KÄRCHER

MEMORANDUM

DATE: November 1, 2023

TO: Justin Lamar
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FROM: Seth Kenney

RE: Flotilla Troubleshooting Guide Rev 1

The purpose of this memo is to document the first steps that should be taken if the machine does not function. Further assistance from the team at KNA may be needed if the issues persist.

Generic Errors to check

Description of Failure	Corrective Actions
No response from buttons on HMI but machine turns on.	• Check that handle is not depressed

Error Codes

A list of error codes and possible fixes are listed below.

Byte	Description of Failure	Corrective Actions

0x01	TRACTION TEMPERATURE ERROR – Traction thermistor over temperature	• Inspect traction motor thermistor for damage.
		• Measure the resistance across the traction motor thermistor (acceptable range 2KΩ-50KΩ).
		• Inspect the following connectors for damage:
		  ○ A-C5
		  ○ A-C1
		  ○ B-C1
		  ○ B-C6
		• Inspect the following conductors for damage:
		  ○ B11
		  ○ B12
		  ○ B18
		  ○ A12
		  ○ A13
		  ○ A10
		• Check temperature of traction motor for overheating
		• If all looks good, change control board (8.643-008.0)

0x02	BAD TRACTION MOTOR THERMISTOR ERROR	• Inspect traction motor thermistor for damage.
		• Measure the resistance across the traction motor thermistor (acceptable range 2KΩ-50KΩ).
		• Inspect the following connectors for damage:
		  ○ A-C5
		  ○ A-C1
		  ○ B-C1
		  ○ B-C6
		• Inspect the following conductors for damage:
		  ○ B11
		  ○ B12
		  ○ B18
		  ○ A12
		  ○ A13
		  ○ A10
		• If connections are good, change control board (8.643-008.0)

0x03	BRUSH TEMPERATURE ERROR – over temperature	• Inspect brush motor thermistor for damage.
		• Measure the resistance across the brush motor thermistor (acceptable range 2KΩ-50KΩ).
		• Inspect the following connectors for damage:
		  ○ A-C4
		  ○ A-C1
		  ○ B-C1
		  ○ B-C6
		• Inspect the following conductors for damage:
		  ○ A11
		  ○ A14
		  ○ A12
		  ○ B11
		  ○ B12
		  ○ B18
		• Check temperature of brush motor for overheating
		• If all looks good, change control board (8.643-008.0)

0x04	BAD BRUSH MOTOR THERMISTOR ERROR	• Inspect brush motor thermistor for damage.
		• Measure the resistance across the brush motor thermistor (acceptable range 2KΩ-50KΩ).
		• Inspect the following connectors for damage:
		  ○ A-C4
		  ○ A-C1
		  ○ B-C1
		  ○ B-C6
		• Inspect the following conductors for damage:
		  ○ A11
		  ○ A14
		  ○ A12
		  ○ B11
		  ○ B12
		  ○ B18
		• Check temperature of brush motor for overheating
		• If all looks good, change control board (8.643-008.0)

0x05	BOARD1 TEMPERATURE ERROR	• Change control board (8.643-008.0)
0x06	HEATSINK TEMPERATURE ERROR	• Check board temperature • Change control board (8.643-008.0)

0x07	TRACTION OVER CURRENT ERROR	• Inspect the following connectors for damage: o A-C5 o A-C1 o B-C1 o B-C4 o B-T1 • Inspect the following conductors for damage: o B8 o B5 o A5 o A8 o A16 o A7 o B7 • Check traction current using Flotilla Diagnostics tool. Should read under 3.56A or over-current error is accurate and there is something causing the over-current • Check for obstruction of traction motor • Replace Traction motor (8.644-350.0) • Replace control board (8.643-008.0)
0x08	TRACTION STALL ERROR	• Inspect the following connectors for damage: o A-C5 o A-C1 o B-C1 o B-C4 o B-T1 • Inspect the following conductors for damage: o B8 o B5 o A5 o A8 o A16 o A7 o B7 • Check traction current using Flotilla Diagnostics tool. Should read under 8.9A or stall error is accurate and there is something causing the stall • Check for obstruction of traction motor • Replace Traction motor (8.644-350.0) if all above checks out • Replace control board (8.643-008.0) as a last resort

0x09	TRACTION OPEN CIRCUIT ERROR	• Inspect the following connectors for damage:
		  ○ A-C5
		  ○ A-C1
		  ○ B-C1
		  ○ B-C4
		  ○ B-T1
		• Inspect the following conductors for damage:
		  ○ B8
		  ○ B5
		  ○ A5
		  ○ A8
		  ○ A16
		  ○ A7
		  ○ B7
		• Replace Traction motor (8.644-350.0) if no damage is found

0x0A	BRUSH OVER CURRENT ERROR	• Inspect the following connectors for damage:
		  ○ A-C4
		  ○ A-C1
		  ○ B-C1
		  ○ B-C5
		  ○ B-T1
		• Inspect the following conductors for damage:
		  ○ B6
		  ○ B9
		  ○ A6
		  ○ A9
		  ○ A17
		  ○ A7
		  ○ B7
		• Check brush current using Flotilla Diagnostics tool. Should read under 2.2A or over-current error is accurate and there is something causing the over-current
		• Check for obstruction of brush motor
		• Replace brush motor (8.645-181.0) if all above checks out
		• Replace control board (8.643-008.0)

0x0B	BRUSH STALL ERROR	• Inspect the following connectors for damage:
		  ○ A-C4
		  ○ A-C1
		  ○ B-C1
		  ○ B-C5
		  ○ B-T1
		• Inspect the following conductors for damage:
		  ○ B6
		  ○ B9
		  ○ A6
		  ○ A9
		  ○ A17
		  ○ A7
		  ○ B7
		• Check brush current using Flotilla Diagnostics tool. Should read under 3.2A or over-current error is accurate and there is something causing the over-current
		• Check for obstruction of brush motor
		• Replace brush motor (8.645-181.0) if all above checks out
		Replace control board (8.643-008.0)

0x0C	BRUSH OPEN CURCIT ERROR	• Inspect the following connectors for damage:
		  ○ A-C4
		  ○ A-C1
		  ○ B-C1
		  ○ B-C5
		  ○ B-T1
		• Inspect the following conductors for damage:
		  ○ B6
		  ○ B9
		  ○ A6
		  ○ A9
		  ○ A17
		  ○ A7
		  ○ B7
		• Replace brush motor (8.645-181.0) if all above checks out
		• Replace control board (8.643-008.0)

0x0D	VACUUM OVER CURRENT ERROR	• Inspect the following connectors for damage:
		  ○ D-C1
		  ○ D-T1
		  ○ D-C2
		• Inspect the following conductors for damage:
		  ○ D1
		  ○ D2
		  ○ D3
		• Check brush current using Flotilla Diagnostics tool. Should read under 8A for eco-mode and 11A for normal or over-current error is accurate and there is something causing the over-current
		• Check for obstruction of vacuum motor
		• Replace vacuum motor (8.625-845.0) if all above checks out
		• Replace control board (8.643-008.0) if issue still not resolved

0x0E	VACUUM STALL ERROR	• Inspect the following connectors for damage:
		  ○ D-C1
		  ○ D-T1
		  ○ D-C2
		• Inspect the following conductors for damage:
		  ○ D1
		  ○ D2
		  ○ D3
		• Check brush current using Flotilla Diagnostics tool. Should read under 9A for eco-mode and 12A for normal or stall error is accurate and there is something causing the stall
		• Check for obstruction of vacuum motor
		• Replace vacuum motor (8.625-845.0) if all above checks out
		• Replace control board (8.643-008.0) if issue still not resolved

0x0F	VACUUM OPEN CURCIT ERROR	• Inspect the following connectors for damage:
		  ○ D-C1
		  ○ D-T1
		  ○ D-C2
		• Inspect the following conductors for damage:
		  ○ D1
		  ○ D2
		  ○ D3
		• Replace vacuum motor (8.625-845.0) if all above checks out
		Replace control board (8.643-008.0) if issue still not resolved