

Air Conditioner Controller Servicing (non-USA type) for RHD.

The problem – Aircon always set itself to lowest temperature

Before you begin please check out the following link – I must thank the another SVX owner in Japan (unsure of name) – I have used some of the photos from the following link & it was this web page that inspired me to fix my problem <http://www.itline.jp/~svx/diary/?date=20040912>

Remove Coin holder and also remove the bolt that is now exposed.



Pull forward both sets of switches (Park and Mirrors) and remove them from joining connectors (if you cannot do it at this stage then leave till later on – it is easier to do as you remove more pieces).



Remove the bolt that is exposed behind switches.



Get a mirror to see clip shape and position behind panel; place finger behind the opening and pull slightly upwards to unclip. NB: the clip is part of the fibreglass shell, do not break it!



And again unclip from other side of steering wheel.



Under steering rack cover near 'Winter/Summer wipers switch' there is a small plastic screw that needs to be removed.



Once removed, the cover is held on by only 2 spring clips that are halfway down each side (see the “prongs” in photo 2 below) pull & it will come away, BUT there are still 2 electrical connectors that need to be unmated (see the below): -

- The Winter/Summer wipers switch harness
- The floor/pedal lighting harness. (shown above with red tape).

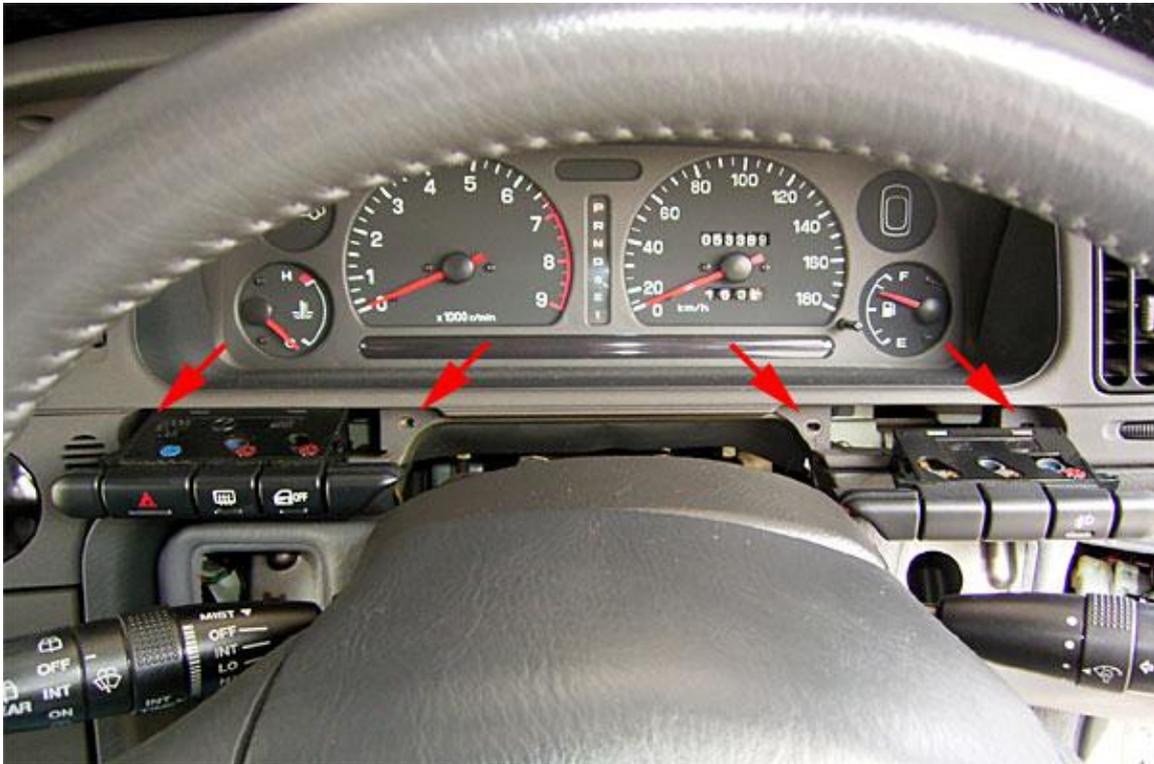
Here is what you should have out from the car: -



Next, slide fingers into the openings below the switch clusters and gently pull the switches forward.

Rotate switches in towards the steering wheel and slide into the bezel slots, this exposes 4 instrument surround screws – remove these.

NB: Depending on the wiring length sometimes the inner plastic pieces on each switch assembly (curved sections next to steering wheel) need to be removed before switches can be fully rotated inwards.

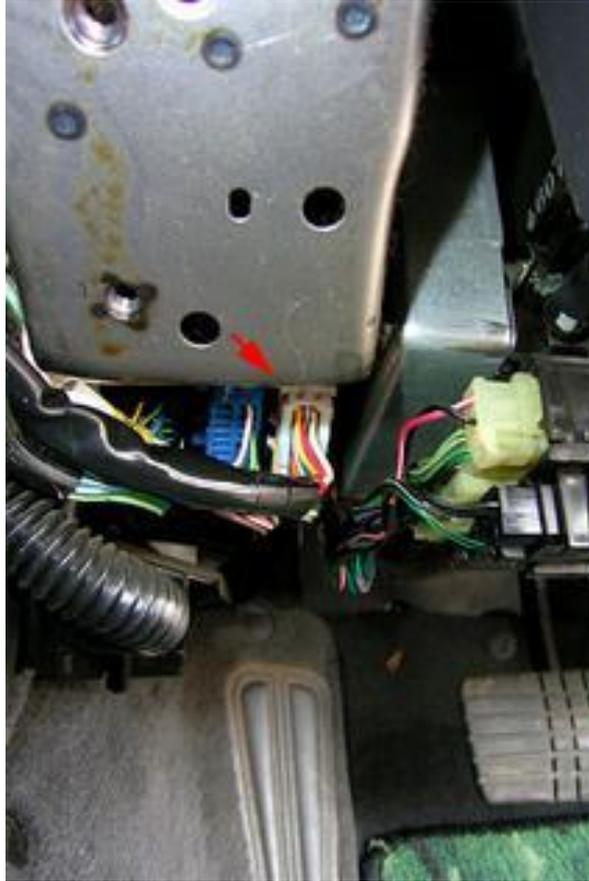


Under the steering rack you now have a metal cover plate – remove this.



With all the covers gone from under steering rack, both switch harnesses are now easily found. Disconnect both from mating connectors and pull out switch assemblies.

- LHS switch harness connector.



- RHS switch harness connector.



Remove the 3 upper screws from under the instrument cluster.



Pull the cluster surround forward, rest on steering rack cover while you unclip wiring connector from the clock.



Bottom Right arrow shows clock connector.

Undo the screws arrowed and pull the vent forward. Be careful as the vent has a small clip (see 2 pictures below) in the bottom LH corner that holds on to the top of the A/C controller (below thumb wheel), this is easily broken if not done carefully - you might see it with a mirror before you attempt to remove this.



Now you can see the clip opening at top RH corner of A/C controller.

Remove the screw and swing the metal bracket to the right.



Remove the 2 screws on top as indicated.



Remove the internal cover on the audio door using a fine flat blade screw driver for this - it has been documented elsewhere in this group ([maybe a link or additional photos](#)).

Remove the Audio surround bezel ([maybe a link or additional photos](#)).

Remove the 2 screws under the A/C Controller (arrowed)



Pull unit out at an angle: all the wiring harness connectors are towards steering wheel side so pull and swivel towards steering wheel.

Once out there are 2 wiring harness connectors and a plastic air pipe (used for the thermistor cabin temperature sensing).



Now the unit is out the rest is pretty straight forward.

The only issue is checking screw lengths (I used some small sealed bags to keep screws separated and labelled from the following operations).



Remove the 2 screws that hold the mounting bar under the unit.

Disconnect the wiring harness that runs to the white connector on top.

Then remove all the screws that you can see, note that the case is still held together by 2 small clips (one at each end).

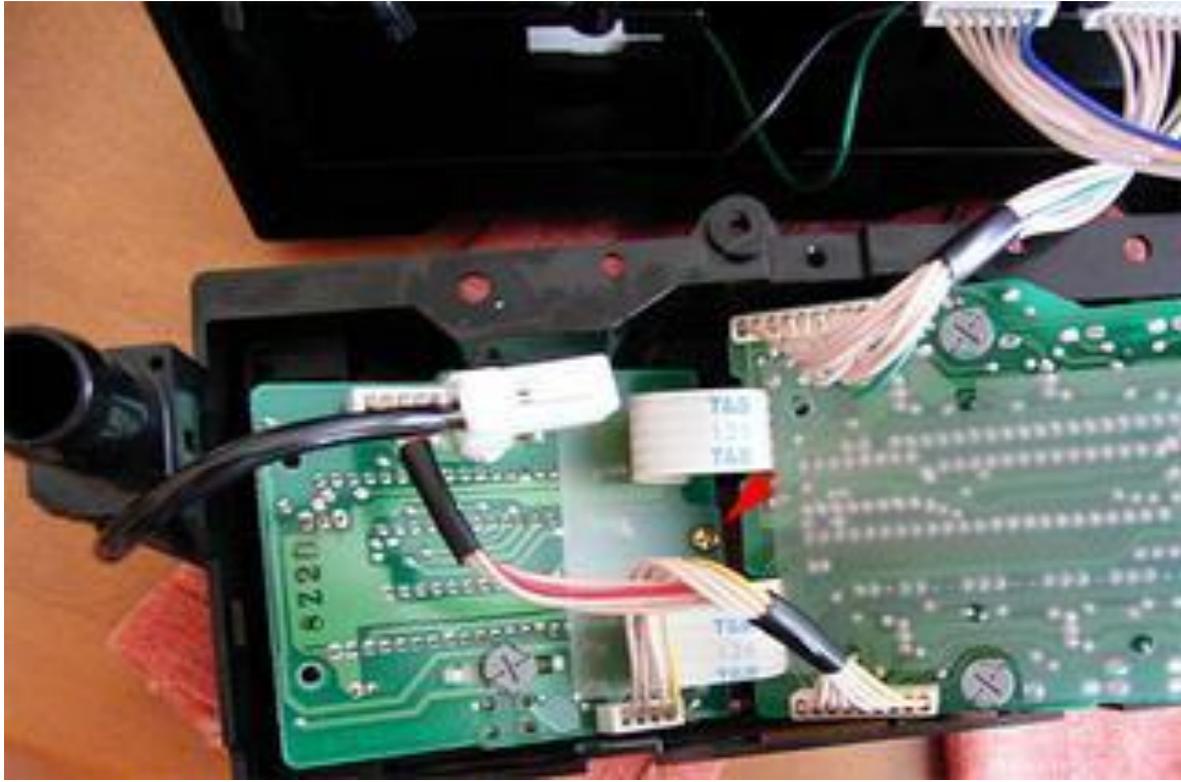


Once the unit is open, remove the 6 screws shown.

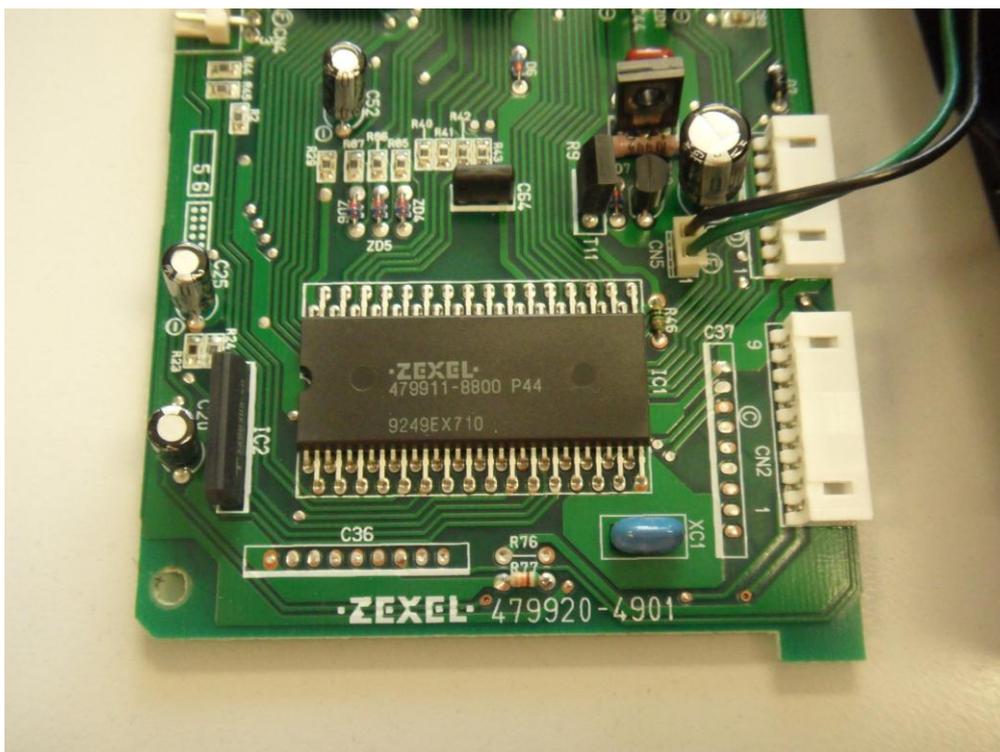


Remove the single screw in the middle.

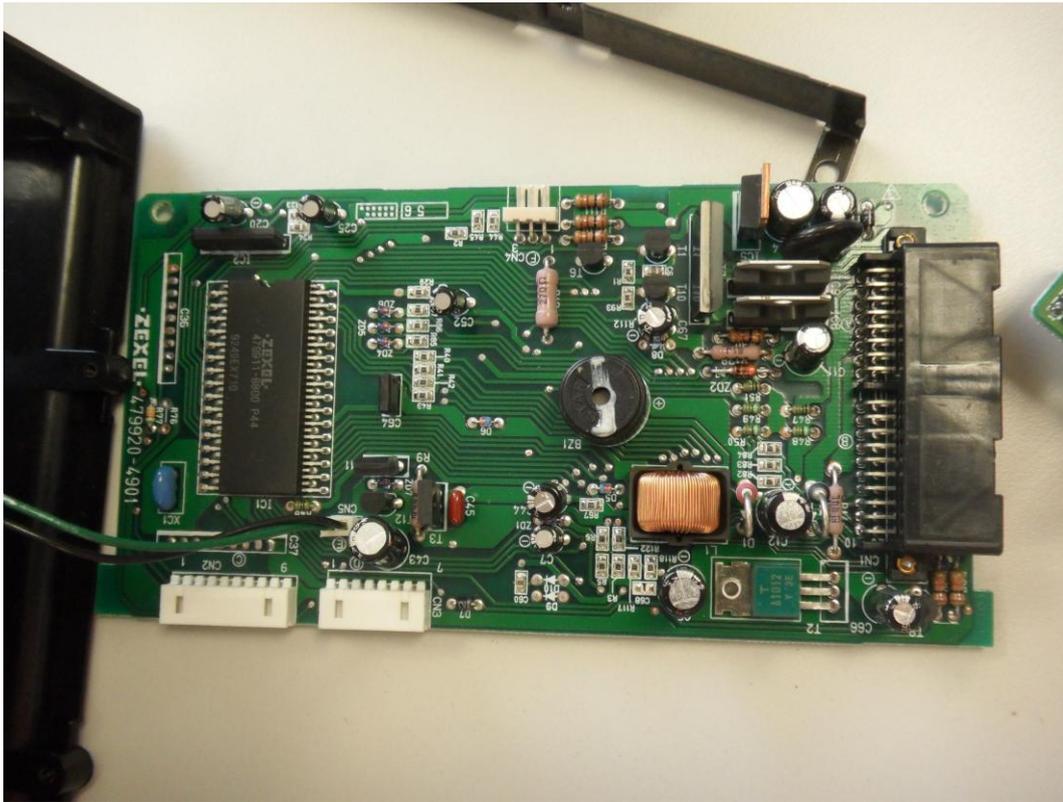
Also at this stage unplug the wiring connectors (2) that are shown at top RH corner of this photo e.g. on the non-display PCB.



Here are the 2 white connectors without wiring harness (there is no reason to take rear PCB out of case –only shown for reference).

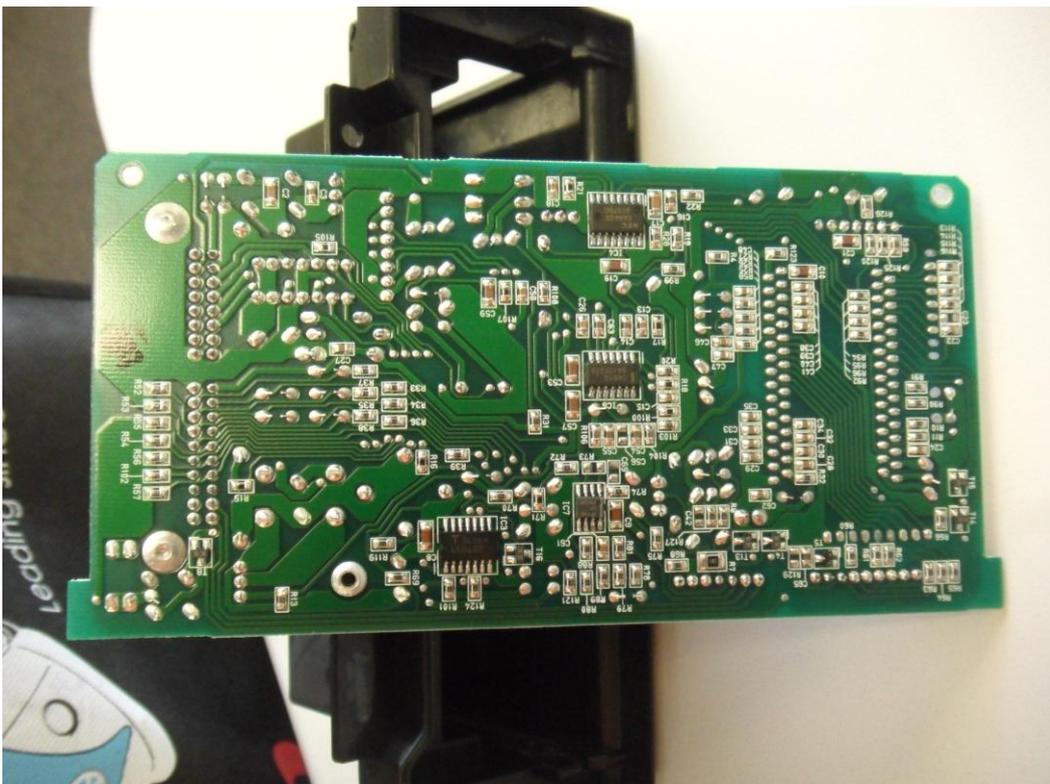


Another shot showing white connectors

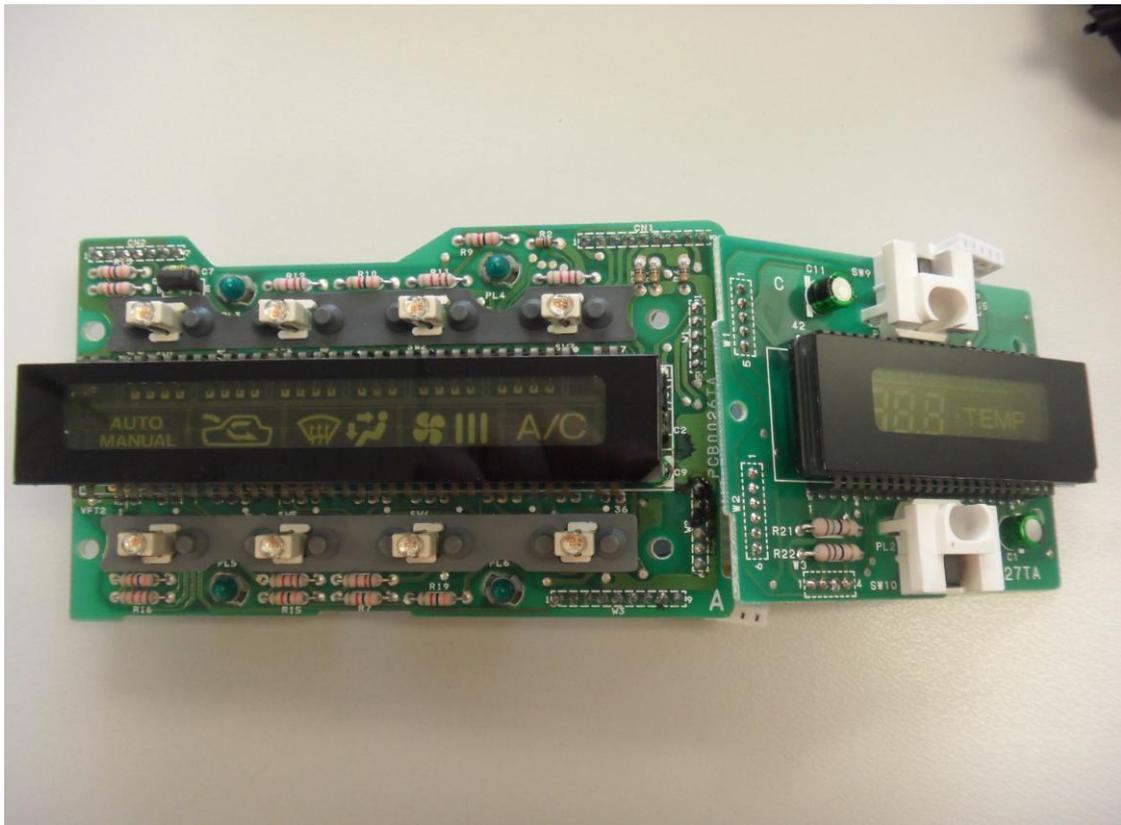


I suspect that Zexel subcontracted out the 2 PCBs to 2 different manufacturers – the unit above shows Rubycon capacitors (high quality), whereas the capacitors on the display PCBs are a no-name brand.

Another shot of non-display PCB showing the use of Surface Mounted Devices (SMD) also on the reverse side.

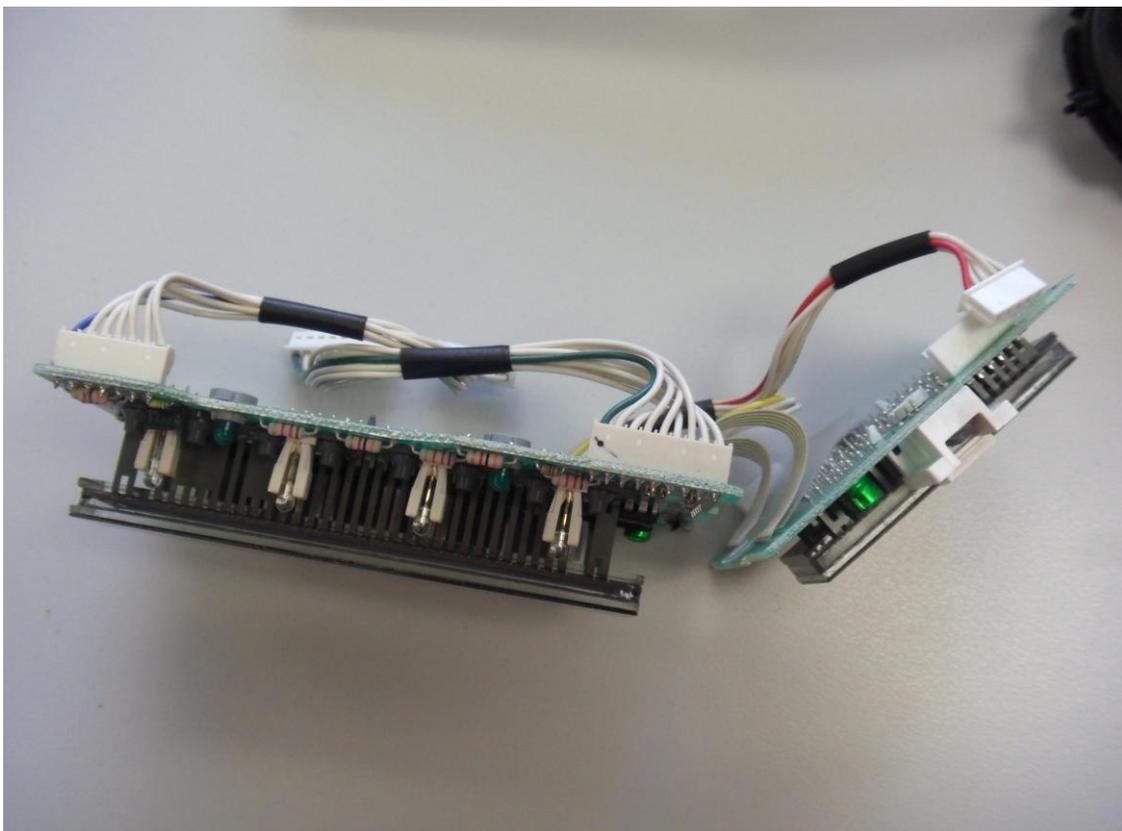


Now to the Display PCB assembly, spot the issue? See the letter 'A' at bottom RH corner of larger PCB – now look just above it at the vertical row of solder joints (W2) – there is a dark area, looks like something burnt.



You will notice that there are 3 green capacitors in the assembly.

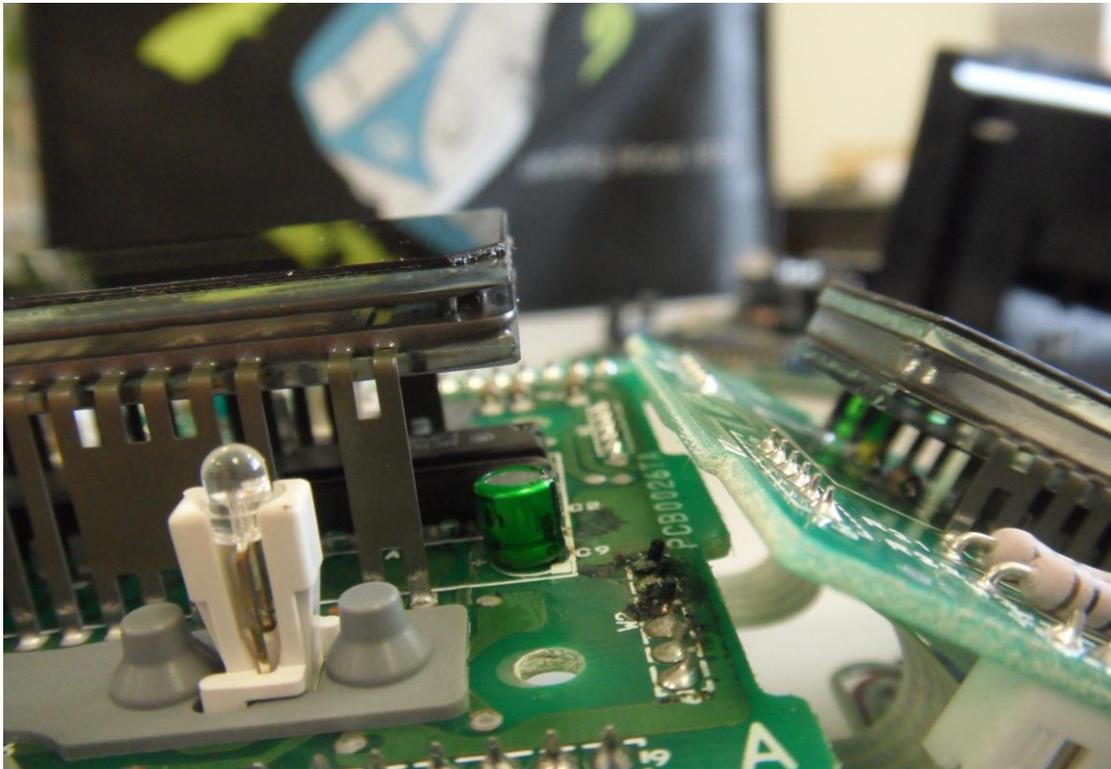
2 are on the up/down PCB – these are 25V rated and are normally ok.



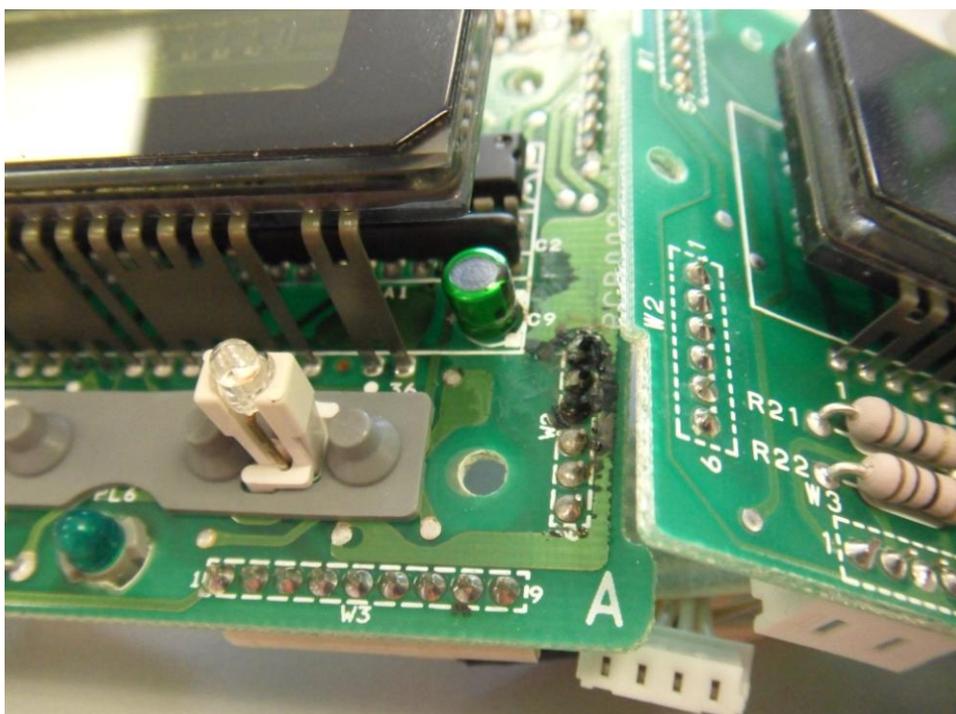
But the one on the larger PCB is C9, and is only 22uF 16V and as such is prone to leaking due to voltage tolerance and also degrading due to the environment that the assembly is located in.

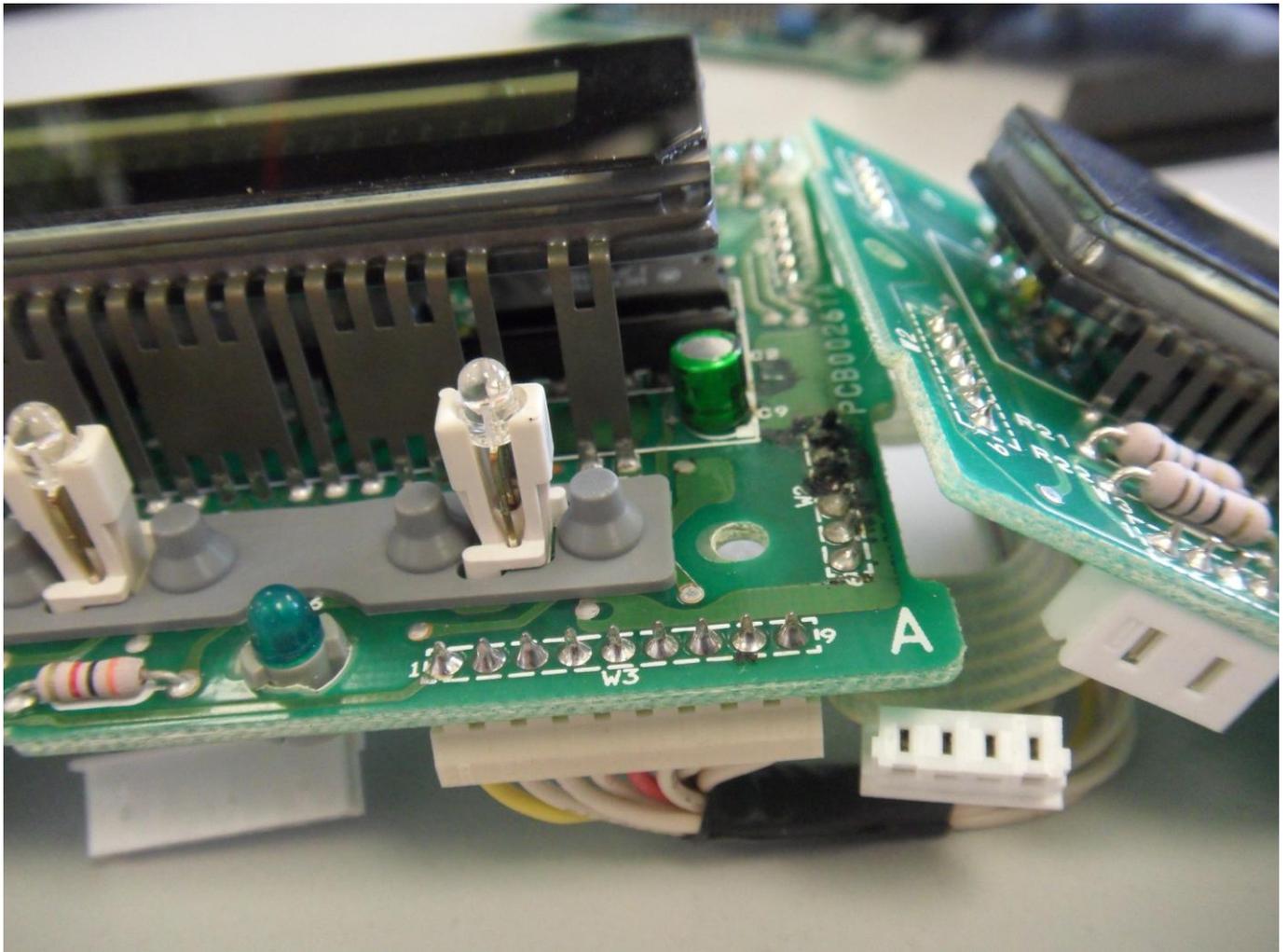
C9 should be changed to 22uF 25V.

As you can see in the series of photos below the negative end of C9 has lifted slightly (due to bulging – leaking electrolytic material from within).



You can see discolouration of the green soldermask between letters C2 and C9 – this is corrosion from C9.





If you have a magnifier then check out the discolouration on the green solder mask covering – this shows where the liquid from the capacitor has eaten its way along the copper.

Carefully remove C9, use solder-wick or a de-soldering station (e.g. solder sucker).

The main issue is that C9 is actually connected across the power supply, and the available de-soldering areas that the legs are soldered to are actually floating pads (e.g. from rear side they are not connected to anything).

All the connections to GND and +VE supply are connected under the C9 body, so be very careful when removing that you do not damage or lift the copper under the C9 body.

NB: Check polarity of capacitor, if you forget which way around it was, use the other green ones as a guide in order to get it around the correct way. Negative is indicated by straight line on the component outline.

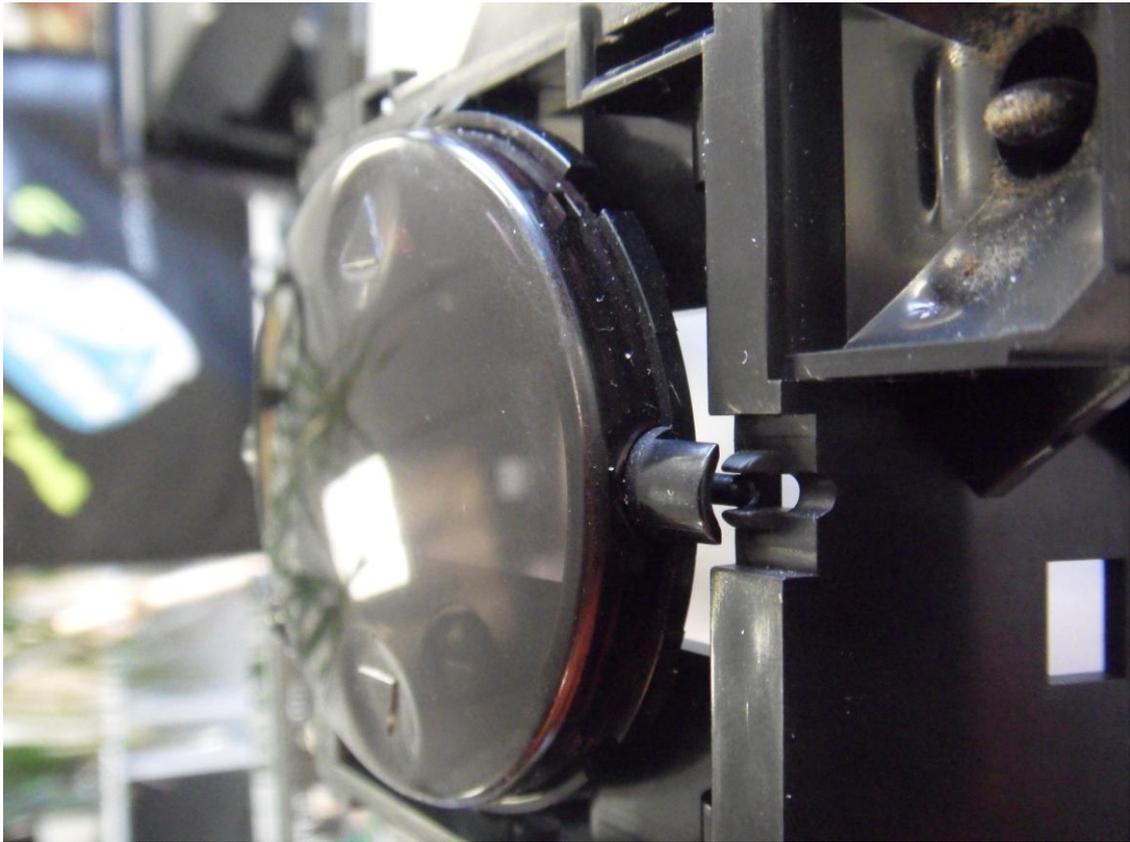
If damage occurs when desoldering, then you will need to trace the copper tracks in order to connect the new capacitor onto some new soldering locations.

I would use either IPA or Ethanol to clean the circuit board after removal of the offending C9 part.

Also check the inductor next to C9 and the IC pin (all 3 units that I was fixing showed corrosion around these areas).

With a fine knife or tweezers you can carefully 'pick off' the corrosion before de-soldering (this way when you re-solder the new part, the surfaces will adhere correctly to both copper pads and C9 legs).

Another thing to check while the unit is apart is the up/down button, this simply pops off.

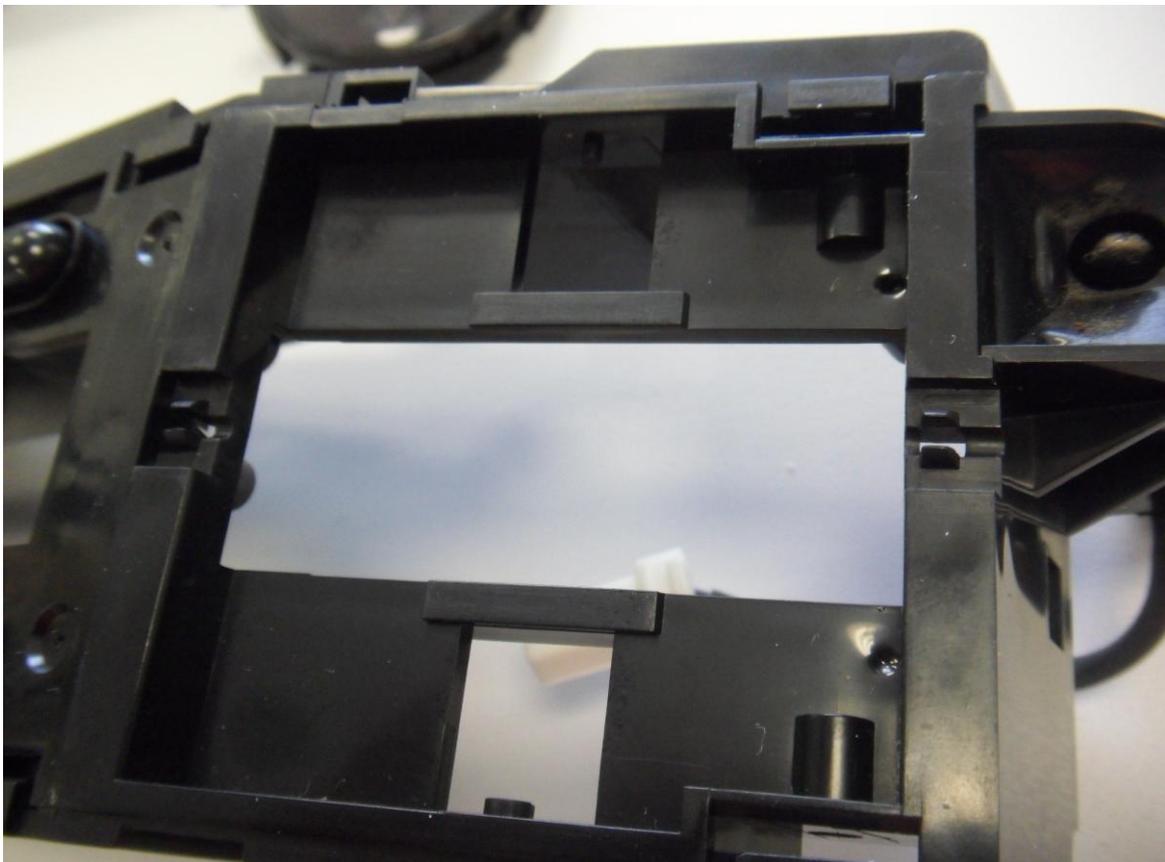


Check that all the foam tape is still in place and that there is no dirt or lint stuck behind (due to cleaning).

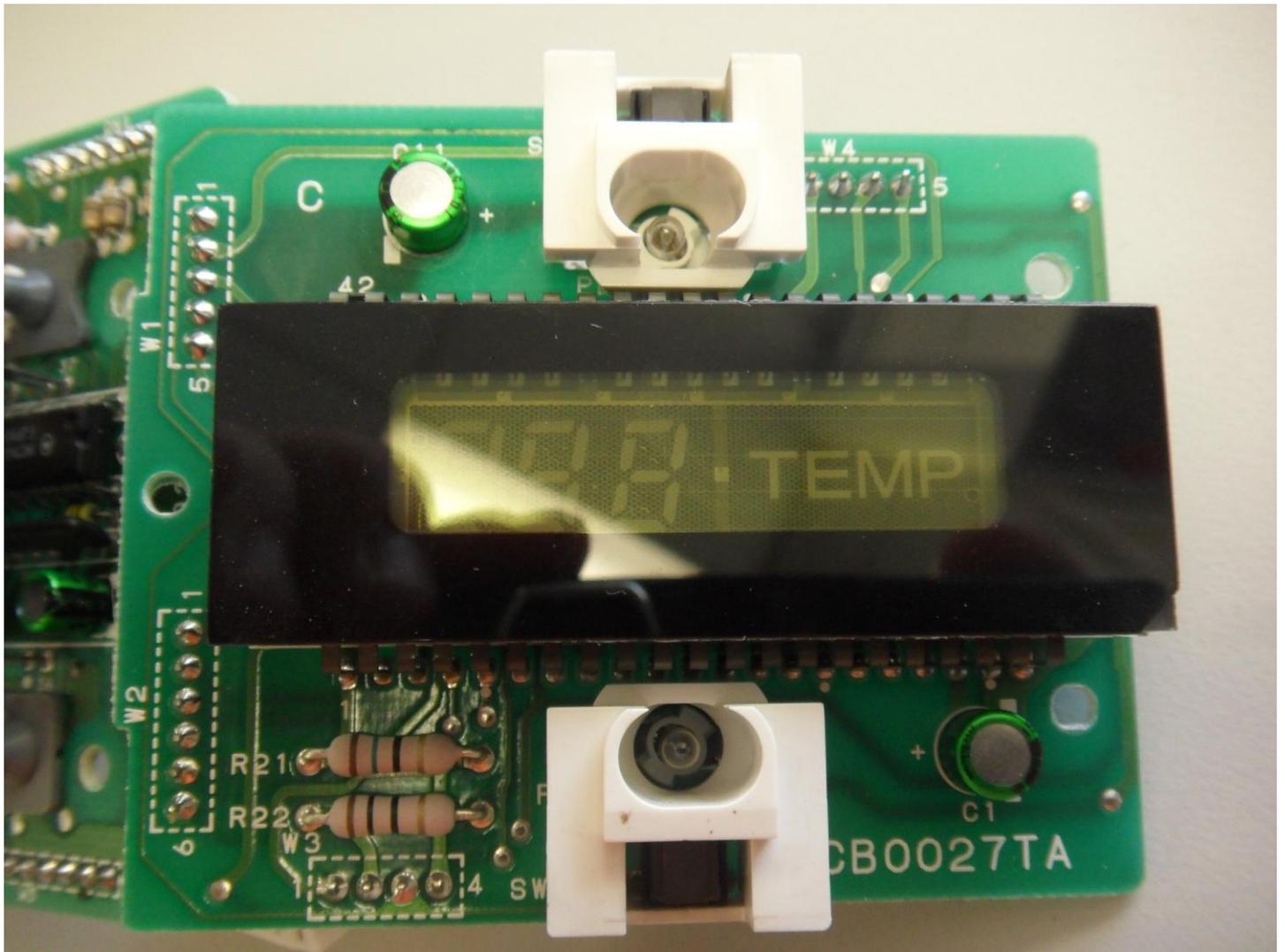




This shows the double hinge pivot area of the up/down button.



This photo shows the other 2 capacitors that are already 25V rated – these do not need replacing.

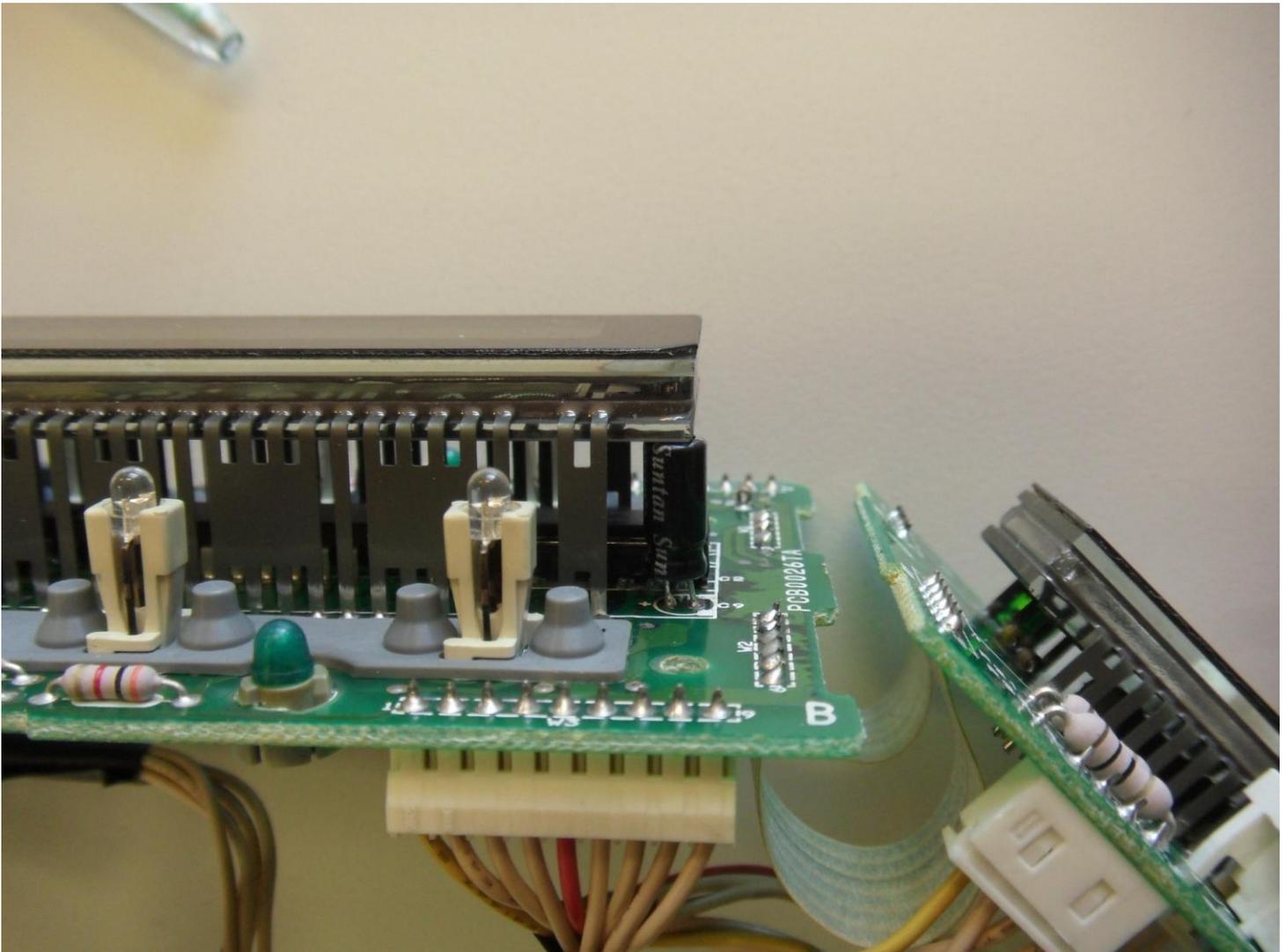


Now back to the problem PCB and Capacitor.

This shows the new 22uF 25V Capacitor in place, I have located the part up against the rear of the display glass in order to gain access to the actual soldering pads from the top side (I used a special microscope at work to check the hole plating and found it damaged by the capacitor liquid corroding the copper and plating in the hole) – hence the initial black colour on the board.

I also soldered the part from the other side of the board.

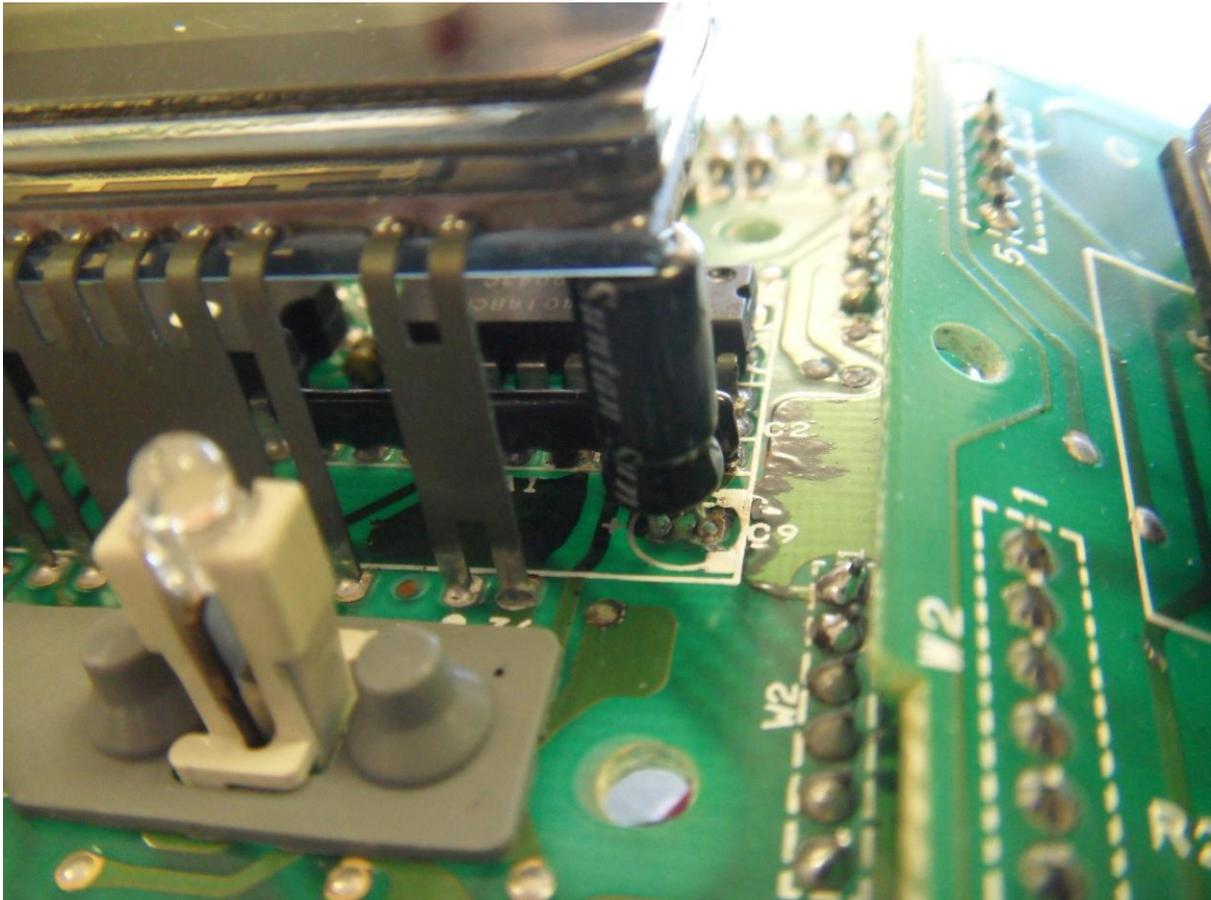
Locating the capacitor in this way will mean that it will have less chance to swing downwards when located in the correct horizontal position within the dashboard (if they had originally rotated C9 then there would be no chance of part bending while installed into dashboard, again another bad design).



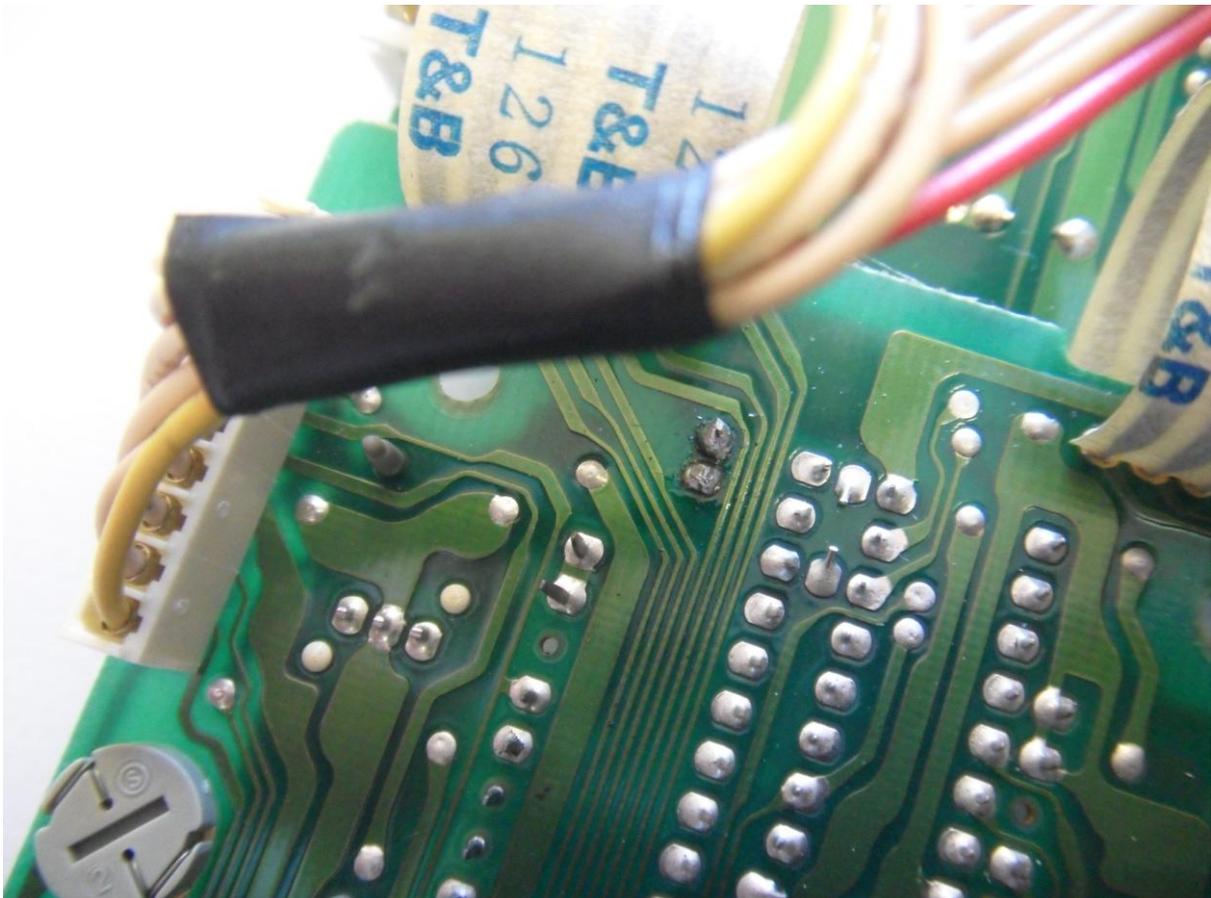
If you cannot reuse the C9 mounting holes then you could connect the positive end to the inductor that sits beside it (small round device with coloured rings along the length) and the other end could be soldered to a ground point, there are plenty of these throughout the board.

If you are going to locate C9 elsewhere remember to 'stick' the capacitor down in order to stop it floating around when the car is moving. N.B:- do not use silicon RTV type adhesive, as while these cure they normally give off acetic acid, which is corrosive for electronic devices, better use a 3M type double-sided foam tape.

You can see that W2 (row of soldered pads) has also been cleaned and re-soldered.



This photo shows the rear of C9 – 2 floating pads, just below the black tape.



You can now put everything back together but just check the unit runs while the dashboard is still apart (no need to try and connect up the plastic tubing) – just the 2 connectors.



I have done a number of these A/C Controllers and only found that C9 has been the issue.

There are 3 different finishes to the front panel Dark Wood / Light Wood / Matt Grey.

Below are the Dark Wood / Matt Grey (light wood was back in the car before I decided to take photo).



Please note that the book has exactly the same contents as in the SVX services manuals, just that Zexel were the suppliers of the controllers to Subaru.



While I bought a spare unit from a wrecker here in New Zealand, I must also say a big thank you to Shane Hobson here in New Zealand (ShaneHobson) for supplying me with another spare controller in order to do a PnP for my SVX – it meant that I did not have the car off the road for more than a couple of hours.

Having 3 units to play with also showed me the common issue that the non-USA type controller has – when I get time I would like to reverse engineer the complete assembly, as I have not yet seen an actual circuit diagram.

Maybe someone has a contact at Zexel that could look into getting one – thereby saving me a lot of time...plus it would be a great addition to the network?

(it may also mean I could also try to modify a spare unit to make some of the switches work with a single push, rather than 2 button push – as some people have requested over the years).

I hope you find this document helpful but should you have any questions, please don't hesitate in contacting me directly.

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