GROUNDSMASTER 5900 (TIER 4) 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	Pedal sensor-voltage out of range	Master TEC	This fault is reported when the traction pedal potentiometer reading is out of range (0.25V–4.75V), indicating either an open or short circuit.		1) Perform the Traction Pedal Position Sensor Calibration procedure using the InfoCenter. 2) Check the traction pedal potentiometer. 3) Test the circuit wiring. 4) Check the connections to the potentiometer and controller. 5) Replace the potentiometer.
2	Pedal sensor-analog and digital signal conflict	Master TEC	This fault is reported when the analog and digital signals of the potentiometer are in conflict with one another.	The potentiometer has one analog signal (to indicate pedal angle) and two digital signals (to indicate pedal position relative to Neutral).	1) Perform the Traction Pedal Position Sensor Calibration procedure using the InfoCenter. 2) Check the traction pedal potentiometer. 3) Test the circuit wiring. 4) Check the connections to the potentiometer and controller. 5) Replace the potentiometer.
3	Pedal sensor neutral switch failure	Master TEC	This fault is reported when the TEC is receiving both Neutral Fwd and Neutral Rev signals simultaneously, which is not physically possible.	Both neutral forward and neutral reverse digital inputs are active.	1) Check the traction pedal potentiometer. 2) Test the circuit wiring. 3) Check the connections to the potentiometer and controller. 4) Replace the potentiometer.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions
5	Traction current-validation failure	Master TEC	This fault is reported when the current monitor (which validates the intended traction coil current) is indicating an unexpected variance between the desired level of current and the actual level of current.	It is expected that the actual level of coil current will track the desired level of current set by the drive-by-wire module.	1) Perform the Traction Pedal Position Sensor Calibration procedure using the InfoCenter. 2) Verify continuity of the traction coil. 3) Verify continuity in the harness wiring. 4) Verify continuity in the connections to the coil and controller. 5) Replace the master TEC.
11	Hydraulic temperature sensor-out of range	Master TEC	This fault is reported when the hydraulic temperature sensor reading is not within the normal range.		1) Check for a loose wire or connector. 2) Check temperature sensor.
12	Fuel level gauge-out of range	Master TEC	This fault is reported when the fuel level sensor reading is not within the normal range.		1) Check for a loose wire or connector. 2) Check the fuel level sensor.
13	Key switch malfunction	Master TEC	This fault is reported when the “key start” input is active, but the “key run” input is off.		1) Check for a loose wire or connector in the key circuit. 2) Check for any corrosion on connectors. 3) Check the TEC harness and/or connector for loose wires. 4) Check the key switch.
14	Cruise control switch malfunction	Slave TEC	This fault is reported when the “cruise engage” input is active, but the “cruise enable” input is not active.		1) Check the cruise control switch for a short. 2) Check the cruise control harness and/or connector for a loose wire or corrosion.
16	Left deck raise/lower switch malfunction	Slave TEC	This fault is reported when the TEC is seeing both “left deck raise” and “left deck lower” inputs at the same time.		1) Check the left deck raise/lower switch for a short. 2) Check the left deck raise/lower switch harness and/or connector for a loose wire or corrosion.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions
17	Center deck raise/lower switch malfunction	Slave TEC	This fault is reported when the TEC is seeing both “center deck raise” and “center deck lower” inputs at the same time.		1) Check the center deck raise/lower switch for a short. 2) Check the center deck raise/lower switch harness and/or connector for a loose wire or corrosion.
18	Right deck raise/lower switch malfunction	Slave TEC	This fault is reported when the TEC is seeing both “right deck raise” and “right deck lower” inputs at the same time.		1) Check the right deck raise/lower switch for a short. 2) Check the right deck raise/lower switch harness and/or connector for a loose wire or corrosion.
19	Range Hi/lo switch malfunction	Slave TEC	This fault is reported when the TEC is seeing both “range high” and “range low” inputs as active at the same time.		1) Check the range Hi/Lo switch for a short. 2) Check the range Hi/Lo switch harness and/or connector for a loose wire or corrosion.
81	Key start timeout	Master TEC	This fault is reported when the key has been held in the “Start” position for more than 30 seconds.		1) If the key was being held in the “Start” position for more than 30 seconds, returning key to the “Run” position will clear the fault. 2) If the fault continues, check the key switch for any shorts.
82	Charging too high	Master TEC	This fault is reported when the alternator is producing a voltage above 16.3 Vdc.		1) Check the alternator voltage regulator output. 2) Refer to the alternator testing procedure in the Service Manual.
84	Internal TEC Fault - Master	Master TEC	This fault is reported when inputs and/or outputs on the master TEC are not working correctly.	Internal master TEC circuit board fault	Replace the master TEC.
85	Internal TEC Fault - Slave	Slave TEC	This fault is reported when inputs and/or outputs on the slave TEC are not working correctly.	Internal slave TEC circuit board fault	Replace the slave TEC.
86	Master contention fault	Master TEC	This fault is reported when the master TEC receives a CAN bus message from another master TEC.	This fault disables the machine.	1) Verify that the two TECs are not both programmed as masters. 2) Reprogram the machine using Toro DIAG.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions
87	Slave contention fault	Slave TEC	This fault is reported when the slave TEC receives a CAN bus message from another slave TEC.	This fault disables the machine.	1) Verify that the two TECs are not both programmed as slaves. 2) Reprogram the machine using Toro DIAG.
88	Software version is incompatible	Master TEC	This fault is reported when the master TEC determines that the slave TEC or the InfoCenter are programmed incorrectly.	This fault disables the machine.	Reprogram the machine using Toro DIAG.
89	Machine number(s) unknown	Master TEC	This fault is reported when the master TEC determines that the machine serial number is programmed incorrectly.	This fault disables the machine.	Reprogram the machine using Toro DIAG
90	Inter-TEC Communication Loss	Master TEC	The master TEC never established communication (or lost) with the slave TEC and/or the Yanmar ECM.		1) Verify the slave TEC and Yanmar ECM both have power. 2) Test the resistance in the CAN bus network. It should measure approximately 60 ohms.
91	Master fuse failure	Master TEC	This fault is reported when one of the three 7.5 amp fuses for the master TEC has failed.		1) Test all three of the 7.5 amp fuses for the master TEC. 2) Replace the failed fuse. 3) If the fuse continues to fail, determine what caused the fuse to fail and repair it.
92	Slave fuse failure	Slave TEC	This fault is reported when one of the three 7.5 amp fuses for the slave TEC has failed.		1) Test all three of the 7.5 amp fuses for the slave TEC. 2) Replace the failed fuse. 3) If the fuse continues to fail, determine what caused the fuse to fail and repair it.
93	Main power relay failure - Master	Master TEC	This fault is reported when the main power relay has failed, or when all three of the 7.5 amp fuses for the master TEC fail at the same time.		1) Test all three of the 7.5 amp fuses for the master TEC. 2) Test the functionality of the main power relay. 3) If relay tests ok, check that the TEC is getting 12 Vdc from the relay.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions
94	Main power relay failure - Slave	Slave TEC	This fault is reported when the main power relay has failed, or when all three of the 7.5 amp fuses for the slave TEC fail at the same time.		1) Test all three of the 7.5 amp fuses for the slave TEC. 2) Check if the master output 2 is powered (since the slave power is from the master).
95	Radiator electric fan fault	Master TEC	This fault is reported when the engine coolant radiator electric fan is overloaded, overheated, draws too much current, or has experienced an internal drive failure.		1) Check if the cooling fans are blocked with debris or grass clippings. 2) If the engine has overheated, let the machine cool and check for operation again. 3) Disconnect each of the radiator electric cooling fans separately to isolate which fan has the malfunction. 4) Replace the fan that is reporting the error.
96	Hydraulic oil cooler electric fan fault	Master TEC	This fault is reported when the hydraulic oil cooler electric fan is overloaded, overheated, draws too much current, or has experienced an internal drive failure.		1) Check if the cooling fans are blocked with debris or grass clippings. 2) If the hydraulic pump has overheated, let the machine cool and check for operation again. 3) Disconnect each of the hydraulic oil cooler electric fans separately to isolate which fan has the malfunction. 4) Replace the fan that is reporting the error.
97	24V bus voltage- out of range	Master TEC	The 24 V bus voltage being read by the TEC (using the voltage divider) is not within the specified range (19–30 Volts).		1) Check the 24 V bus voltage at the batteries. 2) Check the diode for proper orientation. 3) Check for circuit continuity.
123	Internal software fault 3	Master TEC	This fault is reported when a software fault exists within the master TEC.		Contact the Toro TAC group.

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124	Internal software fault 4	Master TEC	This fault is reported when a software fault exists within the master TEC.		Contact the Toro TAC group.
125	Internal software fault 5	Master TEC	This fault is reported when a software fault exists within the master TEC.		Contact the Toro TAC group.
126	Internal software fault 6	Master TEC	This fault is reported when a software fault exists within the master TEC.		Contact the Toro TAC group.