repair manual

Tesla Model 3 (Facelift)

2023

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with motor code 4D1

Ajusa reference EV002100



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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.

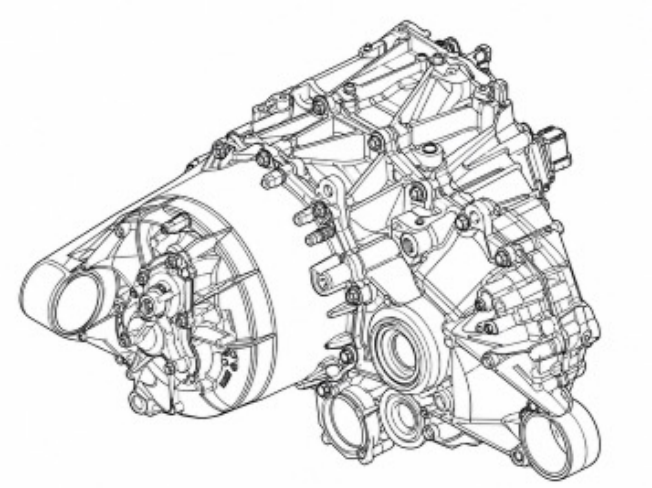
Before working with the electric propulsion system, make sure that the recommended **waiting time after insulating** the high-voltage batteries ensemble has passed by.

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

Insulation failure.

Problems with the main rotor bearing.

Part number

Ajusa kit has the part number **EV002100**

This technical data sheet corresponds to the Tesla Model 3 with engine code 4D1.

Compatibility

Engine code	Model	Version	Years approx.
4D1	Model 3 Highland	Long Range AWD / RWD	2023-2025
4D1	Model Y	Long Range AWD	late 2022–2024
4D1	Model Y	Performance	late 2022–2024
4D1	Model Y	Long Range RWD (long-range)	2024 - present
4D2	Model 3 Highland	Performance AWD (Ludicrous)	2024 - present
4D2	Model Y Juniper	Performance AWD	2025 - present
4D3	Model 3 / Model Y	Long Range AWD (Efficiency)	2024 - 2025
4D3	Model Y Juniper	Long Range AWD / RWD	2025 - present
4D5	Model 3 / Model Y	Standard Range RWD	2023-2026

battery disconnection

Recommendations to connect and disconnect the battery in electric vehicles

Before getting started it is important to highlight that, in usual inspection and maintenance operations, as well as to disconnect the main battery of the vehicle it **is not necessary to disconnect** the batteries ensemble.

Disconnect the battery only when:

> 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 No. Ele.2005: Safety cover for the battery pack isolator plug connection.
>
> Tool No. Ele.2211: Lock for the above-mentioned cover
>
> Electrical test meter
>
> Ensure that all devices and test 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.

Disconnection/isolation of the electric vehicle battery pack.

Low-voltage power supply (disconnection)

1) Ensure that the vehicle's charging cable is disconnected.

2) Switch off the heating/air conditioning system and wait 30 seconds.

3) Fully lower the driver's side window.

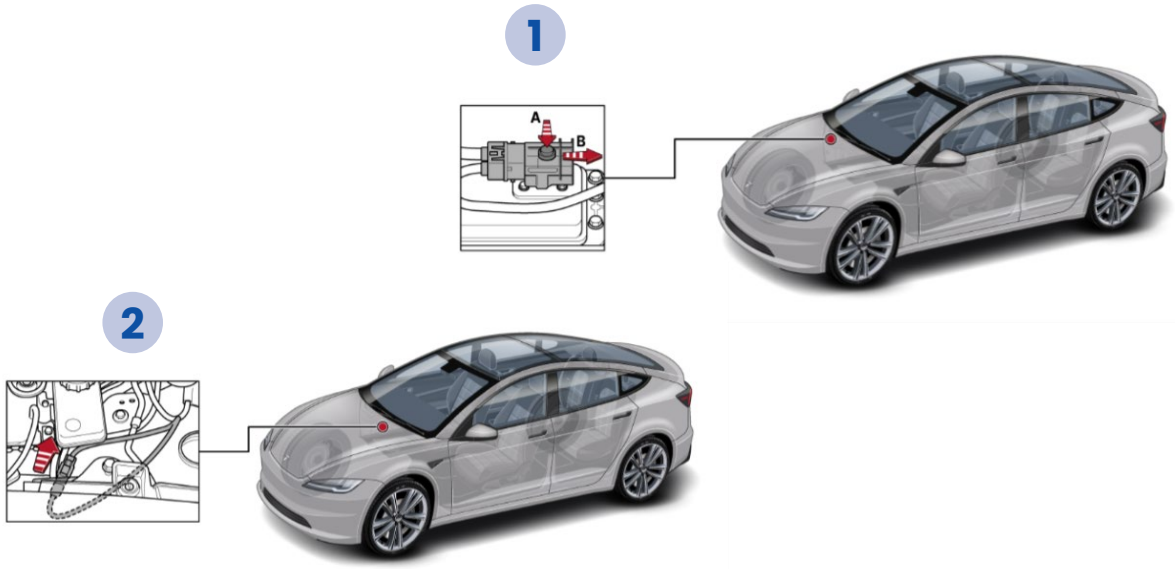
4) Open the driver's door.

5) Power off the vehicle using the Controls menu on the touchscreen:

> Select Controls on the touchscreen.
>
> Select Safety.
>
> Select Power Off.

6) Remove the cowl trim panel to gain access to the vehicle's low-voltage battery.

> Disconnect the vehicle's low-voltage battery wiring harness connector **(Fig. 1)**.
>
> Disconnect the service connector **(Fig. 2)**.
>
> Wait 2 minutes.



Vehicle High-Voltage Deactivation Procedure

1) Disconnect the vehicle's low-voltage battery.

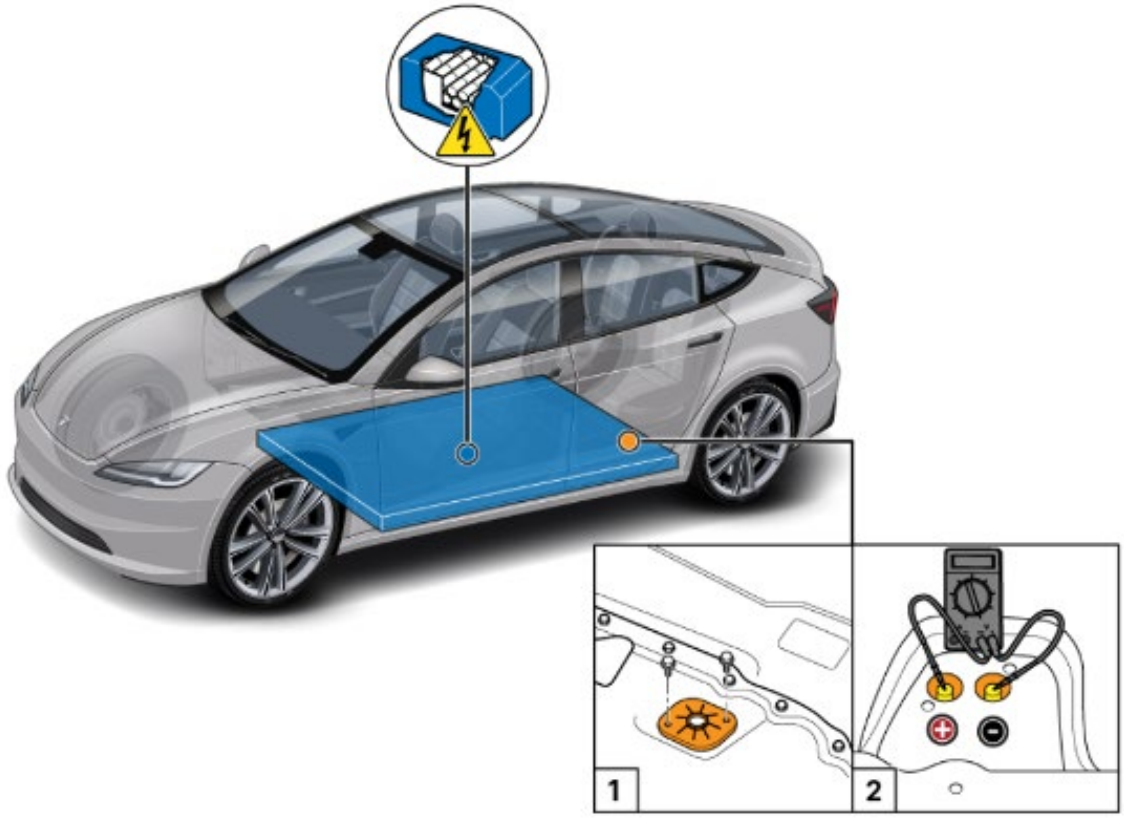
2) Remove the rear seat cushion.

3) Remove the access cover from the high-voltage battery pack voltage test connector terminals **fig1**.

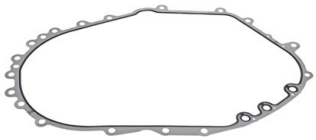
4) Measure the voltage at the high-voltage battery pack voltage test connector terminals **Fig. 2** to ensure that the residual voltage in the circuit is below **10 V** before proceeding:

> Positive terminal to vehicle body ground.
>
> Negative terminal to vehicle body ground.
>
> Positive terminal to negative terminal.

5) Install the access cover for the high-voltage battery pack voltage test connector terminals. Use new screws. Tightening torque: **6 Nm.**



composition



Transmission Housing Gasket[1]
(1 unit)



Stator gasket[2]
(1 unit)



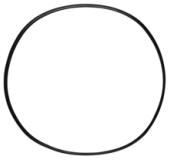
Encoder Cover Gasket[3]
(1 unit)



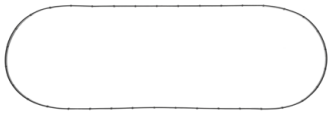
Rotor Bearing[4]
(1 unit)



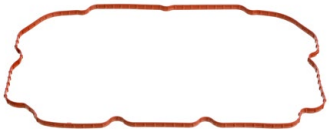
Transmission seals[5]
(2 units)



Outer Winding Protector Gasket[6]
(1 unit)



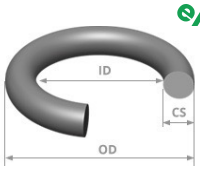
Inner Winding Protector Gasket[7]
(1 unit)



Inverter Gasket[8]
(1 unit)



O-Ring Kit
(25 units)

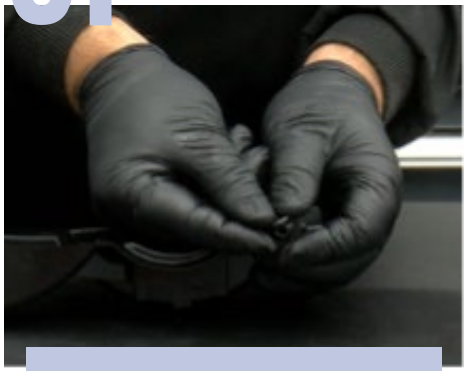


Stator Phase Feedthrough[9] (3 units)		27,00	5,50
Three-Phase Connection Cover (outer)[10] (3 units)	22,70	15,50	3,60
Three-Phase Connection Cover (inner)[11] (3 units)	23,00	18,00	2,50
Stator Phases[12] (3 units)	19,50	12,50	3,50
Oil Pump Gasket (small) [13] (1 unit)	43,00	39,00	2,00
Oil Pump Gasket (medium) [14] (1 unit)	61,00	57,00	2,00
Oil Pump Gasket (large) [15] (1 unit)	65,00	60,00	2,50
Transmission Housing Breather Gasket [16] (1 unit)	21,10	16,30	2,40
Gear Oil Collector [17] (4 units)	15,00	9,00	3,00
Fill/Level and Drain Plug Gasket[18] (2 units)		13,40	2,30
Oil Cooler Gasket [19] (2 units)	20,00	13,00	3,50
Encoder Connector[20] (1 unit)	27,50	21,50	3,00

reparación

The repair of this motor is shown below in a few simple steps.

01



Oil Collector

The first step will be to remove the oil collector assembly and replace the four O-rings G**ear Oil Collector**[17]. It is important to note that the oil collector must be installed together with the differential.

02



Transmission Cover

Once the transmission assembly components and the differential are properly positioned, install the **Transmission Housing Gasket**[1], as shown in the image.

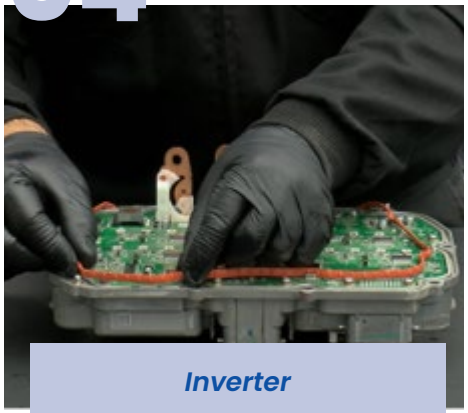
03



Stator Feedthrough

We will now proceed with the installation of the stator feedthrough. It is fitted with three **Stator Phase Feedthrough**[9]. Once the gaskets have been replaced, the feedthrough will be press-fitted into position, followed by the installation of the other housing. The housing bolts should be tightened to a torque of 22 Nm.

04



Inverter

Next, install **Inverter Gasket**[8], positioning it around the entire perimeter. Then, position the inverter onto the locating pins for proper alignment. In this case, tighten the fasteners to a torque of 12.5 Nm.

05



Transmission Seals

Next, we will install the two **Transmission seals**[5]. A suitable installation tool will be used to fit them correctly.

06



Rotor Assembly

Insert the rotor output shaft into the transmission input shaft, ensuring a smooth engagement without applying excessive force.

07



Induction Heater for Bearing Installation

Before starting, ensure that the work area is free of contaminants, especially metal objects within a one-metre radius. Make sure you have all the necessary tools and personal protective equipment (gloves and safety glasses).

08



Bearing Placement on the Induction Heater

Insert the **Rotor Bearing**[4] onto the magnetic core, always using the core that best matches the inner diameter of the bearing. If necessary, two cores may be used. Once inserted, place the bearing on the induction heater supports, which should be greased beforehand.

09



Temperature Probe Placement

Next, place the temperature probe on the inner side of the **Bearing**[4]. This ensures that the induction heater monitors the temperature at the desired location and alerts us when the bearing reaches the target temperature, typically between 80 and 120 °C.

10



Heating and Installation

Once the target temperature has been reached, switch off the induction heater and disconnect the temperature probe. Remove **Bearing**[4] from its supports and proceed with its installation. The heat will have caused the material to expand, allowing the bearing to be fitted easily.

11



Impulse Wheel Installation

Install the impulse wheel onto the rotor shaft, ensuring that it is fully seated against the stop.

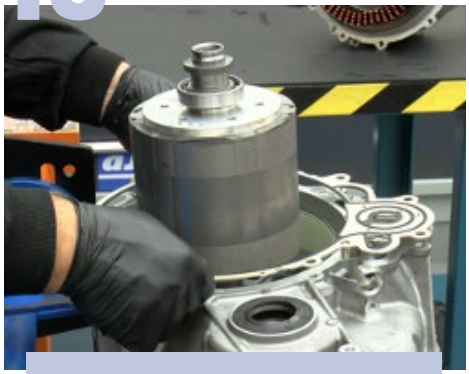
12



Winding Protection Gaskets

Next, install the Inner **Winding Protector Gasket**[7] and the **Outer Winding Protector Gasket**[6], then position the winding protector correctly in the motor housing.

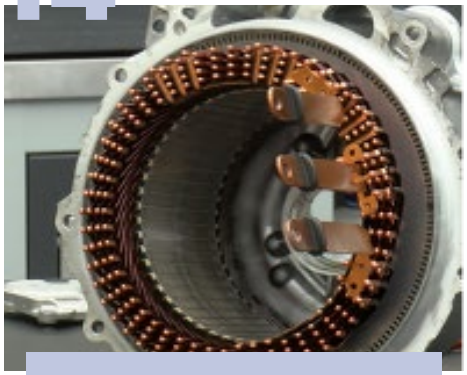
13



Stator Housing

Install the **Stator Gasket**[2] onto the contact surface, ensuring its correct positioning using the locating pins. Then, place the oil filter in its corresponding housing in the gasket.

14



Stator Phases

The next step is to install the **Stator Phases**[12], which seal the three-phase terminals passing through the feedthrough. To facilitate their insertion and ensure proper installation, apply a small amount of neutral petroleum jelly to the gaskets.

15



Stator Assembly

Before installing the stator, fit the adjustment washer. Then, guide the three-phase terminals through the feedthrough while carefully centering the bearing in its corresponding housing within the stator. Finally, tighten the fastening bolts to a torque of 25 Nm.

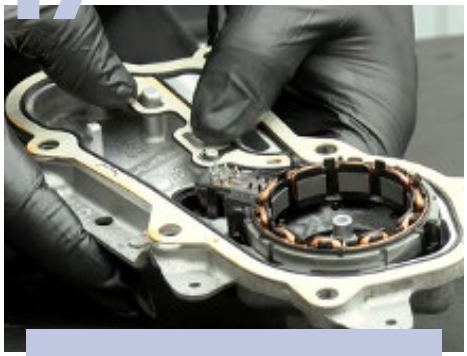
16



Encoder Connector

Next, install the encoder data connector together with **Encoder Connector**[20]. Once installed, tighten it to a torque of 4 Nm.

17



Encoder Cover Gasket

Next, install **Encoder Cover Gasket**[3], securing it with the two locating pins on the cover to ensure its correct positioning. Once the cover is in position, tighten the bolts to a torque of 8 Nm.

18



Oil Pump

The oil pump is fitted with three O-rings: **Oil Pump Gasket (Large)**[15]**, Oil Pump Gasket (Medium)**[14]**, and Oil Pump Gasket (Small)**[13]. Once the O-rings are installed, position the oil pump in its corresponding housing and tighten the bolts to a torque of 5 Nm + 20°.

19



Oil Cooler

Install the two **Oil Cooler Gaskets**[19]. Apply light pressure to fit the oil cooler into its corresponding housings. Once in position, tighten the bolts to a torque of 10 Nm.

20



Filling/Level and Drain Plugs

Install the corresponding gaskets for the filling/level and drain plugs, **Filling/ Level-Drain Plug Gasket**[18]. Tighten the drain plug to 15 Nm, while the filling and level plugs should be tightened after the transmission has been filled and the fluid level has been checked.

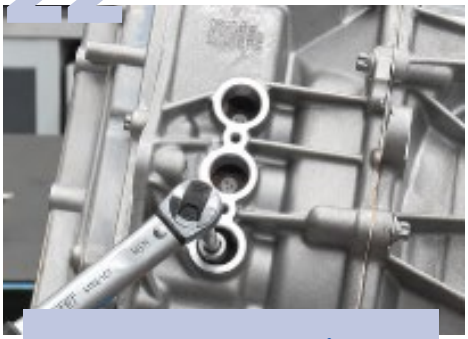
21



Oil Breather

Next, install the **Transmission Housing Breather Gasket**[16]. As the breather plug is made of plastic, the tightening torque must not exceed 5 Nm.

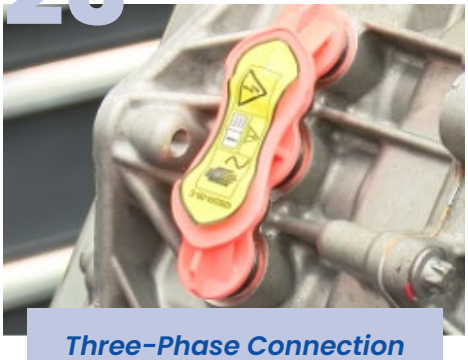
22



Three-phase terminals

It is now time to connect the stator to the inverter. Tighten the three connecting bolts to a torque of 11.5 Nm.

23



Three-Phase Connection Cover

Finally, install the O**uter Three-Phase Connection Cover (1)**[10] and the **Inner Three-Phase Connection Cover (2)**[11] on the cover. Once in position, tighten the bolts to a torque of 10 Nm.



Motor · Final view of the completed 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.

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

VIDEO