
Maximus54/60 Trouble Shooting And FAQ List

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TR 2/TL 2 Right/Left Wheel Motor Stall Detected

Tool: Computer、PCAN、Debugging wire



Check:

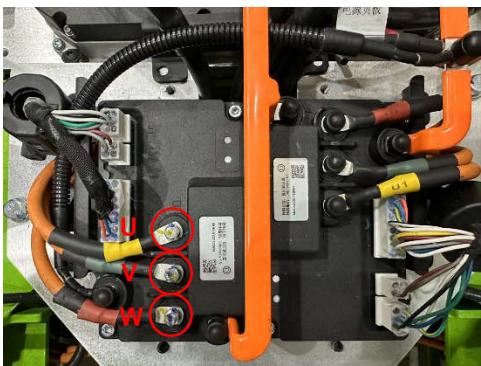
1. Display pop up TR 2/TL 2 fault code
2. Use a forklift to lift the rear wheel off the ground and check whether the rear wheel rotates smoothly and whether there is any abnormal noise when rotating.



3. Check the pin status of the encoder connector corresponding to the motor and whether the connector is connected properly;



4. Check whether the phase wire of the corresponding motor is damaged and whether the phase wire installation is misaligned;



5.Use the Greenworks controller application Check whether the controller software version and parameter version is correct, If the version is incorrect, flash the correct version.

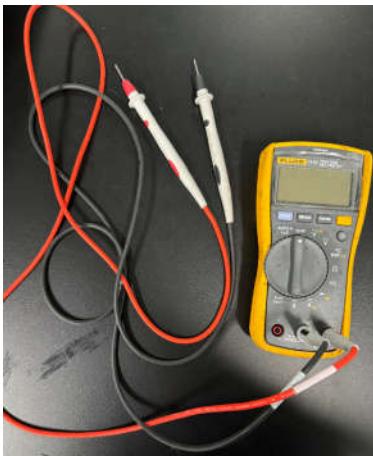
Traction System		PMU System	
L Ctrl POT Value V _b	2.37	R Ctrl POT Value V _b	2.40
L Ctrl SW Ver.	S101	R Ctrl SW Ver.	S107
L Ctrl HW Ver.	H100	R Ctrl HW Ver.	H102
L Mtr Speed rpm.	0	R Mtr Speed rpm.	0
L Mtr Bus Curr A _b	0	R Mtr Bus Curr A _b	0
L Mtr Temp :	50	R Mtr Temp :	51.8
L Ctrl Temp,	59	R Ctrl Temp,	57.2
Error Code,	TL45	Error Code,	TR45
Undefined		Undefined	

Blade System					
L Ctrl SW Ver.	S100	M Ctrl SW Ver.	S1002	R Ctrl SW Ver.	S100
L Ctrl HW Ver.	H1000	M Ctrl HW Ver.	H1000	R Ctrl HW Ver.	H1000
L Mtr Speed rpm.	0	M Mtr Speed rpm.	0	R Mtr Speed rpm.	0
L Mtr Bus Curr A _b	0	M Mtr Bus Curr A _b	0	R Mtr Bus Curr A _b	0
L Ctrl Temp,	59	M Ctrl Temp,	59	R Ctrl Temp,	59
Error Code,	N/A	Error Code:	N/A	Error Code,	N/A

6.restart the vehicle. If this fault code persists, please replace the motor encoder perform motor self-learning test;

TR 4/TL 4 Right/Left Wheel Motor Over Speed Protection

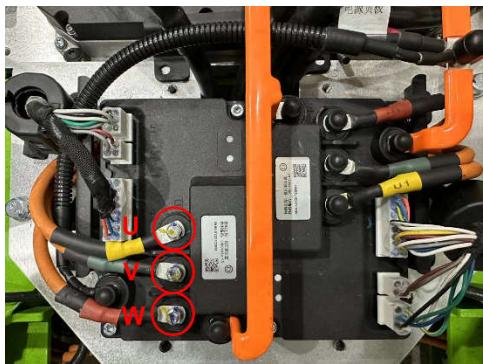
Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

1.Display pop up TR 4/TL4 fault code

2. Check whether the phase wire of the corresponding motor is damaged and whether the phase wire installation is misaligned;



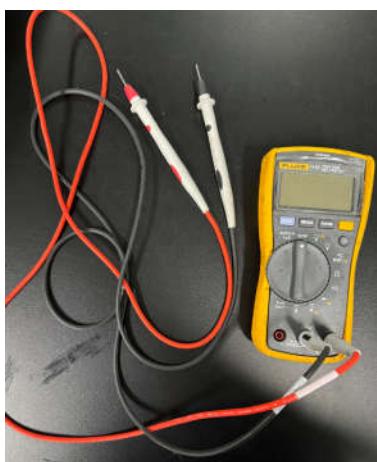
3. Check the pin status of the encoder connector corresponding to the motor and whether the connector is connected properly;



3. Replace the motor and Perform motor self-learning test again;

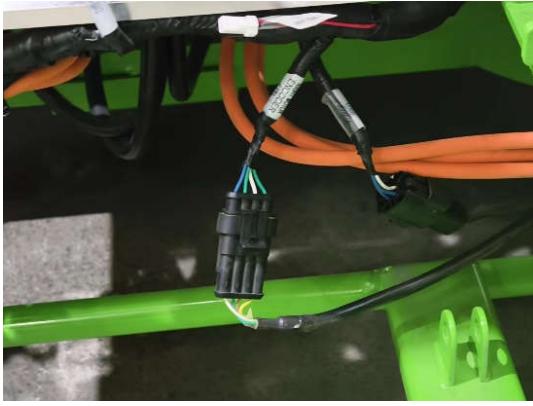
TR 5/TL 5 Right/Left Wheel Motor Encoder Abnormal

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

- 1.Display pop up TR 5 fault code
2. Check the pin status of the encoder connector corresponding to the motor and whether the connector is connected properly;



3. Use a multimeter voltage range to measure the voltage between the red and black wires in Figure 1. If the voltage is below 5V or above 5V, it is determined that the 5V power supply of the controller is faulty and the controller needs to be replaced.

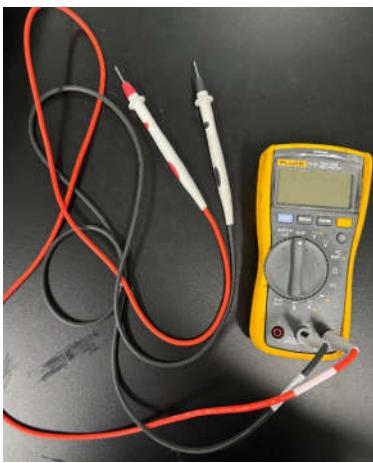


4. If the encoder 5V power supply is normal, but the fault still exists, it is considered that the encoder is faulty.replace the motor encoder.

5. Perform motor self-learning test again.

TR 6/TL6 Right /Left Wheel Motor Phase Open

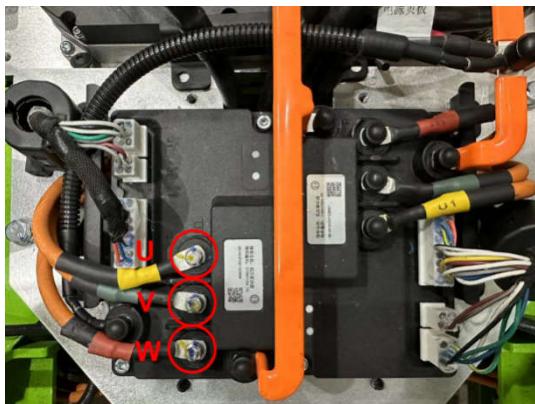
Tool: Multimeter、Computer、PCAN、Debugging wire



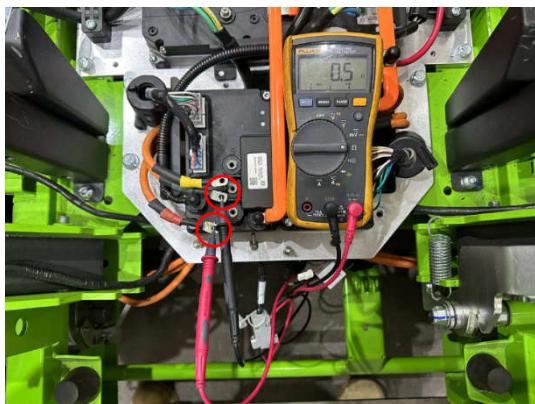
Check:

1. Display pop up TR 6/TL6 fault code

2. Check whether the phase wire of the corresponding motor is damaged and whether the mounting screws are tight;



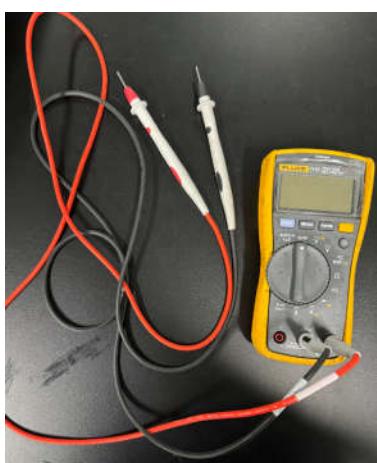
3. restart the vehicle. If the fault continues to occur measure the resistance value between the motor U \ V \ W phases. If the value displayed on the multimeter is 0 or infinity it means that the motor has been damaged inside and a new blade motor needs to be replaced.



4. If you have replaced a new controller or a new motor, remember to perform motor self-learning test.

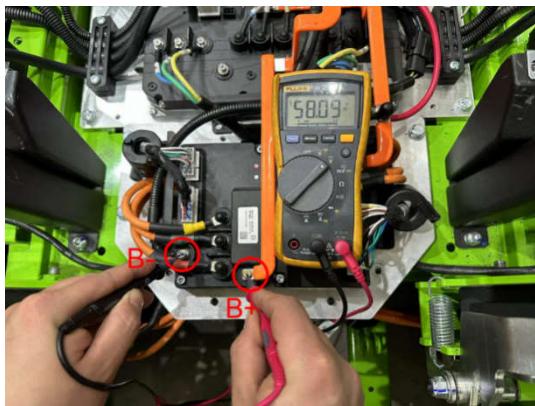
TR 8/TL8 Right/Left Wheel Motor Controller Undervoltage

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

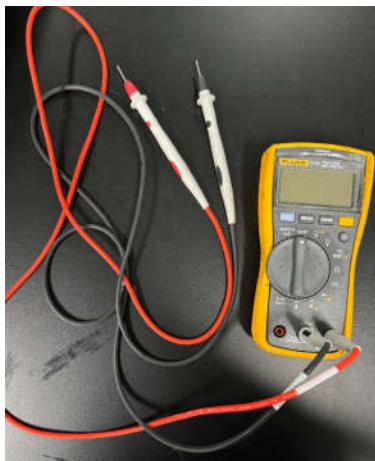
- 1.Display pop up TR 8/TL 8 fault code
- 2.Restart Vehicle.
- 3.If this fault code persists, Please use a multimeter to measure the bus DC voltage of the controller,



- 4.If the value displayed on the multimeter is greater than 42V(60V platform) or 60V(80V/82V platform), it indicates that the internal voltage sensor of the motor controller is faulty and the controller needs to be replaced.
- 5.If the value displayed on the multimeter is less than 42V(60V platform) or 60V(80V/82V platform), replace the fully charged battery pack before use.

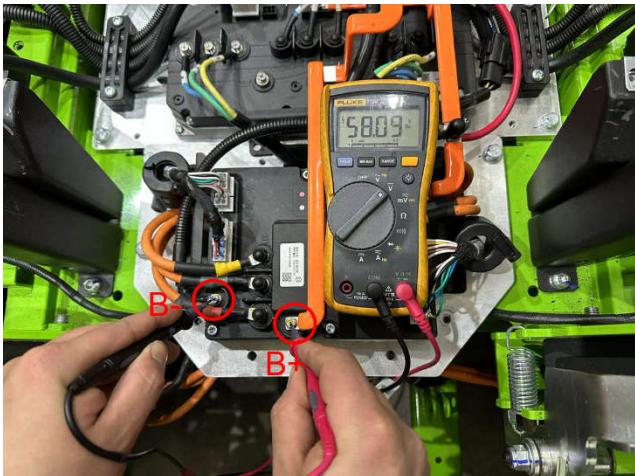
TR 9/TL9 Right/Left Wheel Motor Controller Overvoltage

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

- 1.Display pop up TR 9/TL 9 fault code
- 2.Restart Vehicle.
- 3.If this fault code persists, Vehicle power on Please use a multimeter to measure the bus DC voltage of the controller



4.If the value displayed on the multimeter is less than 70V(60V platform) or 90V(80V/82V platform),it indicates that the internal voltage sensor of the motor controller is faulty and the controller needs to be replaced.

5.If the value displayed on the multimeter is greater than 70V(60V platform) or 90V(80V/82V platform),it indicates a battery failure.

TR 12/TL12 Right/Left Wheel Motor Overtemp

Tool: Infrared Thermometers、Multimeter、Computer、PCAN、Debugging wire



Check:

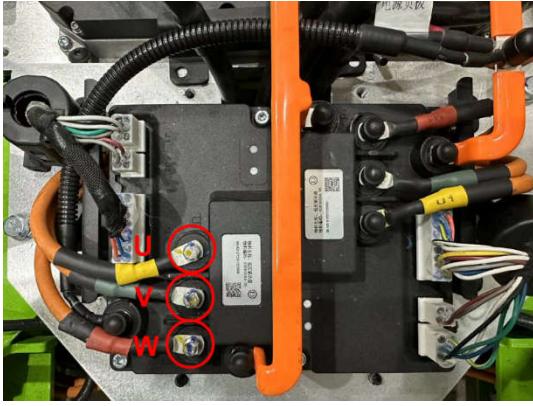
1. Display pop up TR 12/TL 12 fault code
2. Use a forklift to lift the rear wheel off the ground and check whether the rear wheel rotates smoothly and whether there is any abnormal noise when rotating.



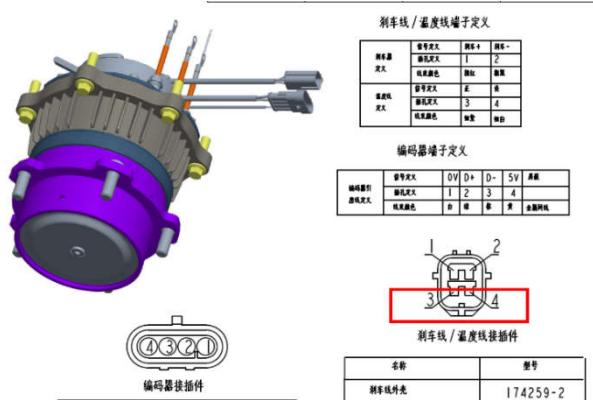
3. Restart the vehicle. Read the feedback temperature of the controller through the host computer ToolsForCAN-PlatformChecker , If the temperature value of the motor is high, it means that the vehicle has been in overload condition for a long time and the duration of the climb needs to be reduced.

A screenshot of the ToolsForCAN-PlatformChecker software interface. The top navigation bar includes 'Connect' (Hardware Select: PCAN_USB 1 S101, Baud Rate: 250 kHz/sec), 'Disconnect' (Connected), 'Engines' (Record TRC File: REC, Start Record, View File), and 'Temperature Mode: Centigrade-C'. The main window displays data from the 'Residential Gen2 CR2' and 'Residential Gen2 CRT' controllers. The 'Traction System' section shows L Ctrl POT Value V: 2.37, R Ctrl POT Value V: 2.40, L Ctrl SW Ver.: S107, R Ctrl SW Ver.: S107, L Ctrl HW Ver.: S107, R Ctrl HW Ver.: S107, L Mtr Speed rpm: 0, R Mtr Speed rpm: 0, L Mtr Bus Curr A: 0, R Mtr Bus Curr A: 0, and L Mtr Temp: 59, R Mtr Temp: 59. The 'PMU System' section shows SW Ver.: S107, HW Ver.: S107, Vol V.: 55.1, Cur A.: 0.3, Temp.: 57.2, Avl Curr.: 55, and Error Code: N/A. On the left, there are icons for a camera, a network connection, and a battery level indicator showing 4 (99%). Below the main window, there are two smaller sections for 'Blade System' and 'Residential Gen2 CR2'.

4. Restart the vehicle. If the fault is not eliminated, check the connection of the motor U/V/W phase line on the controller and tighten the loose bolts.



5. Restart the vehicle. If the fault is not eliminated, check the current ambient temperature. Measure the resistance value of the motor temperature sensor.



6. Check the table against the actual temperature to see if the resistance value is correct (If at room temperature 25°C environment, it returns to about 570Ω, it means that the temperature sensor is normal. If the resistance value is above 629Ω, it indicates that the temperature sensor has been damaged, so the motor must be replaced.)

Table 7. Ambient temperature, corresponding resistance, temperature coefficient and maximum expected temperature error for KTY84/130 and KTY84/150
 $I_{sen(cont)} = 2 \text{ mA}$.

Ambient temperature		Temperature coefficient (%/K)	KTY84/130			KTY84/150				
(°C)	(°F)		Resistance (Ω)		Temperature error (K)	Resistance (Ω)		Temperature error (K)		
Min.	Typ.		Max.		Min.	Typ.	Max.			
-40	-40	0.84	340	359	379	±6.48	332	359	386	±8.85
-30	-22	0.83	370	391	411	±6.38	362	391	419	±8.76
-20	-4	0.82	403	424	446	±6.28	394	424	455	±8.7
-10	14	0.80	437	460	483	±6.16	428	460	492	±8.65
0	32	0.79	474	498	522	±6.07	464	498	532	±8.61
10	50	0.77	514	538	563	±5.98	503	538	574	±8.58
20	68	0.75	555	581	607	±5.89	544	581	618	±8.55
25	77	0.74	577	603	629	±5.84	565	603	641	±8.54
30	86	0.73	599	626	652	±5.79	587	626	665	±8.53
40	104	0.71	645	672	700	±5.69	632	672	713	±8.5
50	122	0.70	694	722	750	±5.59	679	722	764	±8.46
60	140	0.68	744	773	801	±5.47	729	773	817	±8.42
70	158	0.66	797	826	855	±5.34	781	826	872	±8.37
80	176	0.64	852	882	912	±5.21	835	882	929	±8.31
90	194	0.63	910	940	970	±5.08	891	940	989	±8.25
100	212	0.61	970	1000	1030	±4.9	950	1000	1050	±8.17
110	230	0.60	1029	1062	1096	±4.81	1007	1062	1117	±8.08
120	248	0.58	1089	1127	1164	±4.73	1067	1127	1187	±8.17
130	266	0.57	1152	1194	1235	±4.67	1128	1194	1259	±8.09
140	284	0.55	1216	1262	1309	±4.63	1191	1262	1334	±10.24
150	302	0.54	1282	1334	1385	±4.51	1256	1334	1412	±10.8
160	320	0.53	1350	1407	1463	±4.49	1322	1407	1492	±11.37
170	338	0.52	1420	1482	1544	±4.41	1391	1482	1574	±11.06
180	356	0.51	1492	1560	1628	±4.32	1461	1560	1659	±12.58
190	374	0.49	1566	1640	1714	±4.23	1533	1640	1747	±13.2
200	392	0.48	1641	1722	1803	±4.15	1607	1722	1837	±13.85
210	410	0.47	1719	1807	1894	±4.07	1683	1807	1931	±14.51
220	428	0.46	1798	1893	1988	±4.00	1760	1893	2028	±15.19
230	446	0.45	1879	1982	2085	±3.94	1839	1982	2125	±15.88
240	464	0.44	1962	2073	2184	±3.88	1920	2073	2228	±16.59
250	482	0.44	2046	2166	2286	±3.82	2003	2166	2329	±17.32
260	500	0.42	2132	2261	2390	±3.74	2087	2261	2438	±18.15
270	518	0.41	2219	2357	2496	±3.67	2172	2357	2543	±19.36
280	536	0.38	2304	2452	2600	±3.59	2255	2452	2650	±21.21
290	554	0.34	2384	2542	2700	±3.50	2333	2542	2751	±24.14
300	572	0.29	2456	2624	2791	±3.42	2404	2624	2844	±29.05

7. If you have replaced a new motor, remember to perform motor self-learning test.

TR 13/TL13 Right/Left Wheel Motor Controller Overtemp

Tool: Infrared Thermometers、Multimeter、Computer、PCAN、Debugging wire

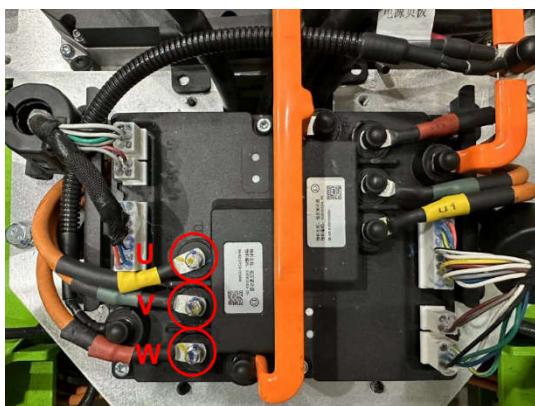


Check:

1. Display pop up TL13/TR13 fault code
2. Use a forklift to lift the rear wheel off the ground and check whether the rear wheel rotates smoothly and whether there is any abnormal noise when rotating.



3. Restart the vehicle. Read the feedback temperature of the controller through the host computer ToolsForCAN-PlatformChecker , If the temperature value of the controller is high, it means that the vehicle has been in overload condition for a long time and the duration of the climb needs to be reduced.
4. Restart the vehicle. If the fault is not eliminated, check the connection of the motor U/V/W phase line on the controller and tighten the loose bolts.



5. Restart the vehicle. If the fault is not eliminated. Read the temperature value of the controller through the host computer ToolsForCAN-PlatformChecker after the controller cools to room temperature. If the difference is significant it indicates that the internal temperature sensor of the controller is faulty and needs to be replaced with a new controller.

Residential Gen2 CRZ Residential Gen2 CRT Commercial ZTR Residential Gen1 CRZ/CRT UTV/GZ/PZ/CZ Residential PMU Troubleshooting

Traction System		Model Select.	
L Ctrl POT Value V _i	2.37	R Ctrl POT Value V _i	2.40
L Ctrl SW Ver.	S107	R Ctrl SW Ver.	S107
L Ctrl HW Ver.	H102	R Ctrl HW Ver.	H102
L Mtr Speed rpm _i	0	R Mtr Speed rpm _i	0
L Mtr Bus Curr A _i	0	R Mtr Bus Curr A _i	0
L Mtr Temp _i	50	R Mtr Temp _i	51.8
L Ctrl Temp _i	59	R Ctrl Temp _i	57.2

Error Codes.	
TL45	TR45
Undefined	Undefined

Blade System

L Ctrl SW Ver.	S003	M Ctrl SW Ver.	S003	R Ctrl SW Ver.	S003
L Ctrl HW Ver.	H003	M Ctrl HW Ver.	H003	R Ctrl HW Ver.	H003
L Mtr Speed rpm _i	0	M Mtr Speed rpm _i	0	R Mtr Speed rpm _i	0
L Mtr Bus Curr A _i	0	M Mtr Bus Curr A _i	0	R Mtr Bus Curr A _i	0
L Ctrl Temp _i	59	M Ctrl Temp _i	59	R Ctrl Temp _i	59
Error Code _i	N/A	Error Code _i	N/A	Error Code _i	Error Code _i

PMU System

SW Ver.	S400
HW Ver.	H400
Vol V _i	55.1
Curr A _i	0.3
Temp _i	57.2
Avg Curr _i	55
Error Code _i	N/A

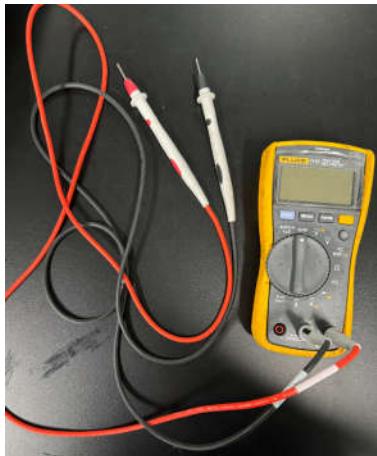
Relay Status

- Relay 1 Status
- Relay 2 Status
- Relay 3 Status
- Relay 4 Status (Green)
- Relay 5 Status
- Relay 6 Status

6. If you have replaced a new motor, remember to perform motor self-learning test.

TR 14/TL14 Right/Left Wheel Motor Controller Software Overcurrent

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

1. Display pop up TR 14/TL 14 fault code
2. Check whether the phase wire of the corresponding motor is damaged and whether the mounting screws are tight;



3. Check the pin status of the encoder connector corresponding to the motor and whether the connector is connected properly;



4. Restart the vehicle.

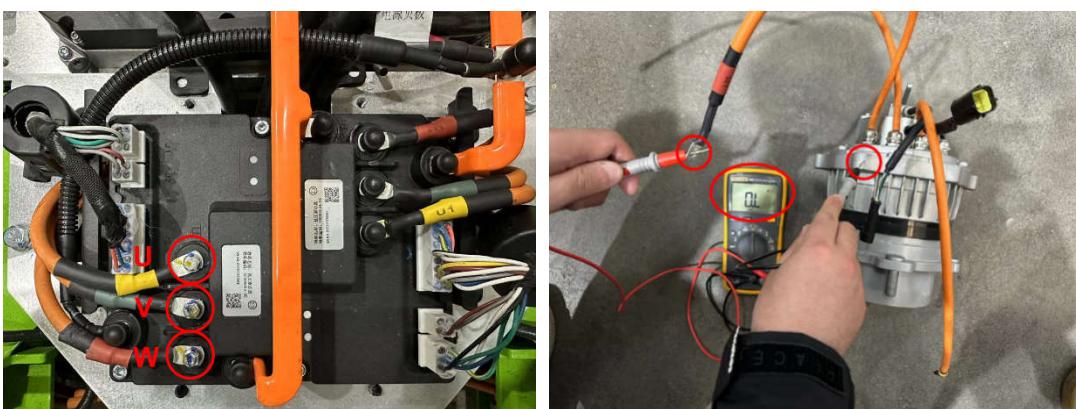
TR 15/TL15 Right/Left Wheel Motor Controller Hardware Overcurrent

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

1. Display pop up TR 15/TL 15 fault code
2. Check whether the insulation skin of motor U \ V \ W phase wire is broken and copper wire is together at the damage, If the wiring harness is damaged, dispose of the damaged area.
3. Remove the U/V/W phase line of the motor controller, Measure the resistance value between U \ V \ W phases and the motor housing using a multimeter resistance range,

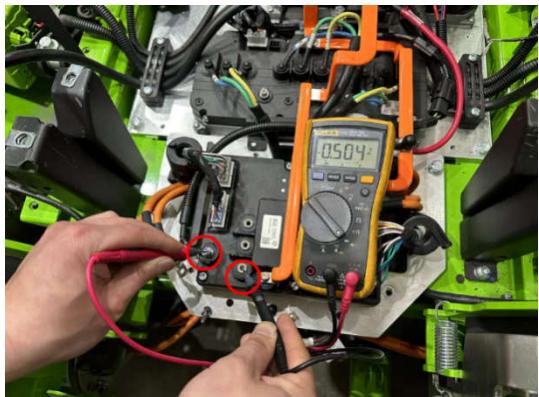


4. If the resistance measured by the motor phase line and the housing is infinite, observe whether there is any

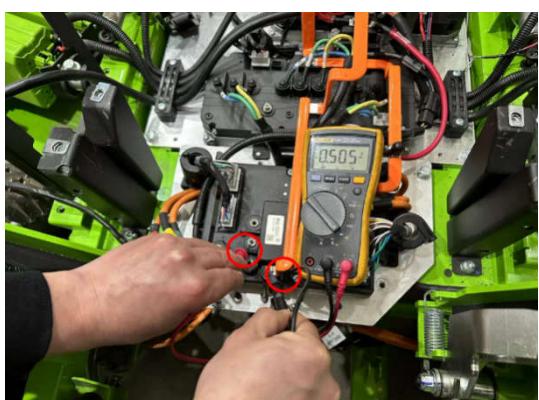
damage to the outer packaging of the motor encoder's wiring harness. If the wiring harness is damaged, replace the motor encode.



5. Set the Multimeter to the diode position and measure the voltage between the U \ V \ W phase and the positive electrode.



6. Set the Multimeter to the diode position and measure the voltage between the U \ V \ W phase and the negative electrode.

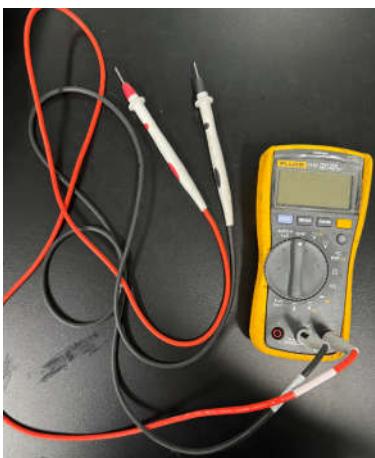


7. If the range is 0.47-0.55V, the MOS is normal. Otherwise, it is judged that the MOS is damaged and the controller needs to be replaced. Refer to the maintenance manual for the specific disassembly and assembly steps.

8. If you have replaced a new motor or controller, remember to perform motor self-learning test.

TR 16/TL16 Right/Left Potentiometer error

Tool: Multimeter、Computer、PCAN、Debugging wire

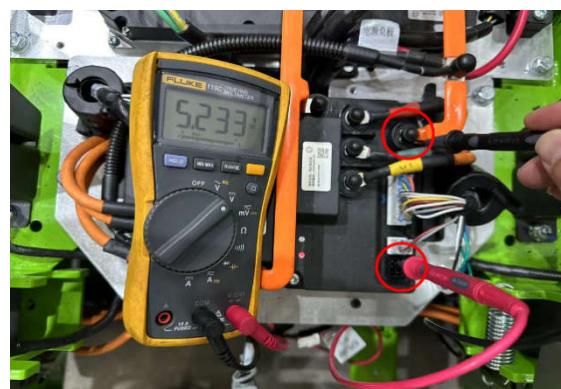
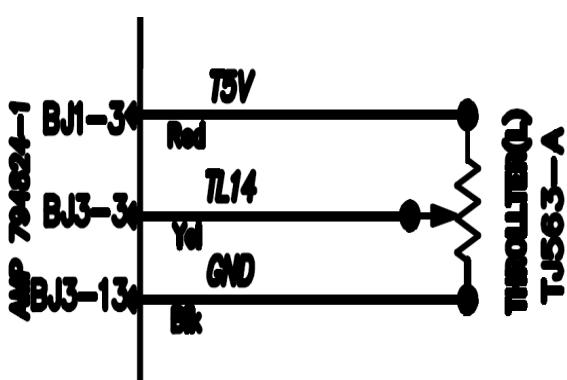


Check:

1. Display pop up TR 16/TL 16 fault code
2. Check the pin status of the Potentiometer connector and whether the connector is connected properly;



3. According to the controller's pin definition diagram, use a multi-meter to measure whether the 5V input voltage of the throttle is abnormal, check the voltage value between pin J1-3 and ground;



4. Read the voltage value of the right or left potentiometer through the host computer ToolsForCAN-PlatformChecker; If the throttle voltage value changes abnormally or the actual voltage value is greater than 4.63V or less than 0.21V, the throttle needs to be replaced.

RZRight手柄

Simulate □ 0x406 - [主控制器(右) ->]

Data Add	Function	Status
Byte0/1	Potentiometer Value	2.41
Byte6	母线限流值	29

0x406 - [主控制器(右) ->]		
Data Add	Function	Status
Byte0/1/2/3	Software	S106
Byte4/5/6/7	Hardware	H101

0x400 - [行走控制器(右) -> GPS]		
Data Add	Function	Status
Byte0/1	Motor Speed	0
Byte2/3	Bus Current	0.0
Byte4/5	Motor Temp	10.0
Byte6/7	Controller	14.0

5.If you replace a new potentiometer, please remember to do the auto-matching of throttle.

TR 19/TL19 Vehicle Initial State Detection Abnormal

Check:

1.Display pop up TR 19/TL 19 fault code

2.The right parking switch is not in parked position .Please return the right lever to the park position to enable operation and sit on seat.

3.The left parking switch is not in parked position .Please return the left lever to the park position to enable operation and sit on seat.

4.Right side throttle lever is not in neutral position .Please ensure right throttle lever is in neutral position to enable operation and sit on seat.

5.Left side throttle lever is not in neutral position .Please ensure left throttle lever is in neutral position to enable operation and sit on seat.

TR 21 ETO Contactor Fault

Tool: Multimeter

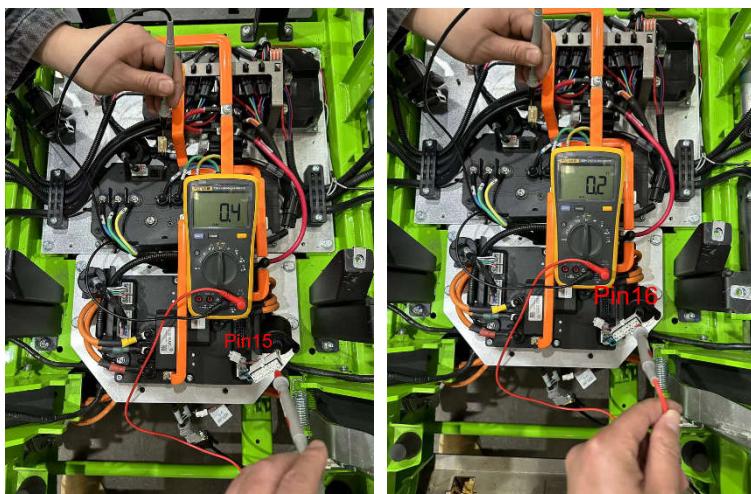


Check:

- 1.Display pop up TR 21 fault code
- 2.Measure the resistance value between the ETO contactor coil using a multi-meter's resistance range. when the resistance is 30Ω means The coil is ok;



- 3.Measure whether the cable from master controller connector to ETO contactor coil connector is open circuit, 0.4Ω means the cables are OK.



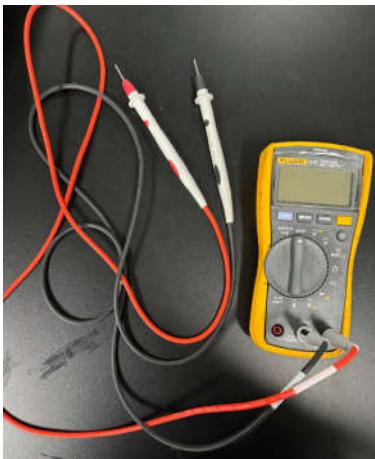
- 4.Pull out these two connectors, Measure whether the two cables(Pin15 and Pin16) are short circuit, 0Ω means the cables are OK. No short circuit happens.



5. Check whether the bus voltage curve of the controller is normal when the fault happens.

TR 22/TL22 Right/Left Wheel Motor Electromagnetic Valve

Tool: Multimeter、Computer、PCAN、Debugging wire

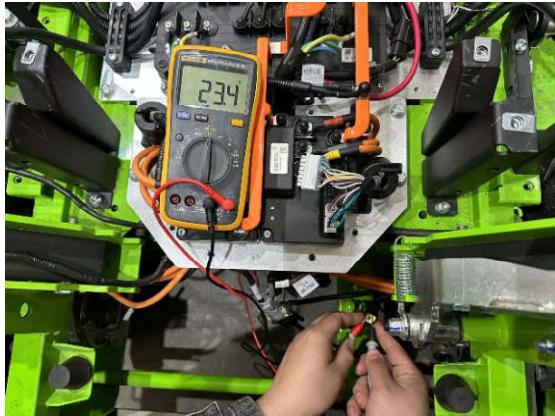


Check:

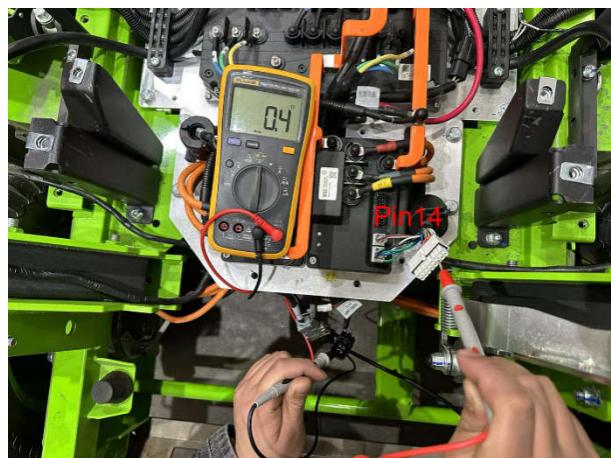
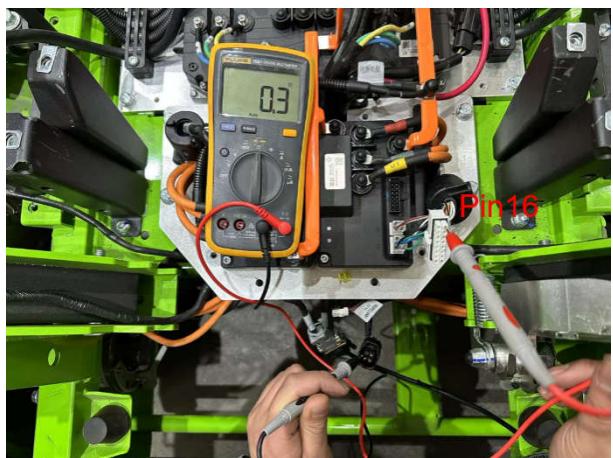
1. Display pop up TR 22/TL 22 fault code

2. Measure the resistance value between the electromagnetic valve coil using a multi-meter's resistance range.

when the resistance is 24Ω means The coil is ok;



3. Measure whether the cable from master controller connector to electromagnetic valve coil connector is open circuit, 0.4Ω means the cables are OK.



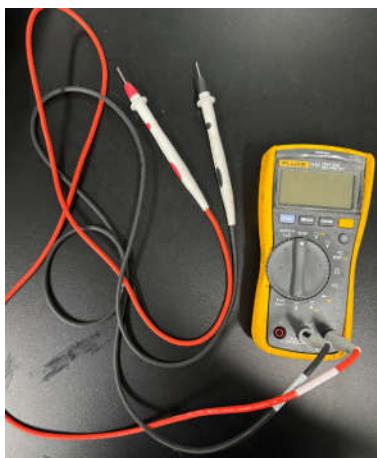
4. Pull out these two connectors, Measure whether the two cables(Pin13 and Pin6) are short circuit, 0Ω means the cables are OK. No short circuit happens.



5. Check whether the bus voltage curve of the controller is normal when the fault happens.

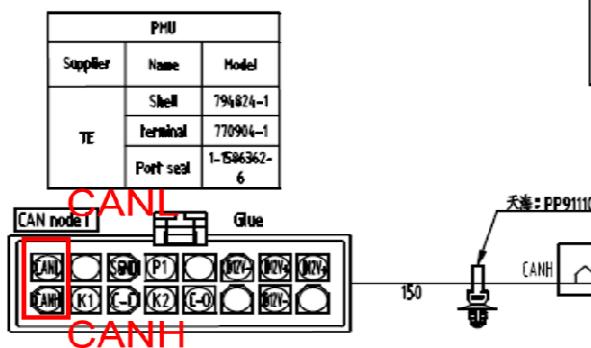
TR 23 PMU CAN Communication Abnormal

Tool: Multimeter、Computer、PCAN、Debugging wire

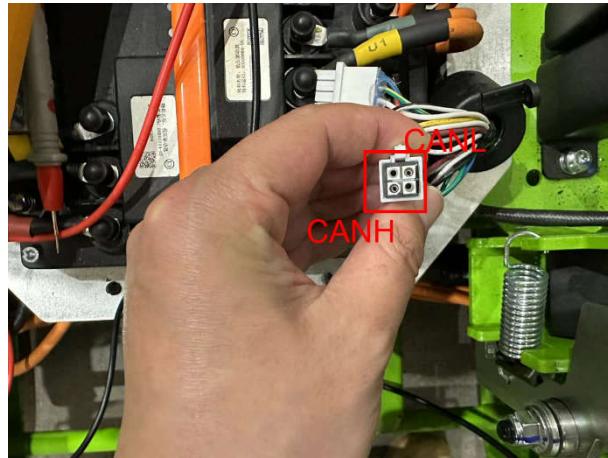
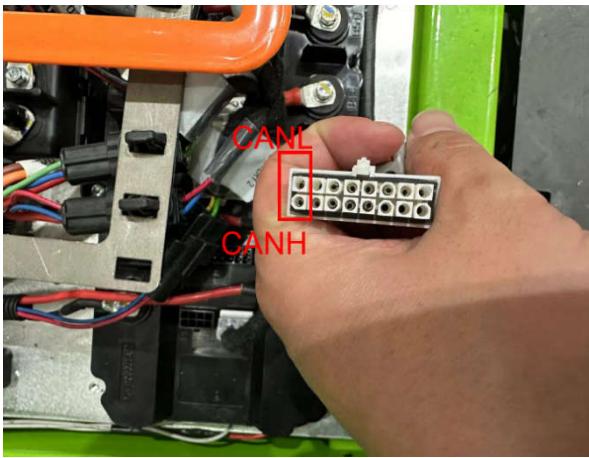


Check:

1. Check if the PMU plugin is loose, check if the PMU plugin CAN-H and CAN-L have retracted needles, and if there is any debris on the surface of the PMU plugin, causing poor contact of the plugin

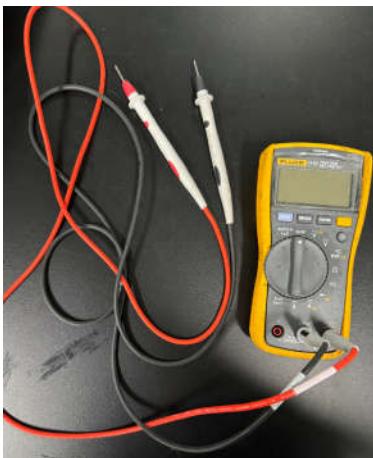


2. If there is no problem with the PMU plugin, use a multi-meter to check if the CAN-H and CAN-L connections between the right traction controller plugin and the PMU plugin are conductive. If there is no continuity, replace the main harness of the vehicle.



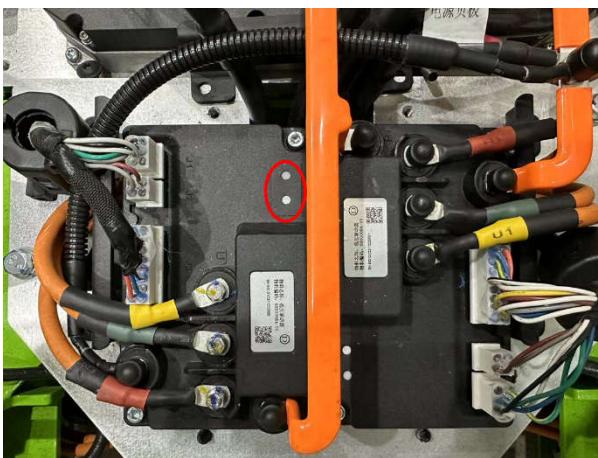
TR 25 Left Wheel Motor Controller CAN Communication Abnormal

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

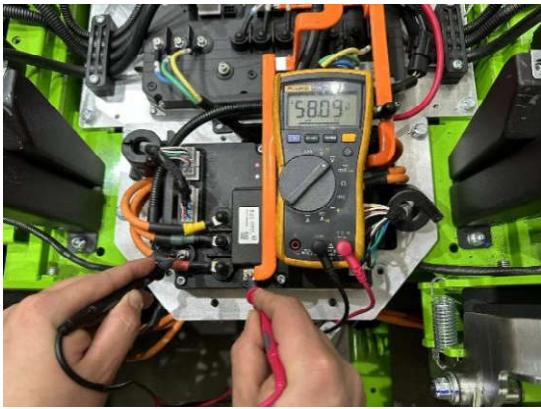
- 1.refer to the maintenance manual to remove the plastic parts, locate the left traction controller, observe the main control indicator light for 20 seconds, and check if the indicator light is flashing.



- 2.If the indicator light of the left traction controller flashes, it indicates that the power supply of the left traction controller is normal. Check if the left traction controller plug-in is loose, check if the left traction controller plug-in CAN-H and CAN-L have withdrawn the needle, and if there is garbage on the surface of the plug-in, which causes poor contact of the plug-in



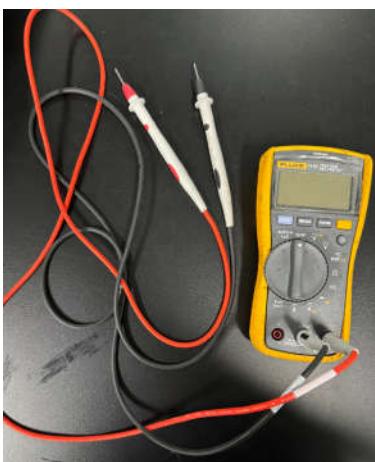
3. Use a wrench to confirm if the bolts at B - are tight and there are no signs of looseness. Measure whether the voltage is abnormal if the indicator light of the left traction controller does not flash. If the controller still does not work, you need to replace the controller.



5. If you have replaced a new controller, remember to perform motor self-learning test.

TR 27/TR 28/TR 29 Left/Middle/Right Blade Motor Controller CAN Communication Abnormal

Tool: Multimeter、Computer、PCAN、Debugging wire



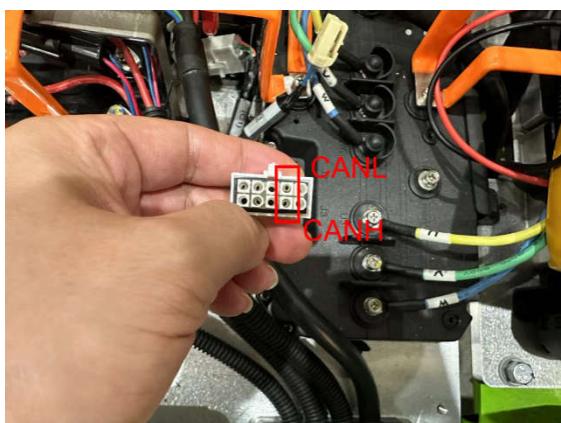
Check:

1. Display pop up TR 27/28/29 fault code

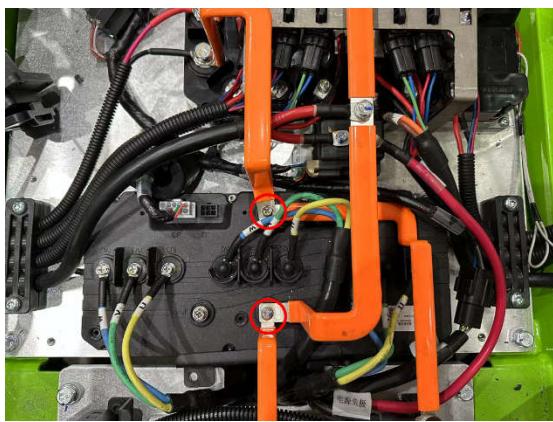
2. Check whether the three-in-one blade controller plug-in is loose, Check whether there is any debris on the surface of the three-in-one blades controller plug-in, resulting in poor contact with the plug-in.



3. If this fault code persists, Use the multimeter to check whether the CAN-H, CAN-L conductivity. If not conductivity, replace the vehicle main line harness.



4. Restart the vehicle. If the fault still happens,Check the connection line on the controller and tighten the loose bolts

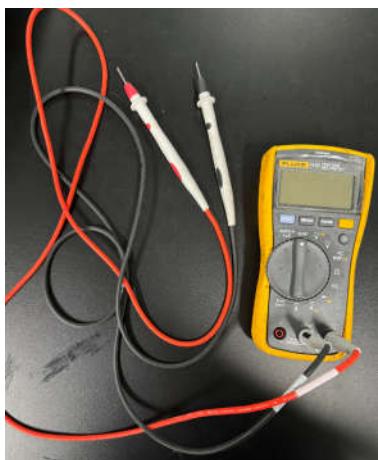


5. Use the multi-meter voltage range to check whether the voltage between B+ and B-. If the voltage is normal, check the controller status through the host computer ToolsForCAN-PlatformChecker ; If there is no CAN information on the host computer , the controller needs to be replaced.

6.restart the vehicle.

TR 31 Seat switch verification error

Tool: Multimeter



Check:

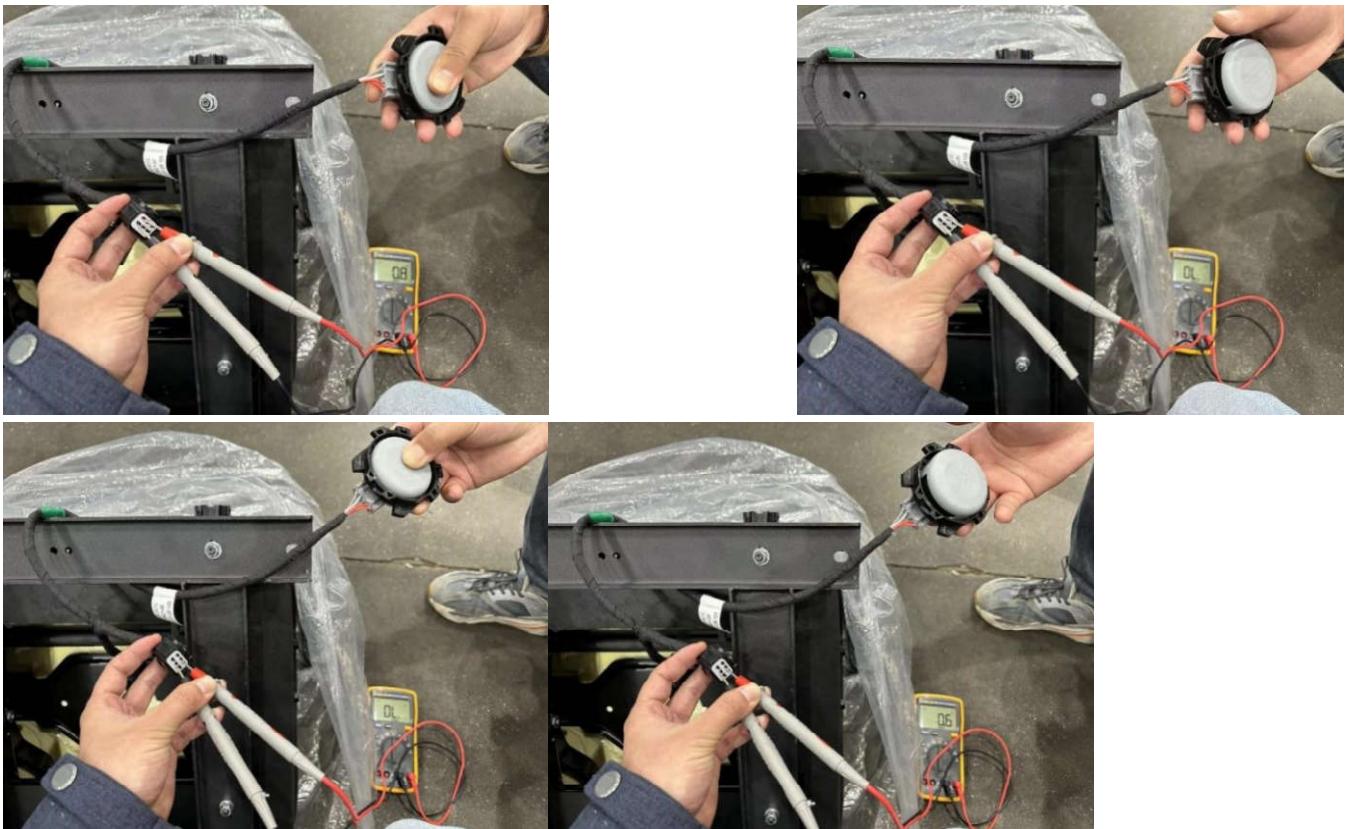
1. Display pop up TR 31 fault code.
2. Check the pin status of the seat switch connector whether the connector is connected properly;



3. Disconnect the seat switch connector ,use a multi-meter to measure the resistance between Pin 5 with Pin 8 and the resistance between Pin 6 with Pin 8; Check whether there is a short circuit or open circuit in the seat switch wiring;



4. Check whether water has entered the seat switch and whether the status of the switch changes normally;



4. Replace the seat switch;

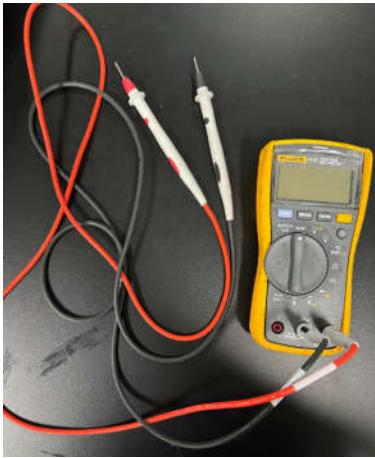
5. Measure the resistance value of the IO port. The normal resistance value between the IO port and P1 is about 238KΩ. If the resistance value is abnormal, the controller needs to be replaced.



6. Replace the controller and perform motor self-learning again.

TR 60/TL 60 Right/Left Wheel Motor Controller Undertemp

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

1. Display pop up TR 60/TL 60 fault code;

2. Restart the vehicle. If the fault is not eliminated. Read the temperature value of the controller through the host computer ToolsForCAN-PlatformChecker after the controller warm to room temperature. If the controller fault disappears after the vehicle returns to room temperature, it means the vehicle needs to be placed in a suitable environment.

3. If the difference is significant it indicates that the internal temperature sensor of the controller is faulty and needs to be replaced with a new controller.

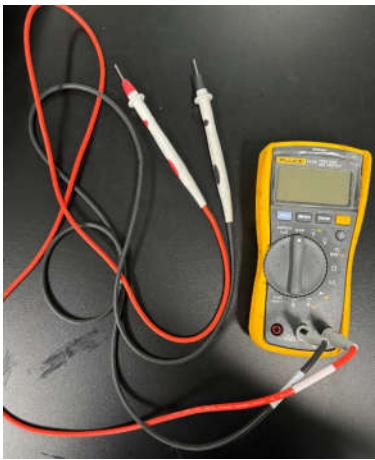
System	Value	Unit
L Ctrl POT Value V.	2.37	V
R Ctrl POT Value V.	2.40	V
L Ctrl SW Ver.	0.00	
R Ctrl SW Ver.	S107	
L Ctrl HW Ver.	0.00	
R Ctrl HW Ver.	0.00	
L Me Speed rpm.	0	rpm
R Me Speed rpm.	0	rpm
L Me Bus Curr A.	0	A
R Me Bus Curr A.	0	A
L Me Temp. M	50	°C
R Me Temp. M	51.8	°C
L Ctrl Temp.	59	°C
R Ctrl Temp.	57.2	°C

System	Value	Unit
PMU System		
SW Ver.	0.00	
HW Ver.	0.00	
Vol V.	55.1	V
Curr A.	0.3	A
Temp °	57.2	°C
Avg Curr .	55	A
Error Code.	N/A	
Relay 1 Status		
Relay 2 Status		
Relay 3 Status		
Relay 4 Status	Green	
Relay 5 Status		
Relay 6 Status		

4. If you have replaced a new motor, remember to perform motor self-learning test.

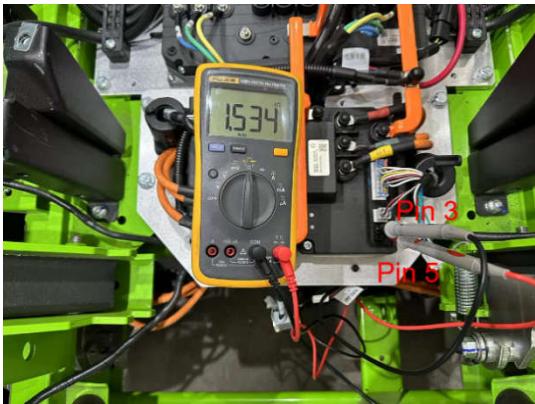
TR 61/TL 61 Right /Left Wheel Motor Controller Ext 5V Supply Failure

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

1. Display pop up TR 61/ TL 61 fault code
2. Measure whether the internal 5V power supply of the controller is short circuited. Use the resistance setting of a multi-meter to measure the resistance between Pin3 and Pin5 of the 6-pin connector. The normal resistance is about $1.534\text{K}\Omega$.



3. Disconnect the encoder connector and use a multi-meter to measure whether there is a short circuit in the motor encoder power supply. The normal resistance is about $12.41\text{M}\Omega$.



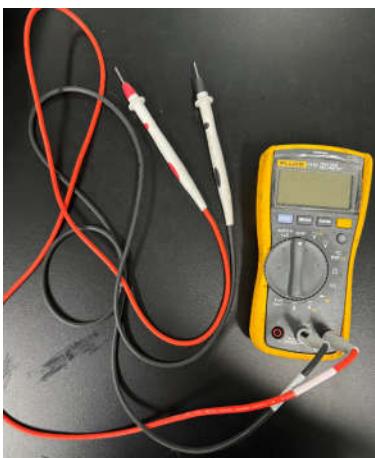
4. Measure for a short circuit between the throttle power supply and its wiring harness. Disconnect the 6-pin and 16-pin connectors of the controller, and use a multimeter to measure the resistance between Pin3 on the 6-pin connector and Pin13 on the 16-pin connector. The normal resistance is about 175Ω .



5. If you have replaced a new motor, remember to perform motor self-learning test.

TR 62/TL 62 Right/Left Wheel Motor Controller Ext 12V Supply Failure

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

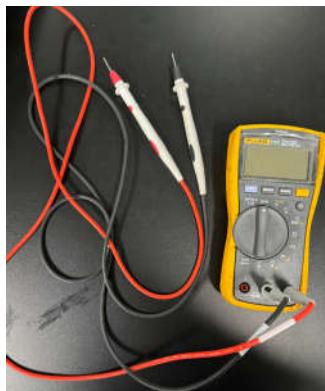
1. Display pop up TR 62 fault code
2. Check whether there is any debris or water accumulation on the surface of the 4-pin connector of the controller.
3. Disconnect the 4Pin connector and measure the resistance between Pin1 and Pin4. The normal resistance is about 120KΩ.



4. If you have replaced a new motor, remember to perform motor self-learning test.

TR 63 /TL 63 Right /Left Wheel Motor Temperature Sensor Abnormal

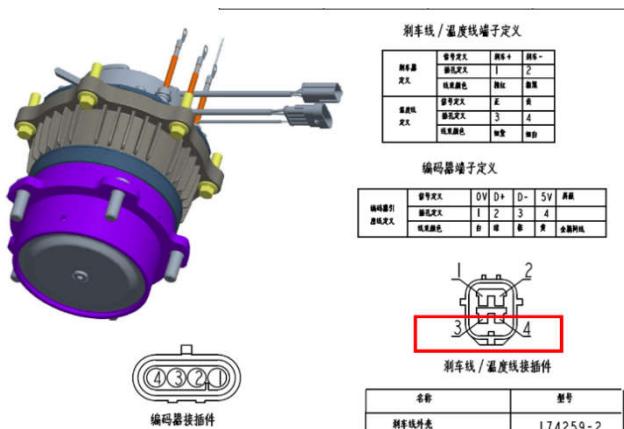
Tool: Infrared Thermometers、Multimeter、Computer、PCAN、Debugging wire



Check:

1. Display pop up TR 63/TL 63 fault code

2. Restart the vehicle. If the fault still happens, check the current ambient temperature. Measure the resistance value of the motor temperature sensor.



4. Check the table against the actual temperature to see if the resistance value is correct (If at room temperature

25°C environment, it returns to about 570Ω, it means that the temperature sensor is normal. If the resistance value is above 629Ω, it indicates that the temperature sensor has been damaged, so the motor must be replaced.)

Table 7. Ambient temperature, corresponding resistance, temperature coefficient and maximum expected temperature error for KTY84/130 and KTY84/150

$I_{sen(cont)} = 2 \text{ mA}$.

Ambient temperature		Temperature coefficient (%/K)	KTY84/130			KTY84/150				
(°C)	(°F)		Resistance (Ω)		Temperature error (K)	Resistance (Ω)		Temperature error (K)		
			Min	Typ		Min	Typ			
-40	-40	0.84	340	359	379	±6.48	332	359	386	±8.85
-30	-22	0.83	370	391	411	±6.38	362	391	419	±8.78
-20	-4	0.82	403	424	446	±6.28	394	424	455	±8.7
-10	14	0.80	437	460	483	±6.18	428	460	492	±8.65
0	32	0.79	474	498	522	±6.07	464	498	532	±8.61
10	50	0.77	514	538	563	±5.98	503	538	574	±8.58
20	68	0.75	555	581	607	±5.89	544	581	618	±8.55
25	77	0.74	577	603	629	±5.84	565	603	641	±8.54
30	86	0.73	599	626	652	±5.79	587	626	665	±8.53
40	104	0.71	645	672	700	±5.69	632	672	713	±8.5
50	122	0.70	694	722	750	±5.59	679	722	764	±8.46
60	140	0.68	744	773	801	±5.47	729	773	817	±8.42
70	158	0.66	797	826	855	±5.34	781	826	872	±8.37
80	176	0.64	852	882	912	±5.21	835	882	929	±8.31
90	194	0.63	910	940	970	±5.08	891	940	989	±8.25
100	212	0.61	970	1000	1030	±4.9	950	1000	1050	±8.17
110	230	0.60	1029	1062	1098	±4.81	1007	1062	1117	±8.08
120	248	0.58	1089	1127	1164	±4.73	1067	1127	1187	±8.0
130	266	0.57	1152	1194	1235	±4.67	1128	1194	1259	±8.0
140	284	0.55	1216	1262	1309	±4.63	1191	1262	1334	±8.0
150	302	0.54	1282	1334	1385	±4.59	1256	1334	1412	±8.0
160	320	0.53	1350	1407	1463	±4.55	1322	1407	1492	±8.0
170	338	0.52	1420	1482	1544	±4.51	1391	1482	1574	±8.0
180	356	0.51	1492	1560	1628	±4.47	1461	1560	1659	±8.0
190	374	0.49	1566	1640	1714	±4.43	1533	1640	1747	±8.0
200	392	0.48	1641	1722	1803	±4.4	1607	1722	1837	±8.0
210	410	0.47	1719	1807	1894	±4.37	1683	1807	1931	±8.0
220	428	0.46	1798	1893	1988	±4.34	1760	1893	2026	±8.0
230	446	0.45	1879	1982	2085	±4.31	1839	1982	2125	±8.0
240	464	0.44	1962	2073	2184	±4.28	1920	2073	2226	±8.0
250	482	0.44	2046	2166	2286	±4.25	2003	2166	2329	±8.0
260	500	0.42	2132	2261	2390	±4.22	2087	2261	2436	±8.0
270	518	0.41	2219	2357	2498	±4.19	2172	2357	2543	±8.0
280	536	0.38	2304	2452	2600	±4.16	2255	2452	2650	±8.0
290	554	0.34	2384	2542	2700	±4.13	2333	2542	2751	±8.0
300	572	0.29	2456	2624	2791	±4.1	2404	2624	2844	±8.0

If you have replaced a new motor, remember to perform motor self-learning test.

TR 64/TL64 Data storage error

Tool: Computer、PCAN、Debugging wire



Check:

1. Display pop up TR 64/TL 64 fault code
2. Restart Vehicle.
3. If this fault code persists, please replace a new controller. Refer to the maintenance manual for the specific disassembly and assembly steps
4. If you have replaced a new controller, remember to perform motor self-learning test.

TR 65/TL65 Motor encoder data error

Tool: Computer、PCAN、Debugging wire



Check:

1. Display pop up TR 65/TL 65 fault code
2. Restart Vehicle.
3. If this fault still happens, replace a new encoder.
4. If this fault still happens, replace a new controller.
5. If you have replaced a new encoder or motor, remember to perform motor self-learning test.

TR 66/TL66 Controller internal communication error

Tool: Computer、PCAN、Debugging wire



Check:

- 1.Display pop up TR 66 /TL 66 fault code
- 2.Restart Vehicle.
- 3.If this fault code persists, please replace a new controller.Refer to the maintenance manual for the specific disassembly and assembly steps
- 4.If you have replaced a new controller, remember to perform motor self-learning test.

TR 67/TL 67 Motor overtemperature warning

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

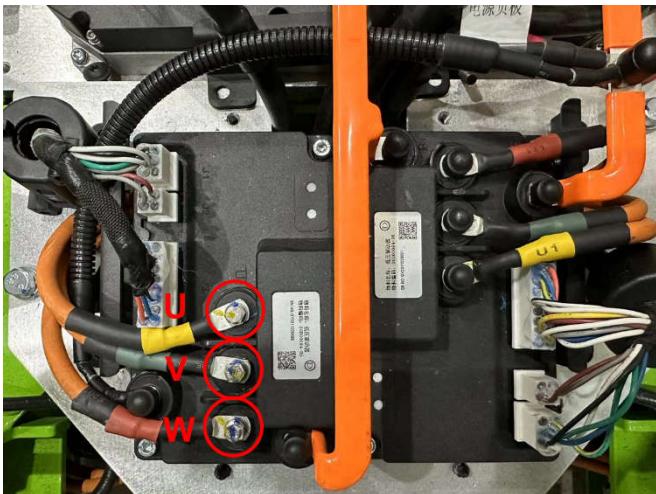
1. Display pop up TR 67/TL 67 fault code
2. Use a forklift to lift the rear wheel off the ground and check whether the rear wheel rotates smoothly and whether there is any abnormal noise when rotating.



3. Restart the vehicle. Read the feedback temperature of the controller through the host computer ToolsForCAN-PlatformChecker . If the temperature value of the motor is high, it means that the vehicle has been in overload condition for a long time and the duration of the climb needs to be reduced.

Traction System		PMU System	
L Ctrl SW Ver.	2.37	R Ctrl SW Ver.	2.40
L Ctrl HW Ver.	59	R Ctrl HW Ver.	51.8
L Ctrl HW Ver.	59	R Ctrl HW Ver.	57.2
L Mtr Speed rpm	0	R Mtr Speed rpm	0
L Mtr Bus Curr Av	0	R Mtr Bus Curr Av	0
L Mtr Temp	58	R Mtr Temp	51.8
L Ctrl temp	59	R Ctrl temp	57.2
Error Code	TL45	Error Code	TR45
Relay Used		Relay Used	
4	3		
Blade System		PMU System	
L Ctrl SW Ver.	59	M Ctrl SW Ver.	59
L Ctrl HW Ver.	59	M Ctrl HW Ver.	59
L Mtr Speed rpm	0	M Mtr Speed rpm	0
L Mtr Bus Curr Av	0	M Mtr Bus Curr Av	0
L Ctrl Temp	59	M Ctrl Temp	59
Error Code	N/A	Error Code	N/A

4.restart the vehicle. If the fault still happens, check the connection of the motor U/V/W phase line on the controller and tighten the loose bolts



TR 68/TL 68 Motor Controller overtemperature warning

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

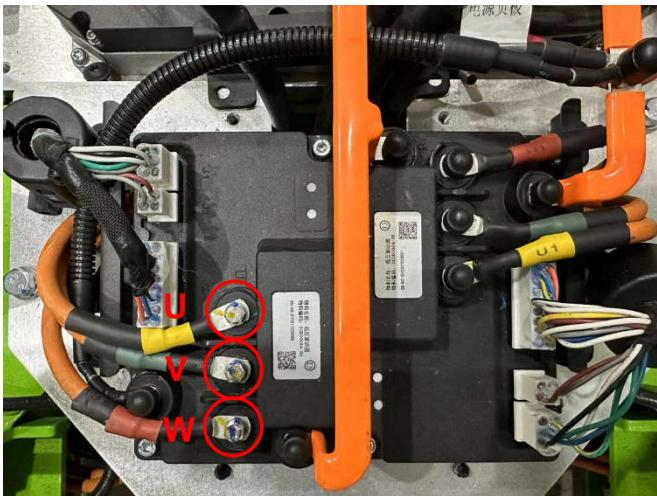
1. Display pop up TR 68/TL 68 fault code
2. Use a forklift to lift the rear wheel off the ground and check whether the rear wheel rotates smoothly and whether there is any abnormal noise when rotating.



3. Restart the vehicle. Read the feedback temperature of the controller through the host computer ToolsForCAN-PlatformChecker . If the temperature value of the motor is high, it means that the vehicle has been in overload condition for a long time and the duration of the climb needs to be reduced.

Traction System		PMU System	
L Ch POT Value V.	2.37	R Chl POT Value V.	2.40
L Ch SW Ver.	N/A	R Chl SW Ver.	S167
L Ch HW Ver.	N/A	R Chl HW Ver.	N/A
L Mtr Speed rpm.	0	R Mtr Speed rpm.	0
L Mtr Bus Cur A.	0	R Mtr Bus Cur A.	0
L Mtr Temp.	50	R Mtr Temp.	51.8
L Chl Temp.	59	R Chl Temp.	57.2
Error Code.	IL40	Error Code.	IL40
Blade System		Relay 1 Status	
L Chl SW Ver.	N/A	M Chl SW Ver.	N/A
L Chl HW Ver.	N/A	M Chl HW Ver.	N/A
L Mtr Speed rpm.	0	R Chl HW Ver.	N/A
L Mtr Bus Cur A.	0	M Mtr Speed rpm.	0
L Chl Temp.	59	M Mtr Bus Cur A.	0
Error Code.	N/A	R Chl Temp.	59
		Relay 2 Status	
		Relay 3 Status	
		Relay 4 Status	
		Relay 5 Status	
		Relay 6 Status	

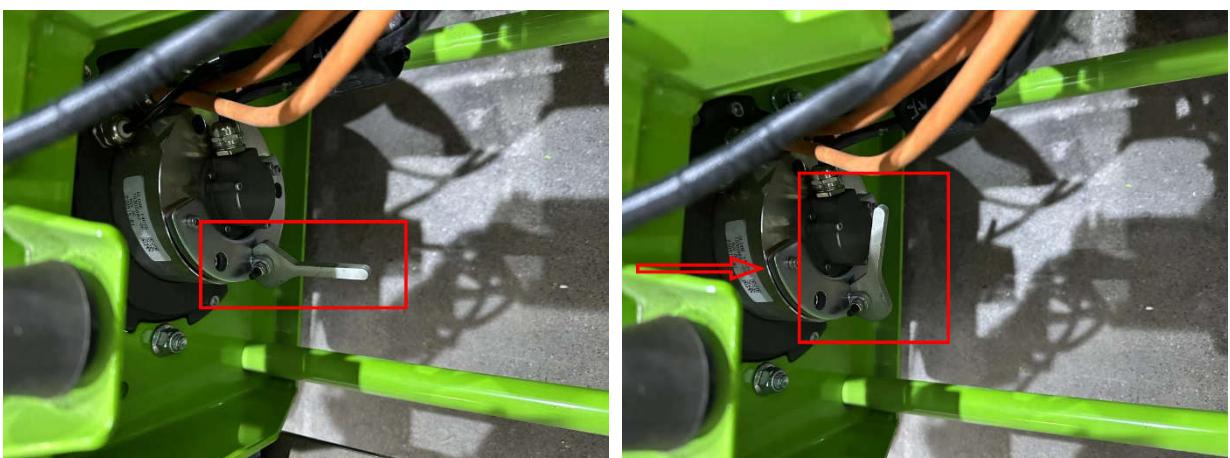
4. restart the vehicle. If the fault still happens, check the connection of the motor U/V/W phase line on the controller and tighten the loose bolts



TR 69/TL69 Right/Left Parking Brake Manually Disengaged and Not Reset

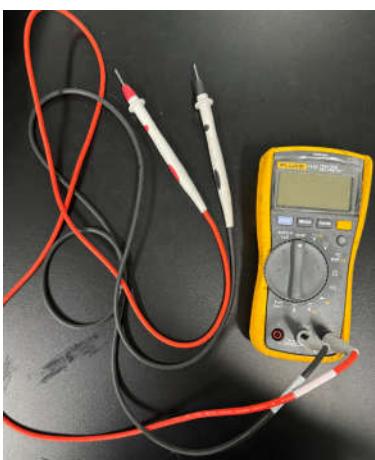
Check:

1. Display pop up TR 69/TL 69 fault code
2. please to keep the brake lever at unreleased state.



ML2/MM2/MR2 Blade motor stalled

Tool: Multimeter、Computer、PCAN、Debugging wire



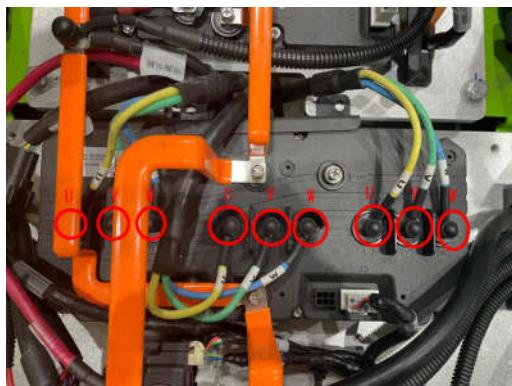
Check:

1. Display pop up ML2/MM2/MR2 fault code.

2. Check whether the blade are stuck, If it is stuck, it is necessary to clean the debris or replace the blade to make it work normally.



3. Check whether the phase wire of the corresponding motor is damaged and whether the phase wire installation is misaligned.



4. Check parameter version.

Traction System			
L Ctrl POT Value V.	0	R Ctrl POT Value V.	0
L Ctrl SW Ver.	0000	R Ctrl SW Ver.	0000
L Ctrl HW Ver.	0000	R Ctrl HW Ver.	0000
L Mtr Speed rpm.	0	R Mtr Speed rpm.	0
L Mtr Bus Curr A.	0	R Mtr Bus Curr A.	0
L Mtr Temp.	0	R Mtr Temp.	0
L Ctrl Temp.	0	R Ctrl Temp.	0
Error Code.	N/A	Error Code.	N/A

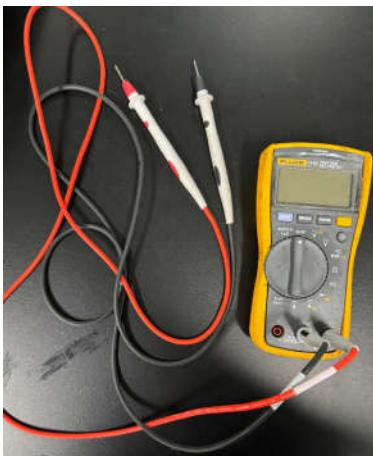
PMU System		
SW Ver.	0000	Discharge Channel 1 Stat.
HW Ver.	0000	Discharge Channel 2 Stat.
Volt V.	0	Discharge Channel 3 Stat.
Curr A.	0	Discharge Channel 4 Stat.
Temp.	0	Discharge Channel 5 Stat.
Avl Curr.	0	Discharge Channel 6 Stat.
Error Code.	N/A	

Recommended Value Of Potentiometer			
Left Side		Right Side	
Foremost V.	0.3~0.4	Foremost V.	4.4~4.5
Neutral V.	2.35~2.45	Neutral V.	2.35~2.45
Rearmost V.	3.15~3.25	Rearmost V.	1.55~1.65

5. Reset the PTO switch.

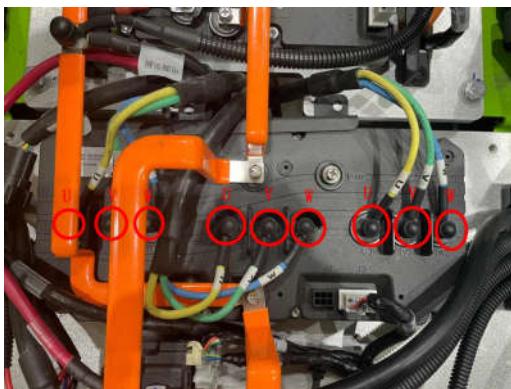
ML6/MM6/MR6 Controller phase loss

Tool: Multimeter、Computer、PCAN、Debugging wire

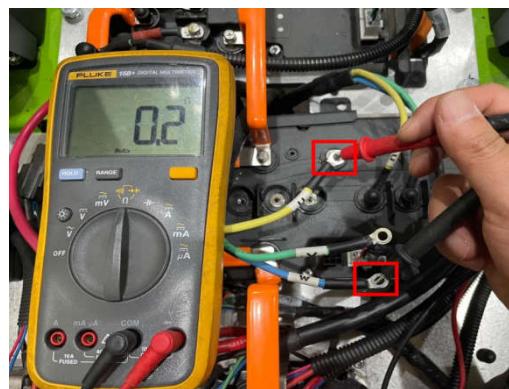
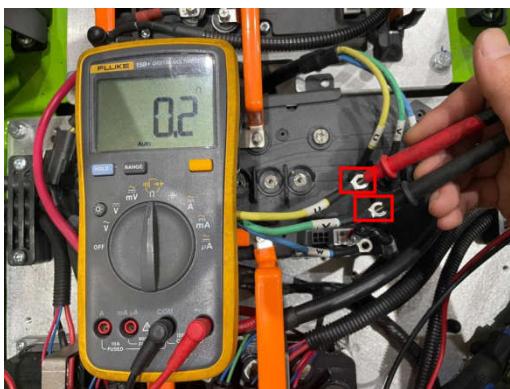


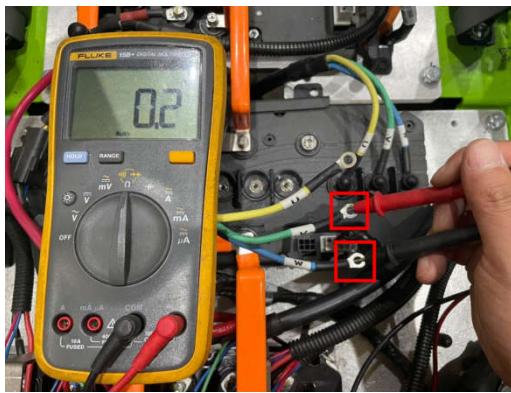
Check:

- 1.Display pop up ML6/MM6/MR6 fault code.
- 2.Check whether the motor phase line is reliably connected to the controller. Check the positions of the six screws. If they are loose, tighten the loose bolts and Check if screws are found to be damaged. Replace the new screws. If the controller screw hole is damaged and the controller needs to be replaced.



- 3.restart the vehicle. If the fault continues to occur measure the resistance value between the motor U \ V \ W phases. If the value displayed on the multimeter is zero or infinity it means that the motor has been damaged inside and a new blade motor needs to be replaced.

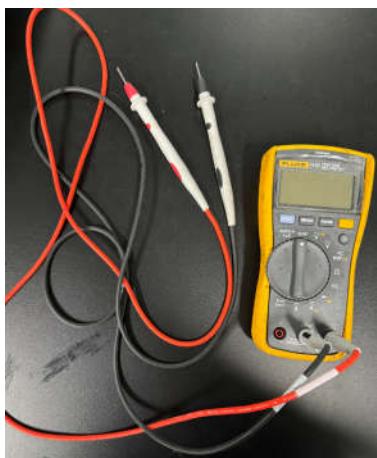




4.If you have replaced a new controller or a new motor, remember to follow the self-learning steps for the motor auto-matching test.

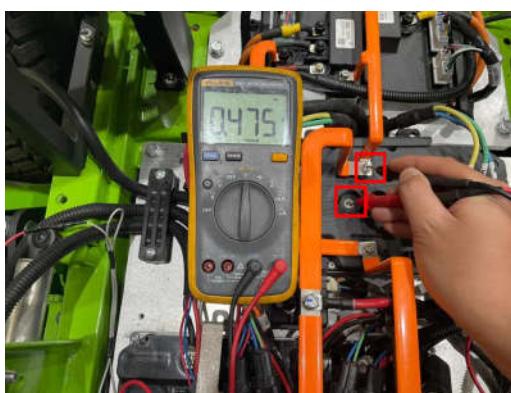
ML7/MM7/MR7 MOSFET error

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

- 1.Display pop up ML7/MM7/MR7 fault code.
- 2.Keep the vehicle power off state.
- 3.Set the Multimeter to the diode position and measure the voltage between the U \ V \ W phase and the positive electrode.



- 4.Set the Multimeter to the diode position and measure the voltage between the U \ V \ W phase and the

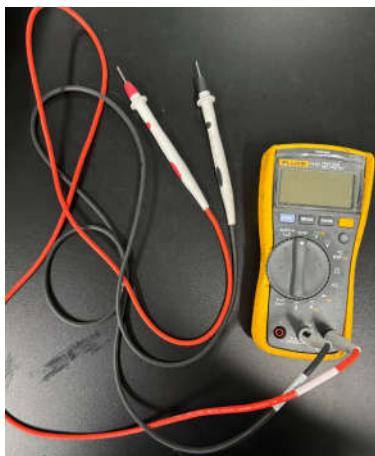
negative electrode.



5.If the range is 4.7-5.0V, the MOS is normal. Otherwise, it is judged that the MOS is damaged and the controller needs to be replaced.Refer to the maintenance manual for the specific disassembly and assembly steps.

ML8/MM8/MR8 Controller undervoltage

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

- 1.Display pop up ML8/MM8/MR8 fault code.
- 2.Restart Vehicle.
- 3.If this fault code persists, Please use a multimeter to measure the bus DC voltage of the controller.

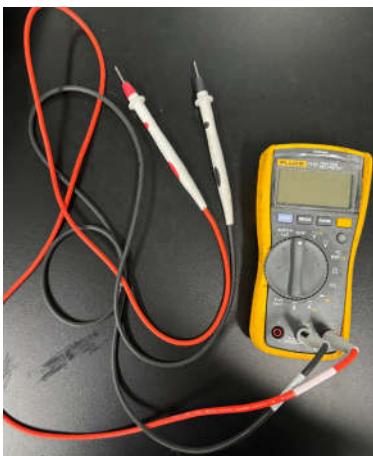


4.If the value displayed on the multimeter is greater than 42V/56V, it indicates that the internal voltage sensor of the motor controller is faulty and the controller needs to be replaced.Refer to the maintenance manual for the specific disassembly and assembly steps.

5.If the value displayed on the multimeter is less than 42V/56V, The battery pack undervoltage.

ML9/MM9/MR9 Controller overvoltage

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

1.Display pop up ML9/MM9/MR9 fault code.

2.Restart Vehicle.

3.If this fault code persists, Please use a multimeter to measure the bus DC voltage of the controller.

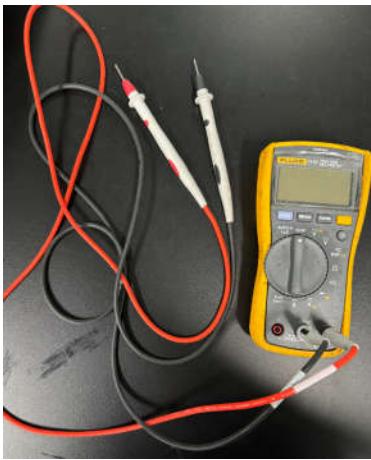


4.If the value displayed on the multimeter is greater than 75V/91V, it indicates that the internal voltage sensor of the motor controller is faulty and the controller needs to be replaced.Refer to the maintenance manual for the specific disassembly and assembly steps.

5.If the value displayed on the multimeter is less than 75V/91V, The battery pack voltage is abnormal.

ML13/MM13/MR13 Controller overtemperature

Tool: Multimeter、Computer、PCAN、Debugging wire

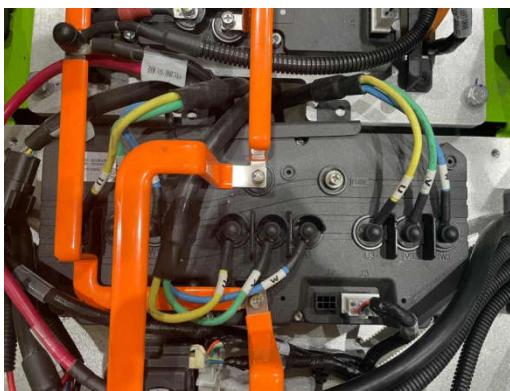


Check:

- 1.Display pop up ML13/MM13/MR13 fault code.
- 2.Move the vehicle to an open area without grass, restart the blades motor If the Fault disappears, the cause of the fault is the controller heating caused by the overload of the blades motor, should be reduce mowing density.
- 3.restart the vehicle. If the fault continues to occur Check the connection of the motor U/V/W phase line on the controller and tighten the loose bolts.

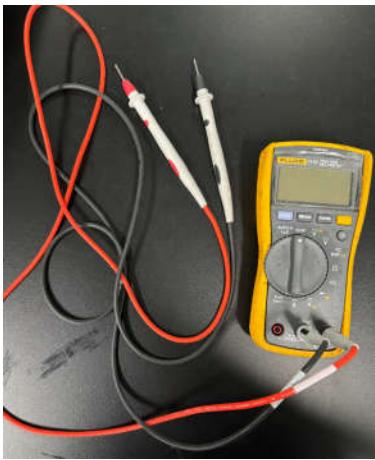


4.restart the vehicle. If the fault continues to occur. needs to be replaced with a new cutting blade controller.



ML14/MM14/MR14 Software overcurrent

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

- 1.Display pop up ML14/MM14/MR14 fault code.
- 2.Check whether the blade are stuck.



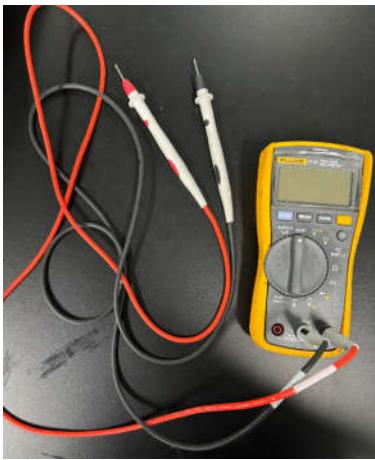
- 3.Check whether the phase wire of the corresponding motor is damaged and whether the mounting screws are tight.



- 4.Reset the PTO switch.

ML15/MM15/MR15 Hardware overcurrent

Tool: Multimeter、Computer、PCAN、Debugging wire

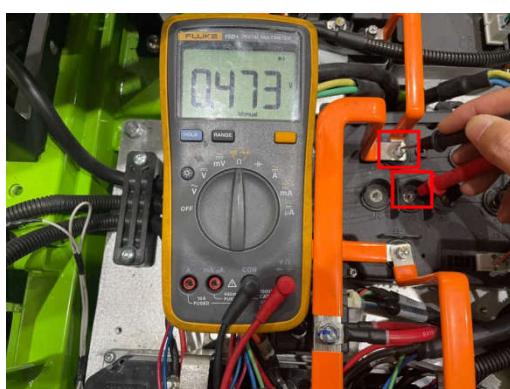


Check:

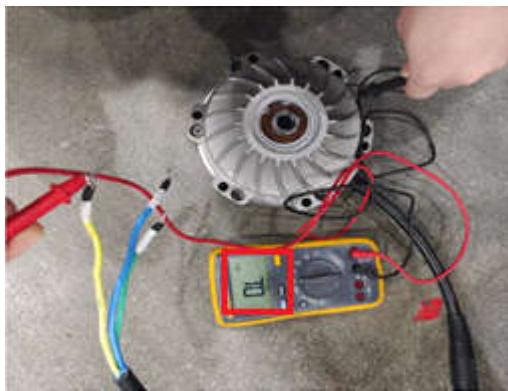
1. Display pop up ML15/MM15/MR15 fault code.
2. Check whether the phase wire of the corresponding motor is damaged and whether the mounting screws are tight.



3. Check the status of the MOS tube of the controller.



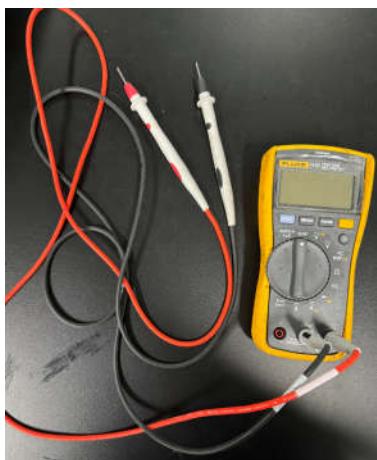
4.Check the insulation resistance value of the motor phase wire and motor shell.



5.Restart the vehicle.

ML19/MM19/MR19 Operating sequence error

Tool: Multimeter、Computer、PCAN、Debugging wire

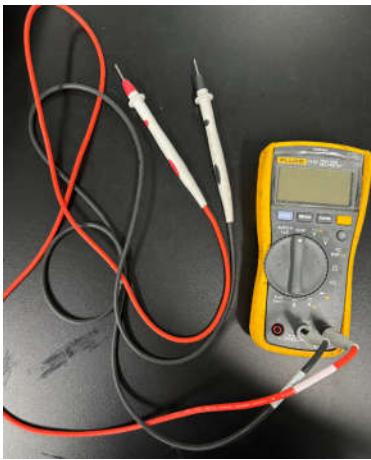


Check:

- 1.Display pop up ML19/MM19/MR19 fault code.
- 2.Check whether the blades switch is pulled up.
- 3.Check whether the seat switch status changes normally.

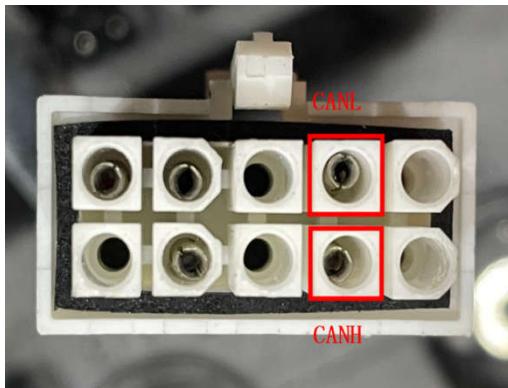
ML26/MM26/MR26 CAN timeout error - right drive

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

- 1.Display pop up ML26/MM26/MR26 fault code.
- 2.Check the pin status of the CAN connector of the blade controller whether the connector is connected properly.



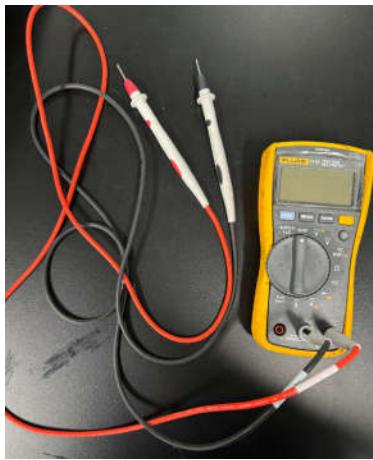
- 3.Check whether CANL and CANH of the blade controller are short circuited or open circuited.



- 4.Restart the vehicle.
- 5.Check whether the indicator light of the blade controller is flashing. If the indicator light does not work, please replace the blade controller.

ML31/MM31/MR31 Blade switch verification error

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

- 1.Display pop up ML31/MM31/MR31 fault code.
- 2.Check the pin status of the PTO switch connector whether the connector is connected properly.
- 3.Check whether there is a short circuit or open circuit in the PTO switch wiring.
- 4.Check whether water has entered the PTO switch and whether the status of the switch changes normally.
- 5.Replace the seat switch.
- 6.Replace the controller.

PMU2 Overtemperature-Level1

Check:

- 1.Display pop up PMU2 fault code.
- 2.At this time, the PMU is in a high heat state, please reduce the load.

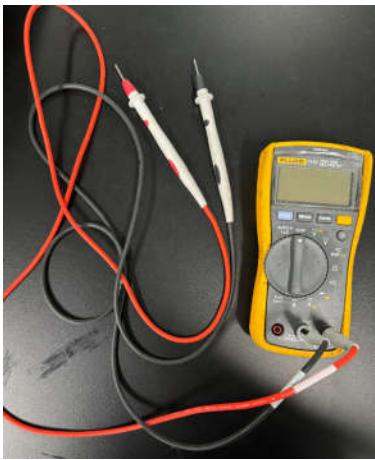
PMU35 Overtemperature-Level2

Check:

- 1.Display pop up PMU35 fault code.
- 2.Power off.
- 3.Waiting 30 min.
- 4.Restart the vehicle.

PMU36 Undervoltage

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

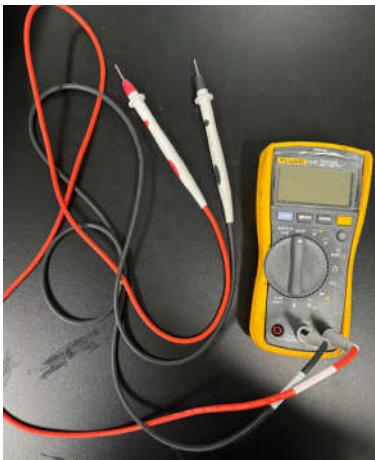
- 1.Display pop up PMU36 fault code.
- 2.If the battery pack voltage is 80V and the operating voltage ranges from 56V to 80V, use a multimeter to measure the battery pack voltage lower than 56V and report an undervoltage fault. If the operating voltage of the 60V platform is 42V to 60V, use a multimeter to measure if the battery pack voltage is lower than 42V.



- 3.Replace the fully charged battery pack.
- 4.Charge the vehicle.

PMU37 Overvoltage

Tool: Multimeter、Computer、PCAN、Debugging wire



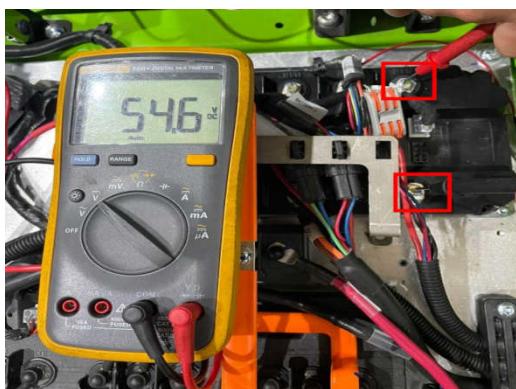
Check:

1.Display pop up PMU37 fault code.

2.Use a multimeter to measure the voltage of the battery pack and use the voltage pack of the accurate voltage platform.

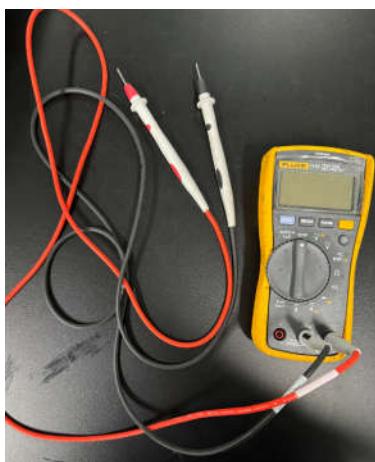


3.Use a multimeter to check whether the input port voltage of the PMU is normal. If the voltage is too high, confirm that the battery pack voltage platform is used incorrectly. If the voltage is normal and the overvoltage fault is still reported, confirm that the detection circuit of the microcontroller inside the PMU is damaged and the PMU hardware needs to be replaced.



PMU38 Power supply output failure

Tool: Multimeter、Computer、PCAN、Debugging wire

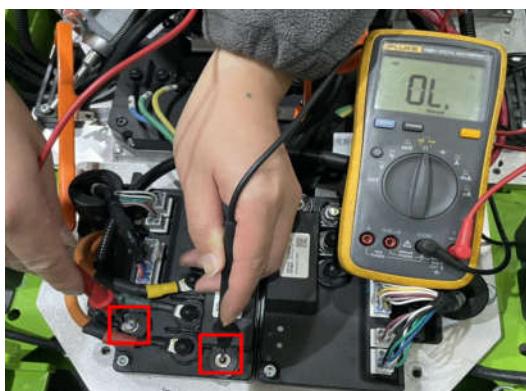


Check:

- 1.Display pop up PMU38 fault code.
- 2.Remove the load from the output end of the PMU and power it on again. If no fault is reported, it indicates that the back-end load is faulty. If a fault is reported, it indicates that the PMU hardware is faulty.



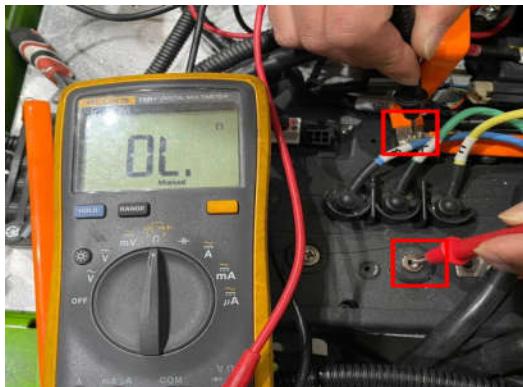
- 3.Remove the power end of the walking controller, and then check whether there is a short circuit in the positive and negative poles of the back end of the left walking controller. If there is a short circuit, it is necessary to replace the left walking controller.



- 4.Check whether there is a short circuit in the positive and negative terminals of the right-walking controller at the back end. If there is a short circuit, replace the right-walking controller.



- 5.Remove the power end of the blades controller and check whether there is a short circuit in the positive and negative terminals of the blades controller at the back end. If there is a short circuit, replace the blades controller.

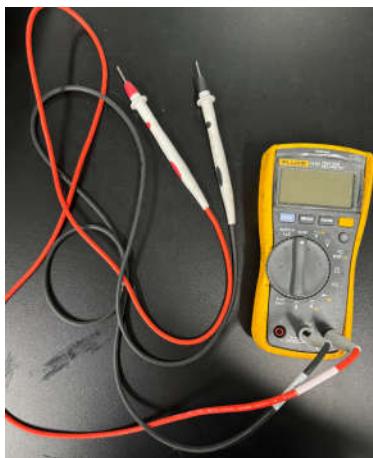


6.Check whether there is short circuit in the positive and negative terminals of the charging port. If there is short circuit, replace the charging harness and charging base.



PMU41 No battery pack available

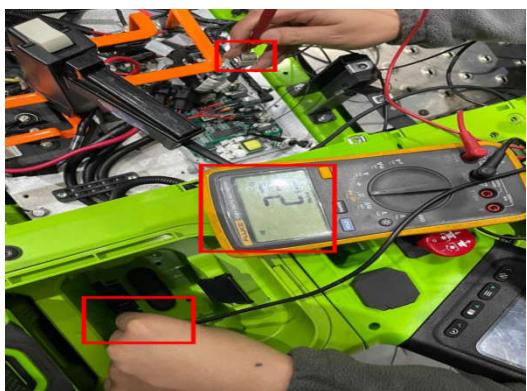
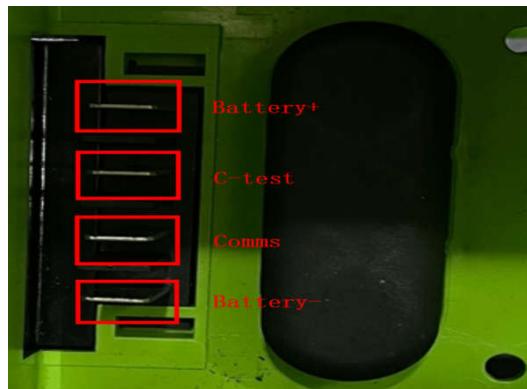
Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

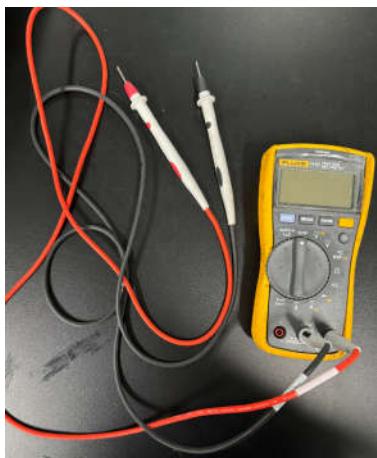
- 1.Display pop up PMU41 fault code.
- 2.Restart the device and check whether the fault can be rectified.
- 3.Replace the battery pack with a new one. Check whether the battery pack can be powered on. If it can be powered on, the battery pack needs to be replaced and maintained.
- 4.Check whether the communication cable between the battery pack and the PMU is normal. If the

communication cable is normal, the internal communication of the PMU is abnormal.



PMU46 Power circuit error

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

1. Display pop up PMU46 fault code.
2. Access the computer to use software to view the details and determine which way to report MOS failure.

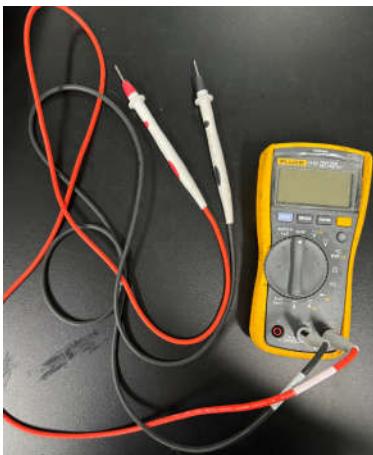
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Feedback Curr Res MOSError	<input checked="" type="radio"/> 0, Normal <input type="radio"/> 1, Error																																												
Feedback Curr Hes Status	<input checked="" type="radio"/> 0, Normal <input type="radio"/> 1, Overtemp																																												
Battery Temp Error	<input checked="" type="radio"/> 0, Normal <input type="radio"/> 1, Error																																												
Battery OpenCircuit Error	<input checked="" type="radio"/> 0, Normal <input type="radio"/> 1, Error																																												

3.Replace the cable in the faulty channel with that in the non-faulty channel, and then power on the cable to check whether the fault is rectified.

4.Replace the PMU.

PMU47 Pre-charge error

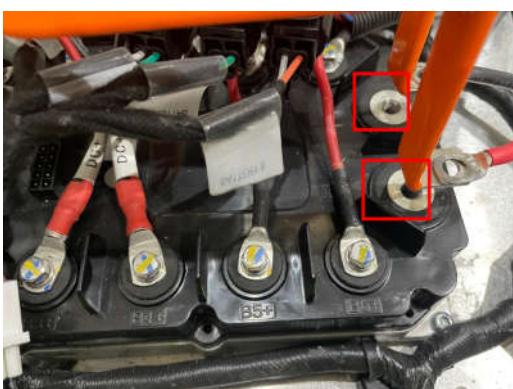
Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

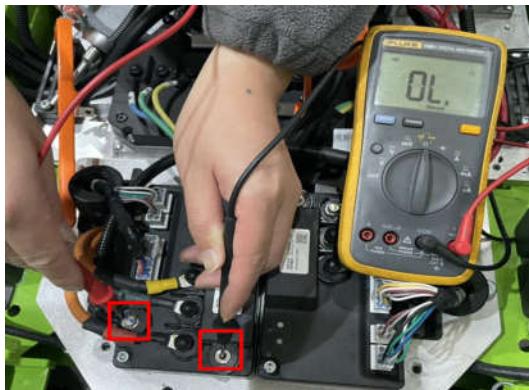
1.Display pop up PMU47 fault code.

2.First, remove the output load of the PMU and power it on again. If no fault is reported, it indicates that the fault point is the back-end load. If a fault is reported, it indicates that the hardware of the PMU is faulty.



3.Remove the power end of the walking controller, and then check whether there is a short circuit in the

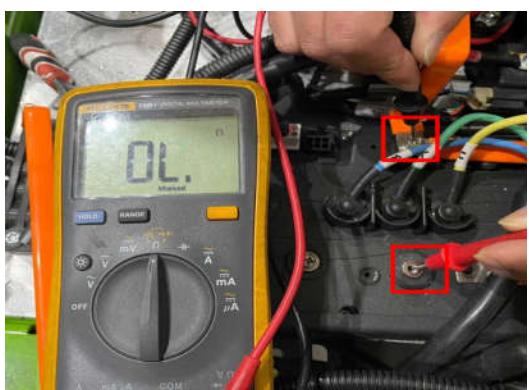
positive and negative poles of the back end of the left walking controller. If there is a short circuit, the left walking controller needs to be replaced.



4.Check whether there is a short circuit in the positive and negative poles of the right walking controller at the back end. If there is a short circuit, the right walking controller needs to be replaced.



5.Remove the power end of the blades controller and check whether there is a short circuit in the positive and negative poles of the back end blades controller. If there is a short circuit, the blades controller needs to be replaced.



6.Check whether there is a short circuit in the positive and negative terminals of the charging port. If there is a short circuit, replace the charging harness and charging base.

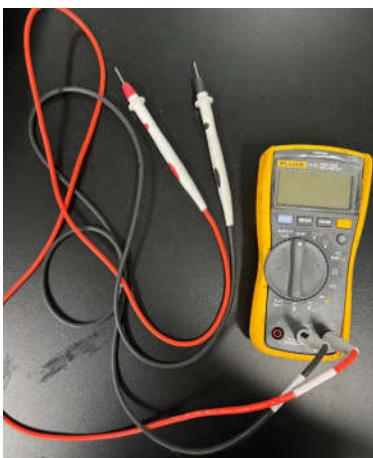


7.The battery pack is faulty. The pre-charge failure is caused by the poor load capacity of the battery pack.
Replace the battery pack.

8.If the PMU hardware fails to be precharged, replace the PMU hardware.

PMU48 Pre-charge hardware error

Tool: Multimeter、Computer、PCAN、Debugging wire

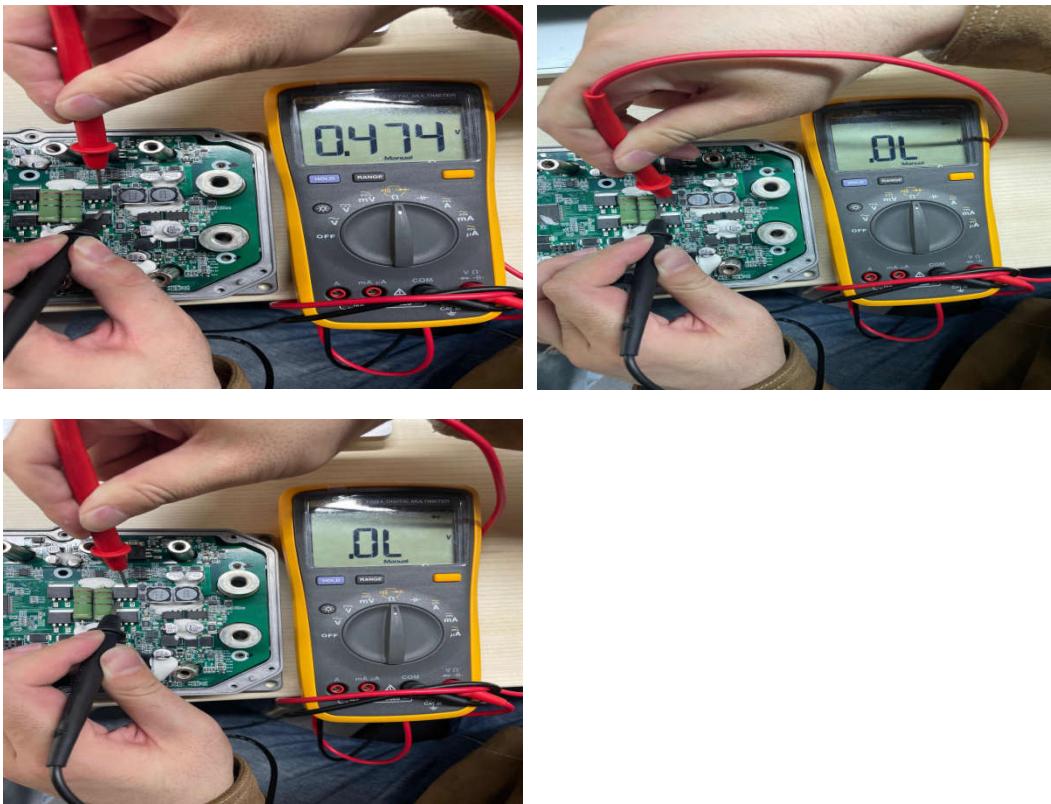


Check:

- 1.Display pop up PMU48 fault code.
- 2.Open the PMU panel and find the pre-charged MOS from the top panel.



- 3.Use the diode gear of the multimeter. Use a stylus to measure the three pins of the triode to see the voltage value.



4. Use the multimeter diode gear to measure the three pins. If any two pins have a pressure drop of 0, it is determined that the MOS is broken down and the hardware needs to be replaced.

PMU49 Negative MOSFET temperature sensor error

Tool: Multimeter、Computer、PCAN、Debugging wire

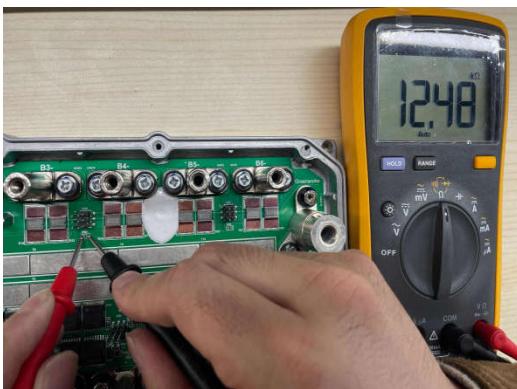


Check:

1. Display pop up PMU49 fault code.
2. Open the PMU panel and find the temperature sensing resistor from the lower panel.



3. Use the universal resistance gear, measure the resistance value of the resistance with the pen, and then compare it with the message value.

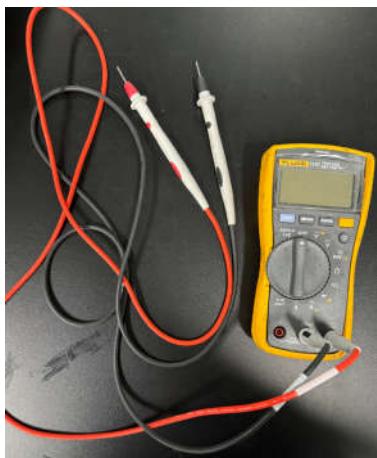


4. If the resistance value is inconsistent and the temperature sensing resistance is abnormal, replace the temperature sensing resistance.

°C	°F	Ω			Resistance Tolerance(%)		Temperature Tolerance	
		MIN(K)	TYP(K)	MAX(K)				
-40	-40	186.294	178.764	171.234	4.21%	-4.21%	0.8	-0.8
-30	-22	109.898	106.073	102.247	3.16%	-3.16%	0.7	-0.7
-20	-4	66.366	64.403	62.44	3.05%	-3.05%	0.63	-0.63
-10	14	41.466	40.442	39.418	2.53%	-2.53%	0.57	-0.57
0	32	26.795	26.256	25.716	2.05%	-2.05%	0.49	-0.49
10	50	17.826	17.544	17.261	1.61%	-1.61%	0.41	-0.41
20	68	12.145	12.002	11.858	1.20%	-1.20%	0.32	-0.32
25	77	10.1	10	9.9	1.00%	-1.00%	0.28	-0.28
30	86	8.467	8.367	8.268	1.19%	-1.19%	0.34	-0.34
40	104	6.016	5.924	5.832	1.55%	-1.55%	0.46	-0.46
50	122	4.33	4.249	4.169	1.89%	-1.89%	0.58	-0.58
60	140	3.152	3.084	3.016	2.21%	-2.21%	0.7	-0.7
70	158	2.319	2.262	2.206	2.51%	-2.51%	0.82	-0.82
80	176	1.725	1.678	1.631	2.79%	-2.79%	0.95	-0.95
90	194	1.297	1.258	1.22	3.06%	-3.06%	1.09	-1.09
100	212	0.987	0.955	0.923	3.32%	-3.32%	1.23	-1.23
110	230	0.76	0.734	0.707	3.56%	-3.56%	1.38	-1.38
120	248	0.607	0.585	0.563	3.76%	-3.76%	1.53	-1.53

PMU52 Current sensor error

Tool: Multimeter、Computer、PCAN、Debugging wire

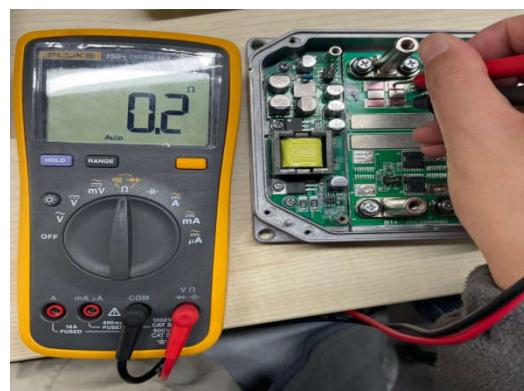
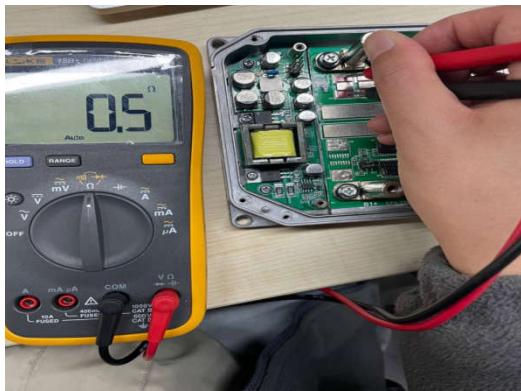


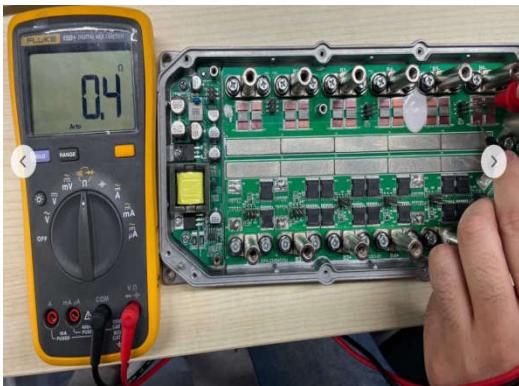
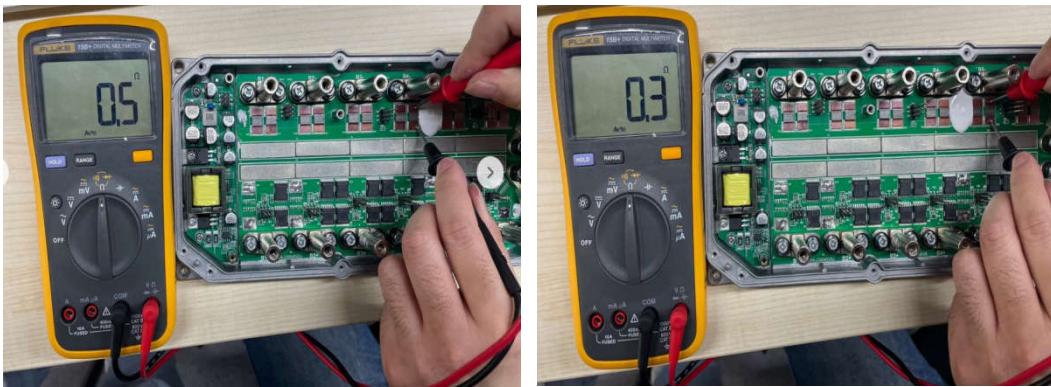
Check:

1. Display pop up PMU52 fault code.
2. Open the PMU panel and find the 0 Ohm resistor from the lower panel.



3. Use a multimeter resistance gear to test the resistance value with a multimeter.

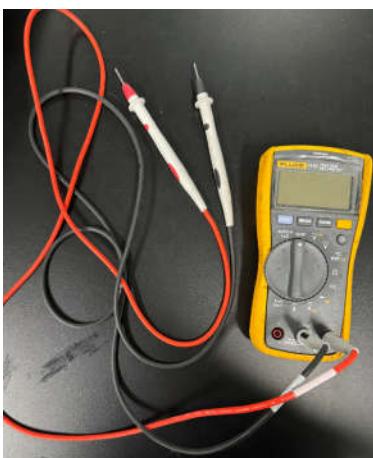




4.If the resistance value of 6 resistors is measured, as long as the resistance value of 1 is infinite, then the resistance of this road needs to be replaced.

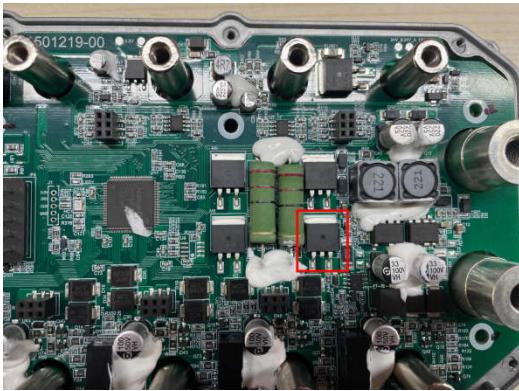
PMU57 KSI Pre-MOS error

Tool: Multimeter、Computer、PCAN、Debugging wire

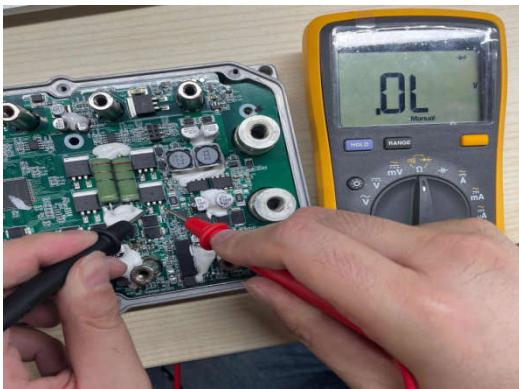
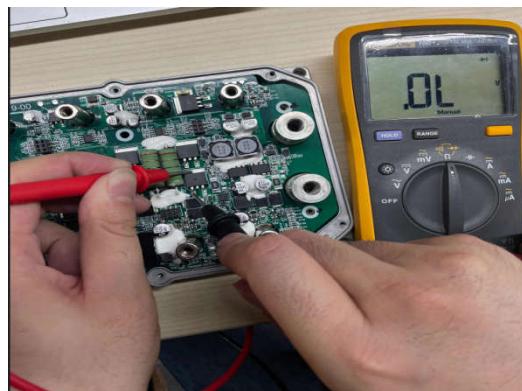
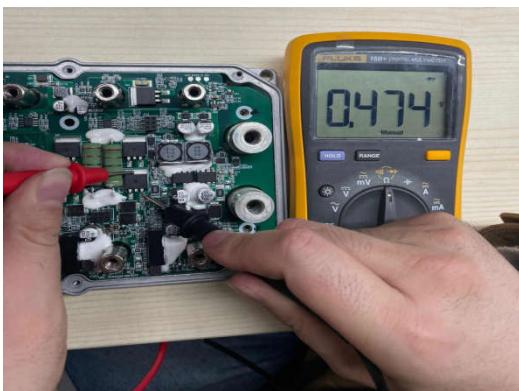


Check:

- 1.Display pop up PMU57 fault code.
- 2.Open the PMU panel and find the KSI front MOS from the top panel.



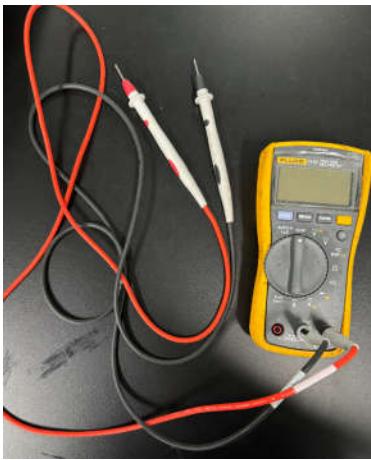
3. Use the diode gear of the multimeter. Use a stylus to measure the three pins of the triode to see the voltage value.



4. Use the multimeter diode gear to measure the three pins. If any two pins have a pressure drop of 0, it is determined that the MOS is broken down and the hardware needs to be replaced.

PMU59 KSI MOS error

Tool: Multimeter、Computer、PCAN、Debugging wire



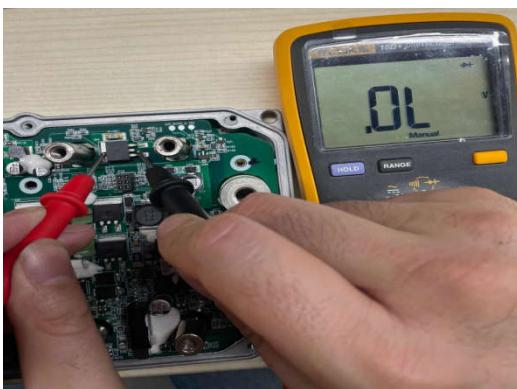
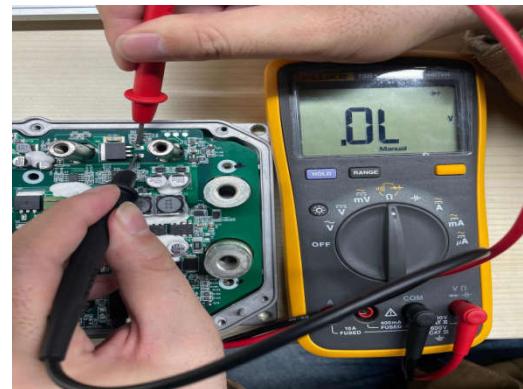
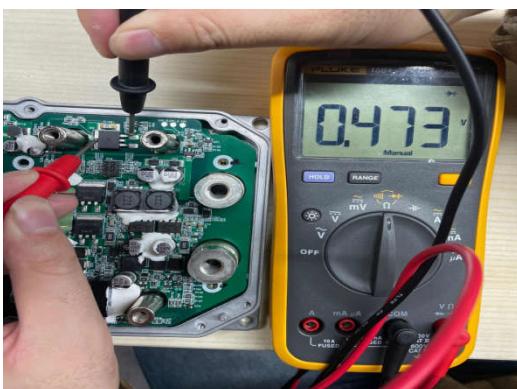
Check:

1. Display pop up PMU59 fault code.

2. Open the PMU panel and find the KSI MOS from the top panel.



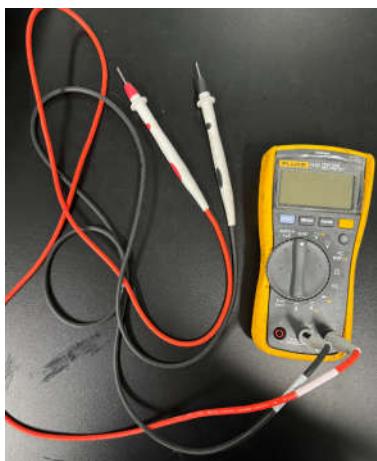
3. Use the diode gear of the multimeter. Use a stylus to measure the three pins of the triode to see the voltage value.



4.Use the multimeter diode gear to measure the three pins. If any two pins have a pressure drop of 0, it is determined that the MOS is broken down and the hardware needs to be replaced.

PMU61 Battery pack 1 does not match

Tool: Multimeter

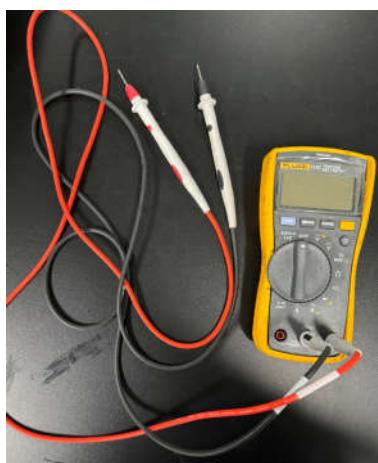


Check:

- 1.Display pop up PMU61 fault code.
- 2.Check the battery pack voltage level.
- 3.Replace the battery pack.

PMU62 Battery pack 2 does not match

Tool: Multimeter

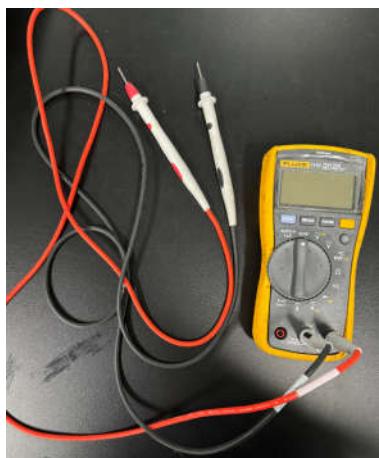


Check:

- 1.Display pop up PMU62 fault code.
- 2.Check the battery pack voltage level.
- 3.Replace the battery pack.

PMU63 Battery pack 3 does not match

Tool: Multimeter

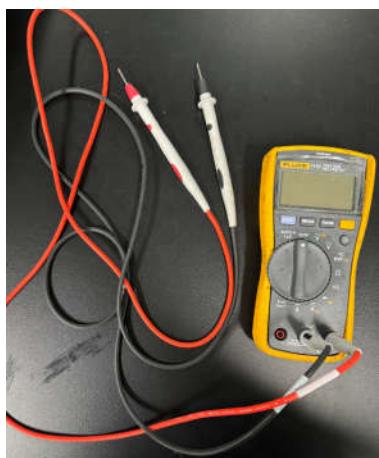


Check:

1. Display pop up PMU63 fault code.
2. Check the battery pack voltage level.
3. Replace the battery pack.

PMU64 Battery pack 4 does not match

Tool: Multimeter

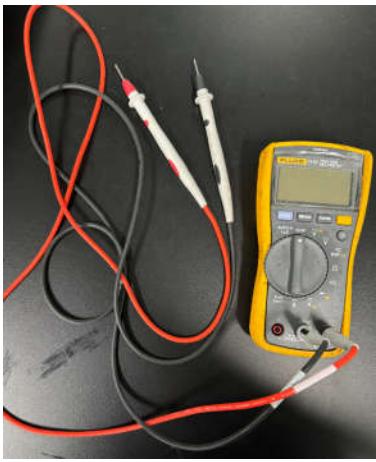


Check:

1. Display pop up PMU64 fault code.
2. Check the battery pack voltage level.
3. Replace the battery pack.

PMU65 Battery pack 5 does not match

Tool: Multimeter

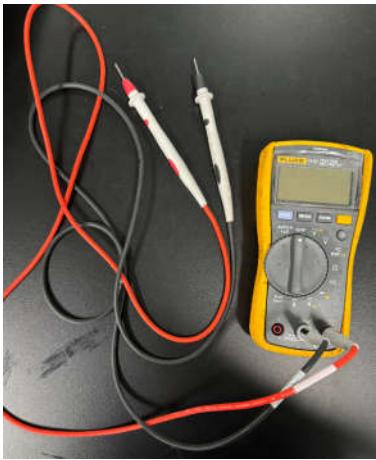


Check:

- 1.Display pop up PMU65 fault code.
- 2.Check the battery pack voltage level.
- 3.Replace the battery pack.

PMU66 Battery pack 6 does not match

Tool: Multimeter

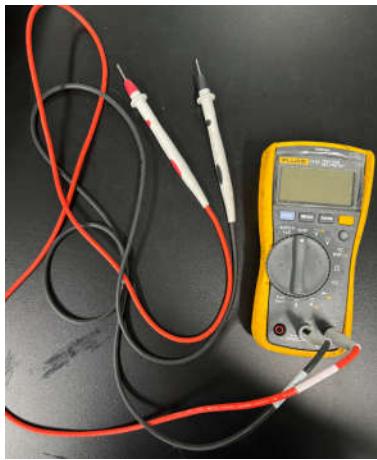


Check:

- 1.Display pop up PMU66 fault code.
- 2.Check the battery pack voltage level.
- 3.Replace the battery pack.

PMU67 Abnormal charging status

Tool: Multimeter、Computer、PCAN、Debugging wire



Check:

1. Display pop up PMU67 fault code.
2. Check whether the charger input plug is inserted properly.
3. Check whether the switch status in the charging socket is abnormal.
4. Check whether the wiring harness between the charging socket switch and the PMU is open or short.