ALPHA LOADING SYSTEMS®
LOADING MACHINE

MANUFACTURED BY BTM, INC.

Serial No. ______________________

Caliber_______________________

Date of MFG____________________

Bitterroot Tool & Machine, Inc.
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406-777-7096 or 855-777-7096
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randyjones@btm-mt.com
The images and screenshots used in this manual may differ from the actual product. The contents of this Operators Manual may differ from the product and are subject to change without prior notice for product improvement purposes.

STOP

1. Always wear protective gear while operating any machinery.
2. Never attempt to operate this machine with any of the safety guards removed.
3. Never make any modifications to this machine that would affect the safety of its operation.
4. Always keep this machine clean and free of dust and debris.
5. Use only trained operators.
   - Let only approved personnel operate Alpha Loading Systems machinery. Obey all the safety decals on the machine. Machine tools are complex and highly technical. Workers that are not approved can cause severe damage to your machine, or injury to themselves.
   - A damaged part can cause severe damage to your machine. A damaged part can cause injury to personnel.
7. Use appropriate personal safety equipment to prevent injuries.
   - Keep your body safe. Use OSHA-approved hearing protection, impact-protection eyewear, and safety-toe shoes.
8. Do not operate the machine unless the doors are closed. Do not operate the machine unless the door interlocks operate correctly.
9. Keep the electrical panel closed. Keep the latches on the control cabinet locked at all times. Unlock the electrical panel during machine installation and service.
   - During Machine installation and service, let only qualified electricians have access to the panel. Avoid the danger of high-voltage electric shock.
10. Do not change your equipment.
    - If changes are necessary, let only an Alpha Loading Systems certified technician do the changes. Changes to Alpha Loading Systems machines can cause personal injury and/or mechanical damage. Changes that are not authorized void your warranty.
11. Do not go into the machine enclosure.
    - The machine could start at any time. This can cause injury or death.
12. Do not do these tasks with your hand near the index table or ram.
    - Operate the control
13. Make sure your setup is safe. Make sure your components are safely loaded.
15. Do not smoke near or have an open flame or around machine, powder or explosives.
16. Stay away from the area directly under the rams.
17. Do not reset a circuit breaker until you find the cause of the fault.
    - Let only qualified service personnel repair the equipment.
18. Read and obey all safety decals.
    - Never change or remove decals.
19. Stay away from the tool heads and indexer changer when you press POWER ON or POWER OFF.
TABLE OF CONTENTS:

1. MACHINE INSTALLATION
   1.1 POWER REQUIREMENTS
   1.2 UNCRATE
   1.3 SET MACHINE
   1.4 POWER UP

2. SETTING UP MACHINE FUNCTIONS
   2.1 CASE FEED
      CASE FEED SWITCH
   2.2 DEBRIS CHECK
      DEBRIS CHECK SWITCH
   2.3 BELL MOUTH
   2.4 POWDER DROP
      2.4.1 MACHINES WITH POWDER SEAL OPTION
      2.4.2 MACHINES WITHOUT POWDER SEAL OPTION.
      2.4.3 ADJUSTING THE POWDER CHARGE
   2.5 BULLET FEED AND SEAT
      2.5.1 BULLET SLIDE ASSEMBLY
      2.5.2 BULLET SEAT TOOL
      2.5.3 SECOND SEAT TOOL
      2.5.4 GUIDED SEATING ASSEMBLY (RIFLE ONLY)
   2.6 CRIMP STATION

3. MACHINE OPERATION
   3.1 START UP
   3.2 THE REJECT BIN
   3.3 IN PROCESS INSPECTION
   3.4 KEEPING THE MACHINE RUNNING
4.0 MAINTAINANCE
  4.1 LUBRICATION

5. TROUBLESHOOTING
  5.1 DISK JAM FAULT
  5.2 CASE JAM FAULT
  5.3 POWDER DELIVERY
  5.4 BULLET DELIVERY SYSTEM
  5.5 OVERALL LENGTH (C.O.L.) EXCESSIVE REJECTS
  9.6 CRIMP
  9.7 REJECT/EJECT

6. SUB ASSEMBLY DRAWINGS
  6.1 CRANK SHAFT ASSEMBLY
  6.2 RAM ASSEMBLY
  6.3 CASE FEED ASSEMBLY
  6.4 POWDER DELIVERY ASSEMBLY
  6.5 POWDER RESORVior ASSEMBLY
  6.6 BULLET FEED ASSEMBLY
  6.7 EJECT / REJECT ASSEMBLY

7. EXPLODED ASSEMBLIES
  7.1 CRANK SHAFT ASSEMBLY
  7.2 YOKE ASSEMBLY
  7.3 RAM ASSEMBLY
  7.4 CASE FEED ASSEMBLY
  7.5 POWDER FEED ASSEMBLY
  7.6 POWDER CHECK LASER BRACKET ASSEMBLY
  7.7 BULLET FEED ASSEMBLY
  7.8 REJECT ASSEMBLY
7.9 EJECT ASSEMBLY

7.10 DISK ASSEMBLY

7.11 CASE HOLDER ASSEMBLY
**Introduction**

The ALPHA LOADING SYSTEMS® L-250 CENTERFIRE LOADER.

This loading machine is NOT caliber specific, loading multiple calibers require specific tooling and components.

The machine is comprised of a reciprocating ram and drive assembly timed to a rotary indexer controlling the table progression.

The machine is controlled by a PLC (programmable logic control) via the Human Machine interface (HMI).

The machine function is as follows

1) Case Load
2) Debris Check
3) Bell Mouth
4) Powder Drop (multiple powder drops may apply)
5) Powder check
6) Bullet Feed and Stake
7) Overall length check (C.O.L.)
9) Bullet Crimp
10) Nonconforming Part Reject
11) Eject

Other tooling may be available and or required to load certain products.

This manual is written under the assumption that the operator and or troubleshooter has had adequate training by Alpha Loading Systems. This document is very brief and intended to touch on fundamentals only. They have been devised as a general guide for the benefit of the operator/troubleshooter. This document is intended for operators experienced in the manufacture of ammunition, and are not intended to educate the operator in the science of loading ammunition.
1. MACHINE INSTALLATION

1.1 POWER REQUIREMENTS

Electrical power- The L-250 loading machine requires a 120/15-amp service receptacle for USA and 230V/50 Hz for European.

Air Supply- A \( \frac{3}{4} \) I.D. supply line is required. The regulator is set @ 80psi. The air supply must produce a minimum of 5cfm at the machine.

Machine weight Appx 1200lbs (544kg)

Appx foot print of machine base (excluding HMI swing arm) 38” (970mm) x 32” (810mm)

Appx height (excluding collators) 60” (1525mm)

Suggested work area 10ft x 10ft minimum 8ft ceiling.

1.2 UNCRATING THE MACHINE

Care in removing the machine from its shipping crate will prevent damage to any of the machine parts.

Remove crating from around the machine, unbolt shipping bracket from bottom of the crate. Remove the machine from the crate base using a fork lift under the machine base. Remove shipping brackets from base and install machine feet leaving enough adjustment (appx 1inch) in the machine foot to level the machine. The machine can now be moved with most standard pallet jacks.

Set the machine in its desired location ensuring the area is free of debris, allowing at least 36” from the back of machine as to allow full access to the electrical panel. A minimum of 48” around all other areas of the machine is suggested.

1.3 SET MACHINE

Level the machine in its desired location, using an 18” level rested on top of the ram plates.

Remove the swing arm pin from the machine base bracket, and install the HMI bracket with the HMI attached. Fit the HMI swing arm bracket into position, and reinsert the swing arm pin. Plug the HMI console and ethernet connector on the back of the HMI console.

Install bullet feed and case feed collators. The operation angle of the collators is preset. See next page for placement. Power up the machine.
1.4 POWER UP

Turn the main power disconnect (located on the main electrical panel on the rear of the machine) to the “ON” position. Connect main air supply and ensure the air valve is in the open position. Turn the power switch on the control panel to the on position. The HMI will take a few minutes to load.

The machine is shipped in “Hand Crank” mode (accessible via the setup page). Ensure power and air are turned on. Use a 3/16 Allen wrench in the motor spindle located at the front of the machine to raise the rams (Note rams will not move with the safety doors open), and remove shipping support blocks. Exit “Hand Crank” mode, then “Home” the press.

2. SETTING UP MACHINE FUNCTIONS

2.1 CASE FEED

1) To set the case feed assembly, first ensure the machine disk is in its operating position. This can be done simply by touching the “BOTTOM PRESS” button on the touch screen, or jogging the machine until the disk stops rotating.

2) Insert case by pushing the case feed slide forward

3) Loosen case feed slide carrier screws, these are the two Allen head screws in slots on either side of the case feed slide carrier. See FIG (2.1.1)

4) While pulling the case feed slide carrier toward the front of the machine push the case feed slide toward the center of the machine as far forward in the case feed slide carrier as it will go. Keeping the slide pushed forward move the carrier assembly forward until the slide contacts the case that was inserted into the case holder. Move assembly
back an absolute minimum amount as to not damage the case while feeding. (Note: An adjustment screw has been added for “fine adjustment”). SEE FIG (2.1.2)

5) Ensure photo eye sensor is recognizing the case, there must be both a green and yellow light illuminated on the bottom side of the photo eye sensor when a case is present. With no case present, there should be a green light illuminated. SEE FIG (2.1.3)
2.2 DEBRIS CHECK

1) Ensure the press is at bottom of stroke

2) Place empty cartridge in position of debris check station.

3) Remove cable connecting debris check proximity sensor. SEE FIG (2.2.1)

4) Place appropriate debris check pin into assembly

5) Loosen jam nut and adjust debris check sleeve to a position such that the head of the debris check pin begins to rise off the debris check sleeve. Then back up ¼ turn or to the desired sensitivity (Note mixed head stamp brass may require backing the sleeve up another ½ turn).

6) Adjust proximity sensor bracket to a position in which the sensor is just above the side of the pin head, and that the head of the pin will not interfere with the proximity sensor. On the side of the proximity sensor there is a yellow indicator light, this light should be off while the head of the pin is at rest on the debris check sleeve.

2.3 BELL MOUTH

1) Ensure press is at bottom of stroke

2) Insert an empty cartridge into the case holder that is in the bell mouth position.

3) Loosen jam nut.

4) Adjust bell mouth tool holder to desired height and retighten jam nut.
2.4 POWDER DROP

2.4.1 MACHINES WITH POWDER SEAL OPTION

For rifle machines with a powder seal option (Note most machines set up for pistol ammunition will not have the powder seal option). With the press in its home position the powder seal tube should be able to be removed. Loosen (see FIG 2.4.1) the set screw that is in the front of the powder seal bracket and pull the powder seal tube in a downward motion. When the seal tube is free of the block it fits in the bracket will rotate toward the front of the machine freely. The seal tube will slide out from the top of the powder seal bracket. Re-insert the appropriate seal tube. Pushing the seal tube upward into the block that receives it pull the seal tube bracket downward about 1/8” such that there is a gap between the seal tube bracket and the block the tube seats in. The gap should remain when the seal-tube is fully retracted.

FIG 2.4.1
2.4.2 MACHINES WITHOUT POWDER SEAL OPTION

For pistol machines, and machines that do not have the powder seal option, there is only a powder drop tube which is adjustable. The powder drop tube is adjusted by loosening the set screw in front of the powder assembly (see FIG 2.4.3) and simply moving the tube up or down. Depending on the propellant being used a .010-.020 gap should be sufficient between the top of the unloaded cartridge and the bottom of the powder drop tube.
2.4.3 ADJUSTING THE POWDER CHARGE

After the powder reservoir is empty and clean (Note: Move the feed gate open and closed a few times to ensure that there is no residual powder left in the valve) fill the hopper with desired propellant open the powder gate. With a receptacle under the powder discharge tube actuate the powder slide by hand several times to ensure the powder is flowing properly. Empty the receptacle and discharge a single powder charge and weigh the charge. To adjust the charge, loosen the hex nut on the front of the charge bar, a small Allen wrench will fit into the hole on the side of the knurled thumb nut to aid in loosening and tightening the hex jam nut. Turning the thumb nut clockwise will increase the amount of propellant discharged into the powder bar. Retighten hex nut when the desired amount of powder is being discharged. Check several times to ensure accurate feeding of propellant.

Home the machine several times and recheck the powder being delivered.

2.5 BULLET FEED AND SEAT

STOP! REMOVE EXISTING BULLET PUNCH FROM BULLET FEED STATION. FAILURE TO REMOVE A PUNCH DURING CHANGEOVER CAN RESULT IN DAMAGE TO A PUNCH OR SLIDE.
2.5.1 BULLET FEED ASSEMBLY

To remove the bullet guide from the bullet feed assembly, remove the two shoulder screws on either side of the bullet guide block that are retaining the springs which hold the bullet guide block down. To remove the bullet feed slide bar, remove the 3/8 x 5/8 shoulder bolt located in the rear half of the slide that goes thru the slide itself. Push the slide bar toward the center of machine thru the slide carrier. Replace both bullet slide bar and bullet guide with appropriate components. (Note: The bullet guide is spring loaded to aid in clearing any jams in the projectile feeding process).

2.5.2 BULLET PUNCH

Bring the bullet slide forward to its loading position, insert the bullet punch into the bullet punch tool holder. Then turn the bullet punch tool holder to desired seating height. For machines or setups with a second seat option, leave the punch setting .050 to .100 inch higher than desired overall length (C.O.L.)

2.5.3 SECOND SEAT TOOL

Loosen jam nut and adjust second seat tool to desired overall length and retighten jam nut.

2.5.4 GUIDED BULLET SEAT

1) Insert unloaded case into position preceding the second seat station such that when bottoming press will index the case to the second seat position.

2) With guided seating assembly inserted in the machine and backed up fully in the ram, bottom the press.

3) Turn the tool assembly down until the spring-loaded guide begins to compress the spring. Now the case will be held in position while the projectile is seated.

4) Turn the hex head backup screw to desired overall length (C.O.L.). (Note: When the machine is in production, the amount of crimp force applied may affect the overall length). Tighten the hex jam nut in position.

2.6 CRIMP STATION

Note: Tapered crimp bushing comes standard with all calibers; other crimp options are available to customer specs. (Note: Ensure all tool holders stay in their respective positions. Some tool holders have internal clearance for projectile, while some do not.)

With crimp tool holder backed up as to not crush a cartridge, insert a loaded cartridge into the case holder approaching the crimp station. Bottom the press. Turn the crimp tool holder down until contacting the cartridge. Home the press and adjust the tool holder to desired crimp. (Note: Variations in case length will cause inconsistent crimping)

3.0 MACHINE OPERATION

The Alpha L-250 loader is a high performance mid-level production machine. It is designed to load high quality ammunition at higher rate than ever before possible however the quality of the product coming out of the machine is directly related to the quality of the components going into the machine. The Alpha L-250 has a top production rate (depending on components) of around 6000 parts per hour, however some loading operations should be run at a slower pace. The minimum cycle rate of the L-250 is 40ppm.
3.1 START UP

Beginning with an empty machine table, with desired powder and bullets, and all calibration complete for the current loading operation. Ensure case feed and bullet feed collators are turned on, both at the speed control box on the side of the electrical panel, and at the HMI main page. Ensure that cases, powder and bullets are turned on, this is done at either the setup page or the production page at the HMI touch screen.

From the main page of the HMI home the press one time. Ensure the machine has properly inserted a case into the case holder. Now press the start button. The machine should cycle as many times as allowed by the “too many rejects” setting on the setup page of the HMI. (note this can be changed by logging into the setup page as “supervisor A”. Press the reset button then the start button again. The machine will again cycle as many times as the too many reject setting will allow. When an empty cartridge reaches the powder drop station the powder assembly will begin to actuate.

When an acceptable charge has been loaded into a case and has passed both powder check stations, the bullet feed assembly will start to actuate. This can be determined by the main page of the HMI, see HMI introduction of the electronics manual.

When acceptably loaded cartridges are being loaded the machine will continue to cycle. (Note while the machine is cycling but not crimping, under certain loading conditions, the first few projectiles may be seated too deep).

3.2 THE REJECT BIN

For machines with an auto reject option, the operator will find cartridges and components in different states of the loading process. The auto reject option is devised as an auto digressionary removal of components that the machine finds unpalatable. IT IS NOT A FINAL INSPECTION. The operator must use due diligence when it comes to inspecting the final product.

On occasion, the operator may find components in the reject bin that meet the specifications of the load setup. In these instances, the rejected product should go thru further scrutiny before being accepted.

3.3 IN PROCESS INSPECTION

It is strongly suggested that a regimented inspection process be implemented during production. Regular checks of the powder charge, and overall length are key to precision performance.

3.4 KEEPING THE MACHINE RUNNING.

The variables that exist in the production of ammunition are vast, there is no perfect recipe for continual production. The operator must determine how the machine runs best. Keeping the right number of components in the collators will help ensure the machine runs smoothly and efficiently, as well as reduce unnecessary stops.

4. MAINTAINANCE

Keeping your L-250 loader clean is the absolute best maintenance that can be done. The machine is made to be durable and perform for many millions of cycles, however it is a precision machine tool. Dust and debris can hinder the production and longevity of the machine.
Clean slides and moving parts regularly, keep propellant and loose components from building up on the tabletop. Semi regularly vacuum (Using a non-sparking pneumatic vacuum) and clean the under drive of the machine, as dust from propellant may collect in certain areas. Keep the drive chains clean and free of powder.

**DO NOT LUBRICATE PNEUMATIC SYSTEM. THE PNEUMATIC SYSTEM ON THIS MACHINE IS A DRY SYSTEM. IF AIR CYLINDER LUBRICATION IS REQUIRED DISCONNECT THE AIR LINES AT THE AIR CYLINDER AND USE A MINIMAL AMOUNT OF AIR TOOL OIL.**

4.1 LUBRICATION

**MOBIL® 1 synthetic 5-w20 or equivalent**

Regular lubrication (Once per shift) of the ball cages is important, the ball cages are lubricated at 6 points on the top of the machine SEE FIG (4.1.1). From the ball cages, the oil will run down the guide post to lubricate points lower on the machine.

Monthly lubrication of the drive chains is suggested.

**FIG 4.1.1**
5. TROUBLESHOOTING

The troubleshooting portion of this manual is written under the assumption that the troubleshooter has had adequate training by Alpha Loading Systems. These instructions are very brief and intended to touch on fundamentals only. They have been devised as a general guide for the benefit of the troubleshooter. Not every possible incident can be covered, and the troubleshooter must use his/her own critical thinking skills.

5.1 DISK JAM FAULT

In the occasion of disk jam faults, the troubleshooter must do some investigating. First look for any obstructions in the 4 key areas of the machine. These are as follows and are in order of the progression of the machine. Experience will lead the operator to quickly recognizing and solving the fault issues as they occur.

1) Case feed area
2) Powder feed area
3) Bullet feed area
4) Reject/Eject area

The case feed area, if a case is not properly inserted into the case holder however is positively identified by the case feed sensor, a “Disk Jam” will occur. Clear the case from the assembly insert a new case, press the reset button and resume production.
The powder feed area, if the machine has active powder seals a seal tube can get “Sticky” from time to time, especially if using certain types of propellants. Remove, and clean the powder seal drop tube. Reinsert the seal tube and resume production.

The bullet feed station, if the bullet feed slide does not fully retract before the disk starts to index a “Disk Jam” will occur. In some instances, this is obvious and a damaged cartridge will be present. In some instances, however this may be a little less obvious and careful observation may be required. The first step in the bullet slide area is to ensure the bullet slide is moving freely and easily when the pneumatic system is discharged. (Note opening one of the safety doors will automatically depressurize the pneumatic system of the machine). If there is any sign of copper or sludge buildup on the slide, clean the slide and bullet gripper thoroughly.

Reject/Eject area, ensure that the reject air cylinder is fully retracted (toward the center of the disk). Check for any debris, foreign material, or obstruction behind the eject bearing or case holder eject pins.

Beyond the 4 key areas, ensure the bottom of the index table is clean. On the bottom of the index table there are four hardened ring segments, these ring segments are situated in a position directly above four backup risers. Atop of the riser, a small hardened block is mounted as to give support when any axial force is applied to the index table. The nominal clearance between the ring segment and the hardened steel block is approximately .002inch. If any debris is caught between these two components, a “Disk Jam” fault can occur.

Ensure the index drive chain is clean and lubricated. If debris or propellant builds up on this chain, it can cause a tight spot in the chain and trip the index overload relief mechanism.

5.2 CASE JAM FAULT

In some instances, a case may be discolored or have residue that may hinder the reflective sensor that identifies the case presence. In this instance, reset and resume production.

If the problem persists first wipe off the reflective sensor with a lint free wipe. Eyeglass cleaners work well.

If the case is not fully seated into the case holder, open the front safety doors and push the case back into the case feed housing then reinsert the case by pushing forward on the case feed slide. Ensure the case feed slide is moving freely and easily, regular cleaning of the case feed assembly will help ensure reliability of the feeding mechanism. Residue may build up inside the case feed housing causing drag on the falling cases, or the slide itself.

Ensure there is no foreign material or obstruction in the failed case holder.

In the instance of rifle cases, a retaining spring finger is supplied to keep cases from falling forward out of the case feed housing. Ensure the spring finger is centered in the case feed housing window that the case is fed out of. Ensure the spring finger is not interfering with the case holder.

5.3 TROUBLESHOOTING POWDER DELIVERY SYSTEM

The powder delivery system consists of two assemblies, the powder reservoir assembly and the powder slide assembly.

In the instance, the machine is excessively failing powder charges, check the reject count on the production page of the HMI. If the high powder charge reject count is excessive the powder charge may need to be recalibrated. If the
low powder charge reject count is excessive there may be some investigating to be done. (Note not all brass is created equal, some manufacturer’s standards are not as accurate as others, and the acceptance window may need to be opened up, especially in the case of mixed head stamp brass).

Catch a failed case, it will be in a position after the bullet feed station. Weigh the powder in the unloaded case to find out if the failure is false. This may need to be done several times to ensure the powder charge is accurate. If the powder charge is within the parameters set up by the operator clean the powder check laser heads. If the powder charge is inaccurate troubleshoot backwards toward the powder reservoir.

Ensure the adjustment bar nut has not loosened from vibration. Ensure the powder slide is not sluggish or jerking. If the powder slide bar seems to be sluggish or jerking, remove the slide bar and clean thoroughly. Replace the slide bar and ensure that the bar moves freely and easily in the full range of its motion.

Watching closely while the machine is in operation may tell the troubleshooter what is happening very quickly.

(Note some propellants are not conducive to consistent feeding i.e. large extruded powders).

5.4 TROUBLESHOOTING BULLET FEED STATION.

5.4.1 NO BULLET PRESENT

In the instance of the bullet feed slide actuating but no bullet present, the first thing to do is look for any possible obstruction in the bullet feed tube and or guide. This can be as small as a granule of propellant or an inverted projectile. Remove the drop tube from the bullet guide, and ensure there are bullets in the feed tube. Some projectiles may have residue from the factory, this residue may build up over time inside the bullet guide or drop tube. The residue may also collect debris, regular cleaning of the assembly will help ensure reliable operation.

Ensure the bullet feed slide is fully actuating and not sluggish.

Ensure actuating shoulder screw is tight.

Ensure bullet latch is operating properly.

5.4.2 SMASHED CASES OR “SMILEYS”

If the bullet seat station is producing damage to the cases while loading, the troubleshooter will need to investigate. Watching carefully while in operation may help determine the issue quickly.

Identify a case holder with damaged cases, ensure the failure is not consistent with one or more individual case holder.

Ensure the bell-mouth is adequate to receive the projectile being loaded. (Note: some flat based bullets may require a larger or special bell mouth punch).

Ensure that the mouth of the brass case is not damaged and is the correct size before reaching the bullet feed station.

Ensure the bullet feed gripper is functioning properly.
Ensure the bullet is aligned properly. Bring the press to operating position or bottom the press. Manually move the bullet slide to its forward position with a projectile in the slide. Gage by eye how centered the projectile is aligned with the case. (Note: before adjusting the bullet slide position please contact Alpha Loading Systems customer support.

5.5 OVERALL LENGTH (COL) EXCESSIVE REJECTS

The overall length or C.O.L. is gaged by a laser micrometer head. A laser is focused from one part of the laser micrometer to another. The measuring system determines where the laser line is broken.

Ensure the laser micrometer heads are clean and free of debris.

Ensure the laser is in the proper position (reference the laser alignment page of the HMI).

Ensure calibration of the O.A.L.

Note: some components may vary enough to cause variations of the O.A.L. (tight or hard brass may affect the O.A.L., non-uniform ogives etc.)

5.6 CRIMP STATION

The standard crimp bushing supplied with the L-250 is a carbide bushing with an internal taper.

In the instance of the crimp station producing “smileys” or peeling cases the first thing to do is look at the bell-mouth on the cases. If the bell-mouth is too large, the crimp bushing can catch the brass and peel the brass down.

If cases are being crushed or the shoulder of rifle cases is being pushed down at the crimp station there may be excessive crimp. (Note: if the brass cartridges vary in length, longer cases will be crimped more than others).

5.7 EJECT/REJECT STATIONS

The eject and reject stations are grouped in one subassembly on the L-250 loader. The reject position on the machine is to remove any components or loaded cartridges that are not acceptable to the machines in process checks. (Note: these functions are not considered inspection they are only for machine function). When the machine finds a component, charge, or loaded cartridge it determines to be a reject, the PLC counts the number of strokes from the check station the part failed, then actuates an air cylinder to expel the part from the machine. This is done automatically without interrupting production.

In the event the reject station is failing to expel rejects, there may be a simple solution. Ensure the reject disk attached to the reject air cylinder is tight and undamaged. Otherwise refer to the electronic/HMI portion of the manual.

The eject station is simply a roller bearing that essentially move the individual ejector pins in the case holders. In the event loaded cartridges are not being properly ejected, ensure the eject roller bearing is adjusted properly.
CONFIGURATION FOR 3.4 INCH STROKE
REF ITEM # 4
CHECK FOR MOST CURRENT DATE
<table>
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<tr>
<th>ITEM NO.</th>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>QTY.</th>
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<tr>
<td>1</td>
<td>449-0119</td>
<td>BOTTOM RAM PLATE</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>449-0120</td>
<td>BEARING BLOCK</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>449-0136</td>
<td>LOWER CRANK PIN</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>449-0129</td>
<td>CONNECTING ROD</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>449-0131-1</td>
<td>UPPER ROD END LONG STROK</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>449-0132</td>
<td>RAM A</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>449-0126</td>
<td>CRANK LEG</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>449-0128</td>
<td>BEARING CAP</td>
<td>2</td>
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**REVISIONS**

<table>
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<tr>
<th>ZONE</th>
<th>REV.</th>
<th>DESCRIPTION</th>
<th>DATE</th>
<th>APPROVED</th>
</tr>
</thead>
</table>

**NAME** | DRAWN | CHECKED | ENG APPR. | MFG APPR. |
---|---|---|---|---|
JCH | | | |

**INTERPRET GEOMETRIC TOLERANCES PER ASME Y14.5**

UNLESS OTHERWISE SPECIFIED:

**DIMENSIONS ARE IN INCHES**

**MATERIAL TOLERANCES:**

XX: ± .01

XXX: ± .005

XXXX: ± .003

XXXXX: ± .001

**HEAT TREAT:**

BREAK ALL EDGES AND C/TER HOLES

.03 X 45 MARK DET NO. ON PART

SCREW HOLE CLEARANCE AND COUNTER BORE DIAM .016 OVER NOMINAL

**SCALE:** 1:12

**WEIGHT:**
<table>
<thead>
<tr>
<th>ITEM NO.</th>
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**Title:** EJECT/REJECT ASSEMBLY

**Designation:** A 449-100-1400

**Scale:** 1:4

**Weight:**
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<td>12</td>
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<td>.240 O.D., .023 WIRE, 2.0 LONG COMP SPRING</td>
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Basic Outline Electrical Manual L250 Machine

1: Power
   A: Power Source
   B: Disconnect and Lockout
   C: Power Up and Safety
   D: Machine Start Conditions

2: HMI page instructions
   A: HMI introduction and basic page navigation
   B: The Main Page
   C: The Set-Up Page
   D: The Production Page
   E: The OEM Page
   F: The Options Page
   G: Inputs
   H: Outputs

3: Calibration Procedures
   A: Calibrate Press
   B: Align Powder Check Lasers
   C: Calibrate Powder Lasers
   D: Align OAL Laser
   E: Calibrate OAL Laser

4: Basic Fault Handling
   A: No Cases Fault
   B: Case Jam Fault
   C: Debris Check Fault
   D: No Bullets Fault
   E: Disc Jam Fault
6: Wiring Diagram

Power

The main power is a 120v 15amp plug that goes through the Lockable external disconnect on the side of the main control cabinet. Either unplug the cord and put a safety cap on the plug or turn off the main disconnect and lock out the disconnect before doing any work on the machine or within the main control cabinet. Turning off the disconnect and locking it out removes all electrical power within the main control cabinet.

There is an On/Off switch on the main control console. This switch removes all control power from the console and the HMI. This puts the machine into an Emergency Stop mode and allows no machine movement. Important: the switch does not remove the power from the main control cabinet.

There are four circuit breakers in the Main control cabinet. One 10amp for the main power. One 10amp for the VFD one 5amp for the 24vdc power supply and one 5amp for the 120v to the collators.

All safety doors must be closed and side panels in place before powering up the machine.
HMI Introduction and Basic Page Navigation

MAIN PAGE:

The Main Page is the default page of the Human Machine Interface (HMI). This page displays basic machine information and allows for a quick look at the machines functions. Starting from the top left, and moving down the main page following information is displayed.

1: CYCLE COUNT: This is the shift cycle count, the number of times the machine has cycled since the last time the shift count was reset. This number can be reset on the production page.

2: MACHINE FAULT MESSAGES: These appear in the top center of the machine.

3: CARTRIDGE COUNT: This is the total number of good cartridges loaded since the last time the shift count was reset.

4: SET UP: This button takes the user to the setup page. (page #?)

5: E STOP: When the E-Stop button is pressed the E STOP indicator appears here.

6: PRODUCTION: This button takes the user to the Production page. (page #?)
7: PRESS POSITION: This indicator shows the present position of the press from 0-359 degrees. 0 degrees is top of the stroke 180 degrees is the bottom of the stroke. This is the down stroke of the press. 181 degrees to 359 degrees is the upstroke of the press.

8: Date and time are displayed as Year, Month, Day, Hour, Minute, Seconds in a 24-hour clock format located below the ALPHA loading machine logo.

9: HOME PRESS: This button will bring the press to its home position if no machine faults are active. It can be used to single stroke the press from its top dead position. (Note: The machine will NOT run from any other position than HOME.)

10: BOTTOM PRESS: This button will bring the press to its bottom of stroke position. This only works with the press starting in the top of stroke position. This is used when aligning lasers calibrating OAL, and setting up case photo eye.

11: AIR ON/OFF: This button closes the machine air valve and relieves residual air pressure.

12: START/STOP COLLATORS: This button enables or disables the machines collators.

13: Indicator lights from 1-20: These indicators show the presence and status of cases on the Disc. No case present will be indicated as yellow. A yellow indicator after a sensor indicates the case failed that check and no further action will be taken on that case and it will be rejected. For example, if the indicator at station 9 turns yellow and then remains yellow as it shifts around the Disc the case failed its first powder check and will not receive a bullet and be rejected. Yellow indicators showing up consistently at the same station can be an indication of a misaligned or calibrated sensor.
SET UP PAGE:

The Set-Up page shows the basic calibration parameters of the press and allows the User access to the OEM, Hand Crank, and Calibration pages.

1: **HOME PRESS**: This button will bring the press to its home position if no machine faults are active. It can be used to single stroke the press from its top dead position.

2: **BOTTOM PRESS**: This button will bring the press to its bottom of stroke position. This only works with the press starting in the top of stroke position. This is used when aligning lasers calibrating OAL, and setting up case photo eye.

3: **PRESS POSITION**: This indicator shows the present position of the press from 0-359 degrees. 0 degrees is top of the stroke 180 degrees is the bottom of the stroke. 0 to 180 degrees on the down stroke and 181 to 359 degrees on the up stroke.

4: **MAIN**: This button will bring the User to the Main Page.

5: **CALIBRATE PRESS**: This button will calibrate the press. The press cannot be in a fault condition and must be at Top of stroke.
6: CALIBRATE POWDER: This button will take the User to the Calibrate Powder page.

7: OAL LASER ALIGNMENT: This button will take the User to the OAL Laser Alignment page.

8: CALIBRATE OAL: This button will take the User to the OAL Calibration page.

9: POWDER A: This is the estimated powder weight by volume of the last case read by the Powder A laser.

10: HIGH LIMIT: This is the High Limit set point of the powder weight by volume for both powder A and powder B checks. This is set by the User during the Powder Calibration process.

11: LOW LIMIT: This is the Low Limit set point of the powder weight by volume for both powder A and powder B checks. This is set by the User during the Powder Calibration process.

12: POWDER B: This is the estimated powder weight by volume of the last case read by the Powder B laser.

13: OAL: This is the estimated overall length of the last cartridge read by the OAL laser micrometer.

14: OAL HIGH LIMIT: This is the High Limit set point of the overall length of the cartridge set by the User during the OAL calibration process.

13: OAL LOW LIMIT: This is the Low Limit set point of the overall length of the cartridge set by the User during the OAL calibration process.

14: HOLD CASES: This button will hold the case feed slide and allow the machine to cycle without feeding any cases onto the Disc.

15: HOLD POWDER: This button will hold the powder slides and allow the machine to cycle without loading any powder.

16: HOLD BULLETS: This button will hold the bullet slide and allow the machine to cycle without loading any bullets.
The Production page is where all the information about machine performance can be viewed.

1: CYCLE COUNT: This is the shift cycle count, the number of times the machine has cycled since the last time the shift count was reset.

2: CARTRIDGE COUNT: This is the total number of good cartridges loaded since the last time the shift count was reset.

3: REJECTS: This is the total number of rejects since the last time the shift count was reset.

4: EFFICIENCY: This is the percentage of good cartridges loaded compared to the number of rejects since the last time the shift count was reset.

5: BATCH COUNT: This count is the total number of cartridges loaded in the present BATCH. To reset this a supervisor must log in using the LOG IN button and then hold the RESET BATCH COUNT BUTTON for 30 seconds. See the LOG IN PAGE instructions for information on how to log in.

6: TOTAL CYCLE COUNT: This is the total number of cycles the machine has made. This cannot be reset from the HMI.
7: HOLD CASES: This button will hold the case feed slide and allow the machine to cycle without feeding any cases onto the Disc.

8: HOLD POWDER: This button will hold the powder slides and allow the machine to cycle without loading any powder.

9: HOLD BULLETS: This button will hold the bullet slide and allow the machine to cycle without loading any bullets.

10: RESET SHIFT COUNTERS: This button resets all the shift counters, Cycle Count, Cartridge Count, Rejects, Efficiency, and all Fail counters.

11: OAL HIGH FAILS: This is the approximate number of cartridges that were rejected for failing outside the OAL high limits this shift.

12: OAL LOW FAILS: This is the approximate number of cartridges that were rejected for failing outside the OAL low limits.

13: OAL FAILS: This is the approximate combined number of cartridges that failed the OAL check this shift.

14: POWDER A HIGH FAIL: This is the approximate number of cartridges that failed the Powder A check high limit this shift. These cartridges were not seated with bullets and rejected.

15: POWDER A LOW FAIL: This is the approximate number of cartridges that failed the Powder A check low limit this shift. These cartridges were not seated with bullets and rejected.

16: POWDER A FAILS: This is the approximate combined number of cartridges that failed the Powder A check this shift.

17: POWDER B HIGH FAIL: This is the approximate number of cartridges that failed the Powder B check high limit this shift. These cartridges were not seated with bullets and rejected.

18: POWDER B LOW FAIL: This is the approximate number of cartridges that failed the Powder B check low limit this shift. These cartridges were not seated with bullets and rejected.

19: POWDER B FAIL: This is the approximate combined number of cartridges that failed the Powder B check this shift.

NOTE: The fail counts OAL, Powder A and Powder B are used for tracking fault trends and are not expected to be an accurate count of total faults.

20: POWDER 1 ON/OFF: This button enables or disables the Powder A slide.

21: POWDER 2 ON/OFF: This button enables or disables the Powder B slide if the machine is equipped with one.

22: MAIN: This button returns the User to the MAIN PAGE.
This page allows the User to examine and if necessary adjust set points of the press control process. All changes should be made with care as changes outside of certain limits may cause harm to the machine. Never make big changes and always note the starting set points before making changes.

1: BULLET COLLATOR FILL TIMER: This is the time in milliseconds that the Bullet Collator waits after not detecting a bullet available at the bullet photo eye on the bullet tube before the Bullet Collator starts loading bullets into the bullet tube.

2: BULLET COLLATOR STOP TIMER: This is the continuous time in milliseconds that the bullet photo eye on the bullet tube detects a bullet before it stops the Bullet Collator.

3: CASE COLLATOR FILL TIMER: This is the time in milliseconds that the Case Collator waits after not detecting a case available at the case photo eye on the case tube before the Case Collator starts loading cases into the case tube.

4: CASE COLLATOR STOP TIMER: This is the continuous time in milliseconds that the case photo eye on the case tube detects a case before it stops the Case Collator.

5: CASE SLIDE BACK: This is the press position in degrees that if the press is equal to or greater than the Case Slide will retract back away from the disc. For example; if the set point is 220 degrees then when
the press position is equal to or greater than 220 degrees the Case Slide will retract back away from the disc.

6: **CASE SLIDE FORWARD:** This is the press position in degrees that if the press is equal to or greater than the Case Slide will move forward toward the disc pushing a case onto the disc. For example; if the set point is 75 degrees then when the press position is equal to or greater than 75 degrees the Case Slide will move forward toward the disc pushing a case onto the disc.

7: **BULLET SLIDE FORWARD:** This is the press position in degrees that if the press is equal to or greater than the Bullet Slide will move forward toward the disc bringing a bullet into position to be pushed into a case. For example; if the set point is 15 degrees then when the press position is equal to or greater than 15 degrees the Bullet Slide will move forward toward the disc bringing a bullet into position to be pushed into a case.

8: **BULLET SLIDE BACK:** This is the press position in degrees that if the press is equal to or greater than the Bullet Slide will retract back away from the disc. For example; if the set point is 179 degrees then when the press position is equal to or greater than 179 degrees the Bullet Slide will retract back away from the disc.

9: **POWDER SEAL DOWN:** If the press is equipped with Powder Seals this is the position in degrees that if the press is equal to or greater than the Powder Seals will descend and contact with the case sealing it from powder loss during the powder drop. For example; if the set point is 55 degrees then when the press position is equal to or greater than 55 degrees the Powder Seals will descend and contact with the case.

10: **POWDER SEAL UP:** If the press is equipped with Powder Seals this is the position in degrees that if the press is equal to or greater than the Powder Seals will rise away from the case clearing it for indexing. For example; if the set point is 210 degrees then when the press position is equal to or greater than 210 degrees the Powder Seals would rise away from the case.

11: **POWDER FORWARD:** This is the press position in degrees that if the press is equal to or greater than the Powder Slide will move forward toward the disc dropping a premeasured powder charge into a case. For example; if the set point is 70 degrees then when the press position is equal to or greater than 70 degrees the Powder Slide will move forward toward the disc dropping a premeasured powder charge into a case.

12: **POWDER BACK:** This is the press position in degrees that if the press is equal to or greater than the Powder Slide will retract back away from the disc. For example; if the set point is 210 degrees then when the press position is equal to or greater than 210 degrees the Powder Slide will retract back away from the disc.

13: **STOP SPEED:** This is set to bring the machine to a safe and regulated stop. This is factory set and not adjustable.

14: **HOME PRESS SPEED:** This is set for a smooth and safe single stroke and homing speed. This is factory set and not adjustable.
15: NO CASES FAULT: This is the number of machine cycles the press can do without seeing cases at the case photo eye on the case tube before stopping the machine.

16: NO BULLETS FAULT: This is the number of machine cycles the press can do without seeing bullets at the bullet photo eye on the bullet tube before stopping the machine.

17: REJECT OUT: This is the press position in degrees that if the press is equal to or greater than and position 17 is showing a bad case (yellow indicator) the Reject Cylinder will move forward toward the case holder ejecting a case onto the reject slide. For example; if the set point is 90 degrees then when the press position is equal to or greater than 90 degrees and position 17 is showing a bad case (yellow indicator) the Reject Cylinder will move forward toward the case holder ejecting a case onto the reject slide.

18: REJECT IN: This is the press position in degrees that if the press is equal to or greater than the Reject Cylinder will retract away from the case holder. For example; if the set point is 180 degrees then when the press position is equal to or greater than 180 degrees the Reject Cylinder will retract away from the case holder.

19: TOO MANY REJECT COUNT: This is the number of consecutive rejects that may occur before the machine stops. Too many consecutive rejects are a symptom of an ongoing fault with the machine; For example, no powder in the powder reservoir.

20: SEALANT START: This only applies if this function has been added to this machine. This is the press position in degrees that if the press is equal to or greater than the Output for the Sealant dispenser will turn on. For example; if the set point is 55 degrees then when the press position is equal to or greater than 55 degrees the output for the Sealant dispenser will turn on.

21: SEALANT STOP: This only applies if this function has been added to this machine. This is the press position in degrees that if the press is equal to or greater than the Output for the Sealant dispenser will turn off. For example; if the set point is 210 degrees then when the press position is equal to or greater than 210 degrees the output for the Sealant dispenser will turn off.

22: SEALANT ON/OFF: This button is enables or disables the sealant function if it has been added to the machine.

23: PRIMER CHECK ON/OFF: This enables or disables the primer check camera if it has been added to the machine.

24: FAULT BYPASS: This function should only be enabled when there are no materials to be fed onto the machine or on the disc being loaded. This machine mode is used to check the timing of all the slides and watch the mechanical movement of the machine. It bypasses all faults except the Doors and Disc Jam. **THE MACHINE IS NOT CHECKING POWDER CHARGE OR OAL WHEN THIS FUNCTION IS ENABLED! DO NOT LOAD CARTRIDGES WITH THIS FUNCTION ENABLED!!!**

25: LOG IN: This takes the operator to the Log In screen so they can log in and enter data or enable locked functions such as the Fault Bypass.
LOG IN PAGE

This page is used to log in to the machine to make changes to the OEM page, put the machine into and remove the machine from Fault Bypass Mode.

Select “Supervisor (A)” and then press the “ENTER PIN NUMBER”. Enter the pin number then press “ENABLE”. You can now go to the OEM page and make changes or go to the PRODUCTION page and reset the Batch Count.
OPTIONS PAGE: This page cannot be altered except under supervision of a Bitterroot Tool And Machine representative.

1: INPUTS: This opens the Inputs Page that allows all the PLC inputs to be examined.

2: OUTPUTS: This opens the Outputs Page that allows all the PLC outputs to be examined.
INPUTS PAGE: This page shows all the PLC inputs that are used.

1: Local:x:I.Data.X: Local indicates that the input is located on the Local PLC. The number after Local indicates the slot or position on the PLC that the input is located. The I indicates an input. Data indicates a binary input. The last number indicates the position of the input on the slot where the input is located, it will be a number between 0-15.

2: The Inputs:

DEBRIS CHECK: Checks for Debris in the case at the bottom of the stroke. If debris is found the machine will stop for operator inspection.

BOTTOM PROX: This is a proximity sensor under the machine that senses the press is at the bottom of its stroke.

REAR DOOR R: This is the reed switch sensor for indicating that the right rear door is open or closed.

CASE JAM PROX: This is a photoeye sensor that checks for the presence of a case on the disc when it is called for. This sensor will stop the machine during a fault.

RIGHT DOOR OPEN: This is the reed switch sensor for indicating that the right door is open or closed.
CRACKED CASE PROX: This sensor will indicate a faulty case if this option has been installed. This fault has two options, passive and active. If the fault is set to passive it will not stop the machine. The case will be indexed around the disc and rejected with no powder or bullet. If the fault is set to active it will stop the machine for operator inspection.

TOP PROX: This is a proximity sensor under the machine that senses the press is at the top of its stroke.

AIR PRESSURE: This senses if the machine air is on or off.

DRIVE PROX: This proximity switch is under the machine and senses if the disc is jammed. It stops the machine and must be cleared by the operator. (see “disc jam fault”)

FRONT L DOOR: This is the reed switch sensor for indicating that the front left door is open or closed.

START BUTTON: Input for the Console Start button. Can be used to check if the start button is working.

STOP BUTTON: Input for the Console Stop button. Can be used to check if the stop button is working.

JOG BUTTON: Input for the Console Jog button. Can be used to check if the jog button is working.

RESET BUTTON: Input for the Console Reset button. Can be used to check if the reset button is working.

FRONT DOOR RIGHT: This is the reed switch sensor for indicating that the front right door is open or closed.

REAR DOOR LEFT: This is the reed switch sensor for indicating that the rear left door is open or closed.

LEFT DOOR: This is the reed switch sensor for indicating that the left door is open or closed.

E STOP: Input for the Console E-Stop button. Can be used to check if the E-Stop button is working.

CASE COLLATOR: This is the case collator proximity switch input. It controls the case collator start stop routine.

BULLET COLLATOR: This is the bullet collator proximity switch input. It controls the bullet collator start stop routine.
OUTP UTS PAGE: This page shows all the PLC Outputs that are used.

1: Local:O.Data.X: Local indicates that the output is located on the Local PLC. The number after Local indicates the slot or position on the PLC that the output is located. The O indicates an input. Data indicates a binary output. The last number indicates the position of the output on the slot where the output is located, it will be a number between 0-15.

2: The Outputs:

BLOW OFF OFF: This is the output to the SMC valve pack for the disc blow off located on the front of the machine beside the case slide. This turns off the blow off.

POWDER SEALS UP: This is the output to the SMC valve pack to bring the powder seals to their up position.
<table>
<thead>
<tr>
<th>Output</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>START:</td>
<td>This is the start output to the VFD interface relay.</td>
</tr>
<tr>
<td>STOP:</td>
<td>This is the stop output to the VFD interface relay.</td>
</tr>
<tr>
<td>JOG:</td>
<td>This is the jog output to the VFD interface relay.</td>
</tr>
<tr>
<td>CASE LOAD:</td>
<td>This is the output to the SMC valve pack that pushes the case slide forward loading a case onto the disc.</td>
</tr>
<tr>
<td>CASE GET:</td>
<td>This is the output to the SMC valve pack that retracts the case slide to get another case.</td>
</tr>
<tr>
<td>BULLET SLIDE IN:</td>
<td>This is the output to the SMC valve pack that pushes the bullet slide forward putting a bullet into position to be pressed into a charged case.</td>
</tr>
<tr>
<td>BULLET SLIDE OUT:</td>
<td>This is the output to the SMC valve pack that pushes the bullet slide back to get another bullet.</td>
</tr>
<tr>
<td>POWDER B IN:</td>
<td>This is the output to the SMC valve pack that pushes powder slide B in to drop a powder charge into a case.</td>
</tr>
<tr>
<td>POWDER A OUT:</td>
<td>This is the output to the SMC valve pack that pushes powder slide A back into position to get a powder charge from the powder reservoir.</td>
</tr>
<tr>
<td>REJECT OUT:</td>
<td>This is the output to the SMC valve pack that pushes the reject cylinder out rejecting a bad case/cartridge.</td>
</tr>
<tr>
<td>REJECT IN:</td>
<td>This is the output to the SMC valve pack that brings the reject cylinder back letting a good cartridge continue to the eject slide.</td>
</tr>
<tr>
<td>POWDER B OUT:</td>
<td>This is the output to the SMC valve pack that pushes powder slide B back into position to get a powder charge from the powder reservoir.</td>
</tr>
<tr>
<td>POWDER A IN:</td>
<td>This is the output to the SMC valve pack that pushes powder slide A in to drop a powder charge into a case.</td>
</tr>
<tr>
<td>AIR SOLENOID:</td>
<td>This is the output to the main air solenoid.</td>
</tr>
<tr>
<td>BLOW OFF ON:</td>
<td>This is the output to the SMC valve pack for the disc blow off located on the front of the machine beside the case slide. This turns on the blow off.</td>
</tr>
<tr>
<td>BULLET COLLATOR:</td>
<td>This is the output to the collator relay that turns the bullet collator on/off.</td>
</tr>
<tr>
<td>CASE COLLATOR:</td>
<td>This is the output to the collator relay that turns the case collator on/off.</td>
</tr>
<tr>
<td>BRAKE:</td>
<td>This is the output to the motor brake relay. If it is on the brake is off.</td>
</tr>
</tbody>
</table>
CALIBRATION PROCEDURES

All calibration procedures are accessed from the Set-Up page of the HMI.

CALIBRATE PRESS: It is best to calibrate the press with no product on the disc. Hold cases, powder and bullets. Home the press. Press the CALIBRATE PRESS button. The press will cycle. Press the CALIBRATE PRESS button a second time. The press will cycle. The press is now calibrated.

ALIGN POWDER LASERS:

The laser dot should be aligned with a case pushed all the way forward in the holder as in the above photo.

The laser height so that the numbers appearing in POWDER A and/or POWDER B in the above figure reads around 5. (the above fig. is taken from the calibrate powder page, see below)
CALIBRATE POWDER:

In the above photo the case with the high limit charge is on the right and the case with the low limit charge is on the left.

Steps for powder calibration.

1: Empty the disc.
2: CALIBRATE PRESS (see calibrate press procedure)
3: Hold Cases, Powder, and Bullets
4: Place a case with a high limit charge and a case with a low limit charge as shown in the above photo.
5: Close the safety door
(refer to the above figure for all the following steps)

6: Enter the high limit weight in grains in the POWDER HIGH SET POINT.

7: Enter the low limit weight in grains in the POWDER LOW SET POINT.

8: Press the START POWDER CALIBRATION button. The press will cycle until calibration is done.

9: Press the FINISH POWDER CALIBRATION button. **THIS IS IMPORTANT THE MACHINE WILL BEHAVE IN AN ERRATIC FASHION IF THIS IS NOT DONE.**

10: Remove the high and low powder cases from the press.

11: Powder calibration is now complete.
ALIGN OAL LASER:

(Note: The OAL is equivalent to the C.O.L.)

1: Bottom the press and then place good cartridge in the insert as shown in the picture above.
2: Loosen the two cap screws that hold the laser bracket in place.

3: Open the “OAL LASER ALIGNMENT” page from the “SET UP” page.

4: Turn the Console so you can view it from the OAL laser as in the picture above.

5: Turn the laser bracket to get the highest displayed number possible on the Console while bisecting the cartridge as true as possible.

6: Move the cartridge gently back and forth in the insert. There should be no more than 200 plus or minus on the reading.

7: Tighten the cap screws on the laser bracket while holding it still.
1: Open the CALIBRATE OAL page.

2: Bottom the press.

3: Press the START OAL CALIBRATION button.

3: Enter the OAL high set point.

4: Enter the OAL low set point.
5: Place a cartridge set at the OAL high limit in the insert as seen above.

6: Press the CALIBRATE OAL HIGH LIMIT button.

7: Remove the high limit cartridge and place a cartridge set at the OAL low limit in the insert as seen above.

8: Press the CALIBRATE OAL LOW LIMIT button.

9: Press the FINISH OAL CALIBRATION button. **THIS IS IMPORTANT TO UNDERSTAND THE MACHINE WILL BEHAVE IN AN ERRATIC FASHION IF THIS IS NOT DONE AS A FINAL CALIBRATION STEP.**

10: Remove the OAL low limit cartridge from the press.

11: Home the press.

12: OAL calibration is finished.
The fault screen above will appear on the main screen in the case of a no cases fault. This fault will occur when the case sensor on the case collator tube fails to see a case for a given amount of time.

These are the possible causes of the fault.

1: The case collator may be turned off.

2: The collator is out of cases

3: A case is jammed inside the collator.
4: Cases may be jammed at the top of the tube.
5: The case sensor may have backed away from the case tube.
6: The collator feed rate may be too slow.
7: The NO CASES FAULT time on the OEM page may be set to short. (reset this with caution as setting this timer to long may lead to jamming of the collator).
The fault screen above will appear on the main screen in the case of a no bullets fault. This fault will occur when the bullet sensor on the bullet collator tube fails to see a bullet for a given amount of time.

These are the possible causes of the fault.

1: The bullet collator may be turned off.
2: The collator is out of bullets.
3: A bullet is jammed inside the collator.
4: Bullets may be jammed at the top of the tube.
5: The bullet photo eye may be loose, out of position or bad.
6: The collator feed rate may be too slow.
7: The NO BULLETS FAULT time on the OEM page may be set to short. (reset this with caution as setting this timer to long may lead to jamming of the collator).
The fault screen above will appear on the main screen in the case of a debris check fault. This fault will occur when the debris check proximity switch is made at the bottom of the stroke of the press. This may be caused by debris in the case, a bent or deformed case, or an upside-down case. The machine will stop at the top of the stroke, leaving the faulty case in the insert one past the debris check. Remove the bad case and replace with a new one then restart the machine.
This fault occurs when the top proximity switch fails to make. Check the proximity switch cable connections. Adjust or replace the proximity switch.
This fault occurs when the bottom proximity switch fails to make. Check the proximity switch cable connections. Adjust or replace the proximity switch.
This fault occurs when the linear position sensor fails to read a change in position. Check the sensor cable connections. Replace the sensor.
The fault screen above will appear on the main screen in the case of a case jam fault. The fault is triggered when the press calls for a case but no case is detected in the insert when the press reaches the bottom of its’ stroke.

These are the possible causes of the fault.

1: The photoeye that senses the case has moved.
2: There was no case in the case slide.
3: There is a case loaded incorrectly in the insert causing a jam. (this condition may also cause a disc jam fault)
A case jam fault may cause the use of the HAND CRANK OPTION:

If a case is jammed and the press needs to rotate in reverse use the HAND CRANK OPTION.

Press the large yellow button so it reads “HAND CRANK ON”. Use a 5mm hex-wrench to rotate the motor in the reverse direction. When finished press the large button so it reads “HAND CRANK OFF” again. THIS IS IMPORTANT THE MACHINE WILL NOT RUN IF THIS IS NOT DONE.
DISC JAM FAULT

There are many reasons that the DISC JAM FAULT will occur. Something will have held the disc from moving and thus opening the circuit on the DISC JAM proximity switch under the machine as seen in the above figure. The machine must be toughly examined and the cause of the jam removed before resetting the machine and continuing operation. This may require the “HAND CRANK OPTION” described above.
TABLE OF CONTENTS

1. REMOVAL OF TOOLING
   1.1 EJECT/REJECT STATION
   1.2 CASE FEED ASSEMBLY
   1.3 O.A.L. LASER ASSEMBLY
   1.4 RAM PLATE ASSEMBLY
   1.5 BULLET FEED SLIDE
   1.6 DISK ASSEMBLY

2. PLACEMENT OF CHANGEOVER TOOLING
   2.1 DISK ASSEMBLY
   2.2 CASE FEED ASSEMBLY
   2.3 O.A.L. LASER ASSEMBLY
   2.4 RAM PLATE ASSEMBLY
   2.5 BULLET FEED SLIDE ASSEMBLY
   2.6 EJECT/REJECT ASSEMBLY
STOP! BEFORE BEGINNING TO CHANGE OVER A MACHINE ENSURE AIR SUPPLY IS TURNED OFF OR DISCONNECTED AND EMERGENCY STOP BUTTON IS DEPRESSED. ENSURE MACHINE IS IN HOME POSITION.

1. REMOVAL OF TOOLING

1.1 EJECT REJECT STATION

Locate and disconnect air supply lines at reject station air cylinder. See FIG 1.1.1

Locate and remove mounting screws from eject/reject bracket assembly. These are the four 3/16 Hex Head screws that fasten the bracket assembly to the main table. A 3/16 ball end “T’ handle will work best. See FIG 1.1.2

Remove blow off hose from bracket lift bracket away. See FIG 1.1.3

FIG 1.1.1
1.2 CASE FEED ASSEMBLY

Disconnect reflective eye sensor cable.

Disconnect air lines.

Remove screws mounting the case feed slide carrier (#449-0727) to the riser, these are the two 3/16 Hex Head screws that pass thru a slot on either side of the case feed slide carrier, and remove the assembly.

Remove screws mounting the case feed riser (#449-0213), these are the four 3/16 Hex Head screws passing thru the case feed riser.

1.3 O.A.L. LASER ASSEMBLY

Locate and remove mounting screws clamping the laser assembly bracket to the table.

Move the laser assembly out of the way taking care not to strain the laser wire connections. See FIG 1.3.1

1.4 RAM PLATE ASSEMBLY

If extra ram plates are part of the changeover package only.

Disconnect the debris check proximity switch.

Locate and remove mounting screws from the ram plate assembly, these are the nine 3/16 Hex Head screws which pass thru the ram plate (nine on each ram). Lift the ram straight up and off of the rod ends which are seated in pockets on the bottom side of the ram plate. See FIG 1.4.1
1.5 BULLET FEED SLIDE

NOTE: IF THE CHANGEOVER DOES NOT REQUIRE A CHANGE IN BULLET SLIDE SIZE I.E. ½ INCH SLIDE TO 1INCH SLIDE THERE IS NO NEED TO REMOVE THE TOP SLIDE CARRIER (#449-1013)

Locate and disconnect bullet latch air hose. See FIG 1.5.1

(Note: not all machines will have a bullet latch assembly)

Locate and remove bullet latch mounting screws. These are the two 9/64 Hex Head screws on either side of the bullet latch mounting bracket. See FIG 1.5.2

Locate and remove the two shoulder bolts passing thru the bullet guide (#449-1012), these are the two 1/8 Hex Head screws which pass thru the bullet guide with compressed springs holding the bullet guide down. Remove the bullet guide from the assembly. See FIG 1.5.3

Locate and remove the two mounting screws which hold the upper slide carrier (#449-1013) in place. These are the two 9/64 Hex Head screws which pass thru the upper slide carrier. (SEE NOTE) See FIG 1.5.5

Remove the bullet feed slide. Locate and remove the shoulder bolt which attaches the slide to the slide kinematic assembly. This is the 3/16 Hex Head screw which passes thru the slide toward the rear of the assembly. See FIG 1.5.6
1.6 DISK ASSEMBLY

Locate and remove the four mounting screws. These are the four 3/16 Hex Head screws which pass thru the disk assembly and into the index adaptor. Lift the disk assembly up and if necessary turn the disk sideways and out of the front of the machine. See FIG 1.6.1

1.6.1 DISK SUPPORT BLOCKS

Locate and remove the disk support risers (#449-1648) these are the four riser blocks that are mounted directly under the disk assembly arranged such that the hardened backup ring is placed directly above them. Remove the mounting screws these are the two 5/32 Hex Head screws on either side of the support assembly. (Note, do not remove the base blocks that are mounted directly to the table.) See FIG 1.6.2
2. PLACEMENT OF CHANGEOVER TOOLING

2.1 DISK ASSEMBLY

NOTE: ENSURE ALL MATING SURFACES OF ALL COMPONENTS ARE CLEAN AND FREE OF DUST AND DEBRIS BEFORE ASSEMBLY.

Replace the four disk support risers with the appropriate replacement. These parts are engraved with the caliber for which they are to be used.

Replace the disk ensuring that the keys on the bottom of the disk assembly are properly oriented and engaged with the index adaptor. See FIG 2.1.1 – 2.1.2
Insert proper mounting bolts and bolt the disk assembly in place.
2.2 CASE FEED ASSEMBLY

Replace the case feed riser (#449-0213) with the appropriate replacement part, this part is engraved with the caliber for which they are to be used.

Replace the case feed assembly
Reconnect case feed sensor wire.

2.3 O.A.L LASER ASSEMBLY

Replace and fasten O.A.L. laser bracket to the table.

Adjust laser O.A.L height. Ensure approximately 1/8 inch clearance between the bottom of the laser bracket and the top of the case holders.

Note, see operator’s electric manual sec 3 B for O.A.L. laser alignment.

2.4 RAM PLATE ASSEMBLY

Replace and fasten Ram assembly, ensuring mating surfaces are clean
Reconnect debris check proximity switch

2.5 BULLET FEED SLIDE ASSEMBLY

Replace upper slide carrier if removed
Reinsert slide from front of slide carrier assembly (note ensure bullet gripper is free moving and working properly). Lube slide and gripper with liquid graphite.

Replace bullet guide with appropriate part (# 449-1012)

Ensure slide assembly moves freely and easily.

2.6 EJECT/REJECT BRACKET ASSEMBLY

Loosen set screw clamping height adjustment post and raise the post as to not interfere with the disk or ejector pins while being placed. Locate and loosen the screws clamping the eject bearing adjustment bar, these are the two 3/16 Hex Head screws passing thru the top plate of the bracket assembly and into the adjustment bar (#449-1510-1).

Locate and loosen the screws mounting the reject air cylinder bracket (#449-1407) these are the two 5/23 Hex Head screws passing thru the mounting bracket attaching it to the horizontal adjustment bar. Raise the air cylinder mounting bracket as not to interfere with the disk or ejector pins during reassembly.

Set the bracket assembly in place and fasten to the table.

Reinsert the blow off hose.

Reconnect the air cylinder hoses.
Adjust the bearing post such that the bearing rides just above the disk, a 1/16" inch gap between the bearing and the disk should be sufficient. Slide the horizontal bearing adjustment bar (# 449-1510-1) to a position that places the eject bearing about .020 inch from the block which the ejector pin protrudes.

Adjust the air cylinder mounting bracket to a position such that there is a minimum of .030 inch clearance between the air cylinder and the disk. Slide the horizontal adjustment bar to a position that places the reject air cylinder plate about 1/8 inch away from the eject pin and will not interfere when retracted.
LIMITED WARRANTY CERTIFICATE
COVERING ALPHA LOADING SYSTEMS® MACHINES

Bitterroot Tool & Machine, Inc. (BTM) provides a One Year/20,000,000 cycles (whichever comes first) Limited Warranty to the original purchaser for all Alpha Loading, Priming and Trimming Machines, and their components. Alpha Loading Systems® products are warranted against defective materials and workmanship only. Electrical components on Alpha Loading Systems® products are covered by a One Year Warranty from the date of purchase. BTM’s liability under this warranty is limited to repair or replacement, at BTM’s sole discretion of the defective materials or workmanship. This warranty is voided if BTM determines any Alpha tampering/modification, neglect, improper installation, improper storage, improper operation or application, intentional damage, or use of defective/improper ammunition and/or propellant.

Limits and Exclusions of Warranty

Components subject to wear during normal use and over time, including, but not limited to, powder coat, polycarbonate guards finish and condition are excluded from this warranty. Manufacturer’s specified maintenance procedures must be adhered to and recorded in order to maintain this warranty. This warranty is void if Manufacturer determines that (1) any BTM/Alpha Product was subjected to mishandling, misuse, abuse, improper operation or application, (2) any BTM/Alpha Product was improperly repaired or serviced by Customer, an unauthorized service technician, or other unauthorized person, (3) Customer or any person makes or attempts to make any modification to any BTM/Alpha Product without the prior written authorization of Manufacturer, and/or (4) any BTM/Alpha Product was used for any non-commercial use (such as personal or household use). This warranty does not cover damage or defect due to an external influence or matters beyond the reasonable control of Manufacturer, including, but not limited to theft, vandalism, fire, weather condition (such as rain, flood, wind, lightening, or earthquake), or acts of war or terrorism.

Without limiting the generality of any of the exclusions or limitations described in this Certificate, this warranty does not include any warranty that any BTM/Alpha Product will meet any person’s production specifications or other requirements, or that operation of any BTM/Alpha Product will be uninterrupted or error-free. Manufacturer assumes no responsibility with respect to the use of any BTM/Alpha Product by any person, and Manufacturer shall not incur any liability to any person for any failure in design, production, operation, performance, or otherwise of any BTM/Alpha Product, other than repair of replacement of same as set forth in the warranty above.

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Manufacturer will not be liable to Customer or any other person for any compensatory, incidental, consequential, punitive, special, or other damage or claim, whether in an action in contract, tort, or other legal or equitable theory, arising out of or related to any BTM/Alpha Product, other products or services provided by Manufacturer, authorized distributor, service technician, or other authorized representative of Manufacturer (collectively, “authorized representative”), or the failure of parts or products made by using any BTM/Alpha Product, even if Manufacturer or any authorized representative has been advised of the possibility of such damages, which damage or claim includes, but is not limited to, loss of profits, loss of data, lost products, loss of revenue, loss of use, cost of down time, business good will, any damage to equipment, premises, or other property of any person, and any damage that may be caused by a malfunction of an Alpha product. All such damages and claims are disclaimed by Manufacturer and waved by Customer. Manufacturer’s sole liability, and Customer’s exclusive remedy, for damages and claims for any cause whatsoever shall be limited to repair or replacement, at the discretion of Manufacturer, of the defective BTM/Alpha Product as provided in this warranty.