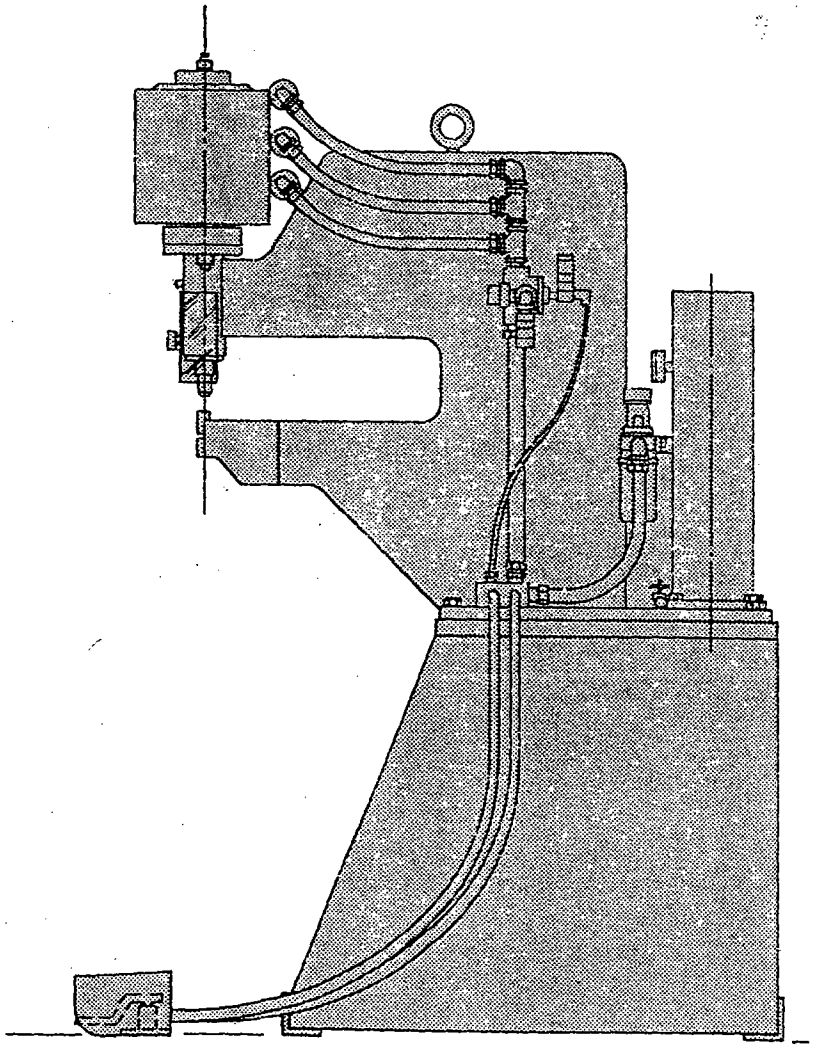
QUICLOK

MEDIUM DUTY
OPERATION AND INSTRUCTION MANUAL



Made in America by LOCKFORMER

CAUTION

To provide clarity to points in question the illustrations and photographs contained herein are shown with cover(s) removed

NEVER OPERATE THIS EQUIPMENT UNLESS ALL COVERS AND GUARDS ARE IN PLACE !

SAFETY FIRST

IMPORTANT! READ THIS

Common sense and **extreme** care must be used at all times during the operation and maintenance of this equipment. It is important that **ALL** personnel who will operate, maintain, or supervise the use of this equipment read and understand the sections of this manual concerning **SAFETY** and the **OPERATION** of the equipment.

The equipment described in this manual was designed and manufactured for a specific function. It should not be used for any other purpose or outside of the design specifications as this may be hazardous. Modifications or additions to this equipment should not be made without consulting the Lockformer Co.

Replacement and maintenance parts should be equal to the original equipment. Use of other parts may result in unsafe operation. If there is a question to the suitability of a part, The Lockformer Co. should be consulted.

In general, every piece of equipment must be treated as dangerous. While operating or maintaining this equipment, each person must be aware of his own safety as well as the safety of all bystanders.

SIGN OFF SHEET FOR ALL EMPLOYEES

It is the employer's responsibility to instruct all persons who may come in contact with this equipment on the safe operation and maintenance of this equipment. Have each person read the sections of this manual concerning SAFETY and the OPERATION of the equipment. If a language barrier or other restriction limits understanding, this manual can be read to the individual with appropriate follow up questions to verify understanding. Have each individual sign below only after demonstrating their understanding of the safety practices described in this manual.

I verify that I have read and understand the safety and operation sections for this equipment installation:

NAME	DATE	NAME	DATE

Remember that this manual is only a portion of an adequate training program. It must be coupled with specific instructions for your application along with full information of national and local safety regulations that may apply.

TABLE OF CONTENTS

GENERAL SAFETY GUIDE

You are not ready to operate this equipment if you have not read and understood the safety information in this manual.

LOCKFORMER

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.

SAFETY GUIDELINES

Before operating the machine, study and follow the safety precautions in this section. These precautions are intended to prevent injury to you and your fellow workers. They cannot, however, cover all possible situations. Therefore, EXERCISE EXTREME CAUTION before performing any procedure or operation.

Safety Precautions BEFORE Starting The Machine(s)

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 tagouts** to prevent accidental start-up when performing maintenance procedures.

Keep your hands away from internal workings of the machinery when starting, running or stopping.

Keep your work area clean. Remove all scrap, oil spills, rags, tools and other loose items that could cause you to slip, trip and fall.

When cleaning the machine or any of its components, do not use toxic or flamable substances. Do not perform any cleaning while the equipment is running.

Never override or disable any safety switch or safety interlock.

If equipped make sure that hydraulic and pneumatic pressures are at specified levels before operating this equipment.

Do not operate the rollformer unless <u>all</u> covers are in place.

Be sure that this Instruction Manual is kept near the machine so the operator can refer to it when necessary.

Keep this equipment properly maintained.

Always turn off power to the machine(s) at the main disconnect before performing any maintenance or adjustments so accidental start-up or electrocution cannot occur.

Safety Precautions WHILE Operating The Machine(s)

Never leave the work area while the equipment is in operation.

Always be alert while operating machinery.

Be alert for loose, worn or broken parts. Do not attempt to operate any machinery with such parts present or if the machinery is making unusual noises or actions.

Avoid skin contact, prolonged breathing, or eye exposure to any stock lubrication fluid being used.

Be aware of the locations of the **Power Off** or **Emergency Stop** button in case of an emergency.

Be sure all guards and covers are in place.

Continually observe the rollforming process and related equipment. If any unusual condition develops, immediately stop and inspect the machine.

Protect yourself ! Wear safety glasses. Do not wear loose clothing, neckties, or jewelry. If long sleeves must be worn, avoid loose cuffs and buttons. Tie back and contain long hair.

Never adjust any roll feature or perform work near the rolls while they are running.

General

If any pneumatic or hydraulic feature is used, disconnect the main supply and exhaust pressure or bleed the lines to prevent cycling on retained pressure.

Always shut off the power at the main disconnect switch before entering the electrical control box.

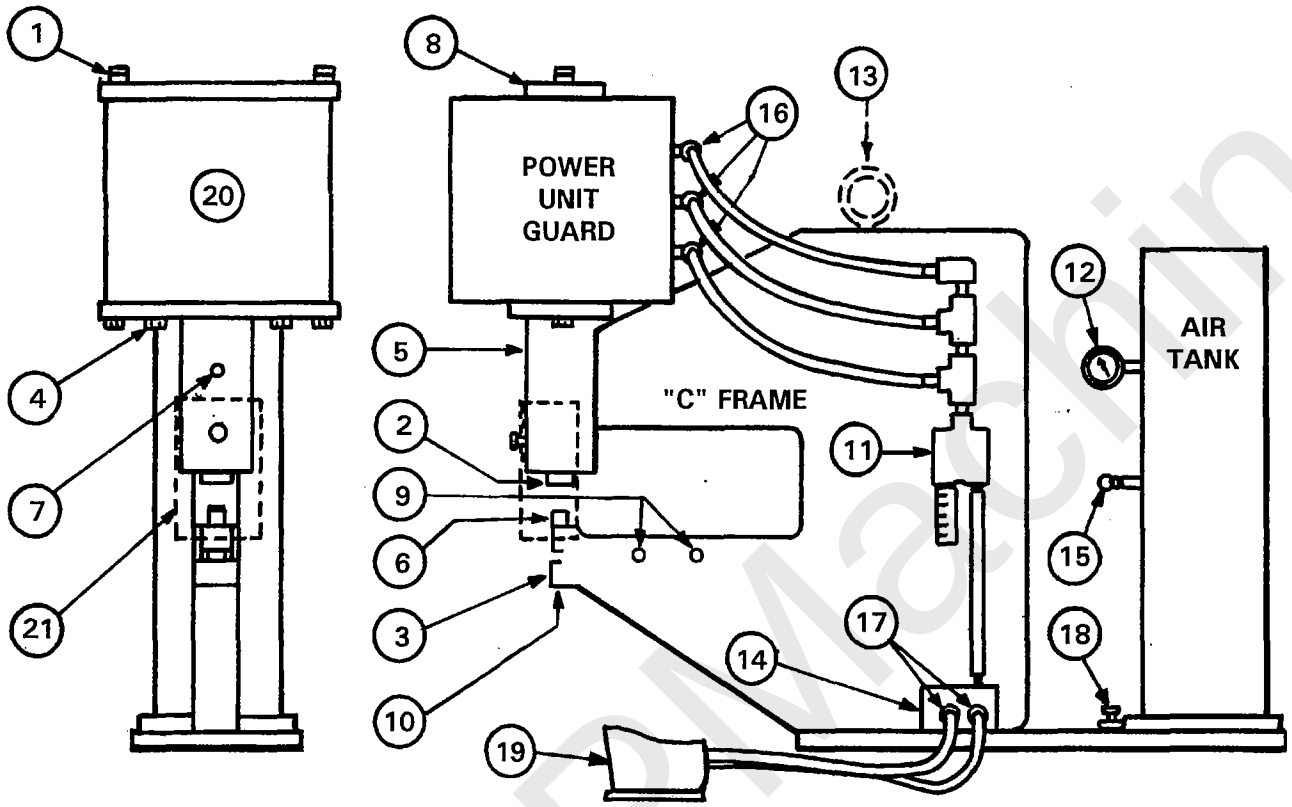
Do not use compressed air to clean the machines. Air pressure may drive dirt and small chips into the machine(s) bearing surfaces or cause bodily injury.

IMPORTANT **The information contained herein is to be used as a general guide only. For further safety information obtain and read the ANSI bulletin entitled: ANSI B11.12-1996 Rollforming and Roll-Bending Machines Safety Requirements for Construction, Care and Use.**

CONTACT: American National Standards Institute
11 West 42nd Street
New York, New York 10036

GENERAL ARRANGEMENT
ILLUSTRATION 1

High Speed Air Valve
61522



1. GUARD/SUPPORT NUT & LOCK NUT (10" CENTERS)
2. UPPER TOOLING ASSEMBLY (SEE PAGE 3)
3. SET SCREW (BOTH SIDES) PT.#62927
4. POWER UNIT NYLOK NUT (2) 4-3/4" CENTERS
5. C FRAME BARREL
6. DIE (BUTTONLOK) SEE PAGE 6
7. BREATHER PT.#61516
8. POWER UNIT TOP SUPPORT
9. BOLT HOLES FOR WORK PIECE TABLE (IF FITTED)
10. ADJUSTER SCREW PT.#42026
11. Filter + Regulator ~~AIR VALVE~~ PT. # 61539
12. AIR TANK GAUGE PT.#61540
13. LIFTING POINT
14. C FRAME AIR MANIFOLD PT.#25941
15. AIR SUPPLY INLET
16. QUICK EXHAUST PT.#61524
17. FITTINGS TO FOOT PEDAL PT. #61521
18. AIR TANK DRAIN PT.#61544
19. FOOT PEDAL PT.#55125
20. POWER UNIT PT. #420303
21. PLASTIC GUARD PT.#29737

DRAWING NUMBER: 55119

QUICLOK UPPER TOOL ASSEMBLY

PT. # 0420801

ILLUSTRATION 2

60375

Ⓐ PUNCH HEAD
PT. #15740

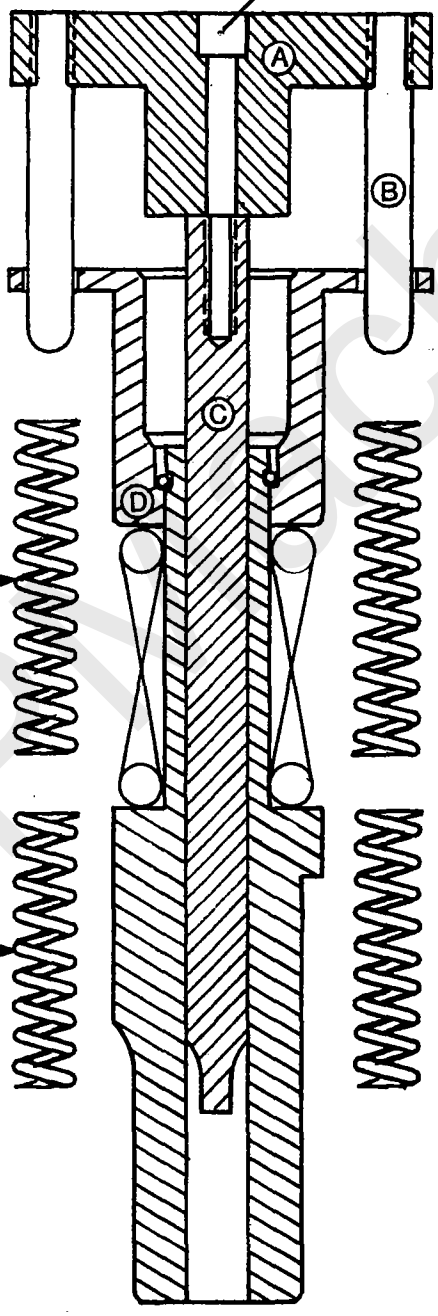
Ⓑ SPRING GUIDES
PT. #42027

Ⓒ PUNCH
PT. #86108

Ⓓ UPPER PUNCH GUIDE
ASSEMBLY PT. #21431

Ⓔ FOUR SPRINGS 3-1/2" LONG
PT. #70977

Ⓕ FOUR SPRINGS 3" LONG
PT. #70978



AIR SUPPLY

Connect air hose to the inlet fitting of the air tank (3/4" or 1" diameter air hose recommended, but 1/2" is the minimum diameter that can be used). Set the Air Regulator to 100 psi by turning the dial on top of the regulator clockwise. The filter should be clean, and lubrication is not necessary. With the unit operating with a stroke of 1", the unit uses approximately 110 cubic inches of air at 100 psi per buttonlok. A four horse power compressor in good condition should be capable of thirty buttonloks per minute.

The Quiclok is now ready to operate with the die mounted. *To adjust for other gauges, or to change dies, please read Die Set Up on page 7.*

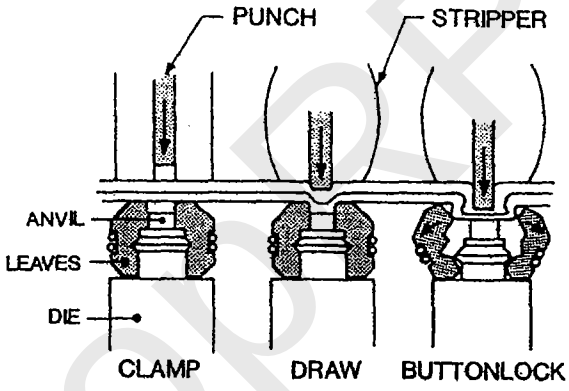
CAUTION - DO NOT ATTEMPT TO ADJUST THE DIE WITHOUT READING DIE SET UP INSTRUCTIONS.

BUTTONLOK DESCRIPTION

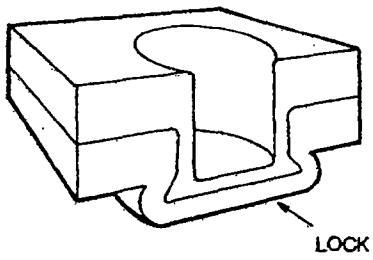
Principle of the Buttonlok

In order to get the best out of your Quiclok, a basic understanding of the buttonlok is advised. The reference numbers in brackets (#), refer to the parts as shown on Illustrations 1 and 2.

PRINCIPLE OF BUTTONLOCK



CROSS SECTION OF A BUTTONLOCK



The buttonlok is formed when the upper tooling (2) squeezes the two layers of material to be joined between the punch (2C) and the die (6). The amount of squeeze is very important to the strength of the buttonlok and to the life expectancy of the punch and die.

The amount of this squeeze is controlled by adjusting the die either towards the punch or away from the punch, with a die adjusting screw (10). For thin material the die will have to be raised (moved towards the punch) and for thick material, the die will have to be lowered (moved away from the punch).

The correct die adjustment is the most critical adjustment on the unit.
Please read the ***Die Adjustment*** section of this manual.

MATERIALS TO BE JOINED

The Quiclok is capable of joining two ply commercial quality mild steel, from 28 gauge to 16 gauge. Both layers of material should be of the same or similar thickness.

If different thicknesses are to be joined (not recommended) the best results will normally be found with the thicker material on the top (punch) side of the two ply.

The top (punch side) material should not be more than twice the thickness of the lower material (die side) and the combined thickness of the two layers should not exceed 0.125".

Other materials can be joined with the Quiclok as long as they are not harder than commercial quality mild steel. In most cases, both plies 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 top (punch side).

Common Materials:	Button Quality:
Drawing Quality Steel	Recommended
Commercial Quality Steel	OK
Copper	OK
Aluminum	Usually OK
Brass	Usually OK
Stainless Steel	Not Usually Possible
High Carbon Steel	Not Usually Possible

DIE SELECTION:

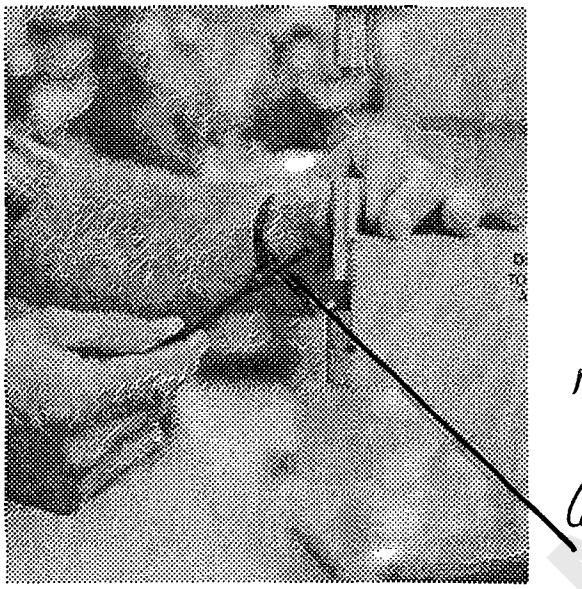
There are three sizes of dies required to cover the complete range of material that the Quiclok can handle. The punch in the upper tooling remains the same. The die selection chart on the next page can be used to find which die will be most suitable for your application, however the chart is a guide only, different types of material may require a different size die.

#50 die	2 ply 16 gauge max	2 ply 18 gauge (min)
#40 die	2 ply 20 gauge max	2 ply 24 gauge (min)
#30 die	2 ply 26 gauge max	2 ply 30 gauge (min)

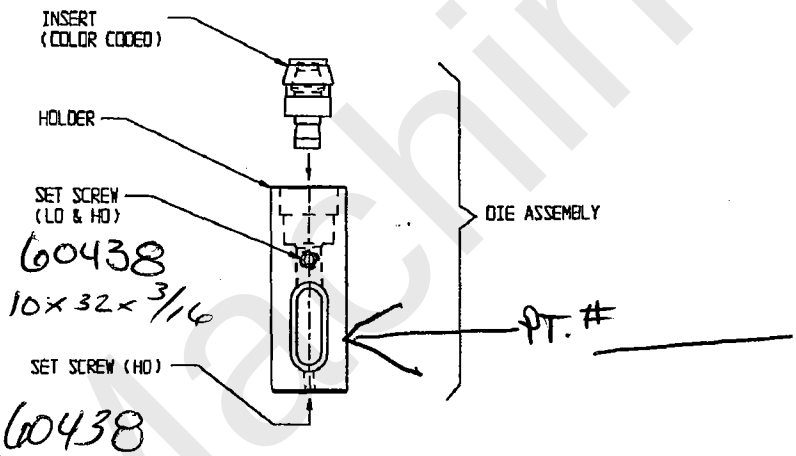
REMOVING THE DIE ASSEMBLY

CAUTION! DISCONNECT AIR SUPPLY AND DRAIN TANK BEFORE REMOVING DIE!

The buttonlok die may be removed by simply removing the Die Securing Screw. See photo and illustration below.



DIE SECURING SCREW



REPLACING THE DIE INSERT

1. Remove the Die Assembly.
2. Loosen the Die Insert Set Screw.
3. Insert an allen wrench up through the hole in the bottom of the die, and push the die insert out the top.
4. Install new die insert, and tighten the Die Insert Set Screw.
5. Install die in Quiclok, and tighten the Die Securing Screw. Lightly oil the die before replacing the die in the machine. The side of the die with the threaded set screw hole faces outward.
6. Replace the Plastic Guard (if removed).
7. Re-connect the Air Supply.

THE MACHINE IS NOW ASSEMBLED
AND READY FOR DIE ADJUSTMENTS

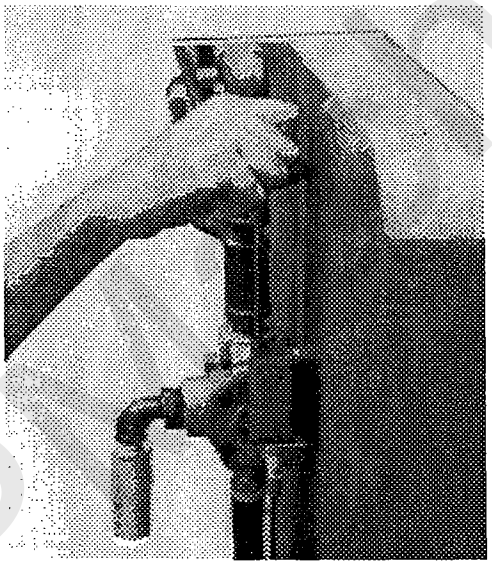
DIE ADJUSTMENTS

REQUIRED TOOLS FOR DIE REPLACEMENT:

15/16" Box Wrench
1/2" Allen Wrench
3/16" Allen Wrench
1/8" Allen Wrench

The die must be adjusted whenever the die has been changed, or a different gauge of material is used. If the material becomes thicker, the die will have to be lowered. Very little adjustment should be necessary.

NOTE: Before any die adjustments can be made, the Automatic Return Valve, mounted on the side of the machine, must be adjusted (by turning the adjusting screw clockwise) so that the press will remain in the buttoning position for at least 3 seconds before automatically returning (see photo). If you're not sure how to adjust the Automatic Return Valve, see page 15.



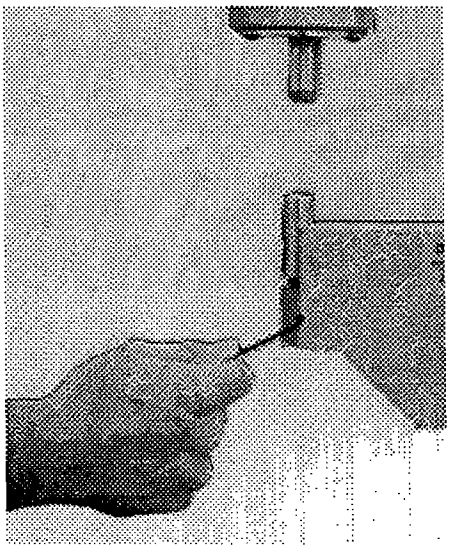
AUTOMATIC RETURN VALVE

It is also necessary to make sure the Pressure Regulator is set to 100 PSI and that at least 100 PSI is maintained in the Air Tank (120 PSI maximum).

TO ADJUST THE DIE

1. Loosen the Die Securing Screw.

2. Loosen the Die Adjusting Retaining Screws on each side of the die.



DIE ADJUSTING RETAINING SCREW

DIE ADJUSTMENT (CONTINUED)

3. Lower the die. Do this by turning the Die Height Adjusting Screw counter-clockwise until the die is as low as it will go.

DIE HEIGHT ADJUSTING SCREW

4. Tighten the Die Securing Screw.

5. With a sample of the material to be joined, try to button lock the two pieces together. Because the die is at the bottom position, Very little, if any buttoning, should be visible. ***It is always best to start with the die set too low and work up to the correct setting.***

6. Turn the Adjusting Screw clockwise 1/4 of a turn, then make a test button lock, carefully noting the button depth. Repeat this process until the machine starts to form a button which seems to have some strength, then start adjusting the die by 1/8 of a turn until a good button is formed.

7. Once a good button seems to have been formed, test it by trying to pull and twist the button loose (see page 11). It's important to remember the amount of force used to pull and twist the button apart. Your feel for the strength of the button will determine the final setting for the press.

8. After the button has been pulled apart, turn the Adjusting Screw counter-clockwise (lowering the die) 1/16 of a turn and form another buttonlok.

9. Test the strength of the newly formed button. Compare the strength needed to separate the first button to the strength needed to pull apart the second button.

(continued)

DIE ADJUSTMENT (CONTINUED)

From this point, You now have two options to follow.

OPTION #1 If the button pulls apart eaiser, your original setting was correct. Re-adjust the die UP 1/16 of a turn (turning the die adjusting screw clockwise) and test the button.

REMEMBER: To get the die to its optimum setting, adjustments are made, AT FIRST, IN 1/4 TURNS AND THEN IN 1/8 TURNS, TESTING THE BUTTON LOCK AFTER EACH ADJUSTMENT HAS BEEN MADE.

STOP. The setting process is now complete.

OPTION #2 If the button-locked material is stronger or as strong as the previous button, turn the Adjusting Screw down another 1/16 of a turn. Again, test the material after each new setting. Continue this fine tuning until it appears that the latest die setting is not as strong as the die setting previous to it. Once this has been determined, turn the adjusting screw UP 1/16 of a turn. Form another button. Test it. This, along with your visual confirmation, should be the best Button Lock setting for the die and the material being used.

REMEMBER

The Key To Long Die Life Is To Set The Die To The Lowest Position That Will Still Produce A Strong Button.

Tighten the Die Securing Screw

Tighten the Die Adjusting Retaining Set Screws

Whenever the die, punch or material thickness is changed
The die has to be reset.

Reset the Automatic return valve for normal cycle speed and re-check the button. If the button is not as strong as before, the return cycle has been set too fast and must be slowed down.

-PRODUCTION CAN NOW BE RUN-

BUTTON STRENGTH

There are two ways to measure the strength of a buttonlok joint, shear (pull) and peel *(see illus. 3 on page 13)*.

Pull is almost always stronger than peel and is less sensitive to die adjustment. Typical button strengths for properly adjusted dies are given for commercial quality mild steel. These should be used as a guide only, different material will affect the button strength.

Material Thickness Each / Two Ply	Button Strength (lbs.)		Recommended Die
	Shear	Peel	
.062"	450	175	#50
.032"	375	85	#40
.022"	300	70	#30

BUTTON FAILURE

If pulled hard enough, any buttonlok will pull apart (fail). There are two usual ways for a buttonlok to fail;

a) The two halves of the button will pull apart, leaving a male button half (punch side) and a female button half (die side).

b) The button will tear out of the top layer (punch side) leaving a hole in it. The button joint will remain in the lower layer (die side).

A correctly formed button will usually fail by tearing (b) in the pull test. The button strength usually increases as the die is adjusted towards the punch - however, it is easy to over adjust the die and overload the punch and die reducing their life.

In the peel test however, an under adjusted button (die too far away from the punch) will fail as in (a) and an over adjusted button (die too close to the punch) will fail as in (b).

The correct adjustment is when the die fails in peel sometimes as in (a) and sometimes as in (b). This will give the greatest peel strength.

If the peel strength of a correctly adjusted button is much less than shown in the chart above (for mild steel only), and the button tends to tear apart, the incorrect die may have been selected;

Change #50 die to #40 die.
Change #40 die to #30 die.

If this does not improve the peel strength of the button, then the material is not suitable for buttonloking - probably too hard.

BUTTON FAILURE (CONTINUED)

If the peel strength of a correctly adjusted button is much less than shown in the chart above (for mild steel only), and the button does not tear apart, the incorrect die may have been selected;

Change #30 die to #40 die.
Change #40 die to #50 die.

If this does not improve the peel strength of the button, then the material is not suitable for buttonloking - probably too soft.

TESTING BUTTON STRENGTH

The best method of testing button strength is to pull the button apart in both shear (pull) and peel and measure the force required with a pull tester.

In production however, an indication of the button strength can be found by measuring the diameter of the button cap (see illus. 3 on page 13).

If a button is tested in shear and peel with a pull tester and the upper and lower limits of the button strength are found, the cap diameters for these two limits can bemeasured.

Calipers or a GO - NOGO gauge can then be used in production to see if the cap diameter is within the measured limits.

NOTE ! If the material changes or the die # is changed, the button cap diameters will change (see illus. 3 on page 13).
When using the button cap diameter; shear and peel tests should also be used occasionally to confirm strengths.

THREE PLY MATERIAL

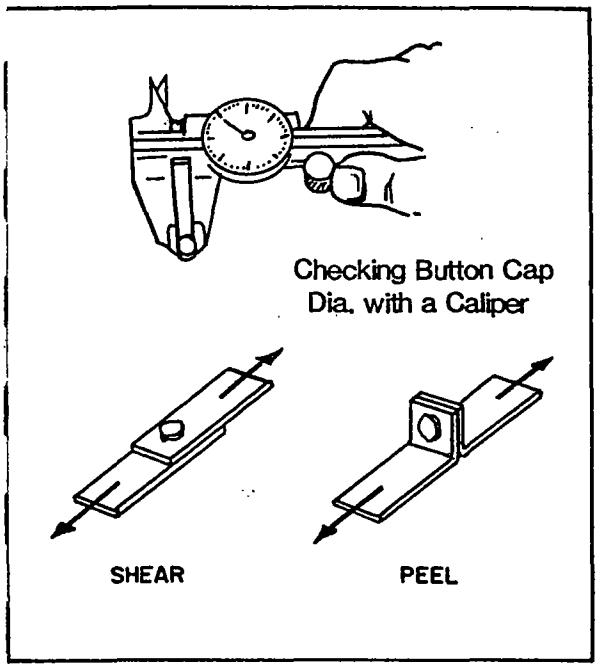
The Quiclok is primarily designed to join two ply material up to a maximum combined thickness of 0.125". It is possible to join three ply material up to a combined thickness of 0.125" however the strength of the top ply button joint (punch side) will be reduced.

It is possible to increase the strength of the top layer by using a punch with a larger punch tip radius, however this will slightly weaken any two ply joints formed with the new punch. Consult Lockformer if you have any problems with three ply material.

METHODS OF TESTING BUTTON STRENGTH

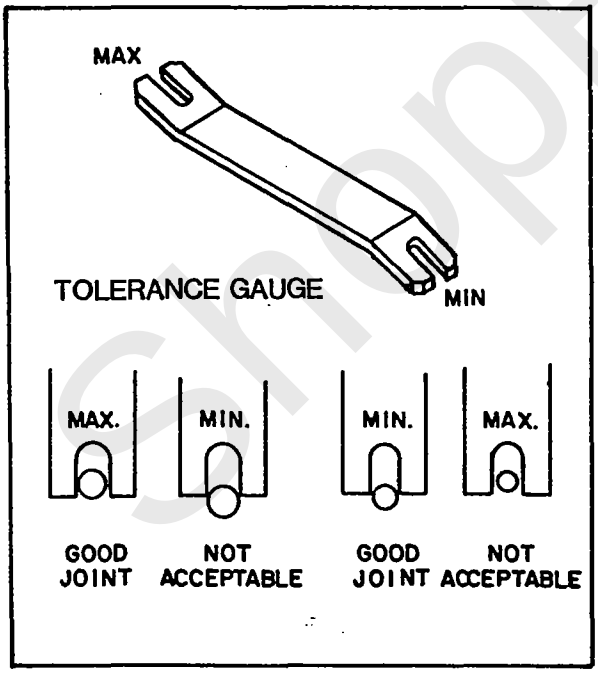
ILLUSTRATION 3

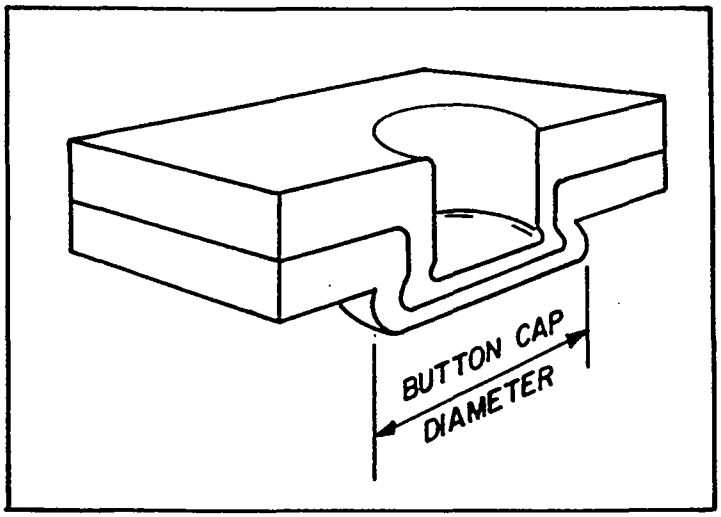
MEASURING THE BUTTON CAP DIAMETER (BD) WITH A CALIPER



SHEAR (PULL) AND PEEL TESTING

GO –NO GO GAUGE FOR TESTING BUTTON CAP DIAMETER





AUTOMATIC RETURN ADJUSTMENT

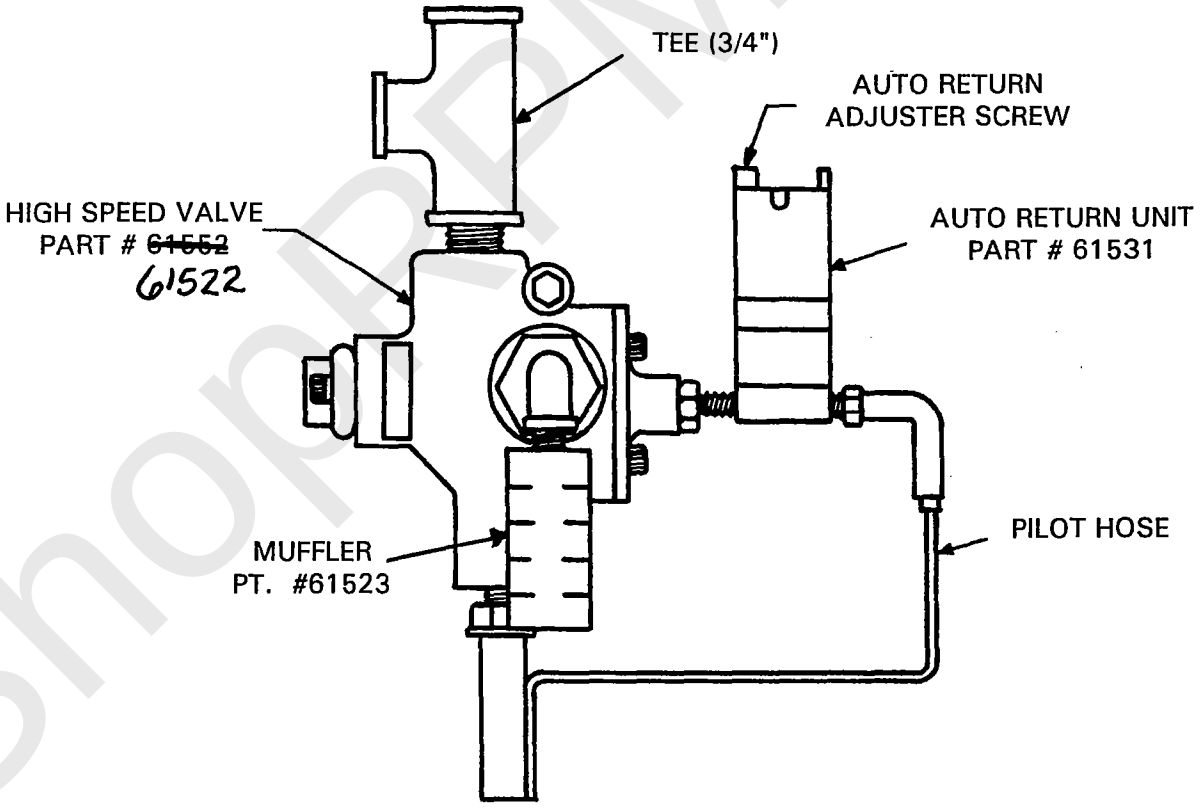
The Quiclok press is equipped with a High Speed Valve (part # 61522) and an Automatic Return Unit (part # 61531). When the foot pedal is depressed, the punch will close on the die; and when the foot pedal is released, the punch will return. However, with the Automatic Return, if the foot pedal is kept depressed, the punch will automatically return after a pre-set delay. To adjust this delay, there is a small adjusting screw in the top of the Auto Return Unit:

To ***increase*** the delay (longer punch duration) - turn the adjuster screw clockwise.

To ***decrease*** the delay (shorter punch duration) - turn the adjuster screw counter-clockwise.

IMPORTANT - If the punch duration is too short, the machine will produce a weak buttonlok. Therefore, the button should be checked after any Auto Return adjustment.

NOTE - If the adjuster screw is turned fully clockwise (increasing), the unit will not return automatically.



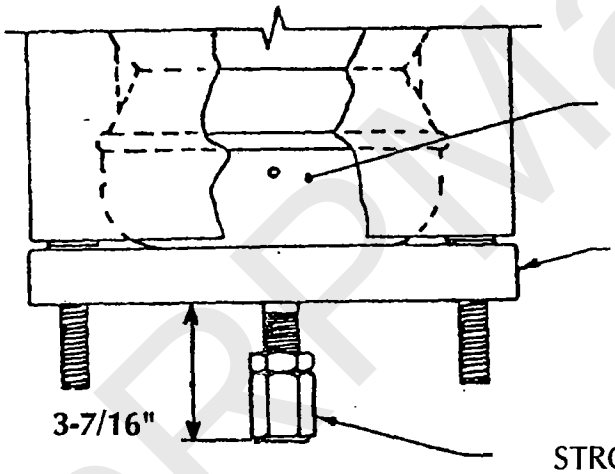
STROKE ADJUSTMENT

The stroke of the machine may be adjusted at the bottom of the Power Unit, when the Power Unit has been removed. Reducing the stroke of the machine will increase the speed of the unit and reduce the air volume required.

1. Before adjusting the Stroke Adjuster (see illustration below), adjust the Open Height Adjustment on top of the Power Unit first; Loosen the Lock nut and turn the socket head set screw counter-clockwise to its maximum opening (see previous page).

2. Remove the Power Unit as described on page 21.

WARNING! THE POWER UNIT IS REMOVED AS AN ASSEMBLY UNIT. DISASSEMBLING THE POWER UNIT VOIDS YOUR WARRANTY. PLEASE CALL FOR SERVICE IF THE POWER UNIT NEEDS TO BE DISASSEMBLED, OR SHIP THE COMPLETE POWER UNIT TO LOCKFORMER FOR SERVICE.



FACTORY SET APPROX. 1/2" STROKE

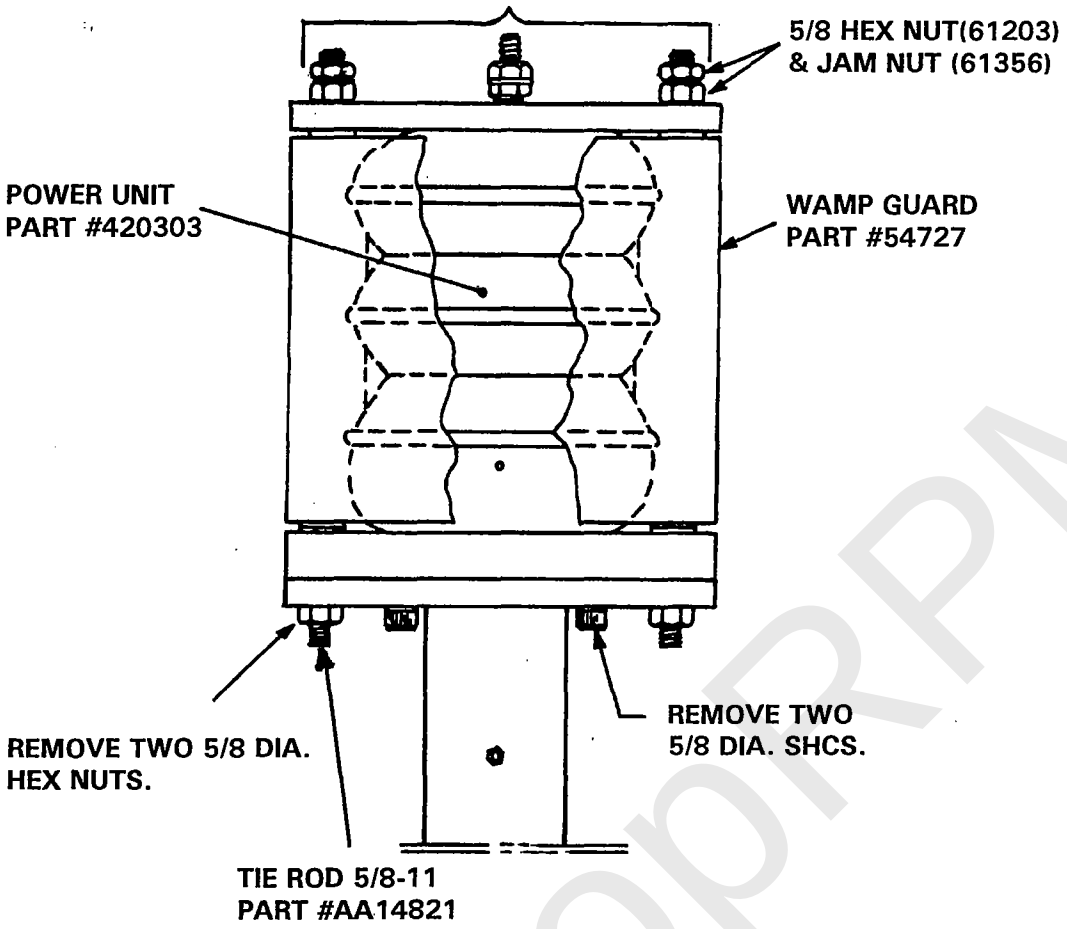
(OPTIONAL SETTING 2-15/16"
FOR AN APPROX. 1" STROKE)

3. Loosen the jam nut from the Stroke Adjuster Nut with two 1-1/4" wrenches. Use one to hold the Adjuster Nut, and at the same time, loosen the jam nut with the other wrench.

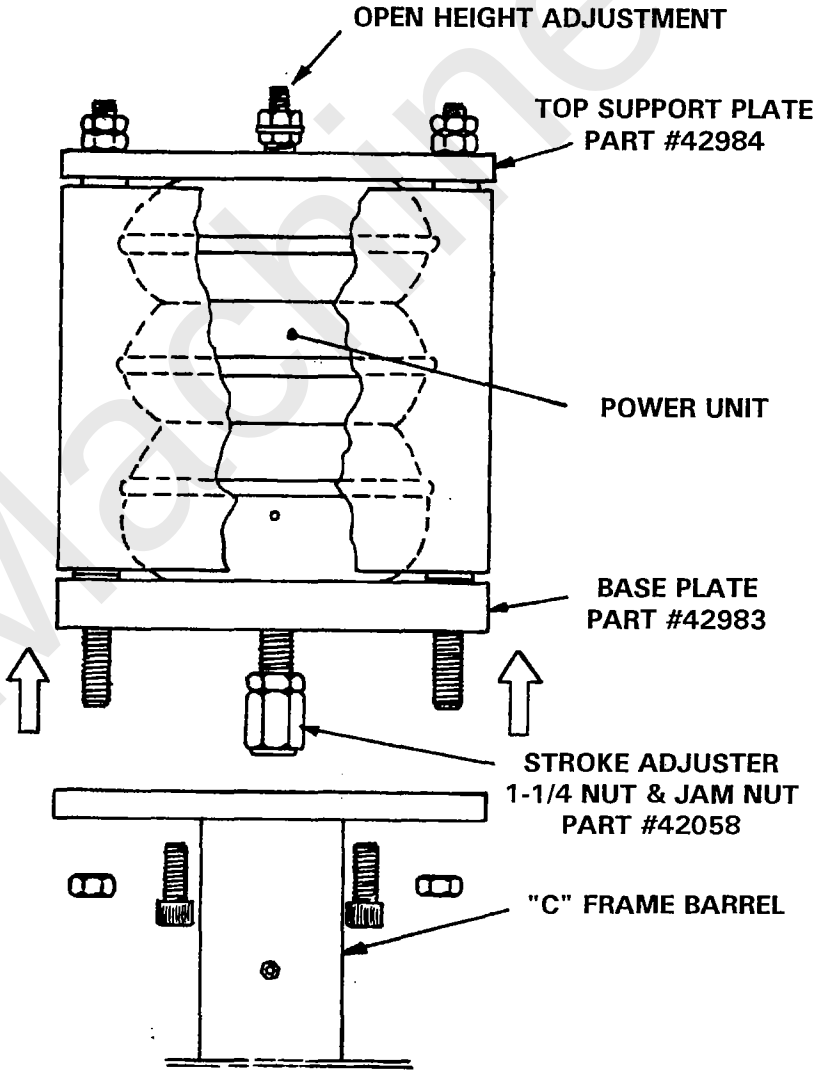
4. To reduce the stroke of the machine, adjust the Stroke Adjuster Nut counter-clockwise.

MAINTENANCE DIAGRAM

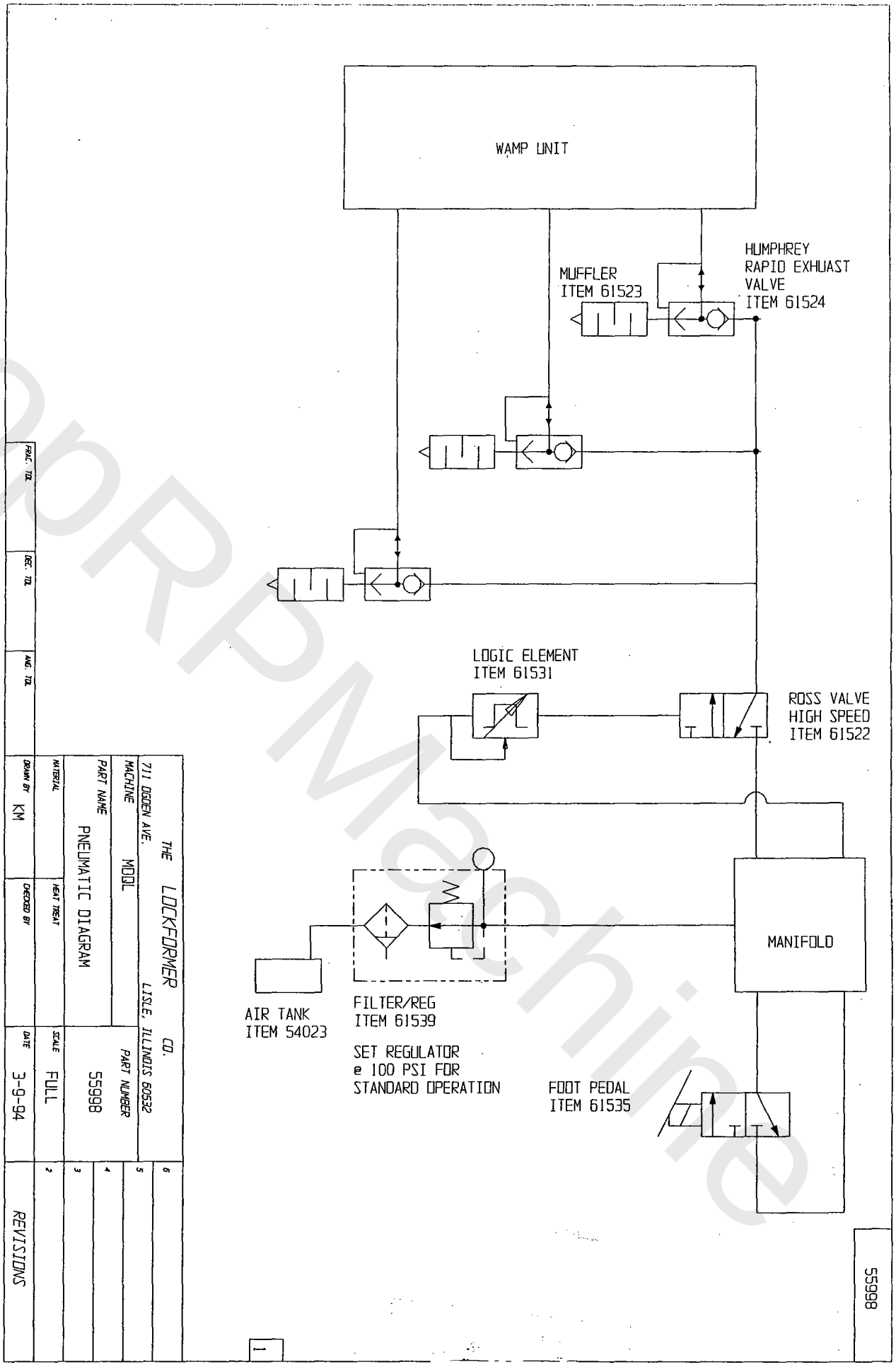
IMPORTANT: DO NOT ADJUST NUTS AT TOP OF POWER UNIT



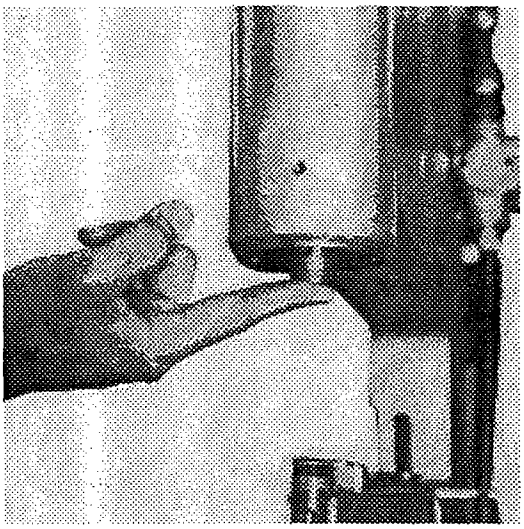
POWER UNIT ASSEMBLED

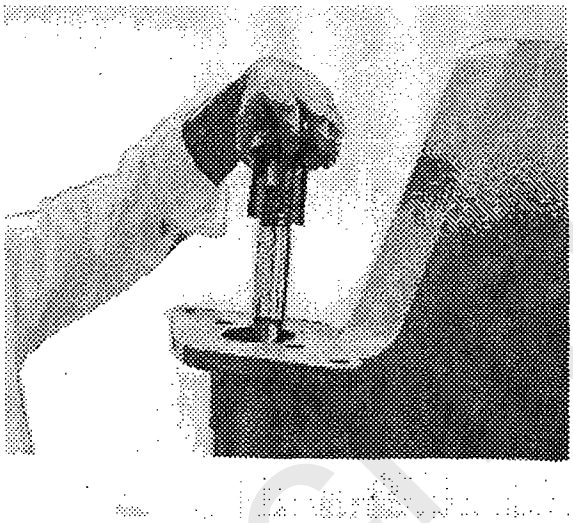


POWER UNIT REMOVED



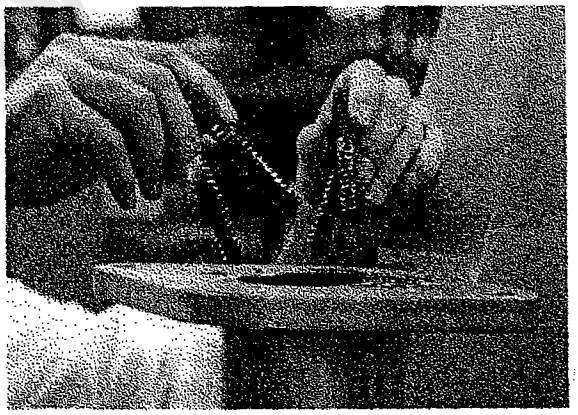
REMOVING THE UPPER TOOLING



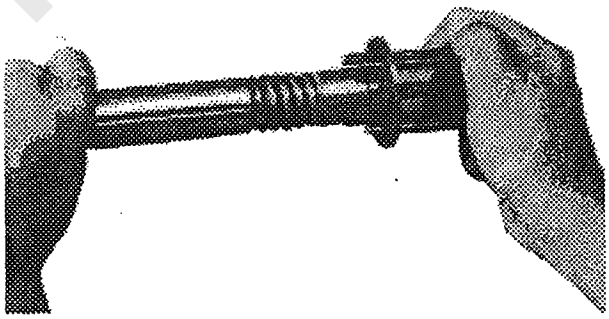


1. Take the Upper Tooling out of the barrel. Do this by pushing UP on the bottom of the Upper Tooling and lifting it up and out from the top of the barrel. See photos above.

2. Remove the four (4) Upper Lifter Springs. There are eight (8) springs in the barrel. Four (4) deep pocket springs and four (4) Upper Lifter Springs. The four Upper Lifter springs will be plainly visible once the Upper Tooling has been removed. Take out the four Upper Lifter Springs ONLY.

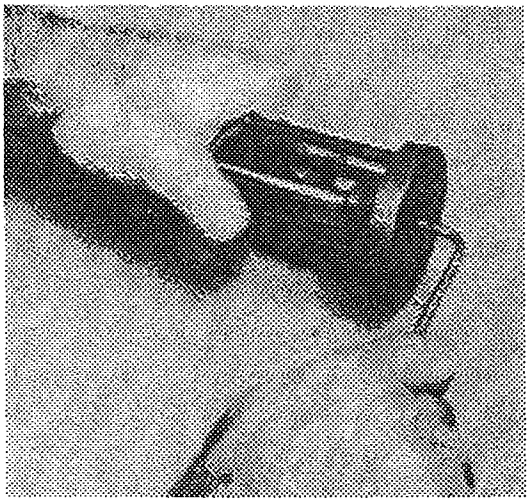


PUNCH CAP



3. Remove the Punch from the Upper Tooling. To do this, the Upper Tooling has to be separated. Simply grab the Punch Cap and pull it apart and away from the Upper Punch Guide.

REMOVING THE UPPER TOOLING (continued)



4. The Punch is removed from the Punch Cap by removing the 10/32" SHCS that holds the Punch in place. It may be necessary to put the Punch in a vise to remove the 10/32" SHCS.

5. Put in a new Punch and tighten down the 10/32" SHCS to 20 ft/lbs. Again, it may be necessary to put the punch in a vise while tightening the SHCS down.

6. Liberally grease the punch and re-assemble the two pieces of the Upper Tooling.

REPLACING THE UPPER TOOLING (see page 3)

Before the Upper Tooling can be replaced ***with*** the (4) Upper Lifter Springs, the Upper Tooling barrel clearance has to be checked. This clearance is checked by inserting the Upper Tooling ***without*** the (4) Upper Lifter Springs.

1. Line up the (4) Upper Tooling Guides with the (4) springs still in the pockets of the barrel. The Upper Tooling should easily push down to the bottom of the barrel. If the tooling is too tight in the barrel, you will have to remove it, loosen the 10/32" SHCS, then re-tighten it. This should correct the problem.

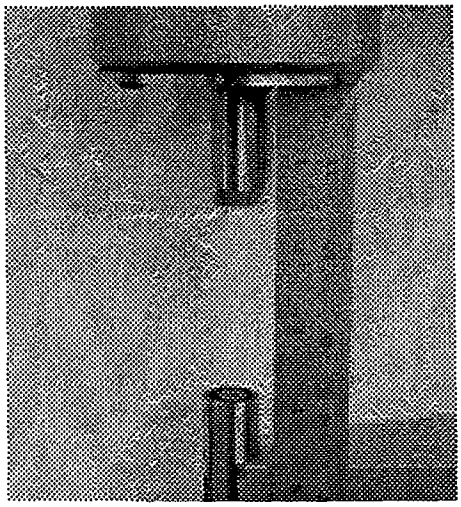
IMPORTANT - The Upper Tooling has to slide down easily to the bottom of the barrel before proceeding with the next step.

2. Once the Upper Tooling slides down easily to the bottom of the barrel, remove it. Put the (4) Upper Lifter Springs on the Spring Guides. A good coat of heavy grease will help hold the springs to the Upper Tooling Spring Guides.

3. After greasing the Upper Tooling, replace it in the barrel. Make sure the (4) Lifter Springs, attached to the Upper Tooling line up with the spring pockets in the barrel. ***Lining the springs up with the spring pockets is critical.***

4. Much of the positioning for the Upper Tooling will depend on the feel the operator has for the machine. You'll know when the Upper Tooling is positioned correctly; the Upper Tooling will *drop* into the pockets of the barrel. This is done by wiggling and turning the Upper Tooling until you can feel and hear the tooling drop into place.

5. When the Upper Tooling does drop into place, measure how much of the tooling is sticking out of the bottom of the barrel. If 1-1/2" to 2" is sticking out, the tooling has been installed correctly (see photo on right). If less than 1-1/2" is sticking out from the bottom of the barrel, continue to turn the tooling from the top until it drops into place. You are now ready to replace the Power Unit.

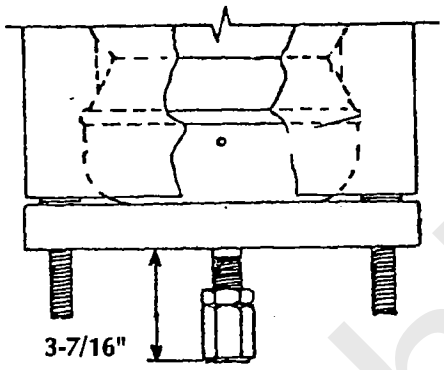


REMEMBER, this is a critical stage of re-assembly. If the Upper Tooling is not positioned correctly, severe damage to the machine will occur.

REPLACING THE POWER UNIT

1. Before the Power Unit can be replaced, the Pressure Nut and Jam Nut setting and tightness have to be checked. Grab hold of them and try turning them. If they turn and the Power Unit shaft *does not* turn, then they are loose. If the nuts and shaft turn as one, then they are tight.

   If the Pressure and Jam nuts are loose, first MEASURE the distance of the shaft from the underside of the base plate of the Power Unit, to the end of the Pressure Nut.



2. If your Quiclok has a 1/2" stroke, the distance from the base plate to the end of the Pressure Nut should be 3-7/16".

   If your Quiclok has a 1" stroke, the distance from the base plate to the end of the Pressure Nut should be 2-15/16".

3. Make the necessary adjustments to the Pressure and Jam nuts, if needed, to get them to the proper setting. After applying Blue Loctite, or its equivalent, to the shaft, tighten the two nuts down to a torque of 80 ft. lbs.

4. Replace the Power Unit, with its mufflers to the rear of the press.

5. Replace the (2) 5/8 SHCS. Tighten them down to a torque of 160-180 ft/lbs.

6. Replace the (2) 5/8" Locknuts and washers. Tighten them down to a torque of 80-90 ft/lbs.

7. Replace the plastic guard.

8. Re-connect the air hoses from the Power Unit to the Valve, being careful not to overtighten the hose end swivels.

9. Re-connect the air supply, and check that the regulator is set to 100 PSI.

THE QUICLOK IS NOW RE-ASSEMBLED.

MEDIUM DUTY QUICLOK
SPECIFICATIONS

Description:	Medium duty Quiclok
Frame:	Steel "C" frame
Throat:	6, 12, 18, or 24
Stroke:	1/2" Standard setting 1" Maximum available
Capacity:	Two ply 16 gauge mild steel (#50 die) Two ply 22 gauge mild steel (#40 die) Two ply 26 gauge mild steel (#30 die)
Power Unit:	Wamp (Pneumatic Press)
Die Type:	MD Die 2.0" x 0.75" diameter.
Punch Type:	Standard MD Punch 0.18" tip diameter .010/.015 tip radius
Cycle Speed:	60 buttons / minute (1/2" stroke) 40 buttons / minute (1" stroke)
Duty Cycle:	100%
Air Requirements:	100 psi (minimum) 120 psi (maximum)
Air Consumption:	0.42 cu. ft. free air per button (Approx. 5HP @ 60 buttons per minute)
Approx. Weight:	MDQL 6 - 528# MDQL 12 - 757# MDQL 18 - 1139# MDQL 24 - 1679#

Trouble Shooting

Problem With Operation

A. Total Failure Of Joint (Also see Section C - Deformed or Distorted Joints)		
Problem	Cause	Solution
A. No Button Formed	Broken Punch or Die High Pressure Too Low	Replace Tool
B. Button Partially Formed-No Squeeze	Metals not of specified thickness	Use specified metal or use proper tooling
	Retainer rings or die spring broken	Replace ring or spring
	Pressure drop	Restore pressure
	Incorrect tooling for metal being used	Verify joint data, change tooling if necessary
	Incorrect shut height tool clearance	Adjust shut height for correct clearance
C. Piercing/Cracking of punch side	Metal not of specified thickness	Use specified metals or change to correct tooling.
	Incorrect tooling for metals	Verify joint data/ change tooling if necessary
	Weak or broken springs	Replace spring(s)
	Punch-die not concentric	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.	Correct parts to conform - Increase stripper force
	Parts do not fit gauging or nesting	Correct parts or gauging to fit
	Parts interfere with tooling operation	Correct parts or gauging to allow clearance

C. Deformed Or Distorted Joints		
A. Cracks appear on Button	Metals not of specified thickness or hardness	Use specified metals or change appropriate tooling
	BD too large, tooling over adjusted	Back off shut height adjustment
	Incorrect tooling for metals	Verify joint data/ change tooling if necessary
	Punch/die not concentric	Relaign tooling
	Excessive deflection	Check for damage
B. Cracks appear inside joint cup	Metals not of specified thickness or hardness	Use specified metals or change to proper tooling.
	Tooling incorrect for metals	Verify joint data/ change tooling if necessary
	Punch/die not concentric	Realign tooling
	Weak or broken stripper spring	Replace spring
C. Lump or Irregularity on button	Chipped punch or die	Replace
D. Concentric Double button	Missing/non-functional stripper	Replace or repair stripper
	Double hit	Check controls or operator
E. No backflow of button round top "squeezed"	Broken or weak stripper spring	Replace spring
F. Partial back flow of button	Die leaf missing or opened before joining	Replace leaf if missing or check for interference causing leaf to open on part loading.
	Deflection in force frame or tool holder	Check for damage

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

The Lockformer Company

Parent Item: 420926 Prod Cat: FA Usr Def:8D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
#50 MDQL DIE Date: 04/28/92 Size: Route:

LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RELEASE--- RLS	REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S T K	C T L	P / M	COMM CODE
1	55708	1.0000	EA	#50 MDQL DIE	0	0	.0	A		03	04/27/92	A	PRIM	A	S	C	M	QLP

The Lockformer Company

Parent Item: 429995 Prod Cat: FA Usr Def:8D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
QCK-LC6 #40DIE ASY Date: 06/15/89 Size: Route: ALT

LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RLS	RELEASE--- REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S T K	C T L	P / M	COMM CODE
1	420101	1.0000	EA	C-FRAME ASSY (6)	0	0	.0	A		00	05/10/89			A	S	C	M	
1	420201	1.0000	EA	STAND ASSY (6,12)	0	0	.0	A		00	05/10/89			A	S	C	M	
1	420303	1.0000	EA	WAMP 11 L90 ASSY	0	0	.0	A		00	04/23/91			A	S	C	P	QLP
1	420402	1.0000	EA	AIR VALVE ASSY	0	0	.0	A		00	05/10/89			A	S	C	M	
1	420501	1.0000	EA	AIR TANK ASSY	0	0	.0	A		00	05/10/89			A	S	C	M	
1	420601	1.0000	EA	AIR MANIFOLD ASSY	0	0	.0	A		00	05/10/89			A	S	C	P	QLP
1	420701	1.0000	EA	FOOT PEDAL ASSY	0	0	.0	A		00	05/10/89			A	S	C	P	QLP
1	420801	1.0000	EA	PUNCH & GUIDE ASSY	0	0	.0	A		00	05/10/89			A	S	C	P	QLP
1	420925	1.0000	EA	#40 MDQL DIE	0	0	.0	A		00	04/28/92			A	S	C	M	
1	421202	1.0000	EA	TOOL KIT	0	0	.0	A		00	02/06/90			A	S	C	M	

The Lockformer Company

Parent Item: 429994 Prod Cat: FA Usr Def:8D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
QCK-LC12 #40DIE AS Date: 06/15/89 Size: Route: ALT

LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RELEASE--- RLS	REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S T K	C T L	P / M	COMM CODE
1	420102	1.0000	EA	C-FRAME ASSY (12)	0	0	.0	A		00	05/10/89			A	S	C	M	
1	420201	1.0000	EA	STAND ASSY (6,12)	0	0	.0	A		00	05/10/89			A	S	C	M	
1	420303	1.0000	EA	WAMP 11 L90 ASSY	0	0	.0	A		00	04/23/91			A	S	C	P	QLP
1	420402	1.0000	EA	AIR VALVE ASSY	0	0	.0	A		00	05/10/89			A	S	C	M	
1	420501	1.0000	EA	AIR TANK ASSY	0	0	.0	A		00	05/10/89			A	S	C	M	
1	420601	1.0000	EA	AIR MANIFOLD ASSY	0	0	.0	A		00	05/10/89			A	S	C	P	QLP
1	420701	1.0000	EA	FOOT PEDAL ASSY	0	0	.0	A		00	05/10/89			A	S	C	P	QLP
1	420801	1.0000	EA	PUNCH & GUIDE ASSY	0	0	.0	A		00	05/10/89			A	S	C	P	QLP
1	420925	1.0000	EA	#40 MDQL DIE	0	0	.0	A		00	04/28/92			A	S	C	M	
1	421202	1.0000	EA	TOOL KIT	0	0	.0	A		00	02/06/90			A	S	C	M	

The Lockformer Company

Parent Item: 429993 Prod Cat: FA Usr Def:8D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
QCK-LC18 #40DIE AS Date: 06/15/89 Size: Route: ALT

LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RELEASE--- RLS	REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S T K	C T L	P / M	COMM CODE
1	420103	1.0000	EA	C-FRAME ASSY (18)	0	0	.0	A		00	05/10/89			A	S	C	M	
1	420202	1.0000	EA	STAND ASSY (18)	0	0	.0	A		00	05/10/89			A	S	C	M	
1	420303	1.0000	EA	WAMP 11 L90 ASSY	0	0	.0	A		00	04/23/91			A	S	C	P	QLP
1	420402	1.0000	EA	AIR VALVE ASSY	0	0	.0	A		00	05/10/89			A	S	C	M	
1	420501	1.0000	EA	AIR TANK ASSY	0	0	.0	A		00	05/10/89			A	S	C	M	
1	420601	1.0000	EA	AIR MANIFOLD ASSY	0	0	.0	A		00	05/10/89			A	S	C	P	QLP
1	420701	1.0000	EA	FOOT PEDAL ASSY	0	0	.0	A		00	05/10/89			A	S	C	P	QLP
1	420801	1.0000	EA	PUNCH & GUIDE ASSY	0	0	.0	A		00	05/10/89			A	S	C	P	QLP
1	420926	1.0000	EA	#50 MDQL DIE	0	0	.0	A		00	04/28/92			A	S	C	M	
1	421202	1.0000	EA	TOOL KIT	0	0	.0	A		00	02/06/90			A	S	C	M	

The Lockformer Company

Parent Item: 429992 Prod Cat: FA Usr Def:8D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
QCK-LC24 #40DIE AS Date: 06/15/89 Size: Route: ALT

LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RELEASE--- RLS	REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S K	C T	P / L	C M	COMM CODE
1	420104	1.0000	EA	C-FRAME ASSY (24)	0	0	.0	A		00	05/10/89			A	S	C		M	
1	420203	1.0000	EA	STAND ASSY (24)	0	0	.0	A		00	05/10/89			A	S	C		M	
1	420303	1.0000	EA	WAMP 11 L90 ASSY	0	0	.0	A		00	04/23/91			A	S	C	P		QLP
1	420402	1.0000	EA	AIR VALVE ASSY	0	0	.0	A		00	05/10/89			A	S	C		M	
1	420501	1.0000	EA	AIR TANK ASSY	0	0	.0	A		00	05/10/89			A	S	C		M	
1	420601	1.0000	EA	AIR MANIFOLD ASSY	0	0	.0	A		00	05/10/89			A	S	C	P		QLP
1	420701	1.0000	EA	FOOT PEDAL ASSY	0	0	.0	A		00	05/10/89			A	S	C	P		QLP
1	420801	1.0000	EA	PUNCH & GUIDE ASSY	0	0	.0	A		00	05/10/89			A	S	C	P		QLP
1	420925	1.0000	EA	#40 MDQL DIE	0	0	.0	A		00	04/28/92			A	S	C		M	
1	421202	1.0000	EA	TOOL KIT	0	0	.0	A		00	02/06/90			A	S	C		M	

The Lockformer Company

Parent Item: 420201 Prod Cat: FA Usr Def:9D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
STAND ASSY (6,12) Date: 05/10/89 Size: Route:

LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RELEASE--- RLS	REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S T K	C T L	P / M	COMM CODE
1	54057	1.0000	EA	STAND WLDM QL 6.12	0	0	.0	A		02	05/10/89	D	PRIM	A	S	C	M	
1	60098	4.0000	EA	3/8-16X2HHCS	0	0	.0	A		00				A	S	C	P	QLP
1	61122	4.0000	EA	3/8-16 HN FIN	0	0	.0	A		00				A	S	C	P	
1	62030	8.0000	EA	3/8X3/32 WSHR	0	0	.0	A		00				A	S	C	P	QLP
1	62363	8.0000	EA	WASHER, LOCK, 3/8", MED	0	0	.0	A		00	08/11/88	-		A	S	C	P	

The Lockformer Company

Parent Item: 420202 Prod Cat: FA Usr Def:9D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
STAND ASSY (18) Date: 05/10/89 Size: Route:

LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RELEASE--- RLS	REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S T K	C T L	P / M	COMM CODE
1	54022	1.0000	EA	STAND WLMT 18	0	0	.0	A		00	05/10/89	D	PRIM	A	S	C	M	QLP
1	60098	4.0000	EA	3/8-16X2HHCS	0	0	.0	A		00				A	S	C	P	QLP
1	61122	4.0000	EA	3/8-16 HN FIN	0	0	.0	A		00				A	S	C	P	
1	62030	8.0000	EA	3/8X3/32 WSHR	0	0	.0	A		00				A	S	C	P	QLP
1	62363	8.0000	EA	WASHER, LOCK, 3/8", MED	0	0	.0	A		00	08/11/88	-		A	S	C	P	

The Lockformer Company

Parent Item: 420203 Prod Cat: FA Usr Def:8D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
STAND ASSY (24) Date: 05/10/89 Size: Route:

LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RELEASE--- RLS	REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S K	C T L	P / M	COMM CODE
1	54058	1.0000	EA	STAND WLDM QL 24	0	0	.0	A		00	05/10/89	D	PRIM	A	S	C	M	QLP
1	60098	4.0000	EA	3/8-16X2HHCS	0	0	.0	A		00				A	S	C	P	QLP
1	61122	4.0000	EA	3/8-16 HN FIN	0	0	.0	A		00				A	S	C	P	
1	62030	8.0000	EA	3/8X3/32 WSHR	0	0	.0	A		00				A	S	C	P	QLP
1	62363	8.0000	EA	WASHER, LOCK, 3/8", MED	0	0	.0	A		00	08/11/88	-		A	S	C	P	

The Lockformer Company

Parent Item: 420101 Prod Cat: FA Usr Def:8D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
C-FRAME ASSY (6) Date: 05/10/89 Size: Route:

LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RELEASE--- RLS	REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S K	C T	C L	P / M	COMM CODE
1	22096	1.0000	EA	DIE HOLDER	0	0	.0	A		00	05/10/89	A	PRIM	A	S	C	M		QLP
1	29737	1.0000	EA	GUARD	0	0	.0	A		02	05/10/89	B	PRIM	A	S	C	M		QLP
1	33227	1.0000	PC	BARREL END CAP	0	0	.0	A		02	06/12/90	A	PRIM	A	S	C	M		
1	42026	1.0000	EA	SET SCREW MODIFIED	0	0	.0	A		00	05/10/89	A	PRIM	A	S	C	M		QLP
1	55121	.0000	EA	MAIN ASSY	0	0	.0	A		00	05/10/89	E		A	S	C	M		
1	55160	.0000	EA	C-FRAME ASSY 6	0	0	.0	A		00	05/10/89	C		A	S	C	M		
1	60050	4.0000	EA	5/16-18X1 1/2HHCS	0	0	.0	A		00				A	S	C	P		QLP
1	60306	4.0000	EA	1/4-20X1 1/2SHCS	0	0	.0	A		00				A	S	C	P		
1	60309	1.0000	EA	1/4-20X1/2 SHCS	0	0	.0	A		00	12/13/85			A	S	C	P		
1	60363	2.0000	EA	5/16-18X3 SHCS	0	0	.0	A		00				A	S	C	P		QLP
1	61516	1.0000	EA	ASP-1-BV BREATHER	0	0	.0	A		00	05/10/89	P		A	S	C	P		
1	62362	4.0000	EA	WASHER, LOCK, 5/16"ID, MED	0	0	.0	A		00	09/20/88	P		A	S	C	P		
1	62938	4.0000	EA	1/4-20X1/2 BHSCS	0	0	.0	A		00	12/07/89	P		A	S	C	P		
1	62941	1.0000	EA	5/8-11 EYE BOLT	0	0	.0	A		00	05/10/89	P		A	S	C	P		
1	62970	2.0000	EA	1/4-20X1/4SS BRSST	0	0	.0	A		00	05/25/90	P		A	S	C	P		QLP
1	85202	1.0000	EA	DECAL QUICKLOK	0	0	.0	A		00	05/10/89	P		A	S	C	P		QLP
1	86162	1.0000	PC	PUNCH GUIDE BSHNG	0	0	.0	A		00	03/08/90	P		A	S	C	P		
1	89113	1.0000	EA	C-FRAME COMPLETE 6	0	0	.0	A		00	05/10/89	P	PRIM	A	S	C	P		
1	AA60338	1.0000	PC	1/4-20X1.25SHCS UN	0	0	.0	A		00	06/25/92	P		A	S	C	P		
1	AA62001	4.0000	EA	FLT WASHER.31X.75	0	0	.0	A		00	10/12/93	P		A	S	C	P		

The Lockformer Company

Parent Item: 420103 Prod Cat: FA Usr Def:8D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
C-FRAME ASSY (18) Date: 05/10/89 Size: Route:

LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RELEASE--- RLS	REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S T K	C T L	P / M	COMM CODE
1	22096	1.0000	EA	DIE HOLDER	0	0	.0	A		00	05/10/89	A	PRIM	A	S	C	M	QLP
1	29737	1.0000	EA	GUARD	0	0	.0	A		02	05/10/89	B	PRIM	A	S	C	M	QLP
1	33227	1.0000	PC	BARREL END CAP	0	0	.0	A		02	06/12/90	A	PRIM	A	S	C	M	
1	42026	1.0000	EA	SET SCREW MODIFIED	0	0	.0	A		00	05/10/89	A	PRIM	A	S	C	M	QLP
1	55121	.0000	EA	MAIN ASSY	0	0	.0	A		00	05/10/89	E		A	S	C	M	
1	55162	.0000	EA	C-FRAME ASSY 18	0	0	.0	A		00	05/10/89	C		A	S	C	M	
1	60050	4.0000	EA	5/16-18X1 1/2HHCS	0	0	.0	A		00				A	S	C	P	QLP
1	60306	4.0000	EA	1/4-20X1 1/2SHCS	0	0	.0	A		00				A	S	C	P	
1	60309	1.0000	EA	1/4-20X1/2 SHCS	0	0	.0	A		00	12/13/85			A	S	C	P	
1	60363	2.0000	EA	5/16-18X3 SHCS	0	0	.0	A		00				A	S	C	P	QLP
1	61516	1.0000	EA	ASP-1-BV BREATHER	0	0	.0	A		00	05/10/89	P		A	S	C	P	
1	62362	4.0000	EA	WASHER, LOCK, 5/16"ID, MED	0	0	.0	A		00	09/20/88	P		A	S	C	P	
1	62925	1.0000	EA	3/4-10 EYE BOLT	0	0	.0	A		00	05/10/89	P		A	S	C	P	
1	62938	4.0000	EA	1/4-20X1/2 BHSCS	0	0	.0	A		00	12/07/89	P		A	S	C	P	
1	62970	2.0000	EA	1/4-20X1/4SS BRSST	0	0	.0	A		00	05/25/90	P		A	S	C	P	QLP
1	85202	1.0000	EA	DECAL QUICKLOK	0	0	.0	A		00	05/10/89	P		A	S	C	P	QLP
1	86162	1.0000	PC	PUNCH GUIDE BSHNG	0	0	.0	A		00	03/08/90	P		A	S	C	P	
1	89112	1.0000	EA	C-FRAME COMPLETE18	0	0	.0	A		00	05/16/89	P	PRIM	A	S	C	P	
1	AA60338	1.0000	PC	1/4-20X1.25SHCS UN	0	0	.0	A		00	06/25/92	P		A	S	C	P	
1	AA62001	4.0000	EA	FLT WASHER.31X.75	0	0	.0	A		00	10/12/93	P		A	S	C	P	

The Lockformer Company

Parent Item: 420102 Prod Cat: FA Usr Def:8D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
C-FRAME ASSY (12) Date: 05/10/89 Size: Route:

LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RELEASE--- RLS	REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S T K	C T L	P / M	COMM CODE
1	22096	1.0000	EA	DIE HOLDER	0	0	.0	A		00	05/10/89	A	PRIM	A	S	C	M	QLP
1	29737	1.0000	EA	GUARD	0	0	.0	A		02	05/10/89	B	PRIM	A	S	C	M	QLP
1	33227	1.0000	PC	BARREL END CAP	0	0	.0	A		02	06/12/90	A	PRIM	A	S	C	M	
1	42026	1.0000	EA	SET SCREW MODIFIED	0	0	.0	A		00	05/10/89	A	PRIM	A	S	C	M	QLP
1	55121	.0000	EA	MAIN ASSY	0	0	.0	A		00	05/10/89	E		A	S	C	M	
1	55161	.0000	IN	C-FRAME ASSY 12	0	0	.0	A		00	05/10/89	C		A	S	C	M	
1	60050	4.0000	EA	5/16-18X1 1/2HHCS	0	0	.0	A		00				A	S	C	P	QLP
1	60306	4.0000	EA	1/4-20X1 1/2SHCS	0	0	.0	A		00				A	S	C	P	
1	60309	1.0000	EA	1/4-20X1/2 SHCS	0	0	.0	A		00	12/13/85			A	S	C	P	
1	60363	2.0000	EA	5/16-18X3 SHCS	0	0	.0	A		00				A	S	C	P	QLP
1	61516	1.0000	EA	ASP-1-BV BREATHER	0	0	.0	A		00	05/10/89	P		A	S	C	P	
1	62362	4.0000	EA	WASHER, LOCK, 5/16"ID, MED	0	0	.0	A		00	09/20/88	P		A	S	C	P	
1	62938	4.0000	EA	1/4-20X1/2 BHSCS	0	0	.0	A		00	12/07/89	P		A	S	C	P	
1	62941	1.0000	EA	5/8-11 EYE BOLT	0	0	.0	A		00	05/10/89	P		A	S	C	P	
1	62970	2.0000	EA	1/4-20X1/4SS BRSST	0	0	.0	A		00	05/25/90	P		A	S	C	P	QLP
1	85202	1.0000	EA	DECAL QUICKLOK	0	0	.0	A		00	05/10/89	P		A	S	C	P	QLP
1	86162	1.0000	PC	PUNCH GUIDE BSHNG	0	0	.0	A		00	03/08/90	P		A	S	C	P	
1	89114	1.0000	IN	C-FRAME COMPLETE12	0	0	.0	A		00	05/10/89	P	PRIM	A	S	C	P	
1	AA60338	1.0000	PC	1/4-20X1.25SHCS UN	0	0	.0	A		00	06/25/92	P		A	S	C	P	
1	AA62001	4.0000	EA	FLT WASHER.31X.75	0	0	.0	A		00	10/12/93	P		A	S	C	P	

The Lockformer Company

Parent Item: 420104 Prod Cat: FA Usr Def:8D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
C-FRAME ASSY (24) Date: 05/10/89 Size: Route:

LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RELEASE--- RLS	REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S T K	C T L	P / M	COMM CODE
1	22096	1.0000	EA	DIE HOLDER	0	0	.0	A		00	05/10/89	A	PRIM	A	S	C	M	QLP
1	29737	1.0000	EA	GUARD	0	0	.0	A		02	05/10/89	B	PRIM	A	S	C	M	QLP
1	33227	1.0000	PC	BARREL END CAP	0	0	.0	A		02	06/12/90	A	PRIM	A	S	C	M	
1	42026	1.0000	EA	SET SCREW MODIFIED	0	0	.0	A		00	05/10/89	A	PRIM	A	S	C	M	QLP
1	55121	.0000	EA	MAIN ASSY	0	0	.0	A		00	05/10/89	E		A	S	C	M	
1	55430	.0000	EA	C-FRAME ASSY 24	0	0	.0	A		00	11/09/90	C		A	S	C	M	
1	60050	4.0000	EA	5/16-18X1 1/2HHCS	0	0	.0	A		00				A	S	C	P	QLP
1	60306	4.0000	EA	1/4-20X1 1/2SHCS	0	0	.0	A		00				A	S	C	P	
1	60309	1.0000	EA	1/4-20X1/2 SHCS	0	0	.0	A		00	12/13/85			A	S	C	P	
1	60363	2.0000	EA	5/16-18X3 SHCS	0	0	.0	A		00				A	S	C	P	QLP
1	61516	1.0000	EA	ASP-1-BV BREATHER	0	0	.0	A		00	05/10/89	P		A	S	C	P	
1	62362	4.0000	EA	WASHER, LOCK, 5/16"ID, MED	0	0	.0	A		00	09/20/88	P		A	S	C	P	
1	62925	1.0000	EA	3/4-10 EYE BOLT	0	0	.0	A		00	05/10/89	P		A	S	C	P	
1	62938	4.0000	EA	1/4-20X1/2 BHSCS	0	0	.0	A		00	12/07/89	P		A	S	C	P	
1	62970	2.0000	EA	1/4-20X1/4SS BRSST	0	0	.0	A		00	05/25/90	P		A	S	C	P	QLP
1	85202	1.0000	EA	DECAL QUICKLOK	0	0	.0	A		00	05/10/89	P		A	S	C	P	QLP
1	86162	1.0000	PC	PUNCH GUIDE BSHNG	0	0	.0	A		00	03/08/90	P		A	S	C	P	
1	89115	1.0000	EA	C-FRAME COMPLETE24	0	0	.0	A		00	05/10/89	P	PRIM	A	S	C	P	
1	AA60338	1.0000	PC	1/4-20X1.25SHCS UN	0	0	.0	A		00	06/25/92	P		A	S	C	P	
1	AA62001	4.0000	EA	FLT WASHER.31X.75	0	0	.0	A		00	10/12/93	P		A	S	C	P	

The Lockformer Company

Parent Item: 420402 Prod Cat: FA Usr Def:8D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
AIR VALVE ASSY Date: 05/10/89 Size: Route:

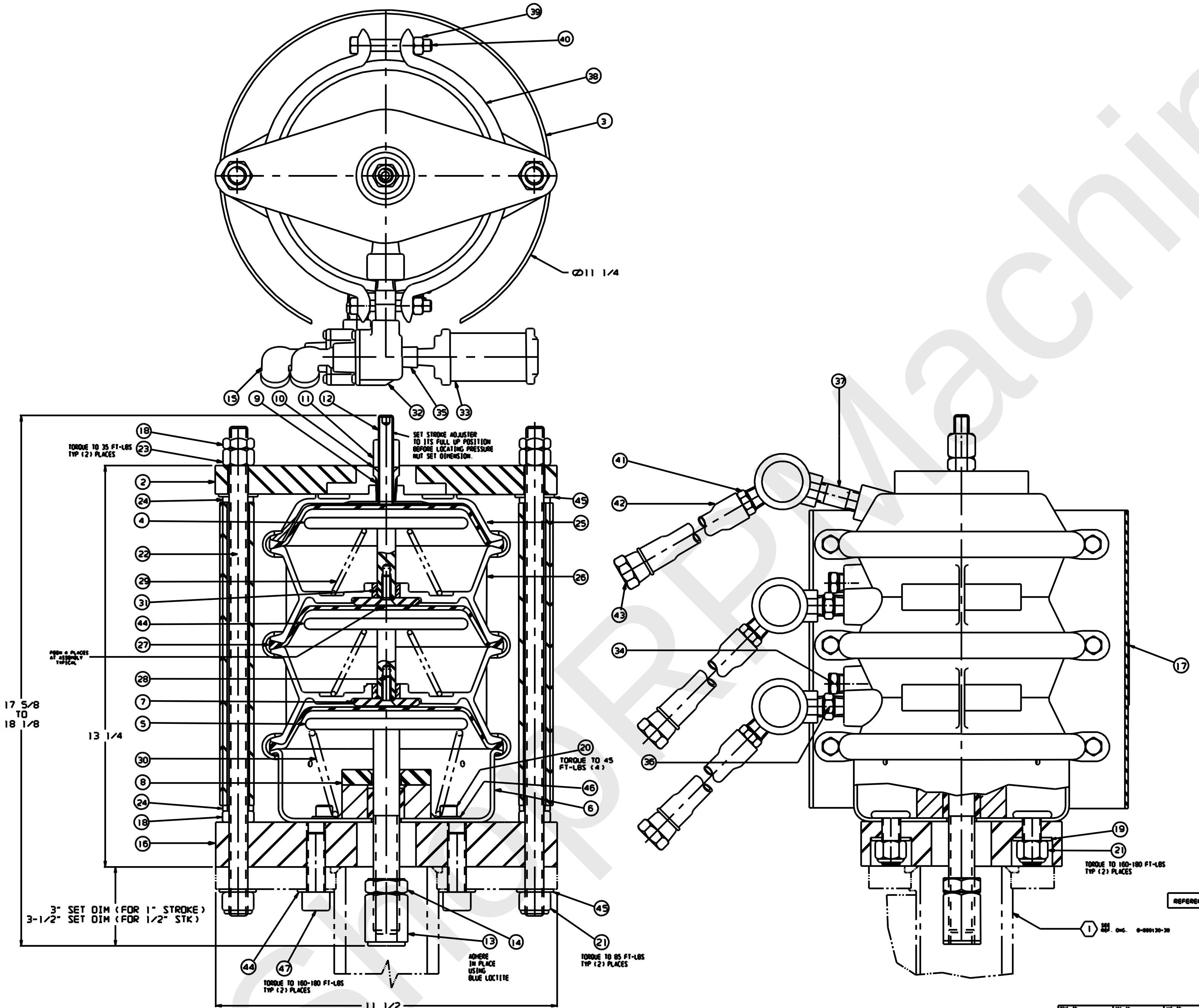
LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RELEASE--- RLS	REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S K	C T	C L	P / M	COMM CODE
1	55123	.0000	EA	AIR VALVE ASSY	0	0	.0	A		00	05/10/89	D		A	S	C	M		
1	61513	1.0000	EA	30182-12-12 FITTG	0	0	.0	A		00	04/14/89	P		A	S	C	P		QLP
1	61522	1.0000	EA	2753A5001 ROSS VLV	0	0	.0	A		00	08/17/89	P		A	S	C	P		QLP
1	61523	1.0000	EA	ASQF-3 MUFFLER	0	0	.0	A		00	05/10/89	P		A	S	C	P		QLP
1	61526	3.0000	EA	6MJ-8MP JICNPTADPT	0	0	.0	A		00	05/10/89	P		A	S	C	P		
1	61527	1.0000	EA	3109-53-11 MALE EL	0	0	.0	A		00	05/10/89	P		A	S	C	P		QLP
1	61530	1.0000	EA	12LOC-12RFJX LOCON	0	0	.0	A		00	05/10/89	P		A	S	C	P		QLP
1	61531	1.0000	EA	LOGIC ELEMENT #59157 (ARO) INCLUDES #59736 COVER PLATE	0	0	.0	A		00	08/17/89	P		A	S	C	P		QLP
1	61556	26.0000	IN	140-53-01TUBE100FT	0	0	.0	A		00	05/19/89	P		A	S	C	P		
1	61647	1.5000	FT	HOSE, 3/4"ID LOCK ON, BLACK	0	0	.0	A		00	05/10/89	P		A	S	C	P		
1	65050	1.0000	EA	1/8 CLS NIPPLE	0	0	.0	A		00				A	S	C	P		QLP
1	65081	3.0000	EA	3/4NPT CLOSE NPPL	0	0	.0	A		00	05/10/89	P		A	S	C	P		
1	65121	3.0000	EA	3/4X1/2 HEX BSHG	0	0	.0	A		00				A	S	C	P		QLP
1	65126	1.0000	EA	1/8 X 1/4 NPT	0	0	.0	A		00				A	S	C	P		QLP
1	65129	1.0000	EA	1 X 3/8 MALE REDS	0	0	.0	A		00	07/22/81	P		A	S	C	P		
1	65183	1.0000	EA	3/8 STREET ELBW	0	0	.0	A		00				A	S	C	P		QLP
1	65288	2.0000	EA	3/4X1/2NPT TEE	0	0	.0	A		00	08/17/89	P		A	S	C	P		
1	65359	1.0000	EA	3/4 FEM ELBOW	0	0	.0	A		00	08/17/89	P		A	S	C	P		

The Lockformer Company

Parent Item: 420501 Prod Cat: FA Usr Def:9D Stk:S Ctl:C P/M:M Comm: Eng Rls: Rev: 00
AIR TANK ASSY Date: 05/10/89 Size: Route:

LEV	COMPONENT ITEM NUMBER	QTY PER	UM	OPTIONS COMPONENT DESCRIPTION	OPER	SQ	SCRAP FCTR	B/M TYP	--ENGR RELEASE--- RLS	REV	DATE	S I Z	PRI ROUTE NUM	ITM STS	S T K	C T L	P / M	COMM CODE
1	54023	1.0000	EA	AIR TANK WLMT	0	0	.0	A		03	05/10/89	C	PRIM	A	S	C	M	QLP
1	55126	.0000	EA	AIR TANK ASSY	0	0	.0	A		00	05/10/89	D		A	S	C	M	
1	61513	1.0000	EA	30182-12-12 FITTG	0	0	.0	A		00	04/14/89	P		A	S	C	P	QLP
1	61530	1.0000	EA	12LOC-12RFJX LOCON	0	0	.0	A		00	05/10/89	P		A	S	C	P	QLP
1	61539	1.0000	EA	FILTER/REG #B12-696-M3LA (NORGREN)	0	0	.0	A		00	05/10/89	P		A	S	C	P	QLP
1	61540	2.0000	EA	W54 PRESSURE GA	0	0	.0	A		00	05/10/89	P		A	S	C	P	QLP
1	61541	1.0000	EA	8MP8MP NPT ADPTR	0	0	.0	A		00	05/10/89	P		A	S	C	P	
1	61543	1.0000	EA	249IFHD22 MALE EL	0	0	.0	A		00	05/10/89	P		A	S	C	P	
1	61544	1.0000	EA	VALVE, NEEDLE #NV-106C-4-2 (PARKER)	0	0	.0	A		00	05/10/89	P		A	S	C	P	QLP
1	61647	2.0000	FT	HOSE, 3/4"ID LOCK ON, BLACK	0	0	.0	A		00	05/10/89	P		A	S	C	P	
1	65081	1.0000	EA	3/4NPT CLOSE NPPL	0	0	.0	A		00	05/10/89	P		A	S	C	P	
1	65186	1.0000	EA	90 STREET EL	0	0	.0	A		00				A	S	C	P	
1	65210	1.0000	EA	1/4NPT SHPP	0	0	.0	A		00				A	S	C	P	QLP
1	65288	1.0000	EA	3/4X1/2NPT TEE	0	0	.0	A		00	08/17/89	P		A	S	C	P	
1	66678	2.0000	IN	TUBE, COPPER 1/4"OD X .030WALL (U424-C4)	0	0	.0	A		00	08/17/89	P		A	S	C	P	QLP
1	85222	1.0000	PC	DECAL DRAIN AIR TK	0	0	.0	A		00	09/21/92	P		A	S	C	P	

D 55990



ITEM NO.	QTY.	DESCRIPTION	PART NO.	DWG.-SIZE
47	2	5/8-11 x 2 1/4 SHCS UNBRAKO	AA60342	
46	4	3/8 ID 7/8 OD 1/8 THK HI-TEN WSR	0063006	
45	6	PLAIN WASHER 5/8ID. NOM. TYPE "A" SER. N	AA62000	
44	1	MIDDLE PLUNGER WLMT	0054577	
43	3	JIC SWIVEL COUPLING 6LOC-6RFJX	0061521	
42	3	6LOR HOSE 3/8ID x 1'-8"	0065777	
41	3	MALE COUPLING 30182-6-6B	0065353	
40	6	3/8-16 HEX FLNG NUT GRD 8 PLTD	0063008	SPPLD W/ AA86059
39	6	3/8-16 x 2-1/2 RND HD/SQ NECK BOLT GRADE 8 PLATED	0063007	SPPLD W/ AA86059
38	3	CLAMP BAND RN21-X (W/HARDWARE)	AA86059	
37	1	TOP CAP NIPPLE 3/8 NPT x 2"	0065082	
36	2	HEX NIPPLE 3/8 NPT	0061518	
35	3	ADAPTOR: 1/4 NPT FEMALE-3/8NPT MALE	0065100	
34	2	BREATHER 3/8NPT	0061517	
33	3	MUFFLER	0061525	
32	3	QUICK EXHAUST VALVE	0061524	
31	2	QUAD RING (SEALS UNLIMITED)	0065665	SPPLD W/ AA86062
30	1	BASE SPRING (CONICAL)	AA71005	A
29	2	INTERMEDIATE SPRINGS	AA86061	SPPLD W/ AA86062
28	2	FHCS 5/16-24 NF x 3/4 UNBRAKO	0062927	
27	3	DIAPHRAMS	AA86060	
26	2	BODY SEAL ASSY	AA86062	
25	1	COVER ASSY	AA86057	
24	4	RUBBER WASHERS 5/8 I.D. NOM.	0062926	
23	2	NUT 5/8-11NC CAD. PLATED	0061203	
22	2	TIE ROD 5/8-11	AA14821	A
21	4	NYLOK NUT 5/8-11 NC GRADE 5	0061368	
20	4	3/8-16 x 1 SHCS (UNBRAKO LOC-WEL)	AA60341	
19	4	FLAT WASHER 5/8 NOM., STRUCTURAL HI-TENSILE SAE PROFILE	0062930	
18	4	JAM NUT 5/8-11 NC CAD. PLATED	0061356	
17	1	"LOCKFORMER" STICKER	0085203	
16	1	WAMP BASE PLATE	42983	A
15	3	3/8 NPT STREET ELBOW	0065183	
14	1	JAM NUT 7/8-9NC	0061361	
13	1	PRESSURE NUT	0042058	A
12	1	STROKE ADJUSTER (1/2-13 x 3 SSS)	0060728	A
11	1	1/2-13 NC COUPLING NUT	0063005	
10	1	"O" RING 1/2 DIA x 11/16 DIA x 3/32W.	0065664	
9	1	STROKE ADJUSTER BUSHING	0045503	A
8	1	PEDESTAL CUSHION	0016278	A
7	2	TRANSFER PLATE	0016171	A
6	1	BASE CHAMBER MACHINED	0042968	B
5	1	BASE PLUNGER WLMT.	0054578	B
4	1	UPPER PLUNGER WLMT.	0054576	B
3	1	WAMP COVER	54727	A
2	1	TOP PLATE	42984	A
1 (REFERENCE)	1	TOOLING BARREL AND C-FRAME REF.	0055162	D

THE LOCKFORMER CO.
711 OGDEN AVE. LISLE, ILLINOIS 60532

MACHINE: M.D. QUICLOK
PART NAME: WAMP II L90 ASSY
PART NUMBER: 55990
DRAWN BY: KM
DATE: 2-23-94
REVISIONS

SUPERSEDES DWG 55815