by ajusa

electric vehicle line

repair manual

Tesla Model S · Tesla Model X

(2012-2021) (2015 - 2021)

Mercedes B-Class · Toyota Rav4 EV

EDB250e (2014-2017) (2012-2014)

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with motor codes 1002633-00-U / 1002633-01-U / 1025598-01-U

Ajusa reference EV000802

content

general information

WARNING!

Electric vehicle propulsion

This vehicle works with high-voltage electricity which can present **risks of severe or even lethal damages**.

SAFETY PRECAUTIONS

When working with high-voltage circuits or components, make sure that the **following safety guidelines** are fulfilled:

Make sure all the staff working with the high-voltage systems of electric propulsion have been provided with **proper training** to conduct the necessary procedures.

Put up **high-voltage warning** signs to guarantee the staff safety in the work area.

Make sure that the staff who don't have proper training doesn't have access to any high-voltage circuits and components.

Always wear **insulation gloves** under the related local safety rules.

Insulate the high-voltage batteries ensemble.

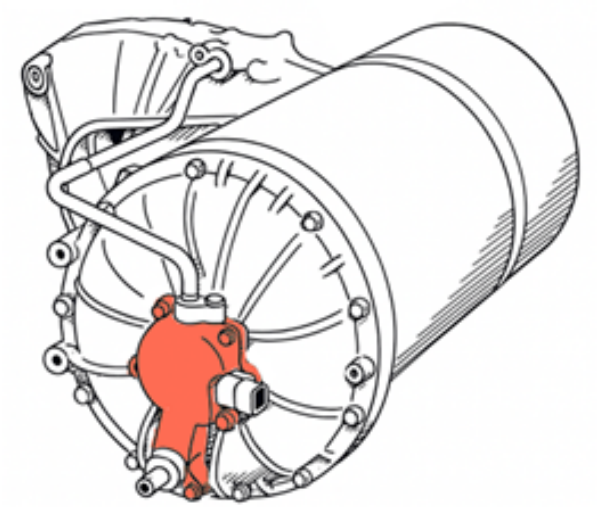
Before working with the electric propulsion system, make sure that the recommended **waiting time after insulating** the high-voltage batteries ensemble has passed by.

Check that the **residual voltage**, which may be in the circuit, is under the recommended safety level.

Make sure that all **test equipment and tools** are suitable to be used in high-voltage circuits or components.

To **ease the identification**, the high-voltage cabling in the electric propulsion system can be covered by an orange insulation.

technical information



Types of failure

The purpose of the bypass assembly is to eliminate rotor cooling, preventing the passage of coolant through this area.

This eliminates the need for the seal associated with this circuit and, with this, prevents the possible entry of coolant liquid inside the electric motor, a situation that could cause serious malfunctions.

References

Kit Ajusa has the reference **EV000802**

Large drive unit (LDU) with OEM references 1002633-00-U / 1002633-01-U / 1002633-01-U / 1025598-01-U

It is fitted to Tesla Model S (2012-2021), Model X (2015-2021) models with the following designations: 60,60D, 70, 70D, 75, 75D, 85, 85D, 90, 90D, 100D, and in the performance versions P85D, P90D and P100D. Also on the MERCEDES B-Class B250e (2014-2017) and Toyota RAV4 EV (2012-2014).

battery disconnection

Recommendations for connecting and disconnecting the battery in electric vehicles

Before starting, it is important to note that, for the usual inspection and maintenance operations, as well as for the disconnection of the vehicle's main battery, it is NOT necessary to disconnect the battery assembly.

The battery should only be disconnected in the following cases

> Replacing the battery.
>
> In need to reset certain parameters of the vehicle.
>
> When the car is going to be parked for a long lapse of time, so that the battery doesn't get fully discharged.

Safety precautions

The batteries ensemble both in electric and hybrid vehicles work with **high voltage**.

> Any worker who doesn't have proper training mustn't have access to any high-voltage circuits and components.
>
> Always wear suitable personal protective equipment (PPE).

It is essential to put up the related signs to guarantee the safety both of the area and of the workers.

The **batteries ensemble** of the electric vehicle must be insulated at all times to prevent potential short circuits. To insulate and strip the batteries ensemble there are different special tools:

> Tool number 1076921-00-B. Insulation multimeter.
>
> Tool number 1130480-00-A. Cable for insulation multimeter.
>
> You must be sure that all the testing devices and equipment are compatible with high-voltage applications.

When the batteries are insulated, a recommended **waiting time must pass** by before proceeding to handling the electric propulsion system.

With the insulation multimeter you will check the residual voltage value in the circuit to be sure that such value is under the recommended value.

The high-voltage cabling in electric vehicles has an orange insulation. Knowing this feature, it is easy to identify it.

Disconnecting/isolating the EV battery pack

1) Locate the battery. For this step, it is advisable to **look it up in the vehicle's manual**, as the method to reach the battery differs from one vehicle to another.

In figure 2 you can see the terminals to jump start.

It is highly advisable to connect the jumper's negative cable to a suitable earth point in the bodywork or the electric propulsion motor. **Do not connect the jumper's cable directly** to the negative terminal of the battery. If you conduct this method, you will prevent the risk of damaging the battery's state sensor which may be located in the earth cable's terminal of the battery.

2) Start the vehicle and verify that the instrument cluster works properly and that it doesn't show any warning or failure.

3) It is recommended to lower the driver's window fully and slightly lower the passenger's window as a safety measure.

4) Check that gearbox is neutral and that the parking brake is activated.

5) Make sure that the power is not connected, and that the keys are not inside the vehicle. Make sure that all electric components are off.

6) Disconnect the earth cable in the battery.

7) Disconnect the First Responder Loop figure 3 and wait for 2 minutes.

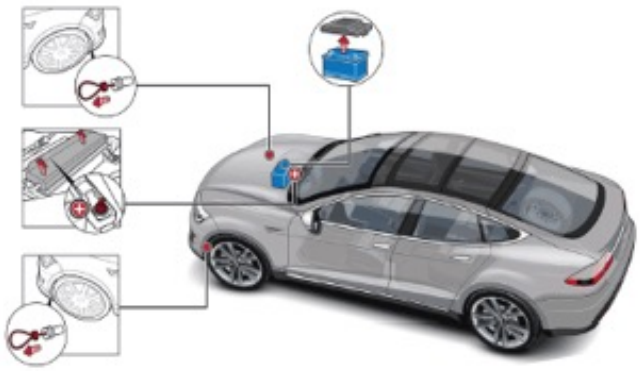


Figure 2. Batteries ensemble location.

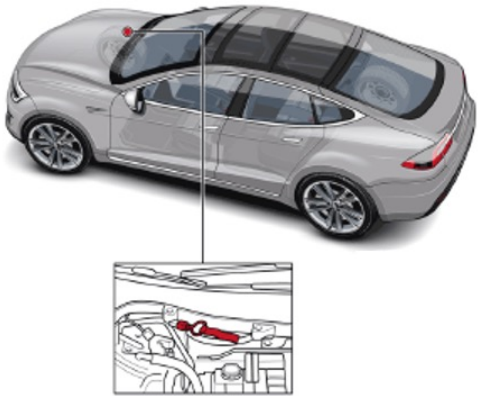


Figure 3. First Responder Loop.

Connection of the batteries ensemble in the electric vehicle

1) Check that the ignition is not activated and that the keys have not been left inside the vehicle.

2) Undo the steps above.

3) Connect the vehicle's main battery and check that everything is working correctly.

After connecting the battery

Power windows and sunroof

1) Make sure that the door is **wide open**.

2) Roll up the window fully.

3) Activate manually the **open-door** fastener with a suitable tool (screwdriver).

4) Use the door's inner handle to disable the fastener.

5) Push the window switch to the automatic opening position.

6) If the **window lowers slightly**:

a. Conduct the calibration process of the electric window operators.

7) If the **window lowers fully**:

a. Make sure that the door is fully closed.

b. Place a spacer between the upper part of the window and the frame of the window.

c. Raise and hold the window switch. Make sure that the window lowers when touching the spacer. Repeat this procedure 14 times.

d. Conduct the calibration process of the electric window operators.

8) **Calibration process** of the electric window operator:

a. Push and hold the window switch to fully lower the window. Keep the switch activated for 2 seconds.

b. Raise and hold the window switch. Keep the switch activated for 5 seconds.

9) Check that the automatic opening and locking functions are **working properly.**

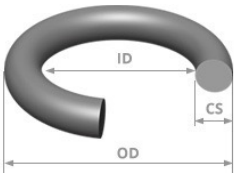
Note: The sliding roof can only be set up with a diagnosis equipment.

composition

Coolant bypass[1]
(1 unit)

Stator coolant inlet gasket[2]
(1 unit)

O-rings
(4 units)



	OD (mm)	ID (mm)	CS (mm)
Encoder gasket[3] (1 unit)	23,52	27,08	1,78
Cooling gasket[4] (1 unit)	25,54	20,03	2,62
Cooling pipe gasket[5] (2 units)	10,03	14,09	2,30

reparation

This system eliminates rotor cooling, so installing the seal is not required. To replace it, the power unit must be removed and placed on a workbench. The following steps describe the kit installation:

01

Accessory gasket

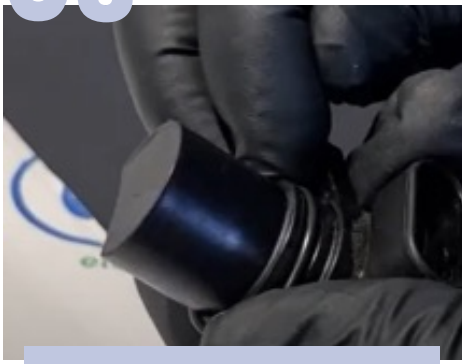
We start the repair by placing the **accessory gasket**[2] in its respective engine housing.

02

Coolant bypass assembly

Apply a uniform bead of AjusEV sealant on the contact surface, then we will place the coolant bypass assembly in its housing and tighten the bolts to 4 Nm.

03



Installing the encoder sensor

We proceed to assemble the encoder sensor, for this we will use the **encoder gasket**[3] once placed in its housing, we will give a torque of 8 Nm.

04

Refrigerant outlet

We continue with the installation of the cooling exit using, for this purpose, **cooling gasket**[4]. In this case, the tightening to be carried out will be 8 Nm.

05

Cooling pipe

Finally, we will mount the **cooling pipe gaskets**[5] on the pipe and once lodged we will apply a tightening of 10 Nm.

Final appearance of the assembly

additional information

Do you know which are the **tools you need** to repair the motor of an electric vehicle? Do you know the **safety measures** to conduct this repair? Is it that you don't know where to start?

Visit the electric vehicle section on our website where we will give you the answers to all these doubts and much more.

You will be able to see the **safety measures video** as well as the **video tutorial** in which you'll see step by step the assembly of the Ajusa kit related to this vehicle.

Furthermore, you can contact our technical assistance department to solve any doubt.

Subscribe to our Youtube channel and learn everything you must know about mechanics.

Click here to watch the **assembly video**:

VIDEO