Greensmaster 3360 and 3370 eTriFlex Diagnostic Fault Code Quick Reference Table

Count on it.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
B1007	Joystick Raise/Lower Broken	T1	This fault is reported when the joystick lower and joystick raise inputs are active at the same time.	The machine will not be capable of a raise or a lower, depending on which switch failed.	1) Test the joystick switches with the InfoCenter. 2) Inspect and test the joystick wiring and connectors (P01, P04, P05). 3) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).
B1197	Mode Switch Broken	T1	This fault is reported when two or more signals from the mode switch are active at the same time.	The traction motors are disabled. The signals begin at P43, pins 1, 3, and 6.	1) Test the mode switch and use the icons on the InfoCenter to diagnose the issue. 2) Test the wiring. 3) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).
C0051	Steering Wheel Sensor - Out of Range	SC7	This fault is reported when the steering wheel input signals are outside the permitted range.	The traction motors are disabled.	1) Test the steering wheel sensor wiring and connector (P72) on the Lord steering device. 2) Test the sensors.
C0526	Steering Angle Sensor - Out of Range	SC7	This fault is reported when the steered angle input voltages are outside the permitted range.	The traction motors are disabled.	1) Inspect and test the wiring and connector (P69) for the steering sensors on the third wheel. 2) Test the sensors.
C0528	Steering Angle Sensor - Not Responding	SC7	This fault occurs when the steering unit is trying to turn the rear wheel and the controller senses movement of the motor but senses no movement on the rear wheel (no change in analog feedback sensor).	The traction motors are disabled.	1) Test the steering sensors on the third wheel (P69). 2) Verify that the gearbox is not blocking the motor. 3) Verify that the gearbox is not damaged.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
C0529	Steering Angle Sensor Signal Correlation Fault	SC7	This fault is reported when the sum of the 2 signals on the rear angle sensor are not correlating correctly.	The traction motors are disabled.	1) Inspect and test the wiring and connector (P69) for the steering sensors on the third wheel. 2) Test the sensors.
C1013	ETR/RTR/OK to Run - Short to Battery	T1	This fault is reported when low current is detected on the Engine Control signal, indicating a short to a high (+) source.	This short could be to battery voltage or to another signal that is in a high state. The circuit starts at P01 pin 10.	1) Inspect the output circuit wiring and connectors (P01, P45, P70) for damage and corrosion. 2) Test the wiring for the engine relay coil, and the resistance of the coil itself. a) Unplug connector P01, and unplug Kawasaki harness connector from the solenoid. b) Connector P01 pin 10 to ground should be 70 to 90 ohms. 3) Test the wiring for the solenoid, and the resistance of the solenoid itself. a) Unplug connector P01, plug in the Kawasaki harness connector to the solenoid, and unplug Toro harness connector P45 from the engine relay. b) Connector P01 pin 10 to ground should be 20 to 30 ohms. 4) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
C1014	ETR/RTR/OK to Run - Short to Ground/Overcurrent	T1	This fault is reported when overcurrent is detected on the Engine Control signal, indicating a short to ground.	The circuit starts at P01 pin 10.	1) Test the circuit wiring to ground. 2) Test the wiring for the engine relay coil, and the resistance of the coil itself. a) Unplug connector P01, and unplug Kawasaki harness connector from the solenoid. b) Connector P01 pin 10 to ground should be 70 to 90 ohms. 3) Test the wiring for the solenoid, and the resistance of the solenoid itself. a) Unplug connector P01, plug in the Kawasaki harness connector to the solenoid, and unplug Toro harness connector P45 from the engine relay. b) Connector P01 pin 10 to ground should be 20 to 30 ohms. 4) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
C1015	ETR/RTR/OK to Run - Open The Circuit	T1	This fault is reported when an open circuit is detected on the Engine Control signal.	The circuit starts at P01 pin 10.	1) Test the wiring for the engine relay coil, and the resistance of the coil itself. a) Unplug connector P01, and unplug Kawasaki harness connector from the solenoid. b) Connector P01 pin 10 to ground should be 70 to 90 ohms. 2) Test the wiring for the solenoid, and the resistance of the solenoid itself. a) Unplug connector P01, plug in the Kawasaki harness connector to the solenoid, and unplug Toro harness connector P45 from the engine relay. b) Connector P01 pin 10 to ground should be 20 to 30 ohms. 3) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).
C1023	Park Brake Disengage - Short to Battery	T1	This fault is reported when low current is detected on the automatic Parking Brake Off signal, indicating a short to a high (+) source.	This short could be to battery voltage or to another signal that is in a high state. The circuit starts at P01 pin 07.	1) Inspect the output circuit wiring and connectors for damage and corrosion. 2) Test the output circuit wiring. 3) Test the resistance of the brake relay coil (should be 70 to 90 ohms). 4) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
C1024	Park Brake Disengage - Short to Ground/Overcurrent	T1	This fault is reported when overcurrent is detected on the automatic Parking Brake Off signal, indicating a short to ground.	Short circuit between the Parking Brake Off signal and ground. The circuit starts at P01 pin 07.	1) Test the circuit wiring to ground. 2) Test the resistance of the brake relay coil (should be 70 to 90 ohms). 3) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).
C1025	Park Brake Disengage - Open Circuit	T1	This fault is reported when an open circuit is detected on the automatic Parking Brake Off signal.	The circuit starts at P01 pin 07.	1) Test the output circuit wiring to the component connected. 2) Test the resistance of the brake relay coil (should be 70 to 90 ohms). 3) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).
C10C4	Steering Wheel Feel Output - Short to Ground/Overcurrent	T1	This fault is reported when overcurrent is detected on the Steering Feedback signal, indicating a short to ground.	The circuit starts at P01 pin 38.	1) Test the output circuit to ground. 2) Test the resistance of the steering wheel sensor (pin 5 to pin 6 should be approximately 10 ohms). 3) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
C10C5	Steering Wheel Feel Output - Open Circuit	T1	This fault is reported when an open circuit is detected on the Steering Feedback signal.	The circuit starts at P01 pin 38.	1) Test the output circuit wiring to the component connected. 2) Test the resistance of the steering wheel sensor (pin 5 to pin 6 should be approximately 10 ohms). 3) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).
C10E3	48V Logic Enable - Short to Battery	T1	This fault is reported when low current is detected on the Logic Relay signal, indicating a short to a high (+) source.	This short could be to battery voltage or to another signal that is in a high state. The circuit starts at P01 pin 08.	1) Inspect the output circuit wiring and the connectors for damage and corrosion. 2) Test the output circuit wiring. 3) Test the resistance of the logic relay coil (should be 68 to 82 ohms). 4) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).
C10E4	48V Logic Enable - Short to Ground/Overcurrent	T1	This fault is reported when overcurrent is detected on the Logic Relay signal, indicating a short to ground.	The circuit starts at P01 pin 08.	1) Test the circuit wiring to ground. 2) Test the resistance of the logic relay coil (should be 68 to 82 ohms). 3) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
C10E5	48V Logic Enable - Open Circuit	T1	This fault is reported when an open circuit is detected on the Logic Relay signal.	The circuit starts at P01 pin 08.	1) Test the output circuit wiring to the component connected. 2) Test the resistance of the logic relay coil (should be 68 to 82 ohms). 3) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).
C1801	Cutting Unit Motor - High Temp Shutdown	T2 T3 T4	This fault is reported when the cutting unit motor temperature is greater than 130 °C (266 °F) in the indicated cutting unit.	Disables the PTO.	1) Let the machine cool off. 2) Check the reel to bedknife contact and the condition of the cutting unit. 3) Reduce the reel speed. 4) Reduce the mow speed. 5) Test the 48V ground to the motor. 6) Swap cutting unit motors between cutting units. Replace the motor if the fault moves to the new position (includes programming the replacement motor with Toro DIAG.)
C180C	Cutting Unit Motor - High Temp Warning	T2 T3 T4	This fault is reported when the motor temperature greater than 120 °C (248 °F) in the indicated cutting unit.	Motor current is limited on a linear basis until the motor temperature reaches 130 °C (266 °F).	1) Let the machine cool off. 2) Check the reel to bedknife contact and the condition of the cutting unit. 3) Reduce the reel speed. 4) Reduce the mow speed. 5) Test the 48V ground to the motor. 6) Swap cutting unit motors between cutting units. Replace the motor if the fault moves to the new position (includes programming the replacement motor with Toro DIAG.)

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
C1811	Cutting Unit Motor Controller - High Temp Shutdown	T2 T3 T4	This fault is reported when the motor controller temperature is greater than 100 °C (212 °F) in the indicated cutting unit.	Disables the PTO.	1) Let the machine cool off. 2) Check the reel to bedknife contact and the condition of the cutting unit. 3) Reduce the reel speed. 4) Reduce the mow speed. 5) Test the 48V ground to the motor. 6) Swap cutting unit motors between cutting units. Replace the motor if the fault moves to the new position (includes programming the replacement motor with Toro DIAG.)
C181C	Cutting Unit Motor Controller - High Temp Warning	T2 T3 T4	This fault is reported when the motor controller temperature is greater than 90 °C (194 °F) in the indicated cutting unit.	Motor current is limited on a linear basis until the motor controller temperature is greater than or equal to 100 °C (210 °F).	1) Let the machine cool off. 2) Check the reel to bedknife contact and the condition of the cutting unit. 3) Reduce the reel speed. 4) Reduce the mow speed. 5) Test the 48V ground to the motor. 6) Swap cutting unit motors between cutting units. Replace the motor if the fault moves to the new position (includes programming the replacement motor with Toro DIAG.)
C1820	Cutting Unit Motor Speed Sensor - Out of Range	T2 T3 T4	This fault is reported when one of the three internal hall effect sensors fails in the indicated cutting unit.	Hall effect sensors are used to detect the motor speed. If a sensor fails, the motor will have trouble maintaining speed and may become unstable.	1) Cycle the key switch. 2) If the fault repeats, replace the motor. 3) Use Toro DIAG to program the replacement motor.
C1821	Cutting Unit Motor Speed - High	T2 T3 T4	This fault is reported when the speed of the motor in the indicated cutting unit is greater than 2,500 RPM.		1) Cycle the key switch. 2) If the fault repeats, replace the motor. 3) Use Toro DIAG to program the replacement motor.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
C1822	Cutting Unit Motor - Stall	T2 T3 T4	This fault is reported when the speed of the motor in the indicated cutting unit is 0 RPM for more than 3 seconds.	Disables the PTO.	1) Check the cutting unit and the motor for mechanical resistance. 2) Check the bedknife adjustment and the condition of the reel. 3) Try spinning the motor without a load. If it doesn't spin, replace the motor. 4) Use Toro DIAG to program the replacement motor.
C1831	Cutting Unit Motor Internal Regulator Voltage - High	T2 T3 T4	This fault is reported when the internal regulator voltage in the indicated cutting unit is greater than 15V.		1) Cycle the key switch. 2) If the fault repeats, replace the motor. 3) Use Toro DIAG to program the replacement motor.
C1832	Cutting Unit Motor Internal Regulator Voltage - Low	T2 T3 T4	This fault is reported when the internal regulator voltage in the indicated cutting unit is less than 10V.	Disables the PTO. Note: If this fault is present on multiple cutting unit motors, check the 48V logic relay and connector P47.	1) Inspect all cutting unit wiring and connectors. 2) Inspect the battery terminals. 3) Swap cutting unit motors between cutting units. Replace the motor if the fault moves to the new position (includes programming the replacement motor with Toro DIAG.)
C1841	Cutting Unit Motor Logic Voltage - High	T2 T3 T4	This fault is reported when the indicated cutting unit measures the 48V logic voltage at greater than 67.5V.	Disables the PTO. Note: If more than one Logic Voltage - High faults are reported, go to fault U1501 and follow the listed service actions.	1) Swap cutting unit motors between cutting units. Replace the motor if the fault moves to the new position (includes programming the replacement motor with Toro DIAG.). 2) Inspect the harness connectors at the cutting unit motor for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) Test the connectors for 48V with the engine shut off and the key in the On position. 4) Test the power and ground wiring resistance in the harness connectors.

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C1842	Cutting Unit Motor Logic Voltage - Low	T2 T3 T4	This fault is reported when the indicated cutting unit measures the 48V logic voltage at less than 32V.	Disables the PTO. Note: If more than one Logic Voltage - Low faults are reported, go to fault U1502 and follow the listed service actions.	1) Swap cutting unit motors between cutting units. Replace the motor if the fault moves to the new position (includes programming the replacement motor with Toro DIAG.) 2) Check the 48V logic power connection to the motor.
C1851	Cutting Unit Motor Bus Voltage - High	T2 T3 T4	This fault is reported when the indicated cutting unit measures the 48V bus voltage at greater than 67.5V.	Disables the PTO. Note: If more than one Bus Voltage - High faults are reported, go to fault U1511 and follow the listed service actions.	1) Swap cutting unit motors between cutting units. Replace the motor if the fault moves to the new position (includes programming the replacement motor with Toro DIAG.). 2) Inspect the harness connectors at the cutting unit motor for damage, corrosion, debris, and proper alignment of the pins inside the connectors. 3) Test the connectors for 48V with the engine shut off and the key in the On position. 4) Test the power and ground wiring resistance in the harness connectors.
C1852	Cutting Unit Motor Bus Voltage - Low	T2 T3 T4	This fault is reported when the indicated cutting unit measures the 48V bus voltage at less than 32V.	Disables the PTO. Note: If more than one Bus Voltage - Low faults are reported, go to fault U1512 and follow the listed service actions.	1) Test the 48V bus Maxi blade fuse under the left side cover. 2) Check the 2 pin, 48V bus connector of the cutting unit motor. 3) Swap cutting unit motors between cutting units. Replace the motor if the fault moves to the new position (includes programming the replacement motor with Toro DIAG.)
C1861	Cutting Unit Motor - Over Current	T2 T3 T4	This fault is reported when the indicated cutting unit detects an internal overcurrent condition.	Disables the PTO.	1) Cycle the key switch. 2) If the fault repeats, replace the motor (includes programming the replacement motor with Toro DIAG.)

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
C1901	Lift/Lower Motor Controller - High Temp Shutdown	SC2 SC3 SC4	This fault is reported when the temperature of the indicated actuator is greater than 75 °C (167 °F).	Disables lift/lower.	1) Check for mechanical resistance in the system making the actuator work extra hard. 2) Replace the actuator. 3) Use Toro DIAG to program the replacement actuator. 4) Cycle the key switch. 5) Follow the actuator calibration instructions displayed on the InfoCenter.
C190C	Lift/Lower Motor Controller - High Temp Warning	SC2 SC3 SC4	This fault is reported when the temperature of the indicated actuator is greater than 65 °C (149 °F).	Lift/Lower speed is reduced until the actuator temperature drops below 65 °C (149 °F) or exceeds 75 °C (167 °F).	1) Check for mechanical resistance in the system making the actuator work extra hard. 2) Replace the actuator. 3) Use Toro DIAG to program the replacement actuator. 4) Cycle the key switch. 5) Follow the actuator calibration instructions displayed on the InfoCenter.
C1910	Lift/Lower Motor Speed Sensor - Out of Range	SC2 SC3 SC4	This fault is reported when an internal sensor fails in the indicated actuator.	Disables lift/lower.	1) Replace the actuator. 2) Use Toro DIAG to program the replacement actuator. 3) Cycle the key switch. 4) Follow the actuator calibration instructions displayed on the InfoCenter.
C1912	Lift/Lower Motor - Stall	SC2 SC3 SC4	This fault is reported when the indicated actuator draws the maximum allowed current.	Disables lift/lower for 5 seconds.	1) Check for mechanical resistance in the system causing the actuator to work extra hard. 2) Use the InfoCenter to recalibrate the actuators. 3) Replace the actuator. 4) Use Toro DIAG to program the replacement actuator. 5) Cycle the key switch. 6) Follow the actuator calibration instructions displayed on the InfoCenter.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
C1919	Lift/Lower Motor - Position Error	SC2 SC3 SC4	This fault is reported when an internal sensor fails in the indicated actuator.	Disables lift/lower.	1) Verify proper power and ground to the actuator. 2) Replace the actuator. 3) Use Toro DIAG to program the replacement actuator. 4) Cycle the key switch. 5) Follow the actuator calibration instructions displayed on the InfoCenter.
C1921	Lift/Lower Motor Logic Voltage - High	SC2 SC3 SC4	This fault is reported when the indicated actuator measures the 48V logic voltage at greater than 67.5V.	Disables lift/lower. Note: If more than one Logic Voltage - High faults are reported, go to fault U1501 and follow the listed service actions.	1) Check the logic power connection to the actuator. 2) Replace the actuator. 3) Use Toro DIAG to program the replacement actuator. 4) Cycle the key switch. 5) Follow the actuator calibration instructions displayed on the InfoCenter.
C1922	Lift/Lower Motor Logic Voltage - Low	SC2 SC3 SC4	This fault is reported when the indicated actuator measures the 48V logic voltage at less than 32V.	Disables lift/lower. Note: If more than one Logic Voltage - Low faults are reported, go to fault U1502 and follow the listed service actions.	1) Check the logic power connection to the actuator. 2) Replace the actuator. 3) Use Toro DIAG to program the replacement actuator. 4) Cycle the key switch. 5) Follow the actuator calibration instructions displayed on the InfoCenter.
C1931	Lift/Lower Motor Bus Voltage - High	SC2 SC3 SC4	This fault is reported when the indicated actuator measures the 48V bus voltage at greater than 67.5V.	Disables lift/lower. Note: If more than one Bus Voltage - High faults are reported, go to fault U1511 and follow the listed service actions.	1) Check the bus power connection to the actuator. 2) Replace the actuator. 3) Use Toro DIAG to program the replacement actuator. 4) Cycle the key switch. 5) Follow the actuator calibration instructions displayed on the InfoCenter.

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C1932	Lift/Lower Motor Bus Voltage - Low	SC2 SC3 SC4	This fault is reported when the indicated actuator measures the 48V bus voltage at less than 32V.	Disables lift/lower. Note: If more than one Bus Voltage - Low faults are reported, go to fault U1512 and follow the listed service actions.	1) Test the actuator 48V bus fuse (48V standard blade fuse (under seat), connector P42). 2) Verify power and ground to the actuator. 3) Replace the actuator. 4) Use Toro DIAG to program the replacement actuator. 5) Cycle the key switch. 6) Follow the actuator calibration instructions displayed on the InfoCenter
C1941	Lift/Lower Controller - Internal Software Failure	SC2 SC3 SC4	This fault is reported when the indicated actuator detects an internal software failure.	Disables lift/lower.	1) Use Toro DIAG to reprogram the existing actuator. 2) Replace the actuator. 3) Use Toro DIAG to program the replacement actuator. 4) Cycle the key switch. 5) Follow the actuator calibration instructions displayed on the InfoCenter.
C1942	Lift/Lower Motor Overload	SC2 SC3 SC4	This fault is reported when the indicated actuator draws 3 amps for more than 10 seconds and reaches an overload condition.	Disables lift/lower for 30 seconds.	1) Let the actuator rest for 30 seconds. 2) Use the InfoCenter to recalibrate the actuators. 3) Replace the actuator. 4) Use Toro DIAG to program the replacement actuator. 5) Cycle the key switch. 6) Follow the actuator calibration instructions displayed on the InfoCenter.

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C1A01	Steering Motor - High Temp Shutdown	SC7	This fault is reported when the temperature of the steering motor is greater than 120 °C (248 °F).	The traction motors are disabled, and steering is disabled.	1) Check for extra mechanical load on the steering unit assembly. 2) Allow steering unit assembly to cool down. 3) If the fault repeats, replace the steering unit assembly. 4) Use Toro DIAG to program the replacement steering unit assembly. 5) Cycle the key switch. 6) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)
C1A11	Steering Motor Controller - High Temp Shutdown	SC7	This fault is reported when the temperature of the controller in the steering unit assembly is greater than 80 °C (176 °F).	The traction motors are disabled, and steering is disabled.	1) Check for extra mechanical load on the steering unit assembly. 2) Allow the steering unit assembly to cool down. 3) If the fault repeats, replace the steering unit assembly. 4) Use Toro DIAG to program the replacement steering unit assembly. 5) Cycle the key switch. 6) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)
C1A20	Steering Motor Speed Sensor - Out of Range	SC7	This fault is reported when a sensor fails inside the motor.	The traction motors are disabled, and steering is disabled.	1) Replace the steering unit assembly. 2) Use Toro DIAG to program the replacement steering unit assembly. 3) Cycle the key switch. 4) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
C1A22	Steering Motor - Stall	SC7	This fault is reported when the steering motor draws too much current for too long (longer than 1 second when the traction speed is higher than 15%, or longer than 5 seconds when the traction speed is lower than 5%).	The traction motors are disabled, and steering is disabled.	1) Check for a physical obstruction that is stopping the steering system from turning. 2) Replace the steering unit assembly. 3) Use Toro DIAG to program the replacement steering unit assembly. 4) Cycle the key switch. 5) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)
C1A27	Steering Motor Position Error	SC7	This fault is reported when there is a disagreement between the motor encoder in the steering unit assembly and external steering range sensor.	Traction motors are disabled.	1) Verify the alignment of the position sensor. 2) Verify that the gearbox is not blocking the motor. 3) Verify that the gearbox is not damaged. 4) Verify that the wiring to the position sensor is good (at connector P69). 5) Replace the steering unit assembly. 6) Use Toro DIAG to program the replacement steering unit assembly. 7) Cycle the key switch. 8) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)
C1A32	Steering Motor Bus Voltage - Low	SC7	This fault is reported when the motor in the steering unit assembly detects that the 48V bus voltage did not reach at least 14V within 3.2 seconds of key on.	The traction motors are disabled, and steering is disabled.	1) Test the 30A standard blade fuse (under seat) for the 48V bus. 2) Verify proper power and ground to the steering unit assembly (P46). 3) Replace the steering unit assembly. 4) Use Toro DIAG to program the replacement steering unit assembly. 5) Cycle the key switch. 6) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)

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C1A41	Steering Controller - Over Current	SC7	This fault can be reported when a current sensor fails in the controller of the steering unit assembly, or when actual high current is detected for an extended period of time.	The traction motors are disabled, and steering is disabled.	1) Visually inspect the outside of the rear wheel caster fork. 2) Manually check that the rear caster fork moves easily through its entire range. 3) Replace the steering unit assembly. 4) Use Toro DIAG to program the replacement steering unit assembly. 5) Cycle the key switch. 6) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)
C1A55	Steering Motor Phase U - Open Circuit	SC7	This fault is reported when the controller in the steering unit assembly detects an open circuit on motor phase U.	The traction motors are disabled, and steering is disabled.	1) Test the 30A, 48V bus standard blade fuse (under the operator's seat) and the power connection to the 48V battery. 2) Replace the steering unit assembly. 3) Use Toro DIAG to program the replacement steering unit assembly. 4) Cycle the key switch. 5) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)
C1A5C	Steering Motor Phase V - Open Circuit	SC7	This fault is reported when the controller in the steering unit assembly detects an open circuit on motor phase V.	The traction motors are disabled, and steering is disabled.	1) Test the 30A, 48V bus standard blade fuse (under the operator's seat) and the power connection to the 48V battery. 2) Replace the steering unit assembly. 3) Use Toro DIAG to program the replacement steering unit assembly. 4) Cycle the key switch. 5) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
C1A5D	Steering Motor Phase W - Open Circuit	SC7	This fault is reported when the controller in the steering unit assembly detects an open circuit on motor phase W.	The traction motors are disabled, and steering is disabled.	1) Test the 30A, 48V bus standard blade fuse (under the operator's seat) and the power connection to the 48V battery. 2) Replace the steering unit assembly. 3) Use Toro DIAG to program the replacement steering unit assembly. 4) Cycle the key switch. 5) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)
C1A69	Steering Wheel Sensor - Feedback Noisy	SC7	This fault is reported when the controller detects electrical noise on the output of the steering wheel feedback sensor (also called the Lord steering device).	The traction motors are disabled, and steering is disabled.	1) Test the steering wheel sensor wiring (P72). 2) Replace the steering unit assembly. 3) Use Toro DIAG to program the replacement steering unit assembly. 4) Cycle the key switch. 5) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)
C1A6C	Steering Controller - Internal Hardware Failure	SC7	This fault is reported when an internal hardware component of the controller in the steering unit assembly fails.	The traction motors are disabled, and steering is disabled.	1) Replace the steering unit assembly. 2) Use Toro DIAG to program the replacement steering unit assembly. 3) Cycle the key switch. 4) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)
C1A7D	Steering Controller - Internal Software Failure	SC7	This fault is reported when an unexpected software error occurs.	The traction motors are disabled, and steering is disabled.	1) Replace the steering unit assembly. 2) Use Toro DIAG to program the replacement steering unit assembly. 3) Cycle the key switch. 4) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
C1A7E	Steering Motor Software - Hardware Incompatibility	SC7	This fault is reported when the software is not compatible with the hardware.	The traction motors are disabled, and steering is disabled.	1) Use Toro DIAG to reprogram the machine. 2) Replace the steering unit assembly. 3) Use Toro DIAG to program the replacement steering unit assembly. 4) Cycle the key switch. 5) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)
P0524	Oil Pressure Low - Kill Engine	T1	This fault is reported when the oil pressure is low for more than 10 seconds while the engine is running.	The controller shuts off the engine. Caution is advised when the operator is cranking the engine for very short times. If the engine only turns over one or two revolutions, the engine can be off, but the oil pressure can take many seconds to drop.	1) Check the oil level. 2) Inspect and test the wiring and connectors (P70, pin F to P01, pin 24). 3) Test the engine oil pressure switch. 4) Test the oil pump.
P058E	Battery - High Temp Shutdown	SC8	The BMS controller reported to the TEC-5004 controller (T1) that the temperature of one or more batteries was greater than 70 °C (158 °F), and then shut off power to the machine.	While this fault is active, the battery management system (BMS) controller keeps the battery contactor open, not allowing battery power to go to the machine. As a result, the machine will not respond when the key switch is turned to the On position.	Allow the machine to cool.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P058F	Battery - Low Temp Shutdown	SC8	The BMS controller reported to the TEC-5004 controller (T1) that the temperature of one or more batteries was less than -20 °C (-4 °F), and then shut off power to the machine.	While this fault is active, the battery management system (BMS) controller keeps the battery contactor open, not allowing battery power to go to the machine. As a result, the machine will not respond when the key switch is turned to the On position.	Allow the machine to warm.
P063C	Generator Logic Voltage - Low	T6	This fault is reported when the starter/generator measures the 48V logic voltage at less than 36V.	Disables the PTO and disables the starter/generator. Note: If more than one Logic Voltage - Low faults are reported, go to fault U1502 and follow the listed service actions.	1) Inspect the harness connector (P21). 2) Install a replacement controller onto the existing starter/generator. 3) Install the starter/generator assembly into the machine. 4) Use Toro DIAG to program the starter/generator controller.
P063D	Generator Logic Voltage - High	T6	This fault is reported when the starter/generator measures the 48V logic voltage at greater than 65V.	Disables the PTO and disables the starter/generator. Note: If more than one Logic Voltage - High faults are reported, go to fault U1501 and follow the listed service actions.	1) Test the starter/generator. 2) Verify that all starter/generator motor-to-controller connections are good. 3) Install a replacement starter/generator assembly into the machine. 4) Use Toro DIAG to program the replacement starter/generator motor.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P06E9	Starter Timeout	T1	This fault is reported when the primary controller (T1) detects that the starter was engaged for more than the maximum permitted crank time. This fault could be caused by the key switch being held in the Start position for more than 15 seconds, or by the key switch and/or its wiring being defective.	Disables the starter output.	1) Cycle the key switch. 2) Inspect the key switch wiring (connector P57). 3) Test the key switch. 4) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).
P0A1B	Traction Controller - Short	SC5 SC6	This fault is reported when either the controller FET has shorted, or the motor phases have shorted, or the phase wires from the motor to controller are shorted in the indicated drive unit.	The traction motors are disabled.	1) Verify that U, V, and W motor phases are correctly connected. 2) Test each motor phase to ground. 3) Check the phase resistance to 48V and 48V ground after the controller's internal capacitor bank has been de-energized. 4) Replace the indicated controller. 5) Use Toro DIAG to program the replacement controller. 6) Cycle the key switch. 7) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.
P0A2A	Traction Motor - Temperature Sensor Failure	SC5 SC6	This fault is reported when the temperature sensor in the indicated motor is out of the normal operating range.	Traction performance is limited.	1) Test the wiring to the motor. 2) Replace the indicated motor. 3) Calibrate the traction motors.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P0A2F	Traction Motor - High Temp Warning	SC5 SC6 T5	This fault is reported when the motor temperature in the indicated drive unit is greater than: 150 °C (302 °F) for SC5, SC6 (Zapi) 120 °C (248 °F) for T5 (Toro):	Traction performance is limited.	1) Reduce ground speed. 2) Check for mechanical resistance in the wheels that would make the motors work extra hard. 3) Replace the indicated motor. 4) For SC5 and SC6: Calibrate the traction motors. For T5: use Toro DIAG to program the replacement motor.
P0A36	Generator - Temperature Sensor Failure	T6	This fault is reported when the FET sensor and the motor sensor fail.	Disables the PTO, disables the starter/generator, and disables start.	1) Replace the starter/generator if this fault continues to appear. 2) Use Toro DIAG to program the replacement starter/generator.
P0A3B	Generator Motor - High Temp Warning	T6	This fault is reported when the motor temperature is greater than 120 °C (248 °F).	When the temperature reaches 120 °C (248 °F), motor current is limited on a linear basis until the temperature reaches 130 °C (266 °F). Note: this fault is not produced by a bad sensor.	1) Clean the air intake screen on the back of the starter/generator. 2) Be sure the starter/generator is pulling air through the air intake by testing with a piece of paper. 3) Let the machine cool. 4) Reduce cutting loads by reducing the reel speed or reducing mow speed. 5) Replace the starter/generator motor.
P0A3C	Traction Motor Controller - High Temp Warning	SC5 SC6 T5	This fault is reported when the motor temperature in the indicated drive unit is: greater than 85 °C (185 °F) (SC5 and SC6) greater than 90 °C (194 °F) (T5)	When the temperature reaches the threshold for this fault, motor current is limited on a linear basis until the temperature reaches the high temp shutdown threshold. Traction performance is limited.	1) Reduce the ground speed. 2) Check for mechanical resistance in the wheels that would make the motors work extra hard. 3) For SC5 and SC6: Replace the controller after the controller's internal capacitor bank has been de-energized. For T5: Replace the motor on the rear wheel. 4) Use Toro DIAG to program the replacement. 5) Cycle the key switch. 6) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P0A3E	Generator Controller - High Temp Warning	T6	This fault is reported when the controller temperature is greater than 90 °C (194 °F).	When the temperature reaches 90 °C (194 °F), motor current is limited on a linear basis until the temperature reaches 100 °C (212 °F). Note: This fault is not produced by a bad sensor.	1) Clean the air intake screen on the back of the starter/generator. 2) Be sure the starter/generator is pulling air through the air intake by testing with a piece of paper. 3) Let the machine cool. 4) Reduce cutting loads by reducing the reel speed or reducing mow speed. 5) Replace the starter/generator controller if this fault continues to appear. 6) Use Toro DIAG to program the replacement starter/generator controller.
P0A44	Traction Motor Speed - High	SC5 SC6 T5	This fault is reported when the ground speed measured by the indicated drive unit is more than the allowed maximum speed of the machine.	The traction motors are disabled.	1) Inspect the wiring of the speed sensors. 2) Check supply voltage to the speed sensor. 3) Replace the indicated motor. 4) For SC5: Calibrate the traction motors. For SC6: Calibrate the traction motors. For T5, use Toro DIAG to program the replacement motor.
P0A54	Traction Controller - Over Current	SC5 SC6 T5	This fault is reported when the current draw from the motor in the indicated drive unit exceeds hardware and software limits.	The traction motors are disabled.	1) Cycle the key switch to clear the fault. 2) Contact the Toro Technical Assistance Center and report that this fault occurred.
P0A5A	Generator Current Sensor Out of Range	T6	This fault is reported when one of the sensors inside the starter/generator controller fails.	Disables the PTO and disables the starter/generator.	1) Cycle the key switch. 2) If the fault repeats, replace the starter/generator controller. 3) Use Toro DIAG to program the replacement starter/generator controller.
P0A5C	Generator Hardware DC Over Current	T6	This fault is reported when the starter/generator controller detects an internal overcurrent condition.	Disables the PTO and disables starter/generator.	1) Cycle the key switch. 2) If the fault repeats, replace the starter/generator controller. 3) Use Toro DIAG to program the replacement starter/generator controller.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P0A80	Battery - Internal Hardware Failure	SC8	This fault is reported when a hardware component in one or more Samsung batteries has failed.	While this fault is active, the battery management system (BMS) controller keeps the battery contactor open, not allowing battery power to go to the machine. As a result, the machine will not respond when the key switch is turned to the On position.	1) Create a Samsung battery output file, as described in Toro DIAG Commercial Products User's Guide. 2) Deliver the Samsung battery output file to the Toro Technical Assistance Center (TAC) by attaching it to a support case. 3) Follow the repair advice provided by Toro TAC.
P0AA1	Battery Contactor - Stuck Closed	SC8	This fault is reported when the battery contactor inside the Samsung BMS controller is measured to be closed when it should be open.		1) Create a Samsung battery output file, as described in Toro DIAG Commercial Products User's Guide. 2) Create a TD2 file, as described in the Toro DIAG Software User's Guide. 3) Deliver the two files to the Toro Technical Assistance Center (TAC) by attaching them to a support case. 4) Follow the repair advice provided by Toro TAC.
P0AA2	Battery Contactor - Stuck Open	SC8	This fault is reported when the battery contactor inside the Samsung BMS controller is measured to be open when it should be closed.		1) Create a Samsung battery output file, as described in Toro DIAG Commercial Products User's Guide. 2) Deliver the Samsung battery output file to the Toro Technical Assistance Center (TAC) by attaching it to a support case. 3) Follow the repair advice provided by Toro TAC.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P0AC2	Battery - Over Current	SC8	This fault is reported when a battery is supplying too much current for too long. This can be caused by too much power draw or by a defective battery.	While this fault is active, the battery management system (BMS) controller keeps the battery contactor open, not allowing battery power to go to the machine. As a result, the machine will not respond when the key switch is turned to the On position.	1) Inspect the wiring for the batteries and the battery controller. 2) Create a Samsung battery output file, as described in Toro DIAG Commercial Products User's Guide. 3) Deliver the Samsung battery output file to the Toro Technical Assistance Center (TAC) by attaching it to a support case. 4) Follow the repair advice provided by Toro TAC.
P0AE4	Hybrid/EV - Contactor Stuck Open	T6	This fault is reported when there is a problem with control of the 48V contactor—the contactor is open when it should be closed.	Disables the PTO, the starter/generator, and lift/lower.	1) Test the contactor. 2) Test the circuit protection diode (across the contactor). 3) Test the wiring.
P0AE5	Hybrid/EV - Contactor Stuck Closed	T6	This fault is reported when there is a problem with control of the 48V contactor—the contactor is closed when it should be open.	Disables the PTO, disables the starter/generator, disables start, and disables lift/lower.	1) Test the contactor. 2) Test the circuit protection diode (across the contactor). 3) Test the wiring.
P0AE6	Precharge Failure	T6	This fault is reported when the minimum precharge voltage (38V) was not achieved in the appropriate time.	Disables the PTO, disables the starter/generator, and disables lift/lower.	Disconnect one cutting unit motor or lift/lower actuator at a time until the fault stops repeating. Start with a component that may have just blown a fuse. The starter/generator or precharge controller must remain connected because it reports this fault. If one cutting unit motor is reporting a COMM fault, that is likely the shorted motor.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P0AFA	Battery - Low Voltage	SC8	This fault is reported when the voltage of a cell inside one of the batteries was measured to be too low but the battery may be recoverable via software or by using the battery charger.	While this fault is active, the battery management system (BMS) controller keeps the battery contactor open, not allowing battery power to go to the machine. As a result, the machine will not respond when the key switch is turned to the On position.	1) Attempt to charge the batteries. 2) Use Toro DIAG to recover the batteries. 3) Create a Samsung battery output file, as described in Toro DIAG Commercial Products User's Guide. 4) Deliver the Samsung battery output file to the Toro Technical Assistance Center (TAC) by attaching it to a support case. 5) Follow the repair advice provided by Toro TAC.
P0AFB	Battery - High Voltage	SC8	This fault is reported when the voltage of a cell inside one of the batteries was measured to be too high.	While this fault is active, the battery management system (BMS) controller keeps the battery contactor open, not allowing battery power to go to the machine. As a result, the machine will not respond when the key switch is turned to the On position.	1) Create a Samsung battery output file, as described in Toro DIAG Commercial Products User's Guide. 2) Deliver the Samsung battery output file to the Toro Technical Assistance Center (TAC) by attaching it to a support case. 3) Follow the repair advice provided by Toro TAC.
P0C06	Traction Motor Phase Short	SC5 SC6	This fault is reported when two traction motor phases in the indicated drive unit are shorted together but not shorted to ground.	The traction motors are disabled.	1) Verify that the U, V, and W motor phase cables are connected in the correct order. 2) Check the motor power cables. 3) Replace the indicated motor. 4) Calibrate the traction motors. 5) Replace the controller after the controller's internal capacitor bank has been de-energized. 6) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P0C19	Traction Motor Power Mismatch	SC5 SC6	This fault is reported when the motor in the indicated drive unit is not responding to the power setpoint.	The controller loses the ability to control the motor. The traction motors are disabled.	1) Verify that the U, V, and W motor phase cables are connected in the correct order. 2) Test the speed feedback sensor (sin-cos) wiring. 3) Calibrate the traction motors. 4) Contact the Toro Technical Assistance Center and report that this fault occurred.
P0D2F	Traction Motor Logic Voltage - Low	SC5 SC6 T5	This fault is reported when the motor in the indicated drive unit measures the 48V logic voltage at less than 32V for T5 (Toro), or 38V for SC5, SC6 (Zapi)	The traction motors are disabled. Note: If more than one Logic Voltage - Low faults are reported, go to fault U1502 and follow the listed service actions.	1) Test the 48V logic voltage at the controller. 2) For SC5 and SC6: Replace the controller after the controller's internal capacitor bank has been de-energized. For T5: Replace the motor on the rear wheel. 3) Use Toro DIAG to program the replacement. 4) Cycle the key switch. 5) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.
P0D30	Traction Motor Logic Voltage - High	SC5 SC6 T5	This fault is reported when the motor in the indicated drive unit measures the 48V logic voltage at greater than 67.5V for T5 (Toro), or 65V for SC5, SC6 (Zapi)	The traction motors are disabled. Note: If more than one Logic Voltage - High faults are reported, go to fault U1501 and follow the listed service actions.	1) For SC5 and SC6: Replace the controller after the controller's internal capacitor bank has been de-energized. For T5: Replace the motor on the rear wheel. 2) Use Toro DIAG to program the replacement. 3) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P0E8E	Traction Motor Bus Voltage - Low	SC5 SC6 T5	This fault is reported when the motor in the indicated drive unit measures the 48V bus voltage at less than 32V for T5 (Toro), or 38V for SC5, SC6 (Zapi).	The traction motors are disabled. Note: If more than one Bus Voltage - Low faults are reported, go to fault U1512 and follow the listed service actions.	1) Test the 48V bus voltage at the controller. 2) Test the MIDI fuse for the controller (SC5 fuse under the operator's seat, SC6 fuse under the left side cover) 3) For SC5 and SC6: Replace the controller after the controller's internal capacitor bank has been de-energized. For T5: Replace the motor on the rear wheel. 3) Use Toro DIAG to program the replacement. 4) Cycle the key switch. 5) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.
P0E8F	Traction Motor Bus Voltage - High	SC5 SC6 T5	This fault is reported when the motor in the indicated drive unit measures the 48V bus voltage at greater than: 67.5V for T5 (Toro), or 65V for SC5, SC6 (Zapi).	The traction motors are disabled. Note: If more than one Bus Voltage - High faults are reported, go to fault U1511 and follow the listed service actions.	1) For SC5 and SC6: Replace the controller after the controller's internal capacitor bank has been de-energized. For T5: Replace the motor on the rear wheel. 2) Use Toro DIAG to program the replacement. 3) Cycle the key switch. 4) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.
P1501	Traction Motor - High Temp Shutdown	SC5 SC6 T5	This fault is reported when the motor temperature in the indicated drive unit is greater than: 170 °C (338 °F) for SC5, SC6 (Zapi) 130 °C (266 °F) for T5 (Toro)	The traction motors are disabled.	1) Attempt to cool off the traction motor. 2) Check for mechanical resistance in the motors. 3) Check air pressure in all 3 tires. 4) For SC5 and SC6 only: a) Check the adjustment of the brakes. b) Verify the Steering System – Center Calibration. 5) Replace the indicated motor. 6) For SC5 and SC6: Calibrate the traction motors For T5, use Toro DIAG to program the replacement motor.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P1511	Traction Motor Controller - High Temp Shutdown	T5	This fault is reported when the controller temperature is greater than 100 °C (212 °F)	The traction motors are disabled.	1) Reduce ground speed. 2) Check for mechanical resistance in the wheels. 3) Replace the motor. 4) Use Toro DIAG to program the replacement motor.
P1520	Traction Motor Speed Sensor - Out of Range	SC5 SC6 T5	SC5, SC6: This fault is reported when the speed sensor reading in the indicated drive unit is outside normal operating range. T5: This fault is reported by the rear traction motor controller(T5) in the optional 3-wheel drive when one of the three hall effect sensors in the motor fails.	The traction motors are disabled.	1) For SC5 and SC6 only: Test the speed feedback sensor (sin-cos) wiring. 2) Replace the indicated motor. 3) For SC5: Calibrate the traction motors. For SC6: Calibrate the traction motors. For T5, use Toro DIAG to program the replacement motor.
P1522	Traction Motor Speed Sensor - Stall	SC5 SC6 T5	SC5, SC6: This fault is reported when the speed sensor reading in the indicated drive unit indicates a stalled motor. T5: This fault is reported by the rear traction motor controller(T5) in the optional 3-wheel drive when the speed of the rear traction motor is 0 RPM for more than 3 seconds	The traction motors are disabled.	1) For SC5 and SC6 only: a) Test the speed feedback sensor (sin-cos) wiring. b) Check the adjustment of the brakes. c) Verify the Steering System – Center Calibration. 2) Check for mechanical resistance in the motors. 3) Check air pressure in all 3 tires. 4) For SC5 and SC6: Replace the controller after the controller's internal capacitor bank has been de-energized. For T5: Replace the motor on the rear wheel. 5) Use Toro DIAG to program the replacement. 6) Cycle the key switch. 7) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P1527	Traction Motor Speed Sensor - Data Invalid	SC5 SC6	This fault is reported when the speed sensor reading in the indicated drive unit is invalid.	The traction motors are disabled.	1) Test the speed feedback sensor (sin-cos) wiring. 2) Replace the indicated motor. 3) Calibrate the traction motors.
P1529	Traction Motor Speed Sensor - Wrong Direction	SC5 SC6	This fault is reported when the speed sensor in the indicated drive unit shows the motor moving in the wrong direction.	The traction motors are disabled.	1) Test the speed feedback sensor (sin-cos) wiring. 2) Test the cables on the U, V, and W phases. 3) Replace the indicated motor. 4) Calibrate the traction motors.
P152C	Traction Motor Speed Sensor - Feedback Noisy	SC5 SC6	This fault is reported when the speed sensor feedback in the indicated drive unit is noisy.	The traction motors are disabled.	1) Test the speed sensor wiring. 2) Check the adjustment of the brakes. 3) Replace the indicated motor. 4) Calibrate the traction motors.
P1531	Traction Motor Internal Regulator - Voltage High	T5	This fault is reported by the rear traction motor controller(T5) in the optional 3-wheel drive when its internal regulator voltage reading is greater than 15V.	The Traction 3 (3WD) motor is disabled.	1) Inspect the wiring and connectors (P19, P20). 2) Replace the motor. 3) Use Toro DIAG to program the replacement motor.
P1532	Traction Motor Internal Regulator - Voltage Low	T5	This fault is reported by the rear traction motor controller(T5) in the optional 3-wheel drive when its internal regulator voltage reading is less than 10V.	The Traction 3 (3WD) motor is disabled.	1) Inspect the wiring and connectors (P19, P20). 2) Replace the motor. 3) Use Toro DIAG to program the replacement motor.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P1541	Traction Motor Phase - Voltage High	SC5 SC6	This fault is reported when the motor phase voltage in the indicated drive unit is out-of-range high.	The traction motors are disabled.	1) Inspect and test the cables on the U, V, and W phases. 2) Test the wheel motor contactor. 3) Replace the indicated controller after the controller's internal capacitor bank has been de-energized. 4) Use Toro DIAG to program the replacement controller. 5) Cycle the key switch. 6) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.
P1542	Traction Motor Phase - Voltage Low	SC5 SC6	This fault is reported when the motor phase voltage in the indicated drive unit is out-of-range low.	The traction motors are disabled.	1) Inspect and test the cables on the U, V, and W phases. 2) Test the wheel motor contactor. 3) Replace the indicated controller after the controller's internal capacitor bank has been de-energized. 4) Use Toro DIAG to program the replacement controller. 5) Cycle the key switch. 6) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.
P1554	Traction Motor Contactor Coil - Short Circuit	SC5	This fault is reported when the coil engage output (NMC signal) of the right-hand traction controller is shorted.	The traction motors are disabled. The circuit starts at P35, pin 12.	1) Test the wire between the controller and the motor. 2) Test the wheel motor contactor. 3) Replace the controller after the controller's internal capacitor bank has been de-energized. 4) Use Toro DIAG to program the replacement controller. 5) Cycle the key switch. 6) Calibrate the traction pedal, then calibrate the traction motors.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P1555	Traction Motor Contactor Coil - Open Circuit	SC5	This fault is reported when an open circuit is detected on the NMC signal from the controller.	The traction motors are disabled. The circuit starts at P35, pin 12.	1) Test the wire between the controller and the motor. 2) Test the wheel motor contactor. 3) Replace the controller after the controller's internal capacitor bank has been de-energized. 4) Use Toro DIAG to program the replacement controller. 5) Cycle the key switch. 6) Calibrate the traction pedal, then calibrate the traction motors.
P156C	Traction Controller - Internal Hardware Failure	SC5 SC6	This fault is reported when an internal component of controller fails in the indicated drive unit.	The traction motors are disabled.	1) Replace the indicated controller after the controller's internal capacitor bank has been de-energized. 2) Use Toro DIAG to program the replacement controller. 3) Cycle the key switch. 4) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.
P156D	Traction Controller - Internal Software Failure	SC5 SC6	This fault is reported when an unexpected software error occurs in the indicated drive unit.	The traction motors are disabled.	1) Use Toro DIAG to force reprogram the existing indicated traction controller. 2) Replace the indicated controller after the controller's internal capacitor bank has been de-energized. 3) Use Toro DIAG to program the replacement controller. 4) Cycle the key switch. 5) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P156E	Traction Motor Software - Hardware Incompatibility	SC5 SC6	This fault is reported when the software in the indicated drive unit is not compatible with the hardware.	The traction motors are disabled.	1) Use Toro DIAG to update the machine software. 2) Replace the indicated controller after the controller's internal capacitor bank has been de-energized. 2) Use Toro DIAG to program the replacement controller. 3) Cycle the key switch. 4) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.
P1A01	Battery Charging - High Temp Shutdown	SC8	This fault is reported when a battery temperature was measured to be greater than 60 °C (140 °F) and the battery controller will not allow it to be charged.		1) Let the machine cool off before trying to charge the battery again. 2) Disconnect the charger from the machine for at least 5 seconds and then reconnect it. 3) Charge the battery in a cooler environment.
P1A02	Battery Charging - Low Temp Shutdown	SC8	This fault is reported when a battery temperature was measured to be less than -10 °C (14 °F) and the battery controller will not allow it to be charged.		1) Let the machine warm up before trying to charge the battery again. 2) Disconnect the charger from the machine for at least 5 seconds and then reconnect it. 3) Charge the battery in a warmer environment.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P1A11	Battery Charging Voltage - High	SC8	This fault is reported when a battery cell voltage was measured to be higher than the allowed threshold while the battery charger was connected. The battery controller will not allow it to be charged.		1) Verify that the correct battery charger is being used. 2) Disconnect the charger from the machine for at least 5 seconds and then reconnect it. 3) Check the battery charger for faults. 4) Try a different battery charger. 5) Create a Samsung battery output file, as described in the Toro DIAG Commercial Products User's Guide. 6) Deliver the Samsung battery output file to the Toro Technical Assistance Center (TAC) by attaching it to a support case. 7) Follow the repair advice provided by Toro TAC.
P1A21	Battery Charging - Over Current	SC8	This fault is reported when a battery cell charging current was measured to be greater than the allowed threshold. The battery controller will not allow it to be charged.		1) Verify that the correct battery charger is being used. 2) Disconnect the charger from the machine for at least 5 seconds and then reconnect it. 3) Check the battery charger for faults. 4) Try a different battery charger. 5) Inspect battery wiring and charger cable for damage or corrosion. 6) Create a Samsung battery output file, as described in the Toro DIAG Commercial Products User's Guide. 7) Deliver the Samsung battery output file to the Toro Technical Assistance Center (TAC) by attaching it to a support case. 8) Follow the repair advice provided by Toro TAC.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P1B01	Generator Motor - High Temp Shutdown	T6	This fault is reported when the motor temperature is greater than 130 °C (266 °F).	Disables the PTO and disables the starter/generator. Note: This fault is not produced by a bad sensor.	1) Clean the air intake screen on the starter/generator. 2) Be sure the starter/generator is pulling air through the air intake by testing with a piece of paper. 3) Let machine cool. 4) Reduce cutting loads by reducing the reel speed or reducing mow speed. 5) Replace the starter/generator motor if this fault continues to appear.
P1B11	Generator Controller - High Temp Shutdown	T6	This fault is reported when the controller temperature is greater than 100 °C (212 °F).	Disables the PTO and disables the starter/generator. Note: This fault is not produced by a bad sensor.	1) Clean the air intake screen on the starter/generator. 2) Be sure the starter/generator is pulling air through the air intake by testing with a piece of paper. 3) Let machine cool. 4) Reduce cutting loads by reducing the reel speed or reducing mow speed 5) Replace the starter/generator controller if this fault continues to appear. 6) Use Toro DIAG to program the replacement starter/generator controller.
P1B20	Generator Motor Speed Sensor Out of Range	T6	This fault is reported when the Hall effect sensors in the motor provide an invalid reading.		1) Inspect the wiring between the starter/generator motor and controller. 2) Install a replacement starter/generator assembly into the machine. 3) Use Toro DIAG to program the starter/generator controller.
P1B21	Generator Motor Speed - High	T6	This fault is reported when the speed of the motor is greater than 3,600 RPM.		1) Check the engine governor if the engine RPM is consistently high. 2) Inspect the wiring between the starter/generator motor and the controller. 3) Replace the starter/generator motor.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P1B2C	Generator Motor - Stall	T6	This fault is reported when the starter/generator motor stalls for 3 seconds or more.	Disables the PTO and disables the starter/generator.	1) Verify that the starter/generator can spin freely. 2) Inspect the wiring between the starter/generator and the controller. 3) Replace the controller. 4) Use Toro DIAG to program the starter/generator controller.
P1B31	Generator Motor Internal Regulator Voltage - High	T6	This fault is reported when the internal regulator voltage is greater than 18V.	Disables the PTO and disables the starter/generator.	1) Inspect the logic relay and harness connectors. 2) Inspect the starter/generator connector and harness connector. 3) Replace the starter/generator controller. 4) Use Toro DIAG to program the starter/generator controller.
P1B41	Generator Bus Voltage - High	T6	This fault is reported when the starter/generator measures the 48V bus voltage at greater than 65V.	Disables the PTO and disables the starter/generator. Note: If more than one Bus Voltage - High faults are reported, go to fault U1511 and follow the listed service actions.	1) Test the starter/generator. 2) Inspect the wiring between the starter/generator and the controller. 3) Replace the starter/generator assembly. 4) Use Toro DIAG to program the replacement starter/generator.
P1B42	Generator Bus Voltage - Low	T6	This fault is reported when the starter/generator measures the 48V bus voltage at less than 36V.	Disables the PTO and disables the starter/generator. Note: If more than one Bus Voltage - Low faults are reported, go to fault U1512 and follow the listed service actions.	1) Test the starter/generator. 2) Inspect the wiring between the starter/generator and the controller. 3) Replace the starter/generator assembly. 4) Use Toro DIAG to program the replacement starter/generator.
P1B4C	Generator Hardware Over Voltage	T6	This fault is reported when the voltage protection hardware inside the starter/generator trips.	Disables the PTO and disables the starter/generator.	1) Replace the starter/generator controller. 2) Use Toro DIAG to program the replacement starter/generator.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P1B51	Generator Hardware Phase Over Current	T6	This fault is reported when the current sensor on phase current indicates an internal short.	Disables the PTO and disables the starter/generator.	1) Replace the starter/generator controller. 2) Use Toro DIAG to program the replacement starter/generator.
P1B6C	Generator Internal Hardware Failure	T6	This fault is reported when the hardware phase overcurrent and hardware overvoltage trip.	Disables the PTO and disables the starter/generator.	1) Replace the starter/generator controller. 2) Use Toro DIAG to program the replacement starter/generator.
P210E	Traction Pedal 1 Sensor/Switch Analog vs Analog conflict	SC5	This fault is reported when the traction pedal sensor reports different positions.	The traction motors are disabled.	1) Test the wiring to the sensors (P36). 2) Check the sensor wiring to the TEC controller (P01). 3) Replace the traction pedal position sensor. 4) Calibrate the traction pedal.
P2503	Alternator - Charging Too Low	T1	This fault is reported when the TEC senses that the 12V charging system is less than 8.8V. Note: The alternator consists of a stator coil, flywheel magnets, and an external voltage regulator.	Disables the PTO. Note: One 12V AGM battery, an alternator (stator coil and flywheel magnets), and an external voltage regulator combine to provide the 12V system electrical power. If the engine wiring or the flywheel need repair or replacement, refer to the Kawasaki FS481V Service Manual.	1) Test the alternator: Measure AC voltage at the voltage regulator input. should be approximately 21 VAC at 2,400 RPM. 2) Test the regulator: Measure DC voltage at the voltage regulator output should be approximately 15 VDC at 2,400 RPM. 3) Test the 15A mini blade style fuse in the 12V fuse holder (under the right side cover). 4) Inspect connectors for damage and corrosion (P70). 5) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P2504	Alternator - Charging Too High	T1	This fault is reported when the TEC senses that the 12V charging system is greater than 16.3V. Note: The alternator consists of a stator coil, flywheel magnets, and an external voltage regulator	Note: One 12V AGM battery, an alternator (stator coil and flywheel magnets), and an external voltage regulator combine to provide the 12V system electrical power. If the engine wiring or the flywheel need repair or replacement, refer to the Kawasaki FS481V Service Manual.	1) Test the alternator: Measure AC voltage at the voltage regulator input. should be approximately 21 VAC at 2,400 RPM. 2) Test the regulator: Measure DC voltage at the voltage regulator output should be approximately 15 VDC at 2,400 RPM. 3) Inspect connectors for damage and corrosion. 4) Test the wiring between the 12V battery and the alternator. 5) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).
P2530	Key Start/Run Correlation Fault	T1	This fault is reported when the Key Start input is active, but the Key Run input is off.	Machine will be shut off since the Key Run input is inactive.	1) Inspect the key switch wiring and connector (P57). 2) Inspect the TEC harness/connector for loose wires (P01). 3) Test the key switch.
P2BE8	Traction Motor Contactor - Open	SC5	This fault is reported when the wheel motor main contactor is detected open when it should be closed.	The traction motors are disabled.	1) Test the wiring (P35, J13). 2) Test the 60A MIDI fuse to the SC5 controller (under the operator's seat). 3) Test the wheel motor contactor. 4) Replace the right-hand traction controller (SC5) after the controller's internal capacitor bank has been de-energized. 5) Use Toro DIAG to program the replacement controller. 6) Cycle the key switch. 7) Calibrate the traction pedal, then calibrate the traction motors.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
P2BE9	Traction Motor Contactor - Closed	SC5	This fault is reported when traction motor contactor is detected closed when it should be open.	The traction motors are disabled.	1) Test the wiring (P35, J13). 2) Test the wheel motor contactor.
P2BEA	Traction Motor Precharge Failure	SC5 SC6	This fault is reported when there is a short on the 48V traction bus or too much resistance or capacitance in the indicated drive unit.	The traction motors are disabled.	1) Check if an external load is installed on the traction 48v bus. If there is, remove it. 2) Replace the indicated traction controller after the controller's internal capacitor bank has been de-energized. 3) Use Toro DIAG to program the replacement controller. 4) Cycle the key switch. 5) For SC5: Calibrate the traction pedal, then calibrate the traction motors. For SC6: Calibrate the traction motors.
U0110	CAN Bus Communication Fault - Traction Motor 1	T1	This fault is reported when the primary controller (T1) never establishes or loses communication with the right-hand traction controller(SC5).	The traction motors are disabled.	1) Test the wiring from the controller SC5 to the CAN bus in connector P35. 2) Verify power to the controller SC5. 3) Replace the right-hand traction controller (SC5) after the controller's internal capacitor bank has been de-energized. 4) Use Toro DIAG to program the replacement controller. 5) Calibrate the traction pedal, then calibrate the traction motors.
U0111	CAN Bus Communication Fault - Battery	T1	This fault is reported when the primary controller (T1) never establishes or loses communication with the battery controller.		1) Test the CAN bus wiring in connector P12. 2) Test the CAN bus wiring through the system interface harness (the adapter cable between the Toro harness connector P12 and the Samsung BMS controller). 3) Verify power and ground to the battery controller. 4) Replace the battery controller. 5) Use Toro DIAG to program the replacement battery controller

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
U0120	CAN Bus Communication Fault - Generator	T1	This fault is reported when the primary controller never establishes or loses communication with the starter/generator controller.	Disables the PTO and the starter/generator.	1) Test the wiring from the controller to the CAN bus in connector P21. 2) Verify power and ground to the starter/generator controller in connector P21. 3) If the fault continues to occur, replace the starter/generator controller. 4) Use Toro DIAG to program the replacement starter/generator controller.
U012A	CAN Bus Communication Fault - Precharge	T1	This fault is reported when the primary controller (T1) never establishes or loses communication with the precharge controller (T6).		1) Test the CAN bus wiring in connector P02. 2) Test power and ground at the precharge controller in connector P03. 3) Test the 3-amp standard blade fuse (machine wire harness on left side of the center battery set). 4) Swap the precharge TEC controller with a known good unit. 5) Use Toro DIAG to program the replacement precharge controller.
U0131	CAN Bus Communication Fault - Steering	T1	This fault is reported when the primary controller never establishes or loses communication with the steering unit assembly.	The traction motors are disabled.	1) Test the wiring from the steering unit assembly to the CAN bus in connector P46. 2) Verify power and ground to the steering unit assembly. 3) Replace the steering unit assembly. 4) Use Toro DIAG to program the replacement steering unit assembly. 5) Cycle the key switch. 6) Follow the steering calibration instructions displayed on the InfoCenter. (Calibrate the Steering Center first, then calibrate the Steering Range.)

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
U0156	CAN Bus Communication Fault - IC	T1	This fault is reported by the primary controller (T1) if it never establishes or loses communication with the InfoCenter. This fault may also be reported by the InfoCenter if the primary controller(T1) loses 12V logic power.		1) Verify 12V logic power to the primary controller (T1) at connector P01, pin 40. 2) Verify 12V power and to the InfoCenter at connector P52, pin 2. 3) Test the wiring from the InfoCenter to the CAN bus. 4) Replace the InfoCenter. 5) Use Toro DIAG to program the replacement InfoCenter.
U0292	CAN Bus Communication Fault - Traction Motor 2	T1	This fault is reported when the primary controller never establishes or loses communication with the controller in the left drive unit.	The traction motors are disabled.	1) Test the wiring from the SC6 controller to the CAN bus in connector P34. 2) Verify power to the controller. 3) Replace the left-hand traction SC6 controller after the controller's internal capacitor bank has been de-energized. 4) Use Toro DIAG to program the replacement controller. 5) Cycle the key switch. 6) Calibrate the traction motors.
U029B	CAN Bus Communication Fault - Traction Motor 3	T1	This fault is reported when the primary controller never establishes or loses communication with the controller (T5) in the motor on the rear wheel.	The traction motors are disabled.	1) Test the wiring from the controller (T5) in the motor on the rear wheel to the CAN bus in connector P19. 2) Test the 48V bus Maxi blade fuse under the left side cover. 3) Verify power and ground to the motor on the rear wheel in connector P20. 4) Replace the motor on the rear wheel. 5) Use Toro DIAG to program the replacement motor .
U0320	Software Version Incompatibility - Steering	T1	This fault is reported when the steering firmware is incompatible.	Disables the machine.	Use Toro DIAG to reprogram the machine.
U1011	Controller Logic Voltage High	T1	The primary controller (T1) is reporting that it is measuring the logic voltage as greater than 16.3V.		1) Check the output of the DC-to-DC converter on the InfoCenter. 2) Replace the DC-to-DC converter. 3) Swap the primary TEC with a known good unit.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
U1012	Controller Logic Voltage Low	T1	The primary controller (T1) is reporting that it is measuring the logic voltage as less than 8.8V.		1) Check the output of the DC-to-DC converter on the InfoCenter. 2) Measure the logic voltage at the DC-to-DC converter. 3) Measure the logic voltage at the primary controller (T1). 4) Replace the DC-to-DC converter. 5) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).
U1012	Controller Logic Voltage Low	T6	The precharge controller (T6) is reporting that it is measuring the logic voltage as less than 32V.		1) Test power and ground at the T6 precharge controller. 2) Swap the precharge TEC controller with a known good unit. 3) Use Toro DIAG to program the replacement precharge controller.
U1025	TEC Fuse 5 Failure	T1	This fault is reported when the fuse has failed for outputs 13–16 on the primary controller (T1).	Connector P01, pin 38, output will not function.	1) Test the 7.5A mini blade style fuse in the 12V fuse holder (under the right side cover). 2) Test the wiring (P68).
U110C	Model Number Unknown	T1	This fault is reported when the model number not recognized.	Disables the engine.	Use Toro DIAG to reprogram the machine.
U1117	Source Address Contention Fault	T1	This fault is reported when the primary controller receives a message from another controller on the CAN bus using the same source address.	Disables the machine. Note: Most often, this fault is caused by installing a controller that was programmed while it was installed in another machine.	Use Toro DIAG to reprogram the machine.
U111F	Source ID - CU Motor ID Out of Range	T1	This fault is reported when multiple cutting units are reporting the same node ID or address.	Disables mow.	1) Inspect for loose wire or connector. 2) Test the internal resistance of the motor ID pin (pin 2 of the 4-pin motor connector). It should be 18 to 20 kohm. 3) Test the resistance of the ID module.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
U1121	48V Devices Offline	T1	This fault is reported when the primary controller (T1) on CAN bus A cannot communicate with any of the 48V devices, which are all on CAN bus B.	PTO and starter/generator are disabled. Note: If this U1121 fault repeats with one of the 48V Logic Enable faults (C10E3, C10E4, or C10E5) repeating and/or the U1502 48V system Logic Voltage — Low fault repeating, troubleshoot the faults in this order 1) C10E3, C10E4, or C10E5 2) U1502 3) U1121	1) Verify that the 48V battery disconnect is plugged in. 2) Inspect CAN bus isolation module connector and harness connector P50 for damage and corrosion. 3) Check for 12V at the CAN bus isolation module. 4) Test the CAN bus wiring in harness connector P50. 5) Verify that 48V logic power is good.
U1122	CAN Bus Communication Fault - CU Motor 1	T1	This fault is reported when the primary controller (T1) never establishes or loses communication with cutting unit 1.	Disables the PTO.	1) Test the wiring from the controller to the CAN bus (P24). 2) Verify 48V logic power to the cutting unit. 3) Swap cutting unit motors between cutting units. Replace the motor if the fault moves to the new position (includes programming the replacement motor with Toro DIAG.)
U1123	CAN Bus Communication Fault - CU Motor 2	T1	This fault is reported when the primary controller (T1) never establishes or loses communication with cutting unit 2.	Disables the PTO.	1) Test the wiring from the controller to the CAN bus (P26). 2) Verify 48V logic power to the cutting unit. 3) Swap cutting unit motors between cutting units. Replace the motor if the fault moves to the new position (includes programming the replacement motor with Toro DIAG.)
U1124	CAN Bus Communication Fault - CU Motor 3	T1	This fault is reported when the primary controller (T1) never establishes or loses communication with cutting unit 3.	Disables the PTO.	1) Test the wiring from the controller to the CAN bus (P22). 2) Verify 48V logic power to the cutting unit. 3) Swap cutting unit motors between cutting units. Replace the motor if the fault moves to the new position (includes programming the replacement motor with Toro DIAG.)

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
U1128	CAN Bus Communication Fault - Lift/Lower Motor 1	T1	This fault is reported when the primary controller (T1) never establishes or loses communication with lift/lower actuator 1.	Disables the PTO.	1) Test the wiring from the actuator to the CAN bus (P62). 2) Verify 48V logic power to the actuator. 3) Replace the actuator. 4) Use Toro DIAG to program the replacement actuator. 5) Cycle the key switch. 6) Follow the Lift-lower 1 calibration instructions displayed on the InfoCenter.
U1129	CAN Bus Communication Fault - Lift/Lower Motor 2	T1	This fault is reported when the primary controller never establishes or loses communication with lift/lower actuator 2.	Disables the PTO.	1) Test the wiring from the actuator to the CAN bus (P61) 2) Verify 48V logic power to the actuator. 3) Replace the actuator. 4) Use Toro DIAG to program the replacement actuator. 5) Cycle the key switch. 6) Follow the Lift-lower 2 calibration instructions displayed on the InfoCenter.
U112A	CAN Bus Communication Fault - Lift/Lower Motor 3	T1	This fault is reported when the primary controller never establishes or loses communication with lift/lower actuator 3.	Disables the PTO.	1) Test the wiring from the actuator to the CAN bus. (P59) 2) Verify 48V logic power to the actuator. 3) Replace the actuator. 4) Use Toro DIAG to program the replacement actuator. 5) Cycle the key switch. 6) Follow the Lift-lower 3 calibration instructions displayed on the InfoCenter.
U1140	Communication Fault - Battery Cell Module	SC8	The BMS controller never established communication or lost communication with one or more batteries.	While this fault is active, the battery management system (BMS) controller keeps the battery contactor open, not allowing battery power to go to the machine. As a result, the machine will not respond when the key switch is turned to the On position.	1) Inspect the M/S (8 batteries) Samsung interface wire harness. 2) Create a Samsung battery output file, as described in Toro DIAG Commercial Products User's Guide. 3) Deliver the Samsung battery output file to the Toro Technical Assistance Center (TAC) by attaching it to a support case. 4) Follow the repair advice provided by Toro TAC.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
U1301	Software Version Incompatibility - CU Motor 1	T1	This fault is reported when the cutting unit 1 software is incompatible.	Disables the engine.	Use ToroDIAG to reprogram the machine.
U1302	Software Version Incompatibility - CU Motor 2	T1	This fault is reported when the cutting unit 2 software is incompatible.	Disables the engine.	Use ToroDIAG to reprogram the machine.
U1303	Software Version Incompatibility - CU Motor 3	T1	This fault is reported when the cutting unit 3 software is incompatible.	Disables the engine.	Use ToroDIAG to reprogram the machine.
U1304	Software Version Incompatibility - Lift/Lower Motor 1	T1	This fault is reported when the lift/lower actuator 1 software is incompatible.	Disables the engine.	Use ToroDIAG to reprogram the machine.
U1305	Software Version Incompatibility - Lift/Lower Motor 2	T1	This fault is reported when the lift/lower actuator 2 software is incompatible.	Disables the engine.	Use ToroDIAG to reprogram the machine.
U1306	Software Version Incompatibility - Lift/Lower Motor 3	T1	This fault is reported when the lift/lower actuator 3 software is incompatible.	Disables the engine.	Use ToroDIAG to reprogram the machine.
U1307	Software Version Incompatibility - Generator	T1	This fault is reported when the starter/generator software is incompatible.	Disables the engine.	Use ToroDIAG to reprogram the machine.
U1308	Software Version Incompatibility - Precharge Controller	T1	This fault is reported when the software in the precharge controller (TEC-2401 or TEC-2402) is incompatible.	Disables the machine.	Use Toro DIAG to reprogram the machine.
U130A	Software Version Incompatibility - InfoCenter	T1	This fault is reported when the InfoCenter software is incompatible.	Disables the machine.	Use ToroDIAG to reprogram the machine.
U130B	Software Version Incompatibility - Traction Motor 1	T1	This fault is reported when the right drive unit firmware is incompatible.	Disables the machine.	Use ToroDIAG to reprogram the machine.
U130C	Software Version Incompatibility - Traction Motor 2	T1	This fault is reported when the left drive unit firmware is incompatible.	Disables the machine.	Use ToroDIAG to reprogram the machine.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
U130D	Software Version Incompatibility - Traction Motor 3	T1	This fault is reported when the rear drive unit firmware is incompatible.	Disables the machine.	Use ToroDIAG to reprogram the machine.
U130E	Software Version Incompatibility - Processor Mismatch	SC5 SC6 SC7	This fault is reported when the software in the indicated component is incompatible.	The traction motors are disabled.	Use ToroDIAG to reprogram the machine.
U130F	Software Version Incompatibility - Unknown	T1	This fault is reported when the primary controller has detected an incompatible software version.	Disables the machine.	Use ToroDIAG to reprogram the machine.
U1311	Software Version Incompatibility - Battery	T1	This fault is reported when the SC8 battery controller software is incompatible.	Disables the machine.	1) Use Toro DIAG to reprogram the battery controller. 2) Create a Samsung battery output file, as described in Toro DIAG Commercial Products User's Guide. 3) Deliver the Samsung battery output file to the Toro Technical Assistance Center (TAC) by attaching it to a support case. 4) Follow the repair advice provided by Toro TAC.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
U1501	48V System Logic Voltage - High	T1	This fault is reported when 3 or more components on the machine are reporting a Logic Voltage - High fault.	PTO is disabled and the starter/generator won't generate. Note: This fault may be dependent upon how aggressive the operator is driving the machine. If they are trying to do frequent aggressive braking and/or driving down hills and braking, they may see this fault repeat because this machine uses regenerative braking.	For the 3360 only: 1) Test the starter/generator. 2) Inspect the wiring between the starter/generator and the controller. 3) Install a replacement starter/generator assembly into the machine. 4) Use Toro DIAG to program the starter/generator controller. For the 3370 only: There are not many ways that the 3370 machine can have its 48V system logic voltage reach the 67.5V level necessary to cause 3 or more components on the machine to report a logic voltage - high fault. Here are some things to consider: • If the fault occurred with already fully charged li-ion batteries during a regenerative charge (i.e., while the machine is coasting, the traction motors charge the battery pack), everything is likely fine. Cycle the key switch and continue operation. • If the fault occurred immediately after fully charging the li-ion batteries, verify that the correct battery charger is being used.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
U1502	48V System Logic Voltage - Low	T1	This fault is reported when 3 or more components on the machine are reporting a Logic Voltage - Low fault.	PTO is disabled.	For the 3360 only: 1) Test the 100A BF1 style fuse (under the operator's seat). 2) Test the 5A standard blade fuse (under the operator's seat) 3) Inspect and test the 48V battery pack. 4) Test the logic relay and inspect connectors. 5) Test the 48V power wires on the logic relay. 6) Test the starter/generator. 7) Inspect the wiring between the starter/generator and the controller 8) Install a replacement starter/generator assembly into the machine. 9) Use Toro DIAG to program the starter/generator controller. For the 3370 only: 1) Attempt to charge the batteries. 2) Test the 175A Mega fuse (behind the left side cover). 3) Test the 5A standard blade fuse (under the operator's seat) 4) Test the logic relay and inspect connectors. 5) Test the 48V power wires on the logic relay. 6) Use Toro DIAG to recover the batteries. 7) Create a Samsung battery output file, as described in Toro DIAG Commercial Products User's Guide. 8) Deliver the Samsung battery output file to the Toro Technical Assistance Center (TAC) by attaching it to a support case. 9) Follow the repair advice provided by Toro TAC.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
U1511	48V System Bus Voltage - High	T1	This fault is reported when 3 or more components on the machine are reporting a Bus Voltage - High fault.	PTO is disabled.	For the 3360 only: 1) Test the starter/generator. 2) Inspect the wiring between the starter/generator and the controller. 3) Install a replacement starter/generator assembly into the machine. 4) Use Toro DIAG to program the starter/generator controller. For the 3370 only: There are not many ways that the 3370 machine can have its 48V system logic voltage reach the 67.5V level necessary to cause 3 or more components on the machine to report a logic voltage - high fault. Here are some things to consider: • If the fault occurred with already fully charged li-ion batteries during a regenerative charge (i.e., while the machine is coasting, the traction motors charge the battery pack), everything is likely fine. Cycle the key switch and continue operation. • If the fault occurred immediately after fully charging the li-ion batteries, verify that the correct battery charger is being used.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
U1512	48V System Bus Voltage - Low	T1	This fault is reported when 3 or more components on the machine are reporting a Bus Voltage - Low fault.	PTO is disabled.	For the 3360 only: 1) Test the 100A BF1 style fuse (under the operator's seat). 2) Test the 5A standard blade fuse (under the operator's seat) 3) Inspect and test the 48V battery pack. 4) Test the logic relay and inspect connectors. 5) Test the 48V power wires on the logic relay. 6) Test the starter/generator. 7) Inspect the wiring between the starter/generator and the controller. 8) Install a replacement starter/generator assembly into the machine. 9) Use Toro DIAG to program the starter/generator controller. For the 3370 only: 1) Attempt to charge the batteries. 2) Test the 175A Mega fuse (behind the left side cover). 3) Test the 5A standard blade fuse (under the operator's seat) 4) Test the logic relay and inspect connectors. 5) Test the 48V power wires on the logic relay. 6) Use Toro DIAG to recover the batteries. 7) Create a Samsung battery output file, as described in Toro DIAG Commercial Products User's Guide. 8) Deliver the Samsung battery output file to the Toro Technical Assistance Center (TAC) by attaching it to a support case. 9) Follow the repair advice provided by Toro TAC.

Fault Number	Fault Title	Controller(s) Affected	Fault Condition/Circuit Description	Additional Notes	Service Actions
U1700	Board Internal Error	T6	The precharge controller (T6) has a power/ground problem or an internal failure.		1) Test power and ground at the precharge controller. 2) Test the 3-amp standard blade fuse (machine wire harness on left side of the center battery set). 3) Swap the precharge controller with a known good unit. 4) Use Toro DIAG to program the replacement precharge controller.
U1701	Board Internal Error - IPE	T1	This fault is reported when inputs or outputs in the primary controller are not working correctly.	Disables the machine.	1) Test the 12V battery voltage at the primary controller (T1) controller (P01). 2) Swap the primary controller (T1) with a known-good unit (includes using Toro DIAG to save the TD2 file out of the original TEC-5004, to program the known-good TEC-5004, and to restore the TD2 file into the final replacement TEC-5004).