REELMASTER 5010-H 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.

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Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
1	Engine Coolant Temperature High – CRM Stop	Master TEC	This fault is reported when the engine coolant temperature reaches or exceeds 220 ºF (104.4 ºC) for 10 seconds or longer.	The cutting units will be disabled when this fault is reported.	1) Check the cooling system, including the cooling fan, the radiator airflow passages, and the coolant level. 2) Test the coolant temperature sender.
2	Engine Coolant Temperature High – Engine Shutdown	Master TEC	This fault is reported when the engine coolant temperature reaches or exceeds 240 ºF (115 ºC) for 10 seconds or longer.	The engine will be shut off to prevent damage when this fault is reported.	1) Check the cooling system, including the cooling fan, the radiator airflow passages, and the coolant level. 2) Test the coolant temperature sender.
4	Input Pull-up Enable (IPE) Voltage Too High	Master TEC	This fault is reported when the inputs are not being properly powered within the TEC-5002.	Use Toro DIAG to save the machine timers and counters file.	Replace the TEC-5002.
5	Main Power Relay Failure	Master TEC	This fault is reported when the TEC-5002 detects all 3 of the 12 Vdc battery voltage circuits are open.	Use Toro DIAG to save the machine timers and counters file.	1) Check all 3 of the 7.5 amp fuses. 2) Test the main power relay. 3) Test the wiring harness. 4) Replace the TEC-5002.
6	Key Start Timeout	Master TEC	This fault is reported when the ignition switch is held in the START position for more than 30 seconds.		1) Cycle the ignition switch. 2) Test the ignition switch using the InfoCenter. 3) Test the ignition switch and circuit wiring manually.
8	12 Vdc Charging System Voltage Too High	Master TEC	This fault is reported when the TEC-5002 detects that the 12 Vdc charging system (alternator) is generating more than 16.3 Vdc.		1) Test the alternator. 2) Test the wiring harness.

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9	12 Vdc Charging System Voltage Too Low	Master TEC	This fault is reported when the TEC-5002 detects that the 12 Vdc charging system (alternator) is generating less than 8.8 Vdc.		1) Check the alternator drive belt. 2) Test the alternator. 3) Test the wiring harness.
13	Ignition switch malfunction	Master TEC	This fault is reported when the TEC-5002 detects the key START input is active but the key RUN input is off.	The ignition switch has 2 output pins. Only 1 should be active at any given time.	1) Test the ignition switch using the InfoCenter. 2) Test the ignition switch manually. 3) Test the ignition switch circuit wiring.
15	Engine Speed Switch Broken	Master TEC	This fault is reported when the TEC-5002 detects an engine speed increase signal and an engine speed decrease signal at the same time.	The engine speed switch may be shorted internally, or the outputs of the engine speed switch may be shorted together in the seat wire harness.	1) Test the engine speed switch. 2) Test the engine speed switch wiring.
16	12 Vdc Alternator Malfunction	Master TEC	This fault is reported when the alternator is faulty.		1) Test the alternator. 2) Test the wiring harness.
17	Reel Enable Out is Overcurrent	Master TEC	This fault is reported when the measured reel enable output of the TEC is beyond the upper limits.	The reel engage/disengage switch is also referred to as the cutting unit enable/disable switch.	1) Test the 48V logic relay enable. 2) Test the 48V logic relay function. 3) Test the harness for a short.
19	Engine Coolant Temperature Out of Range	Master TEC	This fault is reported when the engine coolant temperature sensor is either open or shorted.	The temperature sensor is also called a temperature sender.	1) Test the temperature sensor wiring. 2) Replace the temperature sensor.

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21	ID Module Fault	Master TEC	This fault is reported when the ID module is not functioning, or when more than 1 cutting reel motor is claiming the same node ID.	Each cutting reel motor has an electronic signature code so it can be identified by the TEC-5002	1) Test the location ID module. 2) Test the location ID module wiring. 3) Test the internal resistance of the motor ID PIN (it should be 17.9-20.9 kohm)
24	Joystick Broken	Master TEC	This fault is reported when the joystick switch is broken or shorted internally.	The rear switch under the joystick is used to lower (and engage) the cutting units. The front switch is used to raise (and disengage) them.	1) Test the joystick switches. 2) Test the joystick circuit wiring.
26	Engine Run Output Signal Current is Too High	Master TEC	This fault is reported when the current from the TEC-5002 (that is used to energize the starter relay coil) is too high.	• If the fusible link connected to the starter motor is faulty, all electrical power to the machine (including the InfoCenter) is shut off. • Use Toro DIAG to save the machine timers and counters file.	1) Test the engine start output signal using the InfoCenter. 2) Test the start relay. 3) Test the engine start output signal wiring. 4) Replace the TEC-5002 controller.
27	Engine Run Output Circuit Fault to Fuel Actuator	Master TEC	This fault is reported when the engine run output circuit from the TEC-5002 is supplying too much current to the fuel actuator.	• If a problem occurs with the fuel actuator, the engine mechanical governor will control engine speed above high idle (3,150 rpm). • Use Toro DIAG to save the machine timers and counters file.	1) Test the fuel actuator. 2) Test the wiring for the fuel actuator and the fuel pump. 3) Replace the TEC-5002 controller.

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28	All 48V CAN Bus Devices Offline	Master TEC	All the devices on the CAN bus are offline.	While this fault is active, the engine goes to high idle and the operator does not have control of engine speed.	1) With the engine off, test the 48 Vdc battery system. 2) With the engine running, test the 48 Vdc battery system. 3) Test the 48 Vdc logic relay and the circuit wiring. 4) Test the 48 Vdc power to the logic relay. 5) Test the power to the CAN bus isolation module. 6) Test the CAN bus wiring to the isolation module. 7) Replace the CAN bus isolation module.
29	48V Battery Low Voltage	Master TEC	All six 48V devices are reporting an Undervoltage fault. The cutting reel motors submit this fault at 32 volts and the M/G reports this fault at 36 volts. As a result, the bus voltage must be below 32 volts for the fault to occur	The bus system includes the motor/generator and all 5 cutting reel motors.	1) With the engine running, test the 48 Vdc battery system. 2) With the engine off, test the 48 Vdc battery system. 3) Replace the main 48 Vdc contactor.
30	48V Bus High Voltage	Master TEC	All six 48V devices are reporting an Overvoltage fault. The cutting reel motors submit this fault at 67.5 volts and the M/G reports this fault at 65 volts. As a result, the bus voltage must be above 67.5 volts for the fault to occur	This fault reports when all 6 individual 48 Vdc overvoltage faults are active at the same time.	1) With the engine off, test the 48 Vdc battery system. 2) With the engine running, test the 48 Vdc battery system. 3) Replace the motor/generator controller.

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31	48 Vdc Key Switch Overvolt	Master TEC	This fault is reported when the TEC-5002 detects that all 6 individual 48 Vdc key switch circuit overvolt faults are active at the same time.	The likely cause is a motor/generator issue (charging system failure, wrong type of batteries installed, etc.).	1) With the engine off, test the 48 Vdc battery system. 2) With the engine running, test the 48 Vdc battery system. 3) Replace the motor/generator controller.
32	Unknown Cutting Unit Fault	Master TEC	This fault is reported when an error exists in the TEC-5002 software.		Contact the Toro Technical Assistance Center.
33	Unknown Motor/Generator Fault	Master TEC	This fault is reported when an error exists in the TEC-5002 software.		Contact the Toro Technical Assistance Center.
34	Unknown Master Controller Fault	Master TEC	This fault is reported when an error exists in the TEC-5002 software.		Contact the Toro Technical Assistance Center.
37	TEC Output Current to Glow Plug Relay is Excessive	Master TEC	This fault is reported when the TEC-5002 output current to energize the glow plug relay is excessive.	Use Toro DIAG to save the machine timers and counters file.	1) Test the glow relay. 2) Test the glow relay wiring. 3) Replace the TEC-5002 controller.
38	CAN Bus Fault – CRM 1	Master TEC	This fault is reported when the TEC-5002 loses (or never established) communication with cutting reel motor 1 on the CAN bus.	When any individual cutting reel motor is shut off due to a fault, the TEC-5002 shuts off the other 4 cutting reel motors.	1) Inspect the wiring for cutting reel motor 1. 2) Swap cutting reel motors between units, and replace the faulty motor. 3) Measure 48 Vdc power in main harness connectors P46 and P47. 4) Test the CAN bus wiring in connector P46. 5) Test the location ID module wiring in connector P46.

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39	CAN Bus Fault – CRM 2	Master TEC	This fault is reported when the TEC-5002 loses (or never established) communication with cutting reel motor 2 on the CAN bus.	When any individual cutting reel motor is shut off due to a fault, the TEC-5002 shuts off the other 4 cutting reel motors.	1) Inspect the wiring for cutting reel motor 2. 2) Swap cutting reel motors between units, and replace the faulty motor. 3) Measure 48 Vdc power in main harness connectors P38 and P39. 4) Test the CAN bus wiring in connector P38. 5) Test the location ID module wiring in connector P38.
40	CAN Bus Fault – CRM 3	Master TEC	This fault is reported when the TEC-5002 loses (or never established) communication with cutting reel motor 3 on the CAN bus.	When any individual cutting reel motor is shut off due to a fault, the TEC-5002 shuts off the other 4 cutting reel motors.	1) Inspect the wiring for cutting reel motor 3. 2) Swap cutting reel motors between units, and replace the faulty motor. 3) Measure 48 Vdc power in main harness connectors P40 and P41. 4) Test the CAN bus wiring in connector P40. 5) Test the location ID module wiring in connector P40.
41	CAN Bus Fault – CRM 4	Master TEC	This fault is reported when the TEC-5002 loses (or never established) communication with cutting reel motor 4 on the CAN bus.	When any individual cutting reel motor is shut off due to a fault, the TEC-5002 shuts off the other 4 cutting reel motors.	1) Inspect the wiring for cutting reel motor 4. 2) Swap cutting reel motors between units, and replace the faulty motor. 3) Measure 48 Vdc power in main harness connectors P48 and P49. 4) Test the CAN bus wiring in connector P48. 5) Test the location ID module wiring in connector P48.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
42	CAN Bus Fault – CRM 5	Master TEC	This fault is reported when the TEC-5002 loses (or never established) communication with cutting reel motor 5 on the CAN bus.	When any individual cutting reel motor is shut off due to a fault, the TEC-5002 shuts off the other 4 cutting reel motors.	1) Inspect the wiring for cutting reel motor 5. 2) Swap cutting reel motors between units, and replace the faulty motor. 3) Measure 48 Vdc power in main harness connectors P44 and P45. 4) Test the CAN bus wiring in connector P44. 5) Test the location ID module wiring in connector P44.
43	CAN Bus Fault – M/G	Master TEC	This fault is reported when the TEC-5002 loses (or never established) communication with the motor/generator on the CAN bus.		1) Inspect the wiring for the motor generator at P37. 2) Test the power and ground wiring in connector P37. 3) Test the CAN bus wiring in connector P37. 4) Replace the motor/generator controller.
44	CAN Bus Fault – InfoCenter	Master TEC	This fault is reported when the TEC-5002 loses (or never established) communication with the InfoCenter.	If the engine idle smooths out when any 1 cutting reel motor is unplugged, and fault 44 stops repeating, that cutting reel motor requires replacement.	1) Determine if the InfoCenter is functioning properly. 2) Monitor engine idle performance. 3) Disconnect cutting reel motors 1 at a time. If the fault stops repeating after any 1 motor is unplugged, replace that cutting reel motor. 4) Test the CAN bus wiring in seat harness connector P52. 5) Replace the InfoCenter.

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45	Software Incompatible – CRM 1	Master TEC	This fault is reported when the software in cutting reel motor 1 is incompatible with the software in the TEC-5002 controller.		1) Use Toro DIAG to reprogram the machine. 2) Inspect the wiring for cutting reel motor 1. 3) Test the CAN bus wiring in main harness connector P46. 4) Swap cutting reel motors between cutting units to isolate the issue. 5) Replace the faulty cutting reel motor.
46	Software Incompatible – CRM 2	Master TEC	This fault is reported when the software in cutting reel motor 2 is incompatible with the software in the TEC-5002 controller.		1) Use Toro DIAG to reprogram the machine. 2) Inspect the wiring for cutting reel motor 2. 3) Test the CAN bus wiring in main harness connector P38. 4) Swap cutting reel motors between cutting units to isolate the issue. 5) Replace the faulty cutting reel motor.
47	Software Incompatible – CRM 3	Master TEC	This fault is reported when the software in cutting reel motor 3 is incompatible with the software in the TEC-5002 controller.		1) Use Toro DIAG to reprogram the machine. 2) Inspect the wiring for cutting reel motor 3. 3) Test the CAN bus wiring in main harness connector P40. 4) Swap cutting reel motors between cutting units to isolate the issue. 5) Replace the faulty cutting reel motor.

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48	Software Incompatible – CRM 4	Master TEC	This fault is reported when the software in cutting reel motor 4 is incompatible with the software in the TEC-5002 controller.		1) Use Toro DIAG to reprogram the machine. 2) Inspect the wiring for cutting reel motor 4. 3) Test the CAN bus wiring in main harness connector P48. 4) Swap cutting reel motors between cutting units to isolate the issue. 5) Replace the faulty cutting reel motor.
49	Software Incompatible – CRM 5	Master TEC	This fault is reported when the software in cutting reel motor 5 is incompatible with the software in the TEC-5002 controller.		1) Use Toro DIAG to reprogram the machine. 2) Inspect the wiring for cutting reel motor 5. 3) Test the CAN bus wiring in main harness connector P44. 4) Swap cutting reel motors between cutting units to isolate the issue. 5) Replace the faulty cutting reel motor.
50	Software Incompatible – S/G (Motor/Generator)	Master TEC	This fault is reported when the software in the motor/generator is incompatible with the software in the TEC-5002 controller.		1) Use Toro DIAG to reprogram the machine. 2) Test the CAN bus wiring in main harness connector P37. 3) Replace the motor/generator controller.
51	Software Incompatible – InfoCenter	Master TEC	This fault is reported when the software in the InfoCenter is incompatible with the software in the TEC-5002 controller.		1) Use Toro DIAG to reprogram the machine. 2) Test the power and ground wiring in seat harness connector P52. 3) Test the InfoCenter CAN bus wiring. 4) Replace the InfoCenter.

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52	Software Incompatible – Master	Master TEC	This fault is reported when the software within the TEC-5002 is incompatible with the software in the other controllers.	Use Toro DIAG to save the machine timers and counters file.	1) Use Toro DIAG to reprogram the machine. 2) Replace the TEC-5002 controller.
53	SV1 Out	Master TEC	This fault is reported when the output current is too high from the TEC-5002 to the SV1 hydraulic lift/lower solenoid.	Use Toro DIAG to save the machine timers and counters file.	1) Measure the resistance of the SV1 coil. 2) Test the wiring harness for SV1 at connector P10. 3) Replace the TEC-5002 controller.
54	SV2 Out	Master TEC	This fault is reported when the output current is too high from the TEC-5002 to the SV2 hydraulic lift/lower solenoid.	Use Toro DIAG to save the machine timers and counters file.	1) Measure the resistance of the SV2 coil. 2) Test the wiring harness for SV2 at connector P13. 3) Replace the TEC-5002 controller.
55	SV3 Out	Master TEC	This fault is reported when the output current is too high from the TEC-5002 to the SV3 hydraulic lift/lower solenoid.	Use Toro DIAG to save the machine timers and counters file.	1) Measure the resistance of the SV3 coil. 2) Test the wiring harness for SV3 at connector P19. 3) Replace the TEC-5002 controller.
56	SVRV Out	Master TEC	This fault is reported when the output current is too high from the TEC-5002 to the SVRV (SV4) hydraulic lift/lower solenoid.	Use Toro DIAG to save the machine timers and counters file.	1) Measure the resistance of the SVRV coil. 2) Test the wiring harness for SVRV at connector P18. 3) Replace the TEC-5002 controller.
57	Cutting Unit Size Incompatible	Master TEC	This fault is reported when the cutting unit sizes (5-inch and 7-inch) are mixed.	All cutting unit sizes must match in cutting units 1–5 before the machine will function normally	Verify that all 5 cutting units have the same diameter reel.
58	M/G Current Sensor Failure	Motor/Generator controller	One of the 3 current sensors inside the motor/generator controller has failed.		Replace the motor/generator controller.

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59	Main Contactor – Open Failure	Motor/Generator controller	This fault is reported when the voltages across the main contactor are supposed to be the same, but they are different.		1) Test the main 48 Vdc contactor. 2) Test the control wiring for the contactor coil.
60	Main Contactor – Closed	Motor/Generator controller	This fault is reported when the voltages across the main contactor are supposed to be the different, but they are the same.		1) Test the voltage across the coil of the contactor. 2) Replace the contactor.
61	Main Contactor – Over Current	Motor/Generator controller	This fault is reported when too much current flows through the main contactor.		Replace the motor/generator controller.
62	Motor/Generator Fault Latch – Phase Over Current	Motor/Generator controller	This fault is reported when the motor/generator controller senses excessive current draw through the motor/generator or the controller itself.		Replace the motor/generator controller.

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63	48V Precharge Failure	Motor/Generator controller	This fault is reported when a minimum voltage of 38 Vdc was not achieved on the 48V precharge circuit.		1) Disconnect all 5 cutting reel motors and attempt to start the engine. 2) If the engine starts, connect 1 cutting reel motor at a time with the key off until connecting a reel motor causes the fault. 3) Replace the faulty cutting reel motor. 4) If all cutting reel motors are good, test the 48 V logic power and ground wiring in the main harness.
64	Temperature Sensor Failure	Motor/Generator controller	This fault is reported when the field effect transistor (FET) and motor temperature sensors fail inside the motor/generator.		Replace the motor generator controller.
65	Speed Stall – Cutting Reel Motor 1	Motor/Generator controller	This fault is reported when the cutting reel motor on cutting unit 1 stalls due to heavy cutting conditions or because of a cutting unit malfunction.	• When any individual cutting reel motor is shut off due to a fault, the TEC-5002 shuts off the other 4 cutting reel motors. • You can only swap cutting unit 1 with cutting units 3 or 5.	1) Inspect the cutting unit for any debris clogging the reel. 2) Check the bedknife adjustment and inspect the condition of the reel. 3) Swap cutting reel motors between cutting units. 4) Replace faulty cutting unit motors. 5) Swap cutting units. 6) Inspect the cutting reel motor wiring. 7) Measure 48 Vdc power in connectors P46 and P47. 8) Test for power and ground in connectors P46 and P47. 9) Test the CAN bus wiring in connector P46.

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66	Speed Stall – Cutting Reel Motor 2	Motor/Generator controller	This fault is reported when the cutting reel motor on cutting unit 2 stalls due to heavy cutting conditions or because of a cutting unit malfunction.	• When any individual cutting reel motor is shut off due to a fault, the TEC-5002 shuts off the other 4 cutting reel motors. • You can only swap cutting unit 2 with cutting unit 4.	1) Inspect the cutting unit for any debris clogging the reel. 2) Check the bedknife adjustment and inspect the condition of the reel. 3) Swap cutting reel motors between cutting units. 4) Replace faulty cutting unit motors. 5) Swap cutting units. 6) Inspect the cutting reel motor wiring. 7) Measure 48 Vdc power in connectors P38 and P39. 8) Test for power and ground in connectors P38 and P39. 9) Test the CAN bus wiring in connector P38.
67	Speed Stall – Cutting Reel Motor 3	Motor/Generator controller	This fault is reported when the cutting reel motor on cutting unit 3 stalls due to heavy cutting conditions or because of a cutting unit malfunction.	• When any individual cutting reel motor is shut off due to a fault, the TEC-5002 shuts off the other 4 cutting reel motors. • You can only swap cutting unit 3 with cutting units 1 or 5.	1) Inspect the cutting unit for any debris clogging the reel. 2) Check the bedknife adjustment and inspect the condition of the reel. 3) Swap cutting reel motors between cutting units. 4) Replace faulty cutting unit motors. 5) Swap cutting units. 6) Inspect the cutting reel motor wiring. 7) Measure 48 Vdc power in connectors P40 and P41. 8) Test for power and ground in connectors P40 and P41. 9) Test the CAN bus wiring in connector P40.

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68	Speed Stall – Cutting Reel Motor 4	Motor/Generator controller	This fault is reported when the cutting reel motor on cutting unit 4 stalls due to heavy cutting conditions or because of a cutting unit malfunction.	• When any individual cutting reel motor is shut off due to a fault, the TEC-5002 shuts off the other 4 cutting reel motors. • You can only swap cutting unit 4 with cutting unit 2.	1) Inspect the cutting unit for any debris clogging the reel. 2) Check the bedknife adjustment and inspect the condition of the reel. 3) Swap cutting reel motors between cutting units. 4) Replace faulty cutting unit motors. 5) Swap cutting units. 6) Inspect the cutting reel motor wiring. 7) Measure 48 Vdc power in connectors P48 and P49. 8) Test for power and ground in connectors P48 and P49. 9) Test the CAN bus wiring in connector P48.
69	Speed Stall – Cutting Reel Motor 5	Motor/Generator controller	This fault is reported when the cutting reel motor on cutting unit 5 stalls due to heavy cutting conditions or because of a cutting unit malfunction.	• When any individual cutting reel motor is shut off due to a fault, the TEC-5002 shuts off the other 4 cutting reel motors. • You can only swap cutting unit 5 with cutting units 1 or 3.	1) Inspect the cutting unit for any debris clogging the reel. 2) Check the bedknife adjustment and inspect the condition of the reel. 3) Swap cutting reel motors between cutting units. 4) Replace faulty cutting unit motors. 5) Swap cutting units. 6) Inspect the cutting reel motor wiring. 7) Measure 48 Vdc power in connectors P44 and P45. 8) Test for power and ground in connectors P44 and P45. 9) Test the CAN bus wiring in connector P44.

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70	High Temperature Warning – Cutting Reel Motor 1	Cutting Reel Motor Controller	This fault is reported when the cutting reel motor temperature exceeds 194 ºF (90 ºC).	• If the reel motor temperature reaches 212 ºF (100 ºC), the reel motor will be shut off. • A side effect of this fault is reduced reel speed and an increased chance of a Fault 65, Speed Stall – CRM 1.	1) Reduce mowing speed and open the rear discharge of the cutting unit. 2) Check for any mechanical interference and adjustment within the cutting unit. 3) Swap cutting reel motors between cutting units. 4) Replace cutting reel motor if faulty. 5) Swap cutting unit position. 6) Inspect the cutting unit wiring 7) Measure main harness connectors P46 and P47 for 48 Vdc. 8) With key off, test P46 and P47 for proper resistance.
71	High Temperature Warning – Cutting Reel Motor 2	Cutting Reel Motor Controller	This fault is reported when the cutting reel motor temperature exceeds 194 ºF (90 ºC).	• If the reel motor temperature reaches 212 ºF (100 ºC), the reel motor will be shut off. • A side effect of this fault is reduced reel speed and an increased chance of a Fault 66, Speed Stall – CRM 2.	1) Reduce mowing speed and open the rear discharge of the cutting unit. 2) Check for any mechanical interference and adjustment within the cutting unit. 3) Swap cutting reel motors between cutting units. 4) Replace cutting reel motor if faulty. 5) Swap cutting unit position. 6) Inspect the cutting unit wiring. 7) Measure main harness connectors P38 and P39 for 48 Vdc. 8) With key off, test P38 and P39 for proper resistance.

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72	High Temperature Warning – Cutting Reel Motor 3	Cutting Reel Motor Controller	This fault is reported when the cutting reel motor temperature exceeds 194 ºF (90 ºC).	• If the reel motor temperature reaches 212 ºF (100 ºC), the reel motor will be shut off. • A side effect of this fault is reduced reel speed and an increased chance of a Fault 67, Speed Stall – CRM 3.	1) Reduce mowing speed and open the rear discharge of the cutting unit. 2) Check for any mechanical interference and adjustment within the cutting unit. 3) Swap cutting reel motors between cutting units. 4) Replace cutting reel motor if faulty. 5) Swap cutting unit position. 6) Inspect the cutting unit wiring. 7) Measure main harness connectors P40 and P41 for 48 Vdc. 8) With key off, test P40 and P41 for proper resistance.
73	High Temperature Warning – Cutting Reel Motor 4	Cutting Reel Motor Controller	This fault is reported when the cutting reel motor temperature exceeds 194 ºF (90 ºC).	• If the reel motor temperature reaches 212 ºF (100 ºC), the reel motor will be shut off. • A side effect of this fault is reduced reel speed and an increased chance of a Fault 68, Speed Stall – CRM 4.	1) Reduce mowing speed and open the rear discharge of the cutting unit. 2) Check for any mechanical interference and adjustment within the cutting unit. 3) Swap cutting reel motors between cutting units. 4) Replace cutting reel motor if faulty. 5) Swap cutting unit position. 6) Inspect the cutting unit wiring. 7) Measure main harness connectors P48 and P49 for 48 Vdc. 8) With key off, test P48 and P49 for proper resistance.

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74	High Temperature Warning – Cutting Reel Motor 5	Cutting Reel Motor Controller	This fault is reported when the cutting reel motor temperature exceeds 194 ºF (90 ºC).	• If the reel motor temperature reaches 212 ºF (100 ºC), the reel motor will be shut off. • A side effect of this fault is reduced reel speed and an increased chance of a Fault 69, Speed Stall – CRM 5.	1) Reduce mowing speed and open the rear discharge of the cutting unit. 2) Check for any mechanical interference and adjustment within the cutting unit. 3) Swap cutting reel motors between cutting units. 4) Replace cutting reel motor if faulty. 5) Swap cutting unit position. 6) Inspect the cutting unit wiring. 7) Measure main harness connectors P44 and P45 for 48 Vdc. 8) With key off, test P44 and P45 for proper resistance.
75	High Temperature Warning – Motor/Generator	Motor/Generator controller	This fault is reported when the temperature inside the motor/generator exceeds the design limit.	• When the temperature of the motor/generator rises to the over-temperature range, the controller for the motor/generator reduces electrical current in relation to the motor/generator temperature. This could result to a 48V system undervoltage warning or fault. • If the absolute overtemp value is reached, the cutting reel motors are disabled and the motor/generator stops generating until the fault is no longer active.	1) Make sure the hood screen is clean. 2) Check that the air intake for the motor/generator is not blocked. 3) Allow the machine to cool.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
76	48V Key Switch Low Voltage – Cutting Reel Motor 1	Cutting Reel Motor Controller	A key switch undervoltage fault is reported when the cutting reel motor measures a logic voltage lower than 32 Vdc.	• For this fault, the term “key switch” refers to the 48 Vdc logic power circuit, not to the ignition switch. • If more than 1 cutting reel motor is reporting a key switch undervolt fault, the problem is more likely to be with the 48 Vdc system voltage. Perform the Recommended Service Actions for fault 31.	1) Inspect the wiring for cutting reel motor 1 for damage, corrosion, foreign debris, and proper alignment and seating of the pins inside the connectors. 2) With the ignition key on, check for 48 Vdc power in connectors P46 and P47. 3) Perform resistance tests for 48V logic power in main harness connectors P46 and P47. 4) Swap cutting reel motors between cutting units and replace cutting reel motor if faulty.
77	48V Key Switch Low Voltage – Cutting Reel Motor 2	Cutting Reel Motor Controller	A key switch undervoltage fault is reported when the cutting reel motor measures a logic voltage lower than 32 Vdc.	• For this fault, the term “key switch” refers to the 48 Vdc logic power circuit, not to the ignition switch. • If more than 1 cutting reel motor is reporting a key switch undervolt fault, the problem is more likely to be with the 48 Vdc system voltage. Perform the Recommended Service Actions for fault 31.	1) Inspect the wiring for cutting reel motor 1 for damage, corrosion, foreign debris, and proper alignment and seating of the pins inside the connectors. 2) With the ignition key on, check for 48 Vdc power in connectors P38 and P39. 3) Perform resistance tests for 48V logic power in main harness connectors P38 and P39. 4) Swap cutting reel motors between cutting units and replace cutting reel motor if faulty.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
78	48V Key Switch Low Voltage – Cutting Reel Motor 3	Cutting Reel Motor Controller	A key switch undervoltage fault is reported when the cutting reel motor measures a logic voltage lower than 32 Vdc.	• For this fault, the term “key switch” refers to the 48 Vdc logic power circuit, not to the ignition switch. • If more than 1 cutting reel motor is reporting a key switch undervolt fault, the problem is more likely to be with the 48 Vdc system voltage. Perform the Recommended Service Actions for fault 31.	1) Inspect the wiring for cutting reel motor 1 for damage, corrosion, foreign debris, and proper alignment and seating of the pins inside the connectors. 2) With the ignition key on, check for 48 Vdc power in connectors P40 and P41. 3) Perform resistance tests for 48V logic power in main harness connectors P40 and P41. 4) Swap cutting reel motors between cutting units and replace cutting reel motor if faulty.
79	48V Key Switch Low Voltage – Cutting Reel Motor 4	Cutting Reel Motor Controller	A key switch undervoltage fault is reported when the cutting reel motor measures a logic voltage lower than 32 Vdc.	• For this fault, the term “key switch” refers to the 48 Vdc logic power circuit, not to the ignition switch. • If more than 1 cutting reel motor is reporting a key switch undervolt fault, the problem is more likely to be with the 48 Vdc system voltage. Perform the Recommended Service Actions for fault 31.	1) Inspect the wiring for cutting reel motor 1 for damage, corrosion, foreign debris, and proper alignment and seating of the pins inside the connectors. 2) With the ignition key on, check for 48 Vdc power in connectors P48 and P49. 3) Perform resistance tests for 48V logic power in main harness connectors P48 and P49. 4) Swap cutting reel motors between cutting units and replace cutting reel motor if faulty.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
80	48V Key Switch Low Voltage – Cutting Reel Motor 5	Cutting Reel Motor Controller	A key switch undervoltage fault is reported when the cutting reel motor measures a logic voltage lower than 32 Vdc.	• For this fault, the term “key switch” refers to the 48 Vdc logic power circuit, not to the ignition switch. • If more than 1 cutting reel motor is reporting a key switch undervolt fault, the problem is more likely to be with the 48 Vdc system voltage. Perform the Recommended Service Actions for fault 31.	1) Inspect the wiring for cutting reel motor 1 for damage, corrosion, foreign debris, and proper alignment and seating of the pins inside the connectors. 2) With the ignition key on, check for 48 Vdc power in connectors P44 and P45. 3) Perform resistance tests for 48V logic power in main harness connectors P44 and P45. 4) Swap cutting reel motors between cutting units and replace cutting reel motor if faulty.
81	48V Key Switch Low Voltage – Motor/Generator	Motor/Generator controller	The motor/generator controller detects that the 48 Vdc logic voltage is below the minimum of 36 Vdc, and has disabled the motor/generator.	• This fault can occur because of a key switch issue. Therefore, if this fault condition coincides with starting the machine, inspect the key switch. • If more than 1 cutting reel motor is reporting a key switch undervolt fault, the problem is more likely to be with the 48 Vdc system voltage. Perform the Recommended Service Actions for fault 31.	1) Test the power and ground wiring by checking for resistance in main harness connector P37. 2) With the key off, check for 46-54V at the main contactor. 3) With the engine running, test the 48V battery pack for 46-58 Vdc. 4) If the voltage test fails, replace the motor/generator assembly.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
82	48V Key Switch High Voltage – Cutting Reel Motor 1	Cutting Reel Motor Controller	Cutting reel motor 1 has detected that the 48 Vdc logic voltage has exceeded the high voltage limit. This fault causes the cutting reel motor to be disabled.	• For this fault, the term "key switch" refers to the 48 Vdc logic power circuit, not to the ignition switch. • All 48 Vdc devices are connected to the same 48 Vdc bus. If this is a system issue, the TEC-5002 combines all 6 of the 48V Key Switch Overvolt faults (faults 82 through 87) into a single fault (fault 31).	1) Swap cutting reel motors between cutting units. If the fault moves with the motor to the new location, replace the motor. 2) If the fault remains at cutting reel unit 1, inspect connectors P46 and P47 at cutting reel motor 1 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) With the engine off and the key on, check for 48 Vdc at connector P47. 4) Test connectors P46 and P47 for continuity in the main harness and repair any worn or damaged parts.
83	48V Key Switch High Voltage – Cutting Reel Motor 2	Cutting Reel Motor Controller	Cutting reel motor 2 has detected that the 48 Vdc logic voltage has exceeded the high voltage limit. This fault causes the cutting reel motor to be disabled.	• For this fault, the term "key switch" refers to the 48 Vdc logic power circuit, not to the ignition switch. • All 48 Vdc devices are connected to the same 48 Vdc bus. If this is a system issue, the TEC-5002 combines all 6 of the 48V Key Switch Overvolt faults (faults 82 through 87) into a single fault (fault 31).	1) Swap cutting reel motors between cutting units. If the fault moves with the motor to the new location, replace the motor. 2) If the fault remains at cutting reel unit 2, inspect connectors P38 and P39 at cutting reel motor 1 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) With the engine off and the key on, check for 48 Vdc at connector P39. 4) Test connectors P38 and P39 for continuity in the main harness and repair any worn or damaged parts.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
84	48V Key Switch High Voltage – Cutting Reel Motor 3	Cutting Reel Motor Controller	Cutting reel motor 3 has detected that the 48 Vdc logic voltage has exceeded the high voltage limit. This fault causes the cutting reel motor to be disabled.	• For this fault, the term "key switch" refers to the 48 Vdc logic power circuit, not to the ignition switch. • All 48 Vdc devices are connected to the same 48 Vdc bus. If this is a system issue, the TEC-5002 combines all 6 of the 48V Key Switch Overvolt faults (faults 82 through 87) into a single fault (fault 31).	1) Swap cutting reel motors between cutting units. If the fault moves with the motor to the new location, replace the motor. 2) If the fault remains at cutting reel unit 3, inspect connectors P40 and P41 at cutting reel motor 1 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) With the engine off and the key on, check for 48 Vdc at connector P41. 4) Test connectors P40 and P41 for continuity in the main harness and repair any worn or damaged parts.
85	48V Key Switch High Voltage – Cutting Reel Motor 4	Cutting Reel Motor Controller	Cutting reel motor 4 has detected that the 48 Vdc logic voltage has exceeded the high voltage limit. This fault causes the cutting reel motor to be disabled.	• For this fault, the term "key switch" refers to the 48 Vdc logic power circuit, not to the ignition switch. • All 48 Vdc devices are connected to the same 48 Vdc bus. If this is a system issue, the TEC-5002 combines all 6 of the 48V Key Switch Overvolt faults (faults 82 through 87) into a single fault (fault 31).	1) Swap cutting reel motors between cutting units. If the fault moves with the motor to the new location, replace the motor. 2) If the fault remains at cutting reel unit 4, inspect connectors P48 and P49 at cutting reel motor 1 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) With the engine off and the key on, check for 48 Vdc at connector P49. 4) Test connectors P48 and P49 for continuity in the main harness and repair any worn or damaged parts.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
86	48V Key Switch High Voltage – Cutting Reel Motor 5	Cutting Reel Motor Controller	Cutting reel motor 5 has detected that the 48 Vdc logic voltage has exceeded the high voltage limit. This fault causes the cutting reel motor to be disabled.	• For this fault, the term “key switch” refers to the 48 Vdc logic power circuit, not to the ignition switch. • All 48 Vdc devices are connected to the same 48 Vdc bus. If this is a system issue, the TEC-5002 combines all 6 of the 48V Key Switch Overvolt faults (faults 82 through 87) into a single fault (fault 31).	1) Swap cutting reel motors between cutting units. If the fault moves with the motor to the new location, replace the motor. 2) If the fault remains at cutting reel unit 5, inspect connectors P44 and P45 at cutting reel motor 1 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) With the engine off and the key on, check for 48 Vdc at connector P45. 4) Test connectors P44 and P45 for continuity in the main harness and repair any worn or damaged parts.
87	48V Key Switch Overvolt—M/G	Motor/Generator	The motor/generator (M/G) controller has detected that the logic voltage has exceeded the high voltage limit.	If only the motor/generator is reporting a 48V Key Switch Overvolt fault, the problem is more likely to be with the 48 Vdc logic power connection to the motor/generator.	1) With the engine shut off, test for 46–54 Vdc across the main contactor. 2) With the engine running, measure the voltage across the contactor. The reading should be 46–58 Vdc. 3) Replace the motor/generator controller.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
88	48V Bus Undervolt—CRM 1	Cutting Reel Motor Controller	The cutting reel motor detects that the 48 Vdc bus voltage is measured at less than 32 Vdc.	All 48 Vdc devices are connected to the same 48 Vdc bus. If this is a system issue, the TEC-5002 combines all 6 of the 48 Vdc Bus Undervolt faults (faults 88 through 93) and reports a fault 29 (48V Battery Low Voltage).	1) Test fuse F2-1 (35 amp) (resistance should be 1 ohm or less). 2) Inspect main harness connectors P46 and P47 at cutting reel motor 1 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) With the engine off and the key on, test main harness connectors P46 and P47 for 48 Vdc. 4) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position.
89	48V Bus Undervolt—CRM 2	Cutting Reel Motor Controller	The cutting reel motor detects that the 48 Vdc bus voltage is measured at less than 32 Vdc.	All 48 Vdc devices are connected to the same 48 Vdc bus. If this is a system issue, the TEC-5002 combines all 6 of the 48 Vdc Bus Undervolt faults (faults 88 through 93) and reports a fault 29 (48V Battery Low Voltage).	1) Test fuse F2-2 (35 amp) (resistance should be 1 ohm or less). 2) Inspect main harness connectors P38 and P39 at cutting reel motor 1 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) With the engine off and the key on, test main harness connectors P38 and P39 for 48 Vdc. 4) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
90	48V Bus Undervolt—CRM 3	Cutting Reel Motor Controller	The cutting reel motor detects that the 48 Vdc bus voltage is measured at less than 32 Vdc.	All 48 Vdc devices are connected to the same 48 Vdc bus. If this is a system issue, the TEC-5002 combines all 6 of the 48 Vdc Bus Undervolt faults (faults 88 through 93) and reports a fault 29 (48V Battery Low Voltage).	1) Test fuse F2-3 (35 amp) (resistance should be 1 ohm or less). 2) Inspect main harness connectors P40 and P41 at cutting reel motor 1 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) With the engine off and the key on, test main harness connectors P40 and P41 for 48 Vdc. 4) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position.
91	48V Bus Undervolt—CRM 4	Cutting Reel Motor Controller	The cutting reel motor detects that the 48 Vdc bus voltage is measured at less than 32 Vdc.	All 48 Vdc devices are connected to the same 48 Vdc bus. If this is a system issue, the TEC-5002 combines all 6 of the 48 Vdc Bus Undervolt faults (faults 88 through 93) and reports a fault 29 (48V Battery Low Voltage).	1) Test fuse F2-4 (35 amp) (resistance should be 1 ohm or less). 2) Inspect main harness connectors P48 and P49 at cutting reel motor 1 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) With the engine off and the key on, test main harness connectors P48 and P49 for 48 Vdc. 4) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
92	48V Bus Undervolt—CRM 5	Cutting Reel Motor Controller	The cutting reel motor detects that the 48 Vdc bus voltage is measured at less than 32 Vdc.	All 48 Vdc devices are connected to the same 48 Vdc bus. If this is a system issue, the TEC-5002 combines all 6 of the 48 Vdc Bus Undervolt faults (faults 88 through 93) and reports a fault 29 (48V Battery Low Voltage).	1) Test fuse F2-5 (35 amp) (resistance should be 1 ohm or less). 2) Inspect main harness connectors P44 and P45 at cutting reel motor 1 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) With the engine off and the key on, test main harness connectors P44 and P45 for 48 Vdc. 4) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position.
93	48V Bus Undervolt—M/G	Motor/Generator Controller	The motor/generator controller has detected that the 48 Vdc bus dropped below the low voltage limit.	The TEC-5002 filters this fault and allows it to occur only when the motor/generator contactor is closed.	1) Test the main 48 Vdc contactor. 2) Test the control wiring for the contactor coil. 3) Check the voltage across the contactor with the key on (it should be 0 Vdc). 4) Inspect main harness connector P37 at the motor/generator for damage, corrosion, debris, and proper alignment of the pins inside the connectors.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
94	48V Bus Overvolt—CRM 1	Cutting Reel Motor Controller	Cutting reel motor 1 has detected 67.5 Vdc or more on the 48 Vdc bus.	• This fault can also occur if the TEC-5002 loses communication with the motor/generator and reverts to limp mode. • When the TEC-5002 loses communication, it loses engine speed control, and the mechanical governor limits engine speed to 3,200 rpm.	1) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position. 2) Inspect main harness connectors P46 and P47 at cutting reel motor 1 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) Test connectors P46 and P47 for 48V with the engine off and the key in the ON position. 4) Test the power and ground wiring resistance in main harness connectors P46 and P47.
95	48V Bus Overvolt—CRM 2	Cutting Reel Motor Controller	Cutting reel motor 2 has detected 67.5 Vdc or more on the 48 Vdc bus.	• This fault can also occur if the TEC-5002 loses communication with the motor/generator and reverts to limp mode. • When the TEC-5002 loses communication, it loses engine speed control, and the mechanical governor limits engine speed to 3,200 rpm.	1) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position. 2) Inspect main harness connectors P38 and P39 at cutting reel motor 2 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) Test connectors P38 and P39 for 48V with the engine off and the key in the ON position. 4) Test the power and ground wiring resistance in main harness connectors P38 and P39.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
96	48V Bus Overvolt—CRM 3	Cutting Reel Motor Controller	Cutting reel motor 3 has detected 67.5 Vdc or more on the 48 Vdc bus.	• This fault can also occur if the TEC-5002 loses communication with the motor/generator and reverts to limp mode. • When the TEC-5002 loses communication, it loses engine speed control, and the mechanical governor limits engine speed to 3,200 rpm.	1) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position. 2) Inspect main harness connectors P40 and P41 at cutting reel motor 3 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) Test connectors P40 and P41 for 48V with the engine off and the key in the ON position. 4) Test the power and ground wiring resistance in main harness connectors P40 and P41.
97	48V Bus Overvolt—CRM 4	Cutting Reel Motor Controller	Cutting reel motor 4 has detected 67.5 Vdc or more on the 48 Vdc bus.	• This fault can also occur if the TEC-5002 loses communication with the motor/generator and reverts to limp mode. • When the TEC-5002 loses communication, it loses engine speed control, and the mechanical governor limits engine speed to 3,200 rpm.	1) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position. 2) Inspect main harness connectors P48 and P49 at cutting reel motor 4 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) Test connectors P48 and P49 for 48V with the engine off and the key in the ON position. 4) Test the power and ground wiring resistance in main harness connectors P48 and P49.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
98	48V Bus Overvolt—CRM 5	Cutting Reel Motor Controller	Cutting reel motor has detected 67.5 Vdc or more on the 48 Vdc bus.	• This fault can also occur if the TEC-5002 loses communication with the motor/generator and reverts to limp mode. • When the TEC-5002 loses communication, it loses engine speed control, and the mechanical governor limits engine speed to 3,200 rpm.	1) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position. 2) Inspect main harness connectors P44 and P45 at cutting reel motor 5 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) Test connectors P44 and P45 for 48V with the engine off and the key in the ON position. 4) Test the power and ground wiring resistance in main harness connectors P44 and P45.
99	48V Bus Overvolt—M/G	Motor/Generator Controller	The 48 Vdc bus circuit has exceeded an over-voltage set point (65 Vdc).	• This fault can also occur if the TEC-5002 loses communication with the motor/generator and reverts to limp mode. • When the TEC-5002 loses communication, it loses engine speed control, and the mechanical governor limits engine speed to 3,200 rpm. • If more than 1 cutting reel motor and the motor/generator are reporting a 48V Bus Overvolt, the problem is more likely to be with the 48 Vdc bus voltage. Perform the Recommended Service Actions for fault 30.	1) With the engine off, check the 48 Vdc battery system across the main contactor. It should be 46-54 Vdc. 2) With the engine running, check the 48 Vdc battery system. It should be 46-58 Vdc. 3) Replace the motor/generator controller if the 48 Vdc battery system tests fail.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
100	Over Current Disable – CRM 1	Cutting Reel Motor Controller	Cutting reel motor 1 has detected excessive current draw and has been disabled.	Check the InfoCenter for fault 65 (Speed Stall—CRM 1) or fault 70 (High Temp Warning—CRM 1), as an overheated cutting reel motor or a cutting reel motor stall could be a contributing factor to a fault 100.	1) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position. 2) Inspect main harness connectors P46 and P47 at cutting reel motor 1 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) Test connectors P46 and P47 for 48V with the engine off and the key in the ON position. 4) Test the power and ground wiring resistance in main harness connectors P46 and P47.
101	Over Current Disable – CRM 2	Cutting Reel Motor Controller	Cutting reel motor 2 has detected excessive current draw and has been disabled.	Check the InfoCenter for fault 66 (Speed Stall—CRM 2) or fault 71 (High Temp Warning—CRM 2), as an overheated cutting reel motor or a cutting reel motor stall could be a contributing factor to a fault 101.	1) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position. 2) Inspect main harness connectors P38 and P39 at cutting reel motor 2 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) Test connectors P38 and P39 for 48V with the engine off and the key in the ON position. 4) Test the power and ground wiring resistance in main harness connectors P38 and P39.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
102	Over Current Disable – CRM 3	Cutting Reel Motor Controller	Cutting reel motor 3 has detected excessive current draw and has been disabled.	Check the InfoCenter for fault 67 (Speed Stall—CRM 3) or fault 72 (High Temp Warning—CRM 3), as an overheated cutting reel motor or a cutting reel motor stall could be a contributing factor to a fault 102.	1) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position. 2) Inspect main harness connectors P40 and P41 at cutting reel motor 3 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) Test connectors P40 and P41 for 48V with the engine off and the key in the ON position. 4) Test the power and ground wiring resistance in main harness connectors P40 and P41.
103	Over Current Disable – CRM 4	Cutting Reel Motor Controller	Cutting reel motor 4 has detected excessive current draw and has been disabled.	Check the InfoCenter for fault 68 (Speed Stall—CRM 4) or fault 73 (High Temp Warning—CRM 4), as an overheated cutting reel motor or a cutting reel motor stall could be a contributing factor to a fault 103.	1) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position. 2) Inspect main harness connectors P48 and P49 at cutting reel motor 4 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) Test connectors P48 and P49 for 48V with the engine off and the key in the ON position. 4) Test the power and ground wiring resistance in main harness connectors P48 and P49.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
104	Over Current Disable – CRM 5	Cutting Reel Motor Controller	Cutting reel motor 5 has detected excessive current draw and has been disabled.	Check the InfoCenter for fault 69 (Speed Stall—CRM 5) or fault 74 (High Temp Warning—CRM 5), as an overheated cutting reel motor or a cutting reel motor stall could be a contributing factor to a fault 104.	1) Swap cutting reel motors between cutting units. Replace the motor if the fault moves to the new position. 2) Inspect main harness connectors P44 and P45 at cutting reel motor 5 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) Test connectors P44 and P45 for 48V with the engine off and the key in the ON position. 4) Test the power and ground wiring resistance in main harness connectors P44 and P45.
111	Internal Regulator Overvolt – Motor/Generator	Motor/Generator Controller	Excessive voltage occurred at the motor/generator's 15 Vdc internal regulator, and disabled the motor/generator.	This fault can only be triggered by a failure of the internal motor/generator controller. Such a failure would allow voltage levels beyond engineering specifications to exist in the 48 Vdc circuitry.	Replace the motor/generator controller.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
112	Internal Regulator Undervolt – CRM 1	Cutting Reel Motor Controller	Insufficient voltage was detected at the internal voltage regulator for cutting reel motor 1.		1) Inspect main harness connectors P46 and P47 at cutting reel motor 1 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 2) Test connectors P46 and P47 for 48V with the engine off and the key in the ON position. 3) Test the power and ground wiring resistance in main harness connectors P46 and P47. 4) Replace the cutting reel motor.
113	Internal Regulator Undervolt – CRM 2	Cutting Reel Motor Controller	Insufficient voltage was detected at the internal voltage regulator for cutting reel motor 2.		1) Inspect main harness connectors P38 and P39 at cutting reel motor 2 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 2) Test connectors P38 and P39 for 48V with the engine off and the key in the ON position. 3) Test the power and ground wiring resistance in main harness connectors P38 and P39. 4) Replace the cutting reel motor.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
114	Internal Regulator Undervolt – CRM 3	Cutting Reel Motor Controller	Insufficient voltage was detected at the internal voltage regulator for cutting reel motor 3.		1) Inspect main harness connectors P40 and P41 at cutting reel motor 3 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 2) Test connectors P40 and P41 for 48V with the engine off and the key in the ON position. 3) Test the power and ground wiring resistance in main harness connectors P40 and P41. 4) Replace the cutting reel motor.
115	Internal Regulator Undervolt – CRM 4	Cutting Reel Motor Controller	Insufficient voltage was detected at the internal voltage regulator for cutting reel motor 4.		1) Inspect main harness connectors P48 and P49 at cutting reel motor 4 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 2) Test connectors P48 and P49 for 48V with the engine off and the key in the ON position. 3) Test the power and ground wiring resistance in main harness connectors P48 and P49. 4) Replace the cutting reel motor.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
116	Internal Regulator Undervolt – CRM 5	Cutting Reel Motor Controller	Insufficient voltage was detected at the internal voltage regulator for cutting reel motor 5.		1) Inspect main harness connectors P44 and P45 at cutting reel motor 5 for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 2) Test connectors P44 and P45 for 48V with the engine off and the key in the ON position. 3) Test the power and ground wiring resistance in main harness connectors P44 and P45. 4) Replace the cutting reel motor.
117	Internal Regulator Undervolt – Motor/Generator	Motor/Generator Controller	Insufficient voltage occurred at the internal voltage regulator and disabled the generator.	This fault is most likely to occur if the motor/generator loses power unexpectedly without the proper shutdown sequence.	1) With the engine off, check the 48 Vdc battery system across the main contactor. It should be 46-54 Vdc. 2) With the engine running, check the 48 Vdc battery system. It should be 46-58 Vdc. 3) Replace the motor/generator controller if the 48 Vdc battery system tests fail.
123	Motor Over Speed – M/G	Motor/Generator Controller	The measured speed of the motor/generator has exceeded 3,600 rpm.	Motor/generator rpm is limited by the electronic control of the fuel actuator and the engine mechanical governor. This fault is reported when both of those rpm limiting systems have failed, and the motor/generator is allowed to rotate at more than 3,600 rpm.	Replace the motor/generator controller.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
124	Invalid Hall State – CRM 1	Cutting Reel Motor Controller	If all 3 of the Hall effect sensors provide the same signal, an invalid Hall state is indicated and the fault is reported. No controller action is taken.	When a sensor fails, the cutting reel motor cannot maintain steady speed and becomes unstable.	1) Swap cutting reel motors between cutting units. 2) Replace the motor if the fault moves to the new position.
125	Invalid Hall State – CRM 2	Cutting Reel Motor Controller	If all 3 of the Hall effect sensors provide the same signal, an invalid Hall state is indicated and the fault is reported. No controller action is taken.	When a sensor fails, the cutting reel motor cannot maintain steady speed and becomes unstable.	1) Swap cutting reel motors between cutting units. 2) Replace the motor if the fault moves to the new position.
126	Invalid Hall State – CRM 3	Cutting Reel Motor Controller	If all 3 of the Hall effect sensors provide the same signal, an invalid Hall state is indicated and the fault is reported. No controller action is taken.	When a sensor fails, the cutting reel motor cannot maintain steady speed and becomes unstable.	1) Swap cutting reel motors between cutting units. 2) Replace the motor if the fault moves to the new position.
127	Invalid Hall State – CRM 4	Cutting Reel Motor Controller	If all 3 of the Hall effect sensors provide the same signal, an invalid Hall state is indicated and the fault is reported. No controller action is taken.	When a sensor fails, the cutting reel motor cannot maintain steady speed and becomes unstable.	1) Swap cutting reel motors between cutting units. 2) Replace the motor if the fault moves to the new position.

Fault Number	Fault Title	Controller Affected	Fault Condition/ Circuit Description	Additional Notes	Service Actions (Repair or replace any worn or damaged parts)
128	Invalid Hall State – CRM 5	Cutting Reel Motor Controller	If all 3 of the Hall effect sensors provide the same signal, an invalid Hall state is indicated and the fault is reported. No controller action is taken.	When a sensor fails, the cutting reel motor cannot maintain steady speed and becomes unstable.	1) Swap cutting reel motors between cutting units. 2) Replace the motor if the fault moves to the new position.
129	Invalid Hall State – Motor/Generator	Motor/Generator Controller	If all 3 of the Hall effect sensors provide the same signal, an invalid Hall state is indicated and the fault is reported.	Since the motor/generator reports the engine speed to the TEC-5002, the engine becomes unstable and unable to maintain the desired speed.	Replace the motor/generator.