



EV - Intelligent Report

Date: 3/2/2023

Vehicle: TESLA Model 3

VIN: 5YJ3E1EXXX1234567

Yea: 2020

Reason for this report: Evaluation, solution and budget for repair of TESLA Model 3 - 2020

Inspection: The vehicle cannot be driven after a few minutes of operation.

Initial diagnosis: Entering to the service mode the alert **BMS_a053** is present.

This alert refers to a loss of insulation. This alert shows a problem in the high voltage system.

In an electric vehicle, the isolation between each high voltage component and the chassis must be complete.

The insulation prevents an electric arc from being caused between the different components, whether they are battery cells, modules and components that work or receive high voltage.

The BMS (Battery Management System) is responsible for monitoring the loss of insulation.

An acceptable value for insulation must be greater than 1 Mohm. In this case, when starting the vehicle, a value of 500 Kohms could be observed and after a few minutes this value dropped to 10 Kohms.



This value is observed in the same **Service Mode**.

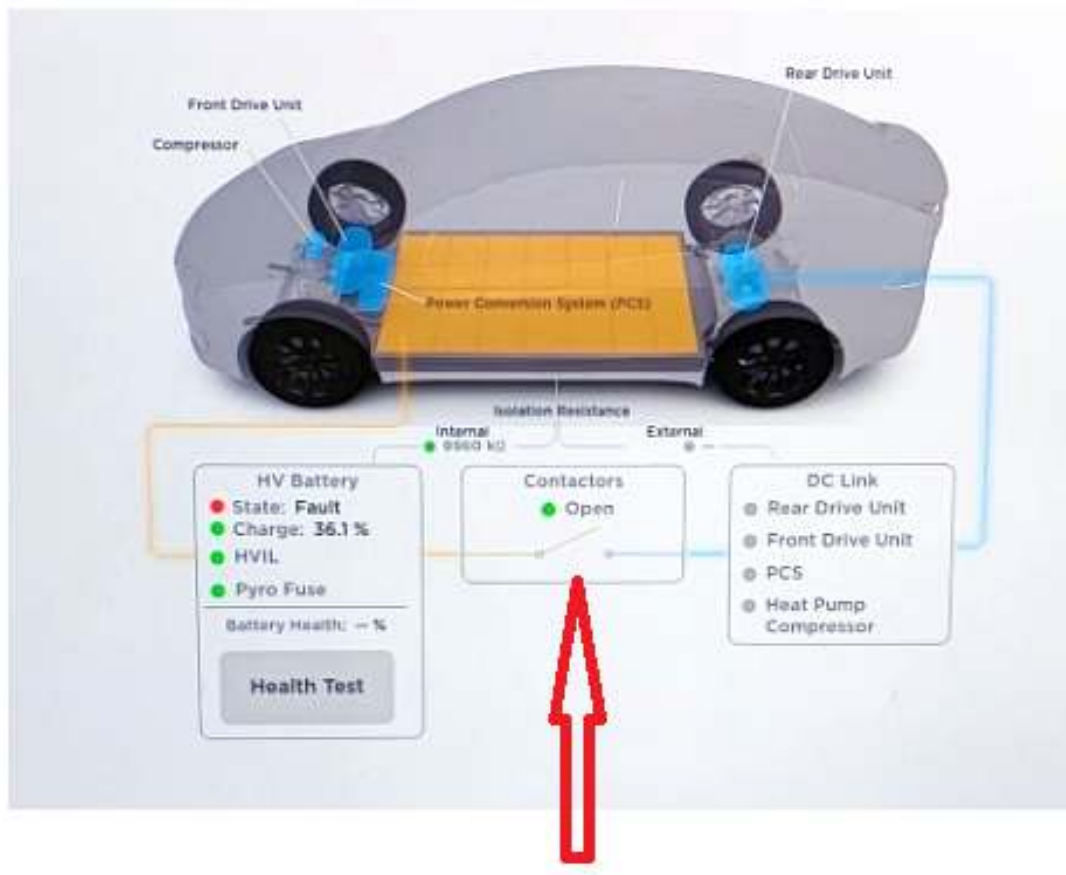
Simultaneously the contactors are open and the vehicle cannot be driven.

Contactors are electromagnetic devices that allow current to pass from the battery to motors and other components.

One of these components is the **PCS (Power Conversion System)** where the conversion from high voltage to low voltage is carried out inside and when it stops working the low voltage system will not be sustained.

When this happens, the alert **VCFRONT_a192** appears and the low voltage battery will discharge in a short time.

According to the measurements made, the insulation leak occurs inside the rear drive unit.



The Rear Drive Unit has 3 parts:



1. Drive Inverter
2. Gearbox
3. Motor

The loss of insulation can occur in the motor or inverter windings.

Solution:

In our lab we can try to repair the insulation loss in the Drive Unit, either in the motor or in the inverter.

Budget:

The cost of this report is US\$ 420.-

The cost of repairing the Drive Unit is US\$ 3,200.-

If it is not possible to repair the Drive Unit, it must be changed and its cost including the new part is US\$ 6400.-