

The Saga:

I've owned a 1996 Lexus LS400 for four years. 49,065 miles. The odometer read a little over 116,000 miles when I bought it. Until ten weeks ago, it was 'as new' in ride and performance. Appearance too. Then, multi-mis-fires started happening.

I felt a miss in the normally smooth engine. Then roughness. Then the check engine light came on and the TracOff light would flash. It never stalled. Never left me stranded. It would be smooth and then rough. After turning it off and on, it would be fine. Sometimes for a mile, sometimes for 30 miles. Unnerving.

I have a OBD-II reader. All sorts of faults were reported. O2, Heated O2, Multiple Mis-Fires, Cat, and on and on. I'd clear them and it would run smooth for a short time. What to do?

I had just filled up at a gas station I'd never been to before. My passenger, riding with me when the first failure happened exclaimed, "Feels like bad gas". I thought, bad gas? I put in a bottle of HEET, water remover. I swear the car ran smoother longer. I was hopeful. The roughness returned. No change. Ugh.

I changed the spark plugs. Hey, I'm an old car guy. That's what we do. I think they were original. Really. And as soon as I looked at the plugs I knew it wasn't ignition related. The roughness returned. No change. Ugh.

The '96 LS400 has four O2 sensors. Two are easy to get to. Two are not. I changed the easy two. Well, there's \$162.00 I'll never have again. No change. Sad part is, I knew. I knew it wouldn't help, but I had to do something. Ugh.

Starting on August 1, and continuing until October 7th, my LS400 wasn't right and I felt hopeless.

Then, a miracle happened.

I have used the internet to successfully solve problems for years. I searched as soon as this problem happened. I didn't find anything that gave me any hope. Lots of people changing lots of parts. Never a good searching solution. As confirmed above. Then, I found this post:

[All my crazy Lexus issues SOLVED!! \(ECU-leaking capacitor\)](#)

It is a short read loaded with great information. And, I think it is well written and interesting. Bill, the guy who wrote the post, did an excellent job. And he responded quickly to the few questions I had.

Basically it says, after 10 or 15 years, electronic components, capacitors, in the Electronic Control Unit, fail. This causes confusion in the operation of several systems in the car and lots of things go wrong, or appear to go wrong. In my case, the tachometer didn't work sometimes, engine runs like crap, then suddenly runs fine again, speedometer not working sometimes.

The Tach and Speedo have been working sometimes and sometimes not for a couple of years. Car ran fine, I thought they were sticky. Hey, it ran fine.

I worked with circuit boards for 30 years, so I wasn't worried about doing the capacitor replacement. And the post made sense to me.

Here is my experience removing the ECU, repairing the ECU and installing the ECU.

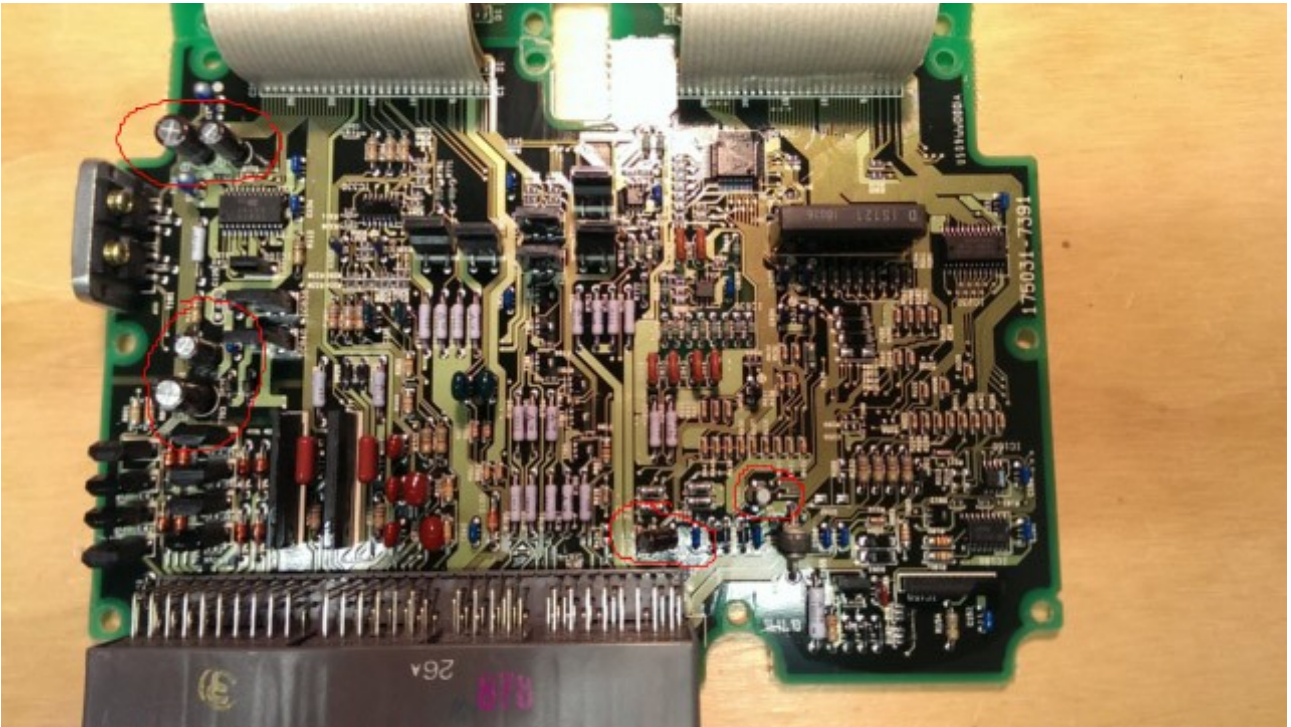
Removing the ECU

This proved to be the hardest part of the job. Thank you Mr. YouTube. I found, after much searching, all the fasteners holding in the glove box. But, it would not come out. I tugged. I spent a lot of time searching for that last screw/nut/bolt holding the glove box in. Finally, I found a video showing me the problem. The guy in the video PULLED the sombitch out. I went out to the garage and PULLED the sombitch out. And out it came. I took pictures.

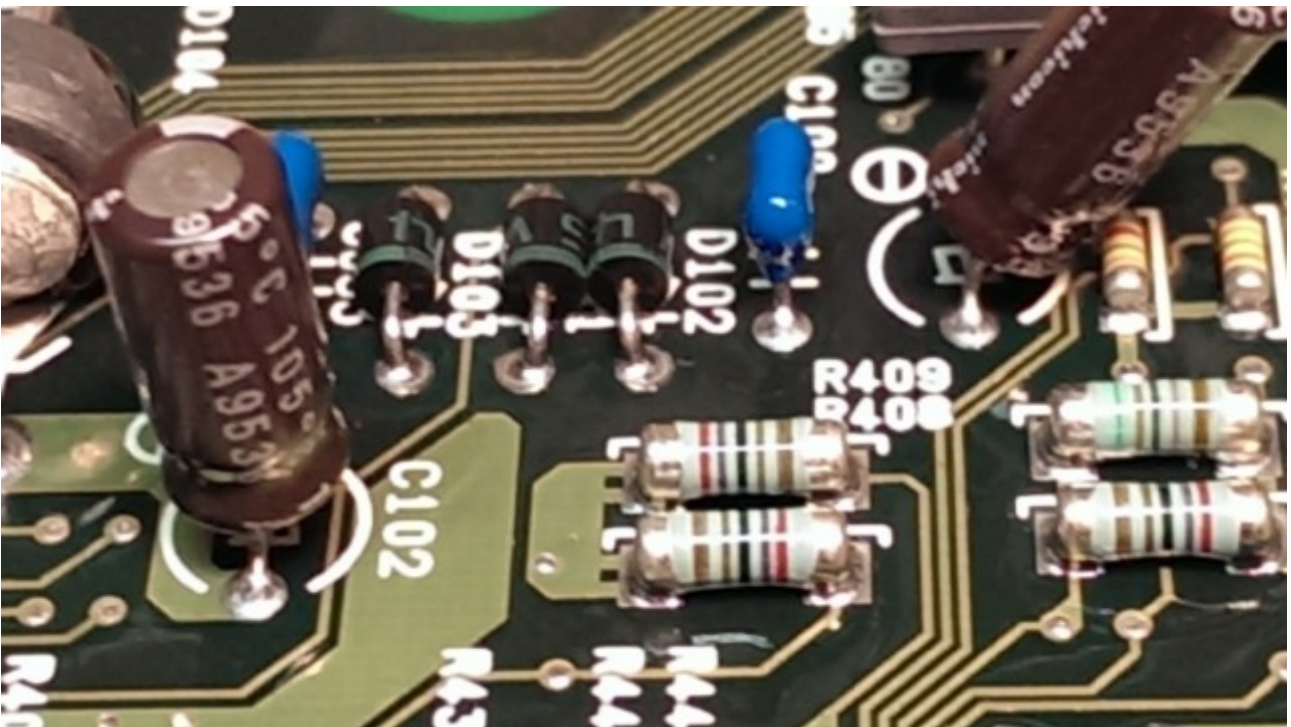


The ECU was not out yet. I could see it. I had hope. The diagram in the post was as good as any I've found. I unplugged everything, AFTER disconnecting the negative cable from the battery. I removed every nut/bolt/screw/fastener I could find and still there were two I could not reach.

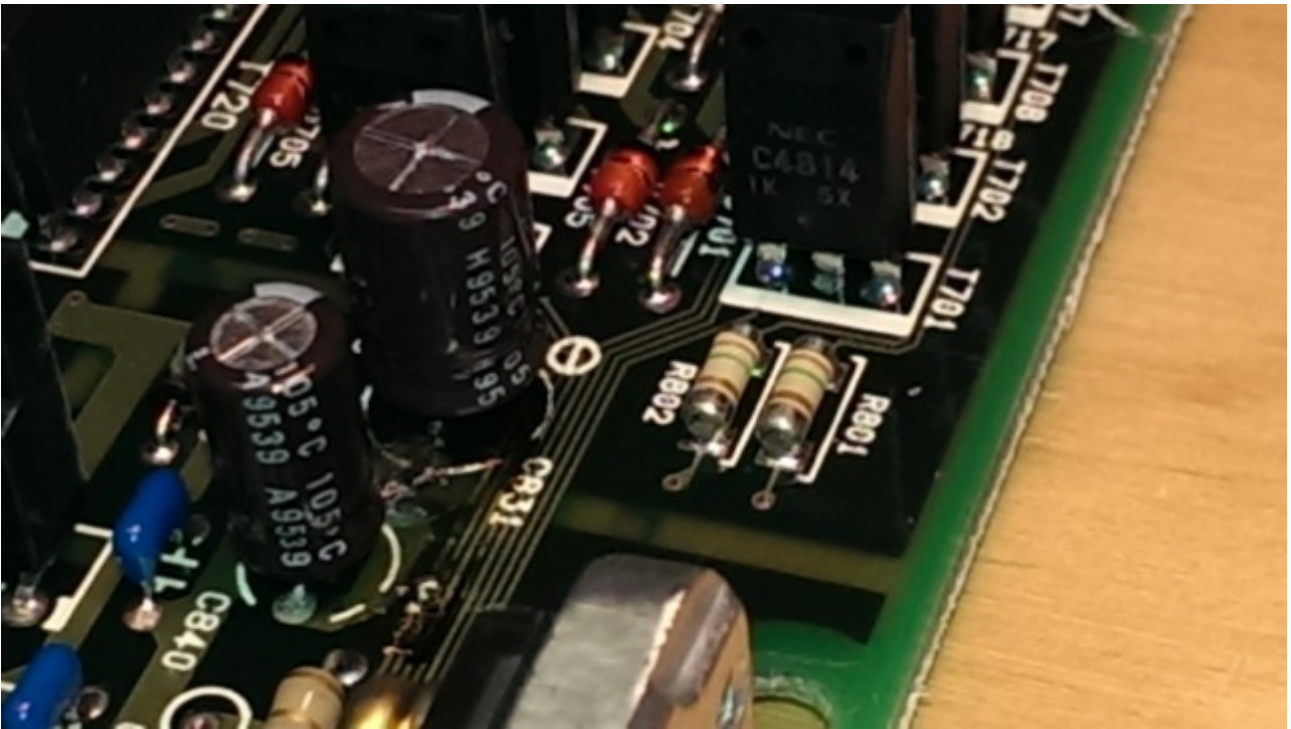
The CD changer, installed in the 1996 and other year LS400s, is another layer in the removal of the ECU. It wasn't shown in the post diagram or in my 2000 LS400 manual. [Here is the video](#) that saved me after exhausting all reasonable, and unreasonable, efforts to remove that blasted CD changer. Once out, the last of the fasteners holding the ECU are revealed and, presto, it is out! Presto and a lot of sweat. I started the ECU repair the next day.



Top of the board with the 6 caps circled in red.

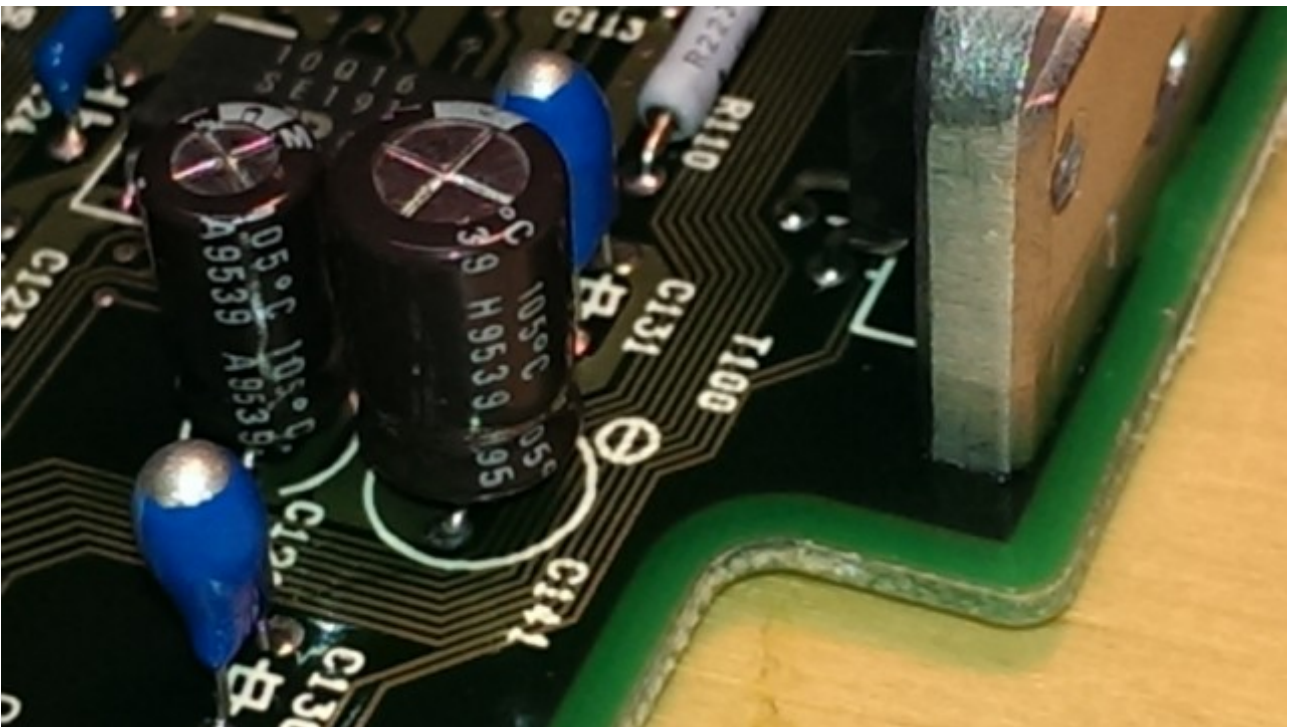


C102 – 10uF 50v, C100 – 10uF 50v (values of the removed caps)



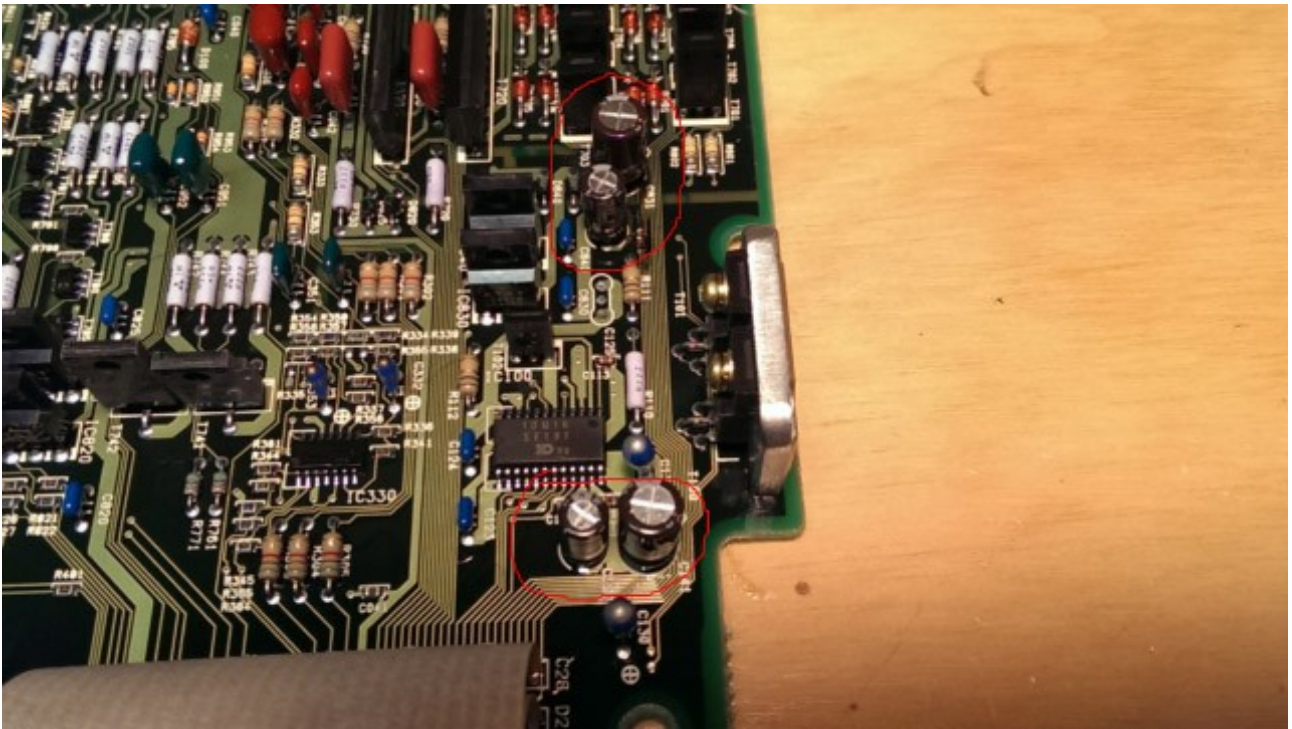
C831 – 47uF 63v, C840 – 100uF 10v (values of the removed caps)

Clearly there is surface damage between and around C831 and C840. The clear coat lifted from the PCB when I cleaned it. First look, and my hopes sunk. Careful inspection, however, revealed no real damage.



C141 – 220uF 16v, C120 – 100uF 10v (values of the removed caps)

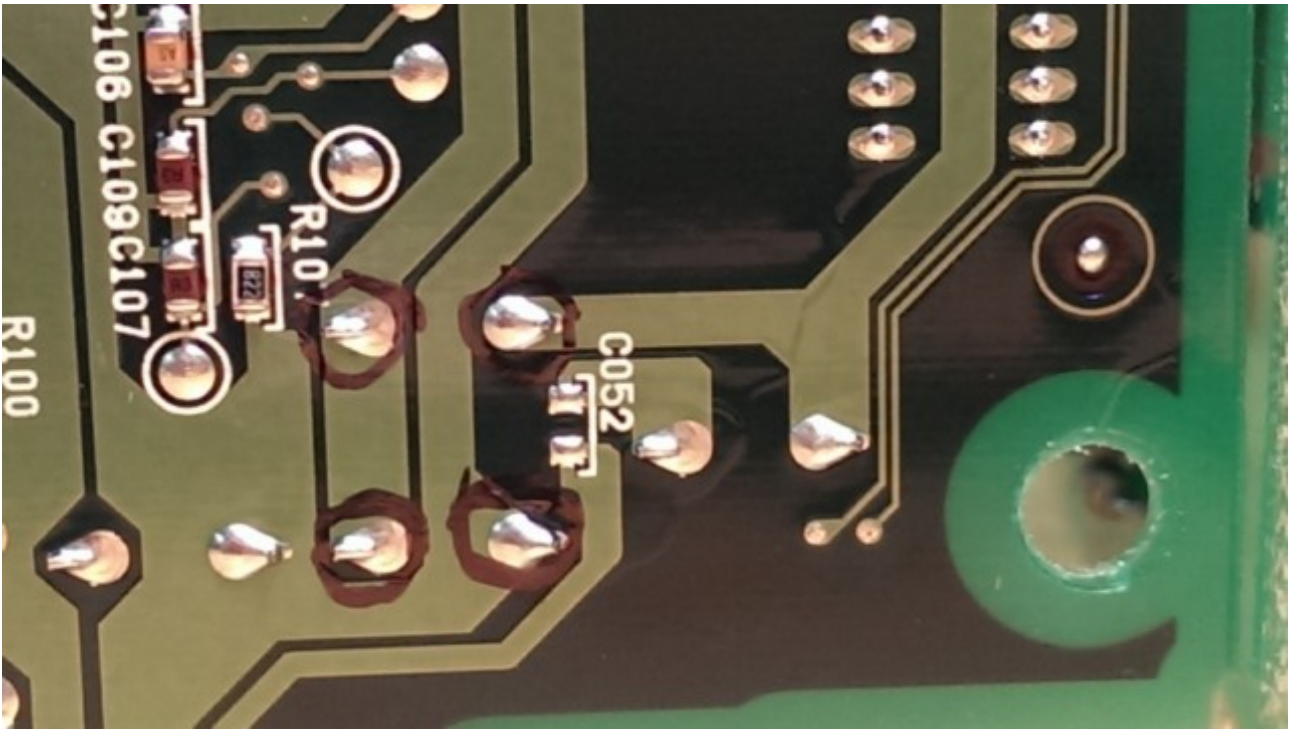
My soldering skills are good. This was hard. My advice is to be careful and take your time. Obvious until I started hacking at the thing to get the old caps out. I used a solder sucker, the RS model described in the post and solder wick. If you can, practice on something else first to gain experience.



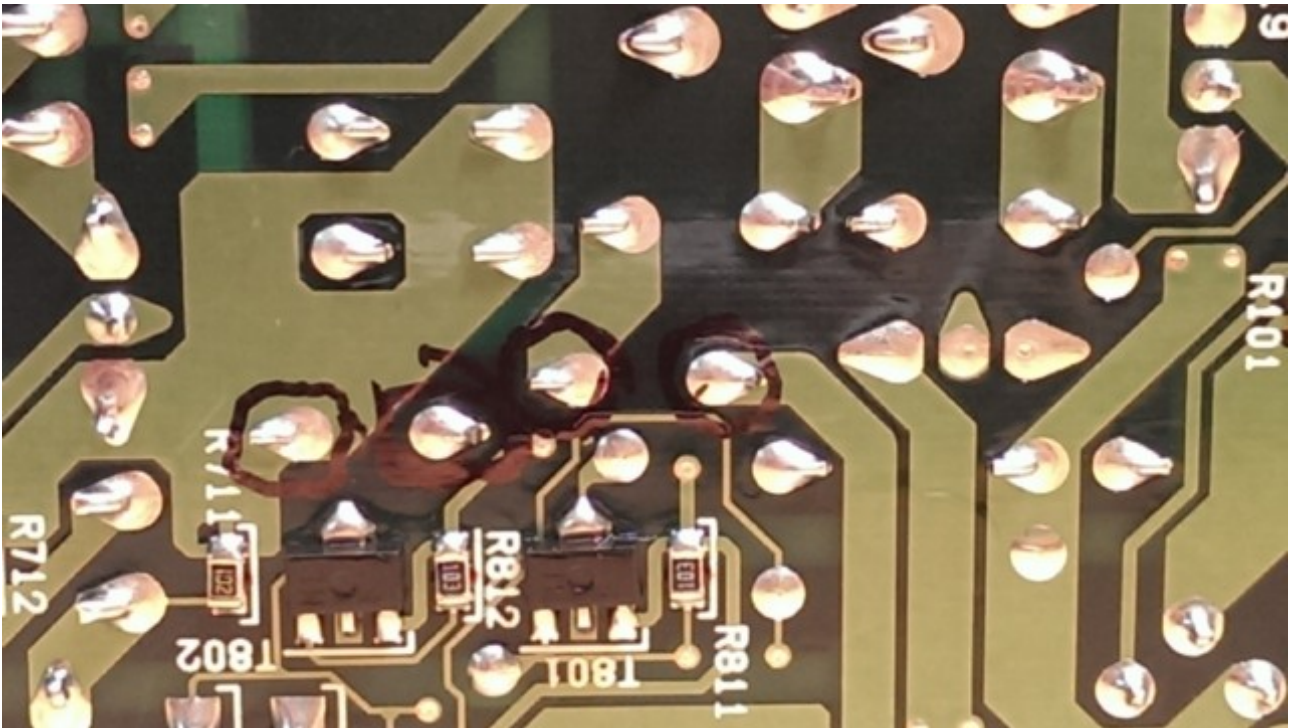
Just another view of the caps on the board before removal.



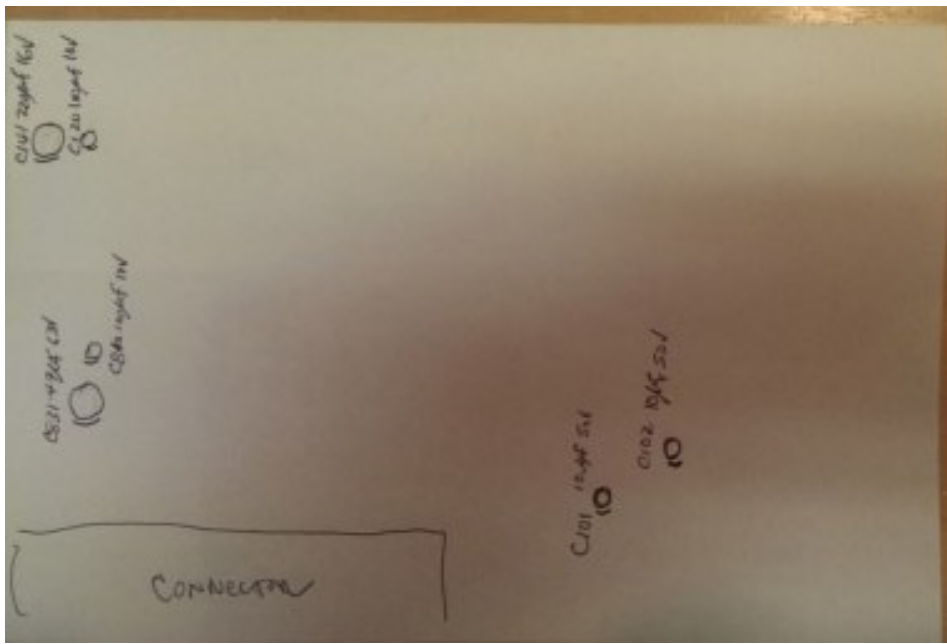
That cap was leaning from the factory



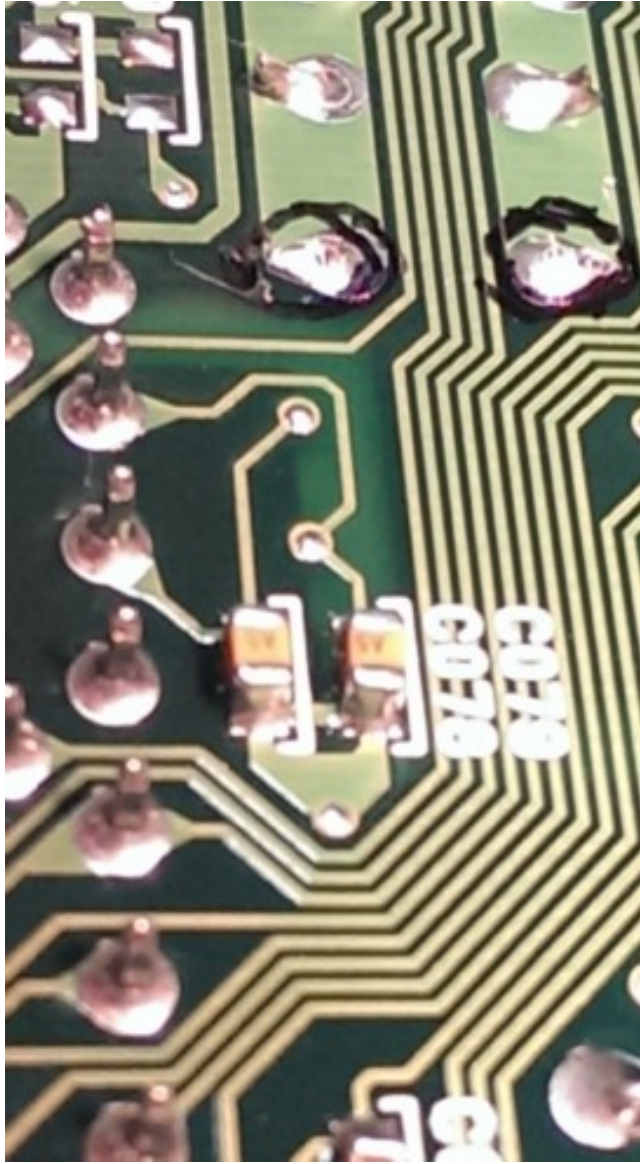
I carefully circled the points to desolder.



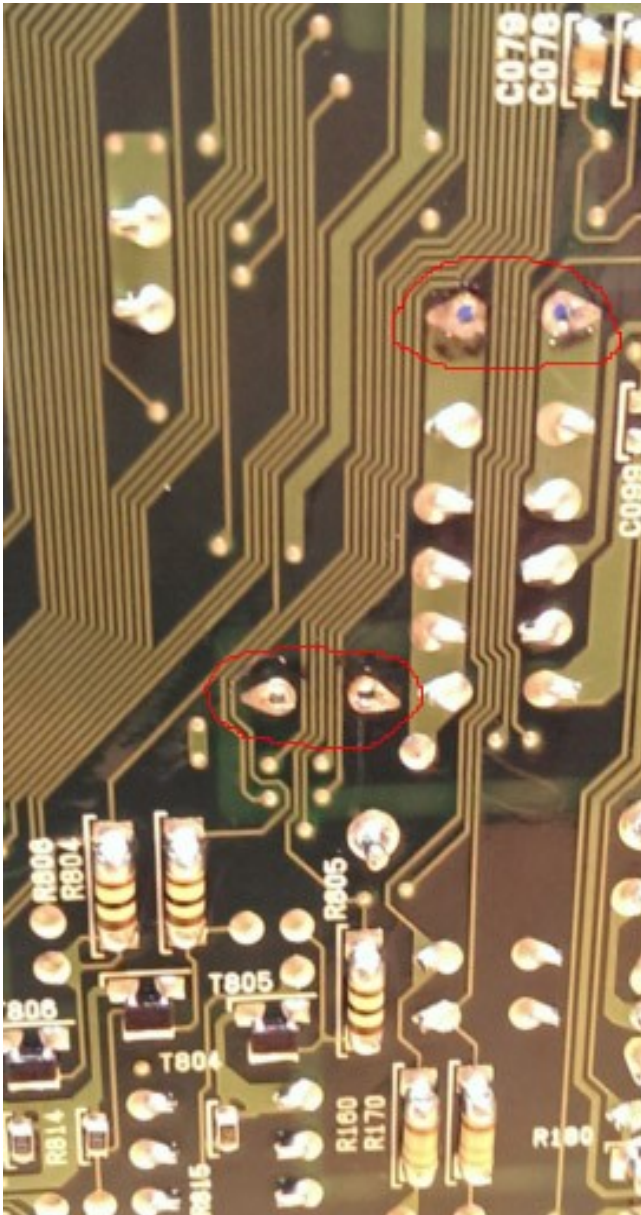
I was careful to check and re-check that I was working on the correct solder joint.



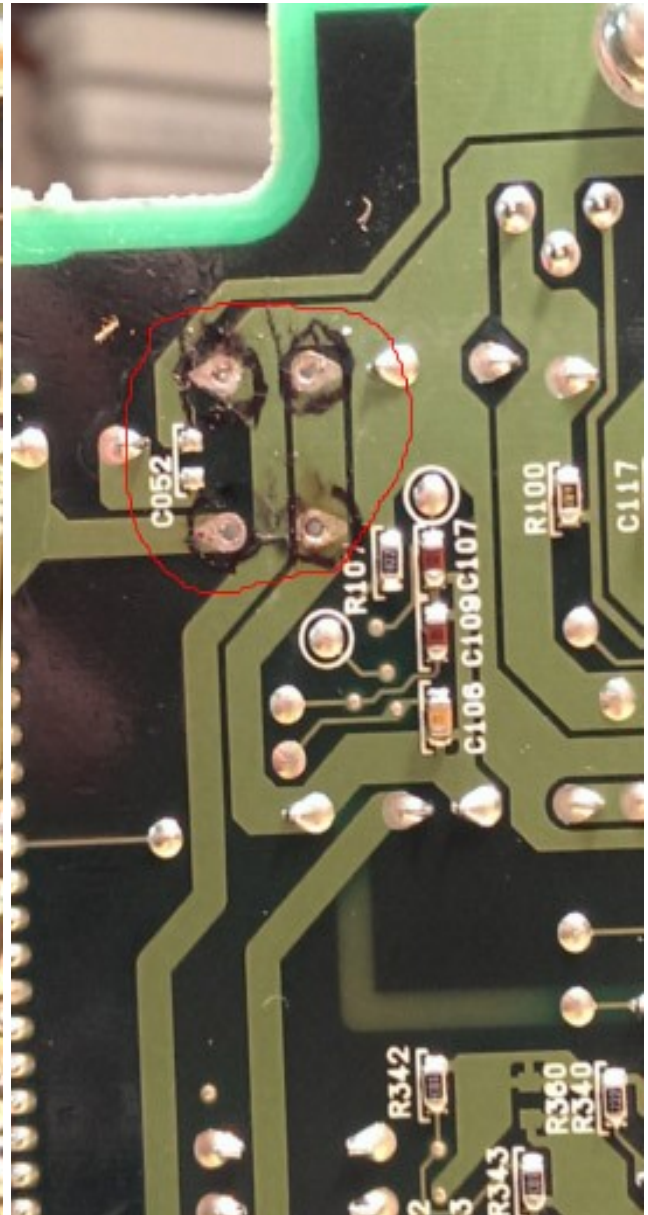
Reading and re-reading the forum post, I drew a diagram. It helped a lot.



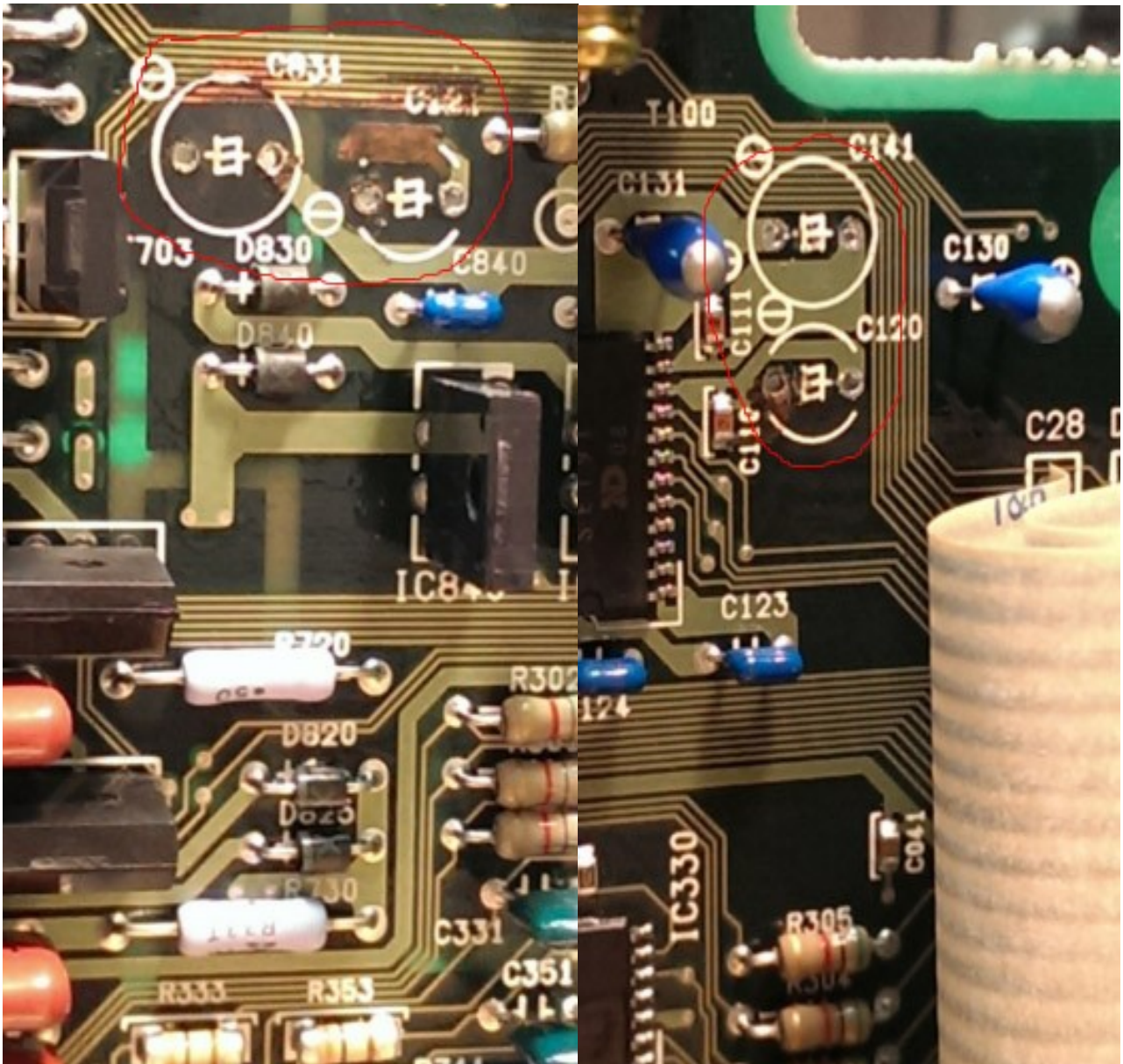
And then I went to work.



Pretty? Not really.



It cleaned up OK.



This shows the damage to the board. I was, at first, concerned with the narrow traces at the top. No worries. Pretty clean really.

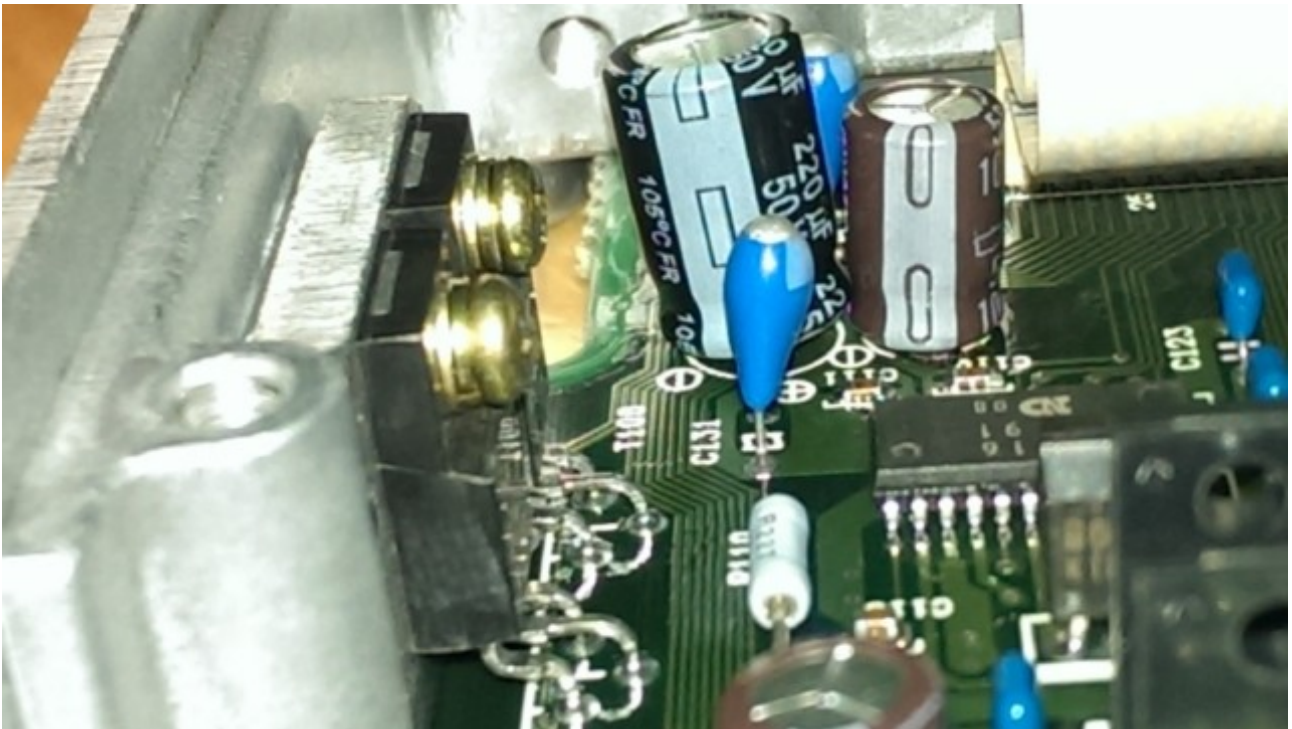
I have a Mouser account, so I purchased the recommended Caps from them. Here are the Mouser part numbers,

661-EKZM500E101MHB5D
EKZM500ELL101MHB5D
50Volts 100uF

667-EEU-FR1H221
EEU-FR1H221
50VDC 220uF

661-EKZE101ELL470MJC
EKZE101ELL470MJC5S
100volts 47uF

661-EKZE500ELL100ME0
EKZE500ELL100ME07D
50volts 10uF



I don't know why, but by the time I put in the new caps, the easiest part of the whole job, I didn't take any photos of them in the board. I remembered just before closing up the boards in the frame.



And back in the car it is.

I connected the battery. No smoke. Always a good sign. I waited a few minutes. I turned the key to ON. Buzzing. Clicking. Whirring. Silence. More Whirring and a racheting sound. Silence. After another minute I started it up. It started without hesitation. The tachometer worked. A good sign. I took a test drive. Smooth. A 3 or 4 mile loop. Smooth. Parked it and cleaned up. I was relieved. So far, so good.

Later that same day, I did some errands, traveling about 20 miles and stopping four times. Smooth from start to finish.

It has been four days since the repair and my LS400 is back to being smooth and fault free. I checked the fault codes and, there are some. No mis-fires, but CAT and O2 sensor codes. The check engine light is not lit so...

Thanks again to Wild Bill for the great guidance and excellent post.

October 29th and still the LS is smooth as silk.

Bill Cogen