12. Use the analyzer keys to select N for no or Y for yes. Press ENTER (ENTER). The control system will default to an estimate of unrestricted capacity, which can be adjusted if necessary. Refer to Table 6-10, SkyGlazier Capacity Reductions and Table 6-11, Pipe Rack Capacity Reductions. The screen will read:

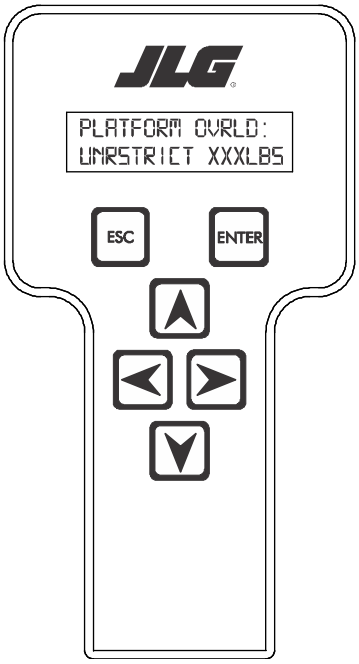


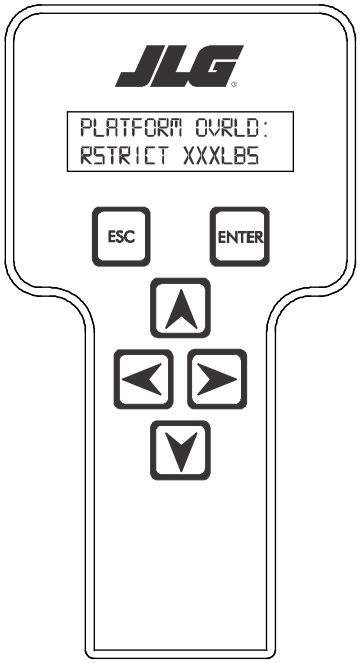
Table 6-10. SkyGlazier Capacity Reductions

Capacity	PLATFORM OVRLD	PLATFORM OVRLD RESTRICT
500 lb. (227 kg)	400 lb. (181 kg)	N/A
550 lb. (250 kg)	400 lb. (181 kg)	N/A
600 lb. (272 kg)	400 lb. (181 kg)	N/A
750 lb. (340 kg)	N/A	590 lb. (268 kg)
1000 lb. (454 kg)	N/A	750 lb. (340 kg)
NOTE: *If both SkyGlazier and Pipe Racks are configured, capacity will be the lower of the two values.*		

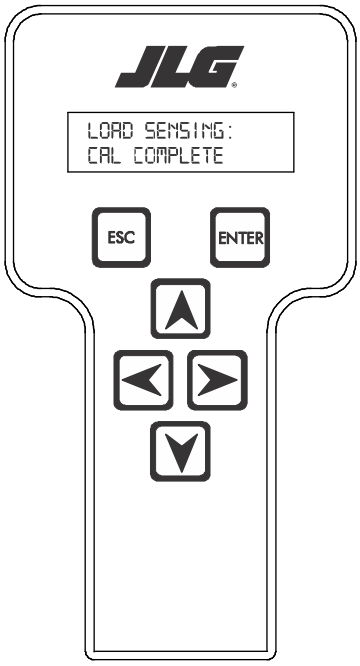
Table 6-11. Pipe Rack Capacity Reductions

Capacity	PLATFORM OVRLD	PLATFORM OVRLD RESTRICT
500 lb. (227 kg)	400 lb. (181 kg)	N/A
550 lb. (250 kg)	450 lb. (204 kg)	N/A
600 lb. (272 kg)	500 lb. (227 kg)	N/A
750 lb. (340 kg)	N/A	650 lb. (295 kg)
1000 lb. (454 kg)	N/A	900 lb. (408 kg)
NOTE: *If both SkyGlazier and Pipe Racks are configured, capacity will be the lower of the two values.*		

13. Press ENTER (ENTER). The following screen will be displayed for restricted capacity, which can be adjusted if necessary. Refer to Table 6-10, SkyGlazier Capacity Reductions and Table 6-11, Pipe Rack Capacity Reductions.



14. Press ENTER (ENTER). If calibration is successful, the screen will read:



Testing & Evaluation

Refer to Troubleshooting if the Load Sensing System fails to meet these guidelines.

1. Connect the JLG Analyzer.
2. Level the Platform. The platform should be approximately level for analysis, or the guidelines below will not be applicable. Level the platform from Ground Control (if necessary) to within ±5 degrees.
3. Observe the Empty Platform Weight. Proceed to the DIAGNOSTICS, PLTLOAD sub-menu and observe the measured platform load. All tools, debris, and customer installed devices shall be removed during evaluation. Ideally, the PLTLOAD should be zero but can vary ±15lbs (±7kg). Further, the reading should be stable and should not vary by more than ±2lbs (±1kg) (unless there is heavy influence from wind or vibration).
4. Use the Technician's Weight to Evaluate. The technician should enter the platform and record the PLTLOAD reading while standing in the center of the platform.
5. Confirm Control System Warnings and Interlocks. Using the keyswitch, select Platform Mode and power-up. Start the vehicle's engine and ensure that all controls are functional and the Load Sensing System's Overload Visual and Audible Warnings are not active. Simulate an Overload by unplugging the Shear Beam Load Cell. The Overload Visual Warning should flash, and the Audible Warning (at Platform and Ground) should sound for 5 seconds On, and 2 seconds Off. With the engine running, all control should be prevented. Cycle the Platform EMS to stop the engine and then power-up again. The Overload Visual and Audible Warning should continue. Confirm that controls are responsive when using the Auxiliary Power Unit for emergency movement. Reconnect the Load Cell. The Overload Visual and Audible Warnings should cease and normal control function should return. Switch the vehicle's keyswitch to Ground Mode and repeat the above procedure. The Overload Visual Warning at the Ground Controls should flash, and the Audible Warning (at Platform and Ground) should sound for 5 seconds On, 2 seconds Off. However, the controls should remain functional when using the engine and the Auxiliary Power Unit (if the Control System's MACHINE SETUP, LOAD is set to "2=CUTOUT PLT". If set to "3=CUTOUT ALL", then Ground Controls will be prevented when using the engine as in the platform).
6. Confirm Control System Capacity Indication (optional for vehicles with Dual Capacity Ratings). For vehicles equipped with a Capacity Select switch on the Platform Console Box, it is necessary to examine an additional interface between the Load Sensing System and the Control System. Using the keyswitch, select Platform Mode and power-up. If necessary, put the boom in the transport position (completely stowed) and center the Jib Plus (if equipped). Place the Capacity Select switch in the unrestricted position and ensure that the proper indicator illuminates on the Platform Console Box. Plug the JLG Analyzer into the Analyzer connection and proceed to the DIAGNOSTICS, SYSTEM submenu. Ensure that the CAPACITY displays indicate OFF. Place the Capacity Select switch in the unrestricted position (if so equipped) and ensure that the proper indicator illuminates on the Platform Console Box (but does not flash). For vehicles with unrestricted capacity, ensure that the unrestricted CAPACITY display indicates ON but the restricted CAPACITY indicates OFF. For vehicles with restricted capacity, ensure that the unrestricted CAPACITY display indicates OFF but the restricted CAPACITY indicates ON.
7. Confirm Load Sensing System Performance with Calibrated Weights. Operate the vehicle from Ground Control and place the boom in the transport position (fully stowed) for safety. Plug the JLG Analyzer into the control system connection and proceed to the DIAGNOSTICS, PLTLOAD display. Place 500lbs (230kg) in the platform and ensure that PLTLOAD is with ±5% of the actual weight. For Dual Capacity vehicles, do the same for the alternate capacity (unrestricted or restricted).

LSS Service Mode

To facilitate the servicing and enabling of functions due to component faults, there is a need to override the normal operation of the machine. Service Mode shall become visible only after entering Service Access Level.

Table 6-12. LSS Service Mode

Service Mode Submenu (Displayed on Analyzer 2nd Line)	Parameter (Displayed on Analyzer 1st Line)	Parameter Value (Displayed on Analyzer 2nd Line)	Transition and Software Checks
LSS? (NOT VISIBLE IF MACHINE SETUP? LOAD SYSTEM = NO)	LSS:	CODE: XXXXX	Operator uses Up and Down Arrow keys on Analyzer to input Service Mode Code; On ENTER, UGM to confirm code of 18171. If correct advance to next menu. If incorrect or on ESC, go to SERVICE MODE menu.
	LSS:	SERVICE ON	The UGM shall treat MACHINE SETUP --> LOAD SYSTEM as if it is set to WARN ONLY until: - Power is Cycled - Analyzer is disconnected - ESC is pressed On ESC, go to SERVICE MODE menu.
DRV CUT? (NOT VISIBLE IF MACHINE SETUP --> TILT = X DEGREES)	DRY CUT:	CODE: XXXXX	Operator uses Up and Down Arrow keys on Analyzer to input Service Mode Code; On ENTER, UGM to confirm code of 23732. If correct advance to next menu. If incorrect or on ESC, go to SERVICE MODE menu.
	DRY CUT:	SERVICE ON	UGM shall treat MACHINE SETUP --> TILT as if it is set to X DEGREES (where X is the currently selected tilt degree value) until: - Power is Cycled - Analyzer is disconnected - ESC is pressed On ESC, go to SERVICE MODE menu.

LSS Service Mode Event Log

The Service Mode events listed below shall be stored in the Service Mode event log (DIAGNOSTICS --> DATALOG --> SERVICE LOG) if their corresponding conditions are met.

- SERVICE LSS – Logged when the LSS Service mode transitions from OFF to ON
- SERVICE DRV CUT – Logged when the LSS Service mode transitions from OFF to ON

Troubleshooting

The following tables are furnished to provide possible resolutions for common difficulties. Difficulties are classified as General, Calibration, Measurement Performance, and Host System Functionality.

Table 6-13. LSS Troubleshooting Chart

Difficulty	Possible Resolution
Empty Platform Weight (DIAGNOSTICS, PLATFORM LOAD) is not within ±15lb (±7kg) of zero. or Platform Load readings (DIAGNOTICS, PLTLOAD) are unstable by more than ±2lb (±1kg) (without the influence of vibration or wind). or There are large variations in Platform Load (DIAGNOSTICS, PLTLOAD) based on the location of the load. Tolerance to variations is 20lbs for an evaluation using the technician's weight, and +5% of Rated Load when using calibrated weights.	The LSS System is unable to properly measure the platform weight. 1. The Load Cell is not properly plugged into the LSS Harness. It is possible poor electrical contact is made. 2. Wiring leading to the Load Cell is damaged. Carefully inspect sensor wiring where it passes through cable clamps for signs of damage. Inspect wiring where damage to the channel is apparent. 3. The Load Cell was not assembled properly during installation. Examine the sensor's reading using the JLG Analyzer. Proceed to the DIAGNOSTICS, CELL, LOAD displays and determine if the readings are reasonable. It is often helpful to apply slight downward pressure above the sensor and observe that its output increases (increasing force measurement; decreasing means the sensor is mounted upside-down). 4. The Load Cell is contaminated by debris or moisture. Examine the sensor's reading using the JLG Analyzer. Proceed to the DIAGNOSTICS, CELL, LOAD displays and determine if the readings are reasonable and stable (not changing by more than ±2lb (±1kg) (without the influence of vibration or wind). Lack of measurement stability is a key indication of contamination. Unplug the connector and inspect for dirt or moisture. Look carefully into the female connector on the sensor's cordset for evidence of contamination. Debris should be brushed away with a soft bristle brush (do not introduce any cleaners as they will leave conductive residue). Moisture should be allowed to evaporate or accelerated with a heat-gun (use low heat and be carefully to not melt connector materials). Moisture intrusion into the molded portion of the connector (capillary action into the wire bundle) or the Shear Beam Load Cell itself will require replacement of the sensor. 5. The Load Cell has been mechanically damaged. If the Load Cell is physically deformed or has damage to the cover it should be replaced immediately. It is also possible to have invisible mechanical damage resulting from an extreme overload (>6000lb [>2722kg]).
The Visual and Audible Overload Warnings fail to sound when platform is loaded beyond Rated Load, or when simulated by unplugging the Load Cell. Controls remain functional at Platform and Ground Control positions.	The Control System is failing to regard the overload signal from the LSS System, or the signal is shorted. 1. The Load Sensing System must be enabled within the Control System. Plug the JLG Analyzer into the Control System, enter the Access Level 1 password (33271), and examine the MACHINE SETUP, LOAD sub-menu. The selection "2=CUTOUT PLT" should be displayed (platform controls prevented during overload, ground controls remain operational). In country- or customer-specific circumstance, the selection "3=CUTOUT ALL" is used (platform and ground controls prevented during overload).
The Ground Audible Warning fails to sound, but the Platform Audible Warning sounds properly.	The Ground Alarm is missing or improperly installed. Verify that the device is mounted. Verify wiring from the Main Terminal Box and Ground Module.
Controls remain functional at the Ground Control position during an overload, or when simulated by unplugging the Load Cell. The Controls at the Platform Control position are prevented when using the engine, but not when using the Auxiliary Power Unit.	The JLG Control System is configured to prevent platform controls only in the event of overload. Alternately, the Host Control System can be configured to prevent ground and platform controls for country- or customer specific circumstances. Using the JLG Analyzer, enter the Access Level 1 password (33271). Proceed to the MACHINE SETUP, LOAD sub-menu. Set this parameter to "2=CUTOUT PLT" to prevent platform controls in the event of overload. Set this parameter to "3=CUTOUT ALL" to prevent platform and ground controls in the event of overload.

6.16 MACHINE FAULT CODES

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
001	EVERYTHING OK	Machine is in Platform Mode; The UGM determines no problems exist	
002	GROUND MODE OK	Machine is in Ground Mode; The UGM determines no problems exist	
0010	RUNNING AT CUTBACK – OUT OF TRANSPORT POSITION	Machine is in the Out of Transport position	Machine is not in the Out of Transport position
0011	FSW OPEN	Machine is in Platform Mode; Any of the following Platform inputs become active after power up, but before Machine Enabled: Drive joystick is not in the neutral position Steer; Lift and/or Swing joystick is not in the neutral position; Telescope; Platform Level; Platform Rotate; Jib Lift (if MACHINE SETUP ⟶ JIB = YES)	Controls initialized
0012	RUNNING AT CREEP - CREEP SWITCH OPEN	Machine is in Platform Mode; Platform Creep switch input = HIGH; DTC 0013 is not active	Platform Creep switch input = Low
0013	RUNNING AT CREEP - TILTED AND ABOVE ELEVATION	Machine is in Platform Mode; The Boom is Above Elevation; Machine chassis is considered Tilted	Not all of the trigger conditions are met
0015	LOAD SENSOR READING UNDER WEIGHT	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; UGM determines that the Platform Load < -50 lbs. for 2 seconds; Do not report if DTC (0030, 825 or 8211) is active or if Platform Load == Unhealthy	UGM determines that the Platform Load >= -50 lbs. for 5 seconds
0031	FUEL LEVEL LOW – ENGINE SHUTDOWN	MACHINE SETUP ⟶ FUEL LEVEL ≠ NONE; Engine Shutdown has occurred due to Fuel Level = EMPTY condition.	Power Cycled
0035	APU ACTIVE	Auxiliary Power/Emergency Descent Mode is active	Auxiliary Power/Emergency Descent Mode is not active

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
0036	FUNCTION PREVENTED - FUNCTION SELECTED BEFORE GROUND ENABLE	Machine is in Ground Mode; (Jumper Configuration Status = 0)} and Jumper Configuration Status < 2]); Any of the following Ground inputs become active after power up, but before Machine Enabled: Lift; Swing; Telescope; Platform Level; Platform Rotate; Jib Lift (if MACHINE SETUP ⟶ JIB = YES)	Controls initialized
0039	SKYGUARD ACTIVE – FUNCTIONS CUTOUT	MACHINE SETUP ⟶ SKYGUARD = YES; Machine is in Platform Mode; SkyGuard Enabled	Not all of the trigger conditions are met
212	KEYSWITCH FAULTY	UGM Ground Mode input J7-3 input = High; UGM Platform Mode input J7-2 input = High	(J7-3 input = LOW) or (J7-2 input = LOW)
213	FSW FAULTY	The ground footswitch input and platform footswitch input have been both HIGH or both LOW for greater than or equal to 1 second	Power Cycled
221	FUNCTION PROBLEM - HORN PERMANENTLY SELECTED	Machine is in Platform Mode; The Horn switch input = High at Startup	The Horn switch input = Low
224	FUNCTION PROBLEM - STEER LEFT PERMANENTLY SELECTED	Machine is in Platform Mode; The Steer Left switch input = High at Startup	The Steer Left switch input = Low; Steer Left and Right and full Drive speed permitted after controls are initialized
225	FUNCTION PROBLEM - STEER RIGHT PERMANENTLY SELECTED	Machine is in Platform Mode; The Steer Right switch input = High at Startup	The Steer Right switch input = Low; Steer Left and Right and full Drive speed permitted after controls are initialized
227	STEER SWITCHES FAULTY	The Steer Left switch input = High; The Steer Right switch input = High; (detectable in Platform or Ground mode)	The Steer Left switch input = Low; The Steer Right switch input = Low; Steer and full Drive speed permitted after controls are initialized
2211	FSW INTERLOCK TRIPPED	Machine is in Platform Mode; The Footswitch is active for more than seven seconds with no Drive, Steer, or Boom commands	The footswitch is released
2212	DRIVE LOCKED - JOYSTICK MOVED BEFORE FOOTSWITCH	Machine is in Platform Mode; The UGM detects one of the following conditions: Drive joystick is not in the neutral position at Startup; Drive joystick is not in the neutral position when Footswitch becomes active or while DTC 2213, 2221 or 2223 is active	If triggered by the Drive joystick not being in the neutral position at Startup, then (Drive joystick is returned to its neutral position) and (Drive and Steer permitted after controls initialized) If triggered by the Drive joystick not being in the neutral position when Footswitch becomes active or while DTC 2213, 2221 or 2223, then controls initialized

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
2213	STEER LOCKED - SELECTED BEFORE FOOTSWITCH	Machine is in Platform Mode; A Steer input is active when Footswitch becomes active or while DTC 2212, 2221 or 2223 is active	Controls initialized
2216	D/S JOY. OUT OF RANGE HIGH	The PM detects that the Drive or Steer joystick signal voltage > 8.1V and reports the fault to the UGM.	The PM no longer reports the fault
2217	D/S JOY. CENTER TAP BAD	The PM detects that the Drive or Steer center tap voltage is not between 3.31 volts and 3.75 volts and reports the fault to the UGM	The PM detects that the drive/steer center tap voltage is between 3.31 and 3.75 volts and no longer reports the fault to the UGM
2219	L/S JOY. OUT OF RANGE HIGH	The PM detects that the Lift or Swing joystick signal voltage > 8.1V and reports the fault to the UGM.	The PM detects that the Lift and Swing joystick signal voltage is < 8.1V and no longer reports the fault to the UGM
2220	L/S JOY. CENTER TAP BAD	The PM detects that the Lift or Swing center tap voltage is not between 3.31 volts and 3.75 volts and reports the fault to the UGM	The PM detects that the lift/swing center tap voltage is between 3.31 and 3.75 volts and no longer reports the fault to the UGM
2221	LIFT/SWING LOCKED - JOYSTICK MOVED BEFORE FOOTSWITCH	Machine is in Platform Mode; The UGM detects one of the following conditions: Lift and/or Swing joystick is not in the neutral position at Startup; Lift and/or Swing joystick is not in the neutral position when Footswitch becomes active or while DTC 2212, 2213 or 2223 is active	If triggered by the Lift and/or Swing joystick not being in the neutral position at Startup, then (Lift and/or Swing joystick is returned to its neutral position) and (Lift and Swing permitted after controls initialized) If triggered by the Lift and/or Swing joystick is not in the neutral position when Footswitch becomes active or while DTC 2212, 2213 or 2223 is active, then controls initialized
2222	WAITING FOR FSW TO BE OPEN	Machine is in Platform Mode; Footswitch is active at Start Up	Controls initialized
2223	FUNCTION SWITCHES LOCKED - SELECTED BEFORE ENABLE	Machine is in Platform Mode; Any of the following Platform inputs are active when Footswitch becomes active or while DTC 2212, 2213 or 2221 is active: Tower Lift; Telescope; Platform Level; Platform Rotate; Jib Lift (if MACHINE SETUP ⟶ JIB = YES)	Controls initialized
2224	FOOTSWITCH SELECTED BEFORE START	Machine is in Platform Mode; The engine is stopped; Startup time has expired; The Footswitch is active before the Platform Engine Start switch input = High	The Platform Engine Start switch input = Low;
2247	FUNCTION PROBLEM - PLATFORM ROTATE LEFT PERMANENTLY SELECTED	Machine is in Platform Mode; The Platform Rotate Left switch input = High at Startup	The Platform Rotate Left switch input = Low; Platform Rotate Left and Right permitted after controls are initialized

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
2248	FUNCTION PROBLEM - PLATFORM ROTATE RIGHT PERMANENTLY SELECTED	Machine is in Platform Mode; The Platform Rotate Right switch input = High at Startup	The Platform Rotate Right switch input = Low; Platform Rotate Left and Right permitted after controls are initialized
2249	FUNCTION PROBLEM - JIB LIFT UP PERMANENTLY SELECTED	Machine is in Platform Mode; MACHINE SETUP ⟶ JIB = YES; The Jib Lift Up switch input = High at Startup	The Jib Lift Up switch input = Low; Jib Lift Up and Down permitted after controls are initialized
2250	FUNCTION PROBLEM - JIB LIFT DOWN PERMANENTLY SELECTED	Machine is in Platform Mode; MACHINE SETUP ⟶ JIB = YES; The Jib Lift Down switch input = High at Startup	The Jib Lift Down switch input = Low; Jib Lift Up and Down permitted after controls are initialized
2251	FUNCTION PROBLEM - TELESCOPE IN PERMANENTLY SELECTED	Machine is in Platform Mode; The Telescope In switch input = High at Startup	The Telescope In switch input = Low; Telescope permitted after controls are initialized
2252	FUNCTION PROBLEM - TELESCOPE OUT PERMANENTLY SELECTED	Machine is in Platform Mode; The Telescope Out switch input = High at Startup	The Telescope Out switch input = Low; Telescope permitted after controls are initialized
2262	FUNCTION PROBLEM - PLATFORM LEVEL UP PERMANENTLY SELECTED	Machine is in Platform Mode; The Platform Level Up switch input = High at Startup	The Platform Level Up switch input = Low; Platform Level Up and Down permitted after controls are initialized
2263	FUNCTION PROBLEM - PLATFORM LEVEL DOWN PERMANENTLY SELECTED	Machine is in Platform Mode; The Platform Level Down switch input = High at Startup	The Platform Level Down switch input = Low; Platform Level Up and Down permitted after controls are initialized
2264	FUNCTION PROBLEM - DOS OVERRIDE PERMANENTLY SELECTED	Machine is in Platform Mode; The DOS Override switch input = High at Startup	The DOS Override switch input = Low
2286	FUNCTION PROBLEM - SOFT TOUCH / SKYGUARD OVERRIDE PERMANENTLY SELECTED	[(MACHINE SETUP ⟶ SKYGUARD = YES) or (MACHINE SETUP ⟶ SOFT TOUCH = YES)]; Machine is in Platform Mode; The Soft Touch / SkyGuard Override switch input = High at Startup	The Soft Touch / SkyGuard Override switch input = Low
2287	PLATFORM ANGLE SENSOR - NOT CALIBRATED	The Platform Angle Sensor has not been calibrated	Platform angle sensor calibrated
2289	PLATFORM ANGLE SENSOR - NOT RESPONDING	The UGM detects the following conditions: The UGM detects < 1 deg change of Platform Angle; Platform Level Up or Platform Level Down output value ≥ Creep output value; Platform Level Up or Platform Level Down has been active longer than 5 seconds; Platform Angle < (Platform Angle Max -1.5 deg); Platform Angle > (Platform Angle Min ± 1.5 deg);	Power Cycled
2290	PLATFORM ANGLE SENSOR DISAGREEMENT	The UGM detects that Platform Angle Sensor #1 and Platform Angle Sensor #2 readings disagree ≥ 2.5 deg for longer than 5 seconds; Do not report if DTC 2287 is active	Power Cycled

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
2295	PLATFORM ANGLE SENSOR - OUT OF RANGE HIGH	The UGM detects that Platform Angle Sensor #1 < 5% or Platform Angle Sensor #2 signal voltage > 95%.	Power Cycled
2296	PLATFORM ANGLE SENSOR - OUT OF RANGE LOW	The UGM detects that Platform Angle Sensor #1 > 95% or Platform Angle Sensor #2 signal voltage < 5%.	Power Cycled
2297	PLATFORM ANGLE SENSOR – FREQUENCY OUT OF RANGE	The UGM detects that Platform Angle Sensor #1 or Platform Angle Sensor #2 signal frequency is not within 100Hz +/- 5Hz	Power Cycled
234	FUNCTION SWITCHES FAULTY - CHECK DIAGNOSTICS/BOOM	The UGM detects one of the following conditions (continuous monitoring): The machine is in Ground Mode and both direction inputs of the following boom controls are engaged at the same time: Engine Start/Aux, Telescope, Platform Level, Platform Rotate, Jib Lift, Tower Lift, Lift, or Swing. The machine is in Platform Mode and both direction inputs of the following boom controls are engaged at the same time: Engine Start/Aux, Telescope, Platform Level, Platform Rotate, Jib Lift (MACHINE SETUP → JIB = YES)	None of the boom controls that trigger this fault have both of their direction inputs engaged at the same time
235	FUNCTION SWITCHES LOCKED - SELECTED BEFORE AUX POWER	The UGM detects one of the following conditions: The machine is in Ground Mode and the engine is stopped and the ground APU/Function Enable switch becomes engaged while a Ground control input is already engaged. The machine is in Platform Mode and the engine is stopped and the platform APU/Auxiliary Descent switch becomes engaged while a Platform control input is already engaged.	The applicable APU/Auxiliary Descent switch is disengaged or all applicable control inputs become disengaged or the engine state becomes ENGINE RUNNING
236	FUNCTION SWITCHES LOCKED - SELECTED BEFORE START SWITCH	The UGM detects one of the following conditions: The machine is in Ground Mode and the engine is stopped and any configured boom control is already engaged and the ground start switch changes from not engaged to engaged The machine is in Platform Mode and the engine is stopped and any drive/steer or configured boom control is already engaged and the footswitch is not engaged and the platform start switch changes from not engaged to engaged	The selected station's start switch is no longer engaged
237	START SWITCH LOCKED - SELECTED BEFORE KEYSWITCH	The start switch for the selected station is engaged during the UGM startup sequence	The selected station's start switch is no longer engaged
2310	FUNCTION PROBLEM - GROUND ENABLE PERMANENTLY SELECTED	Machine is in Ground Mode; (Jumper Configuration Status = 0)} and Jumper Configuration Status < 2]); The Ground Enable switch input = High at Startup	Controls initialized
2343	BOOM ANGLE SENSOR – NOT CALIBRATED	The Boom Angle Sensor has not been calibrated	Boom angle sensor calibrated
2344	BOOM ANGLE SENSOR - OUT OF RANGE HIGH	The UGM detects that Boom Angle Sensor #1 < 0.5V or Boom Angle Sensor #2 signal voltage > 4.5V.	Power Cycled
2345	BOOM ANGLE SENSOR - OUT OF RANGE LOW	The UGM detects that Boom Angle Sensor #1 > 4.5V or Boom Angle Sensor #2 signal voltage < 0.5V.	Power Cycled

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
2346	BOOM ANGLE SENSOR – NOT RESPONDING	The UGM detects the following conditions: The UGM detects < 1 deg change of Boom Angle; Main Lift Up or Main Lift Down output value ≥ Creep output value; Main Lift Up or Main Lift Down has been active longer than 5 seconds; Boom Angle < (Boom Angle Max -1.5 deg); Boom Angle > (Boom Angle Min ± 1.5 deg);	Power Cycled
2370	FUNCTION PROBLEM - JIB LIFT UP PERMANENTLY SELECTED	Machine is in Ground Mode; MACHINE SETUP ⟶ JIB = YES; The Jib Lift Up switch input = High at Startup	The Jib Lift Up switch input = Low; Jib Lift Up and Down permitted after controls are initialized
2371	FUNCTION PROBLEM - JIB LIFT DOWN PERMANENTLY SELECTED	Machine is in Ground Mode; MACHINE SETUP ⟶ JIB = YES; The Jib Lift Down switch input = High at Startup	The Jib Lift Down switch input = Low; Jib Lift Up and Down permitted after controls are initialized
2372	FUNCTION PROBLEM - SWING LEFT PERMANENTLY SELECTED	Machine is in Ground Mode; The Swing Left switch input = High at Startup	The Swing Left switch input = Low; Swing Left and Right permitted after controls are initialized
2373	FUNCTION PROBLEM - SWING RIGHT PERMANENTLY SELECTED	Machine is in Ground Mode; The Swing Right switch input = High at Startup	The Swing Left switch input = Low; Swing Left and Right permitted after controls are initialized
2396	BOOM ANGLE SENSOR DISAGREEMENT	The UGM detects that Boom Angle Sensor #1 and Boom Angle Sensor #2 readings disagree ≥ 2.5 deg for longer than 5 seconds; Do not report if DTC 2343 is active	Power Cycled
23107	FUNCTION PROBLEM - LIFT UP PERMANENTLY SELECTED	Machine is in Ground Mode; The Lift Up switch input = High at Startup	The Lift Up switch input = Low; Lift Up and Down permitted after controls are initialized
23108	FUNCTION PROBLEM - LIFT DOWN PERMANENTLY SELECTED	Machine is in Ground Mode; The Lift Down switch input = High at Startup	The Lift Down switch input = Low; Lift Up and Down permitted after controls are initialized
23109	FUNCTION PROBLEM - TELESCOPE IN PERMANENTLY SELECTED	Machine is in Ground Mode; The Telescope In switch input = High at Startup	The Telescope In switch input = Low; Telescope In and Out permitted after controls are initialized
23110	FUNCTION PROBLEM - TELESCOPE OUT PERMANENTLY SELECTED	Machine is in Ground Mode; The Telescope Out switch input = High at Startup	The Telescope Out switch input = Low; Telescope In and Out permitted after controls are initialized
23111	FUNCTION PROBLEM - PLATFORM LEVEL UP PERMANENTLY SELECTED	Machine is in Ground Mode; The Platform Level Up switch input = High at Startup	The Platform Level Up switch input = Low; Platform Level Up and Down permitted after controls are initialized
23112	FUNCTION PROBLEM - PLATFORM LEVEL DOWN PERMANENTLY SELECTED	Machine is in Ground Mode; The Platform Level Down switch input = High at Startup	The Platform Level Down switch input = Low; Platform Level Up and Down permitted after controls are initialized
23113	FUNCTION PROBLEM - PLATFORM ROTATE LEFT PERMANENTLY SELECTED	Machine is in Ground Mode; The Platform Rotate Left switch input = High at Startup	The Platform Rotate Left switch input = Low; Platform Rotate Left and Right permitted after controls are initialized

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
23114	FUNCTION PROBLEM - PLATFORM ROTATE RIGHT PERMANENTLY SELECTED	Machine is in Ground Mode; The Platform Rotate Right switch input = High at Startup	The Platform Rotate Right switch input = Low; Platform Rotate Left and Right permitted after controls are initialized
23154	TELESCOPE RETRACT SWITCHES - DISAGREEMENT	The UGM detects the following conditions: Telescope Retracted Switch #1 and Telescope Retracted Switch #2 readings disagree for longer than 5 seconds; Telescope In or Telescope Out output value ≥ Creep output value	Power Cycled
23163	FUNCTION PROBLEM – MSSO PERMANENTLY SELECTED	The MSSO switch input = Low at Startup	Power Cycled
23170	BOOM ANGLE SENSOR - SINGLE POINT CALIBRATION PERFORMED	Single point Boom Angle calibration is successfully completed	Fault shall be retentive through Power Cycled; Can be reset if CALIBRATIONS ⟶ BOOM ANGLE is successfully completed
23173	CAPACITY LENGTH SWITCHES - DISAGREEMENT	Dual Capacity is configured; The UGM detects the following conditions: Capacity Length Switch #1 and Capacity Length Switch #2 readings disagree for longer than 5 seconds; Telescope In or Telescope Out output value ≥ Creep output value	Power Cycled
23239	BOOM ANGLE SENSOR – ANGLE OUT OF RANGE HIGH	The UGM detects a Boom Angle ≥ (Boom Angle Max + 1.5 deg); Do not report if Boom Angle == Unhealthy	Fault shall be retentive through Power Cycled; Can be reset by performing a Boom Angle Sensor Calibration
23240	BOOM ANGLE SENSOR - ANGLE OUT OF RANGE LOW	The UGM detects a Boom Angle < (Boom Angle Min - 1.5 deg); Do not report if Boom Angle == Unhealthy	Fault shall be retentive through Power Cycled; Can be reset by performing a Boom Angle Sensor Calibration
241	AMBIENT TEMPERATURE SENSOR – OUT OF RANGE LOW	MACHINE SETUP ⟶ TEMP CUTOUT = YES; Ambient Temperature sensor reading ≤ -50C; Do not report if DTC 6657 is active	Ambient Temperature sensor reading > -50C; Full Speed permitted after controls are initialized
242	AMBIENT TEMPERATURE SENSOR – OUT OF RANGE HIGH	MACHINE SETUP ⟶ TEMP CUTOUT = YES; Ambient Temperature sensor reading ≥ 85C; Do not report if DTC 6657 is active	Ambient Temperature sensor reading < 85C; Full Speed permitted after controls are initialized
259	MODEL CHANGED – HYDRAULICS SUSPENDED – CYCLE EMS	The MACHINE SETUP ⟶ MODEL NUMBER is changed using the analyzer	Power Cycled
2513	GENERATOR MOTION CUTOUT ACTIVE	MACHINE SETUP ⟶ GEN SET = BELT DRIVE; MACHINE SETUP ⟶ GEN SET CUTOUT = MOTION CUTOUT; The platform Generator Switch is engaged Footswitch State = Depressed The machine is in Platform mode	Not all of the trigger conditions are met
2514	BOOM PREVENTED – DRIVE SELECTED	MACHINE SETUP ⟶ FUNCTION CUTOUT = BOOM CUTOUT; Drive or Steer is already engaged; The boom is Above Elevation The operator is attempting to activate one of the boom functions DTC 2514 supercedes DTC 2518 if drive/steer and boom functions are both active when machine transitions from Below Elevation to Above Elevation.	Not all of the trigger conditions are met

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
2516	DRIVE PREVENTED – ABOVE ELEVATION	MACHINE SETUP ⟶ FUNCTION CUTOUT = DRIVE CUTOUT The boom is Above Elevation The operator is attempting to activate Drive or Steer	Not all of the trigger conditions are met
2517	DRIVE PREVENTED – TILTED & ABOVE ELEVATION	MACHINE SETUP ⟶ FUNCTION CUTOUT = DRIVE CUT E&T The boom is Above Elevation The chassis is considered Tilted The operator is attempting to activate Drive or Steer	Not all of the trigger conditions are met
2518	DRIVE PREVENTED – BOOM SELECTED	MACHINE SETUP ⟶ FUNCTION CUTOUT = BOOM CUTOUT The boom is Above Elevation Any boom function is already active The operator attempts to activate Drive or Steer	Not all of the trigger conditions are met
2519	DRIVE PREVENTED - TILTED & EXTENDED OR HIGH ANGLE	Chassis Tilt is > 1.8 degrees and either the boom is above 55 degrees main boom angle and/or the boom is telescoped out beyond the drive disable switches.(Dual Cap Prox.)	Boom lifted below 55 degrees and/or the boom retracted to inside the drive disable length switches. (Dual Cap)
2548	SYSTEM TEST MODE ACTIVE	UGM determines that System Test Mode is active	Power Cycle
2549	DRIVE & BOOM PREVENTED - SOFT TOUCH ACTIVE	MACHINE SETUP ⟶ SOFT TOUCH = YES; Machine is in Platform Mode; Soft Touch State = Enabled	Not all of the trigger conditions are met
2563	SKYGUARD SWITCH – DISAGREEMENT	MACHINE SETUP ⟶ SKYGUARD = YES; Machine is in Platform Mode; [(SkyGuard input #1 Platform Module J7-18) ≠ (SkyGuard input #2 Platform Module J1-23)] > 160ms	[{SkyGuard inputs (Platform Module J7-18 = High) and (Platform Module J1-23 = High)} and (Footswitch State = Not Depressed)]
2568	TEMPERATURE CUTOUT ACTIVE – AMBIENT TEMPERATURE TOO LOW	Low Temperature Cutout = Active	Low Temperature Cutout = Inactive; Full Speed permitted after controls are initialized
2576	PLATFORM LEVEL PREVENTED – ABOVE ELEVATION	Platform Level Override Cutout = Enabled; The Platform Level Up or Down switch input = High; Footswitch is active If 600S: Auto Platform Level = Enabled	Controls initialized
2587	RUNNING AT CREEP – PLATFORM LEVELED UNDER	Platform Leveled Under State = Set	Platform Leveled Under State = Cleared
331	BRAKE – SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
332	BRAKE – OPEN CIRCUIT	The UGM detects an open circuit at this output	Power Cycled
334	LIFT UP VALVE – OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit; Full speed Lift Up and Down permitted after controls are initialized
336	LIFT DOWN VALVE – OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit; Full speed Lift Up and Lift Down permitted after controls are initialized

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
3311	GROUND ALARM – SHORT TO BATTERY	MACHINE SETUP ⟶ ALARM / HORN = SEPARATE; The UGM detects a short to battery on J2-2	Power Cycled
3358	MAIN DUMP VALVE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
3359	MAIN DUMP VALVE – OPEN CIRCUIT	The UGM detects an open circuit at this output	Power Cycled
3360	MAIN DUMP VALVE – SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
3361	BRAKE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
3362	START SOLENOID – SHORT TO GROUND	UGM detects a short to ground at this output	Power Cycled
3363	START SOLENOID – OPEN CIRCUIT	UGM detects an open circuit at this output; if MACHINE SETUP ⟶ ENGINE = FORD DUAL FUEL only evaluate until first Start is attempted for each power cycle due to possibility of ECU opening ground solenoid return path to disable Start and causing erroneous diagnostics.	Power Cycled
3364	START SOLENOID – SHORT TO BATTERY	UGM detects a short to battery at this output	Power Cycled
3365	STEER DUMP VALVE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
3366	STEER DUMP VALVE – OPEN CIRCUIT	The UGM detects an open circuit at this output	Power Cycled
3367	STEER DUMP VALVE – SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
3368	TWO SPEED VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
3369	TWO SPEED VALVE - OPEN CIRCUIT	The UGM detects an open circuit at this output	Power Cycled
3370	TWO SPEED VALVE - SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
3371	GROUND ALARM – SHORT TO GROUND	MACHINE SETUP ⟶ ALARM / HORN = SEPARATE; The UGM detects a short to ground on J2-2	Power Cycled
3372	GROUND ALARM – OPEN CIRCUIT	MACHINE SETUP ⟶ ALARM / HORN = SEPARATE; The UGM detects an open circuit on J2-2	Power Cycled
3373	GEN SET/WELDER – SHORT TO GROUND	MACHINE SETUP ⟶ GEN SET = BELT DRIVE and the UGM detects a short to ground at this output	Power Cycled
3374	GEN SET/WELDER – OPEN CIRCUIT	MACHINE SETUP ⟶ GEN SET = BELT DRIVE and the UGM detect an open circuit at this output	Power Cycled
3375	GEN SET/WELDER – SHORT TO BATTERY	MACHINE SETUP ⟶ GEN SET = BELT DRIVE and the UGM detects a short to battery at this output	Power Cycled
3376	HEAD TAIL LIGHT – SHORT TO GROUND	MACHINE SETUP ⟶ H & T LIGHTS =YES and the UGM detects a short to ground at this output	Power Cycled

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
3377	HEAD TAIL LIGHT – OPEN CIRCUIT	MACHINE SETUP ⟶ H & T LIGHTS =YES and the UGM detects an open circuit at this output	Power Cycled
3378	HEAD TAIL LIGHT – SHORT TO BATTERY	MACHINE SETUP ⟶ H & T LIGHTS =YES and the UGM detects a short to battery at this output	Power Cycled
3384	PLATFORM LEVEL UP VALVE – SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
3385	PLATFORM LEVEL UP OVERRIDE VALVE - SHORT TO GROUND	DTC 662 is active; The UGM detects a short to ground at this output	Power Cycled
3386	PLATFORM LEVEL UP OVERRIDE VALVE - OPEN CIRCUIT	DTC 662 is active; The UGM detects an open circuit at this output	Power Cycled
3387	PLATFORM LEVEL UP OVERRIDE VALVE - SHORT TO BATTERY	DTC 662 is active; The UGM detects a short to battery at this output	Power Cycled
3391	PLATFORM DOWN OVERRIDE – SHORT TO GROUND	DTC 662 is active; The UGM detects a short to ground at this output	Power Cycled
3392	PLATFORM DOWN OVERRIDE – OPEN CIRCUIT	DTC 662 is active; The UGM detects an open circuit at this output	Power Cycled
3393	PLATFORM DOWN OVERRIDE – SHORT TO BATTERY	DTC 662 is active; The UGM detects a short to battery at this output	Power Cycled
33118	SWING RIGHT VALVE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33119	SWING RIGHT VALVE – OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit; Full speed Swing Left and Right permitted after controls are initialized
33122	SWING LEFT VALVE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33182	LIFT VALVES – SHORT TO BATTERY	The UGM detects a short to battery at either the Lift Up or Lift Down valve	Power Cycled
33186	TELESCOPE OUT VALVE – OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit; Full speed Telescope In and Out permitted after controls are initialized
33187	TELESCOPE VALVES – SHORT TO BATTERY	The UGM detects a short to battery at either the Tele In or Tele Out valve.	Power Cycled
33188	TELESCOPE OUT VALVE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33189	TELESCOPE IN VALVE – OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit; Telescope Out permitted after controls are initialized; Full speed Telescope In permitted after controls are initialized
33190	TELESCOPE IN VALVE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33208	HORN – SHORT TO BATTERY	The UGM detects a short to battery on J2-27	Power Cycled

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
33276	APU PUMP RELAY - OPEN CIRCUIT	The UGM detects an open circuit at this output	Power Cycled
33277	APU PUMP RELAY - SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
33278	APU PUMP RELAY - SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33279	GLOWPLUG – OPEN CIRCUIT	MACHINE SETUP ⟶ ENGINE ≠ DEUTZ EMR4, FORD DUAL FUEL; MACHINE SETUP ⟶ GLOW PLUG ≠ NO; The UGM detects an open circuit at this output	Power Cycled
33280	GLOWPLUG – SHORT TO BATTERY	MACHINE SETUP ⟶ ENGINE ≠ DEUTZ EMR4, FORD DUAL FUEL; MACHINE SETUP ⟶ GLOW PLUG ≠ NO; The UGM detects a short to battery at this output	Power Cycled
33281	GLOWPLUG – SHORT TO GROUND	MACHINE SETUP ⟶ ENGINE ≠ DEUTZ EMR4, FORD DUAL FUEL; MACHINE SETUP ⟶ GLOW PLUG ≠ NO; The UGM detects a short to ground at this output	Power Cycled
33287	LIFT – CURRENT FEEDBACK READING TOO LOW	The Engine State = ENGINE RUNNING; The UGM commanded current > 250mA; The difference between the commanded current and the measured feedback current > [the larger of (125mA) or (15% of the commanded function Max)] for longer than 1 second	Power Cycled
33288	TELESCOPE – CURRENT FEEDBACK READING TOO LOW	The Engine State = ENGINE RUNNING; The UGM commanded current > 250mA; The difference between the commanded current and the measured feedback current > [the larger of (125mA) or (15% of the commanded function Max)] for longer than 1 second	Power Cycled
33295	SWING LEFT VALVE – OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit; Full speed Swing Left and Right permitted after controls are initialized
33317	DRIVE FORWARD VALVE – OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit; Full speed Drive Forward and Reverse permitted after controls are initialized
33318	DRIVE VALVES – SHORT TO BATTERY	The UGM detects a short to battery at either the Drive Forward or Drive Reverse valve.	Power Cycled
33319	DRIVE FORWARD VALVE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33320	DRIVE REVERSE VALVE – OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit; Full speed Drive Forward and Reverse permitted after controls are initialized
33322	DRIVE REVERSE VALVE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
33331	DRIVE – CURRENT FEEDBACK READING TOO LOW	The Engine State = ENGINE RUNNING; The UGM commanded current > 250mA; The difference between the commanded current and the measured feedback current > [the larger of (125mA) or (15% of the commanded function Max)] for longer than 1 second	Power Cycled
33406	LIFT UP VALVE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33407	LIFT DOWN VALVE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33410	DRIVE – LOSS OF CURRENT FEEDBACK	Measured feedback current < 225mA while PWM output > 40% for a period of 100ms.	Power Cycled
33412	SWING VALVES – SHORT TO BATTERY	The UGM detects a short to battery at either the Swing Right or Swing Left valve	Power Cycled
33414	SWING – CURRENT FEEDBACK READING TOO LOW	The Engine State = ENGINE RUNNING; The UGM commanded current > 250mA; The difference between the commanded current and the measured feedback current > [the larger of (125mA) or (15% of the commanded function Max)] for longer than 1 second	Power Cycled
33417	LIFT – CURRENT FEEDBACK READING LOST	Measured feedback current < 225mA while PWM output > 40% for a period of 100ms.	Power Cycled
33418	SWING – CURRENT FEEDBACK READING LOST	Measured feedback current < 225mA while PWM output > 40% for a period of 100ms.	Power Cycled
33443	TELESCOPE – CURRENT FEEDBACK READING LOST	Measured feedback current < 225mA while PWM output > 40% for a period of 100ms.	Power Cycled
33537	AUXILIARY LIFT DOWN VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33538	AUXILIARY LIFT DOWN VALVE - OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit
33539	AUXILIARY LIFT DOWN VALVE - SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
33543	OSCILLATING AXLE #1 VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33544	OSCILLATING AXLE #1 VALVE - OPEN CIRCUIT	The UGM detects an open circuit at this output	Power Cycled
33545	OSCILLATING AXLE #1 VALVE - SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
33546	OSCILLATING AXLE #2 VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33547	OSCILLATING AXLE #2 VALVE - OPEN CIRCUIT	The UGM detects an open circuit at this output	Power Cycled

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
33548	OSCILLATING AXLE #2 VALVE - SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
33567	AUXILIARY VALVES - SHORT TO BATTERY	The UGM detects a short to battery at either the Aux Lift Down or Aux Tower Lift Down valve	Power Cycled
33568	AUXILIARY - CURRENT FEEDBACK READING LOST	Measured feedback current < 225mA while output is active for a period of 100ms.	Power Cycled
33575	ECM PULL DOWN RESISTOR - OPEN CIRCUIT	MACHINE SETUP ⟶ ENGINE = DEUTZ EMR4; Pull down resister not detected	Power Cycled
33633	PLATFORM DUMP 1 VALVE - SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
33634	PLATFORM DUMP 1 VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33635	PLATFORM DUMP 1 VALVE - OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit
33636	PLATFORM DUMP 2 VALVE - SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
33637	PLATFORM DUMP 2 VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33638	PLATFORM DUMP 2 VALVE - OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit
33639	TELESCOPE IN DUMP VALVE - SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
33640	TELESCOPE IN DUMP VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33641	TELESCOPE IN DUMP VALVE - OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit
33736	BYPASS DUMP VALVE – SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
33737	BYPASS DUMP VALVE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
33738	BYPASS DUMP VALVE – OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit
343	PLATFORM LEVEL UP VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
344	PLATFORM LEVEL UP VALVE - SHORT TO BATTERY OR OPEN CIRCUIT	The UGM detects a short to battery or an open circuit at this output	Power Cycled
347	PLATFORM LEVEL DOWN VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
348	PLATFORM LEVEL DOWN VALVE - SHORT TO BATTERY OR OPEN CIRCUIT	The UGM detects a short to battery or an open circuit at this output	Power Cycled
349	PLATFORM ROTATE LEFT VALVE – OPEN CIRCUIT	The PM detects an open circuit at this output and reports it to the UGM	The PM no longer detects open circuit; Full speed Platform Rotate Right and Left permitted after controls are initialized
3410	PLATFORM ROTATE LEFT VALVE – SHORT TO BATTERY	The PM detects a short to battery at this output and reports it to the UGM	Power Cycled
3411	PLATFORM ROTATE LEFT VALVE – SHORT TO GROUND	The PM detects a short to ground at this output and reports it to the UGM	Power Cycled
3412	PLATFORM ROTATE RIGHT VALVE – OPEN CIRCUIT	The PM detects an open circuit at this output and reports it to the UGM	The PM no longer detects open circuit; Full speed Platform Rotate Right and Left permitted after controls are initialized
3413	PLATFORM ROTATE RIGHT VALVE – SHORT TO BATTERY	The PM detects a short to battery at this output and reports it to the UGM	Power Cycled
3414	PLATFORM ROTATE RIGHT VALVE – SHORT TO GROUND	The PM detects a short to ground at this output and reports it to the UGM	Power Cycled
3415	JIB LIFT UP VALVE – OPEN CIRCUIT	MACHINE SETUP ⟶ JIB = YES The PM detects an open circuit at this output and reports it to the UGM	The PM no longer detects open circuit; Full speed Jib Lift Up and Down permitted after controls are initialized
3416	JIB LIFT UP VALVE – SHORT TO BATTERY	MACHINE SETUP ⟶ JIB = YES The PM detects a short to battery at this output and reports it to the UGM	Power Cycled
3417	JIB LIFT UP VALVE – SHORT TO GROUND	MACHINE SETUP ⟶ JIB = YES The PM detects a short to ground at this output and reports it to the UGM	Power Cycled
3418	JIB LIFT DOWN VALVE – OPEN CIRCUIT	MACHINE SETUP ⟶ JIB = YES The PM detects an open circuit at this output and reports it to the UGM	The PM no longer detects open circuit; Jib Lift Up permitted after controls are initialized Full speed Jib Lift Down permitted after controls are initialized
3419	JIB LIFT DOWN VALVE – SHORT TO BATTERY	MACHINE SETUP ⟶ JIB = YES The PM detects a short to battery at this output and reports it to the UGM	Power Cycled
3420	JIB LIFT DOWN VALVE – SHORT TO GROUND	MACHINE SETUP ⟶ JIB = YES The PM detects a short to ground at this output and reports it to the UGM; detection occurs for PWM output approximately ≤ 15% or for STG condition.	Power Cycled
431	FUEL SENSOR - SHORT TO BATTERY OR OPEN CIRCUIT	MACHINE SETUP ⟶ FUEL LEVEL = SENSOR; UGM fuel sensor analog input J2-25 detects a voltage higher than 2.50 volts (A/D > 512)	Power Cycled
432	FUEL SENSOR - SHORT TO GROUND	MACHINE SETUP ⟶ FUEL LEVEL = SENSOR; UGM fuel sensor analog input J2-25 detects a voltage less than or equal to 0.3 volts (A/D < 61)	Power Cycled

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
437	ENGINE TROUBLE CODE	An engine with a CAN engine controller is configured in MACHINE SETUP The engine controller reports a J1939 fault	Power Cycled
438	HIGH ENGINE TEMP	An engine with a CAN engine controller is not configured in MACHINE SETUP: - The Engine State = ENGINE RUNNING > 10 seconds - The coolant temperature is greater than or equal to the configured engines max allowed temperature. - The maximum allowed temperature > 110°C. An engine with a CAN engine controller is configured in MACHINE SETUP: - ECM transmits a J1939 DM1 message for an engine coolant high temperature critical fault (SPN:FMI 110:0) on CAN2 or uses the J1939 Transport Protocol every one second to send this information if multiple engine faults exist.	Power Cycled
4310	NO ALTERNATOR OUTPUT	The Engine State = ENGINE RUNNING > 10 seconds and UGM system voltage < 11.5 volts for 10 seconds	UGM system voltage > 11.7 volts
4311	LOW OIL PRESSURE	An engine with a CAN engine controller is not configured in MACHINE SETUP - The Engine State = ENGINE RUNNING > 10 seconds - The engine oil pressure is LOW (debounce 3s). An engine with a CAN engine controller is configured in MACHINE SETUP - ECM transmits a J1939 DM1 message for an engine oil low pressure critical fault (SPN:FMI 100:1) on CAN2 or uses the J1939 Transport Protocol every one second to send this information if multiple engine faults exist.	Power Cycled
4334	ENGINE COOLANT – LOW LEVEL	MACHINE SETUP ⟶ ENGINE = DEUTZ EMR4; ECM transmits a J1939 DM1 message for an engine coolant low level fault (SPN:FMI 111:1) on CAN2 or uses the J1939 Transport Protocol every one second to send this information if multiple engine faults exist.	Power Cycled
4375	WATER IN FUEL	MACHINE SETUP ⟶ ENGINE = DEUTZ EMR4; ECM transmits a J1939 DM1 message for a water in fuel fault (SPN 97) on CAN2 or uses the J1939 Transport Protocol every one second to send this information if multiple engine faults exist.	Power Cycled
441	BATTERY VOLTAGE TOO LOW – SYSTEM SHUTDOWN	The UGM detects that its supply voltage is less than 9 volts Engine State ≠ ENGINE CRANKING Auxiliary Power/Emergency Descent Mode is not active	Voltage is greater than 9.25 volts
442	BATTERY VOLTAGE TOO HIGH – SYSTEM SHUTDOWN	The UGM detects that its supply voltage > 16.0 volts	Power Cycled
443	LSS BATTERY VOLTAGE TOO HIGH	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; The UGM determines that the LSS reports supply voltage > 16.0V	Not all of the trigger conditions are met

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
444	LSS BATTERY VOLTAGE TOO LOW	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Engine State ≠ ENGINE CRANKING or ENGINE STARTING; Auxiliary Power/Emergency Descent Mode is not active; If Load System is the 4-Cell LSS; The UGM determines that the LSS reports supply voltage < 9.0V If Load System is the 1-Cell LSS; The UGM determines that the LSS reports supply voltage < 8.0V or the LSS Supply Voltage reports Out of Range Low Error	Not all of the trigger conditions are met
445	BATTERY VOLTAGE LOW	The UGM detects that its supply voltage < 11 volts for 5 seconds. Engine State ≠ ENGINE CRANKING Auxiliary Power/Emergency Descent Mode is not active Glow Plugs are not energized	Voltage is greater than 11.25 volts
4434	ENGINE START FAILED - TOO MANY ATTEMPTS	MACHINE SETUP ⟶ ENGINE = FORD DUAL FUEL; Cumulative Crank Time > 24 seconds	Power Cycled
4479	LSS BATTERY VOLTAGE - INITIALIZATION ERROR	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; LSS Supply Voltage reports Initialization Error	Power Cycled
4480	LSS BATTERY VOLTAGE - NOT CALIBRATED	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; LSS Supply Voltage reports Not Calibrated Error	Power Cycled
662	CANBUS FAILURE – PLATFORM MODULE	UGM does not receive any CAN messages from the PM in 250ms	CAN messages are received from the PM
663	CANBUS FAILURE – LOAD SENSING SYSTEM MODULE	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; UGM does not receive any CAN messages from the LSS module in 250ms; If Load System is the 1-Cell LSS; Engine State ≠ (ENGINE CRANKING or ENGINE STARTING) > 2 seconds;	Not all of the trigger conditions are met
666	CANBUS FAILURE – ENGINE CONTROLLER	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	CAN messages are received from the engine controller; UGM shall require re-activation of Footswitch (Platform Mode) or Ground Enable (Ground Mode) to enable functions and resume operation.
6613	CANBUS FAILURE – EXCESSIVE CANBUS ERRORS	More than 22 error frames per second for 4 seconds or more than 500 Buss Off conditions since last power cycle.	Power Cycled
6622	CANBUS FAILURE – TCU MODULE	MACHINE SETUP ⟶ CLEARSKY = YES No CAN2 messages are received from the TCU module for more than 30 seconds	Not all of the trigger conditions are met
6635	CANBUS FAILURE – CHASSIS TILT SENSOR	UGM does not receive any CAN messages from the Chassis Tile Sensor in 250ms	CAN messages are received from the Chassis tilt Sensor and controls are initialized

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
6651	CANBUS FAILURE - GROUND DISPLAY	UGM does not receive any CAN messages from the Ground Display in 250ms	CAN messages are received from the Ground Display
6657	CANBUS FAILURE – TEMPERATURE SENSOR	MACHINE SETUP ⟶ TEMP CUTOUT = YES; UGM does not receive any CAN messages from the Ambient Temperature sensor in 250ms	CAN messages are received from the Ambient Temperature sensor
681	REMOTE CONTRACT MANAGEMENT OVERRIDE – ALL FUNCTIONS IN CREEP	MACHINE SETUP ⟶ CLEARSKY = YES Value set by ClearSky TCU	Cleared by ClearSky TCU
813	CHASSIS TILT SENSOR NOT CALIBRATED	The UGM detects one of the follow conditions: The tilt sensor has not been calibrated; For 600S the Tilt Sensor source Address is 0xC0; For 600S the Tilt Sensor Serial number does not match	Tilt sensor calibrated
814	CHASSIS TILT SENSOR OUT OF RANGE	Fault CHASSIS TILT SENSOR NOT CALIBRATED (813) is not present and Tilt sensor measurement > 19° for 4 seconds (internal tilt sensor based machines) or > 35° (external tilt sensor based machines) Not to be reported during Tilt Sensor calibration.	Not all of the trigger conditions are met.
818	TILT SENSOR STAGNANT	The UGM detects the following conditions: The X axis or Y axis raw readings change by < ±0.05° in 5 second; Drive Forward or Drive Reverse output value is ≥ Creep output value; Do not report if DTC 6635, 813 or 814 are active	Power Cycled
8112	CHASSIS TILT SENSOR - SINGLE POINT CALIBRATION PERFORMED	Single point Chassis Tilt calibration is successfully completed	Fault shall be retentive through Power Cycled; Can be reset if CALIBRATIONS ⟶ TILT SENSOR is successfully completed
821	LSS CELL #1 ERROR	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 4-Cell LSS; The UGM detects that LSS is reporting error with Cell #1	Not all of the trigger conditions are met
822	LSS CELL #2 ERROR	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 4-Cell LSS; The UGM detects that LSS is reporting error with Cell #2	Not all of the trigger conditions are met
823	LSS CELL #3 ERROR	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 4-Cell LSS; The UGM detects that LSS is reporting error with Cell #3	Not all of the trigger conditions are met
824	LSS CELL #4 ERROR	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 4-Cell LSS; The UGM detects that LSS is reporting error with Cell #4.	Not all of the trigger conditions are met

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
825	LSS HAS NOT BEEN CALIBRATED	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO If Load System is the 4-Cell LSS; The load sensor has not been calibrated, or DTC 992 (LSS EEPROM ERROR) is active, or DTC 9977 (LSS CORRUPT EEPROM) is active If Load System is the 1-Cell LSS; The LSS serial number does not match	Not all of the trigger conditions are met
826	RUNNING AT CREEP – PLATFORM OVERLOADED	Refer to Table 7-1 for trigger conditions and machine response requirements	Not all of the trigger conditions are met
828	LIFT UP & TELE OUT PREVENTED – PLATFORM OVERLOADED	Refer to Table 7-1 for trigger conditions and machine response requirements	Not all of the trigger conditions are met
829	FUNCTIONS CUTOUT – PLATFORM OVERLOADED	Refer to Table 7-1 for trigger conditions and machine response requirements	Not all of the trigger conditions are met
8211	LSS READING UNDER WEIGHT	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; If Load System is the 4-Cell LSS; The load sensor has been calibrated and Gross Platform Weight < (0.5 * Empty Platform Weight); If Load System is the 1-Cell LSS; UGM determines that the Platform Load < (-1.5 * Unloaded Platform Weight); If Load System is the 1-Cell LSS; Drive Forward / Reverse or Lift Up output value is ≥ Creep output value; Platform Load is < -50 lbs. for the first 5 seconds of command; Do not report if DTC (0030 or 825) is active or if Platform Load == Unhealthy	If Load System is the 4-Cell LSS; Not all of the trigger conditions are met If Load System is the 1-Cell LSS; Power Cycled
8218	LSS SENSOR DISAGREEMENT	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; The UGM detects that (Platform Load 1 and Platform Load 2 disagree by 50 lbs. for longer than 3 seconds) or (that Platform Gross 1 and Platform Gross 2 disagree by 200 lbs. for longer than 3 seconds); Do not report if (DTC 8222 or 8223) is active or if Platform Load == Unhealthy, Platform Gross 1= = Unhealthy or Platform Gross 2= = Unhealthy	Power Cycled or CALIBRATIONS LOAD SENSING is successfully completed
8222	LSS STRAIN GAUGE 1 - STAGNANT	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Engine State ≠ (ENGINE CRANKING or ENGINE STARTING) > 2 seconds; Load System is the 1-Cell LSS; Strain Gauge 1 raw reading does change value for 5 seconds; Do not report if Platform Gross 1= = Unhealthy	Power Cycled

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
8223	LSS STRAIN GAUGE 2 - STAGNANT	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Engine State ≠ (ENGINE CRANKING or ENGINE STARTING) > 2 seconds; Load System is the 1-Cell LSS; Strain Gauge 2 raw reading does change value for 5 seconds; Do not report if DTC Platform Gross 2= = Unhealthy	Power Cycled
8224	LSS STRAIN GAUGE 1 - OUT OF RANGE LOW	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; Strain Gauge 1 reports an Out of Range Low error	Power Cycled
8225	LSS STRAIN GAUGE 2 - OUT OF RANGE LOW	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; Strain Gauge 2 reports an Out of Range Low error	Power Cycled
8226	LSS STRAIN GAUGE 1 - OUT OF RANGE HIGH	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; Strain Gauge 1 reports an Out of Range High error	Power Cycled
8227	LSS STRAIN GAUGE 2 - OUT OF RANGE HIGH	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; Strain Gauge 2 reports an Out of Range High error	Power Cycled
8228	LSS STRAIN GAUGE 1 - INITIALIZATION ERROR	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Engine State ≠ (ENGINE CRANKING or ENGINE STARTING) > 2 seconds; Load System is the 1-Cell LSS; Strain Gauge 1 reports an Initialization error	Power Cycled
8229	LSS STRAIN GAUGE 2 - INITIALIZATION ERROR	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Engine State ≠ (ENGINE CRANKING or ENGINE STARTING) > 2 seconds; Load System is the 1-Cell LSS; Strain Gauge 2 reports an Initialization error	Power Cycled
8230	LSS STRAIN GAUGE 1 - NOT CALIBRATED	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; Strain Gauge 1 reports a Not Calibrated error	Power Cycled
8231	LSS STRAIN GAUGE 2 - NOT CALIBRATED	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; Strain Gauge 2 reports a Not Calibrated error	Power Cycled
8232	LSS STRAIN GAUGE 1 - SENSOR DEFECT	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; Strain Gauge 1 reports a Sensor Defect error	Power Cycled
8233	LSS STRAIN GAUGE 2 - SENSOR DEFECT	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; Strain Gauge 2 reports a Sensor Defect error	Power Cycled
8234	LSS STRAIN GAUGE 1 - NOT INSTALLED	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; Strain Gauge 1 reports a Not Installed error	Power Cycled

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
8235	LSS STRAIN GAUGE 2 - NOT INSTALLED	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; Strain Gauge 2 reports a Not Installed error	Power Cycled
8236	LSS NOT DETECTING CHANGE	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Machine is in Platform Mode; Load System is the 1-Cell LSS; Drive Forward / Reverse or Lift Up output value is ≥ Creep output value; Platform Load does not change (peak to peak) by more than 1 lbs. within the first 5 seconds of the command; Do not report if Platform Load == Unhealthy	Power Cycled
8237	LSS STRAIN GAUGE 1 - A/D DEFECT	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; Strain Gauge 1 reports a A/D Defect error	Power Cycled
8238	LSS STRAIN GAUGE 2 - A/D DEFECT	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; Strain Gauge 2 reports a A/D Defect error	Power Cycled
8318	PLATFORM LEVELING SYSTEM TIMEOUT	Electronic Platform Level = Enabled; Auxiliary Power/Emergency Decent Mode is not active {(Electronic Platform Level Up output value is active) and [(Platform Angle <(Platform Angle Max - 1.5 deg)]} or {(Electronic Platform Level Down output value is active) and [(Platform Angle < (Platform Angle Max - 1.5 deg)]} [(Platform Angle >= Platform Angle Setpoint +5 deg) or (Platform Angle <= Platform Angle Setpoint -5 deg)] for longer than 2000ms	Power Cycled
8639	FRONT LEFT STEER VALVE – OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit
8640	FRONT LEFT STEER VALVE – SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
8641	FRONT LEFT STEER VALVE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
8642	FRONT RIGHT STEER VALVE – OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit
8643	FRONT RIGHT STEER VALVE – SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
8644	FRONT RIGHT STEER VALVE – SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
8645	REAR LEFT STEER VALVE - OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit
8646	REAR LEFT STEER VALVE - SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
8647	REAR LEFT STEER VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
8648	REAR RIGHT STEER VALVE - OPEN CIRCUIT	The UGM detects an open circuit at this output	The UGM no longer detects open circuit
8649	REAR RIGHT STEER VALVE - SHORT TO BATTERY	The UGM detects a short to battery at this output	Power Cycled
8650	REAR RIGHT STEER VALVE - SHORT TO GROUND	The UGM detects a short to ground at this output	Power Cycled
873	MACHINE SAFETY SYSTEM OVERRIDE OCCURRED	MSSO = Active	Fault shall be retentive through Power Cycled; Can be reset only with an Analyzer via the CALIBRATIONS ⟶ MSSO ⟶ MSSO RESET menu
876	WIRE ROPE SERVICE REQUIRED	MACHINE SETUP ⟶ CABLE SWITCH = YES; Wire Rope Service = Enabled	Power Cycled
991	LSS WATCHDOG RESET	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 4-Cell LSS; UGM detects LSS report of an anomaly exists that has caused a WatchDog Timer reset.	Power Cycled
992	LSS EEPROM ERROR	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 4-Cell LSS; UGM detects LSS report of an anomaly that exists in the LSS EEPROM	Power Cycled
993	LSS INTERNAL ERROR – PIN EXCITATION	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 4-Cell LSS; UGM detects LSS report of improper excitation voltage	Power Cycled
994	LSS INTERNAL ERROR – DRDY MISSING FROM A/D	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 4-Cell LSS; UGM detects LSS report of an anomaly that exists in the LSS A/D converter operations.	Power Cycled
998	EEPROM FAILURE - CHECK ALL SETTINGS	The UGM has detected an anomaly in EEPROM	Power Cycled
9910	FUNCTIONS LOCKED OUT - PLATFORM MODULE SOFTWARE VERSION IMPROPER	The UGM software version type is 'P' The UGM has received valid version information from the PM The PM software version type is 'P' The UGM software major version number does not match the major version number of the platform software	Not all of the trigger conditions are met
9911	FUNCTION LOCKED OUT - LSS MODULE SOFTWARE VERSION IMPROPER	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 4-Cell LSS; The UGM determines that the LSS software version is not compatible with existing code	Power Cycled
9915	CHASSIS TILT SENSOR NOT GAIN CALIBRATED	The tilt sensor gain calibration values recorded to flash memory during Phoenix International's manufacturing test are not present	Valid values are present

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
9920	PLATFORM SENSOR REF VOLTAGE OUT OF RANGE	The PM detects that its reference voltage is out of range and reports the fault to the UGM	Power Cycled
9921	GROUND MODULE FAILURE:HIGH SIDE DRIVER CUTOUT FAULTY	The engine is not running The engine is not cranking The UGM 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 UGM hardware shutoff circuitry	Power Cycled
9922	PLATFORM MODULE FAILURE: HWFS CODE 1	The PM detects that its V(low) FET has failed and reports this fault to the UGM	Power Cycled
9924	FUNCTIONS LOCKED OUT - MACHINE NOT CONFIGURED	The machine is powered up and no model has been selected yet in the MACHINE SETUP menu	Power Cycled
9927	GROUND MODULE CONSTANT DATA UPDATE REQUIRED	The UGM detects one of the following conditions when software type is 'P' or 'B': The Version Verification Word #1 or the Version Verification Word #2 values located in the constant data sector of flash memory (found on constant data spreadsheet tab pstConstantDataVersion) do not match the values located in the code area of flash memory The Version Major value located in the constant data sector of flash memory (found on constant data spreadsheet tab pstConstantDataVersion) does not match the value located in the code area of flash memory	A different application code or constant data version is programmed so that the values match Power Cycled
9944	CURRENT FEEDBACK GAINS OUT OF RANGE	One or more of the current feedback gains that are calculated and written to flash memory during the PIC manufacturing test process are detected as being out of range	Power Cycled
9945	CURRENT FEEDBACK CALIBRATION CHECKSUM INCORRECT	The current feedback gains checksum that is calculated and written to flash memory during the PIC manufacturing test process is detected as being incorrect	Power Cycled
9949	MACHINE CONFIGURATION OUT OF RANGE – CHECK ALL SETTINGS	UGM has detected an anomaly in EEPROM with regard to the Machine Setup configuration.	Power Cycled and EEPROM data in associated area is changed
9977	LSS CORRUPT EEPROM	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 4-Cell LSS; and one of the following conditions: UGM determines LSS-stored values for Unloaded weight in Indirect 0x100≠ 0x108 or UGM determines LSS-stored values for Accessory weight in Indirect 0x102≠ 0x10A UGM determines LSS-stored checksum1 (0x10F) ≠ checksum 2 (0x107)	Power Cycled
9979	FUNCTIONS LOCKED OUT - GROUND MODULE SOFTWARE VERSION IMPROPER	Ground software has been installed on a UGM with a ST10F274 processor (Hardware Rev < 6), which does not have guaranteed flash storage in the sector where Constant Data is written.	Power Cycled

Table 6-14. Diagnostic Trouble Codes

DTC	Help Message	Fault Condition/Trigger (For configurable items, fault applies only if configured. All listed conditions to be met unless stated otherwise)	Conditions Required for Movement and/or to Clear Fault
9986	GROUND MODULE VLOW FET FAILURE	VLow FET determined to be failed because all Digital Inputs are high; UGM unable to read high-sensing inputs.	Power Cycled
99285	LSS - FACTORY CALIBRATION ERROR	MACHINE SETUP ⟶ LOAD SYSTEM ≠ NO; Load System is the 1-Cell LSS; LSS reports an Error Status (other than 0,1,2,8,30,31)	Power Cycled

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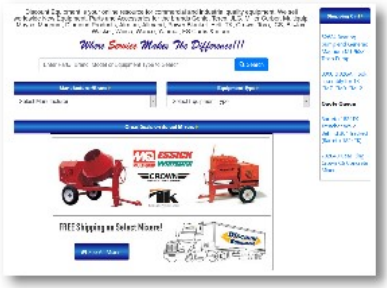

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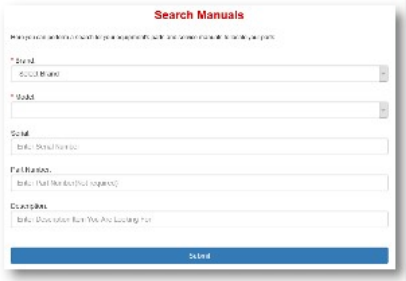

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SECTION 7. BASIC ELECTRICAL INFORMATION & ELECTRICAL SCHEMATICS

7.1 GENERAL

This section contains basic electrical information and schematics for locating and correcting most electrical problems. If a problem develops which is not presented in this section or corrected by listed corrective actions, obtain technically qualified guidance before proceeding with any additional maintenance.

NOTE: *Some procedures/connectors shown in this section may not apply 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 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, location of the signal and leads are correctly connected to the device under test. Also check the lead on the "COM" port goes to the ground or negative side of the signal and 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 kW = 1200 W
Example: 50 mA = 0.05 A

Voltage Measurement

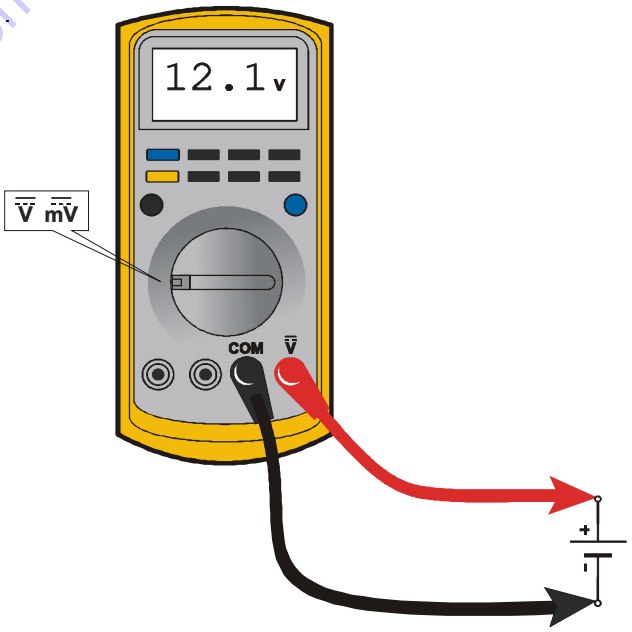


Figure 7-1. Voltage Measurement (DC)

- 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

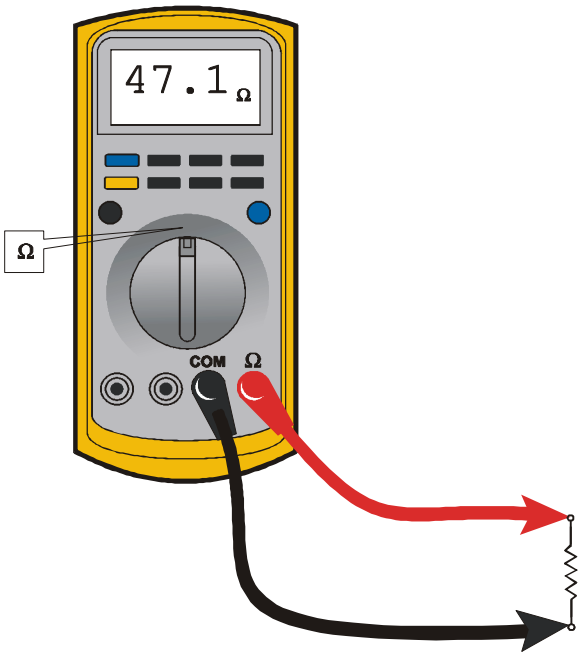


Figure 7-2. Resistance Measurement

- 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

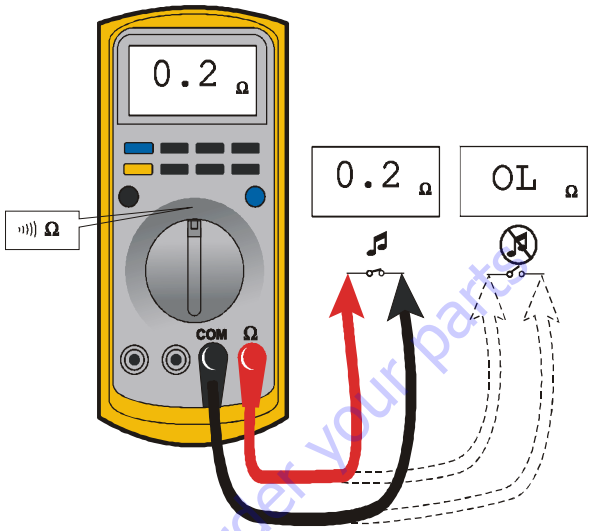


Figure 7-3. Continuity Measurement

- 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

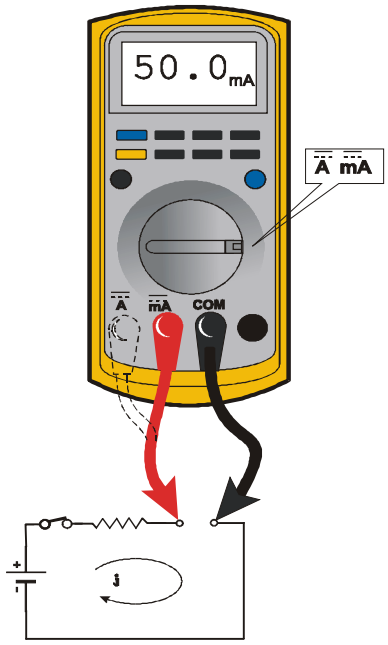


Figure 7-4. Current Measurement (DC)

- Set up meter for expected current range
- Be sure to connect meter leads to correct jacks for selected current range
- If meter is not auto ranging, set it to 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 PN 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.

NOTICE

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).

7.4 DIELECTRIC GREASE APPLICATION

Dielectric grease helps to prevent corrosion of electrical contacts and improper conductivity between contacts from moisture intrusion. Non-waterproof connectors benefit from the application of dielectric grease.

Installation

The following is general guidance for the installation of dielectric grease in a connector system.

- Use dielectric grease in a tube for larger connection points or apply with a syringe for small connectors.
- Apply dielectric grease to plug/male connector housing which typically contains sockets contact/female terminals.
- Leave a layer of dielectric grease on the mating face of the connector, completely covering each connector terminal hole. Refer the pictures shown below.
- Assemble the connector system immediately to prevent moisture ingress or dust contamination.

The following connector systems are specifically addressed because of their widespread use at JLG. However, this guidance may be applied to similar devices.

AMP Mate-N-Lok

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

Improper Proper

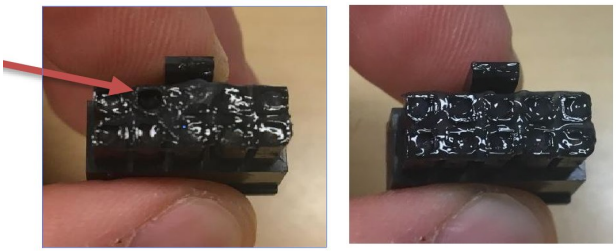
AMP Faston

This connector system is typically used on operator switches at JLG. Follow the general guidance for installation.

Improper Proper

AMP Micro-Fit

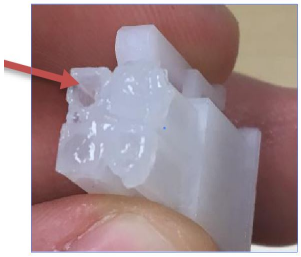
This connector system is typically used on control modules at JLG. Follow the general guidance for installation.



Improper Proper

AMP Mini Fit Jr

This connector system is typically used on control modules at JLG. Follow the general guidance for installation.

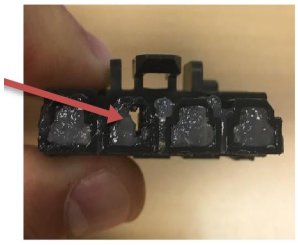


Improper

Proper

Mini Fit Sr

This connector system is typically used on control modules at JLG. Follow the general guidance for installation.

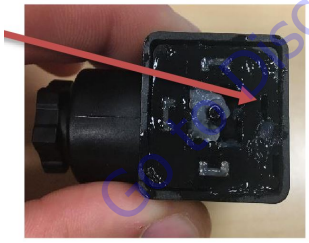


Improper

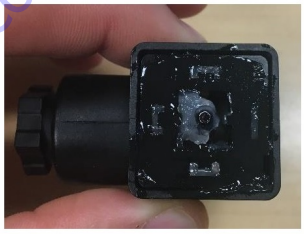
Proper

DIN Connectors

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



Improper



Proper

Exceptions

Some waterproof connector applications do benefit from dielectric grease, and some non waterproof connectors do not benefit from dielectric grease.

In the exceptions below, we have found dielectric grease is not needed for some applications, and in some cases can interfere with the intended connection. Dielectric grease shall be used as an exception in other applications.

Enclosures

Application of dielectric grease is not required in properly sealed enclosures. To meet criteria, the enclosure must be rated to at least IP56 (dust protected; protected from powerful jets of water).

Carling Switch Connectors

Carling switches may experience high impedance, or discontinuity, due to silicone dielectric grease ingress when switching inductive loads. Therefore, dielectric grease shall not be applied to Carling switch mating connectors unless specifically noted.

7.5 AMP CONNECTOR

Assembly

Check to be sure the wedge lock is in the open, or as-shipped, position (See Figure 7-5.). Proceed as follows:

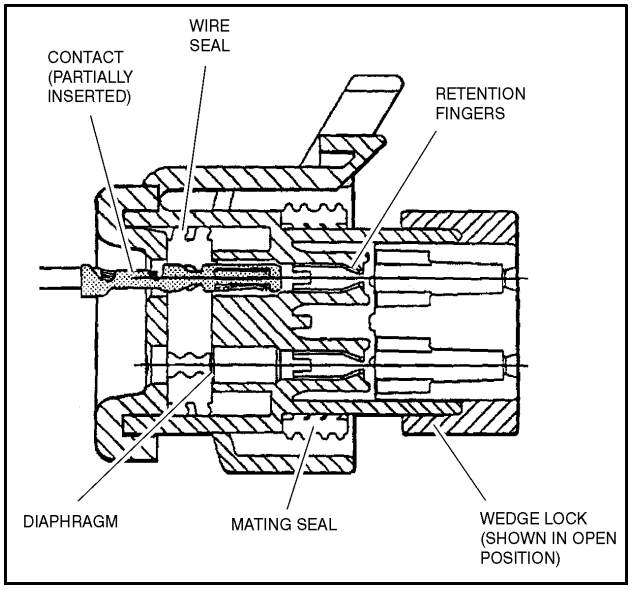


Figure 7-5. Connector Assembly Figure 1

1. To insert a contact, push it straight into the appropriate circuit cavity as far as it will go (See Figure 7-7.).
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 7-7.).

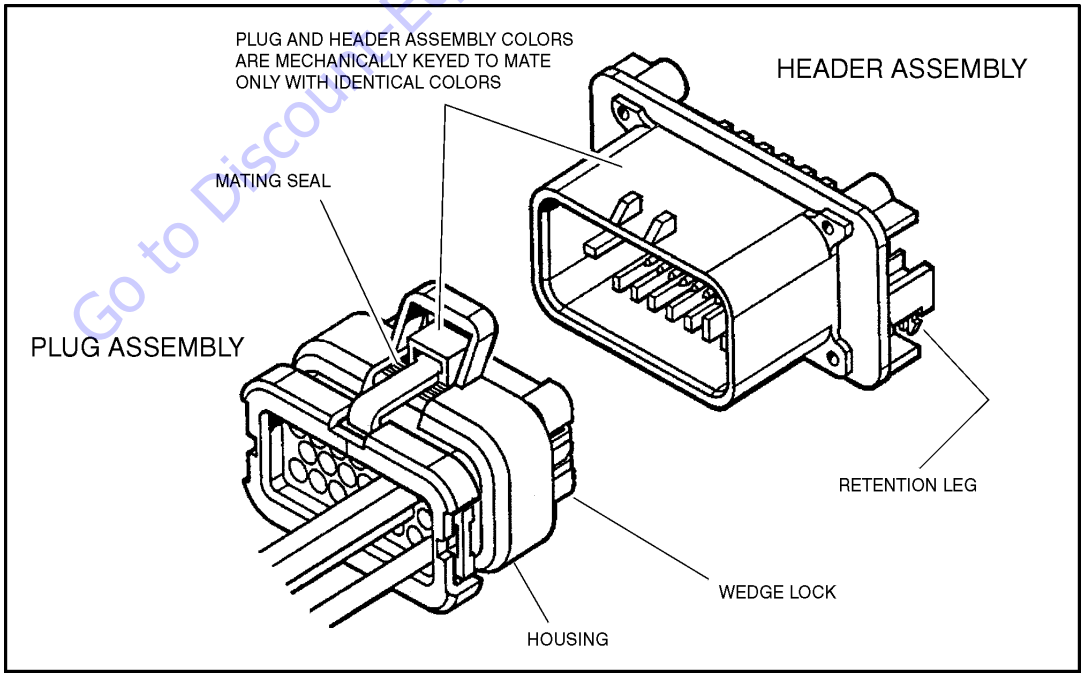


Figure 7-6. AMP Connector

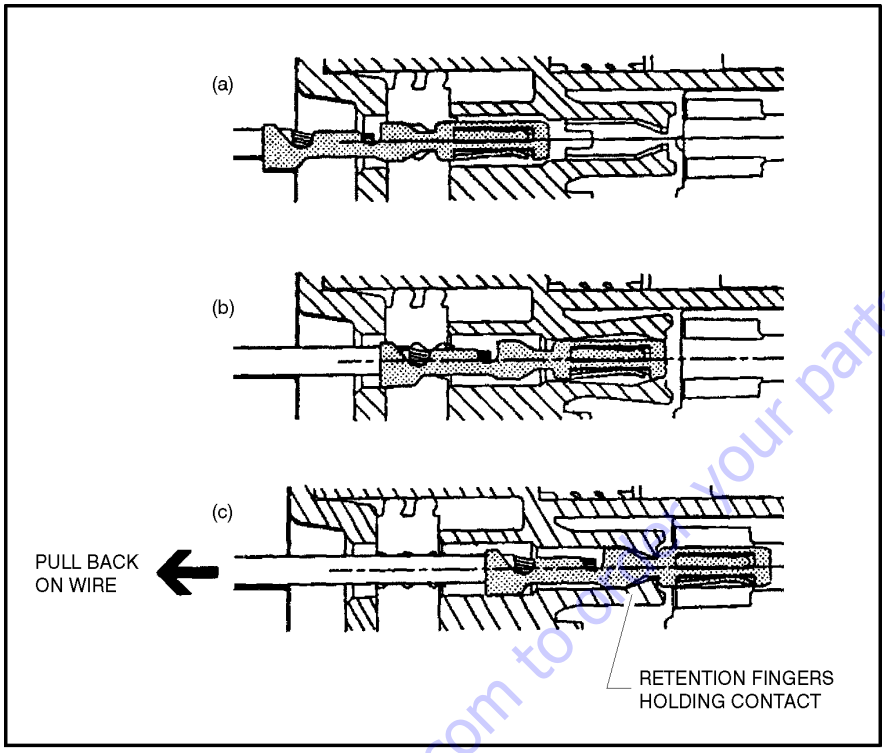


Figure 7-7. Connector Assembly Figure 2

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 7-8.).

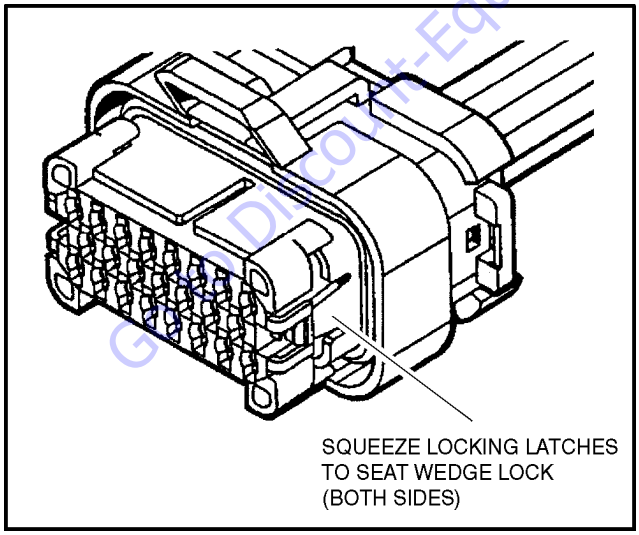


Figure 7-8. Connector Assembly Figure 3

4. Slide the wedge lock into the housing until it is flush with the housing (See Figure 7-9.).

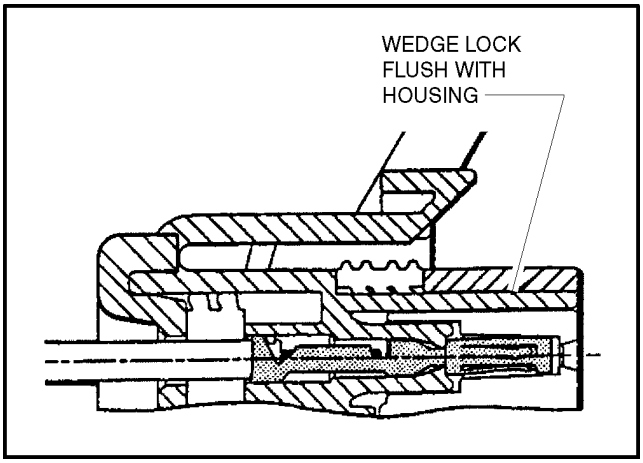


Figure 7-9. Connector Assembly Figure 4

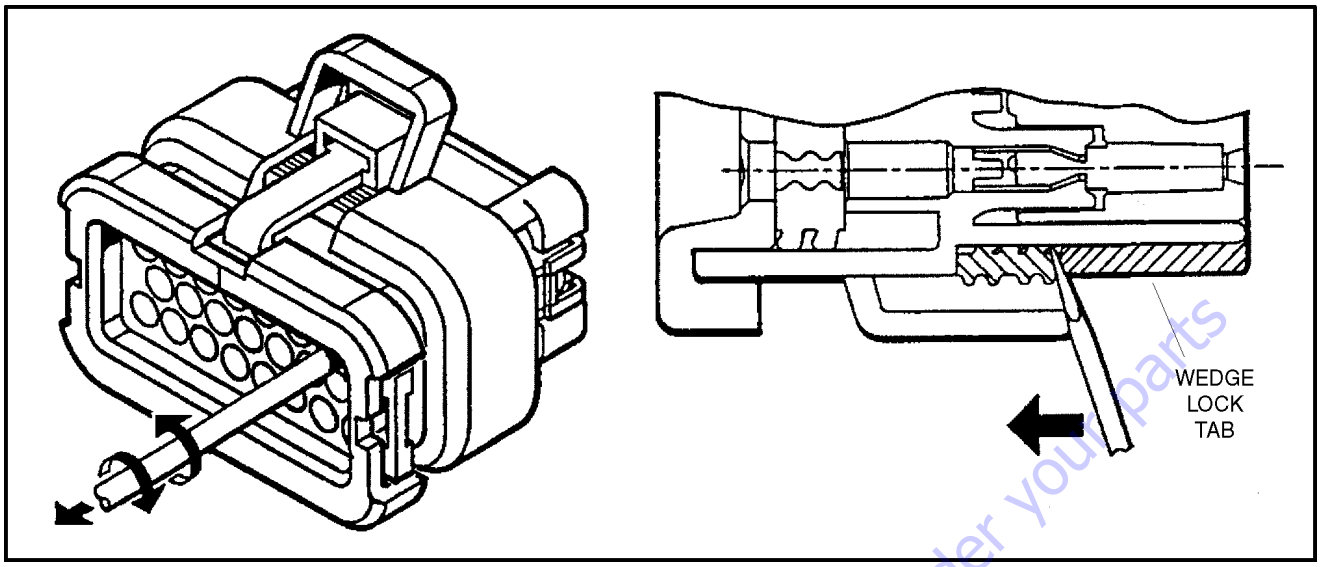


Figure 7-10. Connector Disassembly

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 AMP-SEAL 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.

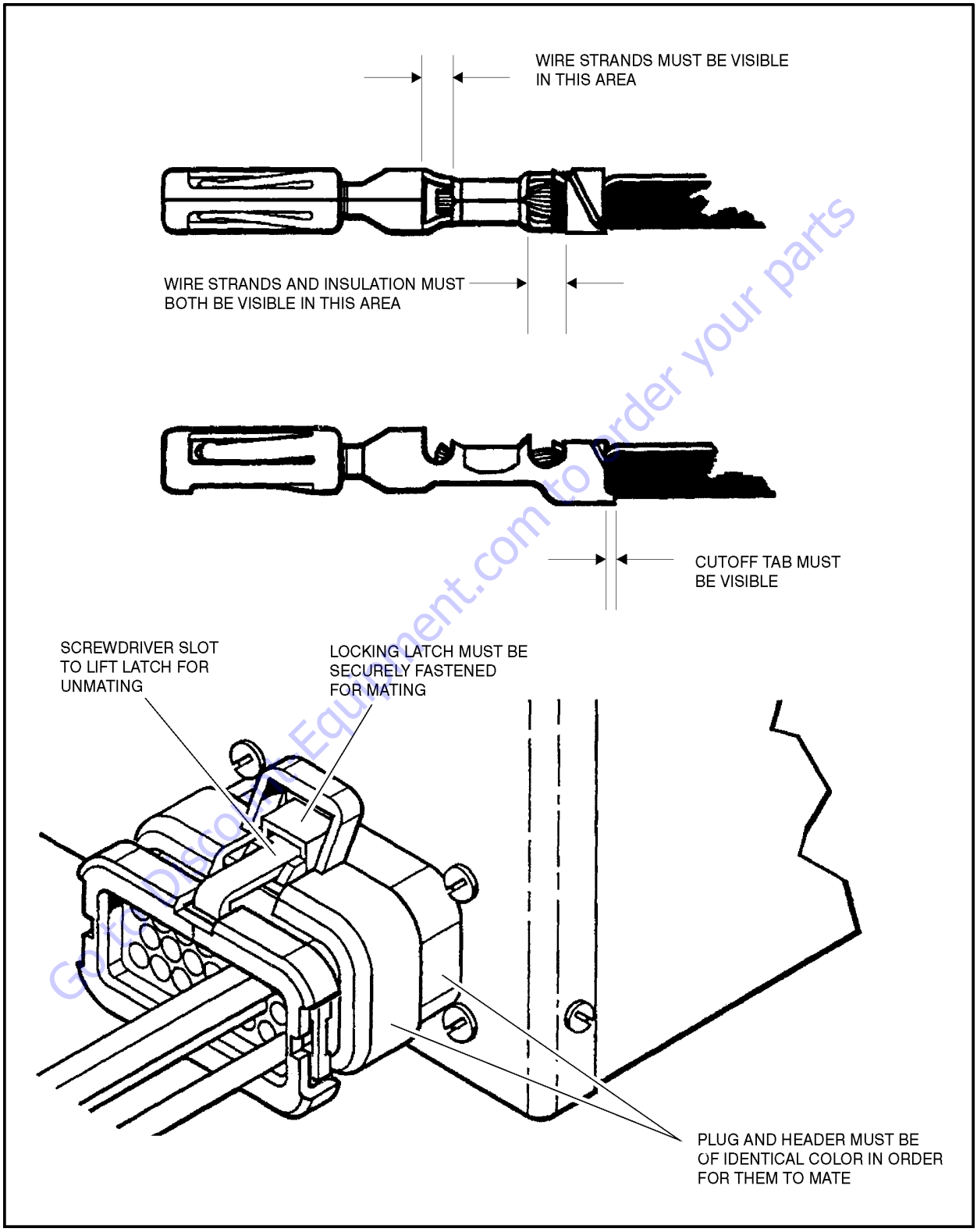


Figure 7-11. Connector Installation

7.6 DEUTSCH CONNECTORS

DT/DTP Series Assembly

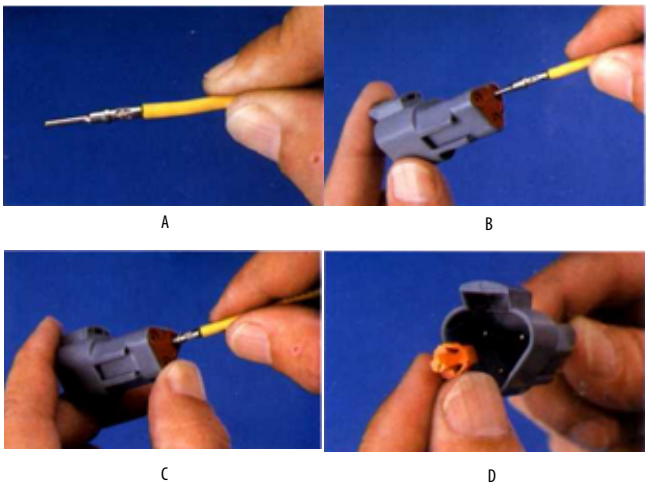


Figure 7-12. DT/DTP Contact Installation

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

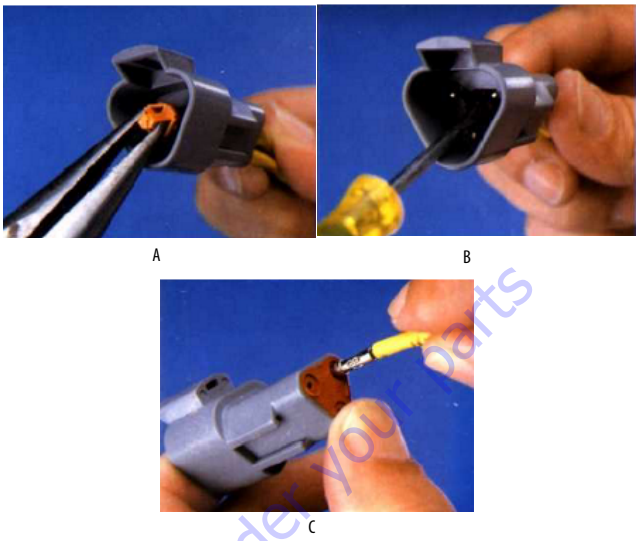


Figure 7-13. DT/DTP Contact Removal

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

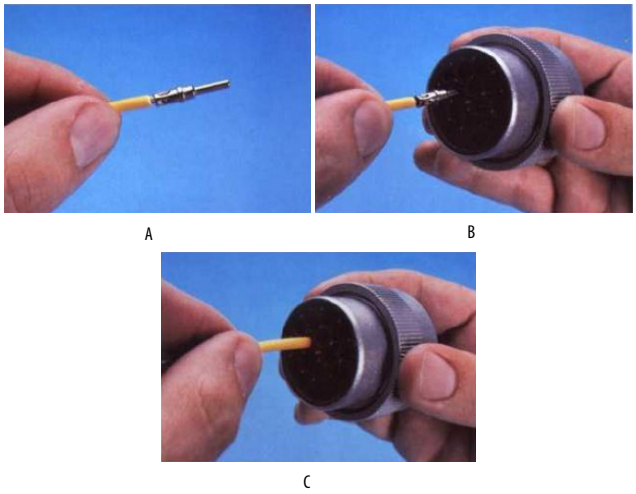


Figure 7-14. HD/HDP Contact Installation

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.

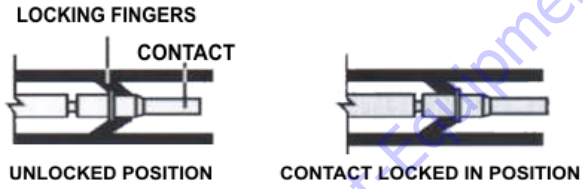


Figure 7-15. HD/HDP Locking Contacts Into Position

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

HD30/HDP20 Series Disassembly

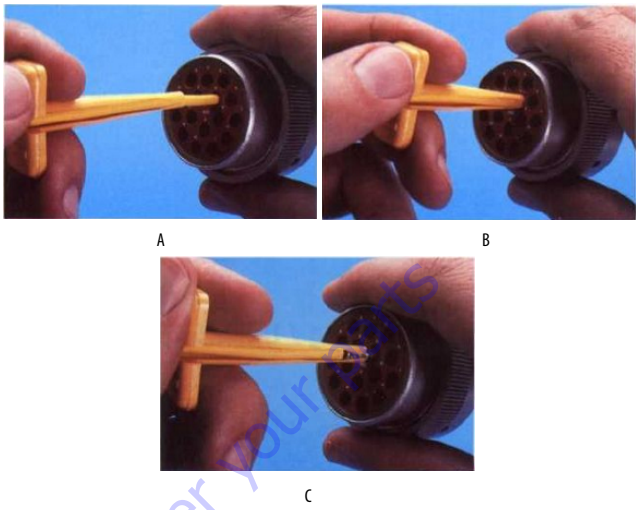


Figure 7-16. HD/HDP Contact Removal

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.

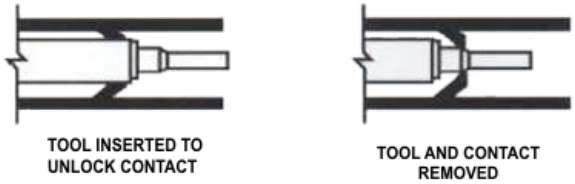


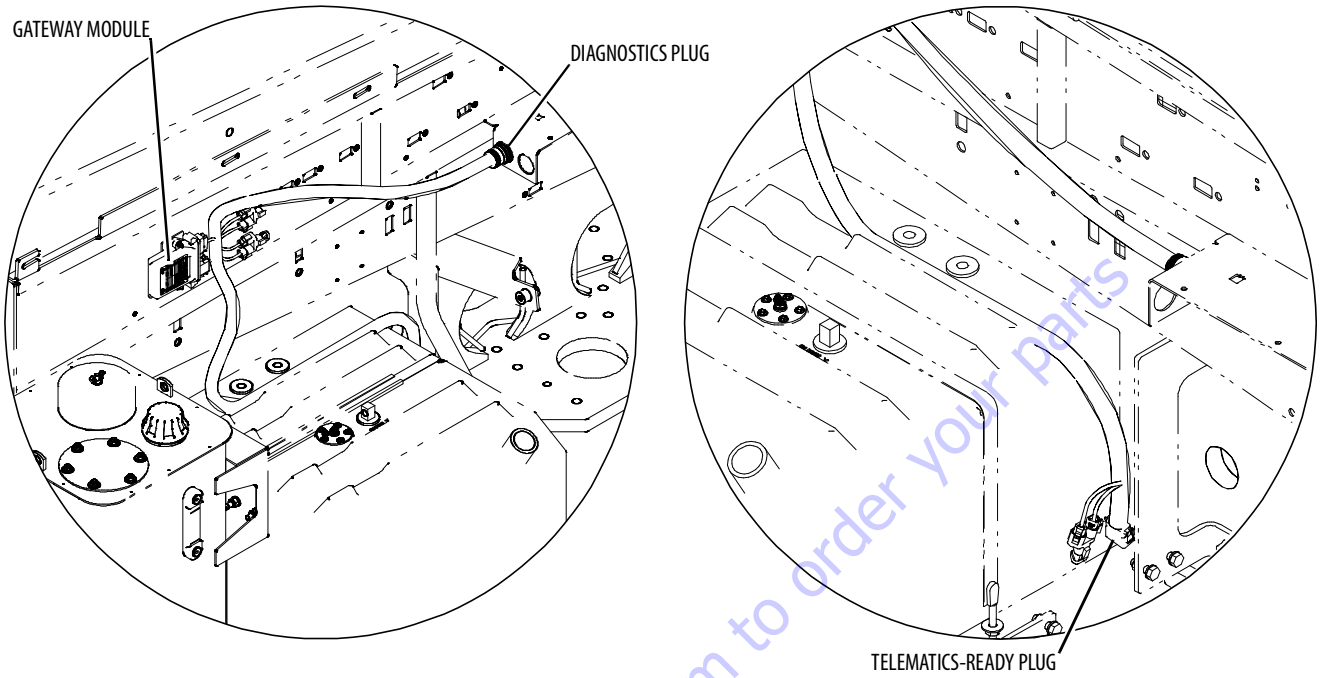
Figure 7-17. HD/HDP Unlocking Contacts

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

7.7 TELEMATICS GATEWAY

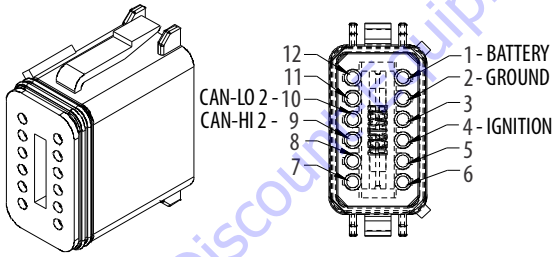
Personnel using machines equipped with an optional telematics gateway will be able to view the following data through their telematics device:

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:



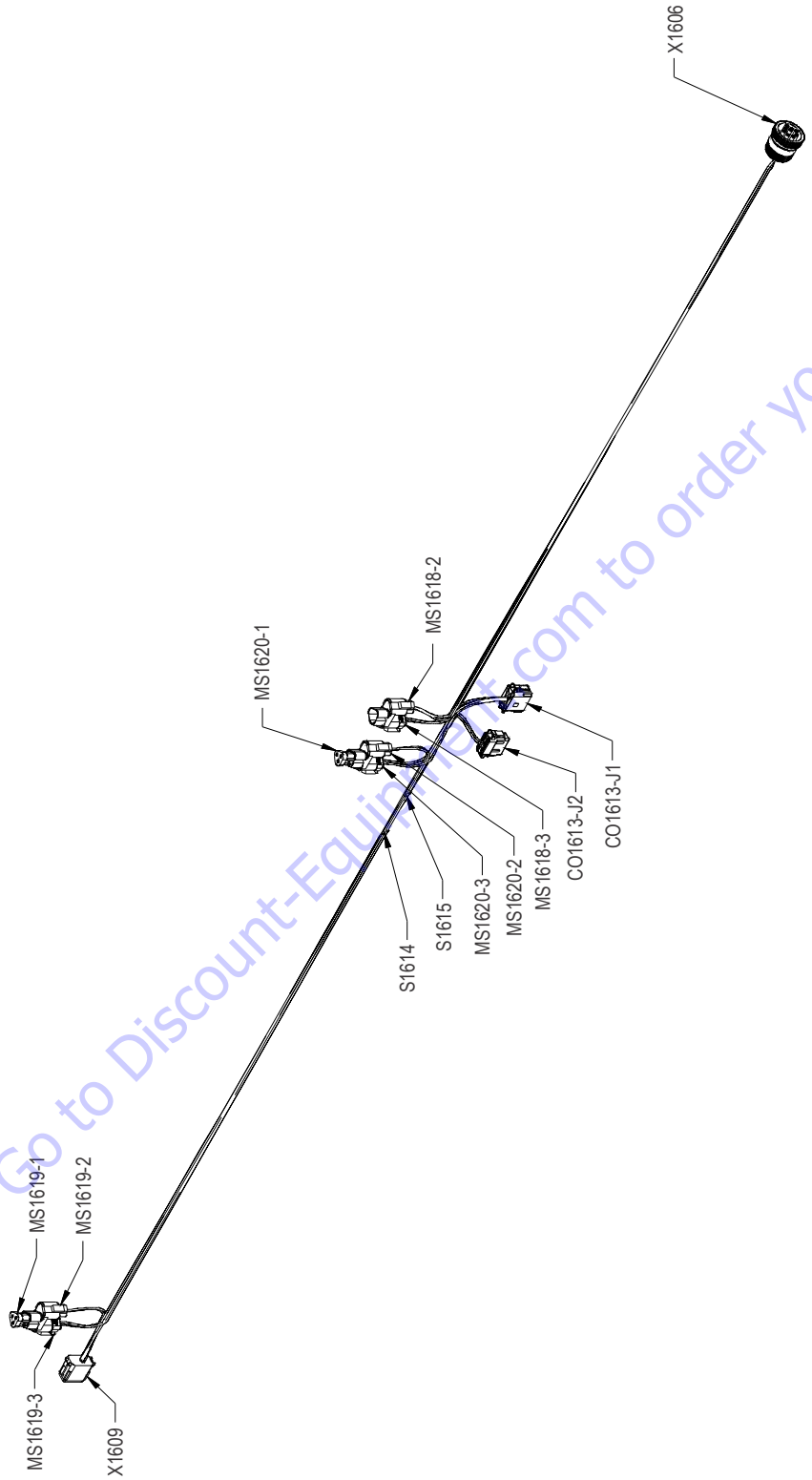


Figure 7-18. Telematics Gateway Harness - Sheet 1 of 3

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 7-19. 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 7-20. Telematics Gateway Harness - Sheet 3 of 3

7.8 WIRING HARNESS

Connector Labels

Connectors between harnesses are identified by the prefix "X" and a sequentially assigned number. An optional suffix (letters & numbers) may be added when multiple terminations occur at one device or when there are optional connections.

Examples:

X25 connects to X25 in another harness.

X65A, X65B connect to different portions of one device

X163 connects to X163A in ANSI and X163B in CE machines

Component Labels

Every component on the vehicle has a unique identification. A standard prefix letter is assigned according to the table below, followed by a unique sequential number. An optional suffix (letters & numbers) may be added when multiple terminations occur at one device.

Terminals that are not loaded into connectors are considered independent components and labeled in the same fashion.

Table 7-1. Wiring Harness Connector Labels

Component	Category	Label
Audible	Alarms	AH
	Horns	
Battery	Batteries	BT
	Battery Terminals	
Control Module	Ground	CO
	LSS	
	Platform	
Engine	Alternator	EC
	Cold Start	
	Controller	
	Coolant Temp	
	Fuel Pump	
	Fuel Solenoid	
	Glow Plugs	
	Oil Pressure	
	Starter	
Fuse & CB Fuse FC	Fuse	FC
	Fusible Link	FC
	Circuit Breaker	CB
Gauge & Display	Board	GD
	Cluster	
	Hour meter	
	LMI	
	Speedometer	
Inline	Resistor	R
	Diode	D
Joystick & Steering	Electronic	JS
	Hydraulic	
Lights	Dome	LB
	Headlights	
	Simple	
	Taillights	
Membrane Panel		MP
Miscellaneous	Radio	MS
	Speakers	
	Splice Blocks	
	T-Connectors	

Table 7-1. Wiring Harness Connector Labels

Component	Category	Label
Other Switches	Disconnect	SW
	EMS	
	Foot	
	HVAC	WH
	Key	SW
	Park brake	
	Pump pot	
	Push	
	Shifter	
	Turn signal	
Relay	5 Pin	RL
	4 Pin	
	Contactor	
	Power module	
Rocker Switch		SW
Sensor	Angle	SN
	Fuel	
	Length	
	Limit	
	Load	
	Pressure	
	Proximity	
	Speed	
	Temperature	
Terminals	Pins	T
	Sockets	
	Male Blades	
	Female Blades	
	Rings	
	Forks	
Toggle Switch	DPDT	SW
	DPST	
	SPDT	
	SPST	
	Special	
Valves	Simple	HV
	Suppression	

Examples:
T67 is a ring terminal connected during installation.
C01-J3 is the J3 connector for a UGM control module.
EC9 is a glow plug supplied with the engine

7.9 WIRING HARNESS CONNECTOR LABEL DIAGRAMS

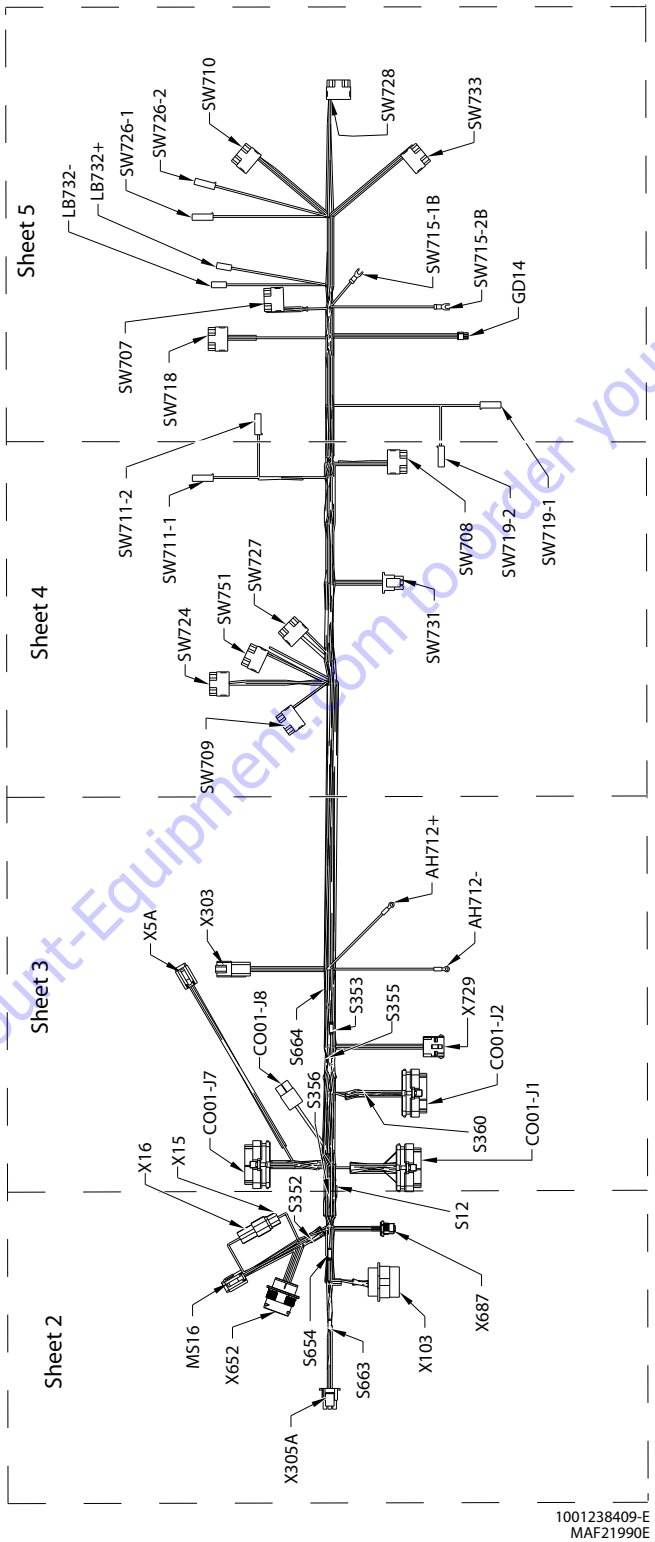


Figure 7-21. Platform Box Harness - Sheet 1 of 6

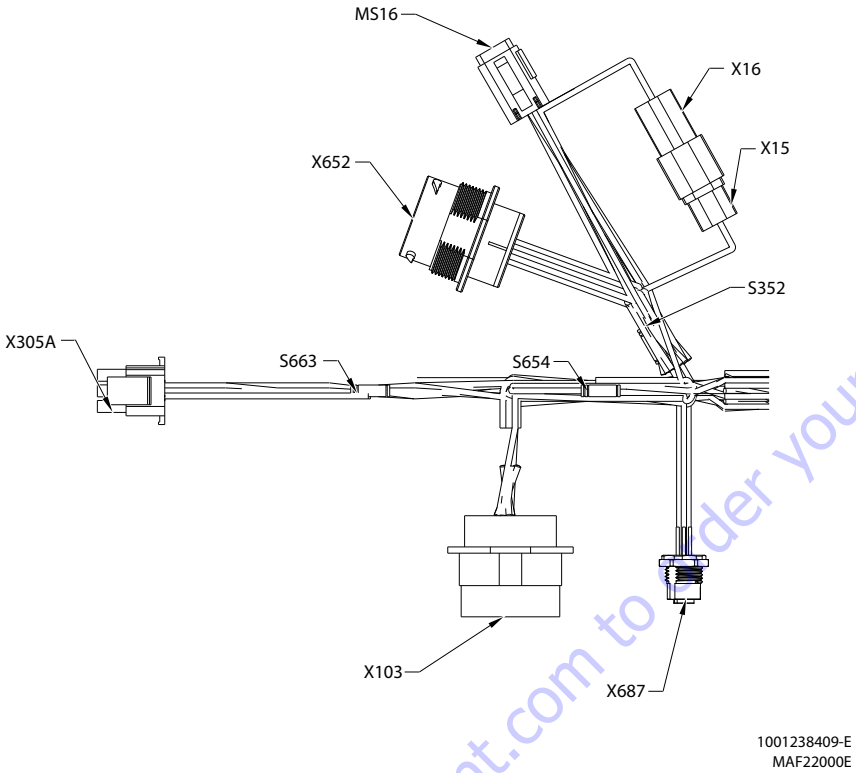


Figure 7-22. Platform Box Harness - Sheet 2 of 6

X16 CAN 1 TAP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CAN-ONE HIGH	18 AWG	GXL	MS16 (11)
B	GRN	CAN-ONE LOW	18 AWG	GXL	MS16 (5)
C					

X652 TO PLATFORM VALVE HARN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	12-3-1 PLAT VLV-	18 AWG	GXL	S664 (2)
2					
3	WHT	90-1 HI PRS DUMP	18 AWG	GXL	X103 (13)
4	WHT	88-1-2 LEVEL UP	18 AWG	GXL	S352 (2)
5	WHT	89-1-2 LEVEL DOWN	18 AWG	GXL	S654 (1)
6					
7					
8	WHT	58-1 PLAT ANGLE 1	18 AWG	GXL	C001-J1 (25)
9	WHT	58-0 PLAT ANGLE 2	18 AWG	GXL	C001-J1 (26)
10	WHT	11-1-1 ANGLE SNSR 5V+	18 AWG	GXL	S356 (2)
11	WHT	11-1-2 ANGLE SNSR 5V+	18 AWG	GXL	S356 (2)
12	WHT	90-2 LOW PRS DUMP	18 AWG	GXL	X103 (15)
13	WHT	86-3 ROTATE LEFT	18 AWG	GXL	C001-J7 (5)
14	WHT	87-3 ROTATE RIGHT	18 AWG	GXL	C001-J7 (6)
15	WHT	82-3 JIB UP	18 AWG	GXL	C001-J7 (25)
16	WHT	83-3 JIB DOWN	18 AWG	GXL	C001-J7 (26)
17					
18					
19					
20	BLK	12-11-2 ANGLE SNSR-	18 AWG	GXL	S355 (2)
21	BLK	12-11-1 ANGLE SNSR-	18 AWG	GXL	S355 (2)

X15 CAN 1 TAP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CAN-ONE HIGH	18 AWG	GXL	X103 (3)
B	GRN	CAN-ONE LOW	18 AWG	GXL	X103 (2)
C					

X103 TO BOOM CABLE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	GRN	CAN-ONE LOW	18 AWG	GXL	X15 (B)
3	YEL	CAN-ONE HIGH	18 AWG	GXL	X15 (A)
4	WHT	9-0 PLAT MODE/GND ENABLE	18 AWG	GXL	C001-J7 (3)
5	WHT	88-1-1 LEVEL UP	18 AWG	GXL	S352 (1)
6					
7	WHT	89-1-1 LEVEL DOWN	18 AWG	GXL	S654 (2)
8					
9	YEL	4-0	18 AWG	GXL	SW715-1B (1B)
10					
11	WHT	8-0 GND MODE/PLAT ENABLE	18 AWG	GXL	C001-J7 (1)
12	YEL	2-7	12 AWG	GXL	C001-J8 (2)
13	WHT	90-1 HI PRS DUMP	18 AWG	GXL	X652 (3)
14					
15	WHT	90-2 LOW PRS DUMP	18 AWG	GXL	X652 (12)
16	BLK	0-7	12 AWG	GXL	C001-J8 (1)
17					
18					
19					

MS16 CAN 1 BUSS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	CAN-ONE HIGH	20 AWG	CABLE	X687 (4)
2	YEL	CAN-ONE HIGH	18 AWG	GXL	X303 (8)
3	YEL	CAN-ONE HIGH	18 AWG	GXL	C001-J7 (31)
4	GRN	CAN-ONE LOW	18 AWG	GXL	C001-J7 (30)
5	GRN	CAN-ONE LOW	18 AWG	GXL	X16 (B)
6	GRY	CAN-ONE LOW	20 AWG	CABLE	X687 (5)
7	GRN	CAN-ONE LOW	18 AWG	GXL	X303 (9)
8					
9	GRN	CAN-ONE LOW	20 AWG	TXL	GD14 (4)
10	YEL	CAN-ONE HIGH	20 AWG	TXL	GD14 (1)
11	YEL	CAN-ONE HIGH	18 AWG	GXL	X16 (A)
12					

S352					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	88-1 LEVEL UP	18 AWG	GXL	C001-J7 (15)
1	WHT	88-1-1 LEVEL UP	18 AWG	GXL	X103 (5)
2	WHT	88-1-2 LEVEL UP	18 AWG	GXL	X652 (4)

S654					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	89-1-2 LEVEL DOWN	18 AWG	GXL	X652 (5)
2	WHT	89-1 LEVEL DOWN	18 AWG	GXL	C001-J7 (16)
2	WHT	89-1-1 LEVEL DOWN	18 AWG	GXL	X103 (7)

S663					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	10-10 SKYG/GEN+	18 AWG	GXL	C001-J7 (7)
1	YEL	10-10-2 SKY GUARD+	18 AWG	GXL	X5A (1)
2	YEL	10-10-1 GEN+	18 AWG	GXL	X305A (2)

X687 SINGLE CELL LSS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	YEL	10-2 LSS+	20 AWG	CABLE	C001-J2 (32)
3	BLU	12-4 LSS-	20 AWG	CABLE	C001-J7 (22)
4	BLK	CAN-ONE HIGH	20 AWG	CABLE	MS16 (1)
5	GRY	CAN-ONE LOW	20 AWG	CABLE	MS16 (6)

X305A OPTIONS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	508-1 GENERATOR SW INPUT	18 AWG	GXL	C001-J7 (9)
2	YEL	10-10-1 GEN+	18 AWG	GXL	S663 (2)
3					
4	WHT	7-2 FOOT SW N.C.	18 AWG	GXL	C001-J7 (8)
5	YEL	10-3 FOOT SW+	18 AWG	GXL	C001-J7 (4)
6					
7					
8					
9	YEL	10-8-2 SOFT TOUCH+	18 AWG	GXL	S360 (2)
10					
11					
12	WHT	504-1-2 SOFT TOUCH	18 AWG	GXL	S12 (2)
13					
14	WHT	1-551	18 AWG	GXL	X305A (15)
15	WHT	1-551	18 AWG	GXL	X305A (14)

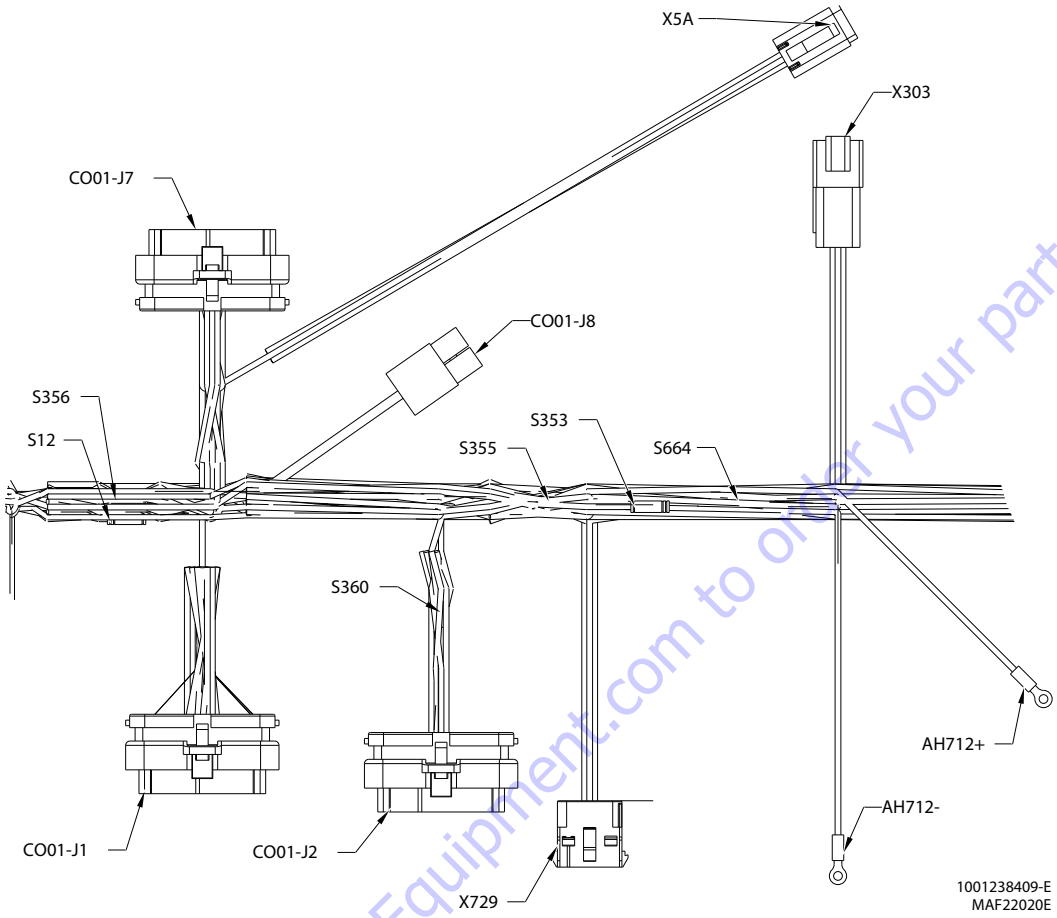


Figure 7-23. Platform Box Harness - Sheet 3 of 6

S12					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	504-1 SOFT TOUCH	18 AWG	GXL	C001-J1 (20)
2	WHT	504-1-1 SOFT TOUCH	18 AWG	GXL	X5A (6)
2	WHT	504-1-2 SOFT TOUCH	18 AWG	GXL	X305A (12)

S356					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	11-1 ANGLE SNSR 5V+	18 AWG	GXL	C001-J7 (11)
2	WHT	11-1-1 ANGLE SNSR 5V+	18 AWG	GXL	X652 (10)
2	WHT	11-1-2 ANGLE SNSR 5V+	18 AWG	GXL	X652 (11)

S360					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	10-8 SOFT TOUCH+	18 AWG	GXL	C001-J2 (34)
2	YEL	10-8-1 SOFT TOUCH+	18 AWG	GXL	X5A (3)
2	YEL	10-8-2 SOFT TOUCH+	18 AWG	GXL	X305A (9)

S353					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	10-6 OPTION+	18 AWG	GXL	C001-J2 (33)
2	YEL	10-6-1 OPTION+	18 AWG	GXL	X303 (7)
2	YEL	10-6-2 OPTION+	18 AWG	GXL	X303 (11)

S355					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	12-11 ANGLE SNSR-	18 AWG	GXL	C001-J7 (14)
2	BLK	12-11-1 ANGLE SNSR-	18 AWG	GXL	X652 (21)
2	BLK	12-11-2 ANGLE SNSR-	18 AWG	GXL	X652 (20)

AH712+ ALARM					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	94-2 PLAT ALARM	18 AWG	GXL	C001-J7 (19)

X5A SG/ST					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	10-10-2 SKY GUARD+	18 AWG	GXL	S663 (1)
2	BLK	12-10 SKY GUARD-	18 AWG	GXL	C001-J7 (21)
3	YEL	10-8-1 SOFT TOUCH+	18 AWG	GXL	S360 (2)
4	WHT	503-1 SKYG INPUT 1	18 AWG	GXL	C001-J7 (18)
5	WHT	503-2 SKYG INPUT 2	18 AWG	GXL	C001-J1 (23)
6	WHT	504-1-1 SOFT TOUCH	18 AWG	GXL	S12 (2)

X303 OPTIONS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3					
4					
5					
6	BLK	12-2-2 OPTION-	18 AWG	GXL	S664 (2)
7	YEL	10-6-1 OPTION+	18 AWG	GXL	S353 (2)
8	YEL	CAN-ONE HIGH	18 AWG	GXL	MS16 (2)
9	GRN	CAN-ONE LOW	18 AWG	GXL	MS16 (7)
10					
11	YEL	10-6-2 OPTION+	18 AWG	GXL	S353 (2)
12	BLK	12-3-2 DISPLAY-	18 AWG	GXL	S664 (2)

X729 ANALYZER					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	10-7 ANALYZER+	18 AWG	GXL	C001-J2 (26)
2	WHT	13-3 RECEIVE	18 AWG	GXL	C001-J2 (28)
3	WHT	13-4 TRANSMIT	18 AWG	GXL	C001-J2 (29)
4	BLK	12-6 ANALYZER-	18 AWG	GXL	C001-J2 (27)

S664					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	12-3 PLAT VLV-	18 AWG	GXL	C001-J7 (29)
2	BLK	12-3-1 PLAT VLV-	18 AWG	GXL	X652 (1)
2	BLK	12-3-2 DISPLAY	18 AWG	GXL	X303 (12)

C001-J7 BLACK					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	8-0 GND MODE/PLAT ENABLE	18 AWG	GXL	X103 (11)
2	YEL	5-0	18 AWG	GXL	SW715-2B (2B)
3	WHT	9-0 PLAT MODE/GND ENABLE	18 AWG	GXL	X103 (4)
4	YEL	10-3 FOOT SW+	18 AWG	GXL	X305A (5)
5	WHT	86-3 ROTATE LEFT	18 AWG	GXL	X652 (13)
6	WHT	87-3 ROTATE RIGHT	18 AWG	GXL	X652 (14)
7	YEL	10-10 SKYG/GEN+	18 AWG	GXL	S663 (1)
8	WHT	7-2 FOOT SW N.C.	18 AWG	GXL	X305A (4)
9	WHT	508-1 GENERATOR SW INPUT	18 AWG	GXL	X305A (1)
10					
11	WHT	11-1 ANGLE SNSR 5V+	18 AWG	GXL	S356 (1)
12					
13					
14	BLK	12-11 ANGLE SNSR-	18 AWG	GXL	S355 (1)
15	WHT	88-1 LEVEL UP	18 AWG	GXL	S352 (1)
16	WHT	89-1 LEVEL DOWN	18 AWG	GXL	S654 (2)
17					
18	WHT	503-1 SKYG INPUT 1	18 AWG	GXL	X5A (4)
19	WHT	94-2 PLAT ALARM	18 AWG	GXL	AH712+ (1)
20	BLK	12-1 PLAT ALARM-	18 AWG	GXL	AH712- (1)
21	BLK	12-10 SKY GUARD-	18 AWG	GXL	X5A (2)
22	BLU	12-4 LSS-	20 AWG	CABLE	X687 (3)
23					
24					
25	WHT	82-3 JIB UP	18 AWG	GXL	X652A (15)
26	WHT	83-3 JIB DOWN	18 AWG	GXL	X652A (16)
27					
28					
29	BLK	12-3 PLAT VLV-	18 AWG	GXL	S664 (1)
30	GRN	CAN-ONE LOW	18 AWG	GXL	MS16 (4)
31	YEL	CAN-ONE HIGH	18 AWG	GXL	MS16 (3)
32					
33					
34	BLK	12-2 OPTION-	18AWG	GXL	X303 (6)
35					

C001-J1 NATURAL					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3					
4					
5	WHT	78-2 TELE IN	18 AWG	GXL	SW707 (3)
6	WHT	79-2 TELE OUT	18 AWG	GXL	SW707 (1)
7	WHT	87-2 ROTATE RIGHT	18 AWG	GXL	SW708 (3)
8	WHT	86-2 ROTATE LEFT	18 AWG	GXL	SW708 (1)
9	WHT	88-2 LEVEL UP	18 AWG	GXL	SW709 (3)
10	WHT	89-2 LEVEL DOWN	18 AWG	GXL	SW709 (1)
11	WHT	82-2 JIB UP	18 AWG	GXL	SW718 (3)
12	WHT	83-2 JIB DOWN	18 AWG	GXL	SW718 (1)
13	BLK	12-0 FUNCTION SPD-	18 AWG	GXL	SW731 (5)
14	WHT	100-2 START SWITCH	18 AWG	GXL	SW710 (3)
15	WHT	93-2 AUX POWER	18 AWG	GXL	SW710 (1)
16	WHT	17-1 CRAB STEER	18 AWG	GXL	SW751 (3)
17	WHT	17-0 COORD STEER	18 AWG	GXL	SW751 (1)
18	YEL	10-0 PLAT CNTRL +	18 AWG	GXL	SW724 (2)
19	WHT	54-5 FULL EXTENTION	18 AWG	GXL	SW733 (1)
20	WHT	504-1 SOFT TOUCH	18 AWG	GXL	S12 (1)
21	WHT	54-2 CAPACITY	18 AWG	GXL	SW733 (3)
22					
23	WHT	503-2 SKYG INPUT 2	18 AWG	GXL	X5A (5)
24					
25	WHT	58-1 PLAT ANGLE 1	18 AWG	GXL	X652 (8)
26	WHT	58-0 PLAT ANGLE 2	18 AWG	GXL	X652 (9)
27	WHT	24-2 TWO SPEED	18 AWG	GXL	SW724 (1)
28	WHT	25-1 MAX TORQUE	18 AWG	GXL	SW724 (3)
29	WHT	504-0 SOFT/SKYG OVRIDE	18 AWG	GXL	SW719-1 (1)
30	WHT	500-3 HEAD LIGHTS	18 AWG	GXL	SW726-1 (1)
31	WHT	30-0 HORN	18 AWG	GXL	SW711-1 (1)
32	WHT	29-0 CREEP SW	18 AWG	GXL	SW731 (2)
33	WHT	107-0 FUEL SELECT	18 AWG	GXL	SW727 (3)
34	WHT	11-0 FUNCTION SPD 7V+	18 AWG	GXL	SW731 (4)
35	WHT	69-0 FUNCTION SPD INPUT	18 AWG	GXL	SW731 (6)

C001-J2 BLUE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3	YEL	10-9 DISPLAY+	20 AWG	TXL	GD14 (3)
4	WHT	51-2 DRV ORENTION SW	18 AWG	GXL	SW728 (1)
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16	WHT	504-2 SOFT TCH/SKYG LT	18 AWG	GXL	LB732+ (1)
17					
18	BLK	12-8 DISPLAY-	20 AWG	TXL	GD14 (6)
19					
20					
21					
22					
23					
24					
25	BLK	12-7 SKYG LT-	18 AWG	GXL	LB732- (1)
26	YEL	10-7 ANALYZER+	18 AWG	GXL	X729 (1)
27	BLK	12-6 ANALYZER-	18 AWG	GXL	X729 (4)
28	WHT	13-3 RECEIVE	18 AWG	GXL	X729 (2)
29	WHT	13-4 TRANSMIT	18 AWG	GXL	X729 (3)
30					
31					
32	YEL	10-2 LSS+	20 AWG	CABLE	X687 (2)
33	YEL	10-6 OPTION+	18 AWG	GXL	S353 (1)
34	YEL	10-8 SOFT TOUCH+	18 AWG	GXL	S360 (1)
35					

AH712- ALARM					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	12-1 PLAT ALARM-	18 AWG	GXL	C001-J7 (20)

C001-J8					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-7	12 AWG	GXL	X103 (16)
2	YEL	2-7	12 AWG	GXL	X103 (12)

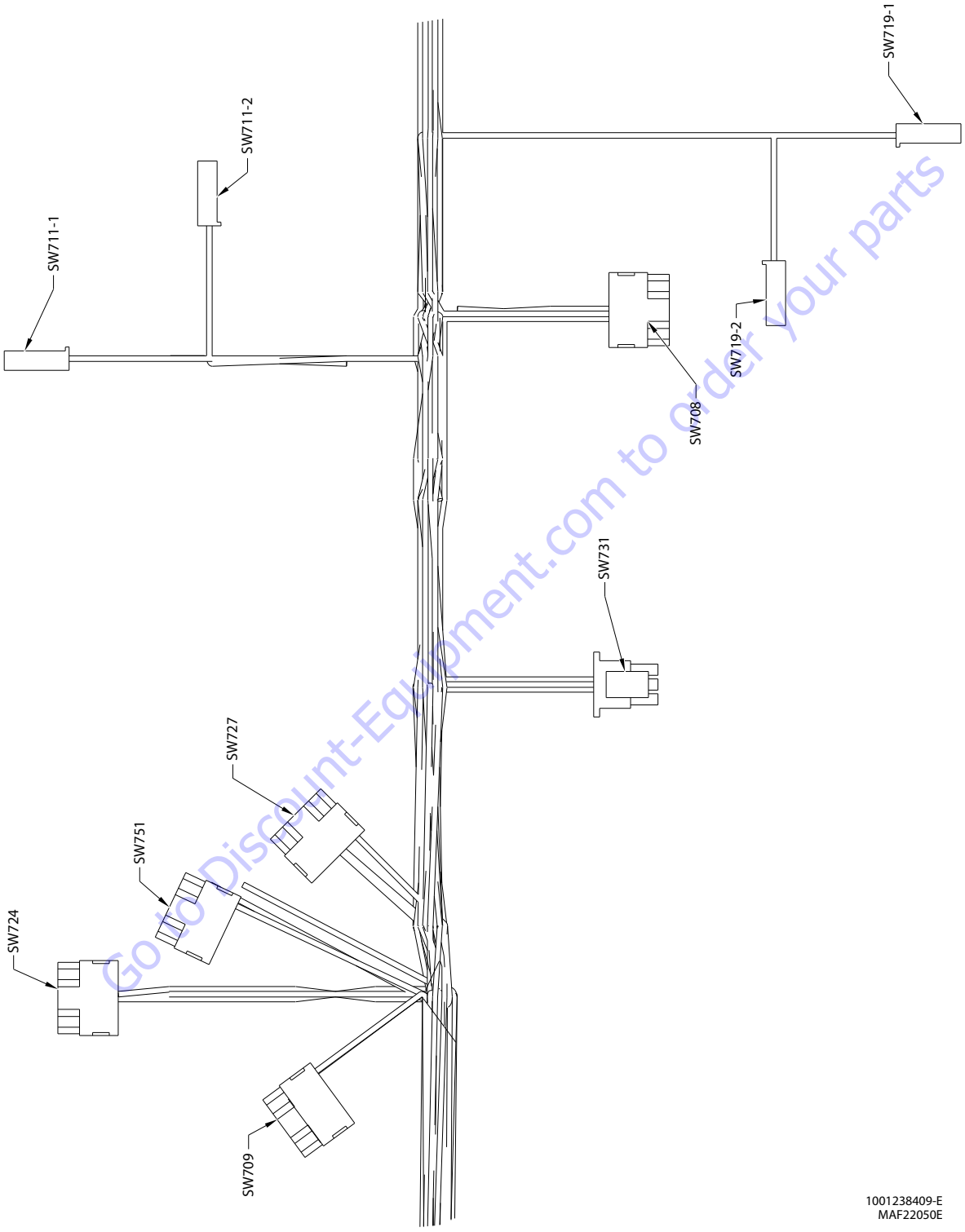


Figure 7-24. Platform Box Harness - Sheet 4 of 6

SW709 LEVEL					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	89-2 LEVEL DOWN	18 AWG	GXL	C001-J1 (10)
2	YEL	10-0-7 PLAT CNTRL +	18 AWG	GXL	SW710 (2)
2	YEL	10-0-8 PLAT CNTRL +	18 AWG	GXL	SW708 (2)
3	WHT	88-2 LEVEL UP	18 AWG	GXL	C001-J1 (9)
4					
5					
6					

SW708 PLATFORM ROTATE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	86-2 ROTATE LEFT	18 AWG	GXL	C001-J1 (8)
2	YEL	10-0-8 PLAT CNTRL +	18 AWG	GXL	SW709 (2)
2	YEL	10-0-9 PLAT CNTRL +	18 AWG	GXL	SW733 (2)
3	WHT	87-2 ROTATE RIGHT	18 AWG	GXL	C001-J1 (7)
4					
5					
6					

SW724 ENGINE SPEED					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	24-2 TWO SPEED	18 AWG	GXL	C001-J1 (27)
2	YEL	10-0 PLAT CNTRL +	18 AWG	GXL	C001-J1 (18)
2	YEL	10-0-1 PLAT CNTRL +	18 AWG	GXL	SW751 (2)
3	WHT	25-1 MAX TORQUE	18 AWG	GXL	C001-J1 (28)
4					
5					
6					

SW731 PUMP POT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	WHT	29-0 CREEP SW	18 AWG	GXL	C001-J1 (32)
3	YEL	10-0-11 PLAT CNTRL +	18 AWG	GXL	SW707 (2)
3	YEL	10-0-12 PLAT CNTRL +	18 AWG	GXL	SW711-2 (1)
4	WHT	11-0 FUNCTION SPD 7V+	18 AWG	GXL	C001-J1 (34)
5	BLK	12-0 FUNCTION SPD -	18 AWG	GXL	C001-J1 (13)
6	WHT	69-0 FUNCTION SPD INPUT	18 AWG	GXL	C001-J1 (35)

SW751 STEER SELECT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	17-0 COORD STEER	18 AWG	GXL	C001-J1 (17)
2	YEL	10-0-1 PLAT CNTRL +	18 AWG	GXL	SW724 (2)
2	YEL	10-0-2 PLAT CNTRL +	18 AWG	GXL	SW727 (2)
3	WHT	17-1 CRAB STEER	18 AWG	GXL	C001-J1 (16)
4					
5					
6					

SW711-2 HORN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	10-0-12 PLAT CNTRL +	18 AWG	GXL	SW731 (3)
1	YEL	10-0-13 PLAT CNTRL +	18 AWG	GXL	SW719-2 (1)

SW727 FUEL SELECT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	YEL	10-0-2 PLAT CNTRL +	18 AWG	GXL	SW751 (2)
2	YEL	10-0-3 PLAT CNTRL +	18 AWG	GXL	SW726-2 (1)
3	WHT	107-0 FUEL SELECT	18 AWG	GXL	C001-J1 (33)
4					
5					
6					

SW719-1 SOFT TCH/SKYG OVRD					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	504-0 SOFT/SKYG OVRIDE	18 AWG	GXL	C001-J1 (29)

SW719-2 SOFT TCH/SKYG OVRD					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	10-0-13 PLAT CNTRL +	18 AWG	GXL	SW711-2 (1)

SW711-1 HORN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	30-0 HORN	18 AWG	GXL	C001-J1 (31)

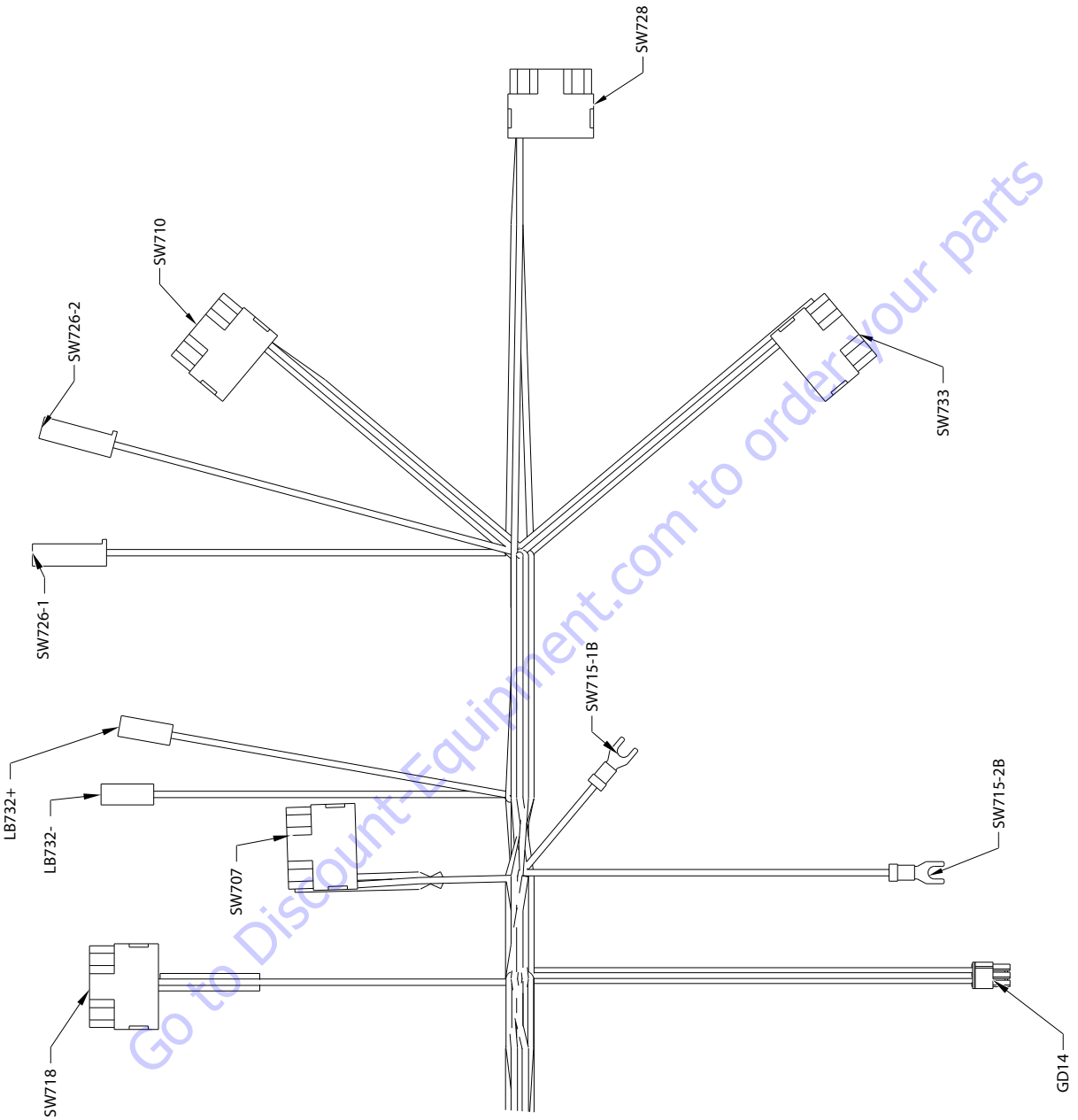


Figure 7-25. Platform Box Harness - Sheet 5 of 6

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MAF22070E

SW715-2B EMS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
2B	YEL	5-0	18 AWG	GXL	C001-J7 (2)

GD14 LED DISPLAY					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	CAN-ONE HIGH	20 AWG	TXL	MS16 (10)
2					
3	YEL	10-9 DISPLAY+	20 AWG	TXL	C001-J2 (3)
4	GRN	CAN-ONE LOW	20 AWG	TXL	MS16 (9)
5					
6	BLK	12-8 DISPLAY-	20 AWG	TXL	C001-J2 (18)

SW715-1B EMS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1B	YEL	4-0	18 AWG	GXL	X103 (9)

SW718 JIB LIFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	83-2 JIB DOWN	18 AWG	GXL	C001-J1 (12)
2	YEL	10-0-4 PLAT CNTRL +	18 AWG	GXL	SW726-2 (1)
2	YEL	10-0-5 PLAT CNTRL +	18 AWG	GXL	SW728 (2)
3	WHT	82-2 JIB UP	18 AWG	GXL	C001-J1 (11)
4					
5					
6					

LB732- SOFT TCH/SKYG WARN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	12-7 SKYG LT-	18 AWG	GXL	C001-J2 (25)

SW707 BOOM TELE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	79-2 TELE OUT	18 AWG	GXL	C001-J1 (6)
2	YEL	10-0-10 PLAT CNTRL +	18 AWG	GXL	SW733 (2)
2	YEL	10-0-11 PLAT CNTRL +	18 AWG	GXL	SW731 (3)
3	WHT	78-2 TELE IN	18 AWG	GXL	C001-J1 (5)
4					
5					
6					

SW726-1 HEAD&TAIL LT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	500-3 HEAD LIGHTS	18 AWG	GXL	C001-J1 (30)

SW726-2 HEAD&TAIL LT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	10-0-3 PLAT CNTRL +	18 AWG	GXL	SW727 (2)
1	YEL	10-0-4 PLAT CNTRL +	18 AWG	GXL	SW718 (2)

LB732+ SOFT TCH/SKYG WARN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	504-2 SOFT TCH/SKYG LT	18 AWG	GXL	C001-J2 (16)

SW710 START AUX					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	93-2 AUX POWER	18 AWG	GXL	C001-J1 (15)
2	YEL	10-0-6 PLAT CNTRL +	18 AWG	GXL	SW728 (2)
2	YEL	10-0-7 PLAT CNTRL +	18 AWG	GXL	SW709 (2)
3	WHT	100-2 START SWITCH	18 AWG	GXL	C001-J1 (14)
4					
5					
6					

SW728 DRIVE ORNT OVRIDE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	51-2 DRV ORENTION SW	18 AWG	GXL	C001-J2 (4)
2	YEL	10-0-5 PLAT CNTRL +	18 AWG	GXL	SW718 (2)
2	YEL	10-0-6 PLAT CNTRL +	18 AWG	GXL	SW710 (2)
3					
4					
5					
6					

SW733 CAPACITY					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	54-5 FULL EXTENTION	18 AWG	GXL	C001-J1 (19)
2	YEL	10-0-10 PLAT CNTRL +	18 AWG	GXL	SW707 (2)
2	YEL	10-0-9 PLAT CNTRL +	18 AWG	GXL	SW708 (2)
3	WHT	54-2 CAPACITY	18 AWG	GXL	C001-J1 (21)
4					
5					
6					

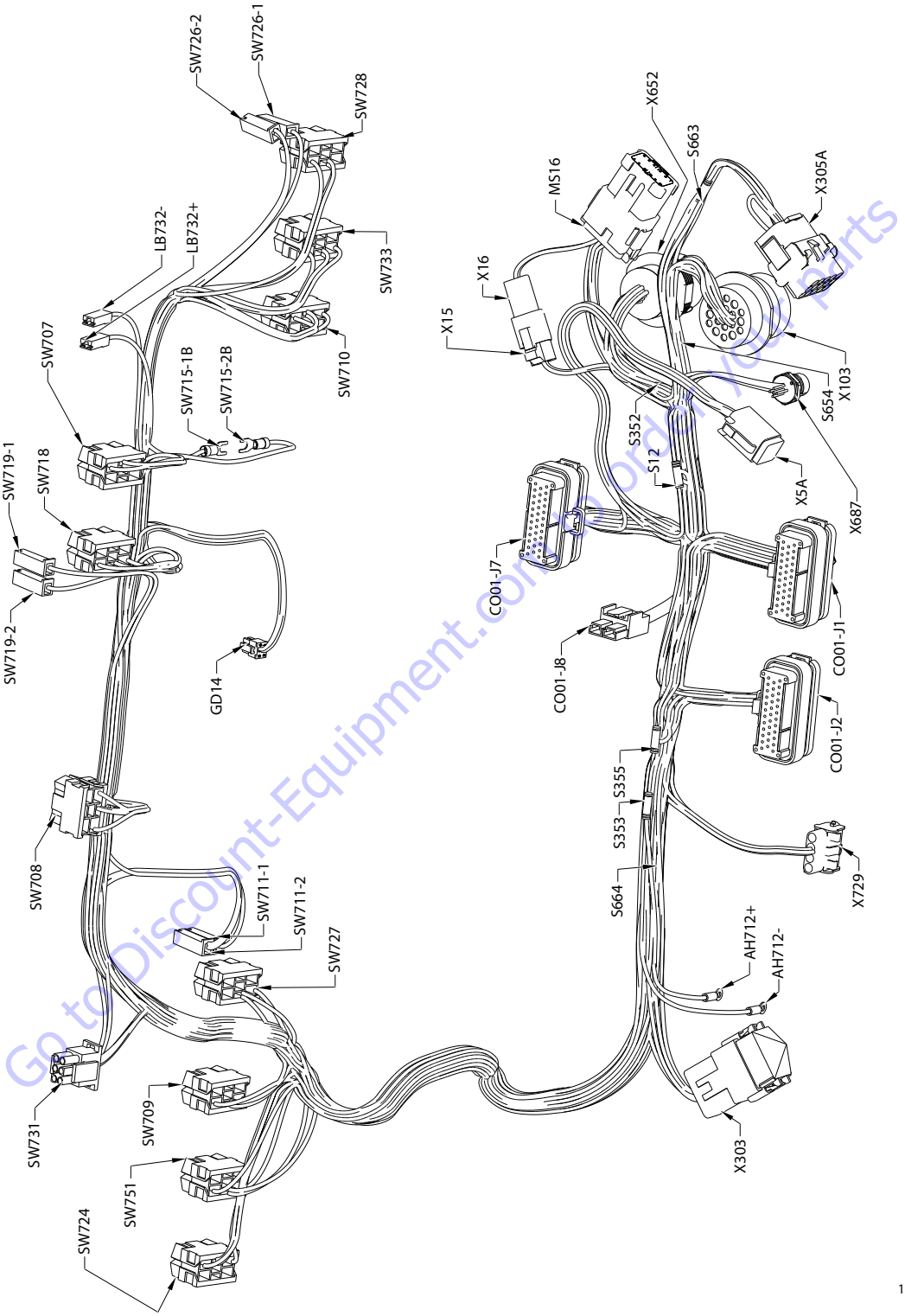

Figure 7-26. Platform Box Harness - Sheet 6 of 6

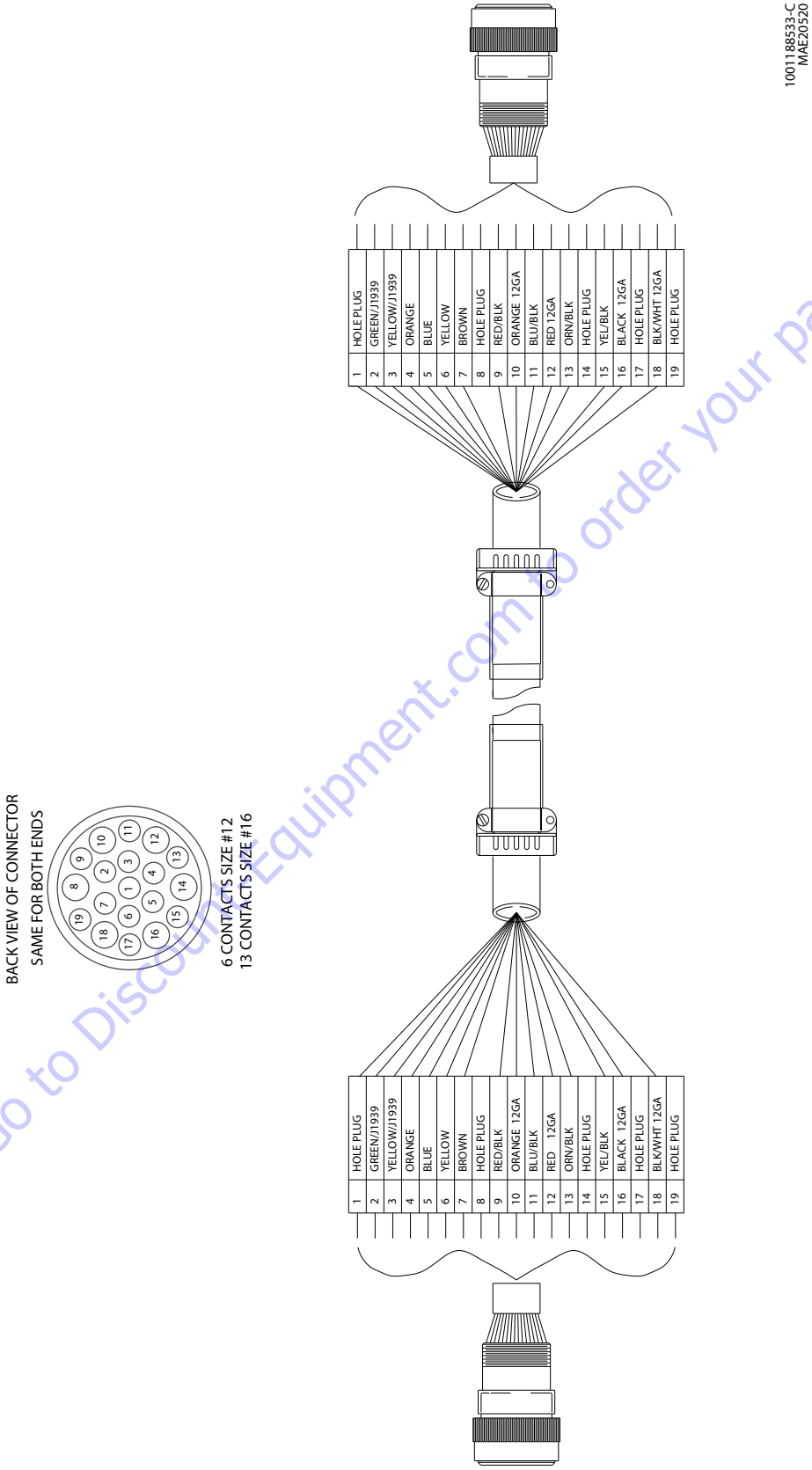

Figure 7-27. Main Boom Harness (Without Jib)

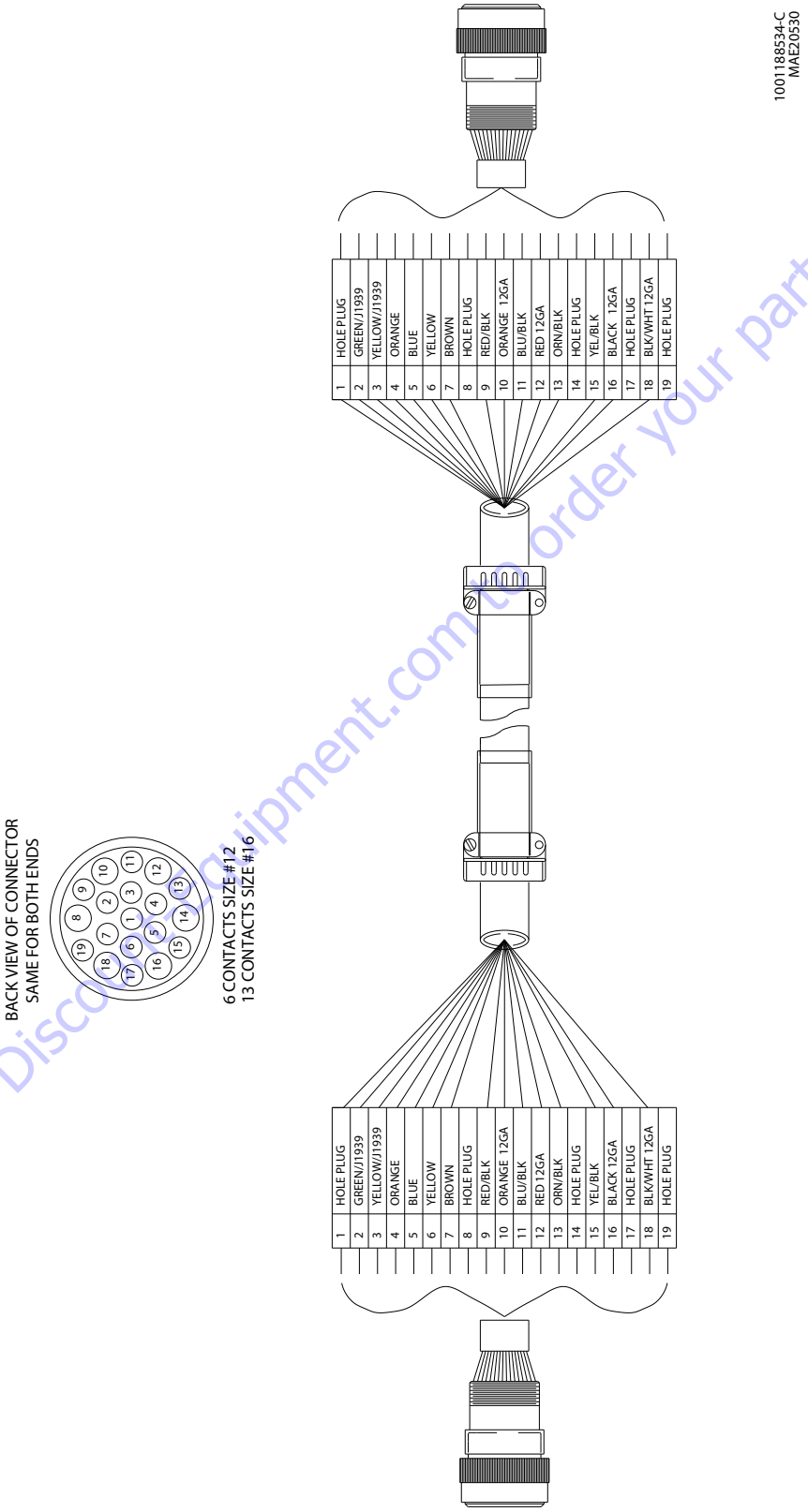

Figure 7-28. Main Boom Harness (With Jib)

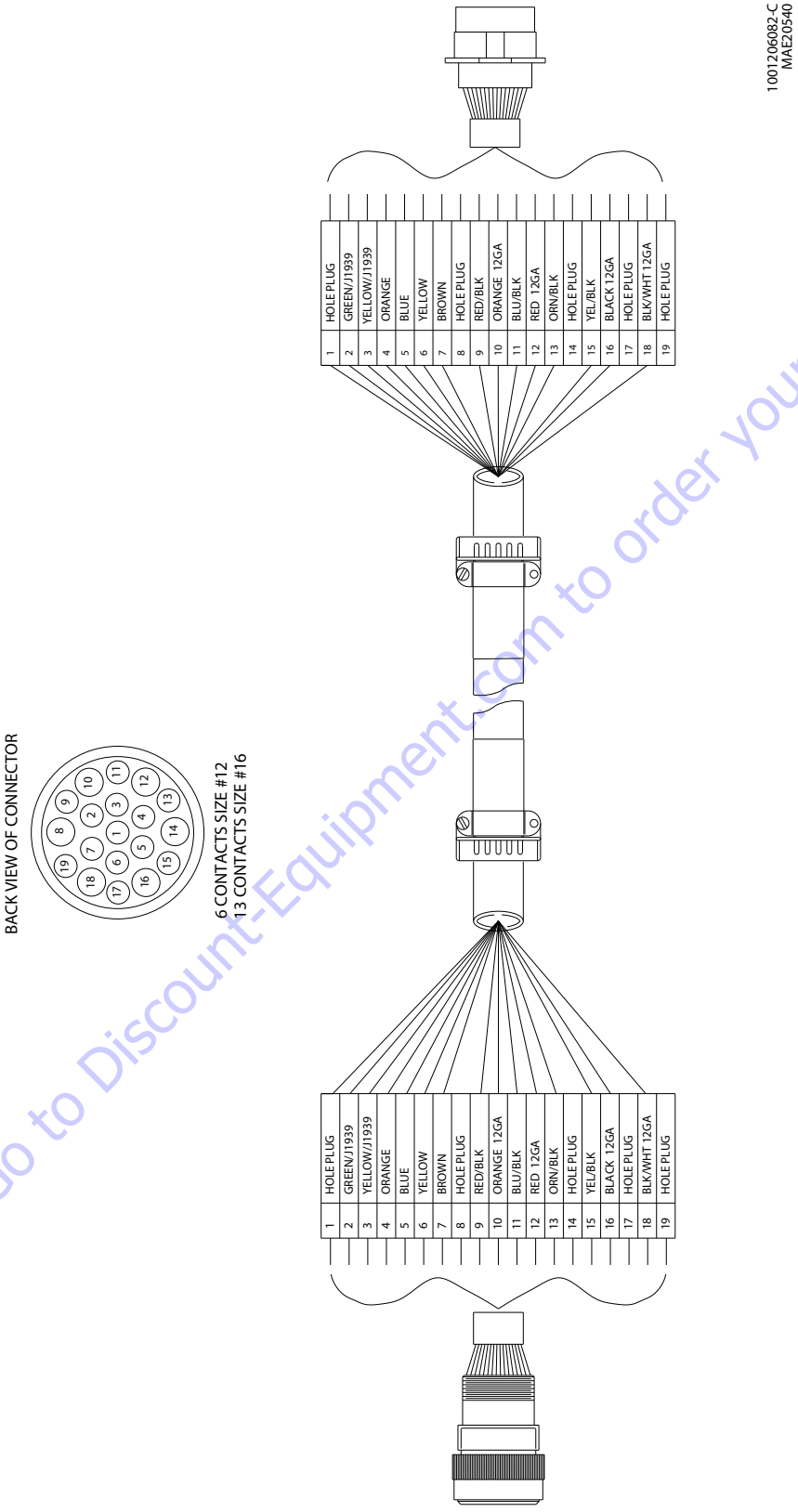

Figure 7-29. Main Boom Harness (TT)

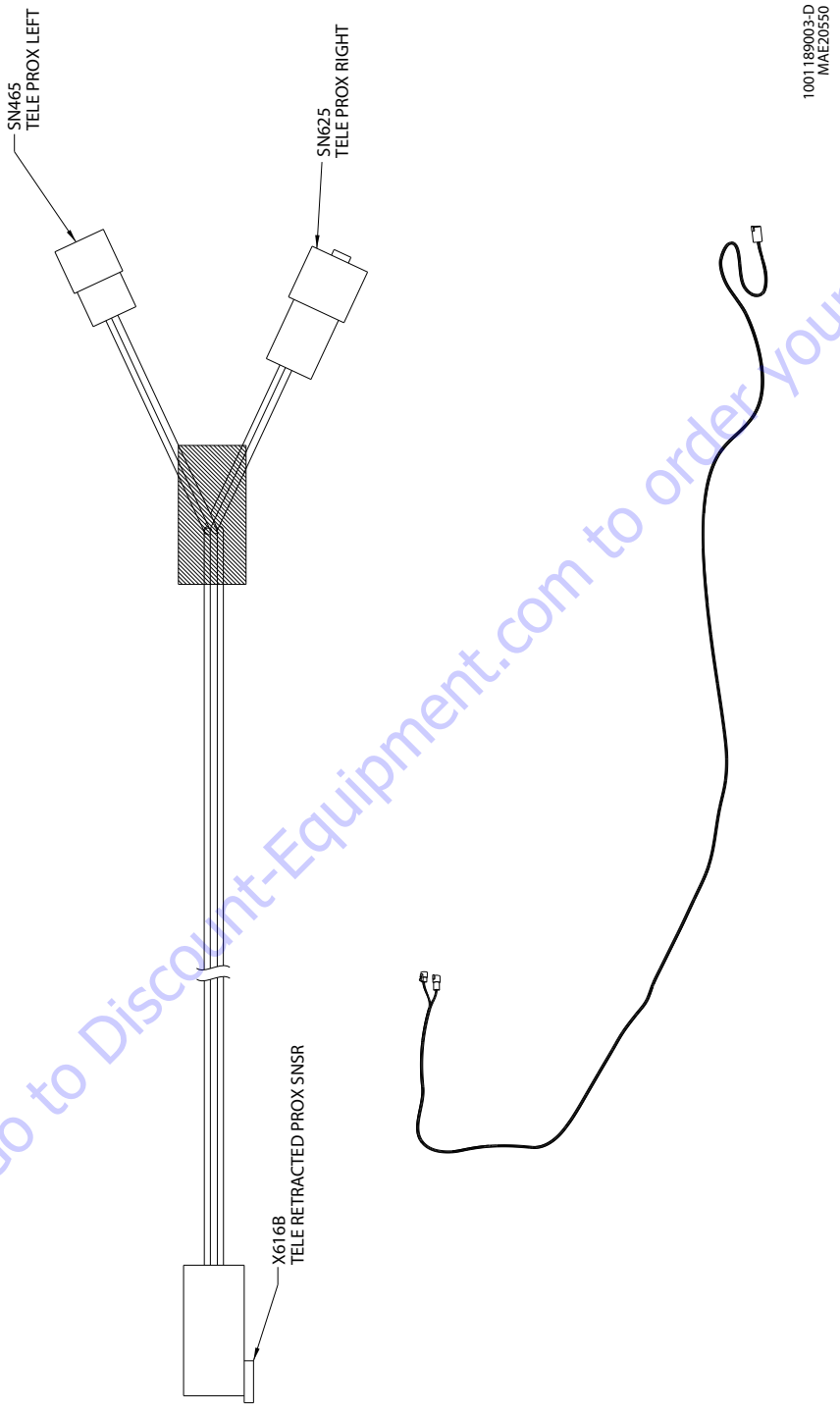

Figure 7-30. Proximity Switch Harness (Telescope In)

X616B TELE RETRACTED PROX SNSR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	ORN/BLK	CABLE CABLE	18 AWG	TFFN	SN465 (1)
2	BLK/RED	CABLE CABLE	18 AWG	TFFN	SN465 (3)
3	BLU/RED	CABLE CABLE	18 AWG	TFFN	SN465 (2)
4	YEL/BLK	CABLE CABLE	18 AWG	TFFN	SN625 (1)
5	BRN/BLK	CABLE CABLE	18 AWG	TFFN	SN625 (3)
6	BLU/BLK	CABLE CABLE	18 AWG	TFFN	SN625 (2)

SN625 TELE PROX RIGHT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL/BLK	CABLE CABLE	18 AWG	TFFN	X616B (4)
2	BLU/BLK	CABLE CABLE	18 AWG	TFFN	X616B (6)
3	BRN/BLK	CABLE CABLE	18 AWG	TFFN	X616B (5)

SN465 TELE PROX LEFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	ORN/BLK	CABLE CABLE	18 AWG	TFFN	X616B (1)
2	BLU/RED	CABLE CABLE	18 AWG	TFFN	X616B (3)
3	BLK/RED	CABLE CABLE	18 AWG	TFFN	X616B (2)

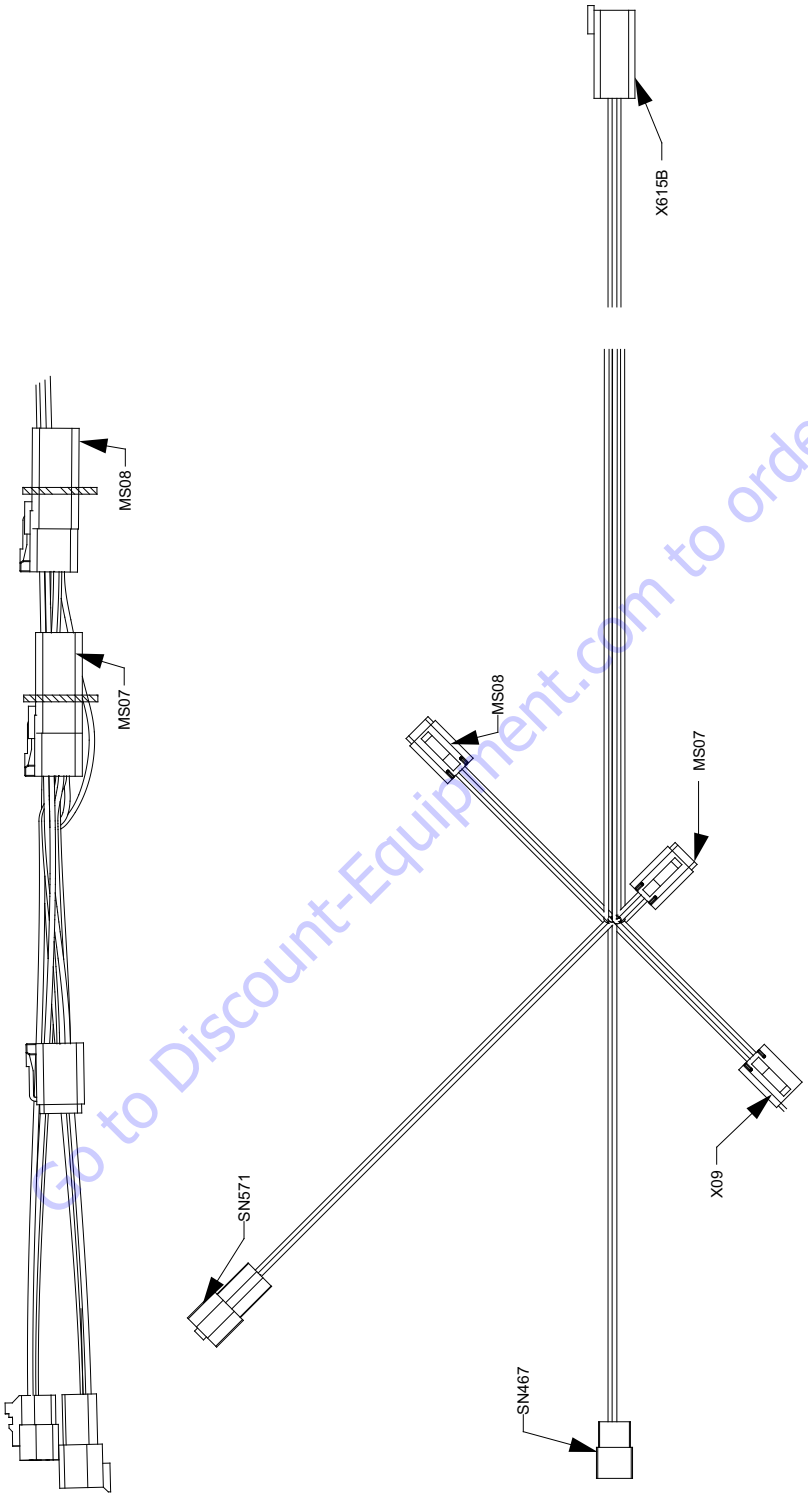

Figure 7-31. Boom Sensor Cable

SN571 CAPACITY LENGTH NC 2					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	7	18 AWG	GXL	MS07 (4)
2	BLU-BLK	114	18 AWG	TFFN	X615B (6)
3	BLK	5	18 AWG	GXL	MS08 (4)

X09 TO FULL EXTENSION					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	4	18 AWG	GXL	MS07 (2)
2	ORG-BLK	110	18 AWG	TFFN	X615B (4)
3	BLK	2	18 AWG	GXL	MS08 (2)
4	YEL	3	18 AWG	GXL	MS07 (1)
5	BLK-RED	112	18 AWG	TFFN	X615B (5)
6	BLK	1	18 AWG	GXL	MS08 (1)

SN467 CAPACITY LENGTH NO 1					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	8	18 AWG	GXL	MS07 (5)
2	BLU-RED	111	18 AWG	TFFN	X615B (3)
3	BLK	6	18 AWG	GXL	MS08 (5)

X615B CAP LENGTH PROX SENSOR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL-BLK	113	18 AWG	TFFN	MS07 (3)
2	BRN-BLK	115	18 AWG	TFFN	MS08 (3)
3	BLU-RED	111	18 AWG	TFFN	SN467 (2)
4	ORG-BLK	110	18 AWG	TFFN	X09 (2)
5	BLK-RED	112	18 AWG	TFFN	X09 (5)
6	BLU-BLK	114	18 AWG	TFFN	SN571 (2)

MS08 GND BUSS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	1	18 AWG	GXL	X09 (6)
2	BLK	2	18 AWG	GXL	X09 (3)
3	BRN-BLK	115	18 AWG	TFFN	X615B (2)
4	BLK	5	18 AWG	GXL	SN571 (3)
5	BLK	6	18 AWG	GXL	SN467 (3)
6					

MS07 PWR BUSS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	3	18 AWG	GXL	X09 (4)
2	YEL	4	18 AWG	GXL	X09 (1)
3	YEL-BLK	113	18 AWG	TFFN	X615B (1)
4	YEL	7	18 AWG	GXL	SN571 (1)
5	YEL	8	18 AWG	GXL	SN467 (1)
6					

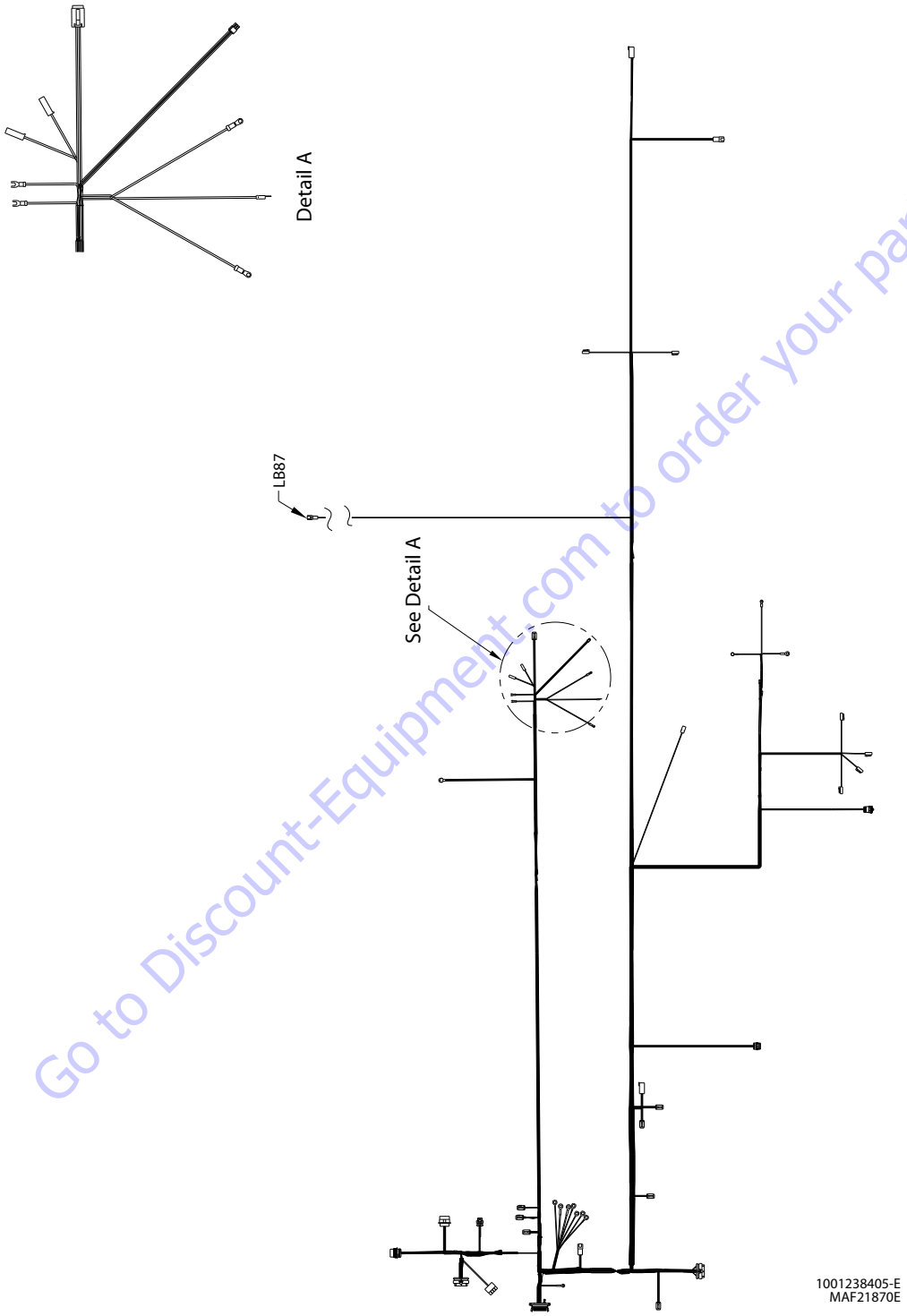

Figure 7-32. Turntable Harness - Sheet 1 of 7

LB87 STROBE LIGHT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	2-11	18 AWG	GXL	FC155 (A4)
2	BLK	0-11	18 AWG	GXL	X127 (1)

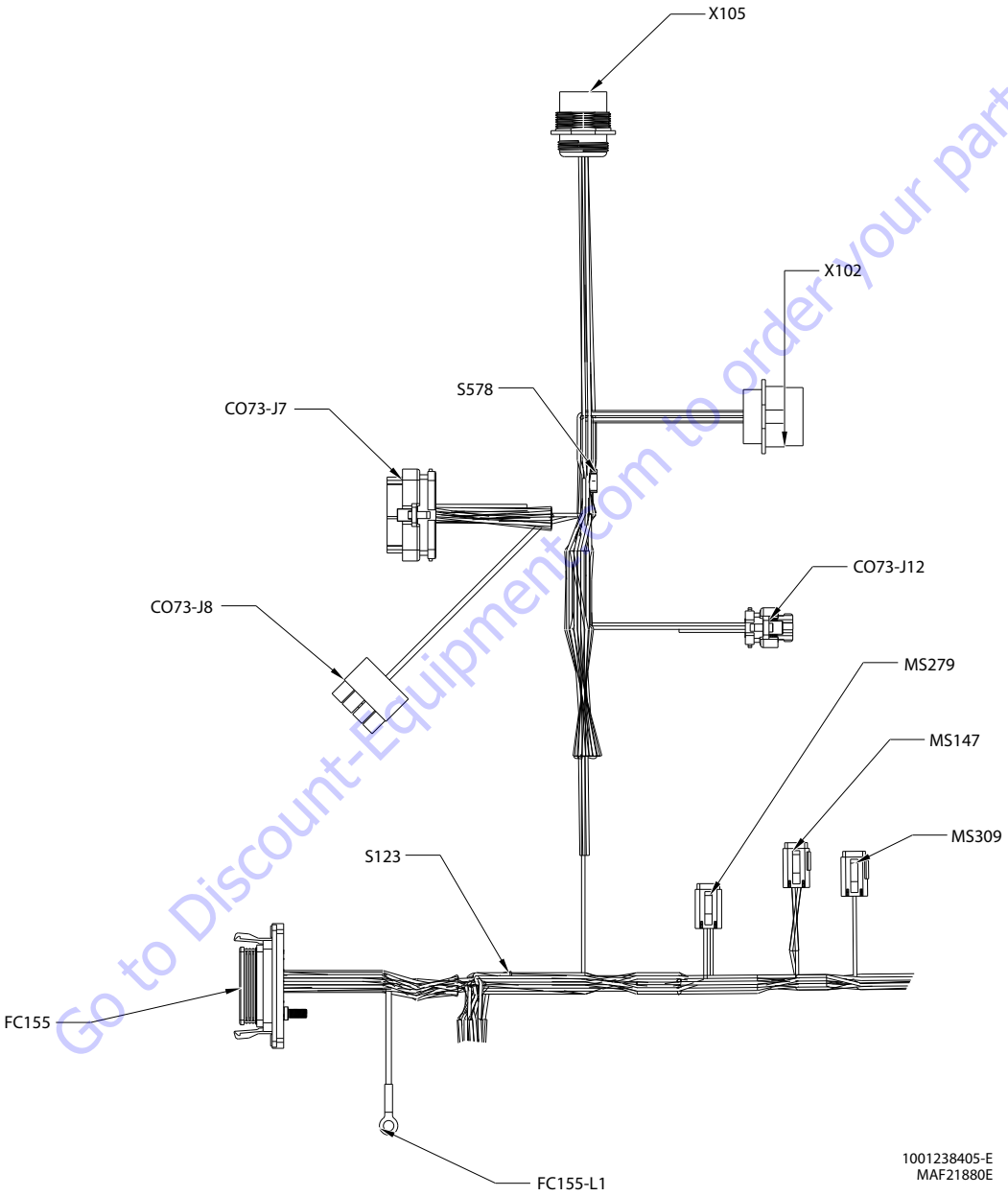

Figure 7-33. Turntable Harness - Sheet 2 of 7

FC155 FUSE BOX					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A1	YEL	2-5	12 AWG	GXL	C073-J8 (2)
A10					
A2	YEL	2-7	12 AWG	GXL	X102 (12)
A3	YEL	2-9	18 AWG	GXL	X183A (1)
A4	YEL	2-11	18 AWG	GXL	LB87 (1)
A5	YEL	2-15	18 AWG	GXL	X113 (1)
A6	YEL	2-13	18 AWG	GXL	X105 (H)
A7	YEL	2-14	18 AWG	GXL	X117 (3)
A8					
A9					
B1	RED	1-2	12 AWG	GXL	S125 (2)
B10					
B2	WHT	6-3 IGN PWR ENABLE	18 AWG	GXL	S120 (1)
B3	RED	1-4	12 AWG	GXL	S124 (2)
B4	WHT	6-4 IGN PWR ENABLE	18 AWG	GXL	S120 (1)
B5					
B8					
C10	WHT	9-0-1 PLAT MODE/ GND ENABLE	18 AWG	GXL	S85 (2)
C2					
C4					
C5					
C6	YEL	4-2 PLAT STAT	18 AWG	GXL	X117 (4)
C7	RED	1-0	18 AWG	GXL	S136 (2)
C8	RED	1-5	18 AWG	GXL	S135 (2)
C9	YEL	3-0	18 AWG	GXL	SW83-1 (1)
D1	BLK	0-1-1	18 AWG	GXL	S123 (2)
D10	WHT	6-1 IGN PWR ENABLE	18 AWG	GXL	S120 (2)
D2	YEL	2-2	12 AWG	GXL	FC155-L1 (L1)
D3	BLK	0-1-3	18 AWG	GXL	S123 (2)
D4	YEL	2-4	12 AWG	GXL	FC155-L1 (L1)
D5					
D6	YEL	4-1	18 AWG	GXL	SW83-3 (1)
D7	RED	1-1	18 AWG	GXL	SW84-2A (2A)
D8	RED	1-7	18 AWG	GXL	S578 (1)
D9	WHT	6-0 IGN PWR ENABLE	18 AWG	GXL	S120 (2)

FC155-L1 FUSE BLK IGN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
L1	YEL	2-2	12 AWG	GXL	FC155 (D2)
L1	YEL	2-4	12 AWG	GXL	FC155 (D4)

S123					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-1	18 AWG	GXL	X129 (1)
2	BLK	0-1-1	18 AWG	GXL	FC155 (D1)
2	BLK	0-1-3	18 AWG	GXL	FC155 (D3)

MS279 PROX BUSS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	14-1-3 TELE PROX +	18 AWG	GXL	X616 (4)
2	YEL	14-1-1 TELE PROX +	18 AWG	GXL	X616 (1)
3	BLK	16-1-3 TELE PROX -	18 AWG	GXL	X616 (5)
4	BLK	16-1-1 TELE PROX -	18 AWG	GXL	X616 (2)
5	BLK	16-1 TELE PROX -	18 AWG	GXL	C073-J7 (28)
6	BLK	16-1-2 TELE PROX -	18 AWG	GXL	X615 (2)
7	YEL	14-1 TELE PROX +	18 AWG	GXL	C073-J7 (33)
8	YEL	14-1-2 TELE PROX +	18 AWG	GXL	X615 (1)

MS147 CAN CHANNEL 1					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3	YEL	CAN-ONE HIGH	18 AWG	GXL	X102 (3)
4	GRN	CAN-ONE LOW	18 AWG	GXL	X102 (2)
5	GRN	CAN-ONE LOW	18 AWG	GXL	C073-J7 (24)
6					
7	GRN	CAN-ONE LOW	18 AWG	GXL	SN476 (4)
8	GRN	CAN-ONE LOW	20 AWG	TXL	GD174 (4)
9					
10	YEL	CAN-ONE HIGH	18 AWG	GXL	C073-J7 (13)
11	YEL	CAN-ONE HIGH	20 AWG	TXL	GD174 (1)
12	YEL	CAN-ONE HIGH	18 AWG	GXL	SN476 (3)

S578					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-7	18 AWG	GXL	FC155 (D8)
2	RED	1-6	18 AWG	GXL	X105 (B)
2	RED	1-7	18 AWG	GXL	X117 (1)

MS309 CAN CHANNEL 2					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	GRN	CAN-TWO LOW	18 AWG	GXL	GD169 (4)
3	GRN	CAN-TWO LOW	18 AWG	GXL	C073-J12 (4)
4	YEL	CAN-TWO HIGH	18 AWG	GXL	GD169 (3)
5	YEL	CAN-TWO HIGH	18 AWG	GXL	C073-J12 (3)
6					
7					
8	YEL	CAN-TWO HIGH	18 AWG	GXL	X183A (3)
9	YEL	CAN-TWO HIGH	18 AWG	GXL	X105 (C)
10					
11	GRN	CAN-TWO LOW	18 AWG	GXL	X183A (4)
12	GRN	CAN-TWO LOW	18 AWG	GXL	X105 (D)

C073-J12 UGM-J12					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3	YEL	CAN-TWO HIGH	18 AWG	GXL	MS309 (5)
4	GRN	CAN-TWO LOW	18 AWG	GXL	MS309 (3)
5					
6	WHT	4-96 CAN2 TERM	18 AWG	GXL	C073-J12 (7)
7	WHT	4-96 CAN2 TERM	18 AWG	GXL	C073-J12 (6)
8	WHT	507-0 MSSO INPUT	18 AWG	GXL	SW114-1 (1)

C073-J8 UGM J8					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-5	12 AWG	GXL	X131 (1)
2	YEL	2-5	12 AWG	GXL	FC155 (A1)
3					
4					

C073-J7 UGM J7					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	9-0-2 PLAT MODE/ GND ENABLE	18 AWG	GXL	S85 (1)
2	WHT	9-0-3 PLAT MODE/ GND ENABLE	18 AWG	GXL	S85 (1)
3	YEL	3-1	18 AWG	GXL	SW83-1 (1)
4	WHT	60-0 ANGLE SNSR 1	18 AWG	GXL	X743 (3)
5					
6	WHT	4-133 CAN1 TERM	18 AWG	GXL	C073-J7 (17)
7	WHT	60-1 ANGLE SNSR 2	18 AWG	GXL	X743 (4)
8					
9	BLK	16-0 ANGLE SNSR-	18 AWG	GXL	X743 (1)
10	BLK	16-13TILT -	18 AWG	GXL	SN476 (2)
11					
12					
13	YEL	CAN-ONE HIGH	18 AWG	GXL	MS147 (10)
14	WHT	8-0 GND MODE/PLAT ENABLE	18 AWG	GXL	X102 (11)
15	WHT	7-0 FOOT SW INPUT	18 AWG	GXL	X102 (6)
16	WHT	15-0 ANGLE SNSR 5V+	18 AWG	GXL	X743 (2)
17	WHT	4-133 CAN1 TERM	18 AWG	GXL	C073-J7 (6)
18					
19					
20					
21	WHT	53-1 NO TRANSPORT LNTH	18 AWG	GXL	X616 (3)
22	WHT	108-1 WIF	18 AWG	GXL	X181A (8)
23	WHT	54-0 NO CAPACITY LNTH	18 AWG	GXL	X615 (3)
24	GRN	CAN-ONELOW	18 AWG	GXL	MS147 (5)
25	BLK	16-5 DISPLAY -	18 AWG	GXL	S148 (1)
26					
27					
28	BLK	16-1 TELE PROX -	18 AWG	GXL	MS279 (5)
29	YEL	14-4 DISPLAY +	18 AWG	GXL	S153 (1)
30	YEL	14-8-3 WIF +	18 AWG	GXL	X181A (7)
31	YEL	14-11 SERVICE CABLE+	18 AWG	GXL	X171 (4)
32	YEL	14-6 DOS +	18 AWG	GXL	X112 (1)
33	YEL	14-1 TELE PROX +	18 AWG	GXL	MS279 (7)
34	YEL	14-7TILT +	18 AWG	GXL	SN476 (1)
35	WHT	51-0 DOS SW	18 AWG	GXL	X112 (2)

X102 BOOM CABLE CONNECTION					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	GRN	CAN-ONE LOW	18 AWG	GXL	MS147 (4)
3	YEL	CAN-ONE HIGH	18 AWG	GXL	MS147 (3)
4	WHT	9-0 PLAT MODE / GND ENABLE	18 AWG	GXL	S85 (2)
5	WHT	88-1-1 LEVEL UP	18 AWG	GXL	X701A (3)
6	WHT	7-0 FOOT SW INPUT	18 AWG	GXL	C073-J7 (15)
7	WHT	89-1-1 LEVEL DOWN	18 AWG	GXL	X701A (4)
8					
9					
10					
11	WHT	8-0 GND MODE/PLAT ENABLE	18 AWG	GXL	C073-J7 (14)
12	YEL	2-7	12 AWG	GXL	FC155 (A2)
13	WHT	90-1 HI PRS DUMP	18 AWG	GXL	X701A (1)
14					
15	WHT	90-2 LOW PRS DUMP	18 AWG	GXL	X701A (2)
16	BLK	0-7	12 AWG	GXL	X133 (1)
17					
18					
19					

X105 JLG DIAGNOSTIC					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	BLK	0-13	18 AWG	GXL	X127 (1)
B	RED	1-6	18 AWG	GXL	S578 (2)
C	YEL	CAN-TWO HIGH	18 AWG	GXL	MS309 (9)
D	GRN	CAN-TWO LOW	18 AWG	GXL	MS309 (12)
E					
F					
G					
H	YEL	2-13	18 AWG	GXL	FC155 (A6)
J					

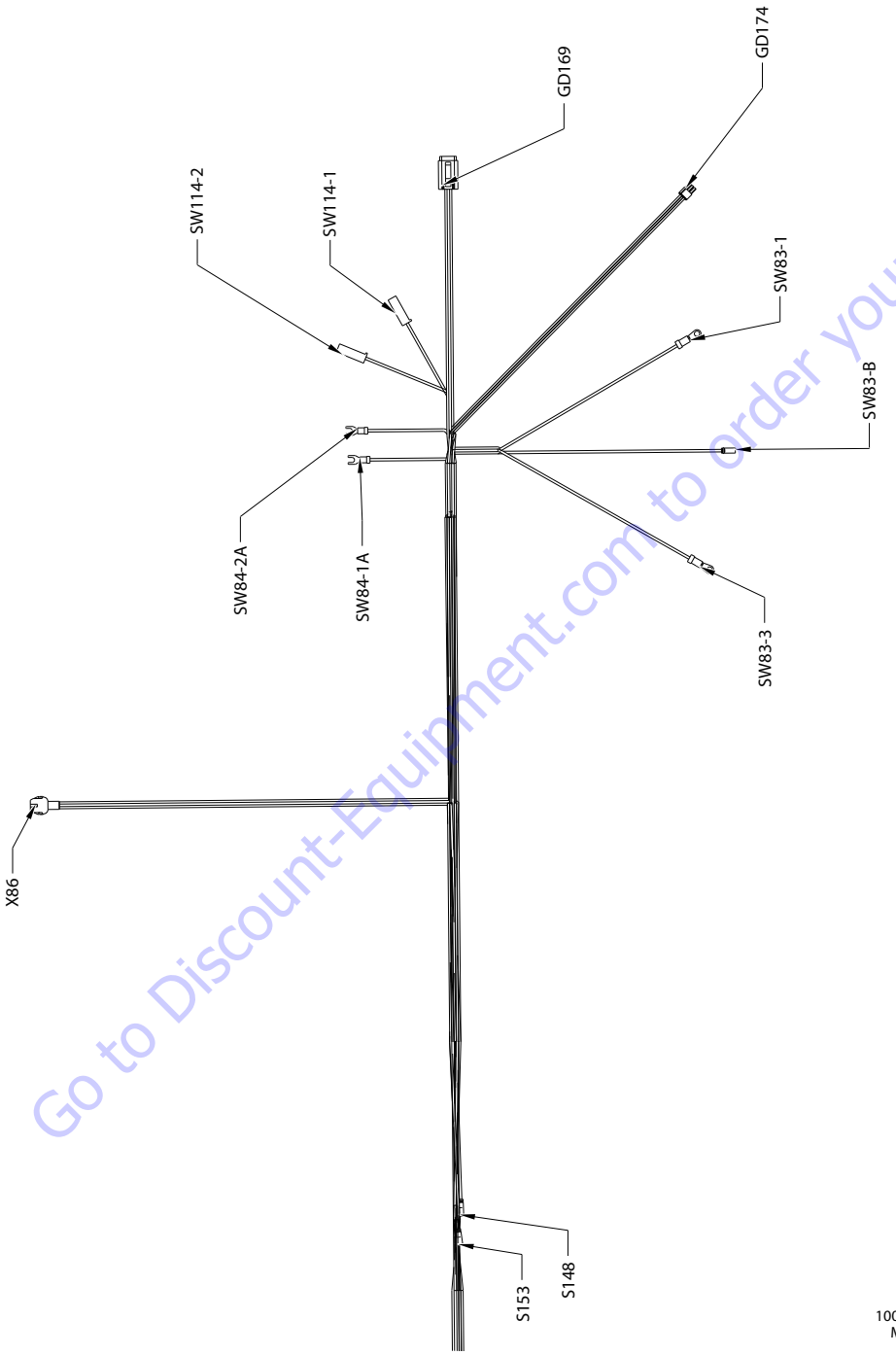

Figure 7-34. Turntable Harness - Sheet 3 of 7

S153					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	14-4 DISPLAY +	18 AWG	GXL	C073-J7 (29)
2	YEL	14-4-1 DISPLAY +	18 AWG	GXL	GD169 (2)
2	YEL	14-4-2 DISPLAY +	20 AWG	TXL	GD174 (3)
2	YEL	14-4-3 DISPLAY +	20 AWG	TXL	GD174 (2)

S148					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	16-5 DISPLAY -	18 AWG	GXL	C073-J7 (25)
2	BLK	16-5-1 DISPLAY -	18 AWG	GXL	GD169 (1)
2	BLK	16-5-2 DISPLAY -	20 AWG	TXL	GD174 (6)

X86 ANALYZER					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	14-2 ANALYZER +	18 AWG	GXL	C073-J1 (28)
2	WHT	13-1 RECEIVE	18 AWG	GXL	C073-J1 (29)
3	WHT	13-2 TRANSMIT	18 AWG	GXL	C073-J1 (30)
4	BLK	16-4 ANALYZER -	18 AWG	GXL	C073-J1 (31)

SW84-1A E-STOP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1A	YEL	2-0	18 AWG	GXL	SW83-B (1)

SW83-3 PLAT MODE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	3-0	18 AWG	GXL	FC155 (C9)
1	YEL	3-1	18 AWG	GXL	C073-J7 (3)

SW83-B KEY SW B+					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	2-0	18 AWG	GXL	SW84-1A (1A)

GD174					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	CAN-ONE HIGH	20 AWG	TXL	MS147 (11)
2	YEL	14-4-3 DISPLAY +	20 AWG	TXL	S153 (2)
3	YEL	14-4-2 DISPLAY +	20 AWG	TXL	S153 (2)
4	GRN	CAN-ONE LOW	20 AWG	TXL	MS147 (8)
5					
6	BLK	16-5-2 DISPLAY -	20 AWG	TXL	S148 (2)

SW84-2A E-STOP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
2A	RED	1-1	18 AWG	GXL	FC155 (D7)

SW114-2 MSSO					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	16-3 MSSO -	18 AWG	GXL	C073-J1 (9)

SW114-1 MSSO					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	507-0 MSSO INPUT	18 AWG	GXL	C073-J12 (8)

GD169 KONGSBERG DISPLAY					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	16-5-1 DISPLAY -	18 AWG	GXL	S148 (2)
2	YEL	14-4-1 DISPLAY +	18 AWG	GXL	S153 (2)
3	YEL	CAN-TWO HIGH	18 AWG	GXL	MS309 (4)
4	GRN	CAN-TWO LOW	18 AWG	GXL	MS309 (2)
5					
6					

SW83-1 GROUND MODE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	4-0	18 AWG	GXL	X102A (9)
1	YEL	4-1	18 AWG	GXL	FC155 (D6)

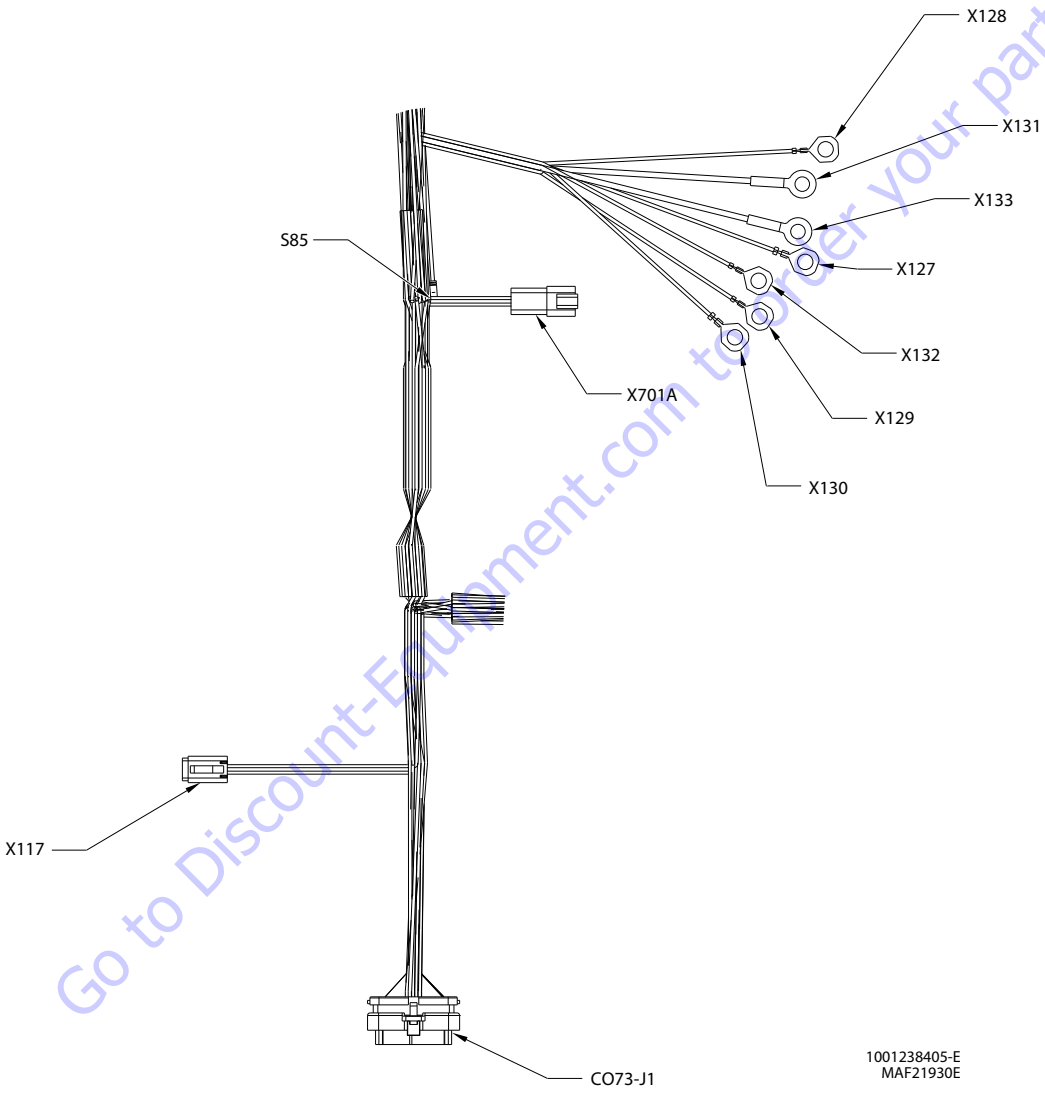

Figure 7-35. Turntable Harness - Sheet 4 of 7

C073-J1 UGM J1					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	WHT	40-2 OSC AXL VLV 2	18 AWG	GXL	HV161 (1)
3	WHT	27-1 DRIVE FORWARD	18 AWG	GXL	HV159 (1)
4					
5	BLK	16-2 BRK/2SPD VLV -	18 AWG	GXL	S80 (2)
6	WHT	28-1 DRIVE REVERSE	18 AWG	GXL	HV160 (1)
7	WHT	40-1 OSC AXL VLV 1	18 AWG	GXL	HV162 (1)
8					
9	BLK	16-3 MSSO -	18 AWG	GXL	SW114-2 (1)
10	WHT	103-0 DELAYED ECU PWR	18 AWG	GXL	X181A (1)
11	WHT	100-1 START	16 AWG	GXL	X183A (2)
12	WHT	102-0 GLOW PLUG	16 AWG	GXL	X181A (4)
13	WHT	93-1 AUX PUMP	18 AWG	GXL	X106 (1)
14					
15					
16					
17					
18					
19					
20	WHT	24-1 TWO SPD	18 AWG	GXL	HV78 (1)
21	WHT	54-6 NC CAPACITY LNTH	18 AWG	GXL	X615 (5)
22	WHT	508-0 GEN ENABLE	18 AWG	GXL	X113 (2)
23	WHT	23-1 BRAKE	18 AWG	GXL	HV79 (1)
24					
25					
26					
27					
28	YEL	14-2 ANALYZER +	18 AWG	GXL	X86 (1)
29	WHT	13-1 RECEIVE	18 AWG	GXL	X86 (2)
30	WHT	13-2 TRANSMIT	18 AWG	GXL	X86 (3)
31	BLK	16-4 ANALYZER -	18 AWG	GXL	X86 (4)
32	WHT	101-0 ALT EXCITE	16 AWG	GXL	X183A (5)
33					
34	WHT	53-0 NC TRANSPORT LNTH	18 AWG	GXL	X616 (6)
35	WHT	54-1 NC CAPACITY LNTH	18 AWG	GXL	X615 (6)

X701A TO MAIN VALVE HARN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-1 HI PRS DUMP	18 AWG	GXL	X102 (13)
2	WHT	90-2 LOW PRS DUMP	18 AWG	GXL	X102 (15)
3	WHT	88-1-1 LEVEL UP	18 AWG	GXL	X102 (5)
4	WHT	89-1-1 LEVEL DOWN	18 AWG	GXL	X102 (7)

S85					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	9-0-2 PLAT MODE/ GND ENABLE	18 AWG	GXL	C073-J7 (1)
1	WHT	9-0-3 PLAT MODE/ GND ENABLE	18 AWG	GXL	C073-J7 (2)
2	WHT	9-0 PLAT MODE/ GND ENABLE	18 AWG	GXL	X102 (4)
2	WHT	9-0-1 PLAT MODE/ GND ENABLE	18 AWG	GXL	FC155 (C10)

X130 GROUND STUD					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-15	18 AWG	GXL	X113 (3)
1	BLK	0-9	18 AWG	GXL	X181A (2)

X117 UNI TELEM					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-7	18 AWG	GXL	S578 (2)
2	BLK	0-2	18 AWG	GXL	X128 (1)
3	YEL	2-14	18 AWG	GXL	FC155 (A7)
4	YEL	4-2 PLAT STAT	18 AWG	GXL	FC155 (C6)

X129 GROUND STUD					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-1	18 AWG	GXL	S123 (1)

X132 GROUND STUD					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-40	18 AWG	GXL	S164 (2)

X127 GROUND STUD					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-11	18 AWG	GXL	LB87 (2)
1	BLK	0-13	18 AWG	GXL	X105 (A)

X133 GROUND STUD					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-7	12 AWG	GXL	X102 (16)

X131 GROUND STUD					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-5	12 AWG	GXL	C073-J8 (1)

X128 GROUND STUD					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-2	18 AWG	GXL	X117 (2)

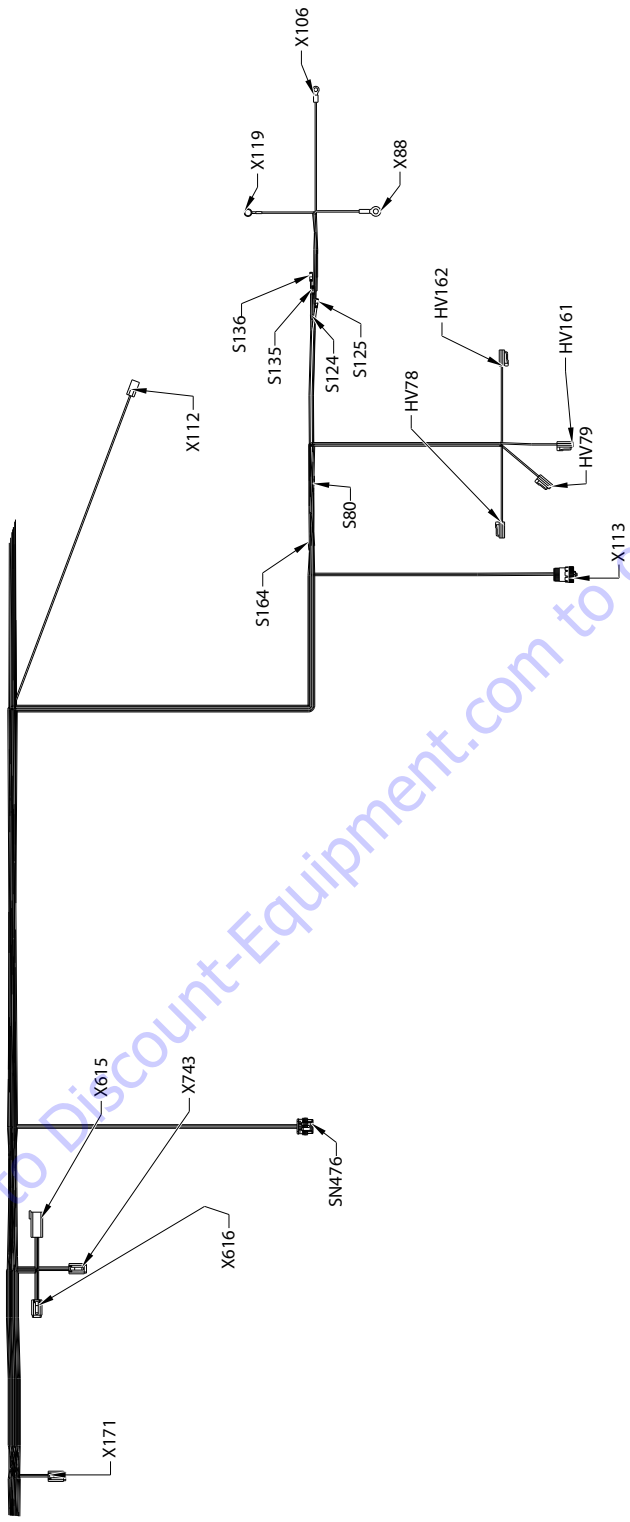

Figure 7-36. Turntable Harness - Sheet 5 of 7

X171 MAIN VALVE INTERFACE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-1 DRV RTN	18 AWG	GXL	S163 (2)
2					
3					
4	YEL	14-11 SERVICE CABLE+	18 AWG	GXL	C073-J7 (31)
5	WHT	54-7 NO CAPACITY LNTH	18 AWG	GXL	X615 (4)
6					

X616 TELESCOPE RETRACTED PROXIMITY SENSOR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	14-1-1 TELE PROX +	18 AWG	GXL	MS279 (2)
2	BLK	16-1-1 TELE PROX -	18 AWG	GXL	MS279 (4)
3	WHT	53-1 NO TRANSPORT LNTH	18 AWG	GXL	C073-J7 (21)
4	YEL	14-1-3 TELE PROX +	18 AWG	GXL	MS279 (1)
5	BLK	16-1-3 TELE PROX -	18 AWG	GXL	MS279 (3)
6	WHT	53-0 NC TRANSPORT LNTH	18 AWG	GXL	C073-J1 (34)

X743 MAIN BOOM ANGLE SENSOR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	16-0 ANGLE SNSR-	18 AWG	GXL	C073-J7 (9)
2	WHT	15-0 ANGLE SNSR 5V+	18 AWG	GXL	C073-J7 (16)
3	WHT	60-0 ANGLE SNSR 1	18 AWG	GXL	C073-J7 (4)
4	WHT	60-1 ANGLE SNSR 2	18 AWG	GXL	C073-J7 (7)

X615 DUAL/TRI CAP LENGTH					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	14-1-2 TELE PROX +	18 AWG	GXL	MS279 (8)
2	BLK	16-1-2 TELE PROX -	18 AWG	GXL	MS279 (6)
3	WHT	54-0 NO CAPACITY LNTH	18 AWG	GXL	C073-J7 (23)
4	WHT	54-7 NO CAPACITY LNTH	18 AWG	GXL	X171 (5)
5	WHT	54-6 NC CAPACITY LNTH	18 AWG	GXL	C073-J1 (21)
6	WHT	54-1 NC CAPACITY LNTH	18 AWG	GXL	C073-J1 (35)

SN476 TILT SENSOR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	14-7 TILT +	18 AWG	GXL	C073-J7 (34)
2	BLK	16-13 TILT -	18 AWG	GXL	C073-J7 (10)
3	YEL	CAN-ONE HIGH	18 AWG	GXL	MS147 (12)
4	GRN	CAN-ONE LOW	18 AWG	GXL	MS147 (7)

X112 DRIVE ORNT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	14-6 DOS +	18 AWG	GXL	C073-J7 (32)
2	WHT	51-0 DOS SW	18 AWG	GXL	C073-J7 (35)

X113 GENERATOR CONNECTOR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	2-15	18 AWG	GXL	FC155 (A5)
2	WHT	508-0 GEN ENABLE	18 AWG	GXL	C073-J1 (22)
3	BLK	0-15	18 AWG	GXL	X130 (1)

S164					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-40-1	18 AWG	GXL	HV161 (2)
1	BLK	0-40-2	18 AWG	GXL	HV162 (2)
2	BLK	0-40	18 AWG	GXL	X132 (1)

S80					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	16-2-1 BRK/2SPD VLV -	18 AWG	GXL	HV79 (2)
1	BLK	16-2-2 BRK/2SPD VLV -	18 AWG	GXL	HV78 (2)
2	BLK	16-2 BRK/2SPD VLV -	18 AWG	GXL	C073-J1 (5)

HV78 2 SPEED					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	24-1 TWO SPD	18 AWG	GXL	C073-J1 (20)
2	BLK	16-2-2 BRK/2SPD VLV -	18 AWG	GXL	S80 (1)

HV79 BRAKE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	23-1 BRAKE	18 AWG	GXL	C073-J1 (23)
2	BLK	16-2-1 BRK/2SPD VLV -	18 AWG	GXL	S80 (1)

HV161 OSC AXLE #2					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	40-2 OSC AXL VLV 2	18 AWG	GXL	C073-J1 (2)
2	BLK	0-40-1	18 AWG	GXL	S164 (1)

HV162 OSC AXLE #1					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	40-1 OSC AXL VLV 1	18 AWG	GXL	C073-J1 (7)
2	BLK	0-40-2	18 AWG	GXL	S164 (1)

X119 SYSTEM B+					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1		03	20 AWG	FUSIBLE LINK	S136 (1)
1		04	20 AWG	FUSIBLE LINK	S135 (1)

X106 AUX PUMP COIL					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	93-1 AUX PUMP	18 AWG	GXL	C073-J1 (13)

X88 SYSTEM B+					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1		01	16 AWG	FUSIBLE LINK	S125 (1)
1		02	16 AWG	FUSIBLE LINK	S124 (1)

S124					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1		02	16 AWG	FUSIBLE LINK	X88 (1)
2	RED	1-4	12 AWG	GXL	FC155 (B3)

S125					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1		01	16 AWG	FUSIBLE LINK	X88 (1)
2	RED	1-2	12 AWG	GXL	FC155 (B1)

S135					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1		04	20 AWG	FUSIBLE LINK	X119 (1)
2	RED	1-5	18 AWG	GXL	FC155 (C8)

S136					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1		03	20 AWG	FUSIBLE LINK	X119 (1)
2	RED	1-0	18 AWG	GXL	FC155 (C7)

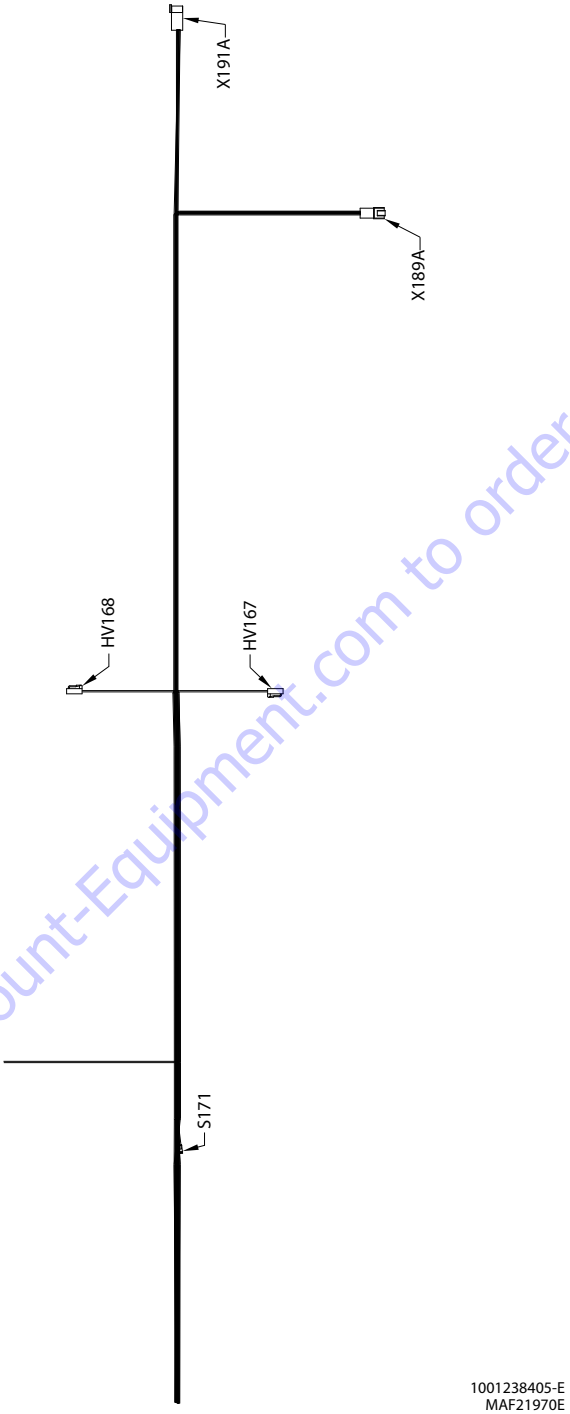

Figure 7-37. Turntable Harness - Sheet 6 of 7

HV160 DRIVE REVERSE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	28-1 DRIVE REVERSE	18 AWG	GXL	C073-J1 (6)
2	WHT	50-1-1 DRV RTN	18 AWG	GXL	S163 (1)

HV159 DRIVE FORWARD					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	27-1 DRIVE FORWARD	18 AWG	GXL	C073-J1 (3)
2	WHT	50-1-2 DRV RTN	18 AWG	GXL	S163 (1)

X181A ENGINE CONNETOR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	103-0 DELAYED ECU PWR	18 AWG	GXL	C073-J1 (10)
2	BLK	0-9	18 AWG	GXL	X130 (1)
3					
4	WHT	102-0 GLOW PLUG	16 AWG	GXL	C073-J1 (12)
5					
6					
7	YEL	14-8-3 WIF +	18 AWG	GXL	C073-J7 (30)
8	WHT	108-1 WIF	18 AWG	GXL	C073-J7 (22)

S163					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-1-1 DRV RTN	18 AWG	GXL	HV160 (2)
1	WHT	50-1-2 DRV RTN	18 AWG	GXL	HV159 (2)
2	WHT	50-1 DRV RTN	18 AWG	GXL	X171 (1)

X183A ENGINE CONNECTOR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	2-9	18 AWG	GXL	FC155 (A3)
2	WHT	100-1 START	16 AWG	GXL	C073-J1 (11)
3	YEL	CAN-TWO HIGH	18 AWG	GXL	MS309 (8)
4	GRN	CAN-TWO LOW	18 AWG	GXL	MS309 (11)
5	WHT	101-0 ALT EXCITE	16 AWG	GXL	C073-J1 (32)
6					

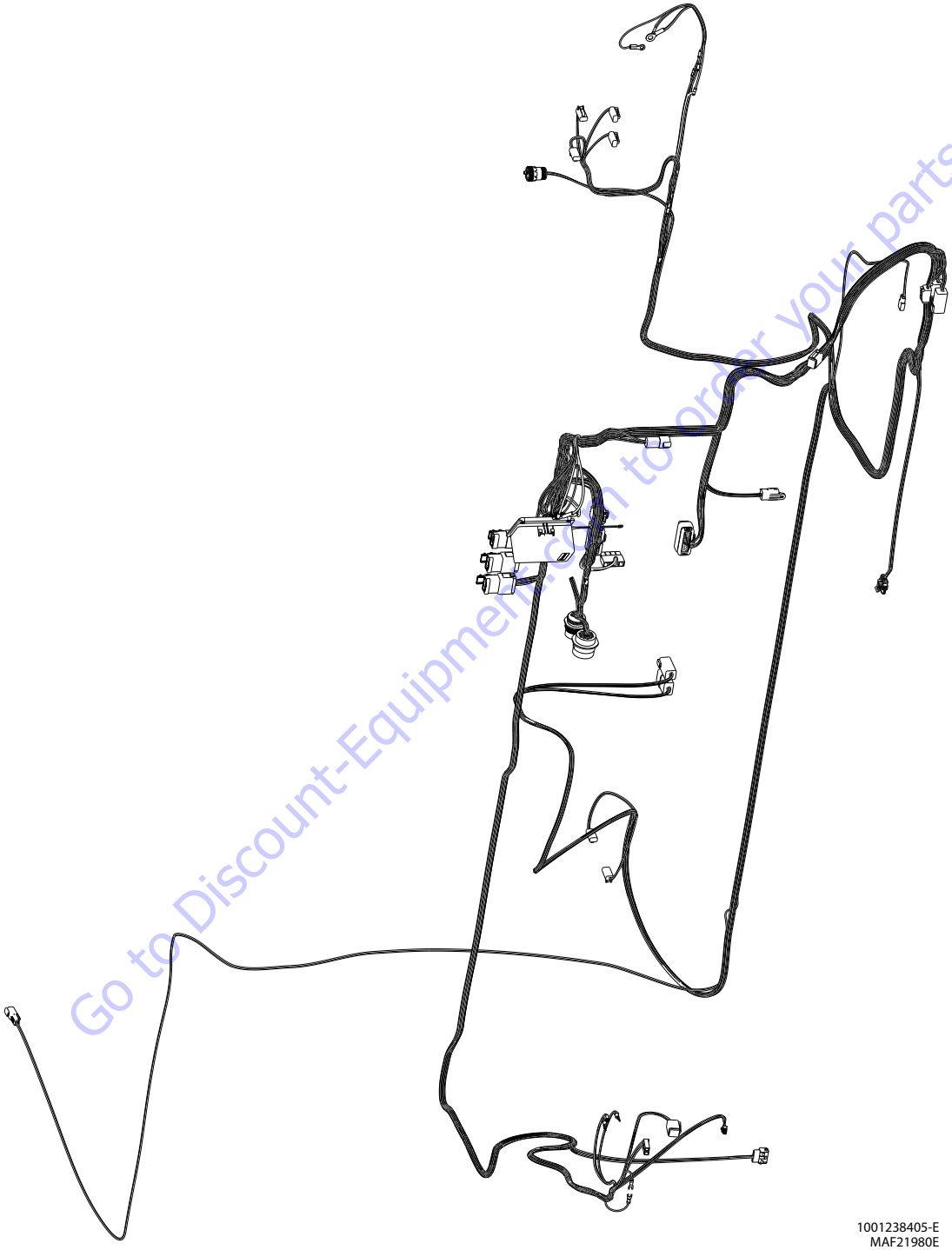

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Figure 7-38. Turntable Harness - Sheet 7 of 7

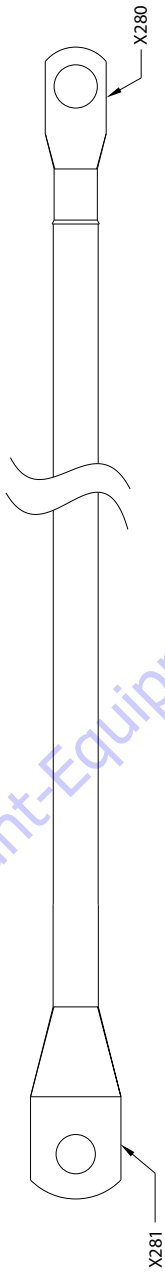


Figure 7-39. Universal Ground Control Module Harness

X281 12V BATTERY STUD					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	1 GND	2 AWG	EPDM	X280 (1)

X280 12V BATTERY STUD					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	1 GND	2 AWG	EPDM	X281 (1)

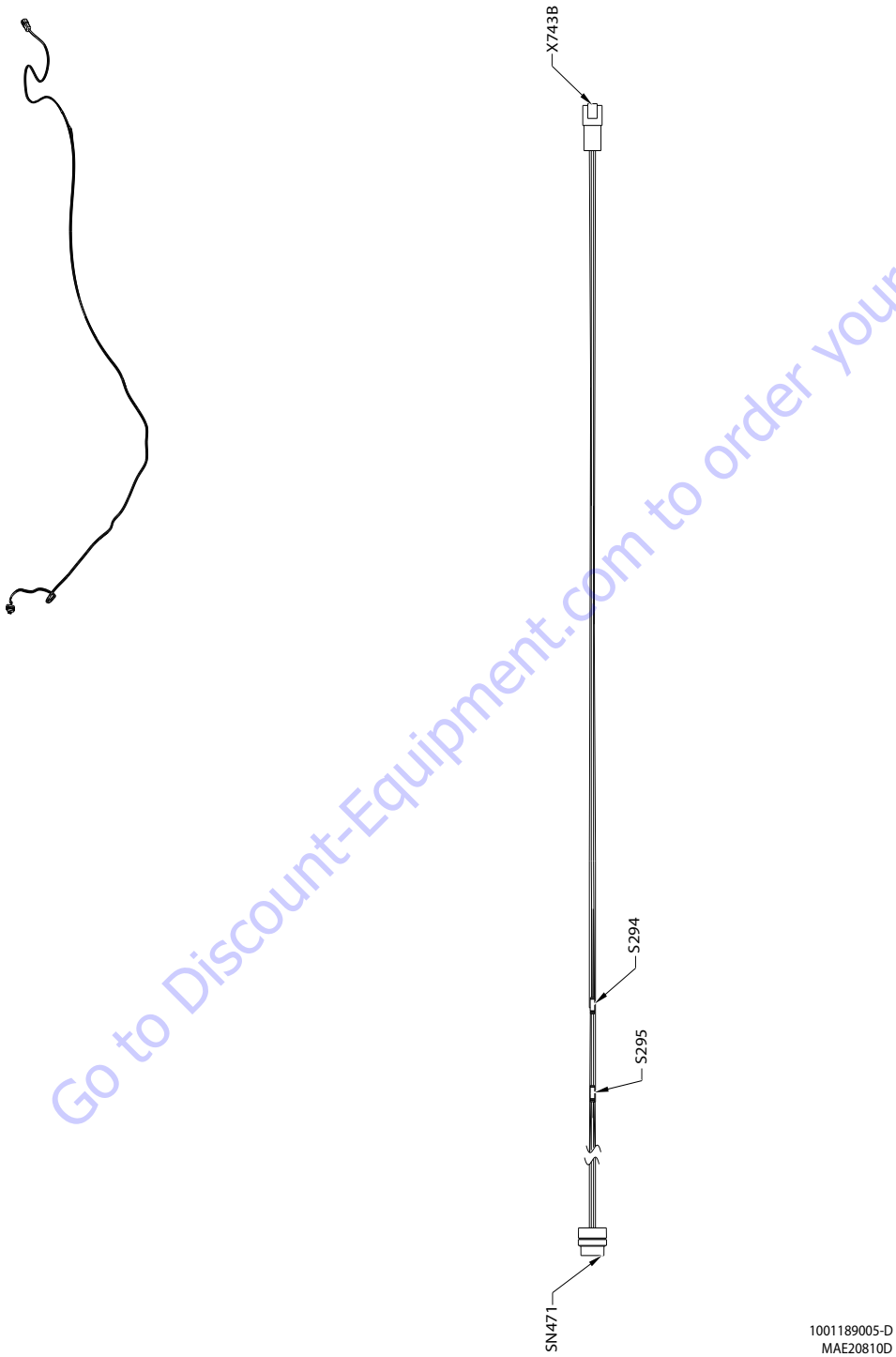


Figure 7-40. Boom Angle Sensor Harness

S294					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	4-108 PWR 5V	18 AWG	GXL	X743B (2)
2	ORN/BLK	4-106 PWR 5V	18 AWG	TFFN	SN471 (B)
2	YEL/BLK	4-112 PWR 5V	18 AWG	TFFN	SN471 (F)

S295					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	000-40-76 GND	18 AWG	GXL	X743B (1)
2	BLK/RED	000-40-78 GND	18 AWG	TFFN	SN471 (A)
2	BRN/BLK	000-40-79 GND	18 AWG	TFFN	SN471 (E)

SN471					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	BLK/RED	000-40-78 GND	18 AWG	TFFN	S295 (2)
B	ORN/BLK	4-106 PWR 5V	18 AWG	TFFN	S294 (2)
C	BLU/BLK	4-86 BM ANGLE SEN 1	18 AWG	TFFN	X743B (3)
D	BLU/RED	4-87 BM ANGLE SEN 2	18 AWG	TFFN	X743B (4)
E	BRN/BLK	000-40-79 GND	18 AWG	TFFN	S295 (2)
F	YEL/BLK	4-112 PWR 5V	18 AWG	TFFN	S294 (2)

X743B					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	000-40-76 GND	18 AWG	GXL	S295 (1)
2	WHT	4-108 PWR 5V	18 AWG	GXL	S294 (1)
3	BLU/BLK	4-86 BM ANGLE SEN 1	18 AWG	TFFN	SN471 (C)
4	BLU/RED	4-87 BM ANGLE SEN 2	18 AWG	TFFN	SN471 (D)

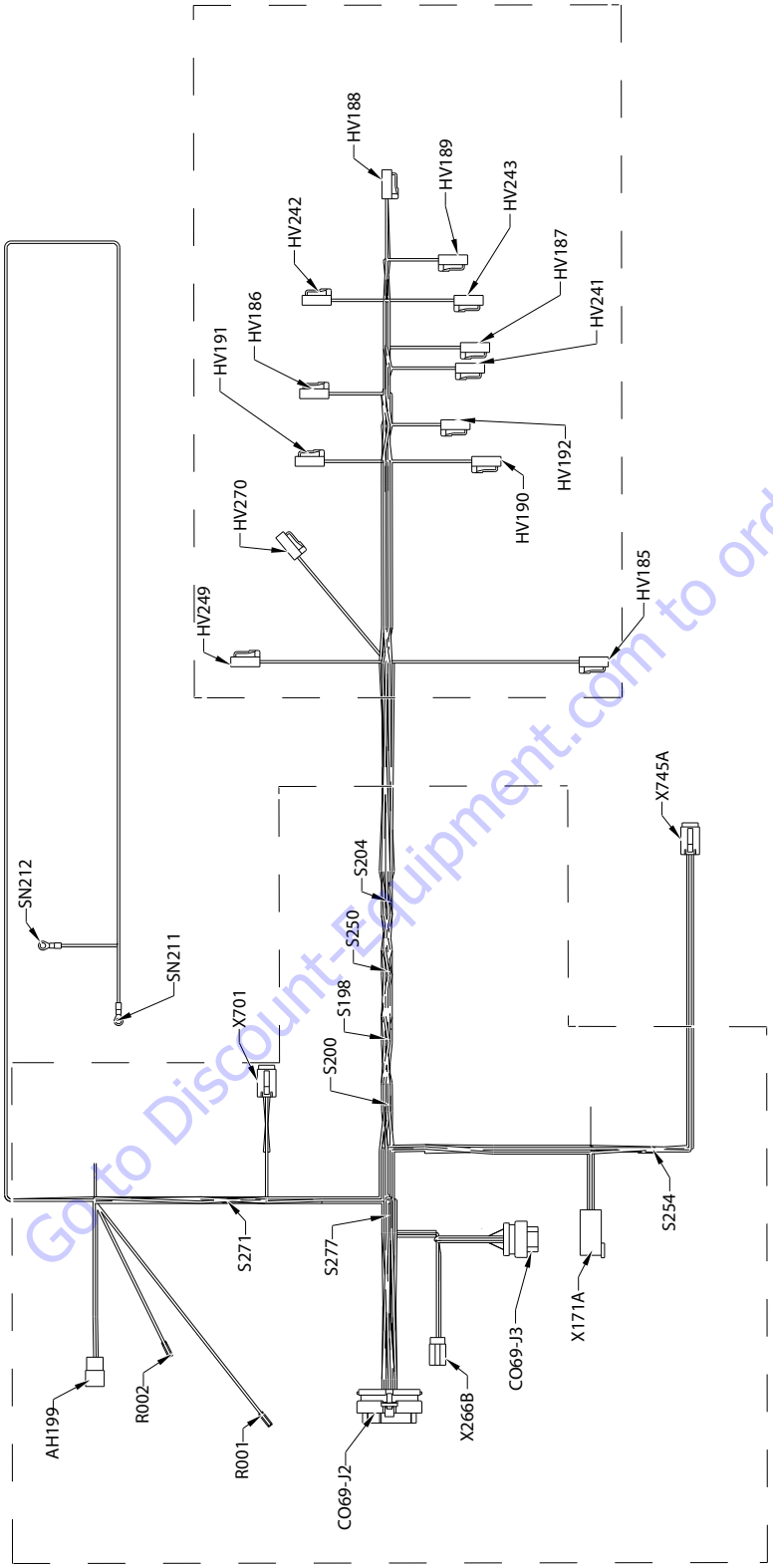


Figure 7-41. Main valve Harness (4WS) - Sheet 1 of 4

SN212 FUEL SENSOR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	16-16 FUEL SNSR-	18 AWG	GXL	C069-J2 (6)

SN211 FUEL SENSOR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	104-0 FUEL SENSOR	18 AWG	GXL	C069-J2 (25)

X745A TO LIFT DOWN HARN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	77-1 BOOM LIFT DN	18 AWG	GXL	C069-J2 (22)
2	WHT	77-2 BOOM LIFT DN ENBL/AUX	18 AWG	GXL	C069-J2 (21)
3	WHT	50-4-1 LIFT RTN	18 AWG	GXL	S254 (1)
4	WHT	50-5 LIFT DN ENBL/AUX RTN	18 AWG	GXL	C069-J3 (2)

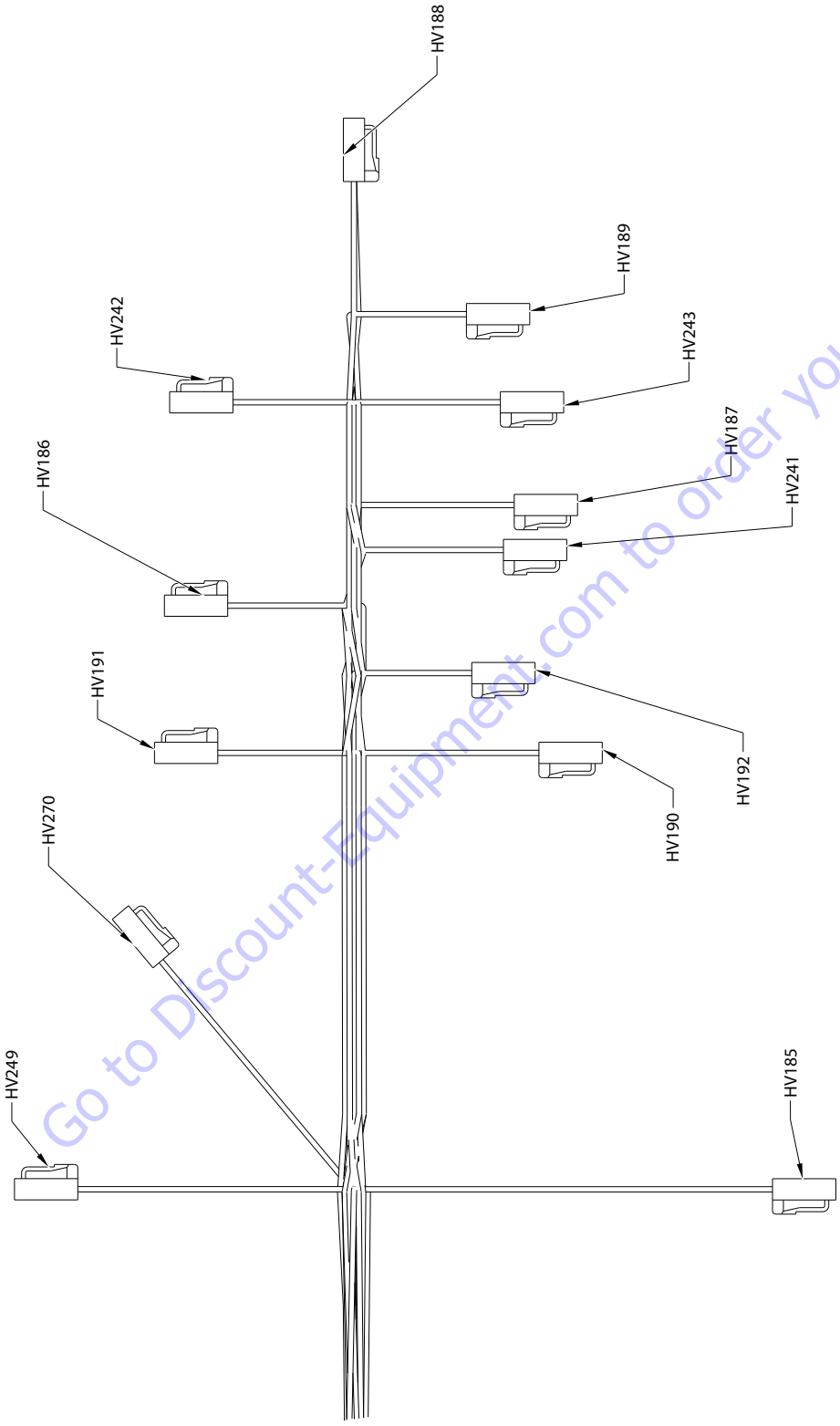


Figure 7-42. Main valve Harness (4WS) - Sheet 2 of 4

HV249 TELESCOPE DUMP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-4 BOOM TELE DUMP	18 AWG	GXL	C069-J2 (31)
2	BLK	16-14-2 DUMP-	18 AWG	GXL	S250 (1)

HV185 MAIN DUMP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-5 MAIN DUMP	18 AWG	GXL	C069-J2 (13)
2	BLK	16-14-3 DUMP-	18 AWG	GXL	S250 (1)

HV270 BYPASS DUMP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-3 BYPASS DUMP	18 AWG	GXL	C069-J2 (4)
2	BLK	16-14-1 DUMP-	18 AWG	GXL	S250 (1)

HV191 SWING RIGHT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	71-1 SWG RHT	18 AWG	GXL	C069-J2 (35)
2	WHT	50-2-1 SWG RTN	18 AWG	GXL	S200 (1)

HV188 STEER RIGHT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	20-1 FRNT STR RHT	18 AWG	GXL	C069-J2 (8)
2	BLK	16-11-3 STR-	18 AWG	GXL	S204 (1)

HV190 BOOM LIFT UP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	76-1 BOOM LIFT UP	18 AWG	GXL	C069-J2 (11)
2	WHT	50-4-2 LIFT RTN	18 AWG	GXL	S254 (1)

HV186 BOOM TELE IN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	78-1 BOOM TELE IN	18 AWG	GXL	C069-J2 (9)
2	WHT	50-5-2 BOOM TELE RTN	18 AWG	GXL	S198 (1)

HV192 SWING LEFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	70-1 SWG LEFT	18 AWG	GXL	C069-J2 (34)
2	WHT	50-2-2 SWG RTN	18 AWG	GXL	S200 (1)

HV241 STEER DUMP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-7 STR DUMP	18 AWG	GXL	C069-J2 (1)
2	BLK	16-15 STR DUMP-	18 AWG	GXL	C069-J2 (18)

HV187 BOOM TELE OUT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	79-1 BOOM TELE OUT	18 AWG	GXL	C069-J2 (20)
2	WHT	50-5-1 BOOM TELE RTN	18 AWG	GXL	S198 (1)

HV243 REAR STR RIGHT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	22-1 REAR STR RHT	18 AWG	GXL	C069-J2 (32)
2	BLK	16-11-1 STR-	18 AWG	GXL	S204 (1)

HV189 STEER LEFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	19-1 FRNT STR LEFT	18 AWG	GXL	C069-J2 (19)
2	BLK	16-11-4 STR-	18 AWG	GXL	S204 (1)

HV242 REAR STR LEFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	21-1 REAR STR LEFT	18 AWG	GXL	C069-J2 (33)
2	BLK	16-11-2 STR-	18 AWG	GXL	S204 (2)

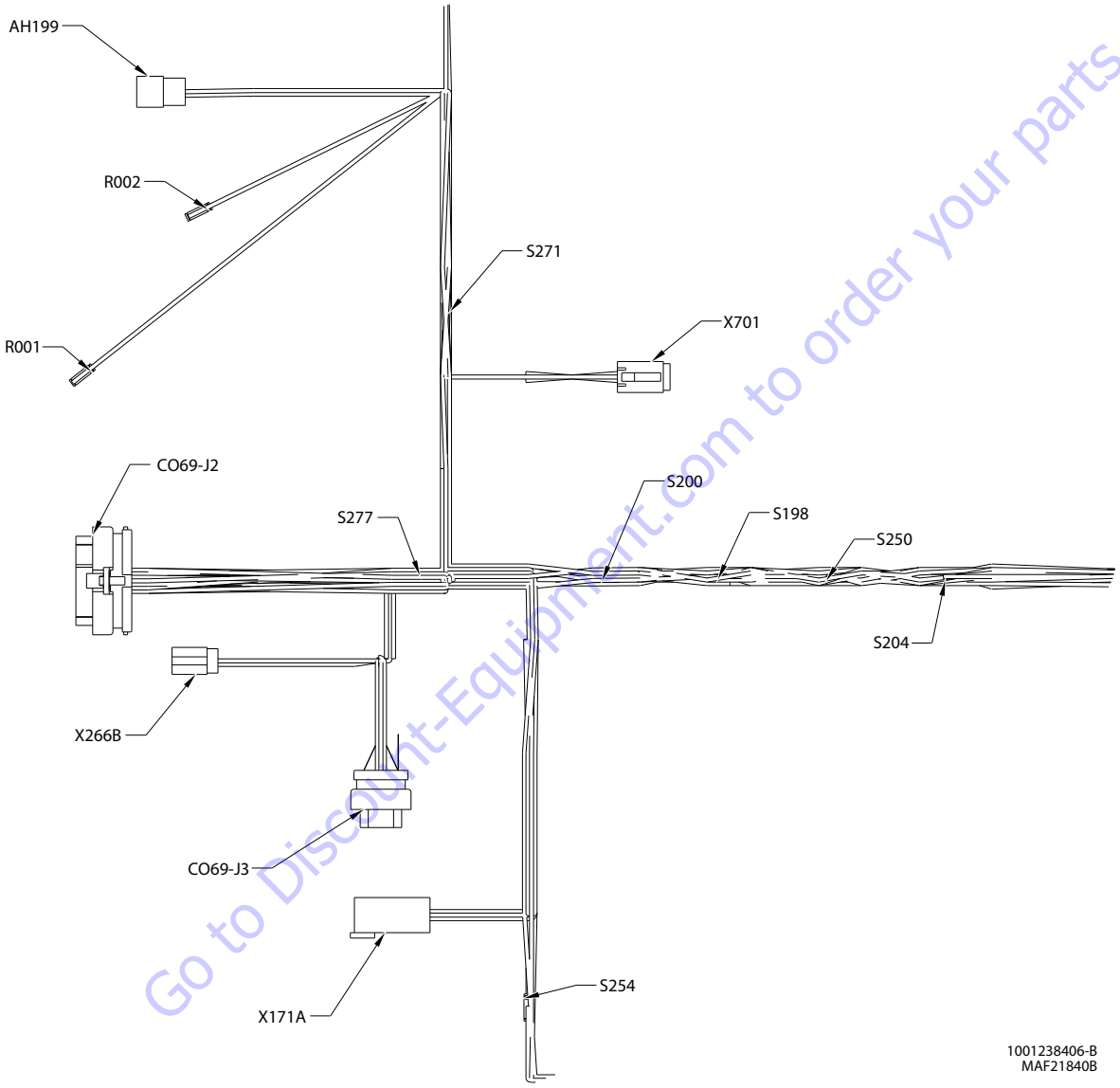


Figure 7-43. Main valve Harness (4WS) - Sheet 3 of 4

C069-J2 GRAY					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-7 STR DUMP	18 AWG	GXL	HV241 (1)
2					
3	WHT	90-1 HI PRS DUMP	18 AWG	GXL	X701 (1)
4	WHT	90-3 BYPASS DUMP	18 AWG	GXL	HV270 (1)
5	WHT	88-1-1 LEVEL UP	18 AWG	GXL	R001 (2)
6	BLK	16-16 FUEL SNSR-	18 AWG	GXL	SN212 (1)
7	WHT	89-1-1 LEVEL DOWN	18 AWG	GXL	R002 (2)
8	WHT	20-1 FRNT STR RHT	18 AWG	GXL	HV188 (1)
9	WHT	78-1 BOOM TELE IN	18 AWG	GXL	HV186 (1)
10					
11	WHT	76-1 BOOM LIFT UP	18 AWG	GXL	HV190 (1)
12					
13	WHT	90-5 MAIN DUMP	18 AWG	GXL	HV185 (1)
14					
15					
16					
17					
18	BLK	16-15 STR DUMP-	18 AWG	GXL	HV241 (2)
19	WHT	19-1 FRNT STR LEFT	18 AWG	GXL	HV189 (1)
20	WHT	79-1 BOOM TELE OUT	18 AWG	GXL	HV187 (1)
21	WHT	77-2 BOOM LIFT DN ENBL/AUX	18 AWG	GXL	X745A (2)
22	WHT	77-1 BOOM LIFT DN	18 AWG	GXL	X745A (1)
23	WHT	90-2 LOW PRS DUMP	18 AWG	GXL	X701 (2)
24	BLK	16-10-2 CONFIG -	18 AWG	GXL	S271 (2)
25	WHT	104-0 FUEL SENSOR	18 AWG	GXL	SN211 (1)
26	WHT	500-0 HEAD & TAIL LT	18 AWG	GXL	X171A (2)
27	WHT	94-0 ALARM SIGNAL	18 AWG	GXL	AH199 (B)
28	BLK	16-11 STR-	18 AWG	GXL	S204 (2)
29	BLK	16-10 ALARM/CONFIG-	18 AWG	GXL	S271 (2)
30	BLK	16-14 DUMP-	18 AWG	GXL	S250 (2)
31	WHT	90-4 BOOM TELE DUMP	18 AWG	GXL	HV249 (1)
32	WHT	22-1 REAR STR RHT	18 AWG	GXL	HV243 (1)
33	WHT	21-1 REAR STR LEFT	18 AWG	GXL	HV242 (1)
34	WHT	70-1 SWG LEFT	18 AWG	GXL	HV192 (1)
35	WHT	71-1 SWG RHT	18 AWG	GXL	HV191 (1)

C069-J3 BLACK					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-1 DRV RTN	18 AWG	GXL	X171A (1)
2	WHT	50-5 LIFT DN ENBL/AUX RTN	18 AWG	GXL	X745A (4)
3	BLK	16-12 SERVICE CABLE-	18 AWG	GXL	X266B (3)
4	WHT	50-2 SWG RTN	18 AWG	GXL	S200 (2)
5					
6	WHT	50-5 BOOM TELE RTN	18 AWG	GXL	S198 (2)
7	YEL	14-5 ALARM/CRIB+	18 AWG	GXL	S277 (2)
8	WHT	95-0 SERVICE CABLE	18 AWG	GXL	X266B (2)
9	WHT	506-0 CRIBBING	18 AWG	GXL	X171A (3)
10	WHT	54-7 NO CAPCITY LNTH	18 AWG	GXL	X171A (5)
11					
12					
13					
14	WHT	50-4 LIFT RTN	18 AWG	GXL	S254 (2)

X266B SERVICE CABLE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	14-11 SERVICE CABLE+	18 AWG	GXL	X171A (4)
2	WHT	95-0 SERVICE CABLE	18 AWG	GXL	C069-J3 (8)
3	BLK	16-12 SERVICE CABLE-	18 AWG	GXL	C069-J3 (3)

X171A TO TURNTABLE HARN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-1 DRV RTN	18 AWG	GXL	C069-J3 (1)
2	WHT	500-0 HEAD & TAIL LT	18 AWG	GXL	C069-J2 (26)
3	WHT	506-0 CRIBBING	18 AWG	GXL	C069-J3 (9)
4	YEL	14-11 SERVICE CABLE+	18 AWG	GXL	X266B (1)
5	WHT	54-7 NO CAPCITY LNTH	18 AWG	GXL	C069-J3 (10)
6	YEL	14-5-2 CRIB+	18 AWG	GXL	S277 (1)

R002					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	89-1-1 LEVEL DOWN	18 AWG	GXL	X701 (4)
2	WHT	89-1-1 LEVEL DOWN	18 AWG	GXL	C069-J2 (7)

S271					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	16-10-1 ALARM-	18 AWG	GXL	AH199 (C)
2	BLK	16-10 ALARM/CONFIG-	18 AWG	GXL	C069-J2 (29)
2	BLK	16-10-2 CONFIG -	18 AWG	GXL	C069-J2 (24)

S277					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	14-5-1 ALARM+	18 AWG	GXL	AH199 (A)
1	YEL	14-5-2 CRIB+	18 AWG	GXL	X171A (6)
2	YEL	14-5 ALARM/CRIB+	18 AWG	GXL	C069-J3 (7)

S200					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-2-1 SWG RTN	18 AWG	GXL	HV191 (2)
1	WHT	50-2-2 SWG RTN	18 AWG	GXL	HV192 (2)
2	WHT	50-2 SWG RTN	18 AWG	GXL	C069-J3 (4)

S198					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-5-1 BOOM TELE RTN	18 AWG	GXL	HV187 (2)
1	WHT	50-5-2 BOOM TELE RTN	18 AWG	GXL	HV186 (2)
2	WHT	50-5 BOOM TELE RTN	18 AWG	GXL	C069-J3 (6)

S250					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	16-14-1 DUMP-	18 AWG	GXL	HV270 (2)
1	BLK	16-14-2 DUMP-	18 AWG	GXL	HV249 (2)
1	BLK	16-14-3 DUMP-	18 AWG	GXL	HV185 (2)
2	BLK	16-14 DUMP-	18 AWG	GXL	C069-J2 (30)

S204					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	16-11-1 STR-	18 AWG	GXL	HV243 (2)
1	BLK	16-11-3 STR-	18 AWG	GXL	HV188 (2)
1	BLK	16-11-4 STR-	18 AWG	GXL	HV189 (2)
2	BLK	16-11 STR-	18 AWG	GXL	C069-J2 (28)
2	BLK	16-11-2 STR-	18 AWG	GXL	HV242 (2)

S254					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-4-1 LIFT RTN	18 AWG	GXL	X745A (3)
1	WHT	50-4-2 LIFT RTN	18 AWG	GXL	HV190 (2)
2	WHT	50-4 LIFT RTN	18 AWG	GXL	C069-J3 (14)

X701 TO TURNTABLE HARN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-1 HI PRS DUMP	18 AWG	GXL	C069-J2 (3)
2	WHT	90-2 LOW PRS DUMP	18 AWG	GXL	C069-J2 (23)
3	WHT	88-1-1 LEVEL UP	18 AWG	GXL	R001 (1)
4	WHT	89-1-1 LEVEL DOWN	18 AWG	GXL	R002 (1)

AH199 ALARM					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	14-5-1 ALARM+	18 AWG	GXL	S277 (1)
B	WHT	94-0 ALARM SIGNAL	18 AWG	GXL	C069-J2 (27)
C	BLK	16-10-1 ALARM-	18 AWG	GXL	S271 (1)

R001					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	88-1-1 LEVEL UP	18 AWG	GXL	X701 (3)
2	WHT	88-1-1 LEVEL UP	18 AWG	GXL	C069-J2 (5)

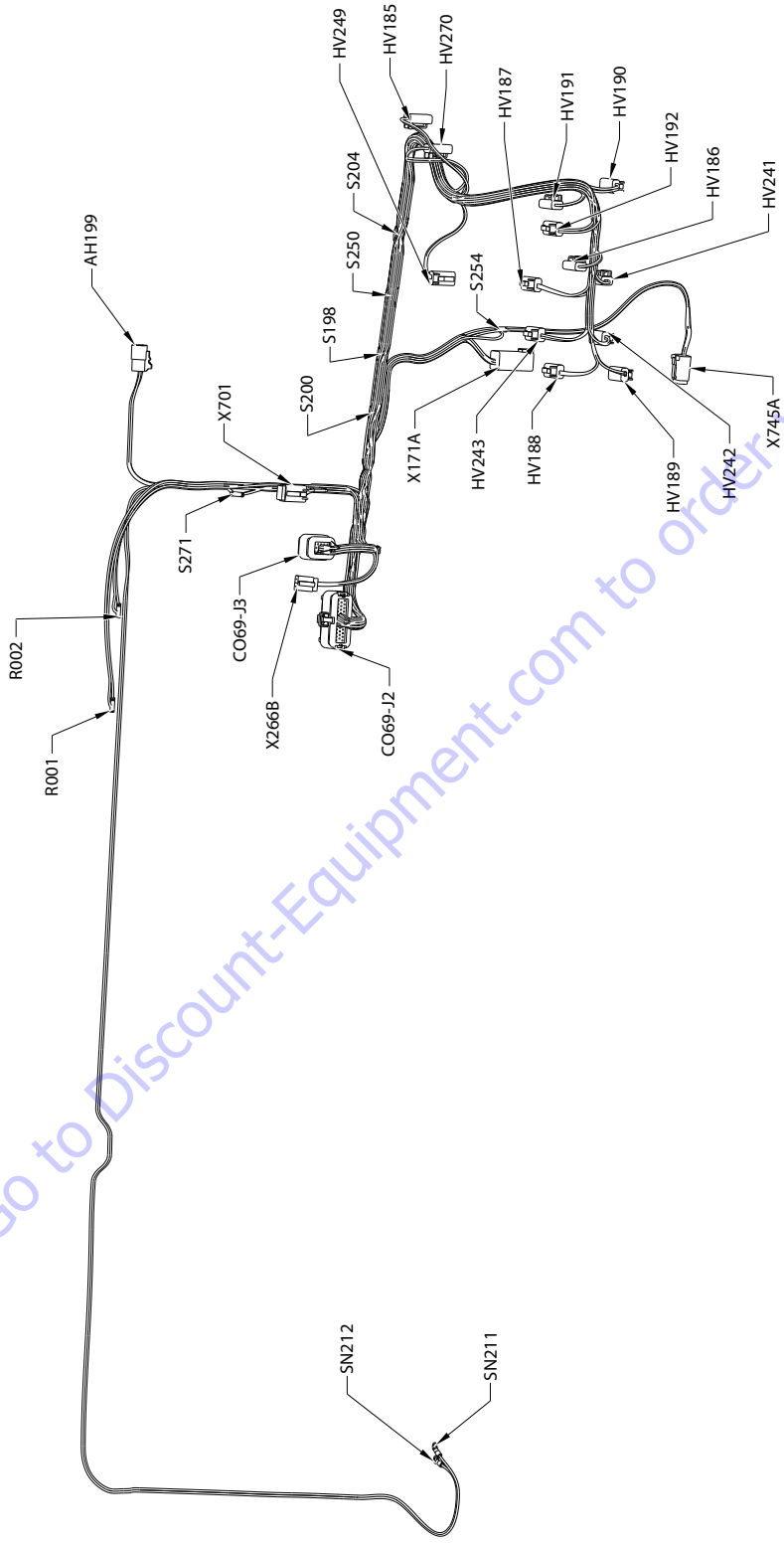


Figure 7-44. Main valve Harness (4WS) - Sheet 4 of 4

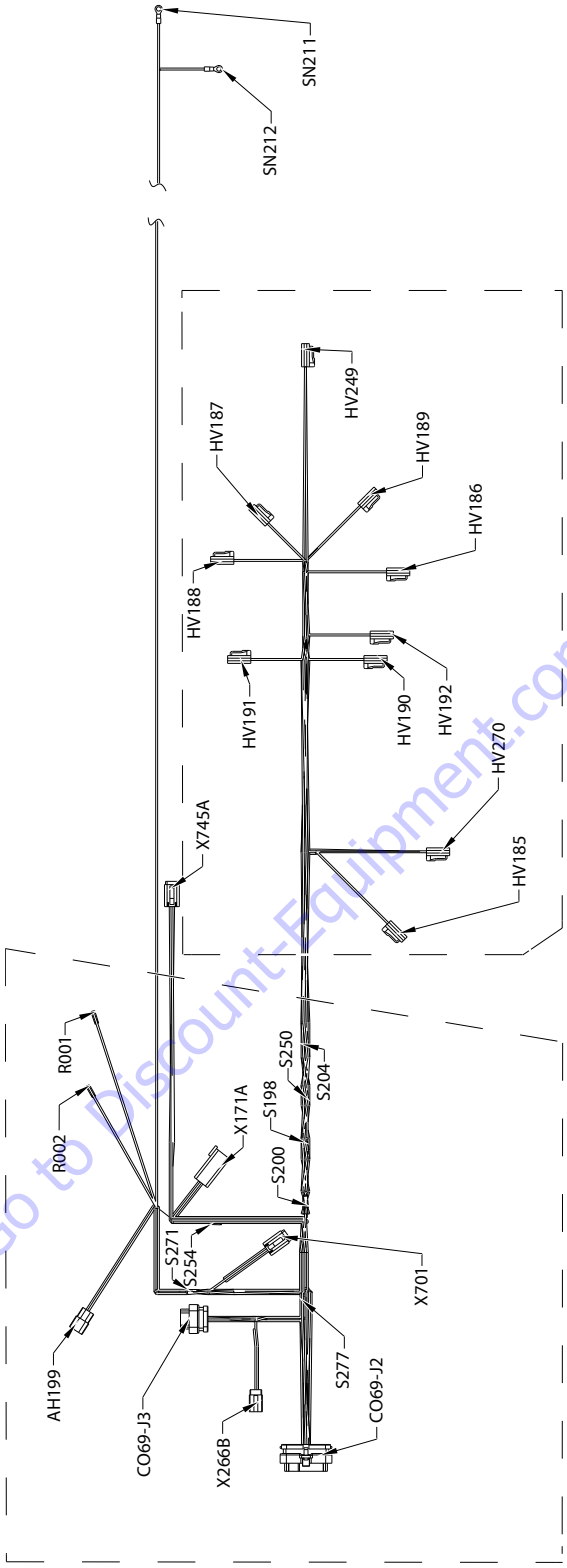


Figure 7-45. Main valve Harness (2WS) - Sheet 1 of 4

X745A TO LIFT DOWN HARN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	77-1 BOOM LIFT DN	18 AWG	GXL	C069-J2 (22)
2	WHT	77-2 BOOM LIFT DN ENBL/AUX	18 AWG	GXL	C069-J2 (21)
3	WHT	50-4-1 LIFT RTN	18 AWG	GXL	S254 (1)
4	WHT	50-5 LIFT DN ENBL/AUX RTN	18 AWG	GXL	C069-J3 (2)

SN211 FUEL LEVEL					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	104-0 FUEL SENSOR	18 AWG	GXL	C069-J2 (25)

SN212 FUEL LEVEL GND					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	16-16 FUEL SNSR-	18 AWG	GXL	C069-J2 (6)

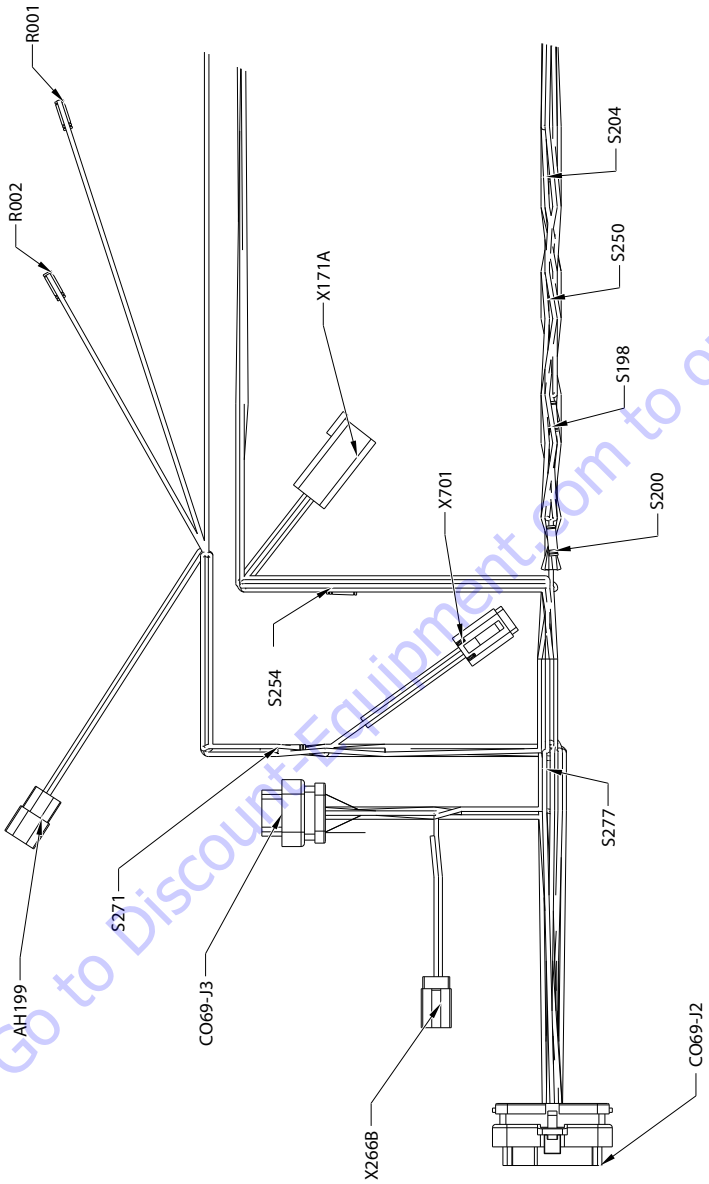


Figure 7-46. Main valve Harness (2WS) - Sheet 2 of 4

C069-J3 BLACK					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-1 DRV RTN	18 AWG	GXL	X171A (1)
2	WHT	50-5 LIFT DN ENBL/AUX RTN	18 AWG	GXL	X745A (4)
3	BLK	16-12 SERVICE CABLE-	18 AWG	GXL	X266B (3)
4	WHT	50-2 SWG RTN	18 AWG	GXL	S200 (2)
5					
6	WHT	50-5 BOOM TELE RTN	18 AWG	GXL	S198 (2)
7	YEL	14-5 ALARM/CRIB+	18 AWG	GXL	S277 (2)
8	WHT	95-0 SERVICE CABLE	18 AWG	GXL	X266B (2)
9	WHT	506-0 CRIBBING	18 AWG	GXL	X171A (3)
10	WHT	54-7 NO CAPCITY LNTH	18 AWG	GXL	X171A (5)
11					
12					
13					
14	WHT	50-4 LIFT RTN	18 AWG	GXL	S254 (2)

X266B SERVICE CABLE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	14-1 SERVICE CABLE+	18 AWG	GXL	X171A (4)
2	WHT	95-0 SERVICE CABLE	18 AWG	GXL	C069-J3 (8)
3	BLK	16-12 SERVICE CABLE-	18 AWG	GXL	C069-J3 (3)

S277					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	14-5-1 ALARM+	18 AWG	GXL	AH199 (A)
1	YEL	14-5-2 CRIB+	18 AWG	GXL	X171A (6)
2	YEL	14-5 ALARM/CRIB+	18 AWG	GXL	C069-J3 (7)

S271					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	16-10-1 ALARM-	18 AWG	GXL	AH199 (C)
2	BLK	16-10 ALARM/CONFIG-	18 AWG	GXL	C069-J2 (29)
2	BLK	16-10-2 CONFIG -	18 AWG	GXL	C069-J2 (24)

X701 TO TURNTABLE HARN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-1 HI PRS DUMP	18 AWG	GXL	C069-J2 (3)
2	WHT	90-2 LOW PRS DUMP	18 AWG	GXL	C069-J2 (23)
3	WHT	88-1-1 LEVEL UP	18 AWG	GXL	R001 (1)
4	WHT	89-1-1 LEVEL DOWN	18 AWG	GXL	R002 (1)

X171A TO TURNTABLE HARN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-1 DRV RTN	18 AWG	GXL	C069-J3 (1)
2	WHT	500-0 HEAD&TAIL LT	18 AWG	GXL	C069-J2 (26)
3	WHT	506-0 CRIBBING	18 AWG	GXL	C069-J3 (9)
4	YEL	14-11 SERVICE CABLE+	18 AWG	GXL	X266B (1)
5	WHT	54-7 NO CAPCITY LNTH	18 AWG	GXL	C069-J3 (10)
6	YEL	14-5-2 RIB+	18 AWG	GXL	S277 (1)

S200					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-2-1 SWG RTN	18 AWG	GXL	HV191 (2)
1	WHT	50-2-2 SWG RTN	18 AWG	GXL	HV192 (2)
2	WHT	50-2 SWG RTN	18 AWG	GXL	C069-J3 (4)

AH199 ALARM					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	14-5-1 ALARM+	18 AWG	GXL	S277 (1)
B	WHT	94-0 ALARM SIGNAL	18 AWG	GXL	C069-J2 (27)
C	BLK	16-10-1 ALARM-	18 AWG	GXL	S271 (1)

R002					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	89-1-1 LEVEL DOWN	18 AWG	GXL	X701 (4)
2	WHT	89-1-1 LEVEL DOWN	18 AWG	GXL	C069-J2 (7)

R001					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	88-1-1 LEVEL UP	18 AWG	GXL	X701 (3)
2	WHT	88-1-1 LEVEL UP	18 AWG	GXL	C069-J2 (5)

C069-J2 GRAY					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3	WHT	90-1 HI PRS DUMP	18 AWG	GXL	X701 (1)
4	WHT	90-3 BYPASS DUMP	18 AWG	GXL	HV270 (1)
5	WHT	88-1-1 LEVEL UP	18 AWG	GXL	R001 (2)
6	BLK	16-16 FUEL SNSR-	18 AWG	GXL	SN212 (1)
7	WHT	89-1-1 LEVEL DOWN	18 AWG	GXL	R002 (2)
8	WHT	20-1 FRNT STR RHT	18 AWG	GXL	HV188 (1)
9	WHT	78-1 BOOM TELE IN	18 AWG	GXL	HV186 (1)
10					
11	WHT	76-1 BOOM LIFT UP	18 AWG	GXL	HV190 (1)
12					
13	WHT	90-5 MAIN DUMP	18 AWG	GXL	HV185 (1)
14					
15					
16					
17					
18					
19	WHT	19-1 FRNT STR LEFT	18 AWG	GXL	HV189 (1)
20	WHT	79-1 BOOM TELE OUT	18 AWG	GXL	HV187 (1)
21	WHT	77-2 BOOM LIFT DN ENBL/AUX	18 AWG	GXL	X745A (2)
22	WHT	77-1 BOOM LIFT DN	18 AWG	GXL	X745A (1)
23	WHT	90-2 LOW PRS DUMP	18 AWG	GXL	X701 (2)
24	BLK	16-10-2 CONFIG -	18 AWG	GXL	S271 (2)
25	WHT	104-0 FUEL SENSOR	18 AWG	GXL	SN211 (1)
26	WHT	500-0 HEAD&TAIL LT	18 AWG	GXL	X171A (2)
27	WHT	94-0 ALARM SIGNAL	18 AWG	GXL	AH199 (B)
28	BLK	16-11 STR-	18 AWG	GXL	S204 (2)
29	BLK	16-10 ALARM/CONFIG-	18 AWG	GXL	S271 (2)
30	BLK	16-14 DUMP-	18 AWG	GXL	S250 (2)
31	WHT	90-4 BOOM TELE DUMP	18 AWG	GXL	HV249 (1)
32					
33					
34	WHT	70-1 SWG LEFT	18 AWG	GXL	HV192 (1)
35	WHT	71-1 SWG RHT	18 AWG	GXL	HV191 (1)

S198					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-5-1 BOOM TELE RTN	18 AWG	GXL	HV187 (2)
1	WHT	50-5-2 BOOM TELE RTN	18 AWG	GXL	HV186 (2)
2	WHT	50-5 BOOM TELE RTN	18 AWG	GXL	C069-J3 (6)

S250					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	16-14-1 DUMP-	18 AWG	GXL	HV270 (2)
1	BLK	16-14-2 DUMP-	18 AWG	GXL	HV249 (2)
1	BLK	16-14-3 DUMP-	18 AWG	GXL	HV185 (2)
2	BLK	16-14 DUMP-	18 AWG	GXL	C069-J2 (30)

S204					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	16-11-3 STR-	18 AWG	GXL	HV188 (2)
1	BLK	16-11-4 STR-	18 AWG	GXL	HV189 (2)
2	BLK	16-11 STR-	18 AWG	GXL	C069-J2 (28)

S254					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	50-4-1 LIFT RTN	18 AWG	GXL	X745A (3)
1	WHT	50-4-2 LIFT RTN	18 AWG	GXL	HV190 (2)
2	WHT	50-4 LIFT RTN	18 AWG	GXL	C069-J3 (14)

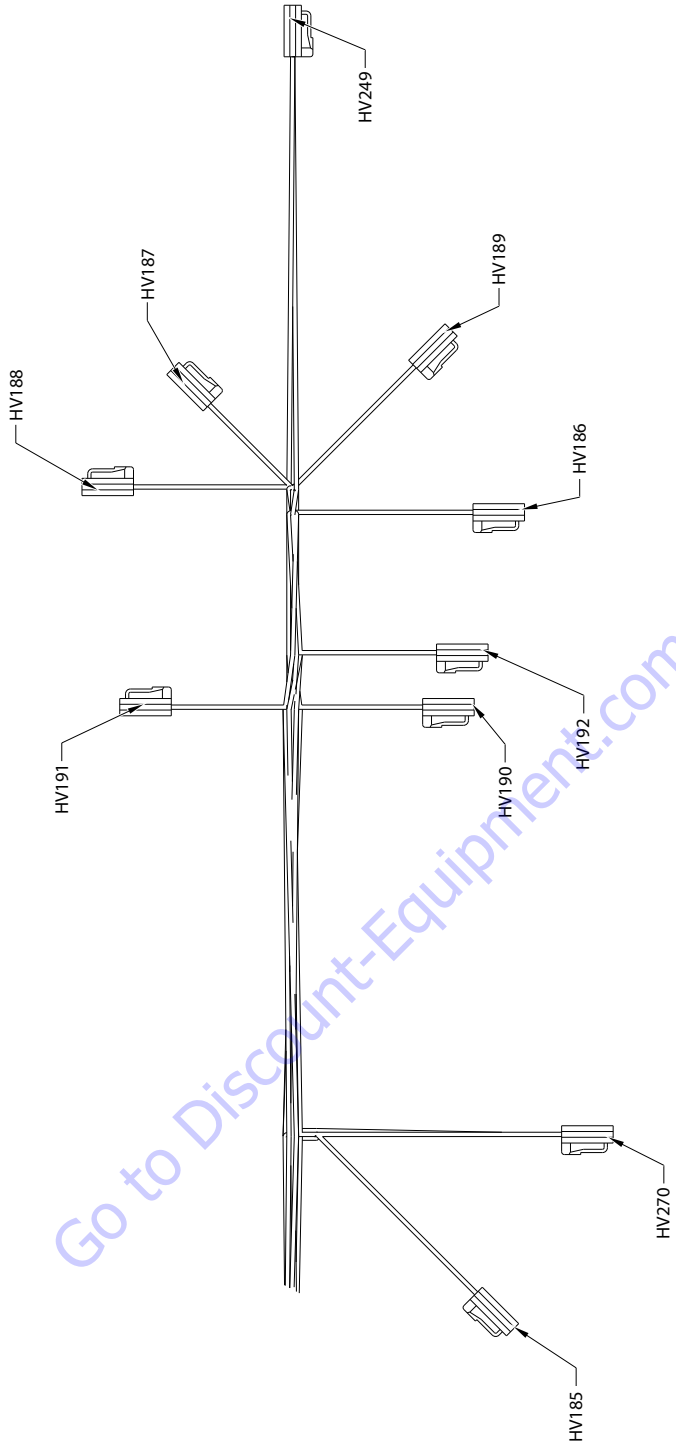


Figure 7-47. Main valve Harness (2WS) - Sheet 3 of 4

HV185 MAIN DUMP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-5 MAIN DUMP	18 AWG	GXL	C069-J2 (13)
2	BLK	16-14-3 DUMP-	18 AWG	GXL	S250 (1)

HV270 BYPASS DUMP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-3 BYPASS DUMP	18 AWG	GXL	C069-J2 (4)
2	BLK	16-14-1 DUMP-	18 AWG	GXL	S250 (1)

HV190 BOOM LIFT UP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	76-1 BOOM LIFT UP	18 AWG	GXL	C069-J2 (11)
2	WHT	50-4-2 LIFT RTN	18 AWG	GXL	S254 (1)

HV192 SWING LEFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	70-1 SWG LEFT	18 AWG	GXL	C069-J2 (34)
2	WHT	50-2-2 SWG RTN	18 AWG	GXL	S200 (1)

HV186 BOOM TELE IN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	78-1 BOOM TELE IN	18 AWG	GXL	C069-J2 (9)
2	WHT	50-5-2 BOOM TELE RTN	18 AWG	GXL	S198 (1)

HV189 STEER LEFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	19-1 FRNT STR LEFT	18 AWG	GXL	C069-J2 (19)
2	BLK	16-11-4 STR-	18 AWG	GXL	S204 (1)

HV249 TELESCOPE DUMP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-4 BOOM TELE DUMP	18 AWG	GXL	C069-J2 (31)
2	BLK	16-14-2 DUMP-	18 AWG	GXL	S250 (1)

HV187 BOOM TELE OUT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	79-1 BOOM TELE OUT	18 AWG	GXL	C069-J2 (20)
2	WHT	50-5-1 BOOM TELE RTN	18 AWG	GXL	S198 (1)

HV188 STEER RIGHT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	20-1 FRNT STR RHT	18 AWG	GXL	C069-J2 (8)
2	BLK	16-11-3 STR-	18 AWG	GXL	S204 (1)

HV191 SWING RIGHT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	71-1 SWG RHT	18 AWG	GXL	C069-J2 (35)
2	WHT	50-2-1 SWG RTN	18 AWG	GXL	S200 (1)

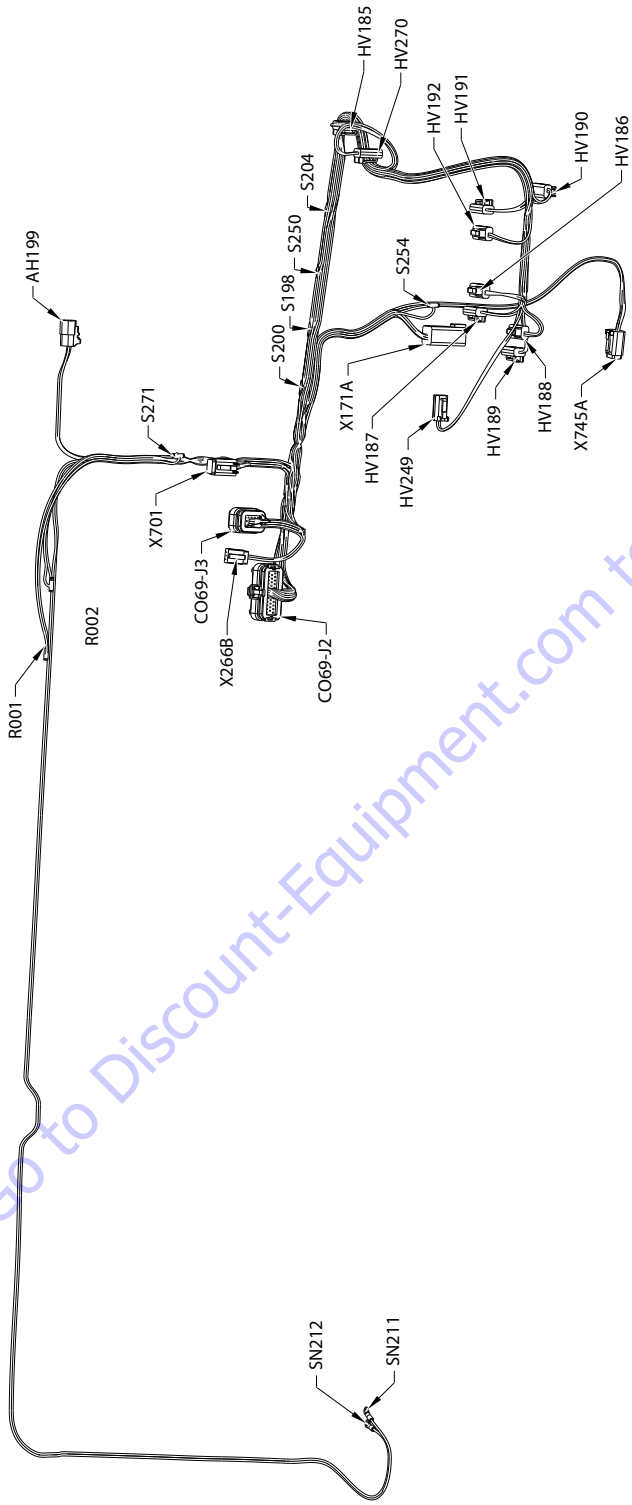


Figure 7-48. Main valve Harness (2WS) - Sheet 4 of 4

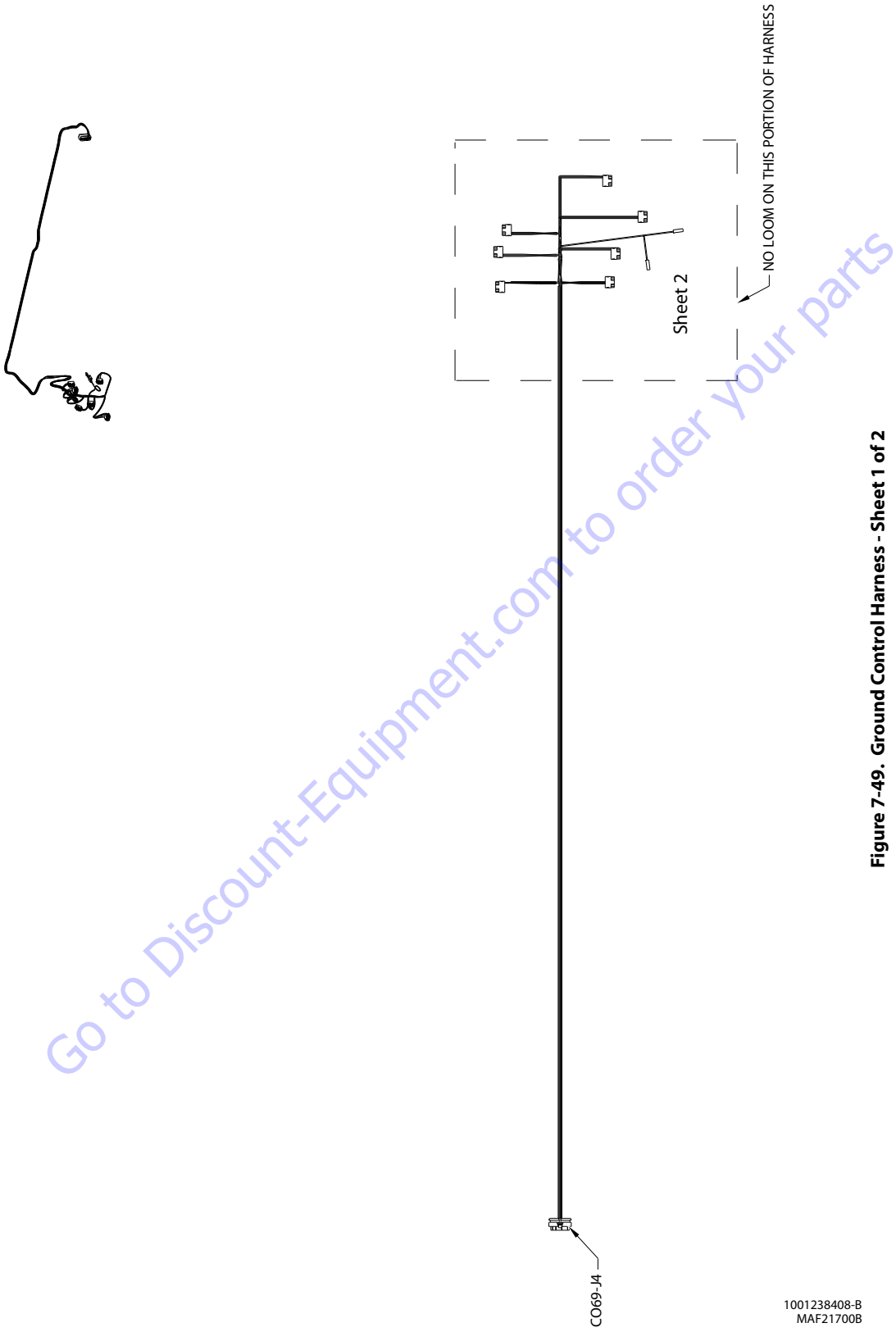


Figure 7-49. Ground Control Harness - Sheet 1 of 2

C069-J4 BLUE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3					
4	WHT	100-0 START	18 AWG	GXL	SW179 (1)
5	WHT	89-0 LEVEL DOWN	18 AWG	GXL	SW178 (3)
6	WHT	86-0 ROTATE LEFT	18 AWG	GXL	SW176 (3)
7	WHT	78-0 TELE IN	18 AWG	GXL	SW177 (3)
8	WHT	83-0 JIB DOWN	18 AWG	GXL	SW180 (3)
9	WHT	109-0 ENG REGEN	18 AWG	GXL	SW293-2 (1)
10					
11					
12					
13					
14					
15					
16	WHT	93-0 AUX PWR	18 AWG	GXL	SW179 (3)
17	WHT	88-0 LEVEL UP	18 AWG	GXL	SW178 (1)
18	WHT	87-0 ROTATE RIGHT	18 AWG	GXL	SW176 (1)
19	WHT	82-0 JIB UP	18 AWG	GXL	SW180 (1)
20					
21					
22					
23	WHT	76-0 BOOM LIFT UP	18 AWG	GXL	SW181 (1)
24					
25	YEL	14-0 GND CNTRL+	18 AWG	GXL	SW177 (2)
26					
27					
28					
29					
30	WHT	79-0 TELE OUT	18 AWG	GXL	SW177 (1)
31					
32					
33	WHT	77-0 BOOM LIFT DOWN	18 AWG	GXL	SW181 (3)
34	WHT	70-0 SWING LEFT	18 AWG	GXL	SW182 (3)
35	WHT	71-0 SWING RIGHT	18 AWG	GXL	SW182 (1)

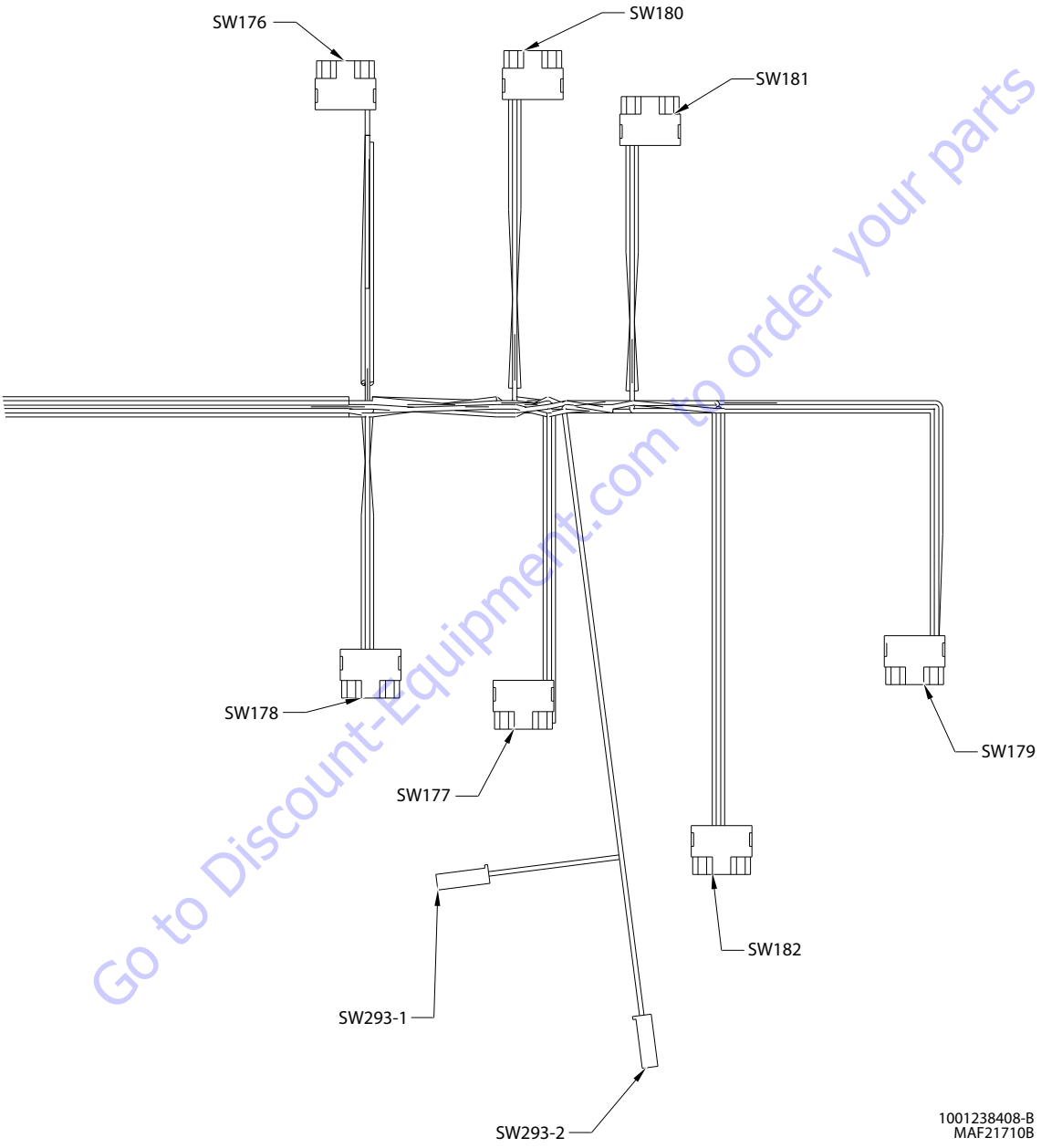


Figure 7-50. Ground Control Harness - Sheet 2 of 2

SW176 ROTATE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	87-0 ROTATE RIGHT	18 AWG	GXL	C069-J4 (18)
2	YEL	14-0-1 GND CNTRL+	18 AWG	GXL	SW177 (2)
2	YEL	14-0-2 GND CNTRL+	18 AWG	GXL	SW178 (2)
3	WHT	86-0 ROTATE LEFT	18 AWG	GXL	C069-J4 (6)
4					
5					
6					

SW178 LEVEL					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	88-0 LEVEL UP	18 AWG	GXL	C069-J4 (17)
2	YEL	14-0-2 GND CNTRL+	18 AWG	GXL	SW176 (2)
2	YEL	14-0-3 GND CNTRL+	18 AWG	GXL	SW179 (2)
3	WHT	89-0 LEVEL DOWN	18 AWG	GXL	C069-J4 (5)
4					
5					
6					

SW180 JIB					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	82-0 JIB UP	18 AWG	GXL	C069-J4 (19)
2	YEL	14-0-4 GND CNTRL+	18 AWG	GXL	SW179 (2)
2	YEL	14-0-5 GND CNTRL+	18 AWG	GXL	SW181 (2)
3	WHT	83-0 JIB DOWN	18 AWG	GXL	C069-J4 (8)
4					
5					
6					

SW177 BOOM TELE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	79-0 TELE OUT	18 AWG	GXL	C069-J4 (30)
2	YEL	14-0 GND CNTRL+	18 AWG	GXL	C069-J4 (25)
2	YEL	14-0-1 GND CNTRL+	18 AWG	GXL	SW176 (2)
3	WHT	78-0 TELE IN	18 AWG	GXL	C069-J4 (7)
4					
5					
6					

SW181 BOOM LIFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	76-0 BOOM LIFT UP	18 AWG	GXL	C069-J4 (23)
2	YEL	14-0-5 GND CNTRL+	18 AWG	GXL	SW180 (2)
2	YEL	14-0-6 GND CNTRL+	18 AWG	GXL	SW182 (2)
3	WHT	77-0 BOOM LIFT DOWN	18 AWG	GXL	C069-J4 (33)
4					
5					
6					

SW182 SWING					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	71-0 SWING RIGHT	18 AWG	GXL	C069-J4 (35)
2	YEL	14-0-6 GND CNTRL+	18 AWG	GXL	SW181 (2)
2	YEL	14-0-7 GND CNTRL+	18 AWG	GXL	SW293-1 (1)
3	WHT	70-0 SWING LEFT	18 AWG	GXL	C069-J4 (34)
4					
5					
6					

SW293-1 ENGINE REGENERATION					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	14-0-7 GND CNTRL+	18 AWG	GXL	SW182 (2)

SW293-2 ENGINE REGENERATION					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	109-0 ENG REGEN	18 AWG	GXL	C069-J4 (9)

SW179 START/ AUX PWR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	100-0 START	18 AWG	GXL	C069-J4 (4)
2	YEL	14-0-3 GND CNTRL+	18 AWG	GXL	SW178 (2)
2	YEL	14-0-4 GND CNTRL+	18 AWG	GXL	SW180 (2)
3	WHT	93-0 AUX PWR	18 AWG	GXL	C069-J4 (16)
4					
5					
6					

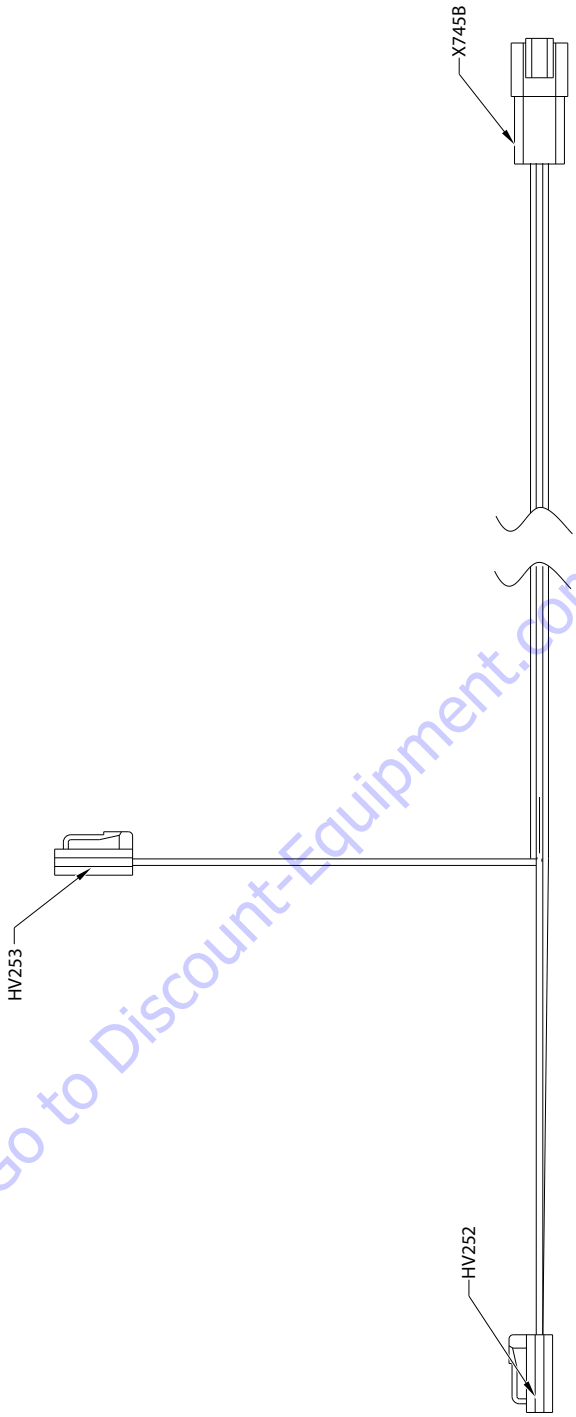


Figure 7-51. Lift Cylinder Harness

HV252 BOOM LIFT DOWN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	77-1 BOOM LIFT DN	18 AWG	GXL	X745B (1)
2	WHT	50-4-1 LIFT RTN	18 AWG	GXL	X745B (3)

HV253 BOOM LIFT DN ENBL/AUX					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	77-2 BOOM LIFT DN ENBL/AUX	18 AWG	GXL	X745B (2)
2	WHT	50-5 LIFT DN ENBL/AUX RTN	18 AWG	GXL	X745B (4)

X745B TO MAIN VALVE HARNESS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	77-1 BOOM LIFT DN	18 AWG	GXL	HV252 (1)
2	WHT	77-2 BOOM LIFT DN ENBL/AUX	18 AWG	GXL	HV253 (1)
3	WHT	50-4-1 LIFT RTN	18 AWG	GXL	HV252 (2)
4	WHT	50-5 LIFT DN ENBL/ AUX RTN	18 AWG	GXL	HV253 (2)

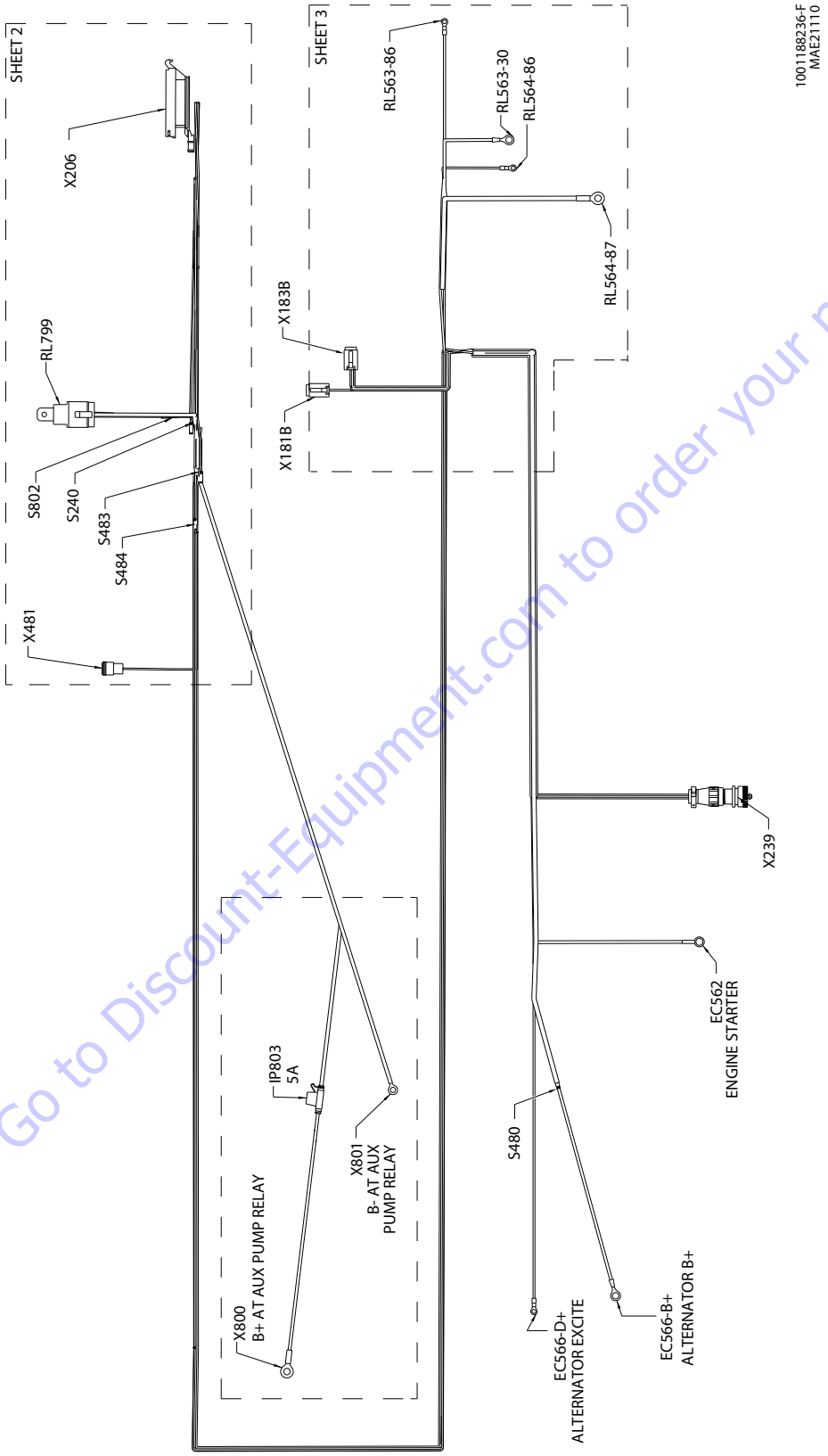


Figure 7-52. Deutz D2011L04 Engine Harness - Sheet 1 of 3

EC566-D+ ALTERNATOR EXCITE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	6-51 ALT EXCITE	16 AWG	GXL	X183B (5)

EC566-B+ ALTERNATOR B+					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	-	FUSE LINK	12 AWG	FUSIBLE LINK	S480 (2)

EC562 ENGINE STARTER					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	12AWG	12 AWG	GXL	RL563-30 (1)

S480					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	8 AWG	8 AWG	GXL	RL564-87 (1)
2	-	FUSE LINK	12 AWG	FUSIBLE LINK	EC566-B+ (1)

X239					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	WHT	6-17 DIAGNOSTIC	18 AWG	GXL	S240 (2)
B	BLK	000-6-3	18 AWG	GXL	X206 (2)
K	WHT	24-6	18 AWG	GXL	X206 (11)
L	WHT	23-6	18 AWG	GXL	X206 (10)

X800 B+ AT AUX PUMP RELAY					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	FUSE LEAD	12 AWG	GXL	IP803 (2)

IP803 5A					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	6-15-2	16 AWG	GXL	RL799 (1)
2	RED	FUSE LEAD	12 AWG	GXL	X800 (1)

X801 B- AT AUX PUMP RELAY					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	000-6-1-3	10 AWG	GXL	S802 (2)

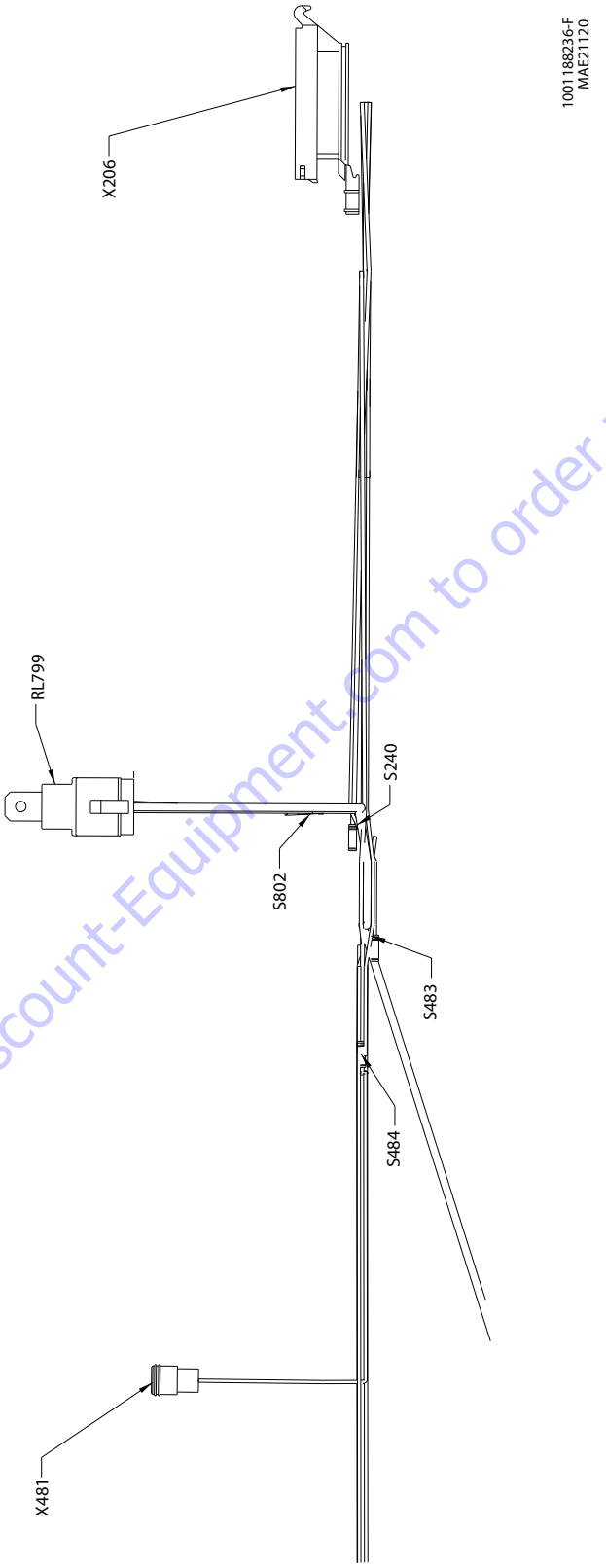


Figure 7-53. Deutz D2011L04 Engine Harness - Sheet 2 of 3

X481					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CABLE CAN HI	18 AWG	CABLE	S484 (1)
B	GRN	CABLE CAN LO	18 AWG	CABLE	S483 (2)
C					

S484					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	CABLE CAN HI	18 AWG	CABLE	X183B (3)
1	YEL	CABLE CAN HI	18 AWG	CABLE	X481 (A)
2	YEL	CABLE CAN HI	18 AWG	CABLE	X206 (12)

RL799					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	6-15-2	16 AWG	GXL	IP803 (1)
2	WHT	6-15 DIAGNOSTIC	18 AWG	GXL	S240 (2)
3					
4	WHT	6-15-3	18 AWG	GXL	X206 (14)
5	BLK	000-6-1-2	18 AWG	GXL	S802 (1)

S483					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	GRN	CABLE CAN LO	18 AWG	CABLE	X183B (4)
2	GRN	CABLE CAN LO	18 AWG	CABLE	X481 (B)
2	GRN	CABLE CAN LO	18 AWG	CABLE	X206 (13)

S240					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-16	18 AWG	GXL	X183B (1)
2	WHT	6-15 DIAGNOSTIC	18 AWG	GXL	RL799 (2)
2	WHT	6-17 DIAGNOSTIC	18 AWG	GXL	X239 (A)

S802					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	000-6-1 GROUND	16 AWG	TFFN	X206 (1)
1	BLK	000-6-1-2	18 AWG	GXL	RL799 (5)
2	BLK	000-6-1-3	10 AWG	GXL	X801 (1)

X206					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	000-6-1 GROUND	16 AWG	TFFN	S802 (1)
2	BLK	000-6-3	18 AWG	GXL	X239 (B)
3					
4					
5					
6					
7					
8					
9					
10	WHT	6-23	18 AWG	GXL	X239 (L)
11	WHT	6-24	18 AWG	GXL	X239 (K)
12	YEL	CABLE CAN HI	18 AWG	CABLE	S484 (2)
13	GRN	CABLE CAN LO	18 AWG	CABLE	S483 (2)
14	WHT	6-15-3	18 AWG	GXL	RL799 (4)
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

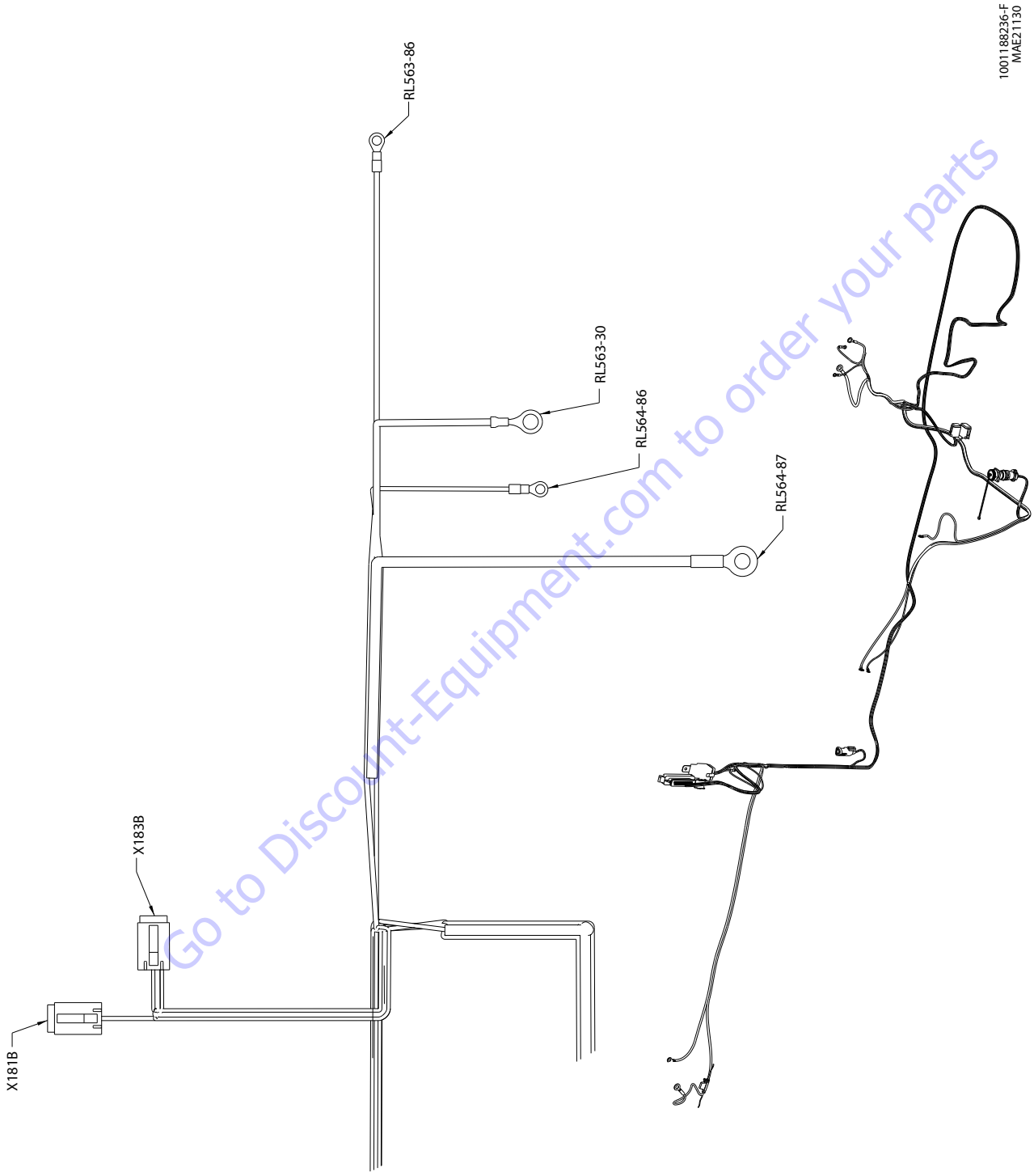


Figure 7-54. Deutz D2011L04 Engine Harness - Sheet 3 of 3

X183B					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-16	18 AWG	GXL	S240 (1)
2	WHT	6-25 ENGINE START	14 AWG	GXL	RL563-86 (1)
3	YEL	CABLE CAN HI	18 AWG	CABLE	S484 (1)
4	GRN	CABLE CAN LO	18 AWG	CABLE	S483 (1)
5	RED	6-51 ALT EXCITE	16 AWG	GXL	EC566-D+ (1)
6					

X181B					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3					
4	WHT	6-18 GLOW	18 AWG	GXL	RL564-86 (1)
5					
6					
7					
8					

RL564-86					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-18 GLOW	18 AWG	GXL	X181B (4)

RL564-87					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	8 AWG	8 AWG	GXL	S480 (1)

RL563-86					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-25 ENGINE START	14 AWG	GXL	X183B (2)

RL563-30					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	12AWG	12 AWG	GXL	EC562 (1)

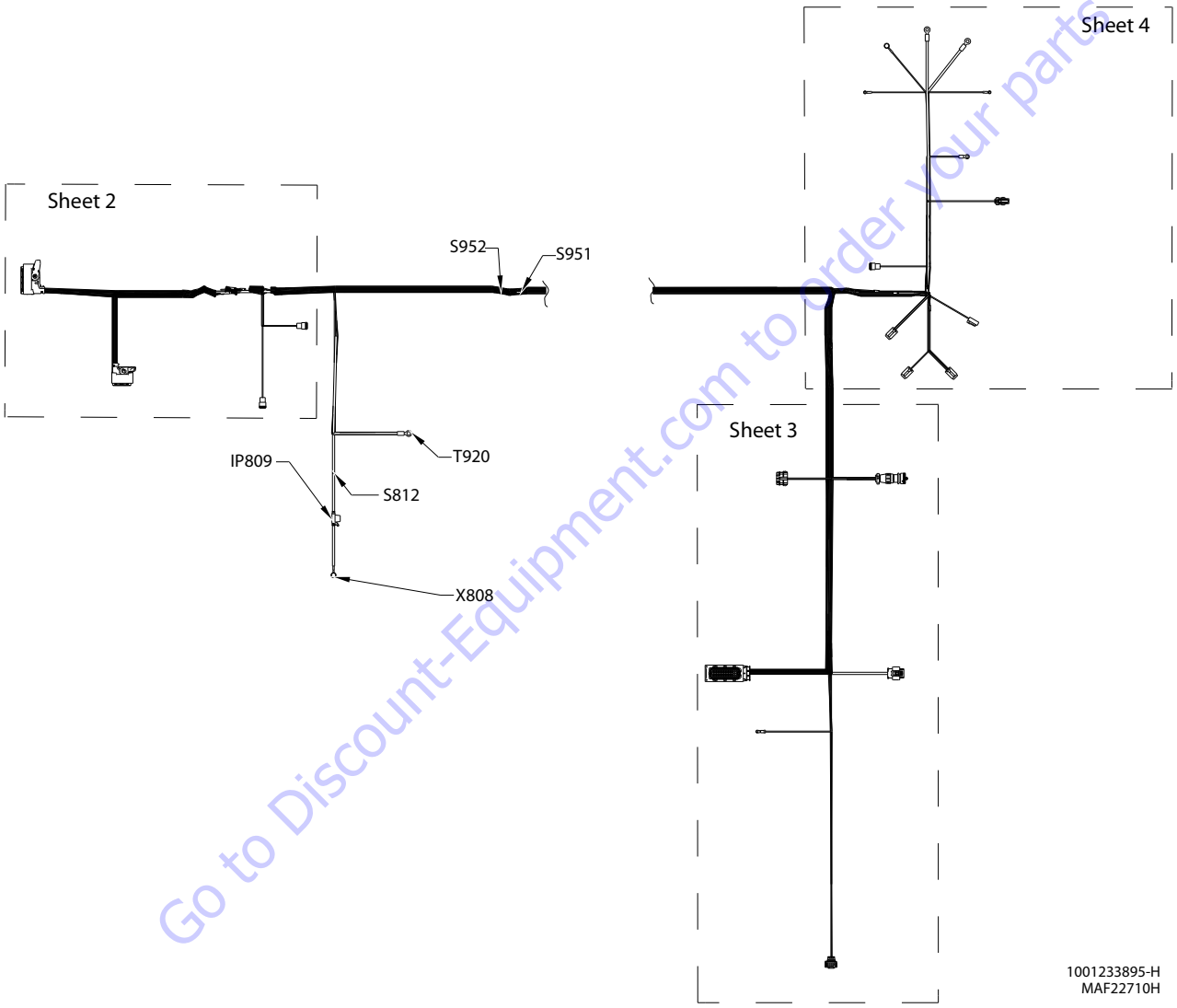


Figure 7-55. Deutz T4F Engine Harness - Sheet 1 of 5

IP809 ECM PWR 30A					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-148-135-2 ECM PWR	12 AWG	GXL	S812 (1)
2	RED	1-148-135-2 ECM PWR	12 AWG	GXL	X808 (1)

T920 ENGINE GROUND					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	000-148-246 ECM GND	8 AWG	GXL	S945 (1)
1	BLK	000-48-1 ENG GND	14 AWG	GXL	X941 (4)
1	BLK	000-48-2 ENG GND	18 AWG	GXL	X950 (B)
1	BLK	000-48-3 GND	18 AWG	GXL	X999 (2)

X808 BATTERY PWR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-148-135-2 ECM PWR	12 AWG	GXL	IP809 (2)

S951					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	CAN 1 HI CUSTOMER CAN HIGH	20 AWG	J1939 CABLE	S953 (2)
2	YEL	CAN 1 HI CUSTOMER CAN HIGH	20 AWG	J1939 CABLE	X901 (3)
2	YEL	CAN 1 HI CUSTOMER CAN HIGH	20 AWG	J1939 CABLE	X950 (M)

S952					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	GRN	CAN 1 LO CUSTOMER CAN LOW	20 AWG	J1939 CABLE	S954 (2)
2	GRN	CAN 1 LO CUSTOMER CAN LO	20 AWG	J1939 CABLE	X901 (4)
2	GRN	CAN 1 LO CUSTOMER CAN LO	20 AWG	J1939 CABLE	X950 (F)

S812					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-148-135-2 ECM PWR	12 AWG	GXL	IP809 (1)
2	RED	1-148-135 ECM PWR	8 AWG	GXL	S944 (1)

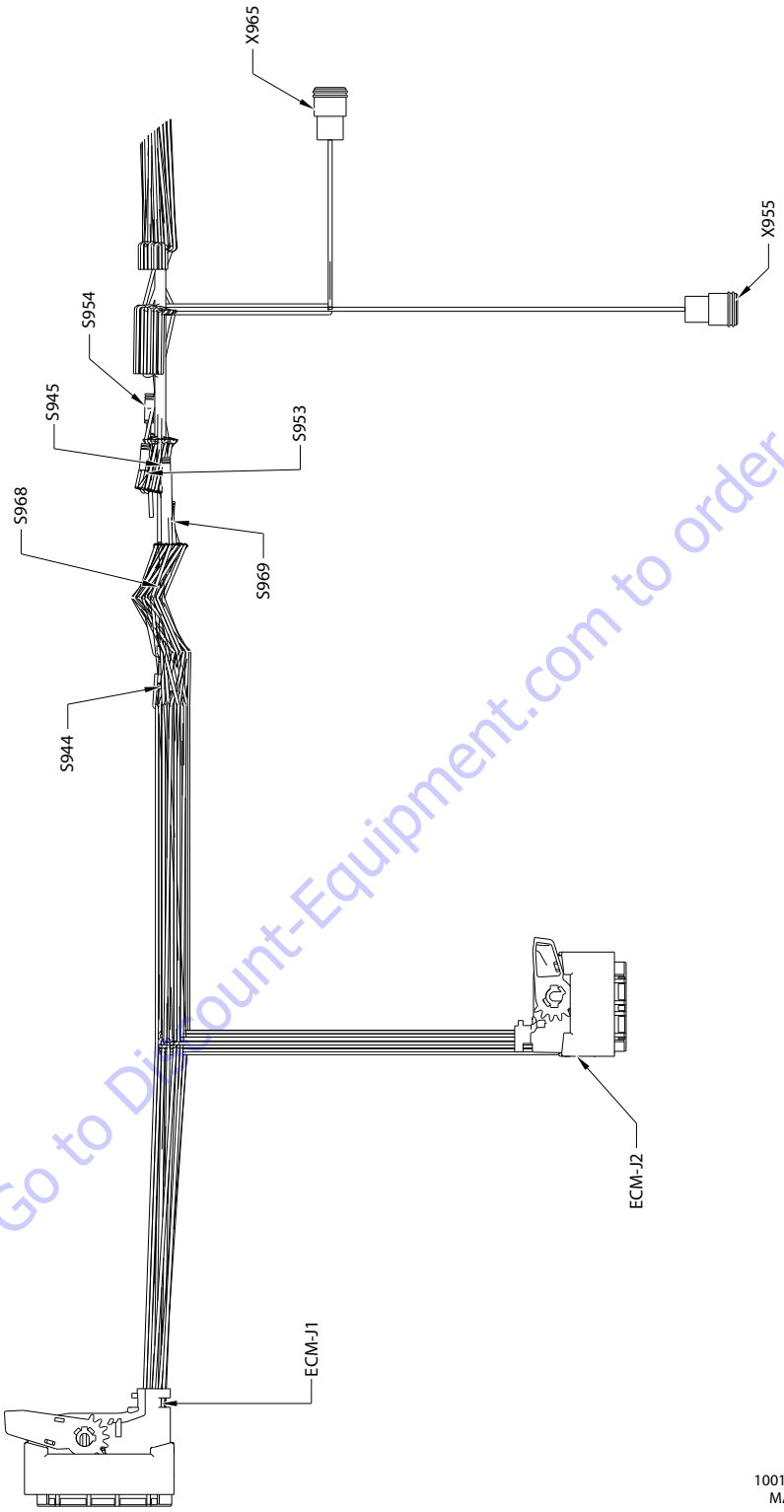


Figure 7-56. Deutz T4F Engine Harness - Sheet 2 of 5

ECM-J1					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	148-1 ECM PWR	2.5 mm^2	FLRYW	S944 (2)
2	BLK	148-2 ECM GND	2.5 mm^2	FLRYW	S945 (2)
3	RED	148-3 ECM PWR	2.5 mm^2	FLRYW	S944 (2)
4	BLK	148-4 ECM GND	2.5 mm^2	FLRYW	S945 (2)
5	RED	148-5 ECM PWR	2.5 mm^2	FLRYW	S944 (2)
6	BLK	148-6 ECM GND	2.5 mm^2	FLRYW	S945 (2)
7					
8					
9					
10					
11					
12					
13	BLK	148-13 COOLANT LEVEL SIG	0.75 mm^2	FLRYW	SN939 (3)
14					
15	BLK	148-15-68 CLUTCH SWITCH	0.75 mm^2	FLRYW	ECM-J1 (68)
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26	BLK	148-26 FUEL PUMP RELAY CTRL GND	0.75 mm^2	FLRYW	RL930 (2)
27					
28	BLK	148-28 START RTN	0.75 mm^2	FLRYW	EIC (2)
29	BLK	148-29 COOLANT LEVEL PWR	0.75 mm^2	FLRYW	SN939 (1)
30					
31					
32					
33					
34					
35	BLK	148-35-2 START	0.75 mm^2	FLRYW	S1001 (1)
36					
37					
38	BLK	148-38 THROTTLE FLAP 4	0.75 mm^2	FLRYW	EIC (52)
39					
40					
41					
42					
43					
44	BLK	148-44 EHXAUST GAS RECIRCULATION	0.75 mm^2	FLRYW	EIC (50)
45					
46					
47					
48					
49					
50					
51					
52					
53	GRN	CAN 2 LO DIAG CAN LOW	20 AWG	J1939 CABLE	S968 (1)
54	YEL	CAN 1 HI CUSTOMER CAN HIGH	20 AWG	J1939 CABLE	S953 (1)
55					
56	BLK	148-56 AIR INLET TEMP	0.75 mm^2	FLRYW	EIC (34)
57	BLK	148-57 WATER IN FUEL SW RTN	0.75 mm^2	FLRYW	X941 (2)
58					
59					
60					
61	BLK	148-61 FUEL LOW PRESSURE	0.75 mm^2	FLRYW	EIC (17)
62					
63					
64	BLK	148-64 WATER IN FUEL SW	0.75 mm^2	FLRYW	X941 (1)
65					
66					
67					
68	BLK	148-15-68 CLUTCH SWITCH	0.75 mm^2	FLRYW	ECM-J1 (15)
69					
70					
71					
72	BLK	148-72 THROTTLE FLAP 3	0.75 mm^2	FLRYW	EIC (49)
73	BLK	148-73 START SIGNAL	0.75 mm^2	FLRYW	EIC (3)
74					
75	YEL	CAN 2 HI DIAG CAN HIGH	20 AWG	J1939 CABLE	S969 (1)
76	GRN	CAN 1 LO CUSTOMER CAN LOW	20 AWG	J1939 CABLE	S954 (1)

77					
78					
79					
80					
81					
82	BLK	148-82 EHXAUST GAS RECIRCULATION	0.75 mm^2	FLRYW	EIC (51)
83					
84					
85	BLK	148-85 EHXAUST GAS RECIRCULATION	0.75 mm^2	FLRYW	EIC (46)
86					
87	BLK	148-87 COOLANT LEVEL GND	0.75 mm^2	FLRYW	SN939 (2)
88	BLK	148-88 IGNITION	0.75 mm^2	FLRYW	S946 (2)
89					
90					
91					
92					
93					
94					
NC	SHLD	CAN 1 SHLD CUSTOMER CAN SHIELD	20 AWG	J1939 CABLE	X901 (6)

S954					
CONN POS	**WIRE COLOR**	**WIRE LABEL**	**GAUGE**	**JACKET**	**TO**
1	GRN	CAN 1 LO CUSTOMER CAN LOW	20 AWG	J1939 CABLE	ECM-J1 (76)
2	GRN	CAN 1 LO CUSTOMER CAN LOW	20 AWG	J1939 CABLE	S952 (1)
2	GRN	CAN 1 LO CUSTOMER CAN LOW	20 AWG	J1939 CABLE	X955 (B)

S953					
CONN POS	**WIRE COLOR**	**WIRE LABEL**	**GAUGE**	**JACKET**	**TO**
1	YEL	CAN 1 HI CUSTOMER CAN HIGH	20 AWG	J1939 CABLE	ECM-J1 (54)
2	YEL	CAN 1 HI CUSTOMER CAN HIGH	20 AWG	J1939 CABLE	S951 (1)
2	YEL	CAN 1 HI CUSTOMER CAN HIGH	20 AWG	J1939 CABLE	X955 (A)

ECM-J2					
CONN POS	**WIRE COLOR**	**WIRE LABEL**	**GAUGE**	**JACKET**	**TO**
1					
2	BLK	248-2 INJECTOR 3	1.5 mm^2	FLRYW	EIC (61)
3	BLK	248-3 INJECTOR 2	1.5 mm^2	FLRYW	EIC (41)
4	BLK	248-M4 PROP ACTUATOR	1.5 mm^2	FLRYW	EIC (19)
5	BLK	248-M5 PROP ACTUATOR	1.5 mm^2	FLRYW	EIC (20)
6					
7	BLK	248-7 RAIL PRESSURE FUEL	0.75 mm^2	FLRYW	EIC (32)
8					
9					
10					
11					
12					
13					
14					
15					
16	BLK	248-16 INJECTOR 1	1.5 mm^2	FLRYW	EIC (35)
17					
18	BLK	248-18 INJECTOR 4	1.5 mm^2	FLRYW	EIC (37)
19	BLK	248-19 EXHAUST GAS RECIRCULATION	1.5 mm^2	FLRYW	EIC (47)
20	BLK	248-20 EXHAUST GAS RECIRCULATION	1.5 mm^2	FLRYW	EIC (48)
21					
22					
23	BLK	248-23 GLOW SENSE	0.75 mm^2	FLRYW	MS932 (E)
24	BLK	248-24 BOOST PRESSURE / TEMP	0.75 mm^2	FLRYW	EIC (22)
25	BLK	248-25 RAIL PRESSURE FUEL	0.75 mm^2	FLRYW	EIC (31)
26	BLK	248-26 RAIL PRESSURE FUEL	0.75 mm^2	FLRYW	EIC (25)
27	BLK	248-27 BOOST PRESSURE / TEMP	0.75 mm^2	FLRYW	EIC (29)
28	BLK	248-28 COOLING TEMPERATURE	0.75 mm^2	FLRYW	EIC (24)
29	BLK	248-29 OIL PRESSURE	0.75 mm^2	FLRYW	EIC (27)
30					
31					
32	BLK	248-32 INJECTOR 3	1.5 mm^2	FLRYW	EIC (38)
33	BLK	248-33 INJECTOR 1	1.5 mm^2	FLRYW	EIC (62)
34					

35	BLK	248-35 GLOW RELAY CONTROL GN D	0.75 mm^2	FLRYW	RL553-85 (1)
36					
37	BLK	248-37 ENGINE SPEED CAMSHAFT	18 AWG	CABLE	EIC (14)
38	SHLD	248-38 ENGINE SPEED CRANKSHAFT	20 AWG	CABLE	EIC (1)
39	BLK	248-39 ENGINE SPEED CRANKSHAFT	18 AWG	CABLE	EIC (15)
40	BLK	248-40 AIR INLET TEMP	0.75 mm^2	FLRYW	EIC (28)
41					
42					
43	BLK	248-43 OIL PRESSURE	0.75 mm^2	FLRYW	EIC (23)
44	BLK	248-44 OIL PRESSURE	0.75 mm^2	FLRYW	EIC (26)
45					
46	BLK	248-46 INJECTOR 2	1.5 mm^2	FLRYW	EIC (40)
47					
48	BLK	248-48 INJECTOR 4	1.5 mm^2	FLRYW	EIC (42)
49					
50					
51					
52	WHT	248-52 ENGINE SPEED CAMSHA FT	18 AWG	CABLE	EIC (13)
53	SHLD	248-5E3 ENGINE SPEED CAMSHA FT	20 AWG	CABLE	EIC (9)
54	WHT	248-54 ENGINE ENGINE SPEED CRANKSHA FT	18 AWG	CABLE	EIC (21)
55					
56					
57					
58					
59					
60					

S969					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	CAN 2 HI DIAG CAN HIGH	20 AWG	J1939 CABLE	ECM-J1 (75)
2	YEL	CAN 2 HI DIAG CAN HIGH	20 AWG	J1939 CABLE	S964 (1)
2	YEL	CAN 2 HI DIAG CAN HIGH	20 AWG	J1939 CABLE	X965 (A)

S968					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	GRN	CAN 2 LO DIAG CAN LOW	20 AWG	J1939 CABLE	ECM-J1 (53)
2	GRN	CAN 2 LO DIAG CAN LOW	20 AWG	J1939 CABLE	S963 (1)
2	GRN	CAN 2 LO DIAG CAN LOW	20 AWG	J1939 CABLE	X965 (B)

S945					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	000-148-246 ECM GND	8 AWG	GXL	T920 (1)
2	BLK	148-2 ECM GND	2.5 mm^2	FLRYW	ECM-J1 (2)
2	BLK	148-4 ECM GND	2.5 mm^2	FLRYW	ECM-J1 (4)
2	BLK	148-6 ECM GND	2.5 mm^2	FLRYW	ECM-J1 (6)

S944					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-148-135 ECM PWR	8 AWG	GXL	S812 (2)
2	RED	148-1 ECM PWR	2.5 mm^2	FLRYW	ECM-J1 (1)
2	RED	148-3 ECM PWR	2.5 mm^2	FLRYW	ECM-J1 (3)
2	RED	148-5 ECM PWR	2.5 mm^2	FLRYW	ECM-J1 (5)

X955					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CAN 1 HI CUSTOMER CAN HIGH	20 AWG	J1939 CABLE	S953 (2)
B	GRN	CAN 1 LO CUSTOMER CAN LOW	20 AWG	J1939 CABLE	S954 (2)
C					

X965					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CAN 2 HI DIAG CAN HIGH	20 AWG	J1939 CABLE	S969 (2)
B	GRN	CAN 2 LO DIAG CAN LOW	20 AWG	J1939 CABLE	S968 (2)
C					

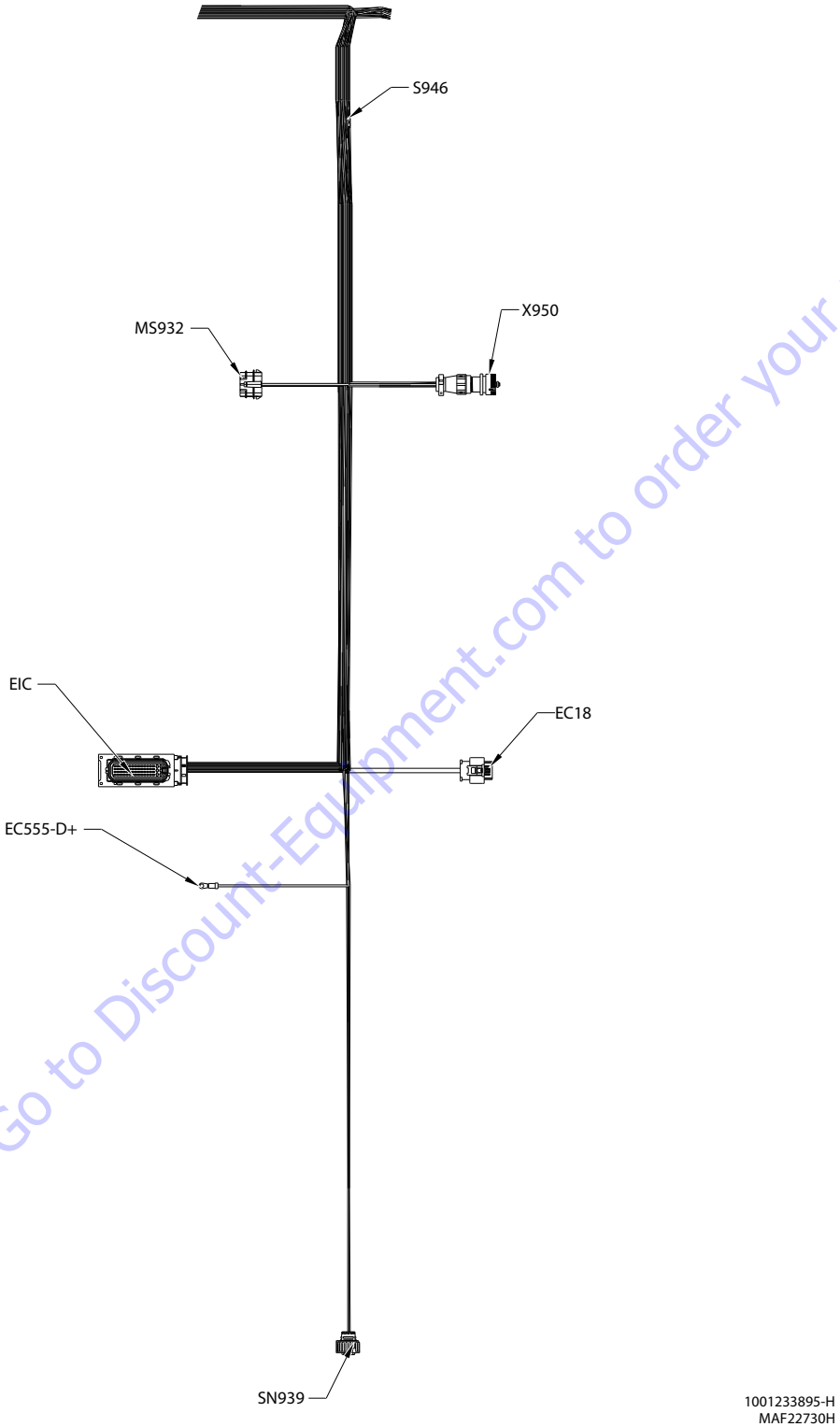


Figure 7-57. Deutz T4F Engine Harness - Sheet 3 of 5

EIC					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	SHLD	248-38 ENGINE SPEED CRANKSHAFT	20 AWG	CABLE	ECM-J2 (38)
2	BLK	148-28 START RTN	0.75 mm^2	FLRYW	ECM-J1 (28)
3	BLK	148-73 START SIGNAL	0.75 mm^2	FLRYW	ECM-J1 (73)
4					
5					
6					
7					
8					
9	SHLD	248-53 ENGINE SPEED CAMSHAFT	20 AWG	CABLE	ECM-J2 (53)
10					
11					
12					
13	WHT	248-52 ENGINE SPEED CAMSHAFT	18 AWG	CABLE	ECM-J2 (52)
14	BLK	248-37 ENGINE SPEED CAMSHAFT	18 AWG	CABLE	ECM-J2 (37)
15	BLK	248-39 ENGINE SPEED CRANKSHAFT	18 AWG	CABLE	ECM-J2 (39)
16					
17	BLK	148-61 FUEL LOW PRESSURE	0.75 mm^2	FLRYW	ECM-J1 (61)
18					
19	BLK	248-4 MPROP ACTUATOR	1.5 mm^2	FLRYW	ECM-J2 (4)
20	BLK	248-5 MPROP ACTUATOR	1.5 mm^2	FLRYW	ECM-J2 (5)
21	WHT	248-54 ENGINE SPEED CRANKSHAFT	18 AWG	CABLE	ECM-J2 (54)
22	BLK	248-24 BOOST PRESSURE / TEMP	0.75 mm^2	FLRYW	ECM-J2 (24)
23	BLK	248-43 OIL PRESSURE	0.75 mm^2	FLRYW	ECM-J2 (43)
24	BLK	248-28 COOLING TEMPERATURE	0.75 mm^2	FLRYW	ECM-J2 (28)
25	BLK	248-26 RAIL PRESSURE FUEL	0.75 mm^2	FLRYW	ECM-J2 (26)
26	BLK	248-44 OIL PRESSURE	0.75 mm^2	FLRYW	ECM-J2 (44)
27	BLK	248-29 OIL PRESSURE	0.75 mm^2	FLRYW	ECM-J2 (29)
28	BLK	248-40 AIR INLET TEMP	0.75 mm^2	FLRYW	ECM-J2 (40)
29	BLK	248-27 BOOST PRESSURE / TEMP	0.75 mm^2	FLRYW	ECM-J2 (27)
30					
31	BLK	248-25 RAIL PRESSURE FUEL	0.75 mm^2	FLRYW	ECM-J2 (25)
32	BLK	248-7 RAIL PRESSURE FUEL	0.75 mm^2	FLRYW	ECM-J2 (7)
33					
34	BLK	148-56 AIR INLET TEMP	0.75 mm^2	FLRYW	ECM-J1 (56)
35	BLK	248-16 INJECTOR 1	1.5 mm^2	FLRYW	ECM-J2 (16)
36					
37	BLK	248-18 INJECTOR 4	1.5 mm^2	FLRYW	ECM-J2 (18)
38	BLK	248-32 INJECTOR 3	1.5 mm^2	FLRYW	ECM-J2 (32)
39					
40	BLK	248-46 INJECTOR 2	1.5 mm^2	FLRYW	ECM-J2 (46)
41	BLK	248-3 INJECTOR 2	1.5 mm^2	FLRYW	ECM-J2 (3)
42	BLK	248-48 INJECTOR 4	1.5 mm^2	FLRYW	ECM-J2 (48)
43					
44					
45					
46	BLK	148-85 EHXAUST GAS RECIRCULATION	0.75 mm^2	FLRYW	ECM-J1 (85)
47	BLK	248-19 EHXAUST GAS RECIRCULATION	1.5 mm^2	FLRYW	ECM-J2 (19)
48	BLK	248-20 EHXAUST GAS RECIRCULATION	1.5 mm^2	FLRYW	ECM-J2 (20)
49	BLK	148-72 THROTTLE FLAP 3	0.75 mm^2	FLRYW	ECM-J1 (72)
50	BLK	148-44 EHXAUST GAS RECIRCULATION	0.75 mm^2	FLRYW	ECM-J1 (44)
51	BLK	148-82 EHXAUST GAS RECIRCULATION	0.75 mm^2	FLRYW	ECM-J1 (82)
52	BLK	148-38 THROTTLE FLAP 4	0.75 mm^2	FLRYW	ECM-J1 (38)
53					
54					
55					
56					
57					
58					
59					
60					
61	BLK	248-2 INJECTOR 3	1.5 mm^2	FLRYW	ECM-J2 (2)
62	BLK	248-33 INJECTOR 1	1.5 mm^2	FLRYW	ECM-J2 (33)

S946					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	2-48-1 IGNITION	16 AWG	GXL	MS932 (H)
1	YEL	2-48-2 IGNITION	18 AWG	GXL	X950 (A)
2	BLK	148-88 IGNITION	0.75 mm^2	FLRYW	ECM-J1 (88)
2	YEL	2-48-3 IGNITION	18 AWG	GXL	RL553-86 (1)
2	YEL	2-48-4 IGNITION	18 AWG	GXL	RL930 (1)

EC18					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	48-14 GLOW	8 AWG	GXL	RL553-30 (1)
2	RED	48-13 GLOW	8 AWG	GXL	RL553-30-1 (1)

X950 DEUTZ DIAGNOSTIC					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	2-48-2 IGNITION	18 AWG	GXL	S946 (1)
B	BLK	000-48-2 ENG GND	18 AWG	GXL	T920 (1)
C					
D					
E					
F	GRN	CAN 1 LO CUSTOMER CAN LO	20 AWG	J1939 CABLE	S952 (2)
G	GRN	CAN 2 LO DIAG CAN LOW	20 AWG	J1939 CABLE	S963 (2)
H	YEL	CAN 2 HI DIAG CAN HIGH	20 AWG	J1939 CABLE	S964 (1)
J					
K					
L					
M	YEL	CAN 1 HI CUSTOMER CAN HIG	H20 AWG	J1939 CABLE	S951 (2)

MS932					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A					
B					
C					
D					
E	BLK	248-23 GLOW SENSE	0.75 mm	FLRYW	ECM-J2 (23)
F	ORG	248-23-1 GLOW SENSE	18 AWG	GXL	RL553-30-2 (1)
G	YEL	2-1-99 IGNITION	18 AWG	GXL	X902 (1)
H	YEL	2-48-1 IGNITION	16 AWG	GXL	S946 (1)

EC555-D+					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE JACKET		TO
1	RED	47-8 ALT EXCITE	16 AWG	GXL	X901 (5)

SN939					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	148-29 COOLANT LEVEL PWR	0.75 mm^2	FLRYW	ECM-J1 (29)
2	BLK	148-87 COOLANT LEVEL GND	0.75 mm^2	FLRYW	ECM-J1 (87)
3	BLK	148-13 COOLANT LEVEL SIG	0.75 mm^2	FLRYW	ECM-J1 (13)
4					

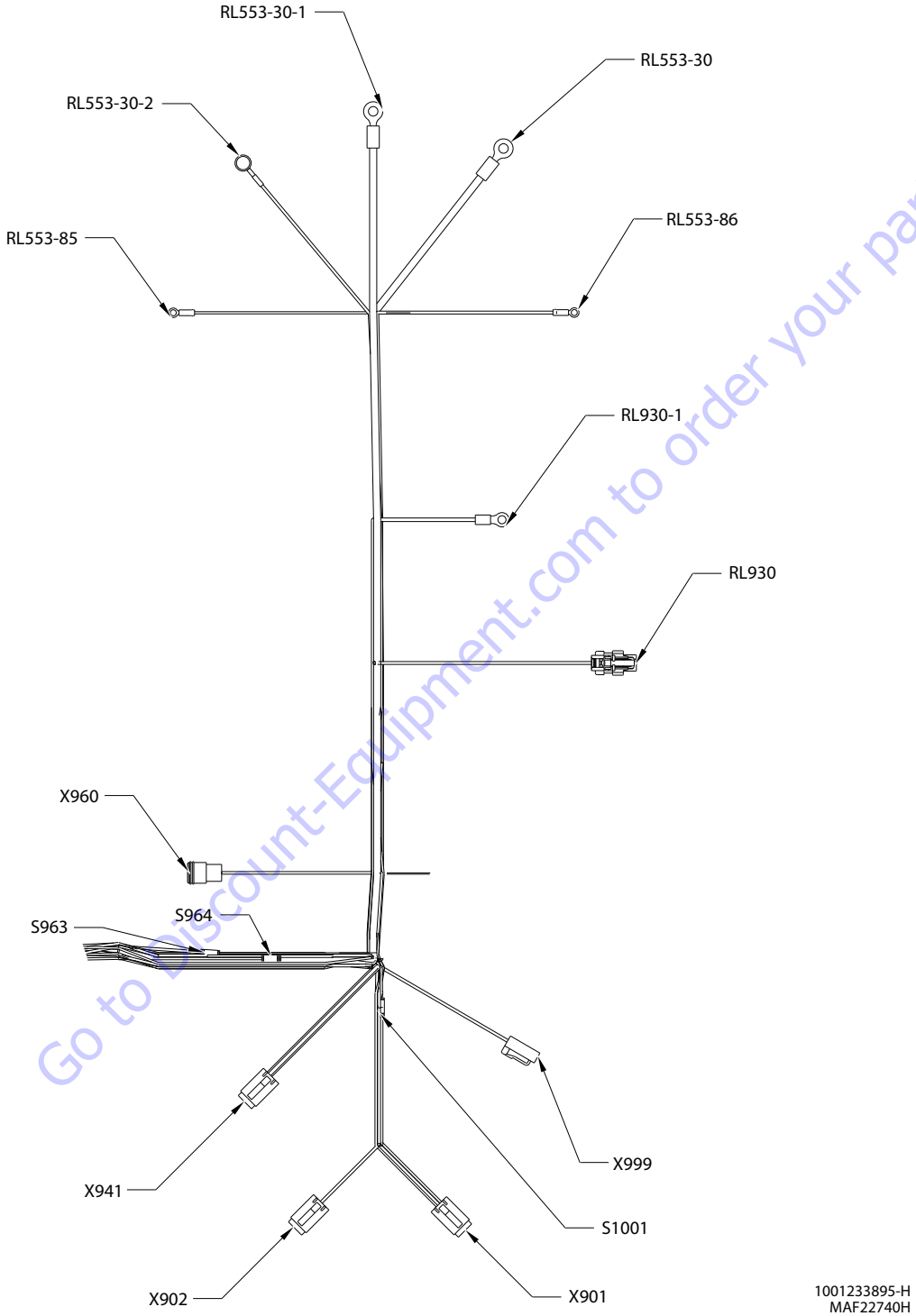


Figure 7-58. Deutz T4F Engine Harness - Sheet 4 of 5

X941					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	148-64 WATER IN FUEL SW	0.75 mm^2	FLRYW	ECM-J1 (64)
2	BLK	148-57 WATER IN FUEL SW RTN	0.75 mm^2	FLRYW	ECM-J1 (57)
3	WHT	48-96 FUEL PUMP	14 AWG	GXL	RL930-1 (1)
4	BLK	000-48-1 ENG GND	14 AWG	GXL	T920 (1)

X902					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	2-1-99 IGNITION	18 AWG	GXL	MS932 (G)
2					
3					
4					
5					
6					
7					
8					

X901					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	BLK	148-35-1 START	18 AWG	GXL	S1001 (2)
3	YEL	CAN 1 HI CUSTOMER CAN HIGH	20 AWG	J1939 CABLE	S951 (2)
4	GRN	CAN 1 LO CUSTOMER CAN LO	20 AWG	J1939 CABLE	S952 (2)
5	RED	47-8 ALT EXCITE	16 AWG	GXL	EC555-D+ (1)
6	SHLD	CAN 1 SHLD CUSTOMER CAN SHIELD	20 AWG	J1939 CABLE	ECM-J1 (NC)

S963					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	GRN	CAN 2 LO DIAG CAN LOW	20 AWG	J1939 CABLE	X960 (B)
2	GRN	CAN 2 LO DIAG CAN LOW	20 AWG	J1939 CABLE	S968 (2)
2	GRN	CAN 2 LO DIAG CAN LOW	20 AWG	J1939 CABLE	X950 (G)

S964					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	CAN 2 HI DIAG CAN HIGH	20 AWG	J1939 CABLE	S969 (2)
1	YEL	CAN 2 HI DIAG CAN HIGH	20 AWG	J1939 CABLE	X950 (H)
2	YEL	CAN 2 HI DIAG CAN HIGH	20 AWG	J1939 CABLE	X960 (A)

S1001					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	148-35-2START	0.75 mm^2	FLRYW	ECM-J1 (35)
1	BLK	148-35-3	18 AWG	GXL	X999 (1)
2	BLK	148-35-1START	18 AWG	GXL	X901 (2)

X999					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	148-35-3	18 AWG	GXL	S1001 (1)
2	BLK	000-48-3 GND	18 AWG	GXL	T920 (1)

RL553-85					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	248-35GLOW RELAY CONTROL GND	0.75 mm^2	FLRYW	ECM-J2 (35)

RL553-30-2					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	ORG	248-23-1 GLOW SENSE	18 AWG	GXL	MS932 (F)

RL553-30-1					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	48-13 GLOW	8 AWG	GXL	EC18 (2)

RL553-30					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	48-14 GLOW	8 AWG	GXL	EC18 (1)

RL553-86					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	2-48-3 IGNITION	18 AWG	GXL	S946 (2)

RL930-1					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	48-96 FUEL PUMP	14 AWG	GXL	X941 (3)

RL930					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	2-48-4 IGNITION	18 AWG	GXL	S946 (2)
2	BLK	148-26 FUEL PUMP RELAY CTRL GND	0.75 mm^2	FLRYW	ECM-J1 (26)

X960					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	YEL	CAN 2 HI DIAG CAN HIGH	20 AWG	J1939 CABLE	S964 (2)
B	GRN	CAN 2 LO DIAG CAN LOW	20 AWG	J1939 CABLE	S963 (1)
C					

S963					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	GRN	CAN 2 LO DIAG CAN LOW	20 AWG	J1939 CABLE	X960 (B)
2	GRN	CAN 2 LO DIAG CAN LOW	20 AWG	J1939 CABLE	S968 (2)
2	GRN	CAN 2 LO DIAG CAN LOW	20 AWG	J1939 CABLE	X950 (G)

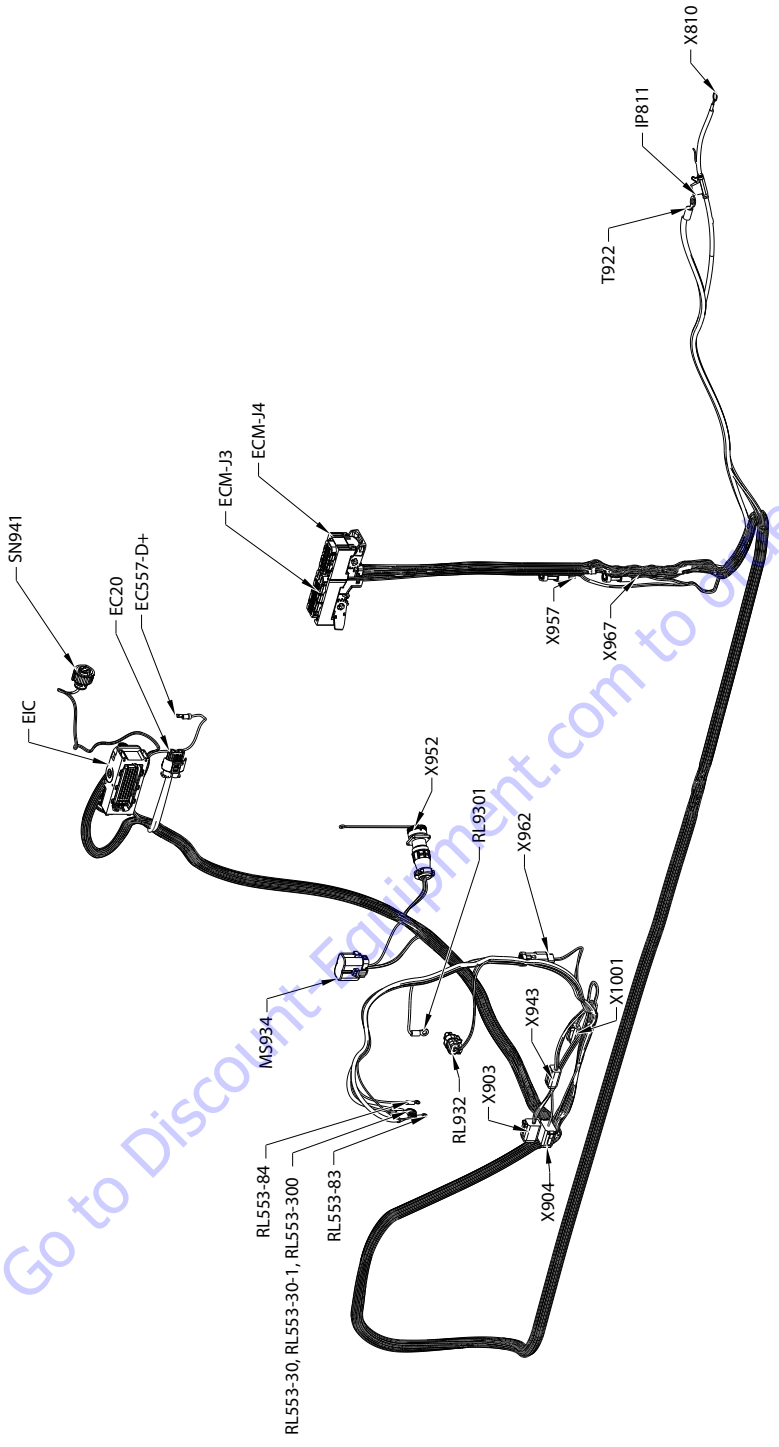


Figure 7-59. Deutz T4F Engine Harness - Sheet 5 of 5

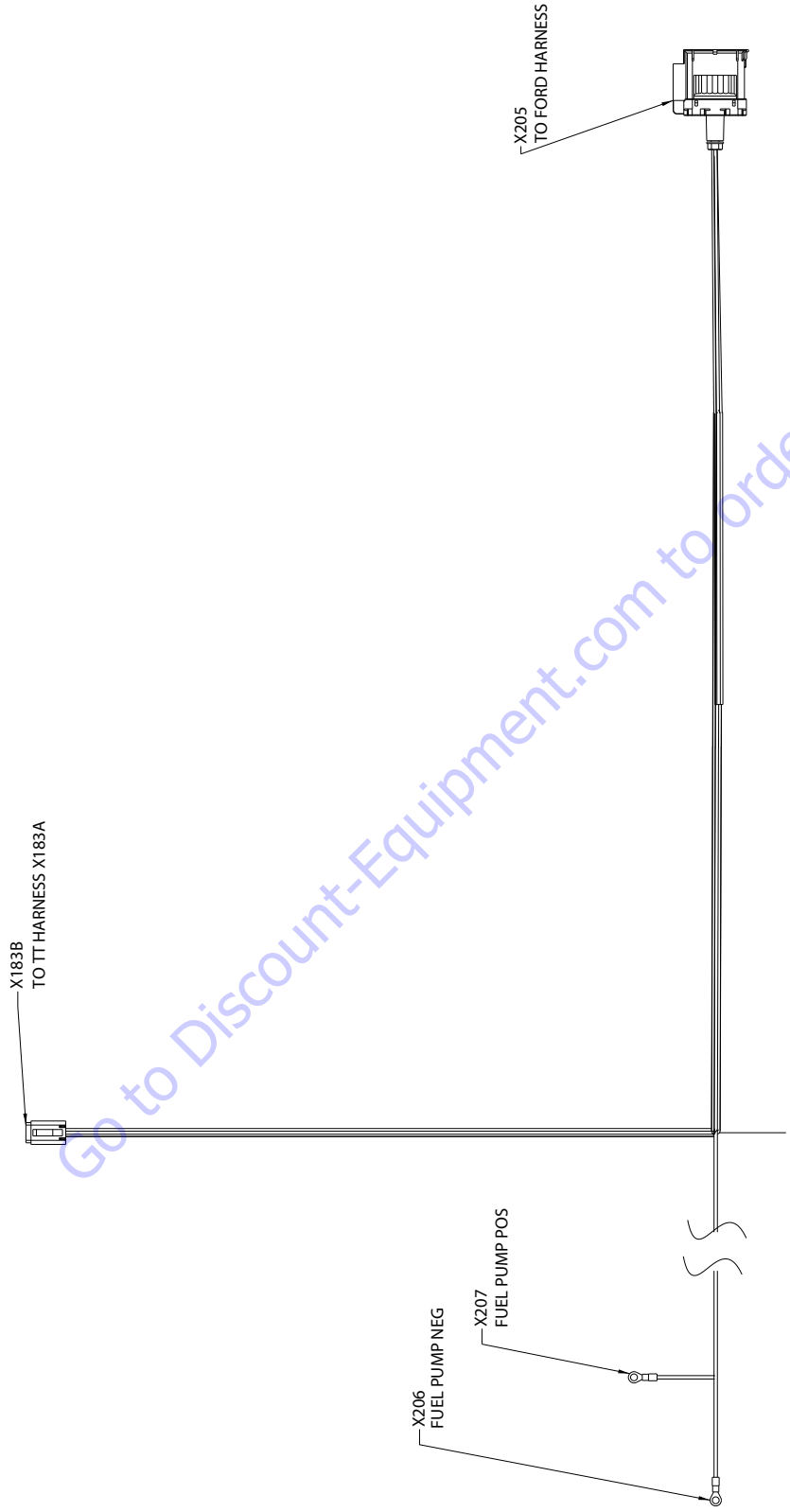


Figure 7-60. Ford Engine Harness

X207 FUEL PUMP POS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-54 FUEL PUMP POS	16 AWG	GXL	X205 (5)

X206 FUEL PUMP NEG					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	000-60-11 FUEL PUMP NEG	16 AWG	GXL	X205 (18)

X183B TO TT HARNESS X183A					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-14 IGNITION	16 AWG	GXL	X205 (1)
2	WHT	6-12 ENGINE START	18 AWG	GXL	X205 (15)
3	YEL	CAN HI	20 AWG	J1939 CABLE	X205 (28)
4	GRN	CAN LO	20 AWG	J1939 CABLE	X205 (29)
5					
6					

X205 TO FORD HARNESS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-14 IGNITION	16 AWG	GXL	X181B (1)
2					
3					
4					
5	WHT	6-54 FUEL PUMP POS	16 AWG	GXL	X208 (1)
6					
7					
8					
9					
10					
11					
12					
13					
14					
15	WHT	6-12 ENGINE START	18 AWG	GXL	X181 (2)
16					
17					
18	BLK	000-60-11 FUEL PUMP NEG	16 AWG	GXL	X207 (1)
19					
20					
21					
22					
23					
24					
25					
26					
27					
28	YEL	CAN HI	20 AWG	J1939 CABLE	X181 (3)
29	GRN	CAN LO	20 AWG	J1939 CABLE	X181 (4)
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					

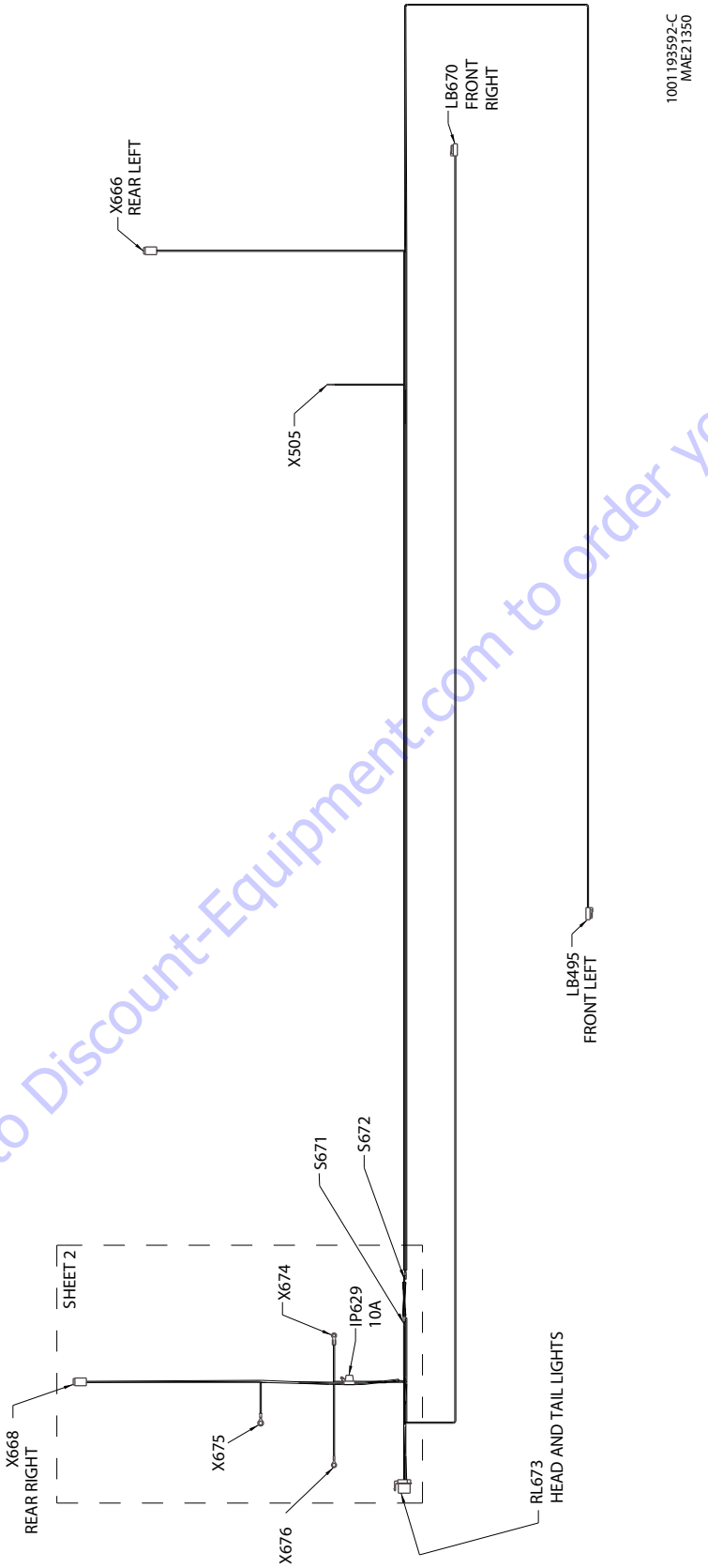


Figure 7-61. Chassis Head and Tail Lights Harness - Sheet 1 of 2

X505					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	4-145	18 AWG	GXL	RL673 (5)

LB670 FRONT RIGHT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-29 12V+	16 AWG	GXL	S671 (1)
2	BLK	000-60-29 GND	16 AWG	GXL	S672 (1)

LB495 FRONT LEFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-11 12V+	16 AWG	GXL	S671 (1)
2	BLK	000-60-11 GND	16 AWG	GXL	S672 (1)

X666 REAR LEFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	BLK	000-60-12 GND	16 AWG	GXL	S672 (2)
3	WHT	6-13 12V+	16 AWG	GXL	S671 (2)
4					

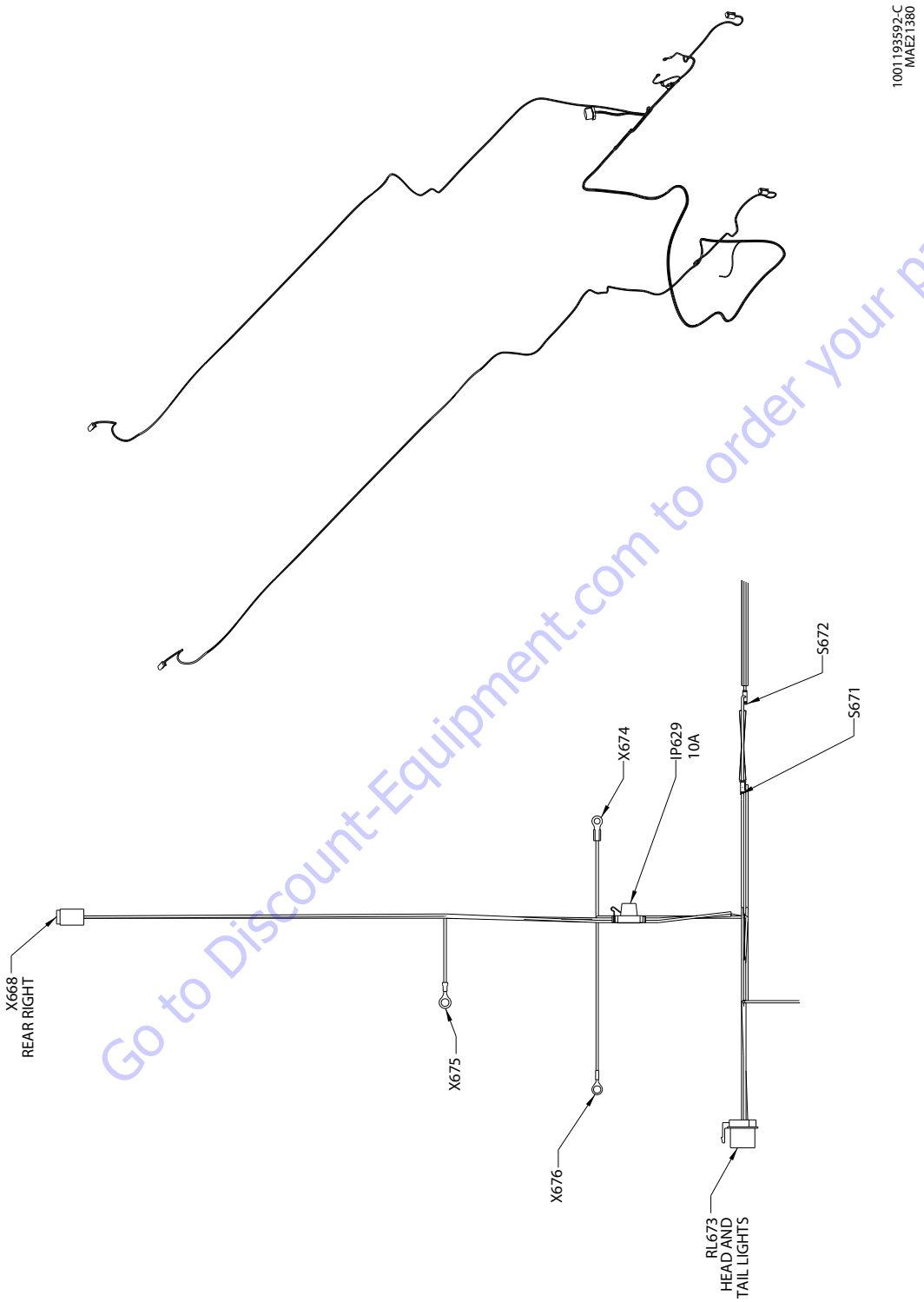


Figure 7-62. Chassis Head and Tail Lights Harness - Sheet 2 of 2

IP629 10A					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	4-146	14 AWG	GXL	X675 (1)
2	WHT	4-146	14 AWG	GXL	RL673 (1)

RL673 HEAD AND TAIL LIGHTS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	4-146	14 AWG	GXL	IP629 (2)
2	BLK	000-40-109 GND	16 AWG	GXL	X676 (1)
3					
4	WHT	6-8 12V+	14 AWG	GXL	S671 (2)
5	WHT	4-145	18 AWG	GXL	X505 (1)

X676					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	000-40-109 GND	16 AWG	GXL	RL673 (2)

X675					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	4-146	14 AWG	GXL	IP629 (1)

X668 REAR RIGHT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	BLK	000-60-30 GND	16 AWG	GXL	S672 (2)
3	WHT	6-30 12V+	16 AWG	GXL	S671 (2)
4					

X674					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	4-122	14 AWG	GXL	S672 (2)

S671					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-11 12V+	16 AWG	GXL	LB495 (1)
2	WHT	6-29 12V+	16 AWG	GXL	LB670 (1)
1	WHT	6-13 12V+	16 AWG	GXL	X666 (2)
2	WHT	6-30 12V+	16 AWG	GXL	X668 (2)
2	WHT	6-8 12V+	14 AWG	GXL	RL673 (4)

S672					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	000-60-11 GND	16 AWG	GXL	LB495 (2)
2	BLK	000-60-29 GND	16 AWG	GXL	LB670 (2)
1	BLK	000-60-12 GND	16 AWG	GXL	X666 (3)
2	BLK	000-60-30 GND	16 AWG	GXL	X668 (3)
2	BLK	4-122	14 AWG	GXL	X674 (1)

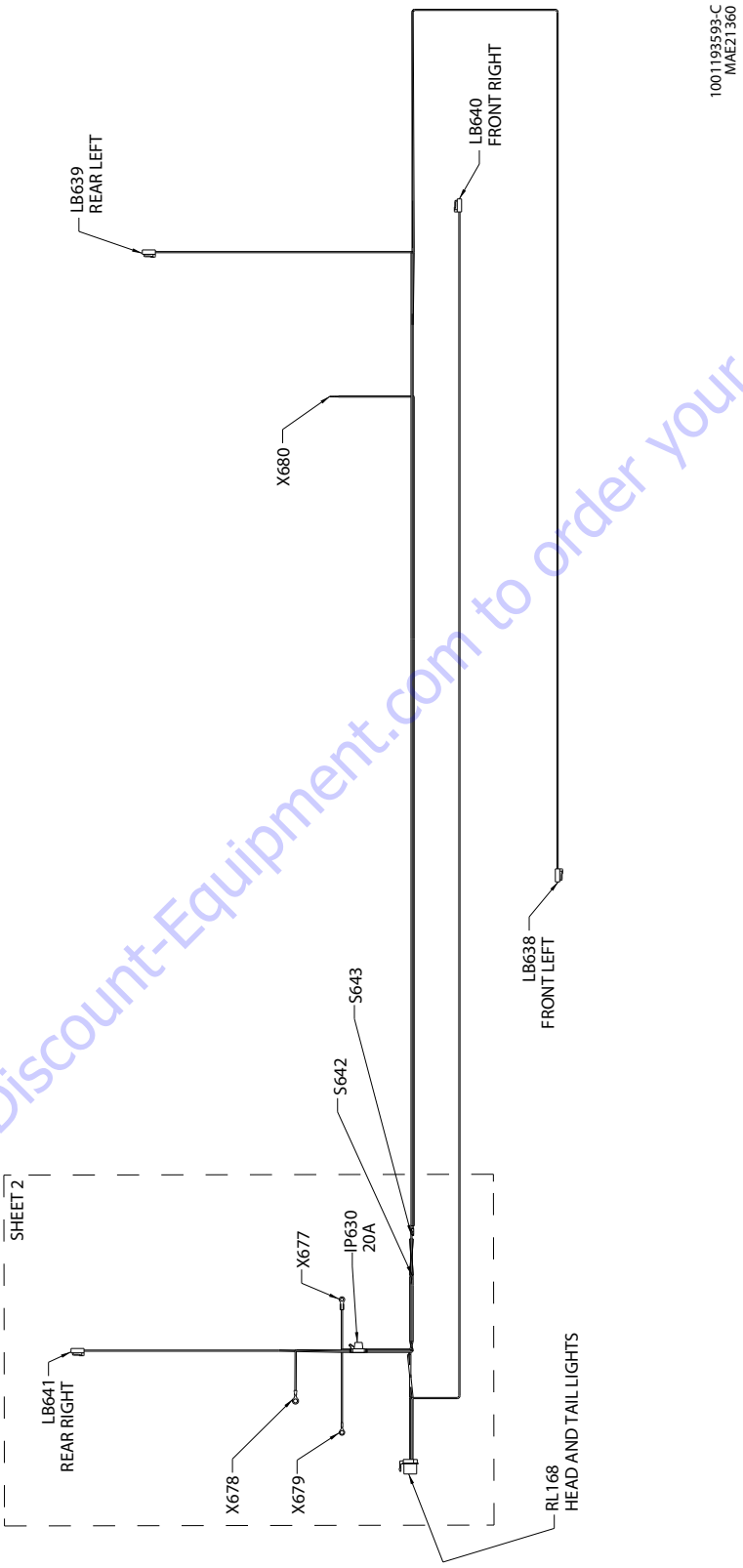


Figure 7-63. Chassis Work Lights Harness - Sheet 1 of 2

LB638 FRONT LEFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-4 12V+	16 AWG	GXL	S642 (1)
2	BLK	000-60-3 GND	16 AWG	GXL	S643 (1)

LB640 FRONT RIGHT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-6 12V+	16 AWG	GXL	S642 (1)
2	BLK	000-60-5 GND	16 AWG	GXL	S643 (1)

X680					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	4-28	16 AWG	GXL	RL168 (5)

LB639 REAR LEFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-5 12V+	16 AWG	GXL	S642 (2)
2	BLK	000-60-4 GND	16 AWG	GXL	S643 (2)

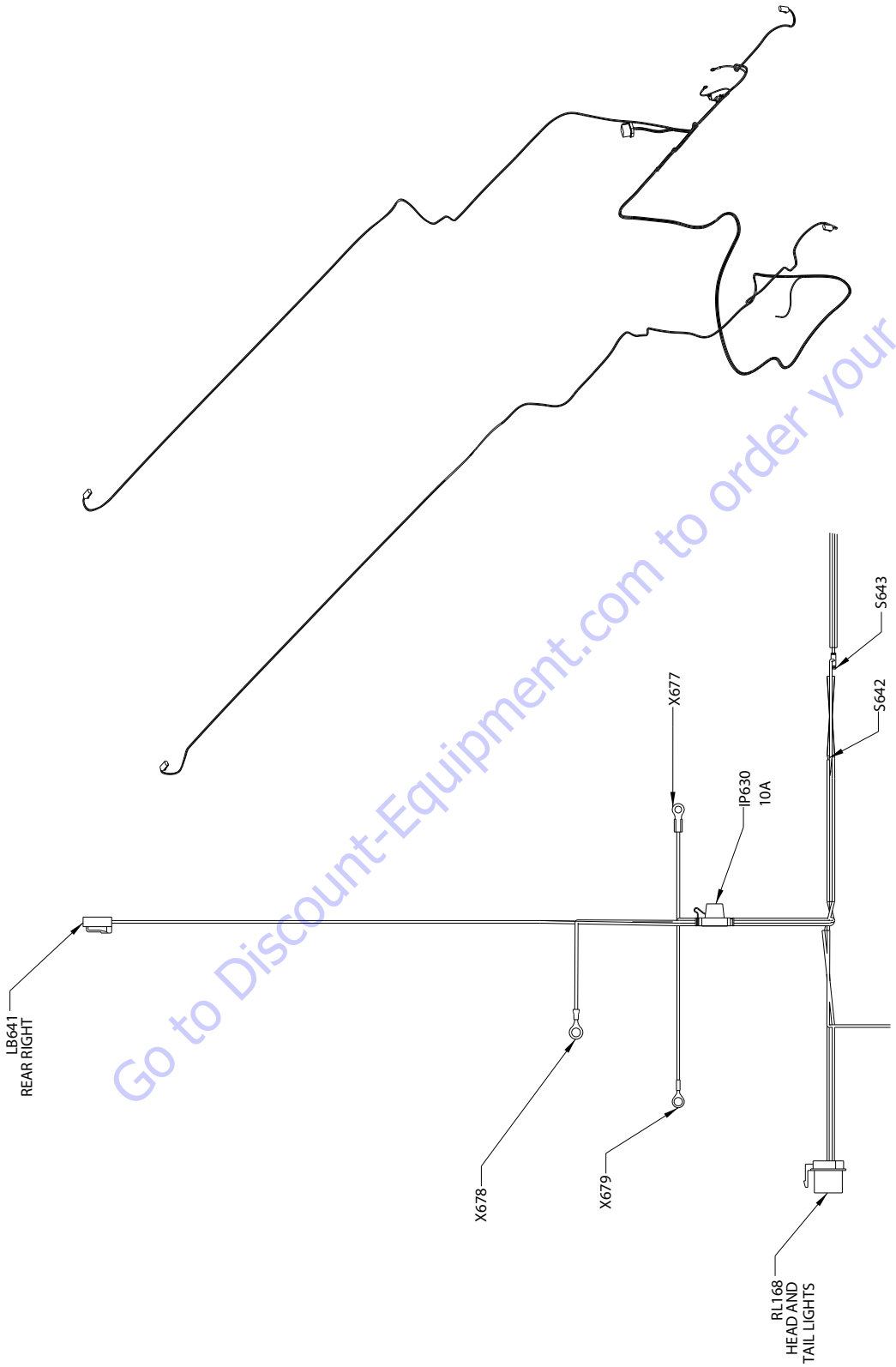


Figure 7-64. Chassis Work Lights Harness - Sheet 2 of 2

X678					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	4-70	14 AWG	GXL	IP630 (1)

X679					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	000-40-9 GND	16 AWG	GXL	RL168 (2)

RL168 HEAD AND TAIL LIGHTS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	4-70	14 AWG	GXL	IP630 (2)
2	BLK	000-40-9 GND	16 AWG	GXL	X679 (1)
3					
4	WHT	6-8 12V+	14 AWG	GXL	S642 (2)
5	WHT	4-28	16 AWG	GXL	X680 (1)

IP630 20A					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	4-70	14 AWG	GXL	X678 (1)
2	WHT	4-70	14 AWG	GXL	RL168 (1)

X677					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	000-40-17	14 AWG	GXL	S643 (2)

S642					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-412V+	16 AWG	GXL	LB638 (1)
1	WHT	6-6 12V+	16 AWG	GXL	LB640 (1)
2	WHT	6-5 12V+	16 AWG	GXL	LB639 (1)
2	WHT	6-7 12V+	16 AWG	GXL	LB641 (1)
2	WHT	6-8 12V+	14 AWG	GXL	RL168 (4)

LB641 REAR RIGHT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	6-7 12V+	16 AWG	GXL	S642 (2)
2	BLK	000-60-6 GND	16 AWG	GXL	S643 (2)

S643					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	000-60-3 GND	16 AWG	GXL	LB638 (2)
1	BLK	000-60-5 GND	16 AWG	GXL	LB640 (2)
2	BLK	000-40-17	14 AWG	GXL	X677 (1)
2	BLK	000-60-4 GND	16 AWG	GXL	LB639 (2)
2	BLK	000-60-6 GND	16 AWG	GXL	LB641 (2)

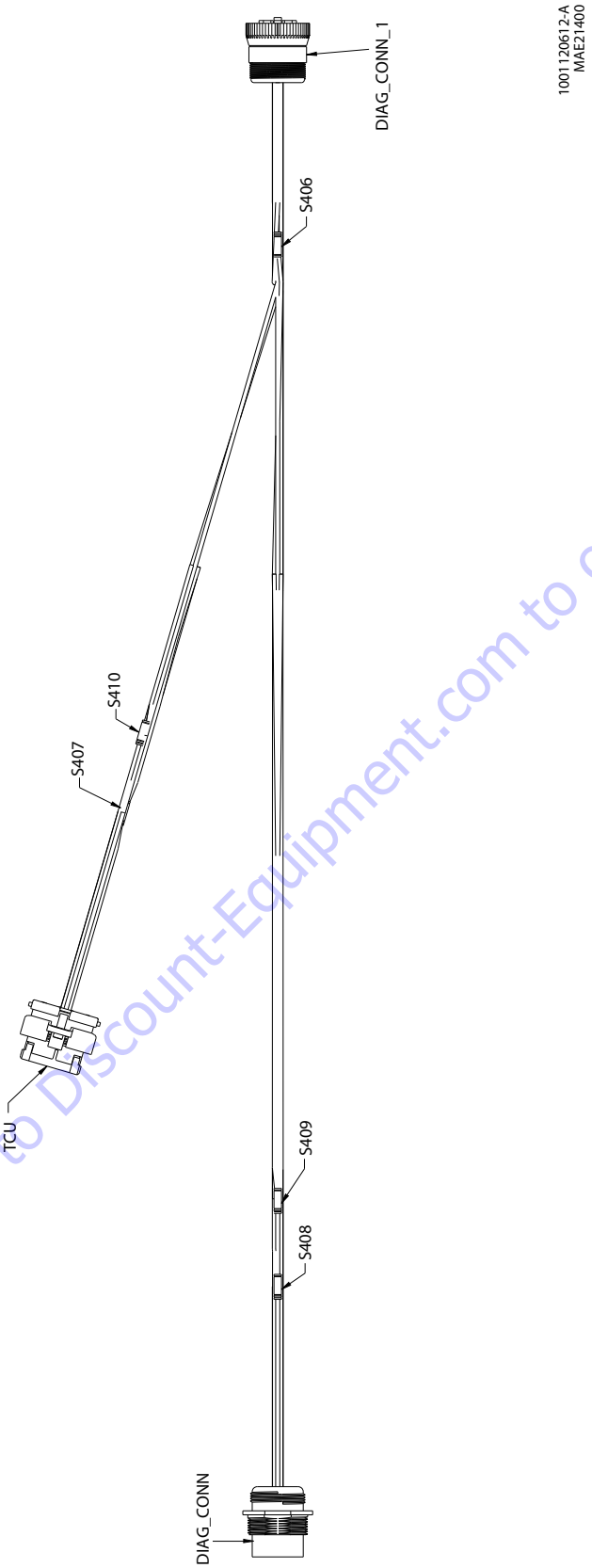


Figure 7-65. ClearSky Harness

S406					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	0-100-1 GND	16 AWG	GXL	TCU (16)
1	BLK	0-100-2 GND	16 AWG	GXL	DIAG_CONN (A)
2	BLK	0-100-3 GND	16 AWG	GXL	DIAG_CONN_1 (A)

S407					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	1-100-2 B+	16 AWG	GXL	DIAG_CONN (B)
1	RED	1-100-3 B+	16 AWG	GXL	DIAG_CONN_1 (B)
2	RED	1-100-1 B+	16 AWG	GXL	TCU (23)

S408					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL	4-100-1 CAN HI	18 AWG	GXL	TCU (7)
1	YEL	4-100-3 CAN HI	18 AWG	GXL	DIAG_CONN_1 (C)
2	YEL	4-100-2 CAN HI	18 AWG	GXL	DIAG_CONN (C)

S409					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	GRN	3-100-1 CAN LO	18 AWG	GXL	TCU (22)
1	GRN	3-100-3 CAN LO	18 AWG	GXL	DIAG_CONN_1 (D)
2	GRN	3-100-2 CAN LO	18 AWG	GXL	DIAG_CONN (D)

S410					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL/ RED	2-100-2 IGN	18 AWG	GXL	DIAG_CONN (H)
2	YEL/ RED	2-100-1 IGN	18 AWG	GXL	TCU (15)
2	YEL/ RED	2-100-3 IGN	18 AWG	GXL	DIAG_CONN_1 (H)

DIAG_CONN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	BLK	0-100-2 GND	16 AWG	GXL	S406 (1)
B	RED	1-100-2 B+	16 AWG	GXL	S407 (1)
C	YEL	4-100-2 CAN HI	18 AWG	GXL	S408 (2)
D	GRN	3-100-2 CAN LO	18 AWG	GXL	S409 (2)
E	BLK	5-100-1 SHLD	18 AWG	GXL	DIAG_CONN_1 (E)
F					
G					
H	YEL/ RED	2-100-2 IGN	18 AWG	GXL	S410 (1)
J					

TCU					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2					
3					
4					
5					
6					
7	YEL	4-100-1CAN HI	18 AWG	GXL	S408 (1)
8					
9					
10					
11					
12					
13					
14					
15	YEL/ RED	2-100-1 IGN	18 AWG	GXL	S410 (2)
16	BLK	0-100-1 GND	16 AWG	GXL	S406 (1)
17					
18					
19					
20					
21					
22	GRN	3-100-1 CAN LO	18 AWG	GXL	S409 (1)
23	RED	1-100-1 B+	16 AWG	GXL	S407 (2)

DIAG_CONN_1					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	BLK	0-100-3 GND	16 AWG	GXL	S406 (2)
B	RED	1-100-3 B+	16 AWG	GXL	S407 (1)
C	YEL	4-100-3 CAN HI	18 AWG	GXL	S408 (1)
D	GRN	3-100-3 CAN LO	18 AWG	GXL	S409 (1)
E	BLK	5-100-1 SHLD	18 AWG	GXL	DIAG_CONN (E)
F					
G					
H	YEL/ RED	2-100-3 IGN	18 AWG	GXL	S410 (2)
J					

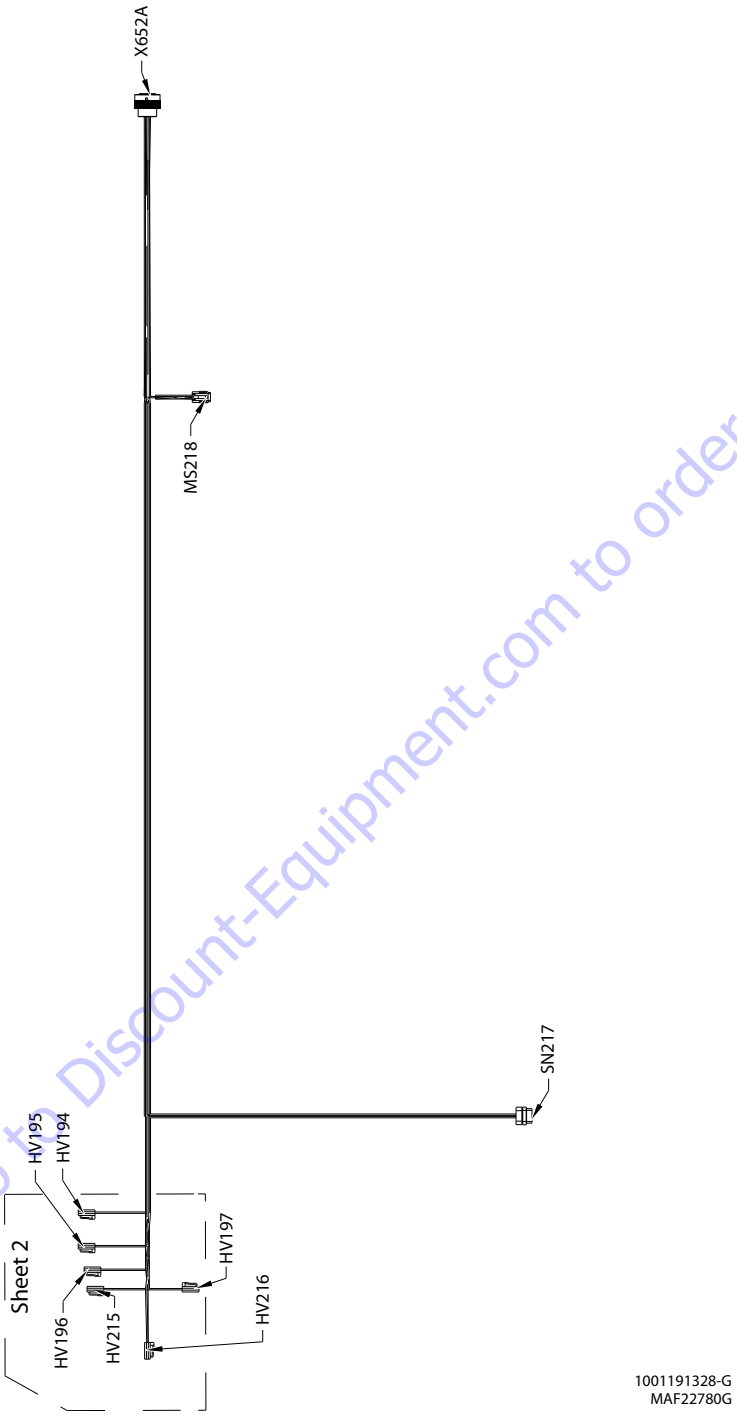


Figure 7-66. Platform Valve W/O Jib Harness - Sheet 1 of 2

SN217 PLATFORM ANGLE SNSR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
A	BLU-BLK	18-6 1060780	18 AWG	CABLE	X652A (21)
B	ORG-BLK	18-6 1060780	18 AWG	CABLE	X652A (10)
C	YEL-BLK	18-6 1060780	18 AWG	CABLE	X652A (9)
D	BRN-BLK	18-6 1060780	18 AWG	CABLE	X652A (8)
E	BLK-RED	18-6 1060780	18 AWG	CABLE	X652A (20)
F	BLU-RED	18-6 1060780	18 AWG	CABLE	X652A (11)

MS218 VLV BANK GND BUSS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	BLK	12-3 PLAT VLV-	18 AWG	GXL	X652A (1)
3	BLK	12-3-1 PLAT VLV-	18 AWG	GXL	HV216 (2)
4	BLK	12-3-2 PLAT VLV-	18 AWG	GXL	HV215 (2)
5					
6					
7	BLK	12-3-5 PLAT VLV-	18 AWG	GXL	HV196 (2)
8	BLK	12-3-6 PLAT VLV-	18 AWG	GXL	HV197 (2)
9	BLK	12-3-7 PLAT VLV-	18 AWG	GXL	HV194 (2)
10	BLK	12-3-8 PLAT VLV-	18 AWG	GXL	HV195 (2)
11					
12					

X652A					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	12-3 PLAT VLV-	18 AWG	GXL	MS218 (2)
2					
3	WHT	90-1 HI PRS DUMP	18 AWG	GXL	HV215 (1)
4	WHT	88-1-2 LEVEL UP	18 AWG	GXL	HV195 (1)
5	WHT	89-1-2 LEVEL DWON	18 AWG	GXL	HV194 (1)
6					
7					
8	BRN-BLK	18-6 1060780	18 AWG	CABLE	SN217 (D)
9	YEL-BLK	18-6 1060780	18 AWG	CABLE	SN217 (C)
10	ORG-BLK	18-6 1060780	18 AWG	CABLE	SN217 (B)
11	BLU-RED	18-6 1060780	18 AWG	CABLE	SN217 (F)
12	WHT	90-2 LOW PRS DUMP	18 AWG	GXL	HV216 (1)
13	WHT	86-3 ROTATE LEFT	18 AWG	GXL	HV197 (1)
14	WHT	87-3 ROTATE RIGHT	18 AWG	GXL	HV196 (1)
15					
16					
17					
18					
19					
20	BLK-RED	18-6 1060780	18 AWG	CABLE	SN217 (E)
21	BLU-BLK	18-6 1060780	18 AWG	CABLE	SN217 (A)

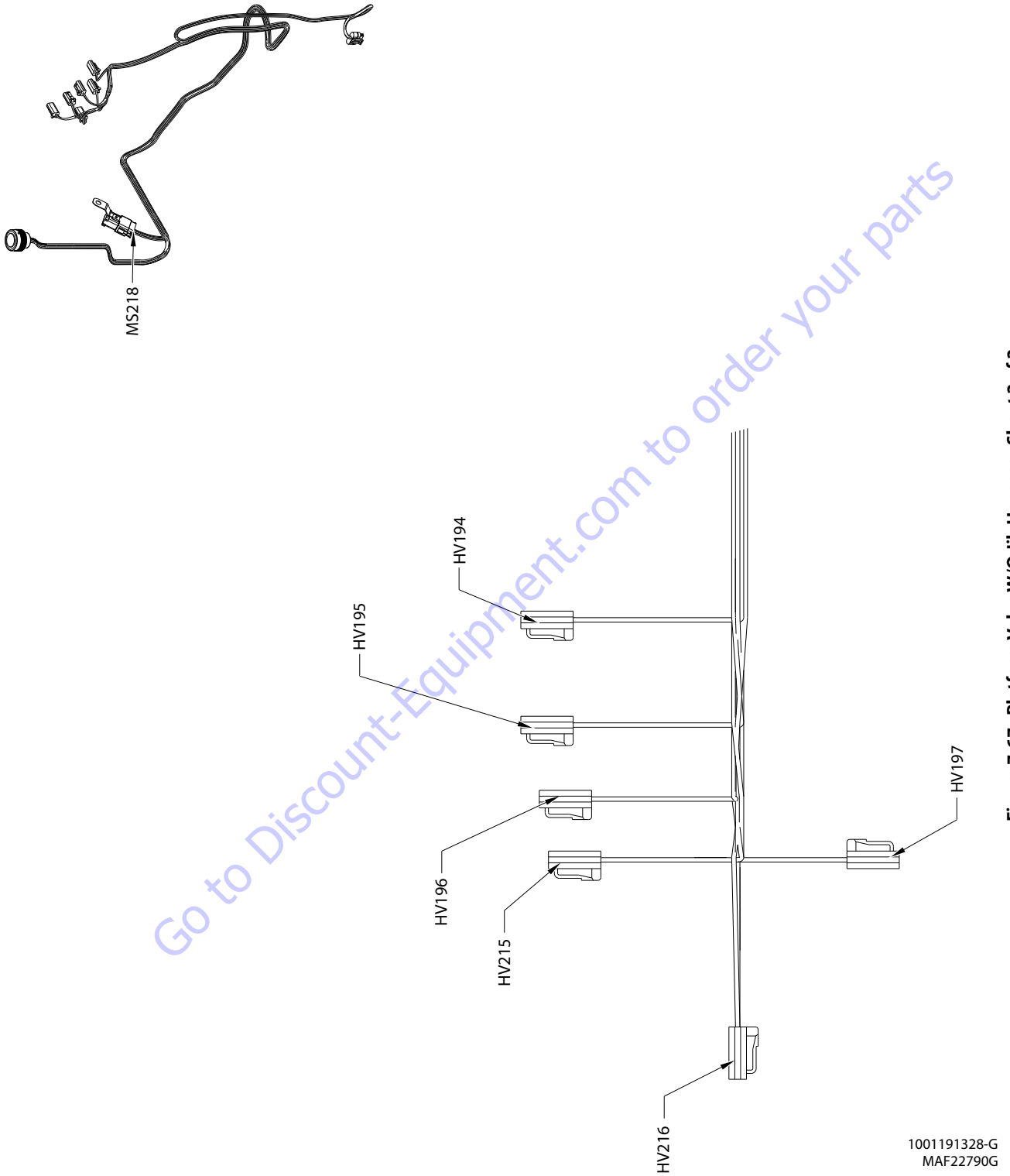


Figure 7-67. Platform Valve W/O Jib Harness - Sheet 2 of 2

HV216 LOW PRS DUMP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-2 LOW PRS DUMP	18 AWG	GXL	X652A (12)
2	BLK	12-3-1 PLAT VLV-	18 AWG	GXL	MS218 (3)

HV197 ROTATE LEFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	86-3 ROTATE LEFT	18 AWG	GXL	X652A (13)
2	BLK	12-3-6 PLAT VLV-	18 AWG	GXL	MS218 (8)

HV215 HI PRS DUMP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-1 HI PRS DUMP	18 AWG	GXL	X652A (3)
2	BLK	12-3-2 PLAT VLV-	18 AWG	GXL	MS218 (4)

HV196 ROTATE RIGHT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	87-3 ROTATE RIGHT	18 AWG	GXL	X652A (14)
2	BLK	12-3-5 PLAT VLV-	18 AWG	GXL	MS218 (7)

HV194 LEVEL DOWN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	89-1-2 LEVEL DOWN	18 AWG	GXL	X652A (5)
2	BLK	12-3-7 PLAT VLV-	18 AWG	GXL	MS218 (9)

HV195 LEVEL UP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	88-1-2 LEVEL UP	18 AWG	GXL	X652A (4)
2	BLK	12-3-8 PLAT VLV-	18 AWG	GXL	MS218 (10)

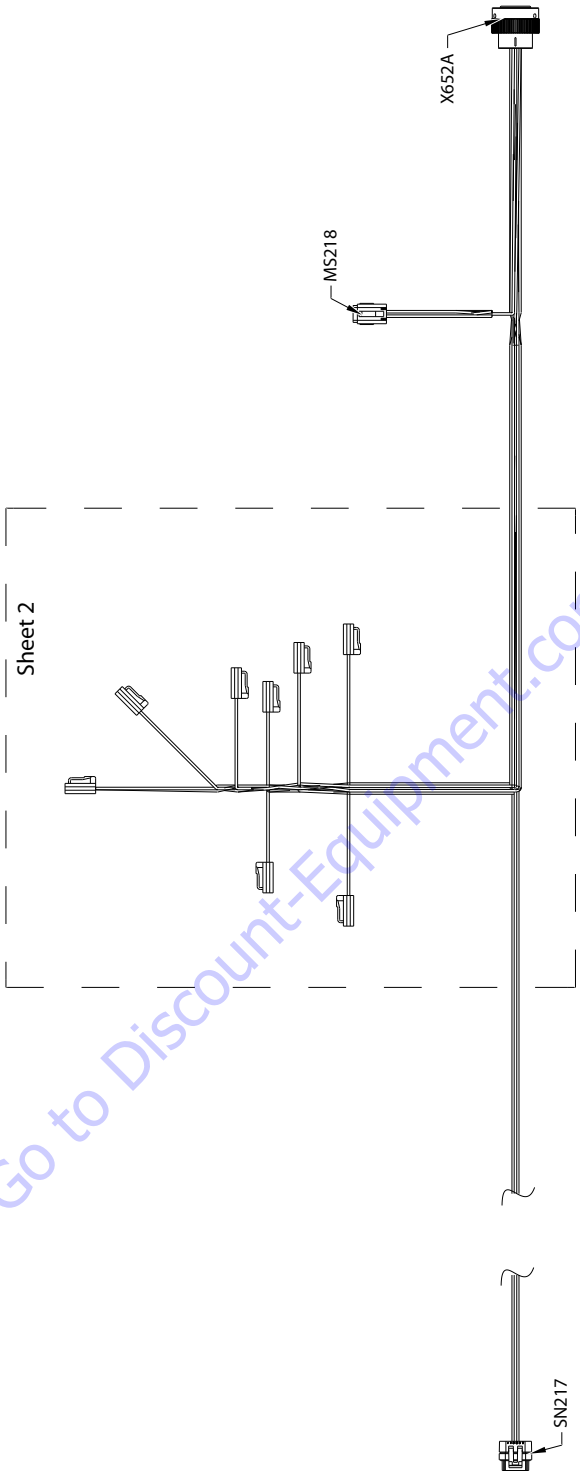


Figure 7-68. Platform Valve w/Jib Harness - Sheet 1 of 3

X652A					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	12-3 PLAT VLV-	18 AWG	GXL	MS218 (2)
2					
3	WHT	90-1 HI PRS DUMP	18 AWG	GXL	HV215 (1)
4	WHT	88-1-2 LEVEL UP	18 AWG	GXL	HV195 (1)
5	WHT	89-1-2 LEVEL DOWN	18 AWG	GXL	HV194 (1)
6					
7					
8	YEL-BLK	18-6 1060780	18 AWG	CABLE	SN217 (C)
9	BRN-BLK	18-6 1060780	18 AWG	CABLE	SN217 (D)
10	ORG-BLK	18-6 1060780	18 AWG	CABLE	SN217 (B)
11	BLU-RED	18-6 1060780	18 AWG	CABLE	SN217 (F)
12	WHT	90-2 LOW PRS DUMP	18 AWG	GXL	HV216 (1)
13	WHT	86-3 ROTATE LEFT	18 AWG	GXL	HV197 (1)
14	WHT	87-3 ROTATE RIGHT	18 AWG	GXL	HV196 (1)
15	WHT	82-3 JIB UP	18 AWG	GXL	HV183 (1)
16	WHT	83-3 JIB DOWN	18 AWG	GXL	HV184 (1)
17					
18					
19					
20	BLK-RED	18-6 1060780	18 AWG	CABLE	SN217 (E)
21	BLU-BLK	18-6 1060780	18 AWG	CABLE	SN217 (A)

MS218 VLV BANK GND BUSS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1					
2	BLK	12-3 PLAT VLV-	18 AWG	GXL	X652A (1)
3	BLK	12-3-1 PLAT VLV-	18 AWG	GXL	HV216 (2)
4	BLK	12-3-2 PLAT VLV-	18 AWG	GXL	HV215 (2)
5	BLK	12-3-3 PLAT VLV-	18 AWG	GXL	HV184 (2)
6	BLK	12-3-4 PLAT VLV-	18 AWG	GXL	HV183 (2)
7	BLK	12-3-5 PLAT VLV-	18 AWG	GXL	HV196 (2)
8	BLK	12-3-6 PLAT VLV-	18 AWG	GXL	HV197 (2)
9	BLK	12-3-7 PLAT VLV-	18 AWG	GXL	HV194 (2)
10	BLK	12-3-8 PLAT VLV-	18 AWG	GXL	HV195 (2)
11					
12					

SN217 PLATFORM ANGLE SNSR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLU-BLK	18-6 1060780	18 AWG	CABLE	X652A (21)
2	ORG-BLK	18-6 1060780	18 AWG	CABLE	X652A (10)
3	YEL-BLK	18-6 1060780	18 AWG	CABLE	X652A (8)
4	BRN-BLK	18-6 1060780	18 AWG	CABLE	X652A (9)
5	BLK-RED	18-6 1060780	18 AWG	CABLE	X652A (20)
6	BLU-RED	18-6 1060780	18 AWG	CABLE	X652A (11)

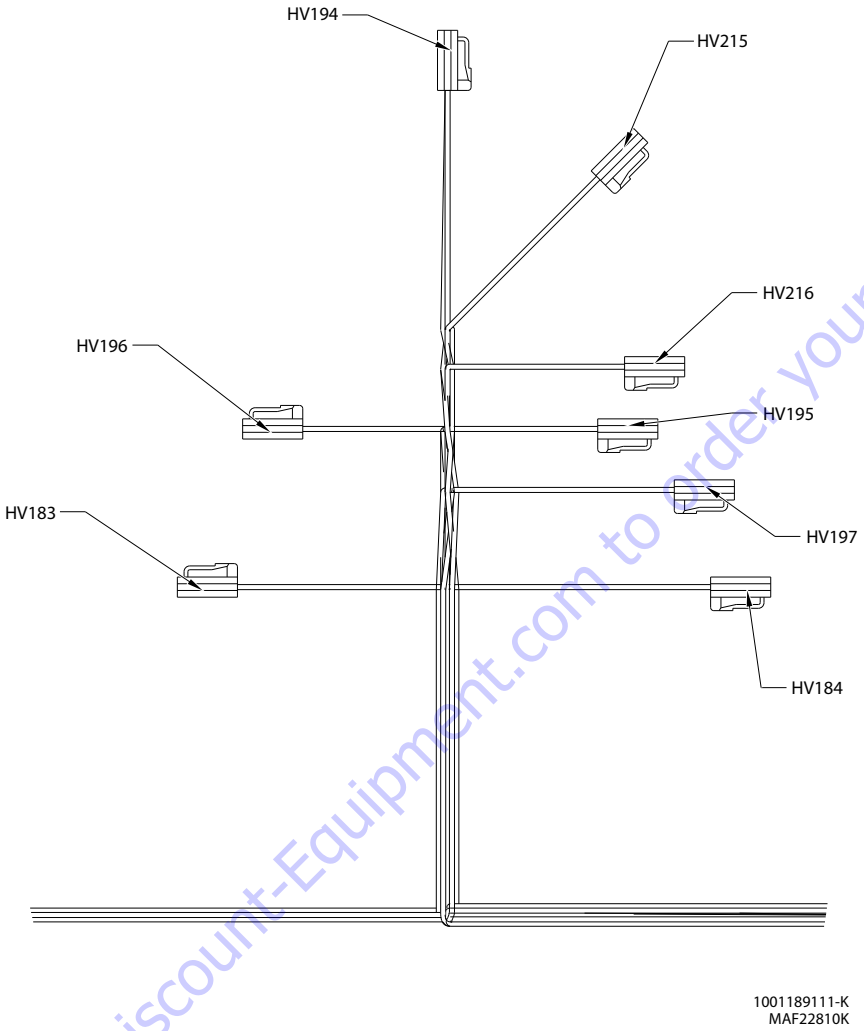


Figure 7-69. Platform Valve w/Jib Harness - Sheet 2 of 3

HV195 LEVEL UP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	88-1-2 LEVEL UP	18 AWG	GXL	X652A (4)
2	BLK	12-3-8 PLAT VLV-	18 AWG	GXL	MS218 (10)

HV183 JIB UP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	82-3 JIB UP	18 AWG	GXL	X652A (15)
2	BLK	12-3-4 PLAT VLV-	18 AWG	GXL	MS218 (6)

HV196 ROTATE RIGHT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	87-3 ROTATE RIGHT	18 AWG	GXL	X652A (14)
2	BLK	12-3-5 PLAT VLV-	18 AWG	GXL	MS218 (7)

HV194 LEVEL DOWN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	89-1-2 LEVEL DOWN	18 AWG	GXL	X652A (5)
2	BLK	12-3-7 PLAT VLV-	18 AWG	GXL	MS218 (9)

HV215 HI PRS DUMP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-1 HI PRS DUMP	18 AWG	GXL	X652A (3)
2	BLK	12-3-2 PLAT VLV-	18 AWG	GXL	MS218 (4)

HV216 LOW PRS DUMP					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	90-2 LOW PRS DUMP	18 AWG	GXL	X652A (12)
2	BLK	12-3-1 PLAT VLV-	18 AWG	GXL	MS218 (3)

HV197 ROTATE LEFT					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	86-3 ROTATE LEFT	18 AWG	GXL	X652A (13)
2	BLK	12-3-6 PLAT VLV-	18 AWG	GXL	MS218 (8)

HV184 JIB DOWN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	83-3 JIB DOWN	18 AWG	GXL	X652A (16)
2	BLK	12-3-3 PLAT VLV-	18 AWG	GXL	MS218 (5)

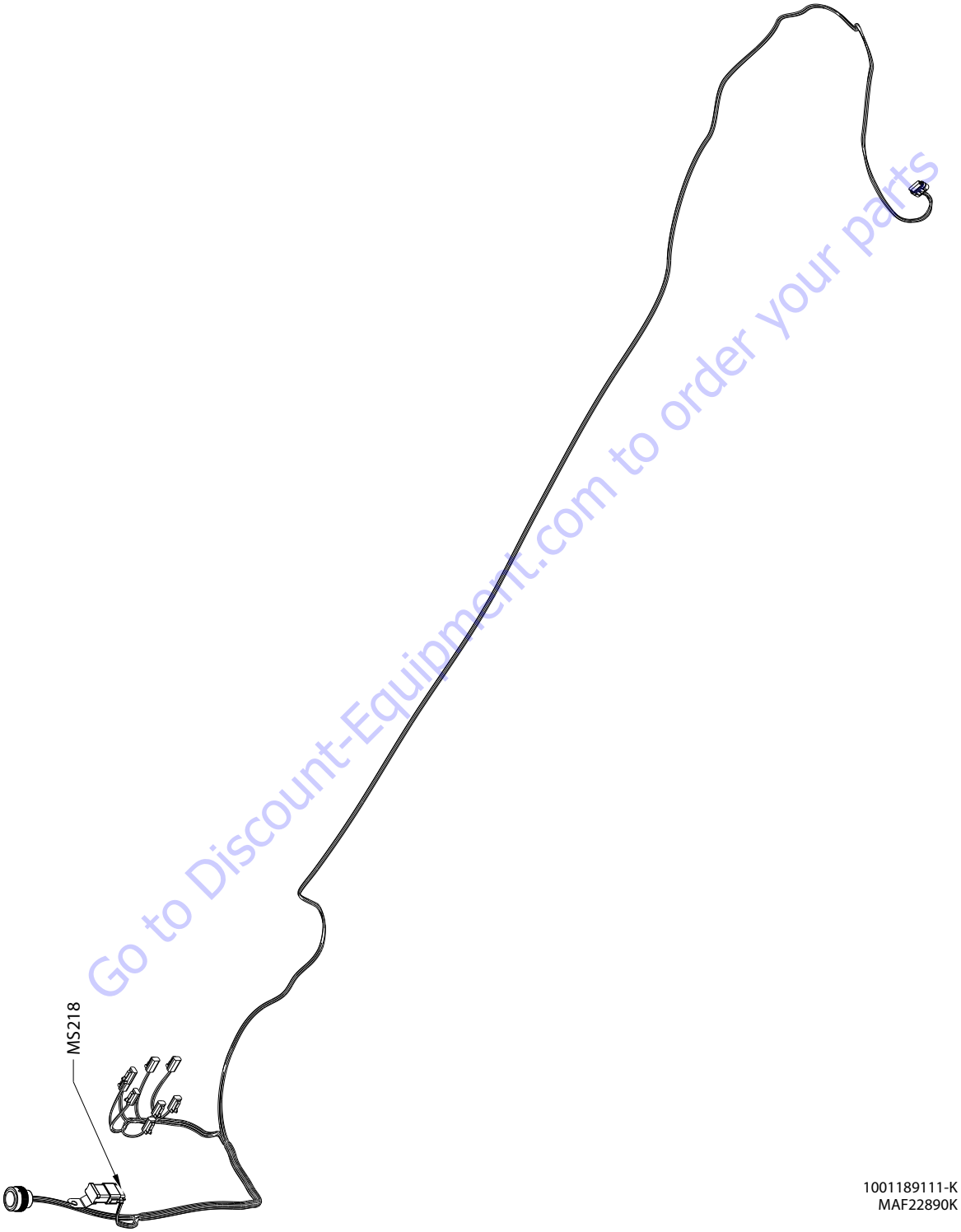


Figure 7-70. Platform Valve w/Jib Harness - Sheet 3 of 3

Figure 7-71. Skyguard GEN2 Platform Interface Harness

X5B - INTERFACE					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	P2	18 AWG	GXL	IP114 (1)
2	WHT	P6	18 AWG	GXL	X500 (2)
3					
4	WHT	P1	18 AWG	GXL	RL503 (87)
5	WHT	P3	18 AWG	GXL	RL502 (87)
6					

RL503 - SKYGUARD RELAY #1					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
30	WHT	P9-1	18 AWG	GXL	IP114 (1)
85	WHT	P5-1	18 AWG	GXL	S191 (1)
86	WHT	P4-1	18 AWG	GXL	S192 (1)
87	WHT	P1	18 AWG	GXL	X5B (4)
87A					

RL502 - SKYGUARD RELAY #2					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
30	WHT	P9-2	18 AWG	GXL	IP114 (1)
85	WHT	P5-2	18 AWG	GXL	S191 (1)
86	WHT	P4-2	18 AWG	GXL	S192 (1)
87	WHT	P3	18 AWG	GXL	X5B (5)
87a					

S192					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	P4-1	18 AWG	GXL	RL503 (86)
1	WHT	P4-2	18 AWG	GXL	RL502 (86)
2	WHT	P4	18 AWG	GXL	X500 (3)

S191					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	P5-1	18 AWG	GXL	RL503 (85)
1	WHT	P5-2	18 AWG	GXL	RL502 (85)
2	WHT	P5	18 AWG	GXL	X500 (4)

X500 - PLATE SENSOR					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	P10	18 AWG	GXL	IP114 (2)
2	WHT	P6	18 AWG	GXL	X5B (2)
3	WHT	P4	18 AWG	GXL	S192 (2)
4	WHT	P5	18 AWG	GXL	S191 (2)

IP114					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	P2	18 AWG	GXL	X5B (1)
1	WHT	P9-1	18 AWG	GXL	RL503 (30)
1	WHT	P9-2	18 AWG	GXL	RL502 (30)
2	WHT	P10	18 AWG	GXL	X500 (1)

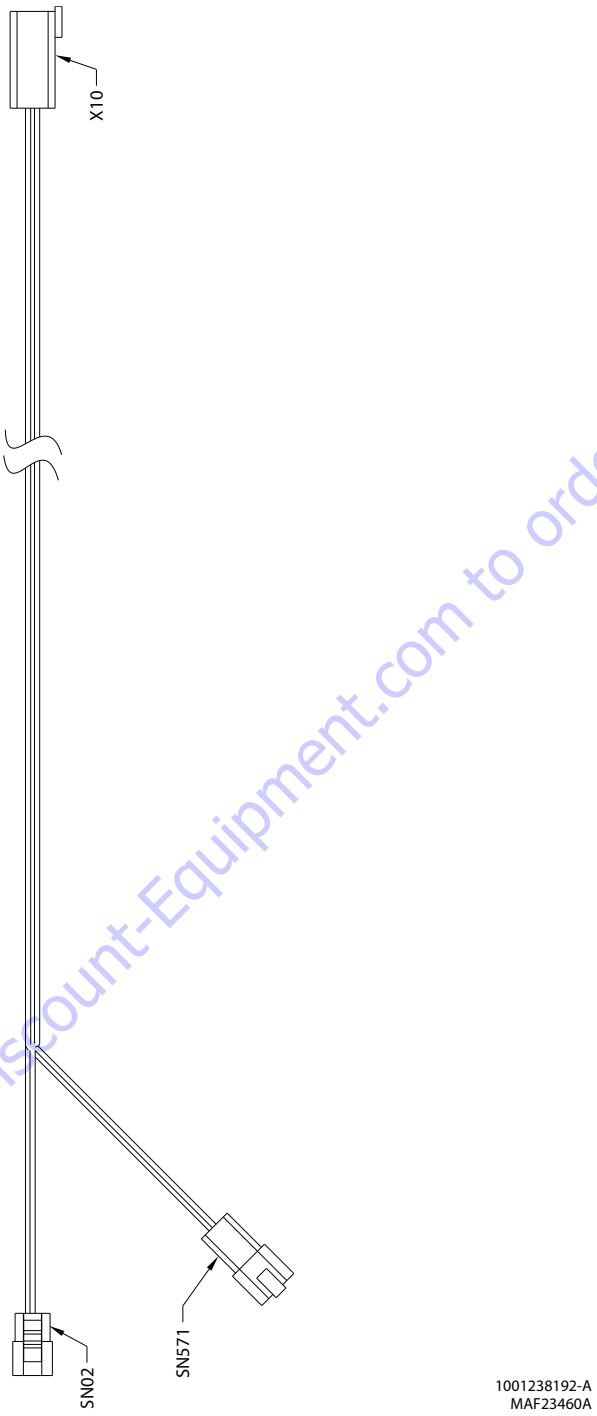


Figure 7-72. Boom sensor harness

SN02 CAPACITYLENGTH NO 1					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL-BLK	1	18 AWG	TFFN	X10 (1)
2	ORG-BLK	2	18 AWG	TFFN	X10 (2)
3	BRN-BLk	3	18 AWG	TFFN	X10 (3)

SN571 CAPACITY LENGTH NC 2					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLU-RED	4	18 AWG	TFFN	X10 (4)
2	BLU-RED	5	18 AWG	TFFN	X10 (5)
3	BLU-BLK	6	18 AWG	TFFN	X10 (6)

X10 FULL EXTENSION					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	YEL-BLK	1	18 AWG	TFFN	SN02 (1)
2	ORG-BLK	2	18 AWG	TFFN	SN02 (2)
3	BRN-BLK	3	18 AWG	TFFN	SN02 (3)
4	BLU-RED	4	18 AWG	TFFN	SN571 (1)
5	BLK-RED	5	18 AWG	TFFN	SN571 (2)
6	BLU-BLK	6	18 AWG	TFFN	SN571 (3)

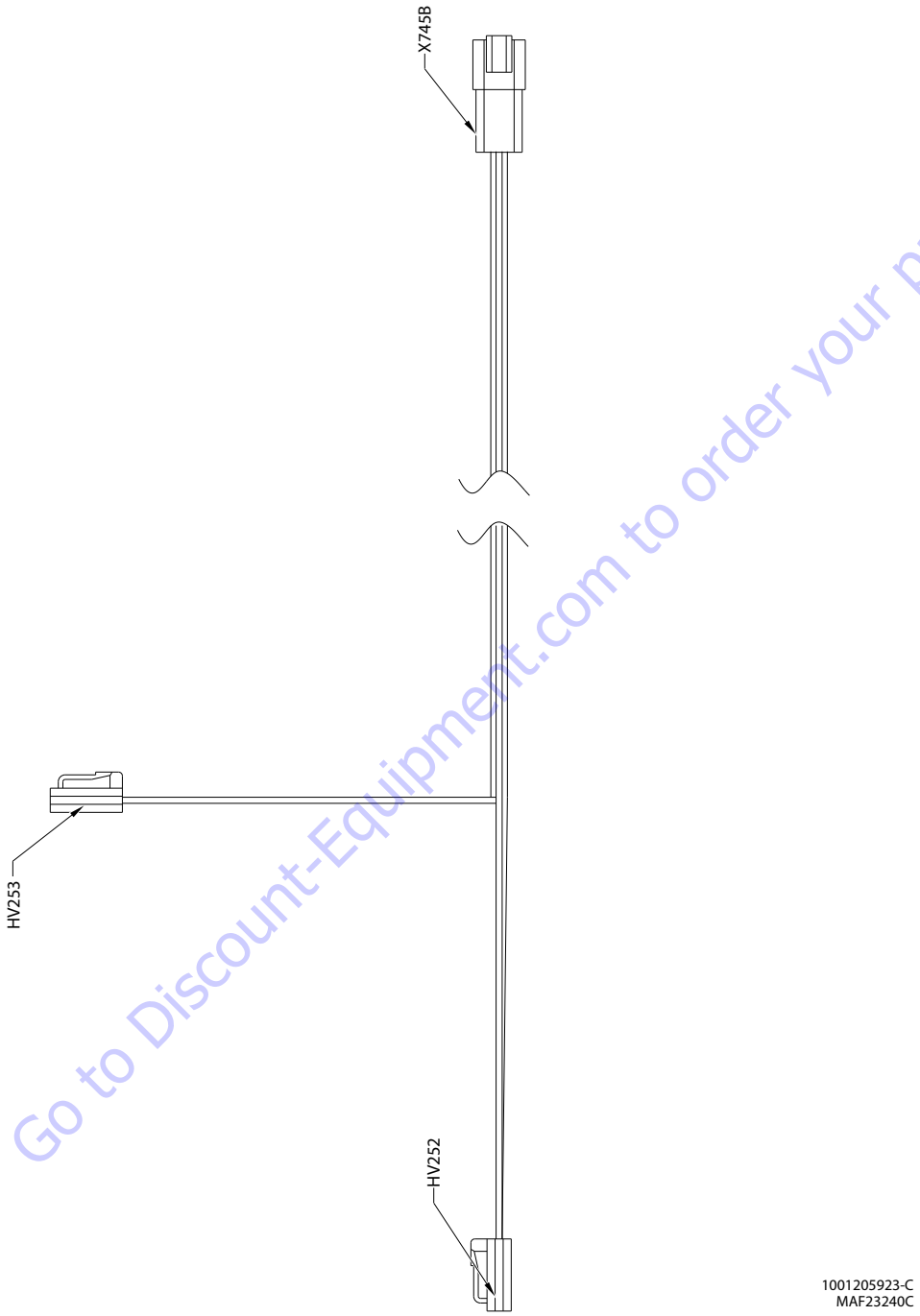


Figure 7-73. Main lift harness

HV252 BOOM LIFT DOWN					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	77-1 BOOM LIFT DN	18 AWG	GXL	X745B (1)
2	WHT	50-4-1 LIFT RTN	18 AWG	GXL	X745B (3)

HV253 BOOM LIFT DN ENBL/AUX					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	77-2 BOOM LIFT DN ENBL/AUX	18 AWG	GXL	X745B (2)
2	WHT	50-5 LIFT DN ENBL/ AUX RTN	18 AWG	GXL	X745B (4)

X745B TO MAIN VALVE HARNESS					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	77-1 BOOM LIFT DN	18 AWG	GXL	HV252 (1)
2	WHT	77-2 BOOM LIFT DN ENBL/AUX	18 AWG	GXL	HV252 (1)
3	WHT	50-4-1 LIFT RTN	18 AWG	GXL	HV252 (2)
4	WHT	50-5 LIFT DN ENBL/ AUX RTN	18 AWG	GXL	HV252 (2)

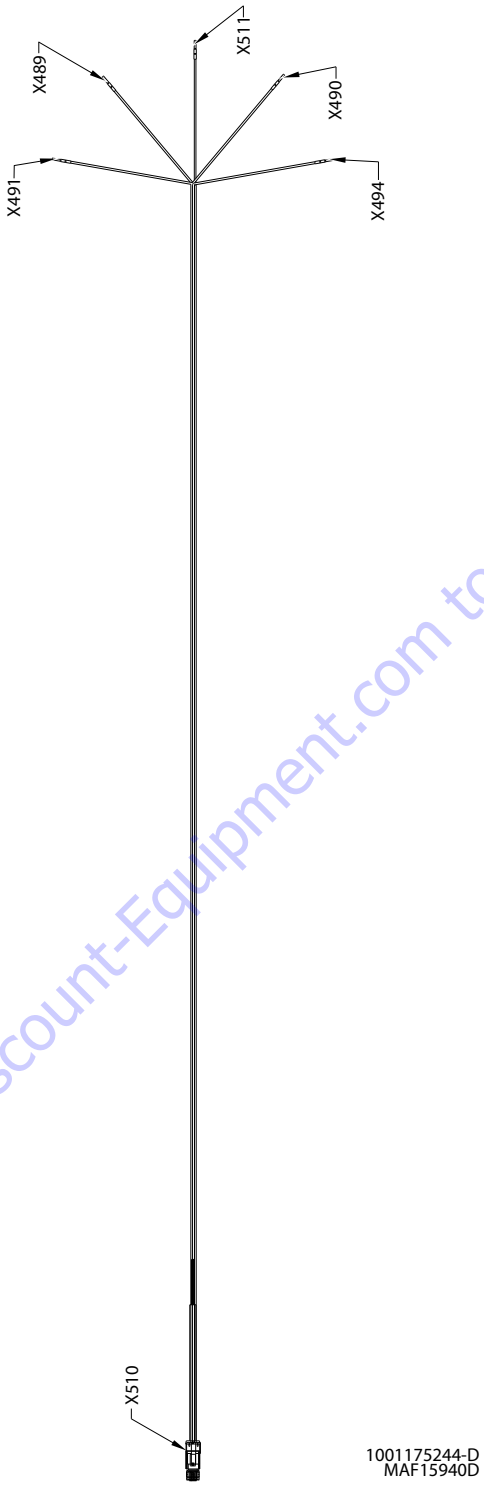


Figure 7-74. LSS Harness

X511 CAN SHIELD					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	SLR	SHLD	22 AWG	SHLD	X510 (1)

X491 LSS CAN LO					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLU	CAN_LO	24 AWG	GXL	X510 (5)

X489 LSS POWER					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	RED	POWER	22 AWG	GXL	X510 (2)

X490 LSS CAN HI					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	WHT	CAN_HI	24 AWG	GXL	X510 (4)

X494 LSS GROUND					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
1	BLK	V-	22 AWG	GXL	X510 (3)

X510					
CONN POS	WIRE COLOR	WIRE LABEL	GAUGE	JACKET	TO
2	RED	POWER	22 AWG	GXL	X489 (1)
4	WHT	CAN_HI	24 AWG	GXL	X490 (1)
5	BLU	CAN_LO	24 AWG	GXL	X491 (1)
3	BLK	V-	22 AWG	GXL	X494 (1)
1	SLR	SHLD	22 AWG	SHLD	X511 (1)

7.10 ELECTRICAL SCHEMATICS

SHEET 2: PLATFORM

Platform Box Harness

SHEET 3: PLATFORM AND BOOM COMPONENTS

LSS Harness 450/400
Boom Control Cable - No Jib,
With Jib, TT
Tele in Prox Switches
Cable, Boom Sensor Cable,
Boom Sensor Harness,
Boom Sensor Cable,
Boom Angle Sensor Cable

SHEET 4: CHASSIS, TURNTABLE

Turntable Harness
UGM Main Ground

SHEET 5: GROUND USER INTERFACE

4WS Main Valve Harness
2WS Main Valve Harness
Ground Control Panel Harness
Platform Valve With Jib
Lift Cylinder Harness

SHEET 6: ENGINE SCHEMATIC DEUTZ - T4I

Deutz T4i Engine Harness
T4i Eng Pos, T4i Eng Neg
Pos Battery, Aux To Aux

SHEET 7: ENGINE SCHEMATIC DEUTZ - T4F

Deutz T4F Engine Harness
T4F Eng Pos, T4F Eng Neg

SHEET 8: ENGINE SCHEMATIC FORD

Ford Engine Harness
Ford Eng Pos, Ford Eng Neg

SHEET 9: OPTIONS

Chassis Head And Tail Lights
Chassis Work Lights, Clear Sky
Skyguard, GEN 2 Platform Interface

SHEET 10: PLATFORM VALVE HARNESS WITH OUT JIB

SHEET 11: NOT APPLICABLE

SHEET 12: GENERATOR

SHEET 13: NOT APPLICABLE

SHEET 14: NOT APPLICABLE

SHEET 15: NOT APPLICABLE

SHEET 1 of 20

1001238404_B

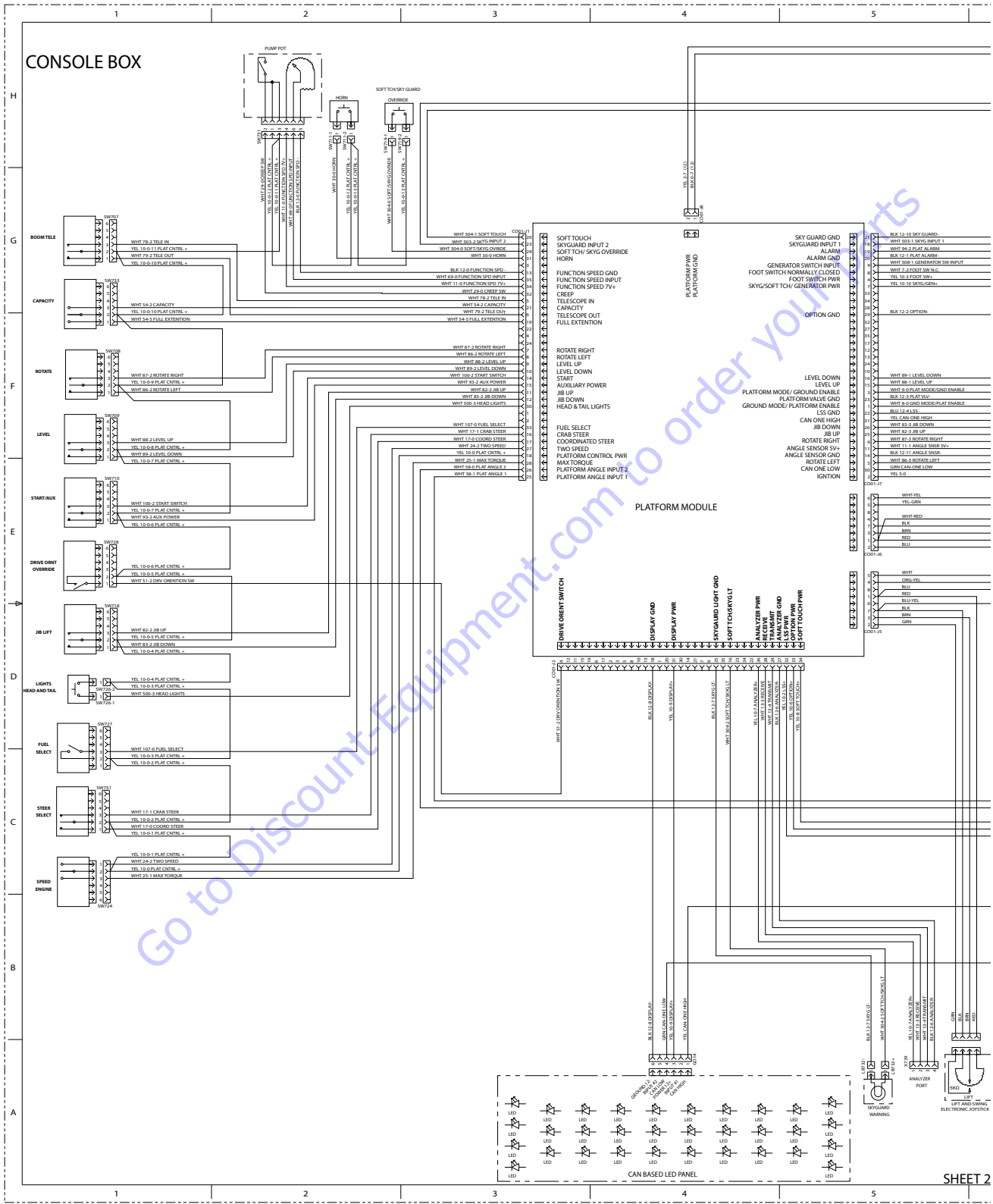
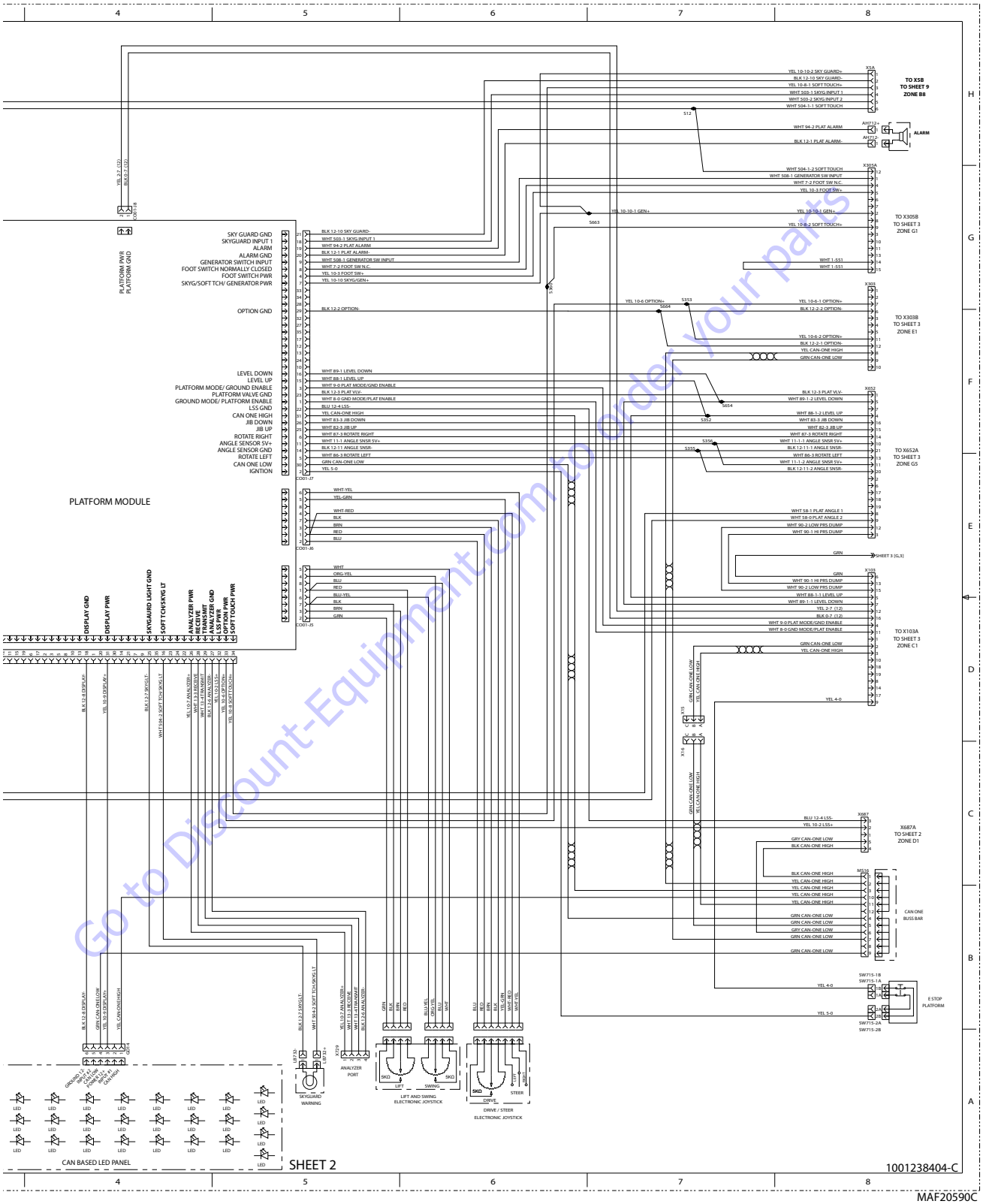


Figure 7-75. Electrical Schematic - Sheet 2 of 20



MAF20590C

Figure 7-76. Electrical Schematic - Sheet 3 of 20

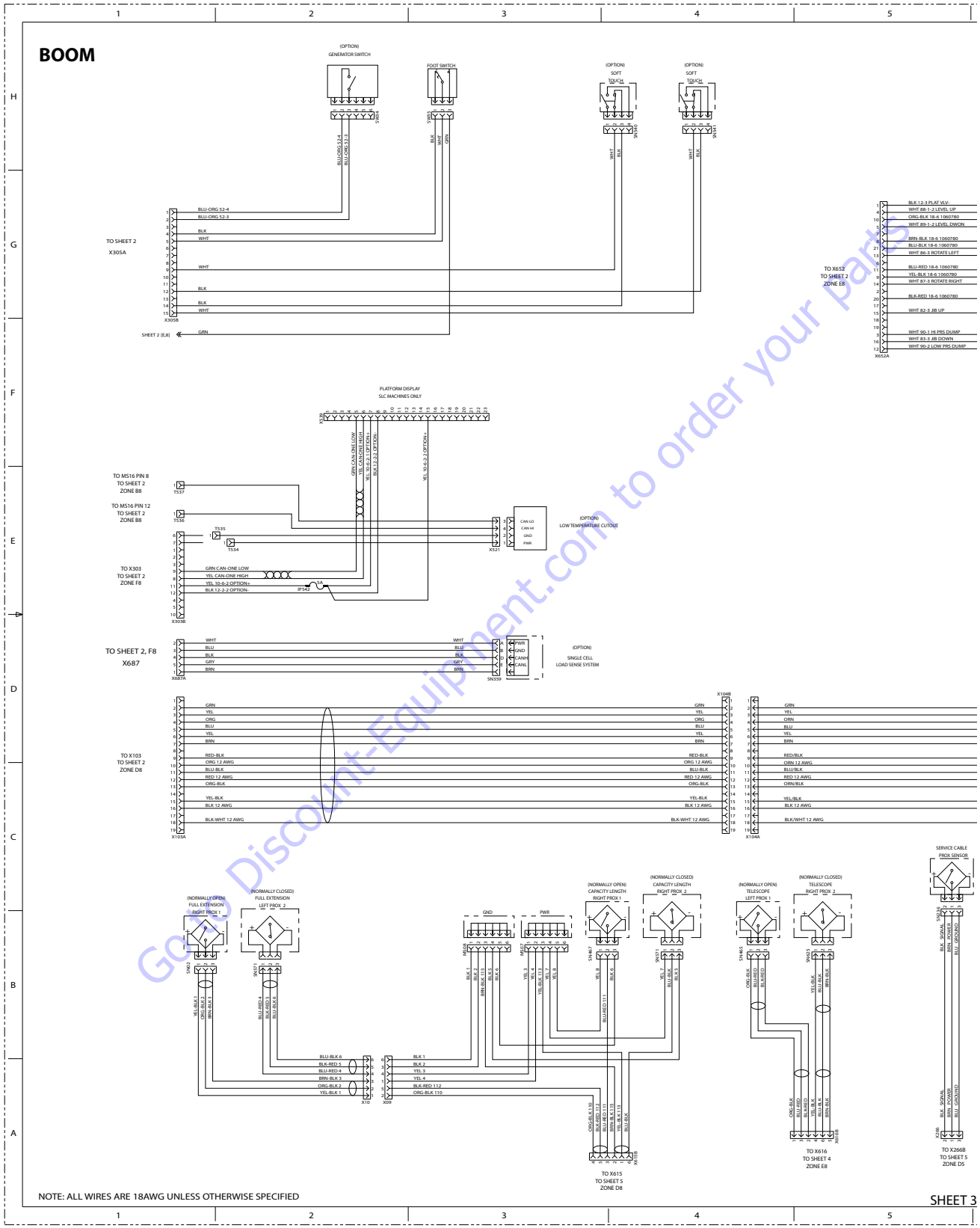


Figure 7-77. Electrical Schematic - Sheet 4 of 20

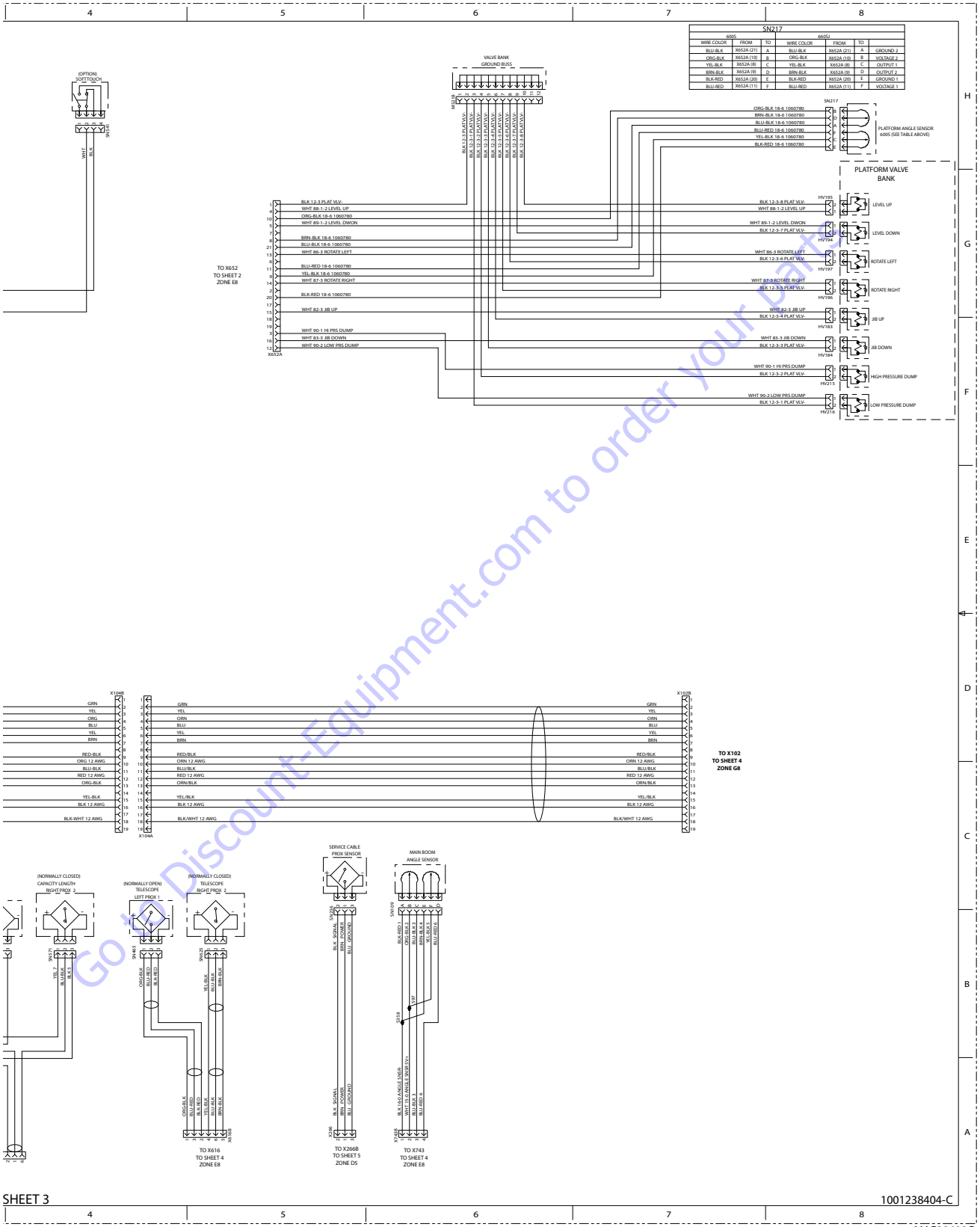


Figure 7-78. Electrical Schematic - Sheet 5 of 20

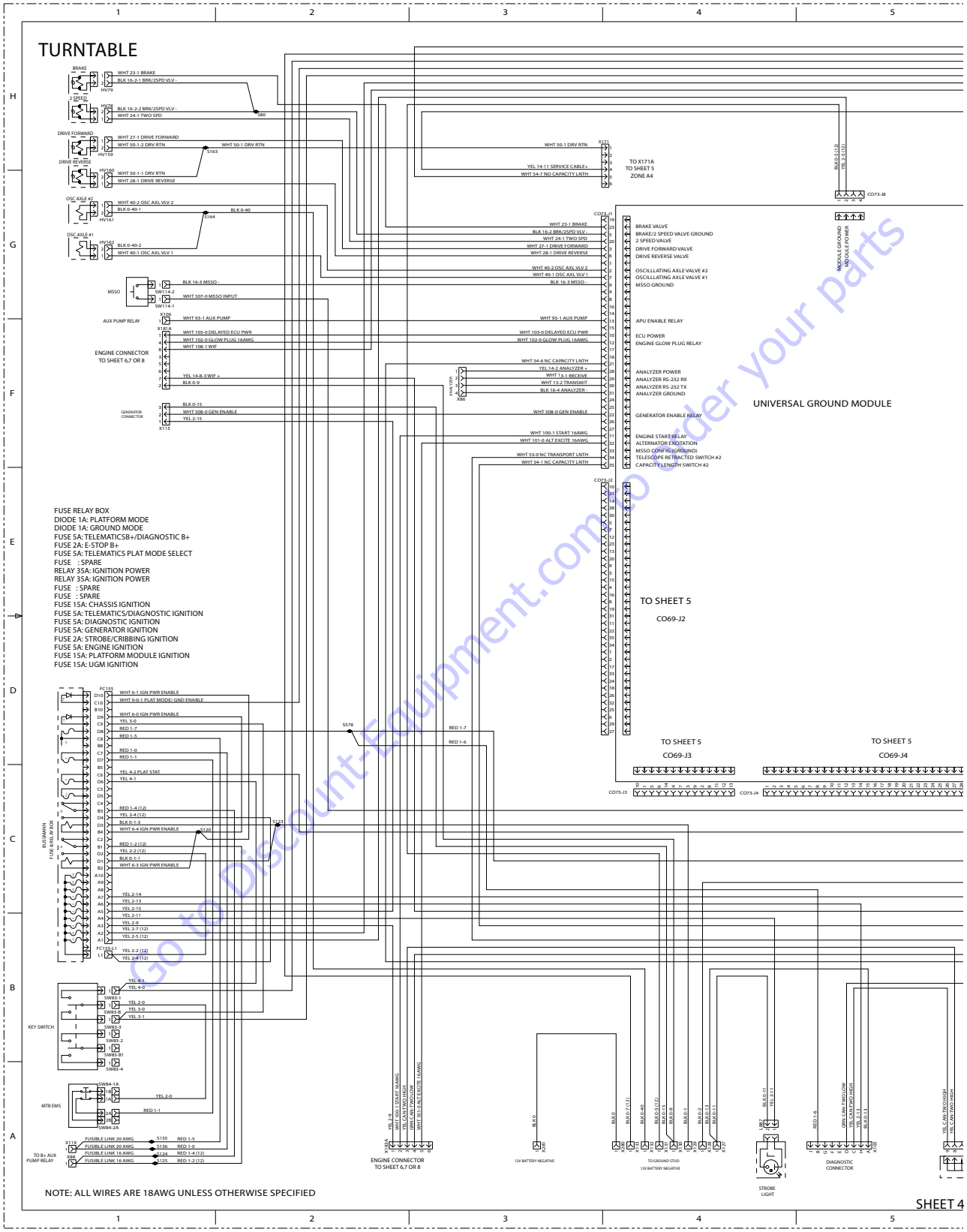


Figure 7-79. Electrical Schematic - Sheet 6 of 20

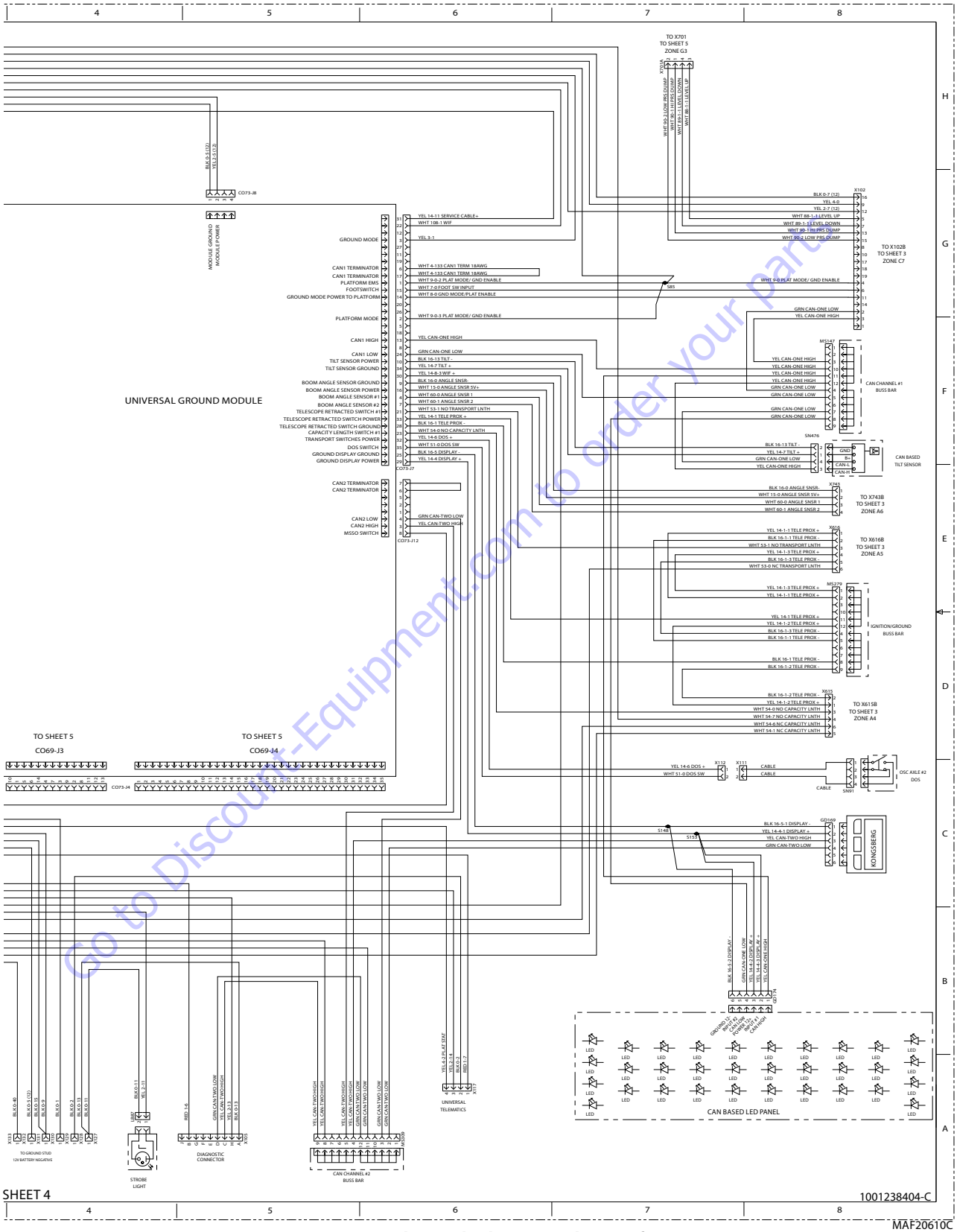


Figure 7-80. Electrical Schematic - Sheet 7 of 20

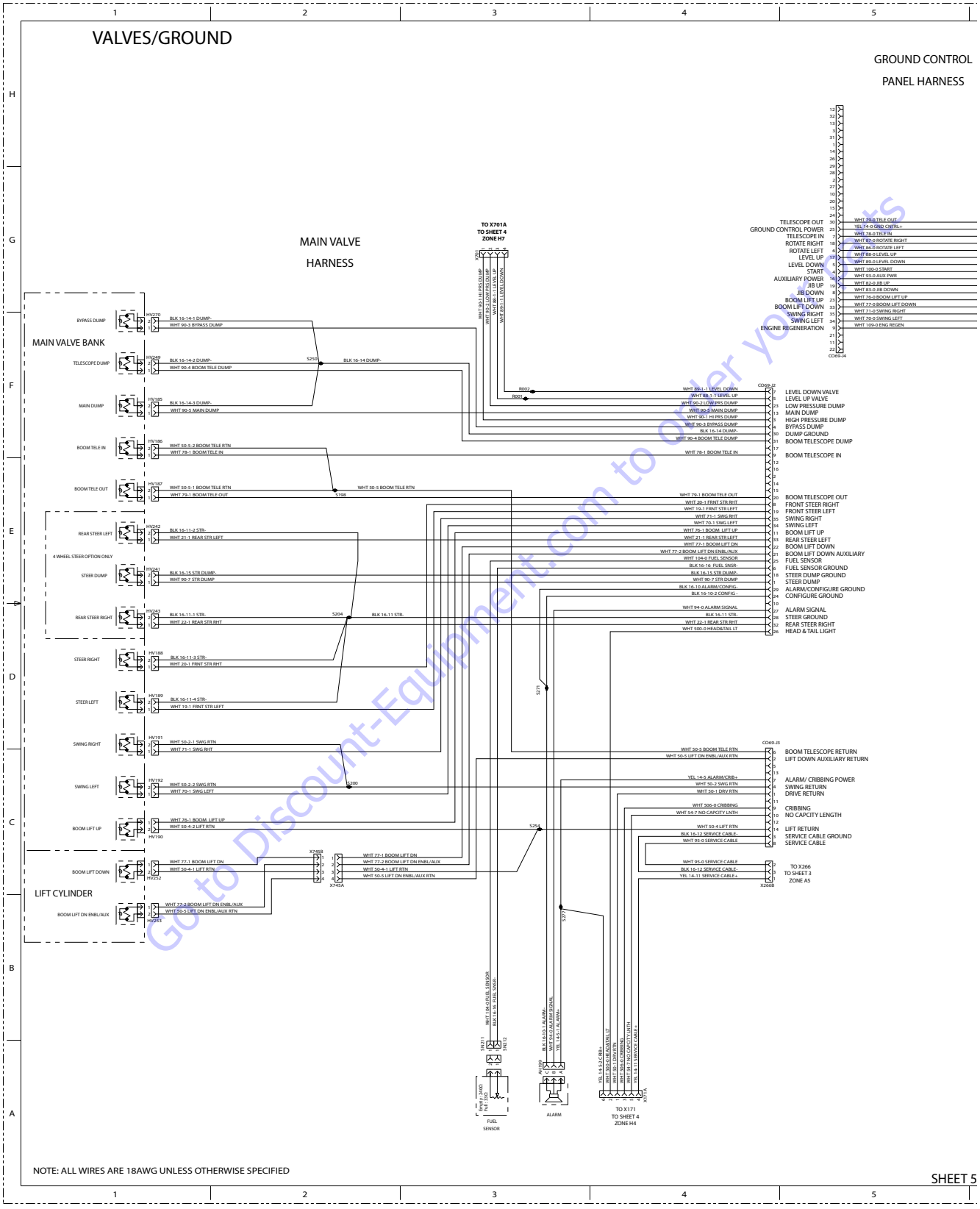


Figure 7-81. Electrical Schematic - Sheet 8 of 20

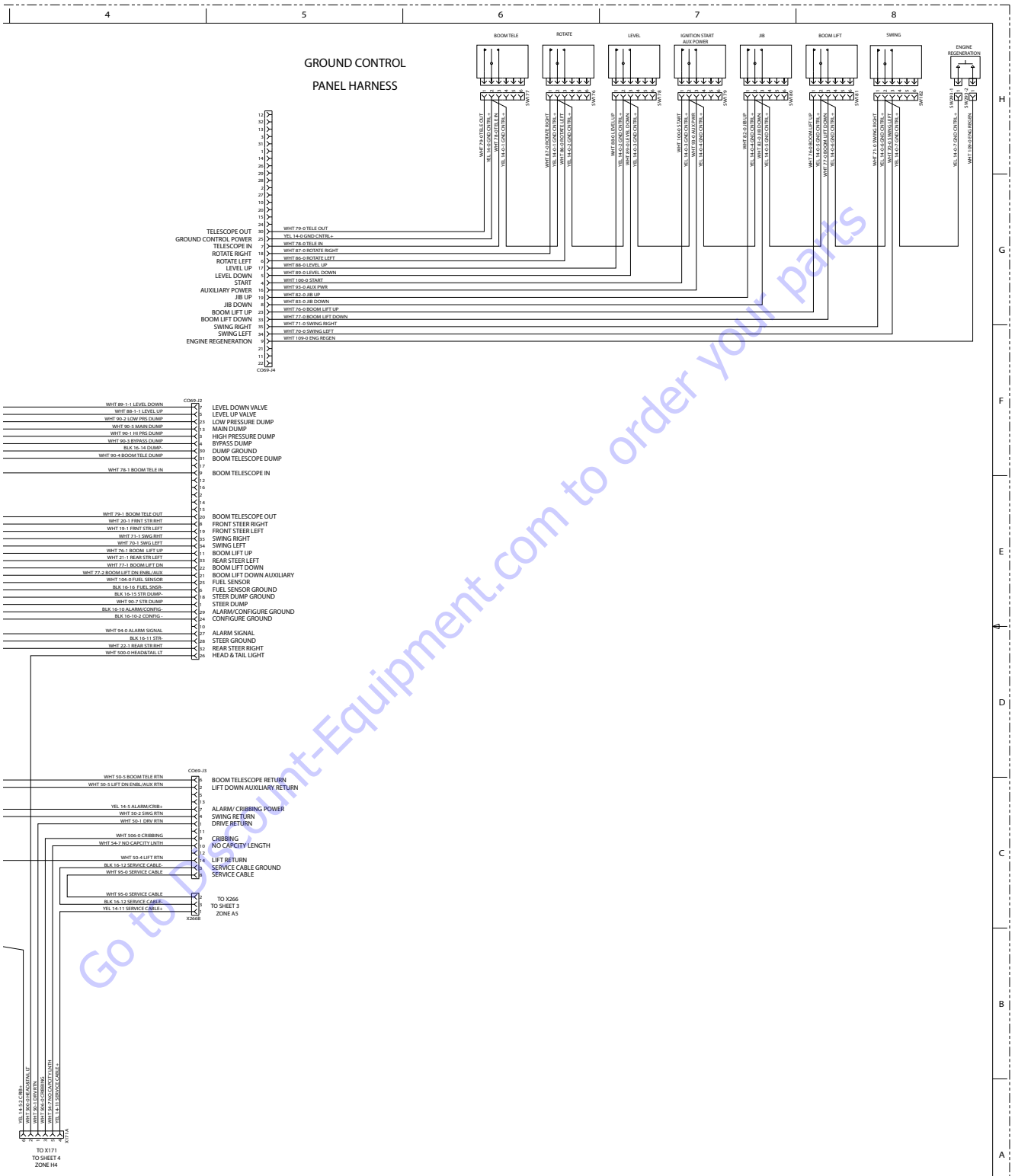


Figure 7-82. Electrical Schematic - Sheet 9 of 20

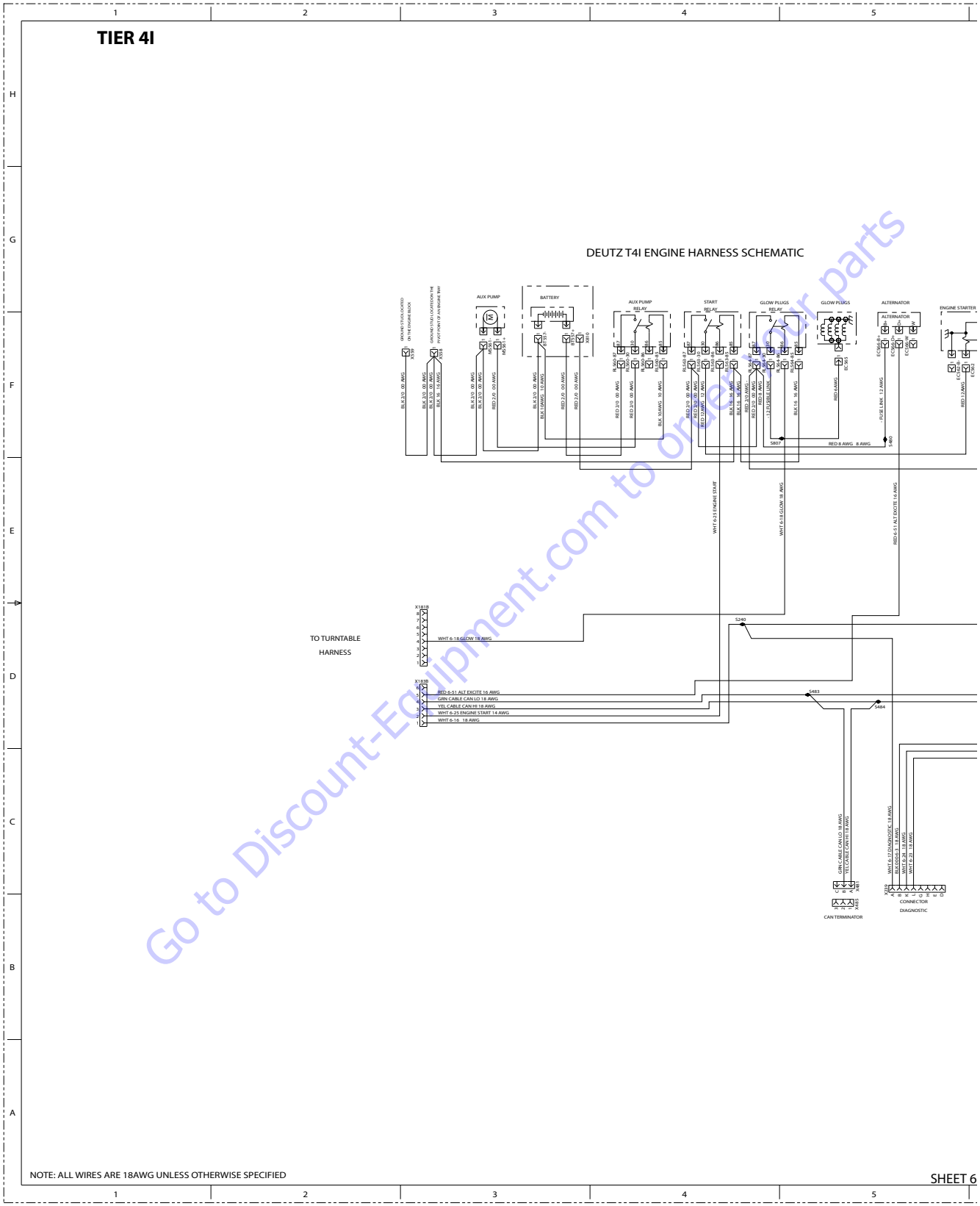


Figure 7-83. Electrical Schematic - Sheet 10 of 20

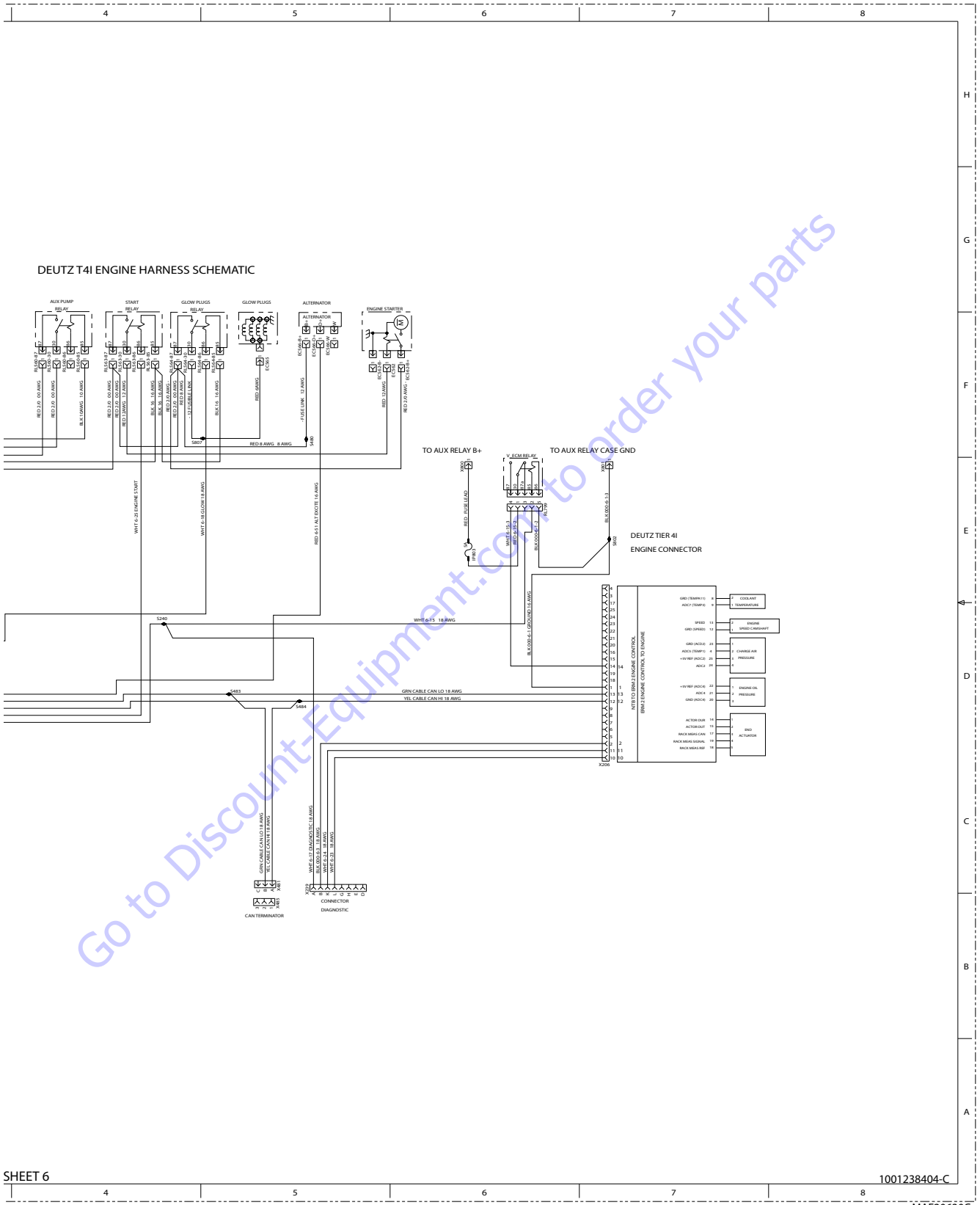


Figure 7-84. Electrical Schematic - Sheet 11 of 20

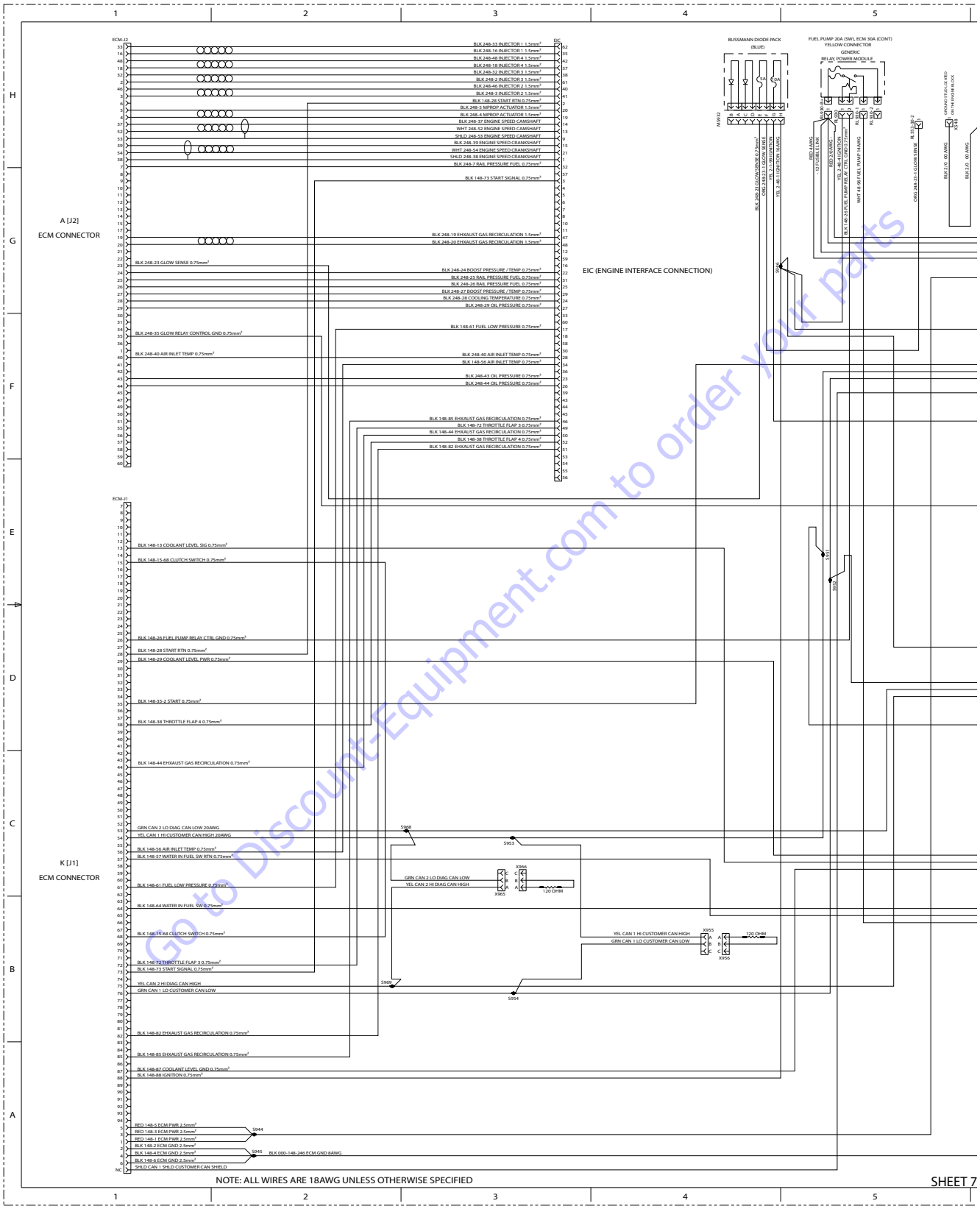


Figure 7-85. Electrical Schematic - Sheet 12 of 20

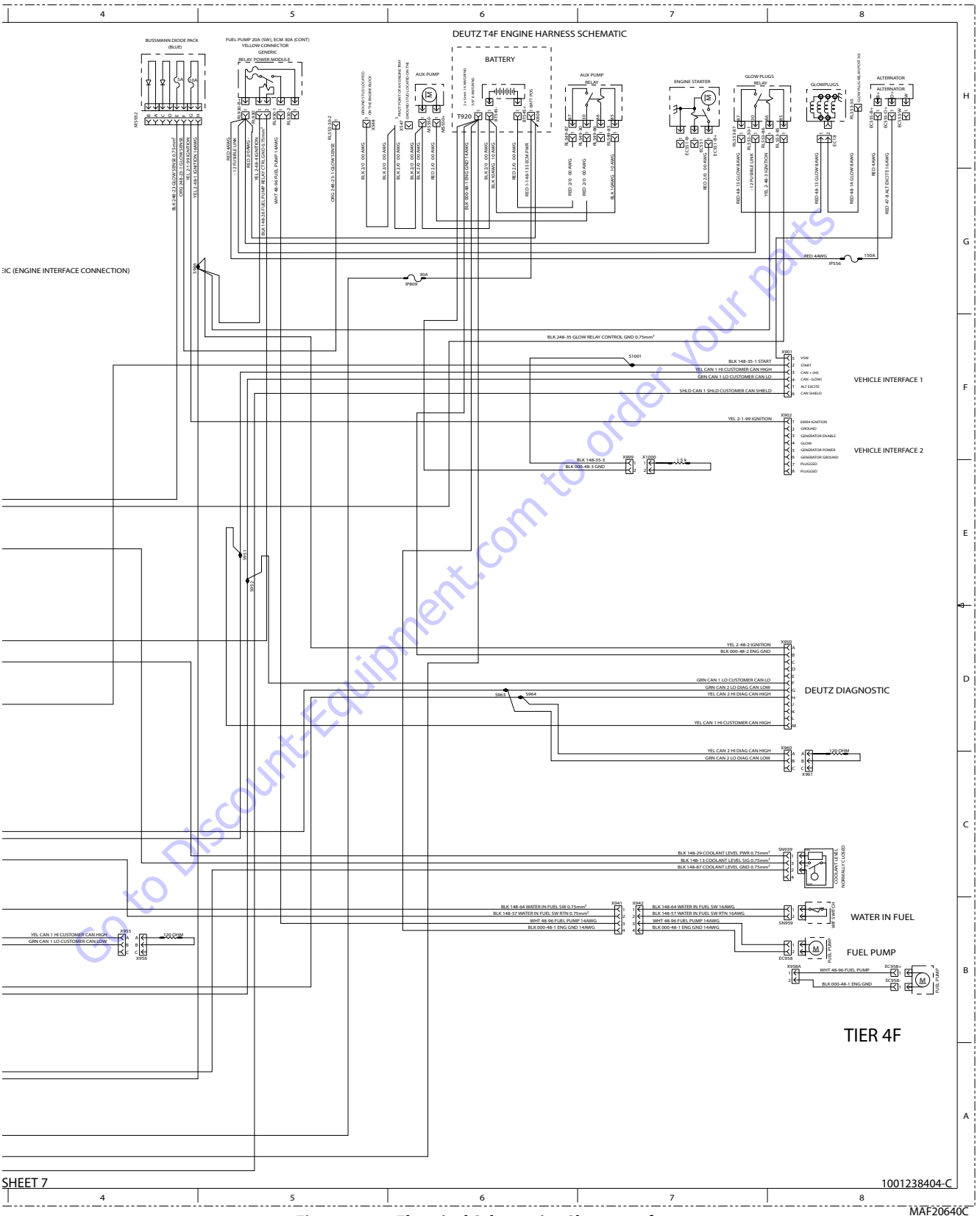


Figure 7-86. Electrical Schematic - Sheet 13 of 20

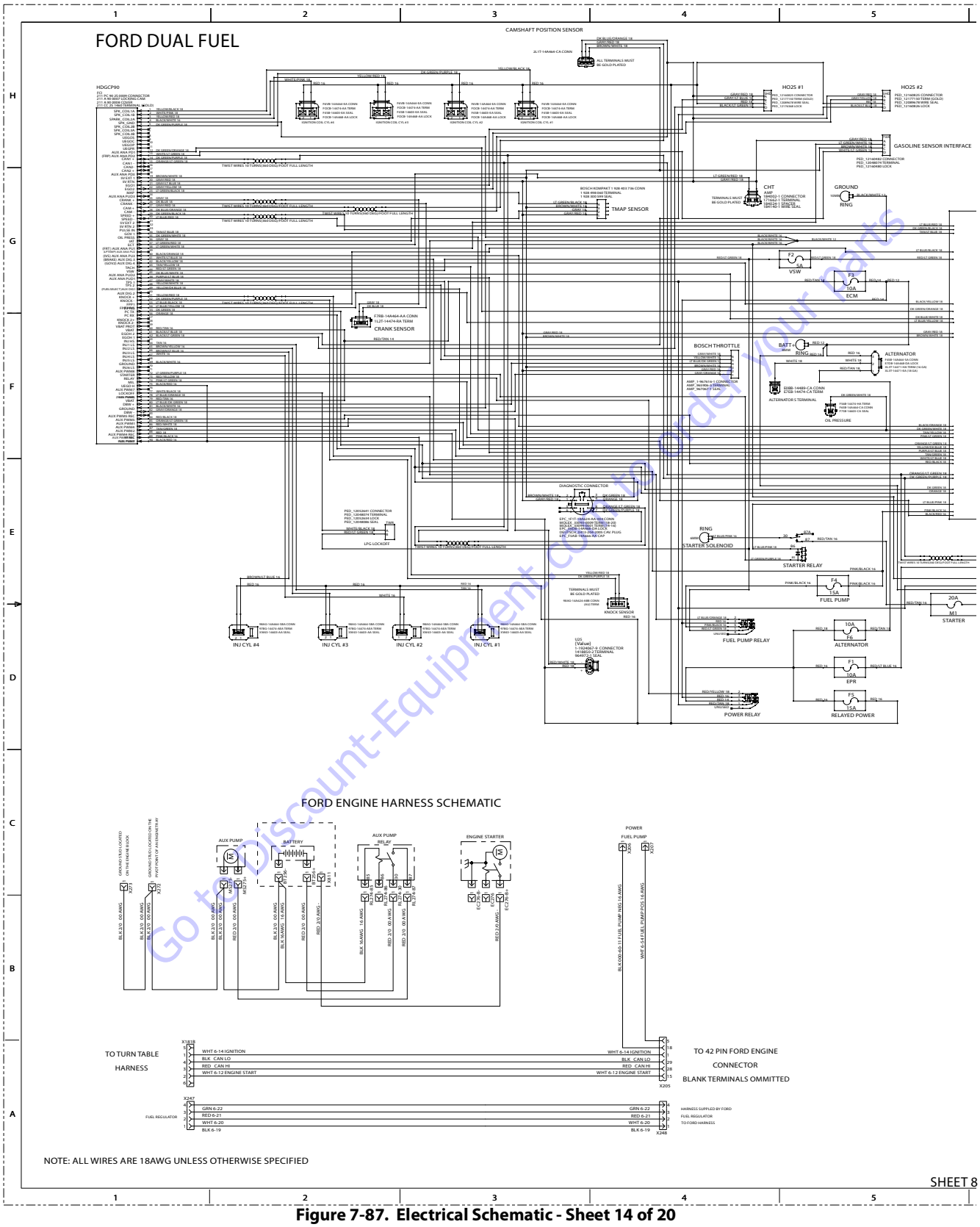


Figure 7-87. Electrical Schematic - Sheet 14 of 20

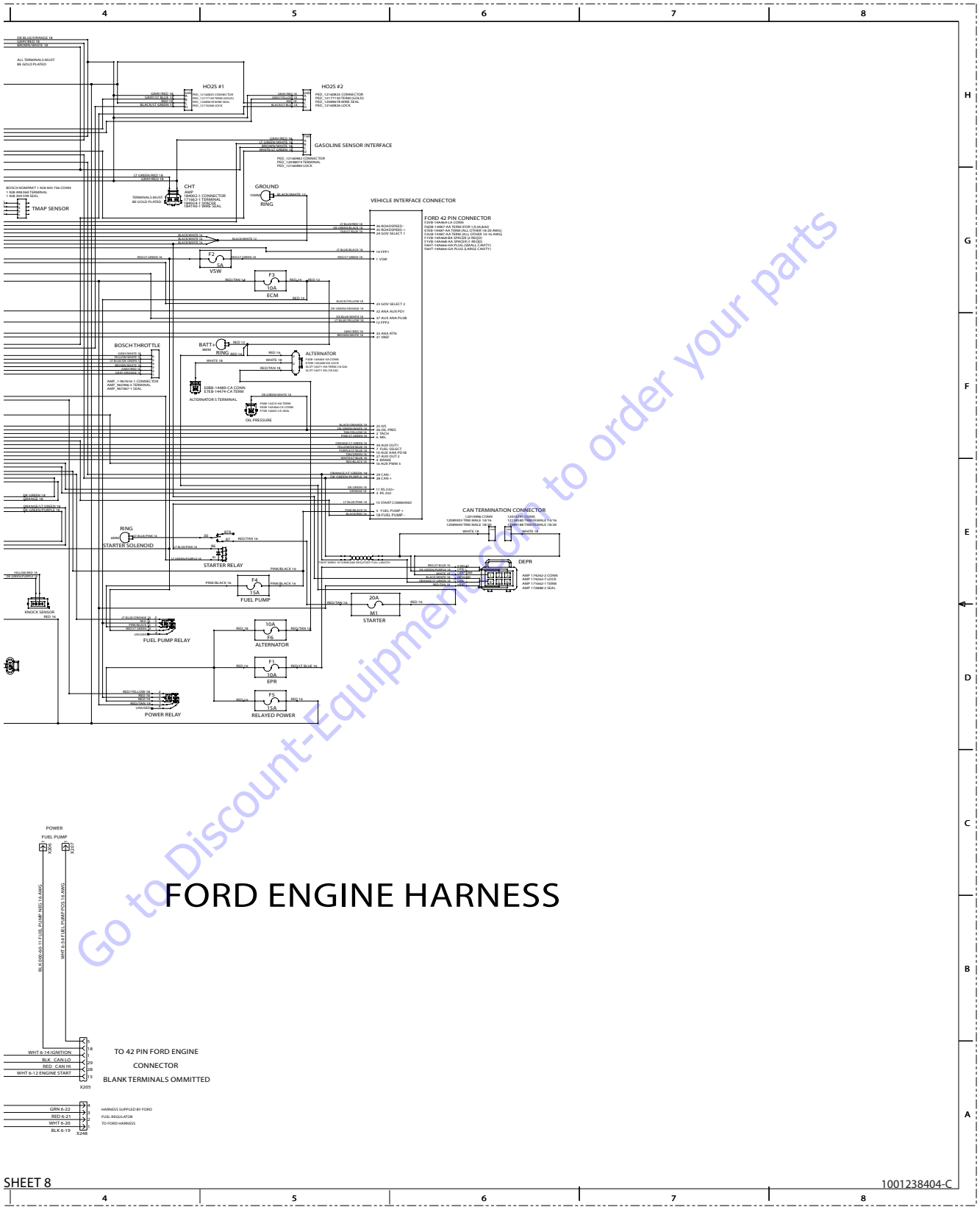


Figure 7-88. Electrical Schematic - Sheet15 of 20

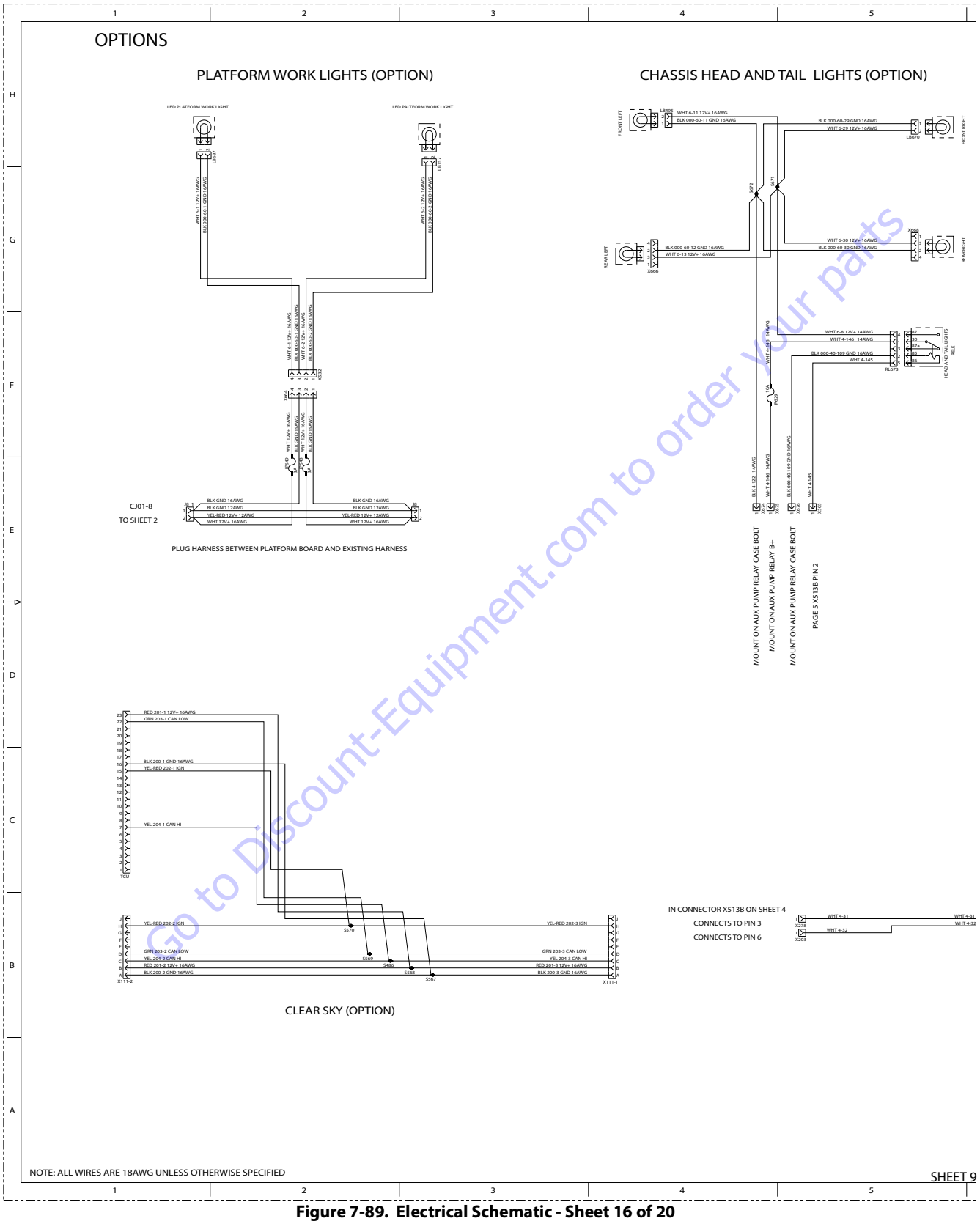


Figure 7-89. Electrical Schematic - Sheet 16 of 20

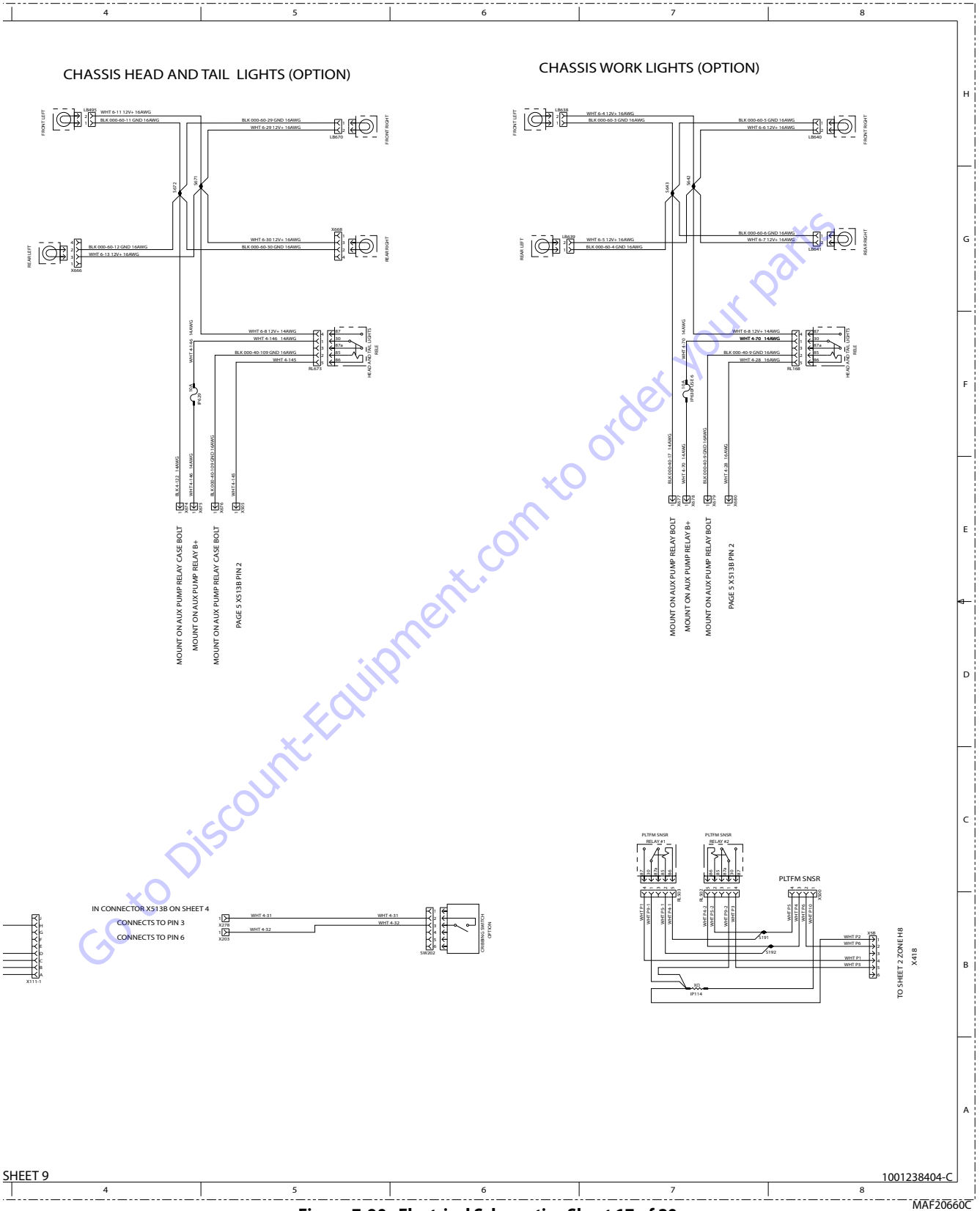


Figure 7-90. Electrical Schematic - Sheet 17 of 20

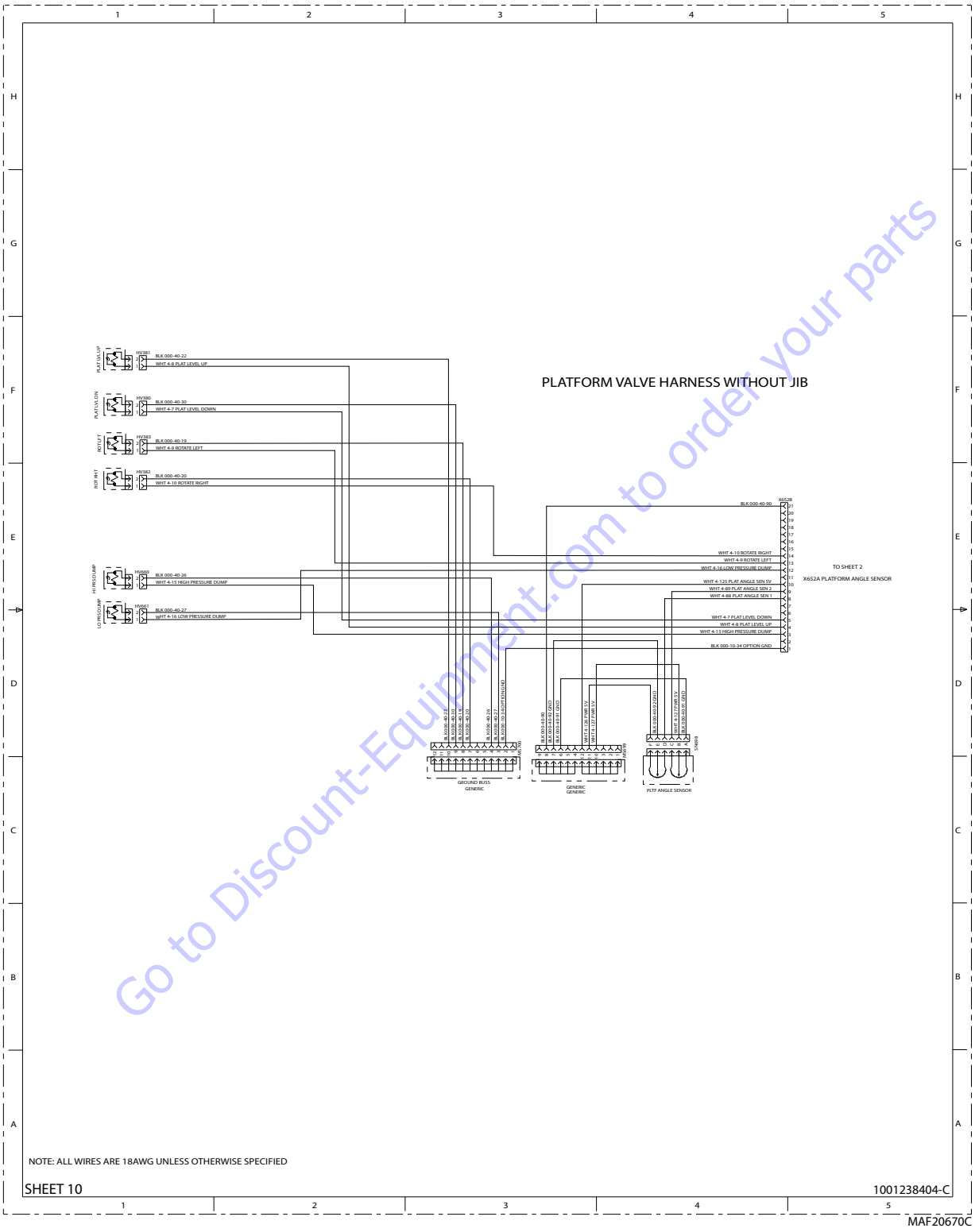


Figure 7-91. Electrical Schematic - Sheet 18 of 20

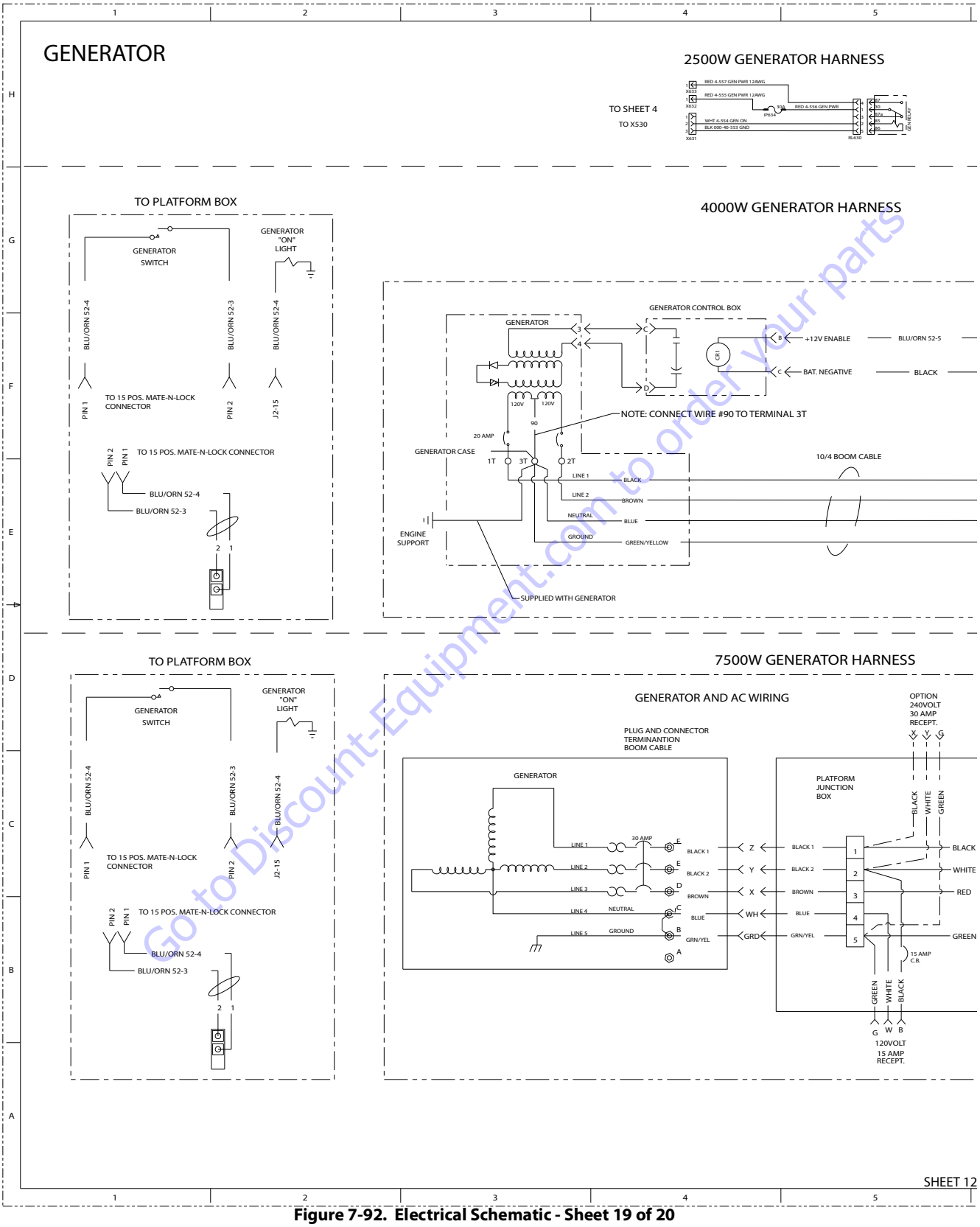


Figure 7-92. Electrical Schematic - Sheet 19 of 20

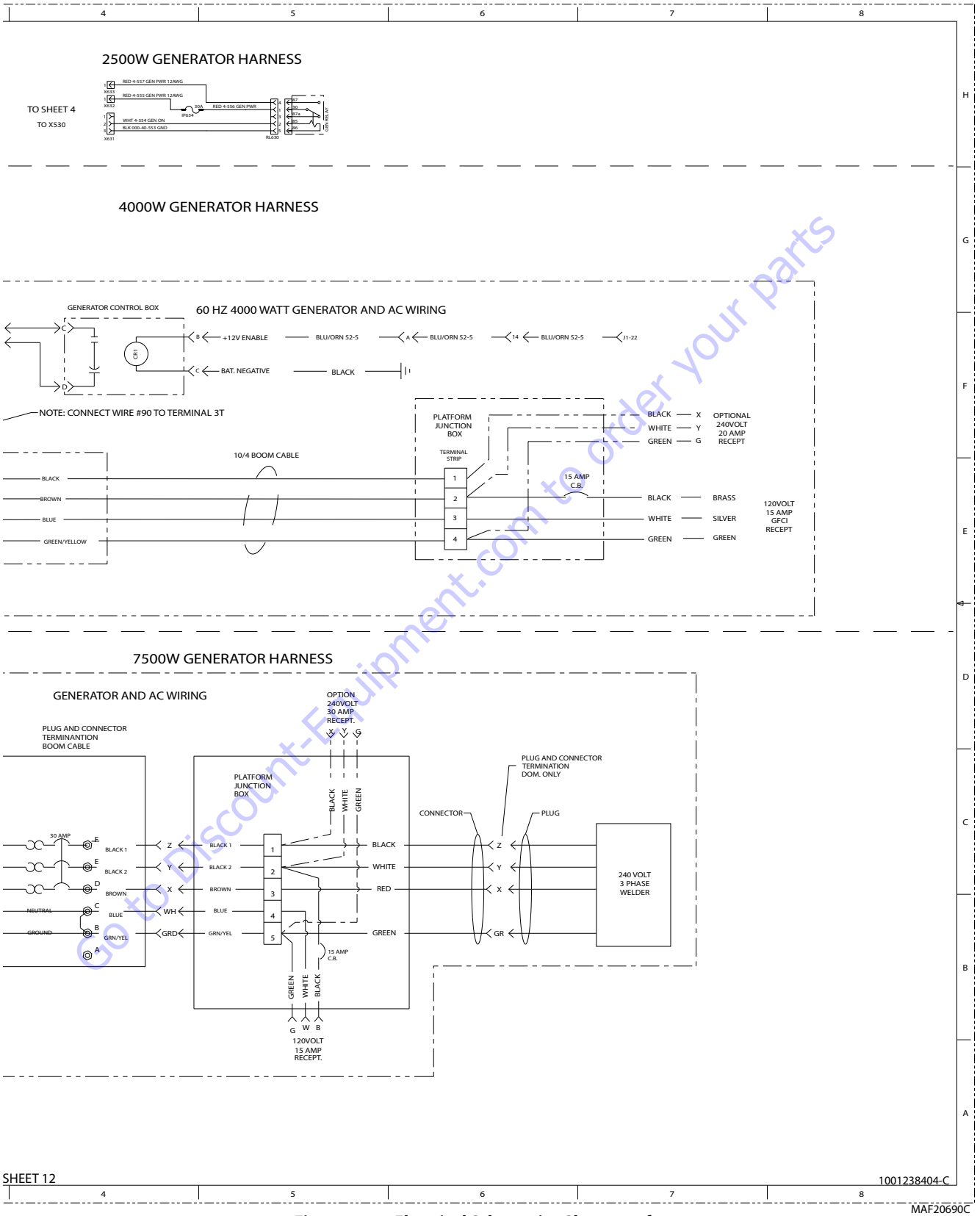


Figure 7-93. Electrical Schematic - Sheet 20 of 20

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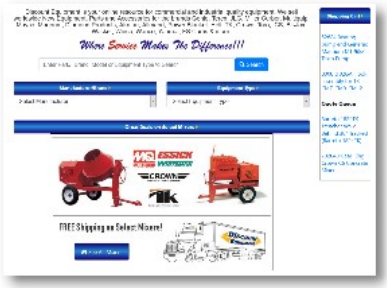

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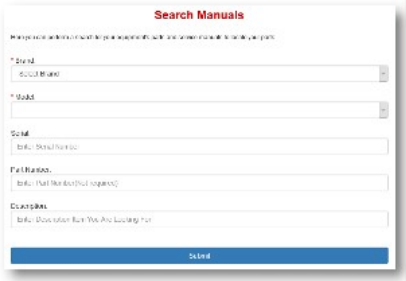

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