

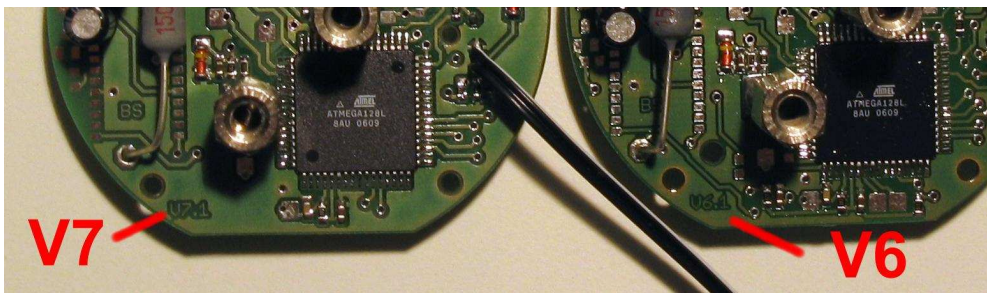
Multi-gauge LCD rework

In case the gauge is showing randomly or permanently 'strange' characters, stripes or even dropouts it is likely that the contacts between display and main electronic have some problems. The contact is provided by small, loaded springs who are prone to alignment tolerances or dirt at their surface.

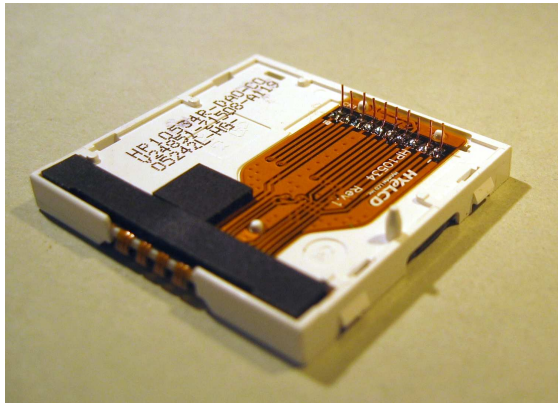
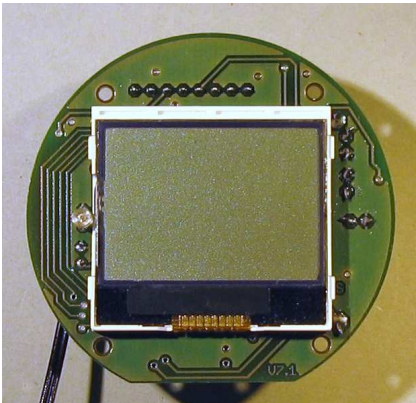
At ignition switch-off the display sometimes shows dark bars at random position. This behaviour is typical, normal, harmless and no failure. The cause for this is the sudden voltage drop. The display has no chance to be correctly powered down and the remaining data fragments are shown.

Before you get started check the type of multi-gauge you have. The version is stamped into the rear of the pcb. So far versions 5, 6 and 7 are in use.

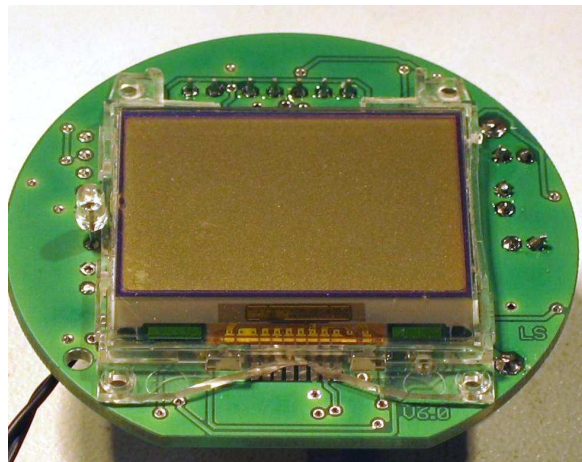
This rework-guide is valid for versions 5 and 6 only. Version 7 uses a different type of LCD which is already permanently connected, no rework necessary or even possible. It will get damaged in case you try to lift it from the pcb.



If you are unclear about the exact type take off the faceplate and compare to the following pictures. It shows a **version 7** and the backside of the LCD-module. Note the 10 short wires.

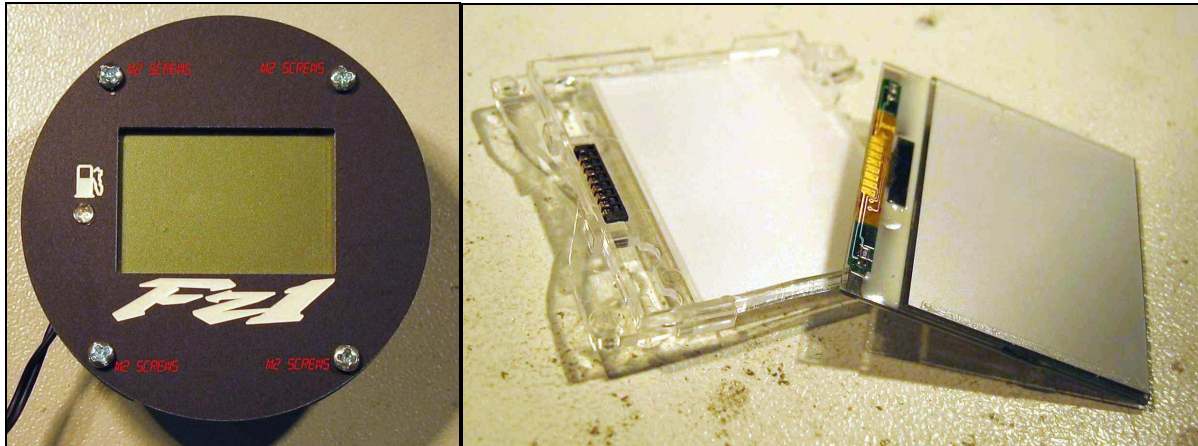


The picture to the right shows a **version 6** (version 5 looks identical). The electrical contact between LCD and main pcb is given by 8 metal springs. The glass is fixed by a plastic holder who also servers as a lightguide. The faceplate is keeping the stackup in place and pressing it onto the pcb.



Proceed in case your gauge is surely of version 5 or 6.

First disassemble the faceplate, if not already done, by removing the four M2-screws. Lift the plate. You see the LCD embedded in its lightguide. Carefully remove lightguide and glass. The display is very fragile! Also pay attention to the orientation of all parts, especially the springs, they are fixed in the lightguide. Note the gold-plated pads for the springs:



Attention:

Some version of LCDs got their springs directly glued onto the LCD-glass. Do not lift the springs up! Otherwise they loose contact permanently. Leave it untouched and clean the pcb only. Reassemble the gauge. If no improvement exchange the complete display.

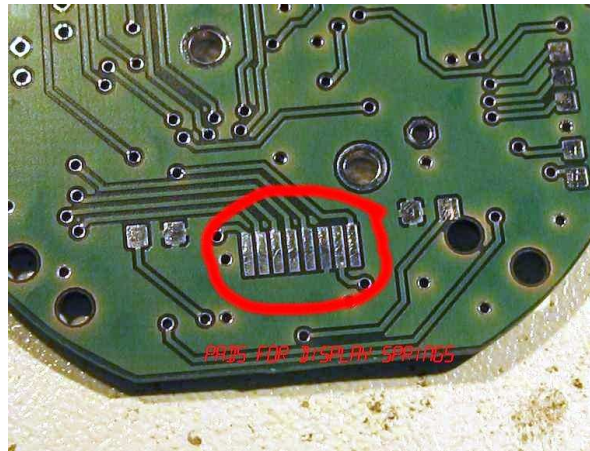
Depending on your skills choose from two options for improving the connection between LCD and main pcb:

Option 1: The easy way, cleaning the contacts and optimize the spring load.

Option 2: Hard-wire the LCD to the board. The ultimate solution, requires experienced solder skills.

Option 1:

The marked pads are counterparts for the springs. They have to be clean and slick. If possible resolder the pads with a very thin(!) layer of solder. Strip the surface with a blade to get it flat:



To give proper contact and tension to the springs the plastic of the lightguide must rest flat onto the pcb. Any obstacles nearby may detain the springs to rest.

To further increase the load to the springs a thin stripe of adhesive tape can be placed inside the marked area on top of the LCD. See also chapter 'Sun protection' in case this area was blank before.



The faceplate is screwed onto the pcb and thereby gives force to the springs. To avoid damage of the LCD the faceplate has an end-stop given by the outer frame of the lightguide. Correct tension of the springs is depending on several parameters and tolerances. To apply more pressure to the spring-region a short stripe of tape should be used.

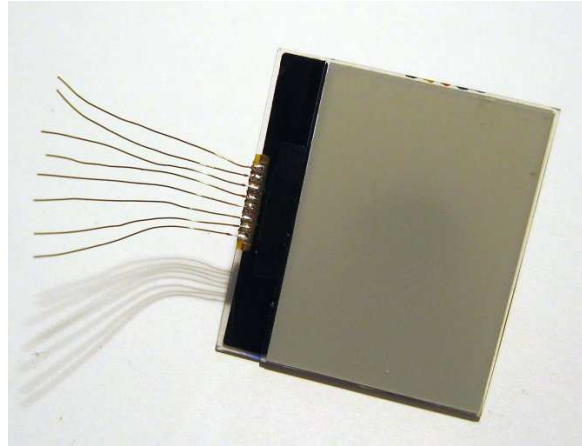
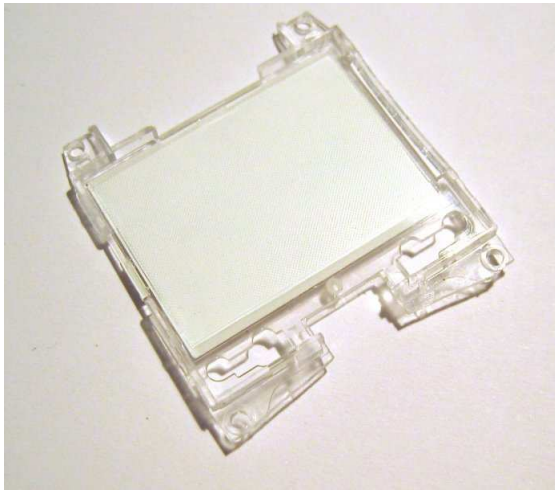
While reassembling the faceplate/display try to align spring and corresponding pads on the pcb. Move the display in the screwholes to find the best position (as far as possible towards 'south') . Have a final inspection by looking through the small opening between faceplate and pcb.

Be sure that the glass is placed properly inside the lightguide, the surface height should not exceed the outer frame of the lightguide. Otherwise it will be cracked. Restrain yourself when tightening the M2 screws.

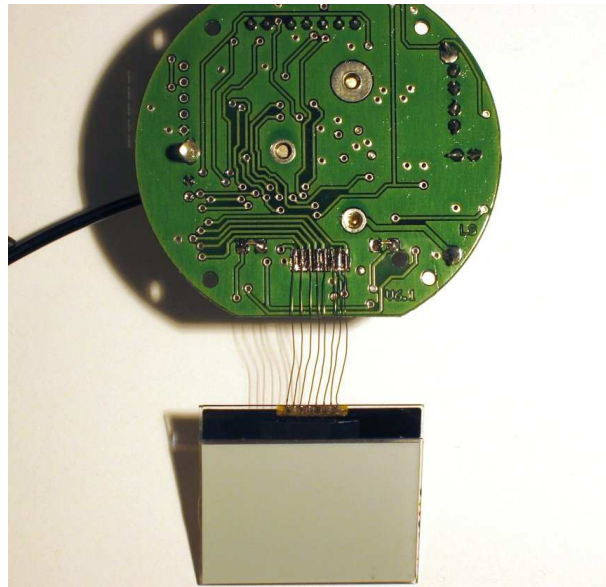
Option 2:

The most perfect remedy is to eliminate all contacts by directly soldering the LCD to the pcb. As the contacts are very tiny this is no easy! Do not try this if you are not experienced in soldering!

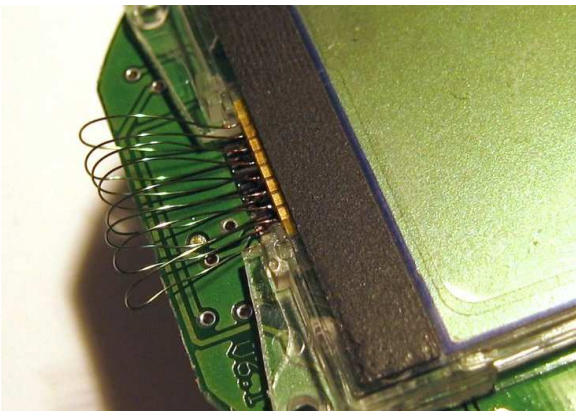
Solder some lacquered copper wire to the pads on the LCD.



Modify the lightguide to get a small cut-out for the wires.



Solder the wires to the corresponding pads on the pcb.



Place it back into lightguide.

Ready to be reassembled!

Sun protection:

Some types of displays are sensitive to intense sunlight caused by a missing protection of the controller-area. They loose contrast, showing a dark brown surface. This effect is non-permanent.

Covering the sensitive part on the LCD with a lightproof tape will fix it.

