Document Information

Location: High Voltage/Hybrid

Topic: McLaren Artura Ground Fault Detection Diagnosis Guide

Condition: Permanent **Diagnostic Trouble Codes:** P21F14D P21F14C P186909

Measure

In the event of a Ground Fault Detection (GFD) warning being displayed on the vehicle's instrument cluster, please proceed with the following steps to diagnose the concern.

Care Point: A TR must be raised with detailed description of concern and highlight the intention of following this KA BEFORE proceeding.

eCompressor Log

- Follow KA-01777 and complete the log of the HVAC eCompressor
- Please submit results from the eCompressor test on the TR for review

Care Point: Before proceeding to the next steps, ensure the vehicles High Voltage (HV) system has been deactivated following the procedure set out in the McLaren Service Portal (MSP) instructions.

Insulation Testing on HV System

The insulation tester must be checked to ensure that it is operating correctly before and after the HV insulation test and that the internal fuse is not blown causing incorrect readings. The below instructions are provided for the McLaren approved Fluke 1587 Insulation Multimeter. For other insulation test models please refer to the user manual.
The following steps must be carried out before and after the HV insulation test:

1. Set meter to resistance setting.
2. Short the terminals shown below with a test lead (VΩ to mA).
3. "OL" indicates that the fuse has failed and must be replaced before proceeding with the insulation test. Any other resistance reading indicates that the fuse is OK and the insulation test can proceed.

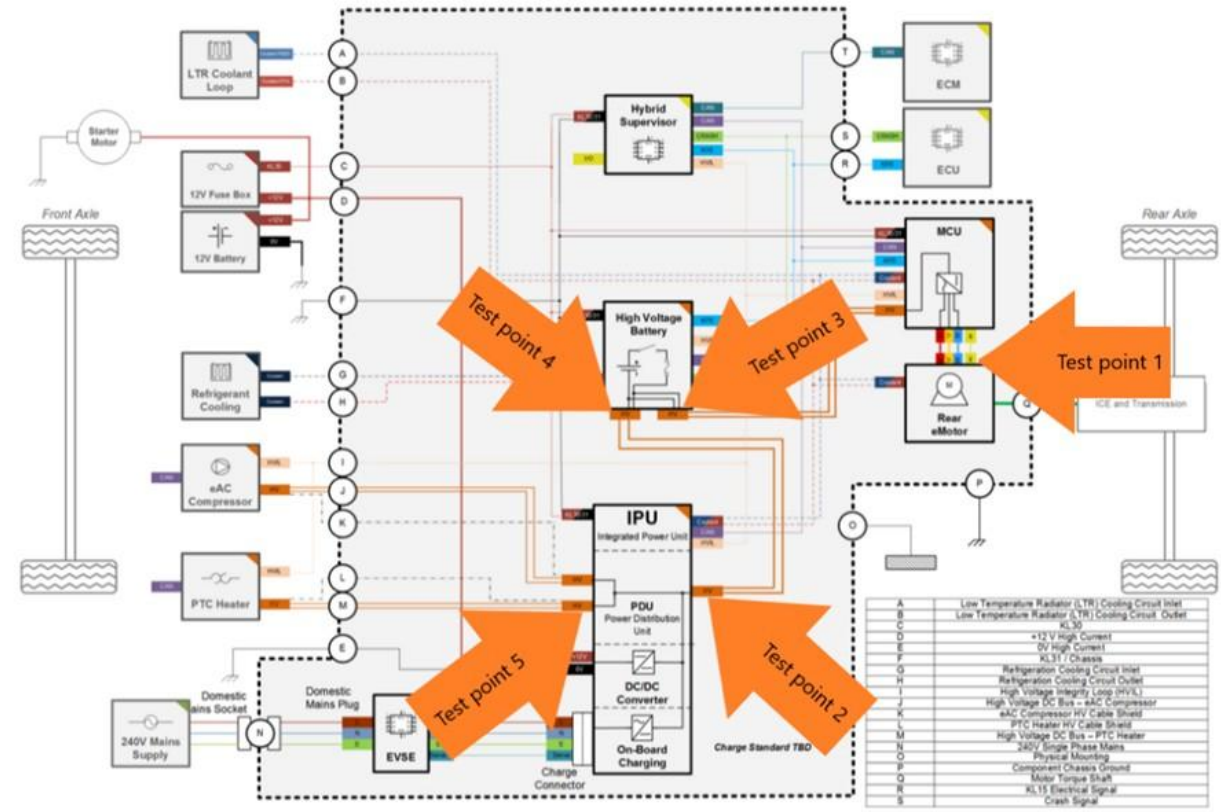
Care Point: Do not perform an insulation test with the probes shorted as the tester fuse will blow.

Test Procedure

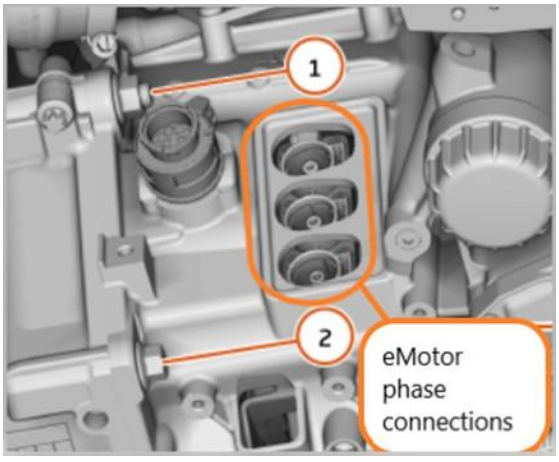
CAUTION: Never perform a HV insulation test between HV+ and HV- as it will damage the component being tested. HV insulation tests must only be done between HV+ or HV- to ground.

1. Ensure the vehicle is off and the HV system has been deactivated and confirmed voltage free as per the MSP instructions
2. Disconnect the HV connector of the component
3. Connect the insulation test probes to the insulation tester as specified in the instrument's user manual
4. Turn on the insulation tester and select a 500V test voltage
5. Perform the measurement between HV+ to ground for a duration of 1 minute
6. Perform the measurement between HV- to ground for a duration of 1 minute
7. Record the resistance in the table and report your findings via TR to Technical Support for review

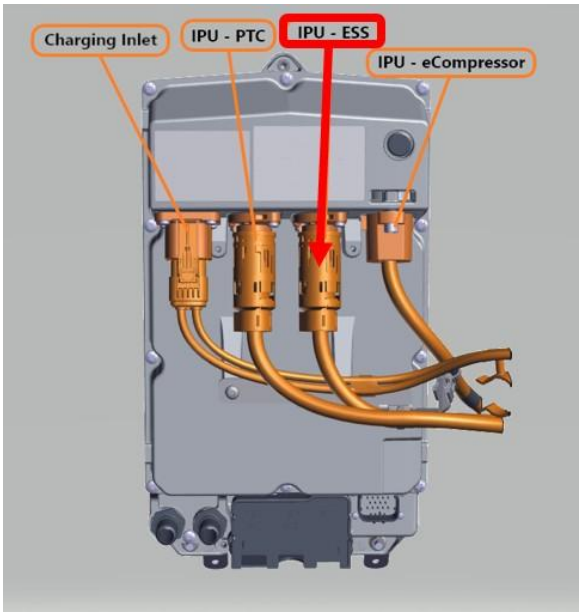
Test Locations



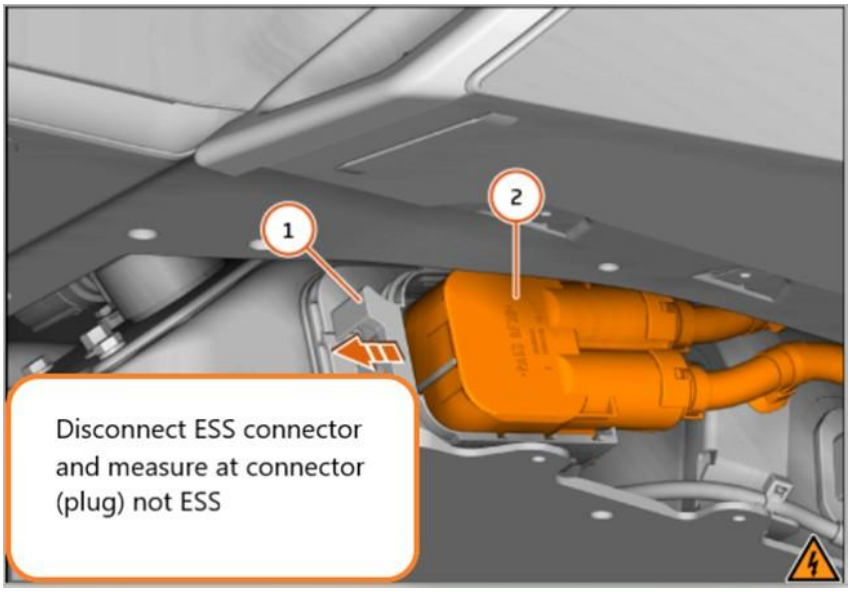
Test Point 1
Phase cables test point – Disconnect phase cable connector and check at each phase on eMotor to ground.
Then measure at the phase cable connector (harness side), each phase to ground.



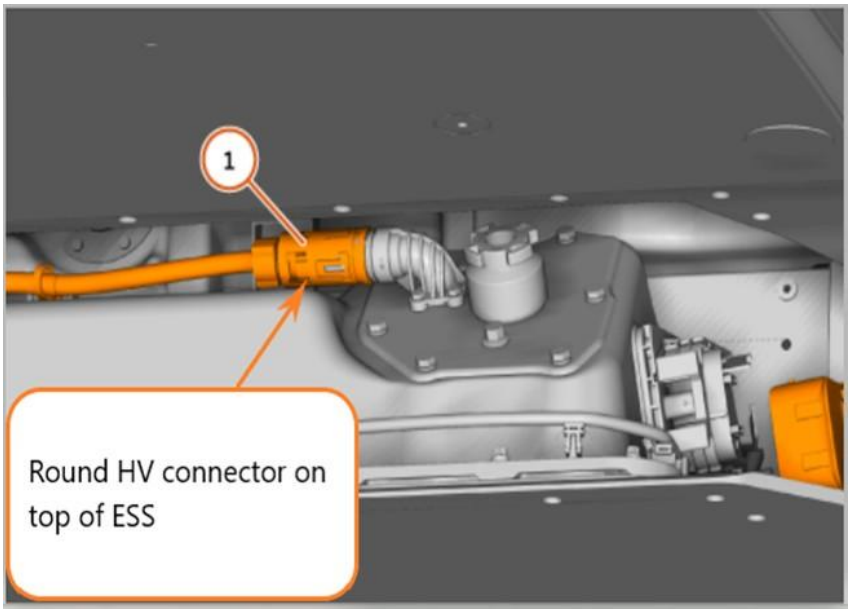
Test Point 2
IPU – ESS Auxiliary DC link test point – Disconnect HV connector highlighted in red and measure at HV connector (harness side) HV+ to ground then HV- to ground.

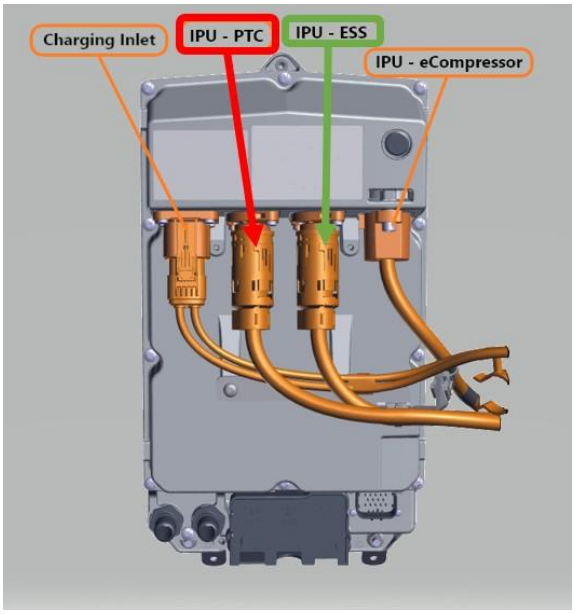


Test Point 3
ESS – MCU DC link test point – Disconnect square HV connector on side of ESS and measure at HV connector (harness side) HV+ to ground then HV- to ground.



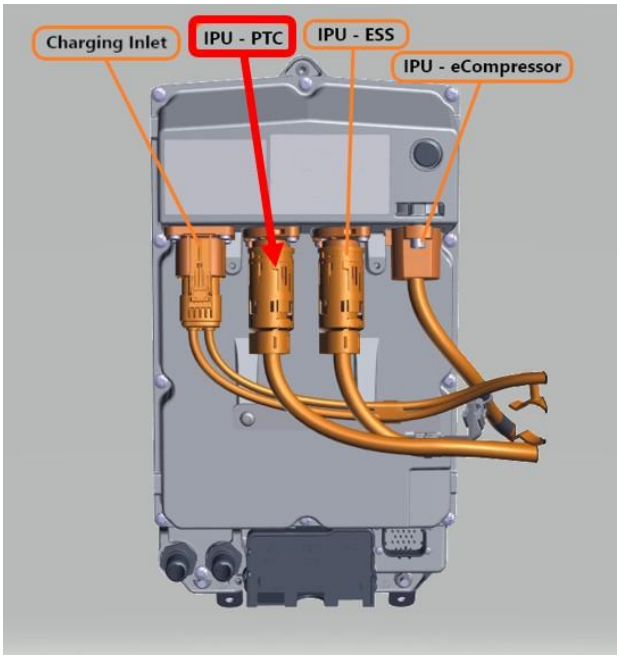
Test Point 4 eCompressor test point – Disconnect round HV connector on top of ESS and disconnect PTC HV connector on IPU highlighted in red. Make sure HV connector on IPU for the ESS is re-connected (test point 2) highlighted in green. Then measure at round HV connector (harness side) HV+ to ground then HV- to ground.





Test Point 5

PTC heater test point – Disconnect PTC heater HV connector at IPU highlighted in red and test at HV connector (harness side) HV+ to ground then HV- to ground.



Once all measurements are complete, please attach results table to the TR for review and await further instructions.

Parts Information

N/A

Attachments

HV Component Ground Fault Detection Tests Table