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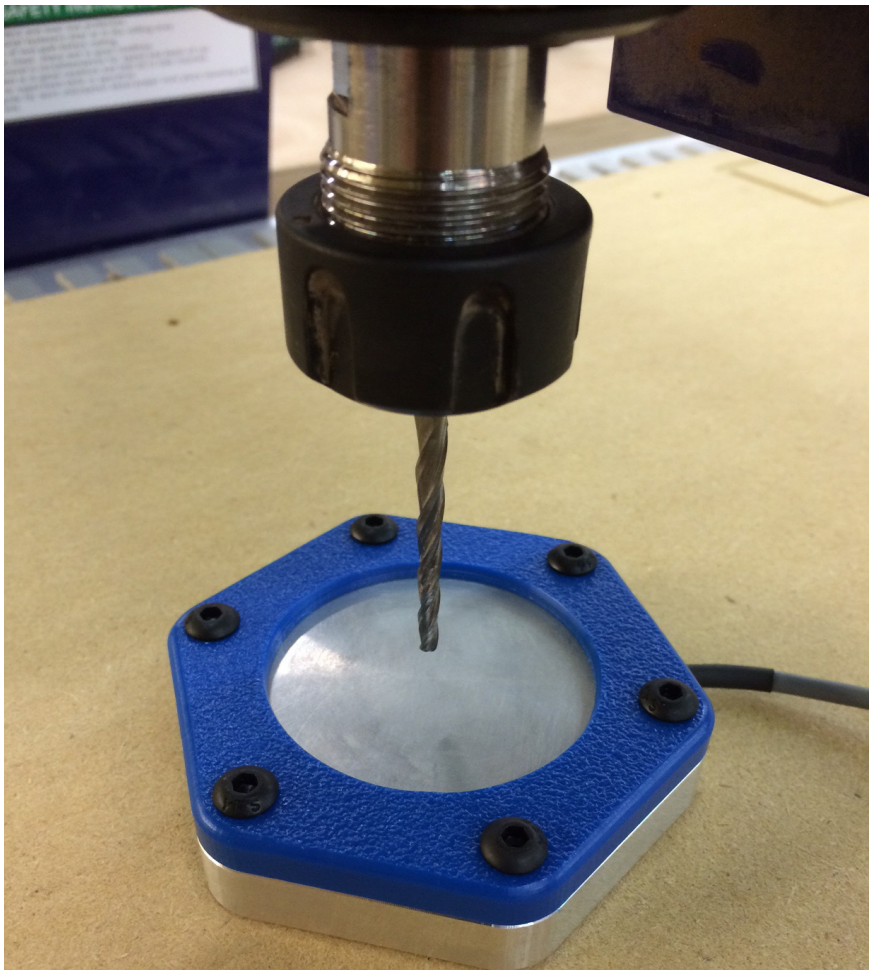
Pressure Sensitive Z Zero Plate



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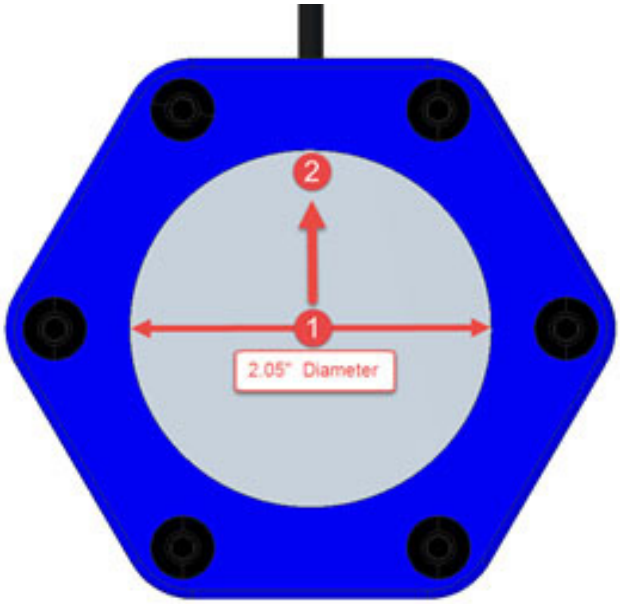
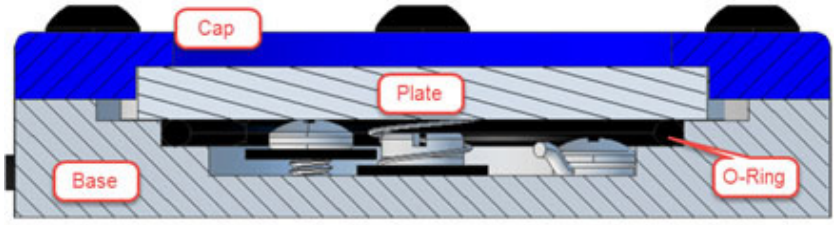
Introduction

This document is for setting up and using the Pressure Sensitive Z-zero plate, replacing the standard Z-zero plate which comes with the tool. The Pressure Sensitive Z-zero plate functions identically to the standard Z-zero plate, using the same Wago connection and C2 command; however the Pressure Sensitive Z-zero plate does not require an alligator clip, and can be used to zero rigid non-conductive cutters.



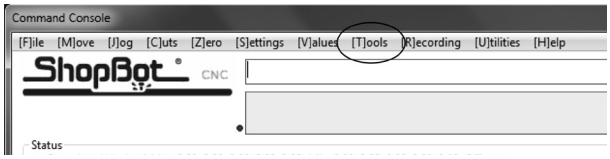


Users can expect repeatability under 0.001” when bit contact occurs at identical points. For example, if designated XY coordinates for the C2 command corresponds to a fixed location, or if using an ATC. Between points 1 and 2 (above) users can expect variance in measured plate thickness up to 0.001”. For this reason, if the plate is being placed by hand, it is worthwhile to ensure that bit contact is occurring as close as possible to the center of the plate for high tolerance applications. This is due to the compressible nature of the O-ring which is isolating the plate from the base, as shown in the section view above.

NOTE: Always handle the z-zero plate by the plate, and not by the cord.

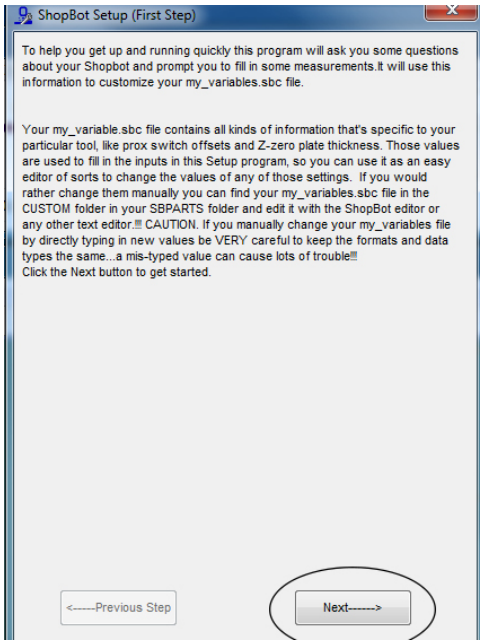
Z Zero Plate Setup

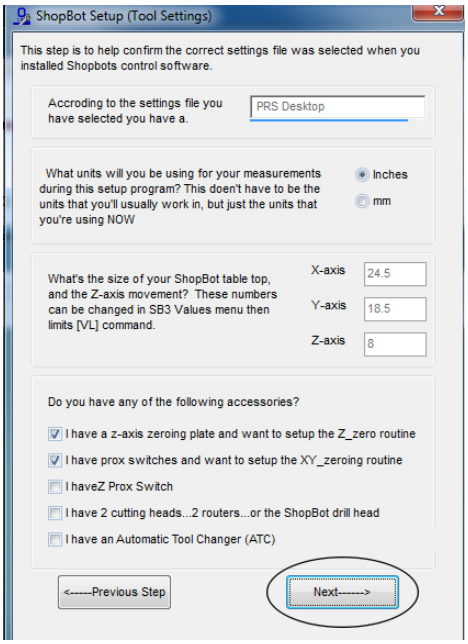
The suggested default plate thickness value for the Pressure Sensitive Z-Zero Plate is 0.570”. To update the plate thickness value:.



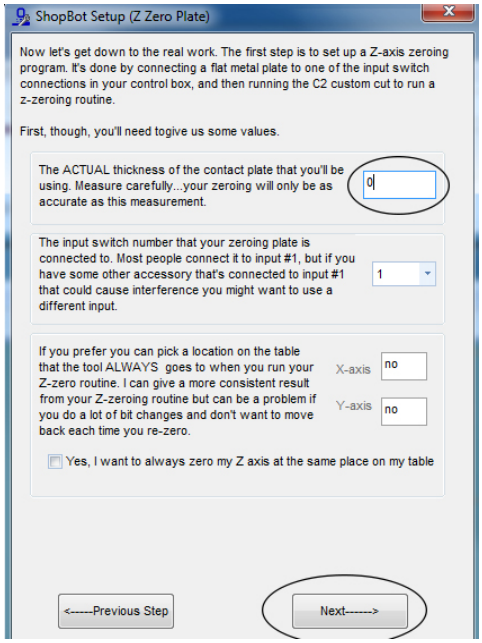
Open ShopBot3 software. Make sure tool is not in EASY mode.

Click Tools, then Shopbot Setup.

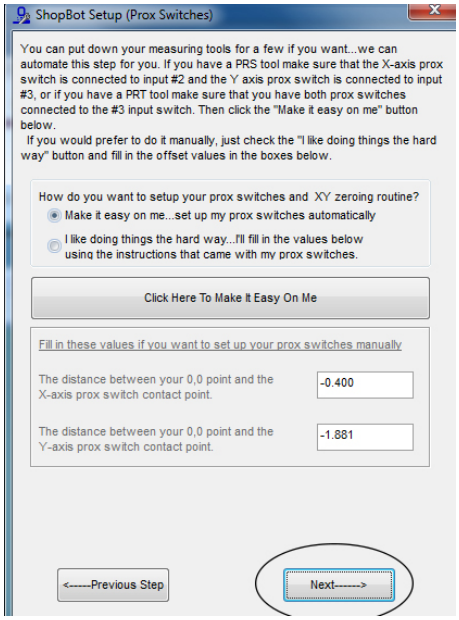


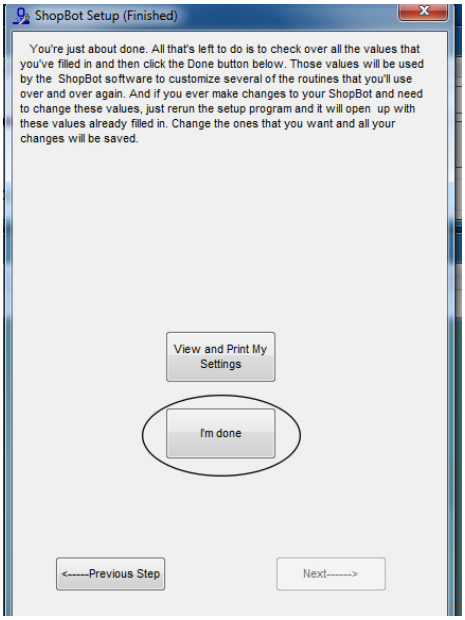


Click “Next”, then “Next” again.



Enter desired thickness of Z-zero plate, and click “Next”.



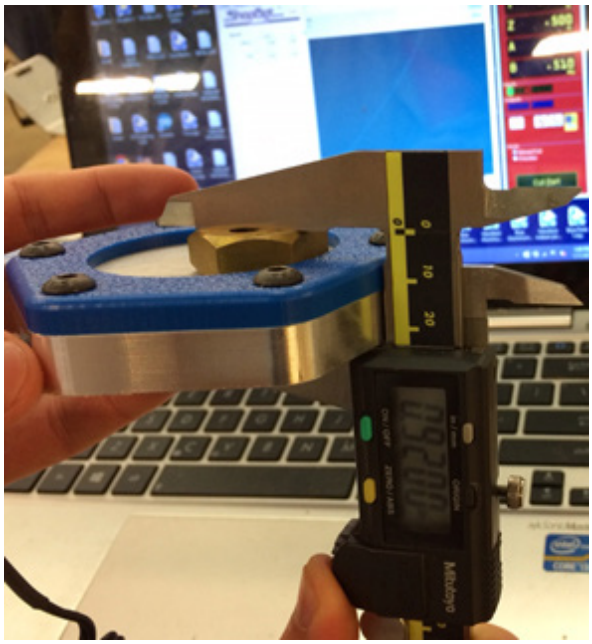


Click “Next” again, and “I’m Done”.

Z Zero Plate Thickness Measurements

For very high tolerance machining applications, there are two suggested methods for calibrating the thickness of the z zero plate. The first and most accurate is to use a measuring device such as a micrometer or caliper and carefully compress the z zero plate until input 1 is triggered.

Using a micrometer is simplest, but the method shown below uses calipers to measure a spacer of arbitrary thickness (in this case, a 0.350” thick nut). The spacer (nut) is installed on the Z-Zero plate, and the calipers are closed to compress the z zero plate to the point of triggering Input 1 (in this case, the trigger point is 0.920”). The difference between the spacer and total measurement (in this case 0.57”) will give the final thickness of the z zero plate when Input 1 is triggered.



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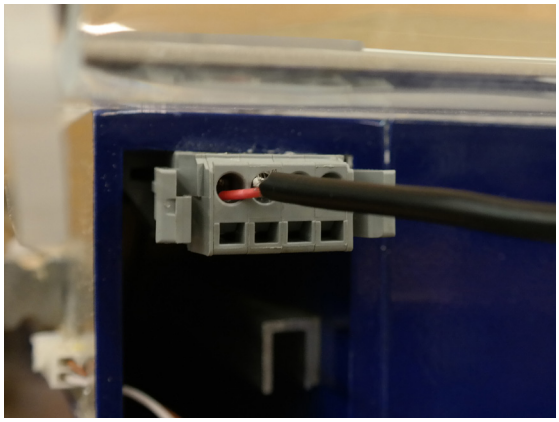
If calipers or a micrometer are not available, the tool itself can be used to find a rough estimate of plate thickness by using the following steps.

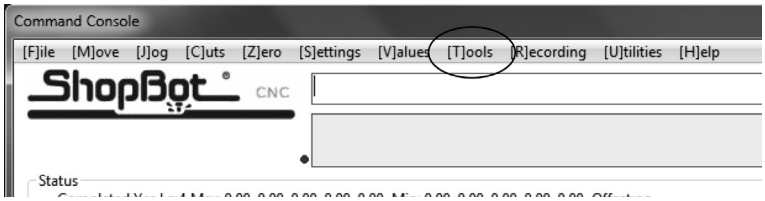
Surface spoil board.

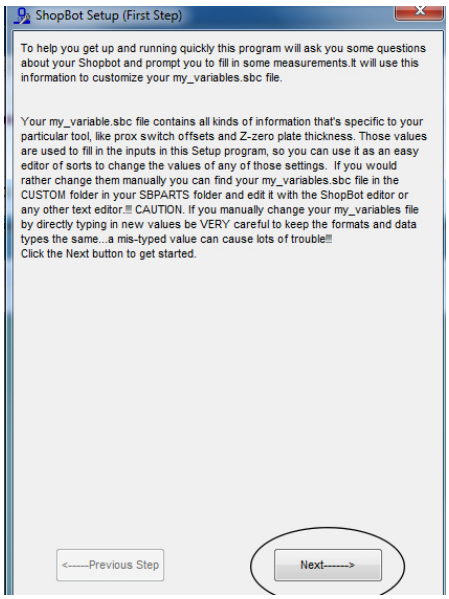


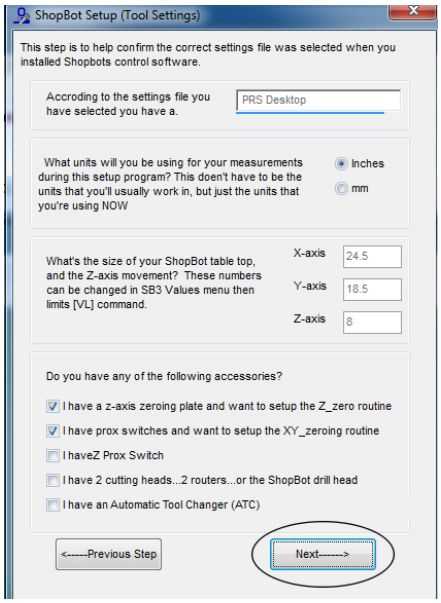
Plug in Wago connector.

Open ShopBot3 software.

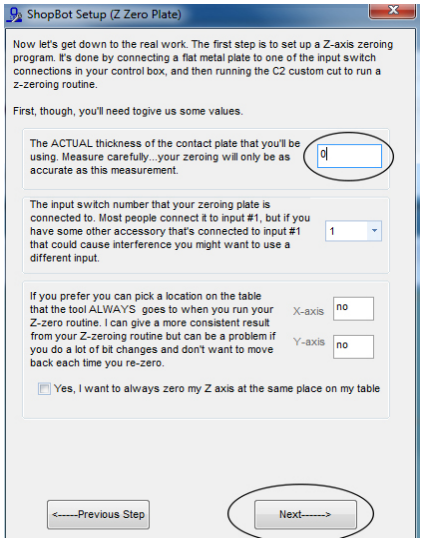
Click Tools, then Shopbot Setup.



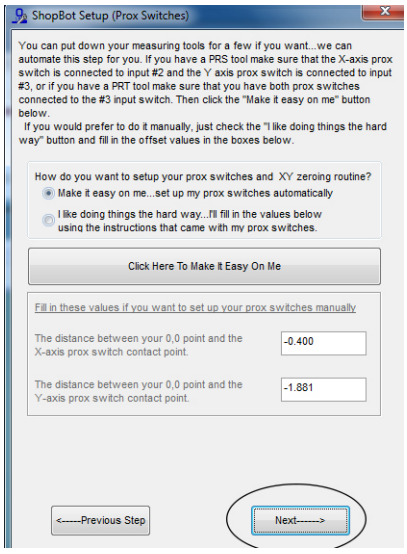


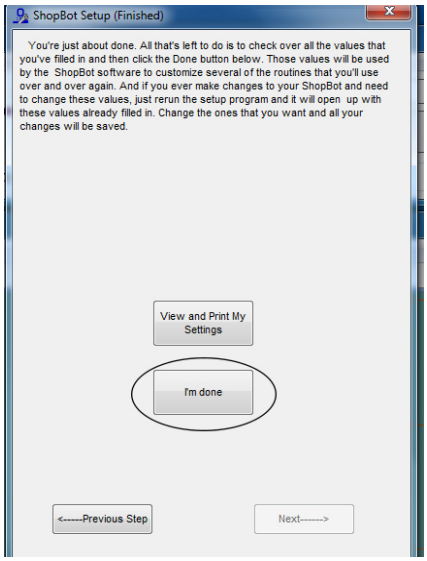


Click “Next”, then “Next” again.



Enter thickness of Z-zero plate as “0”, and click “Next”.





Click “Next” again, and “I’m Done”.

Run “C2” command to zero the bit to the surface of the plate ~0.57” from table surface.

Open keypad and click “Fixed” button.

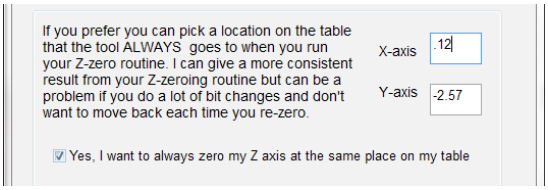
Perform paper test:

- Place a piece of paper onto spoil board. Paper is generally considered to have a thickness of 0.004”.
- Lower bit until paper is barely held by bit.
- Check the position screen and note Z number.

Repeat Z-zero plate setup as above, but enter thickness of Z-zero plate as determined above.

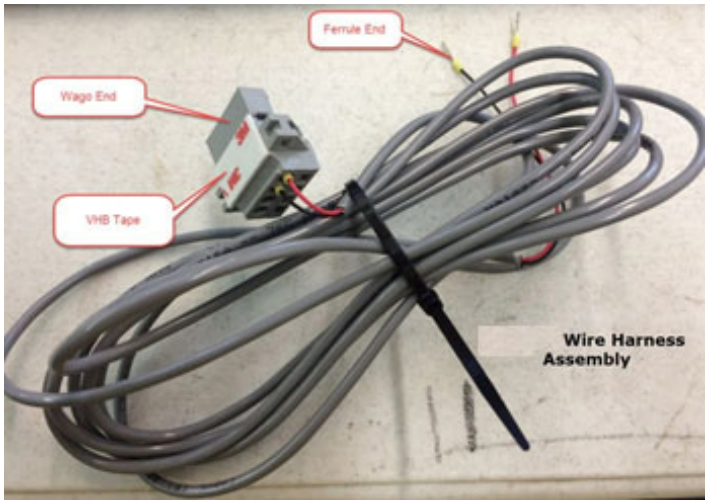
Setting a Fixed Z Zero Plate Location

Run the TS (Tool Setup) routine. Check the box below and fill in the fields for the desired fixed Z Zero location using the overtravel of the tool (not necessary for ATC users).

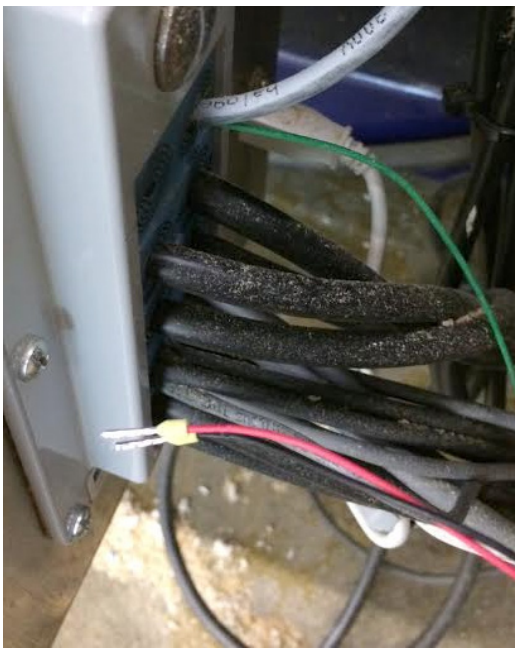


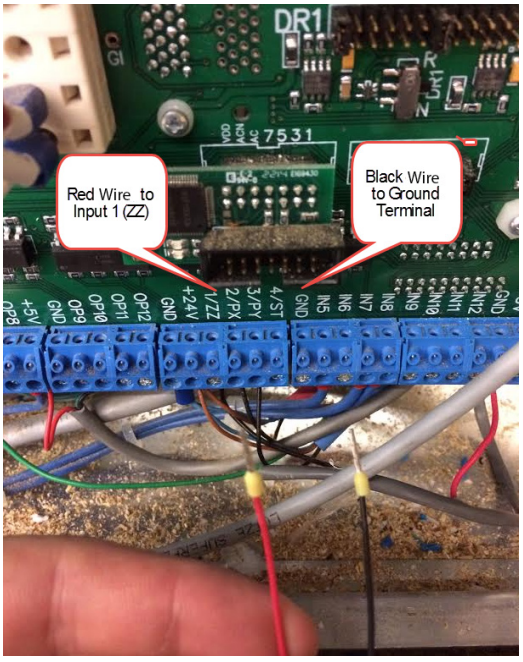
For Gantry/ATC Tool Users

To position the Pressure Sensitive Z Zero Plate in a fixed location with the overtravel of the tool to automate the C2 Routine, it will be necessary to install a wire harness from the control box to the designated location through the following steps.



- Locate the wire harness that came with the plate and remove the zip tie holding it.
- Shut off power to the tool and open the control box.
- Feed the ferrule end of the cable through one of the Roxtec cable entries on the side of the control box.
- Use a flathead driver to wire the Red wire to Input 1 marked as 1ZZ on the control board such that it is sharing the terminal block with the existing Z Zero Plate wire.
- Wire the black wire to any ground terminal on the control board marked Gnd.
- Retighten the Roxtec cable entries and run the wire underneath the tool to the designated location of the fixed z zero plate routine. Remove the paper cover from the strip of VHB tape on the back of the Wago end, and stick the Wago securely to the chassis where it will not interfere with tool travel or be vulnerable to material being loaded on or off the tool.





For ATC Users

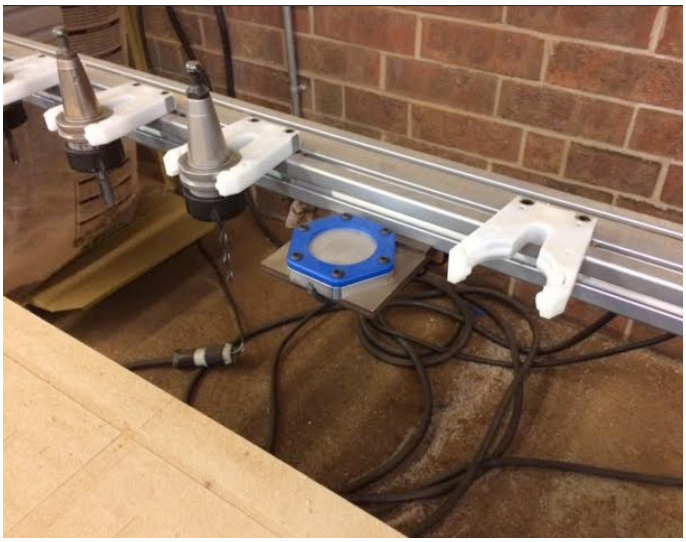
Use a 4mm allen wrench to unscrew the four bolts on the underside of the phenolic block holding the ATC's fixed Z Zero Plate.

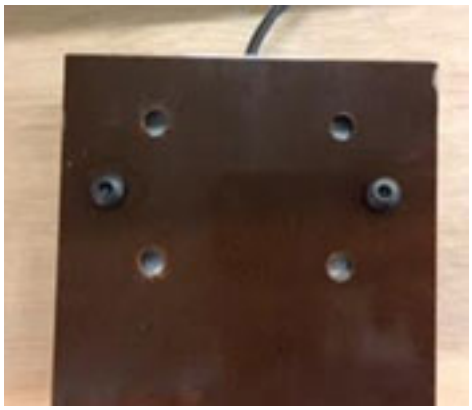
Ensure the phenolic block is free from debris and place the Pressure Sensitive Z Zero Plate securely in the hexagonal pocket. Plug the plate into the Wago connector run.

Use the two 10-32 bolts provided to fasten the Pressure Sensitive Z Zero Plate to the phenolic block through the underside of the phenolic block.

Re-center the fixed Z Zero plate location by loading the file "ATC_FixZ_Plate.sbp" located in "C:\Sb-Parts\Custom\ATC\ ATC_FixZ_Plate.sbp".

Reset the tool's plate offset by running a CN73 command.





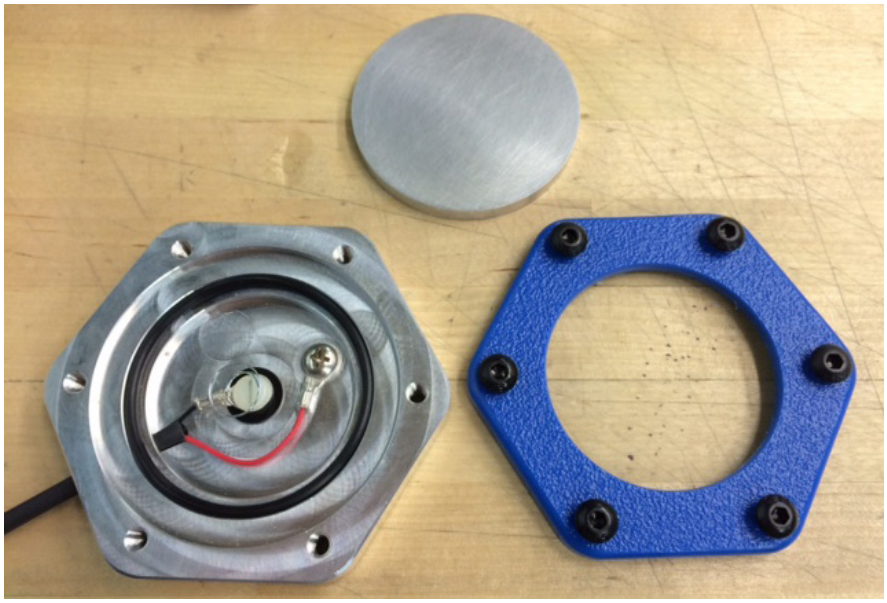
Users retrofitting an ATC purchased before 07/01/16 will need to install a replacement phenolic block (Part number 003547) in order to mount the Plate directly to the tool rack.

Contact ShopBot Sales at (919) 680-46800 to purchase directly.

Z Zero Plate Troubleshooting

Problem	Potential Cause	Resolution
Input 1 is always on.	Plate is stuck.	Press on plate to see if it comes loose. Loosen bolts slightly.
	Chips or dust under cap causing sticking.	Remove six 1/8” hex bolts and cap. Clean under cap with cloth and rubbing alcohol to eliminate contaminants. Install cap and secure with hex bolts.
	Wire or Spring may have come loose.	Remove six 1/8” hex bolts and cap. Remove plate and ensure wire is firmly connected to ring terminal and spring is secure. If wire is loose, or has disconnected from plate, reattach wire with electrical tape or crimpers if available. Install plate, cap, and six 1/8” hex bolts.
	Wires may be frayed.	Remove six 1/8” hex bolts and cap. Remove plate and ensure wire is firmly connected to ring terminal and spring is secure. Loosen wires from under washer. If wire is loose, reattach wire. If wire is frayed, isolate each wire with electrical tape. Install plate, cap, and six 1/8” hex bolts.
Input 1 does not turn on.	Wago connector may not be plugged in.	Make sure Wago connector is plugged in and both wires are firmly installed.
	Chips or dust under cap causing sticking.	Loosen six 1/8” hex bolts. Blow air under cap to eliminate contaminants. Re-tighten hex bolts.

Problem	Potential Cause	Resolution
	Positive wire may be loose.	Remove six 1/8” hex bolts and cap. Remove plate and ensure wire is firmly connected to ring terminal and spring is secure. If wire is loose, or has disconnected from ring terminal, re-attach with electrical tape or crimpers if available. Install plate, cap, and six 1/8” hex bolts.
During Z Zeroing, bit missed plate and contacts the blue HDPE cap.	The plate is stuck in compression from the blue HDPE cap.	First loosen and the remove six 1/8” hex bolts and cap. Examine the cap’s inner race for damage or denting and try to flatten the inner race. Reinstall plate, cap, and six 1/8” hex bolts.



If these troubleshooting steps do not fix the problem, please contact ShopBot technical support at the contact information located on the first page of this document.