Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
TELESCOPE OUT VALVE – OPEN CIRCUIT	33186	The Ground Module detects an open circuit at the Telescope Out Valve output.	Tele speed is limited to Creep	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.
TELESCOPE OUT VALVE – SHORT TO GROUND	33188	The Ground Module detects a short to ground at the Telescope Out Valve output.	Ground Module Telescope Out output is disabled; Tele In speed is limited to Creep.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
TELESCOPE IN VALVE – OPEN CIRCUIT	33189	The Ground Module detects an open circuit at the Telescope In Valve output.	Tele speed is limited to Creep	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.
TELESCOPE IN VALVE – SHORT TO GROUND	33190	The Ground Module detects a short to ground at the Telescope In Valve output.	Ground Module Telescope In and Out outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
GLOWPLUG – OPEN CIRCUIT	33279	The Ground Module detects an open circuit at the Glow Plug output. (Kubota)	No response required	Check for a good connection at the relay and for continuity through this circuit. With the relay disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.
GLOWPLUG – SHORT TO BATTERY	33280	The Ground Module detects a short to battery at the Glow Plug output. (Kubota)	Ground Module Glow Plug relay output is disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
GLOWPLUG – SHORT TO GROUND	33281	The Ground Module detects a short to ground at the Glow Plug output. (Kubota)	Ground Module Glow Plug relay output is disabled.	Inspect wiring for physical damage and check for wire continuity. Check for relay damage or shorting condition in connector. Cycle power to clear the fault.
LIFT – CURRENT FEEDBACK READING TOO LOW	33287	The Ground Module calls for current greater than 250mA, but the actual current is at least 125mA less than the called for current for more than 1 second	The Ground Module suspends Lift Up/Down commands and reverts to Open Loop Current control for Lift; Lift speed is limited to Creep after both Lift Up/Down controls have been returned to neutral and the machine is not Enabled	Part of the commanded current is being divided either prior to the solenoid connection or on the ground return path. Inspect wiring for physical damage and check for wire continuity and a low resistance return path. Cycle power to clear the fault.
SWING LEFT VALVE – OPEN CIRCUIT	33295	The Ground Module detects an open circuit at the Swing Left Valve output.	The Ground Module suspends Swing Left/Right commands and reverts to Open Loop Current control for Swing; Swing speed is limited to Creep after both Swing Left/Right controls have been returned to neutral and the machine is not Enabled	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.
FLOW CONTROL VALVE – OPEN CIRCUIT	33314	The Ground Module detects an open circuit at the Flow Control Valve output.	The Ground Module suspends output commands and reverts to Open Current loop control for Flow Control Valve; Tele In/Out, Jib Up, Rotate Right/Left, and Level Up/Down speed are limited to Creep after controls for those functions have all been simultaneously returned to neutral and the machine is not Enabled.	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.
FLOW CONTROL VALVE – SHORT TO BATTERY	33315	The Ground Module detects a short to battery at the Flow Control Valve output.	Disable Ground Module Flow Control Valve output and open the ground current return path; disallow energization of valves for Tele In/Out, Jib Up (permitted if operating in Emergency Descent mode), Level Up/Down, or Rotate Right/Left.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
FLOW CONTROL VALVE – SHORT TO GROUND	33316	The Ground Module detects a short to ground at the Flow Control Valve output.	Ground Module Flow Control Valve output is disabled; disallows energization of valves for Tele In/Out, Jib Up (permitted if operating in Emergency Descent mode), Level Up/ Down, or Rotate Right/Left.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
DRIVE FORWARD VALVE – OPEN CIRCUIT	33317	The Ground Module detects an open circuit at the Drive Forward Valve output.	The Ground Module suspends Drive Forward/Reverse commands and reverts to Open Current loop control for Drive; Drive speed is limited to Creep after both Drive Forward/Reverse controls have been returned to neutral and the machine is not Enabled.	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.
DRIVE VALVES – SHORT TO BATTERY	33318	The Ground Module detects a short to battery at either the Drive Forward or Drive Reverse valve.	Ground Module Drive Forward and Reverse outputs are disabled and open the ground current return path.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
DRIVE FORWARD VALVE – SHORT TO GROUND	33319	The Ground Module detects a short to ground at the Drive Forward Valve output.	Ground Module Drive Forward and Reverse outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
DRIVE REVERSE VALVE – OPEN CIRCUIT	33320	The Ground Module detects an open circuit at the Drive Reverse Valve output.	The Ground Module suspends Drive Forward/Reverse commands and reverts to Open Current loop control for Drive; Drive speed is limited to Creep after both Drive Forward/Reverse controls have been returned to neutral and the machine is not Enabled.	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.
DRIVE REVERSE VALVE – SHORT TO GROUND	33322	The Ground Module detects a short to ground at the Drive Reverse Valve output.	Ground Module Drive Forward and Reverse outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
DRIVE – CURRENT FEEDBACK READING TOO LOW	33331	The Ground Module calls for current greater than 250mA, but the actual current is at least 125mA less than the called for current for more than 1 second	The Ground Module suspends Drive Forward/Reverse commands and reverts to Open Current loop control for Drive; Drive speed is limited to Creep after both Drive Forward/Reverse controls have been returned to neutral and the machine is not Enabled.	Part of the commanded current is being divided either prior to the solenoid connection or on the ground return path. Inspect wiring for physical damage and check for wire continuity and a low resistance return path. Cycle power to clear the fault.
LIFT UP VALVE – SHORT TO GROUND	33406	The Ground Module detects a short to ground at the Lift Up Valve output.	Lift Up is disabled; Lift Down speed is limited to Creep	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
DRIVE – LOSS OF CURRENT FEEDBACK	33410	Measured feedback current is less than 225mA while Ground Module output is greater than 40% (Displayed on Analyzer DIAGNOSTICS menu).	The Ground Module suspends Drive Forward/Reverse commands and reverts to Open Current loop control for Drive; Drive speed is limited to Creep after both Drive Forward/Reverse controls have been returned to neutral and the machine is not Enabled.	Part or all of the commanded current is being diverted from the ground return path. Inspect wiring for physical damage and check for wire continuity and a low resistance return path. Cycle power to clear the fault.
SWING VALVES – SHORT TO BATTERY	33412	The Ground Module detects a short to battery at either the Swing Right or Swing Left valve	Ground Module Swing Left and Right outputs are disabled and open the ground current return path is open circuited.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
TOWER LIFT – CURRENT FEEDBACK READING TOO LOW	33413	The Ground Module calls for current greater than 250mA, but the actual current is at least 125mA less than the called for current for more than 1 second	The Ground Module suspends Tower Lift commands and reverts to Open Current loop control for Tower Lift; Tower Lift speed is limited to Creep after both Tower Lift Up/Down controls have been returned to neutral and the machine is not Enabled.	Part of the commanded current is being divided either prior to the solenoid connection or on the ground return path. Inspect wiring for physical damage and check for wire continuity and a low resistance return path. Cycle power to clear the fault.
SWING – CURRENT FEEDBACK READING TOO LOW	33414	The Ground Module calls for current greater than 250mA, but the actual current is at least 125mA less than the called for current for more than 1 second	The Ground Module suspends Swing Left/Right commands and reverts to Open Loop Current control for Swing; Swing speed is limited to Creep after both Swing Left/Right have been returned to neutral and the machine is not Enabled	Part of the commanded current is being divided either prior to the solenoid connection or on the ground return path. Inspect wiring for physical damage and check for wire continuity and a low resistance return path. Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
FLOW CONTROL VALVE – CURRENT FEEDBACK READING TOO LOW	33415	The Ground Module calls for current greater than 250mA, but the actual current is at least 125mA less than the called for current for more than 1 second	The Ground Module suspends and reverts to Open Current loop control for Flow Control Valve; Tele In/Out, Jib Up, Rotate Right/Left, and Level Up/Down speed is limited to Creep after controls for those functions have all been simultaneously returned to neutral and the machine is not Enabled	Part of the commanded current is being divided either prior to the solenoid connection or on the ground return path. Inspect wiring for physical damage and check for wire continuity and a low resistance return path. Cycle power to clear the fault.
TOWER LIFT – CURRENT FEEDBACK READING LOST	33416	Measured feedback current is less than 225mA while Ground Module output is greater than 40% (Displayed on Analyzer DIAGNOSTICS menu).	The Ground Module suspends commands and reverts to Open Current loop control for Tower Lift; Tower Lift speed is limited to Creep after both Lift Up/ Down controls have been returned to neutral and the machine is not Enabled.	Part or all of the commanded current is being diverted from the ground return path. Inspect wiring for physical damage and check for wire continuity and a low resistance return path. Cycle power to clear the fault.
LIFT – CURRENT FEEDBACK READING LOST	33417	Measured feedback current is less than 225mA while Ground Module output is greater than 40% (Displayed on Analyzer DIAGNOSTICS menu).	The Ground Module suspends Lift Up/Down commands and reverts to Open Loop Current control for Lift; Lift speed is limited to Creep after both Lift Up/ Down controls have been returned to neutral and the machine is not Enabled.	Part or all of the commanded current is being diverted from the ground return path. Inspect wiring for physical damage and check for wire continuity and a low resistance return path. Cycle power to clear the fault.
SWING – CURRENT FEEDBACK READING LOST	33418	Measured feedback current is less than 225mA while Ground Module output is greater than 40% (Displayed on Analyzer DIAGNOSTICS menu).	The Ground Module suspends Swing Left/Right commands and reverts to Open Loop Current control for Swing; Swing speed is limited to Creep after both Swing Left/Right have been returned to neutral and the machine is not Enabled.	Part or all of the commanded current is being diverted from the ground return path. Inspect wiring for physical damage and check for wire continuity and a low resistance return path. Cycle power to clear the fault.
FLOW CONTROL VALVE – CURRENT FEEDBACK READING LOST	33419	Measured feedback current is less than 225mA while Ground Module output is greater than 40% (Displayed on Analyzer DIAGNOSTICS menu).	The Ground Module suspends and reverts to Open Current loop control for Flow Control Valve; Tele In/Out, Jib Up, Rotate Right/Left, and Level Up/Down speed is limited to Creep after controls for those functions have all been simultaneously returned to neutral and the machine is not Enabled	Part or all of the commanded current is being diverted from the ground return path. Inspect wiring for physical damage and check for wire continuity and a low resistance return path. Cycle power to clear the fault.
TRACTION LOCK VALVE – SHORT TO BATTERY	33420	The Ground Module detects a short to battery at the Traction Lock valve output.	If in Max Speed drive mode, the machine switches to Max Torque; Max Speed drive mode is disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
TRACTION LOCK VALVE – OPEN CIRCUIT	33421	The Ground Module detects an open circuit at the Traction Lock valve output.	If in Max Speed drive mode, the machine switches to Max Torque; Max Speed drive mode is disabled.	Check for a good connection at the solenoid and for continuity through this circuit. Inspect wiring for physical damage.Cycle power to clear the fault.
TRACTION LOCK VALVE – SHORT TO GROUND	33422	The Ground Module detects a short to ground at the Traction Lock valve output.	Traction Lock valve output is disabled. If in Max Speed drive mode, the machine switches to Max Torque; Max Speed drive mode is disabled.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
OSCILLATING AXLE VALVES – SHORT TO BATTERY	33423	The Ground Module detects a short to battery condition on the J1-7 output.	The Ground Module assumes an Above Elevation State and de-energizes the J1-7 Oscillating Axle output.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
OSCILLATING AXLE VALVES – SHORT TO GROUND	33424	The Ground Module detects a short to ground condition on the J1-7 output.	The Ground Module to assumes an Above Elevation State and de-energizes J1-7 Oscillating Axle output.	Inspect wiring for physical damage and check for wire continuity. Check for shorting condition in connector. Cycle power to clear the fault.
TOWER LIFT VALVES – SHORT TO BATTERY	33425	The Ground Module detects a short to battery at either the Tower Lift Up or Tower Lift Down valve.	Ground Module Tower Lift Up and Down outputs are disabled and open the ground current return path.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
PLATFORM ROTATE LEFT VALVE – OPEN CIRCUIT	349	The Platform Module detects an open circuit at the Platform Rotate Left Valve output and reports it to the Ground Module.	Platform Rotate speed is limited to Creep	Check for a good connection at the solenoid and for continuity through this circuit. Inspect wiring for physical damage. Cycle power to clear the fault.
PLATFORM ROTATE LEFT VALVE – SHORT TO BATTERY	3410	The Platform Module detects a short to battery at the Platform Rotate Left Valve output and reports it to the Ground Module.	Platform Module are disabled for Platform Rotate Right, Rotate Left, and Flow Control Valve outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
PLATFORM ROTATE LEFT VALVE – SHORT TO GROUND	3411	The Platform Module detects a short to ground at the Platform Rotate Left Valve output and reports it to the Ground Module.	Platform Rotate Right and Left outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
PLATFORM ROTATE RIGHT VALVE – OPEN CIRCUIT	3412	The Platform Module detects an open circuit at the Platform Rotate Right Valve output and reports it to the Ground Module.	Platform Rotate speed is limited to Creep	Check for a good connection at the solenoid and for continuity through this circuit. Inspect wiring for physical damage. Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
PLATFORM ROTATE RIGHT VALVE – SHORT TO BATTERY	3413	The Platform Module detects a short to battery at the Platform Rotate Right Valve output and reports it to the Ground Module.	Platform Rotate Right, Rotate Left, and Flow Control Valve outputs.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
PLATFORM ROTATE RIGHT VALVE – SHORT TO GROUND	3414	The Platform Module detects a short to ground at the Platform Rotate Right Valve output and reports it to the Ground Module.	Platform Rotate Right and Left outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
JIB LIFT UP VALVE – OPEN CIRCUIT	3415	The Platform Module detects an open circuit at the Jib Lift Up Valve output and reports it to the Ground Module.	Jib Lift speed is limited to Creep.	Check for a good connection at the solenoid and for continuity through this circuit. Inspect wiring for physical damage. Cycle power to clear the fault.
JIB LIFT UP VALVE – SHORT TO BATTERY	3416	The Platform Module detects a short to battery at the Jib Lift Up Valve output and reports it to the Ground Module.	Jib Lift Up and Flow Control Valve outputs are disabled; Jib Lift Down speed is limited to Creep	Check for a good connection at the solenoid and for continuity through this circuit. Inspect wiring for physical damage. Cycle power to clear the fault.
JIB LIFT UP VALVE – SHORT TO GROUND	3417	The Platform Module detects a short to ground at the Jib Lift Up Valve output and reports it to the Ground Module.	Jib Lift Up output is disabled; Jib Lift Down speed is limited to Creep	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
JIB LIFT DOWN VALVE – OPEN CIRCUIT	3418	The Platform Module detects an open circuit at the Jib Lift Down Valve output and reports it to the Ground Module.	Jib Lift speed is limited to Creep.	Check for a good connection at the solenoid and for continuity through this circuit. Inspect wiring for physical damage. Cycle power to clear the fault.
JIB LIFT DOWN VALVE – SHORT TO BATTERY	3419	The Platform Module detects a short to battery at the Jib Lift Down Valve output and reports it to the Ground Module.	Jib Lift Up and Down outputs are disabled.	Check for a good connection at the solenoid and for continuity through this circuit. Inspect wiring for physical damage. Cycle power to clear the fault.
JIB LIFT DOWN VALVE – SHORT TO GROUND	3420	The Platform Module detects a short to ground at this output and reports it to the Ground Module.	Jib Lift Up and Down outputs are disabled.	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
FUEL SENSOR SHORT TO BATTERY	431	Ground Module fuel sensor input (J2-25) detects a voltage higher than 2.50 volts	The Control System shuts down all fuel level indicators in Platform and Ground stations.	Disconnect fuel sender and verify resistance readings can range from approximately 30ohms (full) to 240ohms (empty). If not, replace sender. With fuel sender connected, backprobe J2-25 and verify voltage range from approximately 0.5V to 2.3V. Troubleshoot wiring or connections.
FUEL SENSOR SHORT TO GROUND	432	Ground Module fuel sensor input (J2-25) detects a voltage less than or equal to 0.3 volts	The Control System shuts down all fuel level indicators in Platform and Ground stations.	Disconnect fuel sender and verify resistance readings can range from approximately 30ohms (full) to 240ohms (empty). If not okay, replace sender. With fuel sender connected, backprobe J2-25 and verify voltage range from approximately 0.5V to 2.3V. Troubleshoot wiring or connections.
OIL PRESSURE SHORT TO BATTERY	433	MACHINE SETUP → ENGINE = KUBOTA D1105 Oil Pressure reads a high value at Startup even though the engine has not been started (occurs for STB or OC – wire off pressure switch)	If MACHINE SETUP → ENGINE SHUTDOWN = ENABLED then engine start is not permitted; Low Oil Pressure indicator will be activated	Verify wire is connected to oil pressure switch. With engine off, switch should show low impedance to ground or replace switch. Observe state change on Analyzer under DIAGNOSTICS-->ENGINE-->ENGINE OIL PRESS
COOLANT TEMPERATURE SHORT TO GROUND	435	MACHINE SETUP → ENGINE = KUBOTA D1105 Ground Module coolant temperature input (J1-14) detects a voltage less than or equal to 0.05 volts	If MACHINE SETUP → ENGINE SHUTDOWN = ENABLED then engine will be shutdown High Engine Temperature indicator will be activated	Disconnect temperature sender and verify resistance reading > 0.15ohms (up to 50kohms is acceptable); then troubleshoot wiring. With system on, backprobe J1-14 and verify voltage > 1.5V.
ENGINE TROUBLE CODE	437	The engine controller reports a J1939 fault	Engine will operate at 1800RPM until power cycle.	Cycle power to clear the fault.
HIGH ENGINE TEMP	438	For a machine configured with a Kubota D1105 engine, the engine has been running more than 10 seconds and the engine coolant temperature is greater than 110°C: For a machine with electronic engine controls, the ECM transmits an engine coolant high temperature critical fault (SPN:FMI 110:0)	If MACHINE SETUP → ENGINE SHUTDOWN = ENABLED then the engine will be shut down and the High Engine Temperature indicator will be lit	Reduce hydraulic loading of machine and inspect radiator for blockage of air flow.
NO ALTERNATOR OUTPUT	4310	The engine has been running more than 10 seconds and Ground Module system voltage is less than 11.5 volts for 10 seconds	The No Charge indicator will be lit	Ground Module system voltage greater than 11.7 volts

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
LOW OIL PRESSURE	4311	For a machine configured with a Kubota D1105 engine, the engine has been running more than 10 seconds and the engine oil pressure is LOW (debounce 3s). For a machine with electronic engine controls, the ECM transmits an engine oil low pressure critical fault (SPN:FMI 100:1).	If MACHINE SETUP → ENGINE SHUTDOWN = ENABLED then the engine will be shut down and the Low Oil Pressure indicator will be lit	Check engine oil level. Cycle power to clear the fault.
THROTTLE ACTUATOR FAILURE	4313	For a machine configured with a Kubota D1105 engine: THROTTLE ACTUATOR – OPEN CIRCUIT (33131) is not active THROTTLE ACTUATOR – SHORT TO GROUND (33130) is not active LOSS OF ENGINE SPEED SENSOR (4322) is not active desired engine speed is greater than 1800 but actual RPM is less than 1400 (debounce time = 3s) when no fault exists with Proportional Fuel Rack actuator	Disable Ground Module Throttle Actuator output and call for full opening (current = 1500mA) to Proportional Fuel Rack Actuator.	Cycle power to clear the fault.
WRONG ENGINE SELECTED – ECM DETECTED	4314	Machine is configured with a non-electronic controlled Kubota D1105 engine and the Ground Module detects an electronic engine controller on the CAN bus	No function inhibits required	Cycle power to clear the fault.
LOSS OF ENGINE SPEED SENSOR	4322	Machine is configured with a Kubota D1105 engine and the engine is running: LOW OIL PRESSURE fault (4311) is not active OIL PRESSURE SHORT TO BATTERY fault (433) is not active No engine shutdown command exists Engine RPM is read as 0 for 1500ms and Engine oil pressure is not LOW	Ground Module to limit all function speeds to creep, but run at High Engine speed until the oil pressure drops to a low value. Ground Module to disable Generator relay output until generator operator switch cycled.	Check proper seating/clearance of engine speed sensor installation. Verify continuity of wiring before replacing sensor. Fault cleared when Engine RPM greater than 0
SPEED SENSOR READING INVALID SPEED	4323	Machine is configured with a Kubota D1105 engine and the engine RPM reading is greater than 4000	The Ground Module commands High Engine speed and places all functions in Creep.	Verify integrity of wiring, particularly the ground, before replacing sensor. Fault cleared when engine RPM reading < 4000
FUEL ACTUATOR – SHORT TO GROUND	4326	The Ground Module detects a short to ground at the fuel actuator output. (Kubota)	The Ground Module disables the Fuel Actuator output	Inspect wiring for physical damage and check for wire continuity. Check for coil damage or shorting condition in connector. Cycle power to clear the fault.
FUEL ACTUATOR – OPEN CIRCUIT	4327	The Ground Module detects an open circuit at the fuel actuator output. (Kubota)	The Ground Module controls revert to Open Loop and restrict machine speeds to Creep.	Check for a good connection at the solenoid and for continuity through this circuit. With the solenoid disconnected, an open circuit voltage of nearly 8.0V exists on the Ground Module output pin for diagnostic purposes. Inspect wiring for physical damage. Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
FUEL ACTUATOR – SHORT TO BATTERY	4328	The Ground Module detects a short to battery at the fuel actuator output. (Kubota)	Disable Ground Module Fuel Actuator output and open the ground current return path.	Inspect wiring for physical damage and check for wire continuity. Cycle power to clear the fault.
FUEL ACTUATOR - CURRENT FEEDBACK READING TOO LOW	4329	The Ground Module calls for current greater than 250mA, but the actual current is at least 125mA less than the called for current for more than 1 second	The Ground Module controls revert to Open Loop control and restricts all machine speeds to Creep.	Part of the commanded current is being divided either prior to the solenoid connection or on the ground return path. Inspect wiring for physical damage and check for wire continuity and a low resistance return path. Cycle power to clear the fault.
FUEL ACTUATOR – CURRENT FEEDBACK READING LOST	4330	Measured feedback current is less than 225mA while Ground Module output is greater than 40% for a period of 100ms (Displayed on Analyzer DIAGNOSTICS menu).	The Ground Module controls revert to Open Loop and restricts all machine speeds to Creep.	Part or all of the commanded current is being diverted from the ground return path. Inspect wiring for physical damage and check for wire continuity and a low resistance return path. Cycle power to clear the fault.
BATTERY VOLTAGE TOO LOW – SYSTEM SHUTDOWN	441	The Ground Module detects that its supply voltage is less than 9 volts	Disable all Ground Module valve outputs except those used during Emergency Descent (Tower Lift Down, Lift Down, Jib Up/Down). If MACHINE SETUP → H&T LIGHTS = YES or → ENGINE = KUBOTA D1105 turn off lights and disable glow plugs.	Perform battery maintenance. Fault cleared when voltage is greater than 9.25 volts
BATTERY VOLTAGE TOO HIGH – SYSTEM SHUTDOWN	442	The Ground Module detects that its supply voltage is greater than 16.0 volts.	Disable all Ground Module and Platform outputs until voltage is less than 15.75 volts	Likely cause is poor alternator regulation; check alternator. Cycle power to clear the fault.
LSS BATTERY VOLTAGE TOO HIGH	443	MACHINE SETUP → LOAD SYSTEM NOT EQUAL The machine is configured with and Load Sensing System and the Ground Module detects that the LSS reports supply voltage greater than 16.0 volts.	Ground Module to set Platform Load State = Overloaded	LSS reports voltage less than 16.0V
LSS BATTERY VOLTAGE TOO LOW	444	The machine is configured with and Load Sensing System and the Ground Module detects that the LSS reports supply voltage less than 9.0 volts.	Ground Module to set Platform Load State = Overloaded	LSS reports voltage greater than 9.0V
BATTERY VOLTAGE LOW	445	The Ground Module detects that its supply voltage < 11 volts for 5 seconds while none of the following conditions exist: Engine is not cranking Emergency Descent Mode is not active Glow Plugs are not energized	No functions are inhibited	Voltage is greater than 11.25 volts

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
LSS BATTERY VOLTAGE - INITIALIZATION ERROR	4479	The shear beam is reporting a Sensor Supply Voltage Initialization Error The machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS BATTERY VOLTAGE - NOT CALIBRATED	4480	The shear beam is reporting a Sensor Supply Voltage calibration error. The machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
CANBUS FAILURE – PLATFORM MODULE	662	Ground Module does not receive any CAN messages from the Platform Module in 250ms	All functions will be decelerated to zero and generator will be disabled. If machine equipped with Dual Fuel engine, state of Fuel Selection switch shall be retained until CAN Bus 1 is restored. Reactivation of Footswitch is required to resume operation.	With power off, disconnect the boom cable at the bottom of the Platform box. With a multimeter, verify that the resistance between the CAN1H and CAN1L pins of the boom cable is approximately 120ohms. Verify the same at the connector entering the bottom of the box. If Okay, connect cable at platform and disconnect cable at connection near turntable. Check in the same manner then continue splitting and measuring in the manner over remainder of machine CAN Bus. When a bad reading occurs, check wire continuity on the individual wire. Fault is cleared when CAN messages are received from the Platform Module
CANBUS FAILURE – LOAD SENSING SYSTEM MODULE	663	The control system has lost communication with the load sensing system load pin. The machine will assume the platform is overloaded.	Ground Module to assume Platform Load State = Overloaded	Check wiring to load sensor.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
CANBUS FAILURE – ENGINE CONTROLLER	666	An engine with a CAN engine controller is configured in MACHINE SETUP No CAN messages are received from the engine controller for more than 250ms	Ground Module shall decel all functions, set Target engine RPM = Mid-Engine if Engine State ENGINE STOPPED, and assume Engine Controller reporting mid-Engine; otherwise Engine State = ENGINE STOPPED. If MACHINE SETUP → GENERATOR = YES, Generator Relay output to be turned off until re-enabled by operator. Reactivation of Footswitch is required to resume operation.	With power off, disconnect the CAN2 cable going to the engine at the tee near the UGM. With a multimeter, verify that the resistance between the CAN2H and CAN2L pins is approximately 120ohms both in the path to engine and path to UGM. If a bad reading occurs, check wire continuity on individual wires. CAN messages are received from the engine controller. Ground Module shall require re-activation of Footswitch to enable functions.
CANBUS FAILURE – EXCESSIVE CANBUS ERRORS	6613	More than 22 error frames per second for 4 seconds or more than 500 Buss Off conditions since last power cycle.	No functions are inhibited.	Cycle power to clear the fault.
CANBUS FAILURE – TCU MODULE	6622	MACHINE SETUP → CLEARSKY = YES No CAN2 messages are received from the TCU module for more than 30 seconds	No functions are inhibited.	CAN messages are received from the TCU module.
REMOTE CONTRACT MANAGEMENT OVERRIDE – ALL FUNCTIONS IN CREEP	681	MACHINE SETUP → CLEARSKY = YES Value set by ClearSky TCU	Puts the machine into Creep and locks into Transport	Cleared by ClearSky TCU
CHASSIS TILT SENSOR NOT CALIBRATED	813	The tilt sensor has not been calibrated	The Ground Module reports a faulted chassis tilt angle of 90 degrees	Calibrate the Tilt sensor to clear the fault
CHASSIS TILT SENSOR OUT OF RANGE	814	Fault CHASSIS TILT SENSOR NOT CALIBRATED (813) is not present and Tilt sensor measurement greater than 19º for 4 seconds. Note: Not to be reported during Tilt Sensor calibration.	No additional action required beyond Tilted requirements specified above. Ground Module reports 90° angle.	Tilt sensor reads less than 19º.
CHASSIS TILT SENSOR DISAGREEMENT	815	The Ground Module detects one of the following conditions: If a Drive, Steer, or Boom function is active or if the engine is cranking or if the primary raw Tilt Sensor readings greater than ±10 º then: if the two ground board tilt sensors disagree by more than or equal to 3 degrees for either the X axis or the Y axis for longer than 5 seconds then the fault will be logged. If no Drive, Steer, or Boom functions are active and the engine is not cranking or the primary raw Tilt Sensor readings are less than ±10 º then: if the two ground board tilt sensors disagree by more than or equal to 1 degree for either the X axis or the Y axis for longer than 3 seconds then the fault will be logged. Note: This fault is not reported if DTC 814 is active.	The Ground Module reports a faulted chassis tilt angle of 90 degrees	Cycle power to clear the fault.
LSS CELL #1 ERROR	821	MACHINE SETUP → LOAD SYSTEM is not set = NO The Ground Module detects that LSS is reporting error with Cell #1	Ground Module to assume Platform Load State = Overloaded	CAN messages are received from the LSS module.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
LSS READING UNDER WEIGHT	8211	LSS has been calibrated and the UGM has determined that the load sensing system reading is underweight while a period of time while operating drive or boom lift up at speeds greater than creep OR the UGM has determined that the load sensing system reading is less than -1.5 x Gross Platform Weight. The machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Ensure platform is not resting on the ground or is not leveled at an extreme negative angle. Re-calibrate the load sensing system if the above items are not a factor.
LSS CELL #2 ERROR	822	MACHINE SETUP → LOAD SYSTEM is not set = NO The Ground Module detects that LSS is reporting error with Cell #2	Ground Module to assume Platform Load State = Overloaded	CAN messages are received from the LSS module.
LSS STRAIN GAUGE 1 - STAGNANT	8222	The control system has determined that the strain gauge 1 reading in the load sensor is stagnant (not changing). If the platform is not considered to be overloaded boom functions will be restricted to creep.. If DTC 8223 is active in combination with DTC 8222 the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS STRAIN GAUGE 2 - STAGNANT	8223	The control system has determined that the strain gauge 2 reading in the load sensor is stagnant (not changing). If the platform is not considered to be overloaded boom functions will be restricted to creep. If DTC 8222 is active in combination with DTC 8223 the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS STRAIN GAUGE 1 - OUT OF RANGE LOW	8224	The shear beam is reporting an out of range low issue with the strain gauge 1 reading. If the platform is not overloaded the machine will be placed in to creep. If DTC 8225 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS STRAIN GAUGE 2 - OUT OF RANGE LOW	8225	The shear beam is reporting an out of range low issue with the strain gauge 2 reading. If the platform is not overloaded the machine will be placed in to creep. If DTC 8224 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
LSS STRAIN GAUGE 1 - OUT OF RANGE HIGH	8226	The shear beam is reporting an out of range high issue with the strain gauge 1 reading. If the platform is not overloaded the machine will be placed in to creep. If DTC 8227 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS STRAIN GAUGE 2 - OUT OF RANGE HIGH	8227	The shear beam is reporting an out of range high issue with the strain gauge 2 reading. If the platform is not overloaded the machine will be placed in to creep. If DTC 8226 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS STRAIN GAUGE 1 - INITIALIZATION ERROR	8228	The shear beam is reporting an initialization issue with the strain gauge 1 sensor. If the platform is not overloaded the machine will be placed in to creep. If DTC 8229 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS STRAIN GAUGE 2 - INITIALIZATION ERROR	8229	The shear beam is reporting an initialization issue with the strain gauge 2 sensor. If the platform is not overloaded the machine will be placed in to creep. If DTC 8228 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS STRAIN GAUGE 1 - NOT CALIBRATED	8230	The shear beam is reporting a calibration issue with the strain gauge 1 sensor. If the platform is not overloaded the machine will be placed in to creep. If DTC 8231 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS CELL #3 ERROR	823	MACHINE SETUP → LOAD SYSTEM is not set = NO The Ground Module detects that LSS is reporting error with Cell #3	Ground Module to assume Platform Load State = Overloaded	CAN messages are received from the LSS module.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
LSS STRAIN GAUGE 2 - NOT CALIBRATED	8231	The shear beam is reporting a calibration issue with the strain gauge 2 sensor. If the platform is not overloaded the machine will be placed in to creep. If DTC 8230 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS STRAIN GAUGE 1 - SENSOR DEFECT	8232	The shear beam is reporting a sensor defect issue with the strain gauge 1 sensor. If the platform is not overloaded the machine will be placed in to creep. If DTC 8233 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS STRAIN GAUGE 2 - SENSOR DEFECT	8233	The shear beam is reporting a sensor defect issue with the strain gauge 2 sensor. If the platform is not overloaded the machine will be placed in to creep. If DTC 8232 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS STRAIN GAUGE 1 - NOT INSTALLED	8234	The shear beam is reporting a not installed issue with the strain gauge 1 sensor. If the platform is not overloaded the machine will be placed in to creep. If DTC 8235 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS STRAIN GAUGE 2 - NOT INSTALLED	8235	The shear beam is reporting a not installed issue with the strain gauge 2 sensor. If the platform is not overloaded the machine will be placed in to creep. If DTC 8234 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS NOT DETECTING CHANGE	8236	The control system has determined that the load sensor reading has not deviated by more than 1lb for 5s while operating drive or boom functions at greater than creep speed. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
LSS STRAIN GAUGE 1 - A/D DEFECT	8237	The shear beam is reporting an internal issue with the strain gauge 1 sensor. If the platform is not overloaded the machine will be placed in to creep. If DTC 8238 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS STRAIN GAUGE 2 - A/D DEFECT	8238	The shear beam is reporting an internal issue with the strain gauge 2 sensor. If the platform is not overloaded the machine will be placed in to creep. If DTC 8237 is also active the machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
LSS CELL #4 ERROR	824	MACHINE SETUP → LOAD SYSTEM is not set = NO The Ground Module detects that LSS is reporting error with Cell #4.	Ground Module to assume Platform Load State = Overloaded	CAN messages are received from the LSS module.
LSS HAS NOT BEEN CALIBRATED	825	The load sensing system is configured but has not been calibrated. The machine will assume the platform is overloaded.	Ground Module to assume Platform Load State = Overloaded	Calibrate the load sensing system.
RUNNING AT CREEP – PLATFORM OVERLOADED	826	Machine Setup → LOAD SYSTEM = WARN ONLY The platform is Overloaded Ground mode is active with Emergency Descent mode not active or Platform mode is active	Refer to Table 6-16, Overload Variations for machine response.	Not all of the trigger conditions are met
DRIVE & BOOM PREVENTED – PLATFORM OVERLOADED	827	The Platform is Overloaded and Machine Setup → LOAD SYSTEM = CUTOUT PLATFORM, Platform Mode is active, and conditions of Table 6-16, Overload Variations apply. -or- The Platform is Overloaded and Machine Setup → LOAD SYSTEM = CUTOUT ALL and conditions of Table 6-16, Overload Variations apply.	Refer to Table 6-16, Overload Variations for machine response.	Not all of the trigger conditions are met
LIFT UP & TELE OUT PREVENTED – PLATFORM OVERLOADED	828	MACHINE SETUP → LOAD SYSTEM = SPECIAL 1 Platform Mode is active The platform is Overloaded	Refer to Table 6-16, Overload Variations for machine response.	Not all of the trigger conditions are met
LSS READING UNDER WEIGHT	8211	MACHINE SETUP → LOAD SYSTEM NO The load sensor has been calibrated and Gross Platform Weight < (0.5 * Empty Platform Weight).	Ground Module to set Platform Load State = Overloaded	Not all of the trigger conditions are met
FRONT LEFT STEER VALVE – OPEN CIRCUIT	8639	The Ground Module detects an open circuit at the Front Left Steer Valve output.	Steer Left and Right speed are limited to Creep	Cycle power to clear the fault.
FRONT LEFT STEER VALVE – SHORT TO BATTERY	8640	The Ground Module detects a short to battery at the Front Left Steer Valve output.	The Ground Module disables the Drive Forward/Reverse and Steer Left/Right outputs.	Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
FRONT LEFT STEER VALVE – SHORT TO GROUND	8641	The Ground Module detects a short to ground at the Front Left Steer Valve output.	The Ground Module disables the Steer Left and Right outputs.	Cycle power to clear the fault.
FRONT RIGHT STEER VALVE – OPEN CIRCUIT	8642	The Ground Module detects an open circuit at the Front Right Steer Valve output.	Steer Left and Right speed is limited to Creep	Cycle power to clear the fault.
FRONT RIGHT STEER VALVE – SHORT TO BATTERY	8643	The Ground Module detects a short to battery at the Front Right Steer Valve output.	The Ground Module disables the Drive Forward/Reverse and Steer Left/Right outputs	Cycle power to clear the fault.
FRONT RIGHT STEER VALVE – SHORT TO GROUND	8644	The Ground Module detects a short to ground at the Front Right Steer Valve output.	The Ground Module disables the Steer Left and Right outputs	Cycle power to clear the fault.
OSCILLATING AXLE SWITCH DISAGREEMENT	8669	The Ground Module detects that Oscillating Axle switch #1 and switch #2 are not in agreement. Note: This fault will not to be reported if DTC 23104 BOOM TRANSPORT SWITCH DISAGREEMENT is active.	The Ground Module assumes an Above Elevation State and de-energizes J1-7 Oscillating Axle output.	Cycle power to clear the fault.
FUNCTIONS LOCKED OUT	9911			
LSS WATCHDOG RESET	991	The Ground Module detects an LSS report of an anomaly that has caused a WatchDog Timer reset.	The Ground Module sets the Platform Load State to Overloaded	Cycle power to clear the fault.
LSS EEPROM ERROR	992	The Ground Module detects an LSS report of an anomaly that exists in the LSS EEPROM	The Ground Module sets the Platform Load State to Overloaded	Cycle power to clear the fault.
LSS INTERNAL ERROR – PIN EXCITATION	993	The Ground Module detects an LSS report of improper excitation voltage.	The Ground Module sets the Platform Load State to Overloaded	Cycle power to clear the fault.
LSS INTERNAL ERROR – DRDY MISSING FROM A/D	994	The Ground Module detects an LSS report of an anomaly that exists in the LSS A/D converter operations.	The Ground Module sets the Platform Load State to Overloaded	Cycle power to clear the fault.
EEPROM FAILURE - CHECK ALL SETTINGS	998	The Ground Module has detected an anomaly in the EEPROM	The Ground Module disables all functions and resets the section of EEPROM where the failure occurred back to the defaults.	Cycle power to clear the fault.
FUNCTIONS LOCKED OUT - PLATFORM MODULE SOFTWARE VERSION IMPROPER	9910	The Ground Module software major version number does not match the major version number of the platform software	The platform alarm sounds continuously and, Creep mode is active. If the Platform Mode is active all Drive, Steer, and Boom functions are disabled.	Platform Module needs reprogrammed with correct version of software.
FUNCTION LOCKED OUT - LSS MODULE SOFTWARE VERSION IMPROPER	9911	The Ground Module determines that the LSS software version is not compatible with existing code.	The Ground Module sets the Platform Load State to Overloaded	Cycle power to clear the fault.
CHASSIS TILT SENSOR NOT GAIN CALIBRATED	9915	The tilt sensor gain calibration values recorded to flash memory during manufacturing are not present	The Ground Module reports a faulted chassis tilt angle of 90 degrees	Valid values must be present to reset.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
GROUND SENSOR REF VOLTAGE OUT OF RANGE	9919	The Ground Module has detected reference voltage is out of range (Reference Voltage is between 2.3V and 2.7V).	If MACHINE SETUP → Kubota D1105 and ENGINE SHUTDOWN → ENABLED, then call for engine shutdown and disable engine start operations; otherwise, no interlocks required.	Cycle power to clear the fault.
PLATFORM SENSOR REF VOLTAGE OUT OF RANGE	9920	The Platform Module detects that its reference voltage is out of range and reports the fault to the Ground Module	If in Platform mode, Lift/Swing and Drive are placed in Creep. All other functions shall operate normally.	Cycle power to clear the fault.
GROUND MODULE FAILURE:HIGH SIDE DRIVER CUTOUT FAULTY	9921	The engine is not running The engine is not cranking The Ground Module footswitch input (J7-15) is LOW The machine is in Platform Mode The Main Dump output (J2-13) is detected as HIGH via the analog feedback 300ms after it is attempted to be activated during the one time startup test of the Ground Module hardware shutoff circuitry	All Drive/Steer and Boom functions except Tower Lift Down, Lift Down, and Jib Lift Down are disabled.	Cycle power to clear the fault.
PLATFORM MODULE FAILURE: HWFS CODE 1	9922	The Platform Module detects faulty hardware	No response required.	Cycle power to clear the fault; if faults remains, replace board.
GROUND MODULE FAILURE: HWFS CODE 1	9923	The Ground Module detects faulty hardware.	No response required.	Cycle power to clear the fault; if faults remains, replace board.
FUNCTIONS LOCKED OUT - MACHINE NOT CONFIGURED	9924	The machine is powered up and no model has been selected yet in the MACHINE SETUP menu	Display??? or NO MODEL at Analyzer MACHINE SETUP menu MACHINE SETUP->MODEL NUMBER No other faults will be reported. All machine functions are disabled and the engine is not permitted to start.	Cycle power to clear the fault.
LSS - FACTORY CALIBRATION ERROR	99285	The load sensor is reporting a factor calibration issue (internal error) The machine will assume the platform is overloaded. This fault, once annunciated is latched within a given key cycle.		Possible sensor hardware issue.
CURRENT FEEDBACK GAINS OUT OF RANGE	9944	One or more of the current feedback gains that are calculated and written to flash memory during manufacturing are detected as being out of range	A gain of 1 is used for the factory gain(s) that was out of range; all functions are placed in Creep mode.	Cycle power to clear the fault.
CURRENT FEEDBACK CALIBRATION CHECKSUM INCORRECT	9945	The current feedback gains checksum that is calculated and written to flash memory during manufacturing is detected as being incorrect	All machine and engine functions are disabled (i.e., command engine shutdown and do not permit start).	Cycle power to clear the fault.

Table 6-15. Fault Code Troubleshooting Information

Help Message	DTC	Condition Producing DTC	Control System Response or Machine Condition	Corrective Action/ Operational Requirement for Function Movement and/or to Clear Fault
MACHINE CONFIGURATION OUT OF RANGE – CHECK ALL SETTINGS	9949	The Ground Module has detected an anomaly in stored readings for the Machine Setup configuration.	The Ground Module prompts the operator to correct the issue via Analyzer and disable all functions until stored data in corrupted area is changed.	Cycle Power and change the Machine Setup data.
LSS CORRUPT EEPROM	9977	The Ground Module is advising that the LSS module has detected faulty stored parameters.	The Ground Module sets the Platform Load State to Over-loaded	Cycle power to clear the fault.
FUNCTIONS LOCKED OUT - GROUND MODULE SOFTWARE VERSION IMPROPER	9979	Ground Module detects a disagreement with internal checks on the version of software.	All machine and engine functions are disabled (i.e., command engine shutdown and do not permit start)	Cycle power to clear the fault.
GROUND MODULE VLOW FET FAILURE	9986	Ground Module has determined a hardware fault exists and is unable to read high-sensing inputs.	All machine and engine functions are disabled (i.e., command engine shutdown and do not permit start)	Cycle power to clear the fault.

[1] Annotated DTCs do not flash a numeric code, sound an alarm, and are not stored in annotated DTCs in Logged Help queue (this applies to most DTCs < 0100).

Table 6-16. Overload Variations

BROADCAST ONLY[3]	WARN ONLY	CUTOUT ALL	SPECIAL 1 (Access Industries)	CUTOUT PLATFORM
Platform				
Activate visual overload light at Platform Station	Activate visual overload light at Platform Station	Activate System Distress and Overload lights at Platform station	Activate visual overload light at Platform Station	Activate System Distress and Overload lights at Platform station
Activate Platform and Ground Alarm – 5 sec ON, 2 sec OFF	Activate Platform and Ground Alarm – 5 sec ON, 2 sec OFF	Activate Platform and Ground Alarm – 5 sec ON, 2 sec OFF	Activate Platform and Ground Alarm – on continuously	Activate Platform and Ground Alarm – 5 sec ON, 2 sec OFF
Do not report Fault	Activate creep mode all functions, energize Creep light, and report Fault	Do not permit Machine Enable (no creep light) and report Fault	Activate creep mode all functions, energize Creep light, and report Fault	Do not permit Machine Enable (no creep light) and report Fault
			Disable Telescope Out and Lift Up	
Ground				
Activate visual overload light (Ground Station)	Activate visual overload light (Ground Station)	Activate visual overload light (Ground Station)	Activate visual overload light (Ground Station)	Activate visual Overload light at Ground Station
Activate Platform and Ground Alarm – 5 sec ON, 2 sec OFF	Activate Platform and Ground Alarm – 5 sec ON, 2 sec OFF	Activate Platform and Ground Alarm – 5 sec ON, 2 sec OFF	Activate Platform and Ground Alarm – on continuously	Activate Platform and Ground Alarm – 5 sec ON, 2 sec OFF
Do not report Fault	Report Fault	Report Fault	Do not report Fault	Do not report fault.
	Activate creep mode all functions	Do not permit Machine Enable (no creep light)	Overload shall have no effect on function speeds.	Overload shall have no effect on function speeds.
Auxiliary Power/Emergency Descent				
Platform operation and annunciation as Platform Mode above	Platform operation and annunciation as Platform Mode above	Platform operation and annunciation as Platform Mode above, except do not disable all functions	Platform operation and annunciation as Platform Mode above	Platform operation and annunciation as Platform Mode above, except do not report Fault or disable all functions
Ground operation and annunciation as Ground Mode above, except do not activate creep mode	Ground operation and annunciation as Ground Mode above, except do not activate creep mode	Ground operation and annunciation as Ground Mode above, except do not report Fault or disable all functions	Ground operation and annunciation as Ground Mode above	Ground operation and annunciation as Ground Mode above
Faults				
No applicable fault	When the platform is overloaded, report "RUNNING AT CREEP - PLATFORM OVERLOADED."	When the platform is overloaded, report "DRIVE & BOOM PREVENTED – PLATFORM OVERLOADED."	When the platform is overloaded, report "LIFT UP & TELE OUT PREVENTED – PLATFORM OVERLOADED."	When the platform is overloaded, report the "DRIVE & BOOM PREVENTED – PLATFORM OVERLOADED."

Clarifications:
1. The term Report Fault is defined as logging the DTC on the Analyzer fault stack and flashing the System Distress lamp.
2. When specified, Ground Alarm energization shall only occur if MACHINE SETUP → GROUND ALARM ≠ NO.
3. This selection is not Analyzer configurable in MACHINE SETUP → LOAD SYSTEM but is shown here for completeness of the response table.

NOTES:

PARTS FINDER

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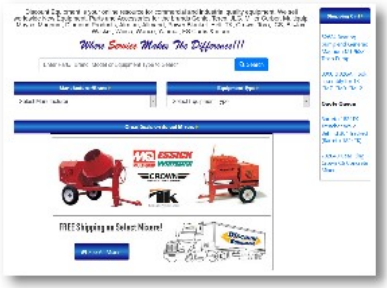

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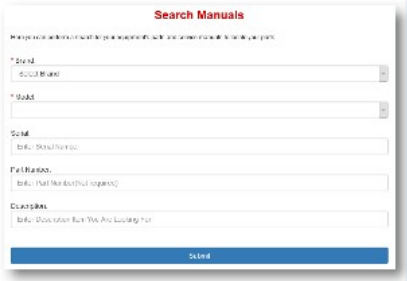

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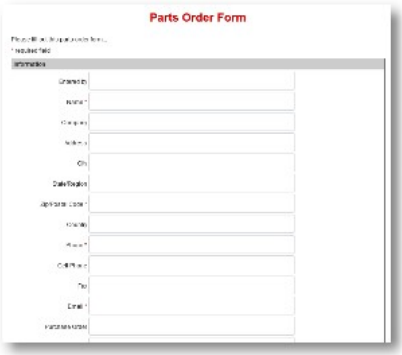

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SECTION 7. BASIC ELECTRICAL INFORMATION & SCHEMATICS

7.1 GENERAL

This section contains basic electrical information and schematics to be used for locating and correcting most of the operating problems which may develop. If a problem should develop which is not presented in this section or which is not corrected by listed corrective actions, technically qualified guidance should be obtained before proceeding with any maintenance.

NOTE: *Some of the procedures/connectors shown in this section may not be applicable to all models.*

7.2 MULTIMETER BASICS

A wide variety of multimeters or Volt Ohm Meters (VOM) can be used for troubleshooting your equipment. This section shows diagrams of a common, digital VOM configured for several different circuit measurements. Instructions for your VOM may vary. Please consult the meter operator's manual for more information.

Grounding

"Grounding the meter" means to take the black lead (which is connected to the COM (common) or negative port) and touch it to a good path to the negative side of the Voltage source.

Backprobing

To "backprobe" means to take the measurement by accessing a connector's contact on the same side as the wires, the back of the connector. Readings can be done while maintaining circuit continuity this way. If the connector is the sealed type, great care must be taken to avoid damaging the seal around the wire. It is best to use probes or probe tips specifically designed for this technique, especially on sealed connectors. Whenever possible insert probes into the side of the connector such that the test also checks both terminals of the connection. It is possible to inspect a connection within a closed connector by backprobing both sides of a connector terminal and measuring resistance. Do this after giving each wire a gentle pull to ensure the wires are still attached to the contact and contacts are seated in the connector.

Min/Max

Use of the "Min/Max" recording feature of some meters can help when taking measurements of intermittent conditions while alone. For example, you can read the Voltage applied to a solenoid when it is only operational while a switch, far from the solenoid and meter, is held down.

Polarity

Getting a negative Voltage or current reading when expecting a positive reading frequently means the leads are reversed. Check what reading is expected, the location of the signal and that the leads are connected to the device under test correctly. Also check that the lead on the "COM" port goes to the Ground or negative side of the signal and the lead on the other port goes to the positive side of the signal.

Scale

M = Mega = 1,000,000 * (Displayed Number)

k = kilo = 1,000 * (Displayed Number)

m = milli = (Displayed Number) / 1,000

µ = micro = (Displayed Number) / 1,000,000

Example: 1.2 kΩ = 1200 Ω
Example: 50 mA = 0.05 A

Voltage Measurement

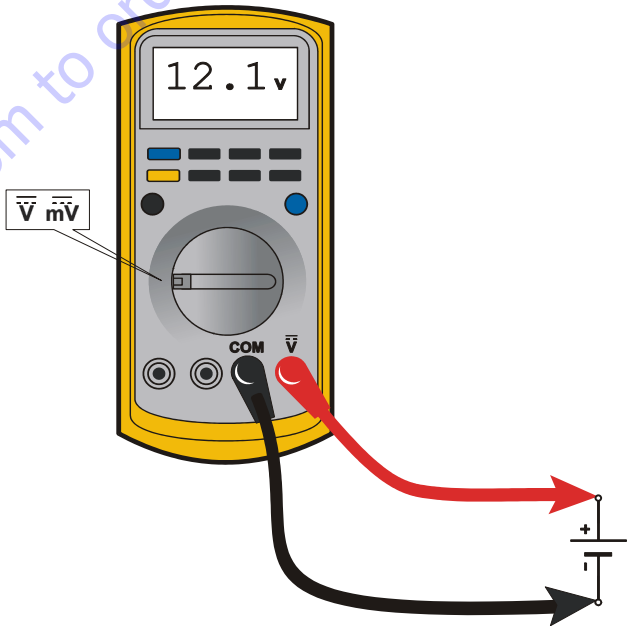


Figure 7-1. Voltage Measurement (DC)

- If meter is not auto ranging, set it to the correct range (See multimeter's operation manual)
- Use firm contact with meter leads

Resistance Measurement

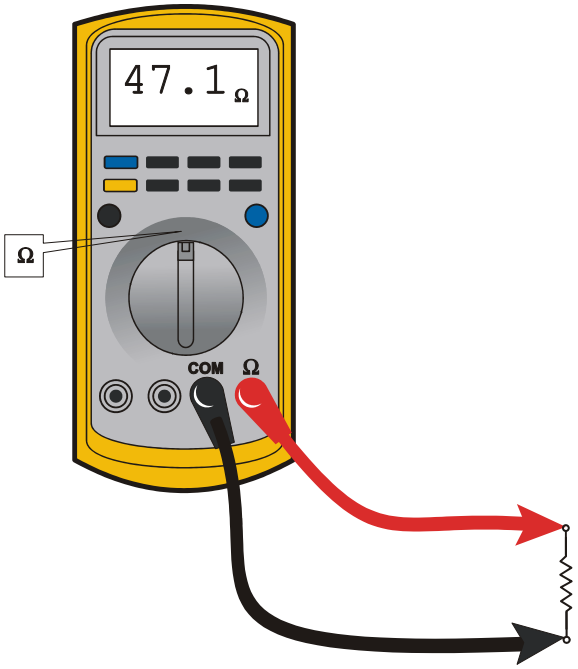


Figure 7-2. Resistance Measurement

- First test meter and leads by touching leads together. Resistance should read a short circuit (very low resistance)
- Circuit power must be turned OFF before testing resistance
- Disconnect component from circuit before testing
- If meter is not auto ranging, set it to the correct range (See multimeter's operation manual)
- Use firm contact with meter leads

Continuity Measurement

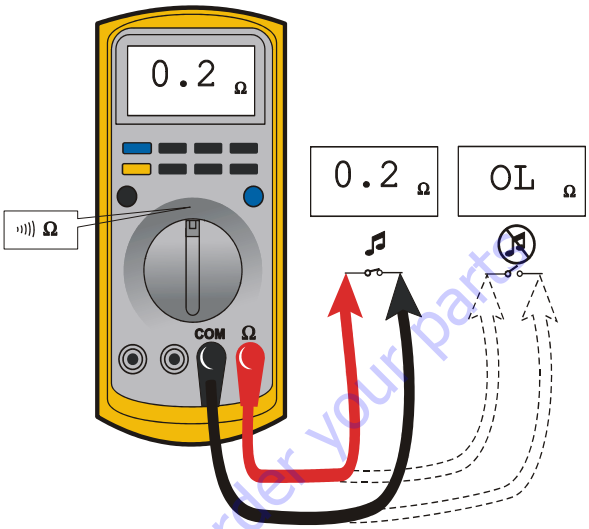


Figure 7-3. Continuity Measurement

- Some meters require a separate button press to enable audible continuity testing
- Circuit power must be turned OFF before testing continuity
- Disconnect component from circuit before testing
- Use firm contact with meter leads
- First test meter and leads by touching leads together. Meter should produce an audible alarm, indicating continuity

Current Measurement

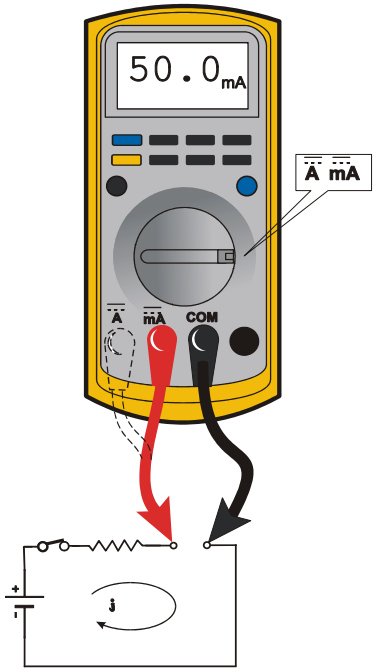


Figure 7-4. Current Measurement (DC)

- Set up the meter for the expected current range
- Be sure to connect the meter leads to the correct jacks for the current range you have selected
- If meter is not auto ranging, set it to the correct range (See multi meter's operation manual)
- Use firm contact with meter leads

7.3 APPLYING SILICONE DIELECTRIC COMPOUND TO ELECTRICAL CONNECTIONS

NOTE: *This section is not applicable for battery terminals.*

NOTICE

JLG P/N 0100048 DIELECTRIC GREASE (NOVAGARD G661) IS THE ONLY MATERIAL APPROVED FOR USE AS A DIELECTRIC GREASE.

NOTE: *Do NOT apply dielectric grease to the following connections:*

- Main Boom Rotary sensor connections (on Celesco Sensor),
- LSS Modules connections,
- Deutz EMR 2 ECM connection.

Silicone Dielectric Compound must be used on all electrical connections except for those mentioned above for the following reasons:

- To prevent oxidation at the mechanical joint between male and female pins.
- To prevent electrical malfunction caused by low level conductivity between pins when wet.

Use the following procedure to apply Silicone Dielectric Compound to the electrical connectors. This procedure applies to all plug connections not enclosed in a box. Silicone grease should not be applied to connectors with external seals.

1. To prevent oxidation, silicone grease must be packed completely around male and female pins on the inside of the connector prior to assembly. This is most easily achieved by using a syringe.

NOTE: *Over a period of time, oxidation increases electrical resistance at the connection, eventually causing circuit failure.*

2. To prevent shorting, silicone grease must be packed around each wire where they enter the outside of the connector housing. Also, silicone grease must be applied at the joint where the male and female connectors come together. Any other joints (around strain reliefs, etc.) where water could enter the connector should also be sealed.

NOTE: *This condition is especially common when machines are pressure washed since the washing solution is much more conductive than water.*

3. Anderson connectors for the battery boxes and battery chargers should have silicone grease applied to the contacts only.

NOTE: *Curing-type sealants might also be used to prevent shorting and would be less messy, but would make future pin removal more difficult.*

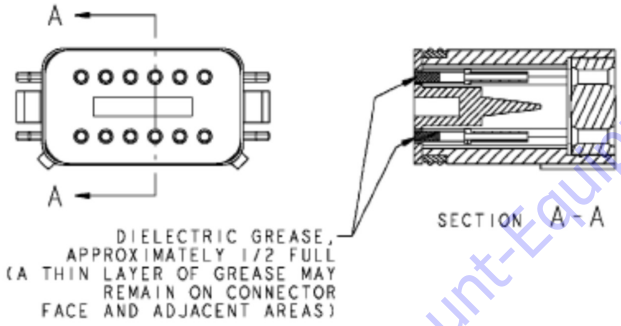
When applied to electrical connections, dielectric grease helps to prevent corrosion of electrical contacts and improper conductivity between contacts from moisture intrusion. Open and sealed connectors benefit from the application of dielectric grease.

Dielectric grease shall be applied to all electrical connectors at the time of connection (except those noted under Exclusions).

Installation of Dielectric Grease

Before following these instructions, refer to excluded connector types (See Exclusions below).

1. Use dielectric grease in a tube for larger connection points or apply with a syringe for small connectors.
2. Apply dielectric grease to the female contact (fill it approximately ½ full; see example below)
3. Leave a thin layer of dielectric grease on the face of the connector
4. Assemble the connector system immediately to prevent moisture ingress or dust contamination
5. Pierce one of the unused wire seals prior to assembly if the connector system tends to trap air (i.e. AMP Seal) and then install a seal plug.



Deutsch HD, DT, DTM, DRC Series

The Deutsch connector system is commonly used for harsh environment interconnect. Follow the installation instructions.

AMP Seal

The AMP Seal connector system is used on the Control ADE Platform and Ground Modules.

Apply dielectric grease to the male connector. If trapped air prevents the connector from latching, pierce one of the unused wire seals. After assembly, install a seal plug (JLG #4460905) in that location to prevent moisture ingress.

Note that seal plugs may be installed by the wire harness manufacturer if an unused wire seal becomes compromised (wire inserted in the wrong cavity during assembly and then corrected).

Figure 7-5. Application to Male Connector

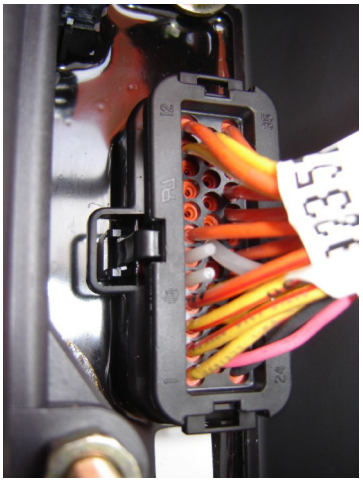
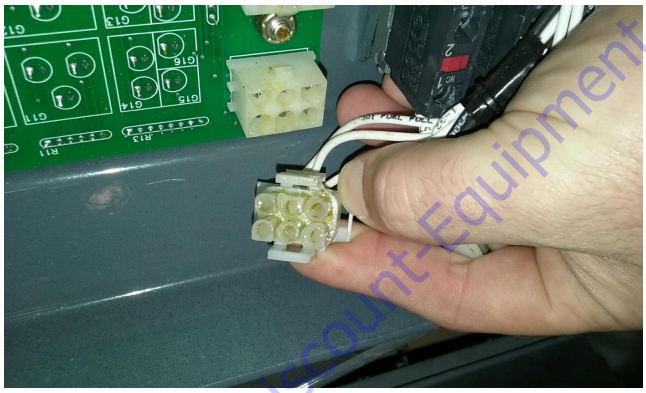


Figure 7-6. Use of Seal Plugs

AMP Mate-N-Lok

This connector system is widely used inside enclosures for general purpose interconnect. Follow the installation instructions..



DIN Connectors

This connector is typically used on hydraulic valves. Follow the installation instructions.

Exclusions

A limited number of connectors do not benefit from dielectric grease, or may be permanently damaged by application. Dielectric grease may not be required in properly sealed enclosures.

BRAD HARRISON / PHOENIX CONTACT M12

The connector uses gold contact material to resist corrosion and an o-ring seal for moisture integrity. If dielectric grease is mistakenly applied to this connector system, the low-force contacts cannot displace the grease to achieve electrical contact. Once contaminated, there is no practical way to remove the dielectric grease (replacement of female contacts required). The JLG Load Sensing System and Rotary Angle Sensors are examples of components with the M12 connector system.

Figure 7-7. Brad-Harrison M12

Figure 7-8. Phoenix Contact M12

ENGINE CONTROL UNIT CONNECTORS

These connectors use back-seals for moisture integrity. However, the low-force contacts cannot displace dielectric grease and create electrical contact. It is possible to use solvents (i.e. contact cleaner or mineral spirits) for the removal of improperly applied dielectric grease. The EMR4 engine control module from Deutz employs this connector system (for example).

SEALED ENCLOSURES

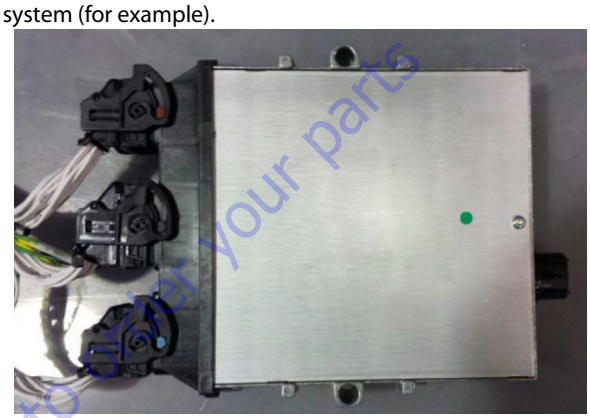
Application of dielectric grease is not required in properly sealed enclosures. To meet criteria, the enclosure must be rated to at least IP66 (dust tight; protected from powerful jets of water). The enclosure must be fitted with a high quality, continuous gasket and all wiring must pass through cable entrances.

MIL-C-5015 SPEC CONNECTORS

Crown Connector Inc's recommendation is to not use dielectric grease for this series connector. For similar model series connectors, the manufacturer should be contacted for confirmation before applying dielectric grease. A typical application for this connector is on David Clark Intercom connections in Aerial Work Platforms.

MOLEX CMC SERIES CONNECTORS

The CMC connector family is a sealed, high-density connection system using matte-seal technology for CP 0.635 and 1.50 mm terminals. To guarantee IP6K7 and IP6K9 sealing, a seal plug option is used. However, the low-force contacts cannot displace dielectric grease and create electrical contact. It is possible to use solvents (i.e. contact cleaner or mineral spirits) for the removal of improperly applied dielectric grease. The flexbox control modules from JDES employ this connector system (for example).



7.4 AMP CONNECTOR

Applying Silicone Dielectric Compound to AMP Connectors

Silicone Dielectric Compound must be used on the AMP connections for the following reasons:

- To prevent oxidation at the mechanical joint between male and female pins.
- To prevent electrical malfunction caused by low level conductivity between pins when wet.

Use the following procedure to apply Silicone Dielectric Compound to the electrical connectors.

1. To prevent oxidation and low level conductivity, silicone dielectric grease must be packed completely around male and female pins on the inside of the connector after the mating of the housing to the header. This is easily achieved by using a syringe to fill the header with silicone dielectric compound, to a point just above the top of the male pins inside the header. When assembling the housing to the header, it is possible that the housing will become air locked, thus preventing the housing latch from engaging.
2. Pierce one of the unused wire seals to allow the trapped air inside the housing to escape.
3. Install a hole plug into this and/or any unused wire seal that has silicone dielectric compound escaping from it.

Assembly

Check to be sure the wedge lock is in the open, or as-shipped, position (See Figure 7-9.). Proceed as follows:

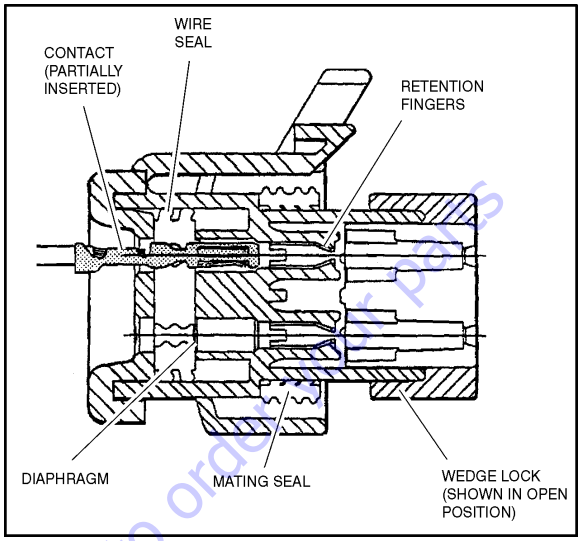


Figure 7-9. Connector Assembly Figure 1

1. To insert a contact, push it straight into the appropriate circuit cavity as far as it will go (See Figure 7-11.).
2. Pull back on the contact wire with a force of 1 or 2 lbs. to be sure the retention fingers are holding the contact (See Figure 7-11.).

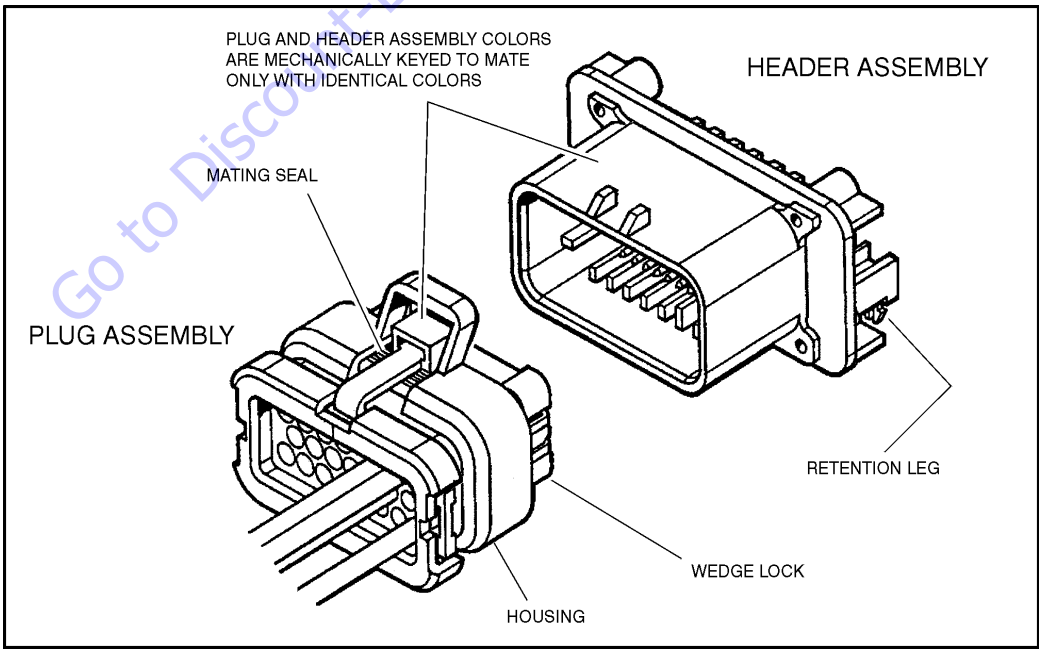


Figure 7-10. AMP Connector

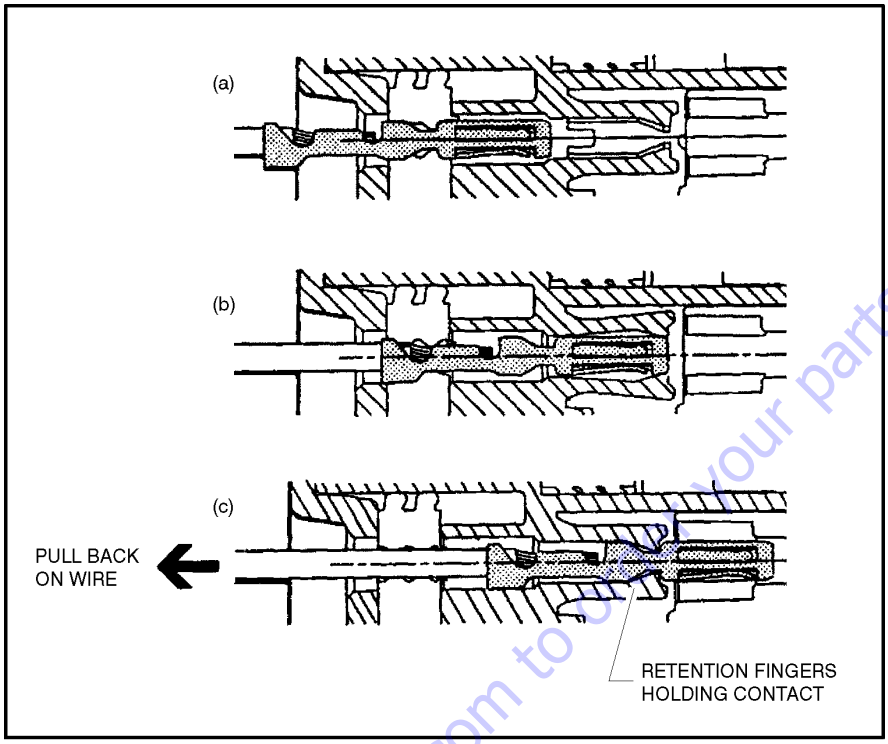


Figure 7-11. Connector Assembly Figure 2

3. After all required contacts have been inserted, the wedge lock must be closed to its locked position. Release the locking latches by squeezing them inward (See Figure 7-12.).

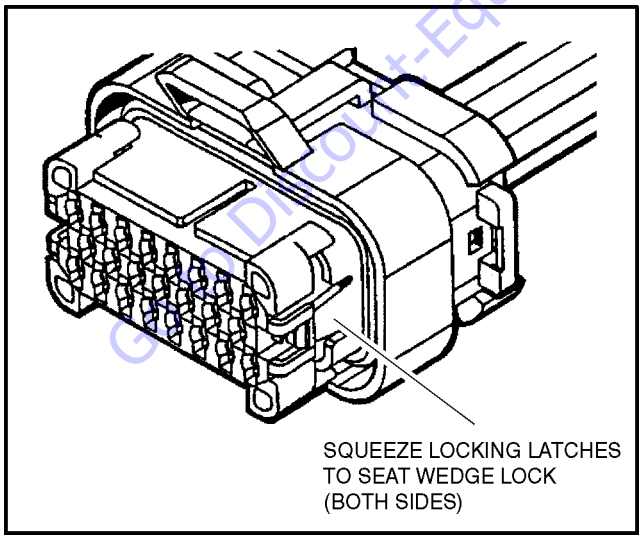


Figure 7-12. Connector Assembly Figure 3

4. Slide the wedge lock into the housing until it is flush with the housing (See Figure 7-13.).

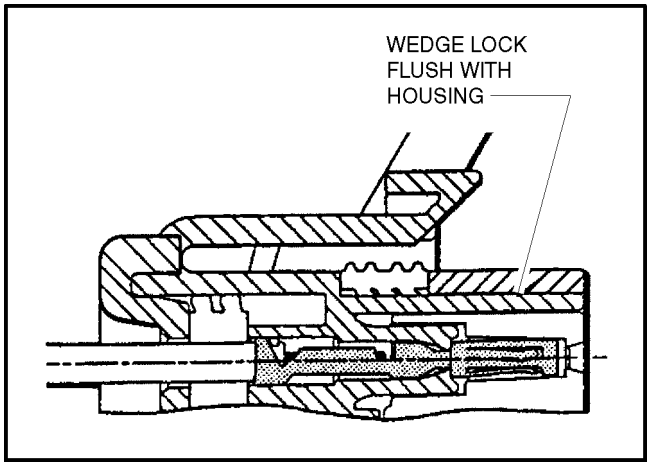


Figure 7-13. Connector Assembly Figure 4

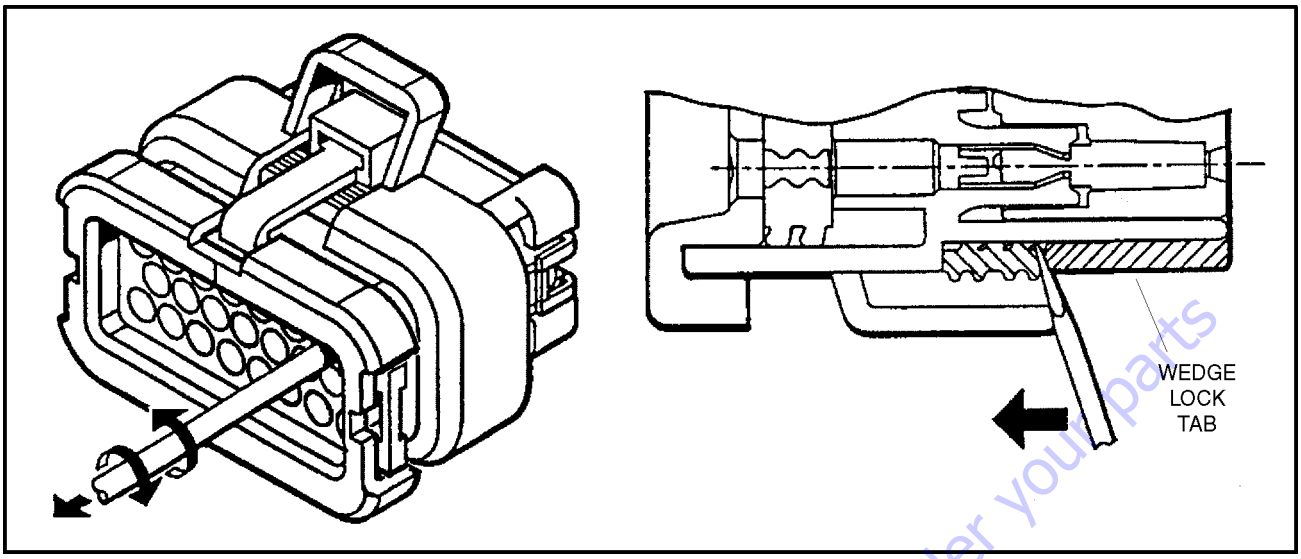


Figure 7-14. Connector Disassembly

Disassembly

5. Insert a 4.8 mm (3/16") wide screwdriver blade between the mating seal and one of the red wedge lock tabs.
6. Pry open the wedge lock to the open position.
7. While rotating the wire back and forth over a half turn (1/4 turn in each direction), gently pull the wire until the contact is removed.

NOTE: *The wedge lock should never be removed from the housing for insertion or removal of the contacts.*

Wedge Lock

The wedge lock has slotted openings in the forward, or mating end. These slots accommodate circuit testing in the field, by using a flat probe such as a pocket knife. DO NOT use a sharp point such as an ice pick.

Service - Voltage Reading

NOTICE

DO NOT PIERCE WIRE INSULATION TO TAKE VOLTAGE READINGS.

It has been common practice in electrical troubleshooting to probe wires by piercing the insulation with a sharp point. This practice should be discouraged when dealing with the AMPSEAL plug assembly, or any other sealed connector system. The resulting pinholes in the insulation will allow moisture to invade the system by traveling along the wire strands. This nullifies the effectiveness of the connector seals and could result in system failure.

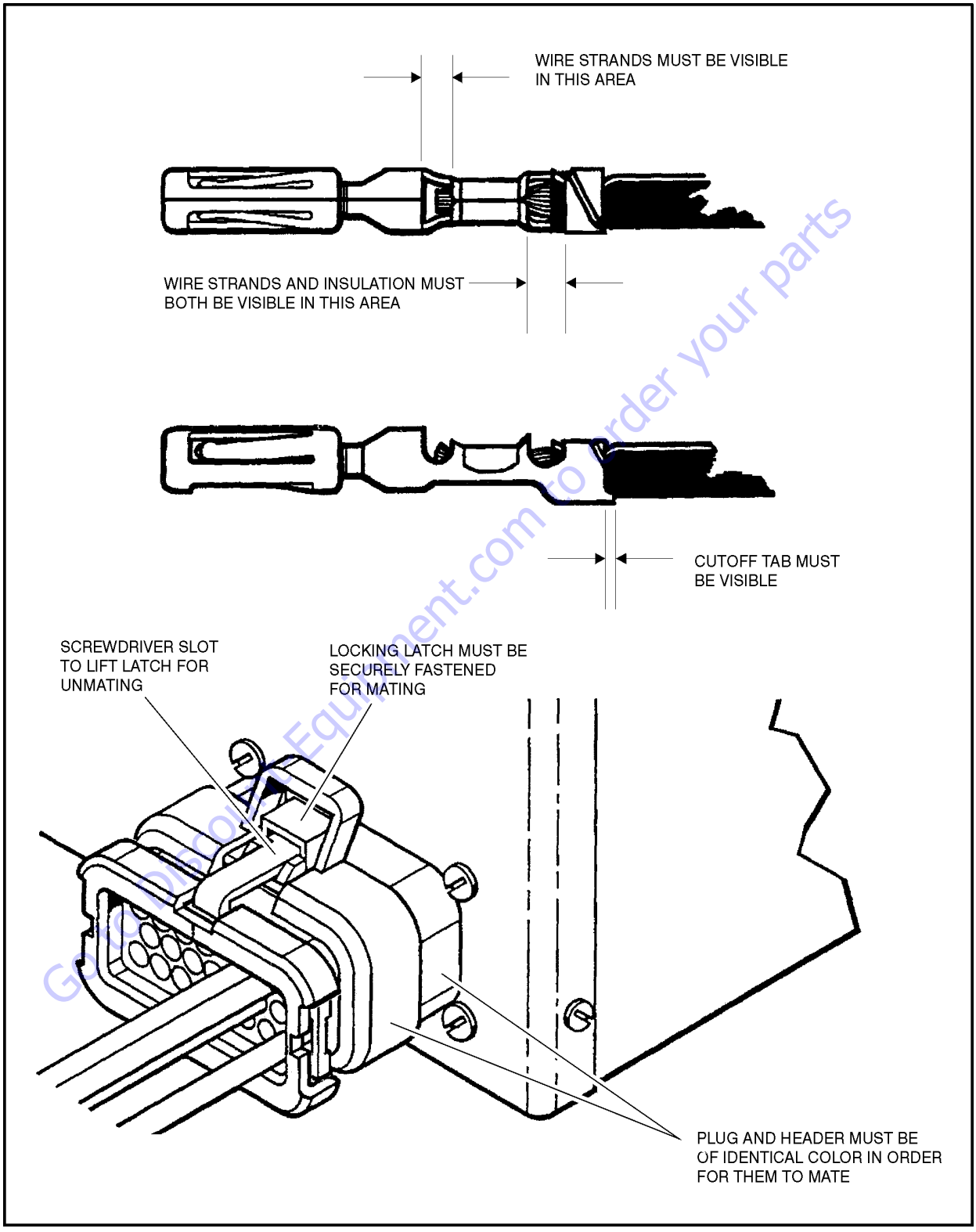


Figure 7-15. Connector Installation

7.5 DEUTSCH CONNECTORS

DT/DTP Series Assembly

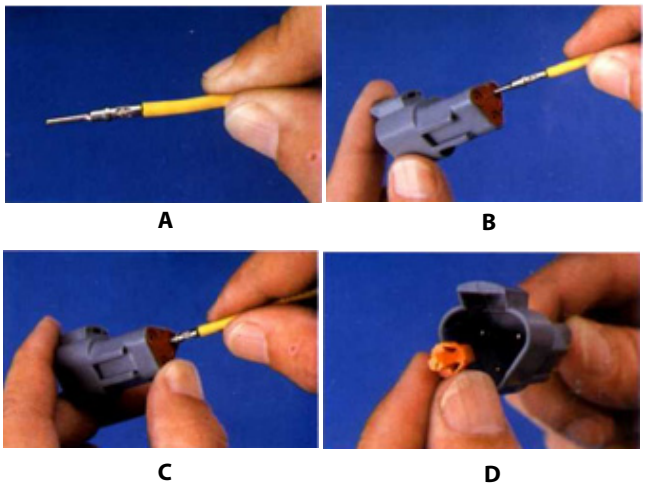


Figure 7-16. DT/DTP Contact Installation

1. Grasp crimped contact about 25mm behind the contact barrel.
2. Hold connector with rear grommet facing you.
3. Push contact straight into connector grommet until a click is felt. A slight tug will confirm that it is properly locked in place.
4. Once all contacts are in place, insert wedgelock with arrow pointing toward exterior locking mechanism. The wedgelock will snap into place. Rectangular wedges are not oriented. Thy may go in either way.

NOTE: *The receptacle is shown - use the same procedure for plug.*

DT/DTP Series Disassembly

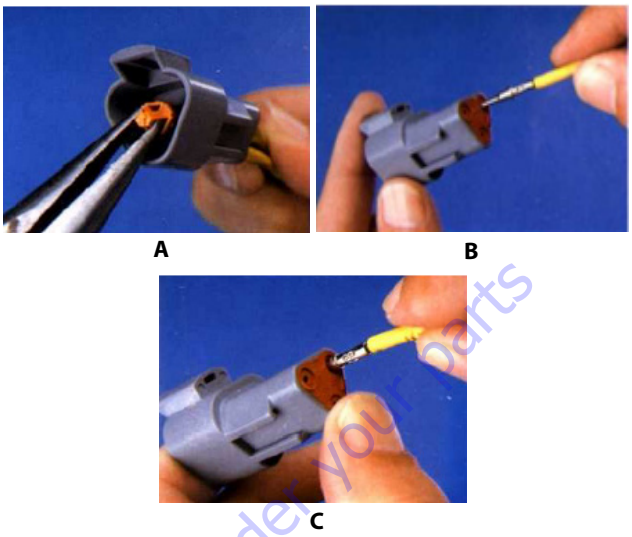


Figure 7-17. DT/DTP Contact Removal

5. Remove wedgelock using needlenose pliers or a hook shaped wire to pull wedge straight out.
6. To remove the contacts, gently pull wire backwards, while at the same time releasing the locking finger by moving it away from the contact with a screwdriver.
7. Hold the rear seal in place, as removing the contact may displace the seal.

HD30/HDP20 Series Assembly

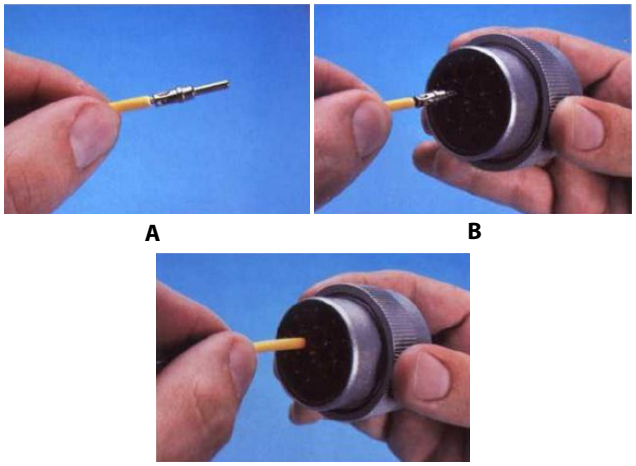


Figure 7-18. HD/HDP Contact Installation

8. Grasp contact about 25mm behind the contact crimp barrel.
9. Hold connector with rear grommet facing you.
10. Push contact straight into connector grommet until a positive stop is felt. A slight tug will confirm that it is properly locked in place.

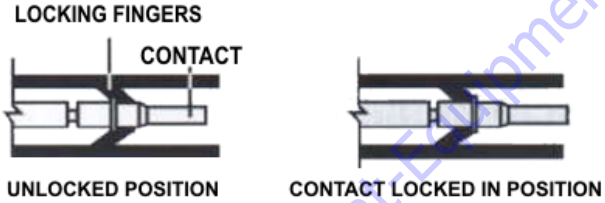


Figure 7-19. HD/HDP Locking Contacts Into Position

NOTE: *For unused wire cavities, insert sealing plugs for full environmental sealing*

HD30/HDP20 Series Disassembly

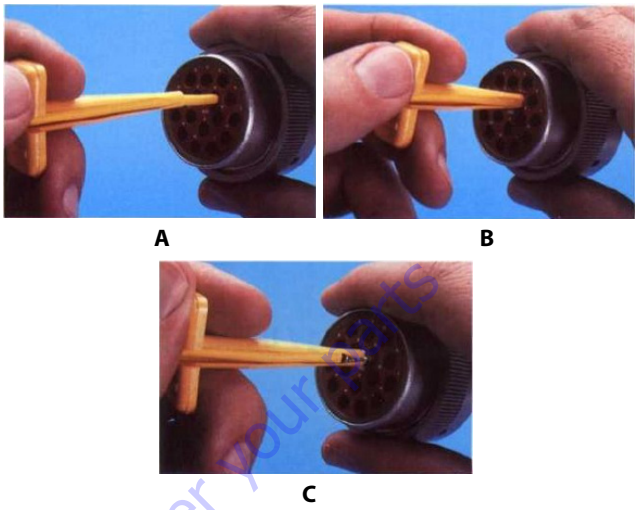


Figure 7-20. HD/HDP Contact Removal

11. With rear insert toward you, snap appropriate size extractor tool over the wire of contact to be removed.
12. Slide tool along into the insert cavity until it engages contact and resistance is felt.
13. Pull contact-wire assembly out of connector.

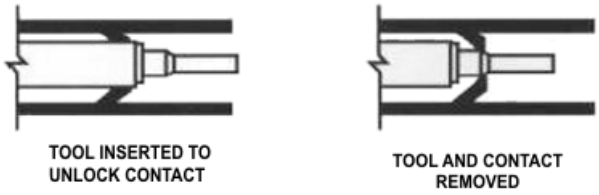


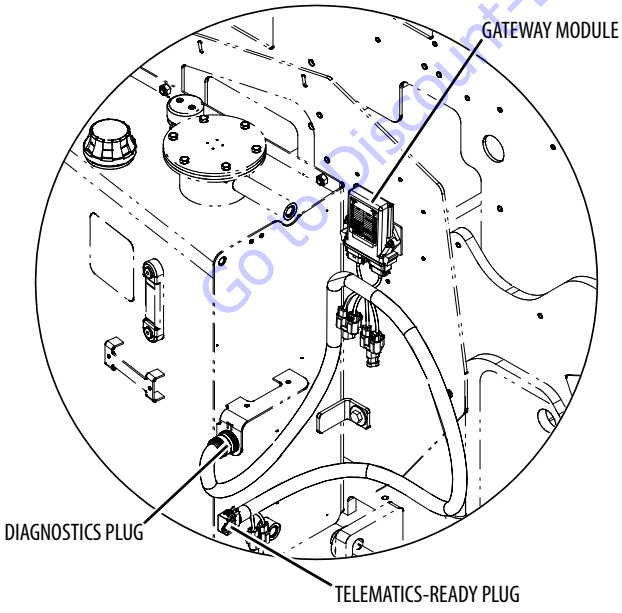
Figure 7-21. HD/HDP Unlocking Contacts

NOTE: *Do Not twist or insert tool at an angle.*

7.6 TELEMATICS GATEWAY

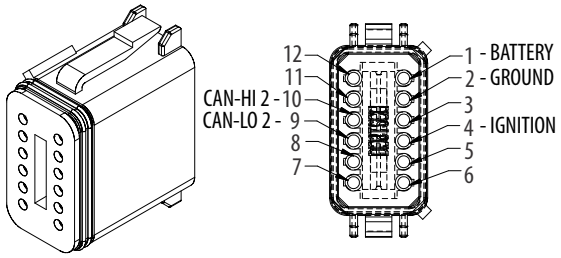
Personnel using machines equipped with an optional telematics gateway will be able to view the following data through their telematics device:

JLG LABEL	DESCRIPTION	UNIT
Engine Speed	Actual engine speed.	RPM
DEF Tank Level (If Equipped)	Indicates the level of DEF (diesel exhaust fluid) within the DEF tank if the machine is equipped with DEF tank. • 0% = Empty • 100% = Full	Percentage (%)
JLG Machine Faults: Active / Not-Active	• 00 - No Machine Faults • 01 - Active Machine Fault • 10 - Error • 11 - Not available	Bit
Total Idle Fuel Used	Total amount of fuel used during vehicle operation during idle conditions.	Liters
Total Idle Hours	Total time of engine operation during idle conditions.	Seconds
Total Engine Hours	Total time of engine operation.	Seconds
Total Fuel Used	Total amount of fuel used during vehicle operation.	Liters
Fuel Rate	Amount of fuel consumed by engine per unit of time.	Liters/Hour
Fuel Level	Ratio of fuel volume to the total volume of the fuel storage container. When a low fuel limit switch is present, the fuel level will indicate "full" until the switch opens, which will then indicate 10% fuel remaining. When Fuel Level 2 (SPN 38) is not used, Fuel Level 1 represents the total fuel in all fuel storage containers. When Fuel Level 2 is used, Fuel Level 1 represents the fuel level in the primary or left side fuel storage container.	Percentage (%)
DM1 Engine Faults	Shows actual engine fault codes.	N/A



Telematics-Ready (TCU) Plug

The telematics-ready (TCU) plug is a standard 12-pin Deutsch connector. Pin-out locations are shown below:



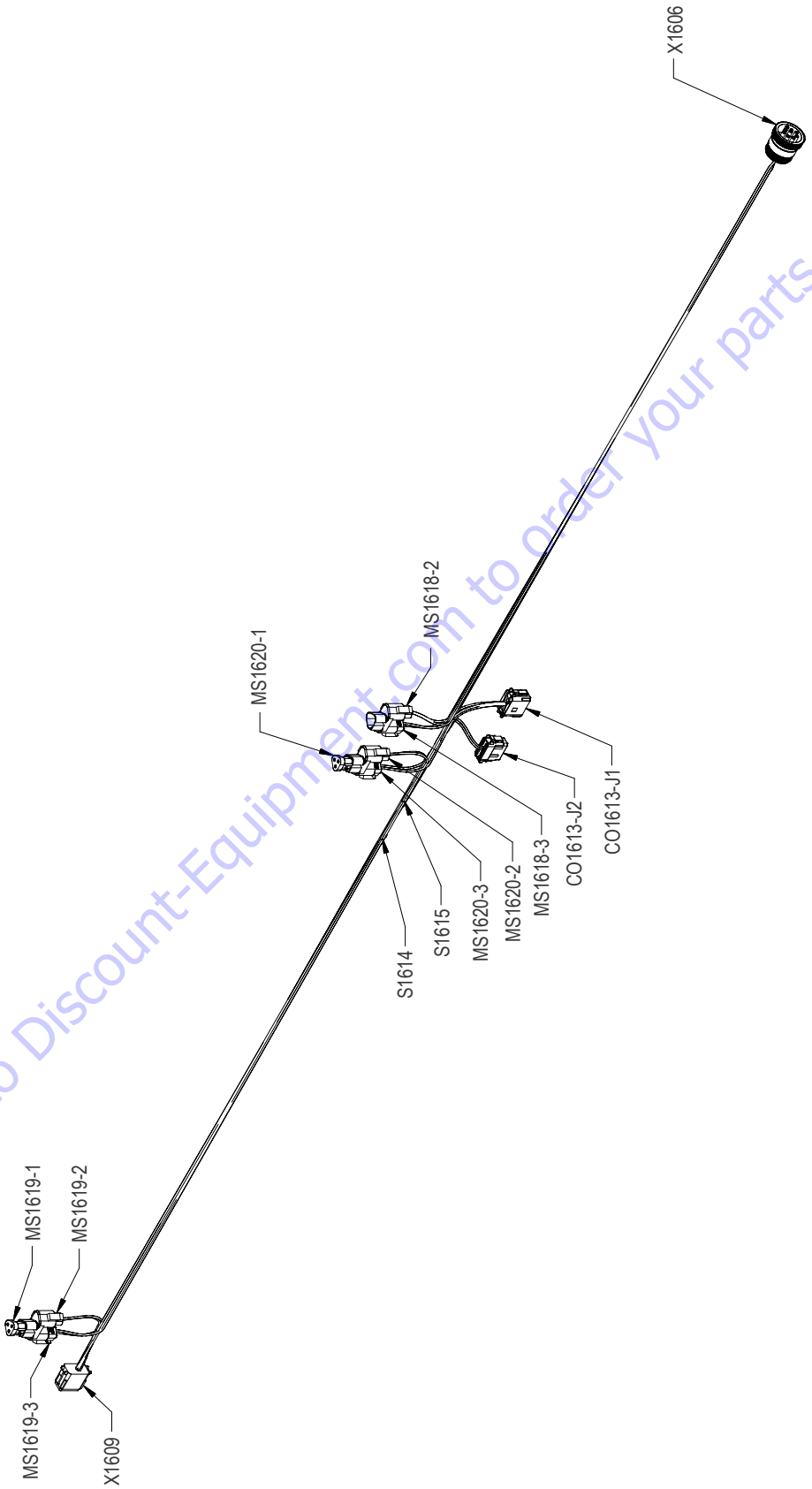


Figure 7-22. Telematics Gateway Harness - Sheet 1 of 3

X1609 (TCU)					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-0 BAT	16 AWG	GXL	X1606 (B)
2	BLK	0-0 GND	16 AWG	GXL	S1615 (1)
4	ORN	2-0 IGN	16 AWG	GXL	S1614 (1)
9	GRN	CANL2	18 AWG	GXL	MS1619-2 (B)
10	YEL	CANH2	18 AWG	GXL	MS1619-2 (A)

MS1619-2 (CAN-T 2)					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CANH2	18 AWG	GXL	X1609 (10)
B	GRN	CANL2	18 AWG	GXL	X1609 (9)

MS1619-3 (CAN-T 2)					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CANH2	18 AWG	GXL	MS1620-2 (A)
B	GRN	CANL2	18 AWG	GXL	MS1620-2 (B)

CO1613-J1 (GATEWAY 1)					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
9	GRN	CAN1	18 AWG	GXL	MS1618-2 (B)
10	YEL	CANH1	18 AWG	GXL	MS1618-2 (A)
11	BLK	0-2 GND	16 AWG	GXL	S1615 (2)
12	ORN	2-2 IGN	16 AWG	GXL	S1614 (2)

CO1613-J2 (GATEWAY 2)					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
9	GRN	CANL2	18 AWG	GXL	MS1620-3 (B)
10	YEL	CANH2	18 AWG	GXL	MS1620-3 (A)

MS1620-2 (CAN-T 2)					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CANH2	18 AWG	GXL	MS1619-3 (A)
B	GRN	CANL2	18 AWG	GXL	MS1619-3 (B)

MS1620-3 (CAN-T 2)					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CANH2	18 AWG	GXL	CO1613-J2 (10)
B	GRN	CANL2	18 AWG	GXL	CO1613-J2 (9)

S1614					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	ORN	2-0 IGN	16 AWG	GXL	X1609 (4)
2	ORN	2-1 IGN	16 AWG	GXL	X1606 (H)
2	ORN	2-2 IGN	16 AWG	GXL	CO1613-J1 (12)

S1615					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-0 GND	16 AWG	GXL	X1609 (2)
2	BLK	0-1 GND	16 AWG	GXL	X1606 (A)
2	BLK	0-2 GND	16 AWG	GXL	CO1613-J1 (11)

MS1618-2 (CAN-T 1)					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CANH1	18 AWG	GXL	CO1613-J1 (10)
B	GRN	CANL1	18 AWG	GXL	CO1613-J1 (9)

MS1618-3 (CAN-T 1)					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CANH1	18 AWG	GXL	X1606 (C)
B	GRN	CANL1	18 AWG	GXL	X1606 (D)

X1606 (DIAG)					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	BLK	0-1 GND	16 AWG	GXL	S1615 (2)
B	RED	1-0 BAT	16 AWG	GXL	X1609 (1)
C	YEL	CANH1	18 AWG	GXL	MS1618-3 (A)
D	GRN	CANL1	18 AWG	GXL	MS1618-3 (B)
H	ORN	2-1 IGN	16 AWG	GXL	S1614 (2)

Figure 7-23. Telematics Gateway Harness - Sheet 2 of 3

					FROM		TO	
WIRE NO.	COLOR	WIRE GAUGE	LENGTH (mm)	JACKET	REFERENCE	PIN	REFERENCE	PIN
CAN L2	GRN	18 AWG	1151	GXL	MS1619-3	B	MS1620-2	B
CAN L2	GRN	18 AWG	151	GXL	X1609	9	MS1619-2	B
CAN L1	GRN	18 AWG	157	GXL	MS1618-2	B	CO1613-J1	9
CAN L2	GRN	18 AWG	225	GXL	MS1620-3	B	CO1613-J2	9
CAN L1	GRN	18 AWG	1076	GXL	MS1618-3	B	X1606	D
CAN H2	YEL	18 AWG	155	GXL	X1609	10	MS1619-2	A
CAN H2	YEL	18 AWG	233	GXL	MS1620-3	A	CO1613-J2	10
CAN H1	YEL	18 AWG	157	GXL	MS1618-2	A	CO1613-J1	10
CAN H2	YEL	18 AWG	1150	GXL	MS1619-3	A	MS1620-2	A
CAN H1	YEL	18 AWG	1079	GXL	MS1618-3	A	X1606	C
0-0 GND	BLK	16 AWG	1006	GXL	X1609	2	S1615	1
0-1 GND	BLK	16 AWG	1145	GXL	X1606	A	S1615	2
0-2 GND	BLK	16 AWG	223	GXL	CO1613-J1	11	S1615	2
1-0 BAT	RED	16 AWG	2150	GXL	X1609	1	X1606	B
2-0 IGN	ORN	16 AWG	939	GXL	X1609	4	S1614	1
2-1 IGN	ORN	16 AWG	1212	GXL	S1614	2	X1606	H
2-2 IGN	ORN	16 AWG	287	GXL	CO1613-J1	12	S1614	2

Figure 7-24. Telematics Gateway Harness - Sheet 3 of 3

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7.7 ELECTRICAL SCHEMATICS

SHEET 2: PLATFORM BOX

SHEET 3: PLATFORM AND BOOM COMPONENTS

SHEET 4: CHASSIS, TURN-TABLE, AND UGM

SHEET 5: GROUND USER INTERFACE AND TELEMATICS INTERFACE

SHEET 6: ENGINE (KUBOTA) AND GENERATOR

SHEET 7: ENGINE (GM) VENDOR SCHEMATIC

SHEET 8: MIDENGINE HARNESS SCHEMATIC

SHEET 9: CHASSIS LIGHT, PLATFORM LIGHTS SCHEMATIC

SHEET 10: ALERT BEACON OPTION
HARNESS,GEN 2 PLAT INTERFACE

SHEET 11: PLATFORM BOX
CONSOLE BOX HARNESS WITH SKYGUARD
CONN AND 1 CELL LSS

1001119638-Q
MAF03010

Figure 7-25. Electrical Schematic - Sheet 1 of 20

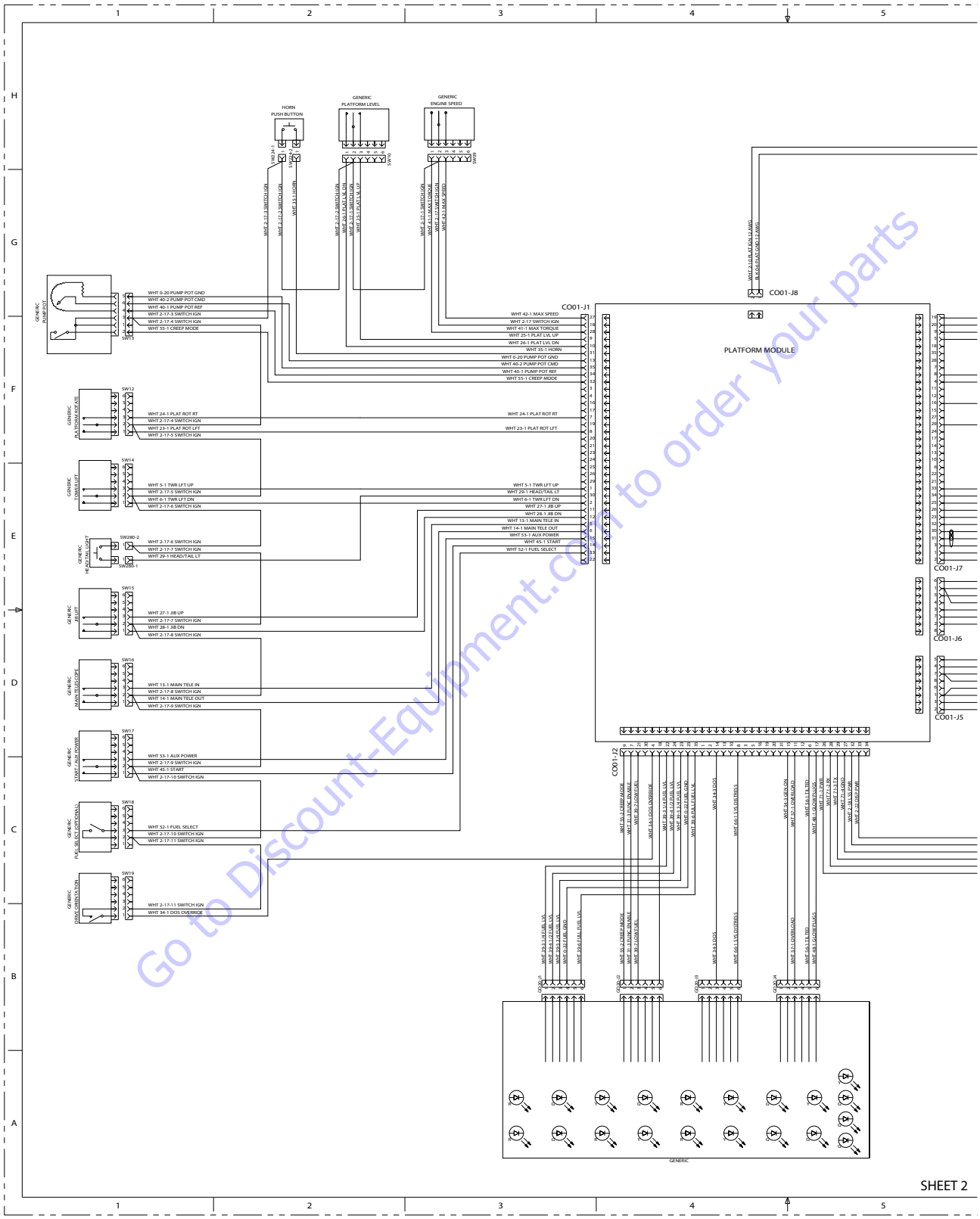


Figure 7-26. Electrical Schematic - Sheet 2 of 20

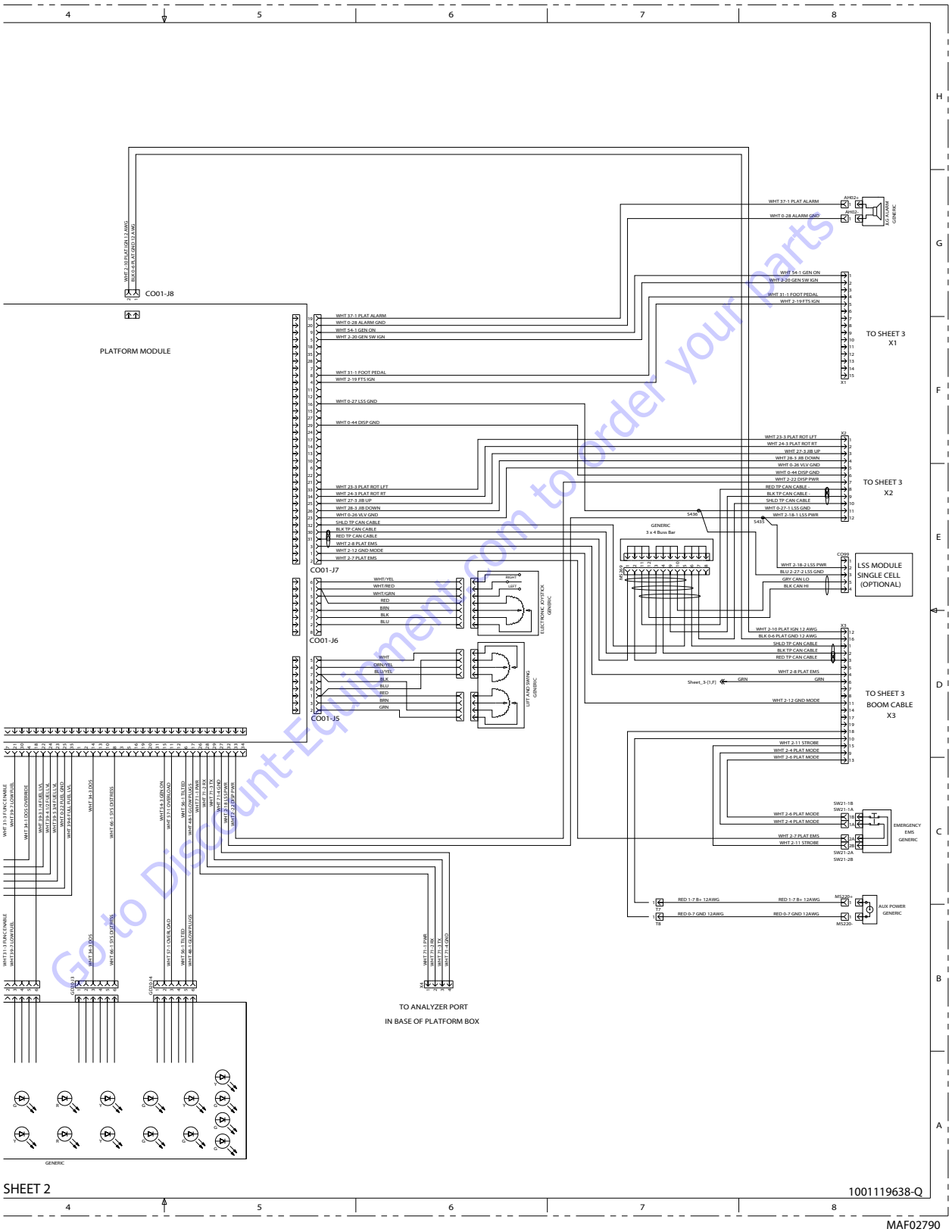


Figure 7-27. Electrical Schematic - Sheet 3 of 20

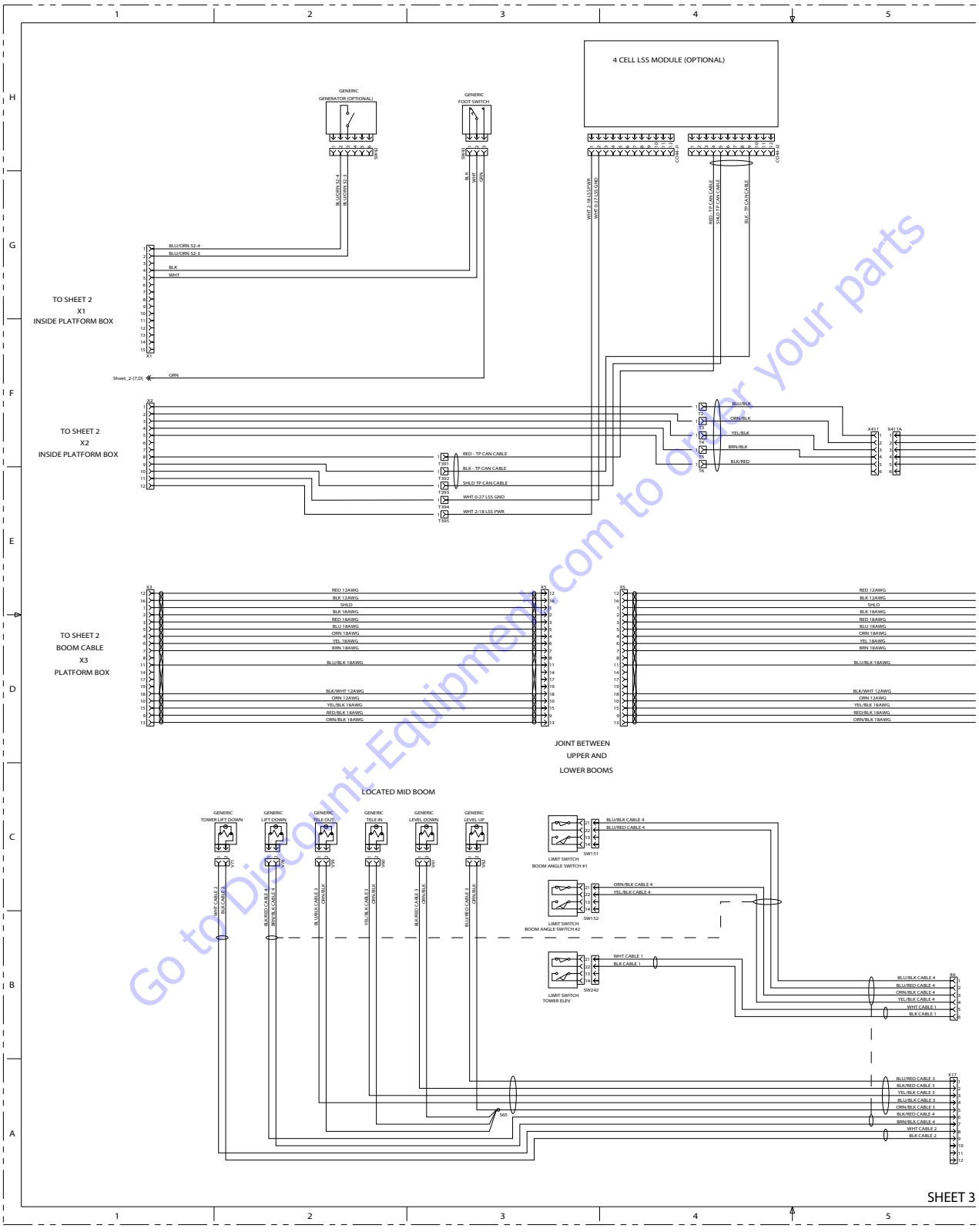


Figure 7-28. Electrical Schematic - Sheet 4 of 20

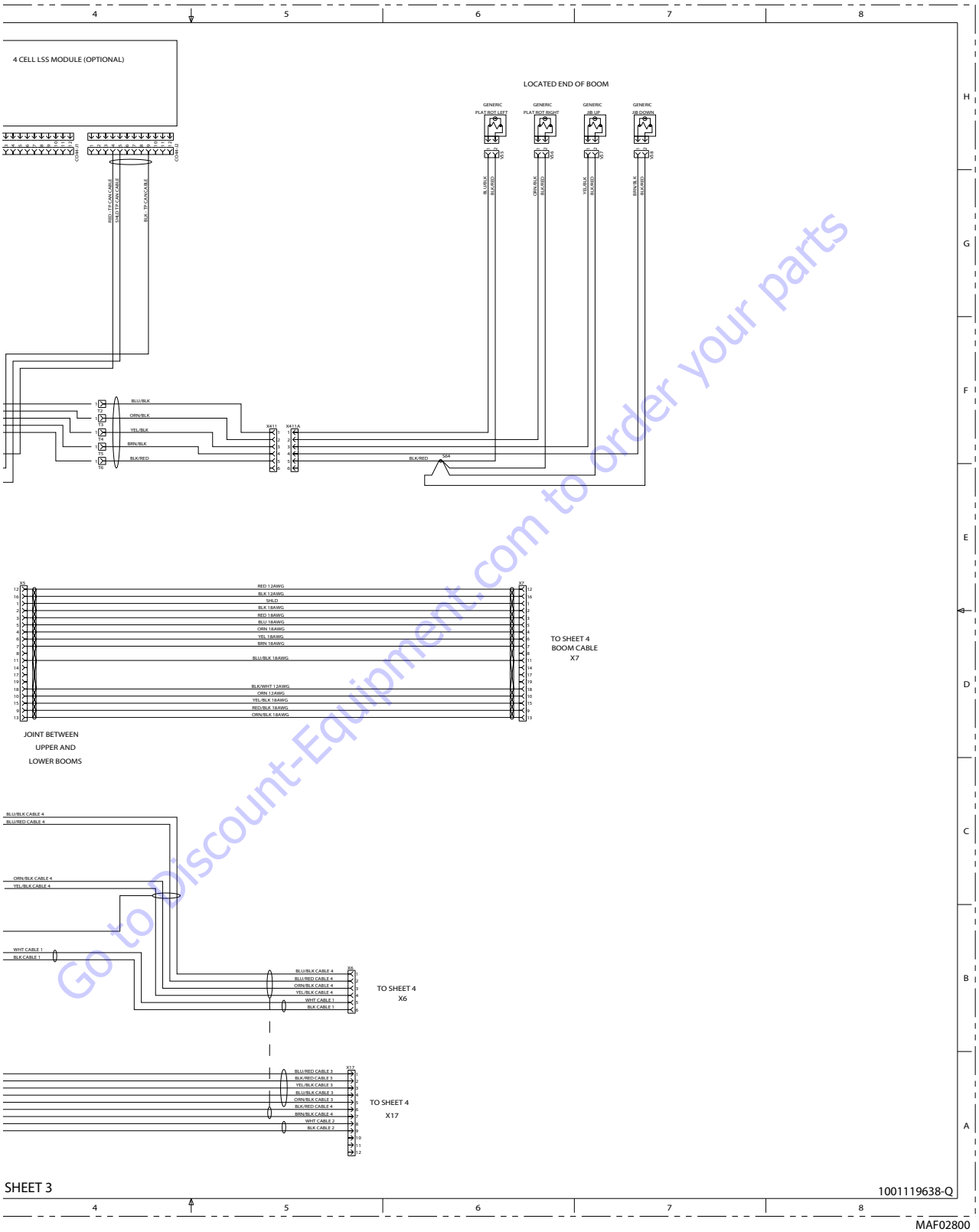


Figure 7-29. Electrical Schematic - Sheet 5 of 20

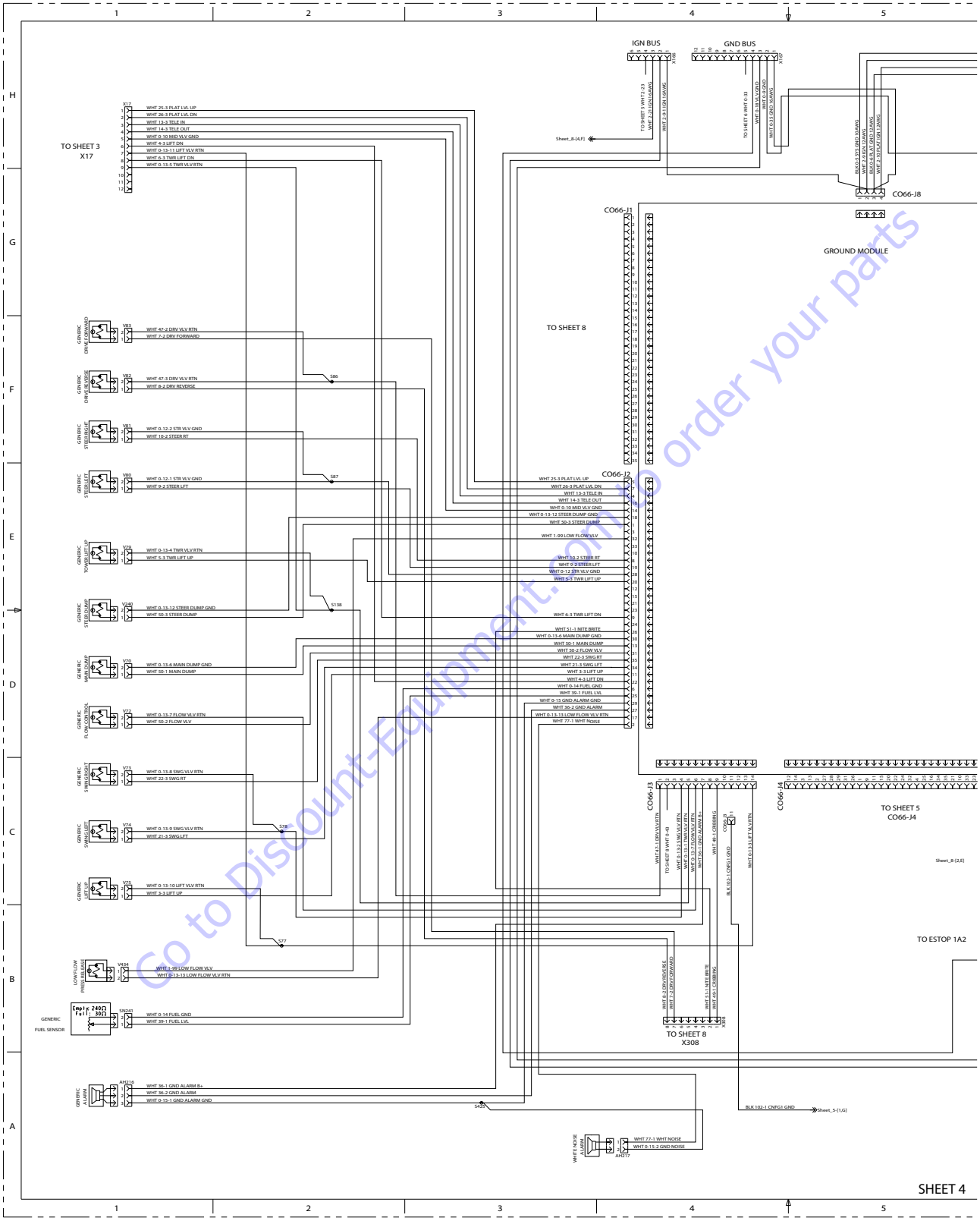


Figure 7-30. Electrical Schematic - Sheet 6 of 20

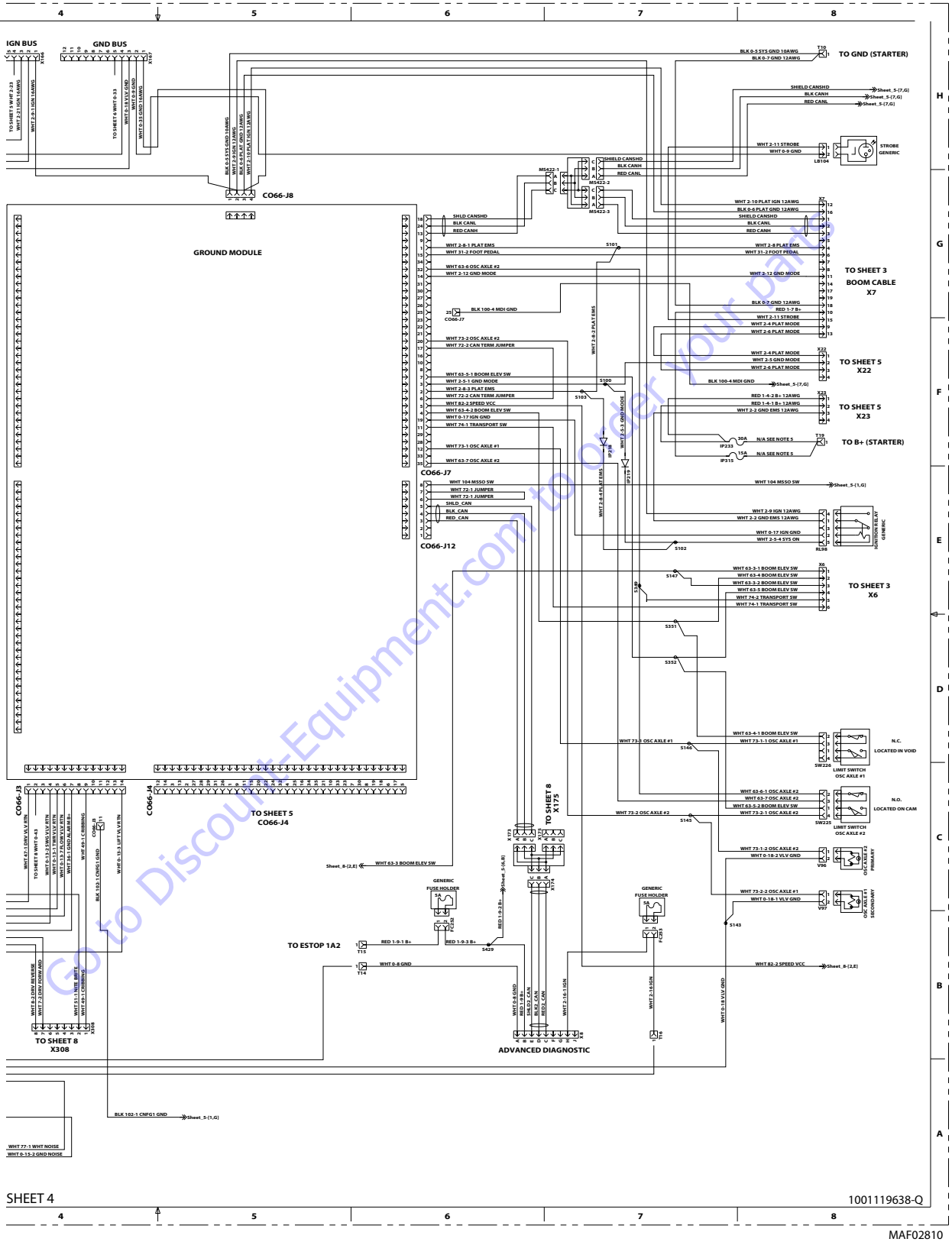
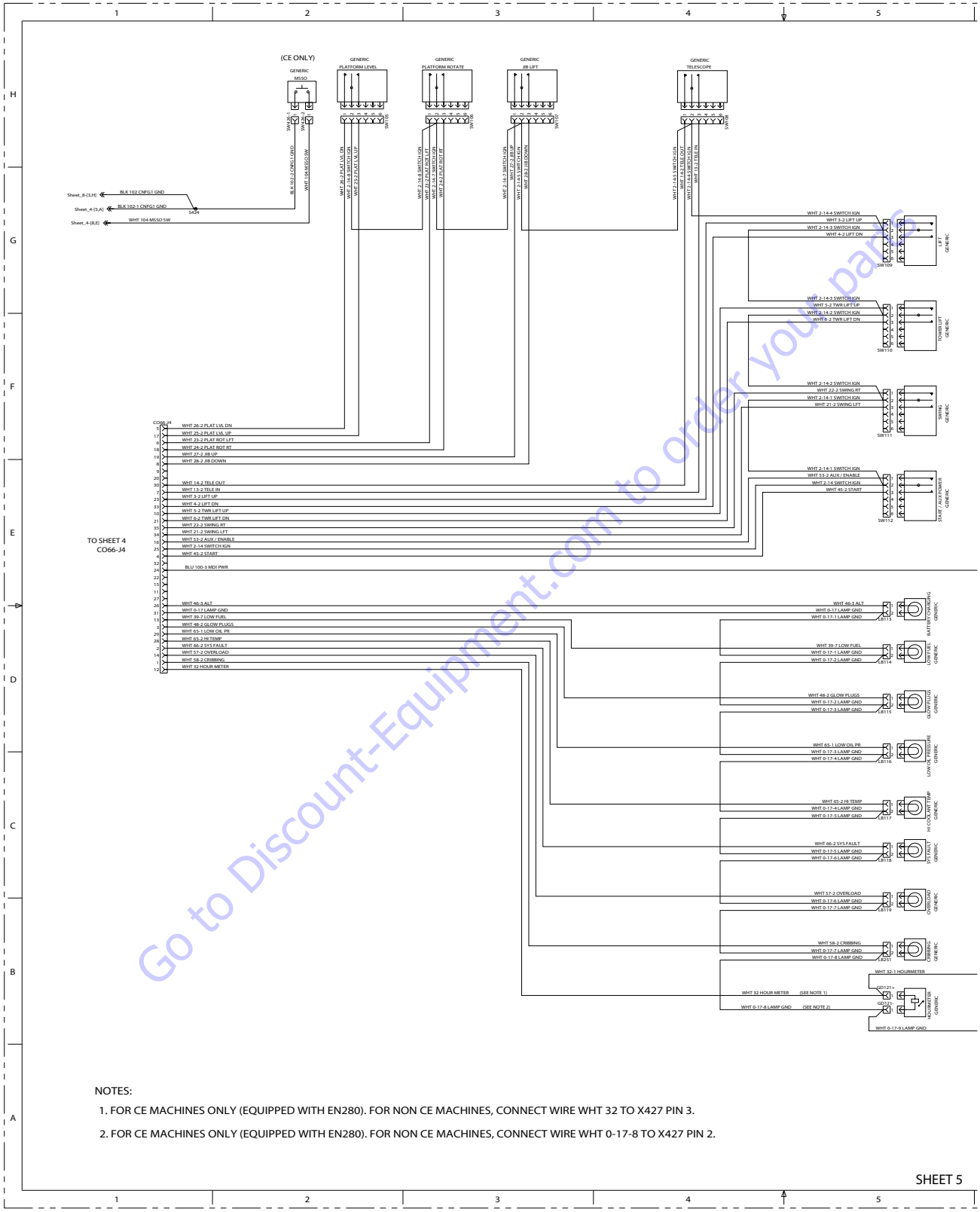


Figure 7-31. Electrical Schematic - Sheet 7 of 20



NOTES:

1. FOR CE MACHINES ONLY (EQUIPPED WITH EN280). FOR NON CE MACHINES, CONNECT WIRE WHT 32 TO X427 PIN 3.
2. FOR CE MACHINES ONLY (EQUIPPED WITH EN280). FOR NON CE MACHINES, CONNECT WIRE WHT 0-17-8 TO X427 PIN 2.

Figure 7-32. Electrical Schematic - Sheet 8 of 20

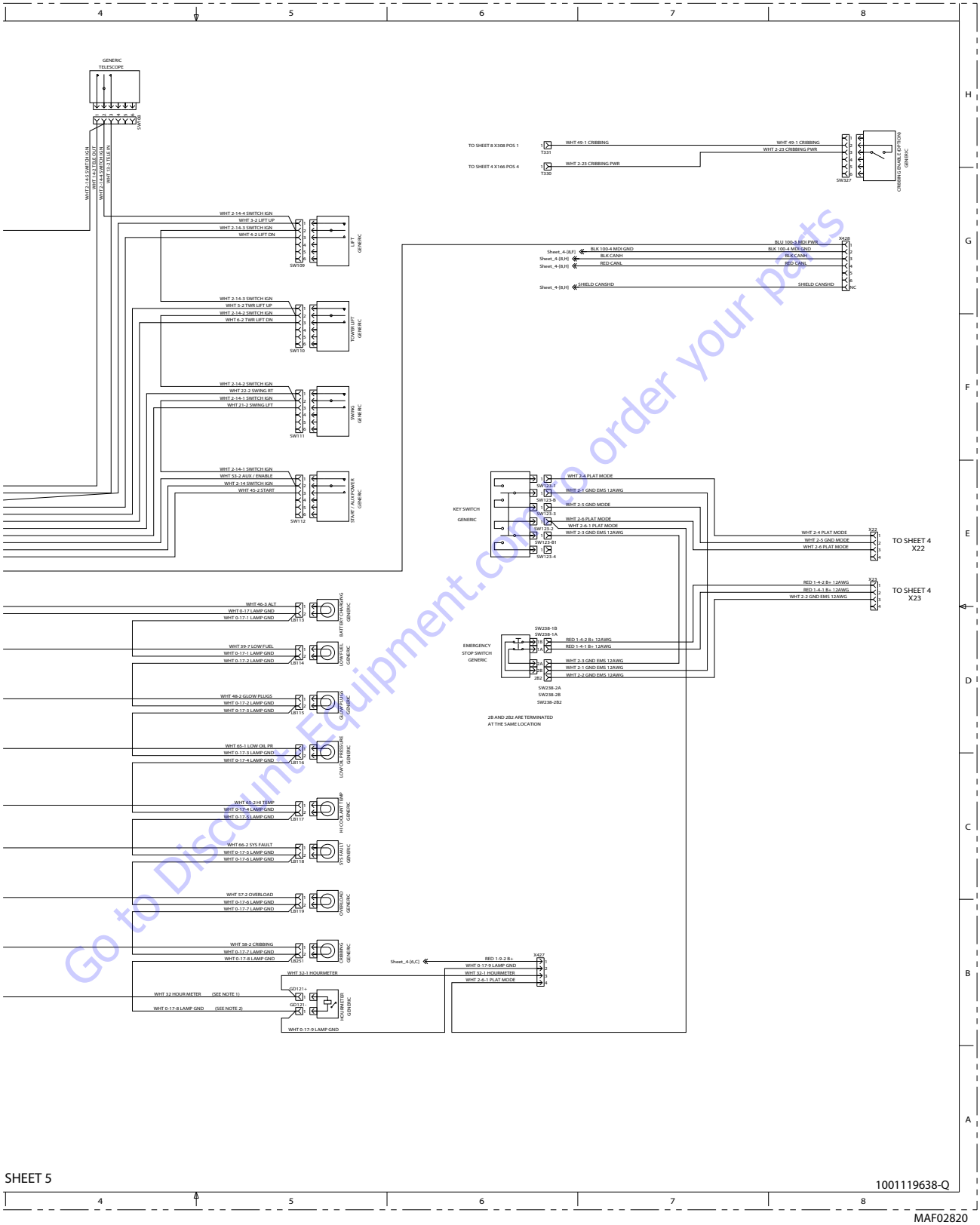


Figure 7-33. Electrical Schematic - Sheet 9 of 20

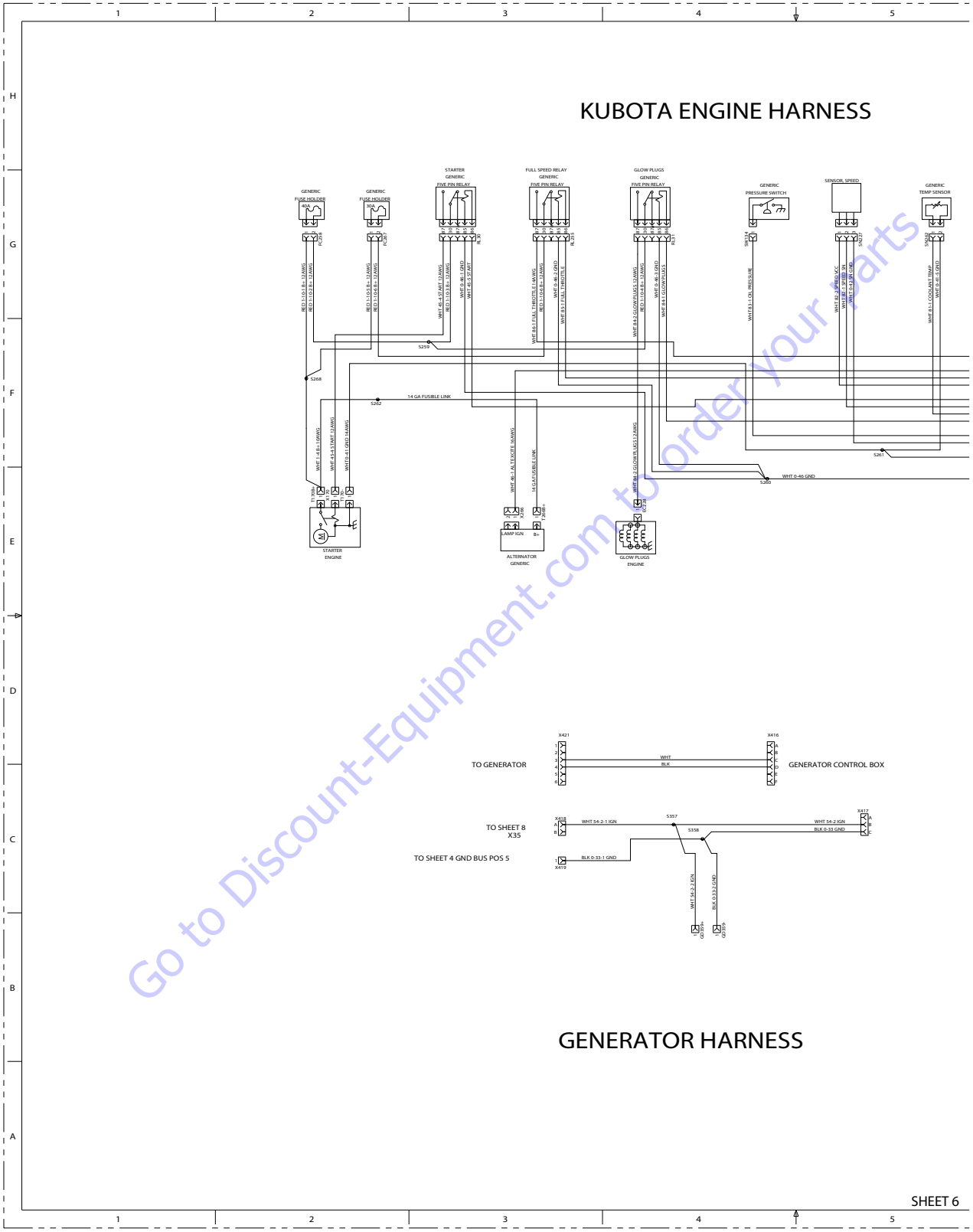


Figure 7-34. Electrical Schematic - Sheet 10 of 20

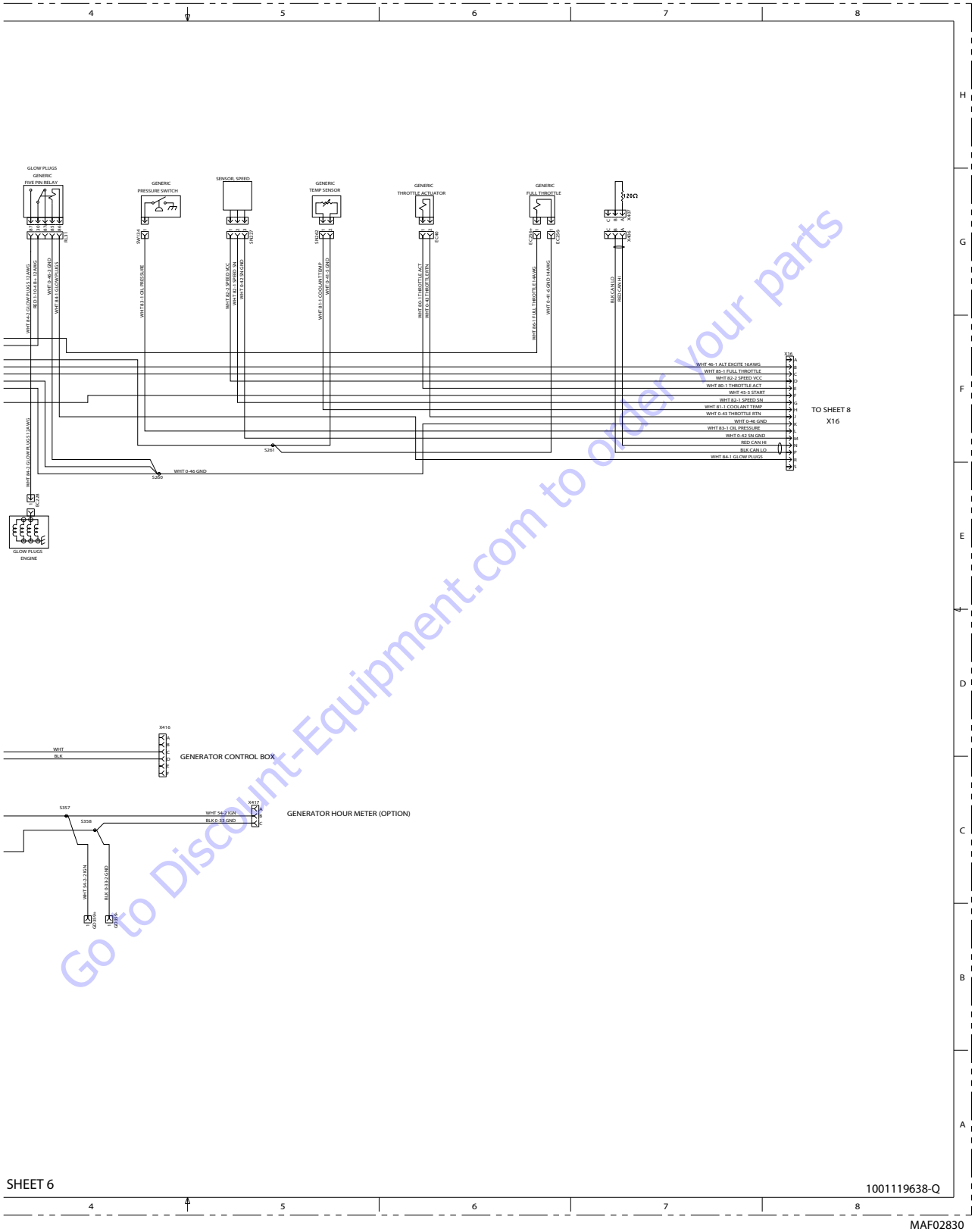


Figure 7-35. Electrical Schematic - Sheet 11 of 20

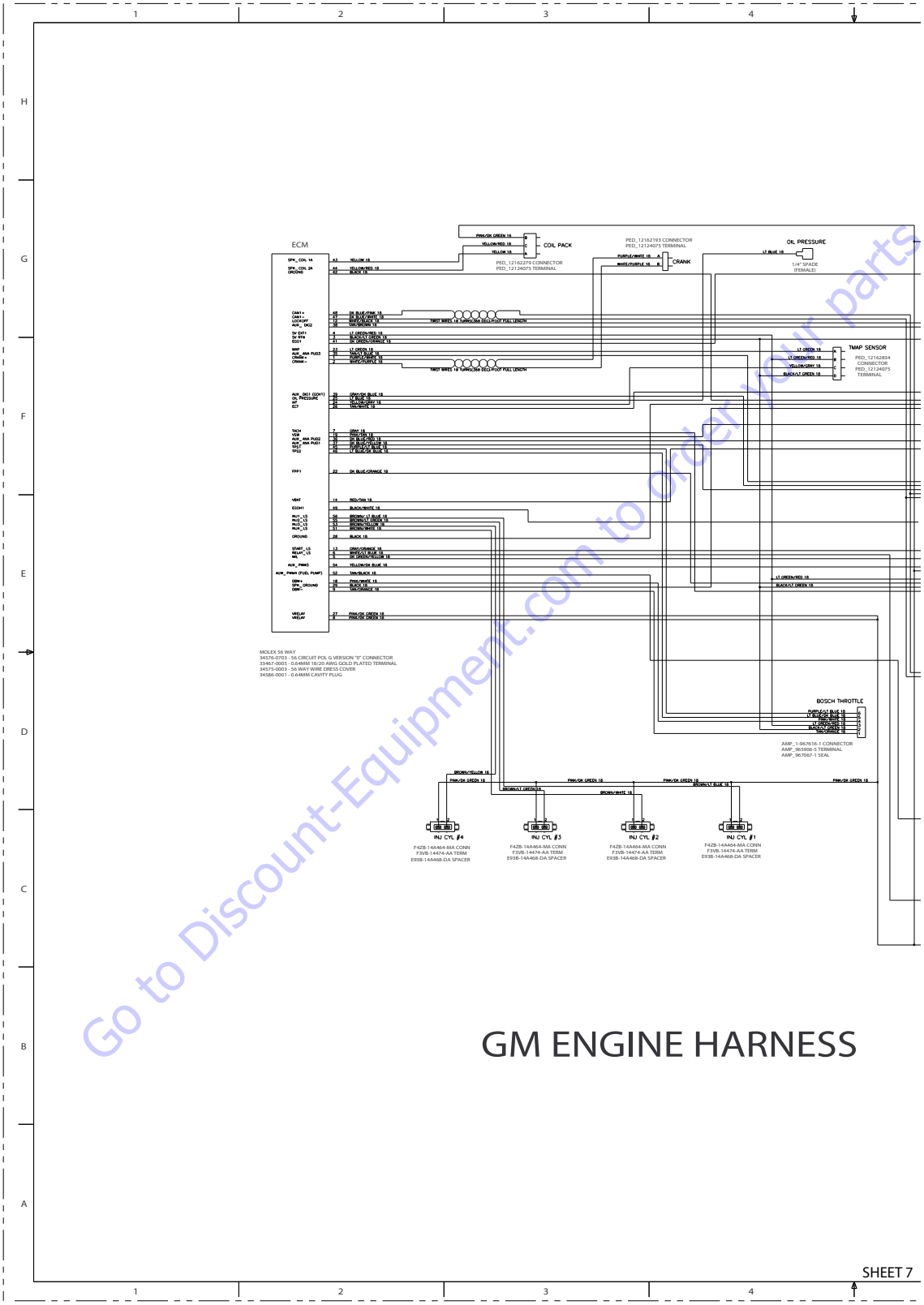


Figure 7-36. Electrical Schematic - Sheet 12 of 20

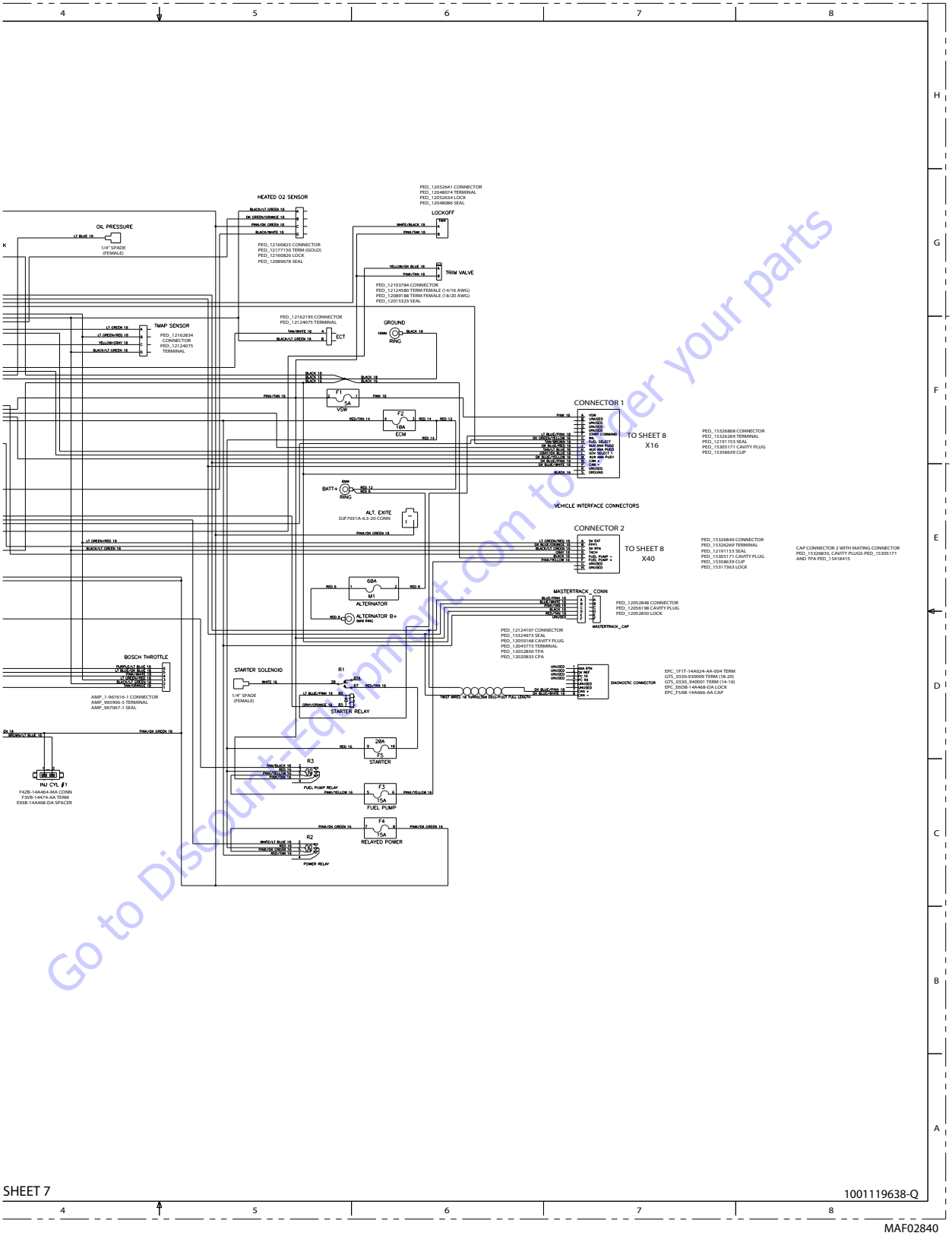


Figure 7-37. Electrical Schematic - Sheet 13 of 20

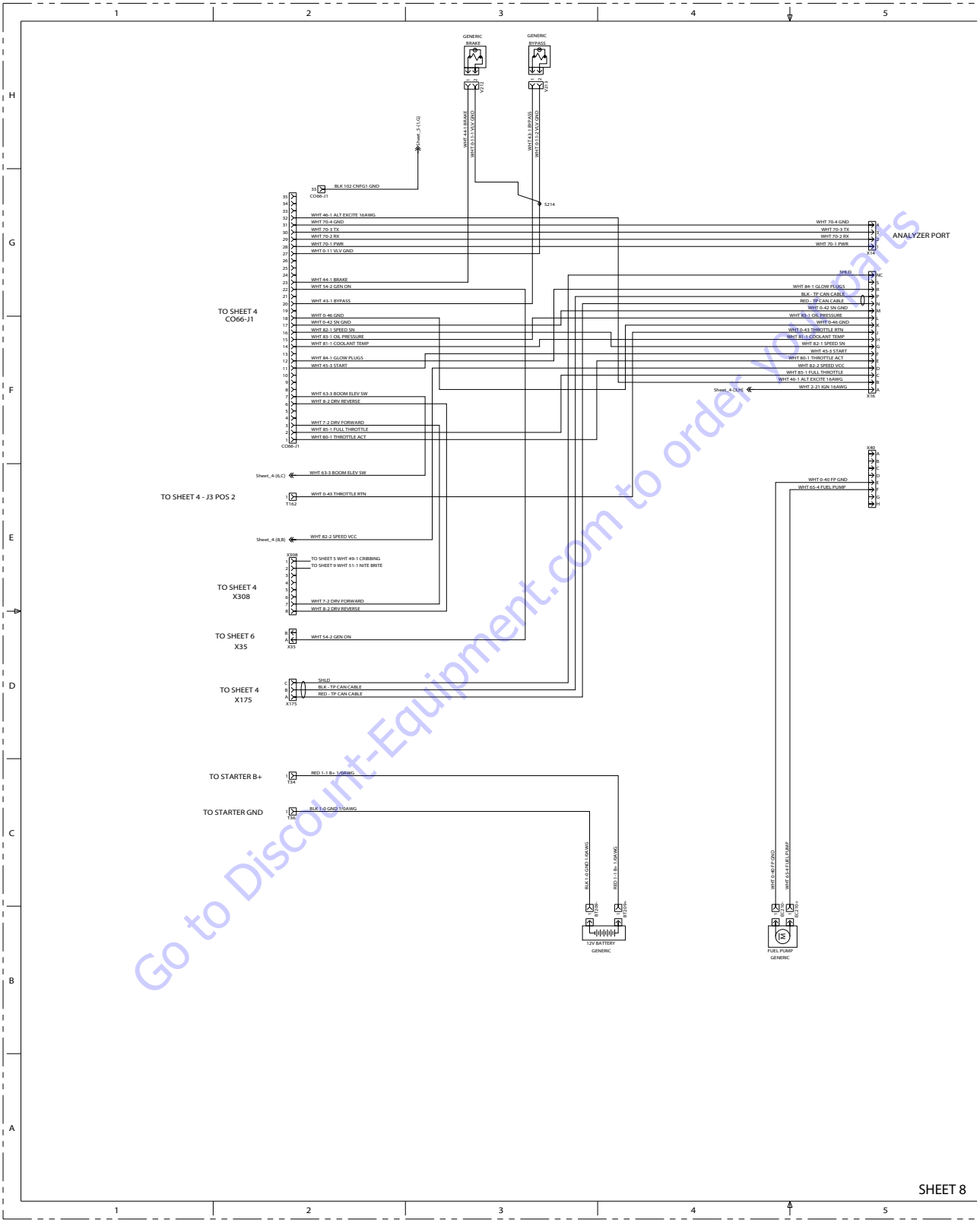


Figure 7-38. Electrical Schematic - Sheet 14 of 20

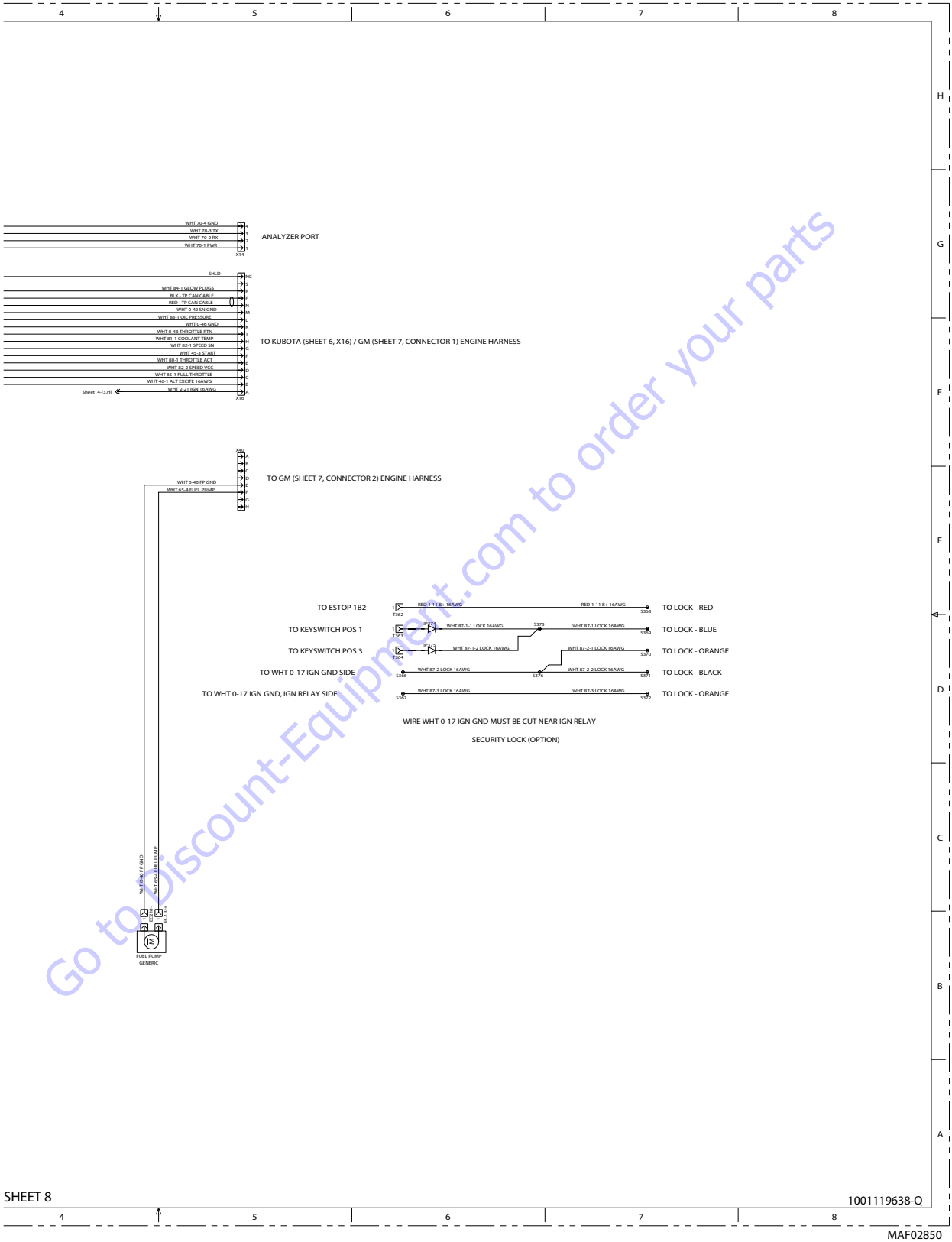


Figure 7-39. Electrical Schematic - Sheet 15 of 20

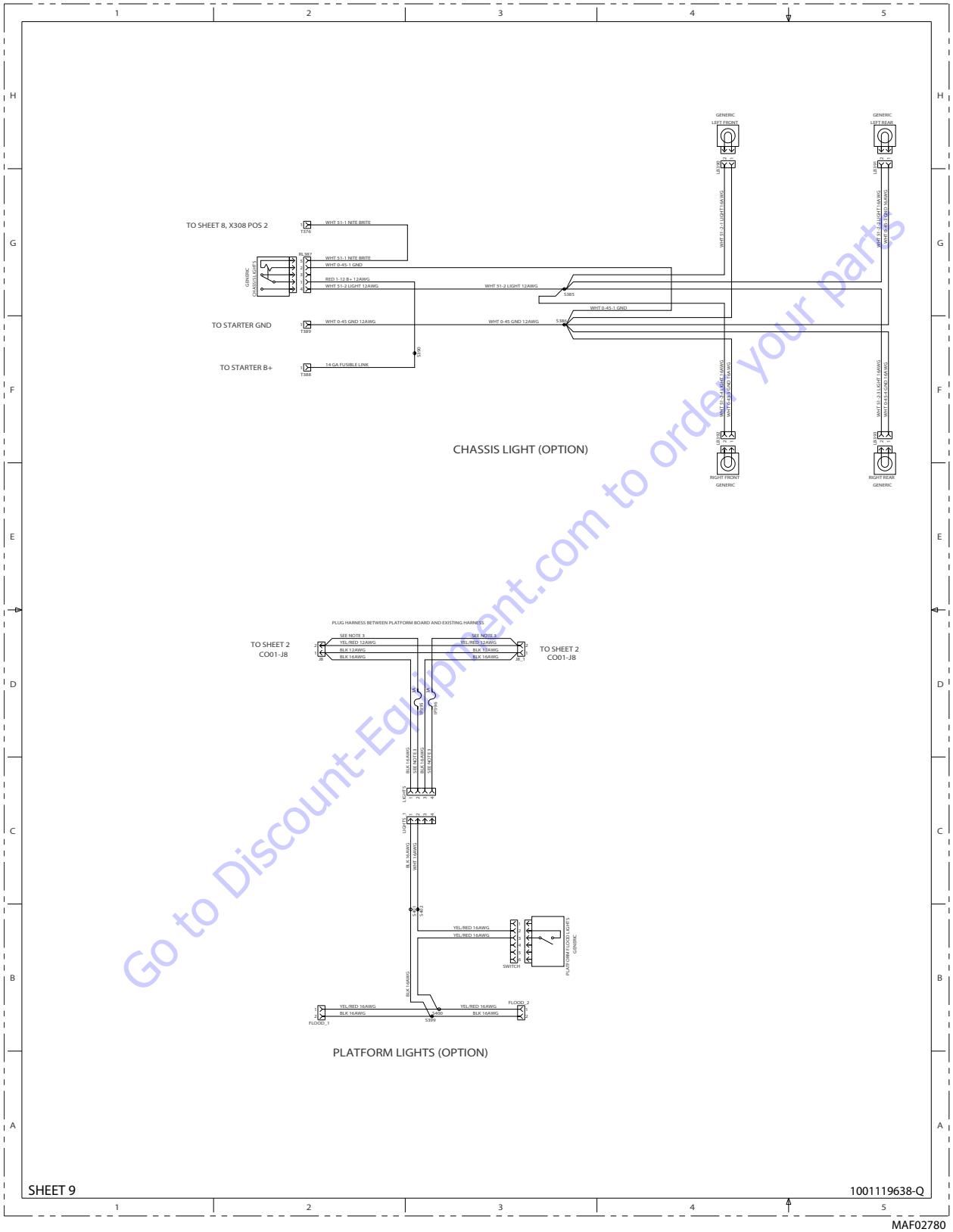


Figure 7-40. Electrical Schematic - Sheet 16 of 20

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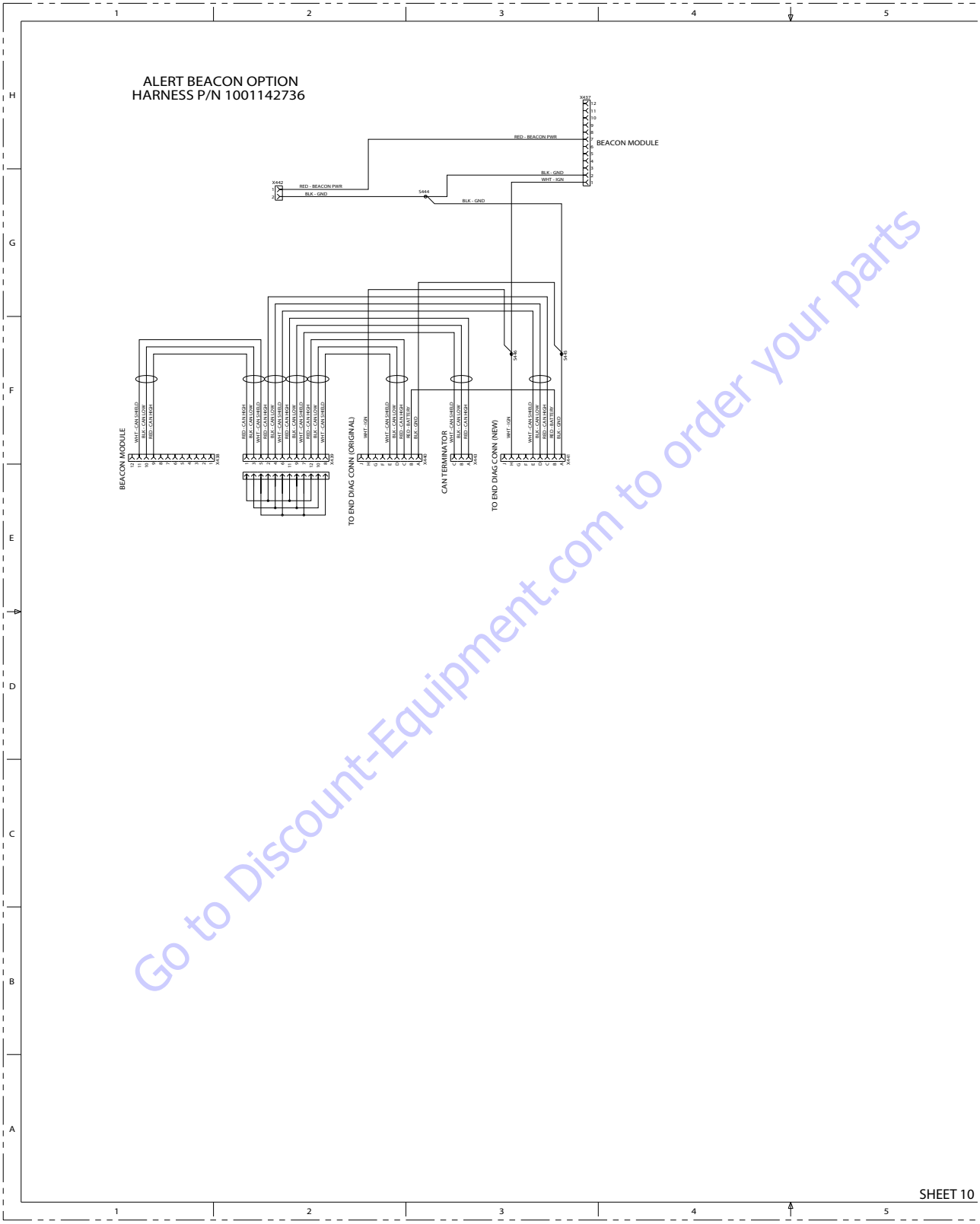


Figure 7-41. Electrical Schematic - Sheet 17 of 20

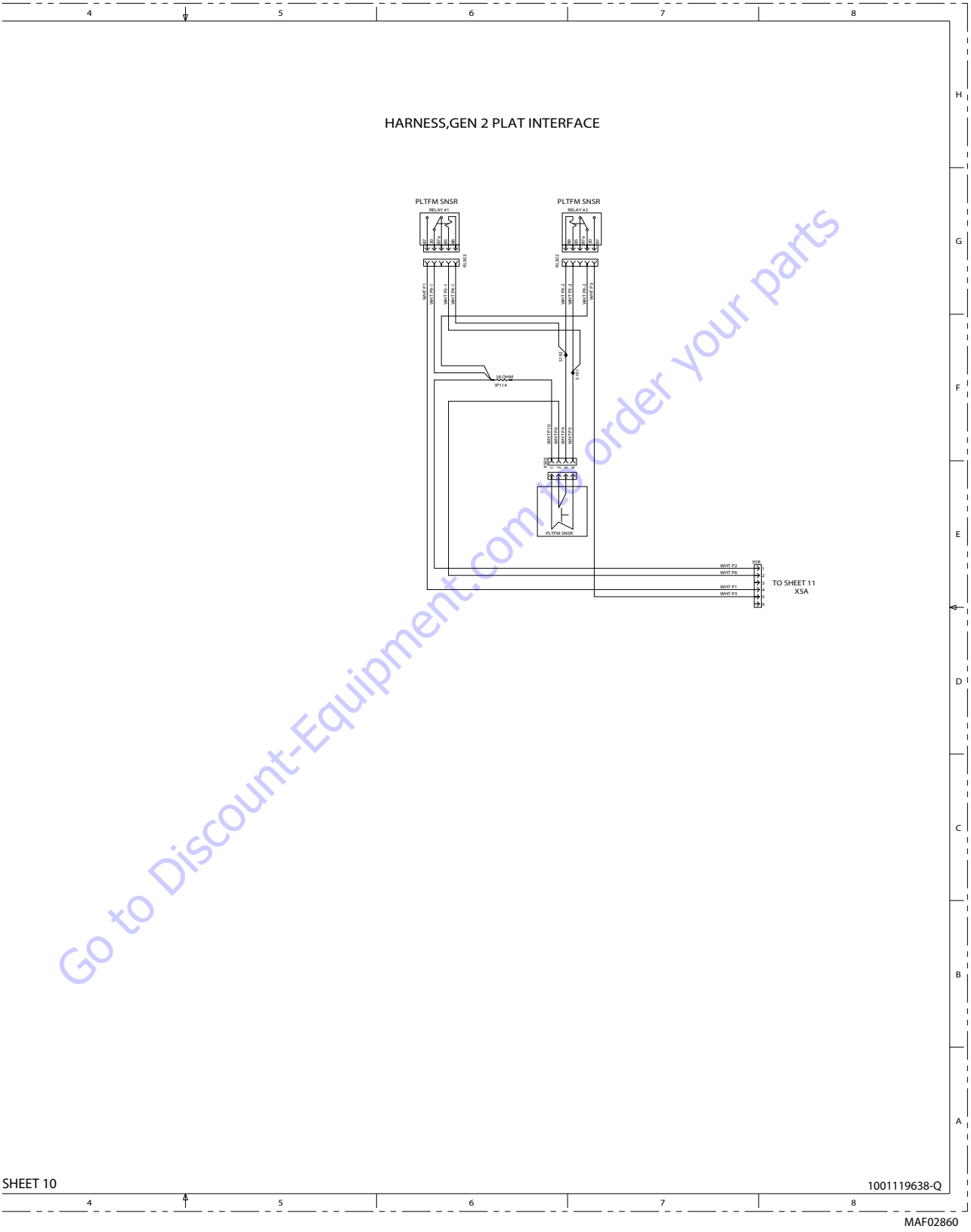


Figure 7-42. Electrical Schematic - Sheet 18 of 20

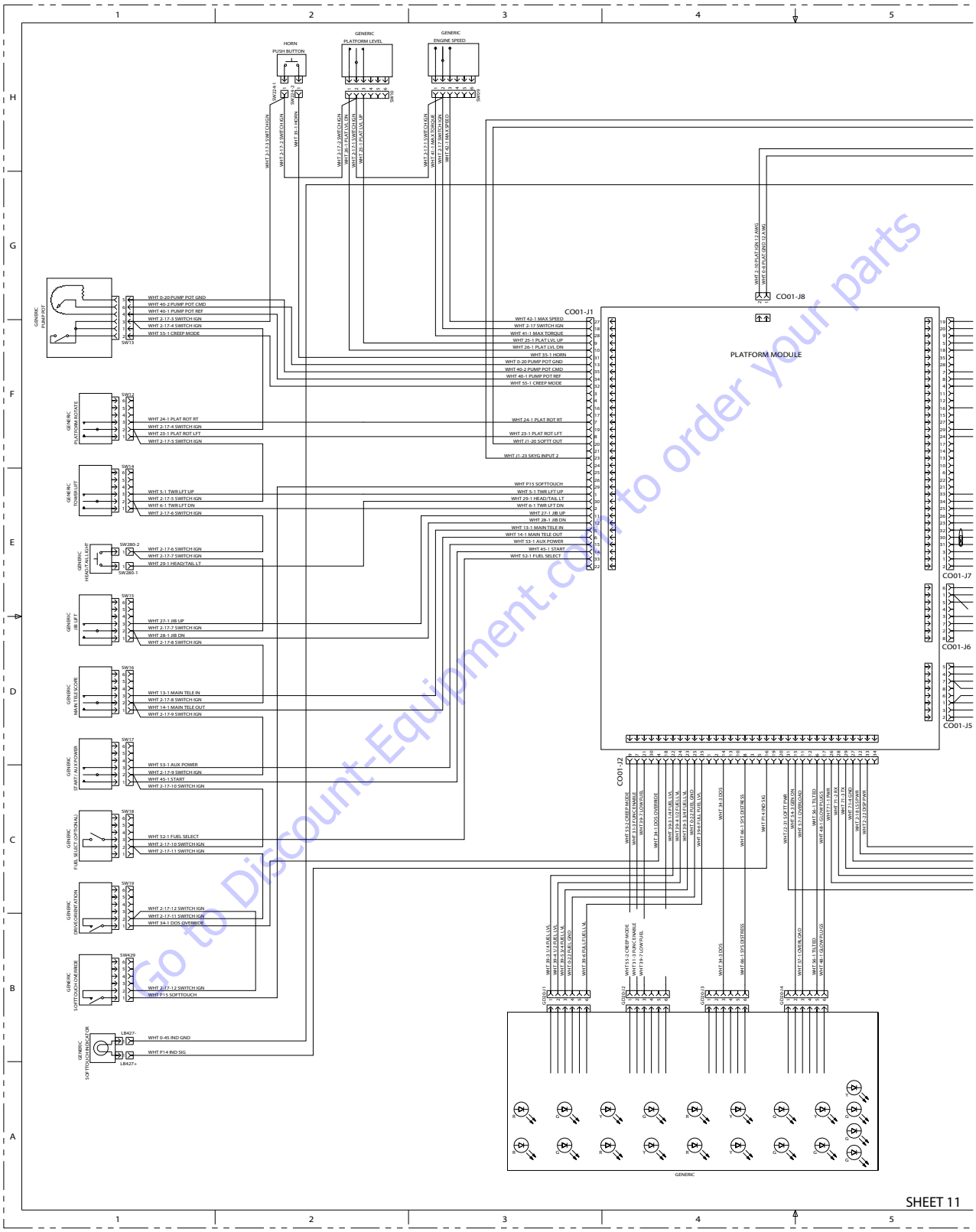


Figure 7-43. Electrical Schematic - Sheet 19 of 20

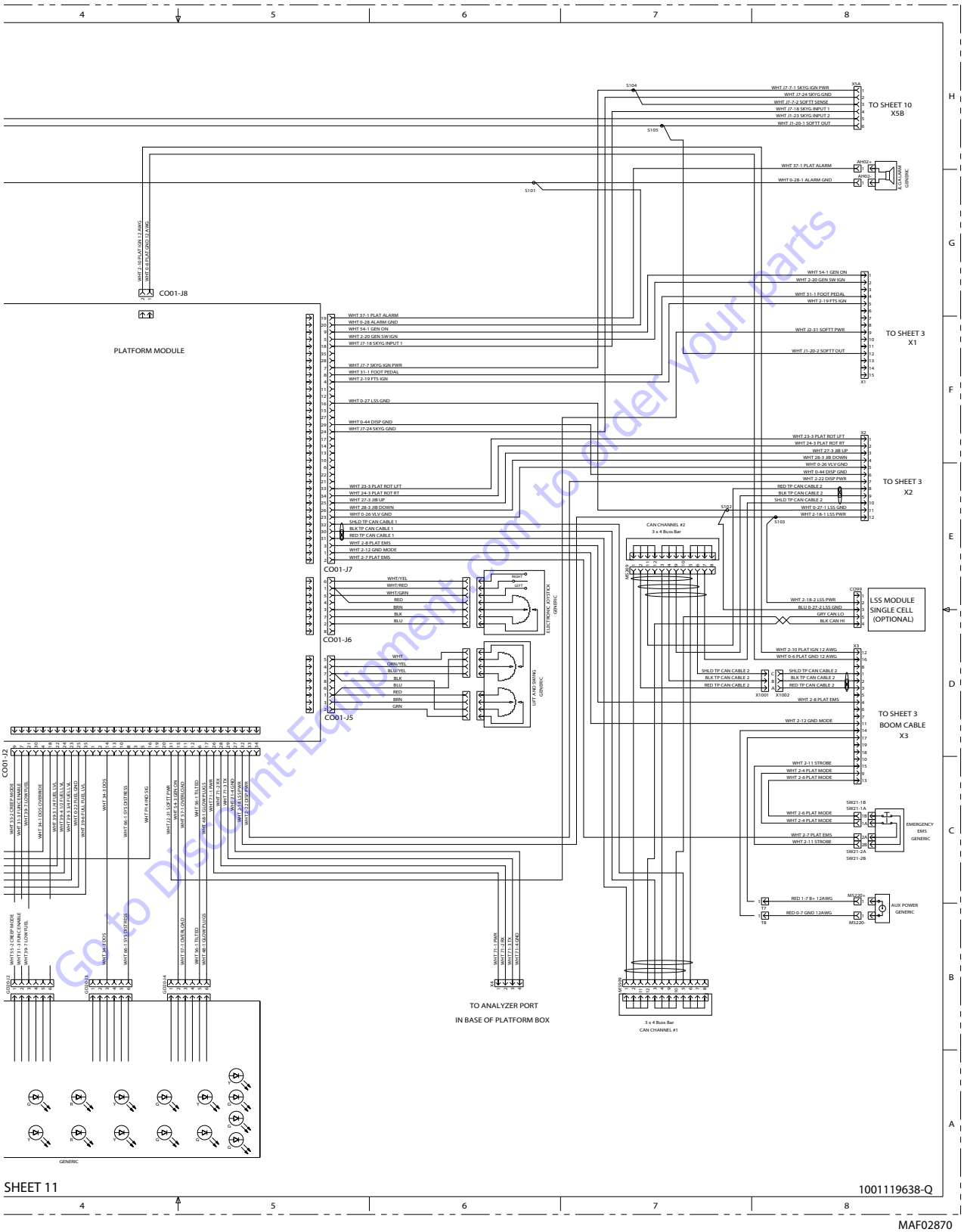


Figure 7-44. Electrical Schematic - Sheet 20 of 20

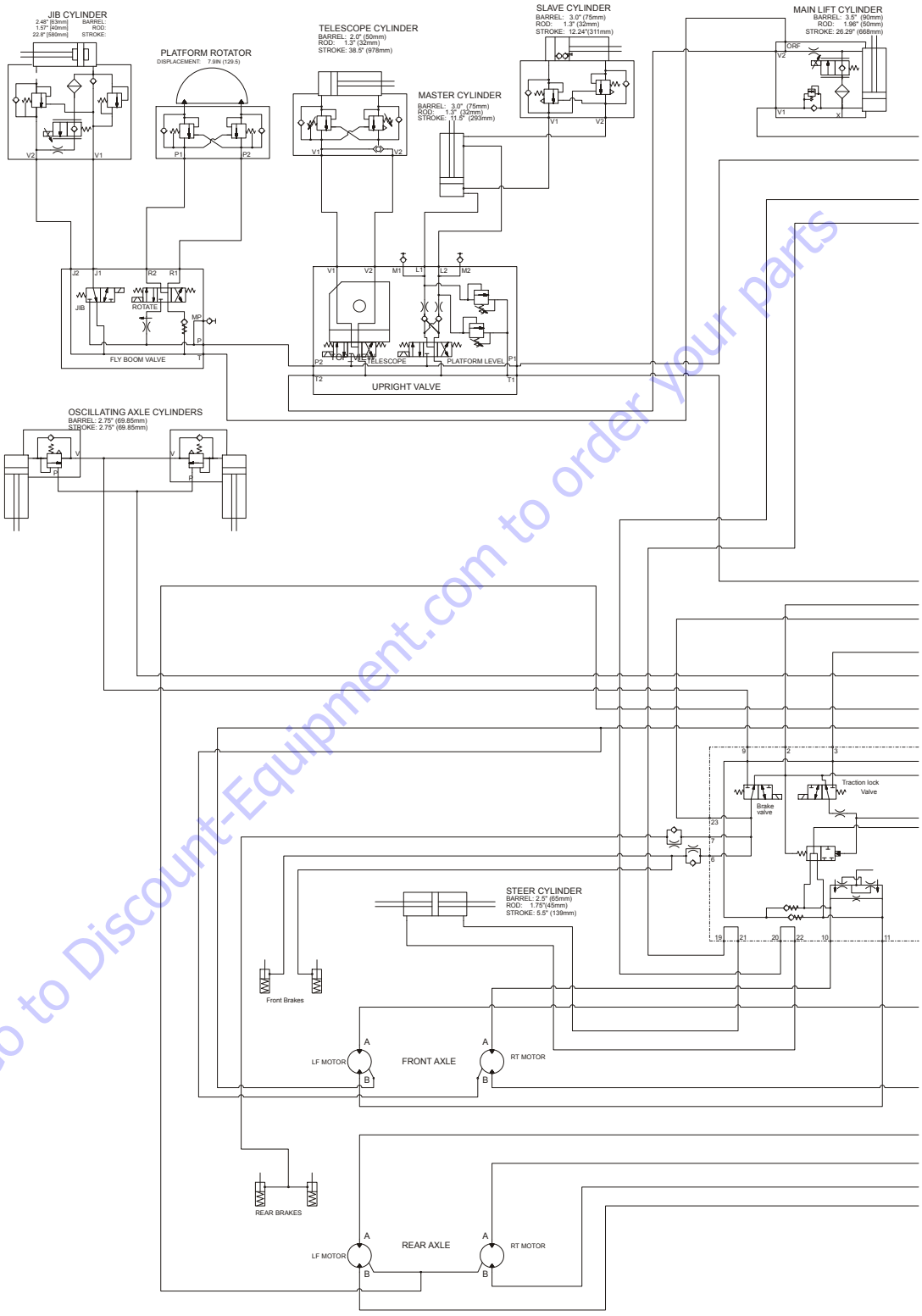
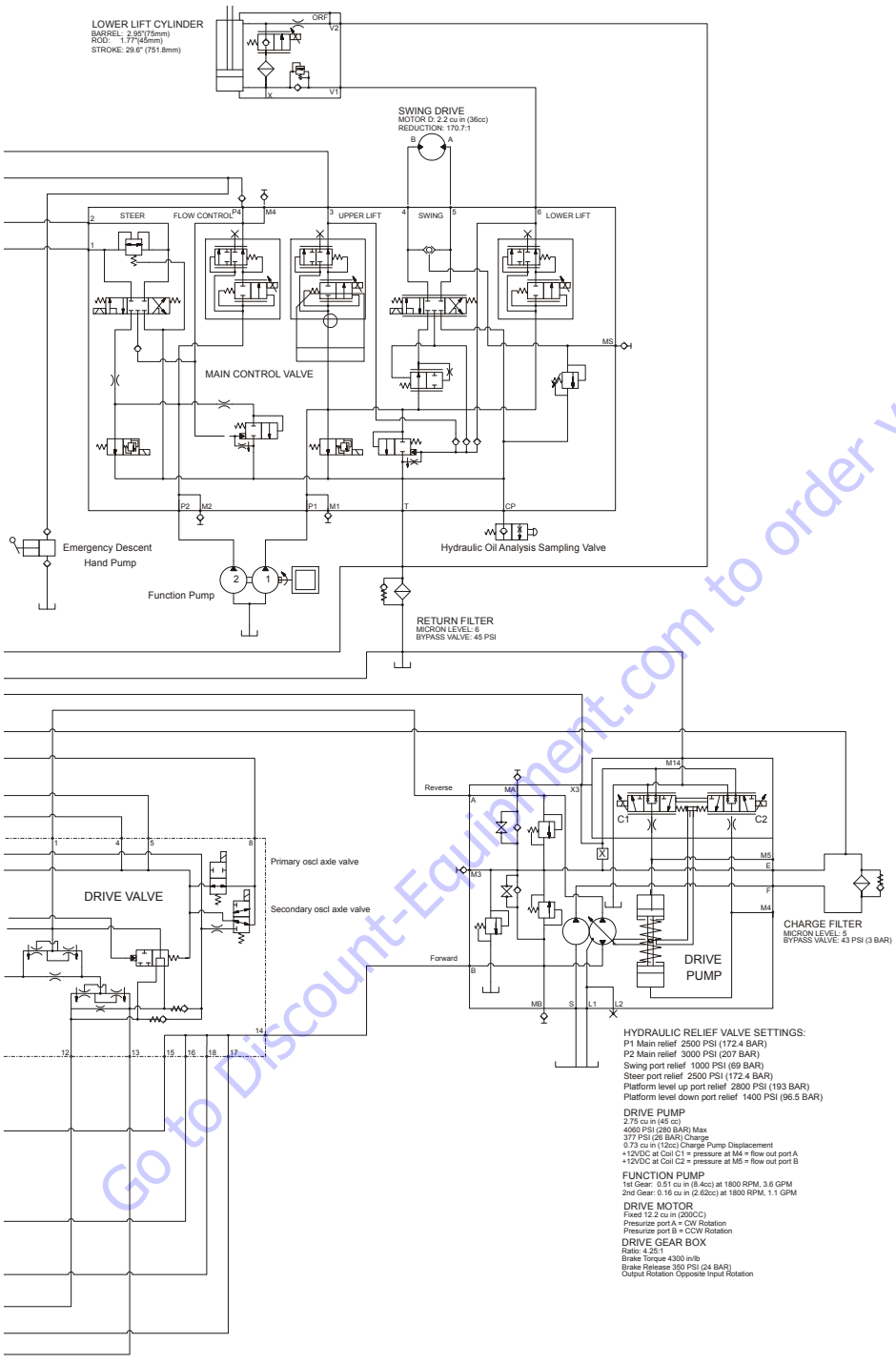


Figure 7-45. Hydraulic Schematic - Sheet 1 of 2



1001120020-C

Figure 7-46. Hydraulic Schematic - Sheet 2 of 2

NOTES:

PARTS FINDER

Search Website by Part Number

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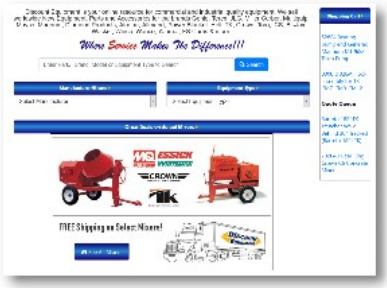
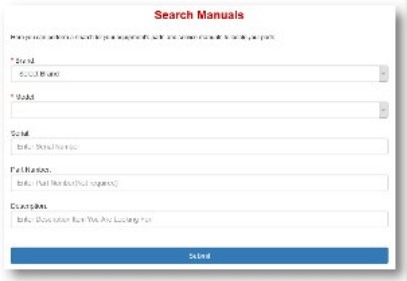
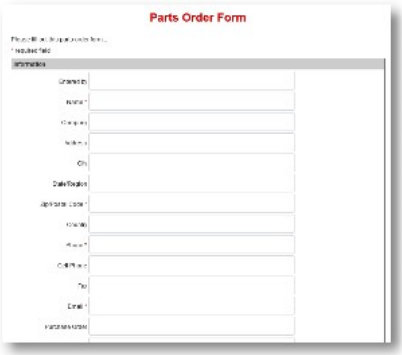


Search Manual Library For Parts Manual & Lookup Part Numbers – Purchase or Request Quote



Can't Find Part or Manual? Request Help by Manufacturer, Model & Description



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