User Guide: Bayonet Units

Covers Standard Bayonet Style Hand Held Clinch Units.
Before You Begin
Inspect your unit, hose(s), booster, and any components for damage prior to operation of the unit. Be sure to check that your desired tooling is installed in the unit, and that the unit is operating at a low pressure (1.4 BAR [20 PSI]) before attempting to make any joints. Read this manual completely prior to operation of the system.

For product questions or service issues, contact BTM’s sales department at 810-364-4567.

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Disclaimer: BTM Reserves the right to amend the contents of this manual without notice. Contact BTM to verify the latest revision.
1.0 TOG-L-LOC®/LANCE-N-LOC® OVERVIEW

### Tog-L-Loc®

BTM’s patented Tog-L-Loc® sheet metal joining system is the simple solution for fastening plain or coated sheet metals. Tog-L-Loc® forms a strong, leakproof joint without welding or riveting in almost any combination of ductile sheet metals. The Tog-L-Loc® system is widely used in the manufacture of automobiles, appliances, furniture, electrical products, building supplies, and more.

<table>
<thead>
<tr>
<th>CLAMPS</th>
<th>DRAWS</th>
<th>LOCKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>The stripper clamps the materials to be joined.</td>
<td>The punch draws the material into the die.</td>
<td>As the material flows into the die, the sides of the die expand, allowing the material to flow into an interlock.</td>
</tr>
</tbody>
</table>

### Lance-N-Loc®

Lance-N-Loc® is a sheet metal clinching system which creates a strong mechanical joint without the use of external fasteners or welding. The metals are lanced and squeezed to form an interlock below the bottom layer of the sheet metal.

Lance-N-Loc® is good for joining harder materials, multiple layers, and is ideal for use where electrical conductivity is required.

The final result is a joint with a greater width than the drawn section of the metals. This accounts for the high strength of Lance-N-Loc® joints. The entire sequence takes place in a single press stroke.

<table>
<thead>
<tr>
<th>CLAMPS</th>
<th>DRAWS</th>
<th>LOCKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>The stripper clamps the materials to be joined.</td>
<td>The punch cuts the metal along the sides leaving the ends attached and draws the material into the die.</td>
<td>As the metal is squeezed the blades open allowing the metal to form an interlock behind the bottom sheet.</td>
</tr>
</tbody>
</table>

Note: Lance-N-Loc® is not leak proof. See Tog-L-Loc®.
2.0 SAFETY

**USER RESPONSIBILITY:** Each person who is to operate or maintain the Tog-L-Loc® unit must be familiar with these, and all other, safety precautions before attempting to use or to service the press equipment. The owner of the equipment is responsible to train and supervise all personnel as to safety precautions.

**DANGER:** NEVER place hands, fingers, or other body parts in the path of the die and the punch. Accidental operation or damaged and worn control devices can result in severe injuries. ALWAYS use tongs, or other inserting devices, to place materials in the press operating area. DO NOT operate with a second person holding the parts in the unit for joining.

**SAFETY GLASSES:** Wear safety glasses while operating this system.

**SAFETY CONTROL INTEGRITY:** Do not alter the control systems, or safety guarding, in any way.

**SAFETY CONTROL MAINTENANCE:** If a control or operating switch is damaged, or fails to work properly, discontinue use immediately and do not use until the controls are repaired or replaced, and the machine is tested by a qualified machine maintenance engineer.

**EQUIPMENT REPLACEMENT PARTS:** Use only genuine BTM punches, dies, hoses, and other spare parts with this system.

**WORK MATERIAL COMPATIBILITY:** Do not attempt to join materials other than those approved for joining by BTM for your tooling.

**REGULAR MAINTENANCE:** Check hand unit, hose, and booster regularly for damage or cracks. Discontinue use if such conditions exist.

Do not operate if tooling is chipped or cracked.
3.0 SETUP PROCEDURE

Requirements:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>5mm Allen Hex Key</td>
<td></td>
</tr>
<tr>
<td>Regulated Air Line</td>
<td>Capable of supplying 20 - 90 psi (1.4 - 6.2 bar)</td>
</tr>
<tr>
<td>Hanger</td>
<td>Capable of supporting at least 50 lb [22.7 kg]</td>
</tr>
</tbody>
</table>

Recommended Operating Air Pressure Range:

- 20 - 80 psi (1.4 - 5.5 bar)
- BTM recommends that clean, dry air is used.

Maximum Air Pressure:

- 90 psi (6.2 bar)

Recommended Oil:

- Amoco AW 32 to DTE 26 or any equivalent, non-foaming oil.

Oil should be handled and disposed of properly.

READ ALL SAFETY INSTRUCTIONS BEFORE OPERATING THE UNIT!

1. After removing your Tog-L-Loc®/Lance-N-Loc® system from its shipping box, visually inspect the system for damage due to shipping. If damage has occurred, call BTM immediately.

2. Make sure that you have received two sets of Tog-L-Loc®, or Lance-N-Loc®, tooling. One set is already installed in the hand unit. The second set should be in a package attached to the hand unit. Remove the second set of tooling and store it for future access.

3. Hang the booster from the hole in the hanger bracket. Make sure the booster unit is securely hung and will not fall or injure someone. The booster should be higher than the hand unit during operation.

HANG THE BOOSTER AS SHOWN. HAND UNIT SHOULD OPERATE LOWER THAN BOOSTER.
5. The booster is shipped with oil in the reservoir. If the oil level is low, add oil by removing the plug at the top of the booster. The oil level should reach the bottom thread of the booster cap.

![Diagram of the booster showing the oil level and plug]

6. Supply an airline to the booster with clean, dry air, regulated to 20 psi (1.4 bars) pressure.

Now you are ready to setup the unit to make clinch joints.

7. To set the button dimension (BD) put part material between the punch and die and press the trigger valve to make a joint. Use the pressure regulator to gradually increase the airline pressure while measuring each button dimension (BD) until the proper size is reached. Reference the chart on page 10 of the User Guide for general BD sizes. Contact BTM to optimize your BD for your specific part material.

8. If the airline pressure exceeds 90 psi (6.2 bar) and the proper BD is not reached then follow the instructions found in Section 4.0 – “Bleeding the Hand Unit” (p.7), and return to step 6.
4.0 BLEEDING THE HAND UNIT

1. Apply 20 psi (1.4 bar) air pressure to the booster by squeezing the trigger. Do this between 5 and 10 times.

2. Press and hold the trigger (Note: Do not release the trigger until the plug is tightened - See item 3).

3. CAUTION! The unit is under hydraulic pressure. Using a 5mm allen wrench, carefully turn the plug, located at the center of the press unit’s endcap, counterclockwise by a small increment between 1/4 and 1/3 of a full turn. Some air and oil should be expelled from the press unit.

4. The bleeding procedure may need to be repeated several times to expel all of the air.

5. This procedure works best when the hand unit is lower than the booster.

6. Check the oil level at the booster. Make sure the reservoir is filled so that the oil reaches the bottom thread on the cap. (See illustration on page 6.)

7. Reduce the air line pressure to 20 psi (1.4 bars) before attempting to setup the unit to make clinch joints. See Setup Procedure - Step 6. (p.6)
5.0 OPERATION

1. Observe all safety instructions as described previously in this manual.

2. Verify that the metals to be joined are within the thickness range as shown in the chart on page 9. Contact BTM if your metal thickness falls outside of this range.

3. Always hold the unit perpendicular to the work in both directions.


5. The trigger must be pressed and held throughout the cycle to ensure the hand unit has fully extended the tooling.

6. When metals of dissimilar thickness are to be joined, the thicker layer should be to the punch side for best results.

7. The die blade, punch, and stripper must be in place when joining metals. These components are crucial to joint quality.

8. Joint quality is monitored nondestructively by measuring the “button dimension” of the formed joint. Read QUALITY CONTROL in the Tog-L-Loc®/Lance-N-Loc® user’s guide for more detailed information. The button dimension is controlled by adjusting the air pressure (See section 6.1).
6.0 TOOLING

**GENERAL JOINT DATA**

<table>
<thead>
<tr>
<th>Joint Type: 4.6 [.18&quot;]</th>
<th>A (x2)</th>
<th>C.R.S.</th>
<th>BD</th>
<th>+0,25</th>
<th>-0,00</th>
<th>Shear</th>
<th>Peel</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>in</td>
<td>mm</td>
<td>in</td>
<td>N</td>
<td>lbs</td>
<td>N</td>
<td>lbs</td>
</tr>
<tr>
<td>0,6 [0.024]</td>
<td>0.6</td>
<td>6,3 [.250]</td>
<td>1178</td>
<td>222 [50]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0,75 [0.030]</td>
<td>0.75</td>
<td>6,7 [.265]</td>
<td>1601</td>
<td>311 [70]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,0 [0.040]</td>
<td>1.0</td>
<td>6,9 [.275]</td>
<td>1734</td>
<td>400 [90]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tog-L-Loc® tools are preset by BTM to give best joining results with a specific range of metal type and thickness, as charted above. Higher strengths for a specific metal thickness may be obtained with optimized tooling from BTM. All Tog-L-Loc® and Lance-N-Loc® tools are marked with numbers for easy identification.

**TOOL CHANGE PROCEDURE:**

Please note: All tooling changes must be done with the press unit in the “open” position. Removal of the air supply is required before the tool change or service begins. Use a 2.5mm allen wrench to change the punch and die in the hand unit.

**PUNCH CHANGE:**

1. Remove the retaining screw with an allen wrench. Remove the punch from its pocket (It may be necessary to pry with a wrench).

**DIE CHANGE:**

1. Remove the retaining screw with an allen wrench (It may be necessary to pry with a wrench).
2. When installing dies, care has to be taken so the springs are not damaged. Load the die on its side, bottom first, then slide the bottom of the die toward the front of the hand unit carefully, so that the springs do not bend. Note: If the springs are bent, the die does not function properly and the hand unit will form inferior joints.

**BUTTON ADJUSTMENT:**

Adjustment is achieved by increasing the air pressure to increase button size. Decreasing air pressure decreases button size. Make test joints until the desired button dimension is achieved.
6.1 JOINT ADJUSTMENT PROCEDURE

Please read the entire procedure before attempting this on your unit. Otherwise, you may cause damage to your tooling.

**WARNING!** - Begin button adjustment at the lowest possible air pressure to avoid damaging the tooling. Increase the air pressure slowly to achieve the proper Button Dimension (BD).

**PLEASE NOTE:** THIS PRESS UNIT USES AN AIR PRESSURE RANGE OF 20-90 PSI (1.4 - 6.2 BAR)

**TO ADJUST BUTTON SIZES:**

Increase the air pressure to increase button dimension (BD). Decrease the air pressure to decrease button dimension. Button dimensions are checked with a “Go-No Go” gage which can be purchased from BTM.

**ADJUSTMENT PROCEDURE:**

1. To achieve proper button dimensions (As noted in the Tooling Component Record - Section 6.2), start at the lowest operating air pressure (20 psi [1.4 bar]).

2. Gradually increase air pressure, and check the button dimension frequently.

3. Repeat until button dimension is proper, or until you reach maximum operating PSI (90 psi [6.2 bar]).

4. Mark air pressure at time of proper button dimension. Operate normally at this air pressure, do not operate the unit above this air pressure.

(If you reach 90 PSI [6.2 bar], and you have not made a proper button dimension, per the Tooling Component Record, refer to section 4.0 - Bleeding the Hand Unit on page 7. DO NOT exceed 90 PSI [6.2 bar].)

Whenever tooling is changed, test the joints to see that they are still proper. If they are not, repeat the process above to find correct air pressure.
BTM has a wide range of products to meet your needs including (but definitely not limited to):

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<th>SHEET METAL JOINING</th>
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<tr>
<td><strong>Light &amp; Heavy Duty Clamps</strong></td>
<td><strong>Tog-L-Loc®</strong></td>
</tr>
<tr>
<td>Clamps range from light duty omni-directional head clamps to heavy duty precision sealed power clamps.</td>
<td>BTM’s Tog-L-Loc® sheet metal joining system is a cold forming process that quickly joins pre-painted, galvanized, coated, and dissimilar metals.</td>
</tr>
<tr>
<td><strong>Light &amp; Heavy Duty Grippers</strong></td>
<td><strong>Lance-N-Loc®</strong></td>
</tr>
<tr>
<td>BTM’s Gripper line ranges from compact light duty models to locking &amp; non-locking heavy duty models.</td>
<td>BTM’s Lance-N-Loc® Joining System produces clean, strong and consistent joints in most coated or uncoated metals.</td>
</tr>
<tr>
<td><strong>Precision Shot Pin cylinders</strong></td>
<td><strong>Ways to Tog-L-Loc®</strong></td>
</tr>
<tr>
<td>BTM’s Precision Part Locators are used whenever your production needs require locating precise holes in a workpiece.</td>
<td>Die Sets Handheld Units Hydraulics Units Universal Presses Specialized Units</td>
</tr>
<tr>
<td><strong>Pin Locator Clamps</strong></td>
<td></td>
</tr>
<tr>
<td>BTMs’ Pin Locator Clamps and Single Finger clamps are used in stationary part nests, welding fixtures, transfer systems, robot end effectors and numerous other clamping applications. These clamps locate and hold the work while other operations are performed.</td>
<td></td>
</tr>
<tr>
<td>Standard pin sizes range from 12.5mm - 40mm.</td>
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</tr>
</tbody>
</table>

For more information, or to see our full line of products, please visit: www.BTMcomp.com