) **Turn off air supply and drain all the air from the air tank.**
- 2) Remove the lexan punch guard.
Wind the Open Height Adjustment Screw to achieve maximum open height (page 34)
- 3) Remove the punch stripper, punch holder and punch by removing the setscrew threaded into the lower portion of the tooling shaft.
- 4) Remove the punch assembly by loosening the setscrew threaded into the lower portion of the tooling shaft.
- 5) It may be necessary to lower the open height to loosen & remove tooling shaft setscrew.
- 6) Unscrew the stripper can from the punch holder. Remove the spring and stripper tip and set aside.
- 7) Unscrew the setscrew holding the punch in the holder. Note the flat on the punch and its relation to the holder.
- 8) Insert new punch (note orientation of the flat in relation to the set screw) and tighten set screw.
- 9) Installation is the reverse of removal.
- 10) The tooling may have to be adjusted to suit the new punch, so check the joint quality before putting the press back into production.



Modular Punch Assembly

Maintenance:

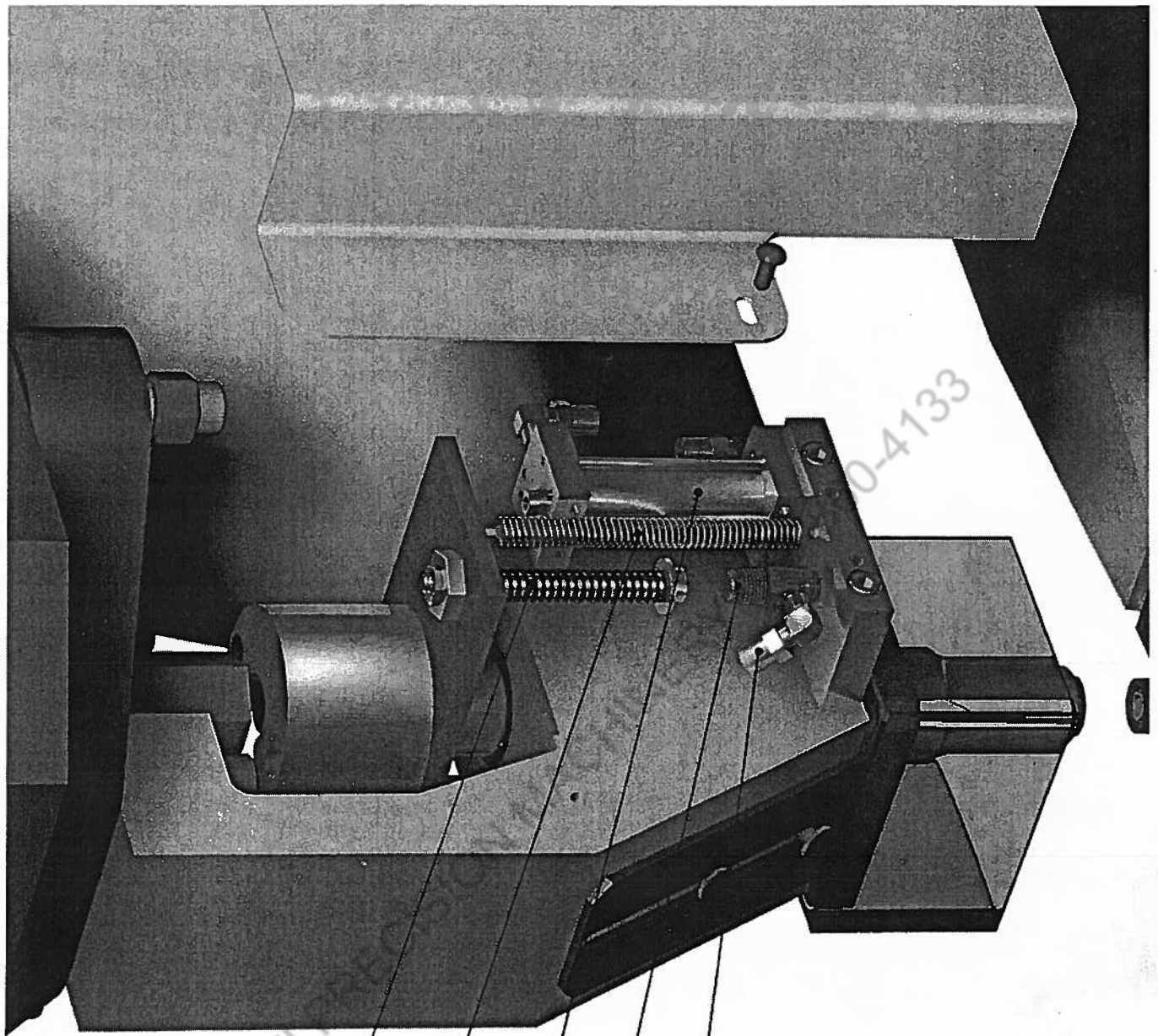
- 1) Ensure all guards and safety equipment are in place.
- 2) Check operation of Safety Stroke (if equipped)
- 3) Check automatic return and adjust if necessary (if equipped).
- 4) Drain moisture from air tank.
- 5) Maintain correct tank air pressure.
- 6) Check and maintain correct air regulator pressure.
- 7) Clean and oil die.
- 8) Clean and oil punch.
- 9) Make sure that the machine is set for the correct material thickness:
 - a) Correct die & correct punch adjustment.
- 10) Check and clean air filters.
- 11) Check for air leaks.
- 12) Grease upper tooling
- 13) Check laser operation
- 14) Check tightness of bolts.

Daily	Weekly	Monthly
X	X	X
X	X	X
X	X	X
X	X	X
X	X	X
X	X	X
X	X	X
X	X	X
	X	X
	X	X
		X
		X
		X

Maintenance - Safety Stroke:

NEVER OPERATE THE MACHINE WITH A SAFETY STROKE GREATER THAN 1/4". NEVER BYPASS THE SAFETY STROKE FEATURE.

- 1) As Shipped, the safety feature is ready to operate.
- 2) The safety stroke system is set such that if any obstruction blocks the tooling from closing to a certain point, the high pressure clinching stroke will NOT operate.
- 3) Connect the inlet air line to the air tank. Make sure that the air tank pressure is at least 100 psi (125 psi best). Do not exceed 125 psi tank pressure.
- 4) Ensure that the main regulator is set to approximately 100 psi.
- 5) Turn on the safety ball valve on the main operator valve, and turn on the safety ball valve leading to the air tank. **WARNING - THE FOOT PEDAL IS NOW ACTIVE.**
- 6) Operate the foot pedal.
The press will cycle as per normal. If the upper tooling is restricted in any way from reaching a set point (3/16" normally) the high-pressure clinching stroke will not operate. Since the low-pressure approach still closes with approximately 20lbs of force, extremely soft material will still deform enough to allow the tooling to reach the safety point, and clinching will still occur.
- 7) Test the quality of the clinchlok. If none of the settings have been altered the press should make perfect joints on the gauge material for which it was factory set.
- 8) The height at which the safety stroke activates can be adjusted up or down from the factory setting. **WARNING – CHANGING THE SAFETY HEIGHT IS NOT RECOMMENDED AND MAY RESULT IN SERIOUS INJURY IF SET TOO HIGH.**
- 9) To adjust the height of the safety stroke, a 5/16" washer is added or (removed) to the top of the tooling return plate. Adding a washer to the top of the return plate lowers the safety stroke height from 1/4" to 3/16". Removing a 5/16" washer from the top of the return plate will increase the height of the safety stroke to 5/16". The correct setting is when the plunger assembly just touches the activation valve with a 1/4" gap between the punch and die.



903197
Safety Stroke Return
Plate Assembly

700123
Extension Spring

300271
Tooling Return Cylinder

200109
Activation Valve

200303
#10-32 NPT x
5/32" Tube 90°

Safety Stroke Layout

Maintenance - Pressure Adjustments:

- 1) Supply the machine with 125 PSI (max) 80 PSI (min) clean dry air. We recommend a 1/2" (min) air line at 120 psi.
- 2) The inlet pressure regulator must be set as follows:
 - a) Medium Duty tooling 100 PSI.
 - b) Light Duty tooling 80 PSI.
- 3) If aluminum is to be joined, the regulator can be lowered by 20 PSI.

Maintenance - Regulator Draining & Filter Cleaning:

- 1) There is only one air filter that will require draining.
- 2) The inlet filter will collect any air contaminants that have collected in the air tank. If filter requires draining other than daily then the inlet air is contaminated. It may be necessary to install an extra inlet filter before the air tank.
- 3) There is a small filter on the exhaust of the foot pedal.
If the filter becomes blocked the press may not return when the foot pedal is released.
This filter should be replaced (not cleaned) if it becomes blocked.
- 4) The breathers on the rear of the "WAMP" unit should be cleaned weekly.

Maintenance - Lubrication of Upper Tooling

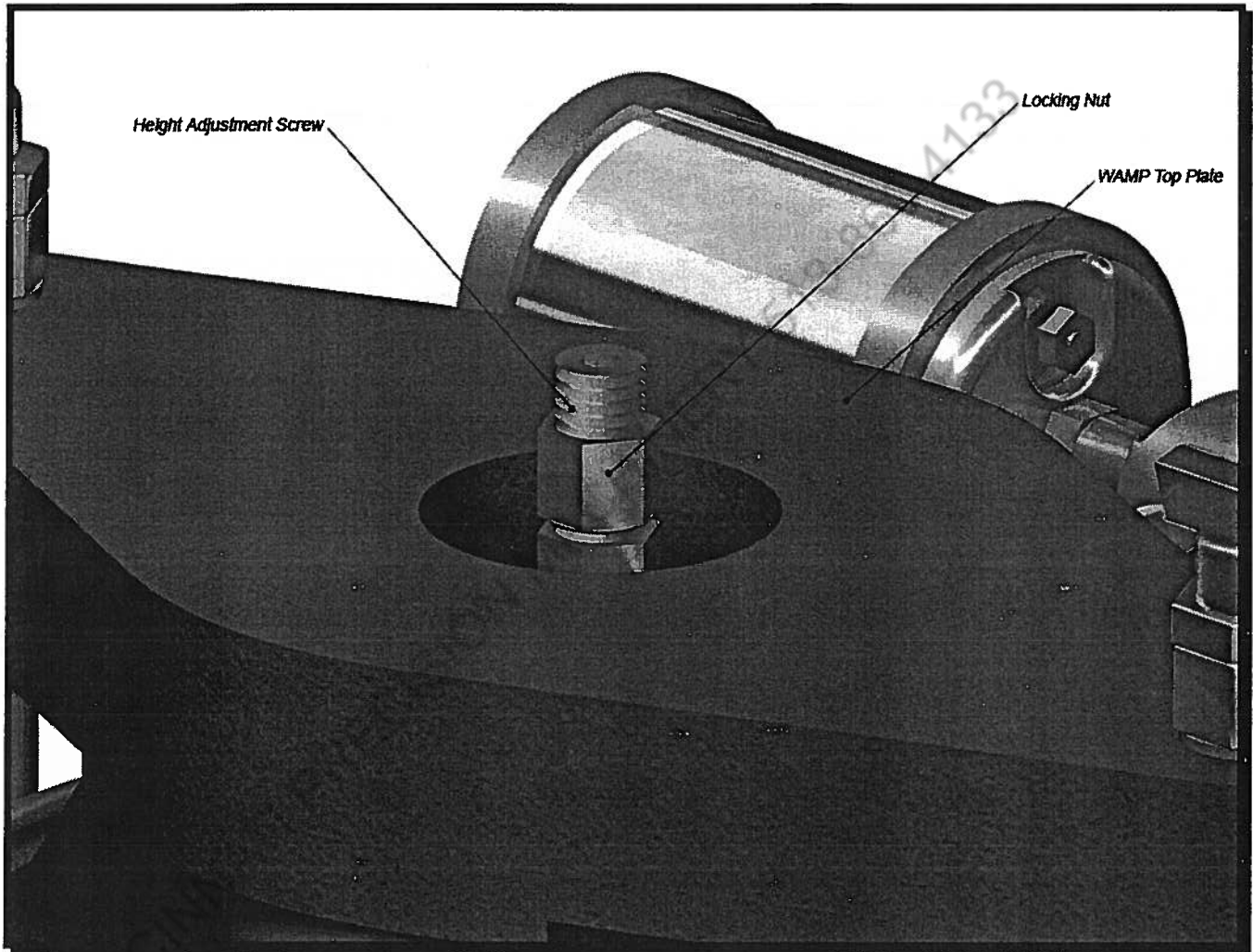
- 1) The upper tooling should be greased with lithium EP general-purpose grease whenever the punch is changed or at least every month.
- 2) It is not necessary to remove the upper tooling to grease the internal components. They can be greased from the outside of the machine through the side access tooling cover plate.
- 3) Disconnect the air supply to the press and drain all air from the reservoir tank.
- 4) Brush grease lightly onto the upper tooling shaft, exposed just above the tooling sleeve.
Do not over grease or a hydraulic lock can occur.
- 5) The upper tooling is now greased and the press is ready for production.

Open Height Adjustment:

The stroke of the Surelok II is factory set to a pinch point opening of 1/4". The Surelok II has a maximum open height - (the gap between the punch and the die), of 1".

This gap may be easily reduced, to eliminate a "pinch point" by adjusting a screw in the center of the top of the WAMP power unit as shown in the drawing below. Reducing the open height has no effect on the joint strength, or any other adjustments on the machine.

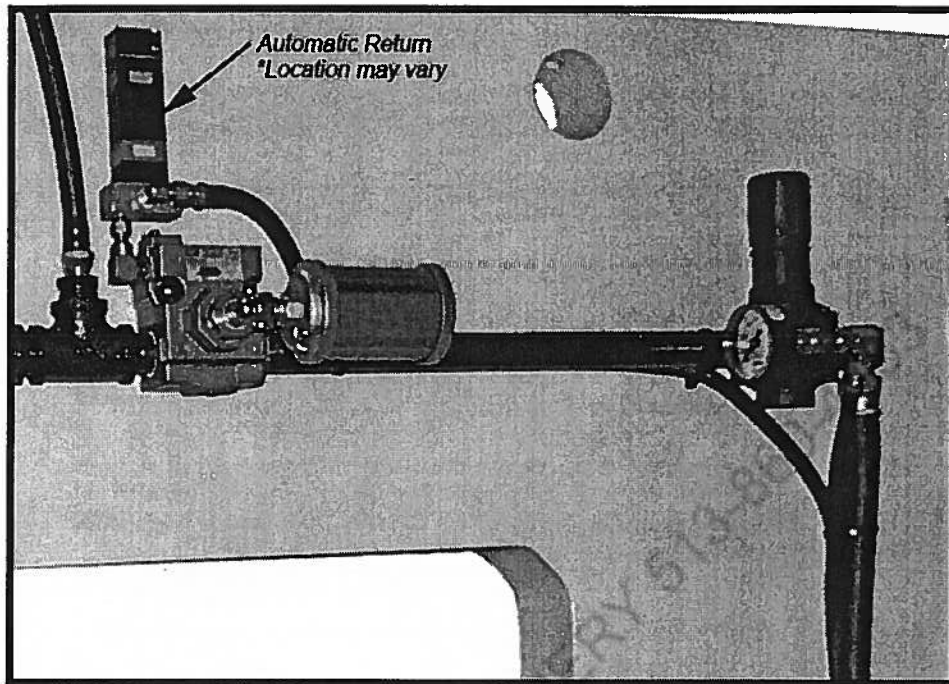
TOP OF WAMP UNIT



Procedure:

- 1) Turn off main air valve.
- 2) Loosen the open height-locking nut.
- 3) Adjust the open height screw with the hex key supplied with the tool kit until the required daylight gap is obtained (the maximum gap is the same as the stroke of the machine - 1").
- 4) Retighten the locking nut.
Do not over tighten - there is an "O" ring seal below the locking nut.
- 5) Reconnect the air supply.
- 6) This adjustment will not affect the joint and the die will not have to be adjusted.

Maintenance - Automatic Return Adjustment:



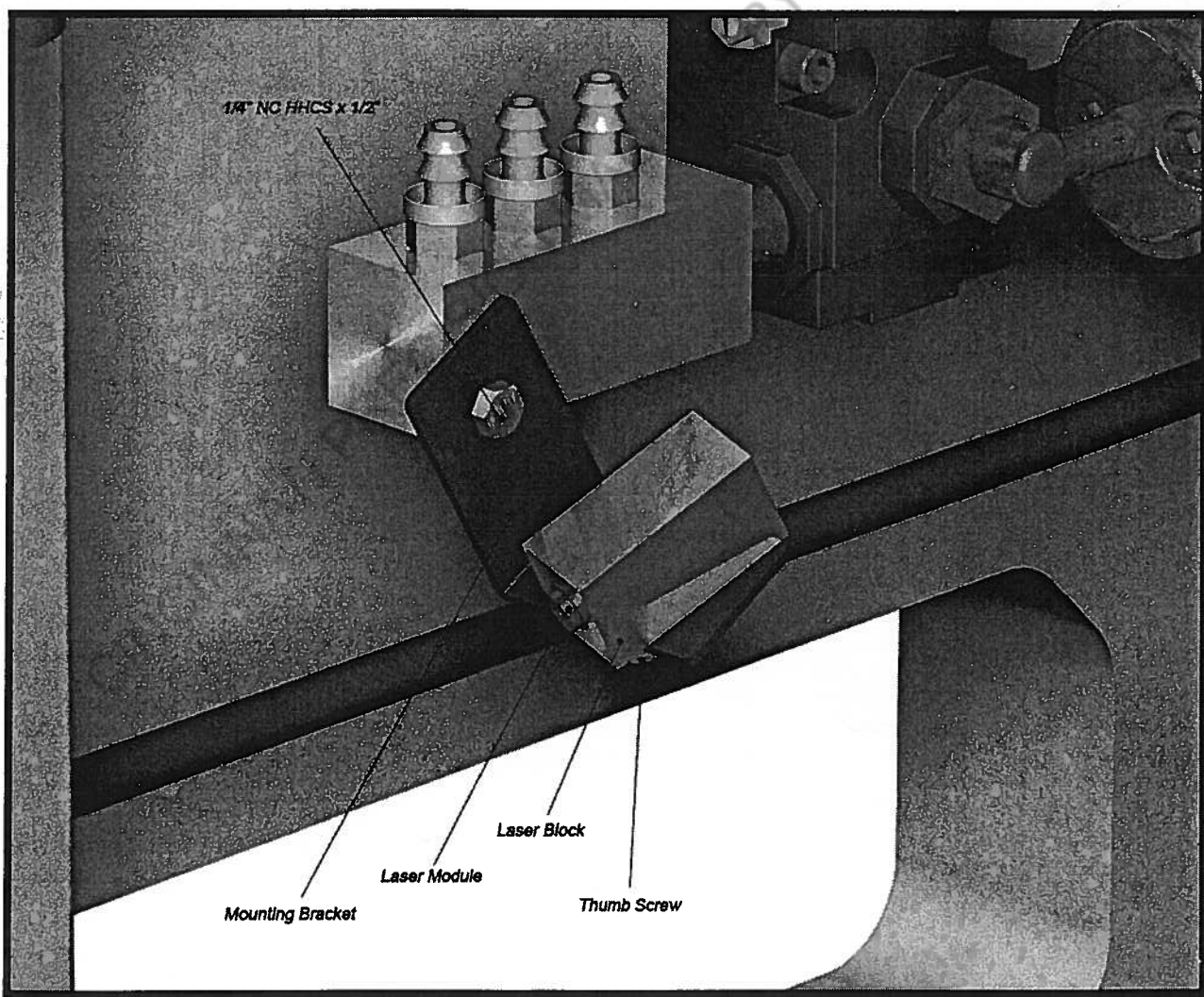
- 1) The press features an automatic - one shot return system.
- 2) The automatic return valve is a time delay system mounted on the side of the operator valve assembly.
- 3) The return valve is adjusted by turning a screw mounted on the top of the valve. Turning the screw clockwise (in) will increase the return delay (slow the press down).
- 4) Adjust the valve so that the upper tooling returns after approximately one second if the foot pedal is kept pressed.
- 5) If the return valve is set too fast the WAMP air power unit may not reach full operating pressure and the joint quality will be reduced - especially if the air supply is low.
- 6) Turning the adjuster screw all the way in will turn off the automatic return. In this mode the press will only return when the foot pedal is released. This is especially useful in trouble shooting joint problems.

Maintenance - Setting Laser:

WARNING!!

ALTHOUGH THIS LASER IS A VERY LOW POWER DEVICE AND CANNOT BURN, IT COULD CAUSE EYE DAMAGE WITH PROLONGED DIRECT EYE EXPOSURE. **NEVER LOOK DIRECTLY INTO THE LASER OR POINT IT AT ANYONE.**

- 1) The Surelok II can be fitted with a laser guide to help locate the center of the joint.
- 2) The laser bracket is mounted as shown on the right side of the "C" frame, with the Laser holder mounted on top of the bracket.
- 3) The laser is powered by a low voltage power supply that is plugged into any 110v receptacle.
- 4) The laser is turned on whenever the power adapter is plugged into a receptacle.
- 5) If necessary the laser can be focused by rotating the laser module inside the laser block.
- 6) To set the position of the laser spot on the material:
 - a) Using a small sample (say 2" square) of the materials to be joined, scribe a cross in the center of the sample.
 - b) Place the sample on the lower tooling with the cross in the center of the die.
 - c) Set the laser so that the laser point is centered on the cross (focus the laser if required).
 - d) Operate the press and make a joint.
 - e) Check to see if the joint is at the center of the cross, if not, adjust the laser position. (see next step)
 - f) Repeat with a new sample but this time set the cross to the center of the laser point.
 - g) Make a joint and check to see if the joint is in the center of the cross.
 - h) Repeat these steps until the alignment is correct.



Maintenance - Surelok II High Speed (H/S) Control:

Overview:

- 1) The H/S control system replaces the auto return valve used on the Surelok II machine.
- 2) The H/S control measures the pressure developed in the WAMP power unit and returns the upper tooling, only when the WAMP power unit has reached a preset pressure.
- 3) It is not necessary to keep the foot pedal pressed during the punch cycle. The H/S control will not only allow the press to operate at up to 140 cycles per minute (depending of air pressures and stroke), but will allow very consistent joints.
- 4) If the air pressure in the tank drops, it will take longer for the WAMP power unit to reach the preset pressure, and the H/S control will slow the press down to compensate.
- 5) If the tank air pressure drops below the pre set operating pressure the press will stall out and not return. Pressing the "STOP" button stops the punch cycle, and returns the press to the open position.

Operation and testing:

- 1) As Shipped the H/S control is ready to operate.
- 2) The H/S control box is factory set to return the press when the WAMP power unit has reached a preset pressure. The Light Duty preset pressure is 70 psi, the Medium Duty preset pressure is 85 psi. This can be changed as outlined in the next section.
- 3) Connect the inlet air line to the air filter on the foot pedal manifold. Make sure that the air tank pressure is at least 110 psi (125 psi best). Do not exceed 125 psi tank pressure.
- 4) Make sure the **main air regulator** is set 15 psi **above** the production control setting, i.e. 85 psi for Light Duty, & 100 psi for Medium Duty.
- 5) Turn on the safety ball valve on the main operator valve.
WARNING - THE FOOT PEDAL IS NOW ACTIVE.
- 6) Operate the foot pedal.
The press will cycle in the high-speed production mode, returning when the WAMP pressure unit reaches the preset pressure.
Unlike with the standard automatic return, the foot pedal need not be kept pressed during the complete cycle of the machine. The press may be returned by pressing the "STOP" button mounted on the control box (If the tank pressure is not high enough to achieve the preset return pressure)
- 7) Test the quality of the clinchlok. If none of the settings has been altered the press should make perfect joints on the gauge material for which it was factory set.
- 8) As the air pressure in the tank drops, the H/S control will slow the press cycle to compensate.
With 125 psi in the air tank, the regulator set to 85 psi and the H/S control set to 70 psi, a 1/2" stroke Light Duty Surelok will cycle at approximately 140 cycles per minute.

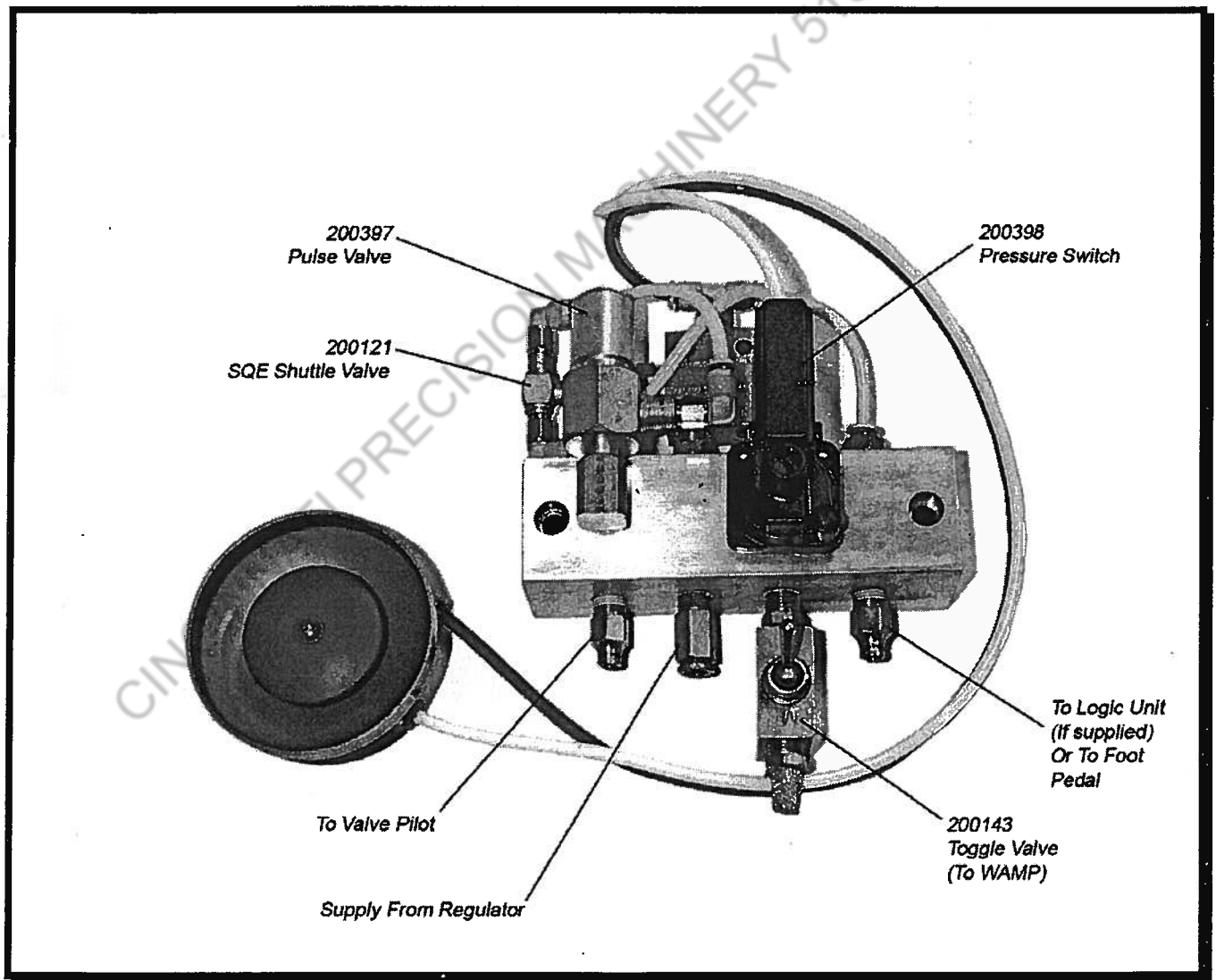
Setting High Speed Control Pressure:

- 1) The return pressure is factory set, and is tagged on the side of the control box.
- 2) To change this setting the following procedure should be used.
- 3) Adjust the main air tank pressure regulator to the desired operating pressure (normally 70 psi for Light Duty machines and 85 psi for Medium duty machines)
- 4) Adjust the return pressure valve as follows:
 - a) Locate the pressure switch adjustment screw. The guard may have to be removed.
 - b) Increase the return pressure adjustment by turning screw clockwise.
 - c) Operate the press. The press should stall in the down position because the return pressure is set above the regulator pressure. If the press automatically returns, increase the return pressure adjustment until the press does NOT return.
- 5) Slowly turn the adjustment screw on the pressure switch, until the press only just returns automatically. The press cycle will be very slow. It is important to make sure that the return pressure setting is the same as the regulator pressure.
- 6) Replace the guard, if removed.
- 7) As a double check of the return pressure setting, lower the air tank regulator pressure and operate the press. The press should not return.
Slowly increase the regulator pressure until the press returns. If necessary repeat the setting procedure.

- 8) Reset the regulator pressure to at least 15 psi above the return pressure, and lock the regulator adjuster.
- 9) Close the control box door.
- 10) Make sure that the air tank pressure is 125 psi (if possible), but at least higher than the regulator pressure (The higher the tank pressure the faster the press – 125 psi MAX).
- 11) The press is now ready for production operation.

Checking Clinch Quality:

- 1) Having set the control return pressure setting the pressure required to fasten the Clinch joint should be tested.
- 2) Set the air tank pressure to the control return setting. (Lower the tank pressure until the press **JUST** returns automatically)
- 3) Remove the 5/32" control hose leading to the toggle valve. This will prevent the automatic cycle of the press
WARNING! When the press is operated air will come out of this hose.
- 4) Test the quality of the clinch joint at the return pressure setting. The "STOP" button must be used to return the press.
- 5) Adjust the punch if required to get a good lock.
- 6) If a good lock cannot be made increase the tank pressure until a good lock is made.
- 7) Install the 5/32" control hose. If the tank pressure has been altered, re-adjust the control box (see section #3).
- 8) Reset the tank pressure to 125 psi. The press is ready for production.



Maintenance – WAMP power unit:

Diagnosing cause of air leak:

- 1) To find the cause of the air leak in a Wamp power unit you must isolate the chamber the leak is coming from.
- 2) When a Wamp power unit is initially operated air will always be exhausted out of the breathers and base chamber. The leak we are looking for is in the pressurized and stalled condition..
- 3) In order to help find the leak the, the dwell time of the press must be increased by adjusting the automatic return pulse unit to the longest setting.
- 4) Remove the two brass breathers from the Wamp intermediate chambers. These should be cleaned or replaced before being reinstalled.
- 5) Disconnect all but one air line from the main valve to the Wamp power unit. Plug the unused hoses or fold them in two and clamp with a vice grip to seal them.
- 6) By using the foot pedal apply air to each of the three chambers one at a time and note the resultant air leak. Use the chart below to identify the cause of the leak.

Air inlet	Leak location	Cause
Top cap (port 1)	Breather A	Top diaphragm
Upper chamber (port 2)	Breather A	Upper chamber seal
	Breather B	Middle diaphragm
Lower chamber (port 3)	Breather B	Lower chamber seal
	Base unit	Bottom diaphragm

- 7) In the case of a diaphragm leak we suggest replacing both the diaphragm and clamp band at the same time (It would be best to replace all three).
- 8) In the case of an intermediate chamber seal leak the chamber must be replaced as an assembly (clamp and diaphragm included).

Part name	Part #
Diaphragm	200002
Clamp band	200003
Breather	200292
Intermediate chamber (in. diaphragm & clamp)	900154

Replacing upper intermediate chamber and top chamber assembly:

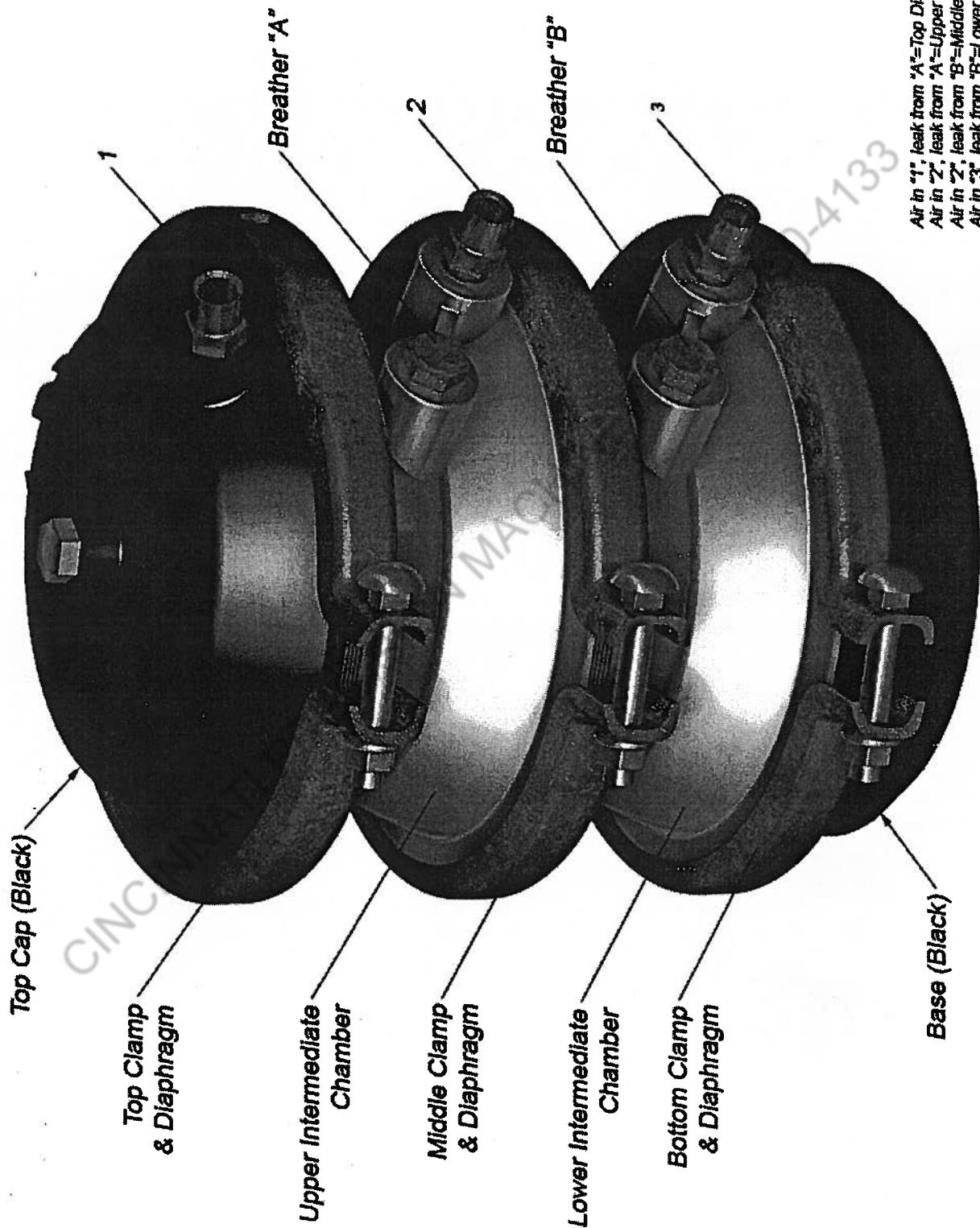
CAUTION: ALWAYS DISCONNECT THE AIR SUPPLY TO THE PRESS AND DRAIN ALL AIR FROM THE RESERVOIR TANK BEFORE SERVICING THE SURELOK II.

- 1) In the event that the intermediate chambers of the "WAMP" power unit require servicing it is not necessary to remove the entire unit from the machine.
- 2) Remove the four 5/8" hex nuts that are located on the top retainer plate of the "WAMP" power unit. These are double nuts mounted at the top of the two 5/8" retainer rods.
- 3) Lift off the top retainer plate and pull off the rectangular "WAMP" guard. The two guard tubes are lined with 5/8" plastic anti rattle hose, if these hoses fall out the guard tubes replace them.
- 4) Remove the three 3/8" hoses that run from the operator valve to the "WAMP" unit.
- 5) Loosen and remove the middle clamp band from the power unit. Do not re-use this clamp band.
- 6) Lift off the upper intermediate chamber and top chamber as a complete unit. Remove the exposed rubber diaphragm from the lower intermediate chamber (this diaphragm may have lifted off with the upper chambers).
- 7) Replace the diaphragm with a new unit, MAKING SURE THAT IT IS RESTING EVENLY ON THE TOP OF THE LOWER INTERMEDIATE CHAMBER.

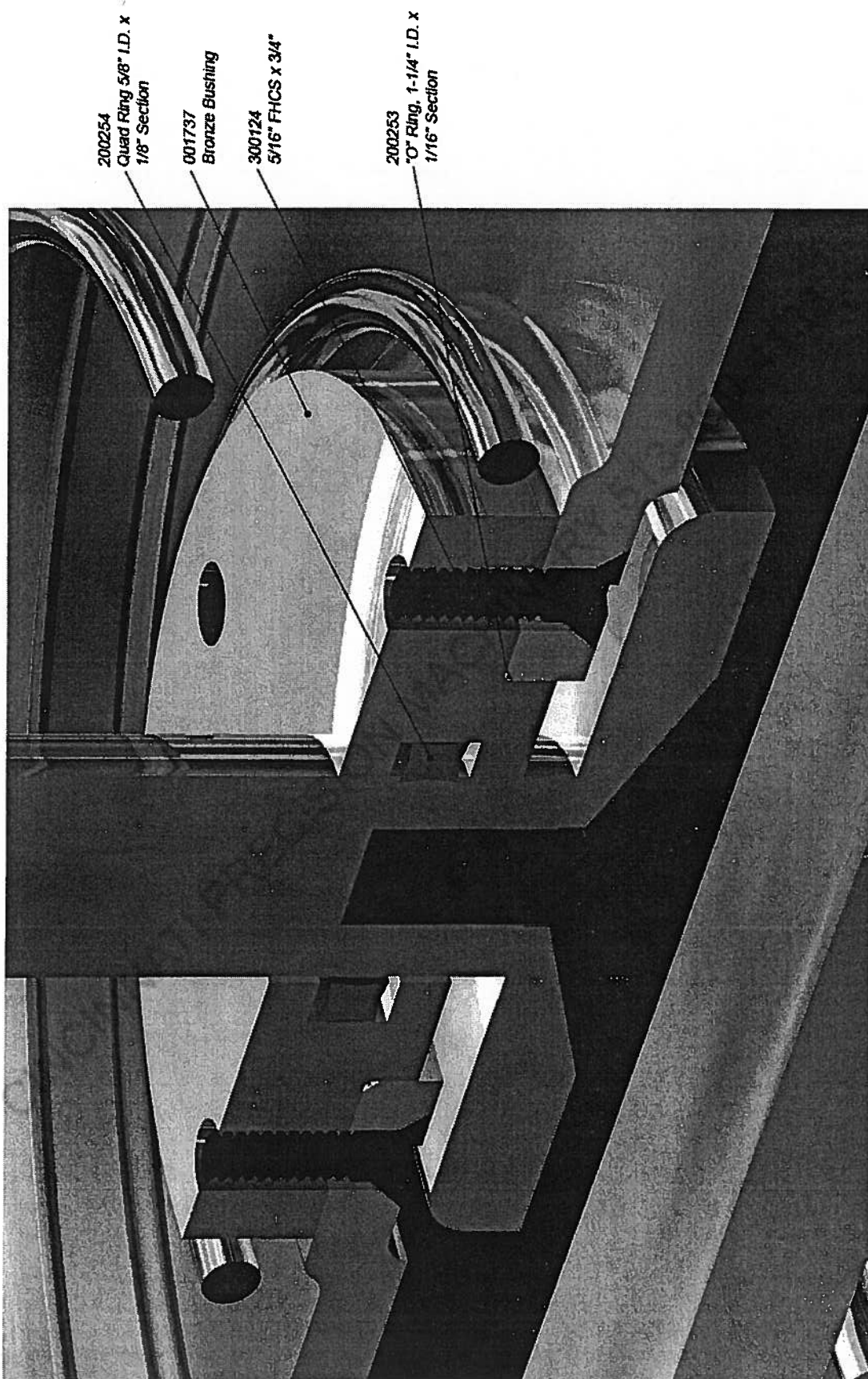
- 8) Install the replacement upper intermediate chamber assembly making sure that the ports at the back of the upper and lower chambers are in line. Again MAKE SURE THAT THE UPPER CHAMBER SITS EVENLY ON TOP OF THE LOWER CHAMBER.
- 9) Carefully install the upper retainer plate with the machine cutouts facing the top chamber. The machined cut-away should be at the back of the power unit. Do not install the guard at this point. MAKE SURE THAT THE NEW CHAMBER AND DIAPHRAGM ARE STILL RESTING EVENLY ON TOP OF THE LOWER INTERMEDIATE CHAMBER.
- 10) Install one washer and bolt on each of the two 5/8" retainer rods and evenly torque to 25 ft lbs, making sure that the top retainer plate lays flat on the top of the top chamber. Again make sure that the components have not moved out of alignment.
- 11) Install a new clamp band between the upper and lower intermediate chambers with the bolts located in the same position as the upper clamp band. Evenly tighten the 3/8" clamp bolts until the clamp band bolt tabs bend slightly.
- 12) Gently "seat" the clamp band onto the "WAMP" unit by striking the center of both halves of the clamp band with a hammer. Re-tighten the clamp bolts, until the clamp bolt tabs bend slightly.
- 13) Remove the two quick exhausts, hex nipples and mufflers from the old chamber and install them on the new chambers.
- 14) Remove the top retainer plate and install the guard. It may help to remove the 5/8" anti rattle hose located inside the two guard tubes, and install these hoses on the 5/8" retainer rods first.
- 15) Install the top retainer plate as outlined in section (9).
- 16) Install the 5/8" washer and 5/8" hex nut on each retainer rod and evenly tighten the nuts to 35 ft lbs **(DO NOT OVERTIGHTEN and make sure the top retainer plate lays flat on the top of the top chamber).**
- 17) Install the two remaining locking nuts onto the retainer rods and lock against the previously torqued nuts.
- 18) Re-connect the three air hoses from the operator valve to the "WAMP" power unit.
- 19) The machine is now ready to placed back in operation.

Replacing Clamp Bands and Diaphragms:

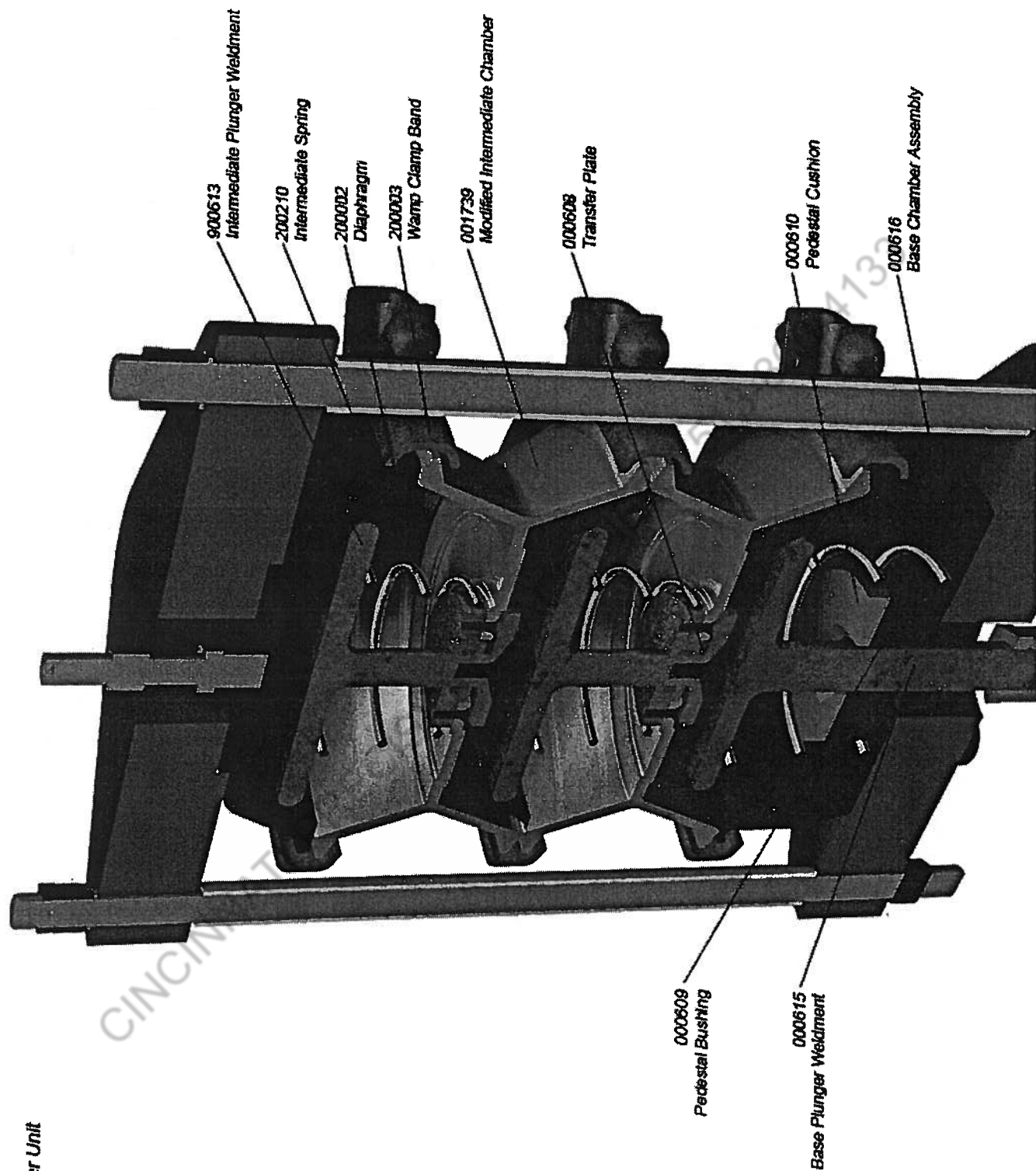
- 1) In the event that the diaphragms and clamp-bands of the "WAMP" power unit require replacement, it is not necessary to remove the entire unit from the machine.
- 2) Remove the four 5/8" hex nuts that are located on the top retainer plate of the "WAMP" power unit. These are double nuts mounted at the top of the two 5/8" retainer rods.
- 3) Lift off the top retainer plate and pull off the rectangular "WAMP" guard. The two guard tubes are lined with 5/8" plastic anti rattle hose, if these hoses fall out the guard tubes replace them.
- 4) Remove the three 3/8" hoses that run from the operator valve to the "WAMP" unit.
- 5) Loosen and remove the lower clamp band from the power unit. Do not re-use this clamp band.
- 6) Lift off the upper intermediate chamber, lower intermediate chamber and top chamber as a complete unit. Remove the exposed rubber diaphragm from the base chamber (this diaphragm may have lifted off with the upper chambers).
- 7) Replace the diaphragm with a new unit, MAKING SURE THAT IT IS RESTING EVENLY ON THE TOP OF THE LOWER INTERMEDIATE CHAMBER.
- 8) Reinstall the chamber assemblies, making sure that the ports at the back of the upper and lower chambers are in line. Again MAKE SURE THAT THE UPPER CHAMBER SITS EVENLY ON TOP OF THE LOWER CHAMBER.
- 9) Install a new clamp band between the lower intermediate chamber and the base chamber with the bolts located in the same position as the upper clamp band.
- 10) Evenly tighten the 3/8" clamp bolts until the clamp band bolt tabs bend slightly. Gently "seat" the clamp band onto the "WAMP" unit by striking the center of both halves of the clamp band with a hammer. Re-tighten the clamp bolts, until the clamp bolt tabs bend slightly.
- 11) Repeat steps 6-12 for the remaining two chambers.
- 12) Install the top retainer plate (not including guard).
- 13) Install the 5/8" washer and 5/8" hex nut on each retainer rod and evenly tighten the nuts to 35 ft lbs **(DO NOT OVER-TIGHTEN and make sure the top retainer plate lays flat on the top of the top chamber).**
- 14) Re-tighten the clamp bands and reseal them as outlined in step 10.
- 15) Remove top plate, install guard. Evenly tighten the nuts to 35 ft lbs **(DO NOT OVER-TIGHTEN and make sure the top retainer plate lays flat on the top of the top chamber).**
- 16) Install the two remaining locking nuts onto the retainer rods and lock against the previously torqued nuts.
- 17) Re-connect the three air hoses from the operator valve to the "WAMP" power unit.
- 18) The machine is now ready to placed back in operation.



Air in "1", leak from "A"=Top Diaphragm
 Air in "2", leak from "A"=Upper Int. Chamber Seal
 Air in "2", leak from "B"=Middle Diaphragm
 Air in "3", leak from "B"=Lower Int. Chamber Seal
 Air in "3", leak from Base=Bottom Diaphragm



**Advanced Power Unit
Internal View**



Spare Parts List:

Tooling:

"P" Series:

Ø0.200, 0.015" PTR Punch (White, for 32 gauge material)	400346
0.010" PTR Punch (Yellow, for light gauge material)	402478
0.015" PTR Punch (Blue, for most material)	400265
0.020" PTR Punch (Red, for heavy gauge material)	402749
#30 Medium Duty Die (Yellow, 26 gauge – 32 gauge)	405061
#40 Medium Duty Die (Blue, 20 gauge – 26 gauge)	405063
#50 Medium Duty Die (Red, 14 gauge – 20 gauge)	405065
Die Collar	402973
Die Plate Base (Except Fitting Machine)	402725
Elastomer	404500
Die Blade	403471
Punch Stripper	000204
Stripper End Cap	000332

"E" Series:

0.010" PTR Punch (for light gauge material)	402798
0.015" PTR Punch (for most material)	423294
0.020" PTR Punch (for heavy gauge material)	402992
#30 Medium Duty Die (Yellow, 26 gauge – 32 gauge)	405061
#40 Medium Duty Die (Blue, 20 gauge – 26 gauge)	405063
#50 Medium Duty Die (Red, 14 gauge – 20 gauge)	405065
Die Collar	402973
Die Plate Base	402725
Elastomer	404500
Die Blade	403471
Urethane Punch Stripper	400030

Modular Tooling:

0.010" PTR Punch (Round, for light gauge material)	402798
0.020" PTR Punch (Round, for heavy gauge material)	402992
Lance Punch (Rectangular, for Stainless, etc.)	402936
#30 "A" Style Die (Yellow, 25 gauge – 32 gauge)	403947
#40 "A" Style Die (Blue, 20 gauge – 26 gauge)	403961
#50 "A" Style Die (Red, 14 gauge – 20 gauge)	403977
#20 Lance Die (Rectangular)	417357
#30 Lance Die (Rectangular)	417359
#40 Lance Die (Rectangular)	417361
#50 Lance Die (Rectangular)	417363
#60 Lance Die (Rectangular)	417365
#70 Lance Die (Rectangular)	417367
#80 Lance Die (Rectangular)	417369
Die Collar (Round)	402982
Die Collar (Lance)	402775
Die Plate Base	402725
Stripper Can (Ø1-1/2" x Ø 5/8")	415404
Stripper Can (Ø1-1/2" x Ø 7/8")	407119
Stripper Tip (Round Ø 1-1/2" x Ø 5/8")	415403
Stripper Tip (Round Ø 1-1/2" x Ø 7/8")	407117
Stripper Tip (Lance Ø 1-1/2" x Ø 7/8")	405697
Stripper Spring (Ø1-1/2")	406388
Complete Punch Assembly, Round (0.010" PTR)	415405
Complete Punch Assembly, Round (0.020" PTR)	415406
Complete Punch Assembly, Lance	415258

Fitting Machine:

Die Plate

403077

WAMP:

Intermediate Chamber Assembly, Standard

900005

Intermediate Chamber Assembly, Advanced Power Unit

900154

Base Chamber Assembly

900006

Wamp Diaphragm

200002

Wamp Clamp Bands

200003

Wamp Quick Exhaust

200008

3/8" Muffler, M00 (On quick exhaust)

200009

3/8" Breather, P38 (WAMP breathers)

200292

Main Valve, Standard 56C

200293

Main Valve, High Speed 57D

200395

Misc:

Automatic Return Module

200015

Filter Regulator, Standard B74G 6AK QD3 RMN

200026

Filter Regulator, High Speed R17-600-RNLA

200297

Foot Pedal

200325

1/4" NPT Bronze Muffler P28 (On foot pedal)

200035

1/2" Muffler B48

200014

Lexan Guard

002692

Lexan Guard Bracket

002694

Air gauge 0-160 PSI

200040

Problems with Press Operation:

Problem	Cause	Solution
<u>Press will not operate</u>	No air	Connect air supply
	Regulator set too low	Check tank pressure (100 – 125 psi) Check regulator – 100 psi
	Lock-out valve turned off	Turn on valve
	Auto return set very fast	Set to 1 second (minimum). See page 29.
	Main valve jammed	Service or replace
<u>Slow (or no) press return after foot pedal is released.</u> <u>Press returns when air is shut off.</u>	Foot pedal jammed	Check and release. Replace if required.
	Blocked foot pedal exhaust	Remove foot pedal exhaust muffler to check. Clean or replace muffler
	Auto return valve faulty	Bypass auto return valve to check operation. Replace valve if defective.
	Main operator valve faulty	Usually indicated by long exhaust from valve Replace (or use service kit to rebuild)
<u>Press does not return after foot pedal released.</u> <u>Press does not return when air is shut off.</u>	Open height adjust set too low	Adjust open height adjuster to required open height
	Upper tooling binding	Remove power unit. If tooling remains down after power unit is removed, remove tooling and lubricate (see manual). If tooling returns to up position, fault is in WAMP power unit.
	Wamp power unit jammed	Tooling will remain down after main valve has exhausted Remove power unit and rebuild (see page 34)
<u>Joints inconsistent</u> <u>Press lacks power</u>	Low or inconsistent air pressure	Check air supply and regulator pressures
	Back pressure in Wamp power unit	Replace exhaust vents in intermediate chambers. See page 34.
	Major air leak in Wamp power unit	Check for leaks when unit is stalled in down position. See page 34. Repair or replace defective Wamp chamber

Problems with Clinch Joint:

Problem	Cause	Solution
<u>Weak clinch –</u> <u>Punch shears top layer of material</u>	Wrong die (too deep)	Check die chart for correct die / gauge Change die to lower die # (shallower anvil depth) - If #50 change to #40 - If #40 change to #30
	Wrong punch (too sharp)	Change punch to larger PTR - # 30 die 0.010" ptr (punch # 402478) - # 40 die 0.015" ptr (punch # 400625) (standard punch) - # 50 die 0.020" ptr (punch # 402479)
	Punch set too low	Adjust punch away from die (see manual for instructions)
<u>Weak clinch –</u> <u>Clinch pulls apart</u> <u>Inconsistent joint strength</u>	Die dirty Die damaged	Check for dirt buildup in die holder and between blades Check for weak or broken elastomer – replace Check for damaged or broken die blades – replace
	Punch damaged	Inspect punch and replace if required
	Wrong die	Change die to deeper die - If #30 change to #40 - If #40 change to #50
	Wrong punch	Change punch to sharper punch tip radius (ptr)
	Punch set too high	Adjust punch closer to die (see pages 18-20))
	Low air pressure	Check tank pressure (100 – 125 psi) during clinching Check regulator pressure (100 psi)
	Press cycle too fast	Check auto return (1 second minimum) Reset to 3 seconds and check clinch
	Back pressure in WAMP power unit	Remove two vents in back of WAMP unit and retry. If clinch OK replace or clean vents, and reset auto return to 1 second. Also check for air leaks (see below). See page 36.
	Air leak in WAMP unit	Remove two vents in back of WAMP unit and check for major air leak with unit stalled in down position (set auto return to maximum to stall). If more than a slight leak then diaphragm or internal seal has failed (see manual for repair). See page 36.

WARRANTY INFORMATION

Subject to the conditions below, and with the exception of punches and dies, Norlok Technology Inc. ("Norlok") warrants to the first end user (the "Buyer") that Norlok equipment and components are free from defects in material and workmanship for one year from the date of purchase of the equipment or components. Punches and dies are covered under the same warranty conditions for a period of thirty days from purchase from Norlok Technology Inc.

Norlok will either repair, or replace defective components, including lowest transportation costs, but not including installation or any similar charges, provided that;

- 1) The buyer notifies Norlok in writing of the claimed defect within one year of the shipment from the Norlok factory (thirty days in the case of punches and dies).
 - 2) Provides a complete explanation of the claimed defect, the application of the product, and any other information as may be requested by Norlok.
 - 3) Returns the defective component to Norlok in accordance to Norlok's specific written instructions and authorization obtained from Norlok prior to the return of the product.
 - 4) Norlok's inspection of the product confirms that the product was defective.
- This warranty applies only if the product was;
- a) Used in, and applied correctly under normal operating conditions and good engineering practice,
 - b) Was installed, operated, and maintained in accordance with all instructions issued or published by Norlok,
 - c) Was used within the stated pressure, and operating limitations published by Norlok,
 - d) Was not subject to abuse, misuse, or unauthorized modification.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, notwithstanding any disclosures to Norlok of the use for which the product is to be put. The Buyer's SOLE AND EXCLUSIVE REMEDY on any claim of any kind of loss or damage arising out of the use of Norlok equipment or components shall be for the repair or replacement of any defective product as provided herein.

IN NO EVENT SHALL NORLOK BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES. There are no warranties expressed or implied made by Norlok other than the warranty against defects in material and workmanship set forth above, and Norlok neither assumes or authorizes any other person or firm to assume for it any other obligations or liability.

EXCELON® 74
Filter/Regulator
3/8", 1/2", 3/4" Port Sizes

- EXCELON design allows in-line or modular installation
- Quick release bayonet bowl
- Highly visible, prismatic liquid level indicator lens
- Full flow gauge ports
- Balanced valve design minimizes effect of variation in the inlet pressure on the outlet pressure
- Modular installations with EXCELON 72, 73, and 74 series can be made to suit particular applications


Technical Data

Fluid: Compressed air

Maximum pressure:

Transparent bowl: 10 bar (150 psig)

Metal bowl: 17 bar (250 psig)

Operating temperature*:

Transparent bowl: -20° to 50°C (0° to 125°F)

Metal bowl: -20° to 80°C (0° to 175°F)

* Air supply must be dry enough to avoid ice formation at temperatures below +2°C (+35°F).

Particle removal: 5, 25 or 40 µm filter element

Air quality: Within ISO 8573-1, Class 3 and Class 5 (particulates)

Typical flow with 10 bar (150 psig) inlet pressure, 6,3 (90 psig) set pressure and a droop of 1 bar (15 psig) from set:
 100 dm³/s (212 scfm)

Manual drain connection: 1/8"

Automatic drain connection: 1/8"

Automatic drain operating conditions (float operated):

Bowl pressure required to close drain: Greater than 0,3 bar (5 psig)

Bowl pressure required to open drain: Less than 0,2 bar (3 psig)

Minimum air flow required to close drain: 1 dm³/s (2 scfm)

Manual operation: Depress pin inside drain outlet to drain bowl

Nominal bowl size: 0,2 litre (7 fluid ounce)

Gauge ports:

1/4 PTF with PTF main ports

Rc1/4 with ISO Rc main ports

Rc1/8 with ISO G main ports

Materials:

Body: Aluminum

Bonnet: Aluminum

Valve: Brass

Bowl:

Transparent: Polycarbonate with steel bowl guard

Metal: Aluminum

Metal bowl liquid level indicator lens:

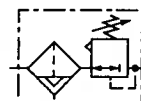
Transparent nylon

Element: Sintered plastic

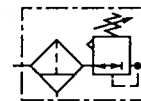
Elastomers: Neoprene and Nitrile

Ordering Information

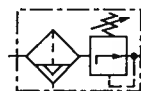
See *Ordering Information* on the following pages.

ISO Symbols


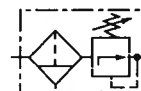
Automatic Drain, Relieving



Manual Drain, Relieving



Automatic Drain, Non Relieving

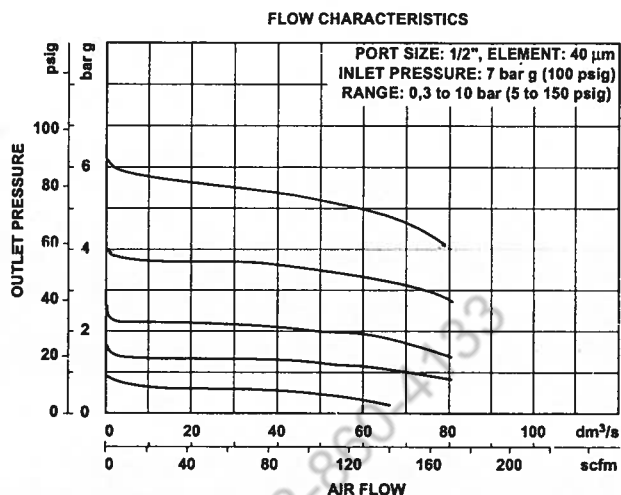
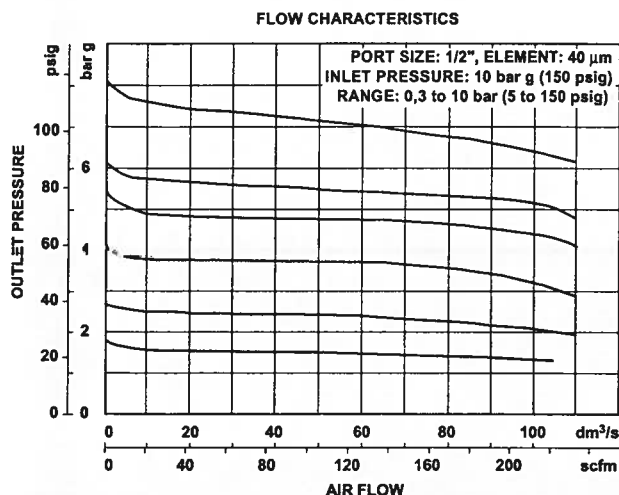


Manual Drain, Non Relieving



B74G

Typical Performance Characteristics



Ordering Information. Models listed include ISO G parallel threads, knob adjustment, automatic drain, metal bowl with liquid level indicator, 40 µm element, relieving diaphragm and 0,3 to 10 bar (5 to 150 psig) outlet pressure adjustment range*.

Main Port Size	Model Number	Flow† dm³/s (scfm)	Weight kg (lb)
G3/8	B74G-3GK-AD3-RMN	77 (163)	1,19 (2.62)
G1/2	B74G-4GK-AD3-RMN	100 (212)	1,17 (2.59)
G3/4	B74G-6GK-AD3-RMN	100 (212)	1,16 (2.55)

† Typical flow with 10 bar (150 psig) inlet pressure, 6,3 bar (90 psig) set pressure and a 1 bar (15 psig) droop from set.

Alternative Models

Port Size	Substitute
3/8"	3
1/2"	4
3/4"	6

Threads	Substitute
PTF	A
ISO Rc taper	B
ISO G parallel	G

Adjustment	Substitute
Knob	K
T-bar	T

Drain	Substitute
Automatic	A
Manual, 1/4 turn	Q

B 7 4 G - * * * - * * * - * * *

Gauge	Substitute
With	G
Without	N

Outlet Pressure Adjustment Range*	Substitute
0,3 to 4 bar (5 to 60 psig)	F
0,3 to 10 bar (5 to 150 psig)	M
0,7 to 17 bar (10 to 250 psig)**	S

Diaphragm	Substitute
Relieving	R
Non relieving	N

Element	Substitute
5 µm	1
25 µm	2
40 µm	3

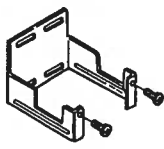
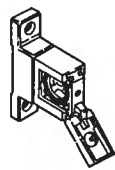

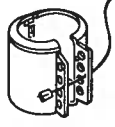
Bowl	Substitute
Metal with liquid level indicator	D
Transparent with guard	P


* Outlet pressure can be adjusted to pressures in excess of, and less than, those specified. Do not use these units to control pressures outside of the specified ranges.

** Units with 17 bar (250 psig) outlet pressure range are available only with the T-bar adjustment; therefore substitute *T* at the 7th digit and *S* at the 12th position.



Accessories

			
Wall Mounting Bracket	Quickclamp and Quickclamp Wall Bracket	Panel Nut	Tamper Resistant Cover & Seal Wire ††
4324-50	4314-52	4348-89	4355-51
			Seal Wire: 2117-01

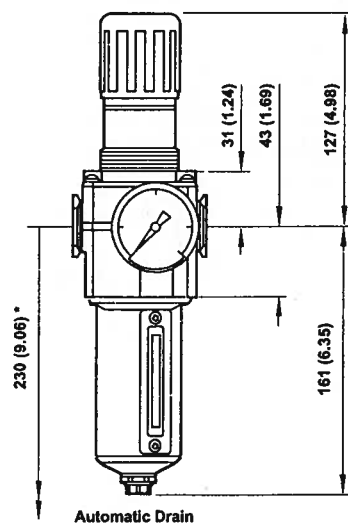
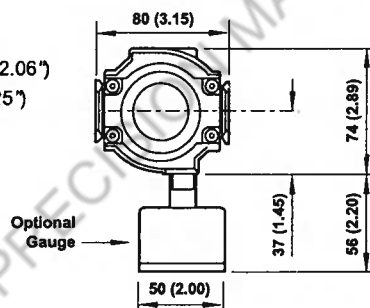
			
Ø 50 mm Pressure Gauge	R1/4 Connection	R1/8 Connection	1/4 PTF Connection
4 bar (60 psig)	18-013-266	18-013-011	18-013-208
10 bar (150 psig)	18-013-260	18-013-013	18-013-209
20 bar (300 psig)	18-013-267	18-013-014	18-013-210

†† Use padlock with shackle up to 8 mm (0.3") in diameter.

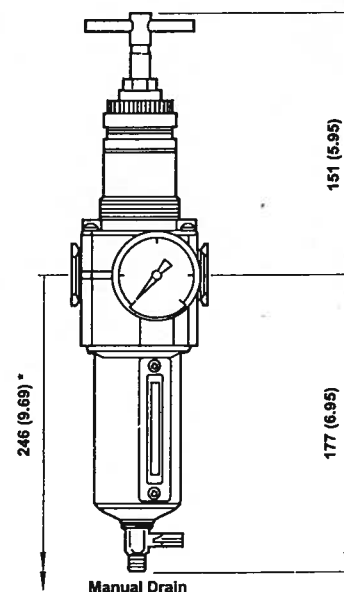
Dimensions mm (inches)

Panel mounting hole diameter: 52 mm (2.06")

Panel thickness: 2 to 6 mm (0.06" to 0.25")



Automatic Drain



Manual Drain

* Minimum clearance to remove bowl.

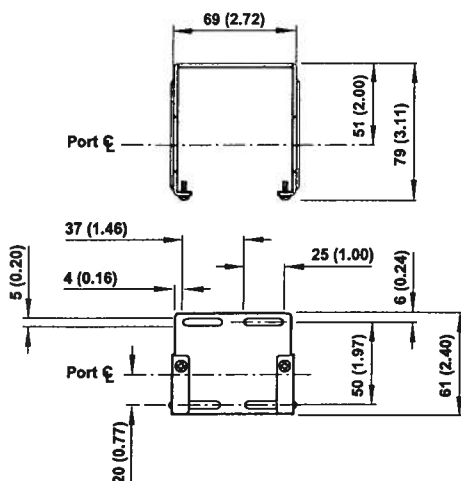


B74G

Bracket Mounting

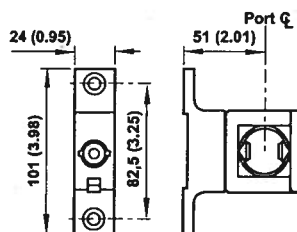
Mounting Bracket

Use 5 mm (3/16") screws to mount bracket to wall.



Quikclamp and Quikclamp Wall Bracket

Use 6 mm (7/32") screws to mount bracket to wall.



Bracket Kit Reference

Item	Part Number
Wall Bracket	4324-50
Quikclamp and Quikclamp Wall Bracket	4314-52

Service Kits

Item	Type	Part Number
Service kit	Relieving	4383-700
	Non relieving	4383-701
Replacement elements	5 µm	4338-04
	25 µm	4338-07
	40 µm	4338-05
Liquid level lens kit	Prismatic	4380-050
Replacement drains	Automatic (1/8 NPT outlet)	3000-10
	Automatic (G 1/8 outlet)	3000-97
	Manual quarter turn	619-50

Service kit includes diaphragm assembly, valve assembly, valve spring, louvre o-ring, bowl o-ring, drain seal.

Warning

These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under 'Technical Data'.

Before using these products with fluids other than those specified, for non-industrial applications, life-support systems, or other applications not within published specifications, consult Norgren.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes. The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.

System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.

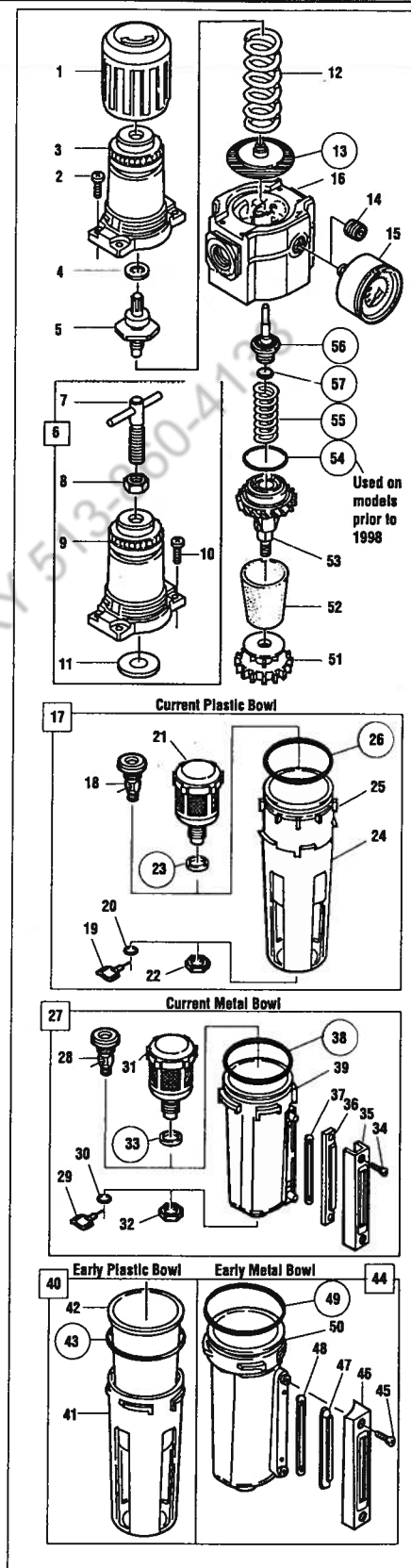
Water vapor will pass through these units and will condense into liquid if air temperature drops in the downstream system. Install an air dryer if water condensation could have a detrimental effect on the application.

In the following parts list, assemblies are printed in capital letters. Parts that are included with an assembly are listed and indented directly beneath it. When an assembly is ordered, the assembly and all parts indented beneath it are included in the shipment.

When an assembly lists a letter code in the USED ON column, parts that list the same letter code are used in that assembly. Parts coded A are used in the Assembly coded A, parts coded B are used in the Assembly coded B, etc.

ITEM	DESCRIPTION	PART NO.	QTY	USED ON
1	Knob, adjusting.....	4307-89	1	
2	Screw.....	9PM5-12	4	
3	Bonnet.....	4305-89	1	
4	Washer.....	5183-05	1	
5	Screw, adjusting.....	4330-50	1	
6	BONNET ASSMPLY, T-bar adjustment.....	4305-50	1	
7	T-BAR ASSY, adjusting.....	1094-11	1	
8	• Nut, lock.....	5637-01	1	
9	• Bonnet.....	Not normally replaced	1	
10	• Screw.....	9PM5-12	4	
11	• Spring rest.....	5297-88	1	
12	Spring, regulating, 60 psig (4 bar).....	4332-01	1	
	Spring, regulating, 150 psig (10 bar).....	4332-02	1	
	Spring, regulating, 250 psig (17 bar).....	4332-03	1	
13	Diaphragm, relieving (service kit item).....	4309-50	1	
	Diaphragm, nonrelieving (service kit item).....	4309-51	1	
14	Plug, pipe, 1/4 PTF (service kit item).....	2891-97	1	
	Plug, pipe, ISO R1/8 (service kit item).....	2338-99	1	
	Plug, pipe, ISO R1/4 (service kit item).....	2845-02	1	
15	Gage, pressure, 1/4 PTF, 60 psig (4 bar).....	18-013-208	1	
	Gage, pressure, 1/4 PTF, 160 psig (10 bar).....	18-013-209	1	
	Gage, pressure, 1/4 PTF, 300 psig (20 bar).....	18-013-210	1	
	Gage, pressure, ISO R1/4, 4 bar.....	18-013-266	1	
	Gage, pressure, ISO R1/4, 10 bar.....	18-013-260	1	
	Gage, pressure, ISO R1/4, 25 bar.....	18-013-267	1	
	Gage, pressure, ISO R1/8, 4 bar.....	18-013-012	1	
	Gage, pressure, ISO R1/8, 10 bar.....	18-013-013	1	
	Gage, pressure, ISO R1/8, 25 bar.....	18-013-014	1	
16	Body.....	Not normally replaced	1	
17	PLASTIC BOWL & GUARD ASSY, 1/4 turn manual drain.....	4325-51R	1	A
17	PLASTIC BOWL & GUARD ASSY, automatic drain.....	4325-52R	1	B
18	• MANUAL DRAIN ASSY, 1/4 turn.....	619-50	1	A
19	• Valve, drain.....	617-89	1	A
20	• O-ring.....	2307-05	1	A
21	• AUTOMATIC DRAIN ASSY, 1/8 PTF Outlet *.....	3000-10	1	B
22	• Nut.....	2797-89	1	B
23	• Gasket (service kit item).....	2811-01	1	B
24	• Guard, bowl.....	4326-01	1	AB
25	• Bowl, plastic.....	Not normally replaced	1	AB
26	• O-ring (service kit item).....	2316-38	1	AB
27	METAL BOWL ASSY, sight glass, 1/4 turn manual drain.....	4303-51R	1	C
27	METAL BOWL ASSY, sight glass, automatic drain.....	4303-52R	1	D
28	• MANUAL DRAIN ASSY, 1/4 turn.....	619-50	1	C
29	• Valve, drain.....	617-89	1	C
30	• O-ring.....	2307-05	1	C
31	• AUTOMATIC DRAIN ASSY, 1/8 PTF Outlet *.....	3000-10	1	D
32	• Nut.....	2797-89	1	D
33	• Gasket (service kit item).....	2811-01	1	D
34	• Screw (service kit item).....	9P06-12	2	CD
35	• Clamp, sight glass.....	4323-01	1	CD
36	• Lens, sight glass (service kit item).....	4321-88	1	CD
37	• Seal, sight glass lens (service kit item).....	4322-87	1	CD
38	• O-ring, bowl (service kit item).....	2316-38	1	CD
39	• Bowl, metal.....	Not normally replaced	1	CD
40	PLASTIC BOWL & GUARD, early models.....	Not available - order item 17	1	
41	• Guard, bowl.....	Not available - order item 17	1	
42	• Bowl, plastic.....	Not available - order item 17	1	
43	• O-ring (service kit item).....	2316-38	1	
44	METAL BOWL, early models.....	Not available - order item 27	1	
45	• Screw.....	Not available	2	
46	• Clamp, sight glass.....	Not available	1	
47	• Lens, sight glass.....	Not available	1	
48	• Seal, sight glass lens.....	Not available	1	
49	• O-ring, bowl (service kit item).....	2316-38	1	
50	• Bowl, metal.....	Not available - order item 27	1	

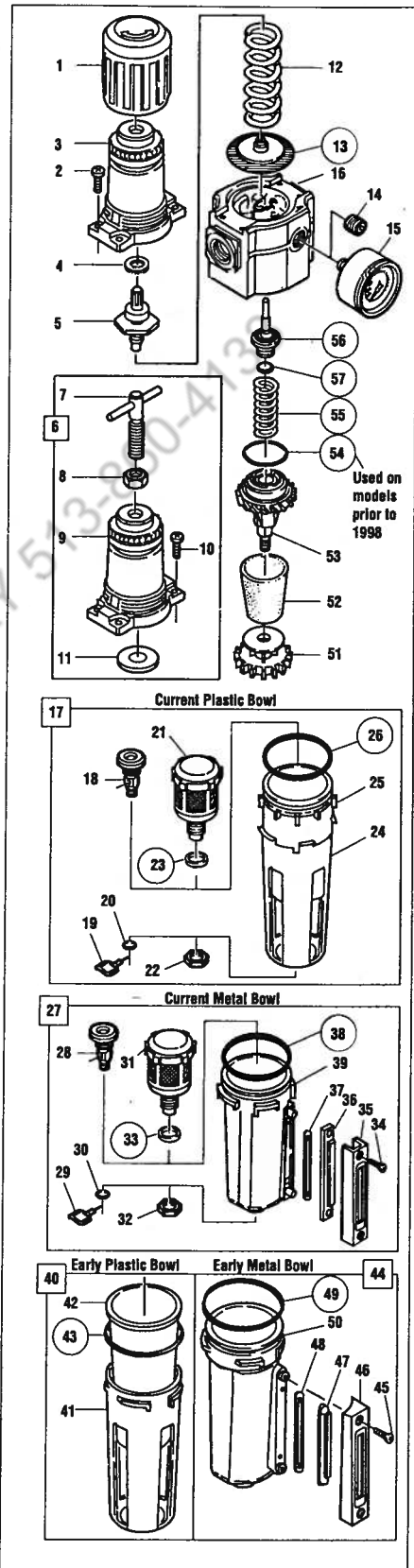
* For optional low flow automatic drain with 1/8 PTF outlet, specify 3000-11.
For standard automatic drain with ISO G1/8 outlet, specify 3000-97.

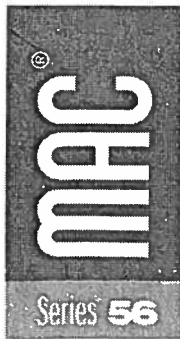


ITEM	DESCRIPTION	PART NO.	QTY	USED ON
51	Baffle	3140-88	1	
52	Element, 5-micron	4338-04	1	
	Element, 25-micron	4338-07	1	
	Element, 40-micron	4338-05	1	
	Element, screen, 75-micron	4338-10	1	
53	Louver - center post	4334-89	1	
54	O-ring, used only on models manufactured prior to 1998 (service kit item)	2305-25	1	
55	Spring, valve (service kit item)	5205-05	1	
56	VALVE ASSY (service kit item)	4308-50	1	
57	• O-ring (service kit item)	2305-13	1	

SERVICE KITS & ACCESSORIES

Service kit, relieving - Includes items circled on exploded view	4383-700
Service kit, nonrelieving - Includes items circled on exploded view	4383-701
Current metal bowl liquid level lens kit - Items 34, 36, 37, 38	4380-050
Kit, pipe plug, 1/4 PTF - item 14 - contains two	3724-05
Kit, pipe plug, ISO R1/8 - item 14 - contains two	3723-06
Kit, pipe plug, ISO R1/4 - item 14 - contains two	3724-09
Wall mounting bracket kit	4324-50
Panel mount nut	4348-89
Tamper resistant cover and seal wire (use only with knob adjustment)	4355-51



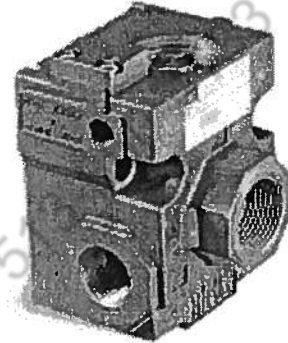


Remote air valves

Function	Port size	Flow (Max)	Individual mounting
3/2 NO-NC 2/2 NO-NC	3/8" - 1/2" - 3/4"	6.2 C _v	Inline

OPERATIONAL BENEFITS

1. Balanced spool, immune to variations of pressure.
2. Short stroke with high flow.
3. The piston (booster) provides maximum shifting forces.
4. Powerful return thanks to the combination of mechanical and air springs.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Wiping effect eliminates sticking.
7. Low leakage rate.



HOW TO ORDER

Port size	Air spring	NC valve	NO valve
3/8" NPTF	Internal	56C-52-RA	56C-82-RA
1/2" NPTF		56C-53-RA	56C-83-RA
3/4" NPTF		56C-57-RA	56C-87-RA
3/8" NPTF	External	56C-52-RE	56C-82-RE
1/2" NPTF		56C-53-RE	56C-83-RE
3/4" NPTF		56C-57-RE	56C-87-RE

Air pilot port : 1/8" NPTF.

Note: Designation "RE" required on remote air pilot models with main valve pressures of vacuum to 25 PSI.

"RE" provides an external pilot port and should have a pressure range of 25-100 PSI. Since the external pilot supplies the air spring, it must not exceed the remote air pilot signal pressure.



100%
OF
PRODUCTION
TESTED
100%

WARRANTY
18
MONTHS

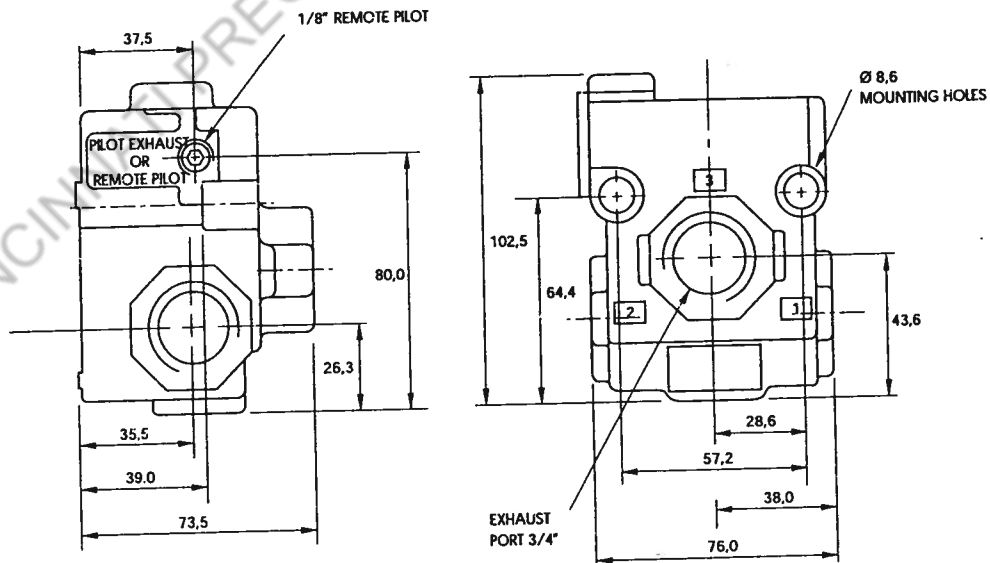
TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Vacuum to 150 PSI
Air signal pressure :	25 - 150 PSI \geq main valve pressure
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
Filtration :	40 μ
Temperature range :	0°F to 120°F (-18°C to 50°C)
Flow (at 6 bar, $\Delta P=1$ bar) :	3/8" : (6.0 C _v), 1/2" : (6.1 C _v), 3/4" : (6.2 C _v)
Leak rate :	70 cm ³ /min

- Spare parts : • Remote air operator : R-56001. • Check valve : 70063.
- Options : • BSPP threads.

DIMENSIONS

Dimensions shown are metric (mm)



Consult "Precautions" before use, installation or service of MAC Valves.