

TrythisTV

VDO Cruise control repair

Version 1 (August 2022 Revision)

For the latest most up to date version:

<https://trythistv.com/cruise-control/>

For videos explaining the procedures:

Actuator testing: https://youtu.be/U_aS3VUR9-k

Stalk and wiring testing: https://youtu.be/2kak_G_EQGk

Amplifier Repair: <https://youtu.be/fW7DTucvysE>

This document and the above linked videos provided free of charge

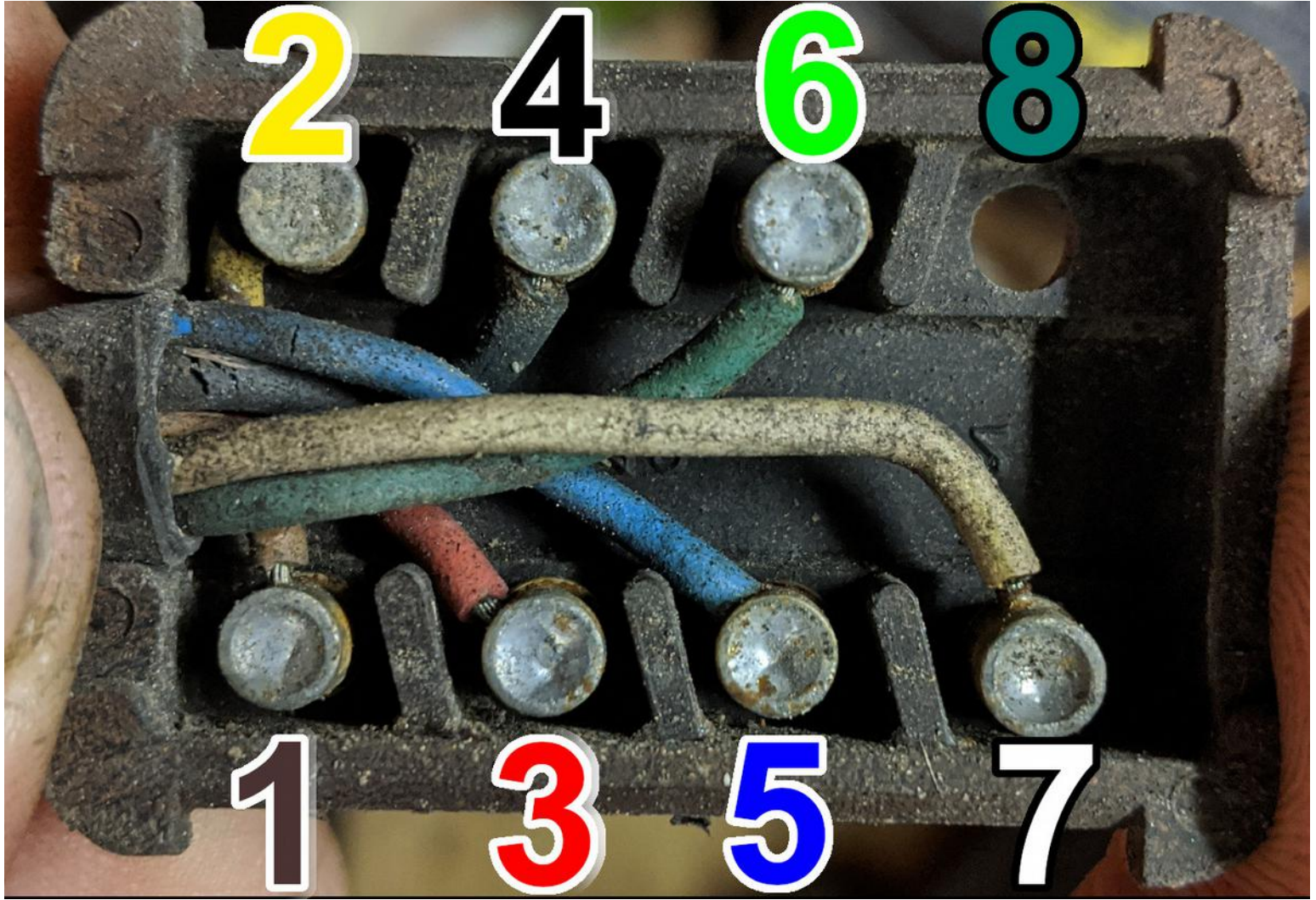
Early style amp and broken solder joint photos contributed by Joe W.







Testing done at the actuator, Prepare jumper leads from a 12 volt source ideally through a fuse around 5A rated:

	Pin	Test condition	Expected result	My Results
Test 1	4: Motor	Connect to 12v+	Audible motor whirring Amp draw 0.12-.018A (120mA-180mA) Optional test: Ohm value 3-30 ohms	
	5: Motor	Connect to Multimeter then GND or directly to GND if using clamp meter		
Test 2	6: Solenoid	Connect to Multimeter then GND or directly to GND if using clamp meter	Solenoid clicks	
	7: Solenoid	Tap to 12v+ and listen for solenoid click		
Test 3	5 & 6	Connect to Multimeter then GND or directly to GND if using clamp meter	Actuator pulls (Don't run too far, might strip gears)	
	4 & 7	Connect to 12v+ momentarily		
Test 4	2 & 3	Test ohms between pins with multimeter (DO NOT CONNECT 12V ACROSS PINS)	Close to 0 ohms	
Test 5	3	Test ohms to GND	Between 2.8K and 4K ohms	



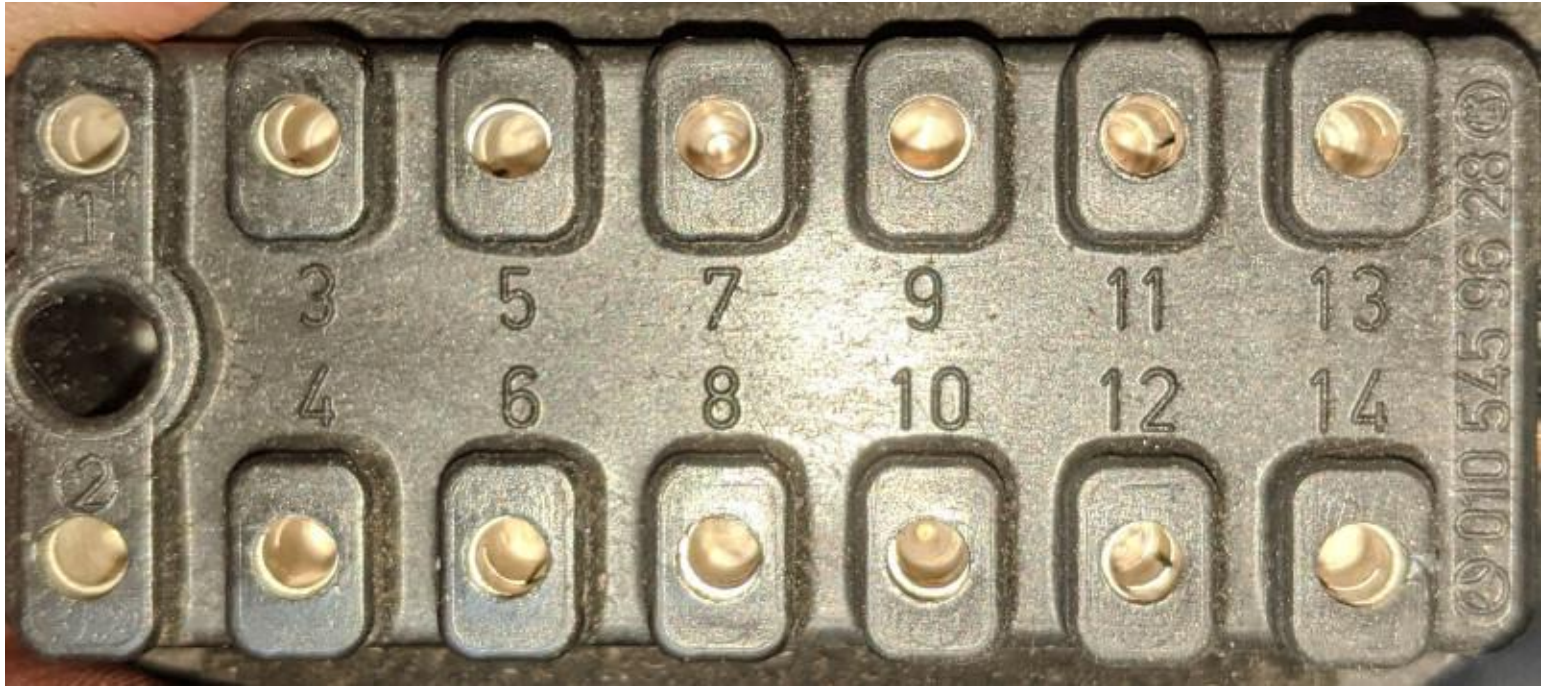
In the event your plug is different, or somehow falls apart, here is the color codes along with numbered pins for each color:



Pin 1	Brown		Ground
Pin 2	Yellow		Potentiometer
Pin 3	Red		Potentiometer
Pin 4	Black		Motor
Pin 5	Blue		Motor
Pin 6	Green		Solenoid -
Pin 7	White		Solenoid +
Pin 8			Empty socket

Testing Control stalk, amp power, brake circuit and wiring to actuator.

Plug actuator back in, remove kick panel in drivers footwell, unplug amplifier and proceed with tests:



The following tests are performed with the **ignition switch on** and are measured at the *Unplugged* Amplifier.

Test 1: Meter set to DC Voltage mode

A) Switch Test (meter common to ground)

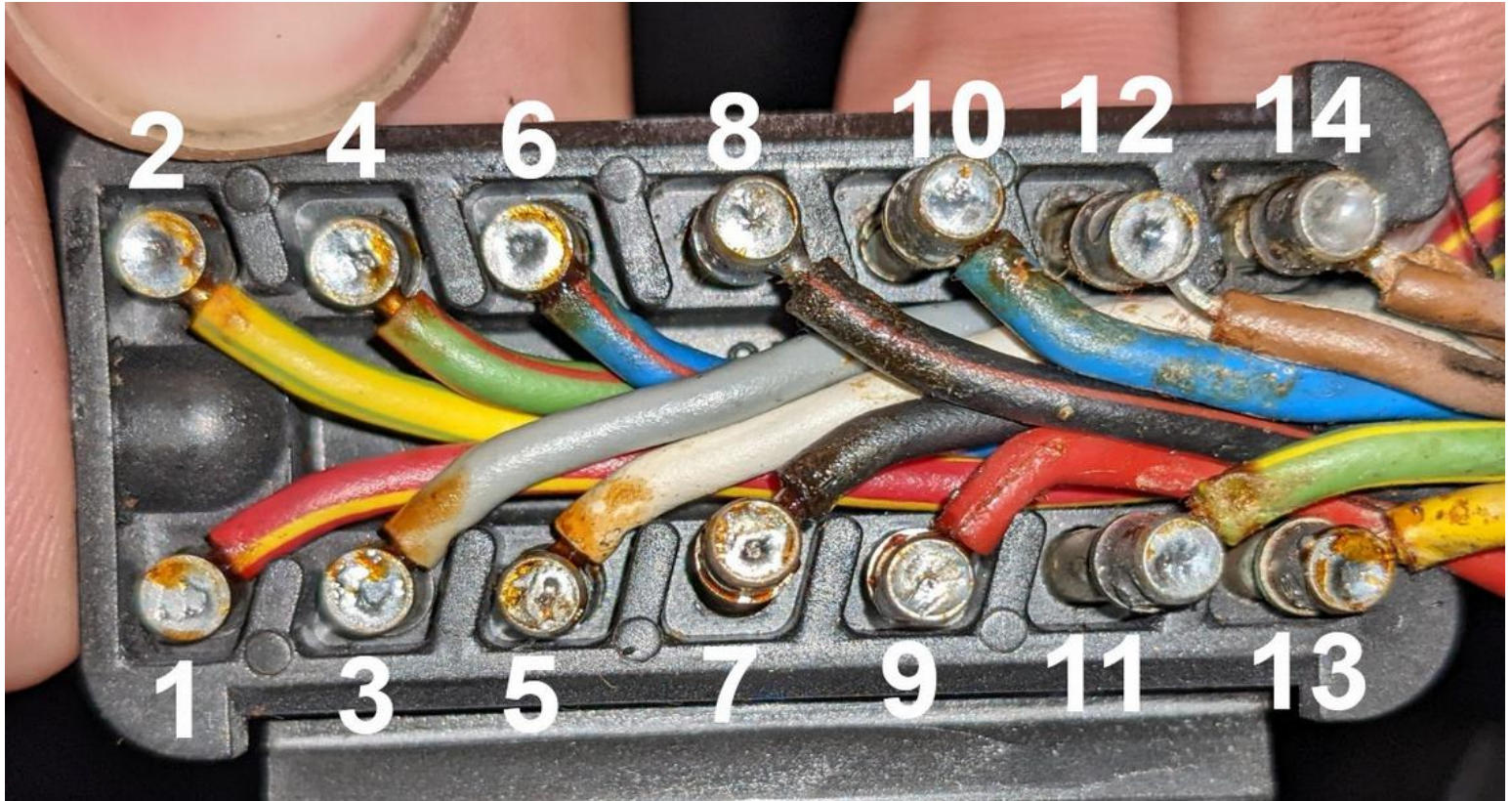
Pin 1	Battery voltage	(BV = battery voltage: somewhere between 12.5 and 13.8 Vdc)
Pin 2	Decel/Set	0 Vdc initially - goes to BV when stalk pushed to Decel/Set
Pin 3	On/Off	BV initially - goes to 0 V when stalk pushed to Off
Pin 4	Accel/Set	0 Vdc initially - goes to BV when stalk pushed to Accel/Set
Pin 6	Resume	0 Vdc initially - goes to BV when stalk pushed to Resume
Pin 8	Brake Disengage	MUST BE 0 Vdc for Cruise System to work - goes to BV when you push on the brake.

Test 2: Meter set to ohms/resistance

Ignition switch off, make measurements at the female amp plug with the (Amp unplugged)

Test From Pin	To Pin	Resistance	Tests	My Result
7	10	3 to 30 ohms (not 0 ohms!)	Actuator motor wiring	
7	Gnd (12)	infinity	Actuator motor not shorted to GND	
10	Gnd (12)	infinity	Actuator motor not shorted to GND	
5	Gnd (12)	infinity or possibly around 40 ohms depending on model	Actuator solenoid	
9	Gnd (12)	Between 2.8K and 4K ohms	Actuator potentiometer	
9	13	0 ohms approx.	Actuator potentiometer	

If you accidentally pop your amp connector apart, here is a photo of how it should look, as well as a table with the colors I could see.



These are vague color codes based on my observation, I did not pull the connector fully apart to inspect each wire, as I did not want to risk losing my cruise control.

Pin 1: Red W/ Yellow Stripe	Pin 2: Yellow W/ Green Stripe
Pin 3: Grey	Pin 4: Green W/ Red Stripe
Pin 5: White	Pin 6: Blue W/ Red Stripe
Pin 7: Black	Pin 8: Black W/ Red Stripe
Pin 9: Red	Pin 10: Blue
Pin 11: Green W/ Yellow Stripe	Pin 12: Brown
Pin 13: Yellow	Pin 14: Brown

The cruise system is provided a critical ground through the brake light bulb filaments via pin# 8 on the amp plug.

If both brake light bulbs are burned out or there is not proper ground here the system will not work. LED bulbs may also cause issues, using a load resistor or bulbs with integrated resistors may allow proper function.

This is the mechanism for canceling the Cruise when you step on the brake: this pin goes from ground to battery voltage, thus losing a ground which is necessary for the system to stay engaged.

If all these tests are within the specified values, The issue is likely the amp.

They are known for bad solder joints due to heating and cooling that happens inside a car, and age/vibration certainly having an effect also.

Step 3: Amp Repair

The basics after removing the amp is to disassemble it by prying the tabs that hold the connector in the aluminum case away and pulling the circuit board out of the shell.

After that, use lacquer thinner to remove the varnish from the green side of the board (Some may be colors other than green, we want to clean the side with the solder and traces, not the components.)

After you have cleaned with the Lacquer thinner for a while, blow the board off with compressed air to remove any residue.

Then we will replace the capacitors, desolder the old ones, most boards should have 5 caps, The factory ratings are:

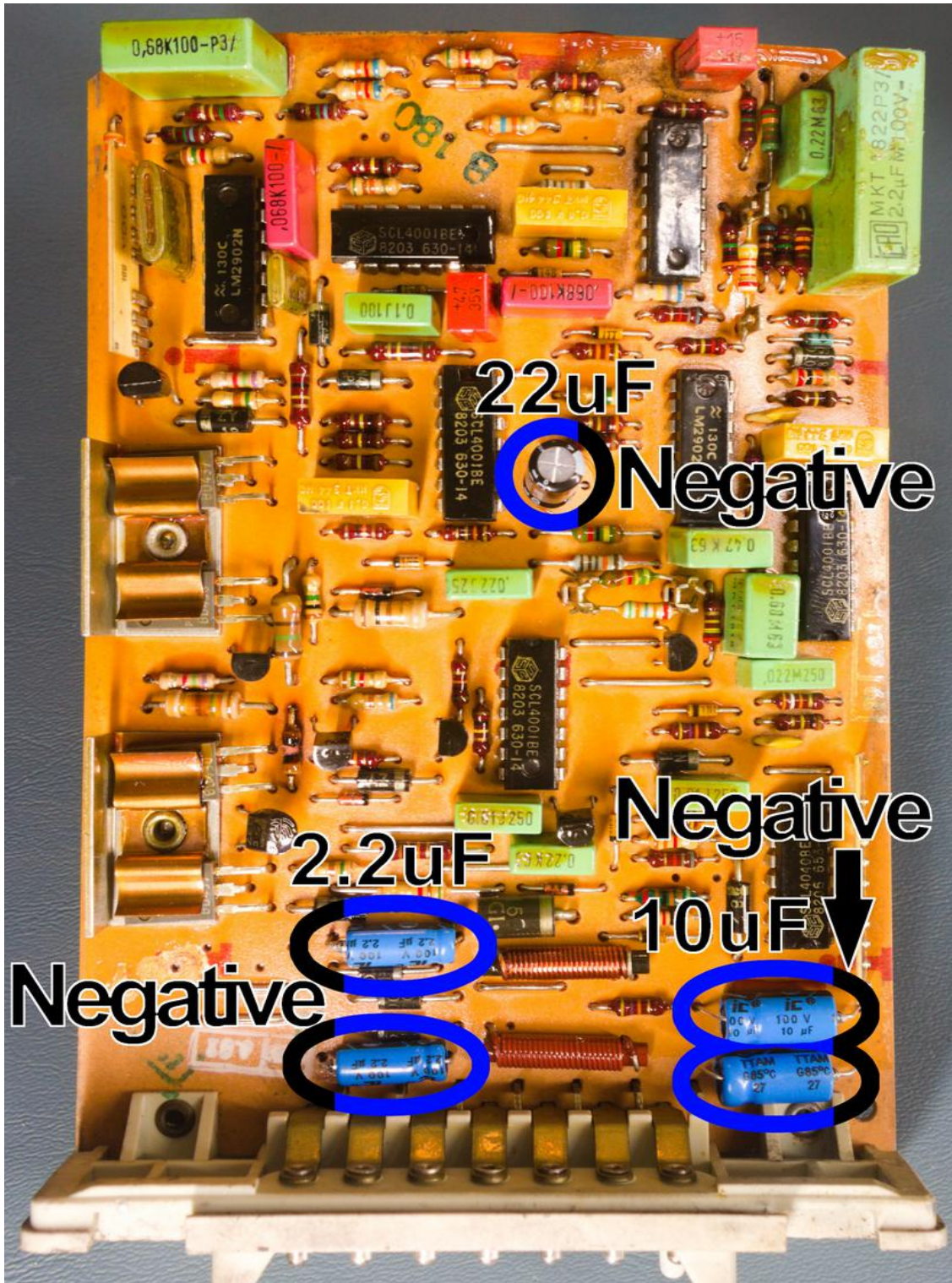
1x 22uF 40V

2x 10uF 63V

2x 2.2uF 63V

The important rating is the uF rating, The voltage just needs to be at minimum what the factory spec was. Pull your amp apart and confirm what style capacitors you need.

Your amp may look like this:



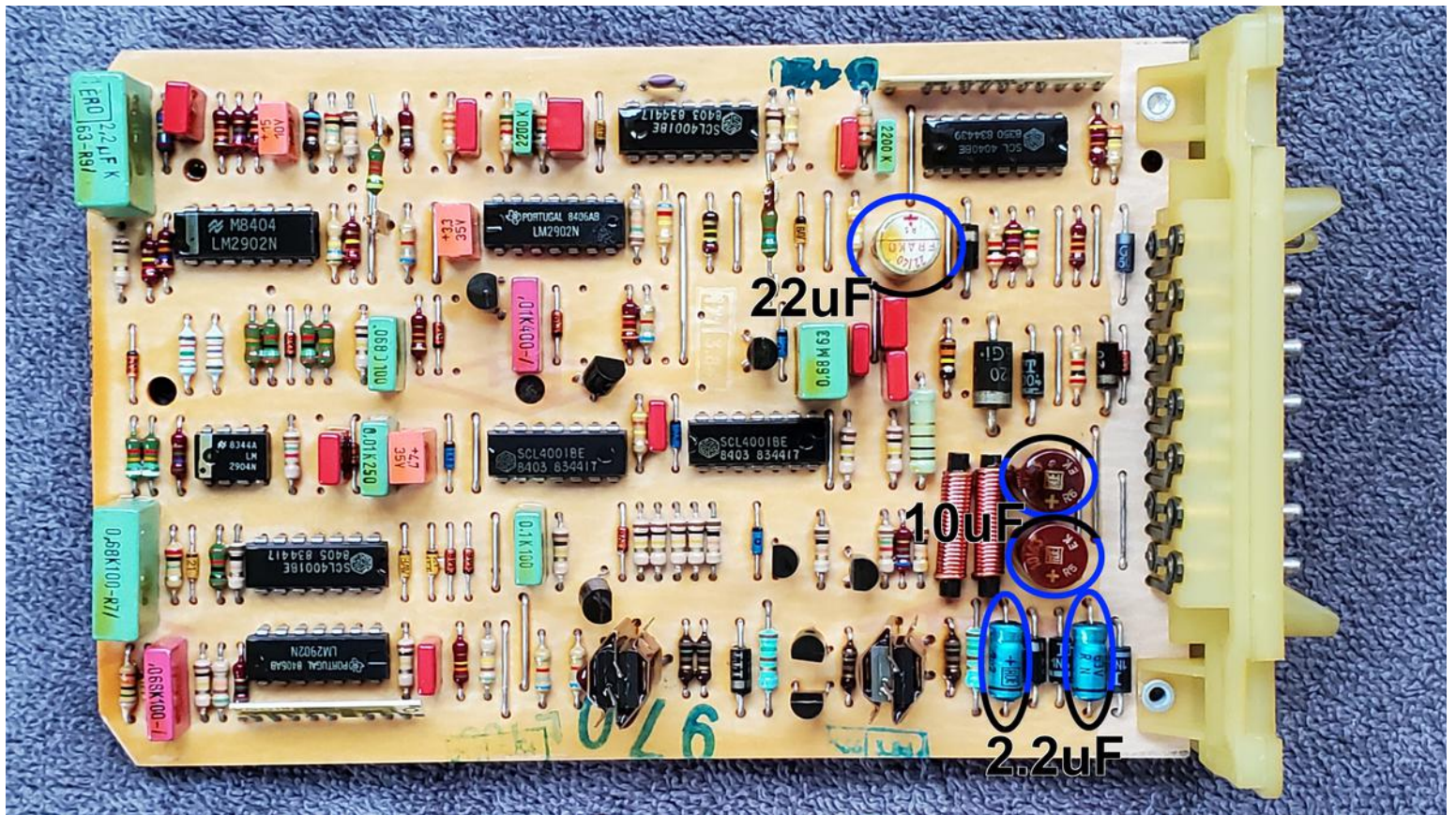
If it does, you'll need:

1x 22µF 100V Mouser part number: 647-UVZ2A220MED1TD

2x 10µF 100V Mouser part number: 598-106TTA100M (Axial – Later amps)

2x 2.2µF 100V Mouser part number: 598-225TTA100M

Or it may look like this:



If you've got this style, you'll need these capacitors:

1x 22uF 100V Mouser part number: 647-UVZ2A220MED1TD

2x 10uF 100V Mouser part number: 647-UVY2A100MDD1TD (Radial – Earlier amps)

2x 2.2uF 100V Mouser part number: 598-225TTA100M

Desolder the old capacitors and replace them with the new ones, noting polarity indicated by the black section in the circle surrounding each capacitor seen in the photos.

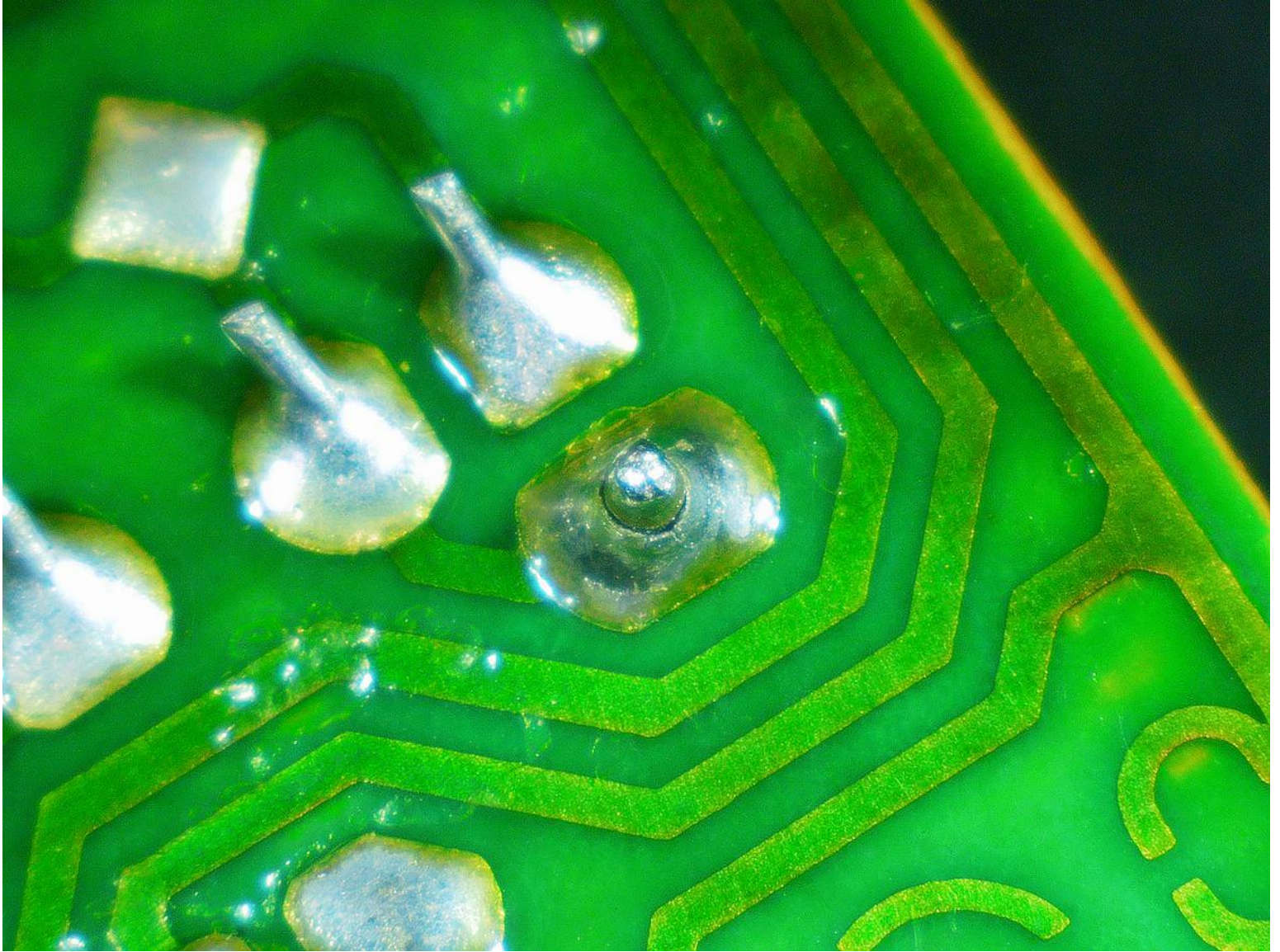
After you have soldered in new capacitors you will need to “reflow” the solder joints on the rest of the board.

This is a time consuming task, basically use your soldering iron to touch every single soldered connection on the board momentarily. Just enough to melt the solder which will clean up any connection that may have been broken.

You may need to add a small amount of solder to some pins. Try to avoid staying on one pin for too long as the components are heat sensitive to some degree.

After you feel you have reflowed the board good enough, look it over well, go over them again if you feel the need or have the time to make the solder joints all look beautiful.

We want to get rid of any broken solder joints like this:



Once you're confident in the solder joints all looking good, reinstall into the car and go for a drive and see if it is functional.

I would highly recommend checking your brake light bulbs, and replacing any LED brake light bulbs with standard filament bulbs or adding ballast resistors to the circuit, otherwise the cruise will definitely not work.

I tested some LED bulbs in the brake lights, and the cruise amp provided enough power that it kept the LED bulbs very dimly lit. If in doubt, swap for some regular filament bulbs when testing!

Hopefully this document and accompanying video series has helped you get your cruise control working, As time goes on this document will get updated with anything new I learn!

Thank you for reading and watching!

Tom