



USER MANUAL

LT1/LT4 - EMU PRO-16 PnP Kit

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1. General information

The **LT1/LT4 - EMU PRO-16 PnP Kit** is designed for V8-powered **Chevrolet Camaro** (2016–2019) and **Chevrolet Corvette C7** (2014–2019).

The following engines are supported in both vehicle models:

- LT1
- LT4

**Important:**

Corvette ZR1 models are not supported, as they are equipped with the LT5 engine.

The kit allows installation of the EMU PRO without modification of the factory wiring.

The following transmissions are supported:

- 7-speed manual
- 8-speed automatic (8L90)

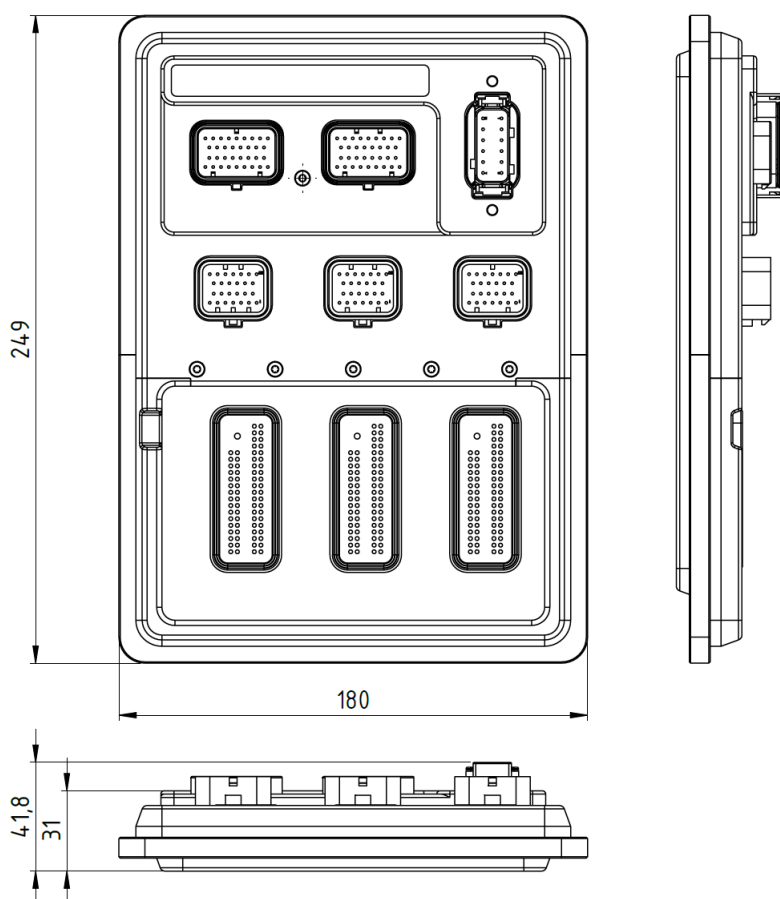
The included base maps are based on a stock vehicle configuration and help reduce setup time on the dyno.

2. Specification

Temperature range	AECQ GRADE3 (-40 °C to +85 °C)
Operating voltage	9 - 16 V
Weight	1537 g
Dimensions	180 x 250 x 42 mm
Connectors	Superseal 1.0 26pin (GDI: 1-1447232-7, 3-1437290-7; EMU: 1473416-1) Superseal 1.0 34pin (EMU :4-1437290-1, 4-1437290-0) Dual WBO(DTM06-12SA)
Terminals	PRO/GDI: 3-1447221-3 16-18 AWG PRO/GDI: 3-1447221-4 20 AWG PRO/GDI: 3-1447221-5 22 AWG WBO: 1-1241380-2

Supported engines	LT1 / LT4
Supported vehicles	Camaro 2016–2019 / Corvette C7 2014–2019
Supported transmission	7-speed manual / 8-speed automatic (8L90)
Fuel system	Direct injection + high-pressure fuel system support
Lambda sensors	LSU 4.9 (included)
Communication	CAN-based integration
Installation type	Plug-and-play adapter (no wiring modification required)

All dimensions in mm



3. Kit contents

The kit includes the following components:

- LT1/LT4 Adapter
- EMU PRO-16
- GDI Driver
- USBtoCAN + USB cable

- Harness - LT1/LT4 Adapter to EMU PRO
- Harness - LT1/LT4 Adapter to GDI Driver
- Harness - LT1/LT4 Adapter to WBO
- Harness - USBtoCAN DB9 to DTM2
- Flying Lead for EMU PRO-16 Connector D
- Sealed Connector D for EMU PRO-16
- Mounting Bracket - Camaro Gen6 LT1/LT4
- Mounting Bracket - Corvette C7 LT1/LT4
- 2 × LSU 4.9 Bosch lambda sensors
- black cable ties – 20 pcs.
- printed *Quick guide*

4. Pinout

EMU PRO Connector A

Pin	Name	Description
A1	Ignition 8	Ignition Coil 8
A2	Injector 1	Injector 1 control signal
A3	Injector 2	Injector 2 control signal
A4	Injector 3	Injector 3 control signal
A5	Injector 4	Injector 4 control signal
A6	Injector 5	Injector 5 control signal
A7	Injector 6	Injector 6 control signal
A8	Injector 7	Injector 7 control signal
A9	Injector 8	Injector 8 control signal
A10	Ignition 7	Ignition Coil 7
A11	Power GND	Chassis Ground
A12	+5V source A	+5V A
A13	Digital 2	Camshaft Position Sensor
A14	Digital 4	Gear Lever Position X (MT) / SPARE (AT)
A15	Digital 8	Run/Crank Signal
A16	Digital 6	Transmission Output Shaft Speed Sensor (MT) / SPARE (AT)

Pin	Name	Description
A17	Power GND	Chassis Ground
A18	Ignition 6	Ignition Coil 6
A19	Power GND	Chassis Ground
A20	Digital GND	Digital Ground
A21	Digital 1	Crankshaft Position Sensor
A22	Digital 3	Gear Lever Position Y (MT) / SPARE (AT)
A23	Digital 7	Brake Switch
A24	Digital 5	MAF Sensor Signal
A25	Auxiliary 9	EVAP Purge
A26	Ignition 5	Ignition Coil 5
A27	Ignition 4	Ignition Coil 4
A28	Ignition 3	Ignition Coil 3
A29	Ignition 2	Ignition Coil 2
A30	Ignition 1	Ignition Coil 1
A31	CAN 1 high	GDI Driver + PC Connection / GMLAN3
A32	CAN 1 low	GDI Driver + PC Connection / GMLAN3
A33	CAN 2 high	GMLAN 1 high
A34	CAN 2 low	GMLAN 1 low

EMU PRO Connector B

Pin	Name	Description
B1	Auxiliary 1	LSU 4.9 Heater Bank 1
B2	Auxiliary 2	LSU 4.9 Heater Bank 2
B3	Auxiliary 3	Coolant Fan
B4	Auxiliary 4	SPARE
B5	Auxiliary 5	SPARE
B6	Auxiliary 6	SPARE
B7	Auxiliary 7	Oil Pressure Regulator
B8	+12V supply	+12V Supply
B9	Digital GND	-

Pin	Name	Description
B10	USB D-	-
B11	USB D+	-
B12	+5V source A	-
B13	Auxiliary 8	EVAP Canister Vent
B14	+12V supply	+12V Supply
B15	+12V switched	+12V Switched
B16	Knock sensor 1	Knock Sensor Bank 1
B17	Knock sensor 2	Knock Sensor Bank 2
B18	WBO 2 VGND	LSU 4.9 Bank 2
B19	Power GND	Chassis Ground
B20	WBO 1 IP	LSU 4.9 Bank 1
B21	WBO 1 VS	
B22	WBO 1 RCAL	
B23	WBO 1 VGND	
B24	WBO 2 IP	LSU 4.9 Bank 2
B25	WBO 2 VS	
B26	WBO 2 RCAL	

EMU PRO Connector C

Pin	Name	Description
C1	Auxiliary 10	Alternator Control
C2	Auxiliary 11	Supercharger Bypass (LT4) / SPARE (LT1)
C3	Auxiliary 12	Intercooler Coolant Pump (LT4) / SPARE (LT1)
C4	Analog 7	Baro Sensor (on top of manifold) (LT4) / SPARE (LT1)
C5	Analog 10	Intake Air Temperature Signal (from MAF sensor)
C6	H-bridge 1A	Throttle Body +
C7	H-bridge 2B	Camshaft Solenoid
C8	H-bridge 3A	Starter
C9	H-bridge 2A	High Pressure Fuel Pump control signal
C10	Analog 1	Manifold Air Pressure

Pin	Name	Description
C11	Analog 3	Accelerator Pedal Position 1
C12	Analog 5	Brake Pedal Position (AT) / Clutch Pedal Position (MT)
C13	Analog 8	Fuel Low Pressure
C14	Analog 11	Coolant Temperature
C15	Analog 13	Park/Neutral Signal (AT) / SPARE (MT)
C16	Analog 15	Baro Sensor (from MAF sensor) (LT4)
C17	H-bridge 3B	Low Pressure Fuel Pump Relay
C18	Analog 2	Baro sensor (LT1) / Supercharger Inlet Pressure Sensor (LT4)
C19	Analog 4	Accelerator Pedal Position 2
C20	Analog 6	Oil Pressure
C21	Analog 9	Oil Temperature
C22	Analog 12	Intake Air Temperature Signal (LT4) / SPARE (LT1)
C23	Analog 14	Fuel Rail Pressure Sensor (Analog 4pin variant)
C24	Analog 16	SPARE
C25	H-bridge 1B	Throttle Body -
C26	LIN	-
C27	+5V source B	+5V B
C28	+5V source B	+5V B
C29	Analog GND	Analog Ground
C30	Power GND	Chassis Ground
C31	Precision analog 1	-
C32	Precision analog 2	-
C33	Precision analog 3	-
C34	Precision analog 4	-

GDI Driver Connector A

Pin	Name	Description
A1	Injector C, D high side	Injector 5&8 high side
A2	Injector A, B high side	Injector 1&6 high side
A3	Injector D low side	Injector 5 low side

Pin	Name	Description
A4	Injector C low side	Injector 8 low side
A5	Injector B low side	Injector 6 low side
A6	Injector A low side	Injector 1 low side
A7	Pump 1 low side	High Pressure Fuel Pump low side
A8	Pump 1 control	High Pressure Fuel Pump control signal
A9	Injector D control	Injector 5 control signal
A10	Injector C control	Injector 8 control signal
A11	Injector B control	Injector 6 control signal
A12	Injector A control	Injector 1 control signal
A13	Pump 1 high side	High Pressure Fuel Pump high side
A14	Power GND	Chassis Ground
A15	Analog output 4	-
A16	Analog output 3	-
A17	Analog output 2	-
A18	Analog output 1	-
A19	+12V supply	+12V Supply
A20	Power GND	Chassis Ground
A21	+5V source	+5V Source
A22	Analog GND	-
A23	Digital GND	Digital Ground
A24	SENT 1	Throttle Body Position Sensor
A25	SENT 2	Fuel Rail Pressure Sensor (SENT 3pin variant)
A26	+12V supply	+12V Supply

GDI Driver Connector B

Pin	Name	Description
B1	Pump 2 low side	-
B2	Injector E low side	Injector 7 low side
B3	Injector F low side	Injector 4 low side
B4	Injector G low side	Injector 2 low side

Pin	Name	Description
B5	Injector H low side	Injector 3 low side
B6	Injector E, F high side	Injector 4&7 high side
B7	Injector G, H high side	Injector 2&3 high side
B8	Pump 2 high side	-
B9	Injector E control	Injector 7 control signal
B10	Injector F control	Injector 4 control signal
B11	Injector G control	Injector 2 control signal
B12	Injector H control	Injector 3 control signal
B13	Pump 2 control	-
B14	+12V supply	+12V Supply
B15	Analog output 5	-
B16	Analog output 6	-
B17	Analog output 7	-
B18	Analog output 8	-
B19	Power GND	Chassis Ground
B20	+12V supply	+12V Supply
B21	SENT 3	-
B22	SENT 4	-
B23	CAN low	EMU PRO + PC Communication
B24	CAN high	EMU PRO + PC Communication
B25	+5V source	+5V Source
B26	Power GND	Chassis Ground

5. Installation

Installation is plug-and-play and does not require modification of factory wiring.

The adapter must be installed between the OEM harness and the ECU system.

Basic installation requirements:

- Disconnect battery before installation
- Ensure all connectors are fully seated
- Do not modify OEM wiring
- Verify correct ECU orientation and mounting
- Route all wiring away from heat sources and moving components
- Secure all harnesses using zip-ties

Detailed installation procedures for specific vehicle models are described in:

[Appendix A - How-to Use LT1/LT4 Adapter Kit in Camaro Gen6 \(on page 17\)](#)

[Appendix B - How-to Use LT1/LT4 Adapter Kit in Corvette C7 \(on page 32\)](#)

6. Base map and system features

The base map includes configuration for the following systems:

- High-pressure fuel pump control
- High-pressure injectors
- OEM sensor calibrations
- Trigger configuration
- Volumetric Efficiency (VE) fuel maps
- Ignition maps
- Camshaft control
- Knock control
- Engine start fueling
- Closed loop idle control
- Air condition control
- Driver switches
- Check engine light
- Alternator control
- Gear detection
- Coolant fan control
- In-tank fuel pump control
- Starter control
- Drive By Wire
- Transmission torque maps (cuts and blips)

The following OEM functions are not supported:

- Cylinder deactivation (AFM)
- Skip shift

The EMU PRO does not support OEM GM O2 sensors.

The kit includes two LSU 4.9 sensors, which must replace factory sensors located before the catalytic converters.

Do not modify internal CAN device configuration. Incorrect configuration may cause improper vehicle operation.

7. System description

This section describes system operation and required configuration.

ECU wake-up

The ECU is powered via vehicle wake-up signals.

Typical triggers:

- Door opening
- Brake pedal press

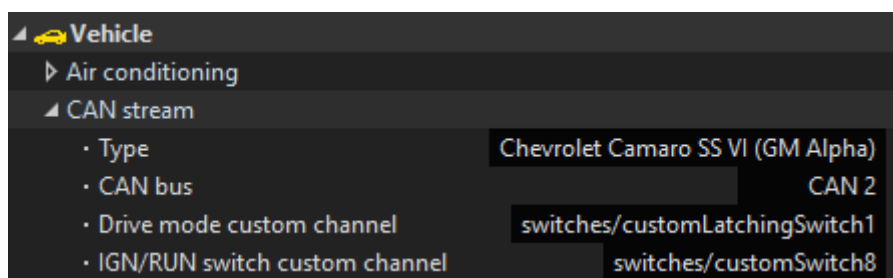
The ECU shuts down when the wake-up signal is no longer present.

Engine start

Engine start operation follows OEM behavior.

Custom Switch 8 reads the IGN/RUN signal.

This signal is required for correct engine start.



Direct injection and high-pressure fuel pump

The system provides full control of the high-pressure fuel system, including:

- High-pressure injectors
- High-pressure fuel pump

All required settings are pre-configured in the base map.

Low pressure fuel pump

Two in-tank fuel pump configurations are used in the Chevrolet Camaro:

Type 1

- The system uses an integrated module that directly controls the fuel pump
- The system maintains target fuel pressure
- External control logic is not required
- Fuel pressure sensor is connected to the module
- EMU PRO sends target fuel pressure via CAN
- Pump controller maintains commanded pressure

Type 2

- EMU PRO controls fuel pressure using closed-loop control
- Fuel pressure sensor is connected directly to EMU PRO
- Fuel pump duty cycle command is sent over an additional CAN bus
- Correct PID controller settings are required
- Base Duty Cycle table calibration is critical



Note:

The **Chevrolet Corvette C7** always uses **Type 2** configuration.

Fuel high pressure sensor

Early production models use an analog fuel pressure sensor (4-pin) mounted on the fuel rail. In this case, go to **Sensors / Fuel High Pressure 1** and set the source to **Analog Input**. All other settings are already pre-configured.

Later production models use a SENT bus fuel pressure sensor (3-pin). In this case, set the source to **Voltage over SENT**. All other settings are pre-configured. This is the default configuration in the Base Map.

Switches

Support for the **Drive Mode** switch is available under **Switches / Custom Latching 1** and it can be used to change maps.

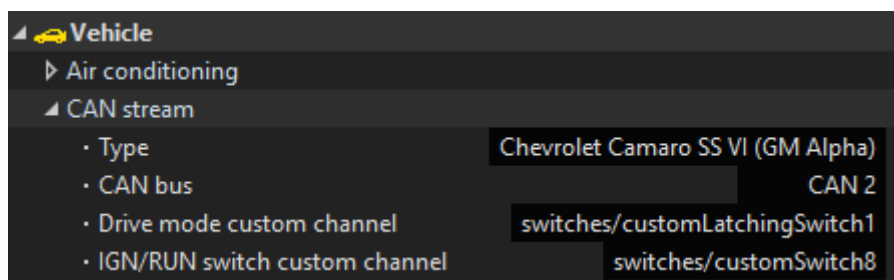
If the vehicle has ECO mode:

- set **Last State** = 4

If ECO mode is not present:

- set **Last State** = 3

The value of the latching switch is assigned to the **Drive Mode Custom Channel** and is used to display the selected drive mode on the instrument cluster.



The Cruise Control switches can be found under **Switches / Driver / Cruise Control**.

The rev-matching paddles can be found under **Switches / Driver / Sport 1 Mode Activation**.

Oil pressure control

Engine oil pressure is controlled under **Outputs / Oil Pressure Regulator**. High oil pressure mode is enabled by default in the Base Map.

Additional Connector D

The kit includes an additional Connector D with flying leads. It can be used to connect additional injectors, sensors or external control devices.

CAN system

The adapter uses internal CAN devices for vehicle communication.

The CAN Switch Board V3 is connected to CAN1 and is responsible for I/O expansion.

The Gateway Lite converts CAN1 speed from 1 Mbps to 500 kbps and is used for communication with GMLAN3.



Important:

Do not modify configuration of these devices. Incorrect settings may cause improper vehicle operation.

CAN data

The following data is received from the vehicle CAN bus:

- Wheel speeds
- GPS coordinates
- Accelerometer
- Yaw rate

- Steering wheel angle
- Transmission temperature (AT – Automatic Transmission)
- Transmission input shaft speed (AT)
- Transmission output shaft speed (AT)

DTC and limp mode

The automatic transmission may enter limp mode in the following cases:

- Firmware update
- Project upload
- ECU replacement

CAN communication can be interrupted during these operations, which may cause a timeout in the transmission control system.

To check if limp mode is active:

- Set selector to **M mode**
- If the cluster still shows **D**, limp mode is active

To restore normal operation, clear all DTC codes using the Tools function in EMU PRO software. This should be done with ignition ON and engine OFF.

As an alternative, switch the ignition off, allow the vehicle to enter sleep mode, and then start it again.

8. Base map configuration

The base map can be generated using the Base Map Loader function in EMU PRO.

For detailed instructions, refer to the How-to Use Base Map Loader guide https://ecumaster.com/files/EMU_PRO/How-to/How-to_Use_Base_Map_Loader_in_EMU_PRO.pdf

9. Document history

Version	Date	Changes
0.1	2026.06.19	Initial release

10. Appendix A - How-to Use LT1/LT4 Adapter Kit in Camaro Gen6

10.1. Introduction

This document describes installation of the LT1 / LT4 Adapter Kit in Chevrolet Camaro Gen6 vehicles.

The procedure includes:

- OEM ECU removal
- LSU 4.9 sensor installation
- Harness routing
- Adapter mounting
- EMU PRO installation
- GDI Driver installation
- Final harness connections

Installation requires basic workshop tools and mechanical experience.

**Important:**

Disconnect the battery before starting installation.

10.2. Fuse box disassembly

1. Disconnect the negative battery terminal.

The battery is located in the luggage compartment on the right side.

2. Open the hood and locate the fuse box on the left side of the engine compartment.



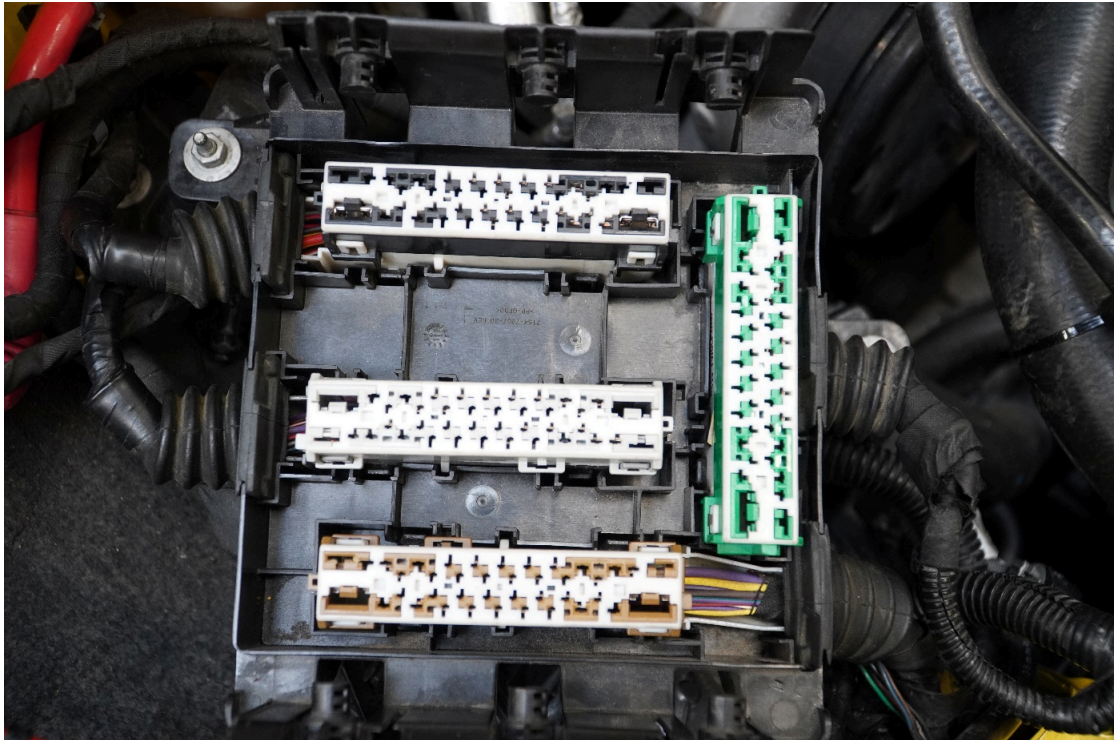
3. Open the fuse box by pulling the release lever.



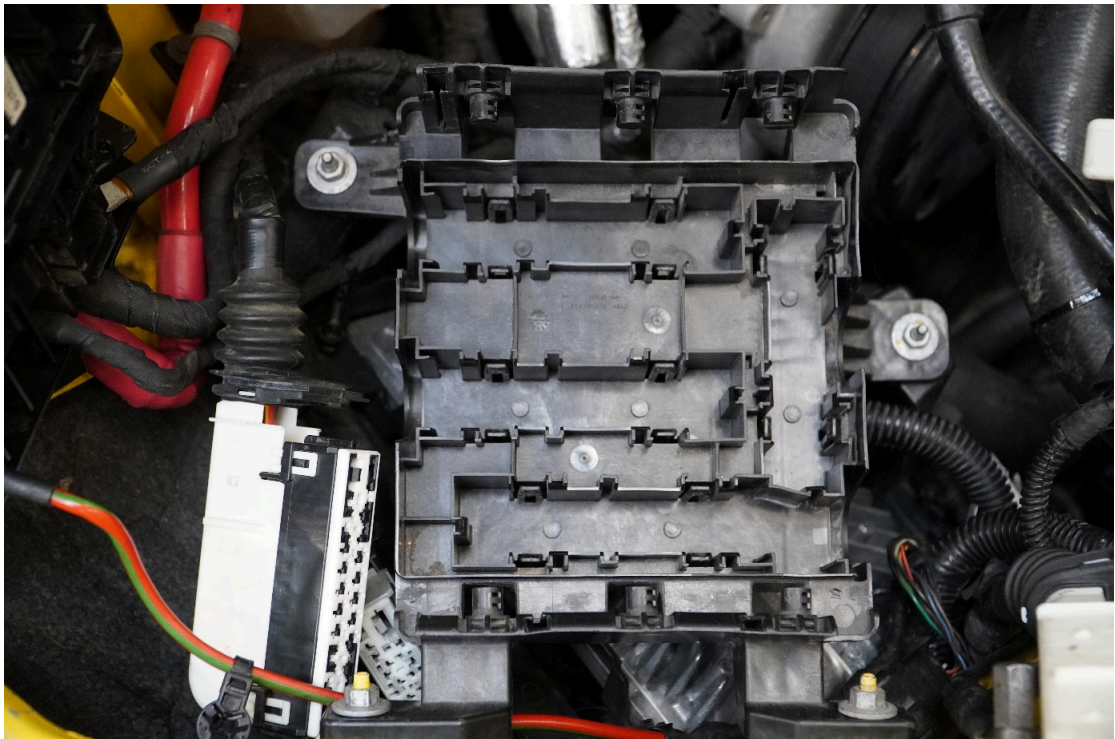
4. Remove all fuse box connectors.

Each connector is secured by four retaining clips located in the corners.

- Release each retaining clip one by one.
- Carefully remove the connector.



5. Remove the plastic fuse box cover.



6. Access the OEM ECU located beneath the fuse box assembly.



10.3. OEM ECU removal

1. Disconnect all OEM ECU connectors.
 - Release the red locking clips.
 - Move the locking lever to unlock the connector.
 - Disconnect all connectors.



2. Release the ECU retaining clips.
3. Remove the OEM ECU from its mounting position.

10.4. Adapter installation

1. Install the LT1 / LT4 Adapter in place of the OEM ECU.



2. Connect the patch harness between the LT1 / LT4 Adapter and EMU PRO.



3. Connect the harness between the LT1 / LT4 Adapter and the GDI Driver.



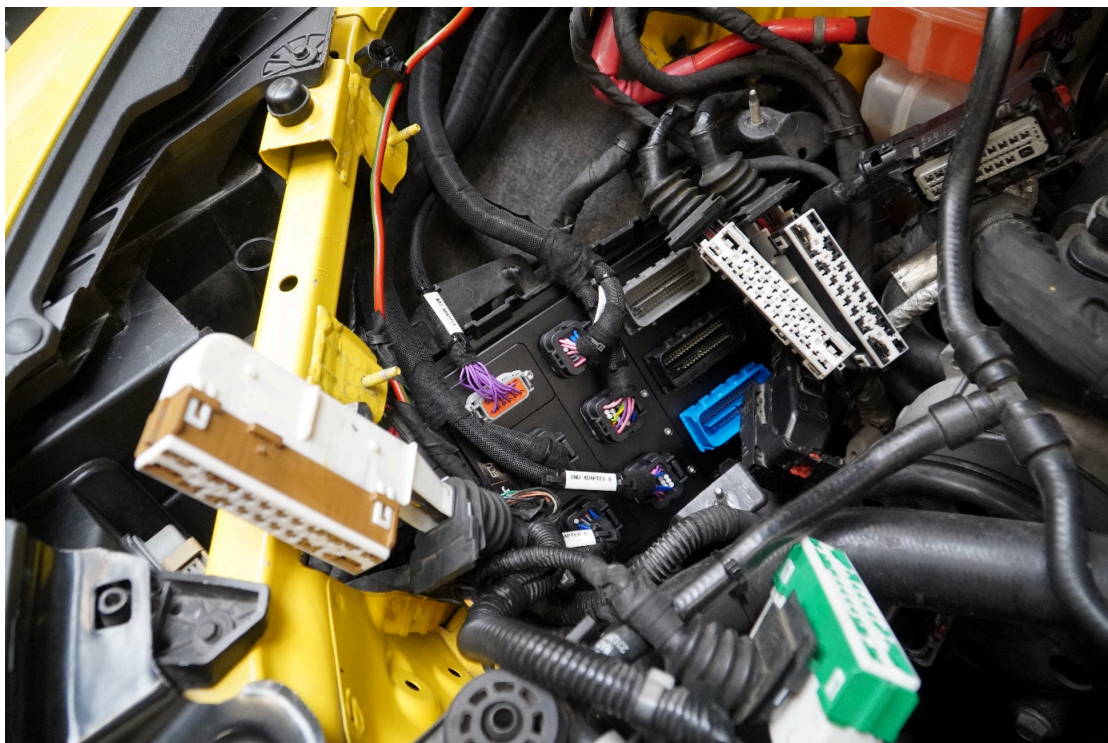
4. Route all harnesses as shown in the reference pictures.



Note:

Avoid sharp edges, moving components, and heat sources.

5. Connect the wideband lambda harness and route it parallel to the previously installed harnesses.



6. Connect the OEM vehicle harness.



7. Rotate the ring-terminal cable to the vertical position as shown in the reference pictures.



10.5. LSU 4.9 sensor installation

The vehicle is not equipped with wideband lambda sensors from factory.

1. Install two LSU 4.9 sensors in place of the OEM oxygen sensors.



2. Route both lambda sensor harnesses vertically toward the top of the engine.



Important:

Avoid areas exposed to high temperature.

3. Connect the lambda extension harness to the routed sensor harnesses.

10.6. EMU PRO installation

Mounting bracket preparation



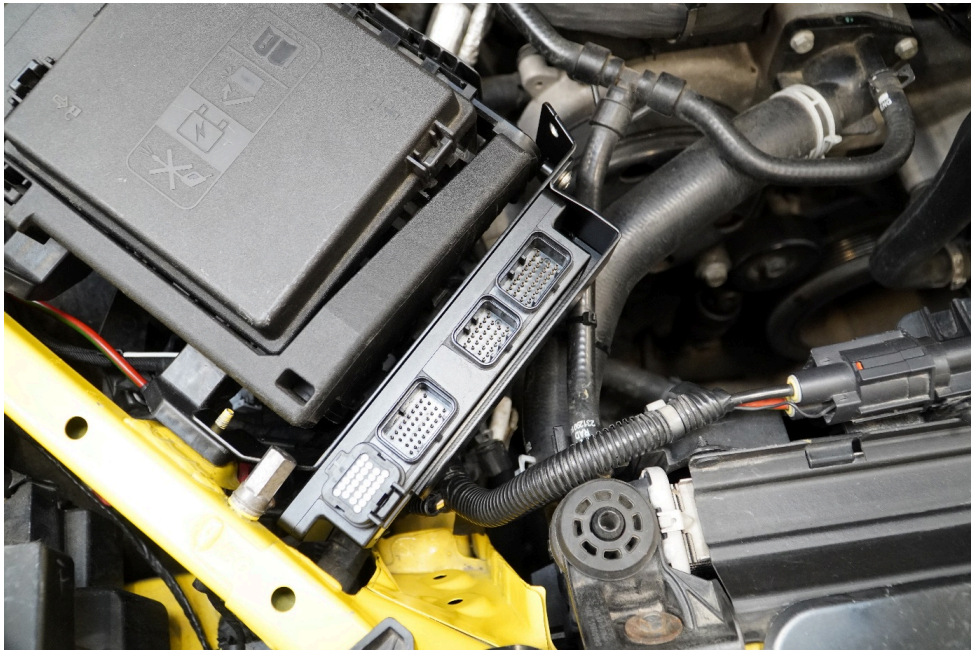
1. Assemble the EMU PRO and GDI Driver mounting brackets outside the vehicle.



2. Install the completed bracket assembly in the vehicle.

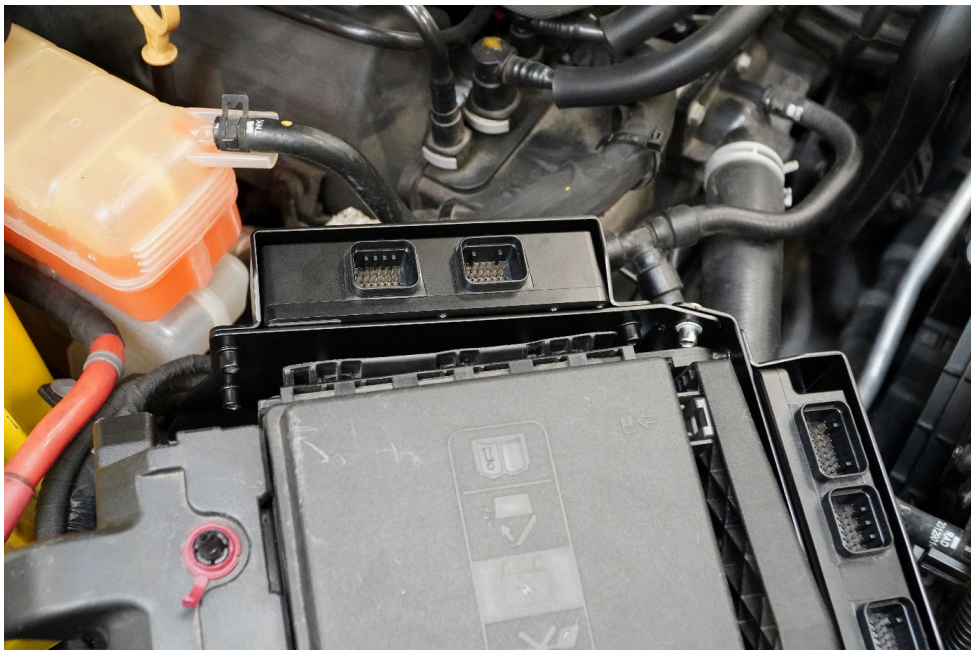
EMU PRO installation

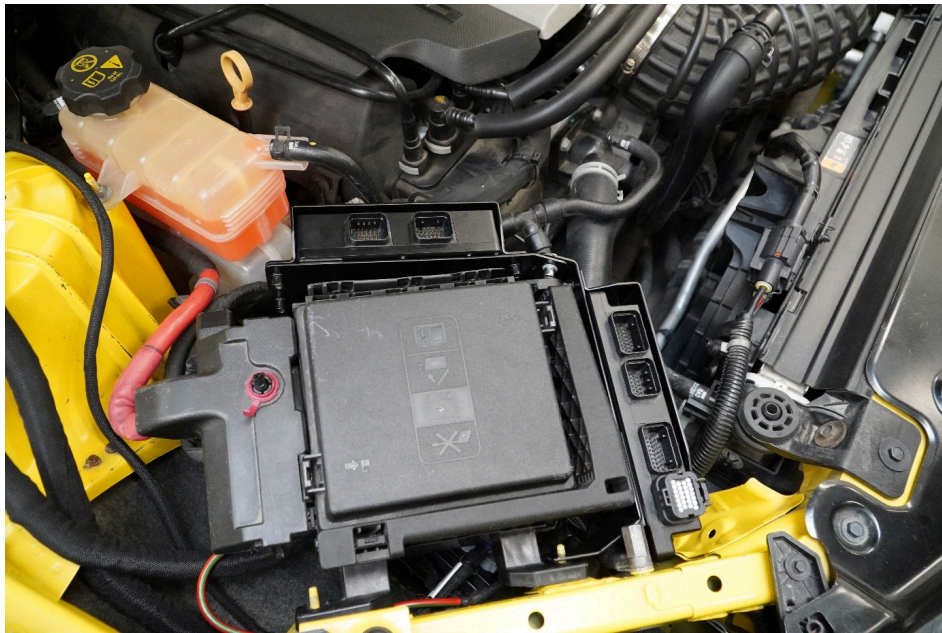
1. Prepare the EMU PRO for installation.
Install the D connector protective cover.
2. Install the EMU PRO into the mounting bracket.
3. Secure the EMU PRO using the supplied mounting hardware.



10.7. GDI Driver installation

1. Install the GDI Driver into its designated mounting position.



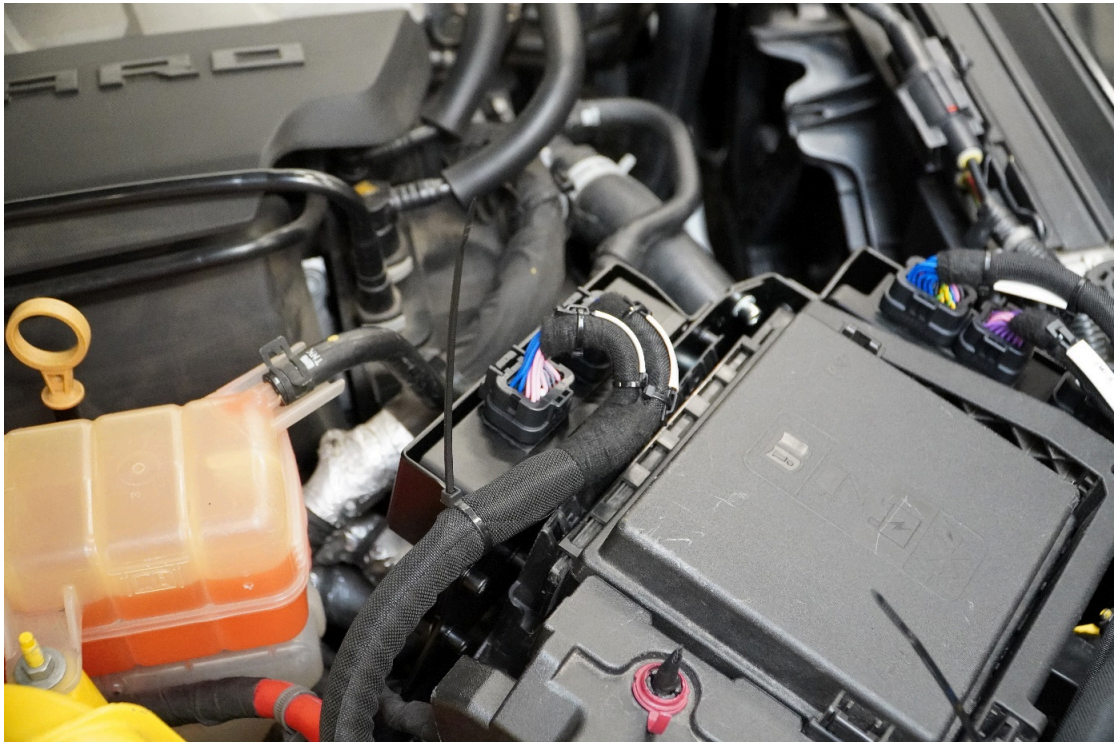


2. Secure the GDI Driver using the supplied mounting hardware.
3. Connect the GDI Driver harness.

10.8. Final harness connections

1. Connect the previously routed adapter harnesses to the EMU PRO.
2. Connect the adapter harnesses to the GDI Driver.
3. Connect both LSU 4.9 lambda sensor harnesses.
4. Verify harness routing according to the reference pictures.
5. Secure all harnesses using zip-ties.





The completed installation should look as shown below.



10.9. Final check

Before completing installation:

- Verify all connectors are fully seated
- Verify all mounting hardware is tightened
- Verify all harnesses are secured
- Verify harnesses are routed away from heat sources and moving components
- Verify fuse box components are correctly reinstalled

Reconnect the battery after installation is complete.

10.10. Base Map Installation

After the installation is complete and the battery has been reconnected:

1. Connect EMU PRO to a PC running EMU PRO software.
2. Use **Base Map Loader** to load the appropriate base map.
3. For detailed instructions refer to https://ecumaster.com/files/EMU_PRO/How-to/How-to_Use_Base_Map_Loader_in_EMU_PRO.pdf



Important:

Verify that the base map has been loaded successfully before starting the engine.

10.11. Document history

Version	Date	Changes
0.1	2026.06.19	Initial release

11. Appendix B - How-to Use LT1/LT4 Adapter Kit in Corvette C7

11.1. Introduction

This document describes installation of the LT1 / LT4 Adapter Kit in Chevrolet Corvette C7 vehicles.

The procedure includes:

- OEM ECU removal
- LSU 4.9 sensor installation
- Harness routing
- Adapter mounting
- EMU PRO installation
- GDI Driver installation

Installation requires basic workshop tools and mechanical experience.



Important:

Disconnect the battery before starting installation.

11.2. Preparation

1. Disconnect the negative battery terminal.

The battery is located in the luggage compartment on the right side.

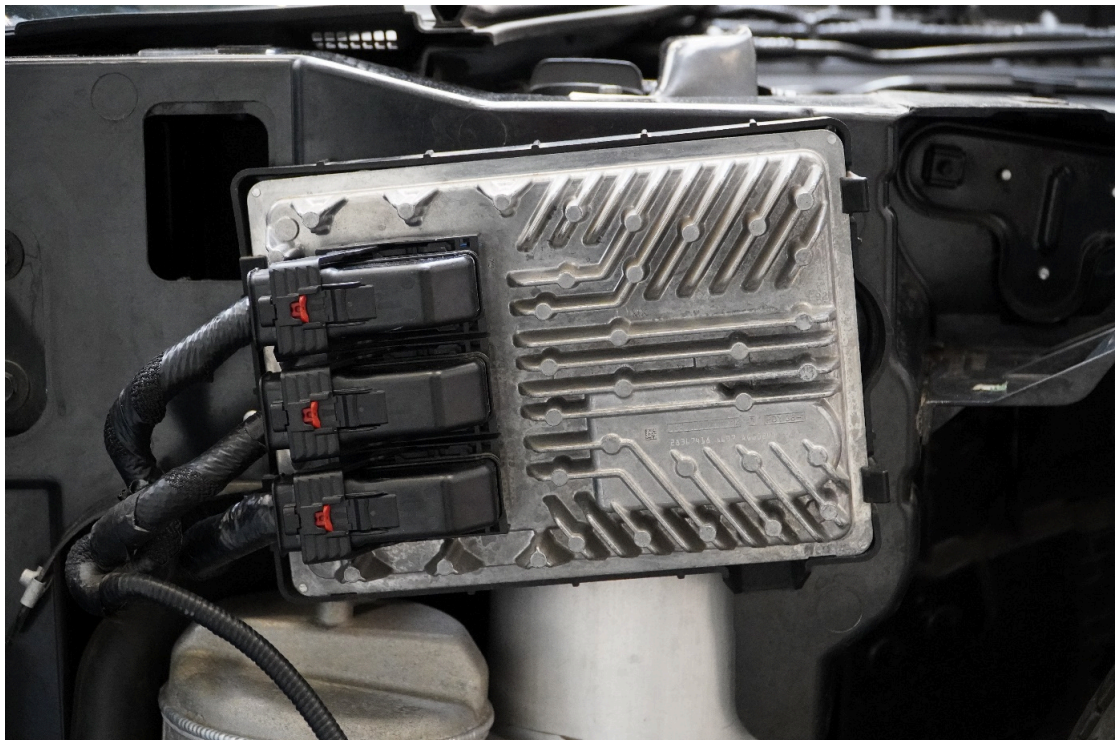
2. Remove the wheel liner.

Refer to the vehicle service manual for the removal procedure.

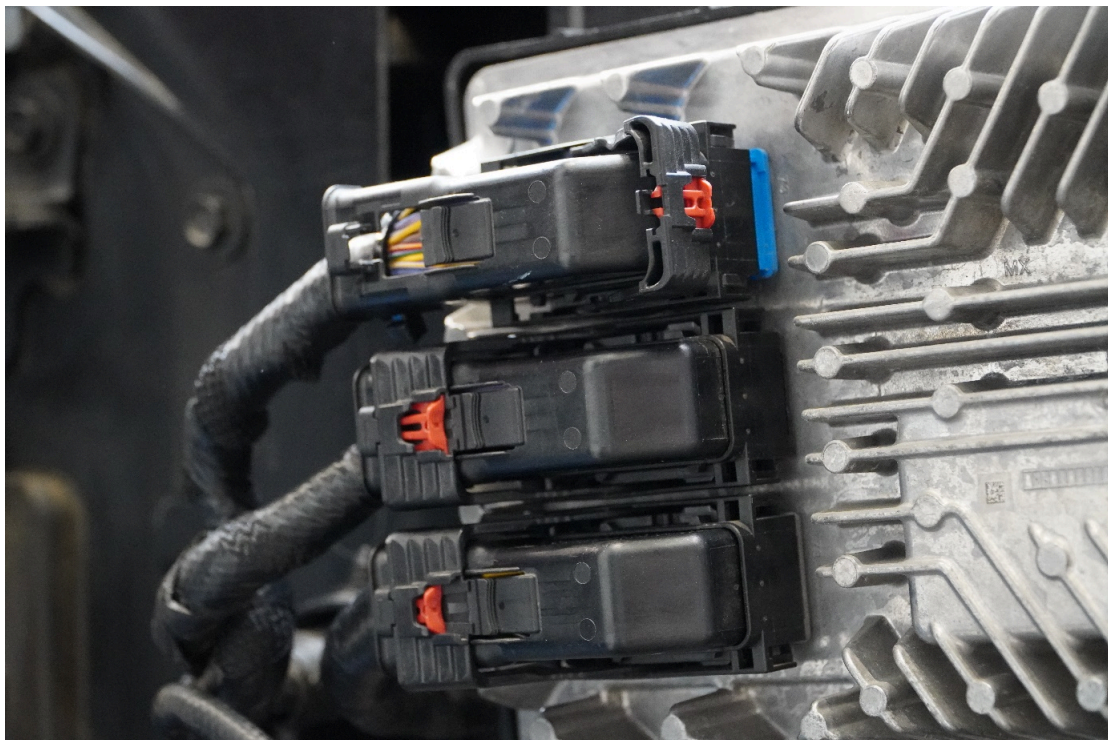


11.3. OEM ECU removal

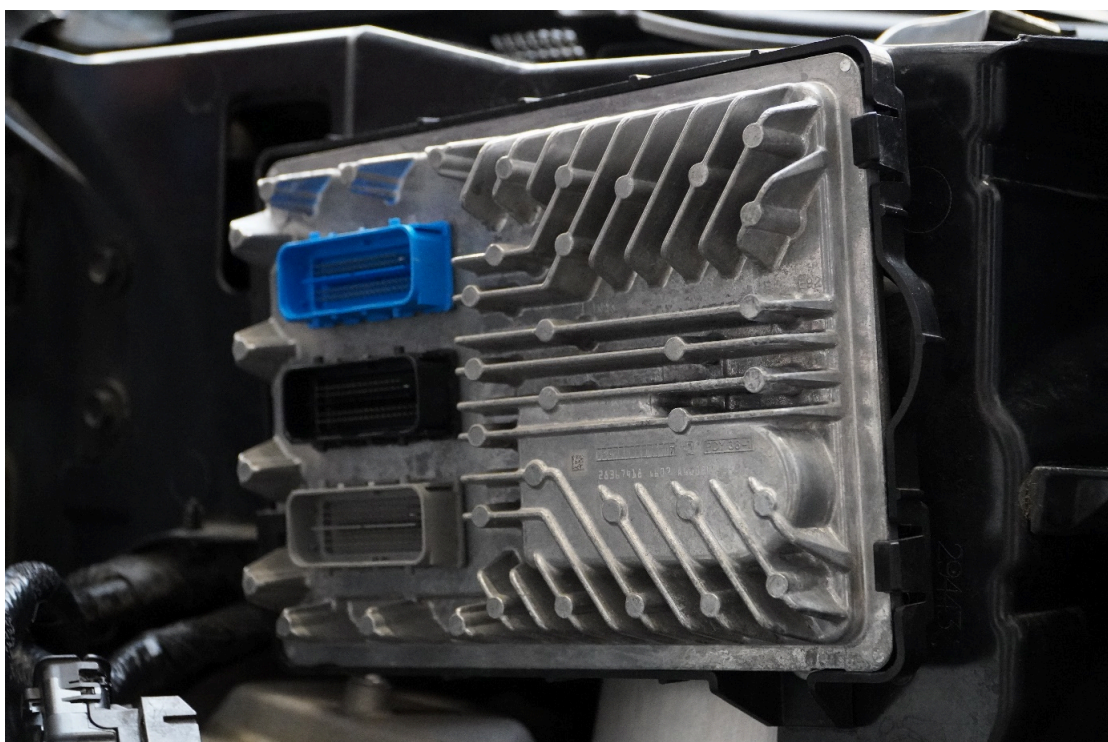
1. Remove the OEM ECU connectors.



- Release the red locking clips
- Move the locking lever to the right
- Disconnect all connectors

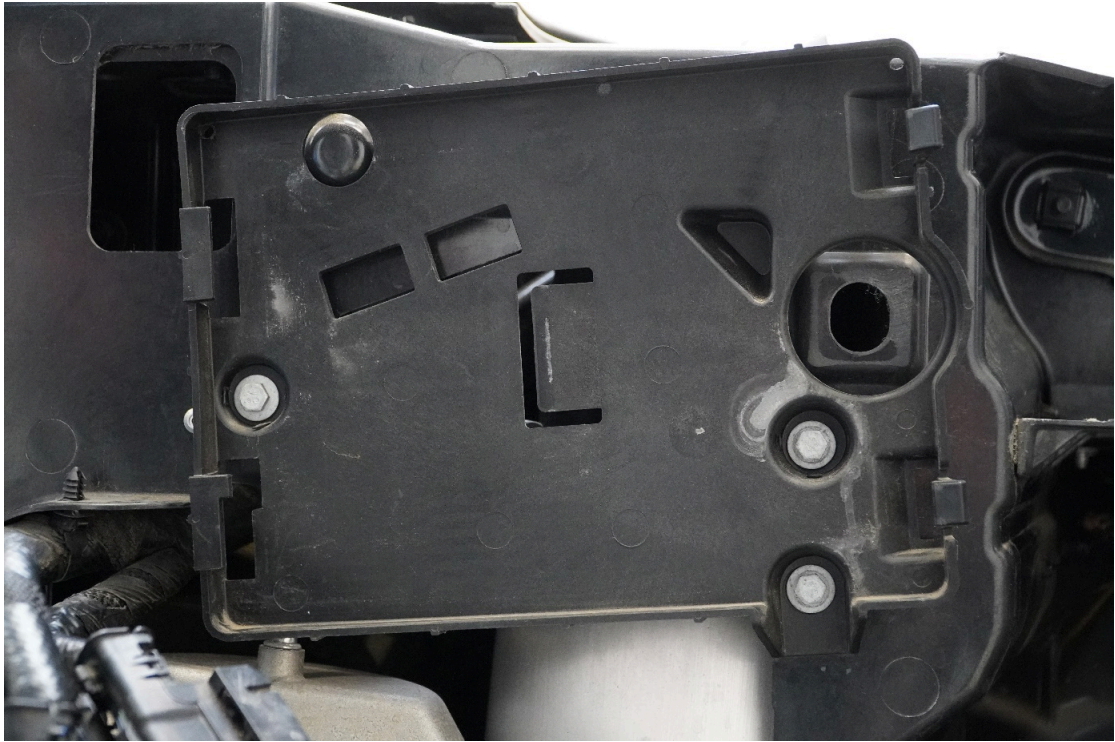


2. Release the retaining clips on the right side and remove the OEM ECU.



3. Remove the OEM ECU bracket.

Use a 10 mm wrench.



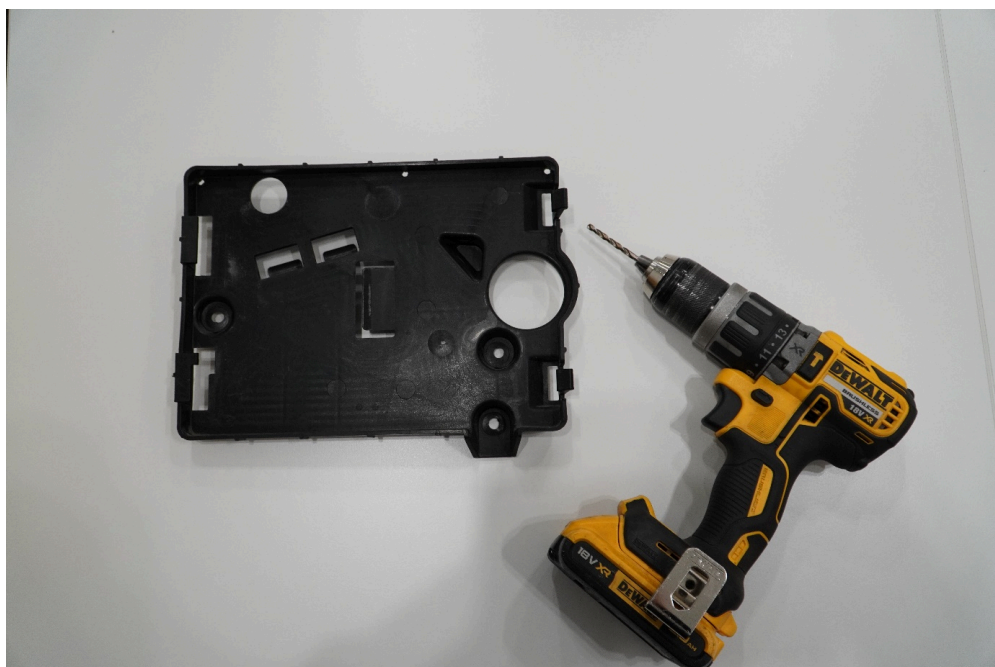
11.4. OEM bracket modification

1. Modify the OEM ECU bracket.
2. Drill three mounting holes.



Important:

Hole dimensions and locations must be verified.



11.5. LSU 4.9 sensor installation

The vehicle is not equipped with wideband lambda sensors from factory.

1. Install two LSU 4.9 sensors in place of the OEM sensors located before the catalytic converters.



2. Route both lambda sensor harnesses vertically toward the top of the engine.

**Important:**

Avoid areas exposed to high temperature.



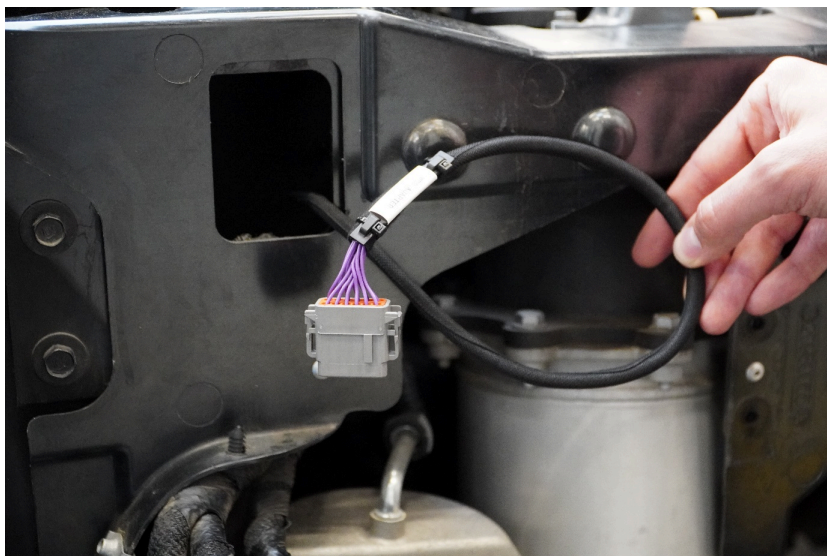


3. Connect the lambda extension harness to the routed sensor harnesses.



11.6. Harness routing

1. Route the lambda harness through the opening in the wheel liner.



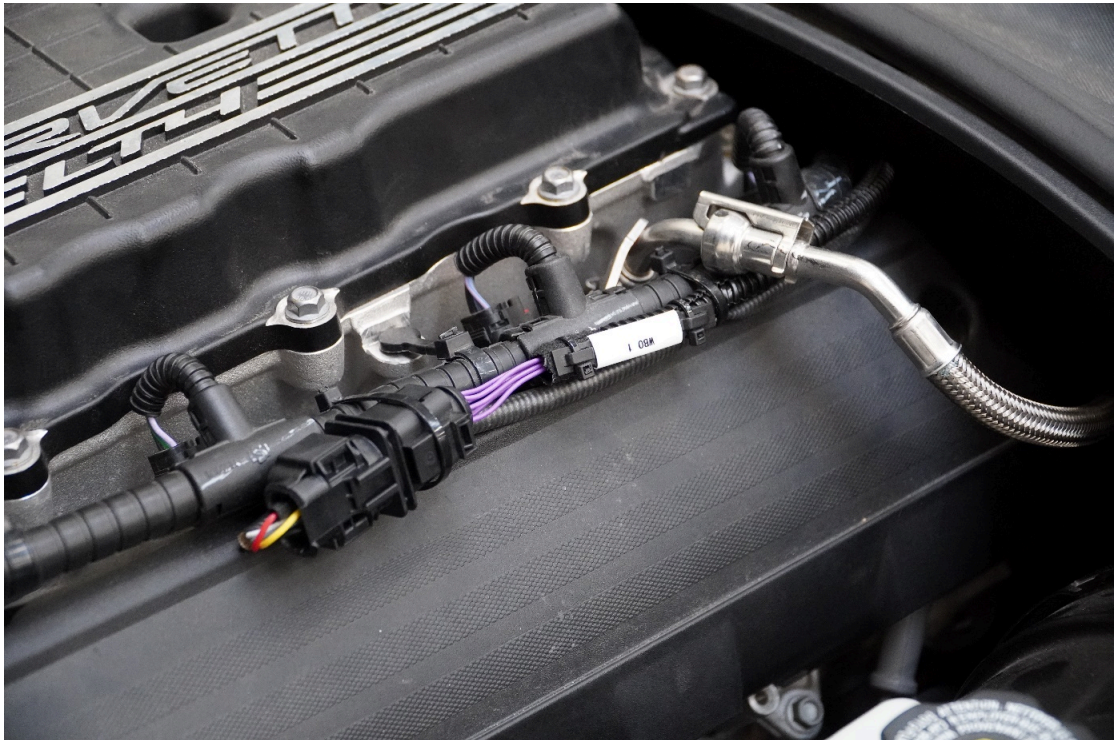
2. Route all harnesses to their final positions.

**Important:**

Avoid hot components.



3. Secure all harnesses using zip-ties.

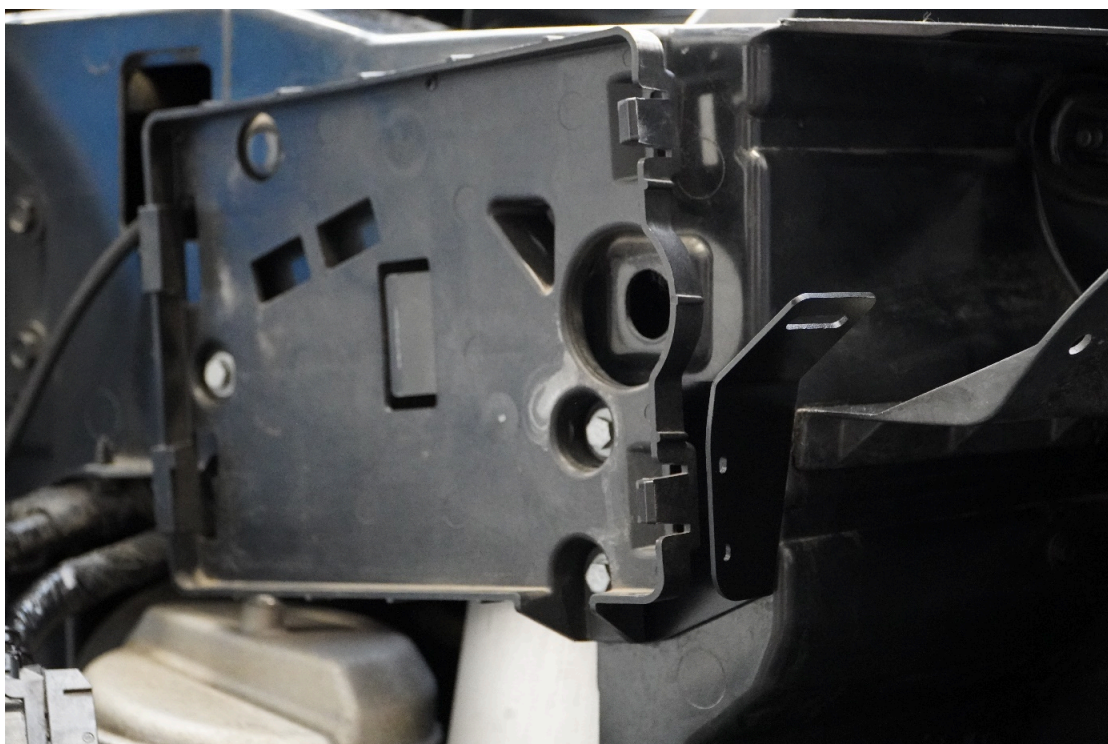


11.7. Adapter bracket installation

1. Install the OEM bracket loosely using the first mounting bolt.
Do not fully tighten the bracket at this stage.



2. Install the additional mounting bracket behind the adapter.



3. Install the remaining mounting bolts.
4. Tighten the first mounting bolt.
5. Loosen the wheel liner mounting bolt.

Use a 13 mm wrench.





6. Install the wheel liner support bracket.





7. Assemble the support bracket.
8. Install the assembled bracket onto the previously installed mounting brackets.

**Note:**

The front section of the bracket must sit flat on the plastic wheel liner before tightening.





9. Tighten all bracket mounting hardware.



10. Drill a mounting hole in the plastic wheel liner.



11. Secure the bracket to the wheel liner.



12. Verify that all mounting hardware is properly tightened.

11.8. Adapter installation

1. Install the LT1 / LT4 Adapter in place of the OEM ECU.



2. Route zip-ties through the previously drilled holes.



11.9. EMU PRO installation

1. Prepare the EMU PRO for installation.

Install the D connector cover.



2. Connect the patch harness to the correct EMU PRO connectors.

3. Install the EMU PRO in its mounting position.

4. Secure the EMU PRO using two mounting bolts.



11.10. GDI Driver installation

1. Install the GDI Driver.



2. Connect the GDI Driver harness.

3. Secure the harness using zip-ties.



11.11. Final harness connections

1. Connect the EMU PRO harness to the LT1 / LT4 Adapter.

Route the harness as shown in the reference pictures.

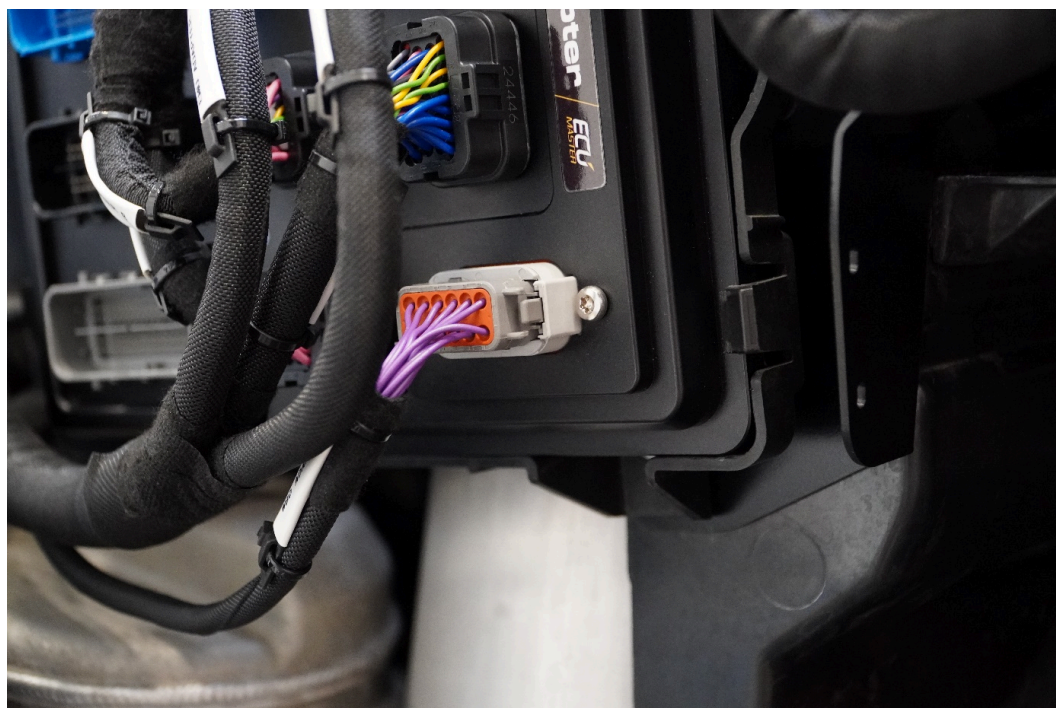


2. Connect the GDI Driver harness.

Route the harness as shown in the reference pictures.



3. Secure the harness using zip-ties.
4. Connect the lambda harness.



5. Route the communication harness through the same wheel liner opening used for the lambda harness.
6. Connect the OEM harness.
Connect matching color connectors.



7. Secure the OEM harness together with the EMU PRO harness.

8. Secure the communication harness.



11.12. Final check

Before completing installation:

- Verify all connectors are fully seated
- Verify all mounting hardware is tightened
- Verify all harnesses are secured
- Verify harnesses are routed away from heat sources and moving components
- Verify wheel liner installation

Reconnect the battery after installation is complete.

11.13. Base Map Installation

After the installation is complete and the battery has been reconnected:

1. Connect EMU PRO to a PC running EMU PRO software.
2. Use **Base Map Loader** to load the appropriate base map.
3. For detailed instructions refer to https://ecumaster.com/files/EMU_PRO/How-to/How-to_Use_Base_Map_Loader_in_EMU_PRO.pdf

**Important:**

Verify that the base map has been loaded successfully before starting the engine.

11.14. Document history

Version	Date	Changes
0.1	2026.06.19	Initial release