**Gen 2 Prius Instrument Cluster Lights**

The instrument cluster lights which display speedometer, fuel gauge, odometer, trip meter, and shift position, must always turn on but do not turn on intermittently. The occurrence probability is around 25%, once every 4 Power on. Driving a vehicle without speed and fuel information is terribly dangerous that old-fashioned vehicles with low-tech mechanical speedometer and fuel gauge never faces. It is one of pitfalls of high-tech.

This was a fatal problem and Toyota recognized that it must be resolved.

The principal cause was deterioration (leaking electrolyte which is just about the same of battery) of a Nichicon 100μF 16V aluminum electrolytic capacitor connected between VQ (+5V) and GND outputs of Infineon TLE4278G 5V voltage regulator applied for the purpose of DC voltage smoothing.

It is common knowledge that the life span of the electrolytic capacitors is notably short (shortest) in electronic components. Other components live much longer or nearly forever.

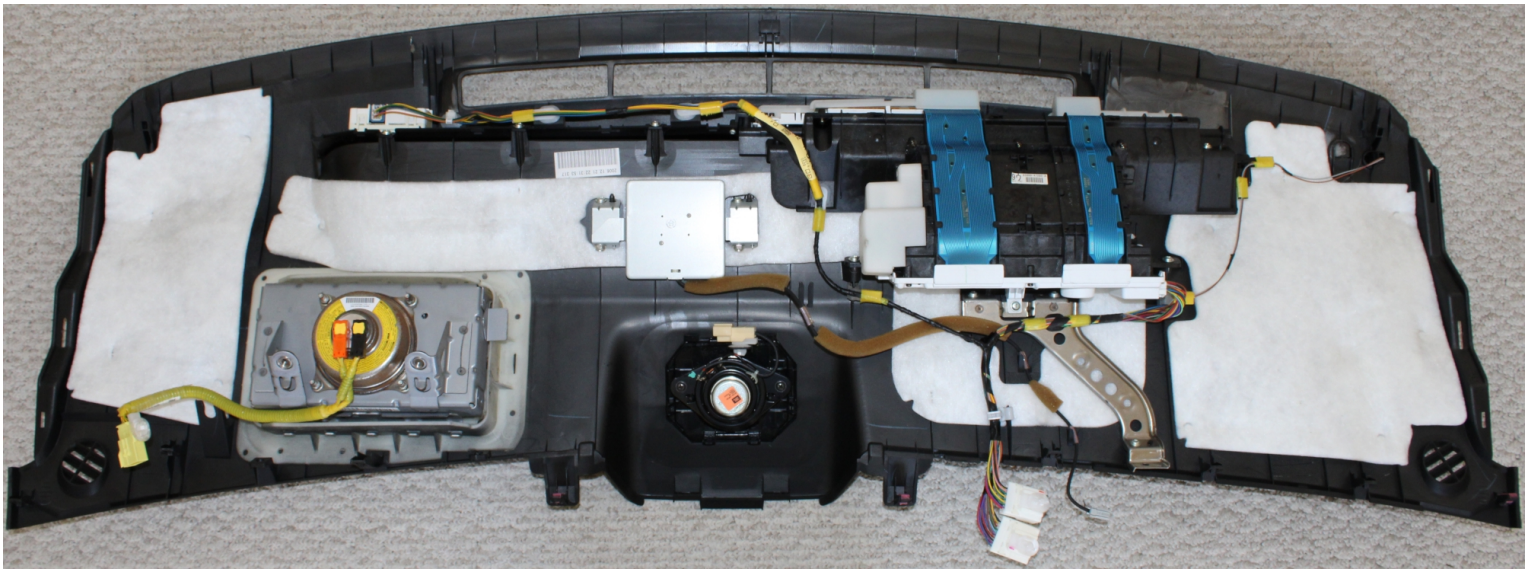
To retrieve the Combination Meter board which implements the Nichicon 100μF 16V electrolytic capacitor, all the instrument panel components below must be detached.


Instrument Panel disassembly sequence (from ① to ⑭)

I referred to a superb video posted on YouTube.

https://www.youtube.com/watch?v=pb19p8zYeTg
Prius Gen2 dash Instrument cluster combination meter and MFD removal 2004-2009

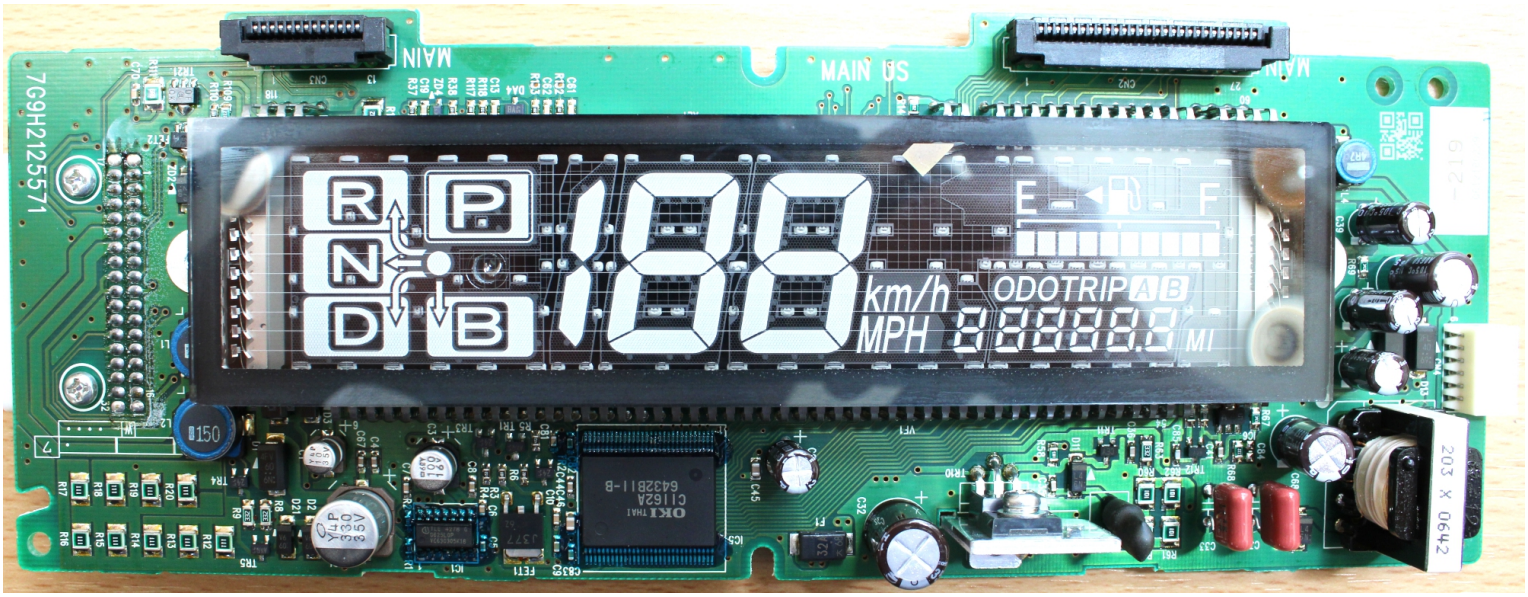
**Disassembly**



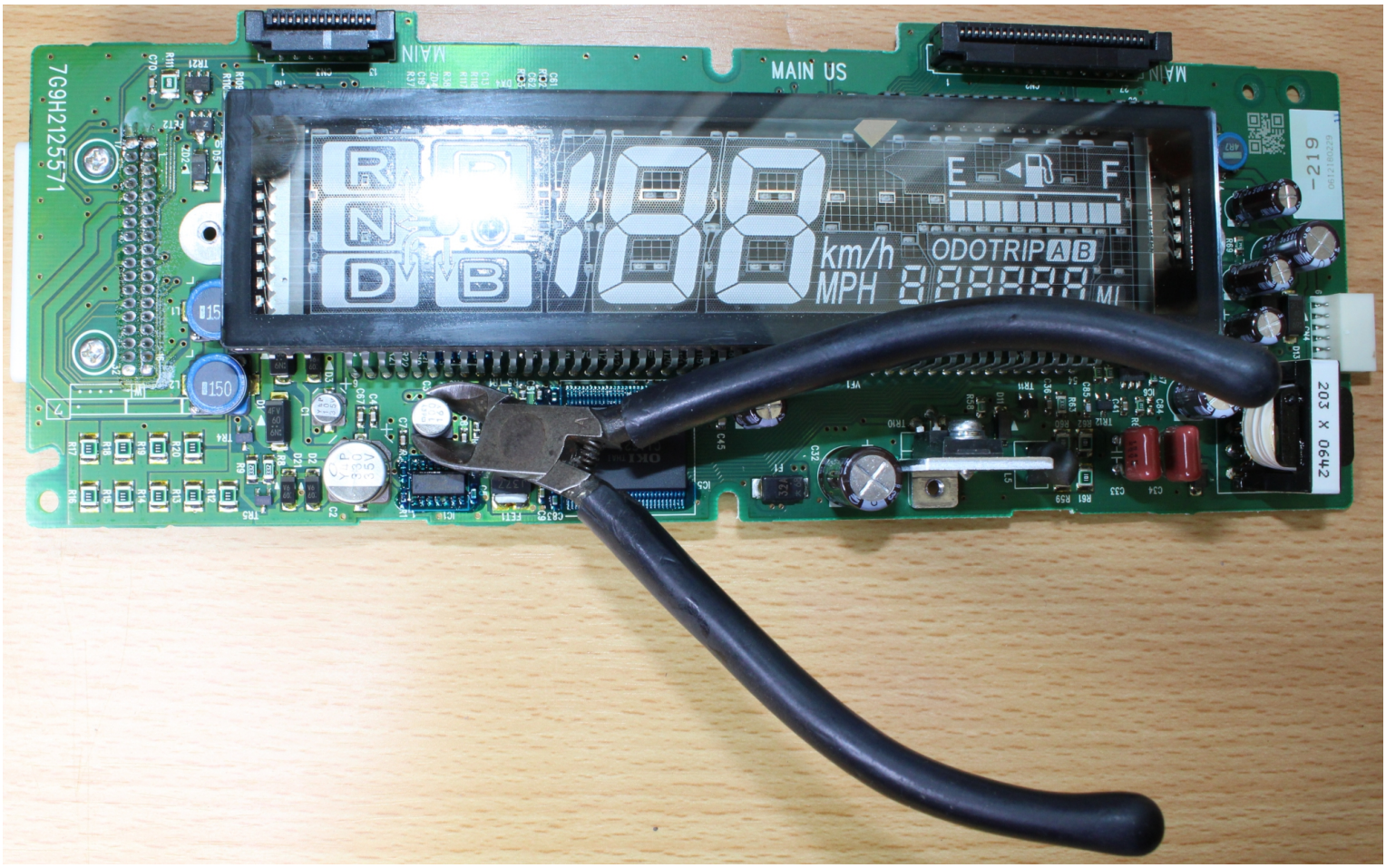
Instrument panel safety pad detached

Combination Meter Board covered by white case

**Replacement**

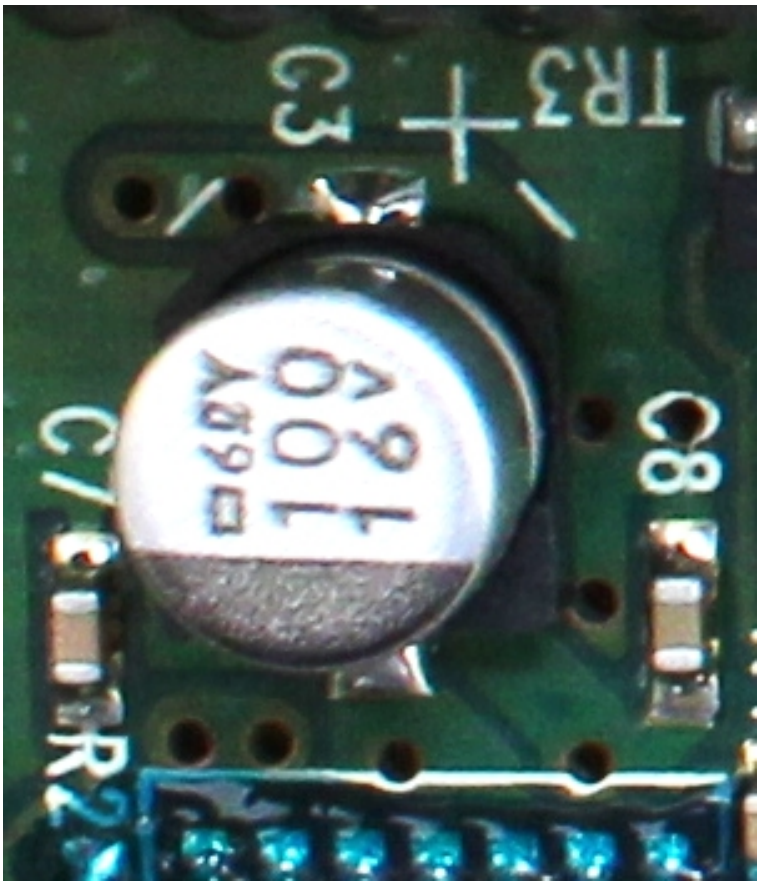



Combination Meter Board

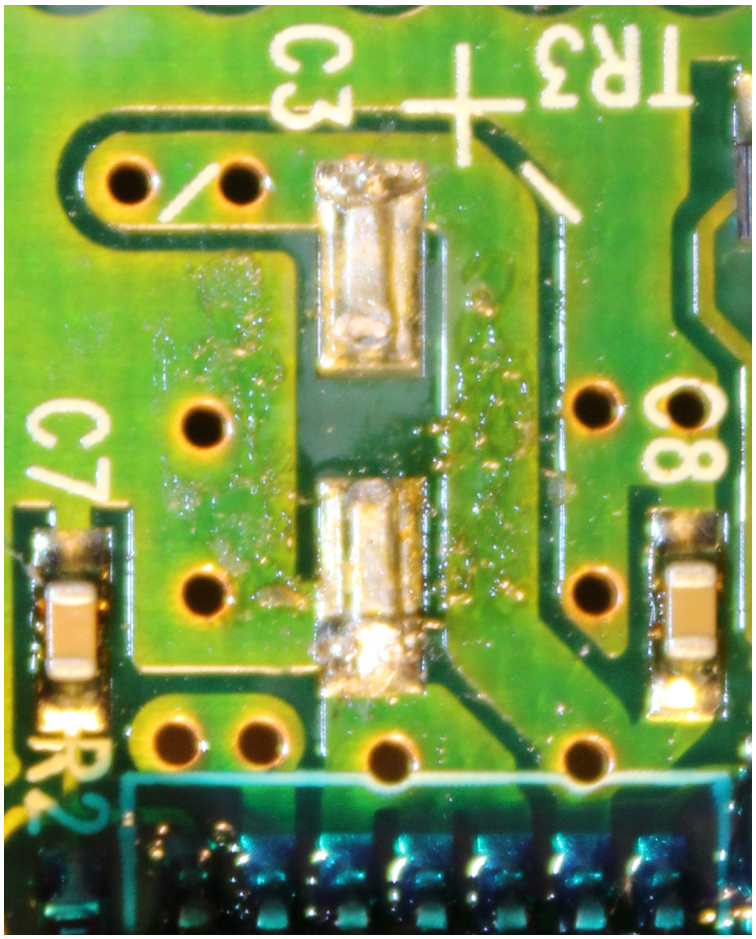



Removing a Nichicon 100μF 16V electrolytic capacitor from Combination Meter Board by rotating a nipper

It is easy to detach the capacitor as wrenching off human being's head because the surface mount soldering is much looser than through-hole soldering. Surface-mount should not be applied for vehicle-mounted electrolytic capacitors that get much gravity and acceleration from various directions and strength swaying the parts. Charging gravity and acceleration to baby's neck is presumable as dangerous act.

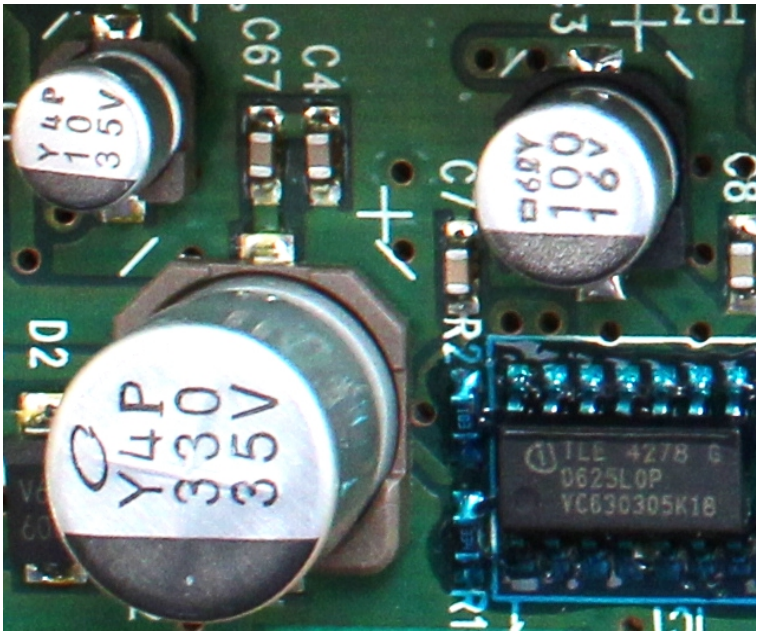



Before Removal of an 100μF 16V electrolytic capacitor

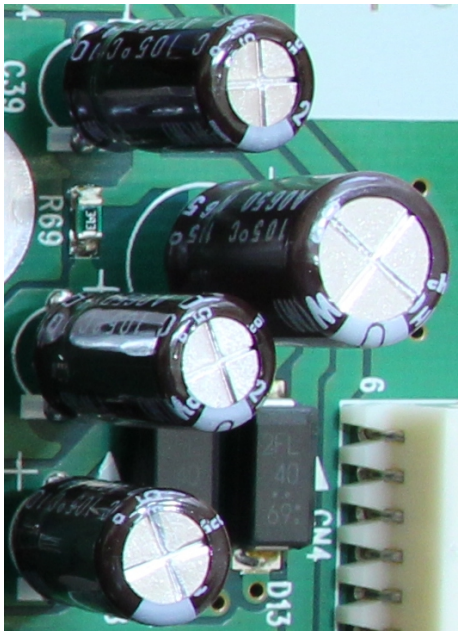



After Removal (Electrolyte leaked is sticking on board)

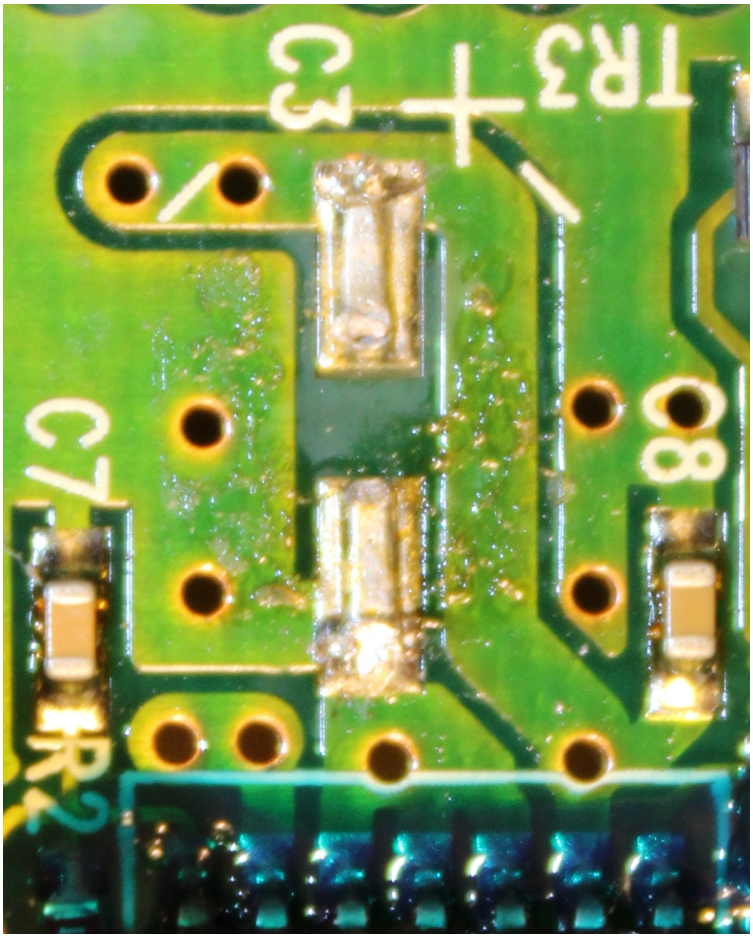
Presumably from the lot number ("6lY"), the 100μF 16V capacitor seemed to be picked up from aging parts stock which deteriorated already.
Compare to two other surface mount Nichicon electrolytic capacitors (10μF 35V and 330μF 35V). Both are "Y4P".



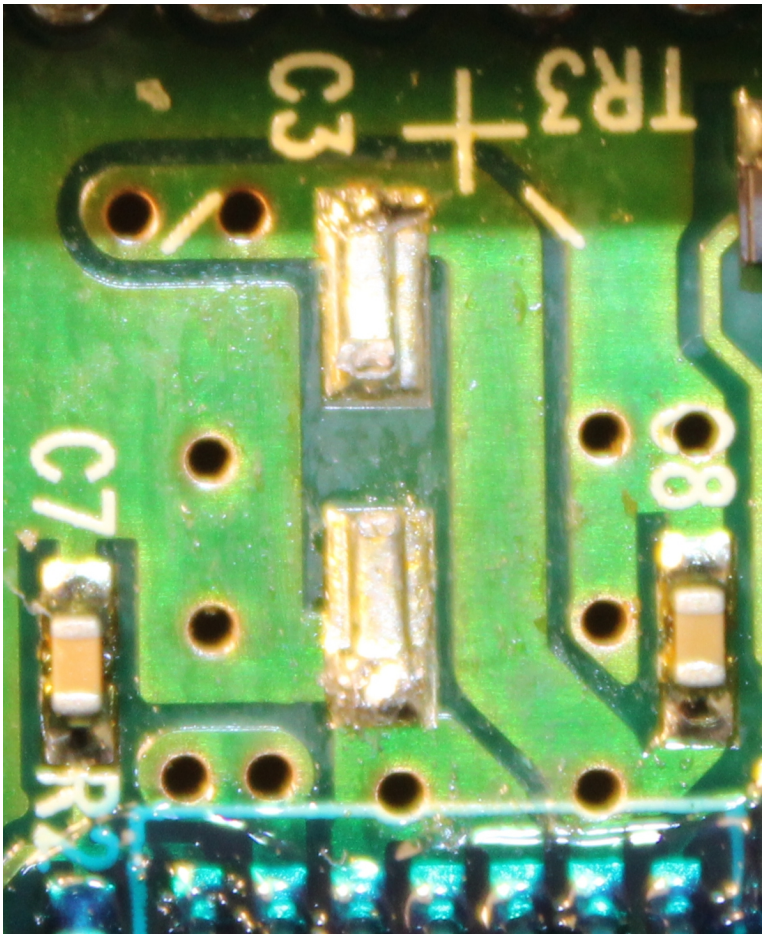

10μF 35V (Upper left), 330μF 35V (Lower left)
100μF 16V ("Culprit", Upper right)
Infineon TLE4278G 5V voltage regulator (Lower right)
All electrolytic capacitors are soldered by surface mount



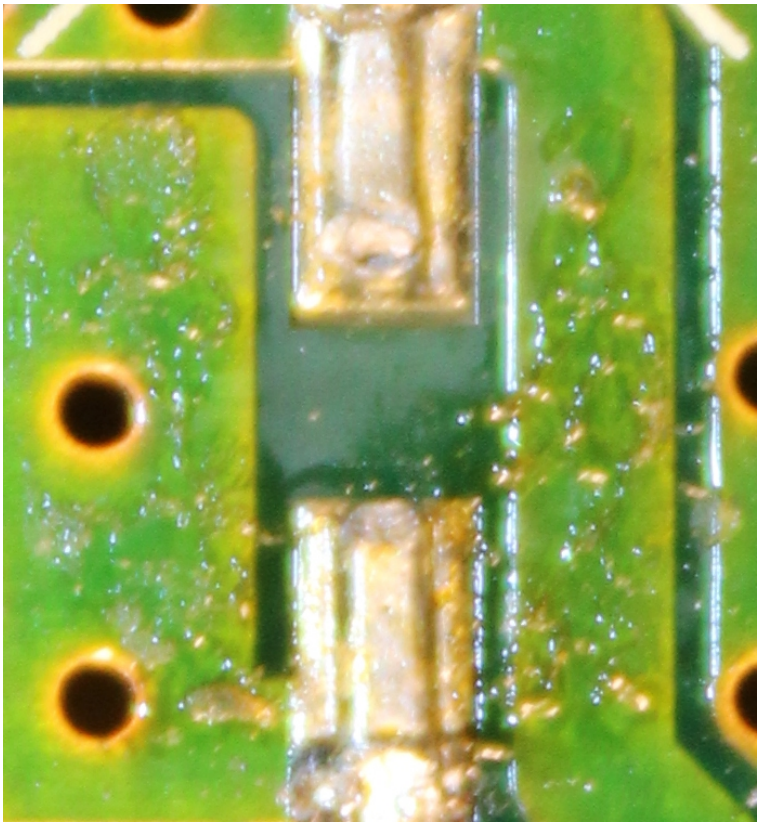

These electrolytic capacitors placed right on the board are tightly soldered by through-hole, much steady!




VQ (pin 9) and GND (pin 10, 11, 12) of Infineon TLE4278G 5V voltage regulator are covered by electrolyte leaked from Nichicon electrolytic capacitor

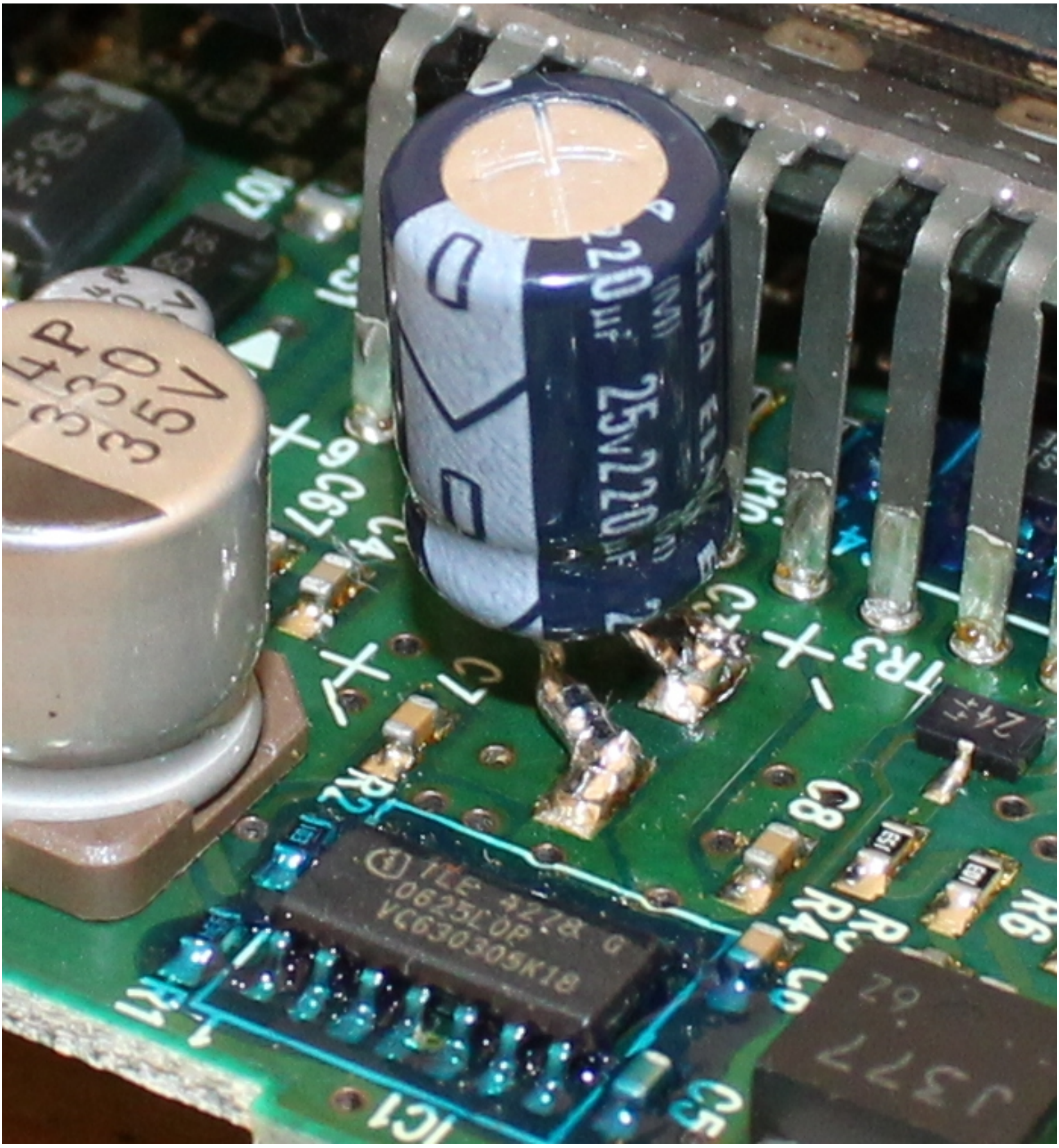



Removed electrolyte, Cleaned pattern
(Original space between VQ and GND looks too narrow)



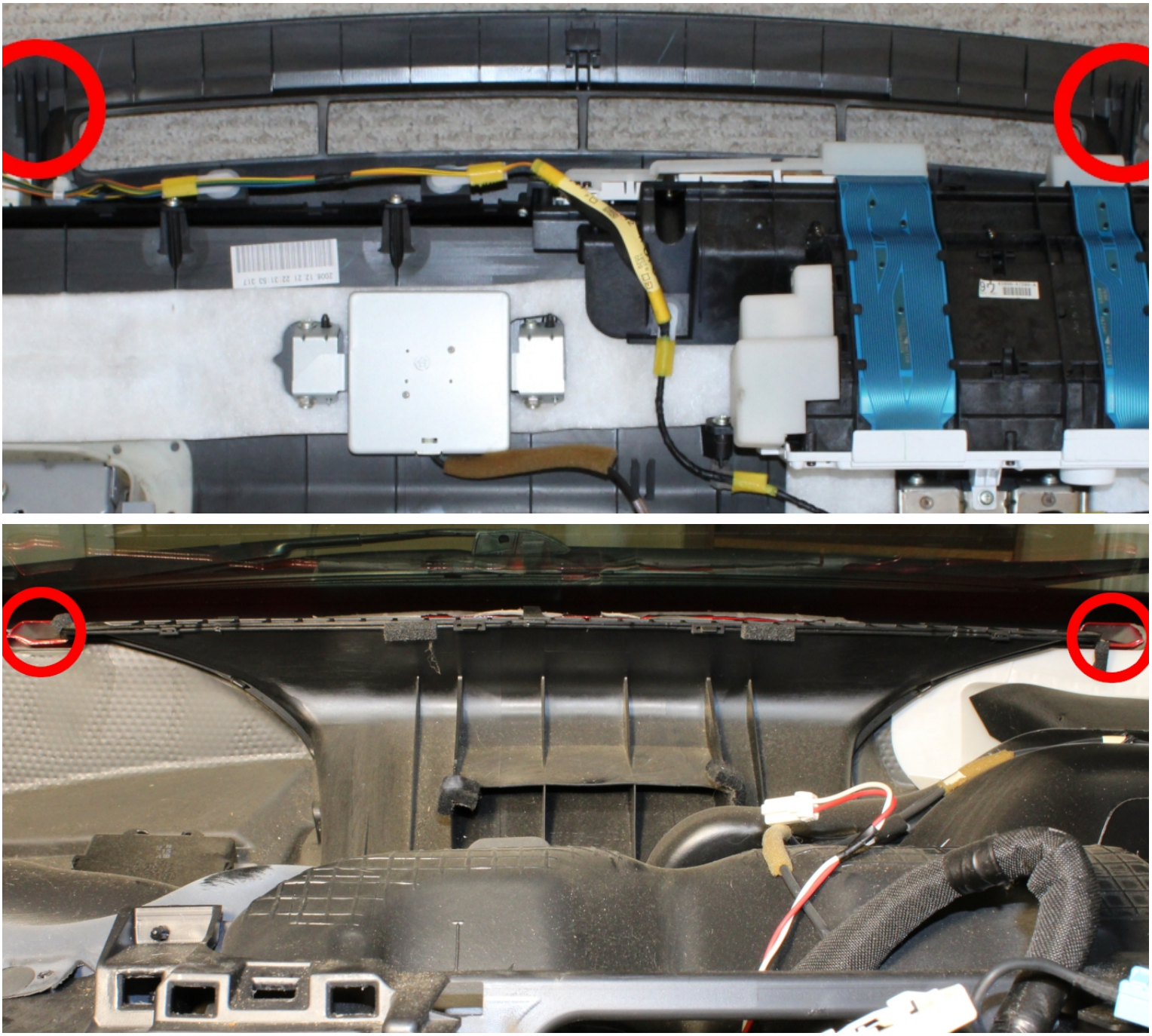
Surface mount PCB parts side (Symmetrical)

Surface mount bottom board side (Symmetrical)




220μF 25V electrolytic capacitor newly mounted

**Tips-1**



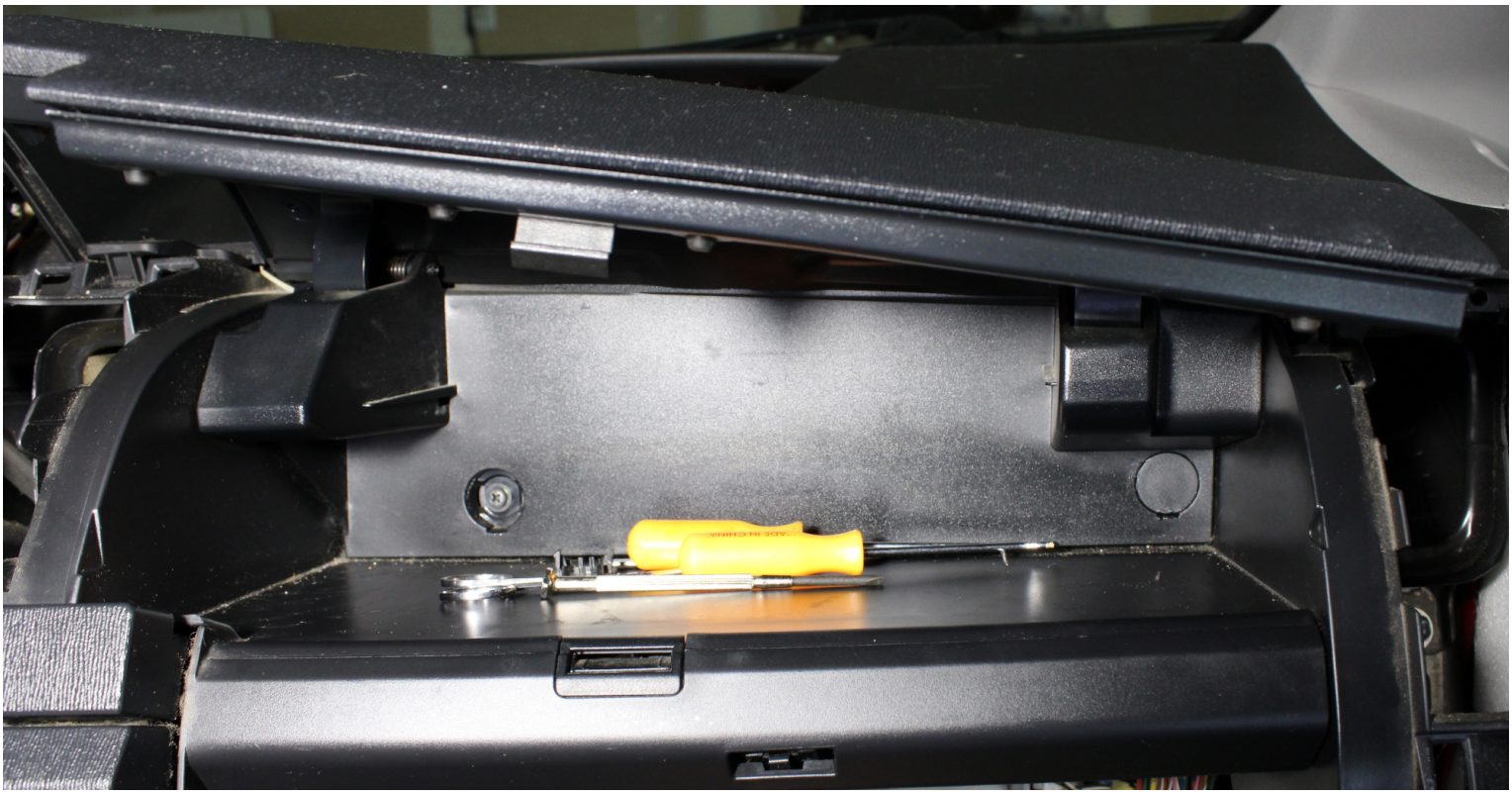
Mark the surface of the pad on two plug positions by tapes to ease engaging the pad to body when reassembly

**Tips-2**

Front Pillar Garnish (RH) Removed

Elastic Clips to be rotated 90 degrees to release

**Tips-3**



Upper glove compartment box is retained by two screws hid by plastic covers which are hard to remove

Made a hole by drill on right cover

Cover removed (I am a bit rough to get accomplishment)

**Tips-4**




An adhesive “B-7000” which has a small metal pipe outlet and a metal needle to make sealing hermetically not to deteriorate and clog adhesives stored in tube. This approach extends the span of the adhesive life a lot. The small metal pipe outlet enables and eases detailed operation work. Excellent!

B-7000 worked beautifully to recover broken clips and support pillars etc. broken when removal. Savior!

**Reassembly**

Reassemble succeeded

After replacing a problematic 100μF 16V electrolytic capacitor surface mounted to a 220μF 25V electrolytic capacitor, so-called “Combination Meter display not illuminating” problem has no longer occurred completely. All the time, pressing Power with Brake illuminates lights such as speedometer, fuel gauge, odometer, trip meter, and shift position as usual. Yay!

**Temporary Fix** (Resolution without replacing 100μF 16V electrolytic capacitor)

There is a temporary fix which is somewhat cumbersome if the problem occurrence is frequent (in my case, once per four times).

- Press “Power” (“ACC mode”) without “Brake”
- Press “Brake” (Keep pressing)
- Open door (for door light test)
- Turn on “headlight” (Door light turns on)
- Press “Power” (“RUN” mode) (All lights turn on)
- Close door and Turn off “headlight” (for safety driving)