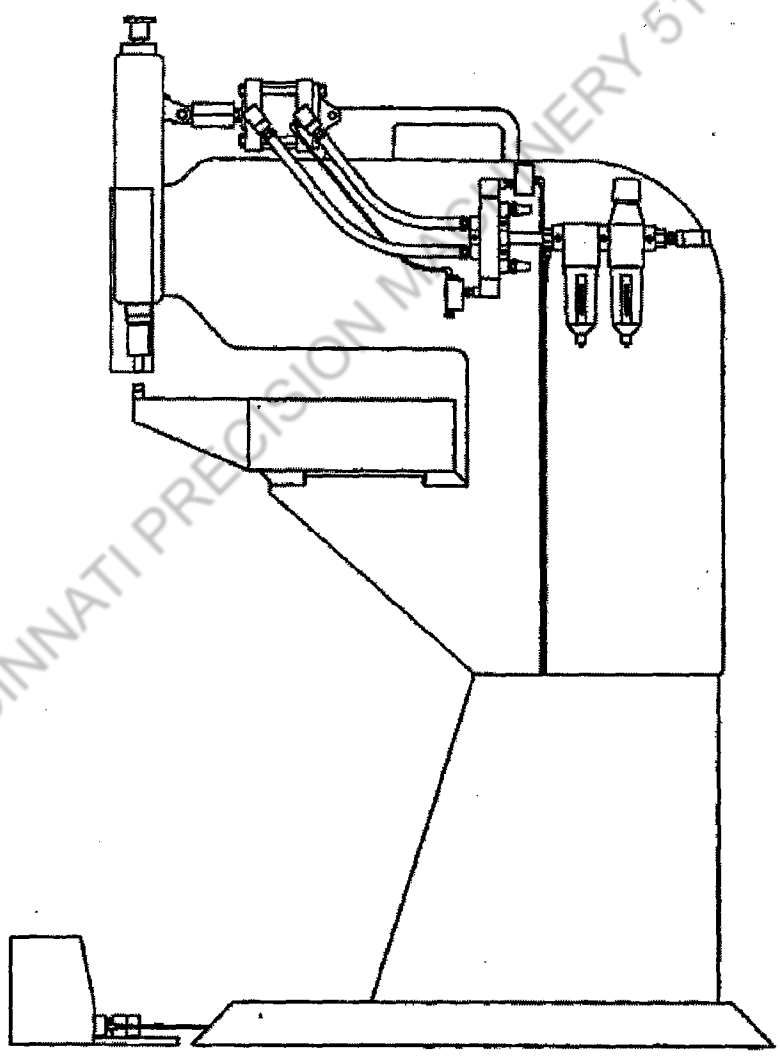
Quiclok

Medium Duty

INSTRUCTION MANUAL



LOCKFORMER

711 OGDEN AVENUE, LISLE, ILLINOIS 60532-1399 Phone (630) 964-8000 Fax (630) 964-5685

TABLE OF CONTENTS

ATTACHED DRAWINGS

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)

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.

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.

Make sure that hydraulic and pneumatic pressures are at specified levels before operating this equipment.

Be sure all guards and covers are in place.

Keep this equipment properly maintained.

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.

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

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

Safety Precautions While Operating The Machine(s)

Always turn the air shut-off valve OFF before performing any maintenance or adjustments so accidental start-up cannot occur.

Always be alert whenever operating any machinery.

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 air, always use lock-outs and warning signs to indicate that you are working on the machines(s).

Keep your hands and arms away from any pinch points when starting, running or stopping.

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

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

Never over-ride or disable any safety switch or safety interlock.

UNPACKING AND INSPECTION

The following items should be found shipped with your Quiclok machine:

- Complete assembly with punch and die of choice
- Foot Pedal
- Tools
- Manual with Parts List
- Button Lok Samples (for reference)
- Spare Dies (if ordered)

Unpack unit and inspect for any damage during shipping.

Please record Serial Number stamped on the side face of the Quiclok frame:

Serial # _____

INSTALLATION

Using the frame floor tubes, use fork truck to remove machine from shipping skid, and level the machine to the floor area where it will be operated.

Connect 1/2" air supply hose from the main supply line and directly to the shut-off valve provided.

SERVICE

For factory service inquiries contact the
Lockformer Service Department at (630) 964-8000.

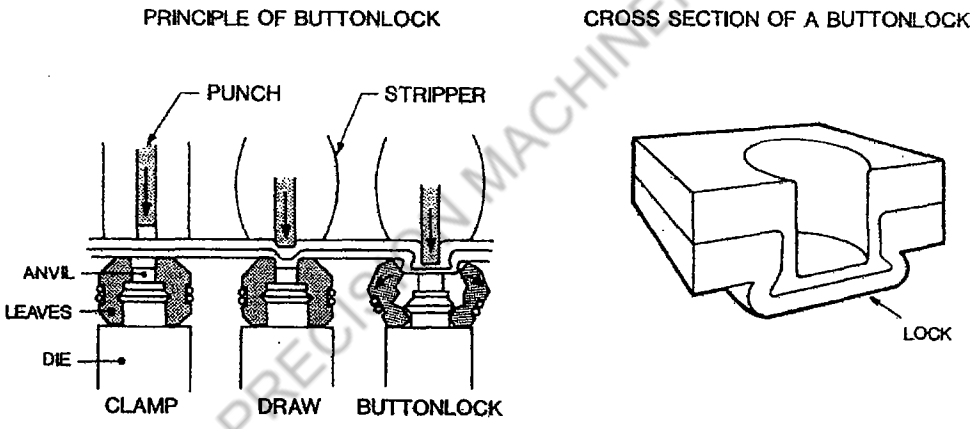
AIR SUPPLY

Connect air hose to the inlet shut-off valve of the equipment (1/2" is the minimum diameter recommended). Set the air regulator to 75 psi by turning the dial on top of the regulator clockwise. The filter should be clean and light lubrication is recommended. With the unit operating with a stroke of 3/4", the unit uses approximately 48 cubic inches of air at 75 psi per buttonlok. A 1 horse power compressor in good condition should be capable of sixty buttonloks per minute with a 50% duty cycle.

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 shown on illustrations 1 and 2.



The button is formed when the upper squeezes the two layers of material to be joined between the punch and the die. The amount of squeeze is very important to the strength of the buttonlok and to the life expectancy of the punch and the die.

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

The correct punch depth is the most critical adjustment on the unit. Please read the punch depth 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

DIE SELECTION CHART

Please Note:

1. Die Size (denoted by color) directly relates to the anvil depth.
2. The thicker the material, the greater the anvil depth.
3. All punches are the same; 0.187" tip diameter, 0.015" chamfer radius.

Condensed Die / Gauge Chart - Reference		
#50 DIE (Red)	16-18 GAUGE	C/Q
#40 DIE (Blue)	20-22-24 GAUGE	C/Q
#30 DIE (Yellow)	26-28 GAUGE	C/Q
#30 DIE (Yellow)	30* GAUGE	D/Q (Recommended)
C/Q = Commercial Quality Mild Steel D/Q = Drawing Quality Mild Steel		

DETAILED DIE SELECTION CHART (For Reference Only)

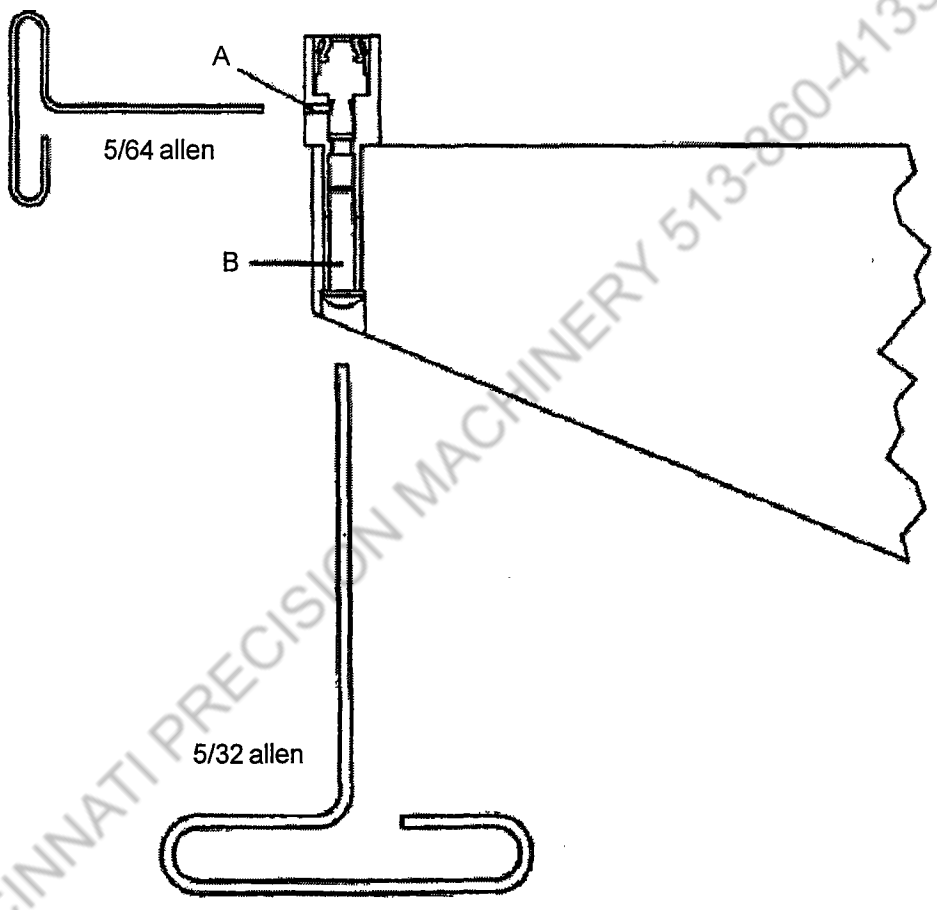
Drawing Quality of material will determine the most successful die/gauge combination. This chart is a guide only. Some materials will require a different anvil depth.

Material Thickness (T-B)	Gauge (Top - Bottom)	Die (Anvil Depth)	Material
0.063 - 0.063	16-16	#50 (Red)	C/Q
0.063 - 0.052	16-18	#50 (Red)	C/Q
0.063 - 0.040	16-20	#50 (Red)	C/Q
0.052 - 0.052	18-18	#50 (Red)	C/Q
0.052 - 0.040	18-20	#50 (Red)	C/Q
0.040 - 0.040	20-20	#40 (Blue)	C/Q
0.040 - 0.034	20-22	#40 (Blue)	C/Q
0.040 - 0.028	20-24	#40 (Blue)	C/Q
0.034 - 0.034	22-22	#40 (Blue)	C/Q
0.034 - 0.028	22-24	#40 (Blue)	C/Q
0.034 - 0.022	22-26	#40 (Blue)	C/Q
0.028 - 0.028	24-24	#40 (Blue)	C/Q
0.028 - 0.022	24-26	#40 (Blue)	C/Q
0.022 - 0.022	26-26	#30 (Yellow)	C/Q
0.022 - 0.018	26-28	#30 (Yellow)	C/Q
0.022 - 0.016	26-30*	#30 (Yellow)	C/Q-(*D/Q)
0.018 - 0.018	28-28	#30 (Yellow)	C/Q
0.018 - 0.016	28-30*	#30 (Yellow)	C/Q-(*D/Q)
0.016 - 0.016	30-30	#30 (Yellow)	D/Q

REMOVING THE DIE / DIE HOLDER ASSEMBLY

CAUTION!
SHUT OFF AIR SUPPLY VALVE BEFORE REMOVING DIE
(AIR WILL BLEED OFF AUTOMATICALLY)

The buttonlok die may be removed by simply removing the Die Securing Set Screw (A). See illustration below.



REPLACING THE DIE HOLDER

1. Remove the die holder retaining screw
2. Install new die holder and tighten the Die Holder Retaining Screw
3. Replace the Plastic Guard (if removed).
4. Turn on the Air Supply.

BUTTON STRENGTH

There are two ways to measure the strength to a buttonlok joint, shear (pull) and peel (see illustration 3 on page 8).

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;

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

2. 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 (2) 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 and an over adjusted button (die too close to the punch) will fail.

The correct adjustment is when the lock fails in peel.

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 preceding chart (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 illustration 3 on page 8).

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 be measured.

Calipers can then be used in production to see if the cap diameter is within the measured limits.

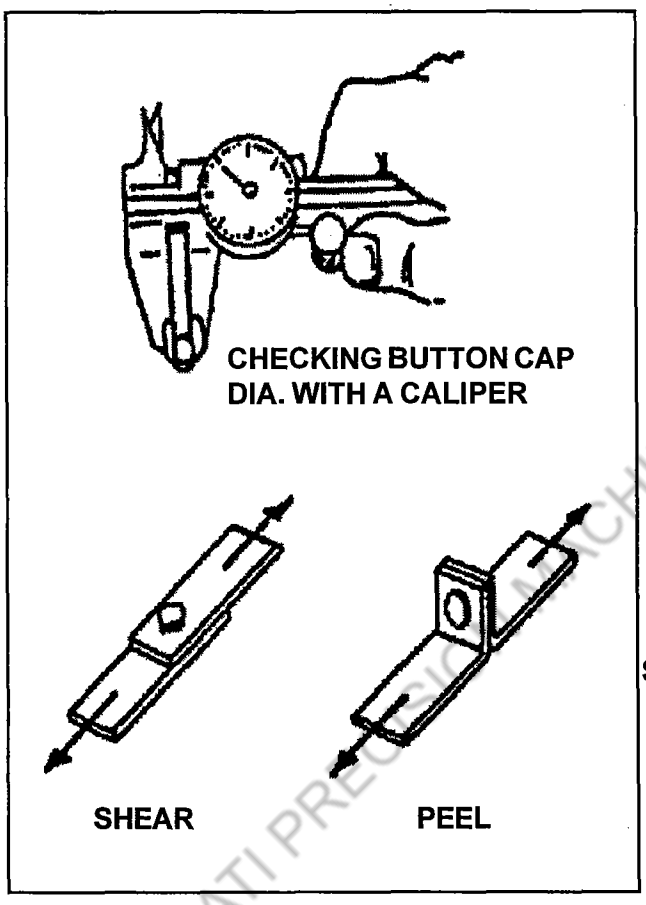
NOTE: If the material changes or the die # is changed, the button cap diameters will change (see illustration 3 on page 8). When using the button cap diameter, shear and peel tests should also be used occasionally to confirm strengths.

THREE PLY MATERIAL

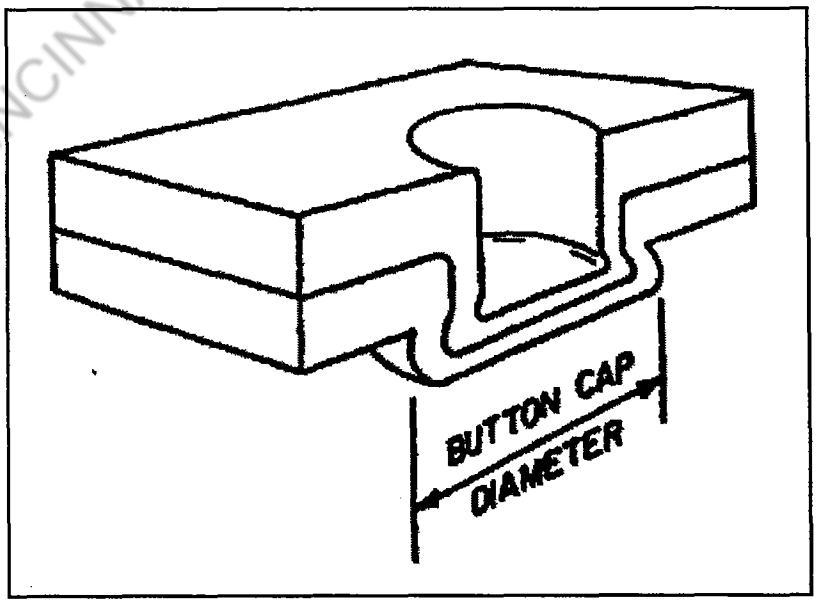
The Quiclok is primarily designed to join two ply material up to a maximum combined thickness of 0.125". It is possible to join three ply material up to a combined thickness of 0.125" however the strength of the top ply button joint (punch side) will be reduced.

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



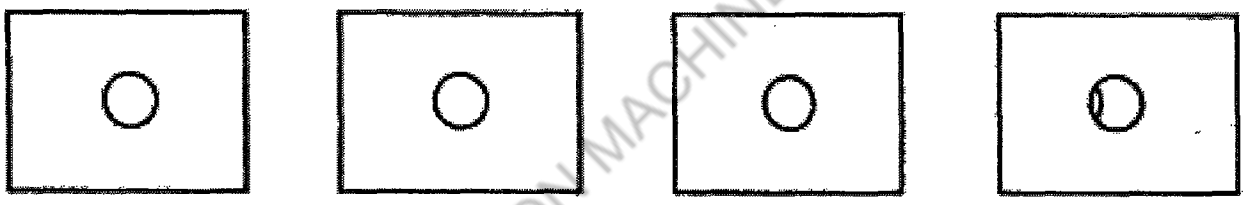
SHEAR (PULL) AND PEEL TESTING



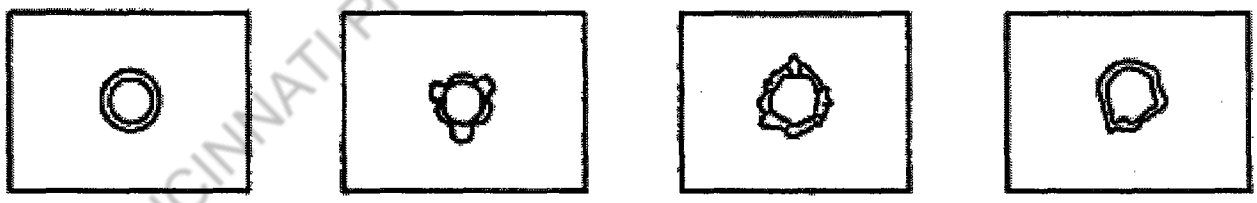
BUTTON VIEWS
ILLUSTRATION 4

1	2	3	4
TOOLING UNDER ADJUSTED	TOOLING ADJUSTED CORRECTLY	TOOLING OVER ADJUSTED	TOOLING CHIPPED OR BROKEN

CROSS SECTION OF BUTTON



TOP VIEW OF BUTTON (PUNCH SIDE)



3 LEAF

BOTTOM VIEW OF BUTTON (DIE SIDE)

AUTOMATIC RETURN ADJUSTMENT

The Quiclok press is equipped with a pressure sensing sequence valve that automatically retracts the punch when the forming is complete. When the foot pedal is depressed, the punch will close on the die and release when the preset pressure is reached. The punch will not retract, however, unless the foot pedal has been released. To adjust the release pressure, there is an adjusting screw on the bottom of the Auto Return Unit.

To **increase** the release pressure - turn the adjuster screw clockwise

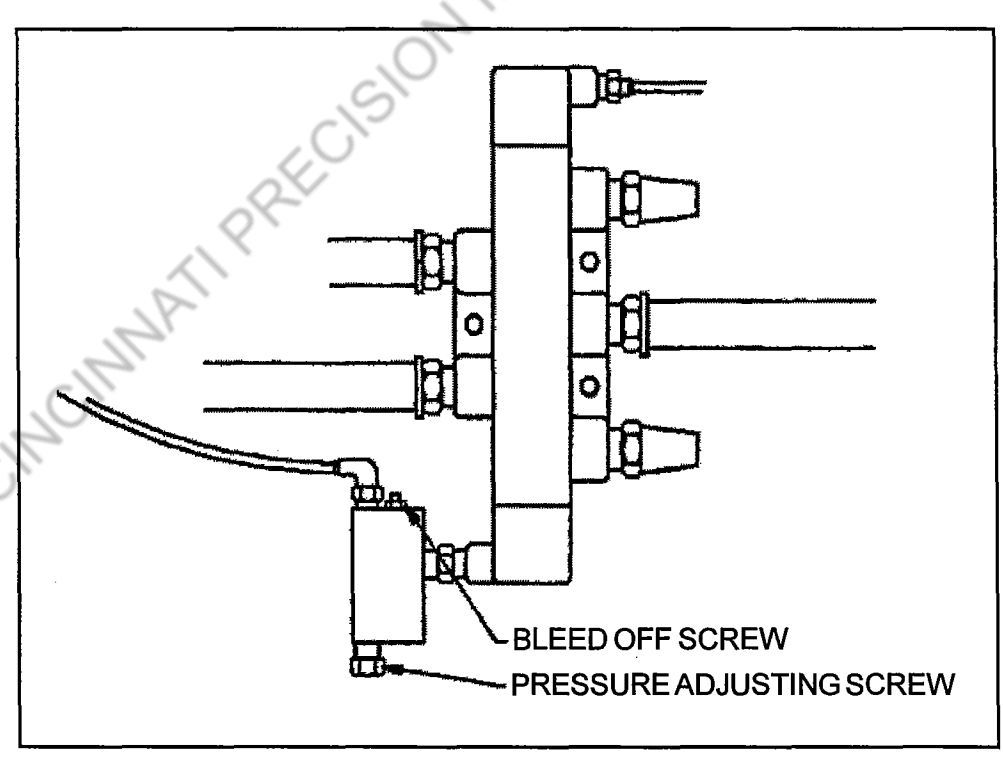
To **decrease** the release pressure - turn the adjuster screw counterclockwise

IMPORTANT: If the punch release pressure is too low, 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.*

Adjustment of the Bleed Off Screw:

Turn screw clockwise until tight and back out 1/2 turn.

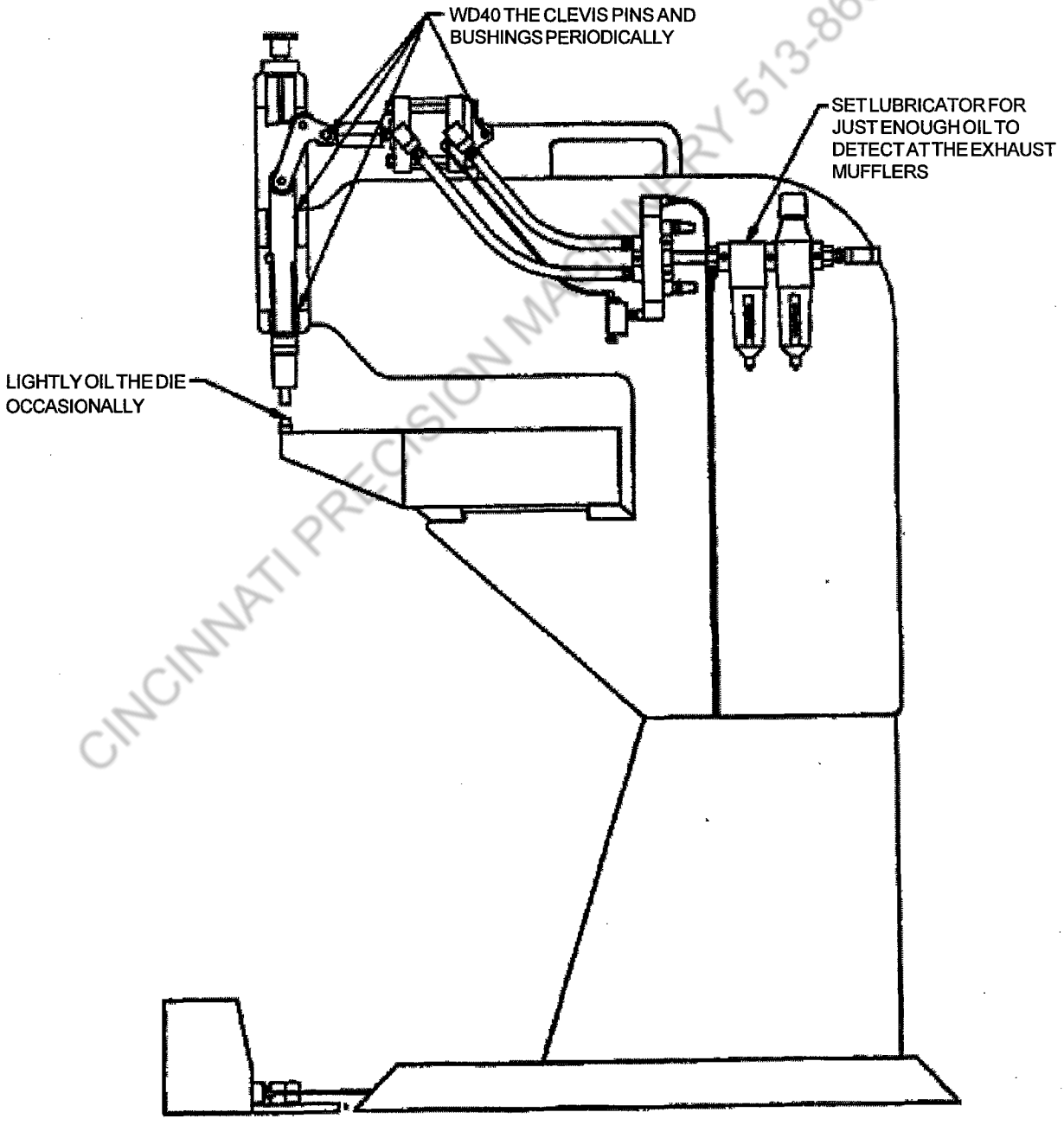


MAINTENANCE

"C" FRAME
Visually inspect the frame for signs of damage or fatigue.

FILTERS AND MUFFLERS
Drain the filter regulator daily by opening the valve underneath the filter cup. Leave open until all the moisture has drained out, then close.

HOSES AND QUICK CONNECTS
Regularly (weekly) inspect all hoses and check 5/32 control lines for damage.



Medium Duty Quiclok Specifications	
Description	Medium Duty Quicklok
Frame	Steel "C" Frame
Throat	18 or 24
Stroke	3/4 Standard setting
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	4" Bore x 2" Stroke Air Cylinder
Die Type	55734 (anvil depth .030) yellow 55735 (anvil depth .040) blue 55736 (anvil depth .050) red
Punch Type	86255 3/16 diameter
Cycle Speed	120 buttons/minute (3/4 Stroke)
Duty Cycle	100%
Air Requirements	75 psi (minimum)
Air Consumption	0.025 cu. ft. air per button (Approx. 1 hp @ 60 buttons per minute)
Approx. Weight	MDQL 18 - 1139 lbs. MDQL 24 - 1679 lbs.

TROUBLESHOOTING

Total Failure of Joint (See also Troubleshooting Section DISTORTED JOINTS)		
Problem	Cause	Solution
No button formed	Broken punch or die	Replace tool
	High pressure too low	Increase pressure to 75 PSI Re-adjust automatic return
Button partially formed no squeeze	Metal not of specified thickness	Use specified metal or use proper tooling
	Pressure drop	Restore pressure
	Incorrect tooling for metal being used	Verify joint data, change tooling if necessary
	Incorrect shut height adjustment	Adjust shut height for correct clearance
Piercing/cracking of punch side	Metal not of specified thickness	Use specified metal 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

Intermittent Failure		
Problem	Cause	Solution
Same tooling produces intermittently good and bad parts	Parts do not fit gauging	Re-adjust shut height with top adjusting knob
	Parts interfere with tooling operation	Correct parts configuration

TROUBLESHOOTING

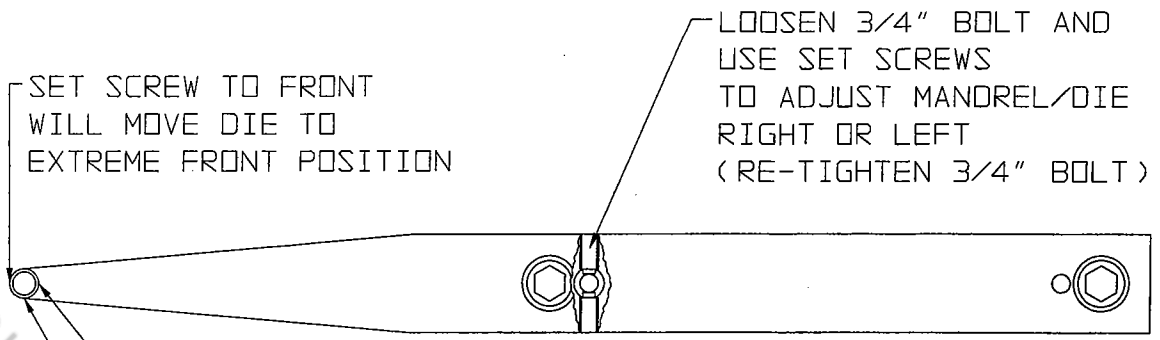
Deformed or Distorted Joints		
Problem	Cause	Solution
Cracks appear on button	Metal not of specified thickness or hardness	Use specified metal or use proper tooling
	BD too large, tooling over adjusted	Back off shut height adjustment
	Incorrect tooling for metals	Verify joint data, change tooling if necessary
	Punch/die not concentric	Realign tooling
	Excessive deflection	Check for damage
Cracks appear inside joint cup	Metal not of specified thickness or hardness	Use specified metal or use proper tooling
	Tooling incorrect for metals	Verify joint data, change tooling if necessary
	Punch/die not concentric	Realign tooling
Lump or irregularity on button	Chipped punch or die	Replace
Button tearing	Shut height to shallow	Re-adjust shut height
		Check controls or operator
No backflow of button (refer to page 9, illustration 4, no. 2)	Shut height to shallow Material not drawing quality	Re-adjust shut height
Partial backflow of button (refer to page 9, illustration 4, no. 4)	Die leaf missing or opened before joining	Replace leaf if missing or check for interface causing leaf to open on part loading
	Deflection in force frame or tool holder	Check for damage

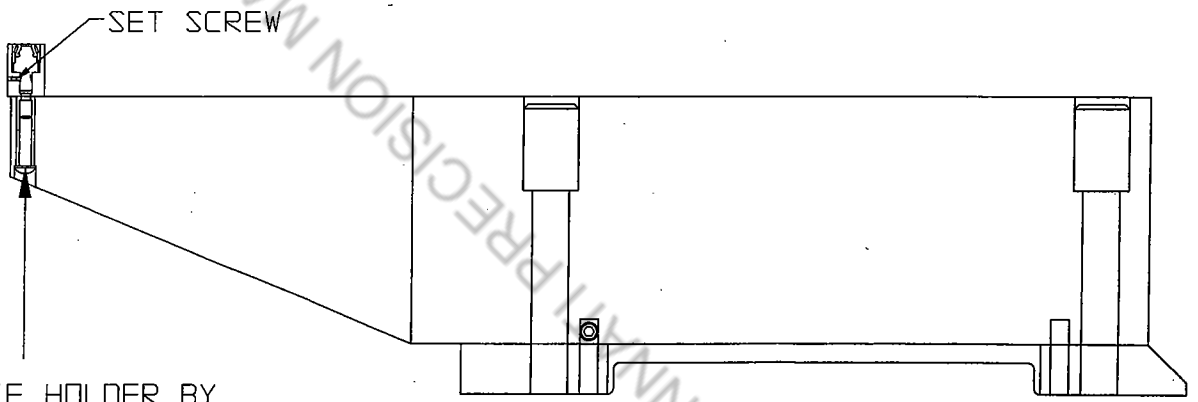
TROUBLESHOOTING

Deformed or Distorted Joints (Continued)		
Problem	Cause	Solution
Dimpling and unformed button	Die leaf missing	Replace leaf
	Retaining ring leaf open	Replace ring
Button not round	Leaf not operating	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
Parts are distorted during joining	Insufficient stripper force	Replace stripper spring (if broken)
	Shut height to deep	Re-adjust shut height

MANDREL/DIE REPLACEMENT AND ALIGNMENT PROCEDURE:

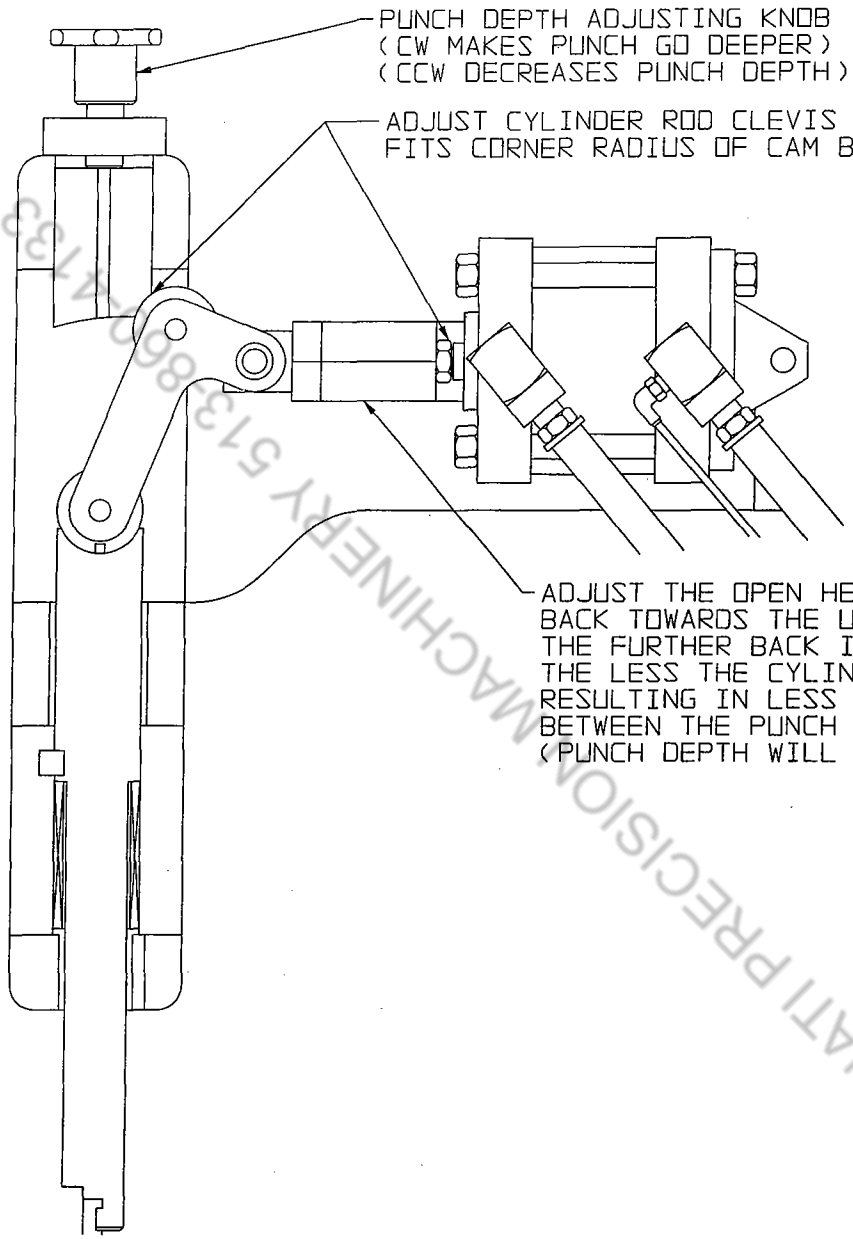
1) REMOVE PUNCH AND REPLACE STRIPPER AND SPRING
2) BOLT MANDREL IN PLACE AND INSTALL DIE HOLDER
3) HOLD FOOT PEDAL DOWN SO STRIPPER COMES DOWN ON DIE HOLDER
4) ADJUST MANDREL RIGHT OR LEFT UNTIL STRIPPER VISUALLY ALIGNS WITH DIE HOLDER
5) RELACE PUNCH AND INSTALL DIE
6) MAKE TEST PUNCH WITH ONE PIECE OF METAL
7) INSPECT FORM TO DETERMINE IF DIE IS OFF CENTER FROM PUNCH
8) ALIGN FRONT TO BACK POSITION FIRST BY LOOSENING DIE HOLDER RETAINING SCREW AND ADJUSTING DIE IN CORRECTIVE DIRECTION
9) MAKE NEW TEST PUNCH AND ADJUST MANDREL RIGHT OR LEFT IN CORRECTIVE DIRECTION
10) REPEAT STEPS 9 AND 10 UNTIL PUNCH FORM LOOKS CENTERED
11) MAKE TEST PUNCH WITH DESIRED TWO PIECES OF METAL AND INSPECT FOR SIGNS OF MISALIGNMENT
12) MAKE MINOR ALIGNMENT CHANGES UNTIL FORM LOOKS RIGHT





MANDREL ALIGNMENT

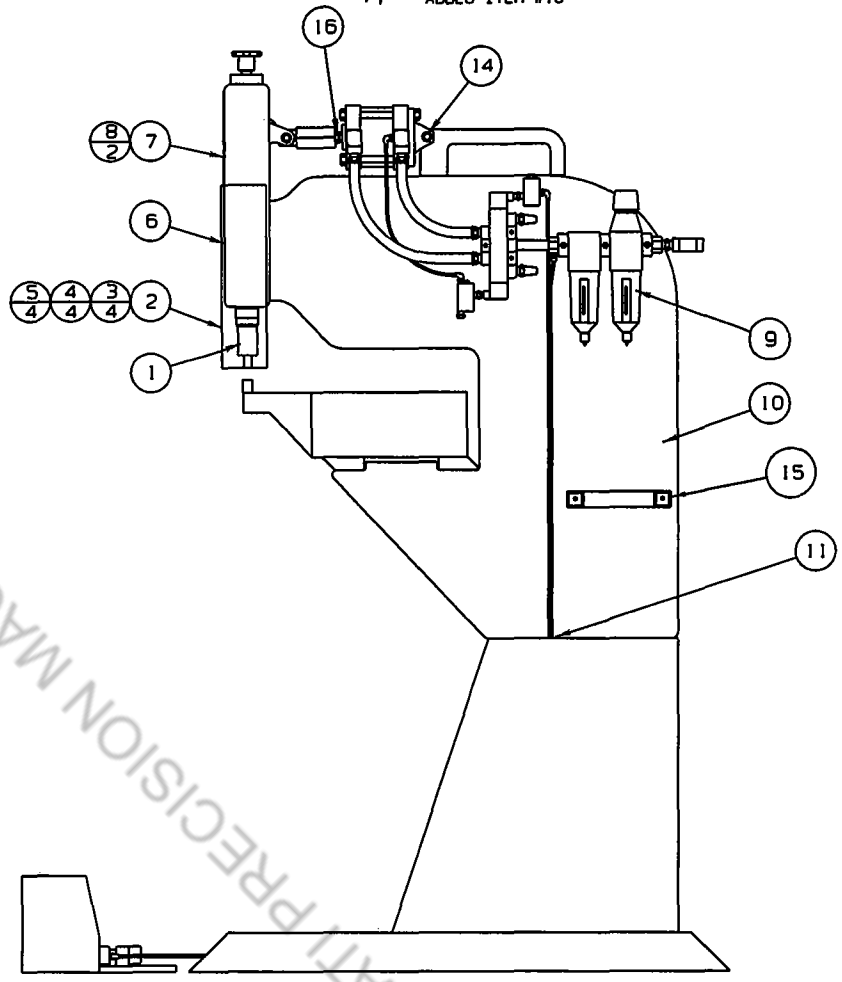
202-0061



AA55280

PUNCH DEPTH
OPEN HEIGHT
& CLEVIS
ADJUSTMENTS

ITEM	QTY	STOCK NO.	DESCRIPTION	LENGTH	L.F. P/N	
1	1	202-0066	TOOLING GROUP	-	AA55281	
2	1	202-0051	PUNCH GUARD	-	AA24601	
3	4	SB-0312-0250	5/16 X 1/4 SHOULDER BOLT	-	AA62907	
4	4	HW-0250	1/4 HARD WASHER	-	62004	
5	4	HW-0312	5/16 HARD WASHER	-	62011	
6	1	201-0000	EYE PROTECTION DECAL	-	AA84147	
7	1	202-0050	RAM HOUSING COVER	-	AB35031	
8	2	BHCS-0250-0375	1/4 X 3/8 BUTTON HEAD	-	62773	
9	1	202-0168	AIR GROUP	-	AA55299	
10	1	202-0128	FINAL WELDMENT 18	-	AA51979	
11	0	500-0018	GROMMET	-	-	
12	2	201-0001	PINCH POINT DECAL	-	AA84148	
13	1	700-0010	QUICKLOK DECAL (NOT SHOWN)	-	85202	
14	1	300-0031	3/4 X 1/2 X .50 LONG NEEDLE BEARING	-	66986	
15	1	202-0054	TOOL HOLDER	-	AB28219	
16	1		JAM NUT	-	AA42543	①



△	REVISION	NAME/DATE
1	ADDED ITEM #16	1/23/03 RB

R WELTY

202-0155
DO NOT SCALE

TOLERANCES	
.0	±.050"
.00	±.025"
.000	±.005"
ANGLES	±.5°

ITEM	QTY	STOCK NO.	DESCRIPTION	LENGTH

CONCEPTS TO REALITY, INC.
DESIGNS by WELTY
2501 McCOY STREET
GADSDEN, ALABAMA 35901
PHONE: 205/549-0500
FAX: 205/549-0570

DRAWN BY	DATE	SCALE
R WELTY	Feb 15-99	NO

NEXT HIGHER USAGE NO.	QTY	TEMPLATE NO/FIXTURE NO
202-0156	-	-

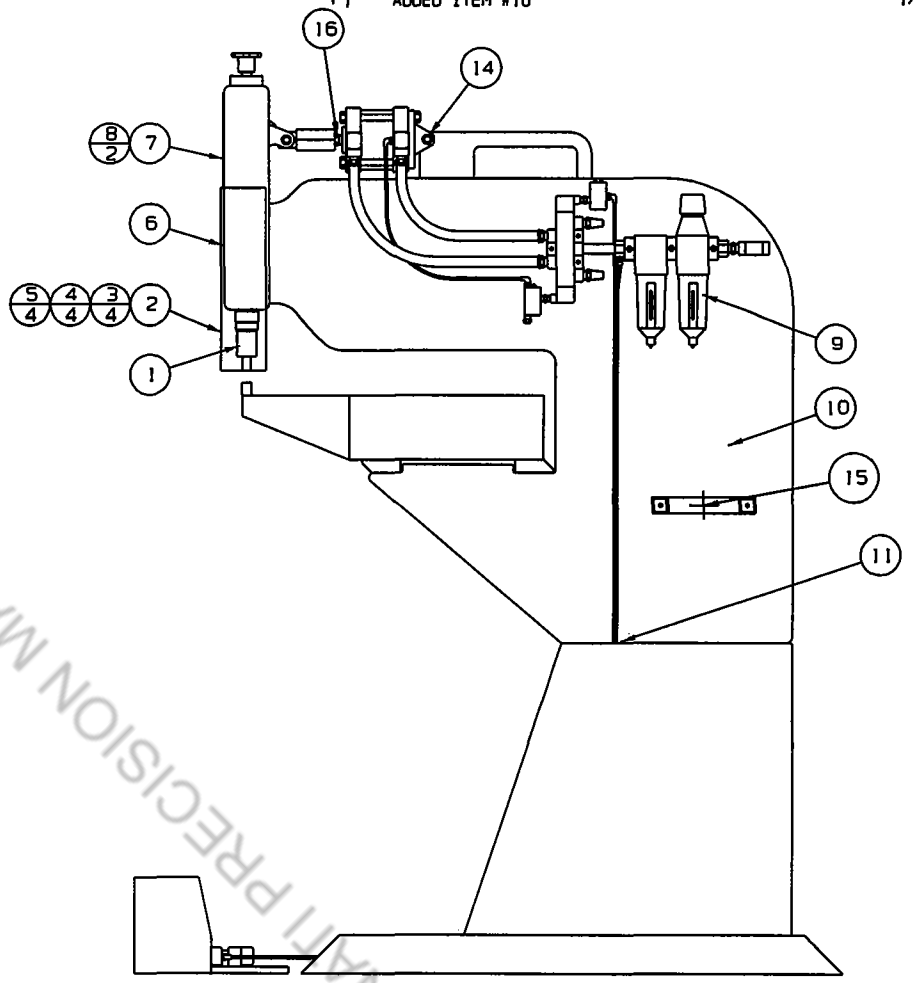
TITLE
QLM018 FINAL ASSEMBLY

AA55298

1 OF 1

ITEM	QTY	STOCK NO.	DESCRIPTION	LENGTH	L.F. P/N
1	1	202-0066	TOOLING GROUP	-	AA55281
2	1	202-0051	PUNCH GUARD	-	AA24601
3	4	SB-0312-0250	5/16 X 1/4 SHOULDER BOLT	-	AA62907
4	4	HW-0250	1/4 HARD WASHER	-	62004
5	4	HW-0312	5/16 HARD WASHER	-	62011
6	1	201-0000	EYE PROTECTION DECAL	-	AA84147
7	1	202-0050	RAM HOUSING COVER	-	AB35031
8	2	BHCS-0250-0375	1/4 X 3/8 BUTTON HEAD	-	62773
9	1	202-0168	AIR GROUP	-	AA55299
10	1	202-0129	FINAL WELDMENT 24"	-	AA51980
11	0	500-0018	GROMMET	-	-
12	2	201-0001	PINCH POINT DECAL	-	AA84148
13	1	700-0010	QUICKLOK DECAL (NOT SHOWN)	-	85202
14	1	300-0031	3/4 X 1/2 X .50 LONG NEEDLE BEARING	-	66986
15	1	202-0054	TOOL HOLDER	-	AB28219
16	1		JAM NUT	-	AA42543 ①

△	REVISION	NAME/DATE
1	ADDED ITEM #16	1/23/03 RB



L.F. P/N	ITEM	QTY	STOCK NO.	DESCRIPTION	LENGTH

TOLERANCES	
.0	±.050"
.00	±.025"
.000	±.005"
ANGLES	±.5°

CONCEPTS TO REALITY, INC.
DESIGNS by WELTY
2501 McCOY STREET
GADSDEN, ALABAMA 35901
PHONE: 205/549-0500
FAX: 205/549-0570

DRAWN BY	DATE	SCALE
R WELTY	Jan 27-02	1.00

NEXT HIGHER USAGE NO.	QTY	TEMPLATE NO/FIXTURE NO
202-0156	-	-

TITLE: QLMD 24 FINAL ASSEMBLY

AA55301

1 OF 1

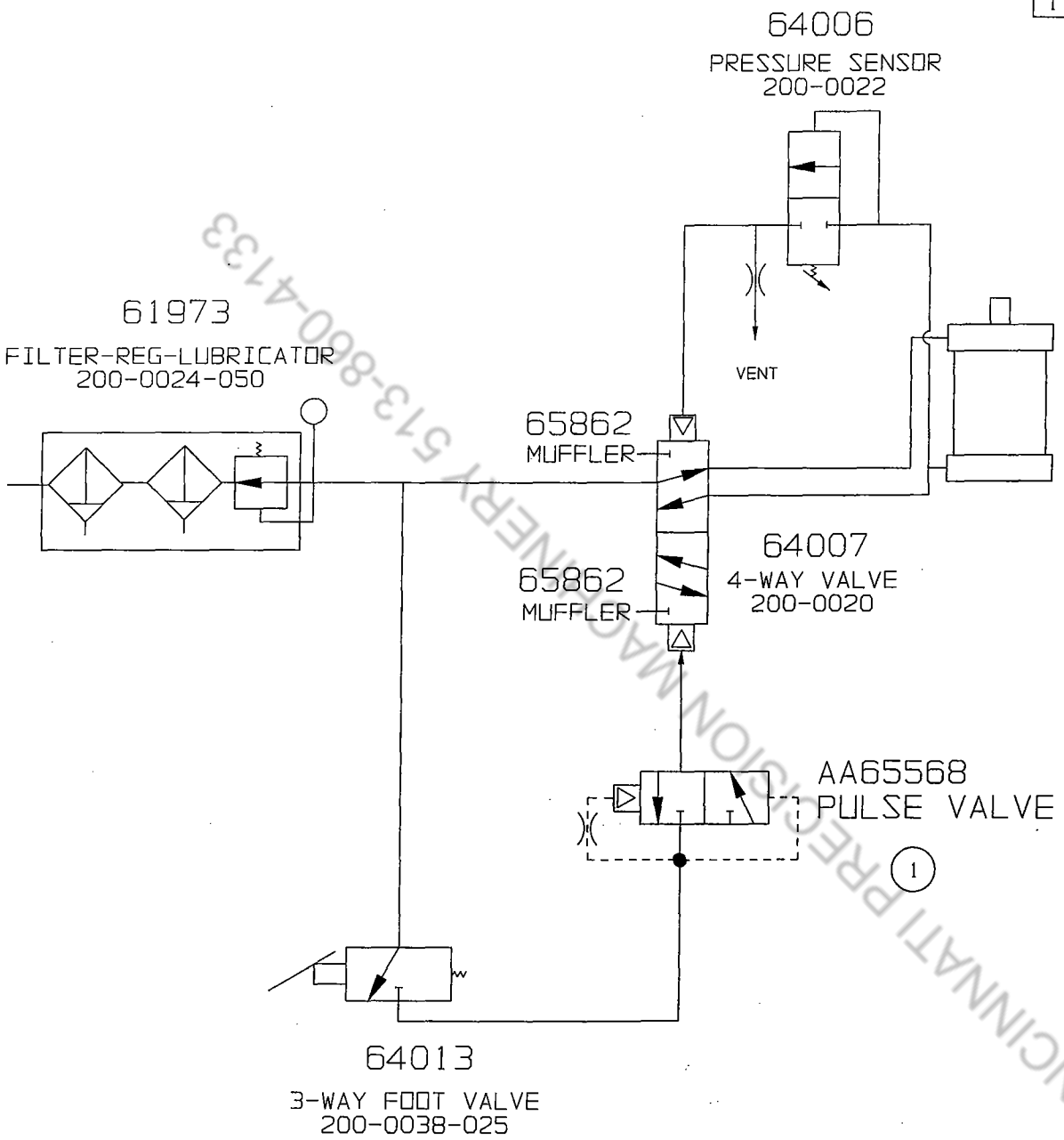
202-0154

DO NOT SCALE

R WELTY

202-0063

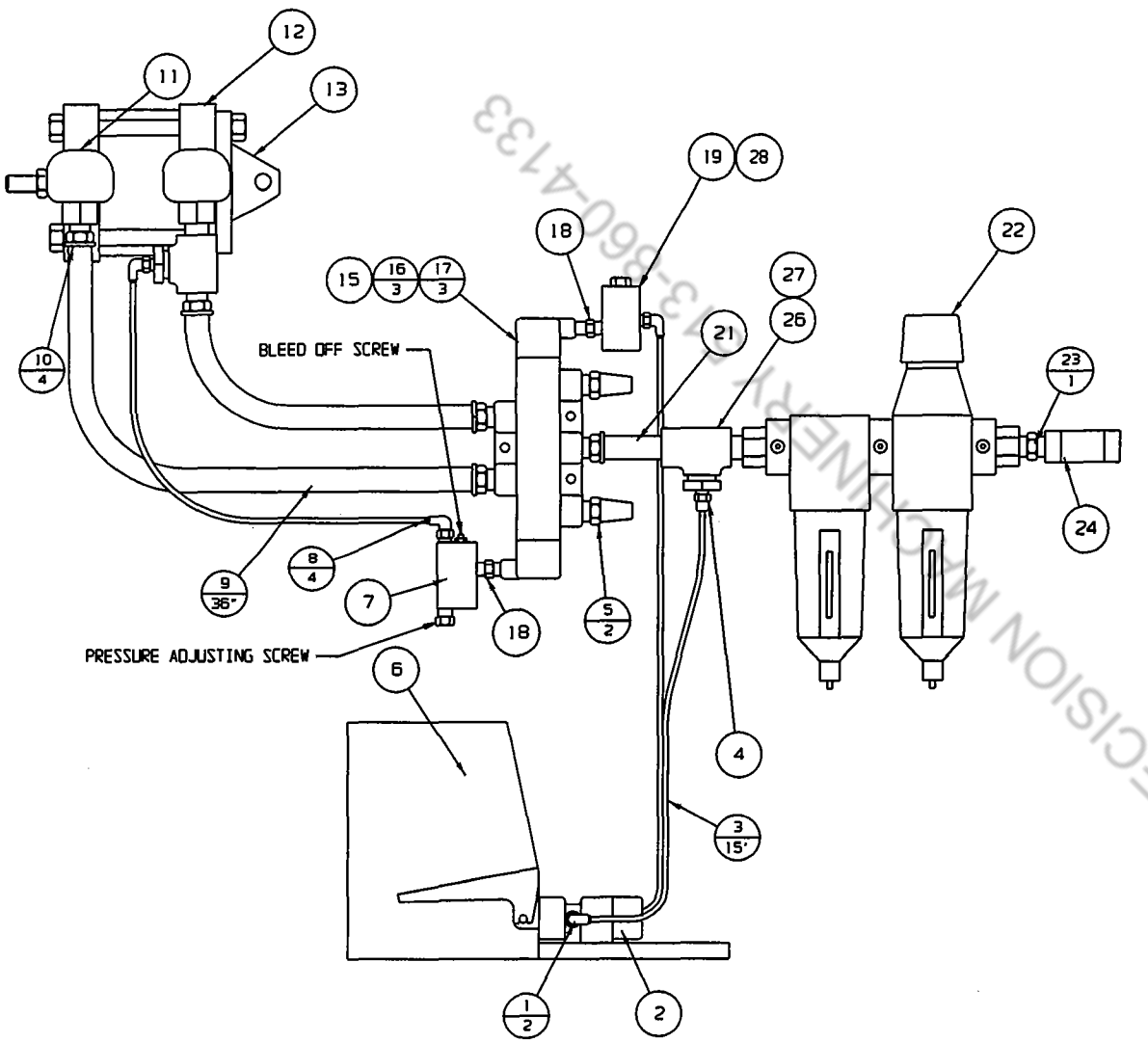
1	ADDED PULSE VALVE	RD/7/15/02



AA55291

QLMD 18/24
PNEUMATIC
DIAGRAM

△	REVISION	NAME/DATE
1	ADDED ITEM 19 & 28	RD/7-15-02



202-0168

ITEM	QTY	STOCK NO.	DESCRIPTION	LENGTH
64009	1	2	200-0034-04	1/4 NPT X 5/32 TUBE 90	-
64013	2	1	200-0038-025	1/4" 3-WAY VALVE	-
61886	3	15'	200-0035-156	5/32 OD PLASTIC TUBING	-
64010	4	1	200-0034-05	1/8 NPT TO 5/32 OD TUBe	-
65862	5	2	200-0023-050	MUFFLER	-
64014	6	1	200-0039	FOOT VALVE GUARD	-
64006	7	1	200-0022	PRESSURE SENSOR	-
64008	8	4	200-0034-01	1/8 NPT TO 5/32 OD TUBE 90	-
65778	9	36"	200-0026-050	1/2" BLACK AIR HOSE	-
65747	10	4	200-0027-050	1/2" PUSHLOCK NIPPLE	-
61623	11	2	-	ELBW.90°,STR. 1/2M X 1/2F	-
64028	12	1	200-0043	4 X 2 POWER CYLINDER	-
AA55286	13	1	202-0047	CYLINDER BASE WELDMENT	-
65868	14	0	200-0040-050	1/2" QUICK EXHAUST	-
64007	15	1	200-0020	1/2" 4-WAY AIR VALVE	-
AA71279	16	3	SP-0250500075	1/4 ID X 1/2 OD X 3/4 LONG SPACERS	-
60306	17	3	SHCS-0250-1500	1/4 X 1 1/2 LONG SOCKET HEAD CAP SCREW	-
66783	18	2	200-0030-000	1/8" HEX CLOSE NIPPLE	-
AA65568	19	1	-	PULSE VALVE DS-1 FABCO-AIR	-
64004	20	0	200-0023-075	3/4" SINTERED MUFFLER	-
AB65823	21	1	PN-B-050-300	1/2" X 3" LONG BRASS NIPPLE	-
61973	22	1	200-0024-050	1/2" FILTER-REG-LUBE	-
61687	23	1	200-0030-050-20	1/2" X 2" LONG HEX NIPPLE	-
64011	24	1	200-0044	1/2" SLIDE VALVE	-
-	25	0	202-0082	REWORKED END BLOCK KIT	-
61715	26	2	-	TEE, STREET,1/2 NPT	-
61720	27	2	-	BSHG,HEX,1/2M X 1/8 F	-
AA65995	28	1	-	BREATHER	-

DO NOT SCALE

TOLERANCES
.0 ±.050"
.00 ±.025"
.000 ±.005"
ANGLES ±.5°

CONCEPTS TO REALITY, INC.
DESIGNS by WELTY
2501 McCOY STREET
GADSDEN, ALABAMA 35901
PHONE: 205/549-0500
FAX: 205/549-0570

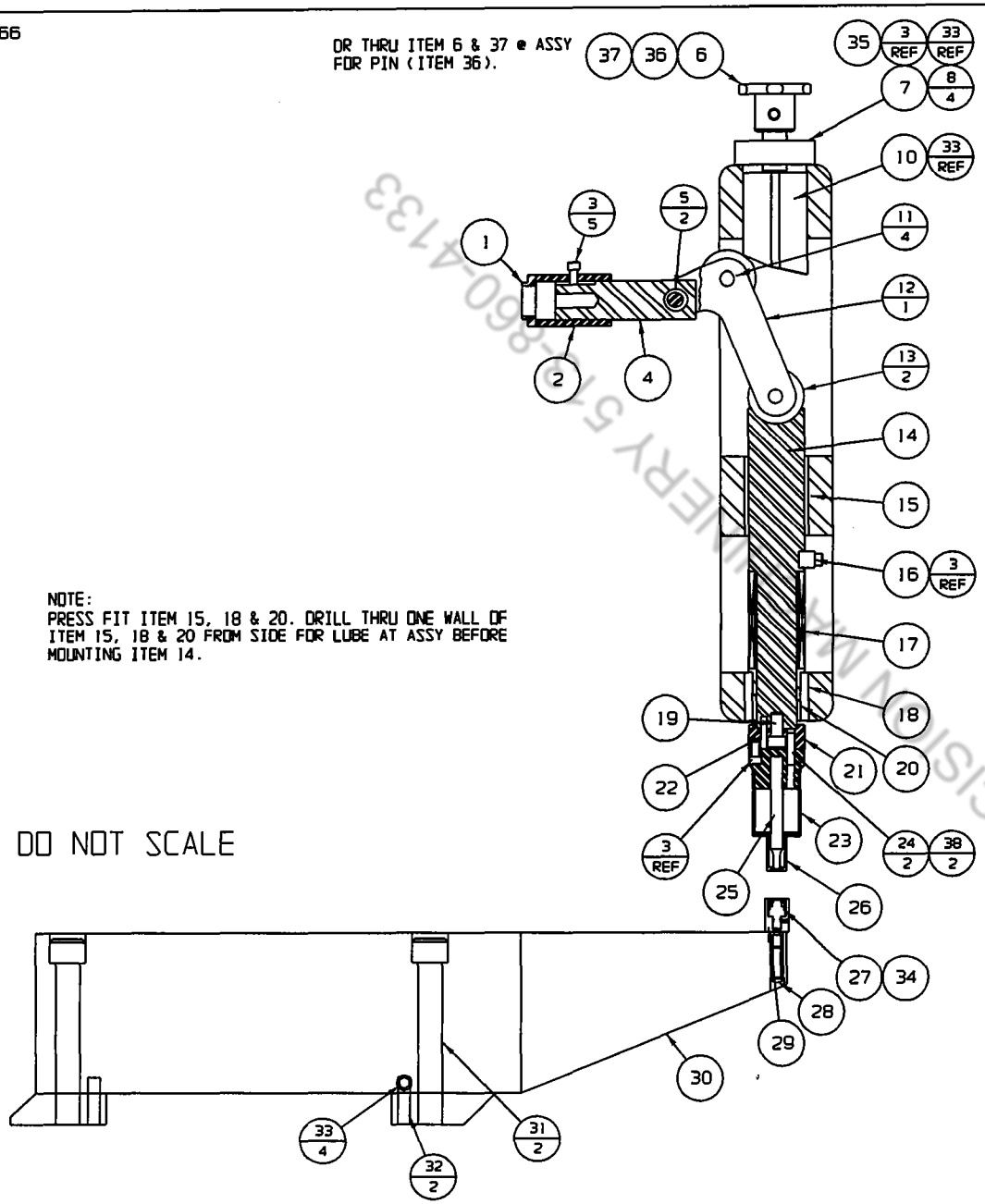
DRAWN BY: R WELTY
DATE: Feb 15-99
SCALE: NO
NEXT HIGHER USAGE NO: -
QTY: -
TEMPLATE NO/FIXTURE NO: -

TITLE
QLMD18/24 AIR GROUP

AA55299

1 OF 1

202-0066



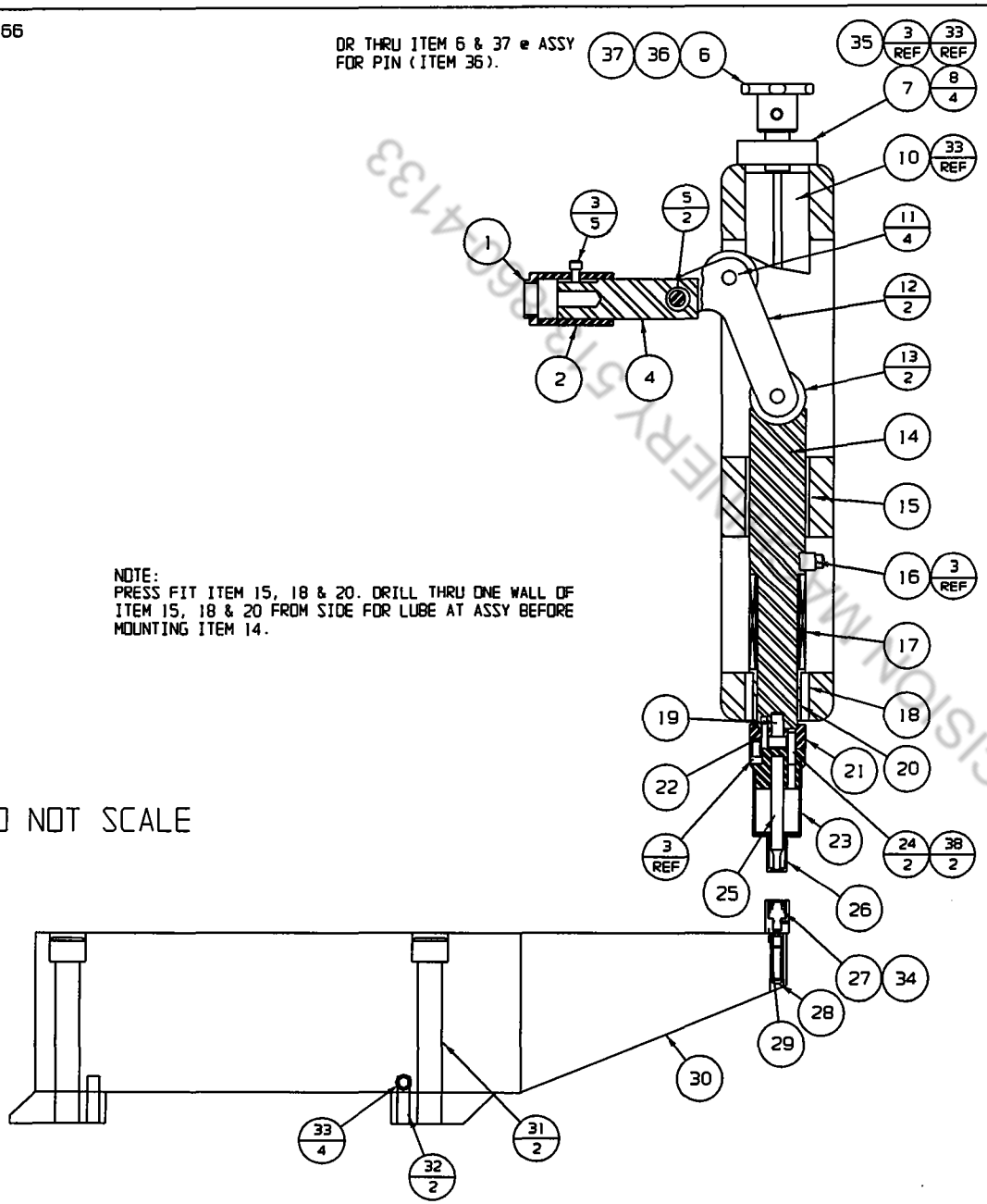
L.F. P/N	ITEM	QTY	STOCK NO.	DESCRIPTION	LENGTH
AA16491	1	1	202-0071	URETHANE SHOCK PAD	-
AA16492	2	1	202-0070	ADJUSTING NUT	-
60309	3	5	SHCS-0250-0500	1/4 X 1/2 SOCKET HEAD CAP SCREW	-
AA16489	4	1	202-0048	ROD CLEVIS	-
AA66029	5	2	300-0030	3/4 X 1/2 X .50 LONG NEEDLE BEARING	-
AA70945	6	1	500-0015	HAND KNOB	-
AA24593	7	1	202-0034	RAM THRUST PLATE	-
60316	8	4	SHCS-0312-0750	5/16 X 3/4 SOCKET HEAD CAP SCREW	-
9000313	9	0	NYRD-0312	5/16 DD NYLON ROD, 25'' LONG	-
AA16488	10	1	202-0036	CAM BLOCK	-
AA62611	11	4	DPST-0500-020	1/2 X 2 STAINLESS DOWEL	-
AA51970	12	1	202-0089	PIVOT ARM	-
AA66032	13	2	300-0023	1 3/4 CAMROL	-
AA16487	14	1	202-0033	RAM	-
AA66440	15	1	300-0022	DILITE BUSHING	-
AA24602	16	1	202-0065	ANTI-ROTATION KEY	-
* AA42540	17	1	~~500-0014~~	RETURN SPRING	-
AA16490	18	1	202-0056	HOUSING SLEEVE	-
60394	19	1	SHCS-0375-0750	3/8 X 3/4 SOCKET HEAD CAP SCREW	-
AA66441	20	1	300-0024	DILITE FLANGED BEARING	-
AA16486	21	1	202-0012	RAM ADAPTOR	-
62714	22	1	-	3/16 X 1 ROLL PIN	-
AA86140	23	1	713400A	PH10 PUNCH HOLDER ASSEMBLY	-
AA62610	24	2	DP-6MM-24MM	6MM X 24MM LONG DOWEL PIN	-
86255	25	1	713900C	4.6MM PUNCH	-
AA86141	26	1	713408A	STRIPPER TIP	-
55736	27	1	RED .050	DIE OF CHOICE	-
55734		1	YELLOW .030		-
55735		1	BLUE .040		-
63077	28	1	-	1/4-20 X 1" LONG BUTTON HEAD	-
AA16493	29	1	202-0140	4.6MM ECCENTRIC DIE HOLDER	-
AA24589	30	1	202-0016	18" MANDREL	-
AA60383	31	2	SHCS-0750-5000	3/4 X 5 SHCS	-
62635	32	2	DP-0375-0150	3/8 X 1 1/2 DOWEL PIN	-
60685	33	3	SS-0375-1000	3/8 X 1 HALF DOG SET SCREW	-
60601	34	1	-	8-32 X 3/16 LONG SET SCREW	-
62969	35	1	-	SSS, 3/8-16 X 1/2 NYLON TIPPED	-
62703	36	1	-	PIN, ROLL, 1/8 X 1-1/4	-
AA14873	37	1	-	THD ROD 3/4-16 X 3 LG	-
AA60617	38	2	-	SSS, M8 X 12MM	-
			-		-

* AA42540 WAS AA71030 (RD/8-19-02)

AA55281

QLMD 18
TOOLING GROUP

202-0066



L.F. P/N	ITEM	QTY	STOCK NO.	DESCRIPTION	LENGTH
AA16491	1	1	202-0071	URETHANE SHOCK PAD	-
AA16492	2	1	202-0070	ADJUSTING NUT	-
60309	3	5	SHCS-0250-0500	1/4 X 1/2 SOCKET HEAD CAP SCREW	-
AA16489	4	1	202-0048	ROD CLEVIS	-
AA66029	5	2	300-0030	3/4 X 1/2 X .50 LONG NEEDLE BEARING	-
AA70945	6	1	500-0015	HAND KNOB	-
AA24593	7	1	202-0034	RAM THRUST PLATE	-
60316	8	4	SHCS-0312-0750	5/16 X 3/4 SOCKET HEAD CAP SCREW	-
9000313	9	0	NYRD-0312	5/16 OD NYLON ROD, 25'' LONG	-
AA16488	10	1	202-0036	CAM BLOCK	-
AA62611	11	4	DPST-0500-020	1/2 X 2 STAINLESS DOWEL	-
AA51970	12	2	202-0089	PIVOT ARM	-
AA66032	13	2	300-0023	1 3/4 CAMROL	-
AA16487	14	1	202-0033	RAM	-
AA66440	15	1	300-0022	OILITE BUSHING	-
AA24602	16	1	202-0065	ANTI-ROTATION KEY	-
* AA42540	17	1	~~500-0014~~	RETURN SPRING	-
AA16490	18	1	202-0056	HOUSING SLEEVE	-
60394	19	1	SHCS-0375-0750	3/8 X 3/4 SOCKET HEAD CAP SCREW	-
AA66441	20	1	300-0024	OILITE FLANGED BEARING	-
AA16486	21	1	202-0012	RAM ADAPTOR	-
62714	22	1	-	3/16 X 1 ROLL PIN	-
AA86140	23	1	713400A	PH10 PUNCH HOLDER ASSEMBLY	-
AA62610	24	2	DP-6MM-24MM	6MM X 24MM LONG DOWEL PIN	-
86255	25	1	713900C	4.6MM PUNCH	-
AA86141	26	1	713408A	STRIPPER TIP	-
55736	27	1	RED	DIE OF CHOICE	-
55734		1	YELLOW		-
55735		1	BLUE		-
63077	28	1	-	1/4-20 X 1" LONG BUTTON HEAD	-
AA16493	29	1	202-0140	4.6MM ECCENTRIC DIE HOLDER	-
AA24595	30	1	202-0040	24" MANDREL	-
AA60383	31	2	SHCS-0750-5000	3/4 X 5 SHCS	-
62635	32	2	DP-0375-0150	3/8 X 1 1/2 DOWEL PIN	-
60685	33	3	SS-0375-1000	3/8 X 1 HALF DOG SET SCREW	-
60601	34	1	-	8-32 X 3/16 LONG SET SCREW	-
62969	35	1	-	SSS, 3/8-16 X 1/2 NYLON TIPPED	-
62703	36	1	-	PIN, ROLL, 1/8 X 1-1/4	-
AA14873	37	1	-	THD ROD 3/4-16 X 3 LG	-
AA60617	38	2	-	SSS, M8 X 12MM	-
			-		-

* AA42540 WAS AA71030 (RD 8-19-02)

AA55300

QLMD 24
TOOLING GROUP