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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.

WARNING

THIS EQUIPMENT IS DESIGNED TO BE OPERATED WITH ALL COVERS SECURED IN PLACE. OPERATION WITHOUT THESE SAFEGUARDS MAY RESULT IN CONDITIONS WHICH 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 operators reference when necessary.

SURE-LOK MD / LD

Operating Manual #8/02

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SAFETY INSTRUCTIONS

OPERATOR SAFETY NOTICE:

THE SURE-LOK 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 SURE-LOK 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 LOCK OUTS 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 OVER-RIDE 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.

SURELOK PPSL24

FEATURES

The **SURE-LOK PPSL24** features a one piece steel "C" frame with an 24" throat and integrated clinch-lok type tooling.

The machine is specifically designed to fasten two ply material together, as used in the sheet metal and manufacturing industry.

This can fasten mild steel, aluminum, brass, copper and other malleable materials from 16g to 28g. in thickness

The press is powered by a pneumatic "WAMP" multi-stack air diaphragm unit which features a fast, low impact, clinching stroke.

The clinching stroke is operated by a guarded foot pedal, and features a "single shot" operating cycle.

The open height between the punch and die may be easily adjusted to eliminate any "pinch point" without effecting the Clinchlok. This open height may be adjusted from full stroke to zero with an adjuster screw.

The machine features a fast change punch and die, either of which can be changed in minutes.

The punch and stripper are located in the upper tooling and operate through the full stroke of the machine. The height of the punch may be easily adjusted to suit different material thickness.

The die is located in the lower arm of the press, and may be easily changed to suit different material thickness.

To cover the complete range of material three different gauge dies are required.

Only one die is supplied as standard and so the gauge of the material to be fastened must be known.

Only one punch is required to fasten all gauges of material.

The machine is supplied with a stand, punch, die, pneumatic filter / regulator, and tool kit.

To assure accurate positioning of the clinch-lok button a low power laser pointer is available as an option, to assist in locating the exact position of the joint.

Unless otherwise requested the machine will be factory set for two ply 22 gauge material with a #40 die installed.

Typical joint strengths for mild steel are as follows;

Material (mild steel)	Pull strength	Peel strength
2 x 0.060"	475 lbs	175 lbs
2 x 0.050"	440 lbs	160 lbs
2 x 0.040"	400 lbs	110 lbs
2 x 0.030"	375 lbs	85 lbs
2 x 0.020"	300 lbs	70 lbs
2 x 0.010"	200 lbs	50 lbs

SPECIFICATIONS - MODEL PP SURE-LOK 24

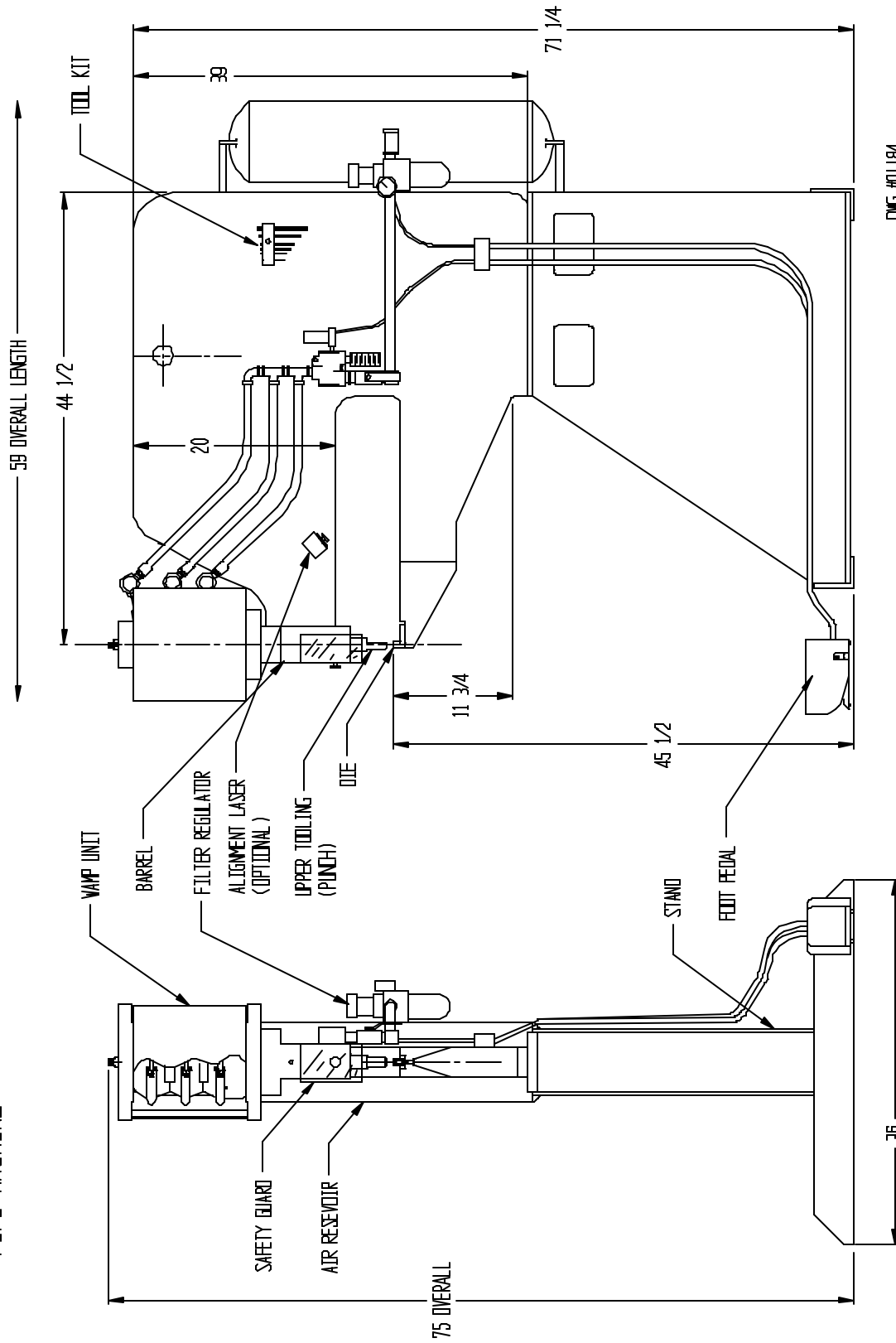
Press Design:	Single steel "C" frame.
Features:	WAMP pneumatic diaphragm power unit. Air surge tank and filter regulator. Guarded foot pedal. Single shot auto return.
Stroke:	1" (approx)
Throat:	24"
Work Height:	45"
Upper Tooling:	Fast change punch. Replaceable punch stripper. Adjustable to suit material thickness.
Lower Tooling:	Die insert set in a hardened die plate.
Capacity:	MEDIUM DUTY (0.18"Ø PUNCH) MAX: Two ply 0.062 mild steel. MIN: Two ply 0.012 mild steel. LIGHT DUTY (0.12"Ø PUNCH) MAX: Two ply 0.032 mild steel. MIN: Two ply 0.010 mild steel.
Cycle speed:	Clinching stroke (1") - 1 second. 100% duty cycle.
Air Requirements:	80 psi (minimum) 125 psi (maximum) 125 psi (recommended)
Air Consumption:	Approx. 0.6 cu ft free air per cycle. (5 HP @ 60 clinches per minute)
Dimensions:	Width 36" (overall) Length 59" (overall) Height 75" (overall) Weight 1900 lbs (approx.)

For this machine we have outlined all the clearances for piping from a 3"Ø to a 12"Ø

Pipe Dia	Die reach into tube(Lower arm)
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	24 1/2"

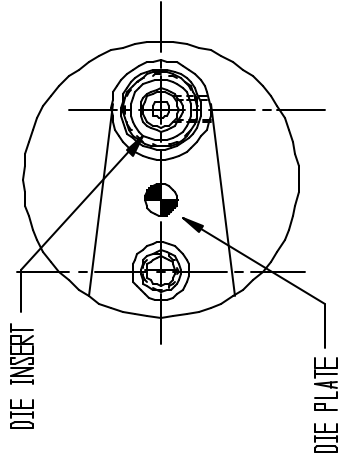
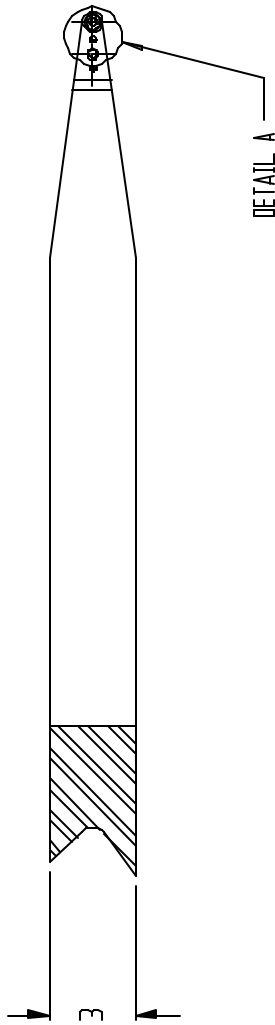


PPSL 24
PIPE MACHINE

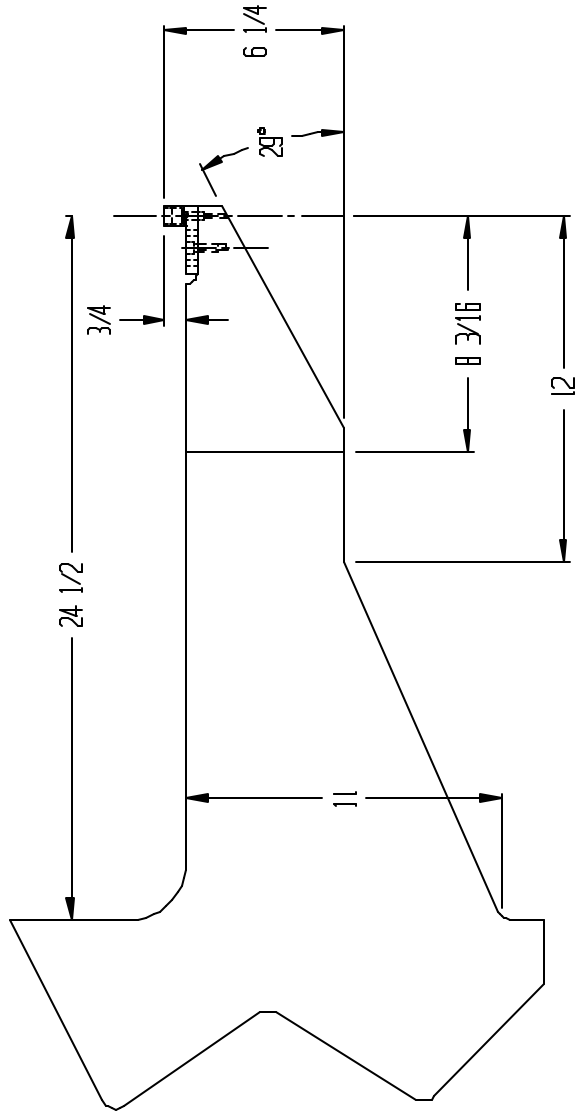
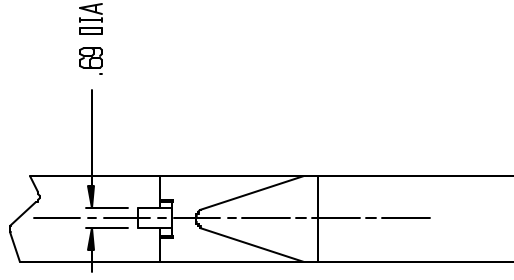


DMG #01184
EDMD 1999/108/23

NORLOK
Technology Inc.
 PPSL-24 LOWER ARM
 PIPE MACHINE



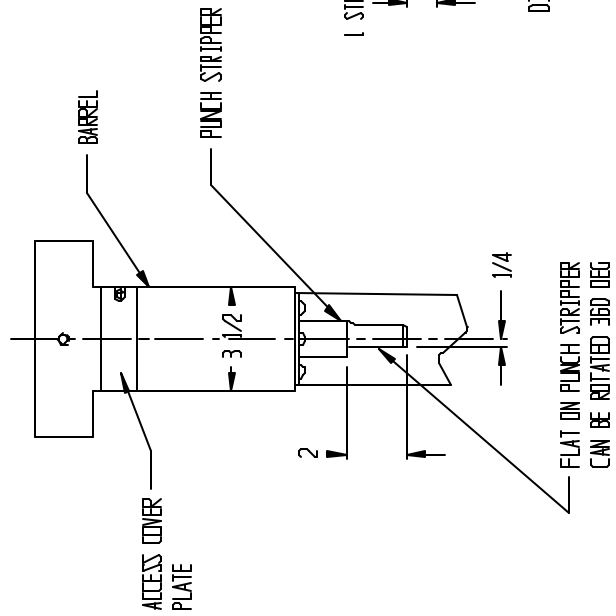
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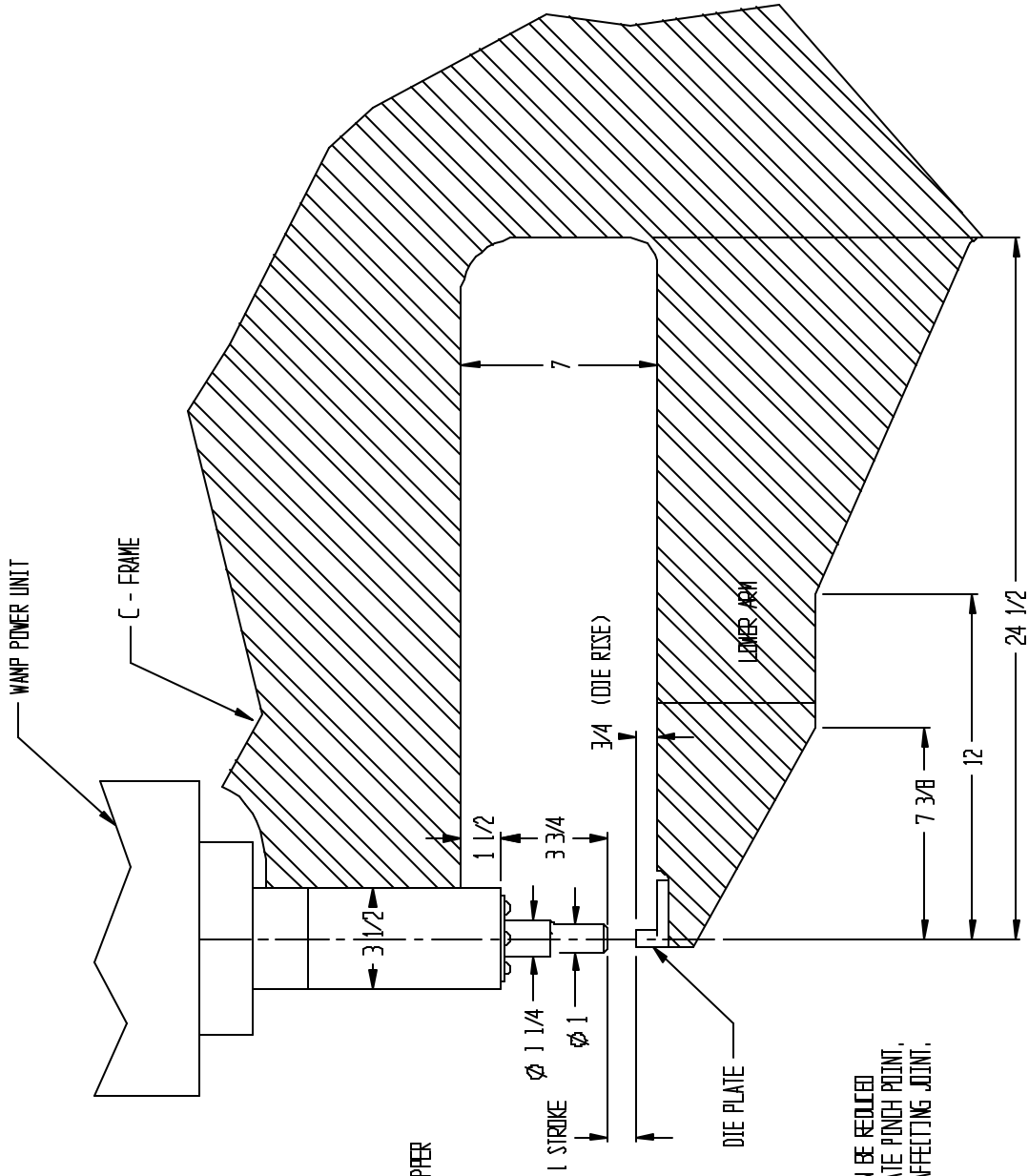
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 BDMO 1999/08/23



PPSL 24
UPPER TOOLING DETAIL



DMG #01198
BDMO 1999/08/09



STROKE CAN BE REDUCED
TO ELIMINATE PUNCH POINT,
WITHOUT AFFECTING JOINT.

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 will have been packed separately;
 - a) Foot pedal and hose.
 - b) Manual.
 - c) Laser locator (if supplied).
 - d) Spare punches and dies (if ordered).
- 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 FOOT PEDAL:

- 1) Locate the foot pedal at the correct location and attach the two fittings at the hose end to the foot pedal manifold.
- 2) The fittings are color coded - red hose fitting to red manifold fitting.

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) 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.
For **Light Duty Tooling** the air tank regulator should be set at 80 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.
- 2) Making sure all guards are in place, operate the foot pedal.
WARNING! THIS ACTION ACTIVATES THE HIGH PRESSURE CLINCHING STROKE.
Keep your foot on the foot pedal, and the machine will activate the high speed clinching stroke and return to the open position automatically.
- 3) 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.
- 4) The foot pedal must be released and re-activated to repeat the clinching stroke.

OPERATION BASICS:

FRAME:

- 1) The SURE-LOK is designed around a very rigid flame cut steel "C" frame.
- 2) The upper tooling barrel is welded pinned to the frame.
- 3) The lower arm is bolted and pinned to the frame, this lower arm may be replaced for a different design if required.

"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 is not user serviceable. 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.
- 4) The pneumatic system features a single shot automatic return. The machine operates through a single clinching stroke each time the foot pedal is activated.
- 5) The automatic return is set to about 1 second on standard machines. If set too fast a good joint may not be formed. If set too slow, production will be reduced. Machines fitted with high speed valving, or Production Controls will operate faster.
- 6) 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.
- 7) 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.
- 8) 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:

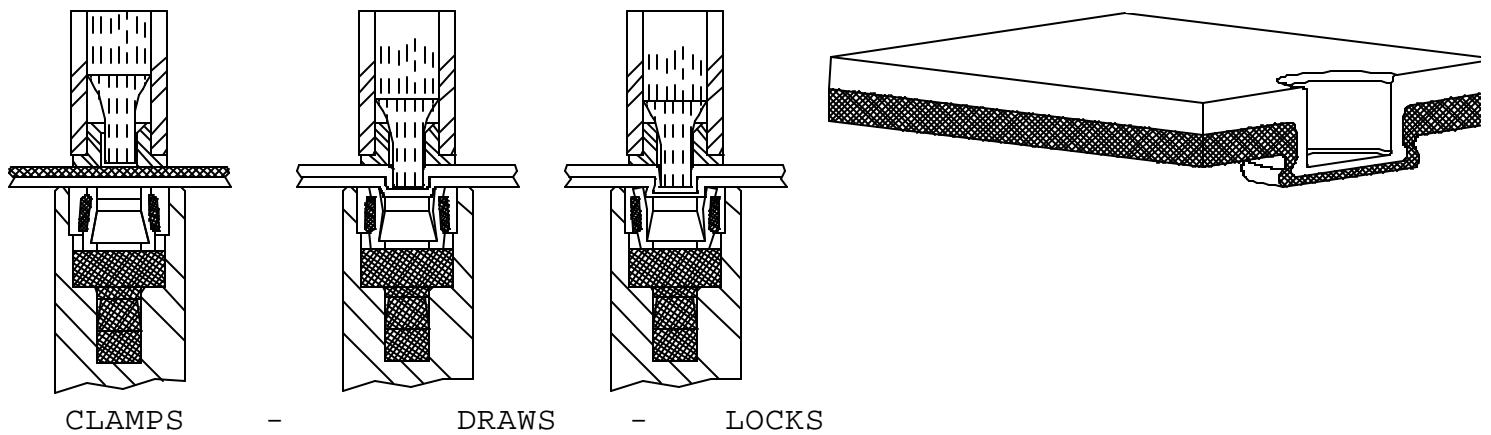
- 1) The clinching punch and stripper are located in the upper tooling and operate through the stroke of the machine (Usually 1" or ½"). The punch may be easily adjusted, through an inspection plate in the front of the barrel, to suit different material thickness.
- 2) The clinching die is located in the lower arm of the machine. Different dies may be selected, and easily installed to suit different material thicknesses.
- 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 back 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 blow-out 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 BASICS:

CLINCHLOK PRINCIPLE.



- 1) The clinchlok joint is formed when the upper tooling squeezes two layers of material between the punch and die.
- 2) The amount of squeeze is very important to the strength of the clinchlok joint and to the life expectancy of the punch and die.
- 3) It will be noted that the die is of a very special design that allows the clinchlok to "mushroom".
- 4) The punch is also a special design and unlike a normal punch the edge of the punch is not sharp, but is rounded. This is known as the punch tip radius.
- 5) Neither the punch nor die can be sharpened.



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 die 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 SURE-LOK. Please read the punch adjustment instructions in a later section of this manual.

MATERIALS TO BE JOINED:

- 1) The SURE-LOK is capable of joining commercial quality mild steel as follows;
 - a) Medium Duty Two ply 0.012" to two ply 0.062".
 - 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.
- 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 0.125" for MD machines and 0.062" for LD machines.
- 4) Other materials can be joined with the SURE-LOK 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 (not recommended) the harder material should be on the upper (punch side) if possible.

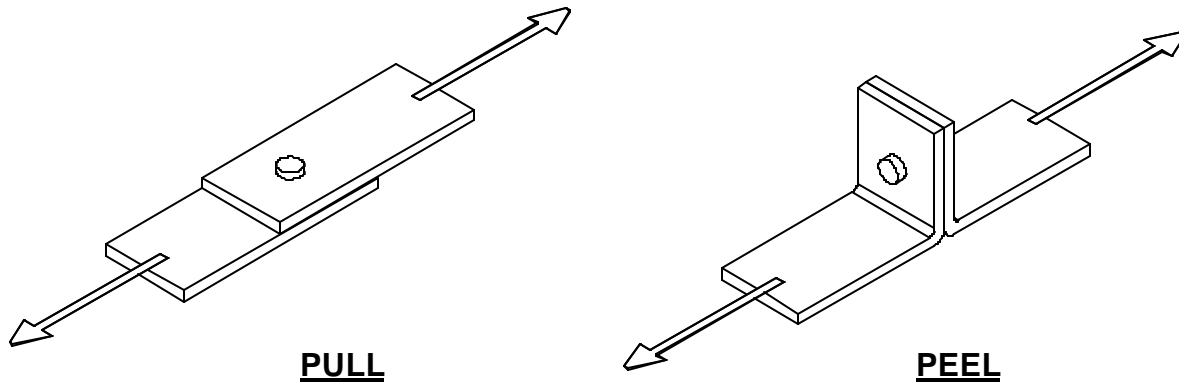
5) <u>Common materials:</u>	<u>Capacity (MD):</u>	<u>Capacity (LD):</u>
Stainless steel	Not usually possible	Not usually possible
High carbon steel	Not usually possible	Not usually possible
Commercial quality steel	0.062" + 0.062" max	0.032" + 0.032" max
Galvanized steel	0.062" + 0.062" max	0.032" + 0.032" max
Drawing quality steel	0.062" + 0.062" max	0.032" +
0.032" max		
Aluminum	0.062" + 0.062" max	0.032" + 0.032" max
Copper	0.062" + 0.062" max	0.032" + 0.032" max
Brass	0.062" + 0.062" max	0.032" + 0.032" max

DIE SELECTION:

- 1) There are three sizes of dies required to cover the complete range of material that the SURE-LOK 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)

<u>MD</u> <u>Die size</u>	<u>Material thickness</u> <u>(punch + die side)</u>	<u>LD</u> <u>Die size</u>	<u>Material thickness</u> <u>(punch + die side)</u>
MD #50	0.062" + 0.062"	LD #30	0.032" + 0.032"
	0.062" + 0.052"		0.032" + 0.028"
	0.062" + 0.040"		0.028" + 0.028"
	0.052" + 0.052"		0.028" + 0.022"
	0.052" + 0.040"		0.022" + 0.022"
MD #40	0.040" + 0.040"	LD #25	0.022" + 0.022"
	0.040" + 0.034"		0.022" + 0.019"
	0.040" + 0.028"		0.019" + 0.019"
	0.034" + 0.034"		0.019" + 0.016"
	0.034" + 0.028"		0.016" + 0.016"
	0.034" + 0.022"		
	0.028" + 0.028"		
0.028" + 0.022"			
MD #30	0.022" + 0.022"	LD #20	0.016" + 0.016"
	0.022" + 0.018"		0.016" + 0.013"
	0.022" + 0.014"		0.013" + 0.013"
	0.018" + 0.018"		0.013" + 0.010"
	0.018" + 0.014"		0.010" + 0.010"
0.014" + 0.014"			

JOINT STRENGTH:



- 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	Joint strength		Recommended Die
	PULL	PEEL	
#50 0.06"	475 lb.	175 lb.	MD
#50 0.05"	430 lb.	150 lb.	MD
#40 0.04"	400 lb.	120 lb.	MD
#40 0.03"	375 lb.	100 lb.	MD
#40 0.02"	285 lb.	70 lb.	MD #30

LIGHT DUTY

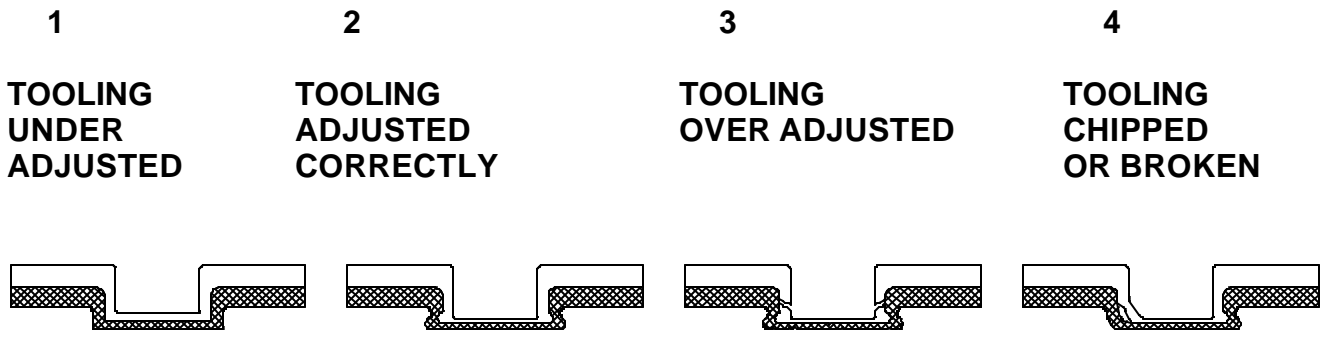
Material thickness Each / two ply	Joint strength		Recommended Die
	PULL	PEEL	
0.030"	200 lb.	35 lb.	LD #30
0.025"	185 lb.	28 lb.	LD #30
0.020"	175 lb.	24 lb.	LD #25
0.015"	150 lb.	18 lb.	LD #20
0.010"	120 lb.	15 lb.	LD #20

JOINT FAILURE

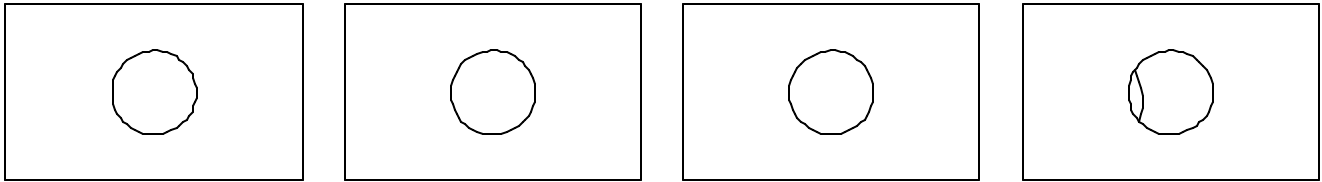
- 1) If pulled hard enough any clinchlok joint will pull apart.
- 2) There are two usual ways for a clinchlok to pull apart;
 - a) **NON TEARING FAILURE**
The two halves of the joint will pull apart leaving a male joint half (punch side) and a female joint half (die side).
 - b) **TEARING FAILURE**
The 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 than 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).
- 7) If the peel strength of a correctly adjusted joint is much less than 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).

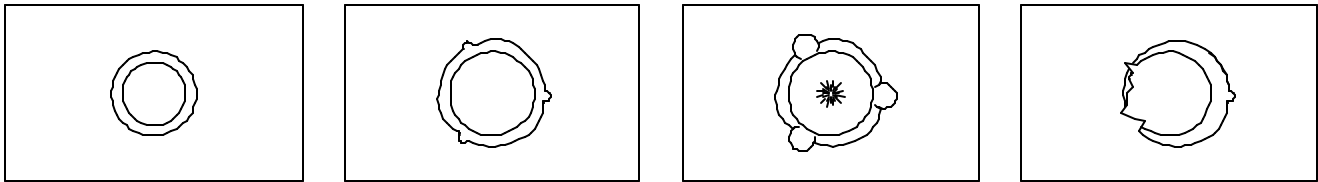
VIEWS OF THE CLINCHLOK JOINTS.



CROSS SECTION OF JOINT



TOP VIEW OF JOINT (PUNCH SIDE)



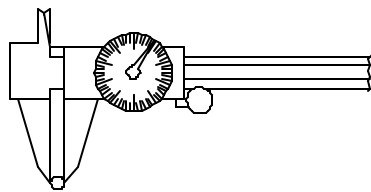
BOTTOM VIEW OF JOINT (DIE SIDE)

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.

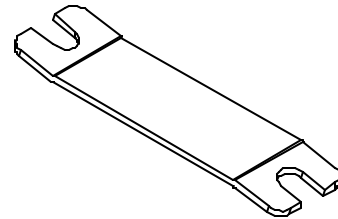
NOTE!

- 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.



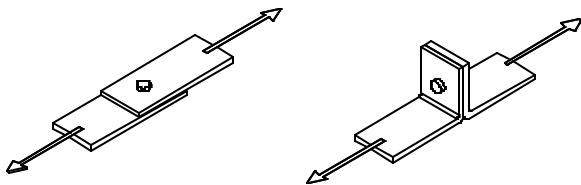
checking Button Cap Dia
With a Caliper

MAX

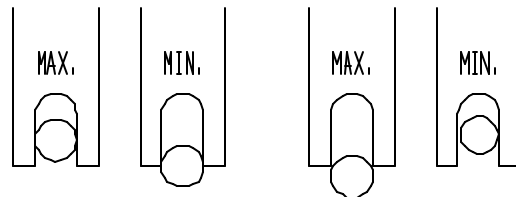


TOLERANCE GAUGE

MIN



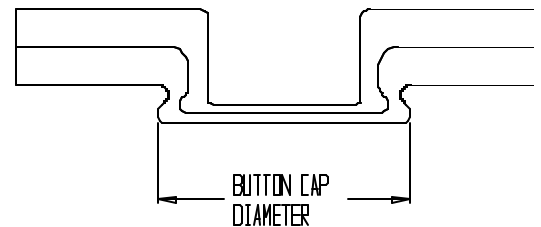
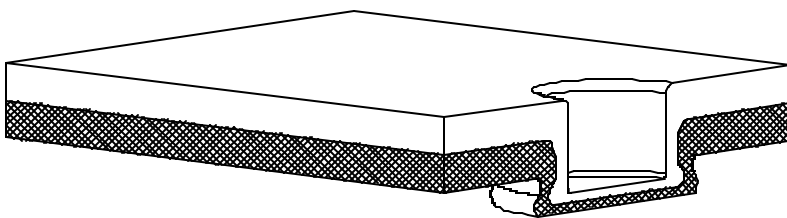
PULL AND PEEL TESTING.



Good Joint

Not Acceptable

TESTING BUTTON CAP DIAMETER.



PUNCH ADJUSTMENT **PRINCIPLE**

- 1) The punch must be adjusted to produce the correct amount of "squeeze" between the punch and die when the joint is made.
- 2) As described earlier, the correct punch adjustment is very important for producing a good joint and to maximize punch and die life.
- 3) The aim of punch adjustment is to produce minimum "squeeze" that will produce a good joint.
- 4) 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.

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

PROCEDURE: SEE DRAWING ON PAGE 22

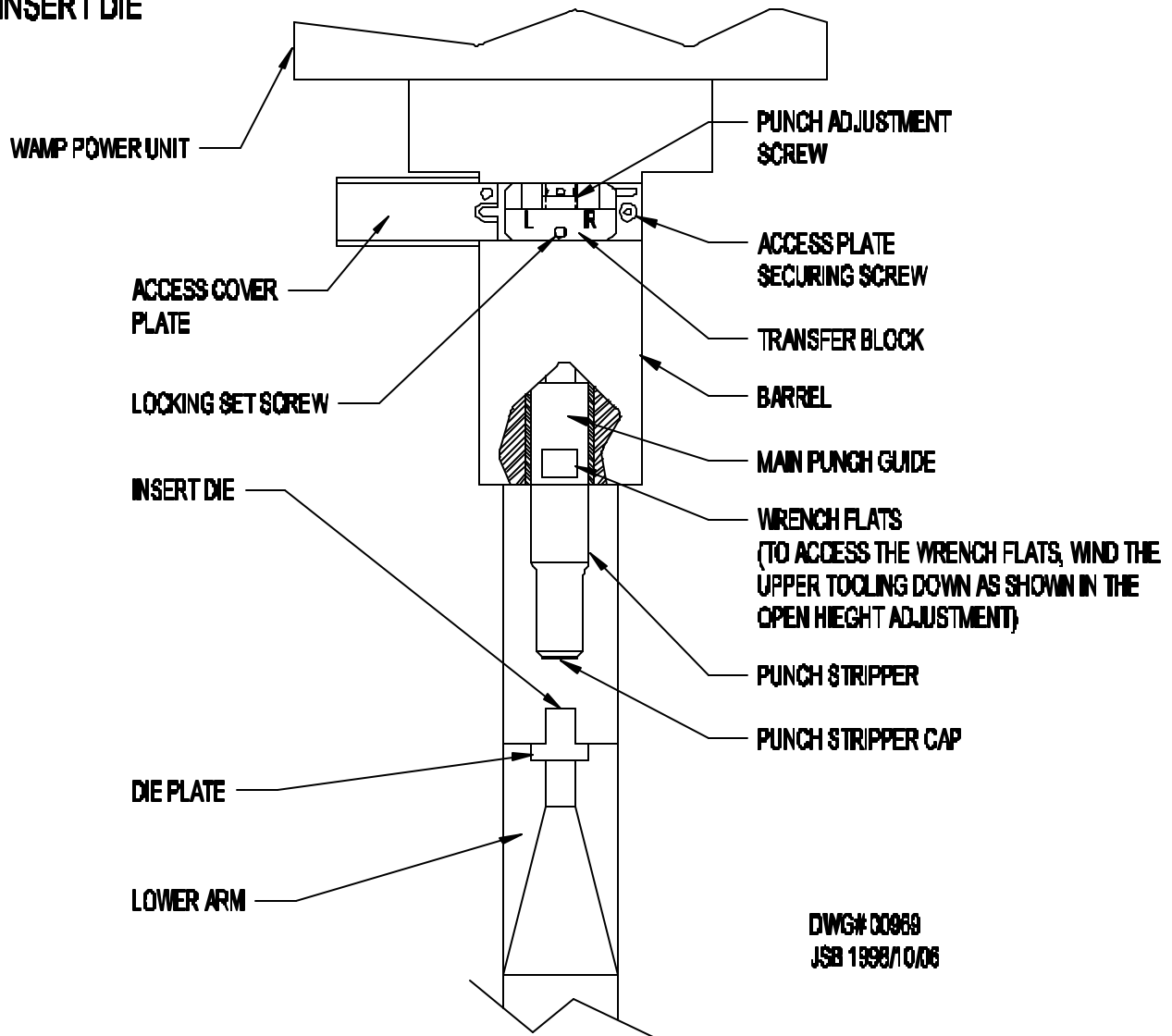
- 1) Make sure that the correct die has been selected for the material to be fastened.
- 2) Make sure the automatic return is set correctly. The punch cannot be set correctly if the automatic return is set too fast.
If in doubt slow the return to a 3-second delay when setting the die adjustment. (See maintenance section for adjustment)
- 3) Make sure that the pressure on the inlet filter is set correctly.
- 4) Loosen (do not remove) access plate securing screw, and slide 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. It may be necessary to wind down the daylight adjuster on top of the "Wamp" power unit to gain full access to the punch adjustment features. Set the punch / die gap to 1/2" for punch adjustments.
- 5) Turn the punch adjusting screw counter clockwise (towards the 'R'), 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 the die is set too high in the lower arm and the die will have to be reset to a lower position.

- 6) **OBSERVE ALL SAFETY PRECAUTIONS, AND MAKE SURE ALL GUARDS AND COVER PLATES ARE IN PLACE.**
- 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 adjuster screw clockwise (towards the "L") 1/6th turn, lowering the punch.
- 10) Make a joint and check the joint strength.
- 11) If the joint is still weak lower the punch by 1/6th 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) If it is found that the punch tip extends below the stripper when adjusted correctly then the die is set too low in the lower arm and the die will have to be raised.
- 14) Tighten the locking set screw and replace the barrel cover.
- 15) Replace the lexan guard.
- 16) Re-adjust automatic return (if altered).

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



**ADJUSTABLE UPPER TOOLING
DETAIL WITH SLIDE PLATE
AND INSERT DIE**



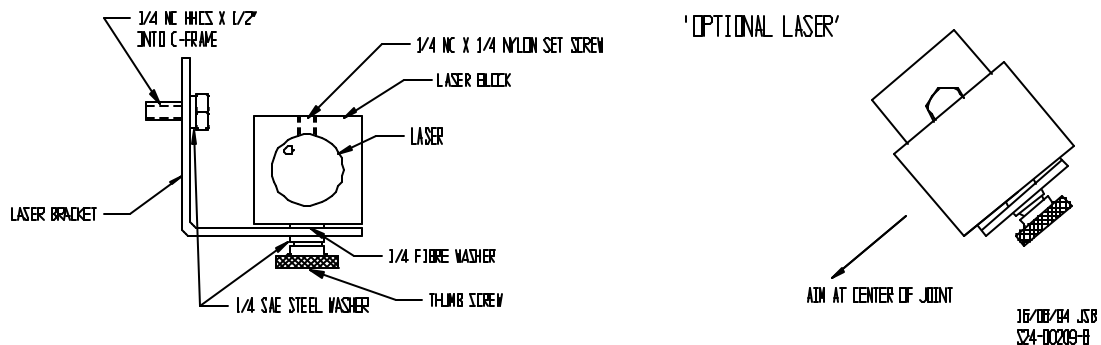
DWG# 00888
JSB 1998/10/06

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.**

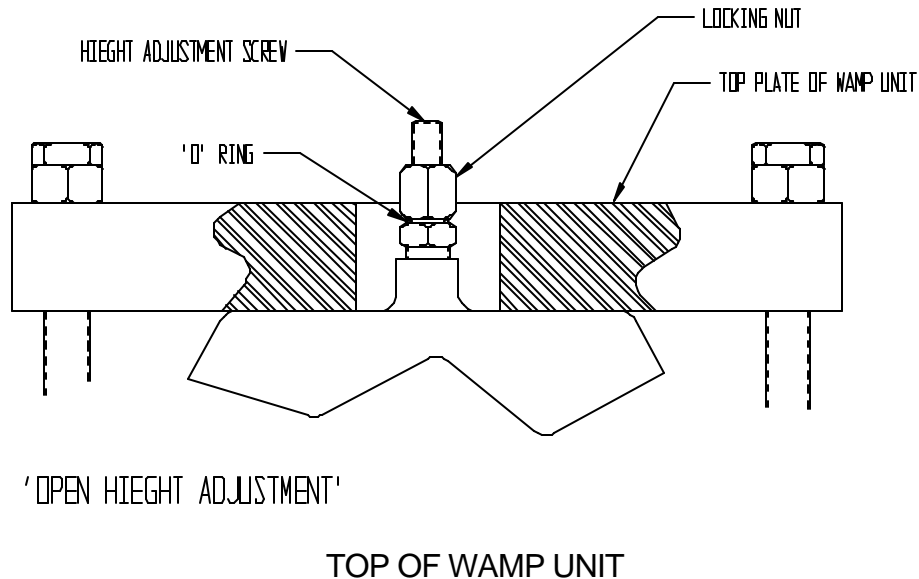
- 1) The SURE-LOK can be fitted with a laser guide to help locate the center of the joint.
- 2) The laser bracket is mounted as shown on the right side of the "C" frame, with the Laser holder mounted on top of the bracket.
- 3) The laser is powered by a low voltage power supply that is plugged into any 110v receptacle.
- 4) The laser is turned on by a small switch on the back of the unit. There is a beam cover on the front of the laser that can be swung out of the way.
- 5) If necessary the laser can be focused with a small tool provided with the laser, the focus ring is in the front of the laser. Let the laser beam shine through the focus tool.
- 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.



OPEN HEIGHT ADJUSTMENT:

The stroke of the SURE-LOK is factory set at 1" (or optional ½"). This will give a maximum open height - (the gap between the punch and the die), of 1" or ½".

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.



PROCEDURE:

- 1) Disconnect the air supply and drain the air tank.
- 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) Re-tighten the locking nut.
Do not over tighten - there is an "O" ring seal below the locking nut.
- 5) Re-connect the air supply.
- 10) This adjustment will not effect the joint and the die will not have to be adjusted.

MAINTENANCE

DAILY:

- 1) MAKE SURE ALL GUARDS AND SAFETY EQUIPMENT ARE IN PLACE.
- 2) Drain moisture from air tank.
- 3) Check and clean air filters.
- 4) Maintain correct inlet air pressure.
- 5) Check and maintain correct air regulator pressure.
- 6) Check automatic return and adjust if necessary.
- 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.
 - b) Correct punch adjustment.
- 10) Check tightness of all bolts especially those on the lower arm.
- 11) Check for air leaks.

MAINTENANCE - REPLACING DIE (see drawing next page)

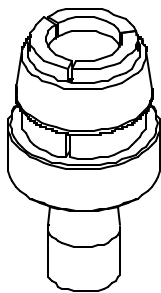
- 1) REMOVE THE AIR SUPPLY TO THE PRESS AND DRAIN ALL THE AIR FROM THE AIR TANK.
- 2) Loosen the die securing screw.
- 3) Remove the die by pulling out of the die plate.
- 4) Clean and oil the new die and install into the die plate. The new die should sit flush with the top of the die plate.
- 5) Retighten the die securing set screw.
- 6) REPLACE THE LEXAN GUARD if it has been removed.
- 10) Connect air supply.
- 10) Test the joint and set punch adjustment as described previously in the manual.

MAINTENANCE - REPLACING DIE COMPONENTS

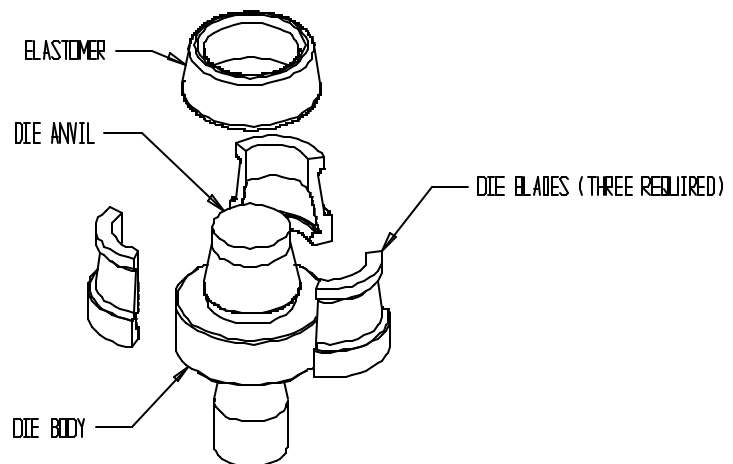
DIE INSERT ASSEMBLY

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 plate/holder.

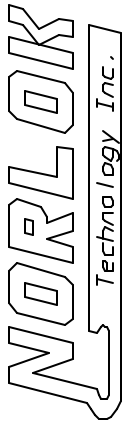
ASSEMBLY



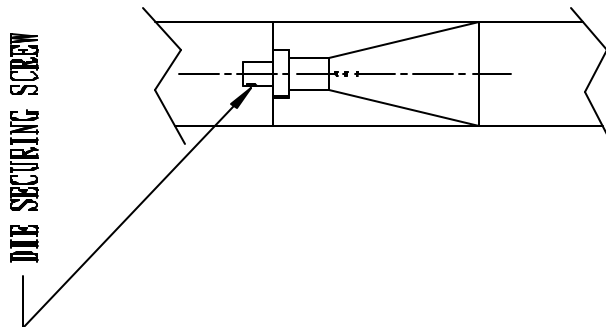
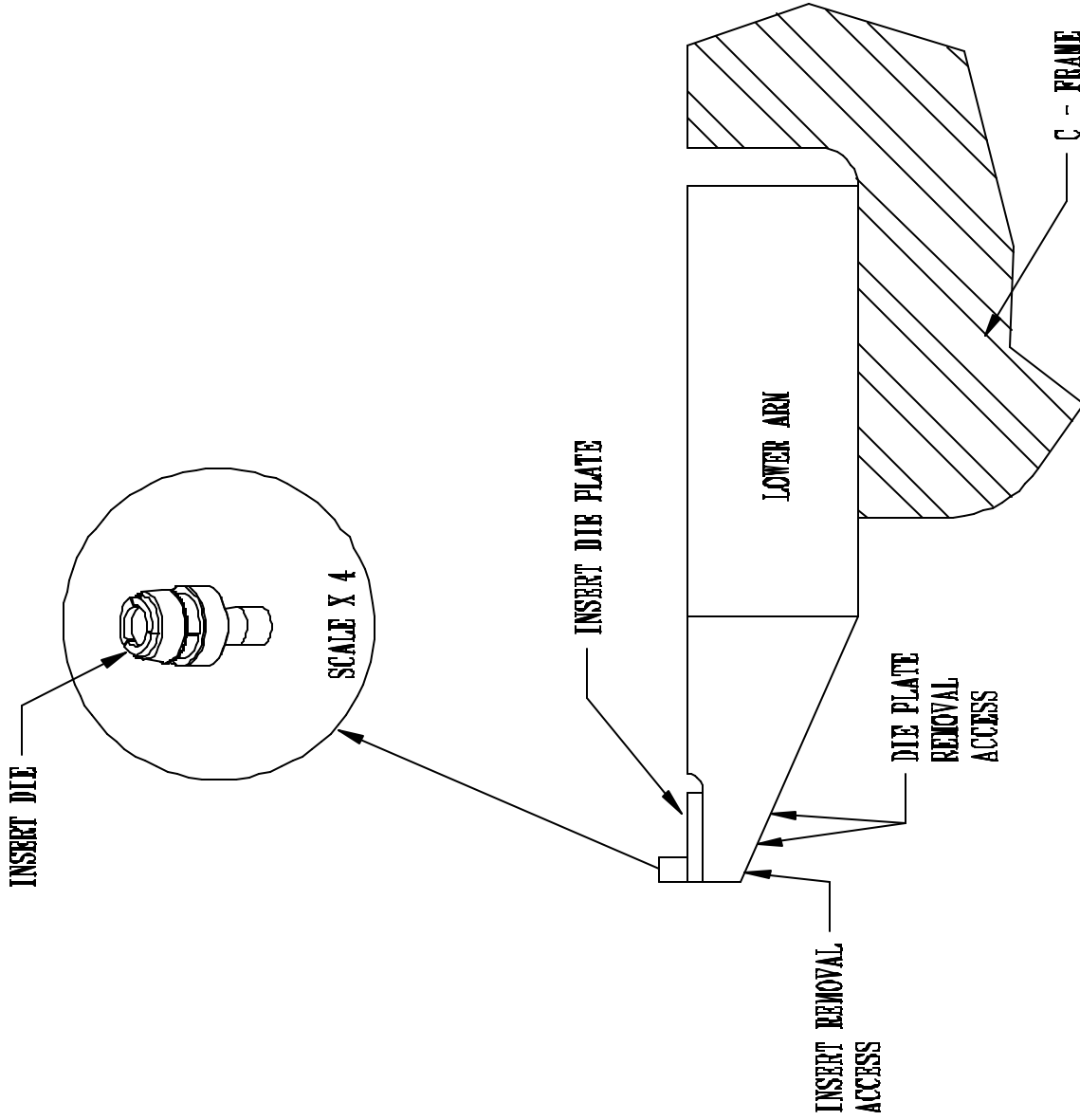
EXPLODED VIEW



N.B. IT IS NOT NECESSARY TO REMOVE THE DIE PLATE



SURELOK
CHANGING DIE DETAIL



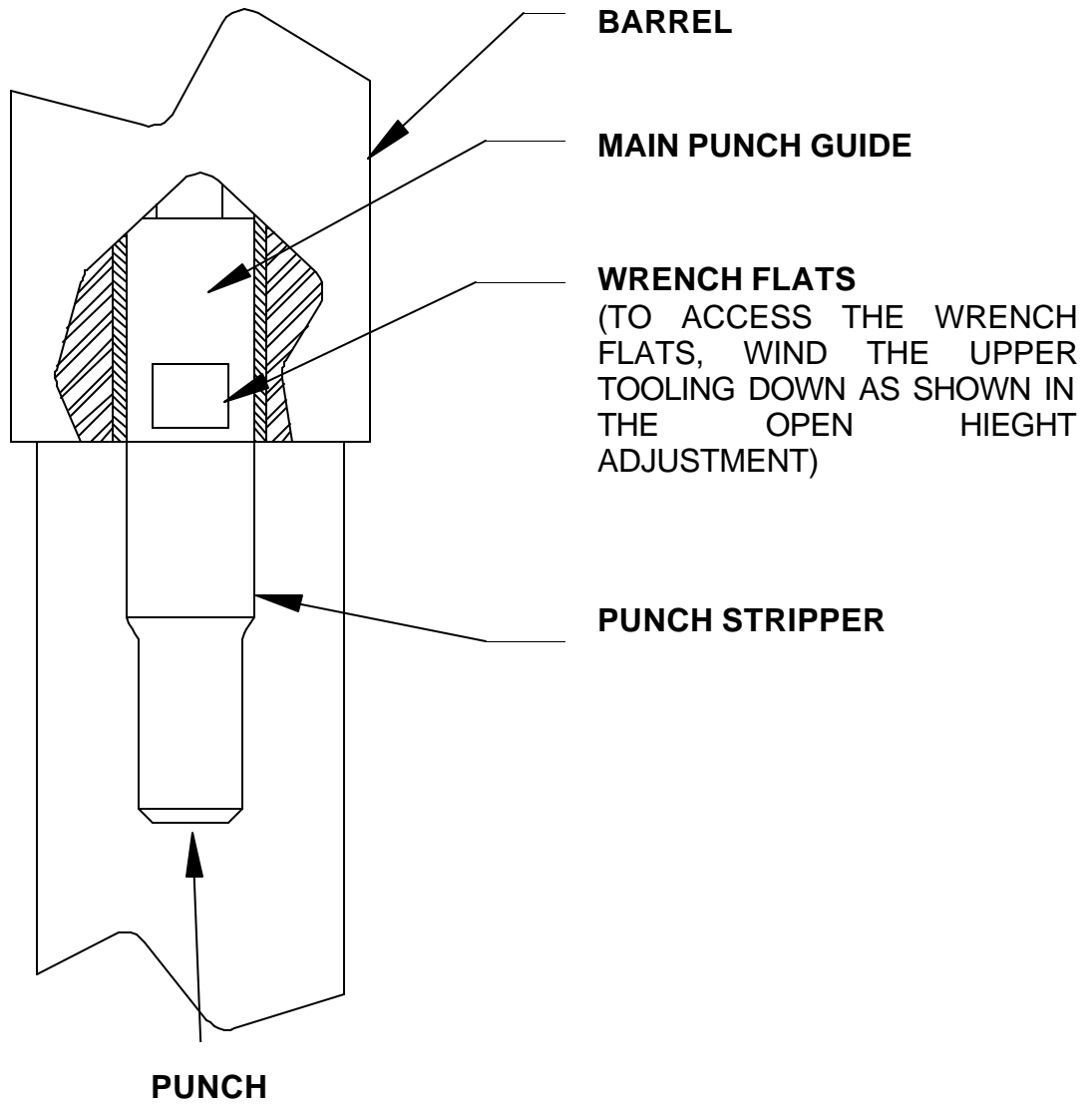
MAINTENANCE - REPLACING PUNCH: (see diagram next page)

- 1) **TURN OFF AIR SUPPLY AND DRAIN ALL THE AIR FROM THE AIR TANK.**
- 2) Remove the lexan punch guard.
- 3) Wind the Open Height Adjustment Screw to achieve maximum open height (**pg 24**)
 - for a standard 1" stroke machine go to step 4
 - for a ½" stroke machine remove the die plate to allow clearance for the removal of the punch stripper

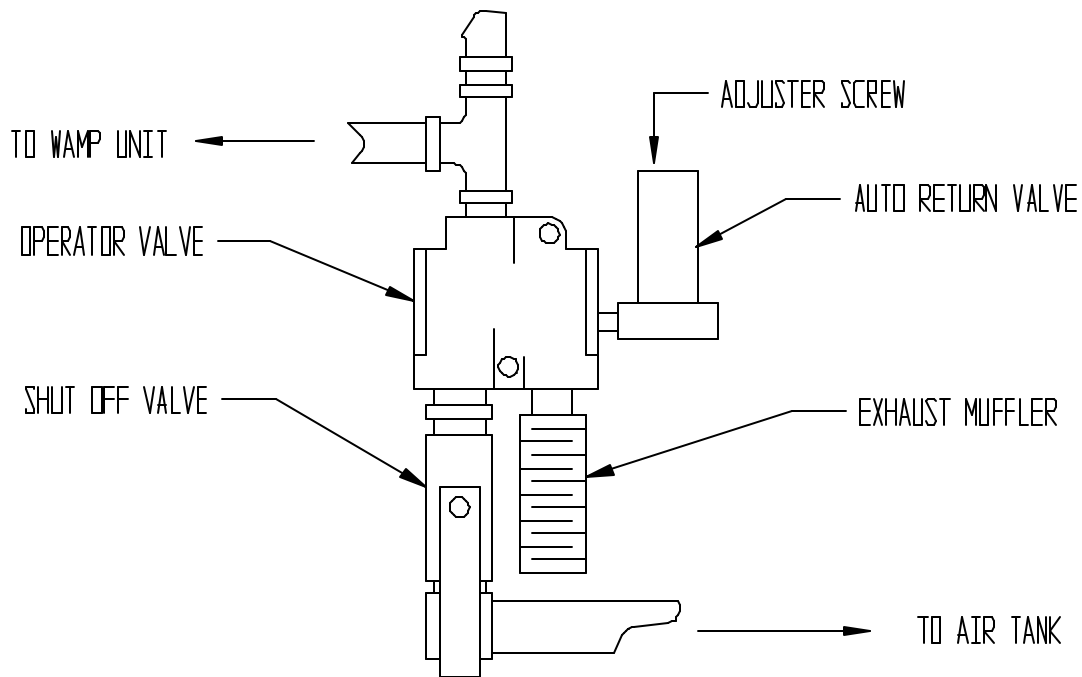
REMOVING THE DIE PLATE (die plate held in place by ¼" SHCS & 2 dowel pins)

 1. Remove ¼" socket head cap screw from top of the die plate
 2. Remove the die plate. If necessary gently tap the die plate from beneath using a 1/8 drift alternately in each of the two die plate access holes located in the bottom of the lower arm (see page 27) **NB do not use insert removal access hole bottom front of arm**
 3. Two locating dowel pins should remain in the lower arm
- 4) 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.
- 5) 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).
- 6) Remove the punch stripper and punch from the machine and remove the punch from the stripper.
- 7) 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.
- 8) Slide the punch and punch stripper back onto the punch guide.
- 9) Tighten the stripper cap onto the punch guide and re-adjust the daylight gap if it has been altered.
- 10) If it has been removed, install the die plate and tighten the die plate securing screw.
- 11) Install the lexan punch guard and re-connect the air supply.
- 12) The upper punch may have to be adjusted to suit the new punch, so check the joint quality before putting the press back into production.

SURE-LOK UPPER TOOLING DETAIL



MAINTENANCE - AUTO 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 pressure 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 - PRESSURE ADJUSTMENTS

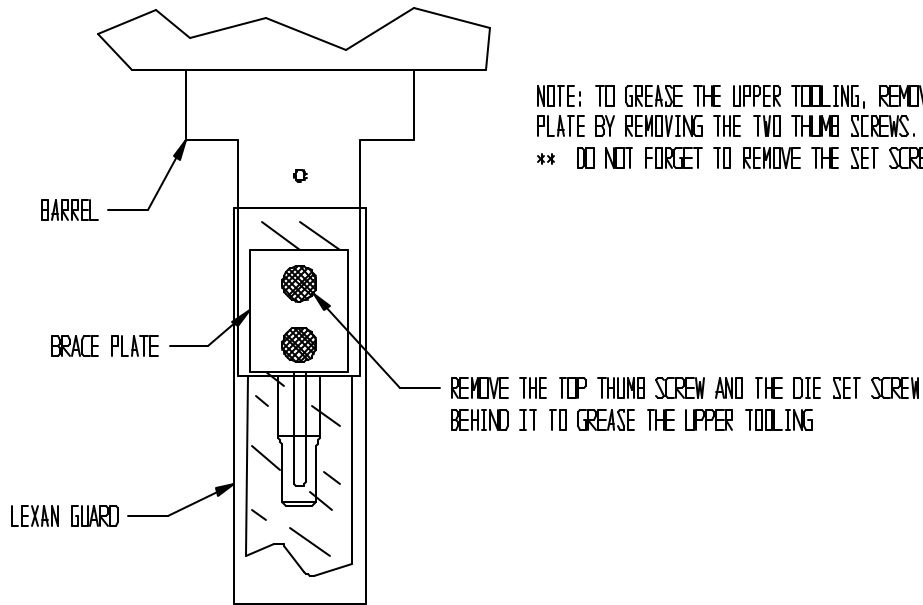
- 1) Supply the machine with 125 PSI (max) 80 PSI (min) clean dry air. We recommend a 1/2" (min) air line at 120 psi.
- 2) The inlet pressure regulator must be set as follows;

Medium Duty tooling	100 PSI.
Light Duty tooling	80 PSI.
- 3) If aluminum is to be joined, the regulator can be lowered by 20 PSI.

MAINTENANCE - FILTER DRAINING

- 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" units and the breather on the front of the barrel should not require cleaning or replacing under normal use.

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 six months.
- 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 a grease hole in the barrel.
- 3) Disconnect the air supply to the press and drain all air from the reservoir tank.
- 4) Remove the two thumbscrews securing the lexan front punch guard to the barrel and remove the guard.
- 5) Remove a 1/4" NF set screw that is located in the upper of the two 1/4" NF screw holes with a 1/8" hex key wrench. This set screw is not visible from the outside of the barrel and is used to seal in the grease.
- 6) Make sure that the upper tooling is between 1/4" and 1" from the lower die (adjust the open height if required).
- 7) Force grease into the grease hole (a grease fitting can be used if required). Do not over grease or a hydraulic lock can occur. Two pumps with a grease gun should be all that is required every six months.
- 8) Remove the grease fitting (if used) and install the set screw back into the grease hole so that it bottoms out in the hole.
- 9) Reinstall the lexan guard and thumbscrews.
- 10) The upper tooling is now greased and the press is ready for production.

SURE-LOK: Trouble Shooting - Press Operation

Problem	Cause	Solution
1. Press does not operate with the foot pedal.	Air pressure too low Upper tooling sticking Operator valve stuck. Auto return valve set too fast.	Set inlet pressure to 100 psi. Remove and repair. Clean Adjust to 1-second return delay.
2. Press does not return when foot pedal is released.	Auto return valve failed. Foot pedal exhaust filter blocked. Operator valve jammed. WAMP mufflers blocked.	Replace. Replace. Clean or replace. Remove and clean.
3. Press does not return unless the foot pedal is released.	Auto return valve set too slow. Auto return valve failed.	Adjust to 1-second return delay. Replace.
4. Weak joint or no joint formed.	Low air pressure. Auto return set too fast. Broken or damaged punch or die. Major air leak in WAMP power unit.	Set to 100 psi. Adjust. Replace. Replace.

SURE-LOK Trouble Shooting - Problem with joints

A. Total failure of joint (also see section C - deformed or distorted joints)

Problem	Cause	Solution
A. No clinch formed	Broken punch or die. Air pressure too low. Auto return too fast.	Replace tool Adjust to 100 psi. Adjust to 1-second delay.
B. Clinch partially formed.	Metals not of specified thickness. Low air pressure or auto return set too fast. Die elastomer broken or weak. Incorrect tooling for metal being used Incorrect die adjustment.	Use specified metals or use proper die. Adjust. Replace. Verify joint data. Change tooling if necessary. Adjust die height.
C. Piercing or cracking on punch side of joint.	Metal not of specified thickness Incorrect tooling for metals Weak or broken elastomer. Punch-die not concentric.	Correct material Change tooling Replace. Realign tooling

B. Intermittent Failure

A. Same tooling produces intermittently good & bad parts	Insufficient stripper force to compensate for part variation or non-mating parts Parts do not fit gauging or nesting Parts interfere with tooling operation	Correct parts to conform-increase stripper force Correct parts or gauging to fit Correct parts gauging to allow clearance
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C. Deformed or Distorted Joints

<p>A. Cracks appear on clinch</p>	<p>Metals not of specified thickness or hardness</p> <p>BD too large, tooling over adjusted</p> <p>Incorrect tooling for metals</p> <p>Punch/die not concentric</p> <p>Excessive deflection</p>	<p>Change die</p> <p>Lower die.</p> <p>Change tooling</p> <p>Realign tooling</p> <p>Check for damage</p>
<p>B. Cracks appear inside joint cup</p>	<p>Metals not of specified thickness or hardness</p> <p>Tooling incorrect for metals</p> <p>Punch/die not concentric</p> <p>Weak or broken stripper spring</p>	<p>Use specified metals or change to proper tooling</p> <p>Change tooling</p> <p>Realign tooling</p> <p>Replace spring</p>
<p>C. Concentric Irregularity on clinch</p>	<p>Chipped punch or die</p>	<p>Replace</p>
<p>D. Concentric double clinch</p>	<p>Missing non-functional stripper</p> <p>Double hit</p>	<p>Replace or repair stripper</p> <p>Check controls or operator</p>
<p>E. No back flow of clinch round top "squeezed"</p>	<p>Broken or weak stripper spring</p>	<p>Replace spring</p>
<p>F. Partial back Flow of clinch</p>	<p>Die leaf missing or opened before joining</p> <p>Deflection in frame or tool holder</p>	<p>Check for broken leaf or elastomer</p> <p>Check for damage</p>

C. Deformed or Distorted Joints (Cont.)

G. Dimpling and unformed clinch	Die leaf missing Retaining ring leaf open	Replace leaf Replace ring
H. Scarring of top material	Heavy: stripper spring bottoming-insufficient spring travel. Light die not protected adequately	Replace with correct stripper Add leaf shielding
I. Clinch not round	Leaf not open Deflection is binding leaves Flexing of force frame Punch and die are not concentric	Check for interference Check leaf guarding Check for damage Realign tooling
J. Parts are distorted during joining	Insufficient stripper force Stripper tip too small Die not protected Die leaf below shield Mis-gauging / nesting	Replace stripper spring to suit Replace with large diameter Add Blade shield Adjust shield height Adjust or replace gauging/nesting to suit.

SURE-LOK INSERT STYLE

SPARE PARTS LIST

DESCRIPTION:	LD PART #	MD PART #
Punch (upper tooling)	400287	400265
Die insert # 20 (white)	403815	N/a
Die insert # 25 (purple)	403941	N/a
Die insert # 30 (yellow)	403942	405061
Die insert # 40 (blue)	N/a	405063
Die insert #50 (red)	N/a	405065
Elastomer	404510	404500
Die blade (3 required.)	404053	403471
Insert Die Plate	400958	400956
Die retaining screw	300149	300240
Punch Stripper (standard)	000204	000204
Punch stripper cap	000331	000332
Laser (c/w holder and bracket)	900001	900001
Operator Valve (standard)	200013	200013
Inlet Filter/Reg. (standard)	200026	200026
Operator valve (high speed)	200096	200096
Inlet filter (high speed)	200094	200094
Inlet regulator (high speed)	200093	200093
Auto return Valve	200015	200015
Foot Pedal	200032	200032
Lexan Punch Guard	000253	000253
WAMP exhaust mufflers. (3 requ.)	200009	200009
WAMP quick exhaust (3 requ.)	200008	200008
WAMP L90 complete (exchange unit)	900002	900002
Stroke adjusting spacer (1/8")	000592	000592
Stroke adjusting spacer (1/4")	000593	000593
Stroke adjusting spacer (1/2")	000594	000594