

GM 4500-D/4700-D DIAGNOSTIC FAULT CODE QUICK REFERENCE TABLE



Directions:

Perform the Service Actions in the order they are presented. Every Service Action has the potential to repair the fault completely. Test the machine after the completion of each Service Action to verify the active fault remains. If the fault is still active, perform the next Service Action step. Continue this process until the fault is no longer reported.

Fault Number	Fault Title	Controller Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
1	Engine Coolant Overheat- PTO Shutdown	Master	This fault is reported when the engine coolant temperature has reached 105 °C.	The PTO is disabled.	1) Test the cooling fan function. 2) Inspect the radiator airflow passages to ensure they are clear. 3) Check the coolant level.
2	Engine Coolant Overheat- Engine Shutdown	Master	This fault is reported when the engine coolant temperature has reached 115 °C.	The engine is turned off.	1) Test the cooling fan function. 2) Inspect the radiator airflow passages to ensure they are clear. 3) Check the coolant level.
3	Fuse Failure	Master/Slave	This fault is reported when the fuse has failed for one of the output circuits on the master or slave TEC.		1) Check the 7.5 amp fuse F-A1 protecting outputs 1–4 on the master TEC. 2) Check the 7.5 amp fuse F-B1 protecting outputs 5–10 on the master TEC. 3) Check the 7.5 amp fuse F-C1 protecting outputs 11–14 on the master TEC. 4) Check the 7.5 amp fuse F-A2 protecting outputs 1–4 on the slave TEC. 5) Check the 7.5 amp fuse F-B2 protecting outputs 5–10 on the slave TEC. 6) Check the 7.5 amp fuse F-C2 protecting outputs 11–14 on the slave TEC.

Fault Number	Fault Title	Controller Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
4	IPE Voltage Low	Master	This fault is reported when the inputs or outputs on the master TEC are not working correctly.	Engine will be disabled by this fault.	1) Replace the master TEC.
5	Main Power Relay Failure	Master/Slave	This fault is reported when the main power relay on the master or slave TEC has failed.	This fault may also generate Fault 11.	1) Test all of the 7.5 amp fuses. 2) Test the functionality of the main power relay. 3) If the relay test passes, verify that the master TEC is getting 12 Vdc from the relay. 4) If the relay test passes, verify that the slave TEC is getting 12 Vdc from the relay.
6	Key Start Timeout	Master	This fault is reported when the ignition key has been stuck or held in the "Start" position for more than 30 seconds.	If the key was held for more than 30 seconds, returning key to the run position will clear the fault.	1) Check the key switch for any shorts. 2) Test the key switch for any mechanical malfunction.
7	Software Incompatible	Master	This fault is reported when one or more of the component firmware programs is incompatible with the firmware in the Master TEC.		1) Update the machine firmware using Toro DIAG.
8	Charging Voltage High	Master and/or Slave	This fault is reported when the charging system (alternator) is producing a voltage that the TEC has determined to be out-of-range on the high side.		1) Check alternator voltage output. 2) Refer to alternator specification for typical output voltage.
9	Charging Voltage Low	Master and/or Slave	This fault is reported when charging system (alternator) is producing a voltage that the TEC has determined to be out-of-range on the low side.		1) Check alternator voltage output. 2) Refer to alternator specification for typical output voltage.
10	CAN Bus Timeout – Engine ECU	Master	This fault is reported when the master TEC has lost CAN communication with the engine electronic control unit (ECU) for at least 10 seconds.	The master TEC reviews incoming CAN messages from all of the components on the network.	1) Check the resistance of the CAN network. 2) Check the CAN connections at TEC 5002, engine controller, and all junctions. 3) Verify power to the engine control unit (ECU).

Fault Number	Fault Title	Controller Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
11	CAN Bus Timeout - Slave TEC	Master	This fault is reported when the master TEC has lost CAN communication with the slave TEC for at least 1 second.	The master TEC reviews incoming CAN messages from all of the components on the network.	1) Check the resistance of the CAN network. 2) Check the CAN connection at the slave TEC. 3) Verify power to the slave TEC.
12	CAN Bus Timeout - Mini InfoCenter	Master	This fault is reported when the master TEC has lost CAN communication with the InfoCenter for at least 3 seconds.	The master TEC reviews incoming CAN messages from all of the components on the network.	1) Check the resistance of the CAN network. 2) Check the CAN connection at the InfoCenter. 3) Verify power to the InfoCenter.
13	Key Switch Broken	Master	This fault is reported when the ignition key "Start" input is active, but the ignition key "Run" input is off.		1) Check for a loose wire or a loose connector. 2) Check for corrosion due to water. 3) Check the master TEC harness/connector for loose wires. 4) Check the ignition key switch.
14	Traction Pedal Neutral Switch Broken	Master	This fault is reported when the master TEC is receiving "Neutral Forward" and "Neutral Reverse" signals simultaneously.		1) Verify neutral switch function through InfoCenter traction pedal diagnostics. 2) Check the traction pedal potentiometer, harness wiring, and connection points to the potentiometer and controller.
15	Engine Throttle Switch Broken	Master	This fault is reported when the master TEC is receiving "Increase RPM" and "Decrease RPM" signals simultaneously.		1) Check the switch. There could be a short in the switch. 2) Test the speed request input circuits from the switch to the master TEC (pins 11 and 12). 3) Check the harness/connector for a loose wire or corrosion.
16	Range High/Low Switch Broken	Master	This fault is reported when the master TEC is receiving "Range High" and "Range Low" signals simultaneously.		1) Check the switch. There could be a short in the switch. 2) Test the "Range High" and "Range Low" input circuits from the switch to the master TEC (pins 5 and 10). 3) Check the harness/connector for a loose wire or corrosion.

Fault Number	Fault Title	Controller Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
17	Pedal Sensor Out of Range	Master	This fault is reported when the master TEC is receiving “Neutral Forward” and “Neutral Reverse” signals simultaneously.		1) Check the traction pedal potentiometer. 2) Check the harness wiring. 3) Check the connection points to the potentiometer 4) Check the connection points to the master TEC (pins 1 and 2).
18	Hydraulic Temperature Sensor Out of Range	Master	This fault is reported when the hydraulic temperature sensor reading is not within range.		1) Check for loose wires or a loose connector. 2) Test the 5V reference at the temperature sensor.
20	Counterbalance Pressure Sensor Out of Range	Master	This fault is reported when the counterbalance pressure sensor reading is not within range.		1) Check for loose wires or a loose connector. 2) Inspect all connections for corrosion. 3) Test the counterbalance pressure sensor. 4) Test the 5V reference at the hydraulic pressure transducer.
21	Center Deck Switch Broken	Master	This fault is reported when the “Center Deck Raise” and “Center Deck Lower” inputs are active simultaneously.		1) Test the switch. There could be a short in the switch. 2) Check the harness/connector for a loose wire or corrosion
22	Left Deck Switch Broken	Slave	This fault is reported when the “Left Deck Raise” and “Left Deck Lower” inputs are active simultaneously.		1) Test the switch. There could be a short in the switch. 2) Check the harness/connector for a loose wire or corrosion
23	Right Deck Switch Broken	Slave	This fault is reported when the “Right Deck Raise” and “Right Deck Lower” inputs are active simultaneously.		1) Test the switch. There could be a short in the switch. 2) Check the harness/connector for a loose wire or corrosion
26	Engine Start Out	Master	This fault is reported when the measured current through the “Engine Start” output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the master TEC (pin 8). 3) Replace the master TEC.

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27	Engine Run Out	Master	This fault is reported when the measured current through the "Engine Run" output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the master TEC (pin 10). 3) Replace the master TEC.
28	Range High Out	Master	This fault is reported when the measured current through the "Range High" output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the master TEC (pin 2). 3) Replace the master TEC.
33	Hydro Forward Out	Master	This fault is reported when the measured current through the traction forward coil is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the master TEC (pin 44). 3) Replace the master TEC.
34	Hydro Reverse Out	Master	This fault is reported when the measured current through the traction reverse coil is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the master TEC (pin 46). 3) Replace the master TEC.
35	Fan Reverse Out	Master	This fault is reported when the measured current through the fan reverse output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the master TEC (pin 7). 3) Replace the master TEC.
39	Left PTO Out	Slave	This fault is reported when the measured current through the "Left Deck PTO" output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the slave TEC (pin 42). 3) Replace the slave TEC controller.
40	Right PTO Out	Slave	This fault is reported when the measured current through the "Right Deck PTO" output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the slave TEC (pin 41). 3) Replace the slave TEC.

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41	Enable S1 Out	Slave	This fault is reported when the measured current through the "Enable" output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the slave TEC (pin 4). 3) Replace the slave TEC.
42	Left Raise S2 Out	Slave	This fault is reported when the current measured through the "Left Deck Raise" output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the slave TEC (pin 8). 3) Replace the slave TEC.
43	Left Lower S3 Out	Slave	This fault is reported when the current measured through the "Left Deck Lower" output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the slave TEC (pin 10). 3) Replace the slave TEC.
44	Left Float S4 Out	Slave	This fault is reported when the current measured through the "Left Deck Float" output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the slave TEC (pin 7). 3) Replace the slave TEC.
45	Center Raise S5 Out	Master	This fault is reported when the current measured through the "Center Deck Raise" output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the master TEC (pin 3). 3) Replace the master TEC.
46	Center Float S6 Out	Master	This fault is reported when the current measured through the "Center Deck Lower/Float" output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the master TEC (pin 4). 3) Replace the master TEC.
47	Right Raise S7 Out	Slave	This fault is reported when the current measured through the "Right Deck Raise" output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the slave TEC (pin 6). 3) Replace the slave TEC.

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48	Right Lower S8 Out	Slave	This fault is reported when the current measured through the "Right Deck Lower" output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the slave TEC (pin 44). 3) Replace the slave TEC.
49	Right Float S9 Out	Slave	This fault is reported when the current measured through the "Right Deck Float" output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the output pin 45. 3) Replace the slave TEC.
50	PTO 1 Out	Master	This fault is reported when the current measured through the center deck PTO 1 output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the master TEC (pin 45). 3) Replace the master TEC.
51	PTO 2 Out	Master	This fault is reported when the current measured through the center deck PTO 2 output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the master TEC (pin 43). 3) Replace the master TEC.
52	Fan Out	Master	This fault is reported when the current measured through the fan output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the master TEC (pin 41). 3) Replace the master TEC.
62	Counterbalance Out	Master	This fault is reported when the current measured through the counterbalance output is too high.		1) Test the output circuit for a short. 2) Test for proper resistance in the component connected to the master TEC (pin 42). 3) Replace the master TEC.
63	Potentiometer Voltage Out of Range	Master	This fault is reported when the pedal potentiometer is reading a voltage outside the 0.25 Vdc to 4.75 Vdc design range.		1) Verify traction pedal voltage through InfoCenter diagnostic screen. 2) Check the traction pedal potentiometer, harness wiring, and connection points to the potentiometer and controller.

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64	Potentiometer Analog Digital Conflict	Master	This fault is reported when the TEC determines that the traction pedal potentiometer analog and digital signals are in conflict with one another.	The pedal potentiometer uses an analog signal to indicate pedal angle and two digital signals to indicate pedal direction ("FWD" or "REV").	1) Verify traction pedal voltage through InfoCenter diagnostic screen. 2) Check the traction pedal potentiometer, harness wiring, and connection points to the potentiometer and controller.
65	Potentiometer Forward Reverse Digital Conflict	Master	This fault is reported when the TEC is receiving "FWD" and "REV" digital signals from the traction pedal potentiometer simultaneously.	The pedal potentiometer uses two digital signals to indicate pedal direction ("FWD" or "REV").	1) Verify traction pedal voltage through InfoCenter diagnostic screen. 2) Check the traction pedal potentiometer, harness wiring, and connection points to the potentiometer and controller.
66	TEC Traction Overcurrent	Master	This fault is reported when the traction coil overcurrent has caused the master TEC to automatically limit the output current.	An overcurrent has been detected in either the forward or reverse output circuit.	1) Verify continuity in the traction circuit loop. This includes the coil itself, harness wiring, and connection points to the coil and controller. 2) Replace the master TEC.
67	Traction Current Validation Failure	Master	This fault is reported when the TEC measures an unexpected variance between the desired level of current to the traction coil and the actual level of current to the traction coil.	Either an open or a short in the traction circuit loop will generate this fault.	1) Verify continuity in the traction circuit loop. This includes the coil itself, the harness wiring, and connection points to the coil and controller. 2) Replace the master TEC.
70	Machine Number(s) Unknown	Master	This fault is reported when the master TEC does not recognize the model number or serial number that was written during manufacturing run-up.		1) Update machine firmware using Toro DIAG.
71	Master Address Contention	Master	This fault is reported when the slave TEC has been replaced with a preprogrammed master TEC.		1) Reprogram the machine using Toro DIAG.