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FID 582: Bosch MG1/MD1 TC29X BSL/BENCH [SM2 PRO/SM3 ONLY]

Overview

Family for unlocking (removing protection) in BSL mode, reading and writing FLASH and EEPROM in BENCH mode for Bosch MG1/MD1 ECUs based on Infineon Aurix TC29X MCUs.

Module: Bosch MG1/MD1 Gen2 BENCH [SM2/SM3 only]

MCU: TC298, TC299

Supporting features

Allows:

- unlocking (removing protection) in BSL mode
- reading and writing FLASH and EEPROM in BENCH mode (after UNLOCK)
- checksum correction is performed automatically during writing

Read and write time is 10-15 minutes. Unlocking (remove protection) typically takes 10-20 minutes, but may take longer depending on the ECU.

Attention!

- Module works only with SM2 PRO/SM3. Update the drivers before using the module: [Download drivers](#)
- For BSL connection, connect the Scanmatik's 13-pin OBD port with a Zener diode 1N5335B (3.9V, 5W) and tantalum capacitor (2.2uF, 16V), or use the BITS002 adapter directly



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BOSCH MG1/MD1 VOLTAGE GLITCH UNLOCK

⚠ IMPORTANT — INTERIM SOLUTION

This unlock uses a controlled voltage-drop technique to access supported Bosch MG1/MD1 ECUs. It is an **interim solution**, not the preferred long-term method; behavior/results may be less predictable than conventional unlock methods.

A safer, more reliable solution is under development.

REQUIREMENTS

- **Supported J2534:** Scanmatik 2 Pro/3 Pro **only** with [updated drivers](#).
- Intended for professionals experienced in ECU electronics, SMD soldering, and direct processor connections.
- ECU must be opened and the **specified PCB component temporarily removed**.
- Prepare the **VPP line with the specified protective diodes/capacitors** and connect VPP directly to the specified processor point.

⚠ WARNING — PERMANENT DAMAGE POSSIBLE

Incorrect ECU/PCB identification, soldering, connection points, VPP wiring, diode/capacitor placement, shorts, ESD, or excessive heat may cause **immediate and irreversible ECU damage**.

If the ECU/PCB does not exactly match the version shown in the manual, STOP.

Verify all modifications and VPP connections before applying power.

⚠ VOLTAGE-DROP RISK

Correct preparation and connections **do not guarantee** safe or successful operation. Processor response to the voltage drop cannot be guaranteed and may vary between ECUs/processors.

Possible results include:

- loss of communication;
- failure to boot;
- data corruption;
- permanent ECU/processor damage.

DISCLAIMER

All ECU modifications and use of this unlock are performed **entirely at your own risk**. We accept no responsibility for damaged ECUs, lost data, or damaged equipment.

Damaged/bricked ECUs are not a support case. Technical support does not cover ECU repair, recovery, replacement, or compensation.

BEFORE PROCEEDING

By continuing, you confirm that you understand and accept the risks of ECU modification, direct processor connection, and controlled processor voltage reduction, including the possibility of **permanent ECU damage**.

If you do not accept this risk, do not use this unlock feature.



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ECU PREPARATION & CONNECTION

WORK ENVIRONMENT

Perform all ECU opening, PCB handling, soldering, and connection work in proper electronics work environment.

- Use an ESD-safe workstation, grounded ESD mat and wrist strap.
- Use appropriate ESD-safe soldering equipment and tools.
- Keep the PCB clean and protected from conductive debris.
- Make sure all ECU, VPP, CAN, J2534 and USB connections are secure.
- **Never modify or solder the PCB while connected to the programming equipment.**

⚠ WARNING: ESD Hazard!

Working on an open ECU without proper grounding can cause static electricity to damage or burn out sensitive board components. Always use an anti-static wrist strap and an ESD-safe mat before touching the PCB.

1. Check ECU compatibility

Identify the exact ECU type and verify that it is supported by the Bosch MG1/MD1 Voltage Glitch Unlock feature.

Do not proceed with an unsupported or unidentified ECU.

2. VPP connection

Use either the BITS002 adapter or a correctly prepared VPP cable for the VPP connection.

USING THE BITS002 ADAPTER *(available from any of our dealers)*

The [BITS002 adapter](#) can be used for bench connection of the ECU. It provides automatic control of ECU power and boot pins via a supported J2534 adapter.

The violet wire on BITS002 is the VPP lead. No additional VPP cable preparation is required when using this adapter.

USING AN ASSAMBLE VPP CONNECTION CABLE

If your VPP cable has already been correctly prepared, no further cable preparation is required.

For an unprepared cable, connect the required Zener diode 1N5335B (3.9V, 5W) and capacitor exactly as shown in the [VPP Cable assembly](#) section before working on the ECU.

Verify component values, orientation, and connections before using the cable.

Do not connect an unprotected VPP line directly to the processor.

3. Open and verify the ECU

Carefully open the ECU.

Compare the PCB with the corresponding diagram in this manual and verify that the PCB layout and hardware revision match.



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Do not rely only on the ECU label. Always verify the PCB before proceeding.

If complete disassembly and removal of the PCB from the housing is required, handle the PCB with extreme care.

Do not bend, twist or deform the PCB during removal or reassembly.

4. Test the ECU after opening

Before making any PCB modifications, reinstall the ECU in the vehicle and verify that it operates normally.

We strongly recommend performing this test before proceeding.

This confirms that the ECU was not damaged during opening or disassembly.

If the ECU does not operate normally:

STOP. DO NOT CONTINUE WITH THE UNLOCK PROCEDURE.

5. Prepare the ECU and Connect VPP

Using the diagram for the exact ECU and PCB revision:

- remove the specified component(s);

⚠ Keep the removed resistor. It must be soldered back into its original position after unlocking and confirming the UNLOCKED status.

- locate the specified processor connection point;
- connect the VPP line exactly as shown.

If using BITS002, connect its violet VPP wire to the specified processor connection point.

Do not use component locations or connection points from another ECU or PCB revision.

6. Inspect and verify your work

Before connecting the ECU to the programming equipment:

- verify the VPP connection point;
- verify that the correct component(s) were temporary removed;
- inspect all solder joints;
- check for solder bridges or solder droplets;
- check for damaged pads or traces;
- make sure no loose conductive material remains on the PCB.

Do not continue until all modifications and connections have been inspected.

7. Connect Power, Ground and CAN

Connect Power, Ground and CAN to the ECU connector exactly as shown in the corresponding ECU diagram.

Connect the supported J2534 adapter and VPP line.

Do not manually apply or switch ECU power. Power must be controlled automatically by the supported adapter during the procedure.

Make sure all connections are secure before continuing.



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8. Identify the ECU

Perform ECU identification using the software.

The supported adapter will control ECU power automatically as required.

Identification must complete successfully before proceeding.

If identification fails, stop and check:

- ECU/PCB compatibility;
- Power, Ground and CAN connections;
- J2534 and USB connections;
- VPP connection;
- PCB modifications.

Do not repeatedly attempt the procedure if the cause of the identification failure is unknown.

CHECKLIST

Before selecting Remove Protection, confirm:

- ☐ Exact ECU type is supported
- ☐ VPP cable is prepared correctly or BITS002 adapter is used, where VPP is the violet wire
- ☐ PCB matches the diagram for this ECU
- ☐ ECU was tested after opening and operates normally
- ☐ Correct PCB component(s) were removed
- ☐ VPP cable is prepared correctly or the BITS002 adapter is used
- ☐ PCB and solder joints have been inspected
- ☐ No solder bridges, droplets or loose conductive material are present
- ☐ Power, Ground and CAN are connected according to the ECU diagram
- ☐ Supported J2534 adapter with automatic power control is used
- ☐ All connections are secure
- ☐ ECU identification completes successfully

If any item above cannot be confirmed, **STOP**. DO NOT RUN REMOVE PROTECTION.



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9. Remove Protection

After successful ECU identification, select:

Remove Protection

Follow the software instructions.

Do not disconnect the ECU, J2534 adapter, USB, CAN or VPP connection while the procedure is running. Do not interfere with automatic power control.

10. Verify the unlock status

After Remove Protection completes successfully, perform ECU identification again using the software.

Confirm that the status is displayed as **UNLOCKED**.

11. Restore the ECU

After confirming the UNLOCKED status, make sure ECU power is off and disconnect the ECU from the power supply and all programming equipment.

Remove the temporary VPP connection from the PCB. Solder the disconnected resistor during ECU preparation back into its original position.

Inspect the solder joints and check for solder bridges, damaged pads and loose conductive material before reassembling the ECU.

Never solder or modify the PCB while the ECU is powered or connected to programming equipment.

12. Bench operations after unlock

After unlocking (removing protection) in BSL mode, you can use the same family in BENCH mode for Identification/Read/Write/Read EEPROM/Write EEPROM features.



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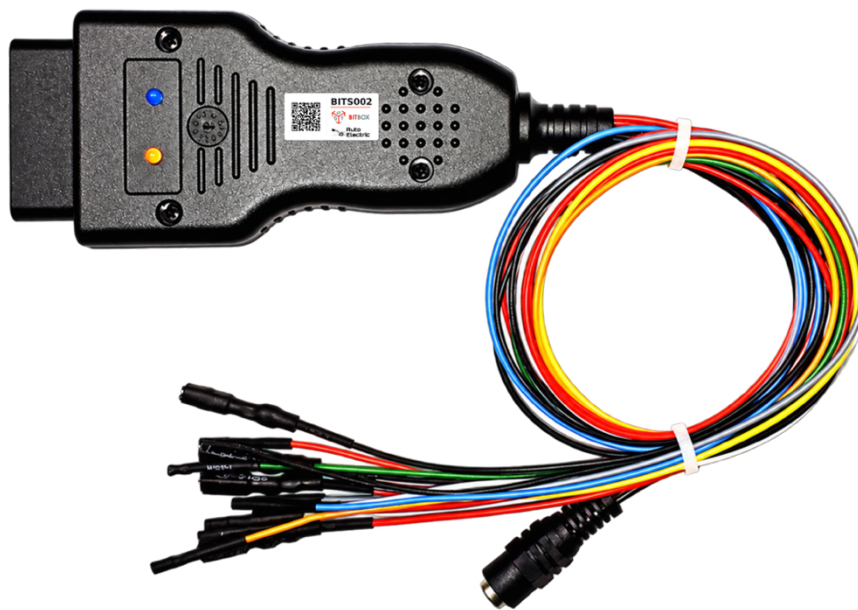
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BITS002 ADAPTER

A dedicated adapter for connecting ECUs on the bench. It automatically controls ECU power and boot pins via a supported J2534 adapter.

The female OBDII connector connects to the J2534 adapter. BITS002 is available for purchase from any of our dealers.

BITS002 bench connection adapter



VPP: use the violet wire. Connect it to the processor point shown in the diagram for the exact ECU.

WIRE ASSIGNMENTS

Wire colour	Function
Red	+12 V POWER
Black	Ground
Yellow	CAN-Hi
Blue	CAN-Lo
Green	K-line
Grey	Boot L0
White	Boot L1
Orange	Boot H0
Violet	VPP
White/red	GPT1
White/black	GPT2



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VPP CABLE ASSEMBLY

Follow these steps if you are not using the **BITS002 adapter**.

PARTS REQUIRED

⚠ The Zener diode and tantalum capacitor **must have** the exact ratings specified below. Using components with different ratings may permanently damage the ECU.

- Zener diode (stabilatron): **3.9V, 5W** (1N5335B).
- Any tantalum capacitor: **2.2uF, 16V**. **Do not use a ceramic capacitor.**
- Three insulated leads with suitable connectors: VPP, PCB Point and GND.
- Two short wires for the capacitor: red for (+), black for (-).
- Soldering tools, heat-shrink tubing or other connection supplies and a multimeter.

ASSEMBLY

Keep the cable disconnected from the ECU, J2534 interface and power supply during assembly.

1. Prepare the leads. Label the three leads VPP, PCB Point and GND. Strip and tin the ends to be soldered. Slide the heat-shrink tubing onto the wires before making the joints.



2. Make the VPP joint. Join the VPP lead and the PCB Point lead together. Solder both to the diode lead at the banded end, marked with a grey line (+). These three connections form the VPP joint.



3. Make the GND joint. Solder the GND lead to the diode lead at the unbanded end (-). This is the GND joint.



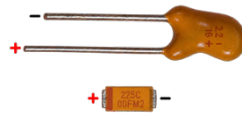


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4. Identify the capacitor polarity.

Leaded tantalum capacitor: The leg next to the (+) marking is positive; the other leg is negative. Before trimming, the longer leg is normally (+) and the shorter leg is (-). If the legs have been cut, use the body marking or datasheet.

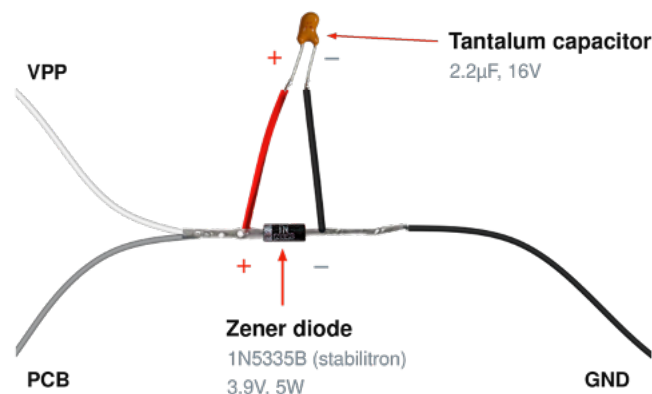


SMD tantalum capacitor: The end marked with a stripe or bar is positive (+); the opposite, unmarked end is negative (-).

5. Assemble the capacitor with its wires. Prepare two short wires: one **red** and one **black**. Strip and tin both ends of each wire. Solder one end of the **red wire to the capacitor's positive (+) leg or terminal**. Solder one end of the **black wire to its negative (-) leg or terminal**. Leave the opposite ends free for connection to the Zener diode.



6. Connect the capacitor assembly in parallel with the Zener diode. Solder the free end of the **red wire (+)** to the diode's **grey-banded end (+)**, at the joint with the VPP and PCB Point leads. Solder the free end of the **black wire (-)** to the diode's **unbanded end (-)**, at the GND joint.



7. Check the assembly. Verify all connections and component polarity against the connection diagram. Use a multimeter to check continuity between the **VPP and PCB Point leads**. Inspect for **solder bridges and loose wire strands**.



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8. Insulate the joints. Cover every exposed solder joint and component lead with heat-shrink tubing. Keep the VPP and GND joints separately insulated. Secure the assembly so cable movement does not strain the component leads.

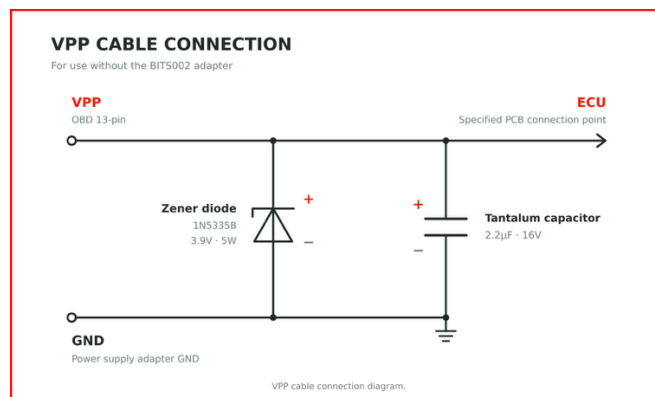
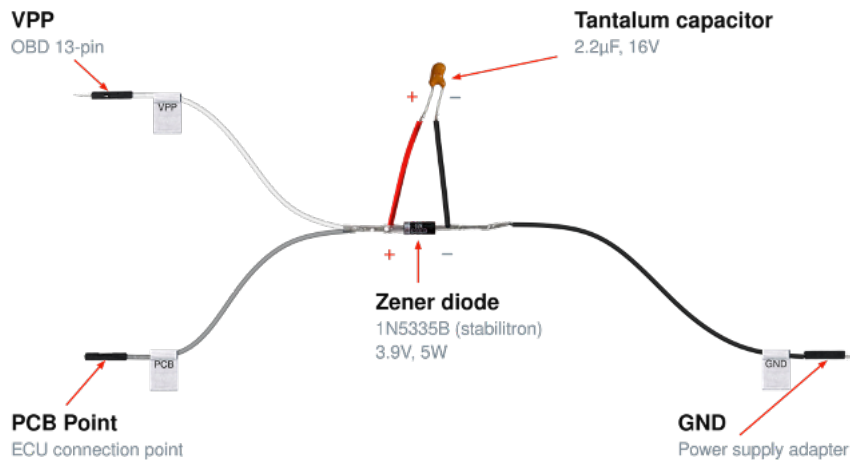
9. Connect the finished cable. With power off, connect the three leads as follows:

Lead	Connect to
VPP	OBD 13-pin: the VPP wire of the connection cable.
PCB Point	The processor connection point shown in the diagram for the exact ECU.
GND	The GND terminal of the power supply adapter.

The diode and capacitor connect in parallel between VPP and GND. The VPP and PCB Point leads remain directly connected.

ASSEMBLED CABLE

Assembly shown before insulation. Insulate all exposed joints before use.





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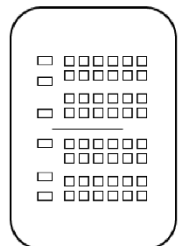
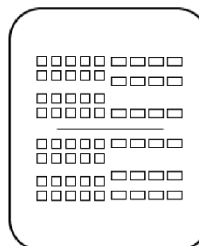
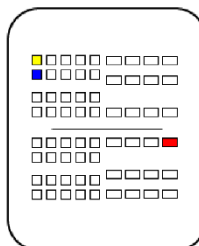
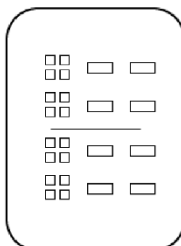
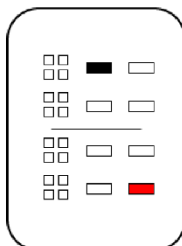
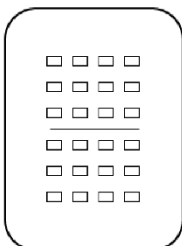
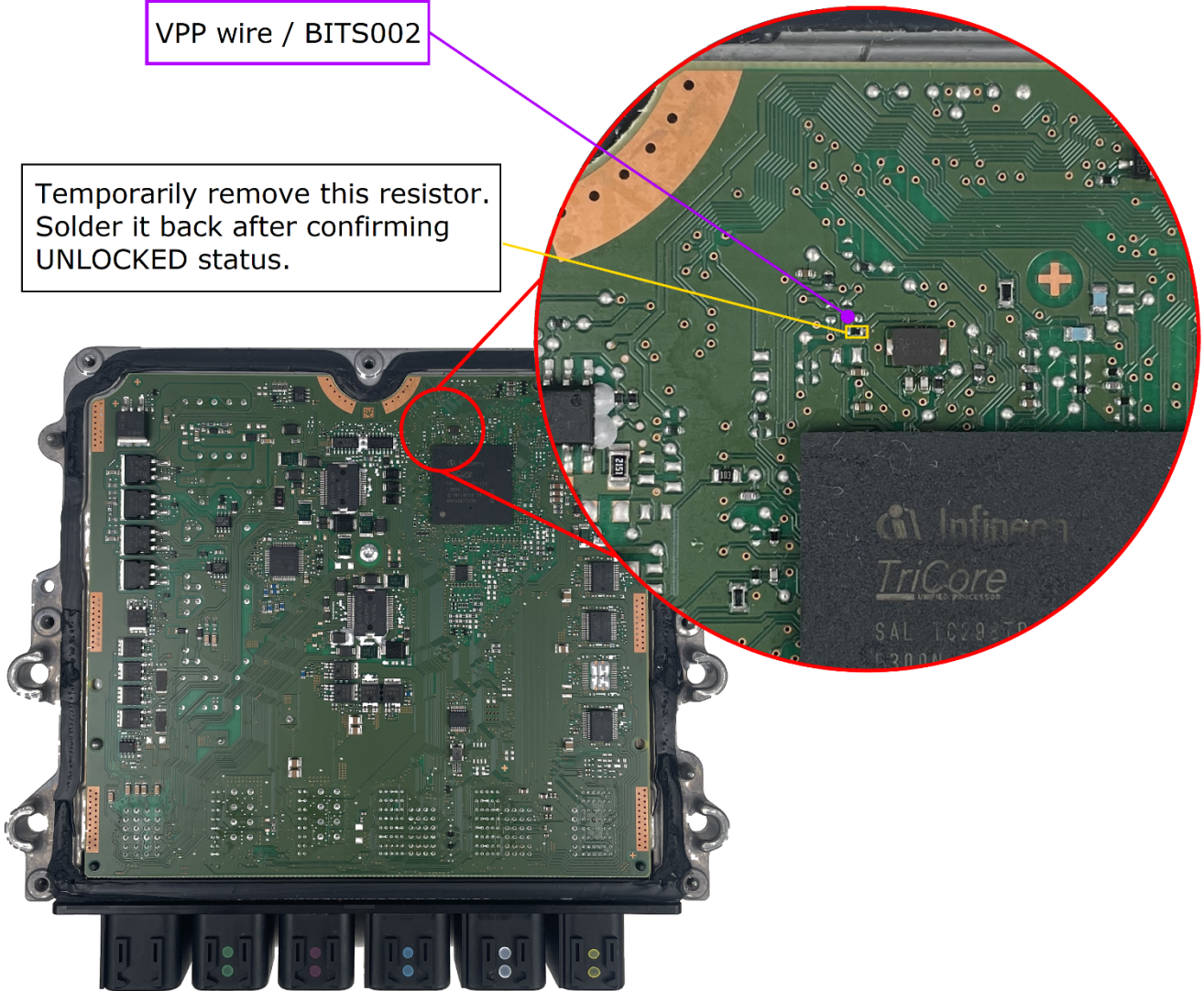
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JLR

MD1CP017

VPP wire / BITS002

Temporarily remove this resistor.
Solder it back after confirming
UNLOCKED status.



Ground Power CAN-H CAN-L

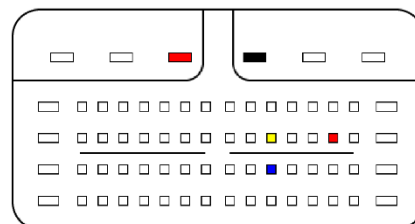
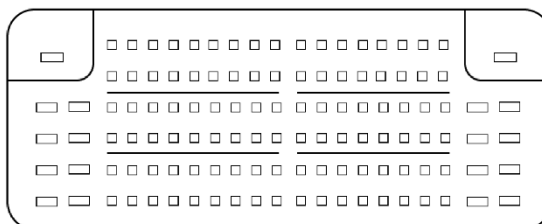
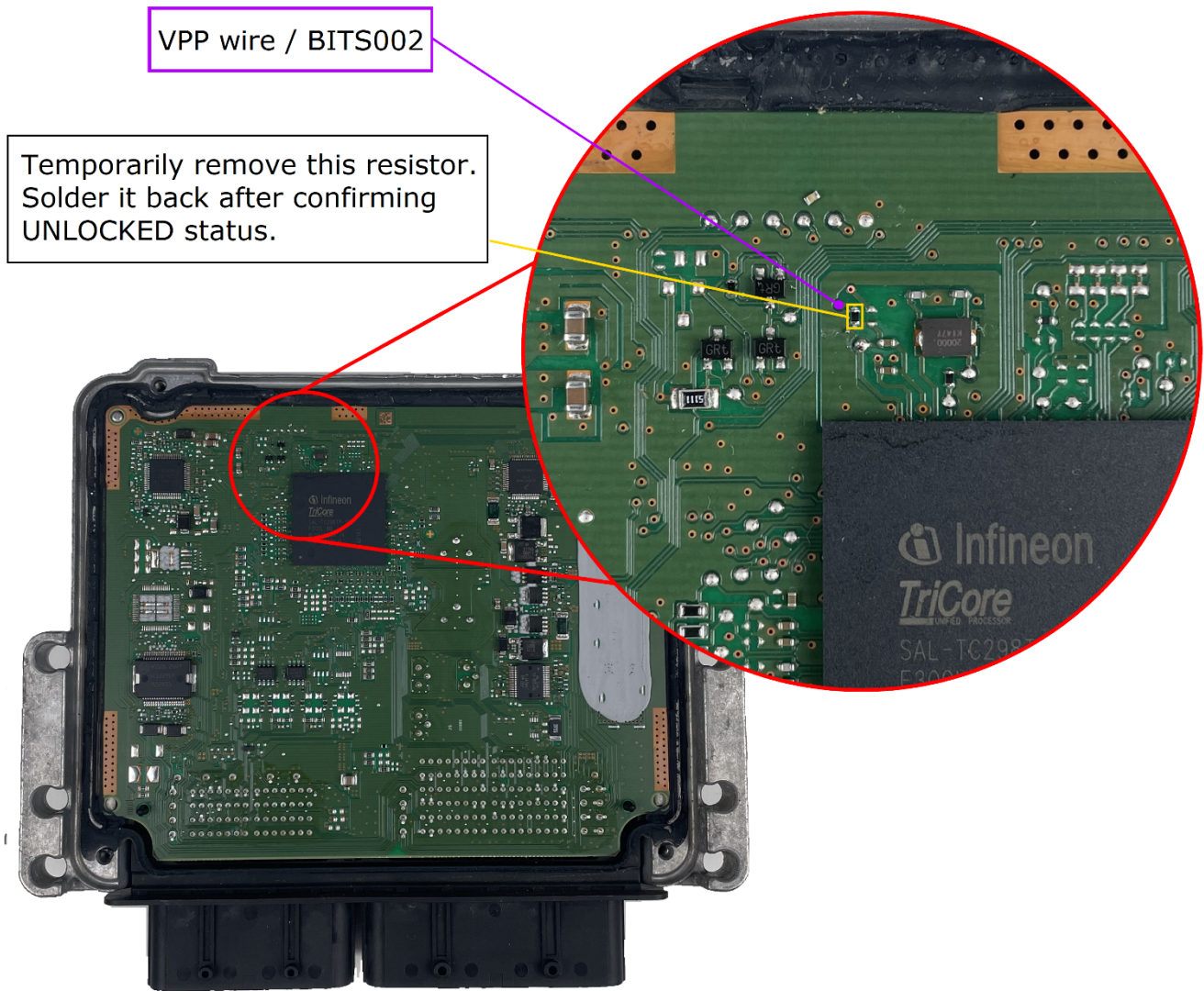


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PSA

MD1CS003



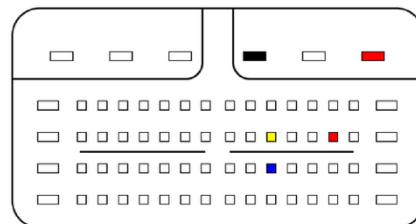
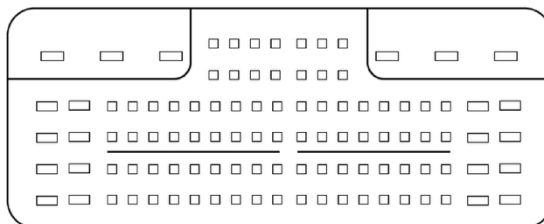
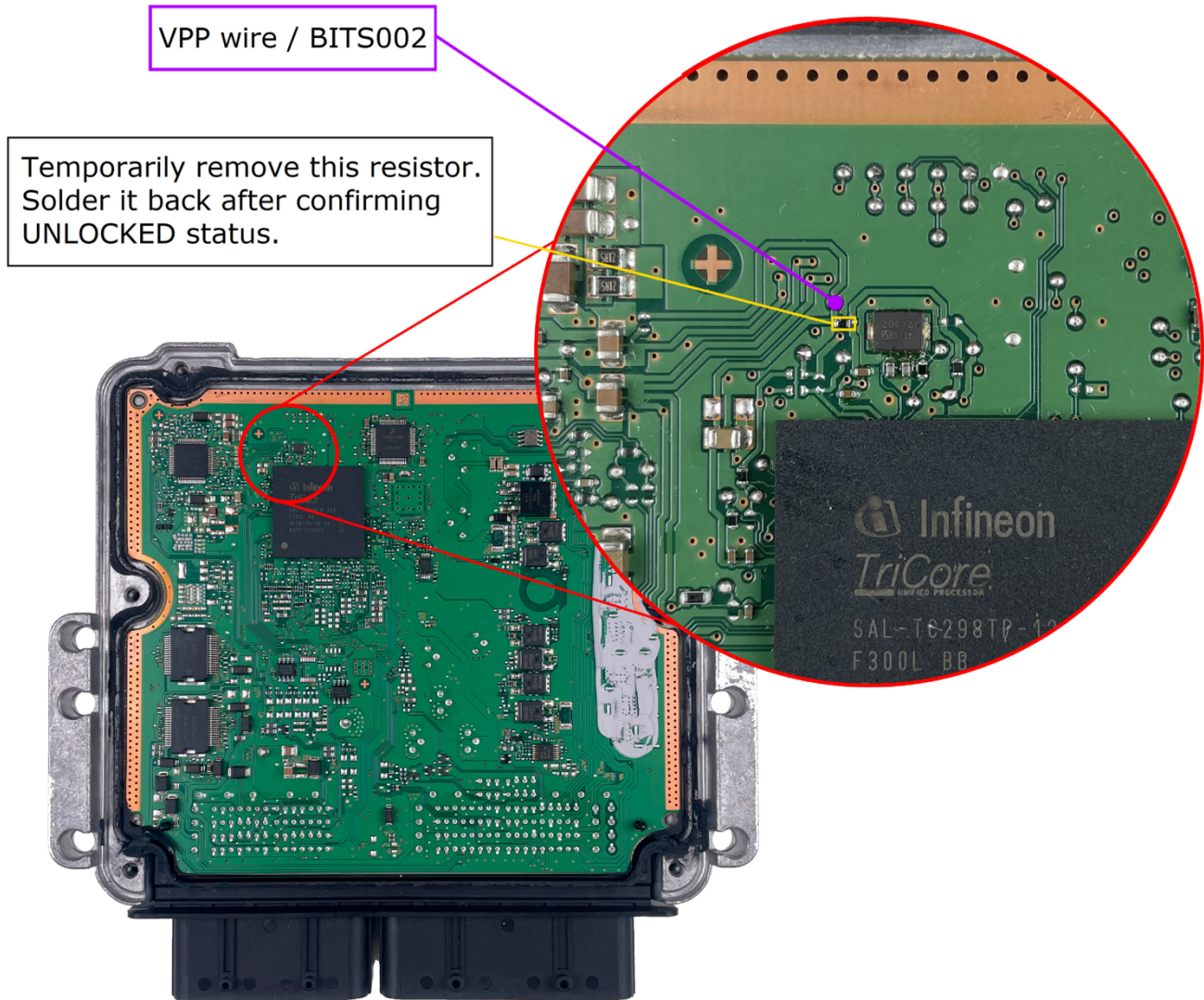
Ground
 Power
 CAN-H
 CAN-L



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MG1CS042



Ground
 Power
 CAN-H
 CAN-L

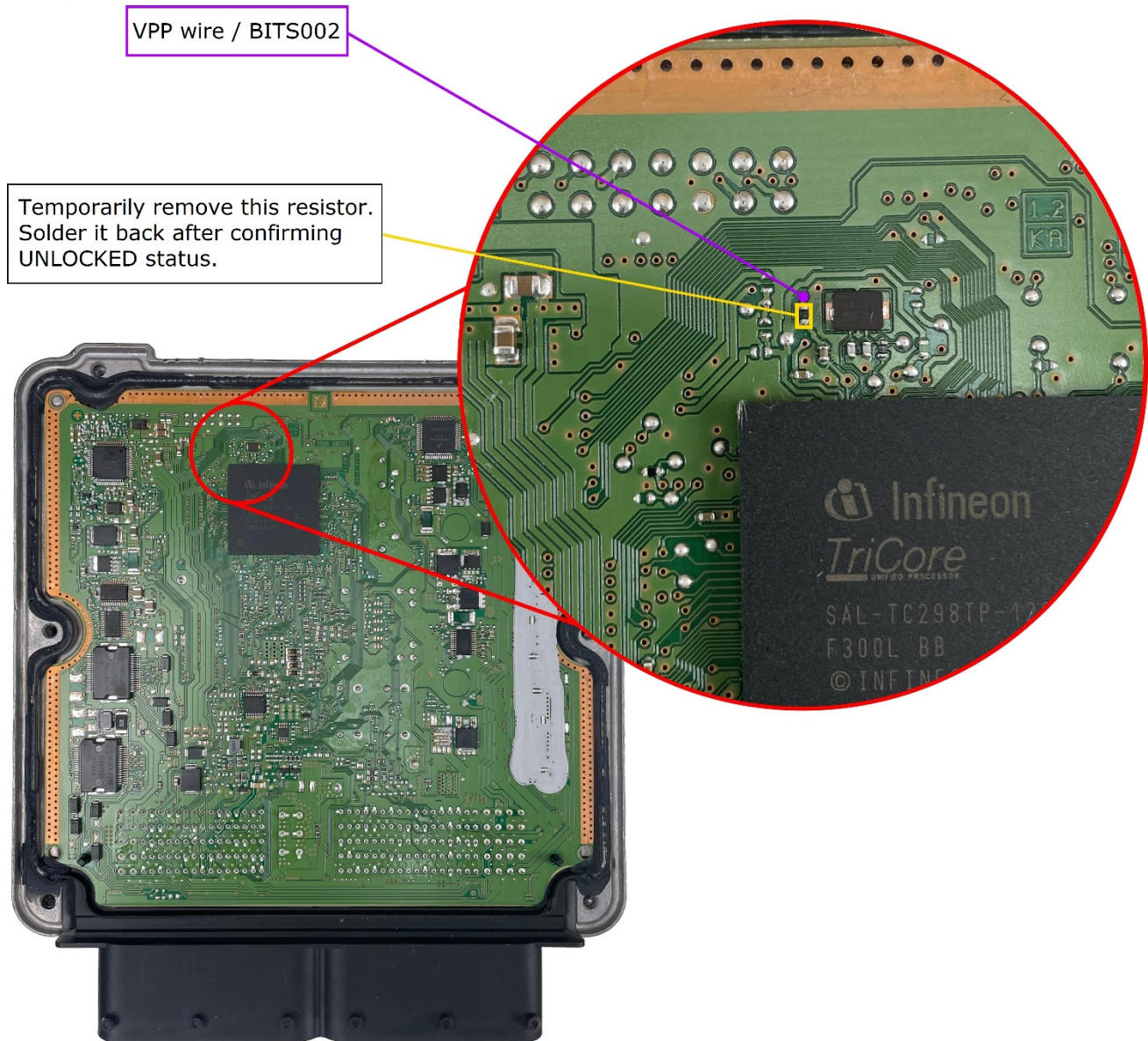


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VAG

MD1CS004



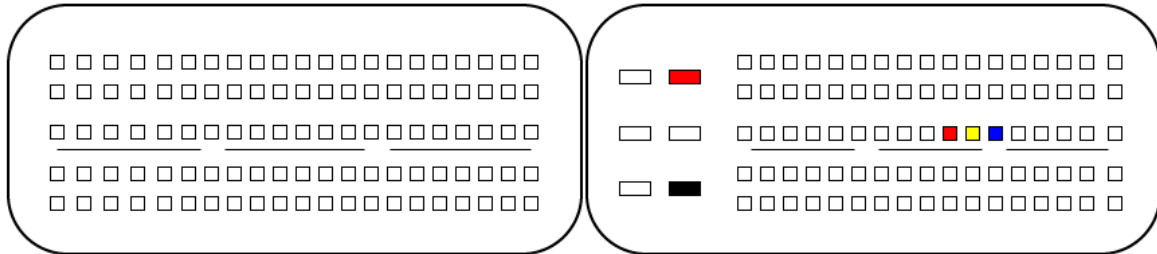
■ Ground ■ Power ■ CAN-H ■ CAN-L



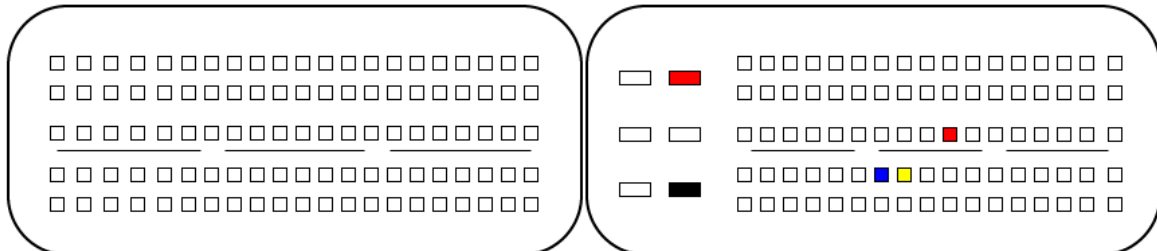
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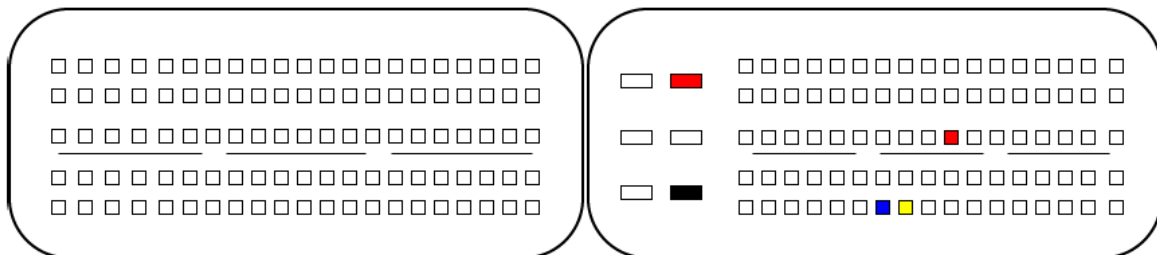
Version 1



Version 2



Version 3





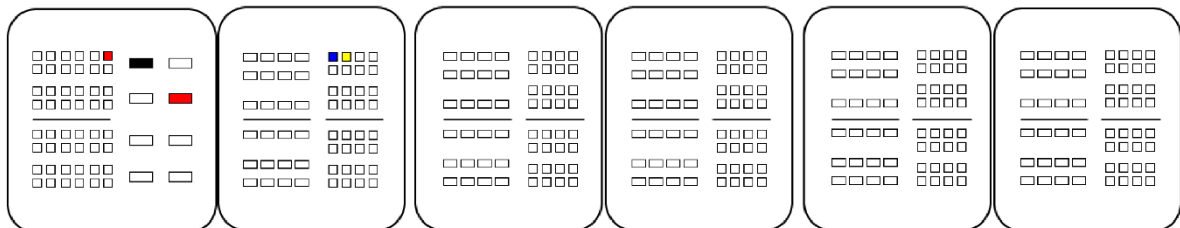
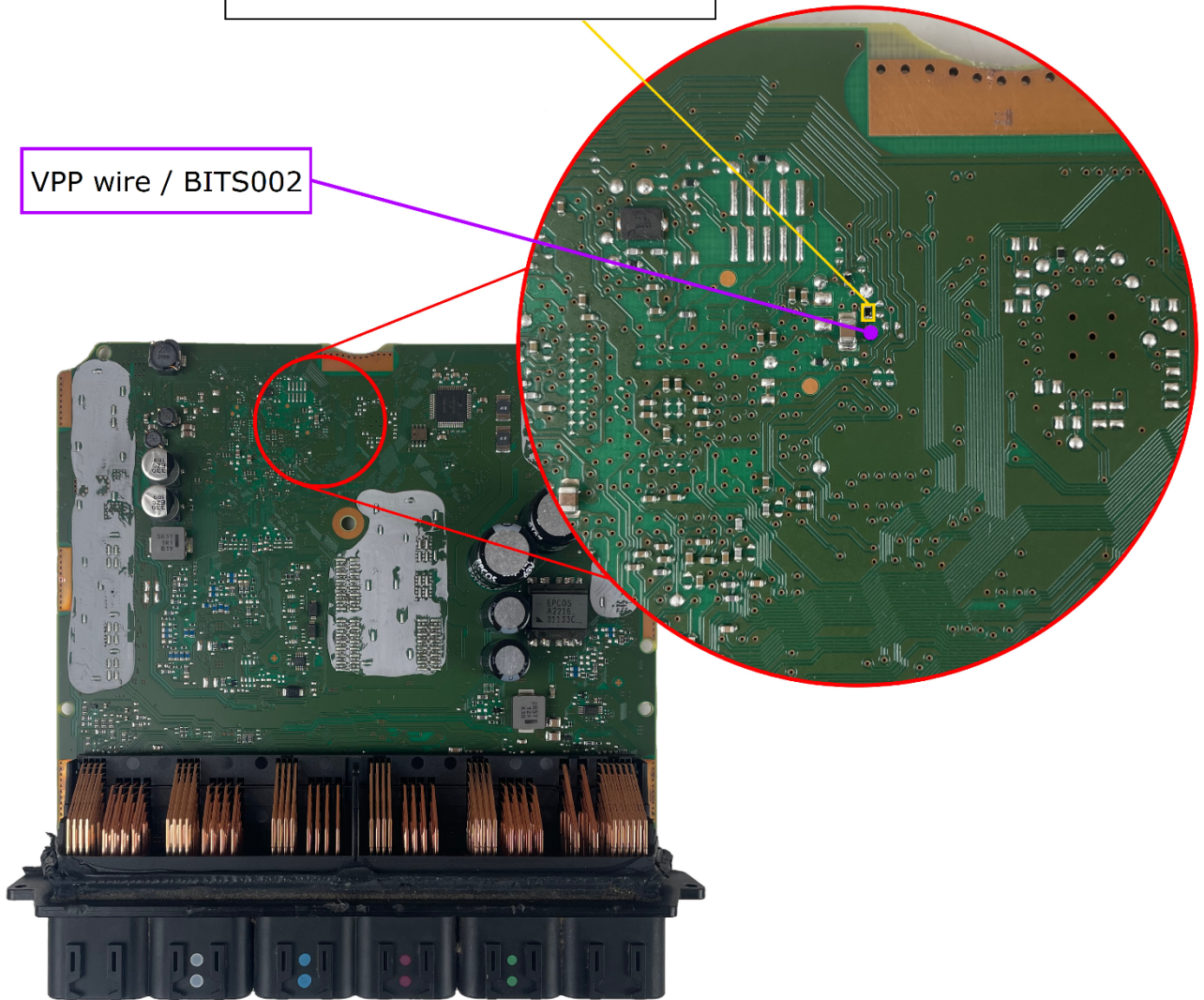
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MD1CS014

Temporarily remove this resistor.
Solder it back after confirming
UNLOCKED status.

VPP wire / BITS002



■ Ground ■ Power ■ CAN-H ■ CAN-L



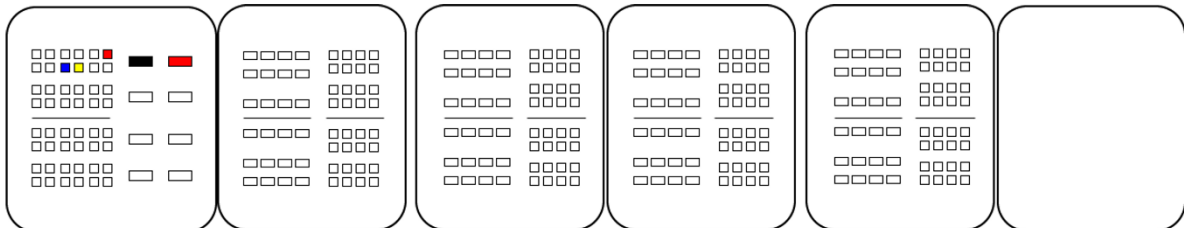
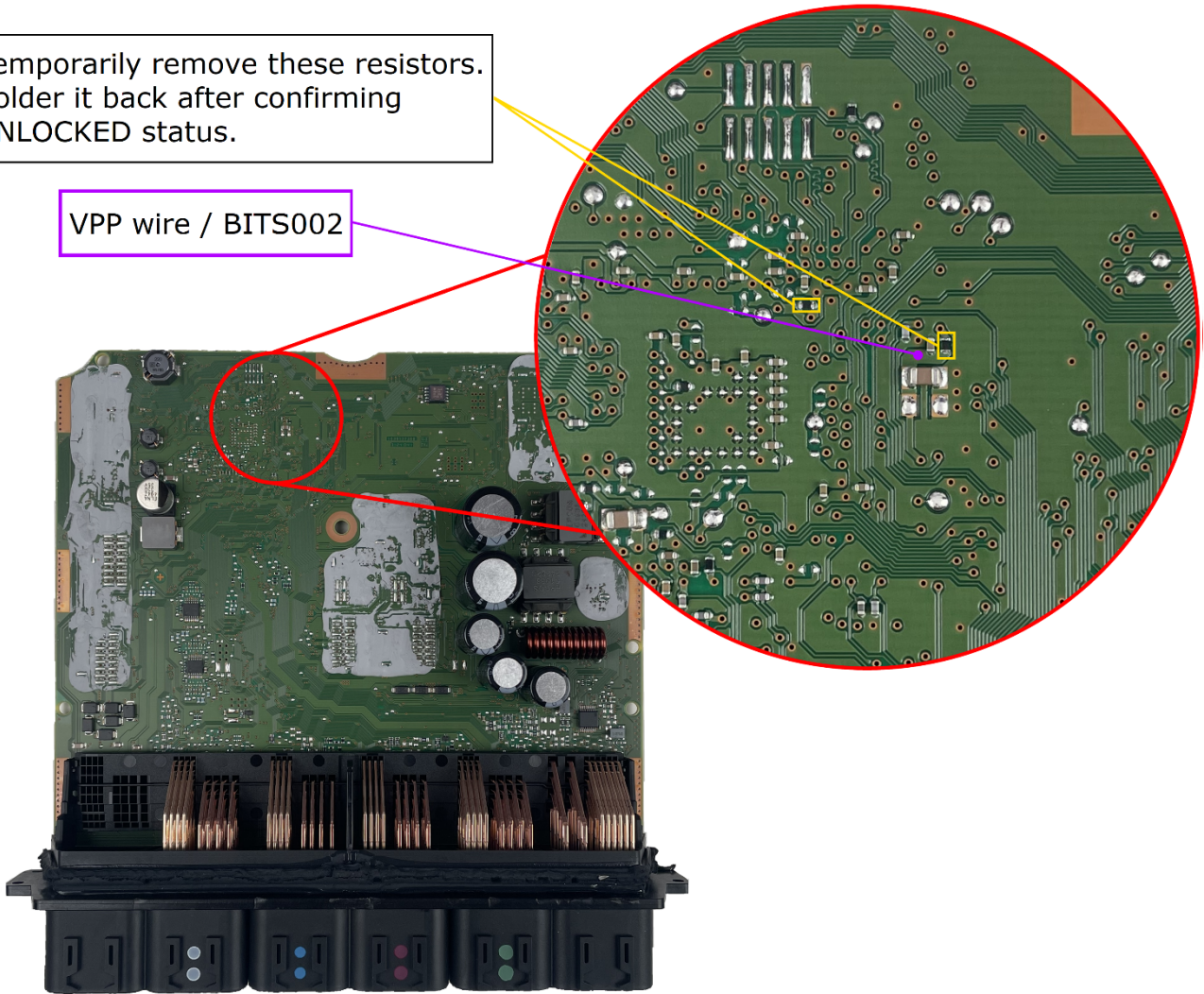
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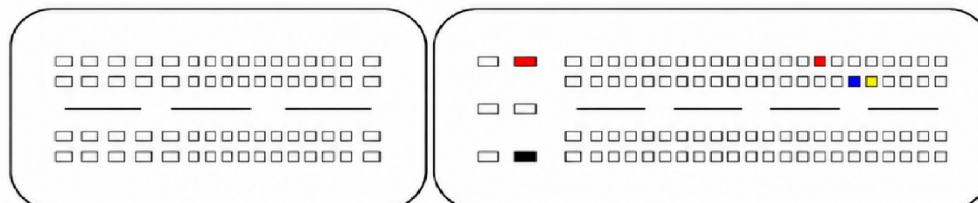
MG1CS002

Temporarily remove these resistors.
Solder it back after confirming
UNLOCKED status.

VPP wire / BITS002



Ground Power CAN-H CAN-L



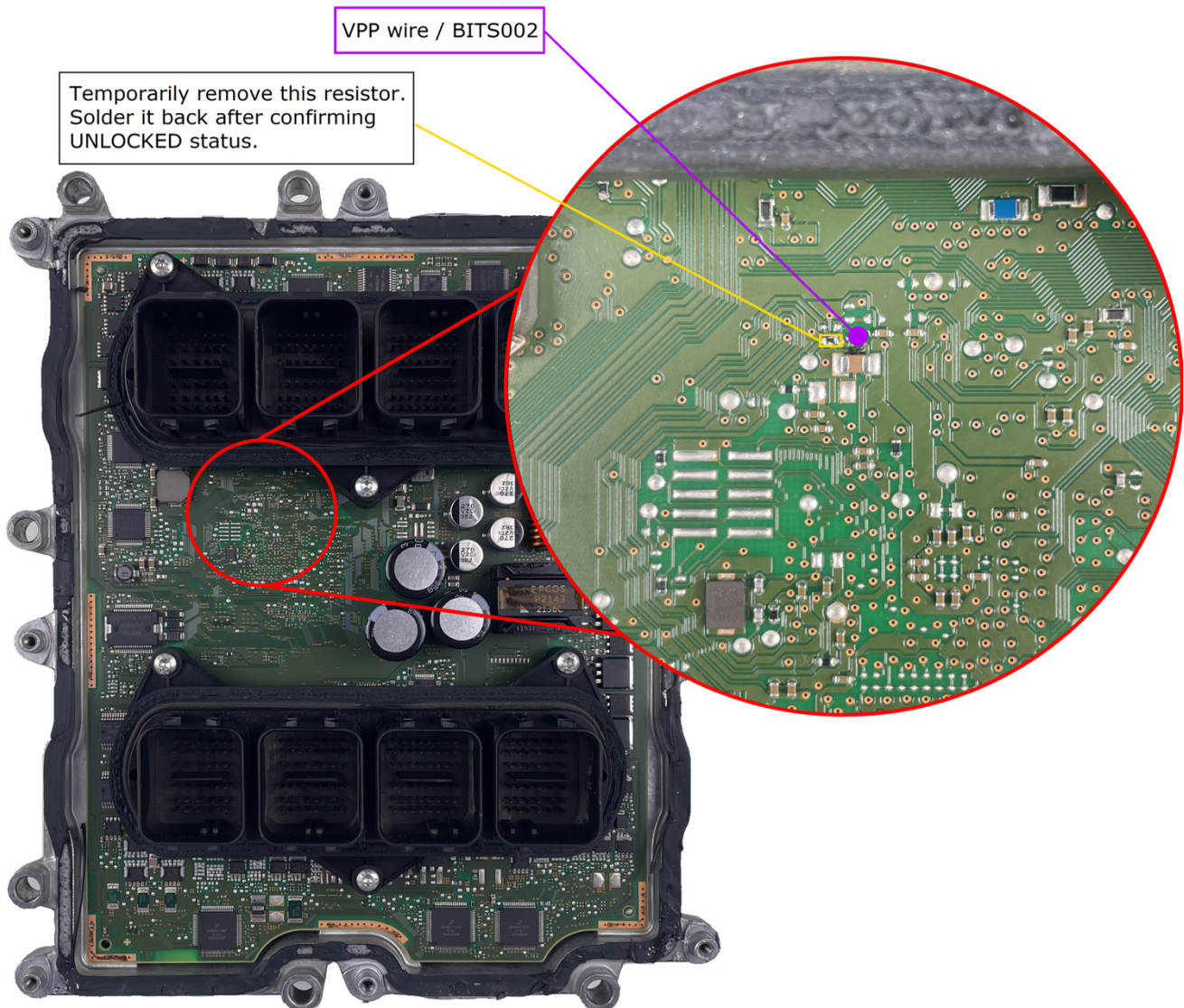


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Trucks/Industrial

MD1CE100

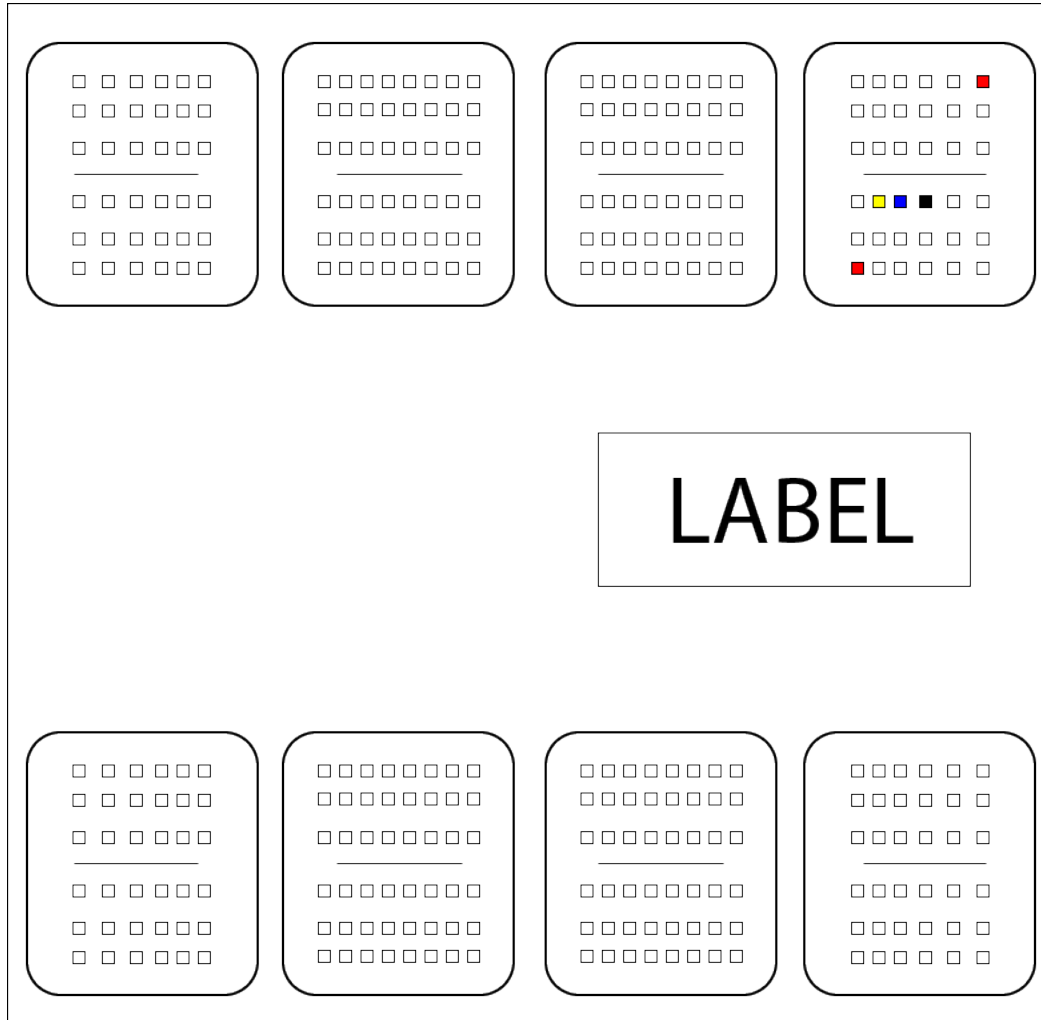




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Version 1

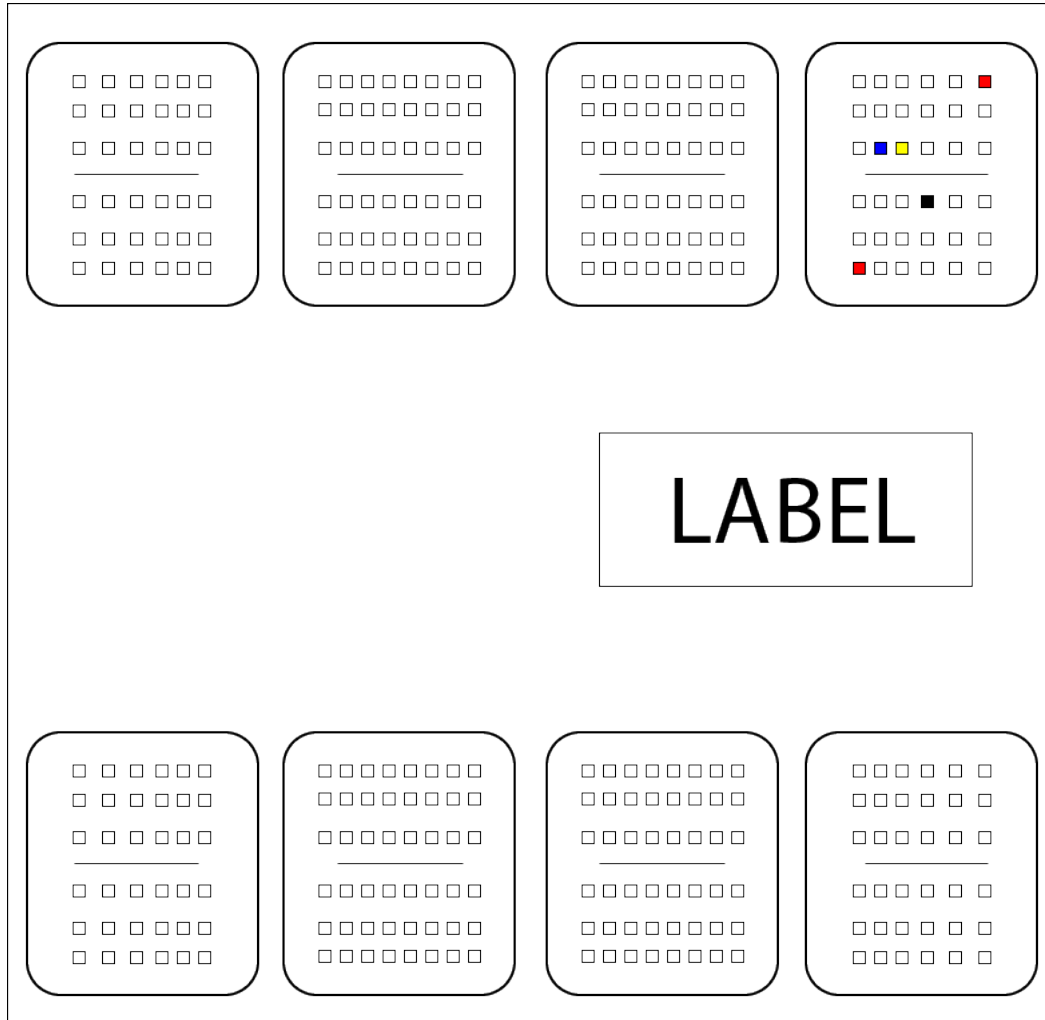




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Version 2



Ground Power CAN-H CAN-L