Fitting the SAB80515 external ROM daughterboard in a Bosch EZK116K ignition box

Disclaimer

Please follow the instructions carefully and make sure You use the proper tools and materials as well as proper procedures. The daughterboards are thoroughly inspected optically and fully tested in a car test environment with tuning EPROM installed. Please read this document in its entirety before installation!

When installing this kit You will need the following:

- Torx screwdriver T10
- Isopropanol and cotton buds (Q-tips) for cleaning
- Flux (optional)
- Desoldering wick (braid)
- Flux-core solder
- Plain paper or Wettex type tissue
- Brush
- Flat nose pliers and wire cutter
- A small screwdriver for setting the DIP switches

- A temperature-controlled soldering iron station, 50W recommended. Always use a soldering iron with a chisel tip when desoldering to ensure good contact with the desoldering wick.

NOT recommended:

Using a vacuum plunger instead of a desoldering wick
Cheap desoldering wick - poor flux - contamination
Cheap solder - poor flux - contamination
Using an underpowered soldering iron - PCB traces easily damaged
Using a poorly suited soldering tip - PCB traces easily damaged.

Recommended:

Working in an ESD safe environment and with good lighting is highly recommended. Any electrostatic discharge may damage the electronics. Prepare the work area properly in advance so you have all things handy when needed.

Do not attempt unless You are fully comfortable working with electronics and have good experience in soldering, and follow the instructions rigorously. Otherwise You run a high risk of destroying the ignition box!

If You feel the least doubtful, it's better to leave the work to someone with experience and have them do it for You. The installation in easily performed by an experienced person.

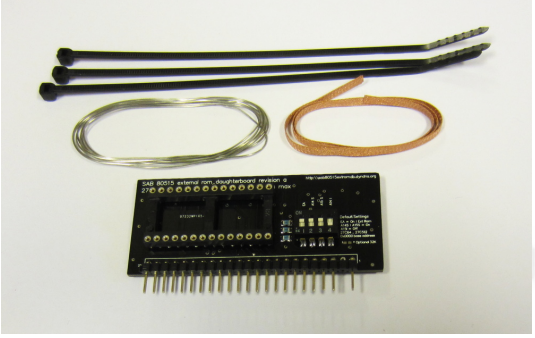
Important:

Make sure to keep the tip oxide free wiping it after each operation, keeping the tip properly wetted with tin when soldering or desoldering. Take care not to create solder bridges, use the desoldering wick to correct this in case this happens.

Visible residue from cleanable fluxes, or any active flux residues on electrical contact surfaces are considered defective conditions.

Particulate matter on an assembly is also considered a defective condition. Assemblies should be free of dirt, lint, dross and other particulate matter. Dirt or other residues might be electrically conductive and cause short circuits.

A video showing proper procedures when soldering as well as using suitable equipment and materials can be found here:
https://www.youtube.com/watch?v=b15MMzb_GWw



The kit includes:

SAB80515 external rom daughterboard revision a
3 cable ties - polyamide, halogen free
20+ cm of Chemtronics Soderwick Pb-free Rosin-SD desoldering wick
2 grams of Almit SR-37 0.5 mm (1 m) or Almit SR-38 0.8 mm (62.5 cm) Pb-free high performance resin flux cored solder.

The amount of desoldering wick and solder is about twice as much as needed.

Note: All parts are Pb-free and RoHS approved components.

Background

The adapter daughterboard is based entirely on information openly available on the internet regarding the Bosch JeTronic LH2.4 / EZK116K ECU.

Neither the manufacturer of, nor the resellers of the external rom daughterboard have participated in any research concerning Bosch JeTronic LH2.4 / EZK116K.

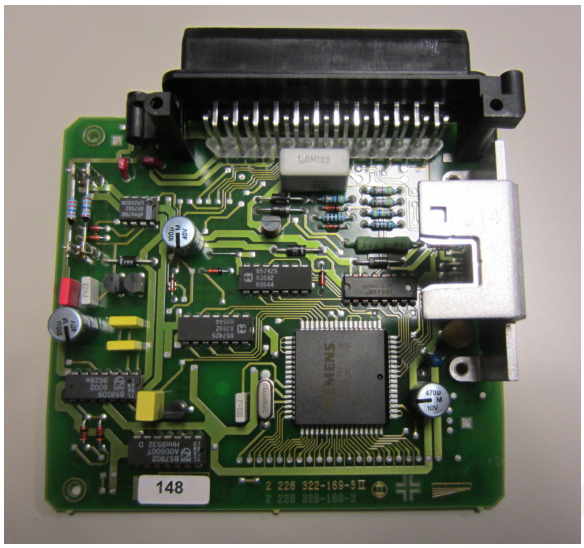
Step by step instructions

Make sure You work in a safe environment with good lighting and with all tools and materials ready.

Remove the three Torx screws on the rear end of the box.

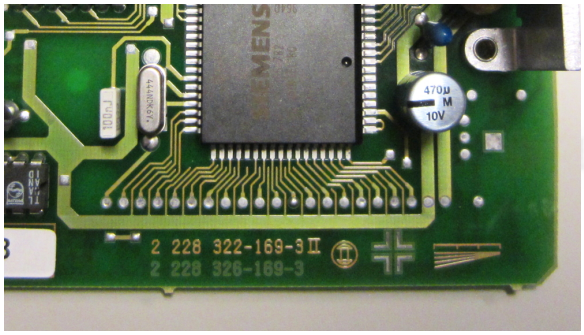
Remove the four Torx screws on the front of the box and gently remove the front cover. The PCB is supported by two guide rails molded into the inside of the front cover.

Carefully slide the PCB out from the housing.



The Bosch EZK116K PCB.

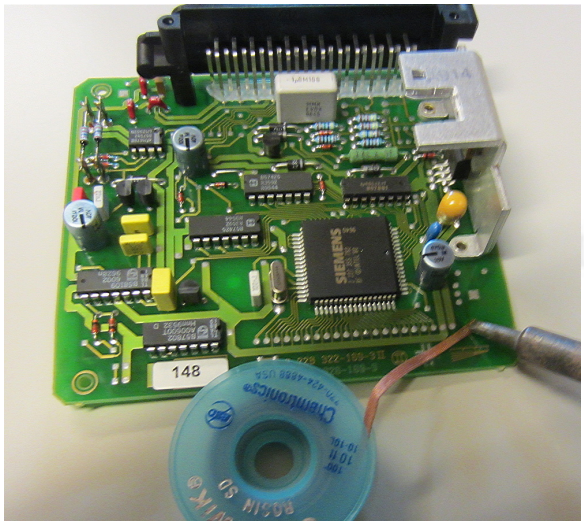
There are some different versions of the PCB with minor variations, though all chippable boxes share the same functionality with the use of an external ROM daughterboard when fitted.



The daughterboard will be fitted here after removing the solder from the via holes.

1. Important! Never apply heat for more than a maximum of 4 to 5 seconds when desoldering. If You do it for longer You may destroy the circuit board traces, at the given temperature. The same applies when soldering. Repeated attempts greatly increase the risk of damaging the PCB traces.

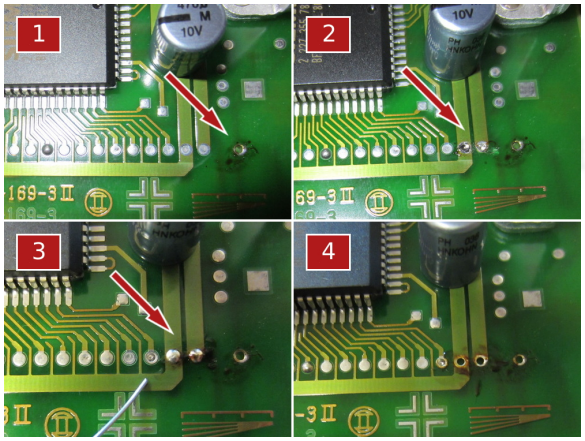
Never use more than 370°C when soldering. 350°C is recommended when desoldering.



2. Place the heated chisel tip flush against the desoldering wick making sure the wick is in parallel with the PCB/via and the side of the chisel tip comes into full contact with the wick so that heat is transferred optimally.

Apply pressure making sure the wick is heated evenly. Doing this correctly it will take 3 to 4 seconds. You may have to move the wick (horizontally) a bit while doing this if it becomes saturated with tin (You can see it turns a silver colour).

Cut the saturated end of the solder wick down after each desoldering to make sure that the solder-filled part of the wick does not act as a heat sink. This makes sure You will get the best results and minimum of problems using the wick.



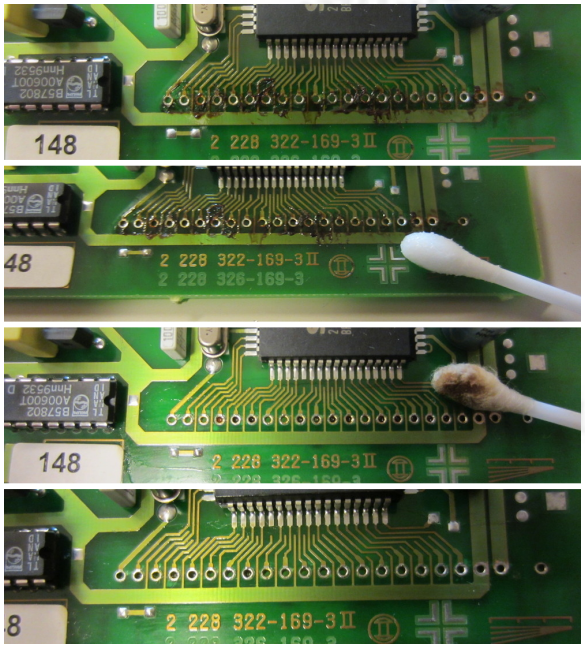
3. If there is solder remaining in the hole from step 1, apply fresh solder (flux) and repeat step 2. This may well be the case at the wider traces (+ and -) on the PCB as shown here:

(1) Successfully desoldered via.

(2) Example of unsuccessful desoldering attempt.

(3) Fresh solder (with flux remaining - do not heat for too long, then the flux will evaporate) applied so that the solder will flow freely into the desoldering wick. Adding pure flux is highly recommended.

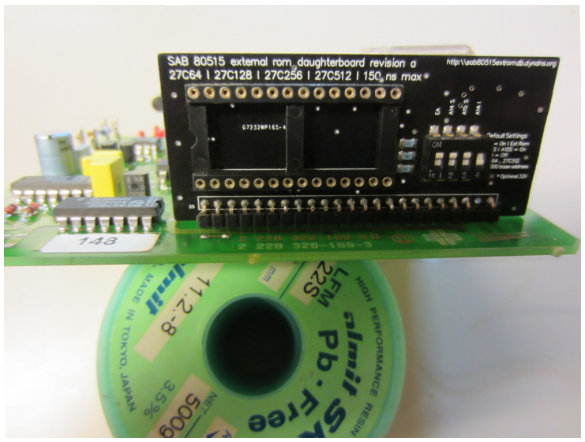
(4) Now successfully desoldered.



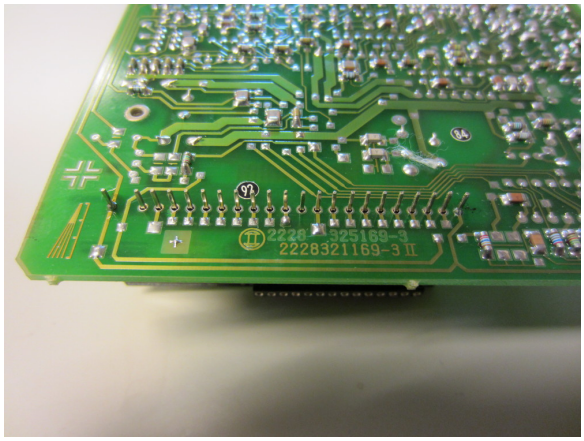
4. With the solder removed from all via holes, the flux residue must be wiped off using isopropanol. Use cotton buds. This is a vital step since some flux residue is slightly conductive and leaving any behind may cause serious and hard to locate problems.

The risk of running into such problems is minimised using a high quality desoldering wick and solder. Nevertheless removing all flux residue is strongly recommended in order to avoid problems.

Repeat steps 2 through 4 on the reverse side of the PCB as needed.



5. Having cleaned everything thoroughly, insert the daughterboard making sure the pins are inserted all the way and the board is flush with the main board PCB.

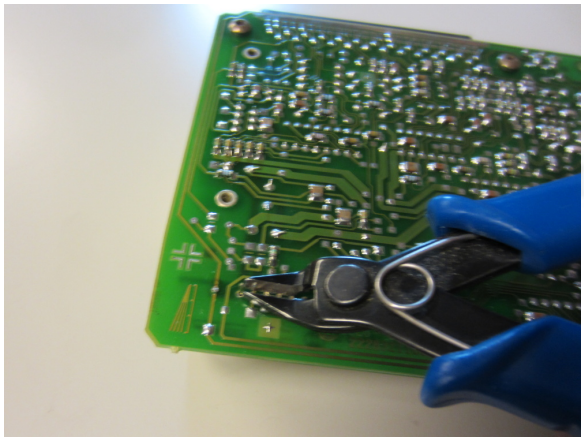


6. Gently pressing the daughterboard against the PCB, solder the two outermost pins (pins 1 and 23).

Make sure the daughterboard is flush and level with the PCB while doing this.

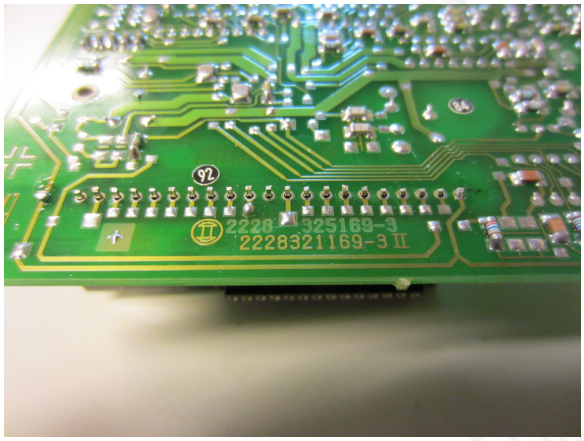
Important: use a small amount of solder since you will resolder these pins later, but enough to keep the daughterboard in place.

7. When soldering, feed approx. 1.5 - 2 cm of the supplied solder (typically. for about 2-3 seconds) and stop feeding solder when the joint is filled, still applying heat for about a second until the solder has flowed into the via. Withdraw the tip quickly. Important note: If You apply heat for too long and the flux evaporates completely the solder will stick to the tip when removing it resulting in a poorly made solder joint and You must apply fresh solder or flux, or even remove solder using the desoldering wick.

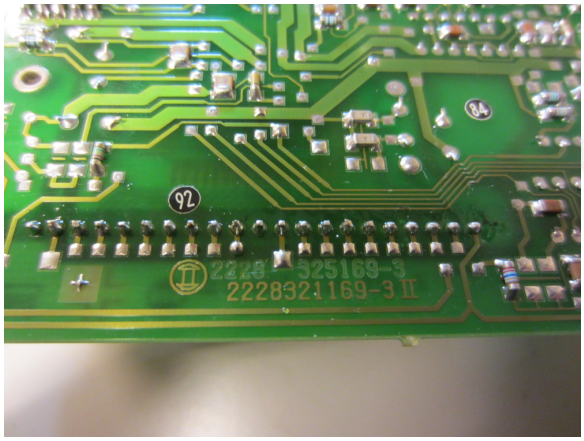


8. Cut pins 1 and 23, applying more solder to re-solder these two pins while gently pressing the daughterboard flush with the mainboard.

Never just cut the pins without resoldering, since this will very likely result in cracks in the solder joint by the mechanical stresses from cutting.

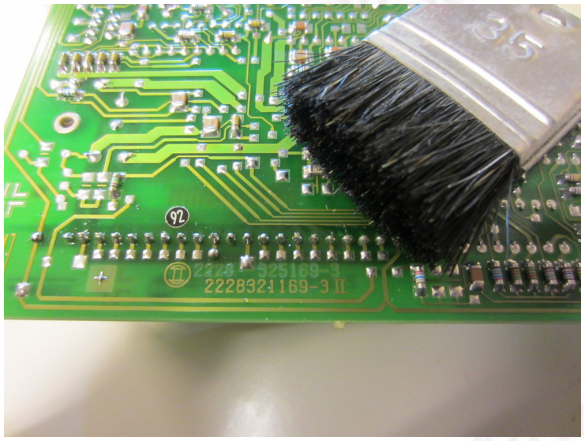


9. Now cut pins 2 through 22, leaving about a millimeter in length protruding.



10.Solder all these remaining pins as detailed above. Place the chisel tip at an angle pressing gently against the pin and the via. You may solder every other pin in turn (as shown in the video) to allow the previous solder joint time to set.

Pre-heat for about a second before feeding the solder (from the opposite side to the tip). Do not abort this procedure prematurely - keep a constant thermal contact with the pin and feed the solder from the other side of the pin.



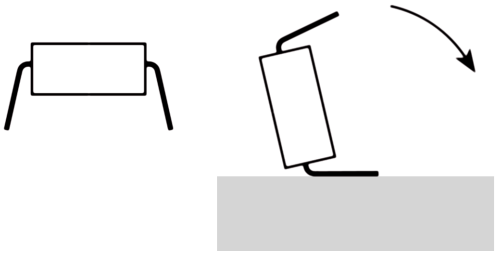
11. Clean off all flux residue from the PCB using a brush and plenty of isopropanol.

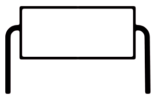
Use a piece of paper or wettex tissue and press it against the solder joints to take up isopropanol and flux residue.

Repeat a couple of times making sure all flux residue is removed. Finally, You may rinse the PCB by pouring isopropanol over the area while holding the board pointing down at an angle to wash off the last remnants of flux, then quickly using the paper to take up the remaining isopropanol. Don't just let it dry off/evaporate by itself, this will not work well as You may leave a film of residue in place.

12. Test the box with the DIP switch 1 (EA) in the OFF position without EPROM. The car should start, using the 80515 internal mask ROM.

13. Test the box with the DIP switch 1 (EA) in the ON position without EPROM. The car should not start, since there is no EPROM installed.



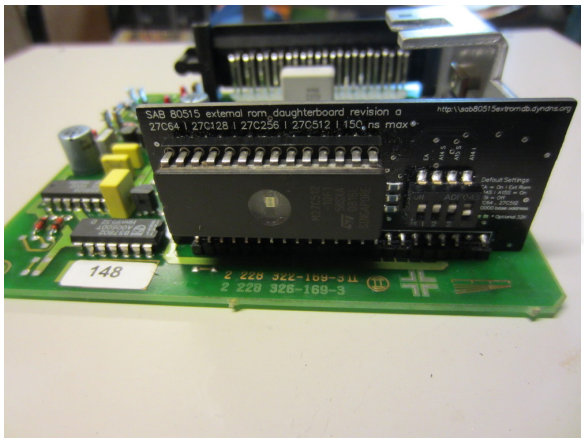


14. Most EPROM chips bought by tuning companies are programmed in a ZIF socket and thus the legs will not be at a perfect right angle to the ceramic, this is the way they come when made.

To properly insert the chip into the provided socket - with machined holes - You will therefore have to bend the legs so that they are at a precise right angle to the chip.

Grasp the chip with the thumb and index finger of both hands and carefully bend the legs against a hard surface until they are at a right angle with the chip.

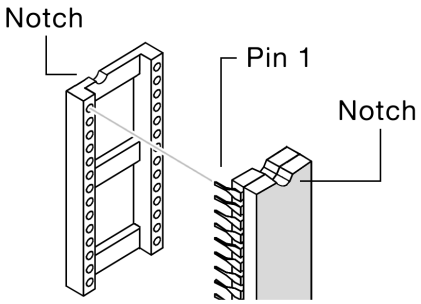
See pictures.



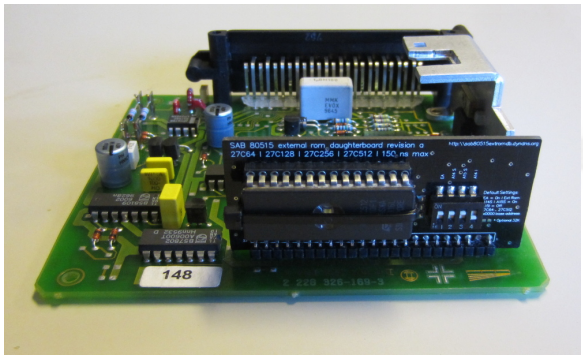
15. Take the utmost care mounting the EPROM chip - the machined socket on the daughterboard is of a high quality but aligning the legs properly is a bit tricky. Take Your time doing this making sure all the legs are centered on their respective socket holes before inserting. Repeat step 14 if necessary.

If a leg is bent or buckles while inserting You will have to straighten it making sure it is 100% straight before inserting again and every time You do this the metal is weakened through fatigue and will eventually break. So take care this does not happen!

Make sure no leg goes in under the chip or outside the socket.

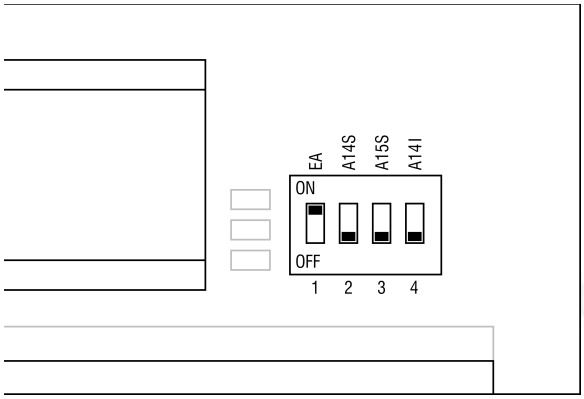


Important! Pin 1 on the EPROM must seat into position 1 of the socket, as shown.180° wrong oriented can most likely destroy the EPROM.



16. The original boxes that come fitted with a daughterboard (known as Gold Boxes) include an ABS plastic fixture to hold the EPROM chip in place in the socket. When competition driving or during bumpy rides there is a risk of the chip working itself loose from the socket if it is not held in place by a fixture.

Included with the kit is a halogen-free cable tie for fixing the chip in place. Slide the cable tie underneath the socket and wrap it around and over the chip ceramic and tighten it. Make sure You get it tight at the ends of the chip, and place the lock on the left side of the socket. See picture.



17. Set DIP switches ON-OFF-OFF-OFF

18. If everything was done correctly the car should now start with the tuning chip active.

19. Carefully reassemble the box. Make sure the PCB slides into the guide rails molded into the box cover and take care that the daughterboard slides freely inside the box and is not damaged by being pressed against the box edges. When done correctly there is ample space between the top of the daughterboard and the inside of the box. Do not force it. Once the PCB is fully inserted and the cover put in place, start by tightening the three Torx screws on the back next to the connector, then tighten the four Torx screws on the cover.

20. Assuming the installation has been performed correctly according to the instructions and using a verified working EPROM for the ignition box in question, everything will work as intended.

DIP switch settings

1. EA: ON = Enable external ROM, OFF = Enable internal mask ROM.
2. A14S (A14 Static): ON means A14 = “0” otherwise pull-up to “1” (see note 1)
3. A15S (A15 Static): ON means A15 = “0” otherwise pull-up to “1” (see note 2)

4. A14I (A14 Internal): Do not use . Must be set to OFF.

Note 1. Must be set to OFF if using 27C64, 27C128
Note 2. Must be set to OFF if using 27C64, 27C128 or 27C256

A14S A15S

The SAB80515 can address 16 kilobytes on the external EPROM. Using the switches one can choose a fixed setting of A14 and A15, thus selecting different 16K banks on the 27C256 (2 banks) and 27C512 (4 banks), The original boxes fitted with daughterboard use 27C256 with 4 copies (mirrors) of 8K blocks. Newer boxes with OBD may support 16K blocks. In such case 27C128 or bigger EPROM must be used.

A14I(A15I) is an option that is not used or documented and must not be set to ON.

The adapter daughterboard supports the EPROMs/variants listed below.

We recommend using an EPROM with access time 150 ns or less.

The base address settings below is the “offset” of the 16K bank in the EPROM in question! On smaller size EPROMs A14 and/or A15 pin have different functions and their respective DIP switches must be set to OFF.

Base address is selected by setting DIP switches 2 and 3 as follows:

27C64 - 8K	27C128 - 16K	27C256 - 32 K	27C512 - 64 K
ON ON = X	ON ON = X	ON ON = X	ON ON = 0x0000
ON OFF = X	ON OFF = X	ON OFF = 0x0000	ON OFF = 0x8000
OFF ON = X	OFF ON = X	OFF ON = X	OFF ON = 0x4000
OFF OFF = 0x0000	OFF OFF = 0x0000	OFF OFF = 0x4000	OFF OFF = 0xC000

X = setting not valid for this type of EPROM.

Features

Why use our board when there are other similar ones on the market?

Only high quality throughout - PCB, CAD work, parts & components.

Our daughterboards are carefully designed with an optimal ground plane and decoupling capacitors to minimise any problems. They are fully tested on all banks, thoroughly inspected and cleaned. And delivered in ESD bags.

We use all 23 pins to ensure optimal grounding. Our boards are also about the same size as the original daughterboards and designed to fit in the box without problems.

FAQ

Q: I have done everything correctly but the box is not working with a tuning chip and/or internal mask ROM – I have also tried all other dip-settings!
A: Many thing can go wrong if some of the steps above are not followed firmly. We cant provide support at this time – as the modules are all thoroughly tested in the production the EZK daughter board should NOT be the problem you experience.

Q: My box is not working with my verified tuning chip?
A: If the size of the Tuning EPROM is unknown, it is likely that A15S and/or A14S must be set to OFF for it to work with this daughter-board. See the “DIP switch settings” section.

Q: What is A14I?
A: As of this writing, its function is not documented. DIP switch 4 must always be set to OFF. The functionality of this will be explained on the Wiki – Page coming at a later time. Please check on sab80515extromdb.com site for any updates and if the planned Wiki-Page is present. But this is for advanced usage and will need additional hardware options or diy solutions.

Q: I have accidentally damaged a PCB trace or via, what can I do?
A: You can find several guides on the internet on how to attempt repair in such cases. The PCB of the EZK116K is fairly easy to repair should this happen.

Q: I heard that this board can be modified to switch between up to 4 banks externally.
A: This is true, even up to 8 banks can be switched but this must be explained in the planned Wiki-Page, and will need other hardware options coming or diy solutions.
Bear with us to find the time to write the planned Wiki-Page asap.

Q: Can this daughter-board support wasted spark?
A: Not without optional hardware options, we hope soon can offer this optional hardware.

Have Fun, and take utmost care of our precious old Volvo's!

This document is revised 2026-02-02, please note that sab80515extromdb.duckdns.org will be opted out due to DNS problems, sab80515extromdb.com is the primary site.