

Powertrain Diagnostics

Overview:

This document outlines the recommended method to allow quick and easy diagnosis of powertrain related faults in Gen 5 UBCO 2x2 bikes.

Outline:

The powertrain system that drives each wheel of the UBCO 2x2 is comprised of the following components:

- Motor Controller
- Motor Cable
- Hub Motor

This system was designed for modularity and ease of service, allowing parts to be replaced individually and using identical components on the front and rear of the bike.

When a bike's front or rear wheel drive system exhibits a fault, this design often allows for the cause to be easily identified by swapping, or cross-connecting components between the front and rear of the bike, as per the below process.

Components Required:

To carry out this diagnostic process, the following parts are required:

These should be kept on hand as workshop tools, with replacements available from your local UBCO distributor.

Quantity	Part Number	Part Description
1 x	BTR-BPBS-0-002	Battery Extension Cable Gen 5
2 x	2X2-EA-MCE-001	Motor Extension Cable 2.2m Workshop
1 x	2X2-EA-MC-003	Motor Cable 1000mm Gen 5

Fault Symptoms:

An issue with a powertrain component can present a range of symptoms including:

- Loss of drive to front or rear wheel.
- Skipping/jumping/erratic rotation of front or rear wheel.
- Implausible temperature sensor reading from front or rear motor.
- Powertrain related alert codes stored- (See next page for full list)

Powertrain Alert Codes:

	Alert Code	Description
Front Powertrain Alert Codes	C-1058	Caution: Front Motor - Supply Voltage Low - Power Reduced
	C-1061	Caution: Front Motor - Supply Voltage High - Power Reduced
	C-1062	Caution: Front Motor - Over Temperature - Power Reduced
	F-1012	Fault: Front Motor - Phase Current High
	F-1013	Fault: Front Motor - Current Sensor Fault
	F-1014	Fault: Front Motor - Current Sensor Above Threshold
	F-1016	Fault: Front Motor - Hall Sensor Signal Error
	F-1018	Fault: Front Motor - Phase Voltage out of Range (Static Test)
	F-1021	Fault: Front Motor - Loss of Communication
	F-1022	Fault: Front Motor - Phase Current High (Intermittent)
	F-1023	Fault: Front Motor - Temperature High
	F-1027	Fault: Front Motor - Phase Voltage out of Range (Dynamic Test)
	F-1051	Fault: Front Motor - Communication Timeout
	F-1052	Fault: Front Motor - Hall Sensor Signal Error
	F-1053	Fault: Front Motor - Wheel Movement Restricted
	F-1054	Fault: Front Motor - Wheel Speed Signal Error
	F-1056	Fault: Front Motor - Hall Sensor Signal Error
	F-1057	Fault: Front Motor - Hall Sensor Signal Error
	F-1066	Fault: Front Motor - Thermal Overload - Power Reduced
F-1067	Fault: Front Motor - Low Ambient Temperature	
Rear Powertrain Alert Codes	C-2058	Caution: Rear Motor - Supply Voltage Low - Power Reduced
	C-2061	Caution: Rear Motor - Supply Voltage High - Power Reduced
	C-2062	Caution: Rear Motor - Over Temperature - Power Reduced
	F-2012	Fault: Rear Motor - Phase Current High
	F-2013	Fault: Rear Motor - Current Sensor Fault
	F-2014	Fault: Rear Motor - Current Sensor Above Threshold
	F-2016	Fault: Rear Motor - Hall Sensor Signal Error
	F-2018	Fault: Rear Motor - Phase Voltage out of Range (Static Test)
	F-2021	Fault: Rear Motor - Loss of Communication
	F-2022	Fault: Rear Motor - Phase Current High (Intermittent)
	F-2023	Fault: Rear Motor - Temperature High
	F-2027	Fault: Rear Motor - Phase Voltage Out of Range (Dynamic Test)
	F-2051	Fault: Rear Motor - Communication Timeout
	F-2052	Fault: Rear Motor - Hall Sensor Signal Error
	F-2053	Fault: Rear Motor - Wheel Movement Restricted
	F-2054	Fault: Rear Motor - Wheel Speed Signal Error
	F-2056	Fault: Rear Motor - Hall Sensor Signal Error
	F-2057	Fault: Rear Motor - Hall Sensor Signal Error
	F-2066	Fault: Rear Motor - Thermal Overload - Power Reduced
F-2067	Fault: Rear Motor - Low Ambient Temperature	

Diagnostic Procedure:

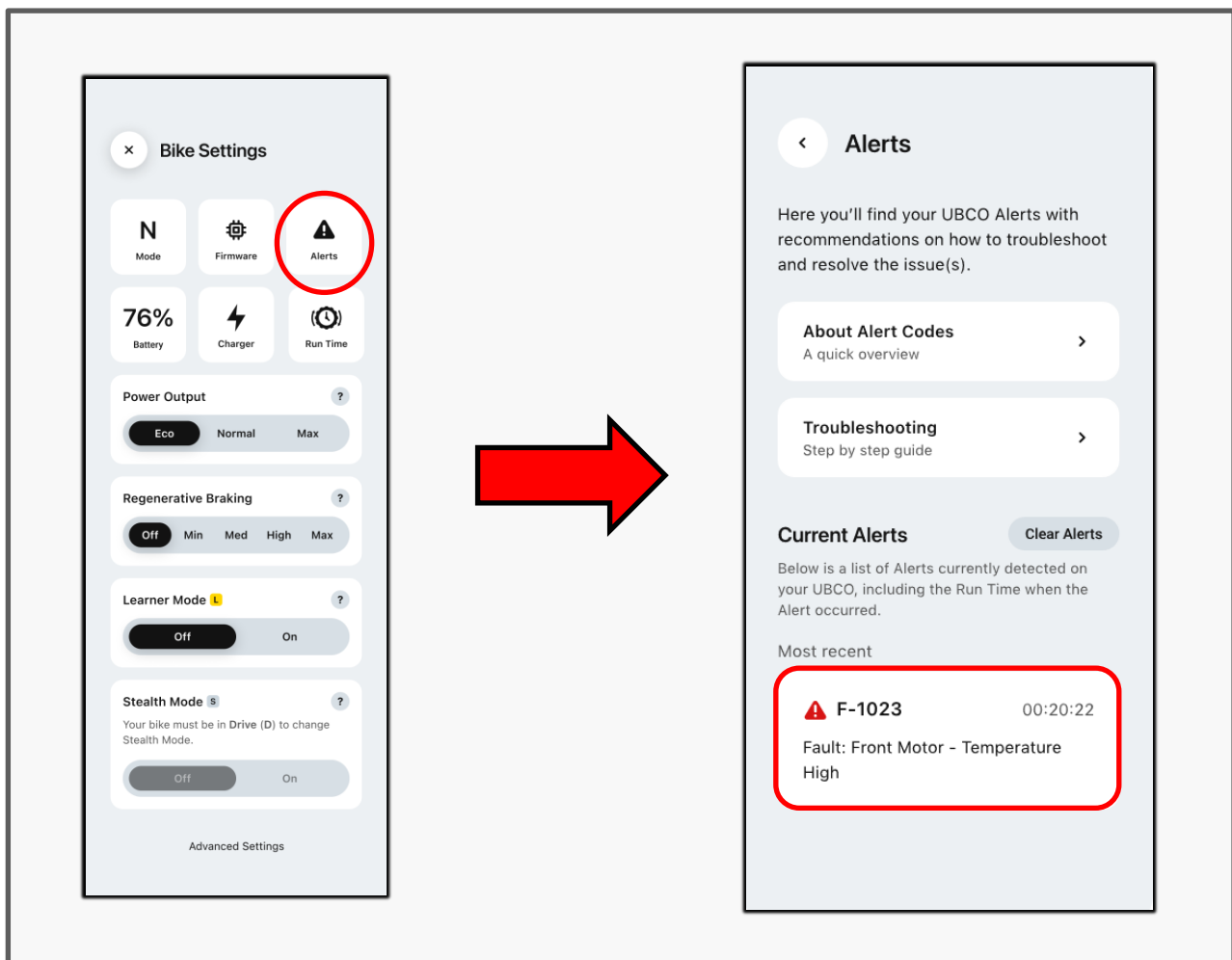
Before proceeding further, ensure that the checks and inspections outlined in the [Diagnostics- Initial Checks](#) document have been completed, and the relevant test results recorded.

Ensure you have a clear understanding of the fault symptoms, a record of any fault codes stored, and have ascertained whether the issue is relevant to the front, or rear powertrain system.

The next step of the process is to isolate the faulty component, by following the diagnostic workflow detailed on the following page:

**This worked example has a fault code stored relating to the front Powertrain system:*

F-1023 Fault: Front Motor – Temperature High



Powertrain

Front	Rear
F-1012	F-2012
F-1013	F-2013
F-1014	F-2014
F-1016	F-2016
F-1018	F-2018
F-1021	F-2021
F-1022	F-2022
F-1023	F-2023
F-1027	F-2027
F-1051	F-2051
F-1052	F-2052
F-1053	F-2053
F-1054	F-2054
F-1056	F-2056
F-1057	F-2057
F-1058	F-2058
F-1061	F-2061
F-1062	F-2062
F-1066	F-2066
F-1067	F-2067

