

IT8000/IT7000/ITC800 *User Manual*



Original Instructions
(Not a translation)

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SAFETY GUIDELINES AND WARRANTY

SAFETY INSTRUCTIONS

Read this manual to help you understand the intent and operation of this tool prior to installing BAND-IT Tie-Lok® ties.

- This product manual contains detailed instructions for setting up the tool and safely installing ties.
- Always wear safety glasses, appropriate gloves and safety shoes when operating this tool.
- Keep hands away from tool head and clamp while operating.
- Care should be taken to ensure fingers are not in the way of the clamp being applied.
- Maintain the tool by following the scheduled preventative maintenance interval provided in this document.
- Never use this product for anything other than its original intended purpose.

IMPORTANT:

- The object clamped and the 3/8" Tie-Lok® tie or 1/4" Tie-Lok® tie must be compatible with each other and the environment in which the final product will be used.
- Always disconnect from air and electrical power sources before performing maintenance.

The IT8000 tool is designed for use with BAND-IT 3/8" Tie-Lok® ties only. The IT7000 tool is designed for use with BAND-IT 1/4" Tie-Lok® ties only. Accordingly, BAND-IT- IDEX, Inc. makes no representations with respect to the compatibility of these tools when used with non-BAND-IT or any other incompatible clamps.

WARRANTY

For warranty information go online at:

<https://www.band-it-idex.com/en/terms-conditions>



Save these instructions for future use.





This equipment has been tested by BAND-IT-IDEX and meets the requirement of stability during use, storage conditions, transportation, assembly, dismantling when out of service, testing or foreseeable breakdowns providing that the proper safety precautions are observed.

DANGER—Misuse of this equipment may result in serious injury to personnel.

- Only use the equipment for its intended purpose, as described in this manual
- Do not attempt to operate the equipment with covers removed
- Refer to the installation section before installing machine
- Do not operate machine with wet hands

Please read this entire manual before unpacking, setting up or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or other personnel, or damage to the equipment.

SAFETY SIGNS

High Voltage – Risk of electric shock	
Compressed Air – Risk of release of pressurized air	
Pinch Point – Refer to accompanying documentation	
Caution – Refer to accompanying documentation	

It is the task of the employer to warn his or her staff of risks, to train them on prevention of accidents, and to provide necessary safety equipment and devices for the operator’s safety.

Before starting to work with the machine, the operator should check the features of the machine and learn all details of the machine’s operation. The machine should only be operated by staff members who have read and understand the contents of this manual.

The machine is only intended to be operated under conditions as outlined in this document.

GUARDING AND INTERLOCKS

Safeguards:

- Main Tool Housing: Covers primary mechanical body and actuators to prevent pinching during operation. Do not attempt to access an open gaps during tool operation.
- Head cover: Covers the mechanical head piece of the tool to prevent pinching during cutoff process. Do not place fingers in head area or under band during operation.
- Circuit breaker: Housed inside main enclosure.
- Power cord: Main method of removing power to unit. Unplug from wall or main enclosure.



Interlocking functions and features:

- The tool is not intended to operate without guards in place. The tool does not have any interlock functions or features that prevent operation if the guards are missing or enclosures are open. It is the responsibility of the user to provide safety interlocks if required.



Securing machine for safe maintenance:

- The tool must have all power and compressed air sources removed before service.
- All guards must be replaced, and enclosures closed before power and air sources are reconnected to the unit.
- Before preventive maintenance, disconnect device from wall. The appliance plug is the disconnect device.
- The Device comes with an emergency stop (E-Stop button) that cuts power to the motor and air to the pneumatics bank when depressed (activated)

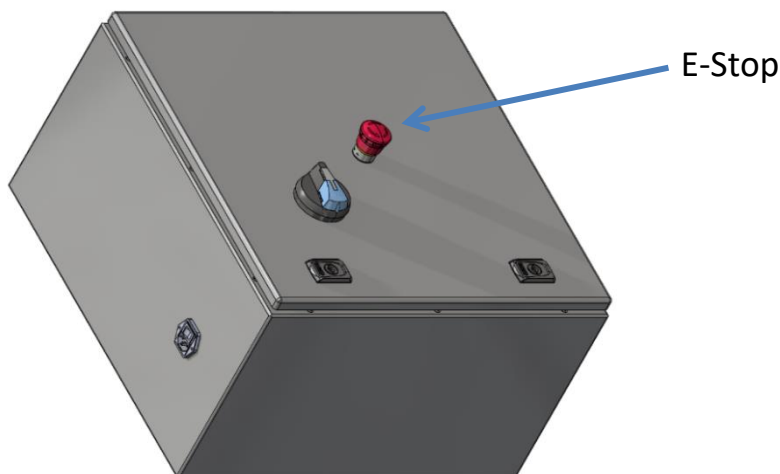


Figure 1

PRODUCT SAFETY LOCATIONS

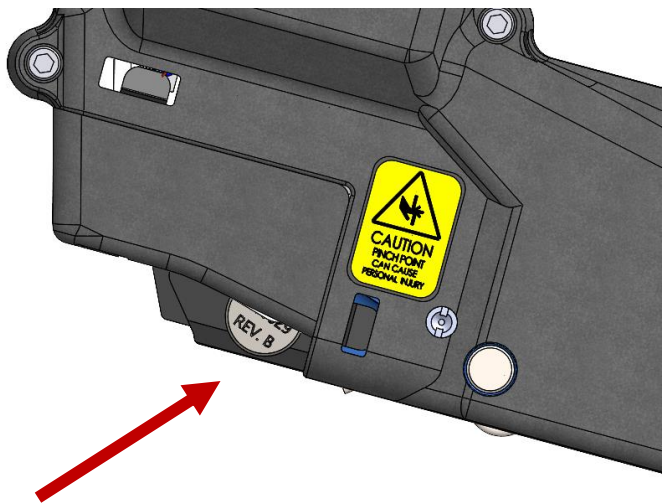


Figure 2



Warning:

Do not place fingers, hands, or any body parts under the **cutting head** while tool is running

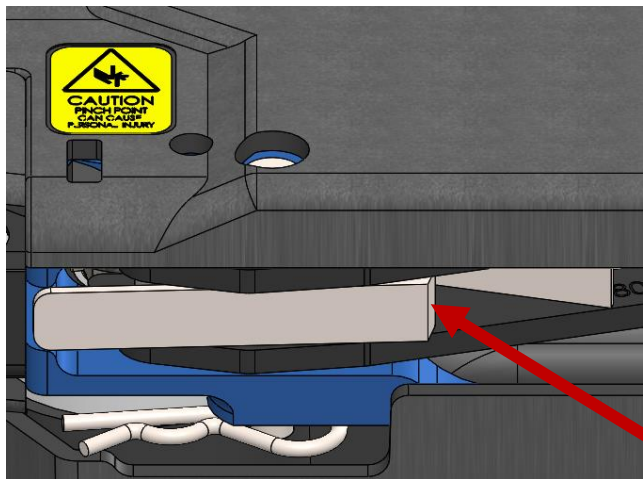


Figure 3



Warning:

Do not place fingers, hands, or any body parts near the **outlet of the tail eject** while tool is running

OVERVIEW

- The IT8000/IT7000 are designed to install 3/8" Tie-Lok® or 1/4" Tie-Lok® ties with repeatability and control. The machine is adjustable for individual applications and provides data to ensure the quality of the finished assembly
- The IT8000/IT7000 is powered by pneumatic cylinders and an electric motor powered with an AC connection. Data is transferred from tool to controller (Siemens PLC) and can be extracted utilizing USB or ethernet
- The mechanical drive portion of the tool tensions, dimples, and cuts a clamp to form a durable and strong fastened joint between two objects
- The electronic control of the tool uses feedback from the mechanical portion to accurately control the tension process of the tool and activate the punch and cut
- The tool can be programmed by the user to accommodate specific applications utilizing the HMI (Human-Machine Interface)
- The tool can provide a data output to allow for verification of the integrity of the finished assembly

QUICK START OVERVIEW

1. Connect data and motor cable to tool (Page 16)
Note: Ensure controller power and air are off before connecting to the tool (Page 16)
2. Connect data cable to controller (Page 17)
3. Connect air harness to tool (Page 18) and controller (Page 18, Fig. 22)
4. Connect HMI (touchscreen) to controller (page 17)
5. Connect external regulator to controller (page 17)
6. Connect air hose to external controller regulator (page 17)
Customer supplied: connect with either 3/8" OD push-to-connect fitting or 1/4" NPT thread
7. Plug in controller (120V US or 230V EU standard outlet)
8. Power on tool, ensure door latch is set to "On" and flip power switch on outlet module (Page 17)
Note: If the controller is not getting power, ensure the internal circuit breaker is flipped on
9. HMI will boot up main program screen
10. Enter tool serial number, located by the three mounting holes (Page 20)
11. Tool is factory set to recommended settings for the IT8000 and .019" band thickness (punch pressure)
 1. Ensure all settings are correct for application (page 32) and input settings as necessary
 1. Set punch pressure (Page 18)
 2. Set target torque (Page 32)
 3. Set error passcode preference (Page 40)
12. Message banner at top of screen should read "Tool Ready" and the tool is ready to use (if trigger is unresponsive press the "Reset Error" button on the HMI)
Note: The controller needs approximately 30 seconds to boot up before the trigger is responsive

ENVIRONMENT

TRANSPORTATION, STORAGE, HANDLING

Table 1

Transportation	Avoid shocks and vibration Immediately check units for transport damage and inform your transport company, if necessary If possible, ship in original packaging
Storage	Store unit in a clean, dry place with air temperature between -25°C and +55°C (-13°F to 131°F)
Handling	Use techniques appropriate for lifting and moving heavy objects.

Normal operating conditions are defined as:

- Intended for Indoor Use ONLY at an automotive assembly plant or similar facility.
- Temperature range from 5°C to 40°C (41°F to 95°F).
- Max relative humidity 80% for temperatures up to 31°C (88°F), decreasing linearly to 50% at 40°C (104°F).
- Conforms to Applicable RATED POLLUTION DEGREE 1.
- Correct illumination for safety of operator (ISO 8995-89).
- Avoid using the tool near equipment with strong EMI / RFI emission.
- Avoid using the tool near equipment susceptible to EMI / RFI interference.
- This tool has been tested for:
 - Altitude: Sea level to 5690 ft (1730 m)
 - Atmospheric pressure: 14.7 lbs/in² (1 Kg/cm²) to 12 lbs/in² (0.85 Kg/cm²)
- Return tool to Band-It at end of life for proper recycling/disposal.

- Tool size:
- Tool only: 12" L x 6.5" W x 8" H (305 x 165 x 203 mm)
 - Controller box: 20" x 20" x 10" (508 x 508 x 254 mm)
 - Tool weight: 10 lbs (4.5 kg)
 - Tool Clearance: Recommended 3ft (1m) for operator maneuverability during use.
 - Controller weight: 63 lbs (28.6 kg)
 - Controller Clearance: Recommended 3ft (1m) to allow access for maintenance

TOOL SETUP

OPERATING REQUIREMENTS

Table 2

Clamp Type	BAND-IT 3/8" Tie-Lok® Tie Series BAND-IT 1/4" Tie-Lok® Tie Series
Operation Air Requirements	80 PSI (552 kPa) Clean dry compressed air Air Flow Rate: 0.25 CFM (7.1 L/min.) Do not exceed 100psi (690kPa) into panel. Input supply not to exceed max listed on regulator assembly.
Power requirements	110Volts/60Hz or 240Volts/50Hz Grounded AC 8 A Max 5kA SCCR
Power Cord	North America: 120V, 15A, 14AWG Cord Receptacle: IEC 60320 C13
Human-Machine Interface (HMI)	Programmable Color Touchscreen
Emergency Stop	Application of emergency stop button will stop electric motor and open all valves, removing air pressure from pneumatic cylinders.
Power Output	Motor: 240V, 3.1A MAX, 8kHz HMI: 24V, 350mA Data Cable: 24V, 2A
Airborne Noise Emissions	A-Weighted Pressure level: 70 dBA Peak C-Weighted Pressure Level: 71 dBA
Vibration Data – Handheld Unit	Continuous: 3.2 m/s ² Peak: 30.2 m/s ² @ cutoff

PART DESCRIPTIONS AND LOCATIONS

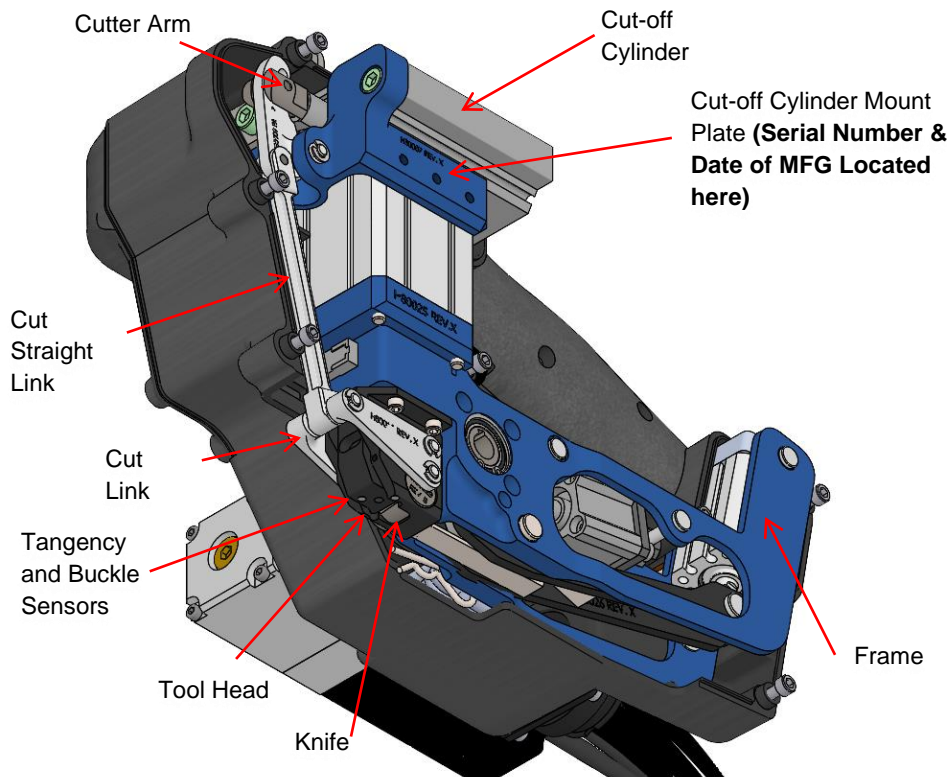


Figure 4

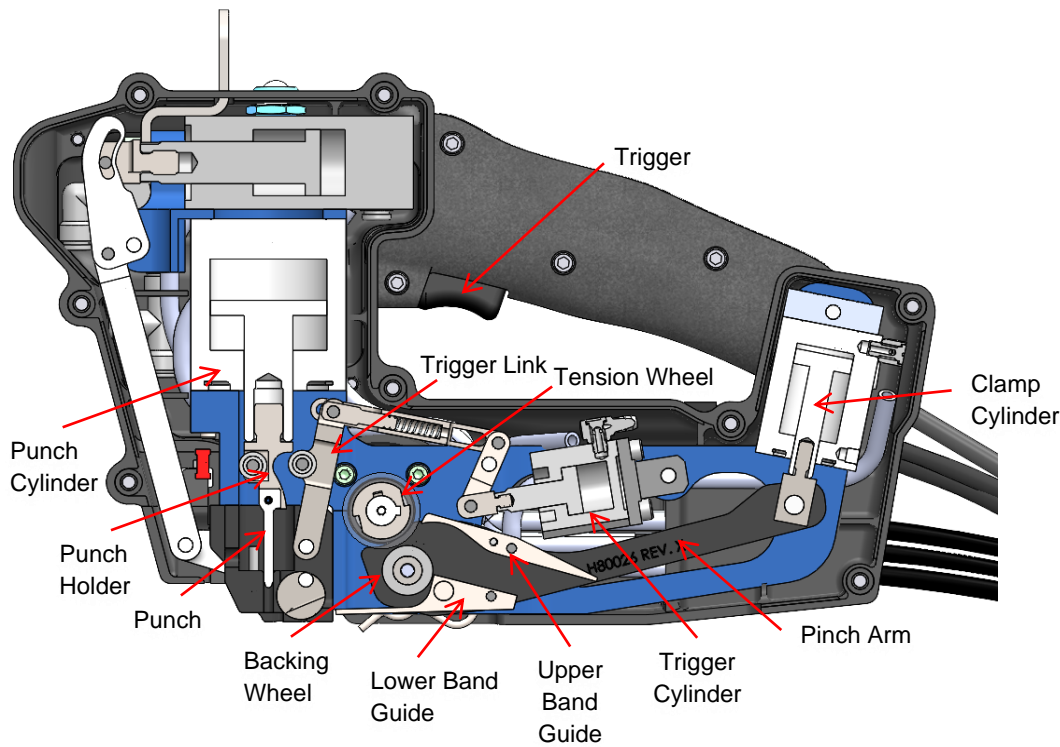


Figure 5

PART DESCRIPTIONS CONT.

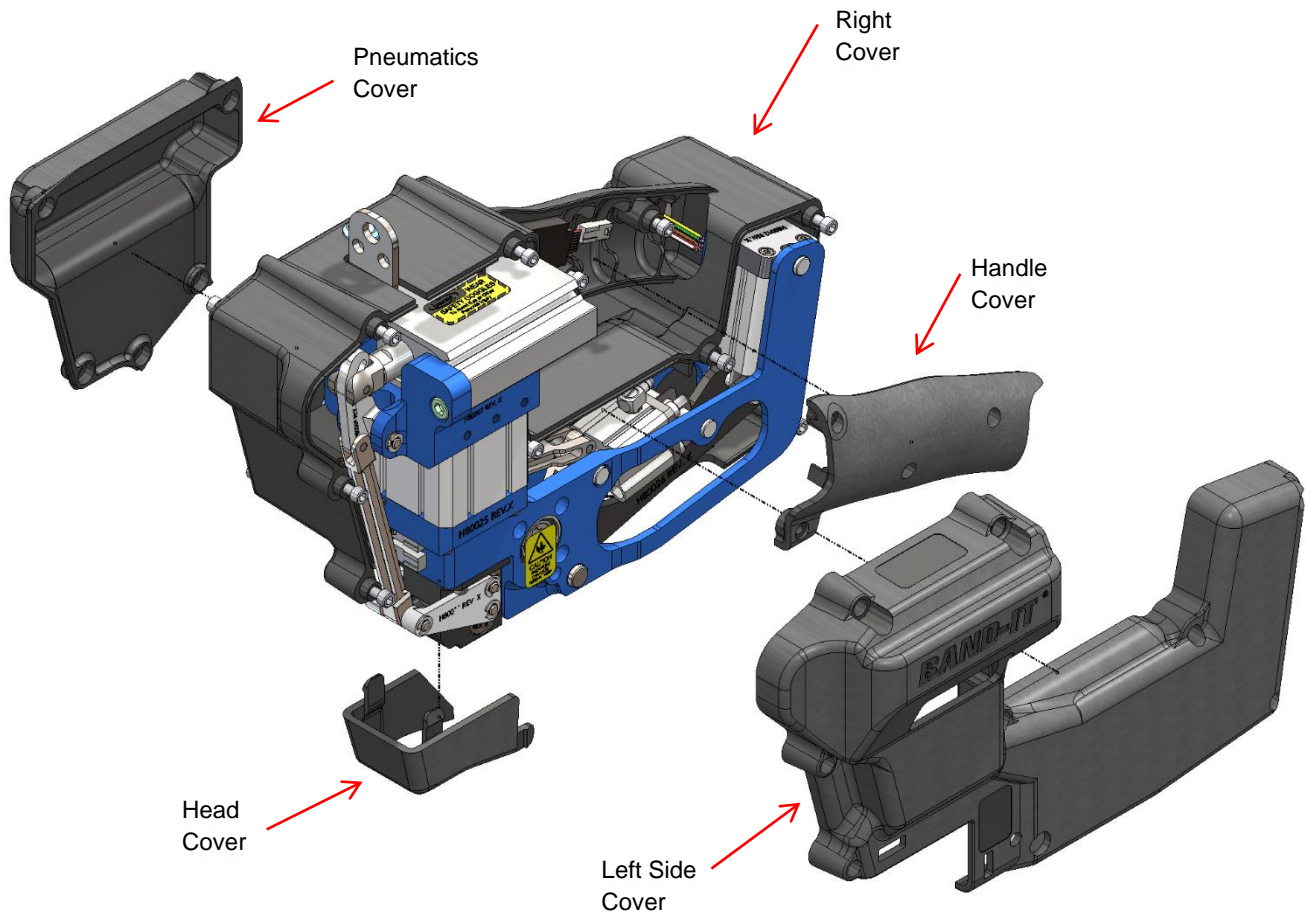


Figure 6

INSTALLATION TOOL DIMENSIONS IT8000

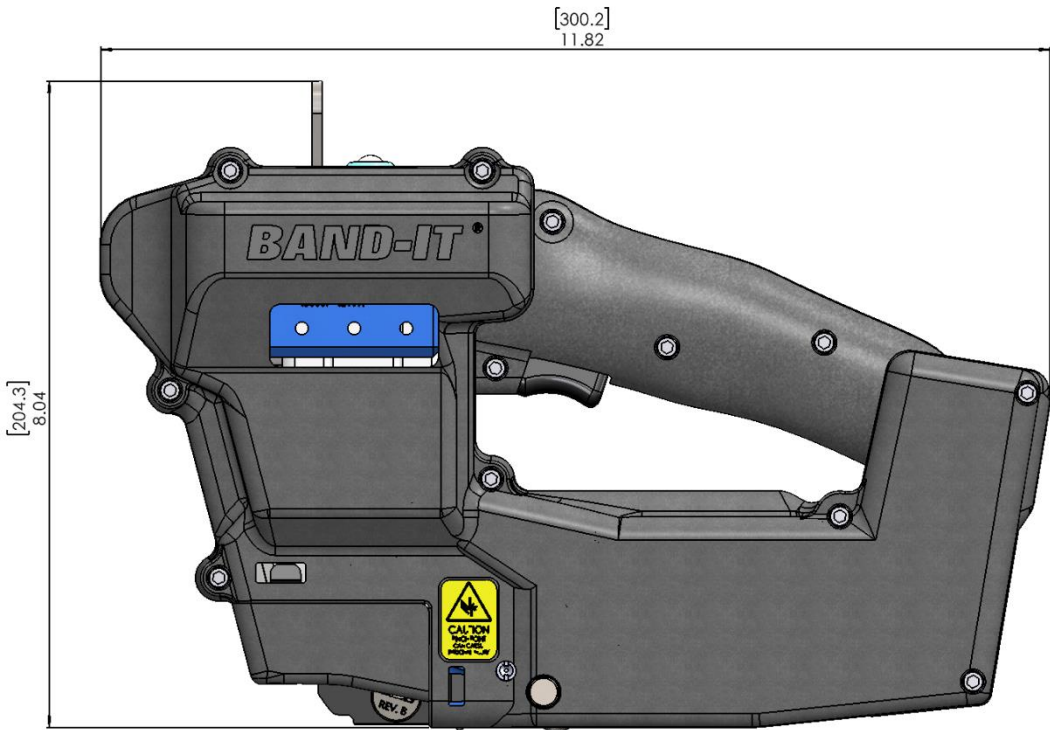


Figure 7

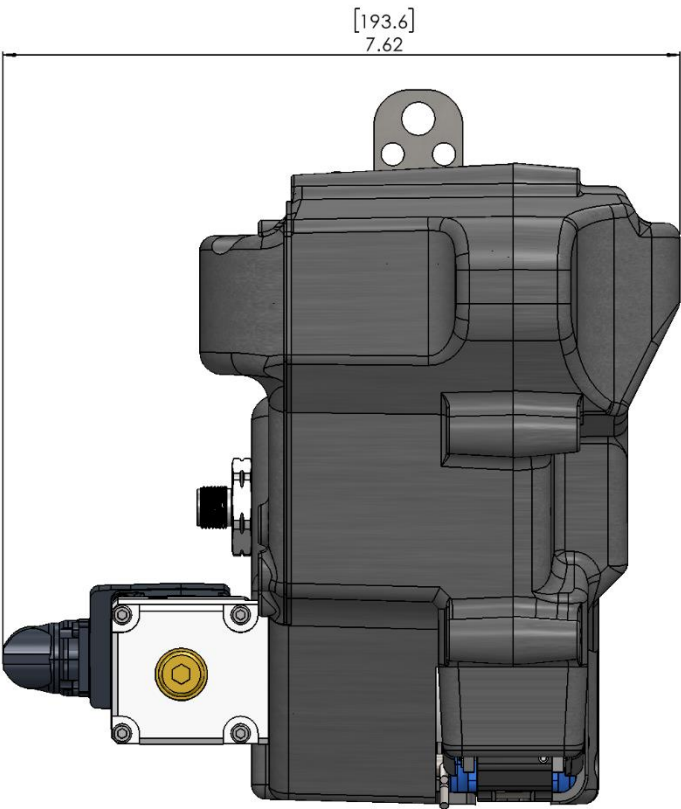


Figure 8

INSTALLATION TOOL DIMENSIONS IT7000

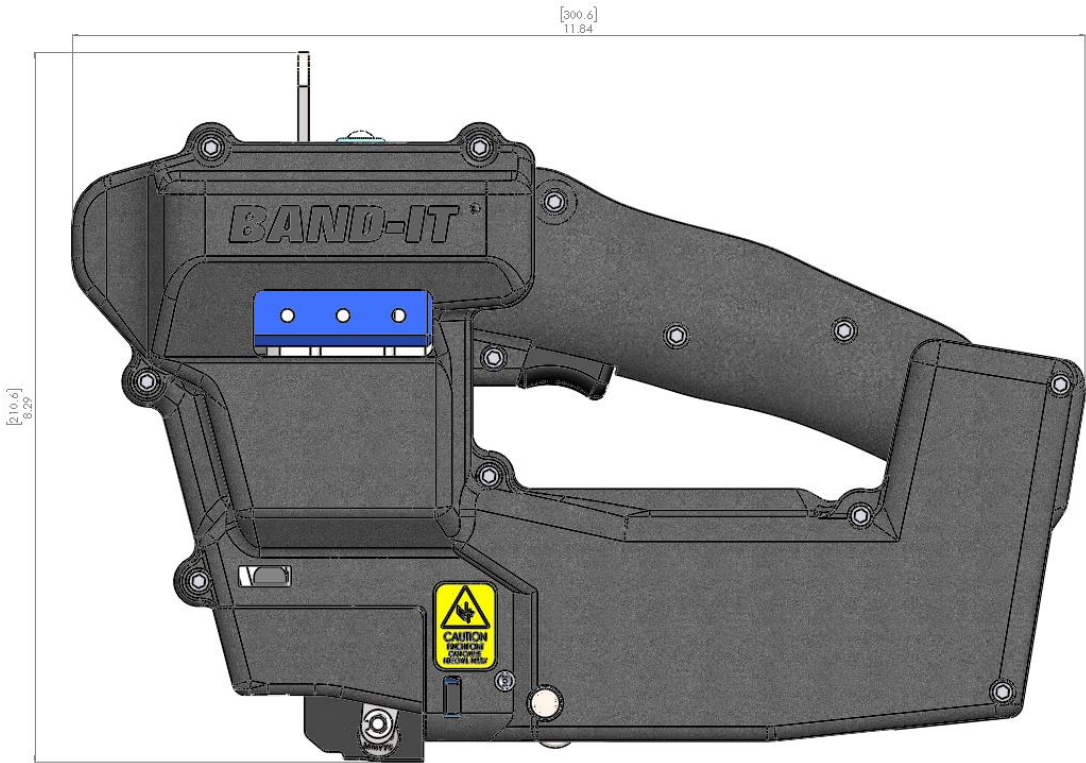


Figure 10

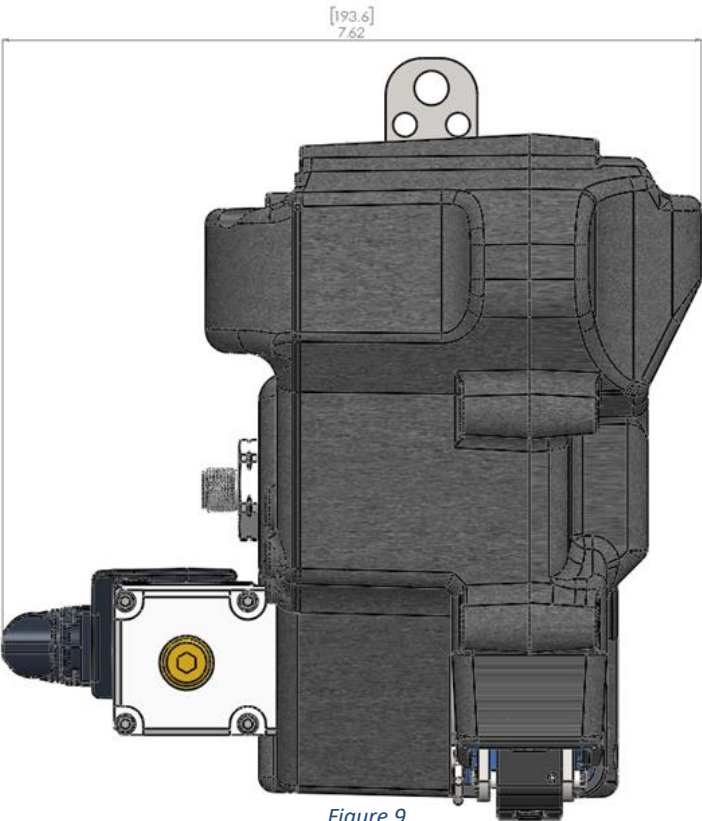


Figure 9

CONTROLLER ENCLOSURE DIMENSIONS

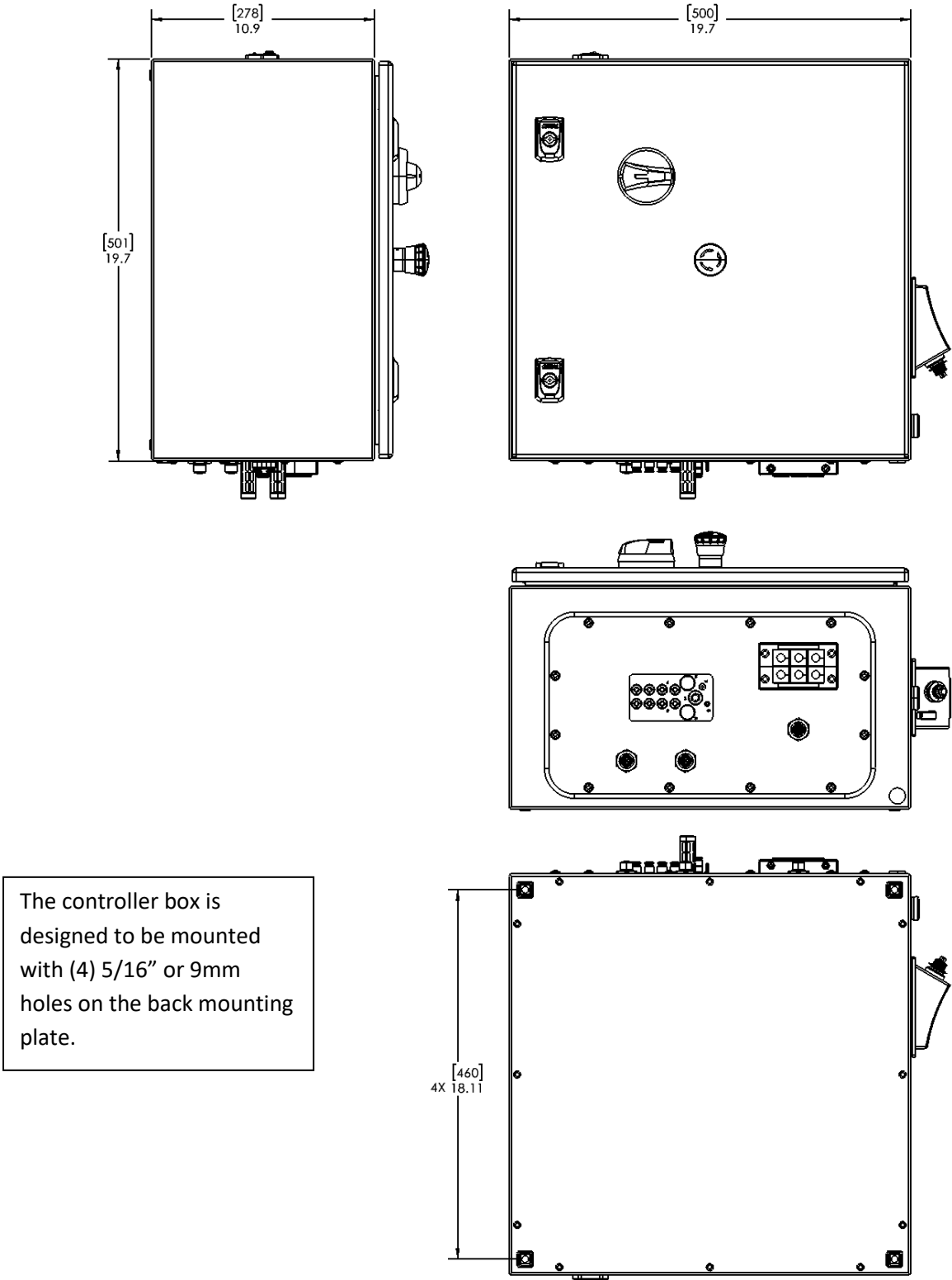


Figure 11

CONNECTING THE TOOL TO CONTROLLER

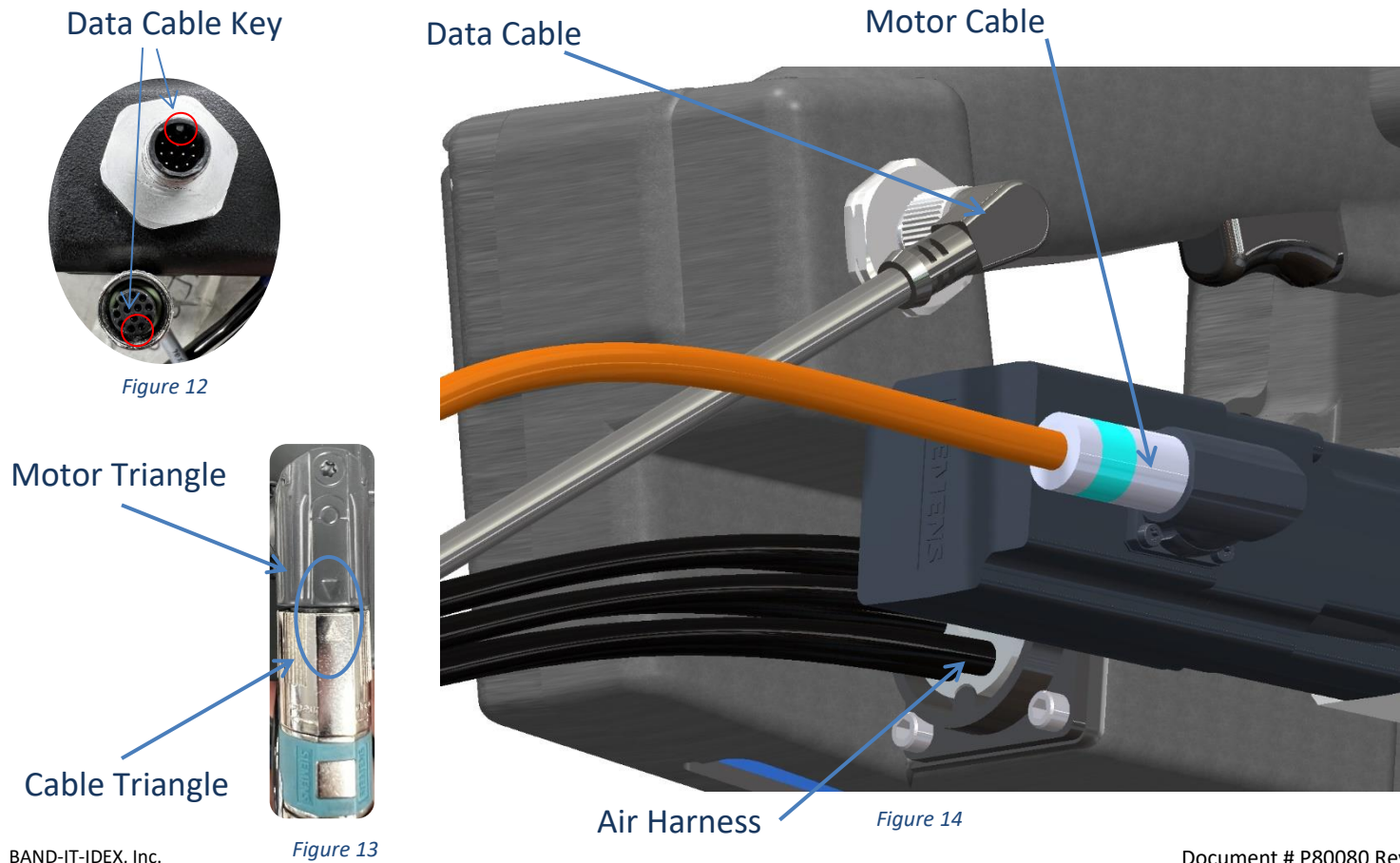
This tool requires both electricity and compressed air to operate. Provisions must be made to deliver both to the tool in a safe manner. The tool can be plugged in a standard 120V US or 230V EU outlet.

Connect the data cable to the main tool housing. **To reduce risk of a bent connection pin ensure that the key is aligned before attempting to screw down the connection (Fig. 12).** Each electrical connector has a unique interface, do not attempt to force a plug into a connector if the receptable does not match or the key is misaligned.

Connect the motor cable to the motor. **Ensure the connector is fully rotated in the direction of the “open” arrow, align the two triangles on the cable and motor, push cable onto motor then rotate connector by hand in the direction of the “close” arrow a minimum of 45° or until the end stop (fig. 13).** Failure to follow the order outlined above may result in bent or broken pins on the motor connector.

The tool includes an air harness with six 1/4" (6.35mm) outside diameter tubes pre-assembled to quick-connect ends. Attach one end to the controller and the other end to the tool connection point, taking care to align keys before insertion. Once inserted, twist coupling until it is tight on the connector.

Only plug in the power cable to the controller after all the other connections have been completed. The power entry module includes the ON/OFF switch. The power cable provided with the tool is standard grounded plug compatible with North America outlets.



CONNECTING THE HMI AND REGULATOR TO CONTROLLER

The connection to the HMI (Human-Machine Interface) (Fig 16) is hardwired, so the green HMI cable only needs to be connected to the controller. To connect the HMI cable to the controller, align the red dots and press the connector in (fig. 15) On the side of the HMI is a USB port that can be used to transfer tool data. The system regulator has two connections that must be connected (Fig.19). Each electrical connector has a unique interface, do not attempt to force a plug into a connector if the receptable does not match or the key is misaligned.

The controller has inputs for a Pass/Fail “cutoff signal” and remote actuation to operate the tool hands free. These do not need to be connected to run the tool in normal operation.

The controller has multiple switches. The I/O power switch above the plug and the door latch function the same, cutting all power and air to the controller. The E-stop on the top of the box removes air from the tool and power to the motor. The HMI will remain on.



Figure 15

HMI Key



Figure 16 - HMI

Regulator
Connections



Figure 19

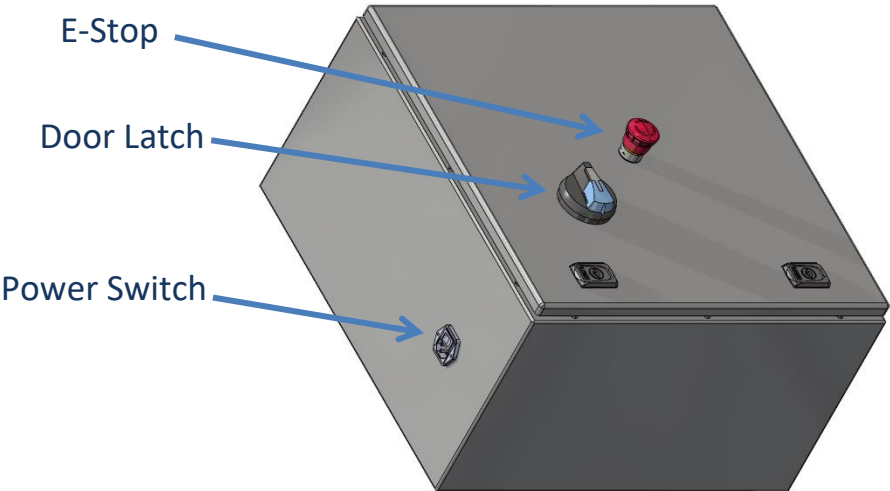


Figure 17

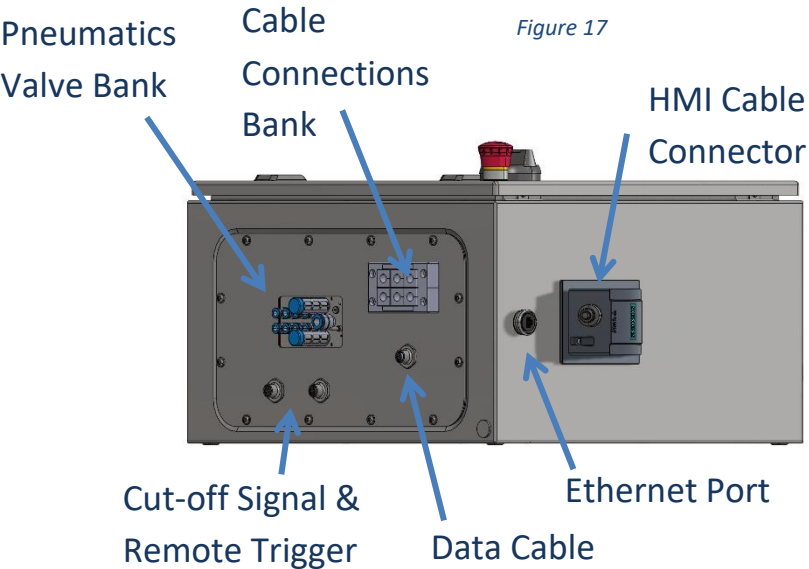


Figure 18

AIR SYSTEM SETUP AND PRESSURE SETTINGS

Table 3 - Recommended Pressure Settings:

Tool	Tie Thickness (in)	Punch Pressure (psi)	System Pressure (psi)
IT8000	0.019	65 ± 2	80 ± 5
IT8000	0.024	80 ± 2	80 ± 5
IT7000	0.014	60 ± 2	80 ± 5



Caution: Pressures above the specified settings may cause premature clamp failure and/or tool wear.



Use the external regulators to adjust the air pressure on the tool. The system pressure regulator is in-line with the Input Air line (Fig 19). It has two connectors that must be attached to power and read the regulator. The punch pressure regulator is in-line with Punch Extend line (Fig. 21). The punch must be extended to read the pressure. The punch pressure reading is shown on the manual screen. (pg. 35). The regulators are adjusted independently. Note that the HMI pressure limits may need to be updated as well (pg. 38), but the pressure cannot be adjusted in the HMI. **The system pressure regulator has a 3/8" OD push-to connect fitting on it. If a different style of fitting is preferred to connect to the input regulator, the fitting can be removed and replaced with a different 1/4" NPT fitting.**

The controller and tool harness air-line valve numbering is shown below.

Valve Position	Actuator
1	Punch Extend
2	Cut Extend
3	Trigger Extend
4	Clamp Extend
5	Punch Retract
6	Cut Retract

Table 4

Tool Air Harness

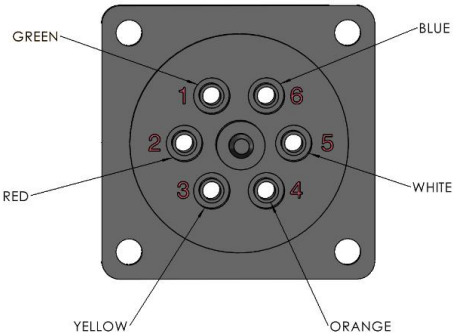


Figure 20



Figure 21

Controller Pneumatics Valve

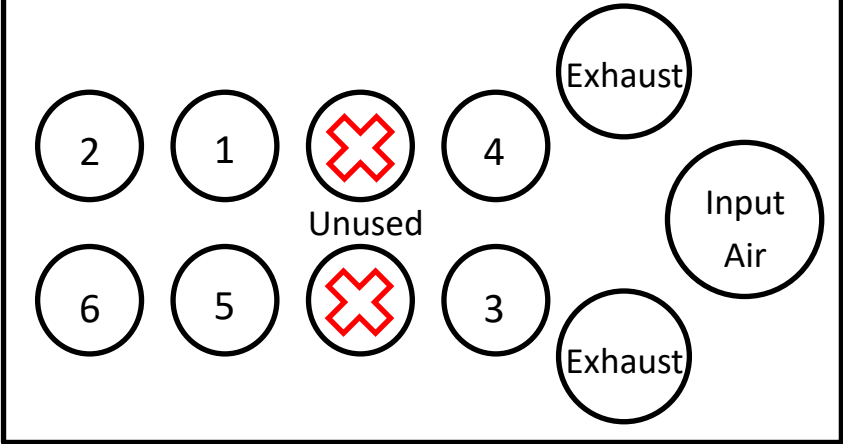


Figure 22

AIR FLOW TIMING

The following chart shows the cylinder actuation for one complete tie install.

Event description		Tool ready for next tie	Engage gripper	Tension clamp / engage punch cylinder	Actuate trigger to dimple	Retract punch	Reset trigger	Cut-off	Eject
Timing / duration		At rest	Entire duration of tensioning tie and ejecting scrap	Entire duration of tightening tie	Immediately after sensors are activated	60 ms (Punch Extend Duration)	Immediately after punch retract	150 ms (Cut Retract Delay)	Auto Eject Only* (0.5 s)
Clamp cylinder	Extend								
Punch cylinder	Extend								
	Retract								
Trigger cylinder	Extend								
Cut-off cylinder	Extend								
	Retract								

Pressurize

Exhaust

Figure 23

*Scrap Ejection: If the automatic ejection setting is ON (recommended), the tail scrap will be automatically released from the tension wheels after the cut operation to ease in pulling out scrap. Otherwise, the tool will wait for the next trigger press to eject scrap. Note: Regardless of the setting, the scrap will have to be pulled out by hand. See HMI settings to change the setting (pg. 37)

SYNCING TOOL TO CONTROLLER

How to connect or replace an existing tool to the controller:

1. Activate E-stop or turn controller off to disable air and power to motor.
2. Disconnect data and motor cable to current tool (only required if a tool is connected).
3. Disconnect pneumatic tubing harness to current tool (if required).
4. Connect data and motor cable to new tool.
5. Connect pneumatic tubing harness to new tool.
6. Release E-stop or turn controller back on. Ensure Door Latch is in the *On* position.
7. Tool Setup automatically appears (skip step 1), if not go to settings screen (General tab)
 1. Select "New Tool / Maintenance"
 2. Select the Enter Serial Number field
 3. Type in the new tool's serial number
 4. Select "Enter"
 5. Enter "Tool Cycle Count"
 6. Select Maintenance Items that have been performed
 7. Select "Done" then "Yes" to confirm selections
8. Input tool settings (If changing application)
 1. Set system pressure and punch pressure (Refer to settings, page 32)
 2. Set target torque (Refer to settings, page 32)
 3. Set ejection preference
9. Message banner at top of screen should read "Tool Ready" and the tool is ready to use.
If an **error** is shown, press the error reset button.

Note: When powering on the controller, it takes approximately 30 seconds for the system to be functional. Air pressure and motor power will not be activated until after this point.

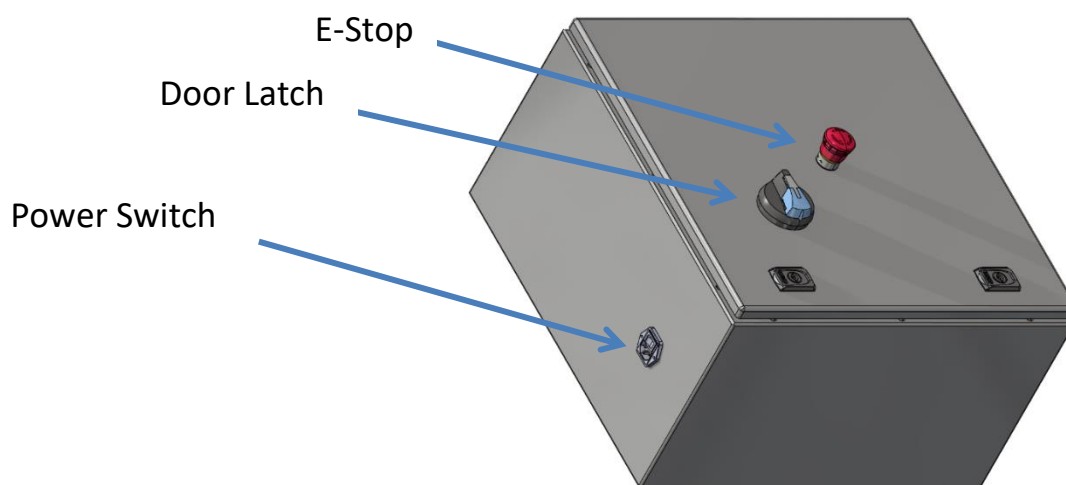


Figure 24

OPERATION

TIE INSTALLATION PROCEDURE

1. Lace the tie snug around the assembly and locate the buckle in the target location. The tie should be at least 3 inches longer than the assembly circumference.
2. Band should be applied to a uniform solid surface allowing the buckle adequate support during the tie installation operation. (pg. 22)
3. Insert the tail of the clamp into the tool at a 30° angle from the buckle. The tail needs to be inserted a minimum of 2.5" into the tool.
4. To reduce the risk of jamming, do not activate the tool until the tie is inserted 2".
5. Ensure proper tool orientation (see below).
6. Begin tensioning by pushing and holding down the trigger or by using the remote trigger system. If the trigger is released, the tool will stop tensioning and open the gripper.
7. The tool will continue to run until it reaches the desired tension. At this point the tool will hold tension but not fire the punch until the tool is moved tangent to the work surface.
8. Once the tangency and buckle sensors have been activated the tool will complete the punch and cut cycle.
9. Data will be logged onto the controller (and can be downloaded to an external device). The clamp count is updated.
10. After the cycle is complete, remove the scrap tail. The tool is now ready for the next tie.
11. Cut off scrap tail can be recycled according to local regulations.

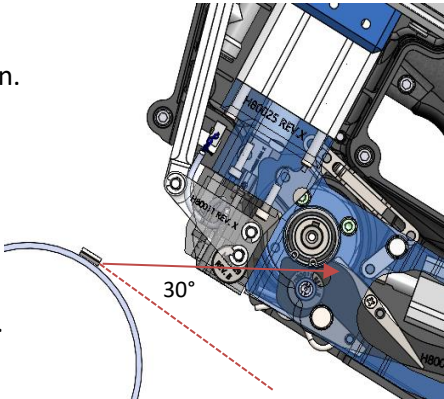


Figure 25

Note: A blinking red LED signifies an error during install. Check the error message on the HMI and verify the clamp was installed correctly.

TOOL OPERATION

The starting tool orientation should be rotated back to allow for the front corner of the buckle to hit first. Go straight into the buckle with the tool in this orientation.

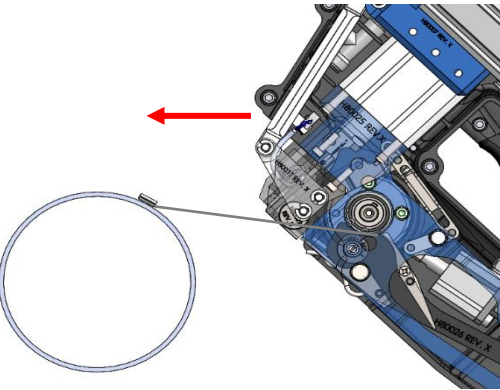


Figure 26

Continue to install the band until it reaches full tension in the orientation shown. Once the LED is solid yellow, rotate the tool to be tangent to the work piece and buckle.

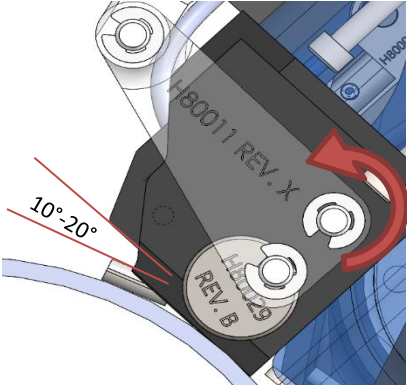


Figure 28

Once the tangency sensors are activated the LED will turn green and the tool will punch & cut the band.

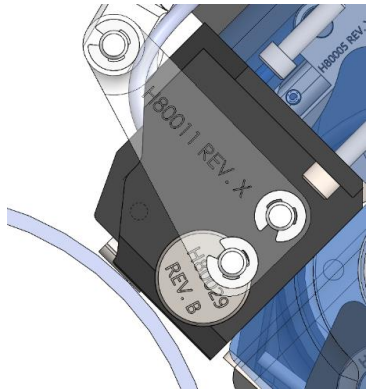


Figure 27

TIE INSPECTION

The IT8000/IT7000 forms a locking dimple into the Tie-Lok® Tie with the punch and cuts the remaining tail. When installing a Tie-Lok® tie, a visual check is recommended to verify the presence of a locking dimple after the tie has been applied.

Locking Dimple

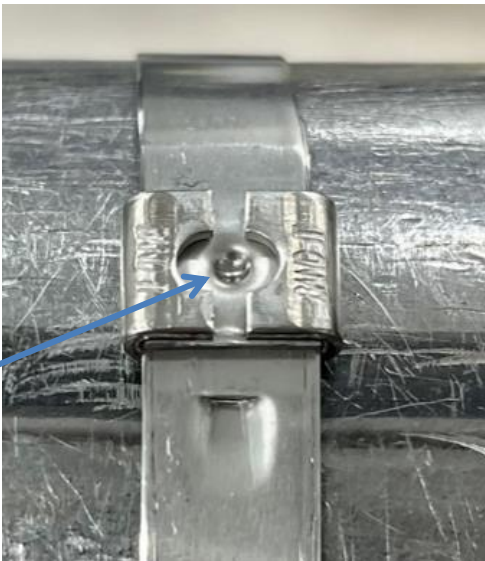


Figure 29

CLAMP PLACEMENT

Buckle location is critical to clamp performance. Use the following guidelines as a reference.

- Do not install clamps at an angle (Fig. 30)
- Buckle locations cannot be over air gaps (Fig. 32)
- Avoid sharp corners, add largest radius possible on square corners (Fig. 31)
- Tie-Lok® can be installed on flat surfaces
- Do not install clamps on tapered surfaces or on tube bends (Fig.31)
- Tie-Lok® advised min installed diameter is 1"
- The buckle area of the shield must be free of voids and wrinkles

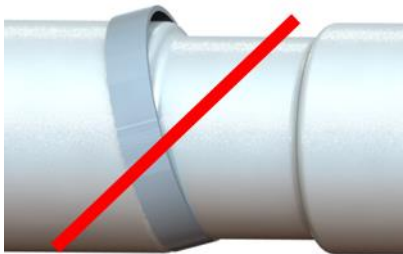


Figure 30

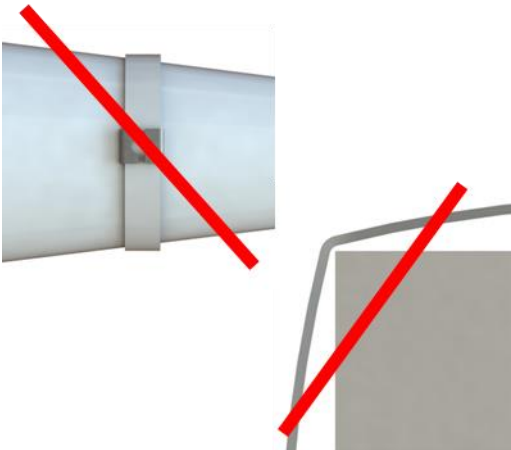


Figure 31

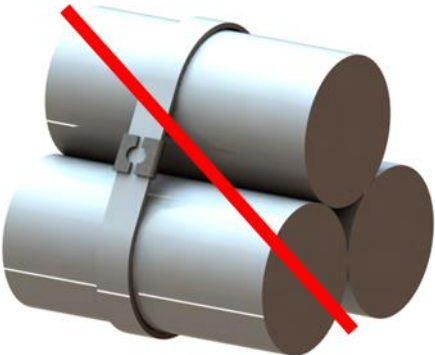


Figure 32

MOUNTING AND FIXTURING

At a minimum BAND-IT recommends that the tool be connected to a tool balancer or connected to an ergonomic lift assistance arm.

Tool Balancer

- The tool needs to be located directly above the clamp location if using a balancer as shown below (Figures 34 & 35).
- The balancer must support the weight of approximately 10 lb.
- The tool comes with a hanger loop to mount to a balancer.
- For more complex installations there are three mounting holes on the side. See page 26 for more information about controlling the tool in roll and yaw.
- Note that the center of gravity is behind the hanger bracket. For best performance, the pivot point should be located on the CG, not directly on the hanger bracket. (Fig 33)

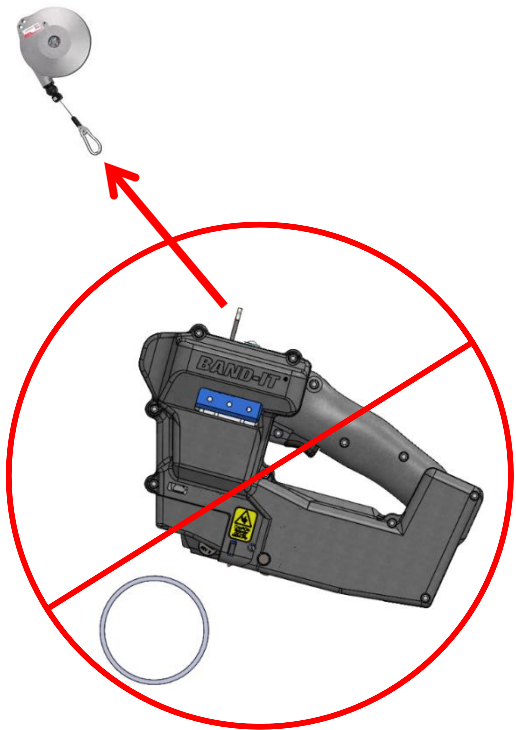


Figure 34



Figure 35

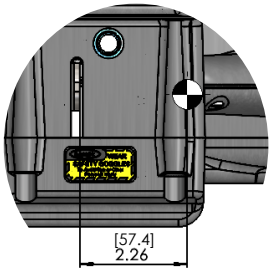


Figure 33

Tool Balancer Cont.

If multiple ties are installed with the same tool, a slide rail or swing arm is required to move between the ties. Always allow the tool to hang directly above the installation. Pulling the tool at an angle will cause increased strain on the operator. Figures 37-38 are an example of a weight balancer that can rotate in all 3 axis. Depending on the application, the harness can either be routed up the balancer or at ground level. For technical drawings or further information about this design, contact your account manager.

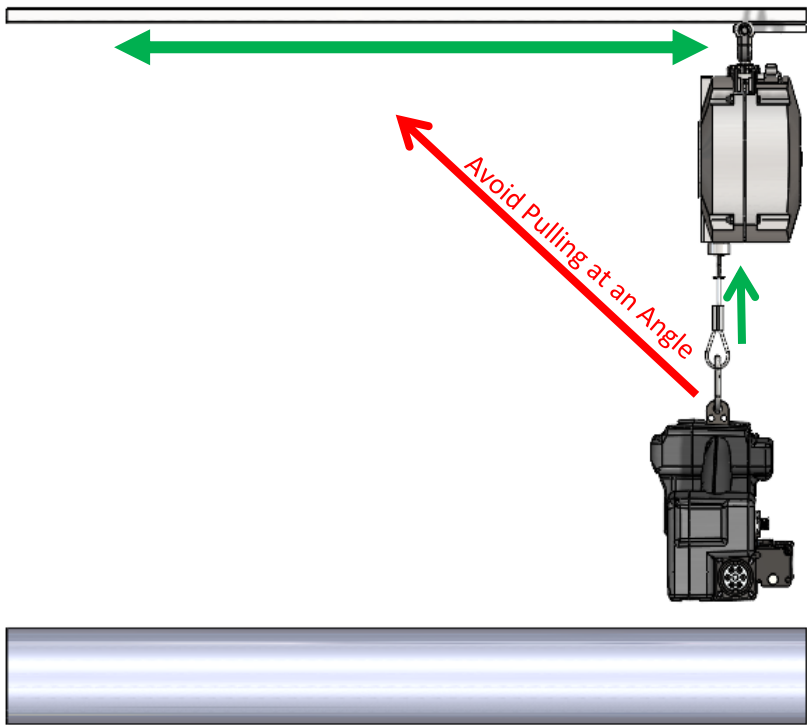


Figure 36



Figure 37

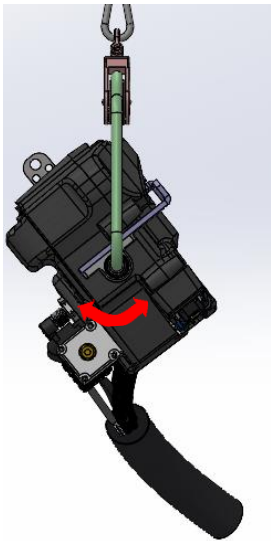


Figure 38

Recommended Setup: For the most ergonomic design, we recommend mounting the tool on an articulating arm or fixture.

Articulating Arms

- Three 10-32 mounting holes are provided to attach the IT8000/IT7000 to an articulating arm.
- The arm must be able to support approximately 10 lb. in addition to any brackets installed to the tool.
- See page 26 for more information about controlling the tool in roll and yaw.
- See Figures 41 & 42 for two examples of articulating arms.

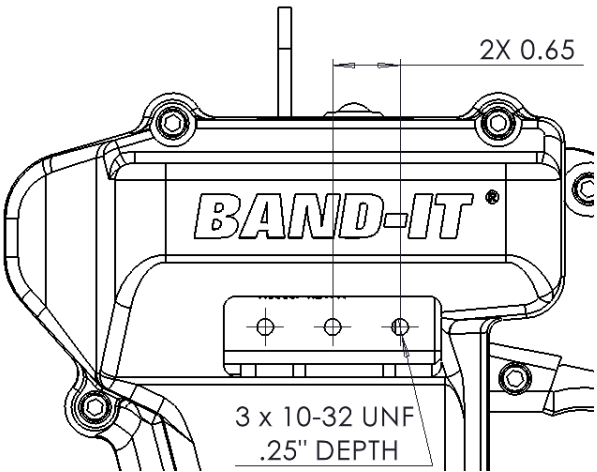


Figure 39

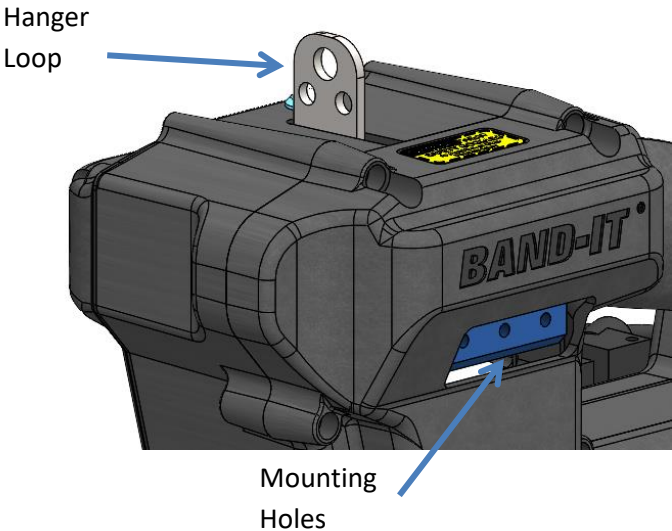


Figure 40

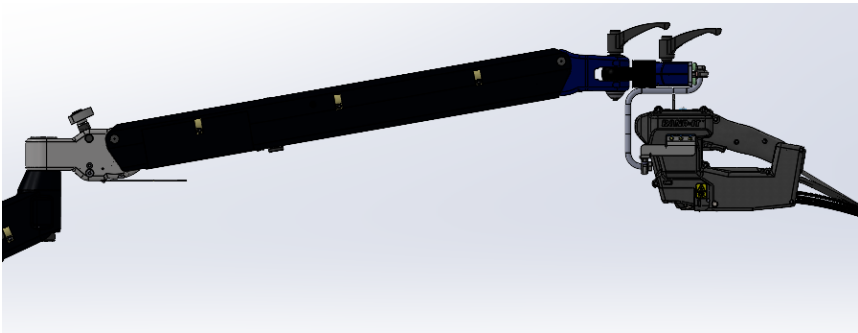


Figure 41

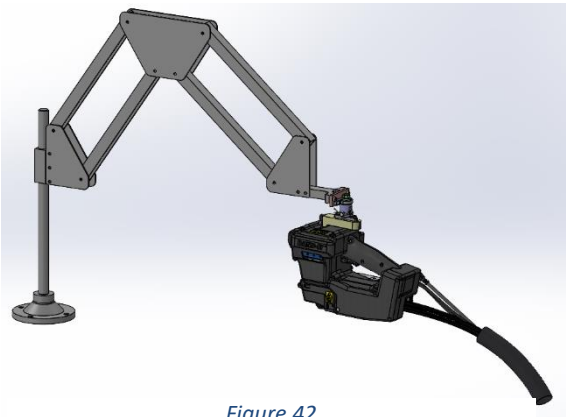


Figure 42

TOOL ROTATION

The tool may have to rotate in all three axes of rotation depending on the application (Fig. 44).

Pitch is required for all setups, as this rotation is required to ensure the buckle is installed tangent to the work piece. A minimum of 30° of rotation is required for the tool to operate, but 120° is recommended. The tool should be allowed to rotate both forwards and backwards from the tangent point the buckle is expected to be placed. See Figure 43 for the minimum rotation away from the buckle.

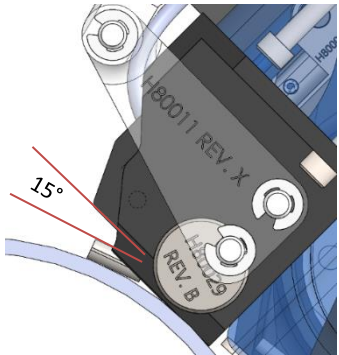


Figure 43

Yaw is typically required if the tool is installing more than one clamp, especially if the tool is on a swing arm or articulating arm. 180° of rotation is recommended, 90° in each direction from straight on.

Roll is required on applications that have clamp(s) at different angles. Depending on the application, 90° of rotation is recommended.

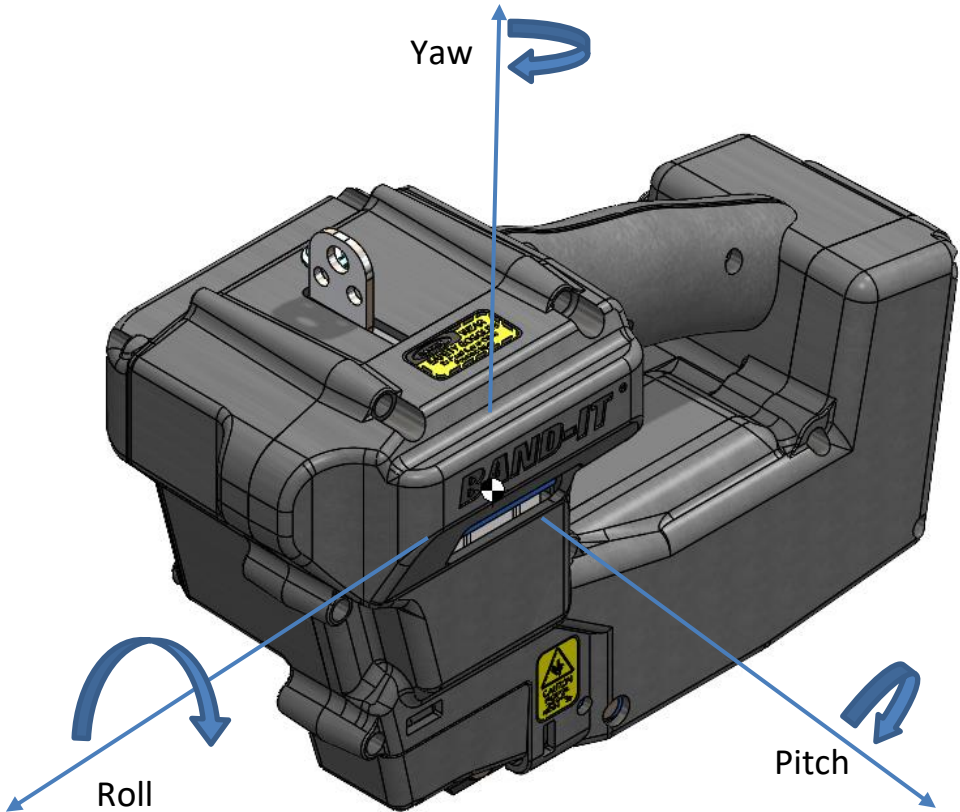


Figure 44

CENTER OF GRAVITY

The center of gravity (CG) is shown below in relation to the hanger loop and mounting holes. The closer the rotational point is to the CG, the easier the rotation will be.

If roll is required for the application, centering the rotation around the roll axis is the top priority. Followed by pitch and then yaw.

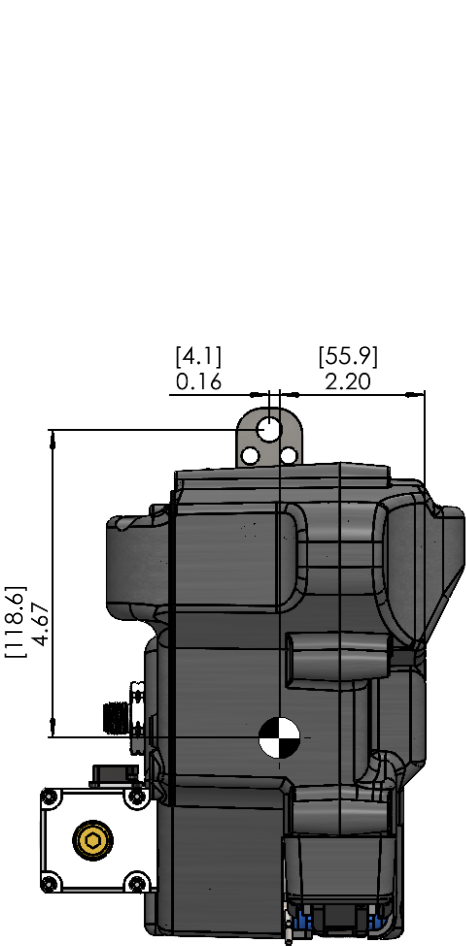


Figure 46

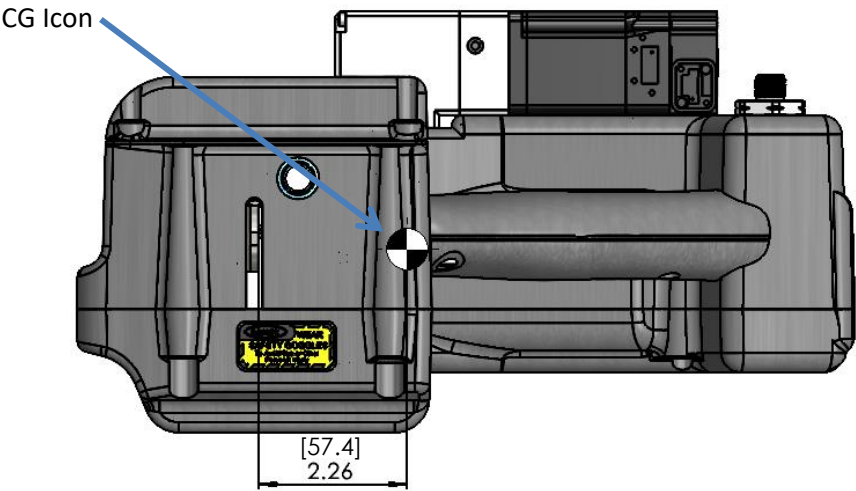


Figure 45

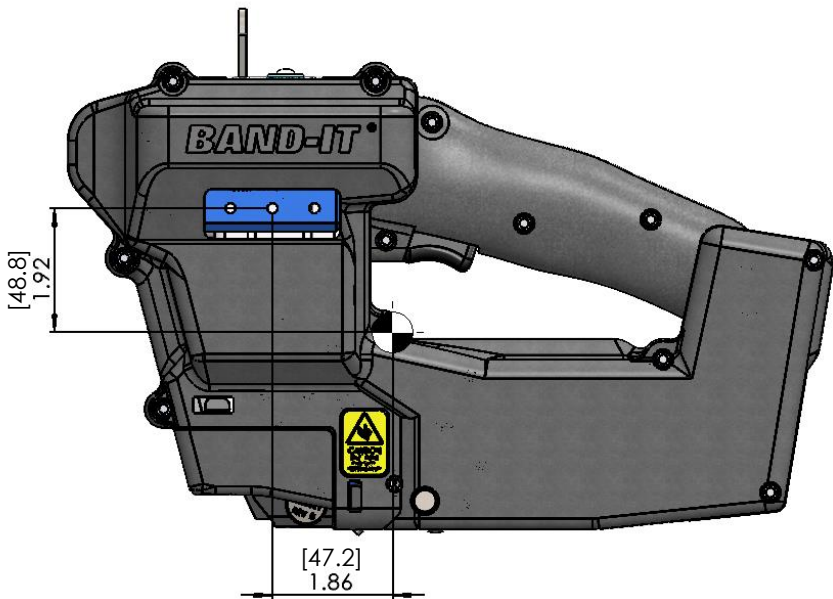


Figure 47

MOUNTING EXAMPLES

Figures 48-51 are an example of an articulating arm and mounting bracket that can rotate in all 3 axis. For technical drawings or further information about this design, contact your account manager.

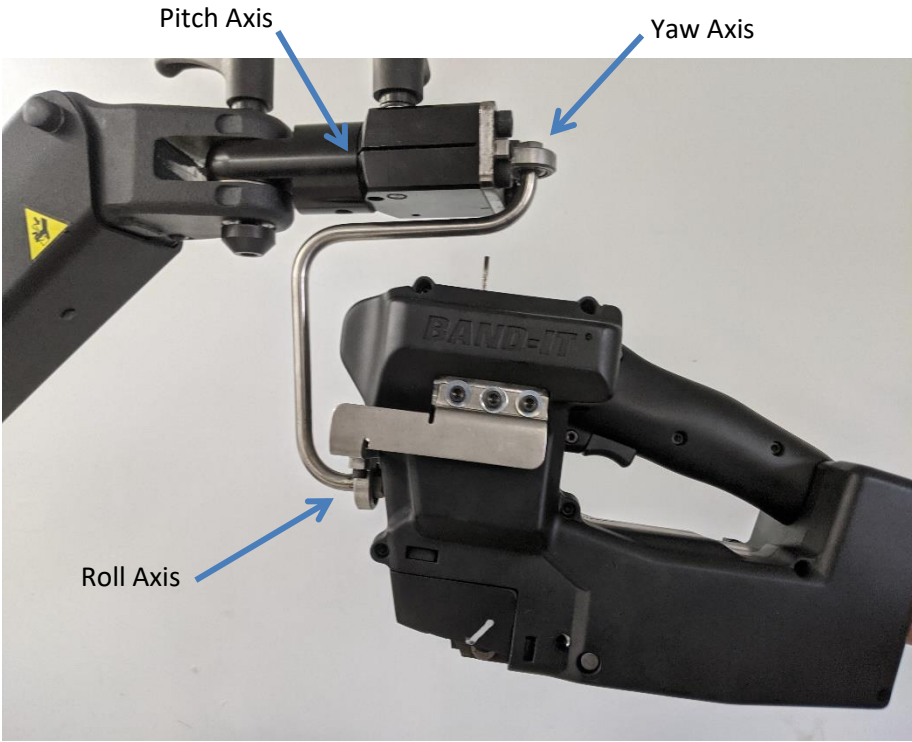


Figure 48



Figure 49

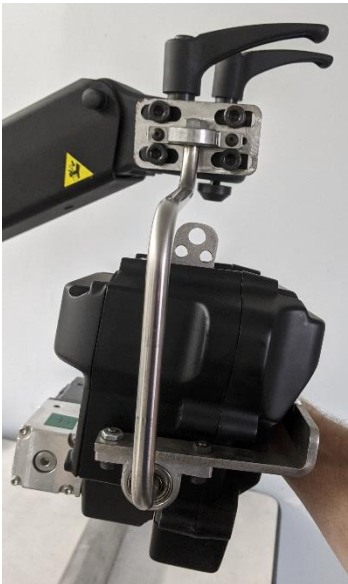


Figure 50



Figure 51

For applications where roll is not required, a bracket with Pitch and Yaw control can be used (Figure 53).

Note that the center of gravity is behind the hanger bracket. For best performance, the pivot point should be located on the CG, not directly on the hanger bracket.

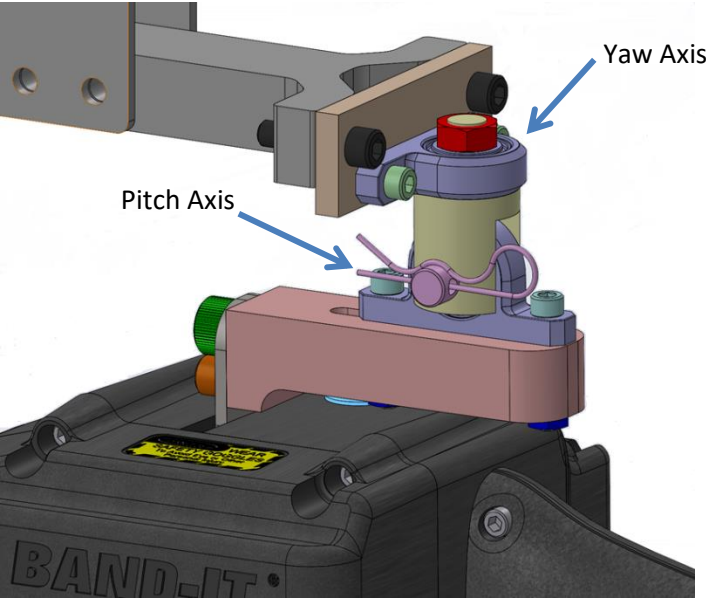


Figure 53

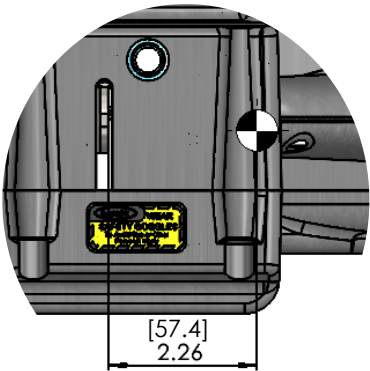


Figure 52

HARNESS ROUTING

It is recommended to run the pneumatic/electrical harness down the length of the articulating arm. This will keep the harness out of the way and protect it from being damaged. Ensure that there is enough slack in the harness to not bind as you maneuver the tool.

Note: the harness will stick approximately 2" (51 mm) behind the tool if the harness is routed as shown below.

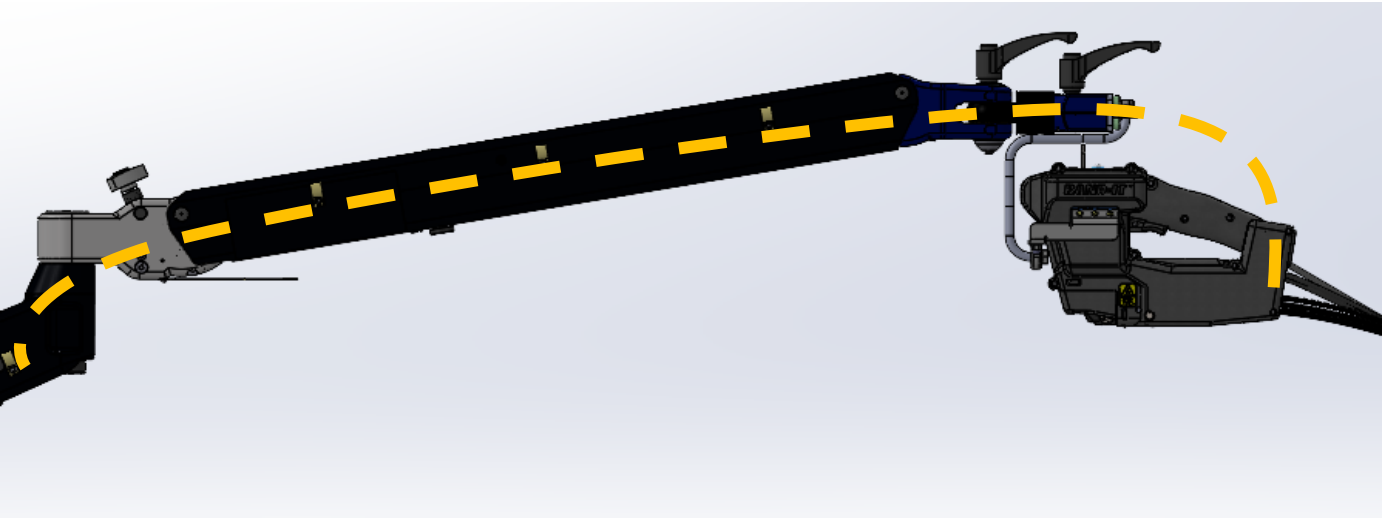


Figure 54

TOOL CLEARANCE REQUIREMENTS

Minimum Clearance Requirements

Dimension	Description	IT8000 (in [mm])	IT7000 (in [mm])
A	Channel Height (max)	0.25" [6.4mm]	0.45" [11.4mm]
B	Head Width (min)	0.85" [21.6mm]	0.71" [18.1mm]
C	Centerline Distance to Flange (min)	1.00" [25.4mm]	
D	Tool Width	5.50" [139.7mm]	

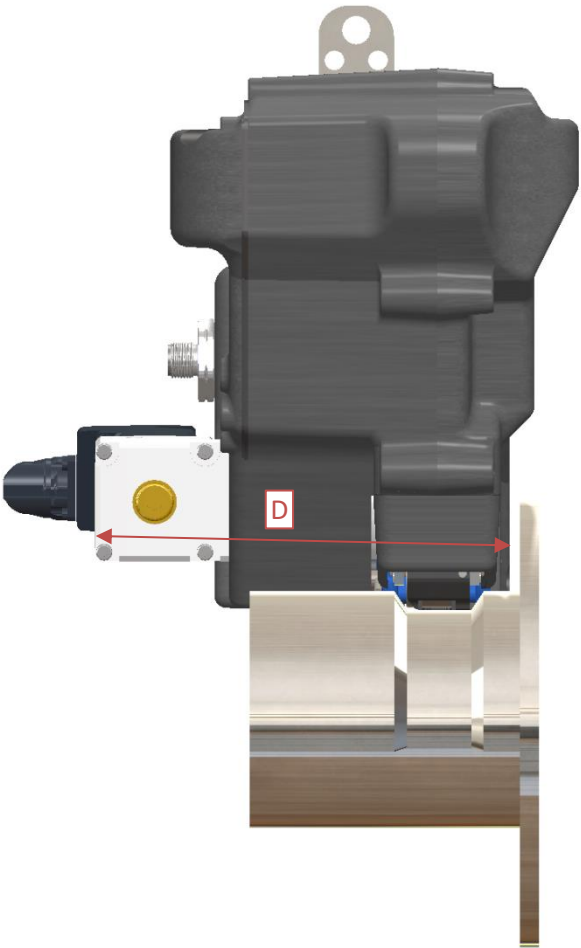


Figure 55

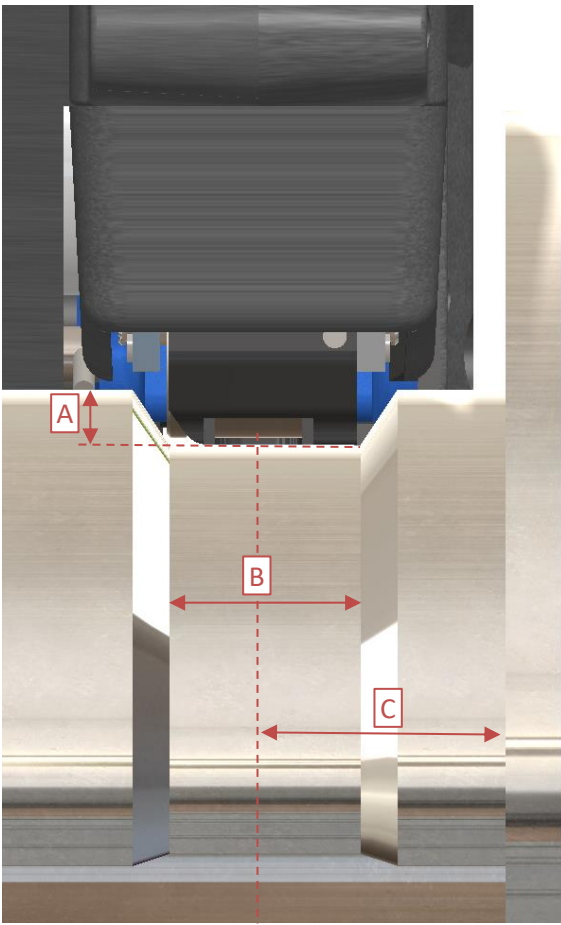


Figure 56

SENSOR ACTIVATION

Note: the tangency sensor is only activated on metallic objects. If installing on plastic or rubber, the sensor will need to be disabled. (pg. 37)

To ensure proper sensor activation, the channel area where the buckle is placed must be void of dimples and folds. If using a foil shield, it is recommended to have a 1"x1" (25mmx25mm) coined or stamped section without wrinkles where the buckle will be placed. Note the location of the tangency sensor that is activated by sensing the installation surface.

To verify the sensors are activating properly, the *Manual* screen on the HMI has two indicators that light up when the buckle and proximity sensors are activated. (pg. 35)

If the sensors are activated improperly without metal near the sensors, first clean the sensors to ensure there are no metal shavings interfering with the sensor. Then verify the sensor location. They should be depressed .005-.010" into the tool head.

If the sensors are still malfunctioning, verify the electrical connections.

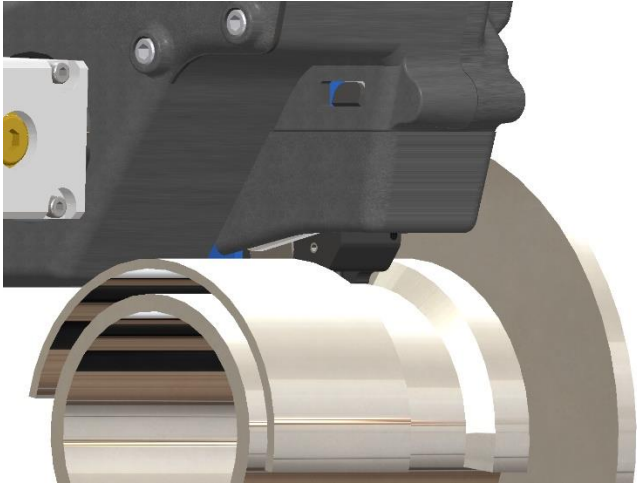
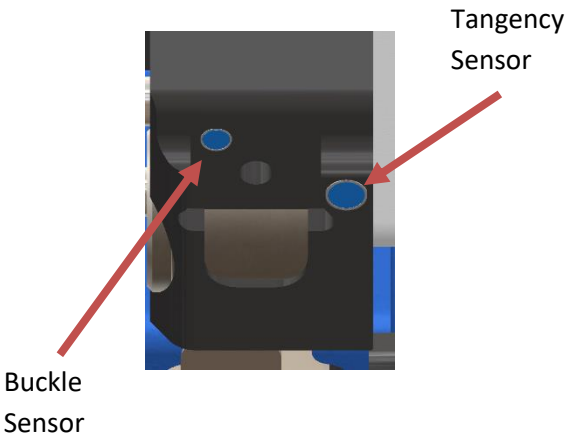


Figure 57



REMOTE ACTUATION

The IT8000/IT7000 can be remote actuated with a foot pedal or palm buttons via the remote trigger 4 pin connection on the side of the box. If using the Mencom yellow cable supplied with the controller, the brown to white pin connection needs to be closed to activate the tool. The external trigger setting also needs to be "On" in Settings. (pg. 37) Contact BAND-IT IDEX for recommendations on remote triggers.

CUT-OFF SIGNAL

The IT8000/IT7000 can send a "cut-off" signal similar to the IT6000/IT1000. Instead of being triggered by the pressure difference inside the tool, the controller will send the signal when a clamp has been installed and did not fail any verification checks. A use case of this would be to count the number of clamps installed on an assembly. The connector is located next to the remote actuation on the controller. If using the Mencom yellow cable, measure the signal across the white and blue wires. Contact BAND-IT IDEX for recommendations on how to setup the cut-off signal.

FACTORY PROGRAM SETTINGS

See page 37-40 for additional information about these settings

Table 5

		Value	
	Tab	IT8000	IT7000
General	Target Torque	40%*	30%
Setpoints	Min Supply Pressure	75 PSI	
	Max Supply Pressure	85 PSI	
	Torque Tolerance	0.10 in-lbf	
	Min Punch Duration	0.5 ms	
	Max Punch Duration	5.0 ms	
	Min Punch Pressure	63 PSI	58 PSI
	Max Punch Pressure	67 PSI	62 PSI
Timing	Line Up Tool Timeout	10 s	
	Position Sensors Debounce	0.01 s	
	Cut Off Delay	0.05 s	
	Punch Extend Duration	0.10 s	
	Auto Eject Duration	0.5 s	
	Cut Retract Delay	0.20 s	
Speed	Max Tension Speed	50%	

*Recommended IT8000 target torque is 40% for optimal component life and performance. For additional clamping performance, target torque can be set to a maximum of 50%.

SOFTWARE AND ELECTRONICS

HMI OVERVIEW

Device Start Up

When the tool is first powered on, the previous screen will appear for 20 seconds, then a blank screen with an hour glass icon will appear for 5 seconds and finally the New Tool / Maintenance Screen. The tool will not function until the New Tool / Maintenance window is cleared.

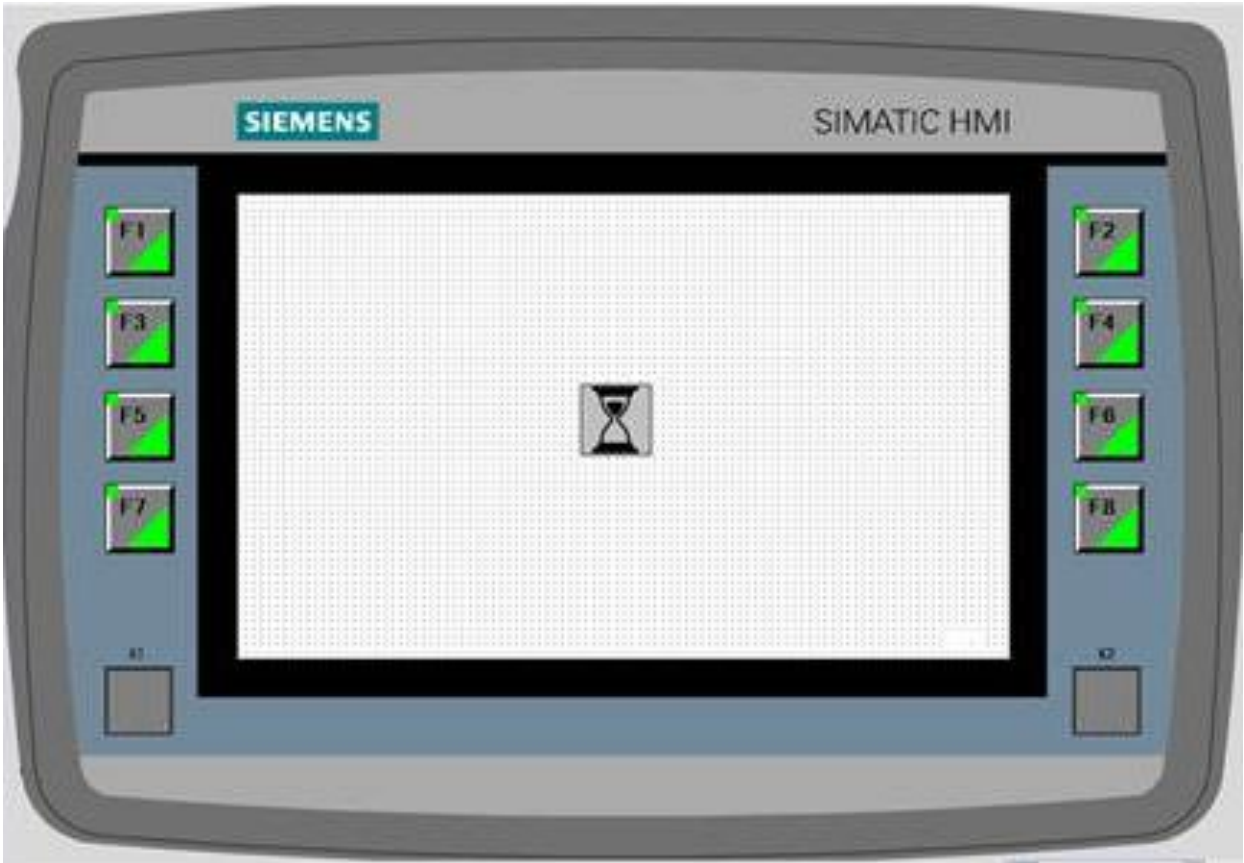


Figure 58

Home Screen

- Status Banner *Tool Ready*: Shows status of tool and error codes if applicable
- Clamp Count: Increments every install. Resettable in *Settings*, not tied to a specific tool.
- Lifecycle Count: Increments every install, a controller count, not resettable.
- System Pressure: Pressure reading off input regulator, controls the non-punch cylinders
- Punch Pressure: Pressure reading inside tool, controls only the punch cylinder
- Motor Torque: Instantaneous motor torque
- Punch Max Duration: Max duration for the punch velocity sensor before giving an error
- Punch Duration: Actual punch duration of the previous cycle
- Motor Torque Target: target final torque
- Serial Number: Serial number of the tool, tied to the motor. Can only be changed when switching motors.
- Tool cycle Count: Cycles on the current serial number, resettable when first connecting to a tool.
- Error code Count: Count of errors, can be reset in *Settings*.
- Log In / Log Out: Allows/Prohibits access to the *Settings* tab.
- Service: Brings up the Maintenance Interval window
- Reset Error: Resets any error on the top banner

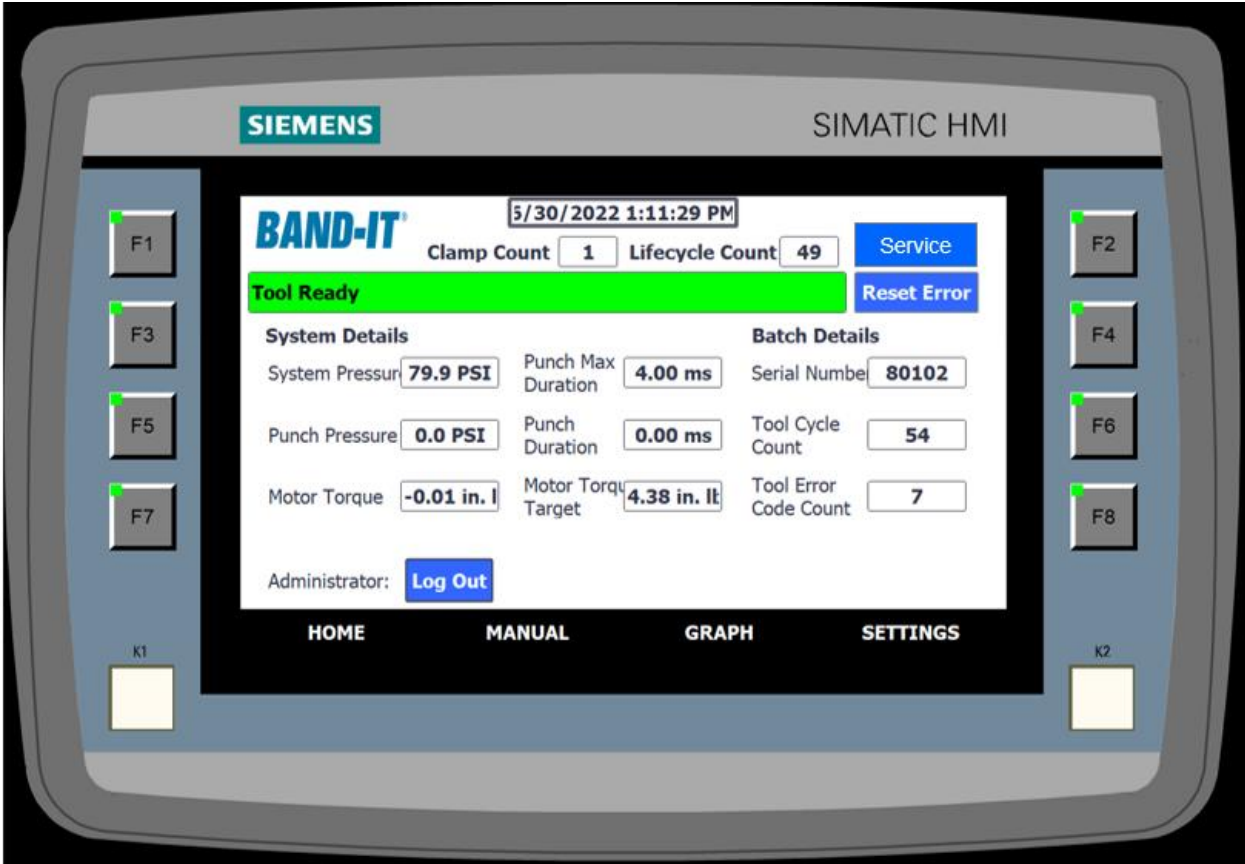


Figure 59

Manual Screen

Enter Manual Mode: Turns on Manual Mode. Allows individual cylinders and the motor to fire independantly for troubleshooting. This will prevent the tool from operating when the trigger is pulled. Manual Mode needs to be selected for the functions on this screen to work.

Note: Manual mode will stay activated if you leave the “Manual” screen. The tool will not install a clamp in this state. An LED on the F1 button will blink to alert you that the tool is still in manual mode.

Pull Band: Rotates the motor to pull the tie into the tool. The motor runs at the speed indicated next to Torque Move.

Release: Rotates the motor to push the tie out of the tool. The motor runs at the speed indicated next to Torque Move.

Torque Move: Rotates the motor to pull the tie into the tool until the torque indicated in the changeable field is reached.

Cylinder Extend/Retract: Fires each cylinder independently, either extending or retracting.

System/Punch Pressure: Shows the current system and punch pressure

Contact Switches/Trigger Indicators: The round indicators will light up blue when the contact switch sensors or trigger are activated respctively.



Figure 60

Graph Screen

The graph screen shows several inputs over the course of a tie install. Velocity and Torque are the motor readings. Pressure is the punch pressure inside the tool. It also has two vertical lines where the Punch and Cut happen. All data shown on the graph screen is stored in the PLC. When switching to the graph screen the HMI will auto populate with the most recent cycle. When on the graph screen “Refresh” must be pressed. Graph populating takes around 1 minute. There is a green status bar below the “Reset Error” button that shows graphing progress.

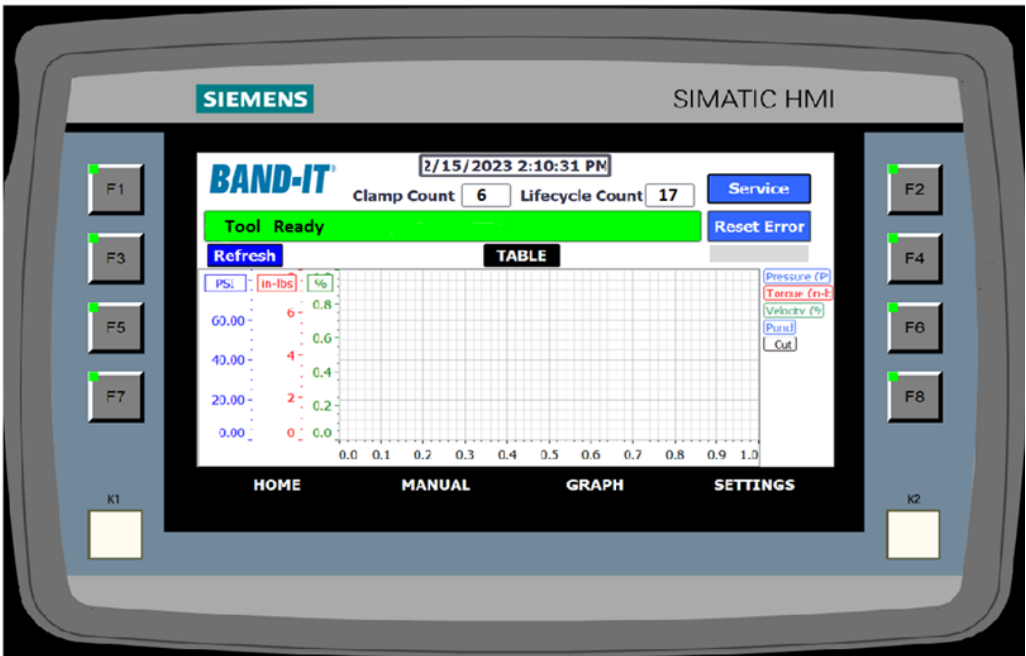


Figure 61

Punch Time History

Punch time history can be seen under the graph tab, by clicking on *TABLE*. The table shows the punch time for the last 30 clamps. It automatically updates with the latest clamp at the top left. To return to the graph screen, press the “graph” button.

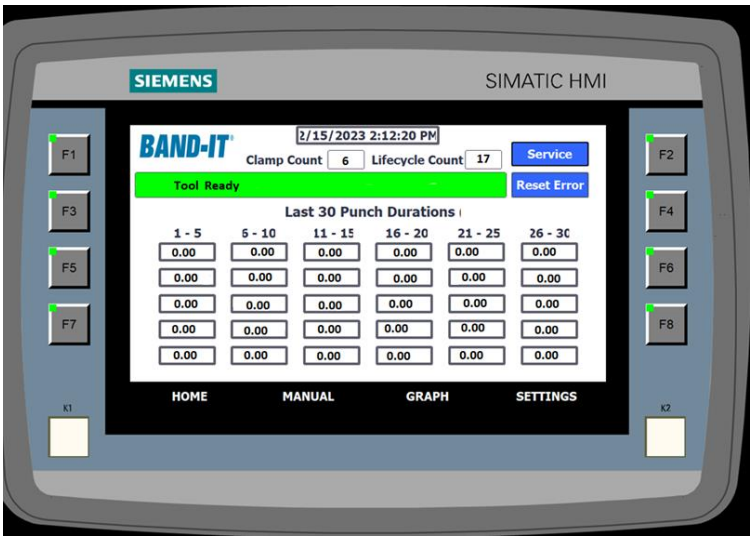


Figure 62

Settings Screen – General

- Target Torque: Percent of max torque the tool tensions the band with.
- Lot Number: Adds a lot number to the data stored
- New Tool / Maintenance: Used when changing to a new tool, see pg. 20 for a detailed overview.
- Choose File: Selects the clamp install data file or Maintenance History file you want to upload.
- Clamp Install Data File format is "TOOLSERIAL# MM_DD_YYYY".csv
- Multiple cycles are stored to each data file, typically a full days' worth of installs.
- Maintenance History File format is "Maintenance_History"
- Copy Log to USB: transfers the selected file to USB flash drive if installed. If a duplicate file name is already on a USB stick, the current file will be over written with the latest version.
- Enable Contact Switch: double tap On/Off switch to enable or disable the tangency and buckle sensors.
- Eject Mode:
- Auto: Activates the motor for a preset time after the cut to eject the tail
 - Manual: does not run the motor after cut.
- Units: Changes between Metric and English units
- External Trigger: The tool will respond to the trigger when off, or the remote trigger connected to the controller when on.
- Reset Cycle Count. Resets the Clamp Count on the top of the screen
- Exit runtime: closes the program and goes to the home windows screen.
- To update date and time on the HMI: Exit Runtime -> Settings -> Date/Time -> Restart Runtime



Figure 63

Settings Screen – Error

Error bypass – Automatically resets errors without hitting *Reset Error*

Enable Error Codes Passcode – Requires a passcode to clear an error

Error Codes to Require Passcode – Number of errors in a row before the passcode is needed.

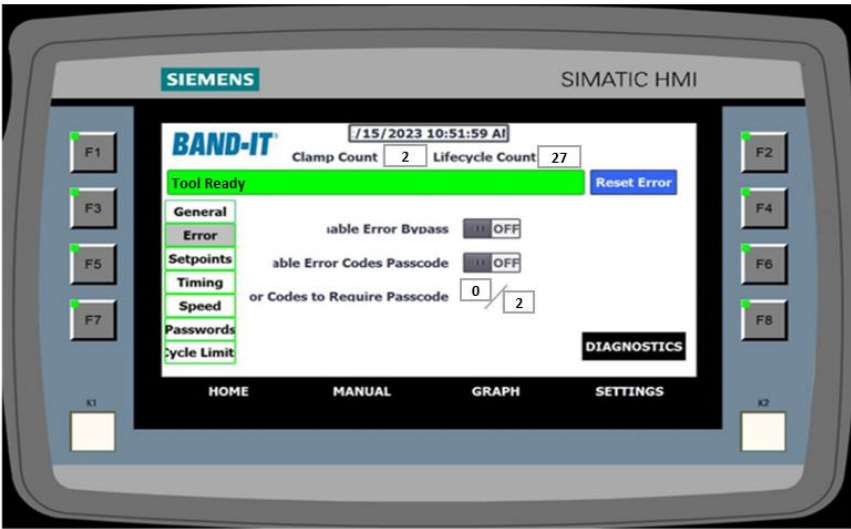


Figure 64

Settings Screen – Setpoints

Min/Max Supply Pressure – Prevents tool from operating outside the settable supply pressure range

Min/Max Punch Pressure – Prevents tool from operating outside the settable punch pressure range

Min/Max Punch Duration – Settable range of punch duration. Tool will give error outside of range.

Torque Tolerance – Tool will give error if cycle torque is outside of target torque.



Figure 65

Settings Screen – Timing

Line up tool timeout – Time before error between when tension is reached and when the proximity sensors are activated.

Position Sensors Debounce – How long the proximity sensors need to be in position before the tool completes the cycle.

Cut off delay – Delay between punch and cut

Punch Extend Duration – Time the punch cylinder is extended.

Auto Eject Duration – Time the tool runs after cut (if automatic ejection is enabled)

Cut Retract Delay – Time the cut cylinder is extended.

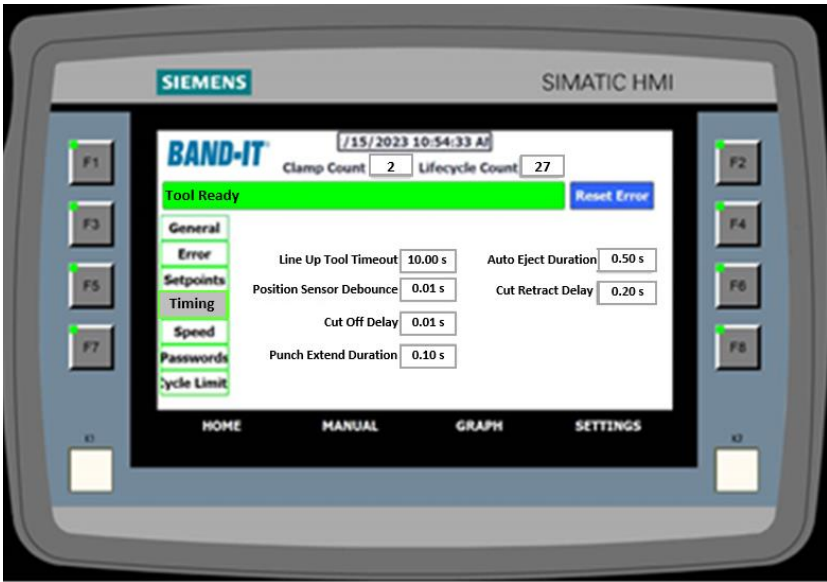


Figure 66

Settings Screen – Speeds

Max Tension Speed – Speed of tool during installation

Slow speed – For standard operation, slow speed is not used.

Eject Speed – Speed of ejection (if automatic ejection is enabled)

Manual Jog Speed – Speed of motor jog in manual mode.



Figure 67

Settings Screen – Passwords

Error Acknowledgement Password: Requires a password to *Reset Error* (Optional)

Settings Administrator Password: Password required to access the *SETTINGS* tab.

Password screen will pop up if *Log In* is attempted on the *HOME* screen.

Auto logout is available for both passwords and the time limit before the logout happens is adjustable.



Figure 68

Settings Screen – Cycle Limits

The recommended maintenance intervals for the Maintenance Interval window.

Values can be adjusted from the settings screen.

Data Record Name window and Export/Import icons are used for cycle count backup during software updates.

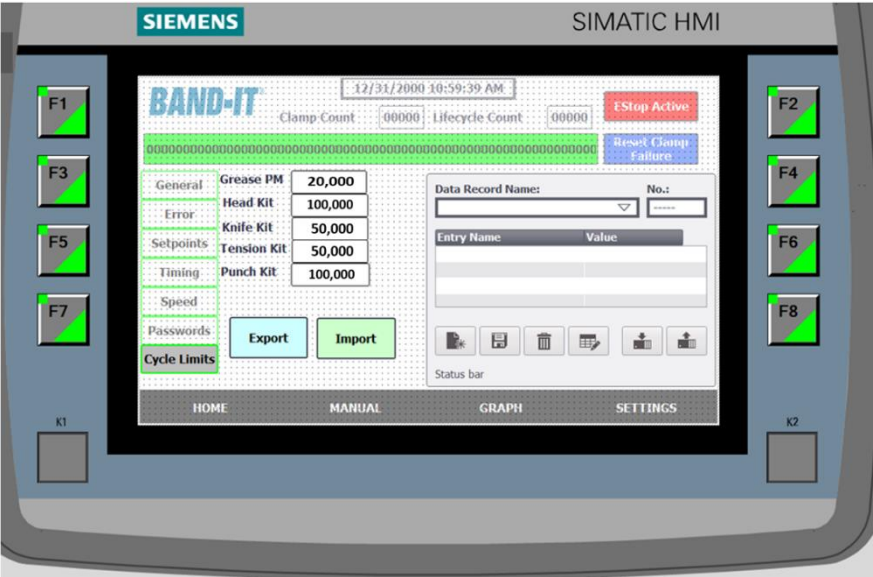


Figure 69

Maintenance Interval Window

When you select the “Service” button in the top right of the screen, the Maintenance Interval window pops up.

If the “Current Cycles” count is greater than the “Recommended Cycles” count for any of the listed items, the service button and item label will turn YELLOW to signify required maintenance.

If “Current Cycles” is greater than 1.5X the “Recommended Cycles” the service button and item label will turn RED to signify risk of damage to tool and components if use is continued.



Figure 70

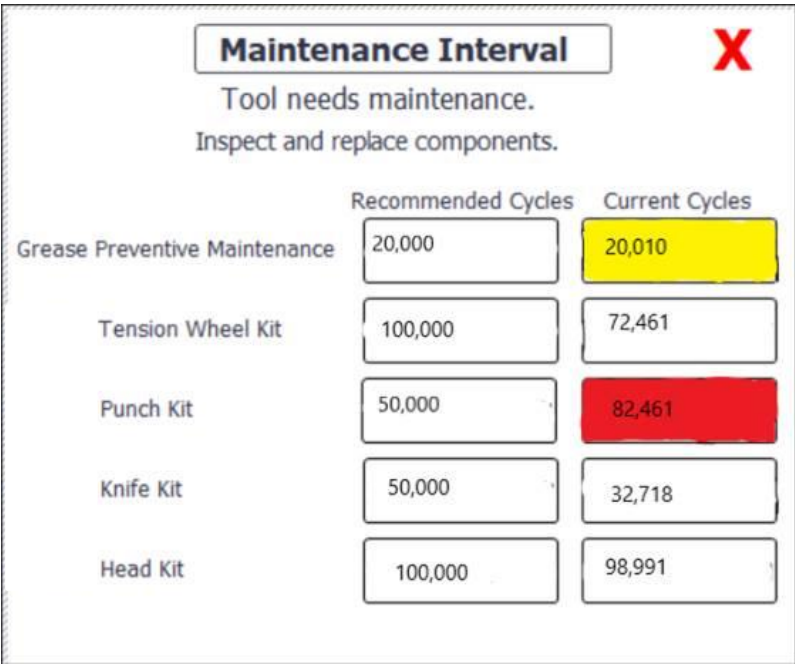


Figure 71

Tool Setup Window

Screen pops up when the “New Tool / Maintenance” button (Settings > General) is pressed and at start up of device.

If the tool has not been changed select “Tool Not Replaced”.

If the tool has been replaced, enter the tool serial number, select which maintenance items have been executed (a white X appears in the left column), select “Yes” to confirm maintenance items.

If “New Tool / No Maintenance” is selected, the other fields can not be selected.

If “Other” is selected, a new window will pop up to manually enter what maintenance has been performed with a 254 character max.

Select “Done” to close the Tool Setup Window

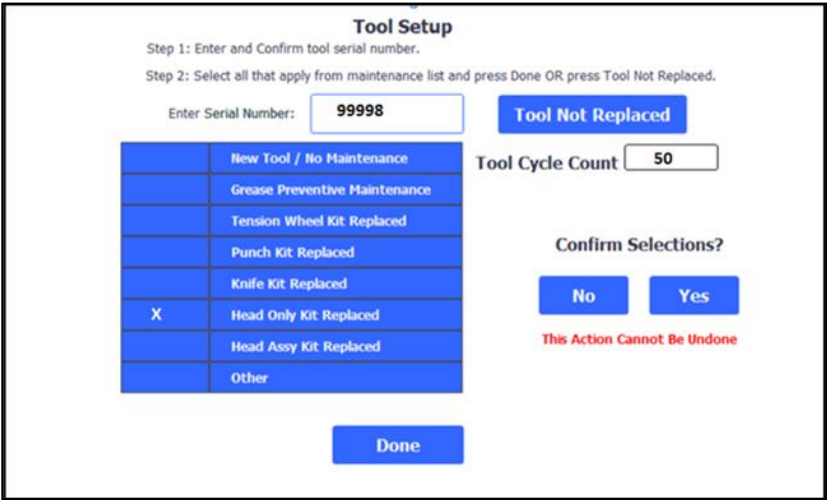


Figure 72

HMI Physical Buttons

The HMI Screen has physical buttons to the sides of the touch screen. Figure 66 shows the settings for those buttons.

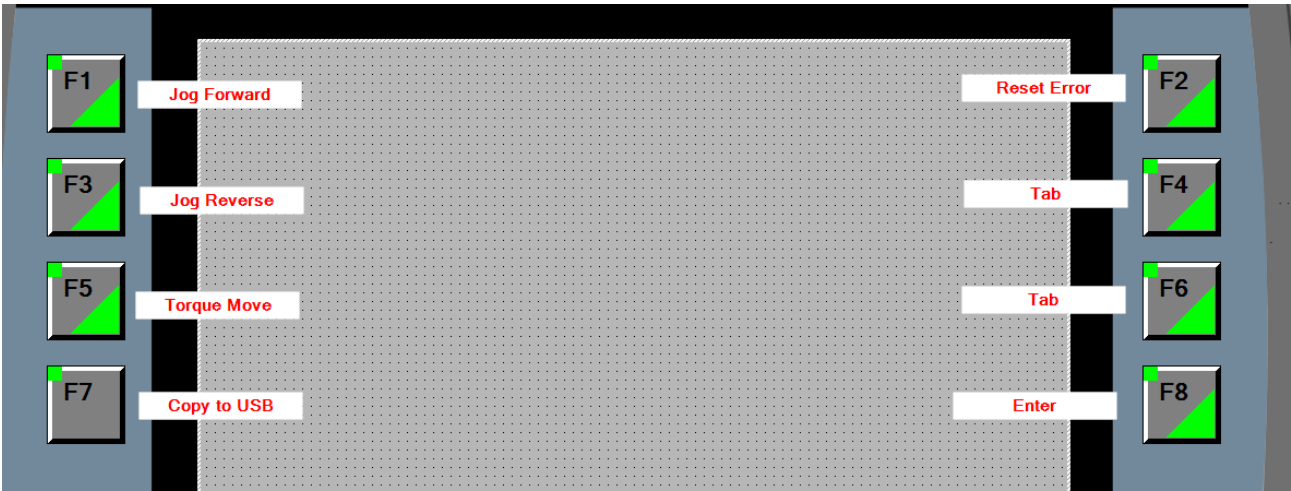


Figure 73

MAINTENANCE

MAINTENANCE SCHEDULE

The IT8000/IT7000 tool requires periodic maintenance to prevent malfunction or damage. Refer to the table below for recommended maintenance intervals of critical tool components. Intervals may vary depending on the operating environment.

Table 6

Components	Recommended Service	Recommended Interval	Page Ref.
Backing Wheel	Grease pin	Every 20,000 clamps	44
	Inspect and replace if worn	100,000 clamps	49
Tension Wheel	Clean with wire brush (included w/ tool) McMaster PN:7092T18	Every 20,000 clamps	45
	Inspect and replace if worn	50,000 clamps	49
Punch	Inspect and replace if worn	100,000 clamps	48
Knife	Grease McMaster PN: 1208K22	Every 20,000 clamps	44
	Inspect and replace if worn	50,000 clamps	46
Head Assembly	Inspect and replace if worn	100,000 clamps	47

To maximize performance and extend tool life:

- Do not use degreaser on any part of the tool.
- Do not spray any lubricant or cleaner into the pneumatic system.
- Do not remove factory-applied lubrication from inside tool unless performing a thorough maintenance procedure and then replacing with clean lubricant immediately.
- Follow preventative maintenance and parts replacement instructions at appropriate service intervals.
- For maintenance beyond what is described in this manual, contact BAND-IT.

LUBRICATION

Lubricate knife and pin with **Bel-Ray Molylube extreme pressure grease**.

- Lubricate backing wheel pin through the grease port on side of tool. Lincoln 5803 or similar needle type grease fitting is required.
- Lubricating the knife requires partially sliding it out, see page 46 for instructions. To increase time between grease, it is recommended to grease inside the curved slot of the involute linkage as well.

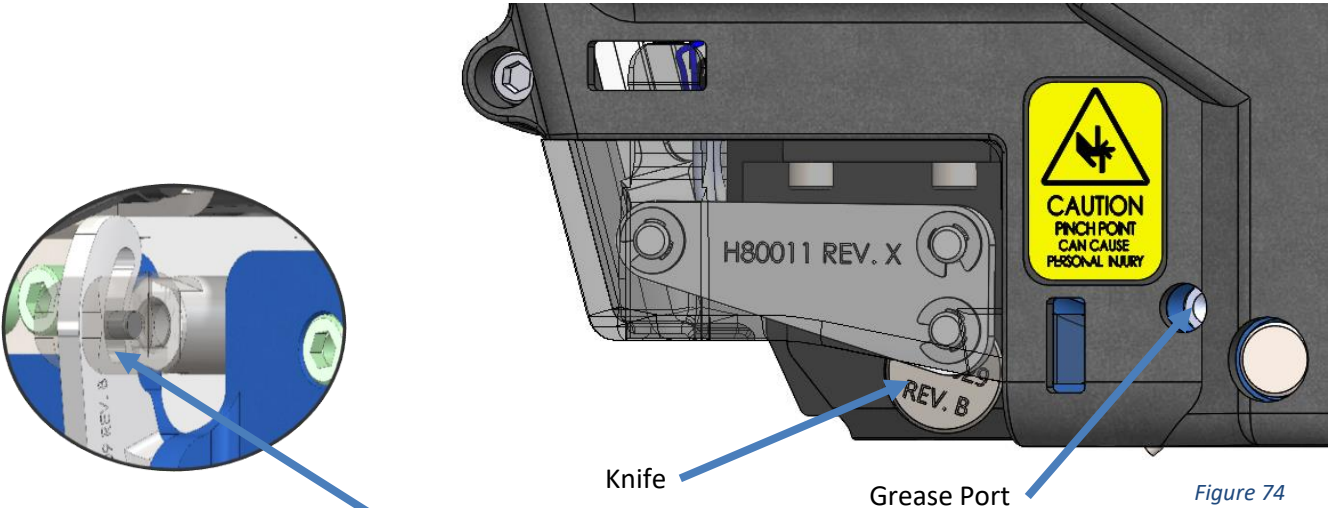


Figure 74

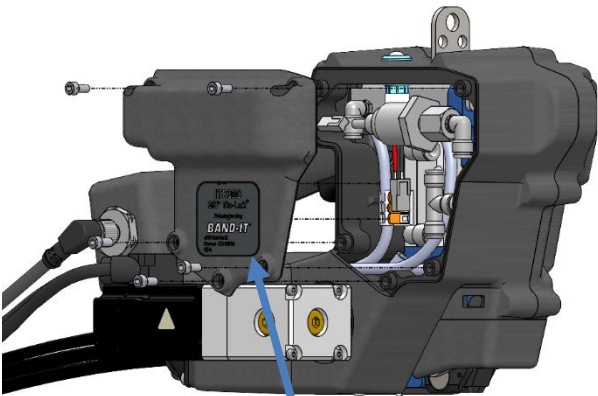


Figure 75

Pneumatics Cover

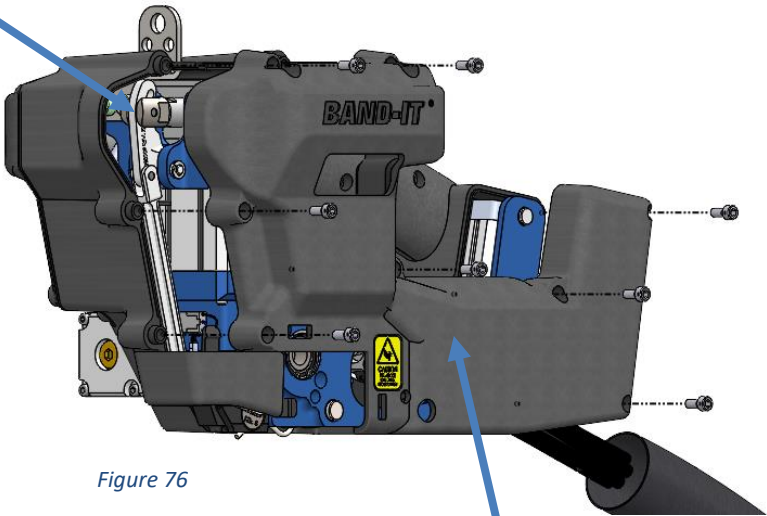


Figure 76

Side Cover

Important:

Prior to any maintenance or disassembly, be sure to disconnect all power sources to the tool and discharge pressurized air from the air system.

TENSION WHEEL CLEANING

1. Remove the clevis pin (1) holding the pinch arms (2) and allow it to swing down. Be careful to ensure the backing wheel and pin do not slide out with the pinch arms removed.
2. Enter manual mode to drive the tension wheel for a few revolutions with the wire brush (1/4" brush width) (3) pressed firmly up into the rotating wheel.
3. During reassembly, re-center the tension wheel between the pinch arms and the band guide lined up on the pinch arms to allow for proper re-assembly.

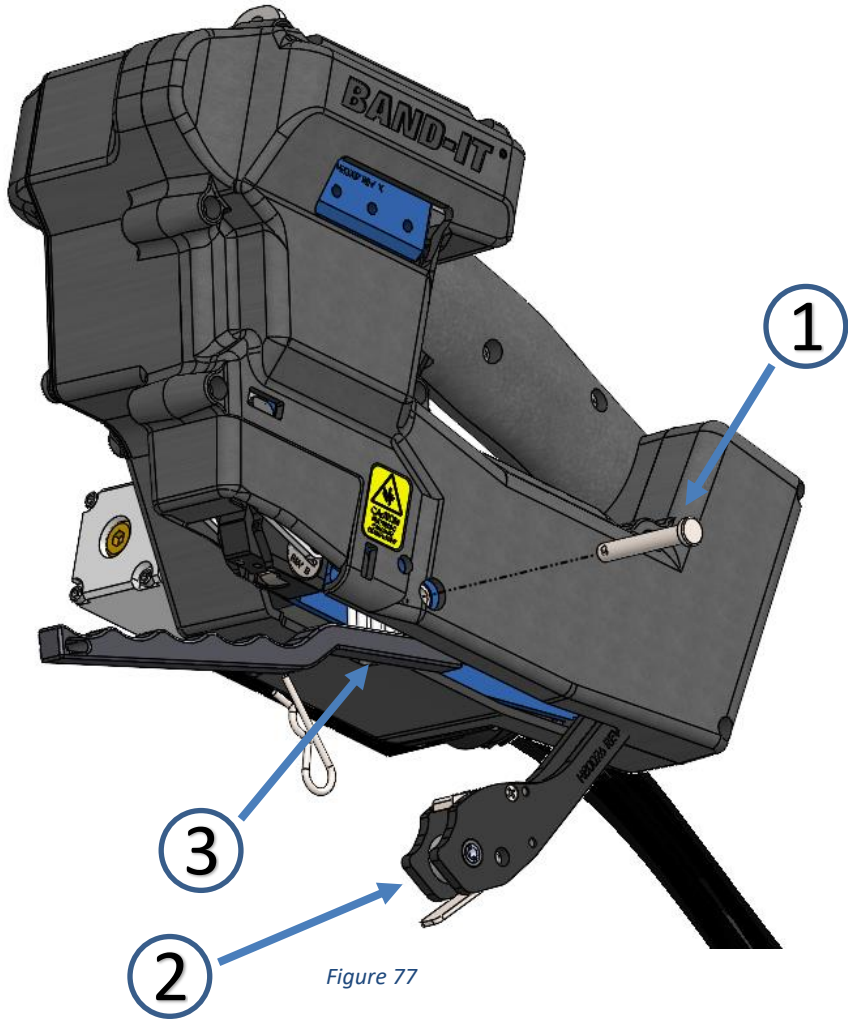


Figure 77

Important:

Prior to any maintenance or disassembly, be sure to disconnect all power sources to the tool and discharge pressurized air from the air system.

KNIFE REPLACEMENT

Remove the Head Cover (1). Pinch the front of cover and rotate down to remove. Remove the E-Clips (2) on the non-motor side only. Push the 2 pins (3) down far enough to allow the linkage (4) to swing out. Remove the knife (5).

Apply a film of grease to the new knife and pins and reassemble, using new E-clips if needed.

Replacement Knife Kit Part Number:

Tool	IT8000	IT7000
Part Number	H80935	H70935

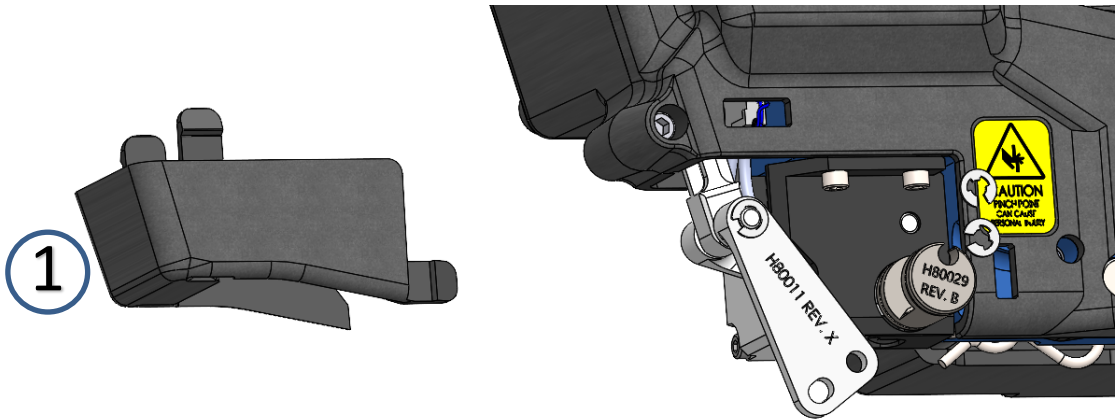


Figure 78

Note: The cutter knife has only one cutting edge. This edge must be properly oriented as shown when installing.

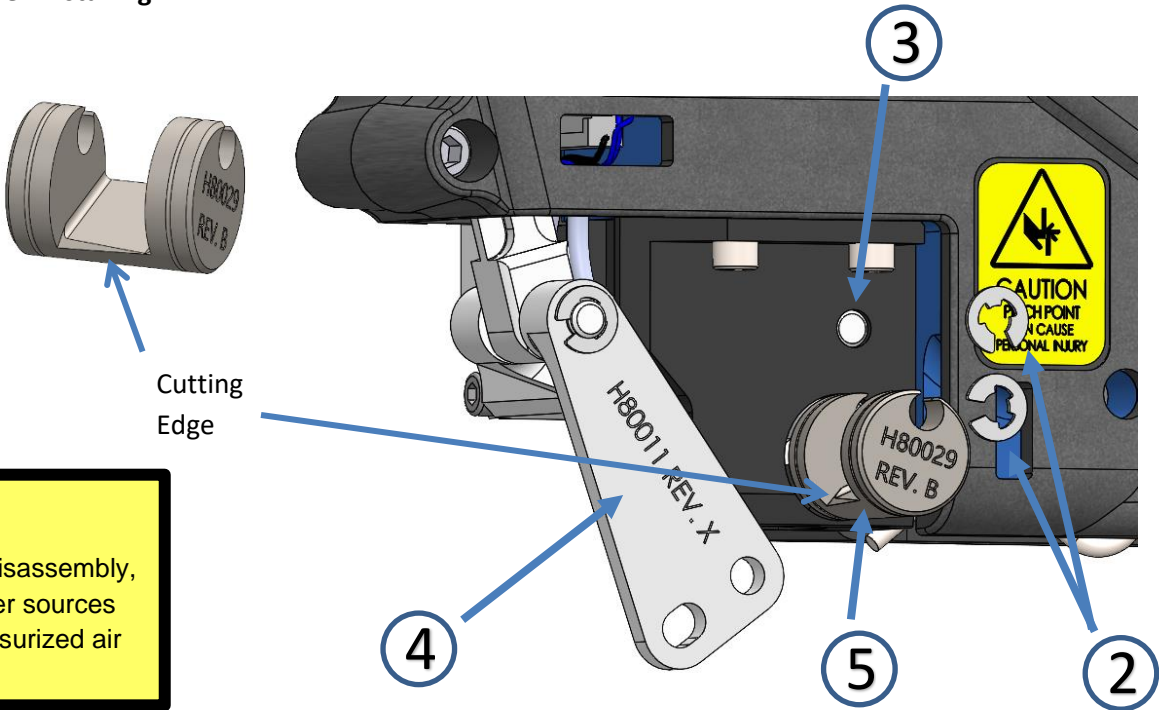


Figure 79

Important:

Prior to any maintenance or disassembly, be sure to disconnect all power sources to the tool and discharge pressurized air from the air system.

HEAD REPLACEMENT

Remove the Head Cover (1). Remove the E-Clips 2x (2) on the motor side only. Pull the pins 2x (3) out of the head. Swing the Linkages (4) down to access the head bolts. Remove the bolts (7/64" hex key) 4x (5). Disconnect the sensor cable and remove the head (6).

Apply a film of grease on the pins and knife and reassemble. Ensure that the upper pin goes through the trigger assembly linkage (7) (Fig. 81). Apply Blue Loctite to screws. Only pull-on gray cable jacket when connecting head sensor.

The pneumatics cover or side cover may need to be removed to reconnect the head sensors or to insert the pins.

Replacement Head Kit Part Number:

Tool	IT8000	IT7000
Part Number	H80945 or H80940 (no sensors)	H70945 or H70940 (no sensors)

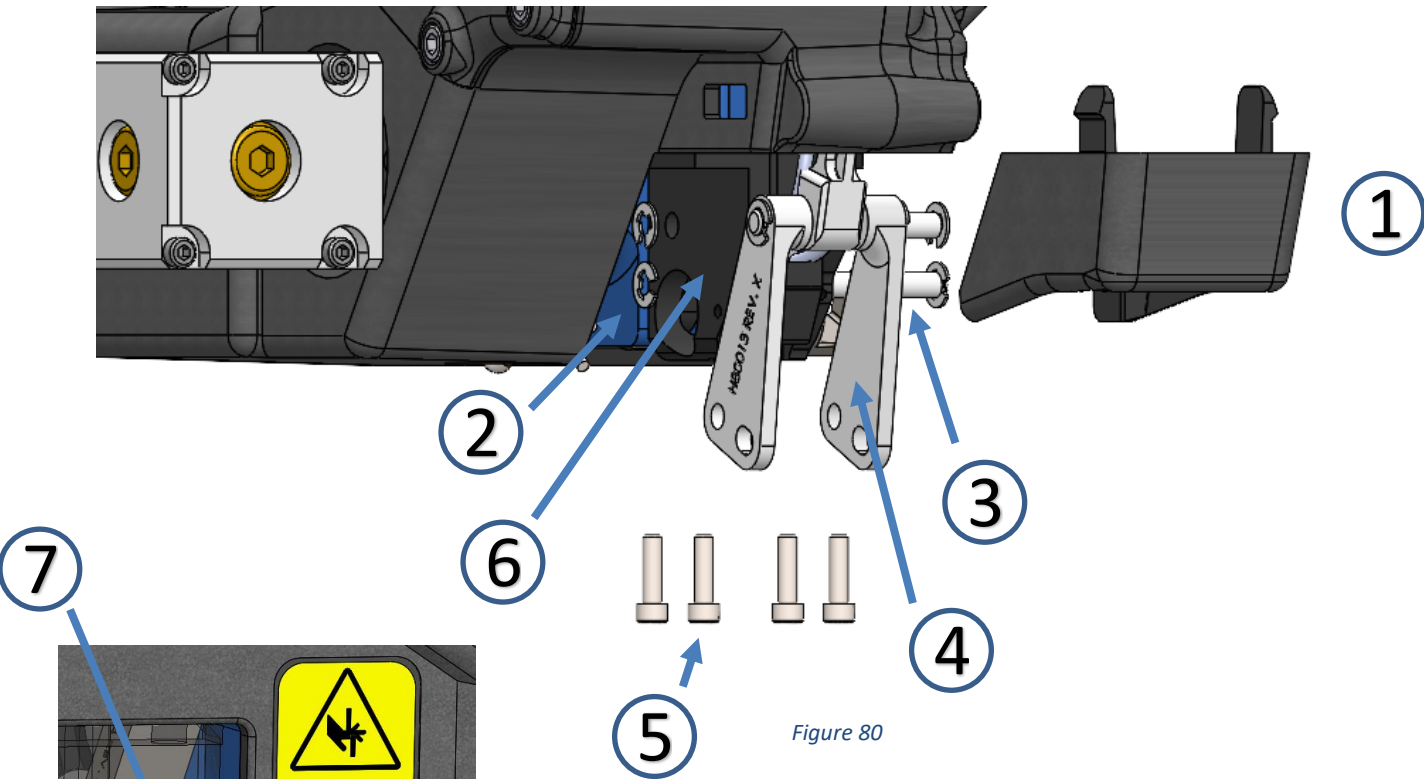


Figure 80

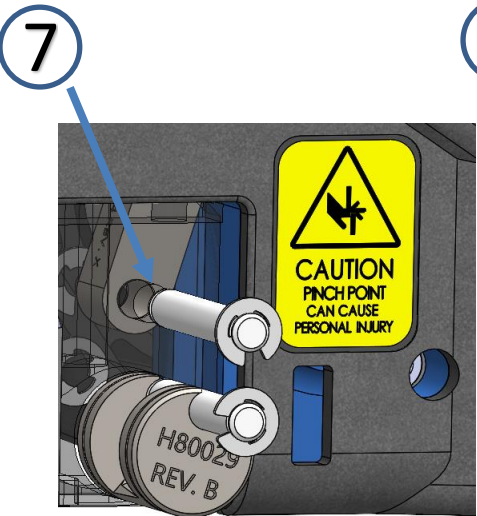


Figure 81

Important:

Prior to any maintenance or disassembly, be sure to disconnect all power sources to the tool and discharge pressurized air from the air system.

PUNCH REPLACEMENT

Remove the head as shown on page 47. Extend the cylinder by pulling on the punch (1) until the punch holder is visible. Punch the spring pin (3/32" Dia) (2) out.

Reassemble. Always using a new spring pin (2) when replacing the punch.

Replacement Punch Kit Part Number:

Tool	IT8000	IT7000
Part Number	H80925	H70925

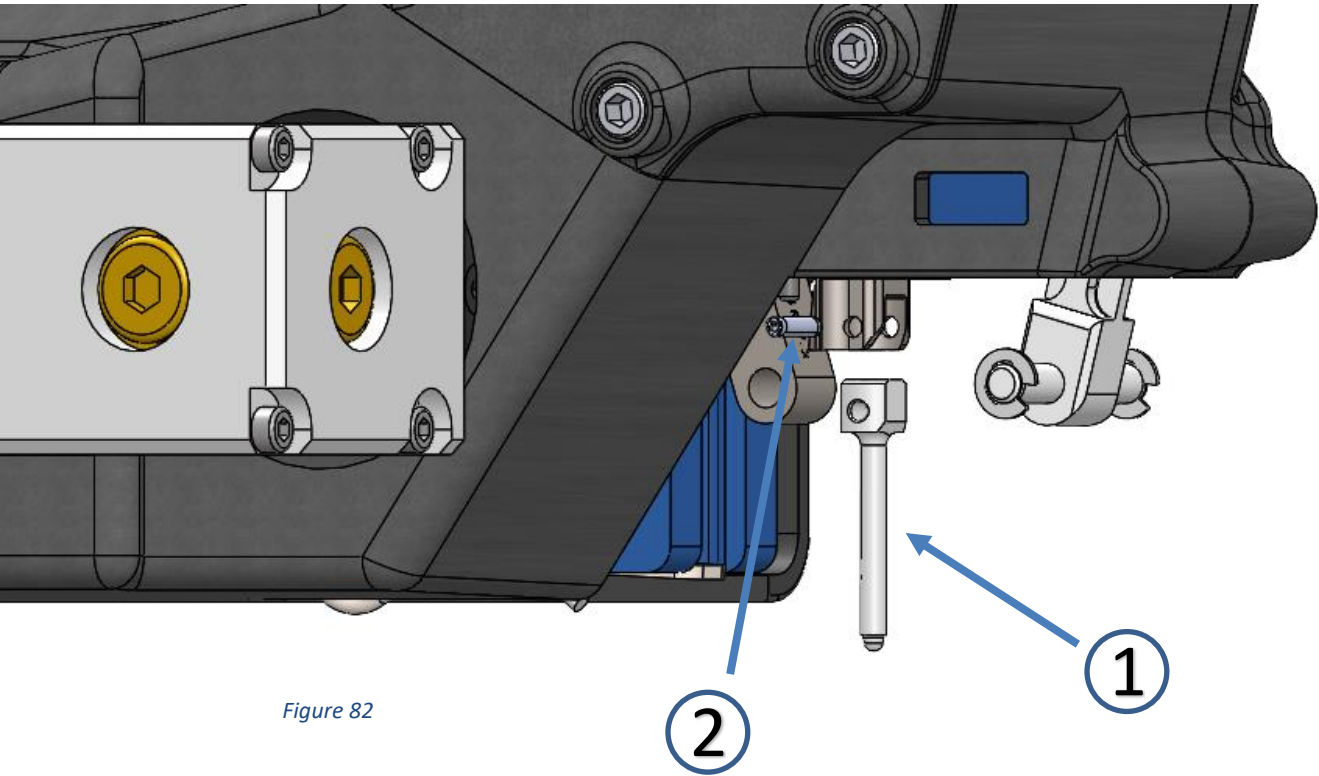


Figure 82

Important:

Prior to any maintenance or disassembly, be sure to disconnect all power sources to the tool and discharge pressurized air from the air system.

TENSION WHEEL REPLACEMENT

Remove the Side Cover (1). Remove the screws (9/64 hex key) 8x (2). Remove the clevis pin (3) and drop the pinch arms (4).
Remove retaining ring (5). Remove ball bearing (6). Remove gripper wheel (7). A small pry bar may be required to break the gripper free from the gearbox shaft. This will also break the bearing free from the frame.
Reassemble, apply grease to inner diameter of gripper and align keyed slot of gear box shaft to gripper.

Replacement Tension Kit Part Number:

Tool	IT8000	IT7000
Part Number	H80915	

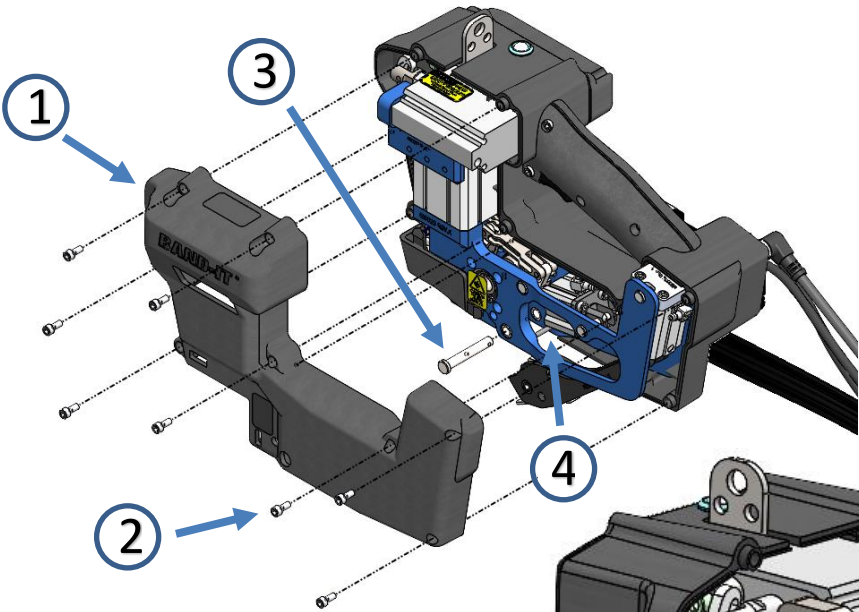


Figure 83

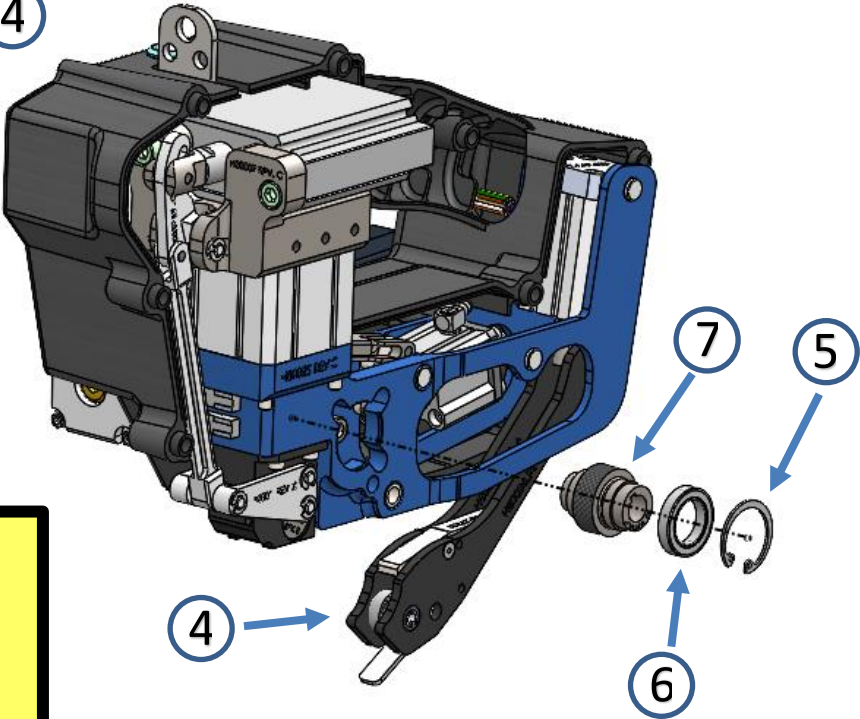


Figure 84

Important:

Prior to any maintenance or disassembly, be sure to disconnect all power sources to the tool and discharge pressurized air from the air system.

TROUBLESHOOTING
TROUBLESHOOTING GUIDE – Table 7

Observed Problem	Possible Cause	Solution
Clamp tail does not insert into tool.	Backing Wheel is touching Tension Wheel.	Verify the return cycle of the clamp cylinder is unimpeded and clamp cylinder is fully retracted.
	Excess material from previous operation did not fully eject.	Clean tension and backing wheels with wire brush.
		Verify the tension wheel rotates enough to remove scrap tail by hand.
Tension wheel does not rotate while tensioning.	Loose motor shaft collar.	Ensure set screw between motor and gearbox is tight. Check for foreign object present or other obstructions.
Pre-set tension is not reached.	Tension Wheel slipping.	Inspect clamp tail for evidence of slipping. Clean Tension and Backing Wheels with wire brush. If slipping persists, replace Tension and/or Backing Wheel.
	Loss of air pressure to Clamp cylinder (<80 PSI).	Verify that air source and fittings are pressurized, unobstructed, and not leaking.
	Drive-train failure.	Contact BAND-IT.
	Clamp tail pinched off at tension wheel due to high pinch force on backing wheel.	Verify air pressure to Clamp Cylinder does not exceed 80 PSI.
	Tension setting too high for clamp/application.	Ensure tension setting (motor torque) is correct for clamp type and application.
	Backing wheel pin un-lubricated.	Lubricate.
Failure to cut clamp tail.	Loss of air pressure to cut-off cylinder (<70 PSI).	Verify that incoming air pressure meets minimum requirements. Check for leaks or obstructions.
	Excessively worn or damaged knife or tool head.	Replace knife or head.

Observed Problem	Possible Cause	Solution
Failure to cut clamp tail (cont.)	Cut-off link jam.	De-energize system for safety. Contact BAND-IT.
	Cut-off Cylinder arm not connected properly.	Verify Cut-off Cylinder arm is connected properly, with pins fully inserted.
	Knife and pins un-lubricated.	Lubricate.
	Loose head mounting screws.	Tighten all mounting screws.
	Cut-off cylinder actuation timing is less than recommended.	Actuate cutoff cylinder for at least recommended timing.
Locking dimple too shallow.	Punch pressure too low.	Check pressure setting. Check air tubing and fittings for obstructions.
	Clamp buckle located above void or opening.	Be sure to locate buckle on fully supported surface.
	Object being clamped is hand-held.	Small light-weight objects clamped must be properly held in place in a fixture.
	Object being clamped is soft with thick wall.	Adjust the Punch pressure higher and verify dimple depth. Be sure that object clamped is held in place and locked down in fixture. Adjust tension and hold force settings if necessary.
	Punch cylinder actuation timing is less than recommended.	Actuate punch cylinder for at least recommended timing.
	Trigger mechanism did not fire properly.	Verify that air source and fittings are pressurized, unobstructed, and not leaking. Verify that the trigger cylinder can extend and retract without obstruction. Grease the trigger clevis pin.
Locking dimple too deep.	Punch cylinder pressure too high.	Adjust to a lower pressure.
Head sensors not activating	Sensor Damaged	Place metallic object against sensor and verify the sensor activates on the HMI screen.

Observed Problem	Possible Cause	Solution
No power to tool or sub-components	Unplugged power cord / connectors.	Check power cord. Check all connections between components. Be sure to match connector styles, number of pins on individual connections and observe keyed orientation of the connectors. All threaded sleeves on connectors must be fully assembled and secured.
	Power entry plug switch or door latch turned Off	Check switch status.
	Internal Circuit Breaker(s) tripped to Off position.	Check to make sure all Circuit Breakers are in the On position (located inside the Electrical Control box).
Tool does not activate when the trigger is pulled.	E-stop is pressed down	Check switch status
	Manual mode is activated	Tool will not install a clamp in manual mode, turn off to go to normal operation
	External trigger is on.	Turn off external trigger.
Can not reset servo fault error: F-12 Fault on servo drive	Grounding braid of motor cable damaged/disconnected	Replace H80122 motor cable

ERROR CODES

Types of Error Messages:

- Warning Messages:** These message types are displayed to assist operators with understanding tool behavior and typically resolve themselves. These can be set to persist if the cycle is ended by the operator before they resolve, depending on the “Enable Error Bypass” setting. They do not count toward Failed clamp counts. All warning type errors will begin with a “3”.
- Error Messages:** These do not stop the sequence and the tool can complete an installation when these occur, but they may mean that the tool has not installed the band to the right specifications. Error messages will persist when the “Enable Error Bypass” setting is not checked. These message types will increment the “Error Codes” counter. All error messages begin with a “2”.
- Critical Alarms:** When these errors occur, the tool cannot continue to operate normally, the tool will not complete the installation and the tool will enter the faulted state. Critical alarms will always be displayed independent of the “Enable Error Bypass” setting and require the user to address the issue or reset the error before the tool can continue operation. The first digit of critical alarms begins with a “1”.
- Troubleshooting:** In event of failure, cut all power, depress e-stop button, and contact authorized/appropriate personnel to address the situation.

Table 8 – Error Code Summary Table:

Number	Description	Details
135	Band Slipping Detected	This error occurs when large changes in motor velocity are detected, and the number of detections exceeds the amount of allowable slipping events defined on the HMI. When this error is triggered, the tool will fault, the LED will blink red, and the sequence will end. Possible Cause: See “Pre-set tension is not reached” troubleshooting section.
144	Tool Line Up Timeout	This error occurs when the time limit set by the “Line Up Tool Timeout” setting on the HMI is exceeded before the contact switches are triggered. When this error is triggered, the tool will fault, the LED will blink red, and the sequence will end. Possible Cause: Buckle/proximity sensors are not functioning correctly.
155	General Servo Fault Detected	This error occurs when the servo and/or the drive are in a faulted state. When this error is triggered, the tool will fault, the LED will blink red, and the sequence will end. Possible Cause: Obstruction in drivetrain.
212	Parameters Not Passed – Punch Duration Out of Range	This error will occur after a completed cycle if the measured "Punch Duration" is outside of the allowed range set on the HMI. Possible Cause: Obstruction in punch assembly, damaged punch cylinder.
213	Parameters Not Passed – Torque Out of Tolerance	This error will occur after a completed cycle if the measured motor torque is outside of the allowed range set on the HMI for the set monitoring period. The torque is monitored from the point where it reaches the torque tolerance band and through tightening until after the punch operation. Possible Cause: Tolerance settings too tight, worn motor/gearbox.
224	Parameters Not Passed – Contact Switch Lost Contact	This error will occur after a completed cycle if the contact switches lose contact during the monitoring period. The contact switches are monitored from the time they are first lined up to just after the punch. Possible Cause: Operator movement during installation process
311	Supply Pressure Out of Range	This message will display when the trigger is pressed, and the supply pressure is outside of the range defined on the HMI. Possible Cause: Regulator set incorrectly
312	Punch Pressure Out of Range	This message will display on the HMI while waiting for the punch pressure measurement to reach the set pressure range. If the punch pressure is achieved, the message will clear, and the tool will continue the sequence normally. Possible Cause: Regulator set incorrectly
313	Torque Out of Tolerance Before Cut	This message will display if the tool has completed the punch operation and motor torque has left the set torque tolerance before the tool completes the band cutting operation. The message will persist until the tool adjusts tension back to within tolerance, at which point it will automatically clear. Possible Cause: See “Pre-set tension is not reached” troubleshooting section.