

## TECHNICAL BULLETIN - 9/23/2020

### BACKGROUND:

It has come to our attention that some Razorcut 45 Plasma Cutters may have been affected by an infrequent misfiring issue. During investigation, it has been determined that this issue is caused by improper timing delay between the electrode start current and the air solenoid valve. Fortunately, a field repair using off-the-shelf supplies can be easily performed to fix the issue.

### AFFECTED MACHINES:

Any Razorcut 45 Plasma Cutter purchased through Langmuir Systems between March 2018 and present that is experiencing a torch misfire when the trigger is pulled or the torch is commanded to fire under CNC control. A misfire is characterized by the plasma cutter being commanded to fire but the pilot arc does not come on and the plasma torch continues to blow air only. Please ensure that your misfire is not caused by incorrect operating procedures such as dirty air, irregular Air pressure or worn out consumables and your machine is not in Air check mode or inconsistent input power commonly caused by running your Plasma cutter on an extension lead.

### TOOLS NEEDED:

- Phillips Screwdriver
- Soldering Iron

### MATERIALS NEEDED:

- Solder (preferably Rosin Core Solder)
- Electrical Tape
- One 100k $\Omega$  resistor

### REPAIR PROCEDURE:

- 1.) Unplug your plasma cutter from wall power and leave unplugged for 10 minutes before proceeding.

**!WARNING!** YOU WILL NEED TO LEAVE YOUR PLASMA CUTTER UNPLUGGED FOR A FULL 10 MINUTES TO GUARANTEE THAT THE HIGH VOLTAGE CAPACITORS INSIDE HAVE FULLY DISCHARGED BEFORE PROCEEDING.

**!WARNING!**

- 2.) Remove the 3 sheet metal screws from one side of the plasma cutter. Flip the cutter over and remove the 3 additional sheet metal screws on the opposite side of the plasma cutter. The fastener locations for one side are shown circled in red below.



3.) Remove the 1 screw on the back of the plasma cutter as shown in the picture below circled in red.



- 4.) Remove the 1 screw on the front of the plasma cutter as shown in the picture below circled in red.



- 5.) Remove the 2 screws from the top of the plasma cutter as shown in the picture below circled in red.



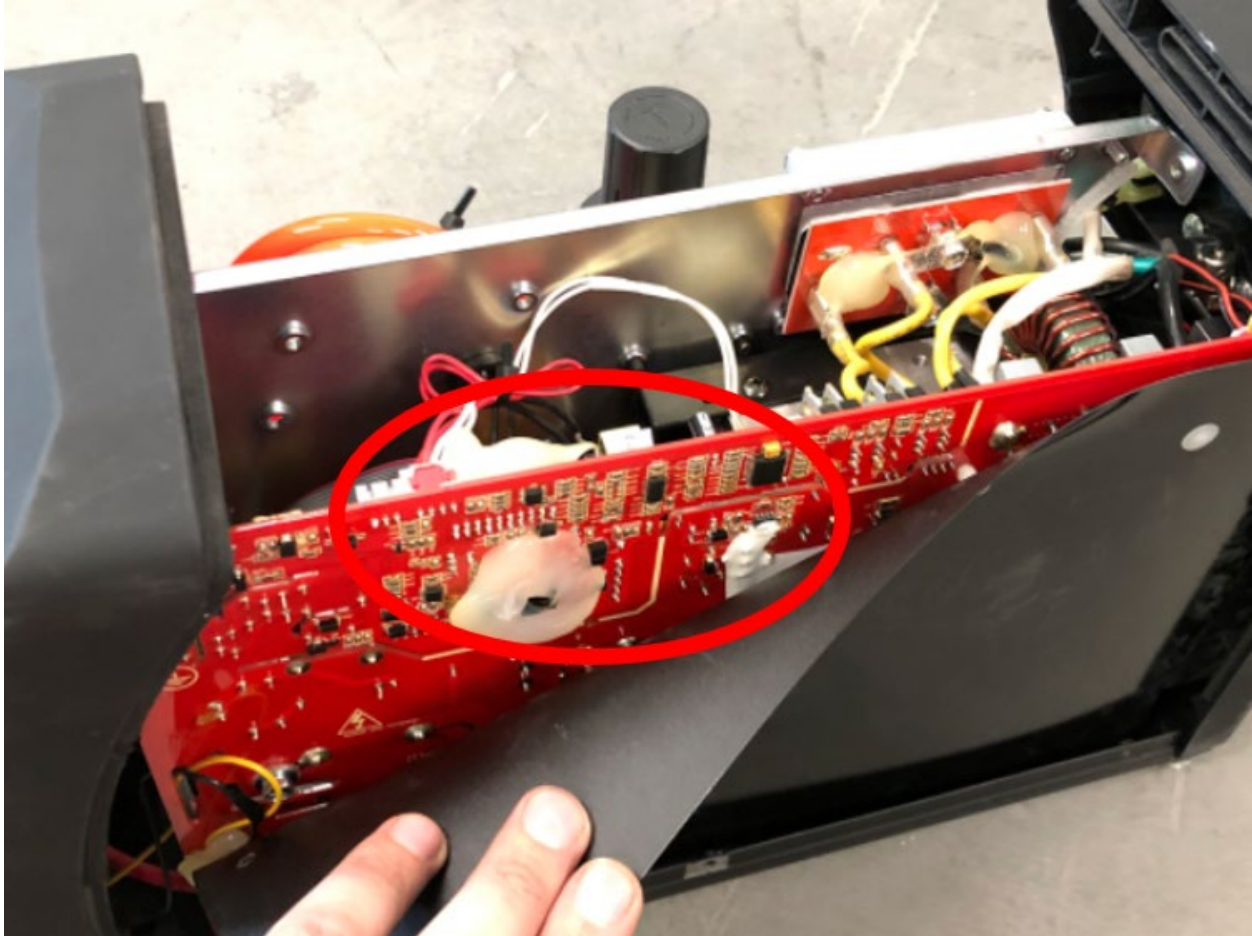
6.) Flip the plasma cutter upside down and remove the 4 screws from the bottom of the plasma cutter as shown in the picture below circled in red.





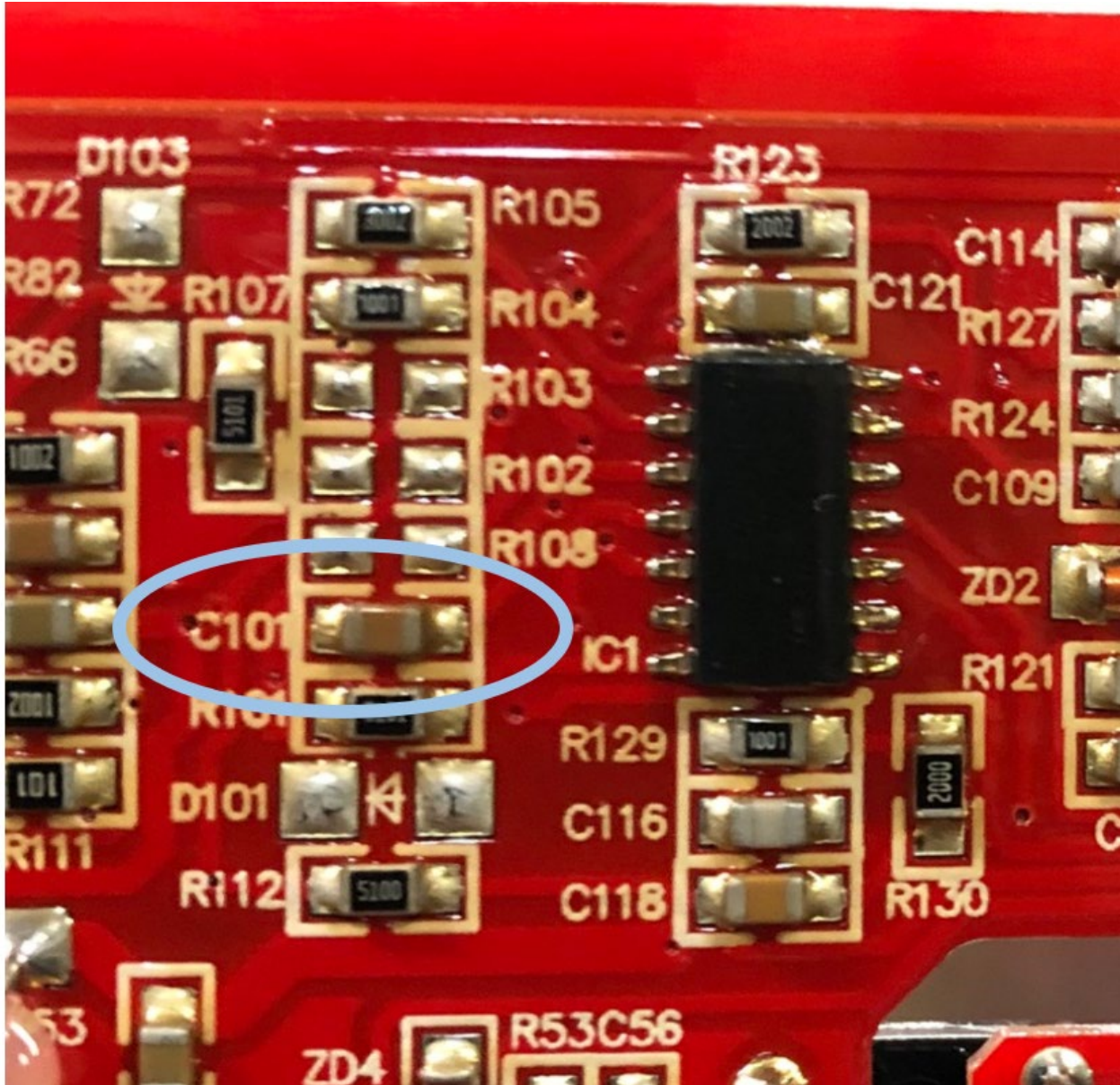


8.) Inside the plasma cutter you will find the large red control board. On the backside of this is a black plastic panel; peel back this plastic panel to reveal the area that we will be working on for the repair. Below is an image of the exposed area of interest circled in red.

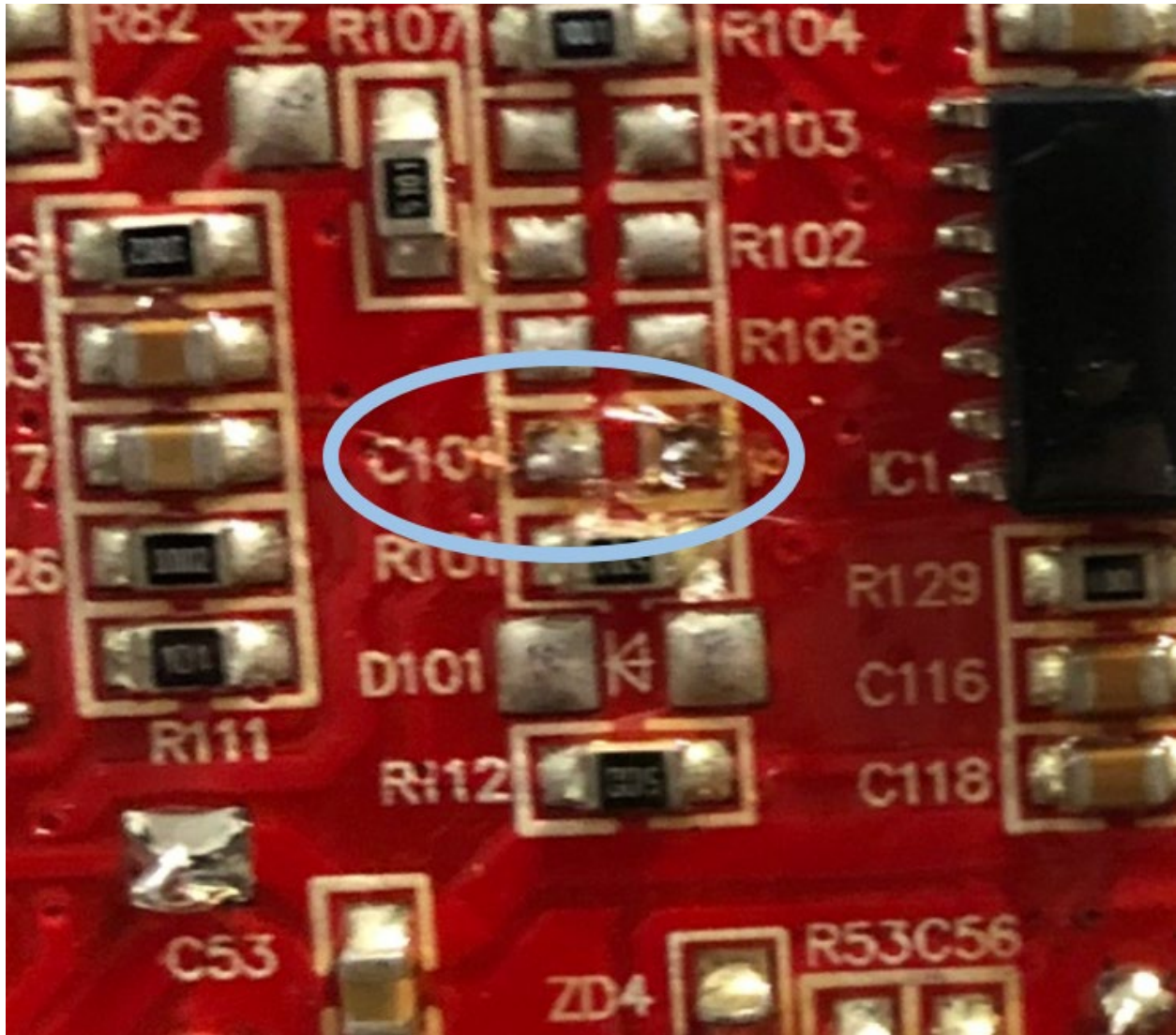


- 9.) Next, locate the capacitor labeled C101 on the red board. It is circled in blue below.  
NOTE: IF YOU CANNOT LOCATE THE C101 CAPACITOR, IT IS POSSIBLE THAT IT IS UNDER A GLOB OF WHITE RTV SILICONE. PEEL THIS SILICONE OFF THE RED BOARD TO EXPOSE THE REGION IN QUESTION BEFORE CONTINUING.



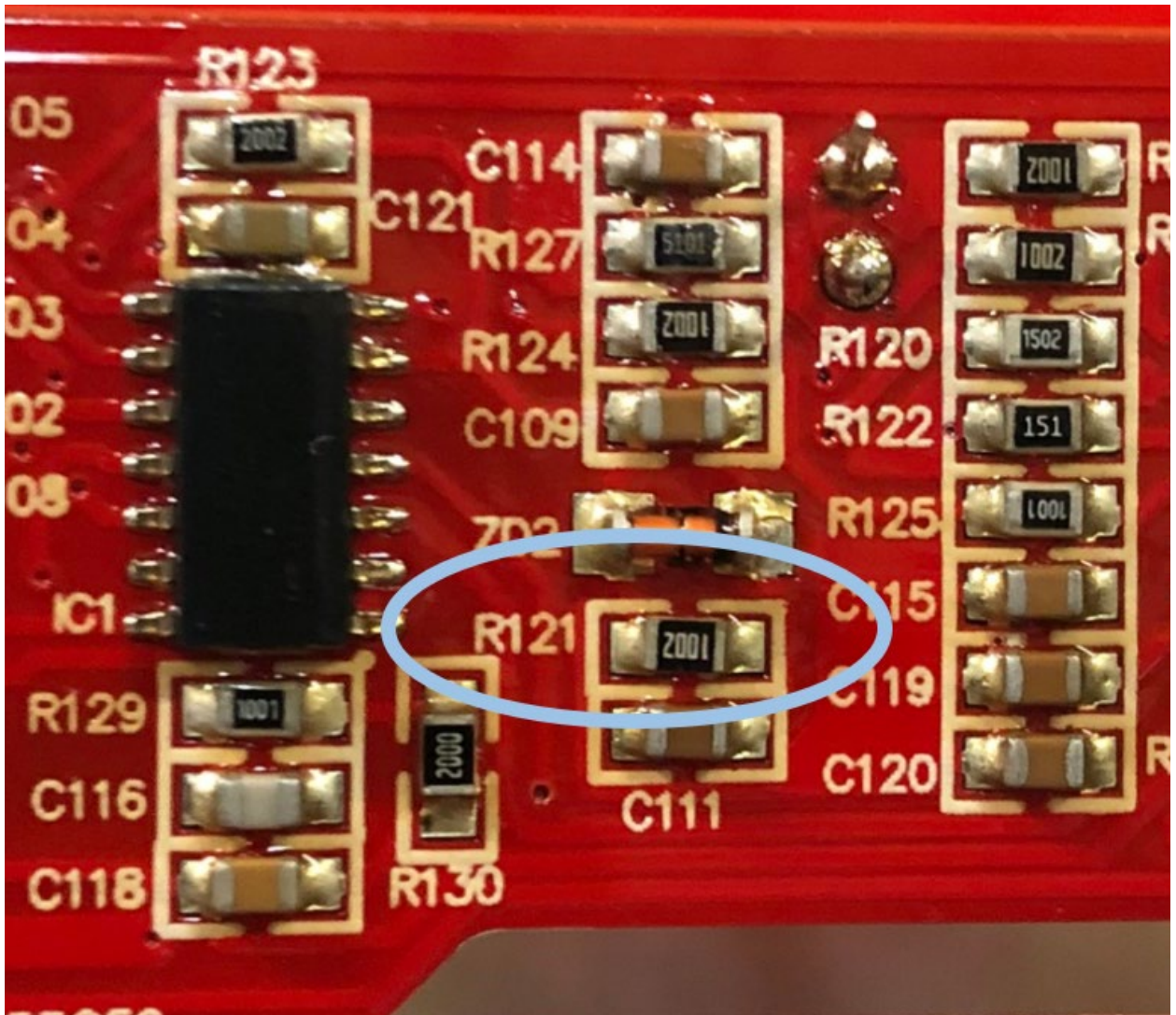


- 10.) Next, you will need to remove this C101 capacitor from the board completely. The easiest way to do this is to touch your hot solder tip against the solder pad on the left side of the capacitor until the solder turns liquid. Once this happens, flick your soldering iron to the right to peel this capacitor up and off the left side pad. Once the resistor has been peeled, you may need to use your soldering iron on the right pad to remove the capacitor completely. You can discard this capacitor; we will be keeping these solder pads empty. If performed correctly, your board should look like the picture below. **NOTE: BE CAREFUL TO AVOID ACCIDENTALLY REMOVING ANY ADJACENT COMPONENTS HERE. ALSO BE CERTAIN THAT THE SOLDER PADS FOR C101 REMAIN EMPTY AND DO NOT TOUCH ADJACENT PADS WITH SOLDER WHEN REMOVED.**

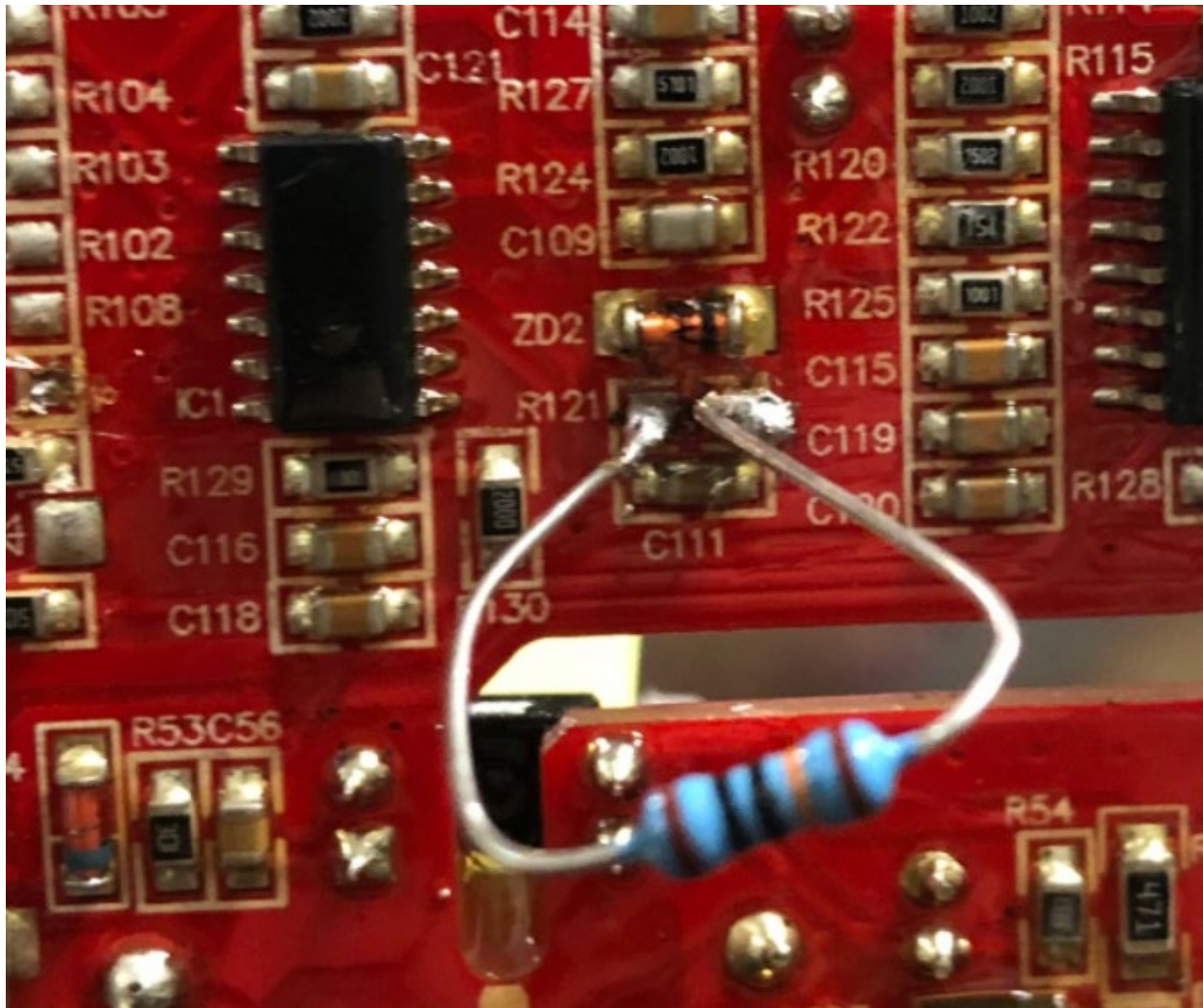


- 11.) Next, you will be removing the R121 resistor from the board completely and replacing it with a 100k $\Omega$  resistor. The R121 resistor is shown circled below in blue. NOTE: IF YOU CANNOT LOCATE THE C101 CAPACITOR, IT IS POSSIBLE THAT IT IS UNDER THE WHITE RTV SILICONE. PEEL THIS SILICONE GLUE OFF THE RED BOARD TO EXPOSE THE REGION IN QUESTION BEFORE CONTINUING.

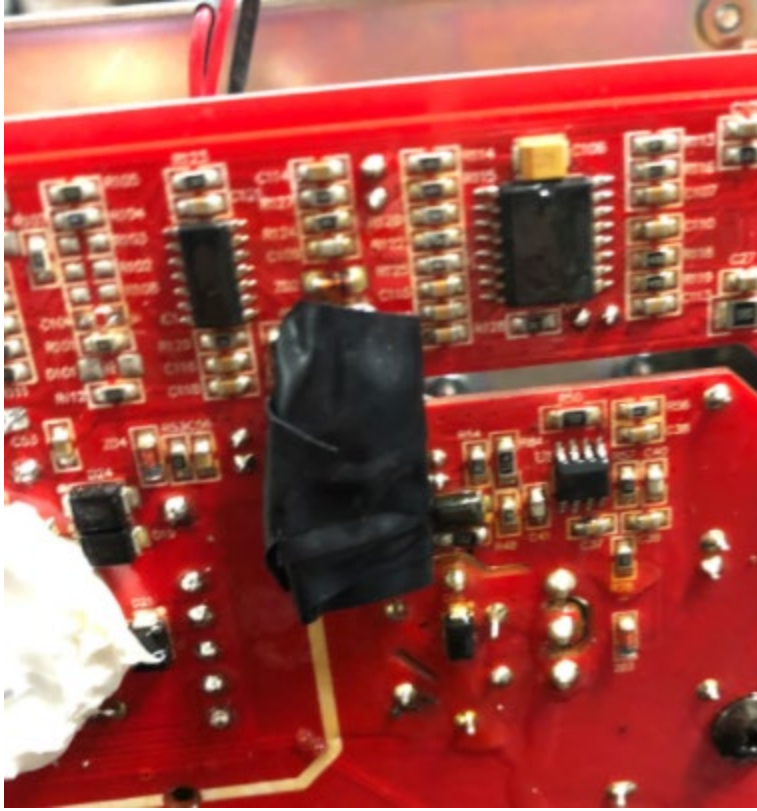




- 12.) To do this we first need to remove the R121 resistor from the board. You will do this in the exact same manner that was used to remove the C101 capacitor above. After removing this resistor, you will need to solder the 100k $\Omega$  resistor to the two empty solder pads at the R121 position. Solder one end of the resistor to one of the solder pads and solder the other end of the resistor to the remaining solder pad. When done correctly, your soldered resistor should look like the picture shown below. NOTE: BE CERTAIN THAT AFTER SOLDERING THE RESISTOR INTO POSITION, YOUR NEW SOLDER JOINT DOES NOT TOUCH THE ADJACENT SOLDER PADS FOR ZD2 AND C111. IF YOU ARE UNCERTAIN, USE A MULTIMETER TO VERIFY THERE IS NO CONTINUITY BETWEEN ADJACENT SOLDER PADS.



- 13.) After completing the solder repair, you will need to wrap the exposed resistor leads in electrical tape or shrink wrap to prevent these leads from touching other components on the board. After completely wrapping the solder leads, fold the resistor down as shown below. Be certain to visually inspect that the resistor is not touching any other components at the base when folded down into position.



- 14.) Re-install the screws, handle, and cover that were removed in steps 2 through 6 to put your plasma cutter back together for cutting.
- 15.) If you are unsure or not confident that you can do the above then connect with us on [sales@razorweld.com](mailto:sales@razorweld.com) and we can make arrangements to facilitate the changes for you.