

A large graphic element consisting of a yellow chevron pointing to the right, which is partially overlaid by a grey chevron pointing to the left. The two chevrons meet in the center, creating a white space where the title and other text are located.

STANLEY[®]
Engineered Fastening

Smart Rivet Tool Programming Manual

Included Models: BR12PP-8

English- Original Document - Revision D
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1. Programming Methods

The BR12PP Smart Rivet tool can be programmed using 3 methods, method 1 requires no controller, while method 2 and method 3 requires a controller.

Programming Methods:

1. STANLEY Gateway .exe program. This program does not require any installation, simply open the software and begin programming. This is the method that will be covered in this programming manual. The next 2 methods are very similar with a few additional steps to get started.
2. Programming the tool directly from an Alpha Controller when paired wirelessly to the controller. See QB Controller Instruction Manual to learn how to connect the tool and controller, and program from the controllers built in screen.
3. There is an option of programming over the controllers embedded software called Alpha Toolbox. See QB Controller Instruction Manual to learn how to connect and use this software.

2. Opening Gateway

The Gateway.exe program is included with the BR12PP Smart Rivet Tool. This software is updated regularly and can be obtained from your STANLEY representative for no fee.

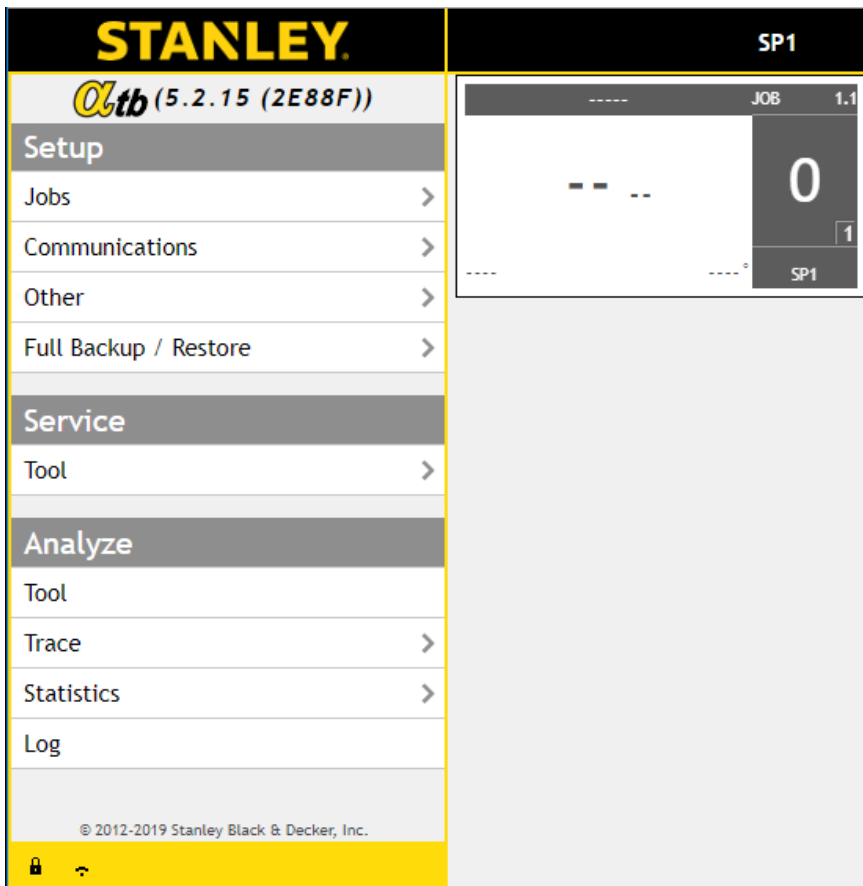


Gateway.exe can be opened when there is no tool connected to the computer. Gateway.exe will open in a web browser. If you encounter issues with the Gateway.exe program, using a different web browser will most likely resolve the issues.

3. Connecting the Tool to Gateway

To program the BR12PP Smart Rivet Tool using Gateway.exe, the user must have a Micro USB cables, charged battery compatible with the BR12PP Smart Rivet Tool, and the Gateway.exe software.

1. Insert a battery onto the tool and turn on the tool by pressing the START trigger one time.
2. The tool should now be providing feedback that it needs to be "Homed" by flashing the red, yellow, orange, and green lights, and there should be a slow "Beeping" noise. The "Homing" process is completed by pulling the START trigger a second time after startup. The "Homing" process must be completed every time the tool is turned off and back on.
3. Once the tool is on and "Homed" Connect the Micro USB plug into the Micro USB port on the back base of the tool, and connect the other end of the cable to a USB port on the users computer.
4. Open the Gateway.exe program as described in "2. Opening Gateway" on page 4. The Gateway.exe program should look as shown in the image below. If the Gateway.exe program does not show up as the image below, follow the troubleshooting guide as described in the next table.



If issues are encountered when using the gateway use the following table for troubleshooting:

Fault	Possible Cause	Probable Solution
No Spindle	Drivers corrupt or not Installed on computer	The correct drivers must be installed on the users computer. The drivers can be obtained from your STANLEY representative.
	BR12PP not connected to computer	The BR12PP must be connected to the users computer using a Data Transfer Micro USB cable.
	BR12PP not powered on	The BR12PP must be turned on for the Gateway.exe program to recognize the tool. Check the battery indicator to ensure the BR12PP battery is charged.
Unexpected Results	Poorly Performing Browser	Switch the browser used to open the Gateway.exe program.
	Out of Date Browser	Update the browser to ensure it is using the latest version available.

4. Pairing Mode

To pair a QPM Cordless Tool, after setting up the QB Alpha Controller following the “QB Controller Instruction Manual”, ensure the QPM Cordless Tool is off by removing the battery pack and re-installing the battery pack.

Wake the QPM Cordless Tool into pairing mode by pressing and holding the MFB and then tap the start trigger switch. Wait for the tone before releasing the MFB (MFB is explained in the BR12PP Tool Instruction Manual). The QPM Cordless Tool will find the wireless capable Alpha controller and request to be added as a trailing spindle by turning on, then off, the status lights in sequence. Accept the BR12PP Cordless Tool as a trailing spindle on the wireless capable Alpha Controllers.

5. Programming

The following provides a guide for programming the BR12PP Smart Rivet Tools.

The controller uses three main menus to display information and enable programming:

-**SETUP** Menu

-**SERVICE** Menu

-**ANALYZE** Menu

Fields with bold font are editable. Fields with gray font are not editable.

To begin programming a tool strategy, press the SETUP interactive menu button.

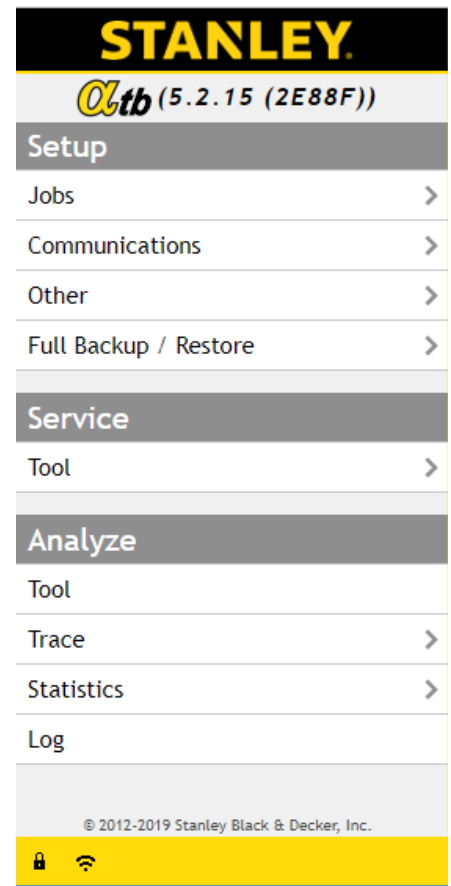
1. Jobs – use to perform tool strategy programming such as Force and speed parameters.

2. Communications – use to program Ethernet, serial port, fieldbus and network protocol options.

3. Other – use to set parameters for all other features, including system level, users, passwords, I/O and tool functions.

4. Restore Factory Defaults – use to backup/restore/delete programming and return controller to factory defaults.

To access, press the corresponding menu item in the expanded list of menus along the left side of the Gateway.exe program.

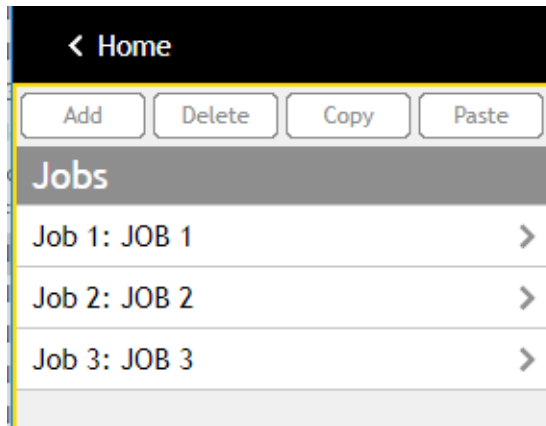


5.1 SETUP Area

This area changes the settings of the Jobs, Tasks, Steps, tool strategies, error-proofing, and Rivet counting. Users must have SETUP or ADMINISTRATOR access level to modify values in this area.

5.1.1 JOBS Menu

Jobs controls tool operation for pulling a rivet: one to sixteen Tasks and one to four Steps. Most BR12PP tools operate with a single Job and Task with one or two Steps. Users must have ADMINISTRATOR or SETUP access in order to modify Job settings. This includes Wizard, Manage and Step parameters. If no tool is attached or if at least one Job exists, the Job tab appears allowing for expert user programming.



Jobs, Tasks and Steps are required to setup a tool strategy.

Inputs and Triggers are used to select specific Jobs or Tasks with different tool strategies, including Error Proofing (batch counting). Program Job parameters according to the plant integration scheme desired and then program Task(s) and Step(s) to create the tool strategy.

Job settings apply to all Tasks and Steps within the Job.

There can be up to 16 Jobs per BR12PP tool.

BR12PP Cordless tools contain their own memory of Jobs/ Tasks/ Steps.

Select Jobs by selecting the JOBS button under the SETUP menu tab on the Home screen.

Alpha toolbox, the SETUP, SERVICE, and ANALYZE menu is expanded and does not require selection.

If a Job already exists, the user must select the job number that is desired to be changed.

If no job is present, selecting the "Add" button will open the Wizard screen which is explained in "5.1.1.1 Wizard Screens" on page 10

Name	Name the Job to define the operation performed (15 character maximum). Use the up/down arrows to spell with letters or use the numeric keypad. When using the PFCS protocol a Machine ID value must be entered here. This name will appear on the Run screen when the Job is selected.
------	--

Barcode ID	<p>This is a mask that when equal to an incoming PART ID (barcode scan) this Job is selected as the active Job. The PART ID can come from the USB port, serial port, a network protocol, a fieldbus input, the internal PLC or the keypad itself. Use periods (.) to mask the negligible portions of the PART ID; use the exact characters in their exact PART ID positions to select the Job.</p> <p>Example: If a PART ID is 123ABC and if the 3A determines when this Job is to run (the third and fourth positions), then enter “..3A..” as the parameter value. Notice that the periods (.) match the length of the expected PART ID.</p>	
Increment Count on NoK	<p>Setting this parameter to YES will allow the selected Job’s rivet count to increment on both OK and NoK rivet pulls. If set to NO the Job’s rivet count will increment only on OK rivet pulls.</p>	
Auto Sequence Tasks	<p>When set to YES, the BR12PP rivet tool automatically sequences from Task 1 through each Task to the final Task in the Job after the fastener count in each Task is complete. The value of NO requires an input to select the Task to run within a Job.</p>	
Auto Reset Job	<p>The value of YES resets the Job automatically after the Batch Count has been met. The tool will not disable with Error Proofing enabled. The value of NO requires an Input to Reset the Job.</p>	
Enable Error Proofing	<p>The value of YES causes the tool to disable after the accumulated fastener count equals the target fastener count for the job, unless Auto Reset Job is set to YES. A Trigger or Input is required to Reset the Job and set the accumulated count to zero. YES also enables more parameters that will dynamically appear on the screen, see below. The value of NO keeps the tool enabled even after the Job’s target count is met. The count will not increase beyond the target value. The value of NO will not cause new parameters to appear.</p>	
Enable Error Proofing	Disable Assembly	<p>This identifies whether the tool disables after each Task has completed. This requires a Reset Job, Task Select or Task Select Bit input to select an incomplete Task which enables the tool for an incomplete Task only. If Auto Sequence Task is used, the tool re-enables when the active Task switches to an incomplete Task.</p>
	On Task Complete	<p>YES disables the tool when the active Task is complete. If an input switches the controller to a completed Task, the tool is disabled. If an input switches the controller to an incomplete Task, the tool is enabled to complete the Task. No will not disable the tool when the active Task is complete.</p>

Enable Job Timer	A value of YES invokes the Job Timer. The Job Timer starts when the first bolt of the batch count exceeds Threshold Force (In Cycle) and stops when the programmed number of seconds has elapsed. If the timer times out before the batch count is complete the Job is set to complete, the tool is disabled and the Job Complete output is energized. A value of NO disables the Job Timer.	
Job Timer	Value is in seconds. Maximum is 9999.9 seconds, minimum is 1 seconds.	

5.1.1.1 Wizard Screens

The Wizard presents programming parameters and gives a list of strategy controls (Smart Steps). The Wizard automatically appears after selecting "Add" if a tool is attached and when a Job or Task is added. The Wizard sets up a Job for a simple rivet cycles using the minimum required setup parameters.

The first 2 Wizard screens define the Audit step of the Task.

Wizard Screen 1:

The screenshot shows a software interface for Wizard Screen 1. At the top right, there are two buttons: "Next" and "Cancel". Below these, there are two input fields. The first is labeled "Batch Count" and contains the value "1". The second is labeled "Units" and has a dropdown menu currently showing "kN".

To modify a parameter, select the parameter and enter the appropriate value then press the "Apply" button on the "Save Changes" pop up box.

The screenshot shows a pop-up dialog box with a yellow header that says "SAVE CHANGES?". Below the header, the text reads: "Alert Operator(s) to any changes in tool behavior before saving." At the bottom of the dialog, there are two buttons: "Apply" and "Cancel".

After all parameters/selections/options are finished, press the NEXT interactive menu button to advance through the Wizard. Repeat for subsequent windows. Press the PREV interactive menu button to move back to previously programmed screens within the Wizard. Press the CANCEL interactive menu button at any time to stop Wizard operation.

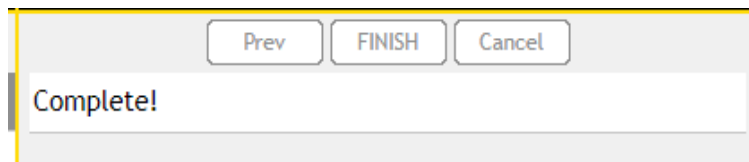
Wizard Screen 2:

High Force	8 kN
Low Force	0 kN
High Distance	9999.9 mm
Low Distance	0 mm

The Smart Steps are helper steps inserted either before or after the Audit step. Smart Steps can not be audit steps. Only STRATEGY steps can be audit steps. A Task must have at least one STRATEGY (Non-Smart step) step. When complete the Wizard will have created the Job, Task and appropriate steps based on programming input.

The Audit step is now defined. The Wizard uses the median value, between the High and Low parameters, as the Target. It also calculates and programs other parameters automatically, including: Snug Force, Threshold Force, and Statistical Force. Change these values after saving Wizard programming if desired.

Press the FINISH interactive menu button to close the Wizard.



The Job tab screen appears. This allows manual editing of parameters prior to saving Wizard programming.

5.1.1.2 Manage Jobs

The interactive button across the top of the Jobs Tab enables Jobs to be added, deleted, copied to the clipboard and pasted into another Job, imported or Exported to the computers download file.

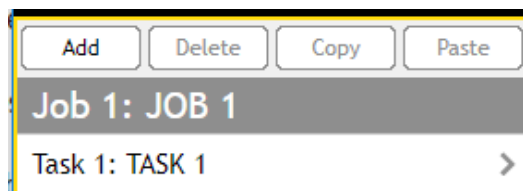


	Adds a Job to the tool. If a tool is attached, the Wizard begins for easy setup of parameters. If a tool is not attached, the Jobs tab appears for manual parameter setup.
Add	Jobs do not have to be added sequentially. A Job can be added before or after the one that is selected. Jobs renumber automatically after being added. Make a selection and press the OK interactive menu button to add a Job, or CANCEL to not add a Job.

Delete	Deletes the selected Job from the tool. Jobs cannot be recovered once deleted.
Copy	Copies the selected Job and its associated Tasks and Steps to the Clipboard.
Paste	Overwrites the selected Job with the values residing in the Clipboard. To copy/ move a Job: first create a new Job where it is needed, then copy the Job to be moved, then paste it into the new Job created and delete the original if required.
Import	Imports the selected Job file from the computer and overwrites all Jobs in the tool. Scroll through the files on the computer until the desired file is selected. Press the OK interactive menu button to import the file. Press EXIT then YES to save the file.
Export	Writes all Jobs and their parameters to a Jobs file on the computer. Press Export and a file will be saved to the computers download folder.

5.1.1.3 TASK

Press the TASK interactive menu button to setup the parameters of the Tasks and Step(s) inside the selected Job.



Select Tasks by selecting the desired task to edit in the expanded list of tasks along the left edge of the browser.

 A screenshot of a settings form for 'Task 1: TASK 1'. The form contains the following fields:

- Name: TASK 1
- Batch Count: 1
- Limit Rejects: NO (dropdown menu)
- Units: kN (dropdown menu)
- Threshold Force: 0kN
- Statistical Force: 0kN
- Cycle Lock-Out: 0s
- Modified: 08/28/2019:20:26:39

Task settings apply to all Steps inside the Task.

Name	Name the Task to define the operation performed (15 character maximum).
Batch Count	This is the number of OK rivet pulls the Task is required to count before it is completed OK. Zero is not allowed. The default value is 1. The maximum is 99.
Limit Rejects	Limits the number of NoK (Not OK) rivet pulls in a Task. If the limit is achieved the tool is disabled. Use Reset Job, Task Select or Task Select Bit inputs to recover. YES turns this function on and increases the Task menu to insert the Reject Count parameter. No turns this function off. The default value is NO.
	Reject Count The maximum number of NoK rivet pulls allowed during this Task. The default value is 3.
Units	Tool operating units: kN, Kilo-newtons
Threshold Force	The Force level during the rivet pull when the In Cycle output transitions high. Data is not stored, or available to Alpha Toolbox, unless Threshold Force is exceeded during the rivet pull. A good starting point is 20% of expected Force to break a rivet. The default value is 0.
Statistical Force	The Force level required to be exceeded before the rivet cycle data is included into Statistics or sent via a network protocol. The default value is 0.
Cycle Lock-Out	This is a timer, in seconds, that activates after the tool has reached its target. While active, the tool is disabled.
Modified	A value that is changed by the controller to indicate the date and time parameter values were last changed in this Task or associated Steps.

5.1.1.4 Manage Tasks

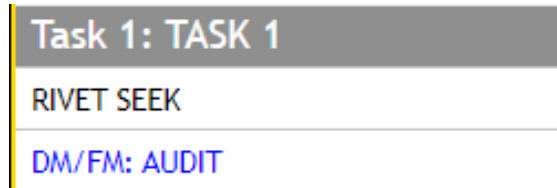
The interactive button across the top of the Tasks Tab enables Tasks to be added, deleted, copied to the clipboard and pasted into another Task, imported or Exported to the computers download file.

Add	<p>Adds a Task to the selected Job. If a tool is attached, the Wizard begins for easy setup of parameters. If a tool is not attached, the Tasks tab appears for manual parameter setup.</p> <p>Tasks do not have to be added sequentially. A Task can be added before or after the one that is selected. Tasks renumber automatically after being added. Make a selection and press the OK interactive menu button to add a Task, or CANCEL to not add a Task.</p>
Delete	Deletes the selected Task from the tool. Tasks can not be recovered once deleted.
Copy	Copies the selected Task and its associated Steps to the Clipboard.
Paste	<p>Overwrites the selected Task with the values residing in the Clipboard.</p> <p>To copy/ move a Task: first create a new Task where it is needed, then copy the Task to be moved, then paste it into the new Task created and delete the original if required.</p>
Import	<p>Imports the selected Task file from the computer and overwrites all Tasks in the tool.</p> <p>Scroll through the files on the computer until the desired file is selected. Press the OK interactive menu button to import the file. Press EXIT then YES to save the file.</p>
Export	<p>Writes all Tasks and their parameters to a Jobs file on the computer.</p> <p>Press Export and a file will be saved to the computers download folder.</p>

5.1.1.5 Step

Press the desired step (Rivet Seek or DM/FM) interactive menu button to setup the parameters of the Step(s) inside the selected Job.

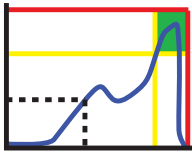
A rivet rundown consist of a Rivet Seek Step and the DM/FM audit step, the user cannot add or delete these two steps.



Select step by selecting the desired Rivet Seek or DM/FM button to edit in the expanded list of steps along the left edge of the browser.

Step settings only affect the selected Job and Task. There can be only one Audit step per Task. Each Step is represented by its own tab.

The parameters for all strategy types are listed. It may be that not all parameters are shown on the display at one time. Use the scroll bar on the display to view more parameters.

Name	Provides an identifier for the step (15 characters maximum).	
	Identifies values used to control the tool during a Step Strategies include:	
Strategy (Standard)		<p>DM / FM Distance Monitor with Force Monitor. The tool only monitors Distance and Force. Audit Step Distance and Force results must fall within their specified limits for the rivet cycle to be acceptable (OK).</p> <p>The program shuts off the tool if the achieved force drops below the peak force by a defined percentage, if the tool reaches its max travel distance, if the user releases the start trigger, or the tools force is exceeded by 115%.</p>
Snug Force	The controller begins to monitor the tool for distance at the preselected threshold Force. Any increase in distance after the snug point results in a corresponding increase in force.	
High Force	Anytime the peak Force recorded exceeds the High Force, the Rivet pull is recorded as a reject for High Force. The High Force Light (Red) illuminates and the rivet pull is given an overall status of NoK.	

Low Force	When the peak Force recorded fails to reach the Low Force, the Rivet pull is recorded as a reject for low Force The low Force light (yellow) illuminates and the Rivet pull is given an overall status of NoK.	
High Distance	Anytime the peak Distance recorded exceeds the High Distance, the Rivet pull is recorded as a reject for high Distance The high Distance light (red) illuminates and the Rivet pull is given an overall status of NoK.	
Low Distance	Anytime the peak Distance recorded fails to reach the Low Distance, the Rivet pull is recorded as a reject for low Distance The Low Distance light (yellow) illuminates and the Rivet pull is given an overall status of NoK.	
Break Detection	The program shuts off the tool when the rivet break is detected and travels a distance past the detected break.	
	Travel Past Break	The amount of distance the tool's jaws must travel past the force drop. If the value selected requires more travel than the tool is capable of, the rivet pull is ended with a shutoff code of MT (Max Travel)

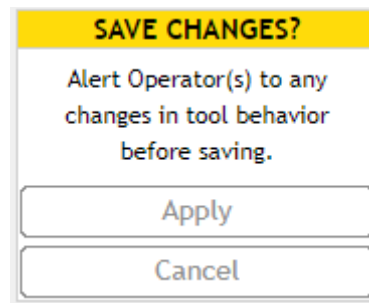
5.1.1.6 Manage Steps

The interactive button across the top of the Steps Tab enables Steps to be added, deleted, copied to the clipboard and pasted into another Step, imported or Exported to the computers download file.

Add	A rivet rundown consist of a Slow Seek Step and the DM/FM audit step, the user cannot add or delete more than these two steps.
Delete	A rivet rundown consist of a Slow Seek Step and the DM/FM audit step, the user cannot add or delete more than these two steps.
Copy	Copies the selected Step and its associated content to the Clipboard.
Paste	A rivet rundown consist of a Slow Seek Step and the DM/FM audit step, the user cannot add or delete more than these two steps.
Import	Imports the selected Step file from the computer and overwrites all Steps in the tool. Scroll through the files on the computer until the desired file is selected. Press the OK interactive menu button to import the file. Press EXIT then YES to save the file.
Export	Writes all Steps and their parameters to a Jobs file on the computer. Press Export and a file will be saved to the computers download folder.

5.1.1.7 Save Changes

Programming changes are stored after selecting Apply on the Save Changes pop-up box. Alert Operator(s) to any changes in tool behavior before saving.



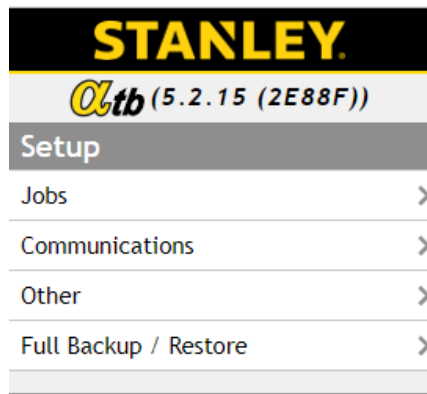
Press the APPLY interactive menu button to save the changes and exit the programming mode. Press CANCEL to not exit the programming mode and continue modifying parameters.

5.1.2 COMMUNICATIONS Menu

This area changes the TCP/IP, wireless, and PFCS Communication settings for the BR12PP tool. Users must have COMMUNICATIONS, SETUP or ADMINISTRATOR access level to modify values in this area.

Select Communications by pressing the SETUP interactive menu button on the Run screen.

To access, press the "Communications" menu item in the expanded list of items along the left side of the Gateway.exe programs home page.



5.1.2.1 TCP/IP Tab

When pairing the BR12PP cordless tool to a QB Alpha controller, the controller will assign the tool an IP Address, Subnet Mask, Gateway, and Physical Address.

For the cordless tool to be assigned an IP Address automatically, the "Obtain IP from Network" must be set to YES.

For instructions on how to pair the BR12PP tool to a QB Alpha controller see the "QB Controller Instruction Manual".

< Home Print ↑ Import ↓ Export SP2 	
	<input type="button" value="RENEW"/>
Communications	TCP / IP
TCP / IP	Network
Wireless	Obtain IP from Network YES ▾
PFCs	IP Address <input type="text" value="172.23.165.206"/>
	Subnet Mask <input type="text" value="255.255.255.0"/>
	Gateway <input type="text" value="172.23.165.1"/>
	DNS <input type="text"/>
	Physical <input type="text" value="D4-CA-6E-79-F7-42"/>
	Lead Controller
	IP Address <input type="text"/>

This information is required when connecting the BR12PP cordless tool to an Alpha controller wirelessly.

	YES allows the BR12PP tool to receive an address from the QB Alpha Controller automatically. No requires the address parameters to be filled in manually.	
Network	Obtain IP From Network	IP Address The IP Address of the BR12PP tool.
		Subnet Mask The Subnet address of the BR12PP tool.
		Gateway The Gateway address to a connecting network.
		DNS The address of the network's DNS server.
	Physical	This is the MAC id of the BR12PP cordless tool. This value comes from the Power/ Communication Module board inside and cannot be changed.

5.1.2.2 WIRELESS Tab

Use these parameters to setup the wireless connection, or a 2.4/5.0 Ghz wireless router.

802.11 and 802.15.4 connections available depending on the model tool and QB Alpha controller chosen.

< Home	Print	Import	Export	SP2
SHOW				
Communications	Wireless			
TCP / IP	WLAN			
Wireless	Network	JOIN ▾		
PFCs	Radio	AUTO ▾		
	Name	QB-073118031		
	Security	OPEN ▾		
	Channels	1-165		
	802.15.4			
	Radio	HIGHEST ▾		
	Channel	26		
	Remote			
	Physical	0013A200418CCD52		

To enable wireless communications for the BR12PP cordless tool, Enable the Radio, type in SSID of the wireless router the tool will be connecting to, select the type of security and enter the network credentials is applicable, and choose the applicable Channels.

Radio Off - Disables the radio in the BR12PP cordless tool.
 Auto - Enables the radio in the cordless tool at the highest power level.

Name This parameter sets the Service Set Identifier (SSID) for the wireless router the tool will be connecting to. The maximum number of case sensitive, alphanumeric (ASCII) characters is 32.

Security	OPEN	Enable connection to an OPEN wireless protocol access point, this mode is an encryption-free (open) mode.
	WPA2	Enable connection to a WPA2 wireless security (encryption) protocol access point. An 8 character minimum length password is REQUIRED, and must follow the WPA2 security protocol password specification.
	PEAP	Enable connection to a PEAP wireless security (encryption) protocol access point.
	EAP-TLS	Enable connection to a EAP-TLS wireless security (encryption) protocol access point.
Pass- word		This parameter sets the encryption key needed to connect to a wireless device access point requiring a password. This parameter can be left blank unless a security protocol is selected.
Region		Select from the drop-down list the region of the world where the tool is operating. This selects the correct frequency channels allowed by that region.

5.1.2.3 PFCS Tab

The BR12PP tool has PFCS communication capabilities but must be paired with a QB Alpha Controller, the plant's System group must provide these values to allow the Alpha controller to communicate on the PFCS or NPL network. If using the NPL network there is a setup per spindle, even in a multiple. Be sure to select each spindle that needs to report to the NPL and setup these parameters.

PFCS	
Type	BASIC NPL ▼
Server IP	<input type="text"/>
Solicited Port	DISABLE ▼
Unsolicited Port	DISABLE ▼
NPL Settings	
Batch Mode	DISABLE ▼
Operation Mode	AUTOMATIC ▼
Manual Messaging	YES ▼
Buffer Size	1024
Options	
Rundown Data	VIN ▼
Buffer while Offline	NO ▼

Choose which type of PFCS communications to be used.	
Type	<p>BASIC NPL This is the enhanced protocol used at Fiat facilities. The controller is enabled by the network, performs many operations until disabled by the network.</p> <hr/> <p>SMART NPL This is the enhanced protocol used at Fiat facilities. The controller is enabled for a specific Job by the network, after successfully completing the job the controller disables itself.</p>
Server IP	Type the IP Address of the PFCS server on the network.

	This port is used to send rivet pull status and data to the PFS system. Enable or Disable this port as required. When enabled type the port number.	
	Port Number	The required virtual port on which the Alpha will communicate to the plant network. Starts with 10,000.
	Wait to Connect	Time period in seconds between a disconnect and an attempt to reconnect.
Solicited Port	Wait for Data	The time period in seconds where the controller waits for a reply to a request sent to the server.
	Wait for ACK	The time period to wait between when the controller sends data to the server and it should receive an acknowledgment. If NO ACK in this time period the data sent again 3 times.
	Keep Alive	The time in seconds for an inactivity timeout between messages when the controller sends a KEEP ALIVE message to ensure cable integrity.
	This port is used by the PFS system to select the Job number on the Alpha controller. Enable or Disable this port as required. When enabled type the port number.	
	Port Number	The required virtual port on which the Alpha will communicate to the plant network. Must be a different port number than the Solicited Port.
	Machine ID	Required for Smart or Basic NPL. May be used for Basic PFCS. The Machine ID for the port.
Unsolicited Port	Wait to Connect	Time period in seconds between a disconnect and an attempt to reconnect.
	Wait for Data	The time period in seconds where the controller waits for a reply to a request sent to the server.
	Wait for ACK	The time period to wait between when the controller sends data to the server and it should receive an acknowledgment. If NO ACK in this time period the data sent again 3 times.
	Keep Alive	The time in seconds for an inactivity timeout between messages when the controller sends a KEEP ALIVE message to ensure cable integrity.

	Use these setting when implementing the NPL protocol communications at Fiat facilities.
NPL Settings	<p>Batch Mode</p> <p>This is for batch processing and printer support. DISABLE: Batch process is disabled. NO MES: Perform the batch process and printer output without the MES command MES: Perform the batch process and printer output with the MES command.</p>
	<p>Operation Mode</p> <p>AUTO: Sends keep alive messages as necessary. MANUAL: Keep Alive messages are Not sent.</p>
	<p>Manual Messaging</p> <p>YES: Send data to the MES while in Manual Mode. NO: Do Not send data to the MES while in Manual Mode.</p>
	<p>Buffer Size</p> <p>The size in characters to set aside to receive network messages. Maximum size is 4096 characters (bytes).</p>
	<p>Transfer Mode</p> <p>For Smart NPL only. Mode 1: NoKs are sent when they happen (TR) and in final message when the Job is complete (ER). Mode 2: NoKs are sent when they happen (TR) and sent in the final message only when the Job failed. OKs are send as ER when Job is complete and passes. Mode 3: All results are sent as they happen (TR). Final rivet pull in Job is sent as ER.</p>
	There are OPTIONS which can be adjusted based on plant Systems requirements.
Options	<p>Rundown Data</p> <p>Specify the PART ID as VIN or AVI.</p>
	<p>Buffer While Offline</p> <p>Select YES to allow the controller to buffer the rivet pull data while the controller is off line (disconnected from the network). No means the controller will not buffer data for network retrieval.</p>

	Change these parameter values as required by Systems department. Units are in seconds.
Timers	Wait to Connect Time period between a disconnect and an attempt to reconnect.
	Wait for Data The time period where the controller waits for a reply to a request sent to the server.
	Wait for ACK The time period to wait between when the controller sends data to the server and it should receive an acknowledgment. If NO ACK in this time period the data sent again 3 times.
	Keep Alive The time for an inactivity timeout between messages when the controller sends a KEEP ALIVE message to ensure cable integrity.
PFCS Version	This is the installed version of the PFCS protocol. Check with the Chrysler's Systems group to determine if this has been approved for use in the facility.

To exit, select the desired Tab to edit in the expanded list along the left edge of the browser and ensure that you "Save Changes".

5.1.3 OTHER Menu

This area sets the parameters for all other BR12PP tool features, including: system level, users, passwords, I/O and tool functions. Each category is represented by its own tab. Use the left/right arrows to select the tabs/category for modification.

Users must have ADMINISTRATOR or SETUP access level to modify values in this area.

5.1.3.1 General Tab

Lock Keypad	In Alpha Toolbox only. When YES is selected the Alpha controllers keypad cannot be used to edit any parameters. It will allow the user to navigate through the system and view any parameters. If the keypad is locked and it is desired for it to be unlocked one must connect to Alpha Toolbox on the controller and set this parameter to NO. If set to NO the keypad on the Alpha controller can be used to edit parameters.
Name	A name distinguishes this controller from other BR12PP tools on the same plant floor. Use the up/down arrows to type letters. Use the numeric keypad to type numbers. This is also the main Machine ID for PFCS protocol. This value will also be used to label any files exported via the USB port or Alpha Toolbox. There is a 15 character limit for this parameter.

Keypad Mode	During normal operation the keypad on the face of the controller can be used to select Jobs (Job Select) or Tasks (Task Select). It can also write a PART ID for storing with rivet pull data or these functions can be disabled. If Job Select, Task Select or PART ID mode is enabled, simply type a number or letter on the keypad when on the run screen to select the Job, Task or Part ID, then press the Enter key.	
Count Mode	Choose Count Up to indicate the fasteners that have been completed OK. Choose Count Down to indicate the number of fasteners yet to be completed. This affects the count in the box on the run screen.	
Stop within Limits	Choose OK to mark the rivet pull as OK, even if the rivet pull is stopped when the achieved Force and Distance are within limits. Choose NoK to mark the rivet pull as NoK when the rivet pull is stopped and the achieved force and distance values are within limits. When event occurs, this option illuminates the red and yellow LEDs on the tool and controller.	
Enable Sleep Timer	YES enables the power saving mode for the BR12PP Cordless Tool. No will turn off the power saving mode.	
	<table border="1"> <tr> <td data-bbox="526 905 727 1037">Sleep Timer</td> <td data-bbox="732 905 1516 1037">Time in minutes from last operation when the power saving mode will turn off the Cordless Tool. Minimum value is 1, maximum value is 60, default value is 10.</td> </tr> </table>	Sleep Timer
Sleep Timer	Time in minutes from last operation when the power saving mode will turn off the Cordless Tool. Minimum value is 1, maximum value is 60, default value is 10.	
	Running a tool, pressing a button on the touch screen, connecting with Alpha Toolbox, changing the state of I/O are all operations that will wake up the controller. Press the Start Trigger Switch on the Cordless Tool to recover from power saving mode.	

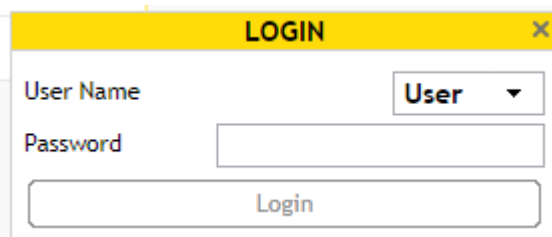
To exit, select the desired Tab to edit in the expanded list along the left edge of the browser and ensure that you "Save Changes".

5.1.3.2 Users Tab

A maximum of eight users with unique passwords can be added. Passwords can contain any character, symbol or number combination written by the keypad (maximum length of 16).

If users are assigned, one must be an Administrator. The first user assigned will be an Administrator by default.

When a user is trying to modify a parameter and the controller is locked, or the user has insufficient privileges, the log in screen appears.



Select the appropriate user from the drop-down and then type in the correct password for the selected user. The parameter value will be modified if the logged in user has sufficient privileges. Otherwise Alpha Toolbox will display the Insufficient Privileges screen and the parameter value will not be modified.



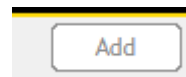
Press OK to acknowledge and try again or CANCEL the modifying operation.

When a user is logged in, the tool is unlocked at that user's access level. The unlocked icon appears and the LOGOUT interactive menu button appears on the run screen.

Alpha Toolbox automatically re-locks the system 15 minutes after the last keypad input. Press the LOGOUT button to re-lock the controller when finished modifying parameters. When the controller is locked the lock icon appears, the LOGOUT button disappears and the controller is password protected. To add a user, press the MANAGE interactive menu button.



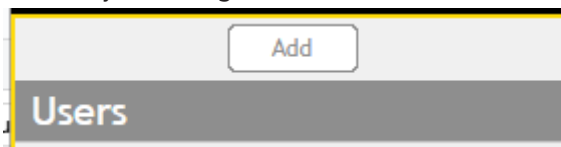
Adding users is a two step process. First add user by choosing option 1. Add:



Name user, enter password, enter password again to verify and press OK.

A form with a yellow border. At the top are "OK" and "Cancel" buttons. Below are three input fields: "User Name" with a dropdown menu showing "User", "Password", and "Verify".

Second, manage the users access by selecting the new user.



Press the MANAGE interactive menu button and select change access.

One user must be an Administrator. Administrator rights give a user full access to the controller. This enables all privileges including restoring factory defaults, deleting logs and adding users.

To assign the selected user as an Administrator choose YES, for Non-administrators choose NO, then press OK.

Select the Access level for Non-administrators.

Options include:

NONE	denies access.
------	----------------

LOCAL	Allows access from the keypad.
REMOTE	Allows access from a computer via Alpha Toolbox.
BOTH	Allows access from the keypad and a computer.

There is no overlap between areas. Select more than one area for access if required.

Setup	Users at this level can modify all parameters in the Job area. They may also modify parameters in the Other area except in the Users, Tool and Stats tabs.
Tool	Users at this level can modify parameters under the Tool tab in the Other area, as well as set Preventive Maintenance Threshold and reset the PM and Cycle counters in the SERVICE menu.
Diagnostics	Users at this level can force Inputs or Outputs ON or OFF and REMOVE forces in the I/O tab of ANALYZE.
Statistics	Users at this level can modify parameters under the Stats tab in the Other area.
Communications	Users at this level can modify all parameters in the Communications area.

Press OK to save.

To delete a user press the MANAGE button and select delete. Confirm deletion by pressing OK. This action requires the Administrator password; once entered, user is deleted.

Import – Users can be entered from a backup file. Connect a USB memory stick to the USB port, scroll to desired file and press IMPORT. The new users display on the User list.

Export – To backup Users, press “Export”, name the file, then save changes.

5.1.3.3 Triggers Tab

The MFB Mode configures the multiple function button for hand-held QPM tools. The button can be configured to operate in any of the following modes.

Disable	The button does nothing.
Job/Task Select	Pressing the button toggles between Job/Task 1 and Job/Task 2 and illuminates the appropriate orange light [6] or [4].
Reset Reject	This function, when selected, will cause the tool to disable after a NoK Rivet pull. The Reject Tone, when enabled, will sound. Pressing the button re-enables the tool indicating the operator acknowledges the rejected Rivet pull and wishes to repair it.
Job Reset	Pressing the button causes the selected Job to be reset. This means that the fastener count is reset and the tool, if disabled due to Error Proofing requirements, re-enables.

Each of the above items can be activated using the below methods:

Tap Action	Defines the operation when the MFB on the tool is tapped (pressed quickly).	
Hold Action	Defines the operation when the MFB on the tool is held for one second.	
Pressure Switch	Enable Pressure Switch	
	NO	Only the tool trigger switch is required to start the tool.
	YES	Requires that both the tool trigger and the pressure switch must be activated to start the tool.

5.1.3.4 Lights Tab

Lights (1, 2)	Defines whether the lights indicate a Job or Task.	
Headlight Timer	Sets the time the tool's headlights remain on, in seconds, after the trigger is pressed.	
Enable Tool Light Timer	YES enables the timer and the tool's Red, Green and Yellow status lights will illuminate for the period of time specified after a rivet pull and then extinguish. If NO is selected the time is disabled and the tool's Red, Green and Yellow status lights will remain illuminated after a rivet pull until the tool is started again. They will only extinguish while the tool is running.	
	Tool Light Timer	The time in seconds the Red, Green and Yellow status lights will remain on after a rivet pull.

5.1.3.5 Tones Tab

The alarm in the tool handle can emit different tones based on the status of the rivet pull. Choose an Accept Tone for an OK rivet pull and a Reject Tone for a NoK rivet pull.



The PLAY Button when pressed will preview the selected tone. A tool needs to be connected to the controller to perform this action.

The STOP button will end the preview.

5.1.3.6 Tool Tab


Values modified under this tab are saved to the tool not the controller. Users must have TOOL or ADMINISTRATOR access level to modify these values. The "Update tool" exit window appears

anytime changes are made in this tab.

PM Limit	When the PM Counter in the tool exceeds this threshold, the preventive maintenance indicator on the front panel illuminates indicating it is time to perform maintenance on the attached tool.
Temperature Limit	Identifies the threshold, in degrees Celsius, for tool shut off. This is caused by excessive duty cycle on the tool.
Torsion Factor	See Appendix A – Torsion Compensation for an explanation of this parameter and how to determine a correct value. Otherwise, use the default (zero).

5.1.3.7 Statistics Tab

Sets values required to calculate the statistics on the stored rivet pull data.

Display	Sets the default screen under statistical analysis in the ANALYZE area. 
Population	Sets the number of rivet pulls included in statistical analysis.
Subgroup Size	Sets the size of the subgroups for the population.

5.1.3.8 REGIONAL Tab

Sets the values for the region of the world in which the tool is used.

Language	Selects the language for the controller screens and files.
Date Format	Selects the Date format for the controller.
24-Hour Time	Selects the 12 hour or 24 hour clock.
Time Zone	Selects the time zone for the controller referenced to GMT (Greenwich Mean Time).

5.1.3.9 Clock Tab

Local Date and Time can be set here. These will be stored with the events and files.

Daylight Saving Time	Modifies the controller time by the appropriate amount.
Time	Sets the controller time.
Date	Sets the controller date.

Press the SYNC interactive button in Alpha Toolbox to set the tool to the connected computer's date and time.

5.1.4 RESTORE FACTORY DEFAULTS Menu

Select the desired Tab to edit in the expanded list along the left edge of the browser.

The BACKUP selection writes the parameter values for the entire BR12PP tool to the computer memory.

The RESTORE selection reads an BR12PP tools backup file on the computer memory and overwrites all values in the tool.

The DEFAULTS selection restores all values for all parameters to factory default settings. It also deletes all rivet pulls info, trace and error log data. This helps when a tool is in an unknown programmed state. Requires ADMINISTRATOR privileges.

5.2 SERVICE Area

In this area the user can view information about the tool, reset tool counters, adjust tool calibration values and upgrade the firmware in the controller and tool.

Users must have TOOL or ADMINISTRATOR access level to modify parameters.

5.2.1 Tool

All tool parameters are stored in the tool memory board in the tool's handle. This area reads/writes values to the tool memory board, not to the controller. Updating the tool's configuration and firmware is managed here.

5.2.1.1 About Tab

This tab displays information about the tool currently attached to the controller. Only the Serial Number value is editable. If there is no serial number, enter one (can only be entered one time).

5.2.1.2 UPDATE Menu Button

Use this button to change the tool configuration or to update the firmware in the tool.

Change the tool configuration.

Download a configuration INI file from the Internet and transfer it to a USB memory stick. Insert the USB memory stick into the USB port. Press the UPDATE interactive menu button to open the file browse window.

Use the up and down arrows to find and highlight the desired INI file. Press the OK interactive menu button. The "Update Tool INI file?" window appears. Press YES to import and load the new configuration file. Press NO to return to the About screen.

Change the tool firmware.

Download a software BIN file from the Internet and transfer it to a USB memory stick. Insert the USB memory stick into the USB port. Press the UPDATE interactive menu button to open the file browse window. Use the up and down arrows to find and highlight the desired BIN file. Press the OK interactive menu button.

The "Update Tool Firmware" window appears. Press YES to import and load the new configuration file. Press No to return to the About screen.

5.2.1.3 Counters Tab

Each of the three counters increments at the same time after an OK and NOK Rivet pull.

Counters	
Odometer	925
PM Counter	925
Trip Counter	925

Odometer – Can not be reset. Indicates the total number of OK and NOK Rivet pulls the attached tool has performed over its lifetime.

PM Counter – Causes the preventive maintenance indicator to illuminate (on front panel and tool) when this value exceeds the PM Threshold.

Trip Counter – Counts the number of OK and NOK rivet pulls between resets.

Use the RESET interactive menu button to reset (back to zero) either the PM Counter or the Trip Counter.

5.2.1.4 CAL Tab

This area is used to set the calibration value(s) for the attached tool.

Cal	
Nominal Cal	38.96
Primary Transducer	T1
Torque Cal	40.44
Redundant Transducer	ENABLE
Torque Cal	40.44
Tolerance	10%
Redundant Angle	ENABLE
Tolerance	5°
Modified	2015-02-04:08:42:16

Nominal Cal	This is a calculated value based on the Force output of the motor, the gear ratios and efficiencies. This is a reference value only and cannot be modified.
Torque Cal	This is the specific Force calibration value for the tool. Enter a new value after performing a lab certification. The Force Cal should not deviate from the nominal Cal value by more than 20%.
Modified	A value that is changed by the controller to indicate the date and time the tool was last calibrated.

To exit, select the desired Tab to edit in the expanded list along the left edge of the browser and ensure that you "Save Changes".

5.3 ANALYZE Area

Analyze displays tool and controller diagnostic information, traces and I/O status.

Press the ANALYZE button to perform diagnostics on the controller, tool or I/O, look at rivet pull traces, perform Statistical Process Control analysis, or to download error log data.

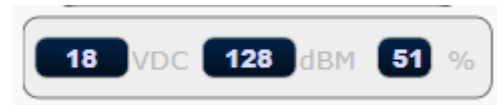
5.3.1 TOOL Tab

This tab shows live status. It updates every millisecond. Use this tab to perform tool diagnostics during troubleshooting operations.

Transducer Force – Provides a live transducer force value during the rivet pull.

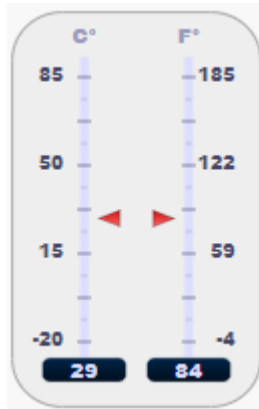


Transducer Current – The transducer is powered with a constant current value. This current should be present and not varying.



Tool DC voltage – The tool voltage should always be approximately 18V DC or 54V DC based on the tool model.

Cordless tools battery life – The battery life in a percentage 100% to 0%.



Tool Temperature – Indicates instantaneous temperature of the tool's stator windings. Temperature is not measured during tool operation. This interacts with the Temperature Limit parameter.



Tool Output Distance – Identifies the distance the jaws move on the tool output. Resets at each start.



Tool Output Speed – Identifies the real time speed of the tool output.

The IDENTIFY interactive menu button will flash the red, yellow and green status lights on the selected tool and controller to distinguish it from another.

Identifying Spindle

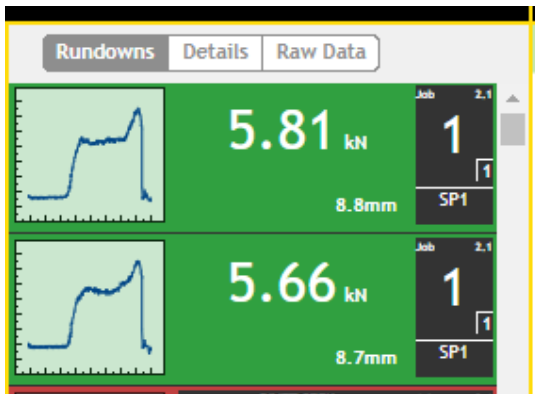
The Identify Spindle dialog box will appear when identifying is active. Press the OK interactive menu button to clear and stop the flashing lights.

5.3.2 TRACE Tab

The cordless tool stores resultant audit data for 2 rivet pulls on a first in/ first out basis. Click on the Analyze>Trace menu from the Home screen in Alpha Toolbox.

Select the Rundowns button to display the rundowns.

A list of rundowns appears on the left. Click on the rundown that corresponds to the trace to be retrieved. The selected rundown turns dark gray.



Click on the Export button and the trace#.csv file will download to the computer. Be sure to understand the browser setting to kNow where the file is saved. The file will be numbered (#) with the unique rundown ID number to distinguish it from the rest and so it can be correlated with the record in the rundowns.csv file.

5.3.2.1 Analyzing Traces

The Trace menu screen in Alpha Toolbox makes it easy to view, print, analyze, export for sharing, and import saved trace files.

5.3.2.2 Screen Controls

The left side of the screen has three types of content. The Rundown button lists the rivet pulls stored on the tool. The Information button shows detailed step by step information about the selected rivet pull. The Point Details button displays details about a point on the trace graph where the mouse is hovering.

5.3.2.3 Rundowns

There is a trace file for each rivet pull. Each rivet pull is represented by a controller run screen with a miniature trace box. The trace box contains an actual representation of the trace for the rivet pull. The trace in the box will change depending on the values chosen for the X, Y1 and Y2 axes.

The run screen background can be green, red or blue. Green indicates the rivet pull status is OK. Red indicates the rivet pull status of NoK. Blue indicates the rivet pull selected for display on the right of the Trace screen, Information, Point Details, print or export.

The most recent rivet pull will always be at the top of the list. A scroll bar is provided to view older rivet pull. Click on the Force value in the run screen to select the rivet pull. The trace will draw on the right of the Trace screen. If the top most rivet pull is selected any new rivet pull will pop into the top of the list and be selected automatically. If a different rivet pull is selected any new rivet pull will pop into the top of the list but will not be selected automatically.

Click on the miniature trace box to lock the trace for viewing. More than one trace may be locked. Each locked trace will draw on the right and overlay on top of each other. They will be represented by dotted lines rather than a solid line.

Selected and locked rivet pull will move down the list as new ones come into the list. Use the scroll bar to view or unlock older traces.

5.3.2.4 Information

Click on the Information button to display information about the selected rivet pull. The left side of the Trace screen will change to display this information.

Rundowns	Information	Point Details
Rundown	51	
Date	01/20/2015	
Time	10:55:54	
Job	1	
Task	1	
Status	OK	
Job Count	1/1	
Task Count	1/1	
Tool Model	E12LB50017-4	
Tool Serial	110110016	
Tool Temperature	26°C	
Steps		
SLOWSEEK		
Torque	0.02 NM	
Angle	180.1°	
Current	3.8 %	
TC/AM		
Torque	0.96 NM	
Angle	1086.8°	
Current	10.5 %	

Rundown – Indicates the unique number for the rivet pull.

Date – The date the rivet pull occurred.

Time – The time the rivet pull occurred.

Job – The Job in which the rivet pull occurred.

Task – The Task in which the rivet pull occurred.

Status – Overall status of the rivet pull.

Job Count – The working bolt of the Job during this rivet pull.

Task Count - The working bolt of the Task during this rivet pull.

Tool Model – The model number of the tool performing the rivet pull.

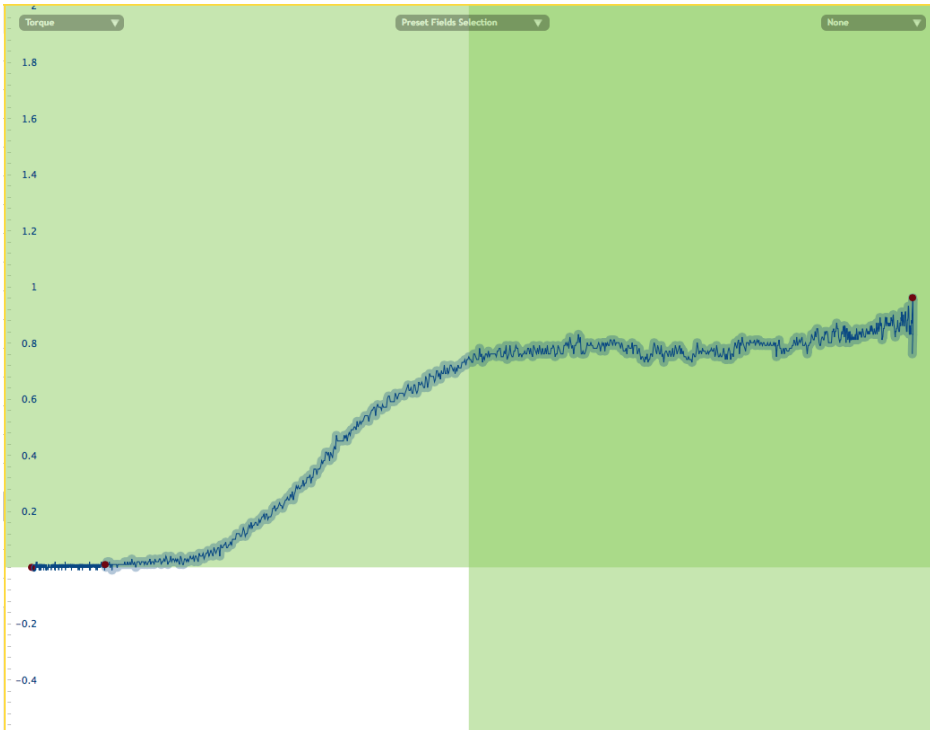
Tool Serial – The serial number of the tool performing the rivet pull.

Tool Temperature – The temperature of the tool at the tool shutoff.

Steps – The steps performed during the rivet pull. The step's strategy type, peak Force, Current, Distance, and Deviation achieved during the step is displayed. The audit step is indicated by blue font. Smart Steps are indicated by name rather than by strategy type.

Click on the step name and the graph on the right will highlight that individual step.

DM/FM	
Force	5.62 kN
Distance	8.0mm
Current	43.3 %



5.3.2.5 Point Details

Click on the Points Detail button to display information about the selected rivet pull. Use the mouse to hover over the drawn trace graph on the right in the Trace screen. The values in the Points Detail window change with the mouse hover.

Raw Data	
Time	2 ms
Force	-0.05 kN
Distance	-5.1 mm
Speed Command	3 mm/s
Speed	0 mm/s*
Bus Voltage	19 V
Current Command	100 %
Current	3.3 %

Time – The time in milliseconds the point occurred in the rivet pull from start.

Force – The force achieved at the mouse hover point.

Distance – The distance achieved at the mouse hover point.

Speed Command – The commanded speed at the mouse hover point.

Speed – The actual tool speed achieved at the mouse hover point.

Bus Voltage – The actual DC Bus voltage achieved at the mouse hover point.

Current Command – The commanded current at the mouse hover point.

Current – The actual tool current achieved at the mouse hover point.

5.3.2.6 Print

Clicking the Print button will open the printer dialog. This window allows the user to modify printer parameters and displays what is to be printed. The currently selected Y axis values are printed separately in their own box on the same page. The X axis is either Time or Distance depending on the current selection.

If no physical printer is attached, choose an installed PDF printer to save as a PDF file.

5.3.2.7 Export

Click the Export button to save the selected rivet pull trace file to the computer. Choose between the selected trace, the number of traces in the population size to be exported. When exporting the selected trace it exports as a comma separated value file. If POPULATION is selected the appropriate number of traces are placed into a zip file before exporting.

The exported trace file is a comma separated values file and contains four sections. They are the identifier section, the step values sections, the trace values section and the events section.

The identifier section repeats some of the same information from the rivet pull record so it can be correlated with the trace file. This information is displayed when the Information button is clicked.

The step values section provides the Force, Distance and current values for each step in the rivet pull. The rivet pull file has only the audit step for each record. If the values for each individual step are required this is the place from which to parse the information.

The trace values section provides the captured X and Y axes information to draw the graph.

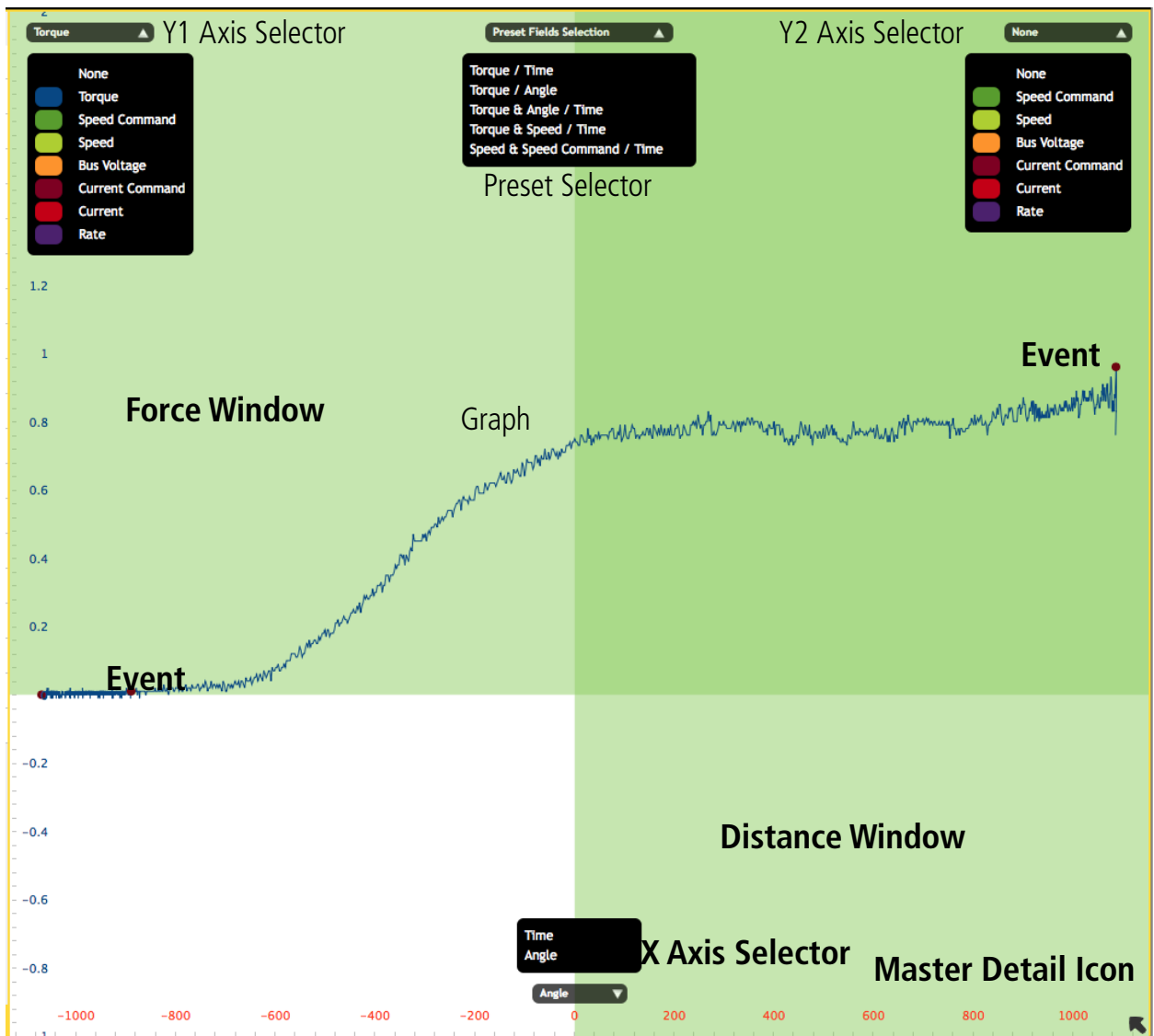
The events section marks the time at which the events occur so they can be entered on the graph.

5.3.2.8 Import

Click the Import button to import a saved trace file for analysis. The file is placed at the top of the rivet pull list and be treated as if it were just received from the controller. It will travel down there list as new rivet pulls are received. When the user navigates away from the Trace screen the imported files are removed from the list.

5.3.2.9 Graph

The selected rivet pull graph (plot) is drawn in the window on the right in the Trace screen. There are two Y axes and one X axis. The values for the axes can be selected. By default the Y1 axis is Force while the Y2 Axis is None and the X axis is Distance. The graph for each Y axes value has its own color. The value selected on one Y axis is not available to the other. The Distance value is not available if the X axis has Distance selected.



The Y axes field selectors are at the top of each axis. The X axis field selector is at the bottom center of the screen. An axes presets selector is at the top center of the screen.

Data for the trace is collected every millisecond from start to finish of the rivet pull. Once the number of data points exceeds ~2000 the graph is automatically scaled between event points for graph and file manageability while ensuring a high resolution around the event points. Event points are things such as Threshold Exceeded, and Control Point (target achieved).

The X axis zero point for Time is when the achieved Force reaches or exceeds Task's Threshold Force value. The X axis zero point for Distance is when the achieved Force reaches or exceeds the audit step's Snug Force value. Time and Distance values between start and the zero point are negative.

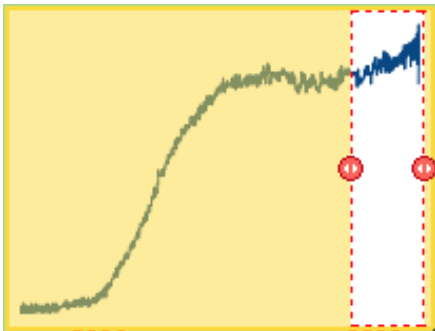
The Master Detail icon arrow in the bottom right corner of the screen allows the user to zoom in on a graph.



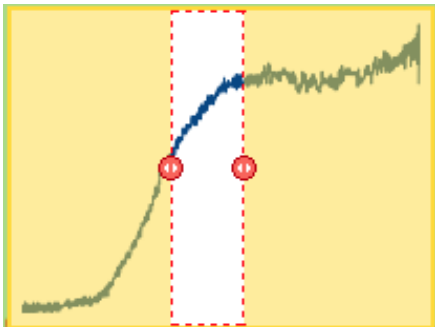
Click the icon to open the Master Detail window.



Slide the left arrow bubble to the right or the right arrow bubble to the left to change the screen zoom. The graph window will follow and display only the area indicated in white.



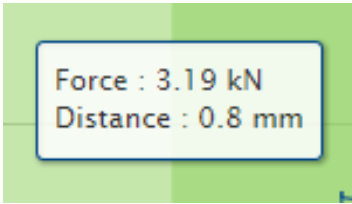
Hover the mouse over the zoomed, white to change the mouse cursor to four arrows. Click and drag the white area to move the zoom to different areas of the graph.



Double click the zoomed, white area to return the graph to normal. Click the arrow in the bottom right corner of the Master Detail to reduce the window to its icon.

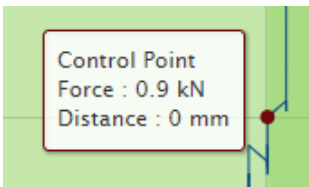
5.3.2.10 Points on Graph

Crosshairs and a point information box appear at the point where the mouse hovers over the graph. The X and Y axes information is presented in the point information box. Move the mouse along the X and Y axes and the values change in the point information box.



5.3.3 Events

The dots on the graphs indicate events that occurred during the rivet pull. Events are things such as Threshold Exceeded, and Control Point (target achieved). The point information box changes color and the event is indicated when the mouse hovers over the event point on the graph.



5.3.3.1 Overlay

Multiple rivet pull graphs can be layered on top of one another. Click the Rundown button at the top of the left window in the Trace screen. Click on the miniature trace box to lock the trace for viewing. More than one trace may be locked. Each locked trace will draw on the right and overlay on top of each other. They will be represented by dotted lines rather than a solid line.

The zero point of the X axis of Time for each graph in overlay view is the programmed Threshold Force. Change the X axis from Time to Distance and the zero point changes to the programmed Snug Force. Selected and locked rivet pulls will move down the list as new ones come into the list. Use the scroll bar to view or unlock older traces.

5.3.4 STATISTICS Tab

Press the right arrow to enter the Statistics area of the controller.

RESULTS	TORQUE	ANGLE
n	0	0
n OK	0	0
n NOK	0	0
n ▲	0	0
n ▼	0	0
n Abr	0	0
n Stp	0	0
R	0	0
▲	---	---
▼	---	---
CAPABILITY		
Cp	---	---
Cpk	---	---
CR	---	---
CPL	---	---
CPU	---	---
\bar{R}	---	---
3σ	---	---
\bar{X}	---	---
PERFORMANCE		

No Data Available!		

CAM		

No Data Available!		

Alpha controllers maintain both sample and population statistics. Sample statistics are calculated using the last completed subgroup of rivet pulls for a given Task. The subgroup size is set using Subgroup Size. Population statistics are calculated using all of the rivet pulls for a given Task up to the population.

To be included in sample or population statistics, a rundown must exceed the Task's Threshold Force and Statistical Force and the rivet pull must Not be marked as a STOP or ABORT shutoff code.

The statistics are calculated for Force and Distance. Data is filtered by Task. Press the **JOB1.1** interactive menu button and choose the Job and Task under analysis.



Values are recalculated each time a tab is selected.

5.3.4.1 Results

This section shows a summary of the rivet pull data results stored in the controller.

n – Shows the number of rundowns included in the population size.

n OK – Identifies the number of OK rundowns.

n NoK – Identifies the number of NoK rundowns.

n ▲ – Displays the number of rivet pulls that exceeded the high limit.

n ▼ – Displays the number of rivet pulls that did not achieve the low limit.

n Abr – Displays the number of rivet pulls that were aborted.

n Stp – Shows the number of rivet pulls that were stopped.

R – Shows the subgroup range (highest minus lowest value).

▲ – Identifies the highest value of all the rivet pulls in the population

▼ – Identifies the lowest value of all the rivet pulls in the population

The Display parameter under Setup/Other/STATS tab determines which of the following sections are displayed after the Results.

5.3.4.2 Capability

This section shows the capability statistics for the selected Job and Task.

Cp – Displays the capability index for a stable process.

Cpk – Displays the capability index for a stable process, typically defined as the minimum of CPU or CPL.

CR – Displays the capability ratio for a stable process and is simply the reciprocal of Cp.

CPL – Shows the lower capability index.

CPU – Shows the upper capability index.

R bar – Identifies the average range of a constant size subgroup series.

3 sigma – Displays the sample estimated Standard Deviation times three.

X bar – Displays the value's average (mean).

Performance

This section shows the performance statistics for the selected Job and Task.

Pp – Shows a performance index of a stable process.

Ppk – Shows a performance index of a stable process typically defined by a minimum of two calculations.

PR – Identifies the performance ratio for a stable process.

3 sigma – Identifies the sample estimated Standard Deviation times three.

X bar – Displays the value's average (mean).

Coefficient D'Aptitude Moyen

This section shows the CAM statistics for the selected Job and Task.

CAM – Coefficient d'Aptitude Moyen (Mean Aptitude Coefficient) shows a capability index for a stable process used in Europe.

R bar – Identifies the average range of a constant size subgroup series.

3 sigma – Identifies the sample estimated Standard Deviation times three.

X bar – Displays the value's average (mean).

5.3.5 LOG Tab

The BR12PP cordless tool stores up to 1000 Events in the log.

Date	Time	Event	Source	Details
09/12/2019	1:26:17 PM	Parameter Changed	αTB	Other

The details provide the Date and Time the event occurred.

Source – Shows where the user changed the values. Controller means the keypad was used, aTB means the Alpha Toolbox was used.

Details – Shows which part of the controller the changes were made.

Press the BACK interactive menu button to return the LOG screen.

Press the MANAGE interactive menu button to export Log Data to the USB memory stick or to clear the event log.

Use the up/down arrows and/or the numeric keypad to type a file name. Pressing the OK interactive menu button saves the data to the USB memory stick.

After the file is saved, press the OK button to return to the LOG screen.

Press the MANAGE interactive menu button to clear the data.

Press OK to clear the data or press CANCEL to return to the LOG screen.

Press YES to clear the data, No to return to the LOG screen.

6. Appendix

This section provides additional information with setting up, programming, data interpretation, and using a BR12PP rivet tool.

The easiest way to determine the job parameter values is to first create a default job, that means leave all the default parameters in the setup wizard, second pull a rivet on the production application, finally use the trace to determine each program parameter value. Follow the below hints on what to look for in the trace data.

6.1 Rivet Seek setup- Helpful Hints

Rivet seek is the first step of the BR12PP rivet tool program setup. Rivet seek detects if a rivet is present and jaw slippage by requiring a programmable force to be exceeded prior to the tool moving onto the next step.

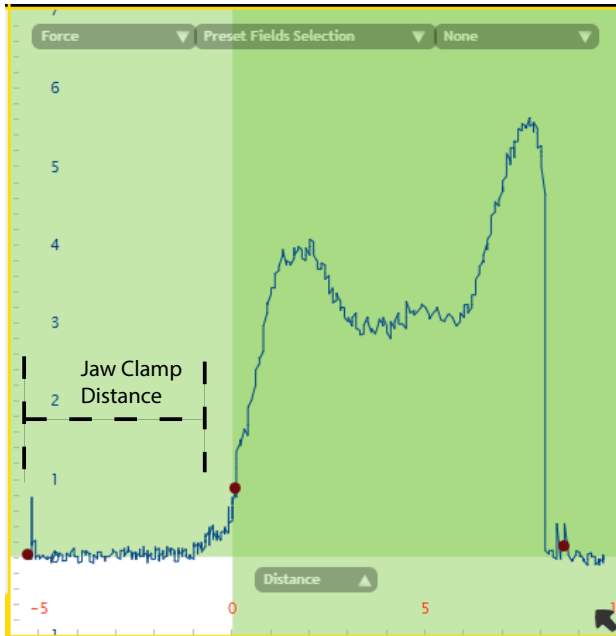
Rivet seek can also reduce wear on the jaws, if setup correctly, by slowly moving the jaws until they are clamped on the rivet mandrel before increasing the speed of the tool to finish the rivet pull process. By default the Rivet Seek step speed is set to 15mm/sec and the final step, DM/FM, is set to a speed of 47mm/sec. These default parameters give an optimized speed and jaw life.

Below are some helpful hints on some of the other setup parameters that can be optimized based on specific applications.

6.1.1 Distance Target Parameter

Distance target cannot be set to anything less than 6mm as it takes at least this distance for the jaws to clamp the rivet mandrel.

The force the BR12PP tool measures is ~0kN until the jaws become clamped on the rivet mandrel.



6.1.2 Grip Force Parameter

Grip Force Parameter should be set lower than the required force to pull the mandrel into the rivet body, typically depicted by the first spike in force on the trace.

If Grip Force is set to zero, the Slow Seek step will be ignored. It is recommended to not set the Grip Force to zero.

Grip force should also be set below or equal to the Snug Force parameter in the DM/FM step.

6.2 DM/FM setup- Helpful Hints

Distance Monitor/ Force Monitor is a monitoring step only, as long as the BR12PP tool start trigger is held until the program stops the tool, the rivet tool will break the rivet. There is no configuration that will shut off the tool for high/low distance, or high/low force. The high and low parameters will only make a judgment of OK or NoK after the tool completes the cycle. Follow the below hints on what to look for in the trace data when setting up the DM/FM step.

6.2.1 Snug Force Parameter

Snug Force parameter should be set higher than or equal to grip force. If Snug Force is set lower than Grip Force, the start distance point, 0mm, will be set at Grip Force instead of the intended Snug Force value.

Snug Force should be set at roughly 70% to 80%, and NEVER above the required force to pull the mandrel into the rivet body, typically depicted by the first spike in force on the trace.

6.2.2 Distance past break Parameter

This value can be setup to pull a rivet mandrel a certain distance after the mandrel and body separate. This value should not be set greater than the max travel of the tool minus the required distance to separate the rivet mandrel and body, including the distance to clamp the jaws onto the mandrel. If this value is set too high, an "MT" Max- travel shutoff code will be displayed.

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